human energy®

gorgon gas development

gorgon and jansz feed gas pipeline and wells operations (commonwealth waters) environment plan

Document ID:	**GOR-COP-0902**
Revision ID:	**8.0**
Revision Date:	**21 March 2025**
Information Sensitivity:	**Company Confidential**

contents

tables

figures

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), this *Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) Environment Plan Summary* (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 the EP
35(7)(a)(i)	the location of the activity	Section 2.16, Section 3.15.1
35(7)(a)(ii)	a description of the receiving environment	Section 4
35(7)(a)(iii)	a description of the activity	Section 3
35(7)(a)(iv)	details of environmental impacts and risks	Section 7
35(7)(a)(v)	a summary of the control measures for the activity	Section 7
35(7)(a)(vi)	a summary of the arrangements for ongoing monitoring of the titleholder's environmental performance	Section 7.20
35(7)(a)(vii)	a summary of the response arrangements in the oil pollution emergency plan	Section 7.19, Ref. 2
35(7)(a)(viii)	details of consultation already undertaken, and plans for ongoing consultation	Section 6
35(7)(a)(ix)	details of the titleholder's nominated liaison person for the activity	Section 2.18

2 introduction

2.1 Overview

On behalf of the Gorgon Joint Venturers, Chevron Australia Pty Ltd (CAPL) is operating the Gorgon and Jansz–Io gas fields which includes offshore production wells and Feed Gas Pipeline infrastructure. The Feed Gas Pipeline infrastructure gathers and transports gas to the Gorgon Gas Treatment Plant (GTP) on Barrow Island.

This Environment Plan (EP) documents the assessment and management of potential environmental impacts and risks associated with operating the Gorgon and Jansz–Io production wells and Feed Gas Pipeline infrastructure, in Commonwealth waters and includes commissioning and start-up of infrastructure associated with Jansz–Io Compression (J-IC).

This EP has been prepared in accordance with the requirements of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (OPGGS Act) and Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (OPGGS(E)R) as administered and for regulatory acceptance by the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA).

2.2 Location

The Gorgon gas field is located within production licences WA-37-L and WA-38-L, ~130 km off the north-west coast of Western Australia (WA), and ~65 km north-west of Barrow Island (Figure 2-1).

The Jansz–Io gas fields are located within production licences WA-36-L, WA-39-L and WA-40-L ~200 km off the north-west coast of WA in water depths of ~1,350 m (Figure 2-1).

Detailed information regarding the location and layout of infrastructure is included in Section 3.15.

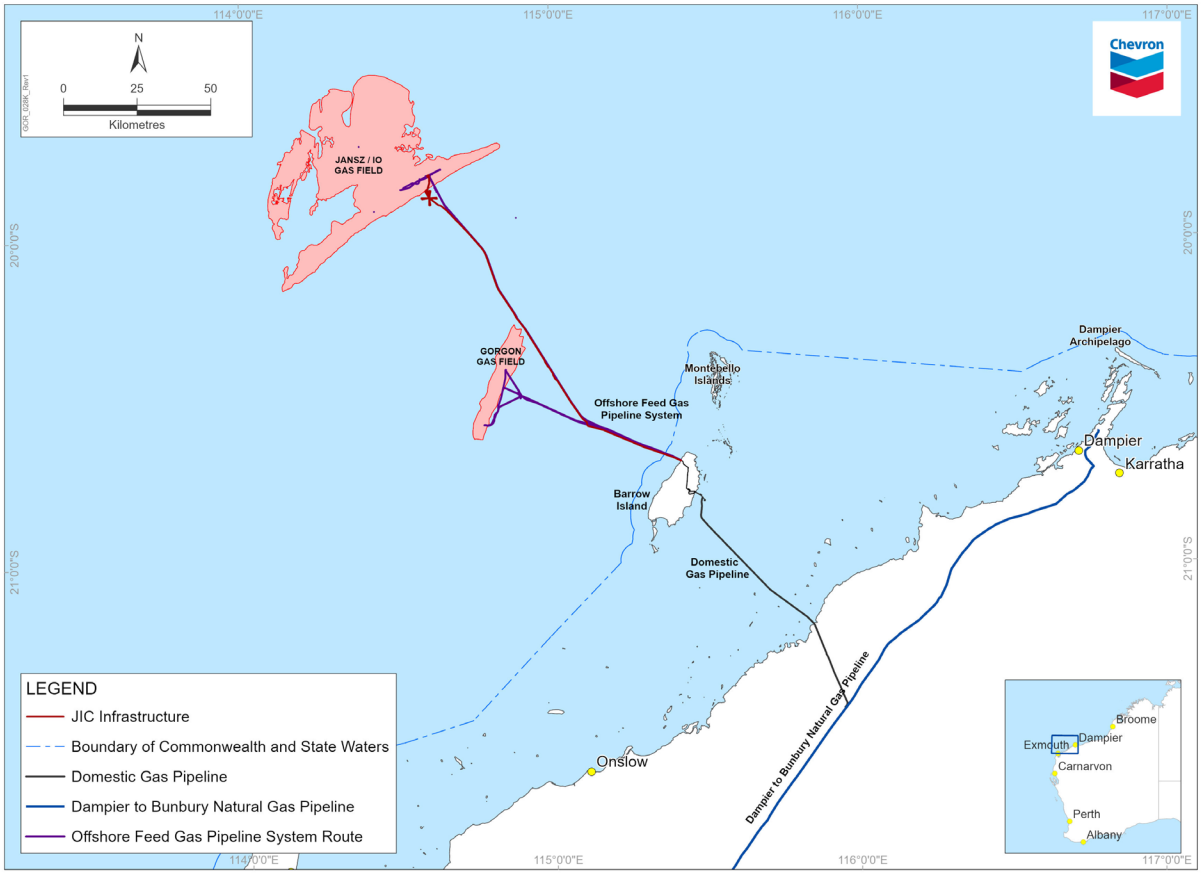


Figure 2-1: Location of Gorgon and Jansz–Io gas fields

2.3 Scope

2.3.1 In scope

This EP addresses activities in Commonwealth waters associated with the Gorgon and Jansz–Io production wells and the Feed Gas Pipeline infrastructure (the 'petroleum activity'); this hydrocarbon system is further described in Section 3.16. Specifically, this EP addresses the following primary activities associated with the Gorgon and Jansz–Io hydrocarbon system:

- commissioning and start-up (Section 3.17)
- operations (Section 3.18)
- inspection, maintenance, and repairs (IMR) (Section 3.19)
- decommissioning (Section 3.20)
- field support (Section 3.21).

2.3.2 Out of scope

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

- installation and pre-commissioning activities (associated with the GFP) completed in accordance with the NOPSEMA-accepted *Offshore Feed Gas Pipeline System Installation Management Plan*[1] (Ref. 3)
- installation and pre-commissioning activities (associated with GS2) which are covered under the NOPSEMA-accepted *Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan* (Rev 3.0) (Ref. 4)
- installation and pre-commissioning activities (associated with J-IC) which are covered under the NOPSEMA-accepted *Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan* (Rev 6.0) (Ref. 7)
- installation for the additional umbilical bundle (GBUP) between the offshore fields and Barrow Island, which is covered under NOPSEMA-accepted *Gorgon Umbilical Environment Plan* (Rev 3.0) (Ref. 8)
- drilling, completion, and well maintenance activities (associated with both the GFP and GS2) which are covered under the NOPSEMA-accepted *Gorgon and Jansz-Io Drilling, Completions and Well Maintenance Program Environment Plan* (Ref. 9)
- commissioning, start-up and operation activities within State waters which are covered under the DEMIRS-accepted *Gorgon and Jansz Feed Gas Pipeline Operations Environment Plan* (State) (Ref. 10)
- installation and pre-commissioning activities associated with J-IC within State waters, which are covered under the DEMIRS-accepted *Gorgon and Jansz Feed Gas Pipeline Umbilicals Installation Environment Plan (*State) (Ref. 11)
- vessels (including emergency response vessels) transiting to or from the operational area (OA) (refer to Section 3.15.1 for definition of the OA); these vessels are deemed to be operating under the Commonwealth *Navigation Act 2012* and are not performing the petroleum activity
- end of facility life (EOFL) decommissioning and removal of infrastructure under Section 572(3) of the Commonwealth OPGGS Act; these activities are not scheduled to occur within the 5-year in-force period of this EP (refer to Section 3.20).

2.4 Titleholder details

CAPL is the nominated titleholder of the production and pipeline licences on behalf of the titleholder companies listed in Table 2-1.

Section 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 one of the registered titleholders or contact details for the registered titleholders; this notification is to occur within 30 days of such a change.

The contact details for the nominated liaison person for this EP is listed in Table 2-2. Regulation 23(3) of the OPGGS(E)R requires that CAPL notifies NOPSEMA if the titleholder's nominated liaison person or contact details for the nominated liaison person changes.

[1] Activities under this EP have been completed and the notification of completion has been accepted by NOPSEMA as per the requirements of Regulation 46 of the OPGGS(E)R.

Table 2-1: Titleholder details

Titles	Details	Titleholders	Nominated Titleholder	Address
WA-36-L WA-37-L WA-38-L WA-39-L WA-40-L WA-19-PL WA-20-PL	Production Licence Production Licence Production Licence Production Licence Production Licence Pipeline Licence Pipeline 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 (ACN: 086 197 757)	1 The Esplanade Perth WA 6000

Table 2-2: Titleholders' nominated liaison person

Name	Kate Yates
Company	Chevron Australia Pty Ltd
ACN	086 197 757
Position	Barrow Island Operations Manager
Business Address	1 The Esplanade, Perth WA 6000
Telephone Number	+61 8 9216 4000
Email Address	feedback@chevron.com

2.5 Environmental management framework

CAPL's operations are managed in accordance with Chevron Corporation's Operational Excellence Management System (OEMS), which is described in Section 7.20.

2.5.1 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).

2.5.2 Relevant requirements

In accordance with regulation 21(4) of the OPGGS(E)R, the legislative framework relevant to the petroleum activity and are relevant to the environmental management of the activity are provided in Table 2-3 and Table 2-4.

Table 2-3: Commonwealth legislative requirements

Legislation	Description	Requirements relevant to the risks associated with the petroleum activity	Demonstration of how requirements are met
Australian Maritime Safety Authority Act 1990	Aims to promote maritime safety, protect the marine environment from pollution from ships or other environmental damage caused by shipping, and 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 Oil Pollution Emergency Plan (OPEP) (Ref. 2).
Biosecurity Act 2015 Biosecurity Regulations 2016	Provides biosecurity protection in Australian waters beyond territorial limits	Pre-arrival information must be reported through the Maritime Arrivals Reporting System (MARS) before arrival in Australian waters	Section 7.8
		Australian Ballast Water Management Requirements (Ref. 12)	
Environmental Protection Act 1986 (EP Act)	Provides for the prevention, control, and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment.	The Gorgon Gas Development was approved under Part IV of the EP Act and is subject to approval conditions. The conditions are intended for the management of the Gorgon Gas Development as a whole, including activities which are beyond the scope of this EP.	Section 7.5 and Section 7.5.6
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) EPBC Regulations 2000	Provides for the protection and management of nationally and internationally important flora, fauna, ecological communities, and heritage places	The EP must describe matters protected under Part 3 of the EPBC Act and assess any impacts and risks to these protected matters	Section 4 and Section 6.15
		EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans	Section 7.2 and Section 7.7
		Injury or fatality caused to EPBC-listed fauna shall be reported	Section 8.18.2
		The Gorgon Gas Development was approved under EPBC Act and is subject to approval conditions. The conditions under EPBC 2003/1294 and EPBC 2008/4178 are intended for the management of the Gorgon	Section 7.5.6

Legislation	Description	Requirements relevant to the risks associated with the petroleum activity	Demonstration of how requirements are met
		Gas Development as a whole, including activities which are beyond the scope of this EP.	
		The Jansz–Io Deepwater Gas Field Development was approved with conditions under the EPBC Act in 2006. There are two approval conditions under EPBC 2005/2184: • Condition 3 which relates to the requirement for an accepted EP to be in place before commencing decommissioning • Condition 8 which relates to the commencement of the Jansz–Io Deepwater Gas Field Development (this requirement has been met and is considered completed).	No decommissioning is scheduled to occur during the in-force period of this EP. However, the approach to decommissioning for the Gorgon and Jansz assets is described in Section 3.20
Navigation Act 2012	Provides for vessel and seafarer safety, and marine pollution prevention	Notice to Mariners	Section 7.1 and Section 7.17
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 30—Prevention of collisions	Section 7.17
		Marine order 91—Marine pollution prevention—oil	Section 7.9, Section 7.15 and Section 7.17
		Marine order 95—Marine pollution prevention—garbage	Section 7.9 and Section 7.11
		Marine order 96—Marine pollution prevention—sewage	Section 7.9
		Marine order 97—Marine pollution prevention—air pollution	Section 7.4
		Marine order 98—Marine pollution prevention—anti-fouling systems	Section 7.8
National Greenhouse and Energy Reporting	The NGER Act establishes the national scheme for the reporting of	Greenhouse gas emissions, energy consumption and energy production from Petroleum	Section 7.5

Legislation	Description	Requirements relevant to the risks associated with the petroleum activity	Demonstration of how requirements are met
Act 2007 (NGER Act)	greenhouse gas emissions, energy production and energy consumption.	Activity program will be reported under the NGER Act.	
Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGS Act) OPGGS Environment Regulations 2023 (OPGGS(E)R)	The OPGGS(E)R under the OPGGS Act requires a titleholder to have an accepted EP in place prior to commencement of a petroleum activity The regulations ensure petroleum activities are undertaken in an ecologically sustainable manner in accordance with an EP	An EP for a petroleum activity must be accepted by NOPSEMA before activities commence	This EP, including the OPEP (Ref. 2) and Operational and Scientific Monitoring Plan (OSMP) (Ref. 17)
OPGGS (Resource Management and Administration) Regulations 2011	These regulations require a titleholder to have an accepted Well Operations Management Plan (WOMP) in place The purpose of a WOMP is to ensure systems are in place to manage well integrity and well activities	A WOMP for a petroleum well activity must be accepted by NOPSEMA before activities commence	WOMP (Ref. 18)
Underwater Cultural Heritage Act 2018 (UCH Act)	Provides protection for shipwrecks, sunken aircraft and other cultural heritage sites in Australian waters	Identification of the presence of protected cultural heritage sites and assessment of any impacts and risks to these sites	Section 4 and Section 6.15

Table 2-4: Standards and guidelines

Standard / guideline	Description	Requirements relevant to the risks associated with the petroleum activity	Demonstration of how requirements are met
Australian Ballast Water Management Requirements (Ref. 12)	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	Ballast water management requirements for vessels, including having a ballast water management plan and certificate (unless an exemption applies).	Section 7.8

Standard / guideline	Description	Requirements relevant to the risks associated with the petroleum activity	Demonstration of how requirements are met
	Ships' Ballast Water and Sediments 2004 (the Ballast Water Management Convention).		
Australian Biofouling Management Requirements (Ref. 13**)**	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 7.8
Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Ref.20)	International Maritime Organization (IMO) guidelines for global management of biofouling	Requires a biofouling management plan and record book to be available and maintained	Section 7.8
National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Ref. 15)	Commonwealth guidance document has been developed to assist industry manage the risk of marine pest translocation and introduction via biofouling	Requires biofouling risk assessments to be completed	Section 7.8
National Light Pollution Guidelines for Wildlife (Ref. 16)	Outlines the process to be followed where there is the potential for artificial lighting to affect wildlife; applies to new projects, lighting upgrades and where there is evidence of wildlife being affected by existing artificial light	The EP must assess if artificial lighting is likely to affect wildlife and identify the management tools to minimise and mitigate impacts and risks	Section 7.5.6

3 description of the petroleum activity

3.1 Overview

This section provides a description of the petroleum activity as required under regulation 21(1) the OPGGS(E)R. The description of the petroleum activity is presented in six sections:

- the hydrocarbon system—includes the infrastructure (including the wells, subsea compression station [SCSt], subsea compression manifold structure [SCMS], other subsea structures, flowlines, and production pipelines) used for gathering and transporting hydrocarbons to the GTP on Barrow Island, and other supporting infrastructure (umbilicals, pipelines, field control station [FCS], etc.) (Section 3.16)
- commissioning and start-up—the verification and testing of infrastructure and the introduction of hydrocarbons to the system (Section 3.17)
- operations—the gathering and transport of hydrocarbons and other fluids from the subsea wells to the GTP (Section 3.16)
- IMR—undertaken to ensure the integrity of hydrocarbon system (Section 3.19)
- decommissioning—long-term planning for decommissioning of redundant infrastructure (Section 3.20)
- field support—includes IMR vessel operations, and helicopters for personnel transfers (Section 3.21).

3.1.1 Operational area

The location of the Gorgon and Jansz–Io gas fields and the Feed Gas Pipeline system is described in Section 2.16 and shown in Figure 2-1.

The Operational Area (OA) for the petroleum activity (Figure 3-1) is defined as:

- petroleum titles WA-36-L, WA-37-L, WA-38-L, WA-39-L, WA-40-L
- a 1.5 km wide corridor either side of the Gorgon and Jansz–Io production pipelines within Commonwealth waters
- a 1.5 km wide corridor either side of infield production flowlines and the M3 and M4 umbilicals.

It is within this OA that the petroleum activity defined within Section 3 of this EP will be undertaken. If required, CAPL will obtain any necessary permit or authorisation for works in areas of the OA that are outside of the petroleum titles described in this EP.

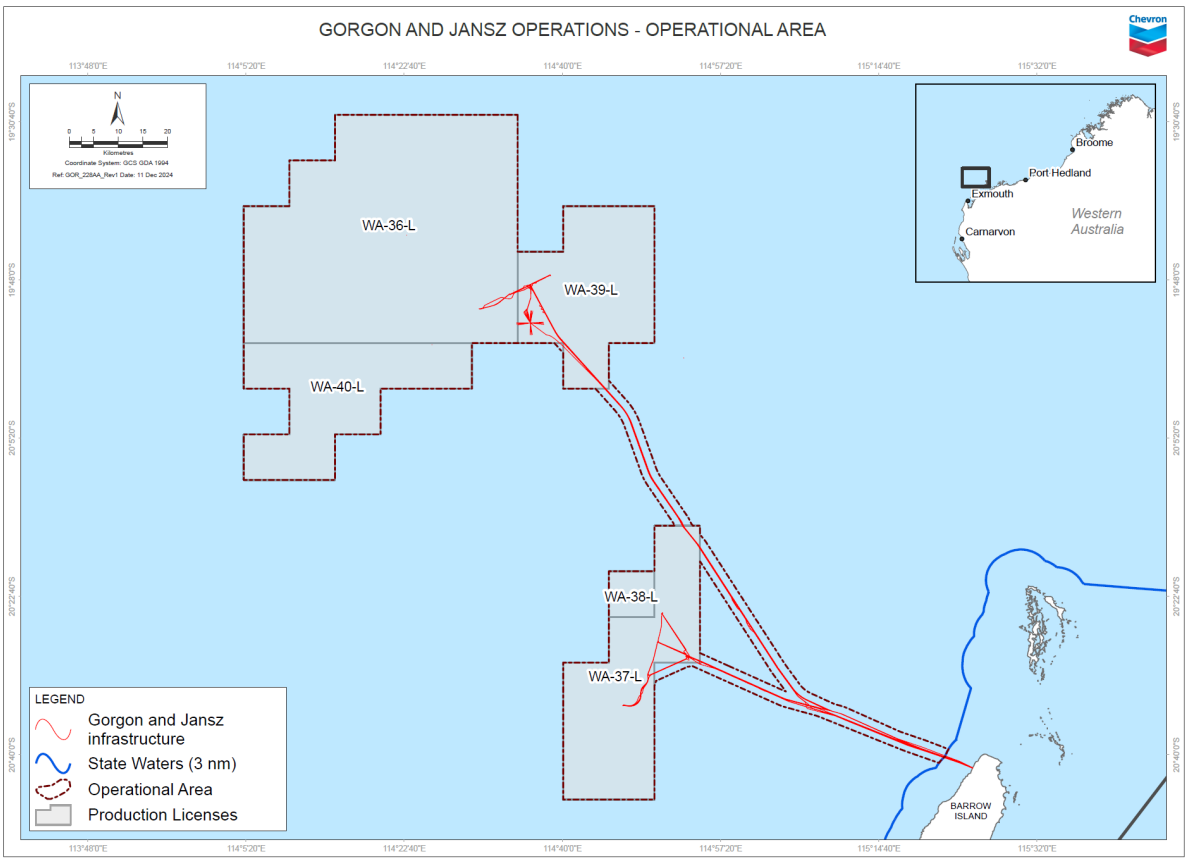


Figure 3-1: Operational Area

3.1.2 Timing

CAPL is currently operating the Gorgon and Jansz–Io production wells and Feed Gas Pipeline infrastructure.

Commissioning of infrastructure associated with J-IC is anticipated to commence from 2026, with start-up and operations expected from 2027 or 2028.

Temporary power supply (described in Section 3.16.12), will be deployed as needed should electrical power be unavailable from the main production umbilicals that serve the Gorgon and Jansz–Io fields. The timings above are indicative and subject to potential delays caused by weather events, vessel availability, and other unforeseen factors.

Operations for the Gorgon Gas Development are expected to continue for the nominal operational design life (~50 years) and in accordance with existing Commonwealth environmental approvals. IMR activities may occur at any time during commissioning, start-up, and operations.

Activities covered by this EP can occur 24 hours a day and 7 days a week.

3.2 Hydrocarbon facilities

3.2.1 Overview

The hydrocarbon system includes infrastructure for gathering and transporting hydrocarbons from the production wells to the GTP on Barrow Island and other

supporting infrastructure in Commonwealth waters. This includes infrastructure associated with:

- Gorgon Project – initial field development
- Gorgon Stage 2 (GS2)
- Gorgon Barrow Umbilical Project (GBUP)
- Jansz–Io Compression Project (J-IC)
- Jansz Barrow Umbilical Project (JBUP)
- Temporary power supply infrastructure (subsea battery system and downline).

3.2.1.1 Gorgon Project – initial field development

The initial field development comprised of wells and subsea infrastructure in the Gorgon and Jansz–Io gas fields, and the installation of Feed Gas Pipeline infrastructure. The Gorgon production pipeline and umbilical route from the Gorgon field heads south-east toward Barrow Island. The pipeline and umbilical then crosses the Halyard Electrohydraulic Umbilical (EHU) at a water depth of ~95 m and continues south-east to Barrow Island. Flowlines and pipelines run from the drill centres (initial development included three drill centres – Gorgon M1, Gorgon M2 and Gorgon M3) to the Gorgon midline pipeline termination structure (PTS).

The Jansz–Io production pipeline and umbilical route from the Jansz–Io gas field traverses the scarp between the Chrysaor Canyons and the Gorgon gas field, on to the continental shelf. The pipeline and umbilical then cross the Halyard EHU at a water depth of ~83 m and then converge with the Gorgon production pipeline and umbilical at ~70 m water depth. Flowlines and pipelines run from the drill centres (initial development included two drill centres – Jansz DC-1 and Jansz DC-2) to the Jansz–Io midline PTS.

A schematic diagram showing the layout of the GFP subsea infrastructure is presented in Figure 3-2.

3.2.1.2 Gorgon Stage 2

GS2 supplemented the initial field development with additional subsea infrastructure:

- three tiebacks (from GS2 infill wells) to the existing manifold at the Gorgon M1 drill centre
- four tiebacks (from GS2 production wells) to the GOR-M4 manifold at the new Gorgon M4 drill centre, which in turn is connected to the existing Gorgon gas gathering system via a M4 PTS and associated flowlines and pipelines
- four tiebacks (from GS2 production wells) to the new Jansz DC-3 drill centre with a combined manifold / PTS, which in turn is connected to the existing Jansz–Io gas gathering system via associated flowlines and pipelines
- two infield control umbilicals for the Gorgon M4 and Jansz DC-3 drill centres, and all interconnecting flying leads to allow control of the facility.

A schematic diagram showing the layout of the GS2 subsea infrastructure within the Gorgon and Jansz–Io fields is presented in Figure 3-3 and Figure 3-4 respectively.

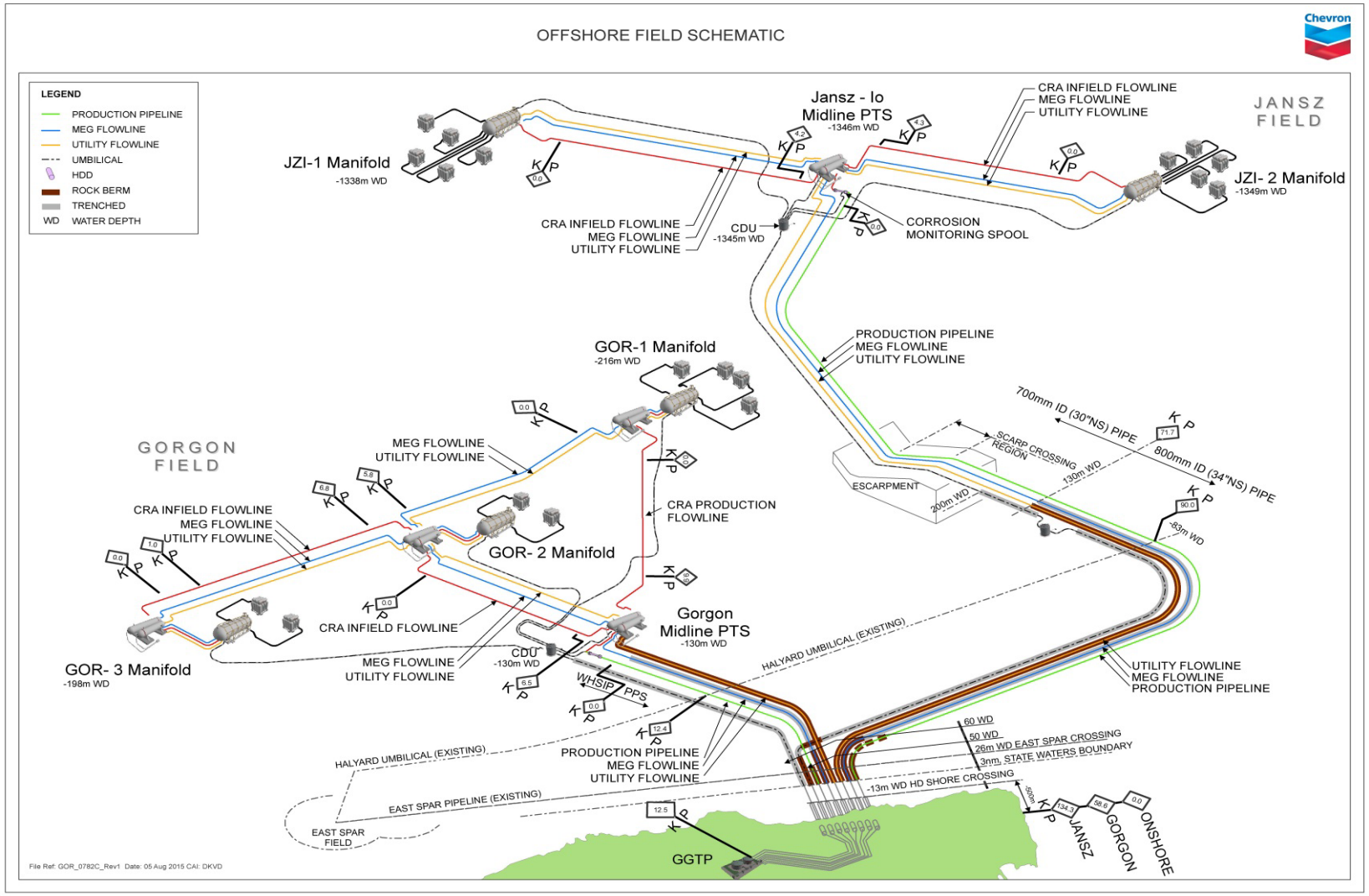


Figure 3-2: Schematic of the Gorgon and Jansz–Io subsea infrastructure associated with the initial development

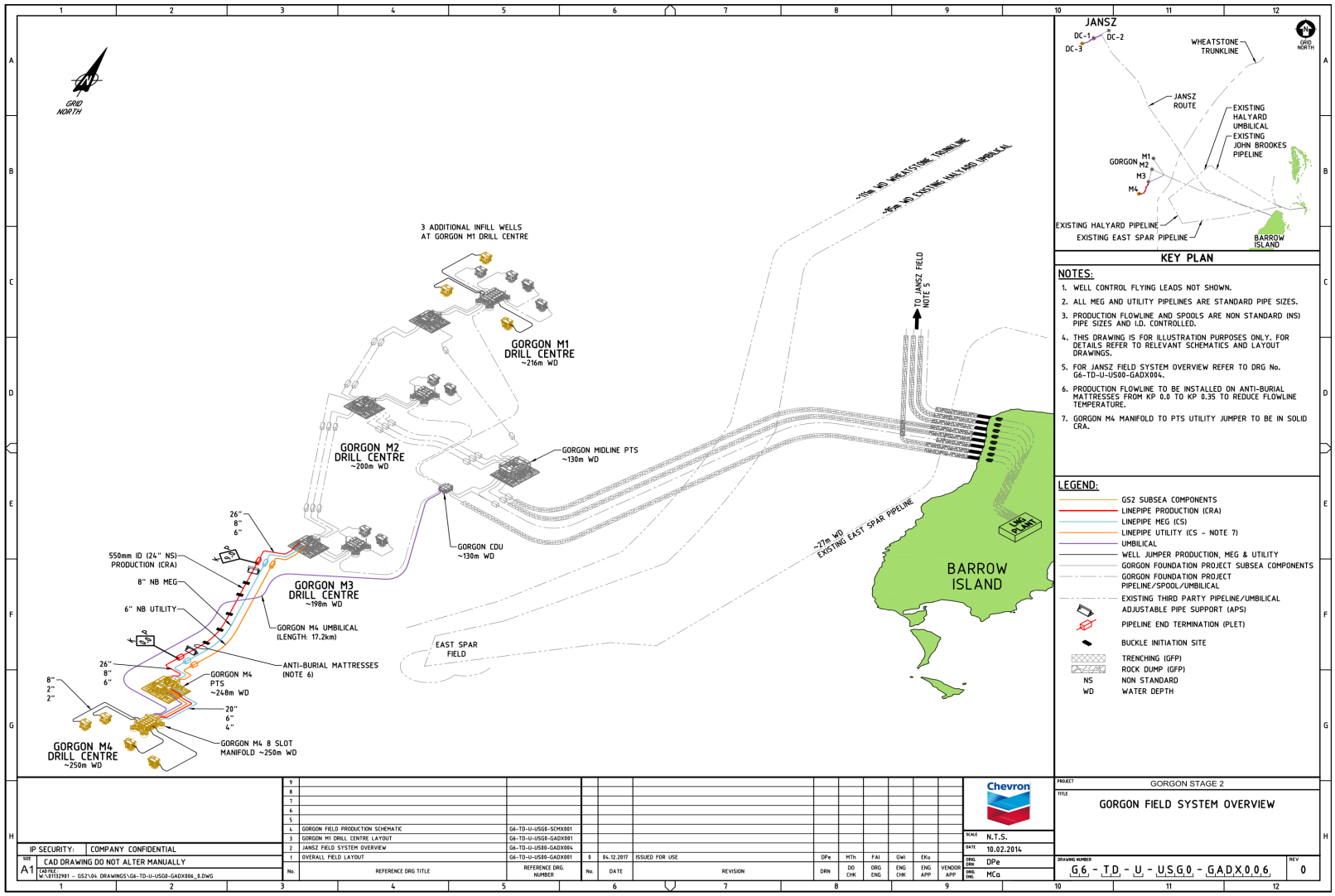


Figure 3-3: Schematic of the GS2 infrastructure within the Gorgon field

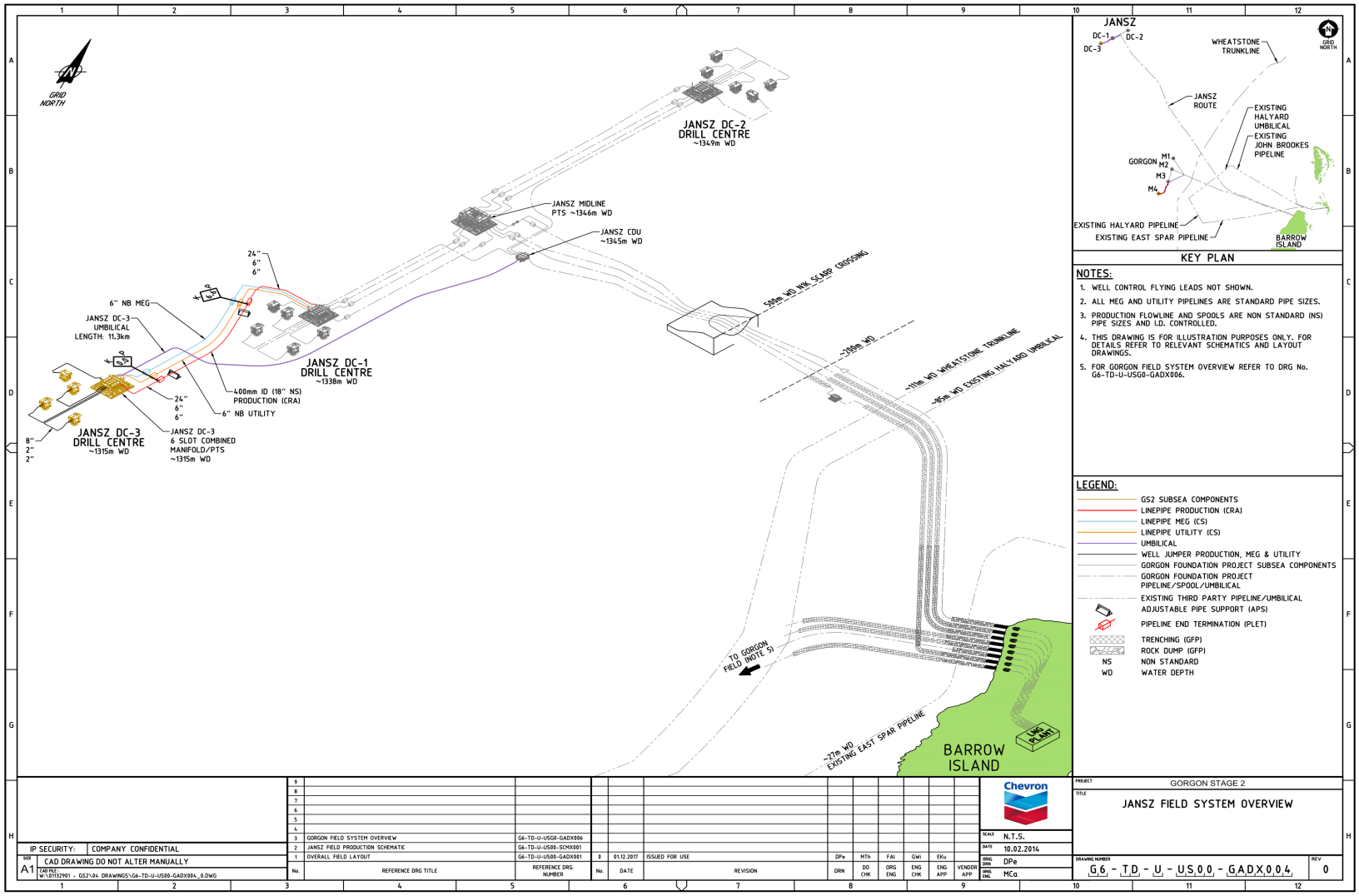


Figure 3-4: Schematic of the GS2 infrastructure within the Jansz–Io field

3.2.1.3 Jansz–Io Compression

An overview of the J-IC field layout is provided in Figure 3-5, with indicative locations of key infrastructure provided in Table 3-1. J-IC comprises of the following key components:

- a SCSt to separate, compress, and pump Jansz–Io production fluids
- a Subsea Compression Manifold Structure (SCMS) and subsea tie in spools to allow connection of the SCSt to the Jansz–Io Midline PTS and accommodate intelligent pigging and potential future tie-ins
- a barrier fluid flying lead (BFFL) to supply barrier fluids[2] to the SCSt from the existing Jansz CDU
- a floating FCS and mooring system to support the power and control requirements of the SCSt along with supporting power and control requirements for existing infrastructure and some provision for potential future tie-ins
- a High Voltage Submarine Cable (HVSC) to transmit power and communications from Barrow Island to the FCS
- medium Voltage (MV) umbilicals to transmit MV power and communications between the FCS and SCSt

Table 3-1: Indicative infrastructure locations and indicative water depths

Infrastructure	Latitude^	Longitude^	Approximate dimensions*	Approximate water depth
SCSt	19°48’35.00” S	114°36’20.84” E	w: 61 m l: 67 m h: 20.7 m	1,345 m
SCMS	19°48’32.44” S	114°36’20.24” E	w: 30.0 m l: 40.0 m h: 8.4 m	1,345 m
FCS	19°52’43.67” S	114°36’28.91” E	w: 83.3 m l: 83.3 m h: 51.0 m	1,290 m
HVSC	From State waters boundary to FCS (refer to Figure 3-5)		l: 130,000 m d: 0.2 m	~25–1,290 m
MV umbilicals	From FCS to SCSt (refer to Figure 3-5)		l: 10,200 m d: 0.2 m	1,290–1,345 m

^ Coordinates provided in GDA94.
** Dimensions (w–width; l–length; h–height; d–diameter)*

[2] Barrier fluids used will be a water-based hydraulic fluid.

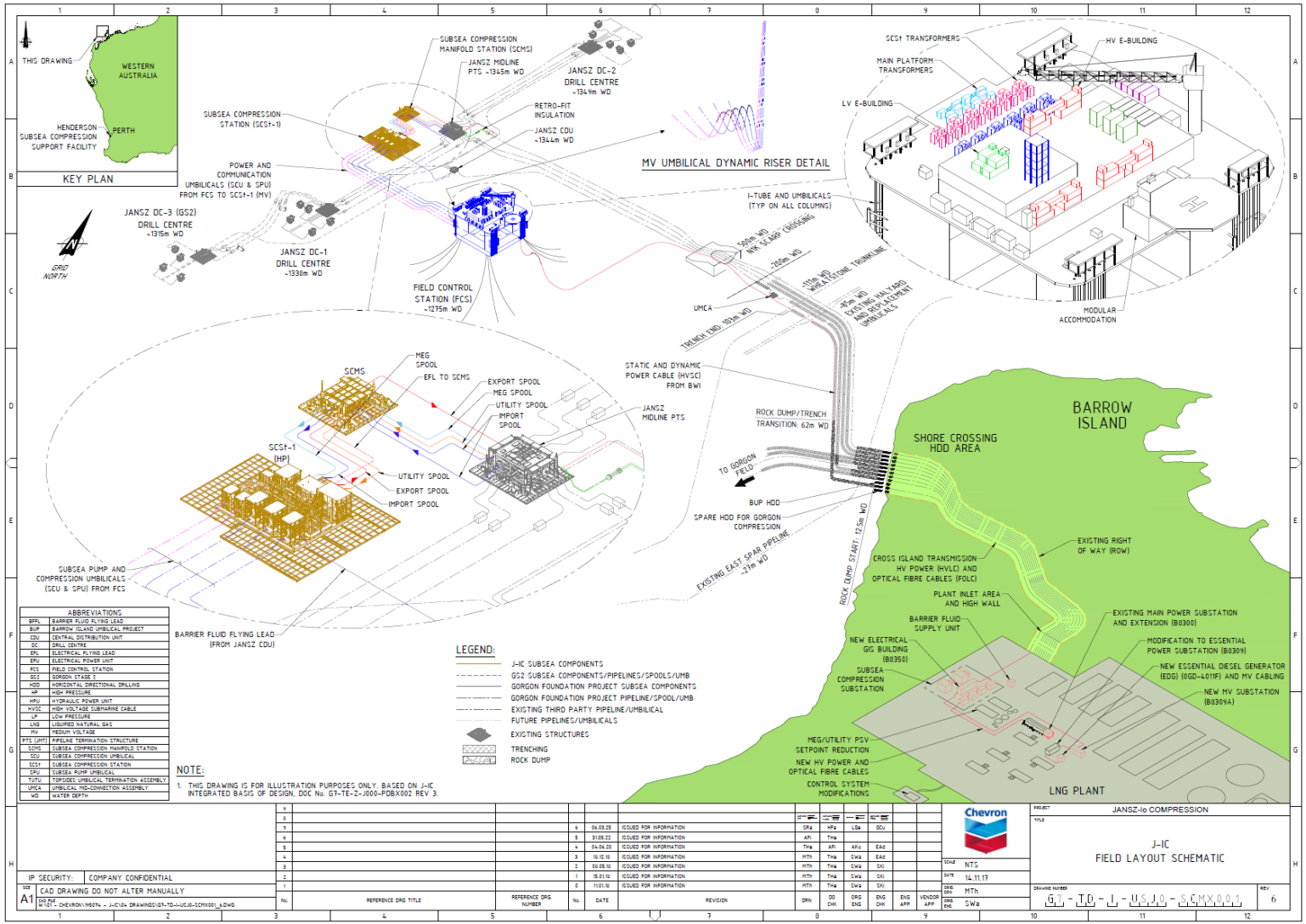


Figure 3-5:Schematic of J–IC field layout

3.2.1.4 Hydrocarbon properties

Table 3-2 summarises the hydrocarbon properties of the condensate in the Gorgon and Jansz–Io gas fields informed by compositional reservoir analyses and assays conducted during well flowbacks (Ref. 7 and Ref. 8). Ongoing analysis of hydrocarbon properties indicate that the compositional analysis presented in Table 3-2 is accurate.

Table 3-2: Hydrocarbon properties

Property	Gorgon	Jansz–Io
Classification	Group II, light persistent oil	Group I, non-persistent oil
Density	848 kg/m^3 at 15 °C	743.1 kg/m^3 at 15 °C
API gravity	35.3 °API	47.9 °API
Dynamic viscosity	2.4 cP at 20 °C	1.2 cP at 25 °C
Pour point	−9 °C	−30 °C
Gas to condensate ratio	5.9 bbl/MMscf	4.09 bbl/MMscf

3.2.1.5 Flow rates

All Gorgon wells have a steady-state design gas flow rate of 270 MM – 300 MM scfd, and all Jansz–Io wells have a steady-state design gas flow rate of 240 MMscfd. Temporary increases to individual well flow above this level may be undertaken from time to time on a case-by-case basis, following the management of change process (Section 8.17.2.2) and internal procedures which outline the process for assessing changes to safe operating limits.

3.2.2 Production wells

Under the current field development there are a total of 15 production wells centred around four drill centres within the Gorgon gas field, and a total of 14 production wells centred around three drill centres for the Jansz–Io field (Table 3-3). There are spare well slots at each of the subsea production manifolds available for future well tie-ins.

Each well is fitted with a subsea tree, which includes a subsea control module (SCM) and an arrangement of valves, controls, and instrumentation. Rigid well jumpers connect each tree to the production manifolds at the drill centres.

Note: Although the production wells are described here, the construction of these wells and the installation of trees and associated infrastructure are outside the scope of this EP (Section 2.17.2).

Table 3-3: Indicative locations and water depths for the production wells

Well name	Associated drill centre	Latitude	Longitude	Approximate water depth
Gorgon field				
GOR-1A	Gorgon M1	20°24’29.13” S	114°50’56.00” E	216 m
GOR-1B		20°24’27.69” S	114°50’57.03” E	216 m
GOR-1C		20°24’28.37” S	114°50’56.84” E	215 m
GOR-1D		20°24’28.61” S	114°50’57.73” E	215 m
GOR-1E		20°24’29.17” S	114°50’58.31” E	215 m

Well name	Associated drill centre	Latitude	Longitude	Approximate water depth
GOR-1F		20°24’30.02” S	114°50’58.54” E	215 m
GOR-1G		20°24´29.87” S	114°50’59.26” E	216 m
GOR-2B	Gorgon M2	20°27´36.54” S	114°50’31.39” E	199 m
GOR-2C		20°27´37.10” S	114°50’31.96” E	199 m
GOR-3B	Gorgon M3	20°31’11.28” S	114°49’25.85” E	199 m
GOR-3C		20°31’11.84” S	114°49’26.42” E	199 m
GOR-4C	Gorgon M4	20°34’38.62” S	114°46’38.40” E	250 m
GOR-4D		20°34’38.34” S	114°46’37.54” E	250 m
GOR-4E		20°34’37.79” S	114°46’36.95” E	250 m
GOR-4F		20°34’36.94” S	114°46’36.39” E	250 m
Jansz–Io field				
JZI-1B	Jansz DC-1	19°49’36.51” S	114°34’13.94” E	1,338 m
JZI-1C		19°49’36.40” S	114°34’12.96” E	1,338 m
JZI-1D		19°49’35.44” S	114°34’12.47” E	1,338 m
JZI-1E		19°49’34.62” S	114°34’12.95” E	1,338 m
JZI-1F		19°49’33.97” S	114°34’12.93” E	1,338 m
JZI-2B	Jansz DC-2	19°47’28.31” S	114°38’40.03” E	1,349 m
JZI-2C		19°47’28.40” S	114°38’41.00” E	1,349 m
JZI-2D		19°47’29.36” S	114°38’41.54” E	1,349 m
JZI-2E		19°47’30.17” S	114°38’41.01” E	1,349 m
JZI-2F		19°47’30.83” S	114°38’41.04” E	1,349 m
JZI-3C	Jansz DC-3	19°51’11.42” S	114°30’54.64” E	1,315 m
JZI-3D		19°51’10.40” S	114°30’54.33” E	1,315 m
JZI-3E		19°51’09.69” S	114°30’54.97” E	1,315 m
JZI-3F		19°51’09.04” S	114°30’55.05” E	1,315 m

3.2.2.1 Environment Plan interface and well custody

When wells are under the custodianship of the Gorgon Operations work group, the wells will be operated and managed in accordance with this EP. However, in the event that a well integrity event occurs, the custodianship will be handed over to the ABU Wells work group and activities completed in accordance with the *Gorgon and Jansz-Io Drilling, Completions and Well Maintenance Program Environment Plan* (Ref. 9). Figure 3-6 shows the handover points when internal custodianship of the Gorgon and Jansz–Io production wells are exchanged.

The well custodian is the work group that most recently took control of the well by signing the well handover certificate. The work group taking custody will be provided with a complete set of ‘as-built’ and ‘as-left’ well details as per the well handover document.

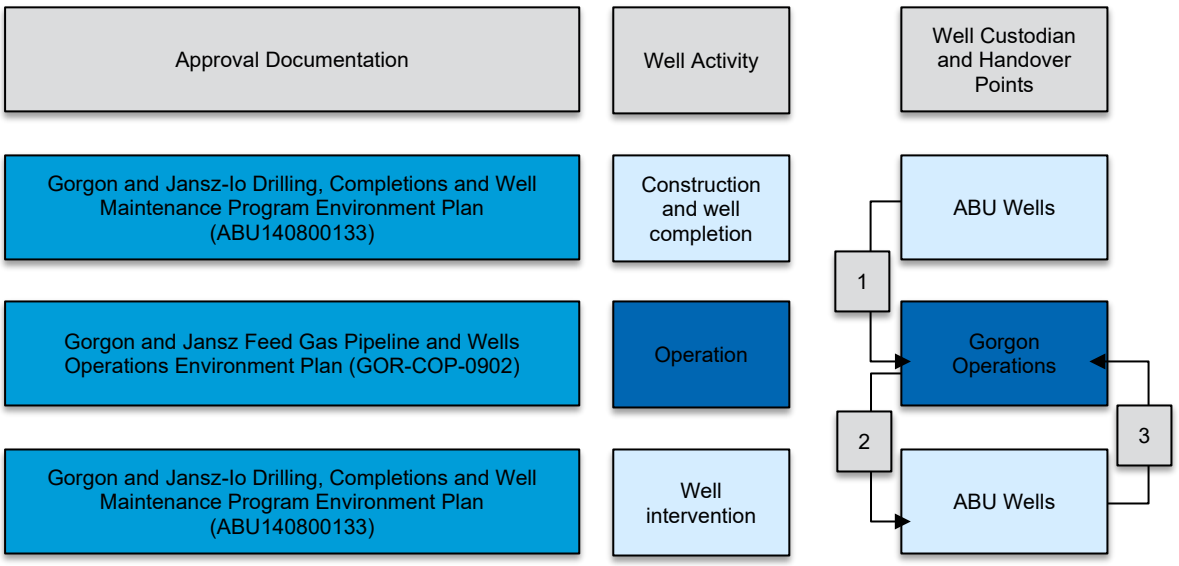


Figure 3-6: Well custody arrangements for Gorgon and Jansz–Io production wells

3.2.3 Subsea production manifolds

The production wells are connected to subsea production manifolds via rigid jumpers. This enables gas condensate from each wellhead to be commingled via the production manifolds before entering the corrosion-resistant alloy (CRA) infield production flowlines. These infield production flowlines then run from the production manifolds to the PTSs.

Single or double-valve isolation is provided on the subsea production manifolds. Individual header valves on the manifolds are actuated valves. Generally, these valves are remotely operated from the GTP; however, they can also be operated by remotely operated vehicle (ROV) if required.

Under the current field development there are a total of four subsea production manifolds within the Gorgon gas field, and three subsea production manifolds within the Jansz–Io gas field (Table 3-4).

Table 3-4: Locations and dimensions for the subsea production manifolds

Drill Centre	Manifold	Approximate dimensions (length x width x height)	Latitude	Longitude
Gorgon field				
Gorgon M1	GOR-1	25 x 19 x 7 m	20°24'29.58" S	114°50'57.27" E
Gorgon M2	GOR-2	25 x 19 x 7 m	20°27'37.44" S	114°50'30.99" E
Gorgon M3	GOR-3	25 x 19 x 7 m	20°31'12.18" S	114°49'25.45" E
Gorgon M4	GOR-4	19 × 15 × 6 m	20°34'37.38″ S	114°46'37.97″ E
Jansz–Io field				

Drill Centre	Manifold	Approximate dimensions (length x width x height)	Latitude	Longitude
Jansz DC1	JZI-1 combined manifold/PTS	17 x 18 x 6.5 m	19°49'35.16" S	114°34'14.31" E
Jansz DC2	JZI-2 combined manifold/PTS	25 x 20 x 6.5 m	19°47'29.65" S	114°38'39.66" E
Jansz DC3	JZI-3 combined manifold/PTS	30 × 25 × 6.5 m	19°51′10.44” S	114°30′56.19” E

3.2.4 Pipeline termination structures

Under the current field development there are five PTS within the Gorgon gas field, and four PTS within the Jansz–Io gas field (Table 3-5). The Gorgon and Jansz PTSs connect the infield production flowlines (running from the subsea production manifolds) and the main production pipelines to the GTP. Gas and condensate from the subsea production manifolds flows into the PTSs where it is commingled before entering the main production pipelines. The PTSs feature isolation valves to enable subsea infrastructure to be isolated from the large pipeline inventory. The valves on the mid-line PTSs are operated by ROV and cannot be operated remotely from the GTP, whilst for the Gorgon PTSs and the Jansz combined manifold/PTSs they have actuated valves that can be operated remotely.

Table 3-5: Indicative locations and dimensions of PTSs

PTS	Approximate dimensions (length x width x height)	Latitude	Longitude
Gorgon field			
Gorgon Midline PTS	19 × 25 x 8 m	20°29’11.20” S	114º53’53.29” E
Gorgon M1 PTS	20 x 25 x 6m	20° 24' 31.22" S	114° 50' 54.042" E
Gorgon M2 PTS	25 x 20 x 6m	20° 27' 39.45" S	114° 50' 27.93" E
Gorgon M3 PTS	25 x 20 x 6m	20° 31' 13.50" S	114° 49' 21.88" E
Gorgon M4 PTS	30 × 25 × 6 m	20°34′36.47” S	114°46′40.40” E
Jansz–Io field			
Jansz-Io Midline PTS	25 × 20 × 8 m	19°48’33.90” S	114º36’26.26” E
JZI-1 combined manifold/PTS	17 x 18 x 6.5 m	19° 49' 35.17" S	114° 34' 14.31" E
JZI-2 combined manifold/PTS	25 x 20 x 6.5 m	19° 47' 29.62" S	114° 38' 39.69" E
JZI-3 combined manifold/PTS	30 × 25 × 6.5 m	19°51′10.44” S	114°30′56.19” E

3.2.5 Infield flowlines and pipelines

The flowlines and pipelines connecting the subsea production manifolds to the PTSs comprise infield production flowlines, monoethylene glycol (MEG) pipelines and utility pipelines (Table 3-6). There are also additional MEG and utility pipelines that run from the PTSs to the GTP (Table 3-6); these are located adjacent to the main Gorgon and Jansz–Io production pipelines (refer to Section 0).

The CRA infield flowlines collect and transfer gas and condensate from the production manifolds to the PTSs.

MEG pipelines provide continuous injection of MEG into the production system for hydrate management. In addition, MEG pipelines deliver production chemicals (for corrosion and scale management if required) to the field. MEG and production chemicals are then returned via the production pipelines to the GTP, where lean MEG will be regenerated and potentially topped up for re-use.

Utility pipelines support a subsea maintenance depressurisation capability, annulus depressurisation, and double-sided depressurisation of the production system in the unlikely event of a hydrate blockage. The utility pipelines are filled with preservation fluid (e.g. MEG) when not in use to reduce susceptibility to corrosion and for an alternative path to inject MEG if required.

All flowlines and pipelines are connected to the subsea production manifolds and PTSs by jumpers and spool pieces.

Table 3-6: Indicative locations of flowlines and pipelines

Flowlines and pipelines between subsea production manifolds and PTSs	Pipelines between the PTSs to GTP
Gorgon field	
3 x 26” CRA infield production flowlines 3 x 8” MEG pipelines 3 x 6” utility pipelines	1 x 8” MEG pipeline 1 x 6” utility pipeline
1 x 24” M4 CRA infield production flowline 1 x 8” MEG pipeline 1 x 6” utility pipeline	
Jansz–Io field	
2 x 24” CRA infield production flowlines 2 x 6” MEG pipelines 2 x 6” utility pipelines	1 x 6” MEG pipeline 1 x 6” utility pipeline
1 x 18” DC-3 CRA infield production flowline 1 x 6” MEG pipeline 1 x 6” utility pipeline	

3.2.6 Controls distribution units

The Gorgon and Jansz–Io gas fields each contain a controls distribution unit (CDU), which is the termination point for the field’s main control umbilical and distributes power and communication to the respective drill centres via the infield umbilicals. Key functionality of the CDU includes the platform for which the Power Communications Distribution Module (PCDM) transforms electrical power from 3 kV to 660 V and provides connection between fibre-optic communication within the main umbilicals and communication within infield umbilicals to each SCM. Barrier fluid to the SCSt is also provided via a flying lead from the Jansz CDU.

3.2.7 Umbilicals

The fibre-optic and electrohydraulic control umbilicals provide hydraulic power, electric power, and a fibre-optic control link from the GTP to the subsea infrastructure within the Gorgon and Jansz–Io gas fields. As outlined in Section 3.16.6, the CDUs are the termination point for the main control umbilicals from the GTP.

As part of GS2, electrohydraulic umbilicals were installed between the existing Gorgon CDU and the Gorgon M4 drill centre, and between the existing Jansz CDU and the UTA on the combined manifold / PTS at the Jansz DC-3 drill centre.

As detailed in Section 3.16.7.2 an additional umbilical has been installed from Barrow Island to a new UTA adjacent to the existing Gorgon CDU (Ref. 22).

MV umbilicals will be installed under the *Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan* (Rev 6.0) (Ref. 7) , to transmit MV power and communications between the FCS and SCSt and the FCS and Jansz CDU.

An additional umbilical is planned to be installed from the Gorgon CDU to the Jansz CDU (Section 3.16.7.3).

3.2.7.1 High voltage submarine cable

The HVSC contains three high voltage (~115 kV) electrical cores and three fiber-optic elements. The HVSC has steel armour wire with a HDPE outer sheath; with an outer diameter of ~200 mm. Within scope of this EP, the HVSC extends ~130 km between the State waters boundary (~25 m water depth) to the FCS (~1,290 m water depth) (Table 3-1).

The HVSC will be installed to the south of, and broadly parallel to, the additional Gorgon umbilical. The route crosses over the Wheatstone pipeline, the East Spar pipeline, and the Gorgon pipeline. Thereafter the HVSC will be installed broadly in parallel to the existing Jansz umbilical until it reaches the FCS location.

Note: The installation of the HVSC is outside the scope of this EP (Section 2.17.2).

3.2.7.2 Additional Gorgon Umbilical

Installation and hook-up of an additional umbilical bundle (GBUP) between the offshore fields and Barrow Island was completed in 2024.

The umbilical contains seven medium voltage (3 kV) electrical triads and four fibre-optic elements. The umbilical has dual layer galvanized steel armour wire with a high-density polyethylene (HDPE) outer sheath; with an outer diameter of ~119 mm.

The umbilical extends from Barrow Island to an umbilical termination assembly (UTA) installed adjacent to the Gorgon Controls Distribution Unit (CDU) (Ref. 8). Electrical flying leads (EFLs) and optical flying leads (OFLs) connect the UTA to the power communications distribution module (PCDM) on the CDU via two electrical junction boxes (EJBs).

The GBUP umbilical has been installed to the south of, and broadly parallel to, the existing GFP umbilical. The route crosses over the East Spar pipeline, Halyard and Halyard replacement (RU-1) EHUs, and the Wheatstone trunkline.

3.2.7.3 Additional Jansz umbilical

CAPL plans to install an additional umbilical (referred to as the JBUP umbilical) to provide power and communications to the Jansz–Io field. The umbilical will contain five medium voltage (3 kV) electrical triads and four fibre-optic elements and have an outer diameter of ~141 mm. The umbilical will be installed from the Jansz CDU area, running south of, and parallel to, the existing Jansz pipeline and existing Jansz umbilical, which will then follow an existing surveyed corridor to the Gorgon M1 drill centre, and then follow along the M1 production pipeline to the Gorgon CDU area. A separate EP will be developed for the installation of the umbilical. Installation is expected to commence

from 2026, and operations are expected to commence from 2027. Ongoing operation of the umbilical will fall within the scope of this EP.

3.2.8 Production pipelines

The Gorgon production pipeline runs for ~65 km between the Gorgon midline PTS to the shore crossing at North Whites Beach on Barrow Island (Figure 3-2). The Gorgon pipeline route crosses the Halyard EHU at a water depth of ~95 m and converges with the Jansz production pipeline at ~70 m water depth.

The Jansz–Io production pipeline runs for ~134 km between the Jansz–Io midline PTS to the shore crossing at North Whites Beach on Barrow Island (Figure 3-2). The pipeline transitions from 30” to 34” diameter at the top of the escarpment where it then crosses the Halyard EHU in ~83 m of water depth. The pipeline from the escarpment to the shore is a 34” pipeline.

3.2.9 Valves

The valves associated with the Gorgon electrohydraulic control system are located on trees and production manifolds in waters deeper than ~200 m. The PTSs at the Gorgon Drill Centres have hydraulically actuated valves that can be operated remotely, however the Gorgon midline PTS contains several valves that cannot be actuated remotely but are actuated manually via ROV.

The valves associated with the Jansz electrohydraulic control system are located on trees and production manifolds in waters deeper than ~1,300 m. The combined manifolds/PTSs at the Jansz Drill Centres have hydraulically actuated valves that can be operated remotely, however the Jansz–Io midline PTS contains several valves that are not a part of the Jansz electrohydraulic control system, and subsequently cannot be actuated remotely, but are actuated manually via ROV.

3.2.10 Subsea compression station and subsea compression manifold structure

The SCSt comprises multiple equipment modules positioned onto a module support frame (MSF), which rests on three foundation mudmats. Each of the modules are tied together via sliding spools. Power and control is handled by EFLs, OFLs and barrier fluid flying leads.

The SCSt will be used to separate, compress, and pump production fluids from the Jansz–Io fields. The SCSt functionality includes:

- inlet gas / liquid cooling and separation
- gas compression and after cooling
- liquids pumping and export
- station monitoring tools and sensors, including acoustic leak detection
- utilities including controls, electrical transformers, MEG and barrier fluid handling
- foundation and support structures.

The SCMS is a simple (no control system) manifold located between the SCSt and existing Jansz infrastructure The SCMS is based on components from the initial field development midline PTS. The SCMS contains piping, EFLs, corrosion probe sensors, structural steel, connection systems and ROV operable valves.

The SCMS functionality includes provision for:

- pigging of the existing Jansz pipeline, MEG pipeline, and utility pipeline
- connection of the SCSt production import and export headers to the existing Jansz Midline PTS
- connection of the SCSt MEG and utility headers to the existing Jansz Midline PTS
- connection points for potential future tie-ins.

The SCSt and SCMS will be in water depths of ~1,345 m (Table 3-1).

A separate wet-park support structure has been installed in close proximity to the SCSt to support installation as well as compressor and pump module replacement during operations.

Note: The installation of the SCSt and associated infrastructure is outside the scope of this EP (Section 2.17.2).

3.2.11 Field control station

The FCS will be located ~7.5 km south of the existing Jansz midline PTS in a water depth of ~1,290 m (Table 3-1) and will host electrical and control equipment to support operation of the SCSt. The FCS also includes provision for supporting power and control requirements for existing infrastructure, and for future electrohydraulic control and power for potential future field tie-backs to the GTP. The FCS is designed as a normally unattended installation (NUI), however accommodation for campaign maintenance will be available.

The FCS includes:

- topside electrical equipment including high voltage (HV) main transformers and medium voltage (MV) and low voltage (LV) distribution transformers
- HV/LV electrical buildings on the FCS, housing variable speed drives for compressors and pumps, electrical distribution equipment, control and telecommunication equipment
- MV power transmission and control umbilicals (containing MV cores and fibre optics) which connect the FCS to the SCSt via a dynamic riser system
- MV power transmission and control system which connects the FCS to the existing Jansz CDU via an umbilical containing MV cores and fibre optics
- Two diesel generators for back-up power (e.g. during start-up and main power outage) and diesel storage (a permanent tank [~73 m^3] incorporated within the crane pedestal and two demountable day tanks for each generator [~8 m^3 each])
- Accommodation (provision for approximately 20 persons on board [POB]), office, workshop and storage areas for campaign maintenance
- an electrical crane
- A mooring system, comprising of 12 mooring lines, each consisting of platform chain, polyester rope, bottom and anchor chain sections with H-links, connectors or shackles connecting the segments to 12 suction piles.

Power and communications are transmitted from Barrow Island via a HVSC (Section 3.16.7.1).

The FCS is not a hydrocarbon handling facility, and as such hydrocarbons will not flow to or from the FCS or be processed onboard the FCS.

Sewage (macerated, but untreated) and grey water will be discharged while the FCS is attended during J-IC commissioning and start-up, as well as during any campaign maintenance. Galley waste (e.g. food scraps and greases from food preparation facilities) will be collected and stored for disposal onshore.

Once installed, a 500 m petroleum safety zone (under the OPGGS Act) will be requested for the FCS, which will remain in place while the FCS is within the offshore area.

Note: The installation of the FCS is outside the scope of this EP (Section 2.17.2).

3.2.12 Temporary power supply

3.2.12.1 Subsea battery system

A subsea battery system (SBS) may be used to provide power on an ongoing basis in the event that power from the existing umbilicals becomes unavailable or if redundancy is required. The SBS is currently installed in the Jansz–Io field; however, may be retrieved and deployed at the Gorgon field as required.

The SBS is comprised of the following structures:

- up to four battery storage skids (BSS), each containing 12 lithium-ion battery storage modules (BSM) and a battery control module (BCM)
- one power skid (PS), containing the output power module, subsea load bank and two acoustic telemetry modems (ATM)
- two open communications hubs (OCH), used to enable communication/control of the SBS system from Barrow Island
- EFLs connecting the SBS and EFLs and OFLs to interface with existing Gorgon or Jansz assets (i.e. UTA and CDU).

All infrastructure is currently installed within a ~150 m radius of the Jansz CDU. Each BSS is installed on a separate mudmat while the PS and OCH are installed on the same mudmat. The size of the mudmats is approximately 11 m x 9 m. Within the SBS system, EFLs connect the PS, BSS and OCHs. To interface with the existing subsea assets, OFLs connect the OCH to the PCDM and UTA, and EFLs connect the PS to the PCDM.

If the SBS is to be deployed at the Gorgon field, it will be installed within a ~150 m radius of the Gorgon CDU. Installation is expected to take ~4 weeks using an IMR vessel (or similar).

3.2.12.2 Operation

The SBS system will supply electrical power to either the Gorgon or Jansz CDU and can be monitored and controlled from Barrow Island during operation.

The power supply from each BSS will be regulated to assure continuous power to the infield production system. Each of the twelve BSMs on each BSS are mechanically and thermally isolated from the adjacent BSM, and are connected to a Battery Control Module (BCM) to output power to the PS.

The BSSs will be recharged every ~2–4 weeks. The BSS will be recovered to a vessel and connected to a topsides charging unit. To reduce the potential impact of a thermal run-away event, the BSS will be charged (one at a time) in a tank containing ~60 m^3 of seawater. The water will be taken from the sea, held in place while charging the

battery and discharged prior to redeployment of the BSS. There may be some hydrocarbon residue in the tank water from the charging connectors, which will be greased prior to connection. All hazardous materials will be assessed as per the CAPL Hazardous Materials Management Procedure (Ref. 36). If a thermal run-away event occurs, the water will be sent to shore for disposal, unless a risk assessment confirms disposal to sea is considered to manage impacts and risks to ALARP and acceptable levels.

In case there is a loss of primary communications to the SBS, transmission between the subsea ATM on the PS and a vessel-based ATM may be used as a contingency measure.

Re-charging and redeployment of all BSSs is expected to take ~1 week.

3.2.12.3 Retrieval and wet storage

Once temporary power supply is no longer required, the SBS equipment will be retrieved to surface and transported onshore for preservation and storage or will remain in-situ for future use as required. During wet storage the SBS will be charged approximately every ~180 days. Health checks may be conducted to check BSS charge status approximately every ~90 days with an estimated duration of ~24 hours. This typically involves ROV intervention for temporary reconnection of EFLs (for the duration of the health check). Required connections may remain in place during wet storage to allow for communications between Barrow Island and the infield system.

3.2.12.4 Downline power cable

A downline power cable deployed from a vessel may be connected to the Gorgon or Jansz CDU as a means of supplying temporary power. The vessel will remain in situ while the downline is being used to supply power. Infrastructure associated with downline use is provided in Table 3-7.

In preparation for the potential use of the downline at the Gorgon field, the following infrastructure has been installed within ~700 m of the Gorgon CDU:

- downline termination unit (DTU) and mudmat junction box (JB) installed on a single mudmat (~7 m x 9 m in size)
- infield umbilical (~700 m) laid out directly onto the seabed between the mudmat and the Gorgon CDU.

Installation of analogous subsea equipment will be required for the Jansz field in the event that downline power is deemed necessary at this location.

The cable will include equipment for ballast and buoyancy to create a submerged lazy loop. Mating and locking the DTU to the mudmat JB will be completed by an ROV.

EFLs will connect the DTU, infield umbilical, and JB to the existing PCDM (on the Gorgon or Jansz CDU).

Connection of the downline is expected to take ~1 day using an IMR vessel (or similar).

The vessel would remain on station for the duration of up to ~200 days. If downline use is required for >200 days then a further risk assessment will be conducted, and this EP will be revised if deemed necessary by the MoC process presented in (Section 8.17.2.2).

In the event of an emergency disconnect, the subsea breakaway coupling at the end of the downline enables a quick disconnect of the downline from the mudmat and static

power cable (including the DTU), with no movement of the seabed attached infrastructure.

Table 3-7: Indicative infrastructure locations, dimensions, and water depth

Infrastructure	Number	Location	Approximate dimensions^	Approximate water depth
Temporary power supply—subsea battery system				
BSS (and mudmat)	Up to 4	~75 m from Gorgon CDU ~75 m from Jansz CDU	l: 11 m w: 9 m	130 m (Gorgon) 1,345 m (Jansz)
PS and OCHs (and mudmat)	1	~75 m from Gorgon CDU ~75 m from Jansz CDU	l: 11 m w: 9 m	130 m (Gorgon) 1,345 m (Jansz)
Temporary power supply—downline power cable				
DTU and JB (and mudmat)	1	~700 m from Gorgon CDU ~700 m from Jansz CDU	l: 7 m w: 9 m	130 m (Gorgon) 1,345 m (Jansz)
Infield umbilical	1	From JB to Gorgon CDU From JB to Jansz CDU	l: 700 m d: 0.12 m l: 700 m d: 0.12 m	130 m (Gorgon) 1,345 m (Jansz)

^ *Dimensions (w–width; l–length; d–diameter)*

3.3 Commissioning and start-up

CAPL is currently operating infrastructure associated with the existing hydrocarbon system; and therefore, the commissioning and start-up activities described in this EP primarily focus on the additional infrastructure associated with J-IC. As described in Section 3.16, in order to pre-commission the SCSt and SCMS, the FCS, HVSC and MV umbilicals will have already been commissioned and started up in accordance with the *Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan* (Rev 6.0) (Ref. 7).

Furthermore, these commissioning and start-up activities are also relevant to all existing infrastructure (for any additional verification testing undertaken, or following any module / component change-outs, or field shut-ins.

The purpose of commissioning activities is to ensure that all components of the system are installed, tested, and function as per the project design documentation and specifications. Once commissioning is complete, start-up activities introduce hydrocarbons to the system. Commissioning and start-up activities therefore involve:

- verification and pre-start-up testing

- introduction of hydrocarbons.

3.3.1 Commissioning (verification and pre-start-up testing)

Verification and pre-start-up testing typically occurs before initial start-up as well as after a field shut-in.

The verification and pre-start-up testing activities for the hydrocarbon system include the testing of the subsea electrohydraulic control and monitoring systems. This involves testing subsea valves and the emergency shutdown of infrastructure such as the subsea trees and choke module. These tests may result in small discharges of control fluids from individual valves. In total, up to ~5 m^3 of control fluid is expected to be discharged from each of the Gorgon and Jansz–Io systems during verification and testing activities.

Verification testing may also include leak testing infrastructure (e.g. jumpers). While unlikely, this testing could result in the release of MEG or inhibited water (in the order of ~20 m^3) to the environment.

These activities will be supported by a vessel (refer to Section 3.21.1 for vessel operations) and ROVs equipped with video cameras.

3.3.1.1 J-IC SCSt

Jansz–Io production from DC1, DC2 and DC3 will continue to be produced through the Jansz midline PTS during the SCSt commissioning phase. Associated isolation at the midline PTS and SCMS will be in place to provide a barrier between existing hydrocarbon production and commissioning activities on the SCSt.

The following main activities shall be performed to condition the SCSt for closed loop commissioning of compressors and pumps:

- leak testing of barrier fluid connections and pressurisation of pump barrier fluid accumulators
- de-isolation of pumps towards the scrubber
- draining of spool segments containing MEG in gas lines into the scrubber
- conditioning of MEG level in scrubber
- nitrogen pressurisation of modules
- leak test of 2” valves in the MEG and hydrocarbon displacement (HCD) system together with service hubs that have been used during installation and pre-commissioning[3]
- setting ROV valve positions for commissioning.

Commissioning will then be undertaken, the focus of which is to undertake a variety of functional testing and verification activities to assess performance of the pumps, compressors and SCSt system as a whole, within the limits imposed by being isolated from hydrocarbon and MEG supply.

The only foreseen discharge specific to the J-IC infrastructure commissioning will be associated with the conditioning of MEG level in the scrubber, which will result in the release of ~10 m^3 of MEG into the receiving environment. Commissioning is anticipated to take approximately ~90 days to complete.

[3] If the pressure caps on service hubs used during installation and pre-commissioning have not already been leak tested, the caps will be leak tested by system MEG during commissioning

3.3.2 Start-up (introduction of hydrocarbons)

Start-up activities commence with the controlled introduction of hydrocarbons into the infield production flowlines and production pipelines. The subsea infrastructure including the MEG and utility pipelines, and the umbilicals are then subject to function testing.

During the introduction of hydrocarbons, residual fluids (which may include nitrogen, MEG/water preservation media), within the CRA infield flowlines, production pipelines, SCSt and SCMS will be displaced. These fluids will be displaced with production fluids from the wells back to the GTP.

Specific to J-IC, initial start-up processes include:

- Confirmation that all J-IC power and control systems (subsea, FCS and Barrow Island) are ready
- re-routing Jansz–Io production through SCSt bypass and close the original Jansz Midline PTS flow path
- Testing of pump modules during initial nitrogen displacement and production. Running compressors at minimum speed to displace nitrogen with hydrocarbons and adjusting SCSt suction pressure for closed loop testing
- Running compressors in closed loop operation, including running compressors individually to verify compressor envelope and performance
- Gradually bringing production up through the SCSt one compressor at a time to full production with three compressors running and subsequent additional functionality, performance and system testing and measurement.

There will be no discharges to the environmental during initial start-up, which is anticipated to take approximately 90 days.

Start-up following a shutdown (planned or unplanned) for J-IC will follow a similar sequence as above; however, in such an instance the SCSt will be dosed with additional MEG to prevent hydrate formation and given that there will be additional liquid build-up, start-up of the SCSt will manage liquid surges to the SCSt scrubber and Barrow Island slug catcher to ensure that they do not exceed their design limits.

3.3.3 SCSt underwater sound measurements

During commissioning, *in situ* measurements of underwater sound from the SCSt will be undertaken to validate predicted underwater sound source levels determined during factory acceptance testing (FAT) of the compressors and pumps. By measuring the sound source level from the SCSt during commissioning, the correlation between a range of operating conditions (e.g. variable compressor power, torque and other parameters) and sound levels can be validated, thereby establishing a basis for ongoing monitoring of sound levels through the review of SCSt operational data.

3.4 Operations

The principal activity during operations will be the flow and transportation of hydrocarbon and other produced fluids from the wells to the GTP, via the infield production flowlines and the Gorgon and Jansz–Io main production pipelines. The subsea infrastructure in Commonwealth waters is predominantly a closed system, however there are discharge points (valves) located at the subsea electrohydraulic control systems and at the Gorgon and Jansz–Io midline PTSs (as described in Section 3.16.9). Operation of this system will result in discharges of hydraulic control fluid to the marine environment from the valves. The volume of fluid discharged will

depend on a number of factors including the location and size of the valve, with each valve actuation estimated to result in a loss of between <1 and ~30 L of control fluid to the marine environment.

If an alternative pathway is required to supply production chemicals to the field, the chemical cores within the umbilicals may be used as a contingency measure. If these lines are required for this purpose, the hydraulic spacer fluid (~20 m^3) within the cores would normally be displaced via production back to the GTP (however may be displaced at the respective drill centre) and replaced with the required chemicals.

The FCS is not a hydrocarbon handling facility, and as such hydrocarbons will not flow to or from the FCS or be processed onboard the FCS. The FCS will operate as a Normally Unattended Installation (NUI), meaning that during normal operations there will be no personnel onboard. Personnel will only be required to attend the FCS periodically for inspection and maintenance campaigns (refer to Section 3.19.2).

If field shut-in is required, system verification and pre-start-up testing will be required prior to start-up (refer to Section 3.17).

3.5 Inspection, maintenance, and repairs

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 of infrastructure is undertaken to ensure that the integrity of the hydrocarbon system is maintained at or above acceptable standards.

IMR activities may occur at any time during operations, including during commissioning and start-up.

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 (Ref. 23).

IMR typically requires the support of a vessel; these vessel operations are covered within Section 3.21.1.

3.5.1 Subsea infrastructure inspections

Inspections provide assurance that asset integrity is being maintained and operated according to design, as well as proactively identifying maintenance or repair activities that may be required. Inspection generally involves the use of a vessel travelling along the route of the subsea hydrocarbon system with an autonomous underwater vehicle (AUV) or ROV (or in some cases, divers).

Inspections will be undertaken with a frequency determined using a risk-based approach. Inspections are typically conducted more frequently (e.g. one to three years) during early operations, with the frequency likely to decrease over time during steady-state operations, depending on previous inspection results. Typically, vessels will be on site for ~10 to ~200 days per year depending on the type and complexity of the inspection. Events such as cyclones or seismic activity that could affect the subsea infrastructure may also trigger inspections. Inspection techniques may include:

- visual inspections—may involve ROVs or AUVs deployed from a vessel; may also involve divers and a dive support vessel

- marine acoustic surveys—may include the use of side-scan sonar (SSS) and multibeam echo sounders (MBES) which are typically undertaken using an ROV or AUV deployed from a vessel or using hull mounted equipment
- non-destructive testing—may include ultrasonic testing or other testing, typically undertaken using an ROV or AUV deployed from a vessel
- cathodic protection measurements—are completed using ROVs or AUVs and conductivity probes, field gradient sensors or visual assessments of anode wastage
- fatigue monitoring / inspection—where required, fatigue monitoring equipment will be installed, inspected, and/or retrieved by a ROV deployed from a vessel
- pigging—temporary pig launchers are deployed from a vessel and tied into the midline PTS or SCMS; they may use a combination of inhibiters, water, gel, MEG, and/or nitrogen slugs to complete pigging activities including internal inspection of the pipeline. Fluids used to drive the pig train are directed to the GTP, and pigs may be equipped with tracking transmitters. In some instances, pigging may result of a discharge of MEG to the marine environment of up to ~100 m^3.

3.5.2 FCS inspections

The FCS has been designed to operate as a NUI that will be managed remotely from the Barrow Island GTP during routine operations.

Inspections will be undertaken with a frequency determined using a risk-based approach. FCS inspections will include above water (topsides, hull), below water (hull, moorings), and inside the tank (hull) inspections. The in-service inspection program shall also be consistent with the principles and performance standards outlined in the ABU Civil, Structural and Marine Structural Integrity Management Strategy (Ref. 422).

Inspections are typically conducted more frequently during early operations, with the frequency likely to decrease over time during steady-state operations, depending on previous inspection results. Further adjustments of the inspection frequency may be undertaken during service life of the FCS, as inspection data becomes available. Typically inspections for floating systems include annual surveys and five-year (renewal) surveys.

Inspection of the FCS, including the mooring system, hull (including ballast tanks) and topsides will employ a number of techniques, including the following:

- General and visual inspections—manned and remote visual inspections, using rope access, unmanned aerial vehicles (UAVs), ROVs, AUVs or crawlers
- non-destructive testing—ultrasonic, electrical resistance, electromagnetic, cathodic protection, magnetic particle and eddy current testing
- fatigue monitoring / inspection—where required, fatigue monitoring equipment will be installed, inspected, and/or retrieved
- monitoring of topside loading (dead and live loading and the centre of gravity, via loading and weight reports
- monitoring mean sea level and deck elevation (e.g. from hull draft gauge)
- review of environmental and metocean database in relation to the hull condition
- monitoring of tension at fairlead and angle at the fairlead chain stopper

- review of anchor pile retaining suction readings
- monitoring of humidity levels within internal void spaces.

3.5.3 Subsea infrastructure maintenance and repairs

Maintenance and repair activities, including equipment change-out, will be conducted during the operational life of the project to:

- 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 exact frequency of maintenance and repair activities will be dependent on the results of inspections and condition monitoring. If minor maintenance and repair is required, a vessel may remain on site for between ~10–90 days at a time, depending on the type of maintenance or repair required. If major maintenance or repair is required, a vessel may be on site for between ~90–200 days at a time.

3.5.3.1 Maintenance and minor repairs

Maintenance and minor repairs (and any associated testing) may include, but are not limited to:

- module / component change-out and repairs (including back sealing of connections)—may include, but is not limited to, modules within the SCSt, the replacement of subsea pipeline equipment or control modules, such as choke modules, tree caps, flying leads or power and control distribution equipment. MEG and inhibited water may discharged during module / component change-out, testing and repairs
- installation of foundations and/or mudmats to support equipment and facilitate maintenance and repair activities
- stabilisation / span correction—may involve activities such as installation of grout bags or concrete mattresses
- subsea excavation—excavation alongside infrastructure may be required to gain access to, or enable minor repairs of, infrastructure or removal of redundant and broken equipment
- maintenance of cathodic protection systems / additional anodes—cathodic protection equipment may be added to, or placed adjacent to, production pipelines or structures using a vessel and ROV spread
- removal of marine biological growth and calcareous deposits—may be undertaken by water jetting from an ROV or by divers, generally with potable water or sea water, although items exhibiting calcareous deposit accumulation may require acid washing or soaking (or use of a similar cleaning agent)
- umbilical repair (including HVSC)—may involve activities such as pre- and post-surveys, removal and reinstatement of stabilisation, removal, installation, and testing of umbilical replacement.

3.5.3.2 SCSt module retrieval and re-installation

Pump and compressor modules on the SCSt will be monitored and, where required, will be retrieved, transported onshore to carry out repairs/maintenance and reinstalled.

Currently the planned interval for the change out of compressor and pump modules is every ~5 – 7 years, however the exact frequency will be dependent on condition and performance monitoring.

Retrieval and replacement of modules will involve the following steps:

- inert and displace hydrocarbons from the pump/compressor module to the rest of the SCSt
- establish process and environmental isolations
- disconnect and retrieve or wet-park the module
- install the replacement module
- commission and leak test
- recover wet-parked module.

The SCSt design facilitates replacement of key modules and equipment while the rest of the subsea compression facility continues to operate. For example, a pump might be maintained or retrieved while the other pump is operating.

Retrieval and replacement of key modules and equipment is expected to be conducted by a construction vessel and take approximately ~10 days per module (subject to weather and metocean conditions).

MEG (~5 m^3) and hydrocarbon gas (<1 m^3) 'trapped' within piping may be discharged to the marine environment during compressor module change-outs. Similarly, MEG (~5 m^3), hydrocarbon gas and condensate (<1 m^3) and barrier fluid (<1 m^3) may be discharged during pump module change-outs.

An acid wash (or similar cleaning agent) may also need to be used to clean subsea infrastructure prior to change-out.

3.5.3.3 FCS maintenance and repairs

The FCS has been designed such that the hull and mooring system are to remain in service for the life of the field with no planned offshore maintenance except for routine surveillance and cleaning prior to inspection.

Machinery on-board the FCS (including pumps, heating, ventilation, and air conditioning) have been designed for easy removal, so the majority of maintenance can be conducted onshore.

In-field maintenance and minor repairs (and any associated testing) may include, but are not limited to:

- structural systems strengthening, modification, or repair
- general repairs (e.g. structural member removal, crack repair, corrosion blasting and recoating)
- marine growth removal
- maintenance and testing of the back-up diesel generators
- maintenance and testing of fire-fighting deluge systems
- sewage lines may need to be flushed with a calcium hypochlorite solution or similar, which will be discharged to the marine environment
- re-tensioning of mooring lines.

Normal maintenance campaigns on the FCS (~5 campaigns per year) are expected to last ~14 days and require up to ~20 personnel, transported by helicopter and accommodated on the FCS. Extended campaigns (~1 campaign every 5 years) are expected to last up to ~60 days and require ~50 personnel, with a 'Walk to Work' vessel to accommodate the additional POB.

3.5.3.4 Major pipeline system repairs

This EP has allowed for scenarios where major repairs of the pipeline system (including flowlines, pipelines and umbilicals) may be required.

CAPL has prepared for a potential major repair event by implementing the Emergency Pipeline Repair System (EPRS). The EPRS delivers a set of repair procedures, common repair equipment, and specific equipment for the main production flowlines and production pipelines. The EPRS also includes methodologies for the repair of support infrastructure such as umbilicals and non-production pipelines.

The target repair duration is ~200 days, however, this is dependent on vessel availability. Several vessels are likely to be involved to conduct and support the repair works or provide temporary power and controls to maintain system operability and reliability.

As major repair of a pipeline is the most complex repair activity, this has been described in greater detail below.

The EPRS includes a combination of equipment which, when used together, enables a section of damaged production flowline or pipeline to be cut out and replaced. The repair equipment is deployed off the back deck of a support vessel or barges and supported with ROVs. The EPRS is preserved, maintained and stored in a warehouse in Perth until required. The EPRS equipment includes:

- pipeline lifting and deployment frames
- pipe preparation tools, including but not limited to, coating removal, weld seam removal, end preparation, and water blasting equipment
- pipeline specific repair clamps and flange adapters.

Depending on the seabed conditions at the repair location, the seabed area immediately surrounding the pipeline system infrastructure may be disturbed. If it is determined that the pipeline requires deburial or the removal of rock or concrete mattresses prior to repair, additional seabed area will be disturbed.

The EPRS equipment may be deployed for the production flowlines or pipelines where the pipeline (or section of pipeline) does not exceed the limitations of its design (i.e. not within water depths of <20 m, along the escarpment crossing, on spools or within proximity of fixed structures).

3.5.3.4.1 Pipeline temporary decommissioning

Following a major defect or full-bore rupture, the field would be shut-in, and the pipeline allowed to naturally depressurise to subsea ambient pressure, resulting in free-flooding of the pipeline with sea water.

The pipeline would then be flooded with seawater inhibited with chemical additives (including biocide and oxygen scavenger) that will propel a flooding/cleaning pig towards the defect location. Flooding may be undertaken from both ends of the pipeline damage location, resulting in a release of sea water, gas, condensate, and rich MEG to the marine environment at the location of the defect.

3.5.3.4.2 Pipeline repair

The EPRS equipment is operated using ROVs, controlled from the support vessel. Two ROVs are expected to be required. The ROVs are electrically powered from the vessel and deliver hydraulic pressure to the operating parts of the repair system.

Pipeline repair includes the following stages:

- pre-deployment survey
- cut -out and remove damaged section (and repositioning of pipeline ends if dragged by anchor)
- EPRS deployment
- installation of new replacement section
- pipeline stabilisation (if required).

Pre-deployment survey

Prior to deployment of the EPRS, a number of different surveys may be undertaken. These surveys may be undertaken up to ~500 m away from the pipeline. The types of survey will depend on the location and event causing the pipeline defect, but may include:

- SSS or MBES or similar
- ROV
- piezocone penetration test (PCPT) or similar.

PCPT involves pushing a probe into the seabed to test soil characteristics and strengths. PCPTs may be required at each of the mudmat locations.

Subsea transponders will be deployed to ensure accurate seabed positioning of the EPRS. The deployment of transponders may result in localised seabed disturbance of ~1–2 m^2 (per transponder). Once no longer needed these transponders are recovered back to the vessel using a ROV.

Remove damaged section

If required, the damaged section will undergo pipeline deburial or have rock stabilisation material physically removed. The damaged section of the pipeline will then be cut using appropriate cutting tools.

Once cut, the damaged section of pipeline will be wet stored on the seabed whilst it is cut into smaller sections, then loaded into debris removal baskets and transferred back to the vessel. In the event of, for instance, an anchor drag, both pipeline ends are likely to be repositioned prior to deployment of the lift equipment.

EPRS deployment

The EPRS lifting frames and cradles for repositioning of the pipeline are then deployed and installed.

The length of pipeline over which a typical repair will take place is ~300 m. Over this length, the areas and depths of seabed expected to be disturbed during a repair include:

- at the four pipe lift frame locations, ~450 m^2 of surficial seabed will be disturbed by the pipe lift frame mudmats to an approximate maximum depth of ~4.5 m by the skirt foundations of these lift frame mudmats

- at the pipe end repair location, ~250 m^2 of surficial seabed will be disturbed by the repair pipeline flange adaptor (PFA) deployment frame mudmats skirts (up to ~0.3 m depth)
- in the vicinity of the repair location, ~100 m^2 of seabed disturbance will be required for temporary wet storage of materials and equipment during the repair operation.

Installation of new replacement section

Once the damaged section of pipeline is removed, the pipeline ends are prepared (coating and weld seams removed) to allow PFA and repair spool installation. The PFA stud bolts are then tensioned with the flange bolting systems and subsequently back seal tested. The PFAs are then activated to complete the repair. The entire pipeline is then typically subjected to hydrostatic leak testing. If the leak testing fails, the repair will need to be rectified, and re-installed. The leak test is typically performed using a small water-winning/filtration and chemical injection spread, and high-pressure pumping equipment, and will use an onshore spread that will differ depending on the pipeline. In the event that additional line cleaning or gauging is required an additional pig train could be run with inhibited seawater.

Pipeline stabilisation

Depending on the seabed conditions at the repair location, additional seabed area may be disturbed by permanent concrete mattresses and post-repair rock stabilisation measures. However, this is location-specific and will be determined at the time of event.

Pipeline recommissioning

Following the successful hydrostatic leak test, the pipeline will be recommissioned via a dewatering and conditioning pig train launched from subsea to the GTP onshore. The conditioning pig train is expected to comprise slugs of compressed nitrogen, treated potable water, and MEG, which will be received onshore, treated and re-injected into the utility pipelines and then discharged subsea via the Gorgon or Jansz midline PTS.

3.6 Decommissioning

In alignment with best practice for proactive decommissioning[4] (Ref. 280) the following summary has been provided of CAPL's approach to decommissioning planning for the infrastructure associated with this EP.

CAPL intends the future retirement of all assets associated with this Petroleum Activity to be undertaken in accordance with the *Chevron Global Upstream Asset Retirement Strategic Framework* (Ref. 281) and in compliance with relevant statutory and regulatory obligations at the time.

The preliminary retirement strategy includes:

- initial survey and confirmation of system integrity and suitability for recovery, removal, and disposal

[4] Where 'decommissioning' is taken to mean "the process of removing or otherwise satisfactorily dealing with offshore petroleum property (including wells) in a safe and environmentally responsible manner when it is neither used nor intended to be used" (Ref. 322).

- a staged shut-in of the subsea wells connected to the subsea infrastructure to allow cessation of production followed by shutdown of all subsea infrastructure associated with the Petroleum Activity
- flushing and decontamination of all subsea infrastructure to remove hydrocarbons and associated contaminants
- isolation and disconnection of power supply and control umbilicals
- transportation of the FCS to an onshore yard for final decontamination, topsides disconnection, and disassembly (for either scrapping, refurbishment, or recycling)
- recovery of subsea infrastructure and transportation to an onshore yard for either scrapping, refurbishment, or recycling
- environmental monitoring throughout decommissioning to ensure activities are executed in accordance with environmental approvals.

Prior to any EOFL decommissioning (Section 3.20.4), CAPL will submit a Decommissioning EP to NOPSEMA that will demonstrate that the impacts and risks associated with decommissioning activities are reduced to ALARP and acceptable levels. While the requirement for complete removal of property will be considered the base case within any Decommissioning EP (as per the requirements of section 572(3) of the OPGGS Act), alternative arrangements that may be satisfactory are ones that deliver equal or better environmental, safety and well integrity outcomes compared to complete removal (Ref. 282). The Decommissioning EP will be developed to meet the requirements of the OPGGS Act and OPGGS(E)R, as well as any additional relevant legislation (e.g. *Environment Protection (Sea Dumping) Act 1981*) or guidelines (e.g. Ref. 282, Ref. 283.) in-force at the time.

Decommissioning may also occur throughout operational field life for property that is within the title area and is neither used nor to be used in connection with the operations authorised by the title (as per the requirements of section 572(3) of the OPGGS Act; see Section 3.20.3).

Furthermore, CAPL conducts a 3-yearly Gorgon Comprehensive Asset Retirement Obligation review to ensure decommissioning is aligned with the latest best practices.

3.6.1 Inventory of property within the Operational Area

To assist with the long-term planning for decommissioning an internal inventory of asset property within the OA is maintained by CAPL. 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. An inventory overview of the property within the OA is provided in in appendix b. Note that none of the property within the OA is planned to be suspended or abandoned of the life of this EP.

3.6.2 Maintenance of property

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. 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 (Ref. 280) As described in Section 3.19, all assets in

the OA will be inspected, maintained, and repaired (as required) to a level which ensures adequate structural integrity is still present at retirement to allow for retrieval.

3.6.3 Removal of property

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. It is understood that removal of property can be undertaken throughout operations; however, NOPSEMA recognises that removal may not always be practical at the time when property is neither used, nor to be used (Ref.21).

In the event that any property becomes neither used or to be used during the in-force period of this EP, the process that CAPL will follow to determine where a deviation from the requirement to remove property at the point in time that it is neither used nor to be used is appropriate, includes consideration of several criteria. Deferral of removal may be considered by CAPL if:

- redundant equipment is incorporated within or located close to live infrastructure which introduces additional complexities and risks that can be avoided during EOFL decommissioning
- while subsea property is in situ, the risks to other marine users associated with its physical presence are low
- the environmental risks when leaving redundant infrastructure in-situ under current operations is considered to be low
- the cost of standalone retrieval work scopes are considered disproportionate when considering the risks of retrieval during current operations versus risk of extending duration in-situ.

If after applying the above criteria, any redundant property is to remain in-situ within the title area for decommissioning as part of EOFL, it will be recorded in the subsea inventory as a “non-operated asset” (refer to Section 3.20.4), and will be subject to inspections to ensure that the property does not degrade to a state that would prevent future removal (refer to Section 3.20.2).

If any redundant property is to be removed, CAPL will engage with NOPSEMA regarding the removal of this property to determine if an EP (either new, or revision to an existing EP) is required.

3.6.4 End of facility life

As described in Section 2.17.2, EOFL decommissioning and removal of infrastructure under section 572(3) of the OPGGS Act, is not within scope of this EP. As described in Section 3.20, prior to any EOFL decommissioning, CAPL will submit a Decommissioning EP to NOPSEMA that will demonstrate that the impacts and risks associated with decommissioning activities are reduced to ALARP and acceptable levels.

As provided for in Section 3.20, CAPL intends that the future retirement of all assets in the OA to be undertaken in accordance with the *Chevron Global Upstream Asset Retirement Strategic Framework* (Ref. 281) and in compliance with relevant statutory and regulatory obligations at the time.

Where CAPL infrastructure crosses over third-party infrastructure, the crossing agreements between parties specifically describes the decommissioning approach to be undertaken at the time.

3.7 Field support

3.7.1 Vessel operations

Typically, a light construction or survey-type vessel (or similar) will be used for IMR and a construction vessel will be used for retrieval and replacement of SCSt modules. In exceptional circumstances, depending on the type of IMR activity, additional similar vessels may be used, and/or a larger vessel. In the event of a major pipeline system repair, multiple vessels may be required with concurrent vessel operations likely at various stages of the repair schedule. Vessels in this instance may include barges, supply vessels, construction vessels and IMR vessels.

Vessel operations may occur for periods of ~10–200 days for inspections, maintenance and repairs (Section 3.19.3). In event that subsea batteries are required, IMR vessels will be used every 2–4 weeks to retrieve, test, re-charge and re-deploy the subsea battery system. IMR campaigns on the FCS may require a vessel with a 'walk to work' capability if the planned POB exceeds the capacity of the FCS (20 POB).

Vessels will typically use dynamic positioning (DP), however in certain circumstances, anchoring may be required. Vessels will not use Heavy Fuel Oil (HFO) but will utilise a lighter marine fuel such as marine diesel oil (MDO) or Marine Gas Oil (MGO). Vessels are expected to return to port to bunker, although may bunker at sea if required.

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.

3.7.1.1 Concurrent activities

During routine operations, concurrent vessel-based activities may be required within the same field. For example, SCSt maintenance (e.g. module retrieval and replacement) and IMR activities associated with other subsea infrastructure within the Jansz–Io field may be undertaken concurrently. Concurrent activities are expected to be infrequent and the period in which vessels are operating in close proximity is expected to be of short duration (e.g. days to weeks).

3.7.2 Helicopter operations

Where required, helicopters may be used for crew transfers to/from vessels and as part of planned inspection and maintenance campaigns for the FCS.

3.7.3 ROVs and AUVs

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

- visual observations or surveys
- positioning of subsea infrastructure
- retrieval and replacement of subsea infrastructure
- inspections of the FCS hull and mooring system
- marine growth removal
- IMR activities.

ROVs, which are connected to a vessel via umbilical to a tether management system, can be equipped with a range of cameras, specialist equipment and tools. These

systems operate as closed systems, such that hydraulic fluids are circulated within to move components.

ROVs will typically be stored on the deck of the vessels, but may be temporarily placed on the seabed between activities, resulting in a disturbance to a small area of the seabed.

4 description of the environment

4.1 Environment that may be affected

The environment that may be affected (EMBA) by the petroleum activity within scope of this EP has been defined as the area where a change to environmental receptors may potentially occur as a result of planned activities or unplanned events.

For the purposes of this EP, CAPL have also defined sub-areas of the EMBA that are used to support the subsequent impact and risk assessments (Table 4-1). Receptors present within the EMBA (and relevant to purpose of each of the specific sub-areas) are described in the following sections.

For the following sections, the document refers to the EMBA when it is applicable to all the sub-areas identified in Table 4-1.

Table 4-1: Description of the EMBA sub-areas for Gorgon Operations

EMBA sub-area	Description and purpose
OA	The OA is defined as the area in which the petroleum activity will be undertaken (Section 3.15.1). The OA is relevant to the impact and risk assessments for all planned activities and unplanned events (except where specified by an aspect-specific EMBA), as the exposure area associated with these impacts and risks is considered to occur within the spatial extent of the OA.
Underwater Sound EMBA (Sound EMBA)	The Sound EMBA is relevant to the impact and risk assessments for planned underwater non-impulsive and impulsive sound emissions (Section 7.7 and 7.8.) and determined by the predicted spatial extent of acoustic exposure at the relevant thresholds. The Sound EMBA was developed based on the largest sound emission exposure identified in Section 7.7 and 7.8.
Unplanned Hydrocarbon Release Ecological EMBA (Hydrocarbon Ecological EMBA)	The Hydrocarbon Ecological EMBA is relevant to the risk assessments for ecological receptors from unplanned hydrocarbon release events (Sections 7.17 and 0), and determined by the predicted spatial extent of hydrocarbon exposure at the relevant thresholds for surface, entrained, dissolved, and shoreline components (Table 7-12).
Unplanned Hydrocarbon Release Social EMBA (Hydrocarbon Social EMBA)	The Hydrocarbon Social EMBA is relevant to the risk assessments for social, economic, and cultural receptors from unplanned hydrocarbon release events (Sections 7.17 and 0), and determined by the predicted spatial extent of hydrocarbon exposure at the relevant thresholds for surface, entrained, dissolved, and shoreline components (Table 7-12). The Social EMBA incorporates lower thresholds for surface and shoreline hydrocarbon exposure that are associated with visible oil but are below concentrations at which ecological impacts are expected to occur.

The Planning Area for Scientific Monitoring is determined by the predicted spatial extent of hydrocarbon exposure at the relevant thresholds for surface, entrained, and dissolved components (Table 7-12). The values and sensitivities of this area are described within Appendix D of the Operational and Scientific Monitoring Plan: Environmental Monitoring in the Event of an Oil Spill to Marine or Coastal Waters (Ref. 17). The Planning Area covers the spatial boundary of the EMBA.

The above approach to defining the spatial extent of the EMBA is considered to be consistent with NOPSEMA's advice in their oil spill modelling environment bulletin (Ref. 121).

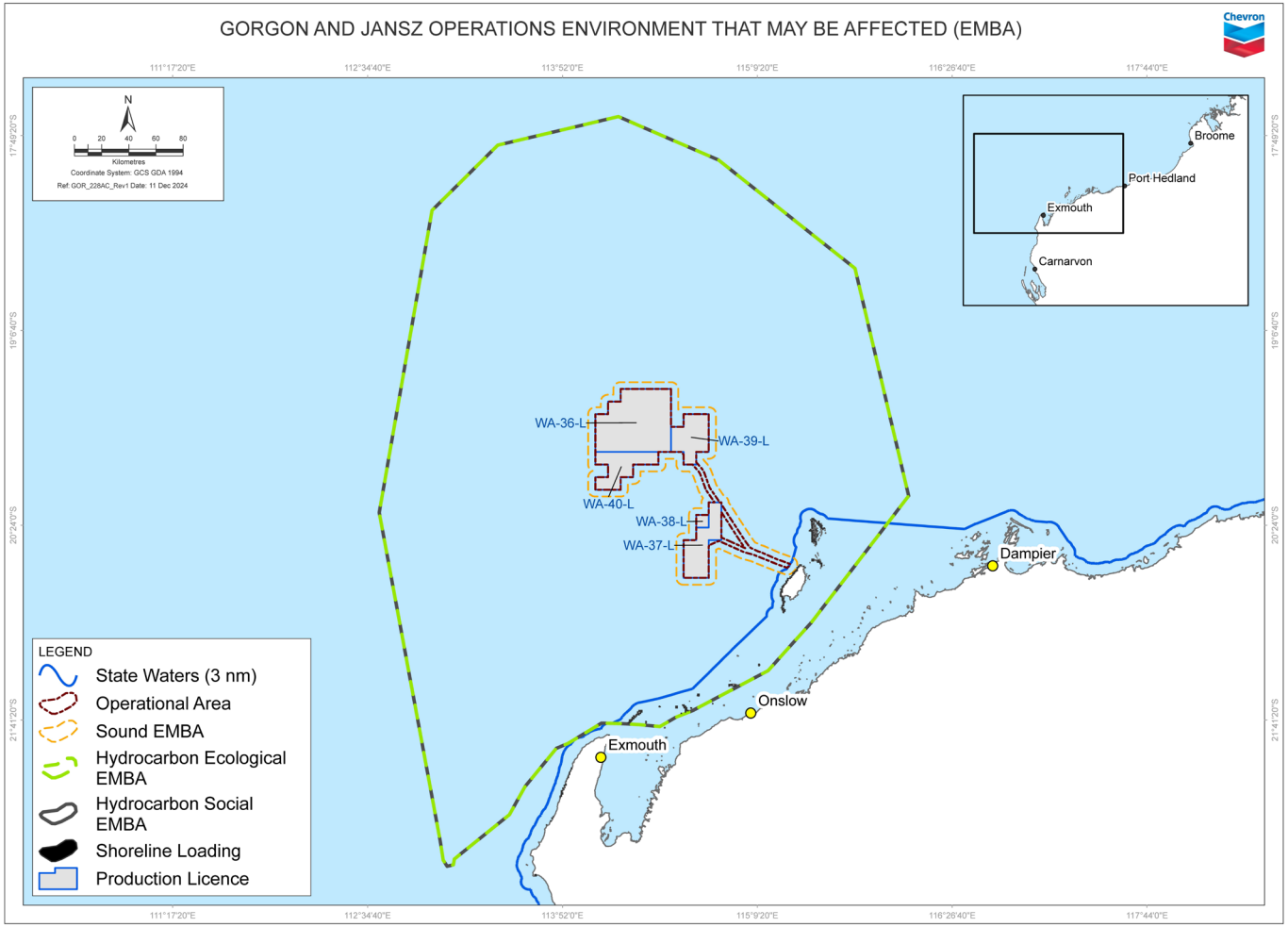


Figure 4-1: EMBA for Gorgon Operations EP

Note: The Hydrocarbon EMBAs are 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 threshold occurs.

4.2 Matters of national environmental significance

Matters of national environmental significance (MNES) are protected under the EPBC Act (Cth). The presence of MNES within the EMBA has been determined from the Australian Government's online Protected Matters Search Tool (PMST) (Ref. 57). Table 4-2 summarises the presence of relevant marine and/or coastal MNES within the EMBA; the full PMST reports[5] are included in appendix e.

It should be noted that the EPBC Act PMST is a general database that conservatively identifies areas in which protected species have the potential to occur.

Table 4-2: Presence of MNES within the EMBA

MNES	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
World Heritage properties^	×	×	✓
National Heritage places^	×	×	✓
Wetlands of international importance (Ramsar wetlands) ^	×	×	×
Nationally listed threatened species and communities^	✓ species × 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.

4.3 Ecosystems and their constituent parts, including people and communities

4.3.1 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. 58).

The EMBA occurs within the North-west Marine Region (NWMR), which is typically characterised by shallow-water tropical marine ecosystems and high species richness

[5] The PMST is a general database that includes all MNES, including species or features (such as terrestrial-based species or features) that are not expected to credibly occur within the EMBA.

(Ref. 59; Ref. 60). The high species richness is thought to be associated with the diversity of habitats available, such as limestone pavement, coral reefs, and pinnacles (Ref. 59). The broader benthic communities and habitats that may be present within the EMBA are summarised below, with additional data specific to the OA summarised in Section 4.17.1.1.

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. 61), the geomorphic features present within the EMBA are shown in Table 4-3. One of the pinnacle features identified within this dataset is Rankin Bank, a known bathymetric feature of regional significance, which occurs within the Hydrocarbon EMBAs (see Section 4.17.1.2).

Table 4-3: Geomorphic features that may occur within the OA and EMBAs

Feature	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Canyon			✓	✓
Deep/hole/valley	✓	✓	✓	✓
Pinnacle		✓	✓	✓
Plateau	✓	✓	✓	✓
Reef				✓
Shelf	✓	✓	✓	✓
Slope	✓	✓	✓	✓
Terrace	✓	✓	✓	✓
Tidal-sandwave/sand-bank				✓
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 of WA comprises bio-clastic, calcareous, and organogenic sediments deposited from relatively slow and uniform sedimentation rates (Ref. 62). 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. 63).

Based on CSIRO's marine benthic substrate database (Ref. 64), the predominant seafloor sediment types within the OA, Sound EMBA, and Hydrocarbon EMBA are 'calcareous gravel, sand and silt,' 'calcareous ooze,' and 'mud and calcareous clay,' with 'biosiliceous marl and calcareous clay' only identified within the Hydrocarbon EMBA.".

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA) is a biogeographic regionalisation of oceanic waters within Australia's EEZ (Ref. 65). The OA and Sound EMBA occur within the Northwest Province and Northwest Shelf Province provincial bioregion[6]. The Hydrocarbon EMBAs also intersect with the

[6] 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. 50).

Northwest Transition, Central Western Shelf Transition, and the Central Western Transition provincial bioregion. The geomorphology characteristics and biological communities for each of these bioregions, as described in The North-west Marine Bioregional Plan: Bioregional Profile (Ref. 60), are summarised in Table 4-4.

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 EMBA.

Table 4-4: Features of provincial bioregions

IMCRA Provincial Bioregion^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
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[7] 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. Of these features and areas within the Central Western Shelf Transition, the Hydrocarbon EMBAs intersect with the Ningaloo Marine Park (refer to Section 4.18.5)			
Central Western Transition			✓
Characteristics of the geomorphology and biological communities of the Central Western Transition include:			

[7] 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	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
• 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 and Cloates Canyon occur within the Hydrocarbon EMBAs. Refer to Section 4.17.6.1 for further descriptions of this 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 poorly understood. 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			

IMCRA Provincial Bioregion^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
• demersal fish communities associated with the slope. Of these features and areas within the Northwest Province, all occur within the OA and EMBAs. Refer to Section 4.17.6.1 for further descriptions of these features.			
Northwest Shelf Province	✓	✓	✓
Characteristics of the geomorphology and biological communities 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 which occurs in ~26–70 m water depth and is 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 sandwaves 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 slightly within ~100 km of the coast, and within ~100 km of the shelf break, but is mostly absent from areas in between • sandy substrates on the shelf within 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 Shoals. Of these features and areas within the Northwest Shelf Province, the ancient coastline at 125 m depth contour occurs within the OA and EMBAs. Refer to Section 4.17.6.1 for further descriptions of this feature.			

IMCRA Provincial Bioregion^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
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 demersal fish communities associated with the slope occurs within the Hydrocarbon EMBAs. Refer to Section 4.17.6.1 for further descriptions of this features.			

^ *Source: Ref. 60.*

4.3.1.1 Operational area

CAPL has conducted surveys to understand the nature and composition of habitat and seabed sediments within the OA. These surveys comprise geophysical surveys, visual ROV surveys, and seabed sampling.

Data from these surveys were interpreted to characterise the benthic substrate within the OA. The benthic substrate within the deeper waters of the OA is predominantly characterised by fine sediments (clays) (Figure 4-2). These transition to sands, clays, or gravels overlying subcropping cemented sediments in the shallower waters (Figure 4-2).

The benthic substrate within the OA from the State water boundary to water depths of ~50 m predominantly comprises bare sand (Figure 4-3). Sand was the dominant substrate in most of the survey observations (~90%). Limestone pavement with a shallow sand veneer was the next most common substrate encountered, dominating the substrate in less than 10% of observations. Reef (low and high profile) was the dominant substrate in less than 5% of observations (Ref. 69).

Coastal and marine baseline and post-development studies undertaken by CAPL for the Feed Gas Pipeline (Ref. 70; Ref. 71) classified the habitat within State waters

adjacent to the OA as ‘soft sediment with sparse sessile taxa’. This habitat type was predominantly unvegetated sand, with patches of seagrass and macroalgae, and no associated sessile biota. Similar habitat is expected to extend within the shallower waters of the OA.

Further offshore in the gully region along the Jansz pipeline route in ~250 m water depth, ROV surveys have indicated that the seabed was dominated by silty mud with little evidence of marine flora or fauna (Figure 4-4) (Ref. 72).

Based on ROV transects taken in the scarp region within water depths of 558–714 m, the most common benthic substrate comprised soft sediments—sand, silt, and mud (Ref. 72; Figure 4-5). These habitat types are widespread in the region and are not considered to be of regional significance due to their ubiquity and the sparseness of biota supported (Ref. 72). The steep scarp face was found to comprise mainly over-consolidated silt materials, mostly devoid of marine growth, with occasional sparse communities of benthic invertebrates including soft corals, bryozoans, and colonial ascidians (Figure 4-5). These over-consolidated silt sediments provide structural diversity to an otherwise flat benthos. They are of higher conservation significance than the soft sediment habitats found in the area as they are less widespread and support more abundant biota (Ref. 72). However, based on the high-resolution bathymetry data from the area (Ref. 72), these hard scarp features probably stretch at least 10 km to the north and 5 km the south of the Jansz pipeline

Recent (2022) surveys of benthic habitat along parts of the Jansz pipeline route (Ref. 73) are consistent with previous surveys. The recent surveys showed the predominant benthic habitat was bare substrate, with either a smooth (mostly flat) or irregular (mostly flat with minor features) surface (Ref. 73). The only area near the Jansz location identified as a high likelihood of biota being present was some patches over the scarp (Ref. 73).

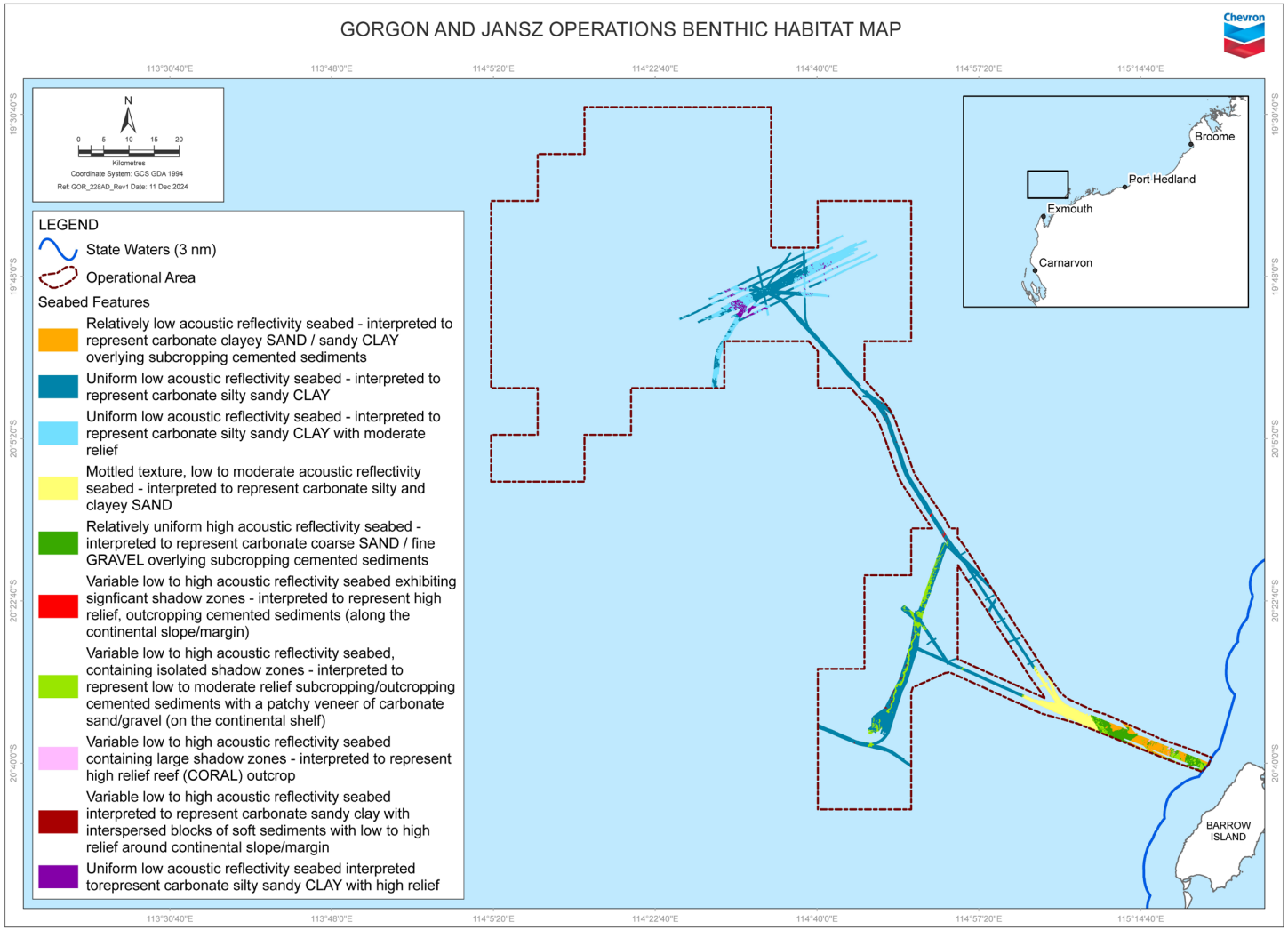


Figure 4-2: Benthic substrate in the vicinity of the existing Jansz Feed Gas Pipeline and field infrastructure

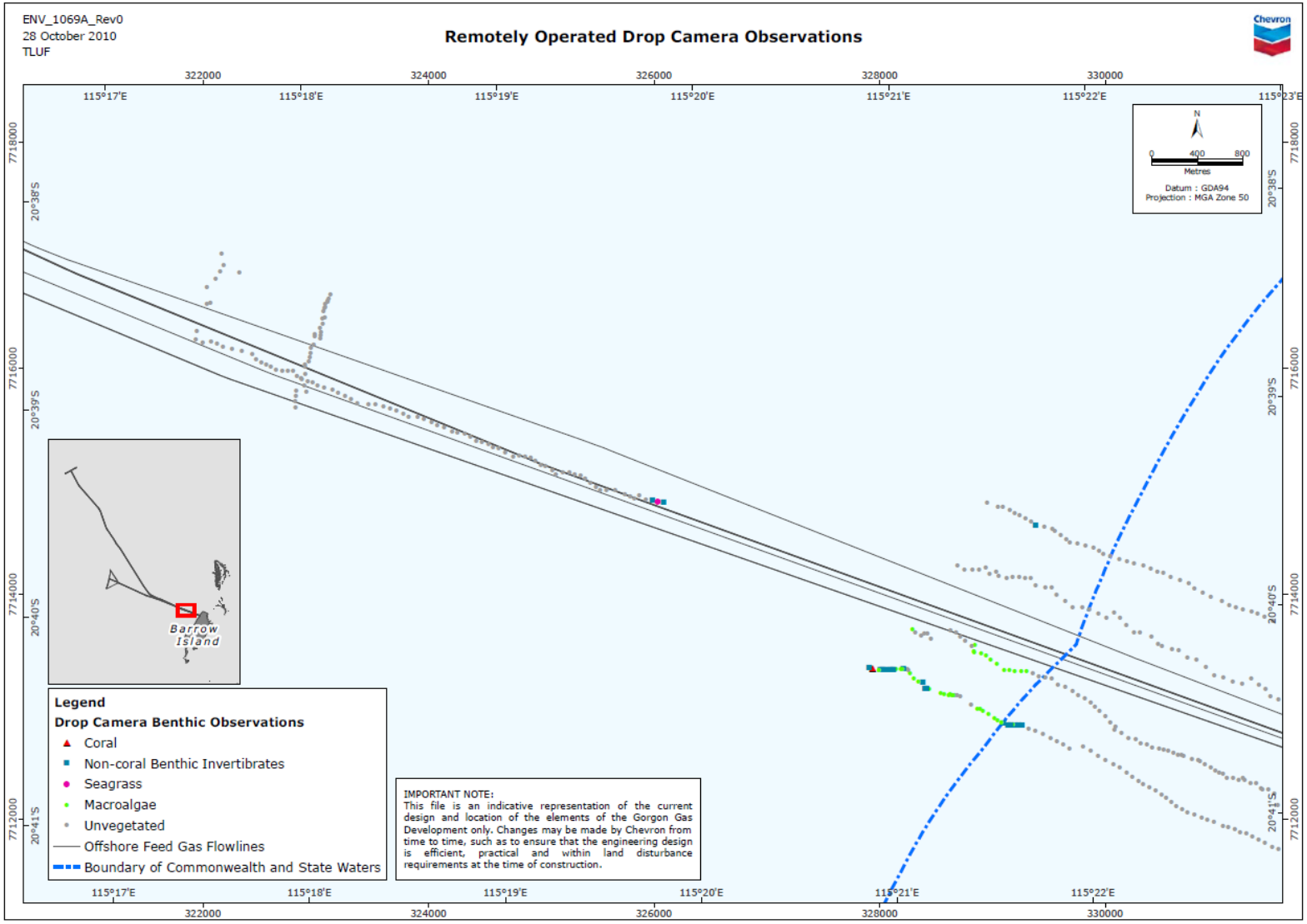
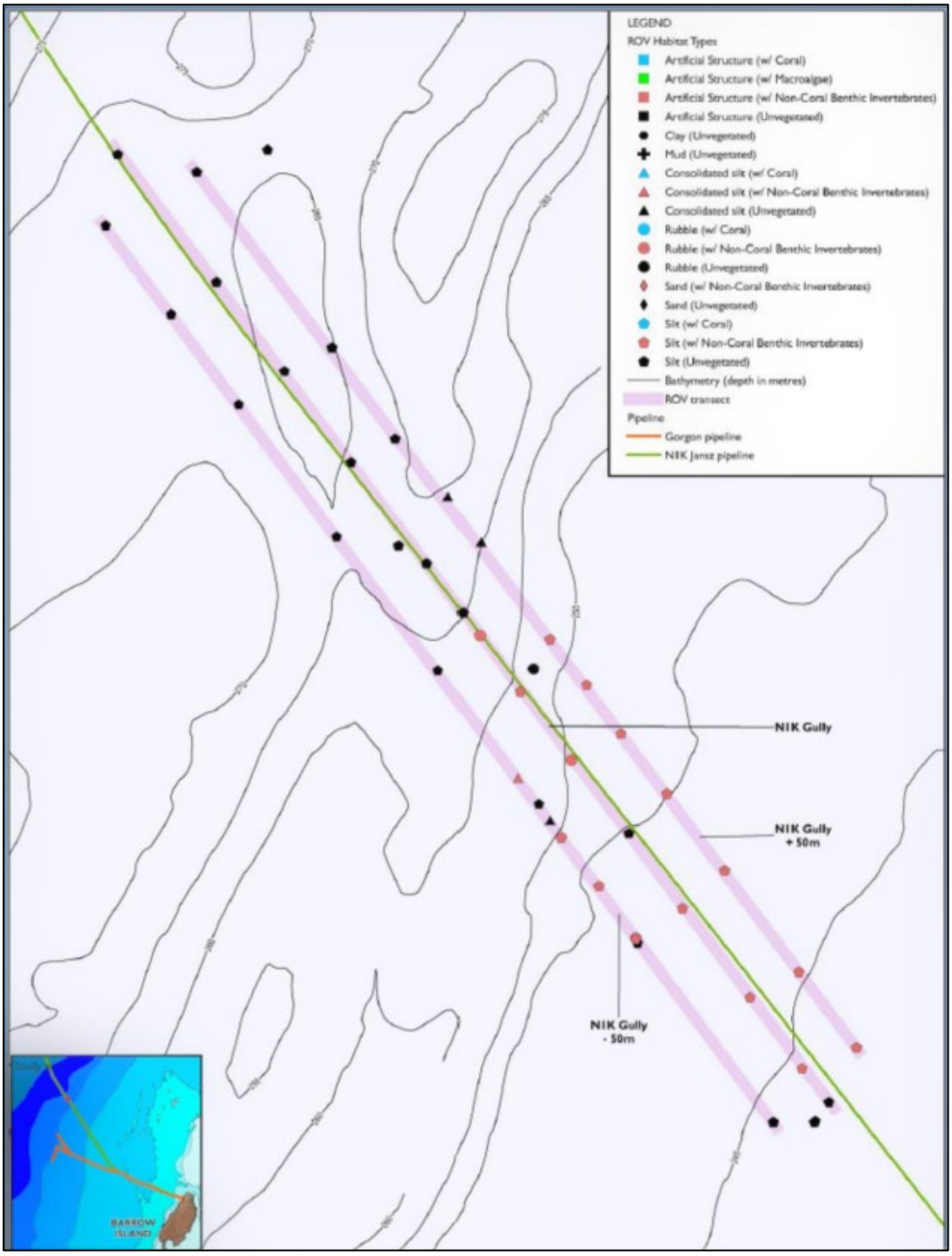
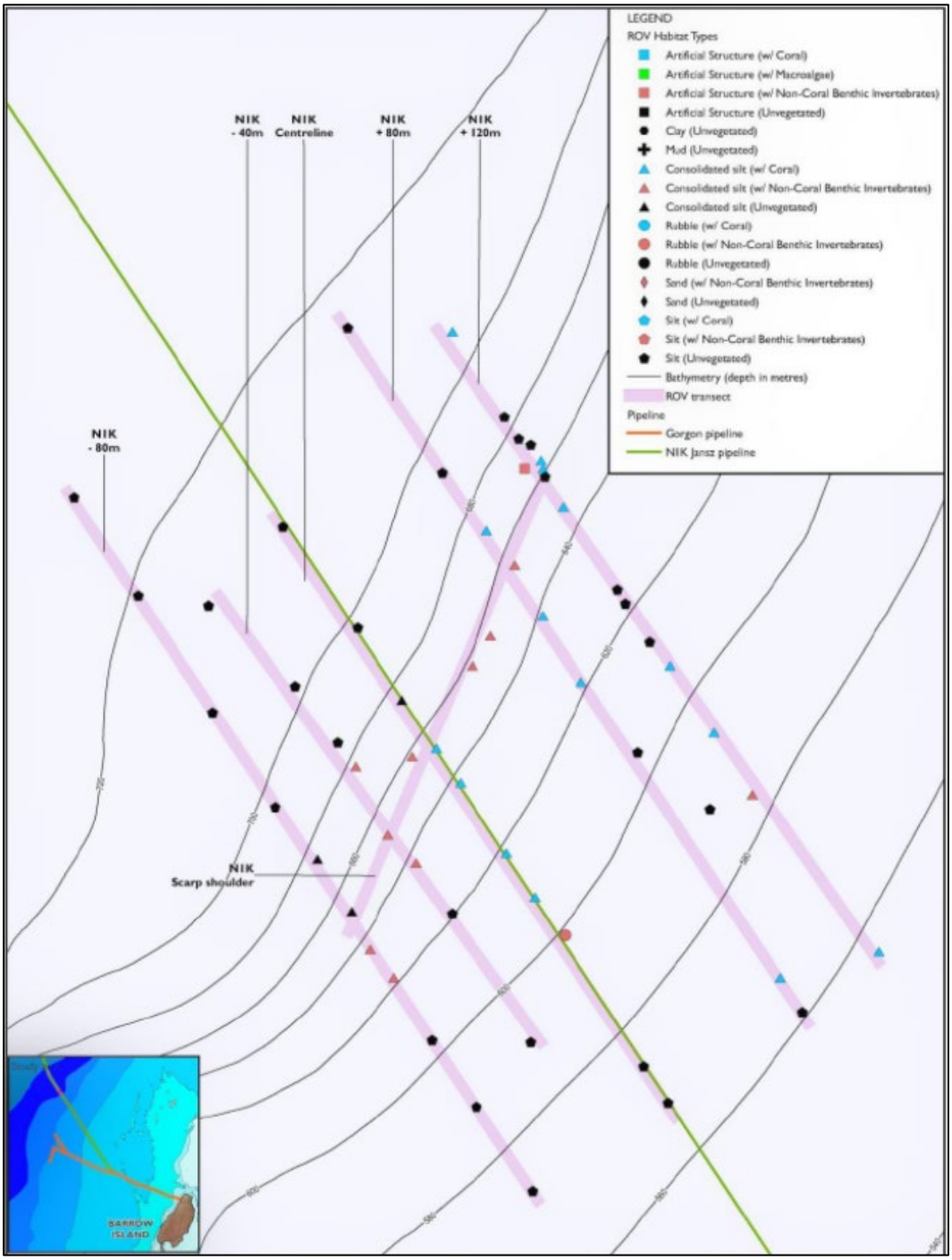


Figure 4-3: Benthic habitat along the Jansz Feed Gas Pipeline within the vicinity of the State waters boundary



Source: (Ref. 72)

Figure 4-4: Benthic habitat at the gully region along the Jansz Feed Gas Pipeline



Source: (Ref. 72)

Figure 4-5: Benthic substrate in the vicinity of the existing Jansz Feed Gas Pipeline and field infrastructure

4.3.1.2 Rankin Bank

Rankin Bank is located ~80 km east of the OA. While Rankin Bank is not protected and is not a key ecological feature (KEF), it is a large, complex bathymetrical feature on the outer western shelf of the Pilbara region and represents habitats that are likely to play an important role in the productivity of the Pilbara region (Ref. 74). Rankin Bank consists of three submerged shoals delineated by the 50 m depth contour with water depths of ~18–30.5 m (Ref. 74). In 2013, 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 composed of consolidated reef and algae habitat (~55% cover), followed by hard corals (~25% cover), unconsolidated sand/silt habitat (~16% cover), and benthic communities composed of macroalgae, soft corals, sponges, and other invertebrates (~3% cover) (Ref. 74). The proportion of cover at Rankin Bank was highest for macroalgae and hard corals, particularly at depths less than 40 m, and decreased with increasing depth (Ref. 75). Encrusting corals (reaching cover of ~12.5%) at depths less than 40 m and solitary corals (~10% cover), primarily at depths between 40–60 m were also present (Ref. 75). Other benthic taxa including soft corals and sponges were present in lower proportions at all depths (Ref. 75). The high cover of macroalgae and hard corals in shallower water depths are likely due to greater light penetration and lower sand cover (Ref. 75).

4.3.2 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. Similarly to benthic communities (as described in Section 4.17.1), coastal communities are likely to play roles in maintaining the integrity and diversity of coastal ecosystems, and the supply of ecological services.

The OA and Sound EMBA occur offshore and do not interface with the coast. The Hydrocarbon EMBAs do interface with the coast (due to predicted shoreline loading associated with unplanned hydrocarbon release events; Table 4-1). The Hydrocarbon Ecological EMBA includes the west coasts of Barrow, Middle and Boodie islands, as well as parts of Montebello, Airlie, Serrurier, Flat and east of Muiron islands. The Hydrocarbon Social EMBA includes the above coastal areas, as well: parts of the western and northern coasts of the North West Cape peninsula, south of Tent Island; and several of the Pilbara Inshore Islands (e.g. Sunday, Fly, Tortoise, Thevenard islands) (Table 4-1). The coastal communities and habitats that may be present within the Hydrocarbon EMBAs are summarised below.

Based on Smartline (Ref. 76), a spatial database containing geomorphic classifications for Australia's coasts, the types of shorelines present within the Hydrocarbon Ecological EMBAs include rocky coasts and sandy beaches. Within the Hydrocarbon Social EMBA, additional shoreline types were identified; mudflats and tidal flats associated with some areas of the North West Cape peninsula.

The Seamap Australia spatial database collates and classifies marine and coastal habitats on the Australian continental shelf (Ref. 77). Based on this dataset, areas of saltmarsh are present on southwestern Barrow Island, North West Cape peninsula and around Tent Island; and isolated areas of mangroves are present on the Montebello Islands and some Pilbara Inshore 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. 78). Coastal and marine baseline studies undertaken by CAPL (Ref. 70) identified that there are no mangrove stands on the west coast of Barrow Island, where the Hydrocarbon Ecological EMBA intersects 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. 70, Ref. 79). This includes mangroves strands within parts of Bandicoot Bay (southern Barrow Island), which does intersect with the Hydrocarbon EMBAs.

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 EMBAs.

4.3.3 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 presence of these species within the EMBA.

The Commonwealth Climate Change, Energy, Environment and Water (DCCEEW) Australian Marine Spatial Information System (AMSIS) Map View (Ref. 80) and the dataset from the DCCEEW website (Ref. 81) were used to verify the presence of Biologically important areas[8] (BIAs) and habitat critical to survival of the species within the OA and EMBAs.

4.3.3.1 Marine mammals

Based on searches of the online PMST (Ref. 57; appendix e), the threatened and/or migratory marine mammal species shown in Table 4-5 may be present within the EMBA. The full list of marine species identified from the PMST is provided in appendix e. BIAs associated with regionally significant marine mammal species are listed in Table 4-6.

For the threatened and/or migratory species with BIAs within, or within close proximity to, the OA or Sound EMBA (i.e. EMBAs associated with planned activities), additional information has been provided in the following subsections.

The threatened and/or migratory cetaceans that may be present within the OA and Sound EMBA are predominantly low-frequency cetaceans (e.g. Antarctic minke whale, blue whale, Bryde's whale, fin whale, humpback whale, sei whale) and high-frequency cetaceans (e.g. sperm whale, Australian humpback dolphin, Australian snubfin dolphin, killer whale, spotted bottlenose dolphin). Very-high-frequency cetaceans (e.g. dwarf sperm whale, pygmy sperm whale) were also identified within the PMST (Ref. 57; appendix e) as species or species habitat that may occur within the OA and Sound EMBA, these species are not listed as threatened and/or migratory under the EPBC Act. As shown in Table 4-6, except for pygmy blue whales and humpback whales, there are no other known BIAs or aggregation areas for other cetacean species that intersect with the OA or Sound EMBA; as such, it is expected that any presence of other cetacean species within the OA and Sound EMBA would be of a transitory nature.

Table 4-5: Presence of listed threatened and/or migratory marine mammals

Common name (EPBC protected status)	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Cetaceans (whales)				
Antarctic minke whale (*Migratory*)	✓	✓	✓	✓
Blue whale (*Endangered, Migratory*)	✓	✓	✓	✓
Bryde's whale (*Migratory*)	✓	✓	✓	✓

[8] Biologically important areas are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, foraging, resting or migration.

Common name (EPBC protected status)	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
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 (*Migratory*)	✓	✓	✓	✓
Australian snubfin dolphin (*Migratory*)	✓	✓	✓	✓
Killer whale (*Migratory*)	✓	✓	✓	✓
Spotted bottlenose dolphin (*Migratory*)	✓	✓	✓	✓
Sirenians				
Dugong (*Migratory*)	✓	✓	✓	✓

Table 4-6: Presence of BIAs for marine mammals

Common Name	BIA Behaviour	Seasonal Presence^	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Dugong	Breeding	Year round			✓	✓
	Calving	Year round			✓	✓
	Foraging (high density seagrass beds)	Year round			✓	✓
	Nursing	Year round			✓	✓
Humpback whale	Migration (north and south)	Northern migration, late July to September	✓	✓	✓	✓
	Resting	Winter				✓
Pygmy Blue whale	Foraging	(Not defined in database)			✓	✓
	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)	✓	✓	✓	✓
	Migration	~April to October			✓	✓

Common Name	BIA Behaviour	Seasonal Presence^	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Southern right whale	Reproduction	~May to September			✓	✓

^Source: Ref. 82, Ref. 83

4.3.3.1.1 Humpback whale

Humpback whales (WA subpopulation) migrate annually between their feeding grounds in Antarctic waters and their calving grounds in Kimberley waters (Ref. 84). The exact timing of the migration period can vary from year-to-year, however in general they are sighted in southern Australian waters in May, they then migrate northwards and southwards along the coast, with sightings rare after November when most individuals are within their Antarctic feeding grounds (Ref. 85).

Northbound humpback whales tend to migrate within deeper waters around the 200 m water depth contour, while southbound humpback whales tend to travel closer to the coastline and Barrow Island and generally occur between 50 m and 200 m water depths (Ref. 84). The migration (north and south) BIA corridor extends from the coast to out to ~100 km offshore in the Kimberley and Pilbara regions; reducing to ~50 km offshore south of North West Cape (Figure 4-6).

The humpback whale breeding and calving grounds in the southern Kimberley region extend from Broome to the northern end of Camden Sound, particularly between Lacepede Islands and Camden Sound (Ref. 84). Breeding and calving occurs in the region between mid-August and early-September (Ref. 84), followed by the start of the southern migration. Exmouth Gulf and Shark Bay are both important resting areas for migrating humpback whales, particularly for cow-calf pairs on the southern migration (Ref. 84). The southerly migration, from around the Lacepede Islands (north of Broome) extends parallel to the coast on approximately the 20–30 m depth contour (Ref. 84, Ref. 86). Southbound migration is more diffuse and irregular, lacking an obvious peak. An increase in southerly migrating individuals may be observed between the North West Cape and the Montebello Islands between August to early September (Ref. 84; Ref. 87). The predicted peaks in humpback whale migration in the Montebello Islands region are late-July (northern migration) and early-September (southern migration) (Ref. 84). Females and calves are known to stop and rest in Exmouth Gulf and Shark Bay (Ref. 84).

The southern section of the OA and Sound EMBA (i.e. Gorgon field and first ~46 km of the pipeline system), which occur in water depths <200 m, overlap with the migration (north and south) BIA. However, the J-IC SCSt is ~81 km north of this BIA. The Jansz–Io field, which occurs in water depths >1,190 m, also does not overlap with the migration (north and south) BIA. Consequently, presence of this species within the OA and Sound EMBA would likely be transitory, particularly within the shallower sections (i.e. Gorgon field and first ~46 km of the pipeline system).

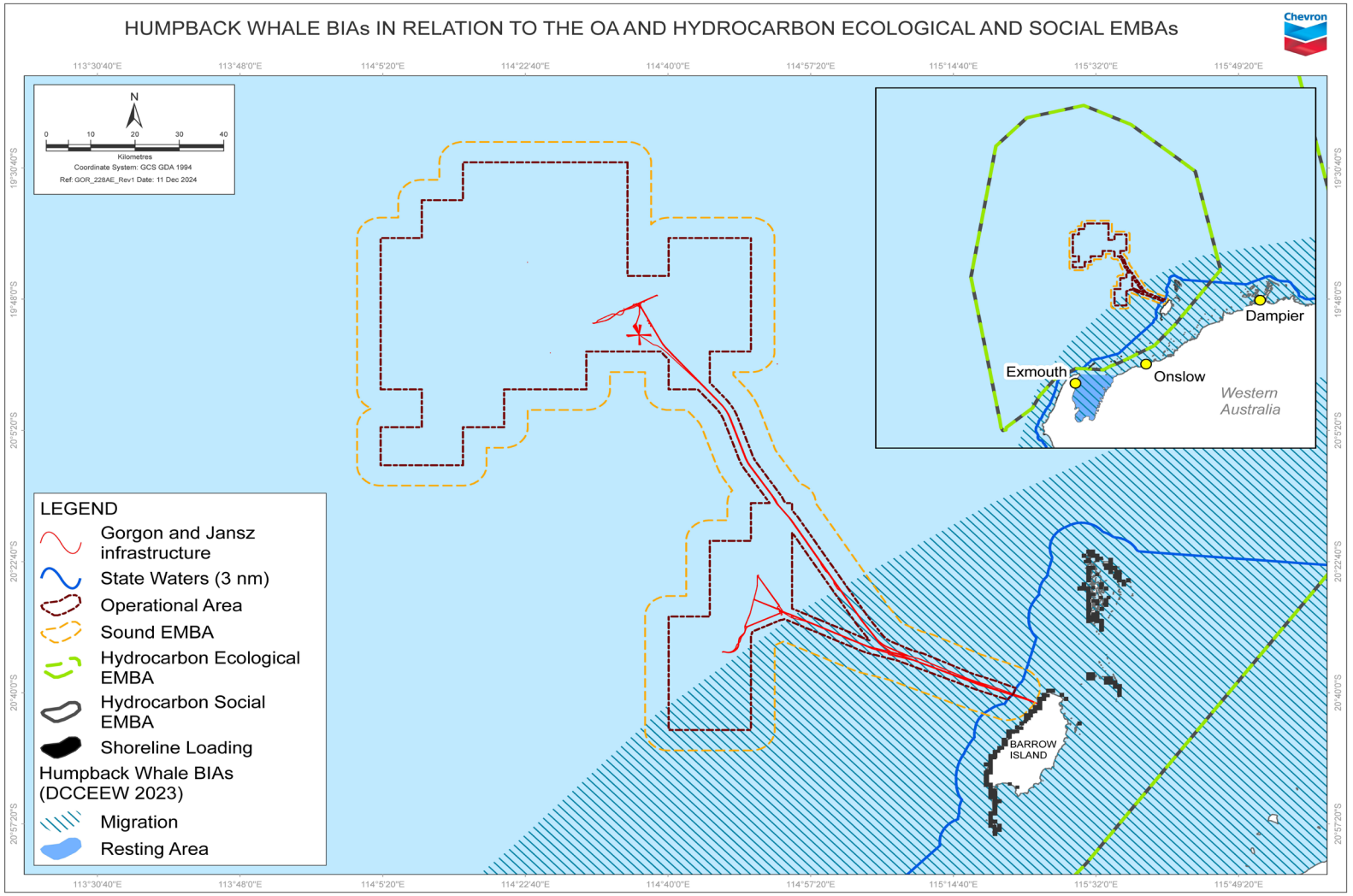


Figure 4-6: Biologically important areas for humpback whales

4.3.3.1.2 Pygmy blue whale

4.3.3.1.2.1 Migration

Pygmy blue whales migrate along the west coast of Australia in the northern direction to their breeding grounds near the Indonesian Archipelago from mid-February to August, and in the southern direction to the feeding grounds in the Southern Ocean from mid-November to early January (Ref. 88). Recent 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. 89; Ref. 90; Ref. 91). These seas are considered the northern terminus of the migration and potentially the breeding and calving ground, but may also act as a feeding area (Ref. 92; Ref. 93).

Acoustic monitoring conducted by McCauley and Jenner (Ref. 94) in the Exmouth and northern Montebello Islands region identified a peak period in the northern migration of pygmy blue whales from May to June, and from November through to late December during the southern migration. It was estimated by McCauley and Jenner (Ref. 94) that between 700–1,500 pygmy blue whales migrated southward past Exmouth in 2004.

CAPL noise loggers deployed for a full year period in 2019 detected pygmy blue whales on their northern and southern migration. The noise loggers were located at various sites and depths adjacent to existing Jansz field infrastructure (and within the OA). The detection of pygmy blue whale song peaked from mid-April to the end July, and then again from beginning of November through to early-December (Ref. 87). These peaks correspond with previously identified northern (May-June) and southern (November-December) migration peak periods of pygmy blue whales. Pygmy blue whale song was detected on more days than any other type of mysticete (baleen whale) sound (Ref. 87).

It is known that pygmy blue whales generally tend to follow the WA continental shelf edge between their feeding grounds at the Perth Canyon and the North West Cape, albeit they appear to remain within the deep waters just off the shelf along the continental slope (Ref. 96). Interestingly, this contrasts with southern Australia, where use of the shelf and shelf break by pygmy blue whales is more common.

The migratory pathway of whales north of the North West Cape is less defined; however, recent data from tagged individuals off the North West Cape (Ref. 411) indicates that whales appear to continue to follow the continental shelf edge past Barrow Island before taking varied routes towards Indonesia waters. An analysis of three years (2019-2023) of passive acoustic monitoring data from the CAPL noise loggers within and surrounding the J-IC location (Ref. 473), has demonstrated that the northern migration corridor is very wide with multiple focal points (west of the continental shelf, west of the shelf edge defined by the 200 m depth contour and one ~65 km west of the J-IC location). The J-IC location appears to be located between these migratory corridor focal points, with sonobuoys indicating a greater density of migrating individuals in the eastern portion of the northern migratory corridor

The migration BIA for pygmy blue whales has been historically described as occurring along the continental shelf edge between 500 m and 1,000 m water depths (Ref. 59; Ref. 95). However, more recent studies (e.g. Ref. 89; Ref. 88) suggest that pygmy blue whales are likely to transit through deeper and further offshore waters north of the North West Cape. Satellite tracking data showed pygmy blue whales on their northern migration travelled 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) (Ref. 96). Data from tagged pygmy blue whales also indicates that during their northern

migration, the width of the migration path increases north of Montebello Islands, from ~175 km to ~690 km at its widest point (Ref. 96). Gavrilov et al. (Ref. 88) 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 shore (Ref. 88). The analysis of passive acoustic monitoring data from the CAPL noise loggers (Ref. 473) demonstrated a focal point within the southern migratory corridor, approximately 65 km west of the JIC location, implying a wider migratory corridor than during the northbound migration, with peak well west of JIC location. This recent analysis reinforced the outcomes of the Gavrilov et al. (Ref. 88) study.

McCauley and Jenner (Ref. 94) recorded 24-hour average counts of pygmy blue whales along the WA coast during their migrations periods and found that the migratory habits are short and sharp pulses for the southbound pygmy blue whales and a more protracted pulse of northbound pygmy blue whales. This suggests that the southern migration pygmy blue whales are swimming purposefully through the area to reach their southern feeding grounds, thus resulting in the data collected for pygmy blue whales migrating through the area is not confounded by lingering pygmy blue whales but they are swimming steadily past. A difference in travel speed was also reported by Thums et al (Ref. 96), 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).

A recent study incorporating data collected from both passive acoustic monitoring and satellite telemetry data, determined the 'most important areas' for migration[9] along the WA coast as an almost continuous stretch from southern WA to around the latitude of Rowley Shoals, and thereafter was more dispersed (Ref. 96). Parts of the OA and Sound EMBA intersect with these most important area for migration (Figure 4-8).

Ferreira et al. (Ref. 106) compiled satellite tracking data for 38 pygmy blue whales and used movement models to distinguish between low and high move persistence and correlated the data with environmental variables. Typically, high move persistence is indicative of migration, while low move persistence is generally indicative of foraging or reproduction (Ref. 96). In alignment with other studies, the continental slope off the north-west Australian coast was predicted to be suitable habitat for migration (Ref. 106).

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. 96, Ref. 106). Monthly spatial predictions indicated higher densities around the Montebello Island region during May and June (northern migration) and November and December (southern migration) (Ref. 96).

4.3.3.1.2.2 Foraging

Pygmy blue whales aggregate in the Austral summer to feed at known locations on or adjacent to the continental shelf including the Perth Canyon, Great Southern Australian Coastal Upwelling System, and the sub-tropical convergence zone (Ref. 96). The areas around the Perth Canyon and Australian Coastal Upwelling System correspond to 'Foraging Areas' and 'Known Foraging Areas' within the Conservation Management Plan for the blue whale (Ref. 95). The *Conservation Management Plan for the Blue*

[9] 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. 75).

whale (Ref. 95) also identifies 'Foraging Areas'[10], 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 ~140 km south-west and ~870 km north-east of the OA respectively.

Thums et al. (Ref. 96) 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 hr) periods of low move persistence (Ref. 97).

The satellite tracking data reviewed in the recent study by Ferreira et. al. (Ref. 106), indicates 17 out of 38 tracked whales (~45%) displayed foraging movement behaviour in north-west WA (Ref. 106). Suitable foraging habitat was identified as a large semi-continuous area from the southern extent (28°S) to the northeastern edge of the modelled region (11.5°S) (Ref. 106). This area occurred almost exclusively on slope (91%), with a small amount of suitable habitat in deep ocean floor (7%) and on the shelf (2%) (Ref. 106). Parts of the OA and Sound EMBA are located within the area identified as suitable for foraging.

Owen et al. (Ref. 99 deployed a multi-sensor tag on a single pygmy blue whale, tracked its movement from the Perth Canyon region to Geraldton, and examined its dive behaviour. The whale completed a total of 1,677 dives over the duration of the tag was attached (7.6 days). A total of 21 feeding dives were identified, with a mean maximum depth of 129 ± 183 m (range 13–505 m). Feeding behaviour appears to be largely a function of prey availability (krill) and their associated oceanographic drivers (i.e. surface currents, light attenuation, upwellings and seabed features) (Ref. 127, Ref. 128).

Data collected from both passive acoustic monitoring and satellite telemetry data, was analysed and determined the 'most important areas' for foraging[11] 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. 96). The OA and Sound EMBA intersect with the 'most important areas' for foraging Figure 4-9). Although foraging areas are described as static, they are likely to be dynamic given their dependence on presence of prey (Ref. 96; Ref. 129). Studies (Ref. 106, Ref. 127, Ref. 128) have identified that variability in chlorophyll-a and oceanographic conditions (e.g. sea surface temperature, surface height anomaly) had a moderate to strong influence on probability of occurrence of whales suggesting suitable habitats and migratory occurrence may vary.

A recent analysis of diving behaviour of pygmy blue whales by AIMS (Ref. 97) demonstrated that foraging and feeding whales within the NW region had much shallower maximum dive depths (median = 100 m) when compared to other key foraging areas within their migratory pathway (Perth Canyon – 320 m and Geraldton – 340 m) suggesting that the highest prey density at Ningaloo is within the upper water column. This analysis aligned with data from a tagged pygmy blue whale off Exmouth (Ref. 130) which suggested that pygmy blue whales within the waters off the North-West Cape (i.e. ~130 km from the OA) demonstrates preferential surface foraging in response to the vertical distribution of krill within these waters, primarily within the upper 100 m of the water column. Thums et al. (Ref. 96) stated that ten of the 24 pygmy blue whales that were encountered during the 2020 field trip were observed to be surface feeding (implied by the visible baleen and pleats on the surface).

[10] Evidence 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" (Ref. 74).

[12] The period of the LGM in Australia is described as 24 to 18 ka (Ref. 74)

These observations were further reinforced by data from a recent AIMS tagging study conducted in 2024 of six pygmy blue whales off Exmouth (Ref. 411). The study revealed that the majority of dives (80%) in waters off the NW Cape were shallower than 100 m (based on 1768 recorded dives), although a maximum depth of 363 m was observed (Ref. 411).

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. 114). 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. 101). Studies in several locations where pygmy blue whales are known to aggregate (New Zealand [Ref. 131]; California [Ref. 132], South Australia, Gill [Ref. 133]; Canada [Ref. 134]; Chile [Ref. 140]) 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. 131) 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.

In a study undertaken to support the JIC project, scientists from the University of Western Australia (Ref. 174) demonstrated that chlorophyll production within the Pilbara region was highest in <100 m of water depth (particularly in summer; Figure 4-7), where sufficient light still penetrates to allow for photosynthesis and nutrients are highest within the thermocline (80-100 m). In winter (Figure 4-7), 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. Noting that this corresponds with the seasonal northern migration peak presence of pygmy blue whales at the JIC location. There is a generally accepted correlation between increased chlorophyll production (i.e. phytoplankton biomass) and increased krill density (Ref. 141).

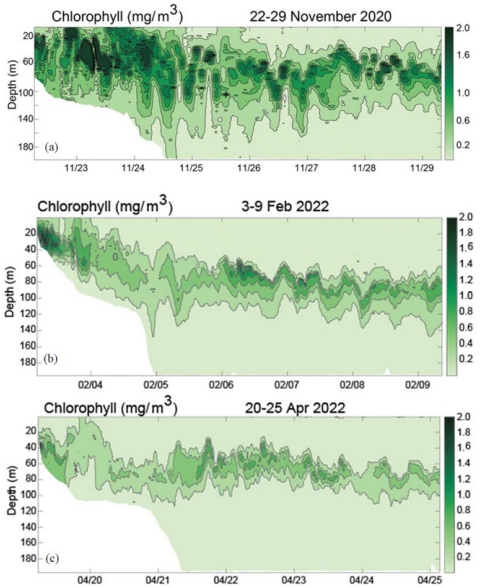


Figure 4-7: Chlorophyll fluorescence concentration (mg/m^3) during summer (left) and winter (right) conditions within the Pilbara region

Furthermore, a sonar krill biomass survey undertaken by scientists from Curtin University (Ref. 474) demonstrated that within the J-IC area, aggregations of krill dense enough to support 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 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), particularly during winter, when production is well mixed within the upper 100 m (Ref. 174).

The OA is located in water depths ranging from ~25–1,435 m. The defined migration BIA for pygmy blue whales overlaps with parts of the OA; however, it is expected based on satellite tracking and acoustic detection studies that pygmy blue whales are likely to travel further offshore (away from the OA) and/or within the continental slope (where there is an intersection with the Jansz feedgas pipeline system and IMR activities may occur), particularly on their southern migration, but also during the northern migration.

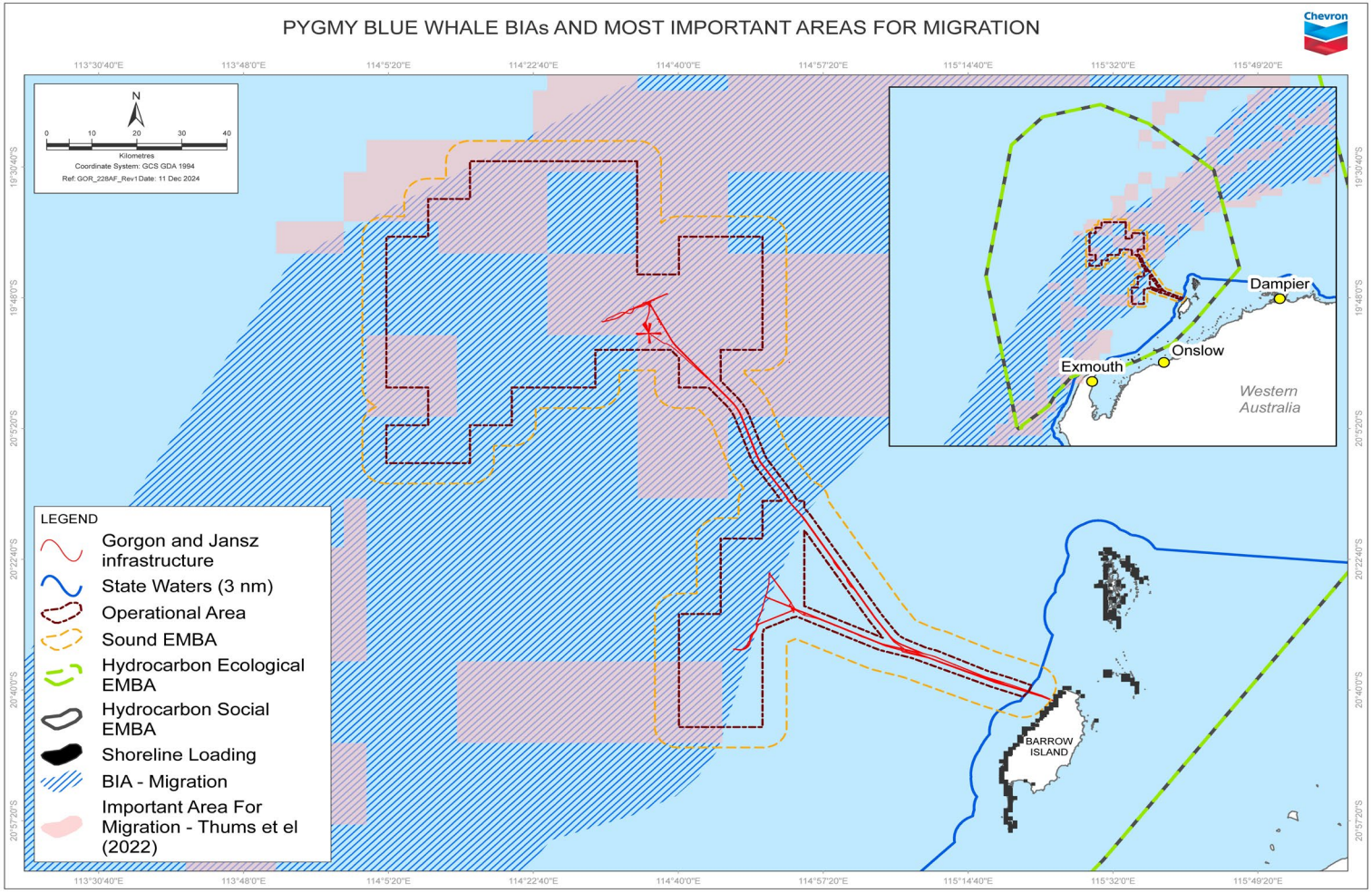


Figure 4-8: Most important areas (pink) for migration along WA coast as determined by Thums et al (2022); inset shows overlap of the OA

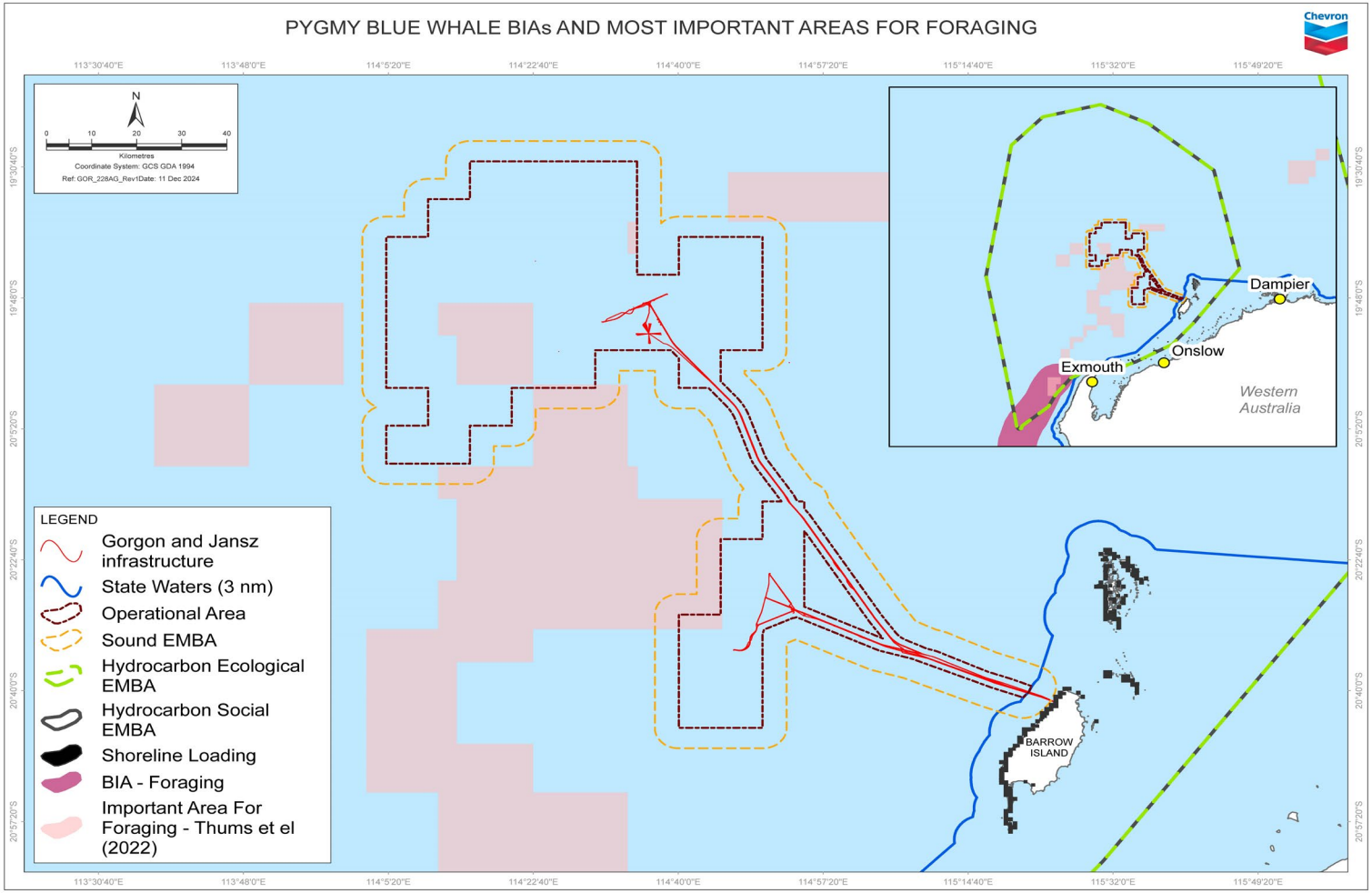


Figure 4-9: Most important areas (pink) for foraging along WA coast as determined by Thums et al (2022); inset shows overlap of the OA

4.3.3.2 Reptiles

Based on searches of the online PMST (Ref. 57; appendix e), the threatened and/or migratory reptile species shown in Table 4-7 may be present within the EMBA. The full list of marine species identified from the PMST is provided in appendix e. Habitat critical to survival of marine turtle species, or BIAs associated with regionally significant marine reptile species, are listed in Table 4-8 and Table 4-9 respectively.

For the threatened and/or migratory species with habitat critical to survival or BIAs within the OA or Sound EMBA (i.e. EMBAs associated with planned activities), additional information has been provided in the following subsections.

While both the leaf-scaled sea snake and short-nosed sea snake were identified within the PMST as potentially being present within the OA and Sound EMBA, they are not considered likely to be present. Both the short-nosed sea snake and leaf-scaled sea snake occur primarily on reef flats or in shallow waters of the outer reef edges to depths of 10 m (Ref. 115; Ref. 116). The OA occurs in water depths of >25 m with no emergent reef features.

Table 4-7: Presence of listed threatened and/or migratory reptiles

Common name (EPBC protected status)	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
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 4-8: Habitat critical to the survival of marine turtles

Common name	Nesting location^	Internesting buffer^	Seasonal presence^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Flatback turtle	Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island.	60 km	October - March	✓	✓	✓
	Dampier Archipelago, including Delambre Island and Hauy Island.	60 km	October - March			✓

Common name	Nesting location^	Internesting buffer^	Seasonal presence^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Green turtle	Barrow Island, Montebello Islands, Serrier Island and Thevenard Island.	20 km	November - March	✓	✓	✓
	Exmouth Gulf and Ningaloo coast.	20 km	November - March			✓
Hawksbill turtle	Cape Preston to mouth of Exmouth Gulf including Montebello Islands and Lowendal Islands.	20 km	October - February	✓	✓	✓
Loggerhead turtle	Exmouth Gulf and Ningaloo coast.	20 km	November - May			✓

^*Source: Ref. 118 and Ref. 142*

Table 4-9: Presence of BIAs for reptiles

Common Name	BIA Behaviour	Seasonal Presence^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Flatback turtle	Aggregation	Not identified		✓	✓
	Foraging	Early in summer			✓
		Not identified		✓	✓
	Internesting	Not identified		✓	✓
	Internesting buffer	Early in summer	✓	✓	✓
		Summer	✓	✓	✓
		Year round			✓
	Mating	Early in summer			✓
		Not identified		✓	✓
	Nesting	Early in summer			✓
		Short summer nesting season, predominantly November- March with peak in January		✓	✓
		Summer			✓
Green turtle	Aggregation	Not identified		✓	✓
	Basking	Summer		✓	✓
	Foraging	Early in summer			✓
		Not identified		✓	✓
		Summer		✓	✓

Common Name	BIA Behaviour	Seasonal Presence^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
		Year round		✓	✓
	Internesting	Not identified		✓	✓
		Summer		✓	✓
	Internesting buffer	Early in summer		✓	✓
		Summer	✓	✓	✓
	Mating	Early in summer			✓
		Not identified		✓	✓
		Summer		✓	✓
	Nesting	Early in summer			✓
		Summer		✓	✓
Hawksbill turtle	Foraging	Early in summer			✓
		Spring and early summer		✓	✓
		Year round		✓	✓
	Internesting	Spring and early summer, peak nesting October		✓	✓
	Internesting buffer	Early in summer		✓	✓
		Not identified		✓	✓
		Peak nesting in spring and early summer	✓	✓	✓
		Spring and early summer, peak nesting October	✓	✓	✓
		Year round			✓
	Mating	Early in summer			✓
		Spring and early summer		✓	✓
		Year round		✓	✓
	Nesting	Early in summer			✓
		Not identified			✓
		Peak nesting in spring and early summer		✓	✓
		Spring and early summer, peak nesting October		✓	✓
		Year round			✓
Loggerhead turtle	Internesting buffer	Not identified		✓	✓
	Nesting	Not identified			✓

^*Source: Ref. 82*

4.3.3.2.1 Flatback turtle

Montebello and Barrow islands support flatback turtle nesting, occurring from October to March, with a peak in December to January. The Montebello Islands and Barrow Island are identified as nesting habitat critical to the survival of the species, as is the 60 km internesting buffer around the Montebello Islands (Ref. 118; Figure 4-10).

The southern section of the OA and Sound EMBA (i.e. first five kilometres of the pipeline system) are located in water depths <25 m and is at closest ~5.5 km from the west coast of Barrow Island, and ~24.5 km from the Montebello Islands. Additionally this section of the OA and parts of the Gorgon field are located within the flatback turtle internesting buffer BIA. The Jansz–Io field which occurs in water depths >1,190 m, is ~45 km from of the closest BIA.

Typically, flatback turtle nesting on Barrow Island occurs between October and March, with peak nesting activity occurring between November and January. On Barrow Island, nesting activity is concentrated on the east coast on sandy, low-sloped, low-energy beaches with wide, shallow intertidal zones (Ref. 143; Ref. 144). Limited nesting activity has also been recorded on the south-west, north, and north-east beaches of Barrow Island (Ref. 145).

During internesting, turtles remain close to the nesting beach or rookery (Ref. 118). The 60 km internesting buffer defined within the *Recovery Plan for Marine Turtles in Australia* (Ref. 118) is based primarily on the movements of tagged internesting flatback turtles in WA (Ref. 146). The study tracked 56 turtles from four different rookeries, which demonstrated varying internesting movements, with distances ranging from 3–62 km, with some turtles at all four rookeries remaining within 10 km of their nesting beaches. However, tracking data showed these movements were largely longshore movements in nearshore coastal waters or travel between island rookeries and the adjacent mainland, which represent the greater distances (Ref. 146). There is no evidence to suggest that flatback turtles move to deep offshore waters during internesting periods.

A habitat suitability modelling study for internesting flatback turtles in the NWS region of WA (Ref. 147) was conducted to identify areas of suitable flatback turtle internesting habitat and determine overlap with identified industrial hazards. The study used a turtle tracking dataset of 47 nesting female turtles from five important rookeries in the NWS study area, including Barrow Island, located at closest ~5.5 km from the OA. The results showed internesting flatback turtles from all rookeries remained within water depths of <44 m, with a mean depth of <10 m (Ref. 147). Results also showed internesting turtles from all rookeries remained within <28 km of the nearest coast, with a mean distance from the coast of <6.1 km. The habitat suitability modelling study defined suitable flatback turtle internesting habitat as water depths of 0–16 m within 5–10 km of the coast. Unsuitable flatback turtle internesting habitat was defined as waters >25 m deep and >27 km from the coast (Ref. 147). The majority of the OA is located in waters classified as unsuitable for internesting flatback turtles.

Another recent study involving satellite tracking data for 11 flatback turtles following nesting on the Lacepede Islands (Ref. 148) found that flatback turtles remained at an average distance of 15.75±12.25 km from the nesting beach in water depths of <20 m.

Other previous studies (e.g. Ref. 149; Ref. 150; Ref. 151) have also presented findings that internesting behaviour was only observed in water depths of <40 m. One of these studies (Ref. 151) further indicates that internesting flatback turtles have relatively shallow dives, with 85% of the time during spent in ≤20 m water.

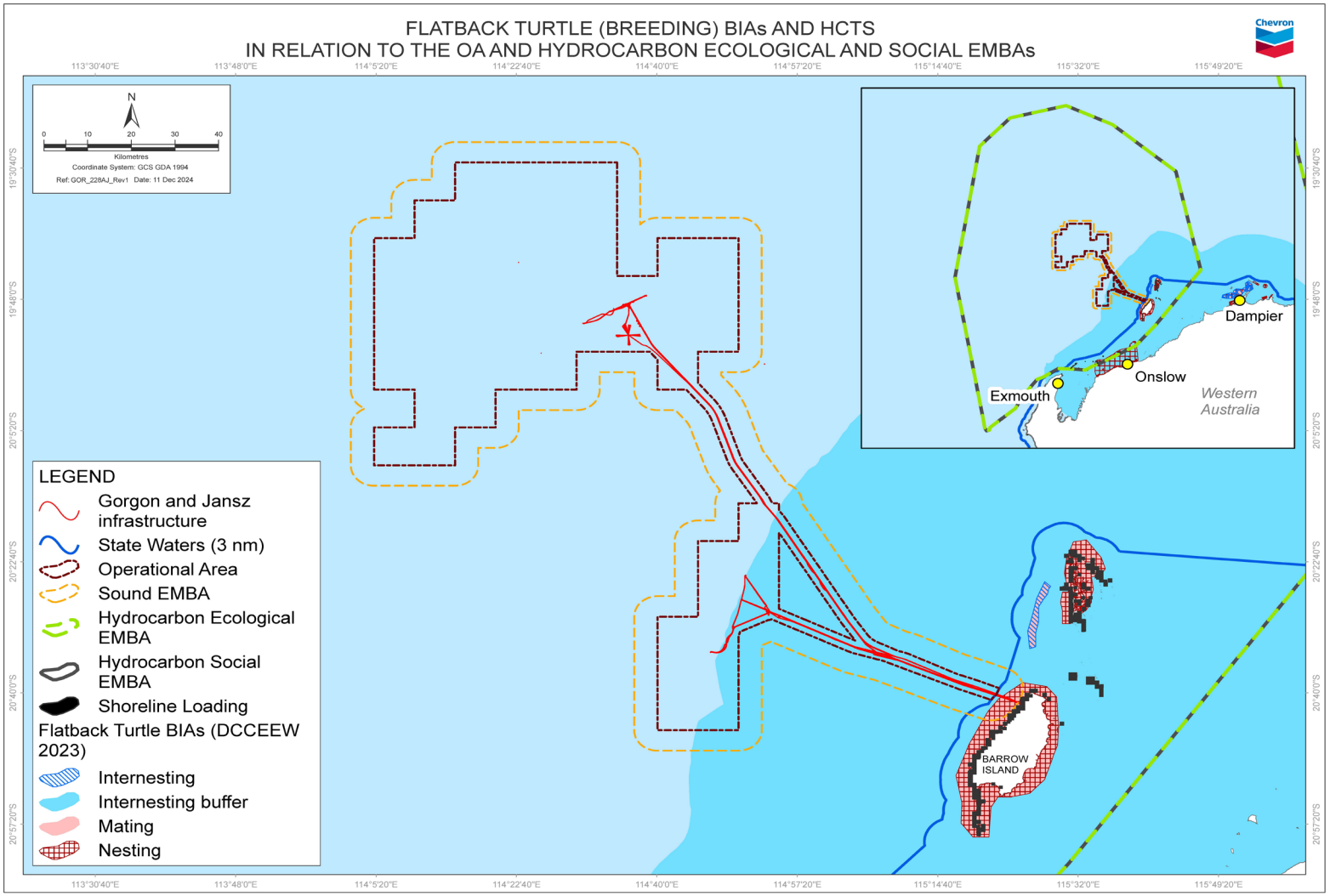


Figure 4-10: Biologically important areas and habitat critical to the survival of the species, for flatback turtles

4.3.3.2.2 Green turtle

The Montebello Islands and Barrow Island supports green turtle nesting, occurring from November to March. The Montebello Islands are identified as nesting habitat critical to the survival of the species, as is the 20 km internesting buffer around the Montebello Islands (Ref. 118; Figure 4-11).

The NWS stock is one of the largest green turtle stocks in the world and the largest in the Indian Ocean (Ref. 152). Nesting occurs over a large geographic range with nesting on offshore islands and the mainland. green turtle nesting usually occurs on the west and north-east coasts of Barrow Island between October and March each year, with a remigration interval of approximately five years (Ref. 153) and peak nesting activity occurring between December and February (Ref. 199; Ref. 143).

During internesting, turtles remain close to the nesting beach or rookery (Ref. 118). Analysis of satellite tracking data for Barrow Island green turtles suggests internesting habitat occurs throughout the rocky intertidal and subtidal platforms common on the west coast, around to the north-eastern beaches and waters (Ref. 153; Ref. 143). Satellite tracking of internesting green turtles on Barrow Island were recorded to remain in shallow water within 5 km of Barrow Island (Ref. 143).

Satellite tracking of post-nesting female green turtles has shown that green turtles nesting on Barrow Island and Sandy Island (Scott Reef, Western Australia) feed between 200 km and 1,000 km from their nesting beaches (Ref. 143). Following nesting at Barrow Island, green turtles that were tracked migrating to foraging grounds extending from Legendre Island in the Dampier Archipelago to waters in the southern Kimberley (Ref. 143).

As green turtle nesting occurs on the west coast of Barrow Island, and the southern section of the OA (i.e. feed gas pipeline system immediately seaward of the State waters boundary) is ~5.5 km from the west coast of the Island, green turtles may be present within the southern section of the OA. During internesting, turtles remain close to the nesting beach or rookery (Ref. 118). Once breeding and nesting is complete, turtles return to their favoured foraging areas (Ref. 154). As such, it is expected that any presence of these species within this area would be of a transitory nature. The Gorgon and Jansz–Io fields are ~40 km and ~75 km respectively from of the closest BIA (i.e. internesting buffer BIA).

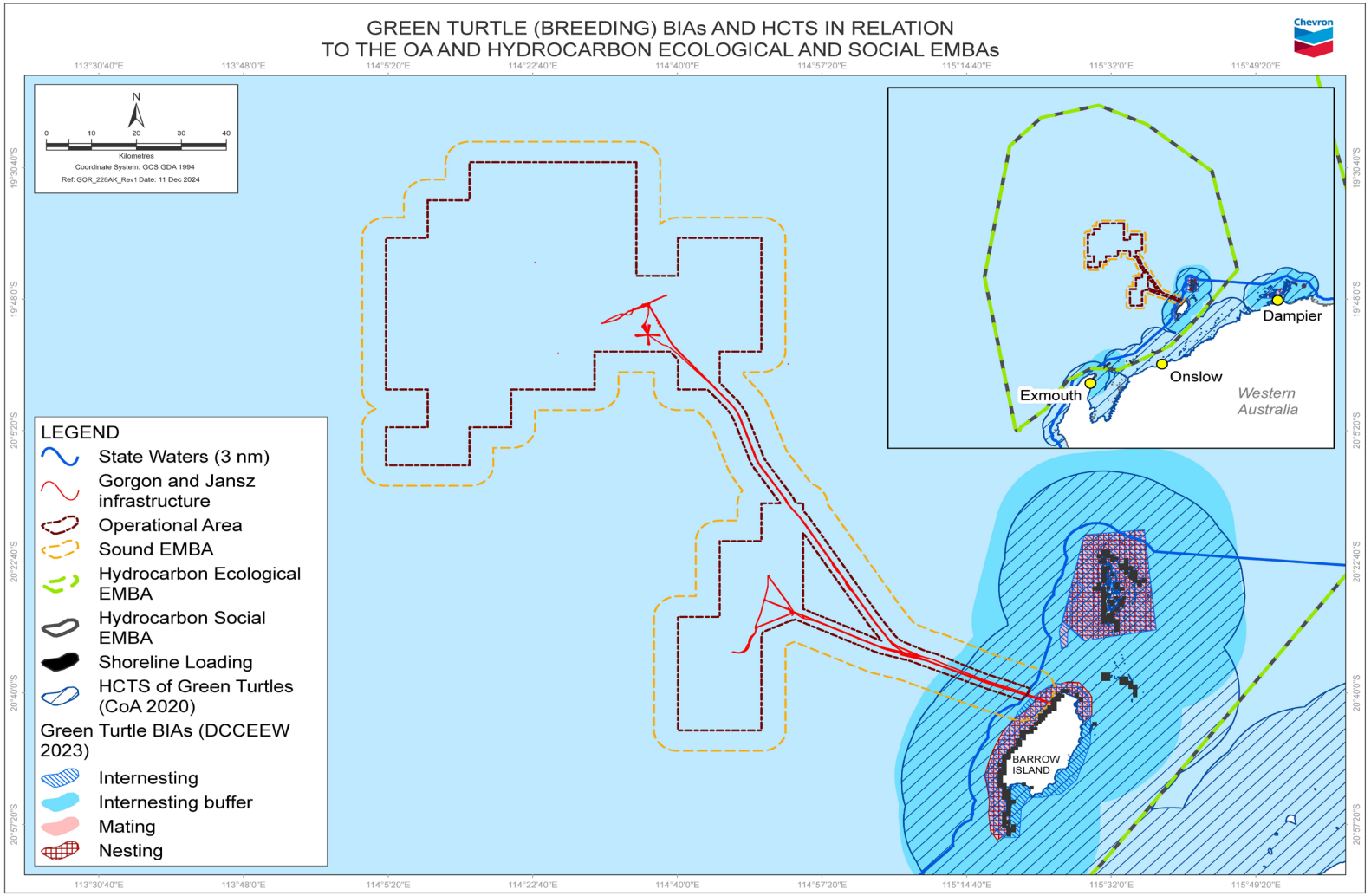


Figure 4-11: Biologically important areas and habitat critical to the survival of the species, for green turtles

4.3.3.2.3 Hawksbill Turtle

The Western Australia hawksbill turtle stock is one of the three stocks within Australia (Ref. 118). Most of the nesting for this stock is located in the Pilbara (Ref. 118). The key nesting and internesting areas in Australia include the Dampier Archipelago, the Ningaloo and Jurabi Coasts, and Thevenard, Barrow, Lowendal and Montebello Islands (Ref. 155). The estimated size of the reproductive population of WA stock is small (Ref. 156). For example, it has been estimated as an overall reproductive population at Barrow Island of 100, an additional 1,000 in the Lowendal Islands, and 1,300 in the Montebello Islands (Ref. 156, Ref. 162).

Monitoring of Barrow Island hawksbill turtle nesting has found that nesting activity is more temporally and spatially diffuse than flatback and green turtle nesting activity and occurs predominantly on small, rocky, east coast beaches. Nesting on Barrow Island peaks in October (Ref. 163) and hawksbill turtles typically have an internesting interval of 14.5 days and a remigration interval of approximately three years (Ref. 155, Ref. 199).

During internesting turtles remain close to the nesting beach or rookery (Ref. 118). Satellite tracking of hawksbill turtles found that they remained in shallow coastal waters (<10 m deep) post nesting (Ref. 143).

The Montebello Islands and Lowendal Islands are identified as nesting habitat critical to the survival of the species, as is the 20 km internesting buffer around the Islands (Ref. 118). Hawksbill turtles are expected to be present within these areas between October and February (Ref. 118).

Although internesting buffer BIAs have been identified (Table 4-9), hawksbill turtle mating, internesting, and foraging grounds have not been identified for Barrow Island (Ref. 156). However, data from hawksbill turtles tracked from nearby Varanus Island indicate potential internesting habitat in waters north-east of Barrow Island (Ref. 143). This internesting is consistent with the internesting habitat critical for the survival of the species that has been identified (Table 4-8).

The southern section of the OA is ~5.5 km northwest of Barrow Island. As hawksbill turtle nesting occurs predominantly on east coast beaches on Barrow Island, it is expected that any presence of these species within the southern section of the OA would be of a transitory nature. The Gorgon and Jansz–Io fields are ~40 km and ~80 km respectively from of the closest BIA (i.e. internesting buffer BIA).

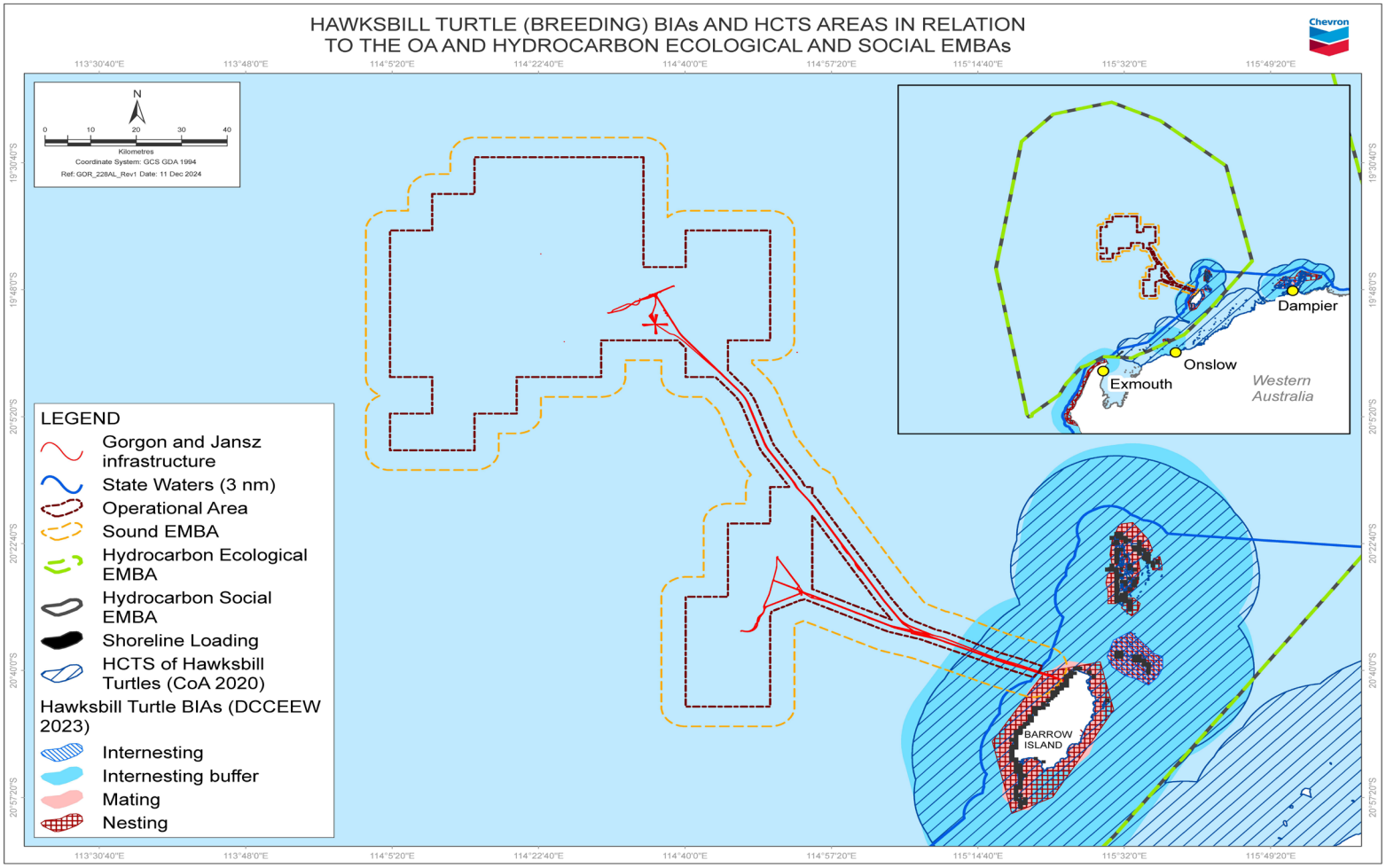


Figure 4-12: Biologically important areas and habitat critical to the survival of the species, for hawksbill turtles

4.3.3.2.4 Loggerhead Turtle

Loggerhead turtles are globally distributed in tropical, sub-tropical waters and temperate waters. Loggerheads are carnivorous, feeding primarily on benthic invertebrates in habitat ranging from nearshore to 55 m depth (Ref. 157). Loggerhead turtles forage in all coastal states and the Northern Territory (Ref. 118).

The primary Australian breeding areas for loggerhead turtles are within southern Queensland and Western Australia (Ref. 158). Loggerhead turtles will migrate over distances in excess of 1,000 km and show a strong fidelity to their feeding and breeding areas (Ref. 159).

In WA nesting occurs from Shark Bay (including on the mainland near Steep Point) to the North West Cape with major nesting at Dirk Hartog Island; Gnaraloo Bay; Murion Island; and the beaches of the North West Cape (Ref. 160). Occasional late summer nesting crawls have also been recorded as far north as Barrow Island, the Lowendal Islands and Dampier Archipelago (Ref. 161). During internesting turtles remain close to the nesting beach or rookery (Ref. 118). Once breeding and nesting is complete, turtles return to their favoured foraging areas (Ref. 154). The closest known foraging BIA is ~350 km east of the OA.

The southern section of the OA is adjacent to the internesting buffer BIA for the loggerhead turtle. The closest habitat critical to the survival of the species is ~108 km of the OA. Note the Gorgon and Jansz–Io fields are ~40 km and ~90 km respectively from this BIA.

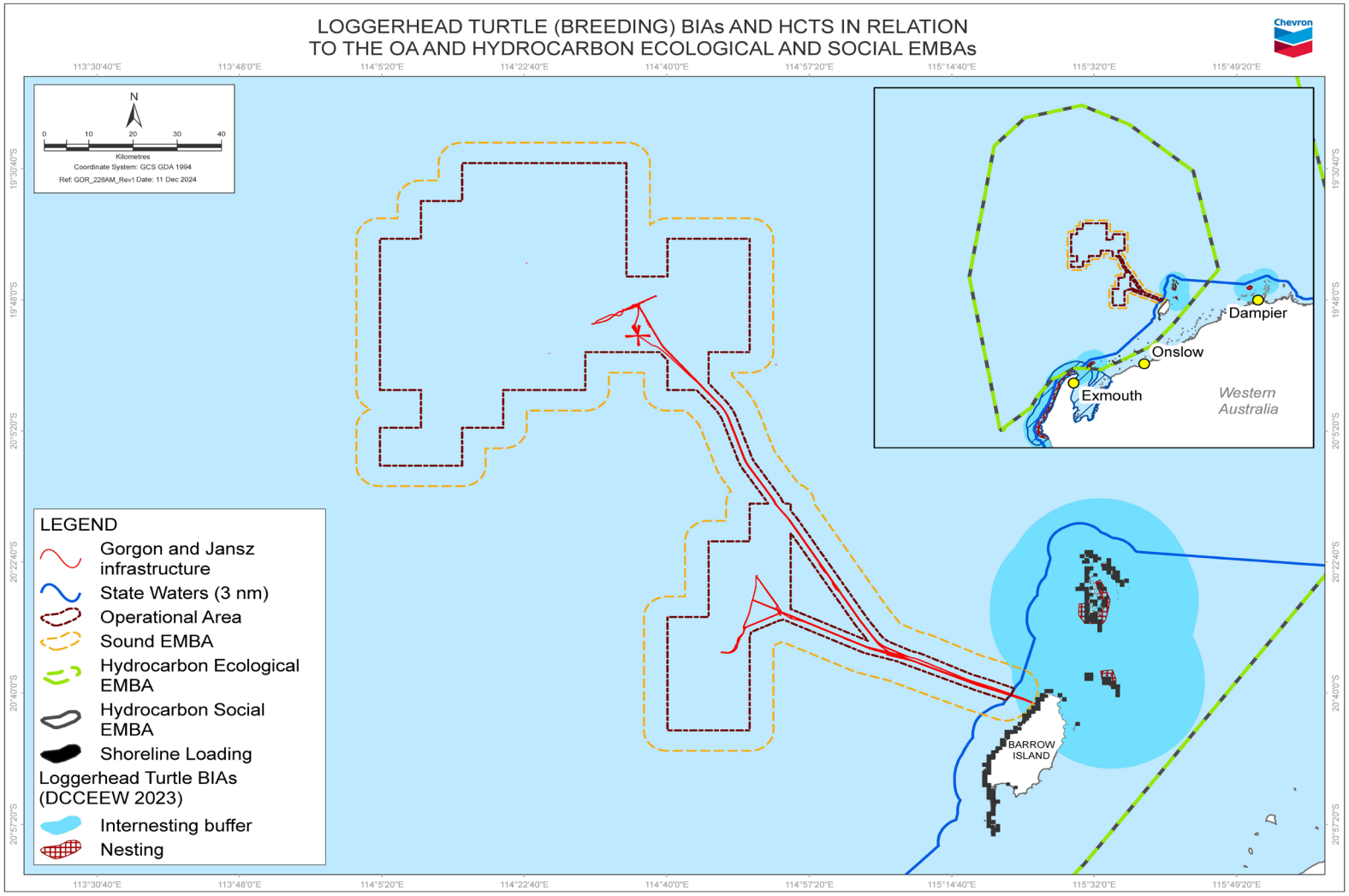


Figure 4-13: Biologically important areas and habitat critical to the survival of the species, for loggerhead turtles

4.3.3.3 Fishes, including sharks and rays

Based on searches of online PMST (Ref. 57; appendix e), the threatened and/or migratory fish species shown in Table 4-10 may be present within the EMBA. The full list of marine species identified from the PMST is provided in appendix e. BIAs associated with regionally significant fish species are listed in Table 4-11.

For the threatened and/or migratory species with BIAs within the OA or Sound EMBA (i.e. EMBAs associated with planned activities), additional information has been provided in the following subsections.

Table 4-10: Presence of listed threatened and/or migratory fishes, including sharks and rays.

Common name (EPBC protected status)	OA	Sound EMBA	Hydrocarbon Ecological EMBAs	Hydrocarbon Social EMBAs
Ray				
Giant manta ray (*Migratory*)		✓	✓	✓
Reef manta ray (*Migratory*)		✓	✓	✓
Sawfish				
Dwarf sawfish (*Vulnerable, Migratory*)	✓	✓	✓	✓
Freshwater sawfish (*Vulnerable, Migratory*)	✓	✓	✓	✓
Green sawfish (*Vulnerable, Migratory*)	✓	✓	✓	✓
Narrow sawfish (*Migratory*)		✓	✓	✓
Sharks				
Grey nurse shark (west coast population) (*Vulnerable*)	✓	✓	✓	✓
Longfin mako (*Migratory*)		✓	✓	✓
Oceanic whitetip shark (*Migratory*)		✓	✓	✓
Porbeagle (*Migratory*)				✓
Scalloped hammerhead (*Conservation Dependent*)	✓	✓	✓	✓
Shortfin mako (*Migratory*)		✓	✓	✓
Whale shark (*Vulnerable, Migratory*)	✓	✓	✓	✓
White shark (*Vulnerable, Migratory*)	✓	✓	✓	✓

Table 4-11: Presence of BIAs for fishes, including sharks and rays

Common Name	BIA Behaviour	Seasonal Presence^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Whale shark	Foraging	Spring	✓	✓	✓
	Foraging (high density prey)	April-June, Autumn			✓

^*Source: Ref. 82*

4.3.3.3.1 Whale shark

Whale sharks have a global distribution in tropical and warm temperate waters, including within Australian waters (mainly Northern Territory, Queensland and northern WA) (Ref. 164; Ref. 165). Within Australia, whale sharks form seasonal aggregations at Ningaloo Reef (March to July), Christmas Island (December to January), and in the Coral Sea (November to December) (Ref. 165). Ningaloo Reef is considered the main known seasonal aggregation area (Ref. 175). Whale sharks aggregate off Ningaloo Reef between March and July each year to feed (Ref. 164; Ref. 176). Their presence off Ningaloo Reef has been linked to coral mass spawning timing (Ref. 164). The whale shark is a suction filter feeder, with a diet consisting of planktonic and nektonic prey, and feeds at or close to the water's surface by swimming forward with mouth agape, sucking in prey (Ref. 164). While the species is generally encountered close to or at the surface, it will regularly dive and move through the water column. Following the aggregation period around Ningaloo Reef, their movements are largely unknown, although three migration routes from Ningaloo reef have been identified through various surveys (Ref. 176):

- north-west, into the Indian Ocean
- directly north, towards Sumatra and Java
- north-west, passing through the NWS region, travelling along the shelf break and continental slope.

The whale shark BIA on the NWS is associated with foraging behaviours during northward migration from Ningaloo Reef / North West Cape along the 200 m isobath during July to November (Ref. 164).

The southern section of the OA and Sound EMBA (i.e. Gorgon field and first ~46 km of the pipeline), which occur in water depths <200 m, overlap with the foraging BIA. However, the SCSt is ~58 km northwest of this BIA. The Jansz–Io field, which occurs in water depths >1,190 m, does not overlap with the foraging BIA either.

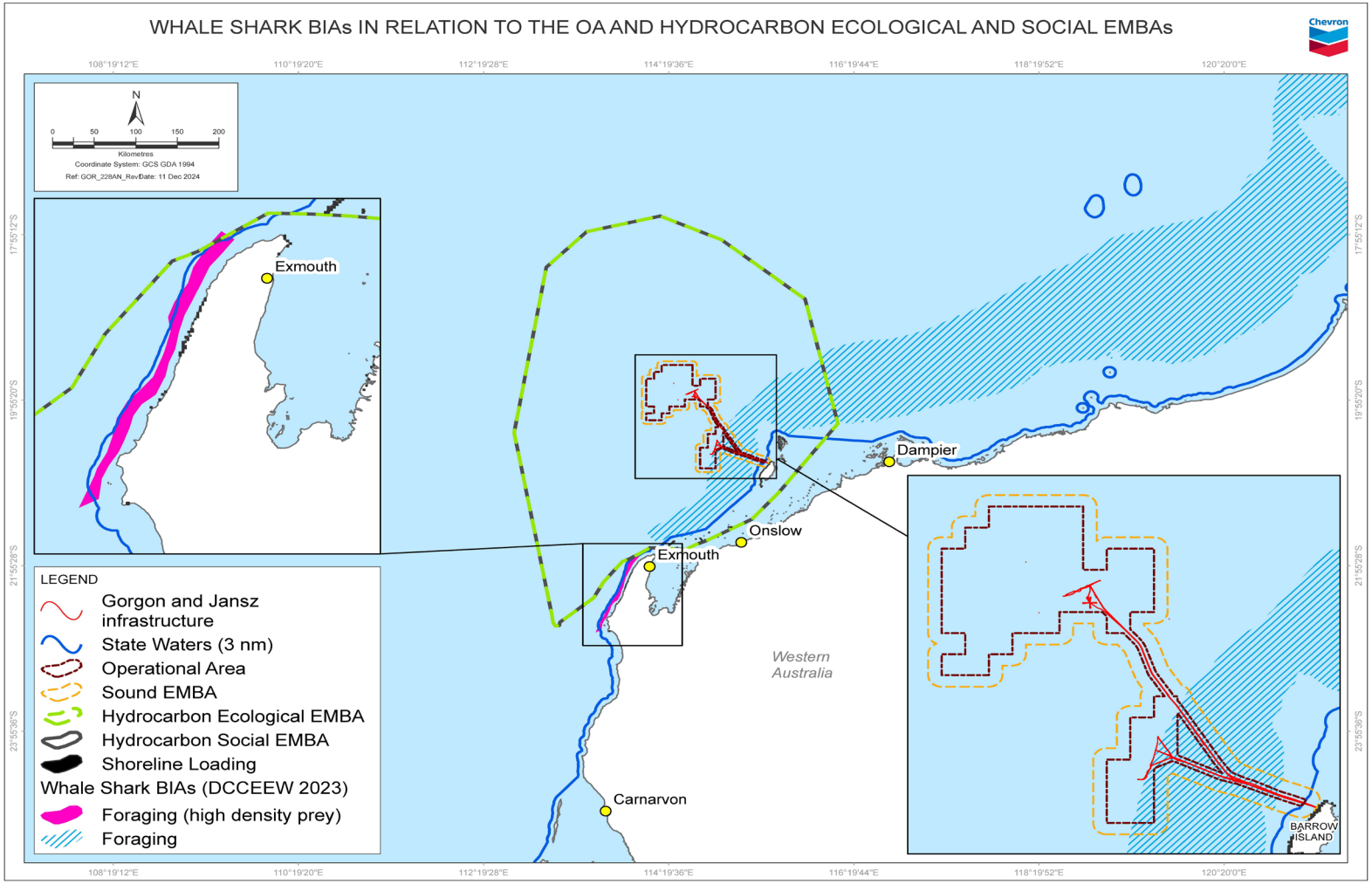


Figure 4-14: Biologically important areas for whale sharks

4.3.3.4 Seabirds and shorebirds

Based on searches of the online PMST (Ref. 57; appendix e), the threatened and/or migratory seabird and shorebird species shown in Table 4-12 may be present within the EMBA. The full list of marine species identified from the PMST is provided in appendix e. BIAs associated with regionally significant seabird and shorebird species are listed in Table 4-13.

For the threatened and/or migratory species with BIAs within the OA (i.e. EMBAs associated with planned activities), additional information has been provided in the following subsections.

Table 4-12: Presence of listed threatened and/or migratory seabirds and shorebirds

Common name (EPBC protected status)	OA	Hydrocarbon Ecological and Social EMBAs
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*)		✓
Christmas Island white-tailed tropicbird (*Endangered*)	✓	✓
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*)	✓	✓
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 (*Migratory*)		✓
Northern Siberian bar-tailed godwit (*Endangered*)		✓

Common name (EPBC protected status)	OA	Hydrocarbon Ecological and Social EMBAs
Oriental plover (*Migratory*)		✓
Oriental pratincole (*Migratory*)		✓
Osprey (*Migratory*)		✓
Pectoral sandpiper (*Migratory*)	✓	✓
Red knot (*Vulnerable*, *Migratory*)	✓	✓
Red-tailed tropicbird (Indian Ocean) (*Endangered*)	✓	✓
Roseate tern (*Migratory*)	✓	✓
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 4-13: Presence of BIAs for seabirds and shorebirds

Common Name	BIA Behaviour	Seasonal Presence^	OA	Hydrocarbon Ecological and Social EMBAs
Australian Fairy Tern	Breeding	July to late September, birds from South-west Marine Region dispersing northwards in winter.	✓	✓
Roseate Tern	Breeding	Mid-March to July. Also, birds from South-west Marine Region dispersing north in winter.	✓	✓
Lesser crested Tern	Breeding	March to June.	✓	✓
Wedge-tailed Shearwater	Breeding	Breeding visitor arriving in mid-August and leaving in April in Pilbara and mid-May in Shark Bay.	✓	✓

^*Source: Ref. 82*

4.3.3.4.1 Australian fairy tern

The fairy tern has a large geographic range between Australia, New Zealand and New Caledonia. Three subspecies have been identified based on phenotypic, genotypic and geographic differences (Ref. 178), only one of which (the Australian fairy tern) occurs in WA. The Australian fairy tern subspecies has been identified in Table 4-13 as having the potential to be present within the OA, and is listed as vulnerable under the EPBC Act.

The Australian fairy tern has been found in embayments of a variety of habitats including offshore, estuarine, or lacustrine (lake) islands, wetlands and mainland coastline (Ref. 179). The Australian fairy tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation (Ref. 180).

Within WA, there appear to be two subpopulations:

- a sedentary subpopulation based along the Pilbara and upper Gascoyne coasts from Exmouth Gulf to the Dampier Archipelago, including Barrow, Montebello, and Lowendal islands; these Australian fairy terns nest from late-July to late-September
- a migratory subpopulation that disperses south along the coast from Shark Bay to breed between the Houtman Abrolhos Islands to the Recherche Archipelago between September and May, with active breeding flocks appearing at various locations between October and February (Ref. 181).

Australian fairy terns are reported from Barrow Island throughout the year and primarily from the south-east to south-west of the island, with high counts between November and April (Ref. 182). Australian fairy terns may nest on offshore islands between Barrow Island and the Montebello Islands (Ref. 183), including intermittently nesting on North and/or South Double Island (Ref. 182).

Australian fairy terns are diurnal plunge diving feeders that predate exclusively on small (<60 mm) surface schooling bait fishes throughout their range. Prey include species of sprats, hardy heads and larval prey of some demersal fish species (Ref. 179). Australian fairy terns feed almost entirely on fish in near-shore waters adjacent to nesting colonies and around island archipelagos (Ref. 181).

Behaviours used to define BIAs for seabirds in Commonwealth marine areas include breeding with a foraging buffer, and roosting (Ref. 177). The BIAs for this species are buffers around islands that the species is known to nest on as they may forage in the waters surrounding the islands during nesting seasons (Figure 4-15).

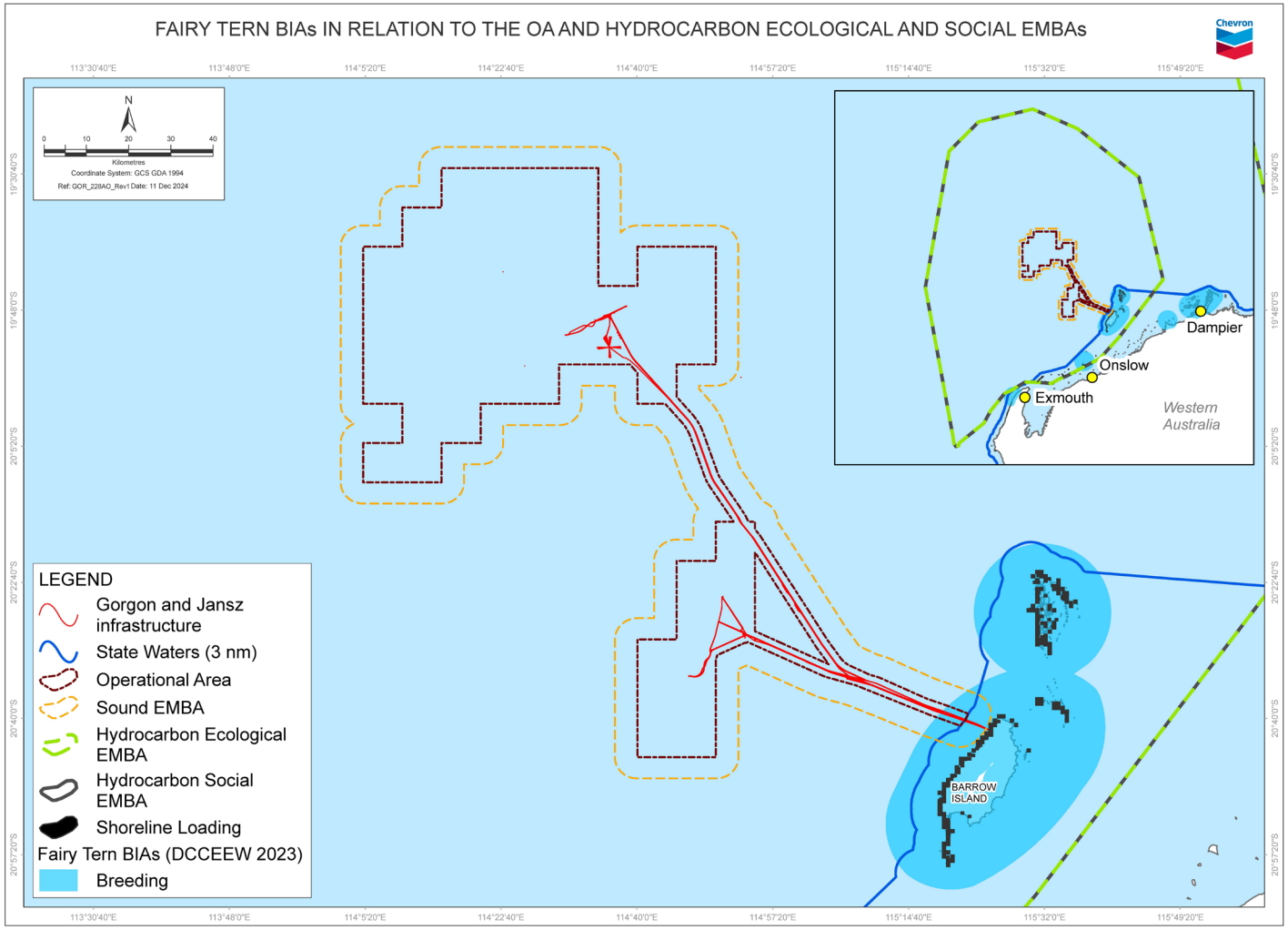


Figure 4-15: Biologically important areas for fairy terns

4.3.3.4.2 Roseate tern

The roseate tern occurs in coastal and marine areas in subtropical and tropical seas. The species inhabits rocky and sandy beaches, coral reefs, sand cays and offshore islands (Ref. 179). The roseate tern is a migratory species, though the movement patterns are not well known. Birds are known to usually move away from breeding colonies following breeding, but their non-breeding range is not well defined (Ref. 179).

In the NWMR breeding populations of roseate terns have been recorded at Ashmore Reef, Napier Broome Bay, Bonaparte Archipelago, Lacepede Island, Bedout Island, Dampier Archipelago, Lowendall Island, Frazer Island, Koks Island, Mary Anne Island and Meade Island (Ref. 184).

Breeding in Western Australia occurs in two distinct periods:

- at some sites (including Montebello Islands), breeding occurs during both late spring-summer and late autumn-winter
- but at other sites (typically further south, including around Cervantes), breeding occurs only during autumn-winter (Ref. 185).

Roseate terns breed in the Pilbara region from March to July and October (Ref. 82; Ref. 186).

Different islands can be chosen for the breeding colony from year to year. As roseate terns do not forage widely from their breeding colonies, suitable nesting islands may be chosen because of nearby aggregations of their pelagic fish prey (Ref. 187).

Behaviours used to define biologically important areas for seabirds in Commonwealth marine areas include breeding with a foraging buffer, and roosting (Ref. 177). The BIAs for this species are buffers around islands that this species is known to nest on (Figure 4-16). Bird species may forage in the waters surrounding the islands during nesting seasons. The closest foraging BIA for the Roseate tern is >800 km southwest of the OA, near Kalbarri.

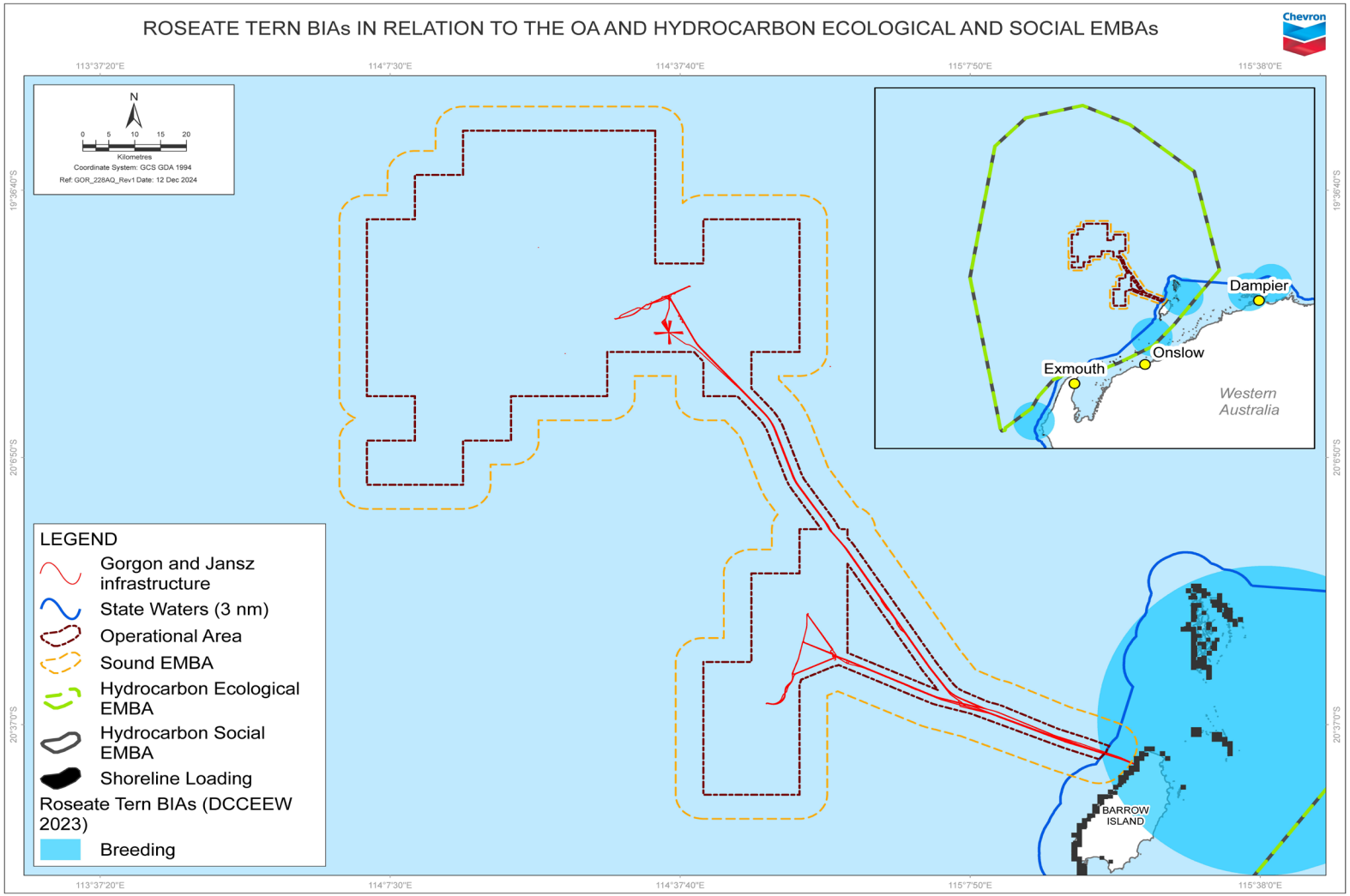


Figure 4-16: Biologically important areas for roseate terns

4.3.3.4.3 Lesser crested tern

The lesser crested tern is listed as marine under the EPBC Act. A breeding BIA for the lesser crested tern overlaps the OA (Figure 4-17). The population size is large and stable with the global population estimate for lesser crested tern sitting around 225,000 pairs, more than half of which are found in Australia (Ref. 404). The species breed in subtropical coastal areas, generally from the Red Sea across the Indian Ocean to the western Pacific Ocean and Australia. The species inhabits tropical and subtropical coasts and estuaries, breeding on low-lying offshore islands (Ref. 404). The breeding season is between March and June and occurs on islands off the north and west Kimberley, Bedout Island, Lowendal Islands, Thevenard Island, and Dirk Hartog Islands (Ref. 405). Lesser crested terns forage in the surf of the ocean and on the surface of offshore waters feeding primarily on small pelagic fish and shrimp (Ref. 406).

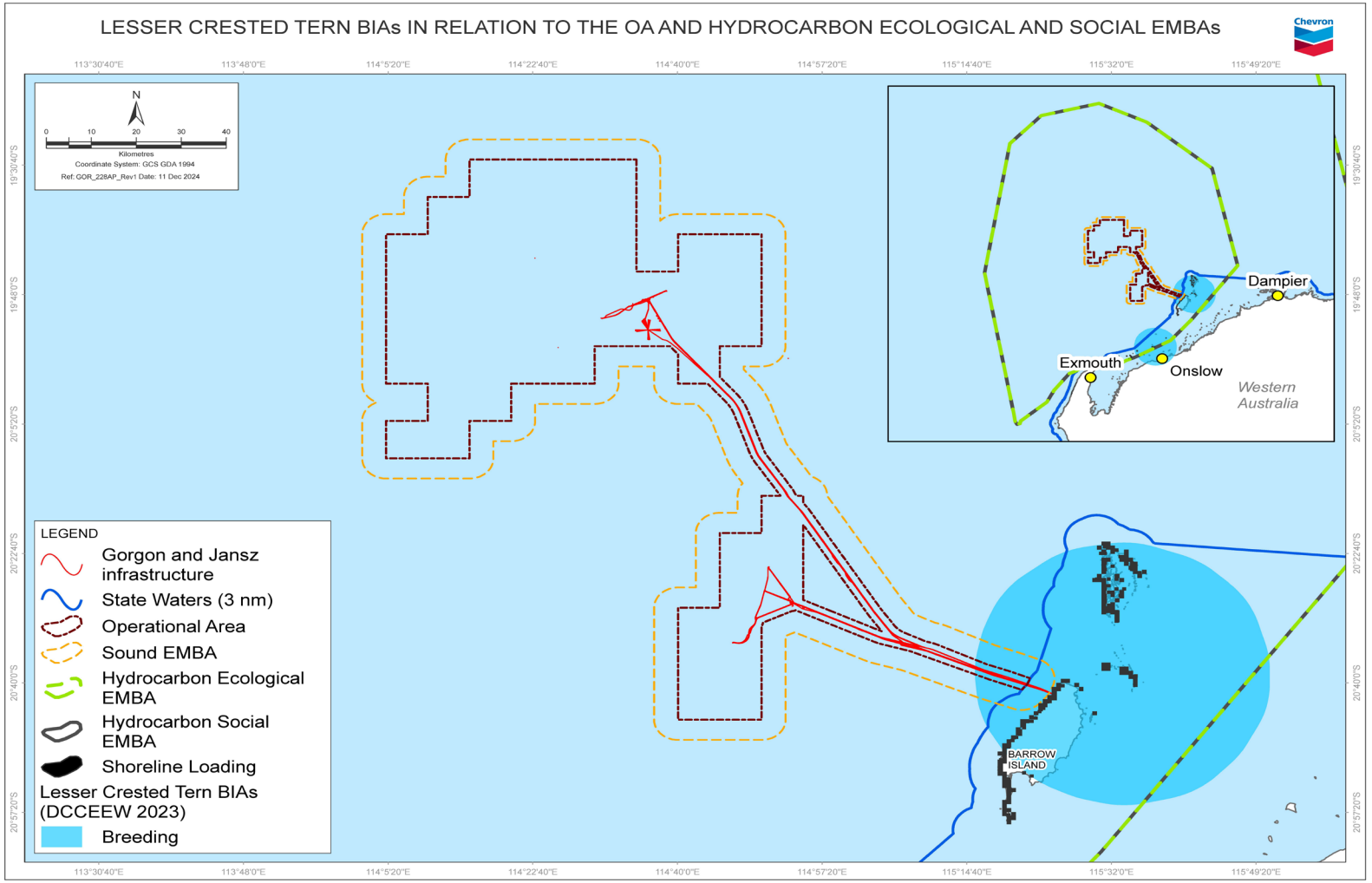


Figure 4-17: Biologically important areas for lesser crested terns

4.3.3.4.4 Wedge-tailed shearwater

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. 188); out of an estimated global population of five million (Ref. 184). The wedge-tailed shearwaters typically begin arriving at their WA colonies around August each year and will excavate burrows on vegetated islands for nesting; peak egg laying typically occurs during November; and they will typically leave nests in early-April to early-May and travel north to the Indian Ocean (Ref. 185; Ref. 189). Migration from the colony is very synchronous, but the return is less so (Ref. 189). The departure (early-April to early-May) and arrival (around August) of Wedge-tailed Shearwaters from WA may overlap with the petroleum activity. Once adults cease returning to feed their young, the young (fledgling) wedge-tailed shearwaters fledge and depart nests (Ref. 190; Ref. 191).

Known breeding locations in the NWMR include Forestier Island (Sable Island), Bedout Island, Dampier Archipelago, Passage Island, Lowendal Island, islands off Barrow Island (Mushroom, 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. 184).

One of the closest colonies to the OA is Double Island (east of Barrow Island). Baseline monitoring (pre-construction of the Gorgon Gas Development) recorded ~20–50 wedge-tailed shearwater nesting burrows on North Double Island and ~300 on South Double Island (Ref. 192; Ref. 182). CAPL (Ref. 193; Ref. 182) provided an estimate of 500 burrows over a 2 ha portion of the north-eastern corner of South Double Island, supporting 5,000–10,000 pairs of wedge-tailed shearwaters.

This species forages relatively close to breeding islands and its diet consists of squid, fish, and crustaceans (Ref. 184). 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. 189). 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. 189). It is noted that this same area is part of the foraging extent used by the wedge-tailed shearwaters from both Pelsaert and Houtman Abrolhos islands) (Ref. 194; Ref. 189). The use of a bimodal foraging strategy suggests that prey availability close to the colony (i.e. areas that would be utilised on short trips) are inadequate for the large numbers of breeding shearwaters (Ref. 189).

Behaviours used to define BIAs for seabirds in Commonwealth marine areas include breeding with a foraging buffer, and roosting (Ref. 177). The BIAs for this species are buffers around islands that this species is known to nest on (Figure 4-18). Bird species may forage in the waters surrounding the islands during nesting seasons. The wedge-tailed shearwater ‘foraging in high numbers BIA’ is much further south (>580 km from the OA), near Carnarvon.

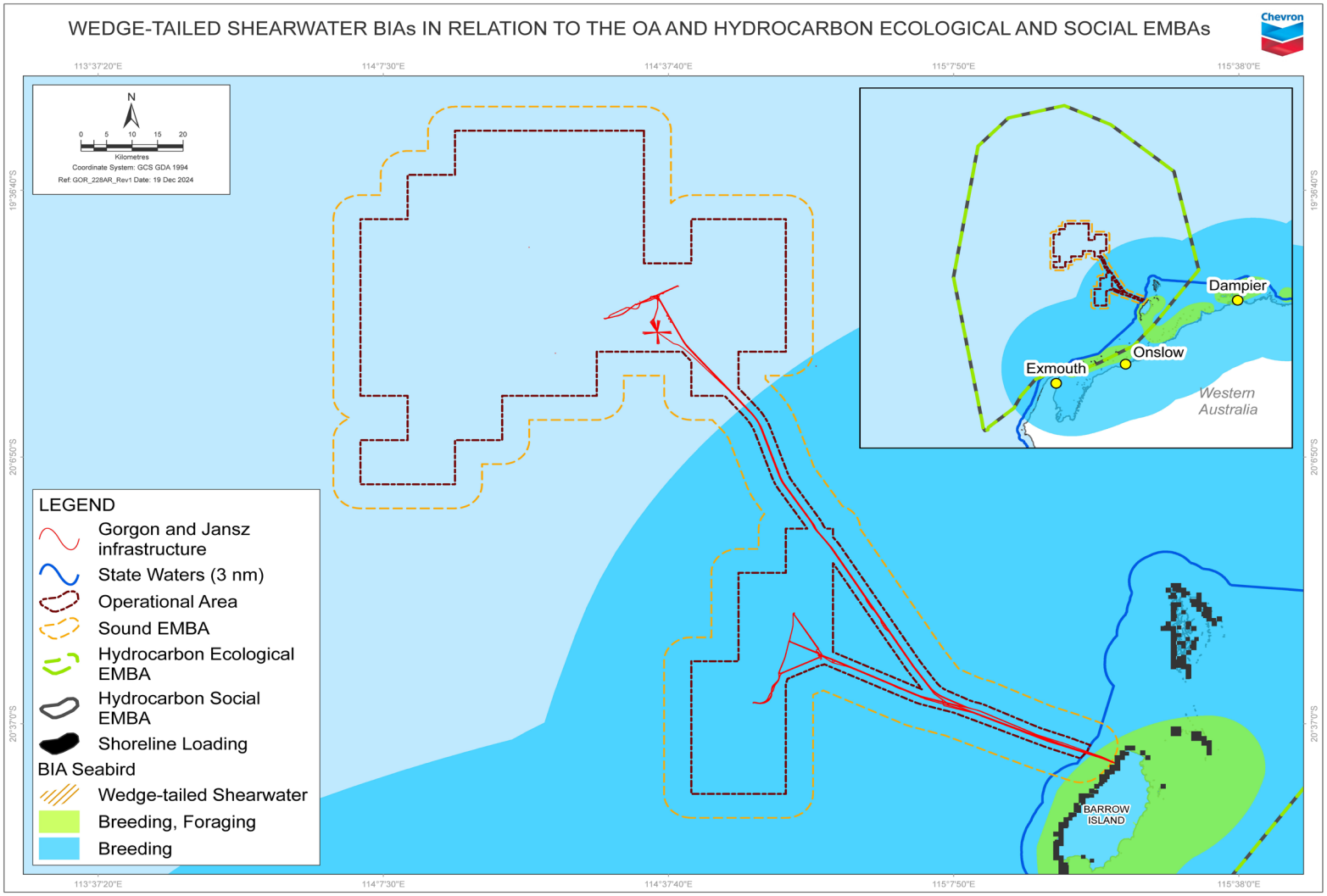


Figure 4-18: Biologically important areas for wedge-tailed shearwaters

4.3.3.5 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 4-14.

Table 4-14: Seasonal presence of marine fauna with biologically important behaviours within the vicinity of the OA

Activity / Species	January	February	March	April	May	June	July	August	September	October	November	December
Marine fauna with biologically important behaviour												
Humpback whale migration[1]												
Pygmy blue whale northern migration[2]												
Pygmy blue whale southern migration[2]												
Flatback turtle nesting and internesting[3]												
Green turtle nesting and internesting[4]												
Hawksbill turtle nesting and internesting[5]												
Whale shark migration and foraging[7]												
Australian fairy tern breeding[8]												
Lesser crested tern breeding[9]												
Roseate tern breeding[10]												
Wedge-tailed shearwater migration[11]												
Wedge-tailed shearwater breeding[12]												
	Indicative activity timing											
	Species may be present and display biologically important behaviour in the region											
	Predicted peak period											

1. *Humpback whale migration along WA coast typically occurs between May and November (Ref. 85; Ref. 195). Predicted peak migration periods for the Montebello Islands region are late-July (northern) and early-September (southern) (Ref. 84).*
2. *Pygmy blue whales migrate north along the WA coast between February and August (Ref. 88; Ref. 94), with predicted highest densities in the Montebello Island region during May and June (Ref. 96). Pygmy blue whales migrate south between November and January (Ref. 88; Ref. 94), with predicted highest densities in the Montebello Island region during November and December (Ref. 96).*
3. *Seasonal presence within nesting and internesting habitat critical to the survival of flatback turtles in the Pilbara (including Barrow and Montebello islands) is predicted to occur between October and March (Ref. 118), with peak nesting activity on Barrow Island predicted between November and January (Ref. 156).*

4. *Seasonal presence within nesting and internesting habitat critical to the survival of green turtles in the North West Shelf (including Barrow and Montebello islands) is predicted to occur between November and March (Ref. 118), with peak nesting activity on Barrow Island predicted between December and February (Ref. 156).*
5. *Seasonal presence within nesting and internesting habitat critical to the survival of hawksbill turtles in WA (including Montebello and Lowendal islands) is predicted to occur between October and February (Ref. 118), with peak nesting activity on Barrow Island predicted in October (Ref. 156).*
6. *Migration occurs mainly between July and November along the 200 m isobath (Ref. 164). A foraging BIA for whale sharks is associated with the area around this isobath.*
7. *The Pilbara and upper Gascoyne sedentary population of Australian fairy terns nests from late-July to late-September (Ref. 181).*
8. *Lesser crested terns breed in the Pilbara region from March to June (Ref. 82; Ref. 186).*
9. *Roseate terns breed in the Pilbara region from March to July and October (Ref. 82; Ref. 186).*
10. *Wedge-tailed shearwaters typically begin arriving at their WA colonies around August; and then leave nests in early-April to early-May (Ref. 179; Ref. 189). Once adults cease returning to feed their young, the young (fledging) wedge-tailed shearwaters fledge and depart nests (Ref. 190; Ref. 191).*
11. *Wedge-tailed shearwaters breed in the Pilbara region from November to April (Ref. 186); peak egg laying typically occurs during November (Ref. 179; Ref. 189).*

4.3.4 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. 198).

4.3.4.1 Water quality

Marine water quality within the EMBA is expected to be representative of high-water quality found in offshore waters.

The NWS is characterized by a relatively clear water column; however, these waters sometimes have naturally higher levels of turbidity as a result of local current, tidal or wave induced resuspension of fine sediments and seasonal fluvial inputs (Ref. 199, Ref. 200). In the waters off the east coast of Barrow Island, turbidity and concentrations of suspended sediments were generally low (<5 mg/L) and indicative of clear water environments (Ref. 200).

The nearshore waters on the east coast of Barrow Island are generally oligotrophic, with temporal fluctuations in nutrients (Ref. 200; Ref. 201). Nutrient concentrations were generally below the ANZG default trigger values (nutrient enrichment) for tropical Australia, with occasional fluctuations of ammonia, nitrite+nitrate, and orthophosphate well above guideline values (Ref. 200; Ref. 201).

Water quality sampling undertaken in proximity of existing the Janz-Io field infrastructure showed that concentrations of hydrocarbons (total recoverable hydrocarbon [TRH), benzene, toluene, ethylbenzene and xylenes [BTEX] and polycylic aromatic hydrocarbon [PAH]) were below the laboratory limits of reporting (LoR) (Ref. 73). Dissolved metals concentrations were also below the respective ANZG default guideline values for 99% species protection (Ref. 73). Previous water quality data indicated that the coastal waters of the NWS (based on sampling from around the Dampier Archipelago) generally have very low levels of anthropogenic contamination (Ref. 202) The Wenziker et al (Ref. 202) study found no detectable levels of the sampled organics chemicals, and metals were below ANZG guidelines in the waters of the Dampier Archipelago. Pre-construction water quality sampling off the east coast of Barrow Island showed that concentrations of metals were typically consistently below the ANZG guideline trigger values for 99% species protection (Ref. 200). However, natural oil seeps are known to occur on the NWS (Ref. 199).

It is expected that these low levels of contamination would continue throughout the EMBA (unless within the immediate vicinity of an offshore point source).

4.3.4.2 Sediment quality

Marine sediment quality within the EMBA is expected to be representative of high-sediment quality typically found in offshore waters away from anthropogenic sources of contamination.

Previous sediment quality data for Pilbara coastal waters (Ref. 203) 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. 200). 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. 200). Total petroleum hydrocarbons (TPH) and Total 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 above ISQG-Low concentrations for benzo(a)pyrene, but well below the ISQG-High concentrations (Ref. 200).

Sediment quality sampling undertaken in proximity of the existing Janz-lo field infrastructure showed that concentrations of hydrocarbons (TRH, BTEX, and PAHs) were below the laboratory LoR (Ref. 73). Total metal concentrations were also below the respective ANZG default guideline values (Ref. 73).

It is expected that these low levels of contamination would continue throughout the EMBA (unless within the immediate vicinity of an offshore point source).

4.3.4.3 Air quality

Air quality within the EMBA is expected to be representative of typically high air quality found in offshore areas, away from anthropogenic sources of contamination.

As part of the Ambient Air Quality Monitoring Program on Barrow Island, there were no recorded exceedances for nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), hydrogen sulfide (H_2S), or aromatic hydrocarbons (BTEX) against the relevant National Environmental Protection Measure (NEPM) standards (Ref. 204). There have been elevations of PM_{10} levels around facilities on Barrow Island, however these are likely associated with vehicle traffic and regional weather events (Ref. 204).

It is expected that these low levels of contamination would continue throughout the EMBA (unless within the immediate vicinity of an offshore point source).

4.3.5 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 affected, or are affected by, the existing physical and biological environments.

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. 59). These uses of the

NWMR make an important economic and social contribution to settlements along the coast (Ref. 59). Industry activities present with the EMBA are identified and described in Section 4.18.

4.3.5.1 Land use

The OA and Sound EMBA occur offshore and do not have any interface with the coast. The Hydrocarbon EMBAs interface 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 Peninsula (Section 0). Noting however that the Hydrocarbon EMBAs typically only extends landward to the high-water mark (HWM).

The land uses that may be present within the Hydrocarbon EMBAs are summarised below.

Barrow, Double, Middle, and Boodie islands are designated as State Nature Reserves (IUCN Ia) (Section 4.19.3) and are surrounded by the Barrow Island Marine Park (IUCN Ia) and Barrow Island Marine Management Area (IUCN VI) (Sections 4.19.2). 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 an oilfield and the Gorgon Gas Project (Ref. 205). Camping is not permitted on any of these islands (Ref. 205).

The Montebello Islands are designated as a State Conservation Park (IUCN II) (Section 4.19.3), and are surrounded by the State Montebello Islands Marine Park and Commonwealth Montebello Marine Park (Sections 4.19.2 and 4.19.1, respectively). 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. 205). Camping is permitted on some of the islands (with some restrictions during turtle nesting season) (Ref. 205; Ref. 206).

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. 205). Some of the islands that occur within the Hydrocarbon EMBAs are classified as Nature Reserves (IUCN Ia) (Section 4.19.3). The islands are gazetted to both the 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. 205). Fishing, beach walks and wildlife viewing are types of activities that may occur in the Pilbara Inshore Islands Nature Reserves (Ref. 205). Camping is only permitted on certain islands, such as the Muiron Islands, and may require a permit (Ref. 205).

The Cape Range National Park (IUCN II), Bundegi Coastal Park (IUCN) and Nyingguulu (Ningaloo) Coastal Reserve (IUCN II) are protected under WA jurisdiction (Section 4.19.3), 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. 207, Ref. 208).

One Native Title determination (WCD2019/016) extend into the Hydrocarbon Social EMBA (Section 4.20). The determination areas contain places of special significance, such as mythological and ceremonial sites and natural resources (Ref. 209).

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

4.3.5.2 Heritage

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. 210).

Where known heritage sites and/or artefacts are formally protected under specific heritage legislations, these are described within Section 4.20. The following sections summarise other known heritage values identified within the EMBA.

4.3.5.2.1 First Nations cultural activities, connections, and obligations

The land adjacent to the NWMR has been inhabited by First Nations people for at least 50,000 years, and they continue to use the NWMR and adjacent coastal resources, and have an ongoing connection to these areas (Ref. 59).

Although outside the EMBA, evidence from offshore waters near Murujunga (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. 211). 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)[12] . At the LGM sea level was ~125 m below present (Ref. 212); this coincides with the ancient coastline at 125 m depth KEF (see Section 4.17.6.1 for a description of this KEF). Part of the OA extends into water depths of <125 m (activities within these water depths are associated with IMR; Section 3.2.2), would therefore have been emergent land during the history of First Nations occupation.

Recent studies at Murujuga have demonstrated that archaeological material remains on the seabed, predating inundation by rising seas (Ref. 211; Ref. 215). Previous geomorphological work (which was based on the analysis of available 3D seismic data) on the mid to outer shelf regions proximal to Barrow Island, demonstrated the presence of a highly complex and geomorphically mature coastal landscape preserved at depths of 70–75 m below sea level, including coastal barrier dunes, lagoonal systems, tidal flats, and estuarine channels. (Ref. 212). Such feature preservation has significant geoheritage value (Ref. 212). However, as described above, most of the OA occurs in water depths >125 m, would be located further offshore than these features of potential geoheritage value, and would not have been emergent land during the history of First Nations occupation.

Archaeological deposits from Boodie Cave on Barrow Island, reveal some of the oldest evidence for First Nations occupation of Australia, as well as illustrating the early use of marine resources (Ref. 213). First occupation on Barrow Island has been dated as occurring between 51.1 and 46.2 ka, overlapping with earliest dates for occupation of Australia (Ref. 213). There is evidence of marine resources (e.g. shellfish, fish) being incorporated into dietary assemblages by 42.5 ka on Barrow Island; which continued through all periods of occupation, despite fluctuating sea levels and associated extensions of the coastal plain (Ref. 213). The caves on Barrow Island (including Boodie Cave), and others on nearby Montebello Islands, were abandoned by 6.8 ka when rising sea levels reached their present levels, and the islands had become increasingly distant from the mainland coast (Ref. 213). Despite the isolation of Barrow Island from the mainland for most of the Holocene, Thalanyji knowledge holders refer

[12] The period of the LGM in Australia is described as 24 to 18 ka (Ref. 74)

to historic use of the island from both colonial-era fishing activities and indentured labour in the pearling grounds (Ref. 452).

First Nations people have a culture that relates to a connectedness of land and sea in a holistic way (Ref. 216). The term ‘Country’ refers to more than just a geographical area, and includes values, places, resources, stories, and cultural obligations associated with that geographical area (Ref. 217). For First Nations peoples, the term ‘Country’ includes both land and sea and the coastal areas that are connected with the traditional Country of a group or clan. Both Country and Sea Country, contain evidence of the ancient events by which all geographic features, animals, plants and people were created (Ref. 216). For example, Thalanyji knowledge holders reference Sea Country “between the islands of the shelf”, and “see the artifacts as an important manifestation of their ancestral use of, and connection to, the now-drowned coastal plain” (Ref. 452).

Cultural heritage is not only comprised of tangible values; it also includes intangible values. Tangible values are those with a physical nature (such as artefacts and engravings); while intangible values are those that do not have a physical component (such as songlines and dances). Songlines are a feature of First Nations culture, linking people, places, and practices (Ref. 218). Certain songlines are referred to as ‘Dreaming pathways’ because of the tracks forged by Creator Spirits during the Dreaming; these Dreaming songlines have specific ancestral stories attached to them (Ref. 220). Nunn and Reid (Ref. 221) discuss how First Nations oral traditions have documented sea level rise over the last 7,000 years. Kearney et al. (Ref. 222) 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 studies involving Thalanyji knowledge holders (Ref. 452) and also identified by representatives of Mardathoonera Cultural Heritage Pty Ltd (MCH) during consultation (Table 4-15).

The cultural, customary, and spiritual significance of species and the ecological communities they form are diverse and varied for First Nations people and their stewardship of Country (Ref. 224). For example, some First Nations people have a strong connection to whales, which has significance as totemic ancestors to some groups (Ref. 224). 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. 224).

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. 217). Their commitment to 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 northwest WA (Ref. 217).

First Nations peoples of northwest WA engage in a diverse range of marine resource use activities, including hunting, egg collecting, fishing and gathering shellfish. Activities also continue on lands and waters where they have ceremonial and spiritual connections (Ref. 217).

Consultation with First Nations groups and individuals has identified that Sea Country is of importance to their people (Table 4-15). These values include coastal areas, offshore islands, marine fauna, and traditional stories (e.g. it is believed that the Dreamtime serpent which created the rivers and inland springs is now in its resting place off the Pilbara coast; and as such, if the sea is protected, then the serpent is also

being protected). It is acknowledged that First Nations people who are the custodians of this knowledge have the rights to decide how it is shared and used.

Underwater cultural heritage (UCH), including First Nations heritage, as protected under the UCH Act is discussed in Section 4.20.2.

Table 4-15: Cultural values or features identified through consultation

Source	Cultural value or feature
Baiyungu Aboriginal Corporation (BAC)	• Protecting land and Sea Country is a significant focus of the BAC • The Baiyungu coastal area, Sea Country, and adjacent islands are highly valuable to the Baiyungu people.
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^ – 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)	• Identified a connection with Barrow Island and surrounding waters; specific values described include: – the creation story starts on Barrow Island – Barrow Island is a place that connects saltwater and freshwater together – Barrow Island is connected to Murujuga; both are considered by MCH as women's places – Biggada Creek is significant and connected to the Fortescue River; and that the rock formations in the creek are protectors – women's sites and ancestor spirits are present on Barrow Island • Identified that Barrow Island was a hill in ancient times and is a sister hill to two hills on the mainland, and old people would walk across before the sea levels rose and the island drifted; because of this, there will be artefacts and stories underwater • Identified cultural importance of traditional stories, songlines ocean, and marine fauna – marine fauna, such as whales, dugongs, dolphins and turtles hold cultural significance for Mardathoonera people – the sea is the source of energy for all life, it holds the codes that are encrypted in each person's body, the songlines, and is the lifeforce for the world – the places where the saltwater from the sea and the freshwater from the land connect are where the biggest energy lines are, and that connection is a force of creation relevant to a Dreaming story

Source	Cultural value or feature
	– songlines extend out from the land, through the sea, and around the globe – songlines connect places, people, and animals to each other, creating migratory patterns for animals and telling animals of the right time to birth and eat – freshwater that flows underneath the seabed carries the songlines – there is a large energy line that exists off the coast of Murujuga and runs through the area that CAPL operates in – there are songlines that go through Barrow Island and offshore and connect Barrow Island to the mainland; this includes a whale songline – Mardathoonera people are connected to songlines—if the songlines are disrupted, their widdart (heart) is disconnected, like the whales, their feet get lost and they don't know where to go anymore. • Country owns people and we are all connected by energy – different frequencies connect all beings on earth and everything on earth is connected – if you protect country, it will protect you – women hold the energy connected to water.
Murujuga Aboriginal Corporation (MAC)	• No specific areas have been identified through consultation however MAC has noted the cultural importance of Sea Country and the need to ensure it is protected.
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	• No specific areas have been identified through consultation however NTGAC has noted the cultural importance of Sea Country and the need to ensure it is protected • In addition CAPL understands the Ningaloo Coast is culturally significant to the groups NTGAC represents.
Ngarluma Aboriginal Corporation (NAC)	• NAC has noted that offshore islands are culturally significant.
Ngarluma Yindjibarndi Foundation Ltd (NYFL)	• The people from the land speak for and care about the marine animals, even if they are far out to sea • Identified that marine fauna, specifically whales, dugongs, and turtles are species of importance • The nature of many traditional narratives have origins and connection to the seascape, and that impacts to the seascape can have cultural repercussions • Presence and importance of intangible values, such as Barrimirndi (the serpent), which is an important part of dreaming for Ngarluma and Yindyibarndi people • Identified the interconnectedness of the cultural landscape, whereby Traditional Owners from the western Pilbara are held to account by other Nyambali (cultural bosses) when proponents impact land and sea • Cultural responsibilities transcend Native Title and other boundaries.
Robe River Kuruma Aboriginal Corporation (RRKAC)	• None identified within the EMBA • Values beyond the EMBA boundary included: – the area within their Kuruma Marthudunera native title claim, Jajiwurra (Robe River) and the waters extending seaward from the river mouth – ecological integrity of Jajiwurra.

Source	Cultural value or feature
Wirrawandi Aboriginal Corporation (WAC)	• The coastal area, Sea Country, and adjacent islands are highly valuable to the Yaburara and Mardudhunera people • Identified a connection to Barrow Island*.
Yamatji Marlpa Aboriginal Corporation (YMAC)	• no specific areas have been identified through consultation however, YMAC has noted the cultural importance of Sea Country and the need to ensure it is protected.
Yinggarda Aboriginal Corporation (YAC)	• Bernier Island#, Dorre Island# and associated Sea Country have been identified as significant to the Yinggarda people.

^ *Direction Island, Weld Island, North and South Islands, Ashburton Island, and Twin Islands are located outside the EMBA for this EP (~11 km, ~26 km, ~17 km, ~07 km, and ~13 km inshore of the EMBA respectively).*

 # Both Bernier and Dorre islands (located in Shark Bay) are located outside the EMBA for this EP (~232 km and ~260 km south of the EMBA respectively).

4.3.5.2.2 European 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. 59). British colonisation did not begin in the Pilbara until 1860s, with pastoralism the first major industry, followed by small ports and service centres (Ref. 59). The pearling industry began in the late-1800s and remains a significant contributor to the economy of northwest WA (Ref. 59). 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. 59). Petroleum discovery and development commenced from the 1950s, with both onshore and offshore discoveries (Ref. 59).

The marine and coastal industries that still exist and operate within the NWMR are further described in Section 4.18.

4.3.6 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 EMBA for this activity intersects with Commonwealth waters that are part of the NWMR.

The NWMR comprises the Commonwealth waters and seabed from the WA -Northern Territory border south to Kalbarri (Ref. 59). 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. 59). 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. 61). 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. 59).

Conservation values of the Commonwealth marine area include:

- protected species and/or their habitat (Section 4.17.3)
- protected places including Australian Marine Parks (Section 4.19.1) and heritage places (Section 4.20)
- KEFs (Section 4.17.6.1).

4.3.6.1 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. 229).

- a species, group of species, or a community with a regionally important ecological role (e.g. a predator, or 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.

KEFs have been identified by the Australian Government based on advice from scientists about the ecological processes and characteristics of the area (Ref. 229).

The presence of KEFs within the EMBA, and a description of the KEFs values, are shown in Table 4-16 and Figure 4-18.

Table 4-16: Presence of KEFs

Key ecological feature	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Ancient coastline at 125 m depth contour	✓	✓	✓
Parts of the ancient coastline, particularly where it exists as a rocky escarpment, 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. 59). 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. Little is known about fauna associated with the hard substrate of the escarpment but it is likely to include sponges, corals, crinoids, molluscs, echinoderms and other benthic invertebrates representative of hard substrate fauna in the North West Shelf bioregion (Ref. 59). **Values:** Unique sea floor feature with ecological properties of regional significance.			
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula			✓
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			

Key ecological feature	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
heads. Aggregations of whale sharks, manta rays, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area (Ref. 59). 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. 59). 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. 63) **Values:** Unique sea floor features with ecological properties of regional significance.			
Commonwealth waters adjacent to Ningaloo Reef			✓
The Commonwealth waters adjacent to Ningaloo reef include Ningaloo Marine Park (Commonwealth waters) and encompass an area of 243 km^2. This feature lies adjacent to the Ningaloo Reef state water margin at the three nautical mile 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. 59). Aggregations of whale sharks, manta rays, humpback whales, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area (Ref. 59). **Values:** High productivity and aggregations of marine life			
Continental slope demersal fish communities	✓	✓	✓
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. 229). The demersal fish species occupy two distinct demersal community types associated with the upper slope (water depth of 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. 59). **Values:** High levels of endemism.			
Exmouth Plateau	✓	✓	✓
The Exmouth Plateau is a regionally and nationally unique deep-sea plateau (water depths of 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. 59). The topography of the plateau (with valleys and channels), in addition to potentially constituting a range of benthic environments, may provide conduits for the movement of 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 depths of around 1,000 m. Sediments on the plateau suggest that biological communities include scavengers, benthic filter feeders and epifauna (Ref. 59). Fauna in the pelagic waters above the plateau are likely to include small pelagic species and nekton (Ref. 63). **Values:** Unique sea floor feature with ecological properties of regional significance.			

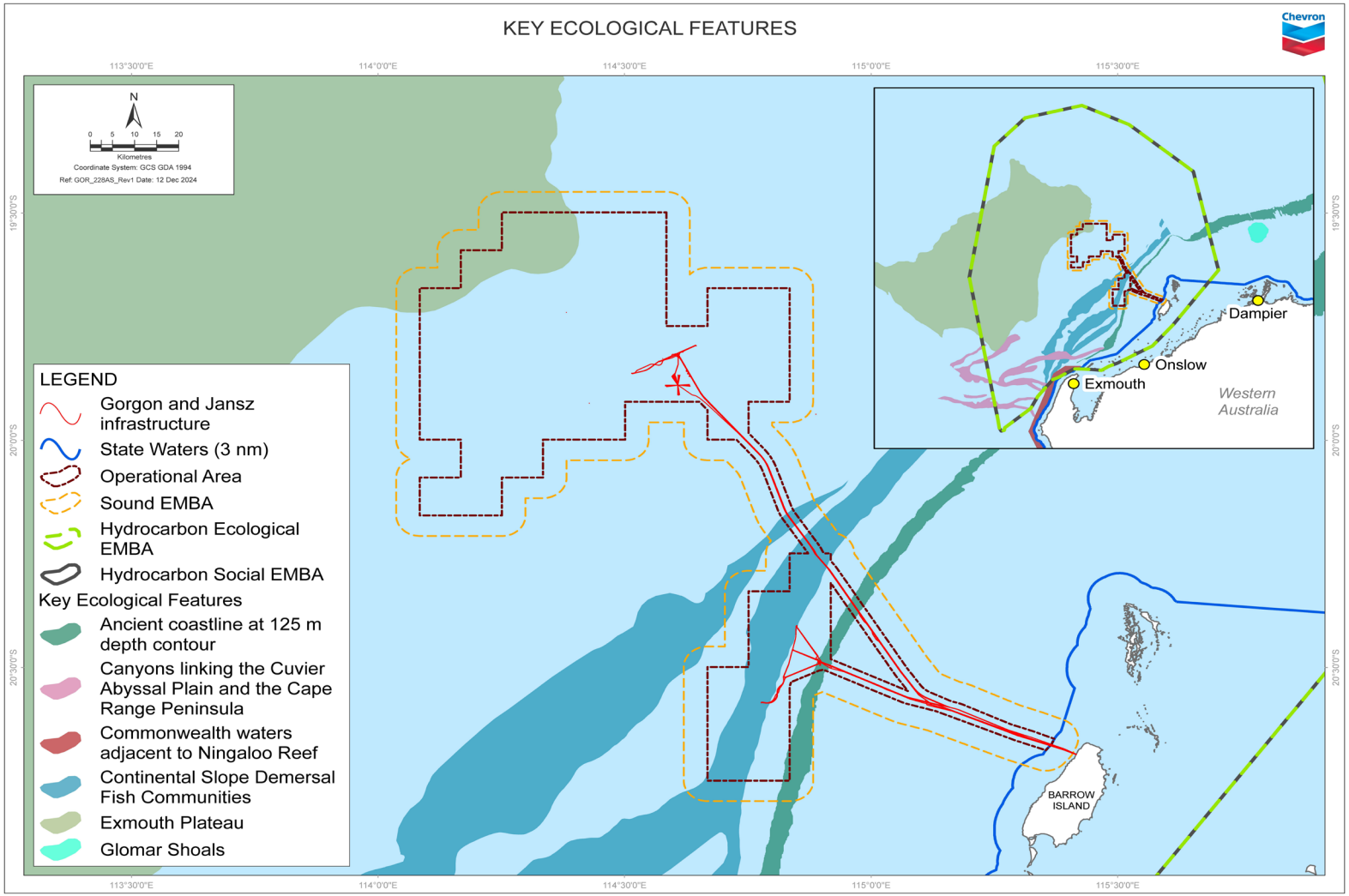


Figure 4-19: Key ecological features within the vicinity of the OA

4.3.7 Commonwealth land area

Commonwealth land[13] is a relevant value and sensitivity under the OPGGS(E)R. Based on spatial review and searches of the EPBC Act protected matters database (Ref. 57; appendix e) there is Commonwealth land associated with Department of Defence facilities that intersect with the Hydrocarbon EMBAs. These facilities are further described in Section 4.18.6.

4.4 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 such resources 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 interest with the EMBA they have been identified and described in the following sections.

4.4.1 Commercial fisheries

4.4.1.1 Commonwealth-managed fisheries

The Commonwealth-managed commercial fisheries with fishery management areas that intersect the EMBA, and that have fishing effort recorded during 2017–2024 (Ref. 234) are listed in Table 4-17.

For the fisheries with fishing effort recorded within the OA or Sound EMBA (i.e. EMBAs associated with planned activities), additional information has been provided below.

Table 4-17: Presence of recent (2017-2024) fishing effort recorded within Commonwealth-managed commercial fisheries

Fishery	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
North West Slope Trawl Fishery	✓	✓	✓
Western Deepwater Trawl Fishery			✓

Relative fishing intensity data is not available for the North West Slope Trawl fishery due to low vessel numbers and confidentiality. Fishing activity during 2017-2024 is shown in Figure 4-20.

The North West Slope Trawl Fishery use bottom (or demersal) trawl methods to target deep-water prawn and scampi between the 200 m depth contour to the outer limit of the Australian Fishing Zone (Ref. 235). The primary species landed in the North West Slope Trawl Fishery is the Australian scampi (*Metanephrops australiensis*), and other scampi species such as velvet scampi (*M. velutinus*) and Boschma's scampi (*M. boschmai*). A quantity of prawns is also harvested each season, and squids are becoming an increasingly significant component of the catch. Mixed snappers (Lutjanidae) and redspot emperor (Lethrinus lentjan) have historically been an

[13] 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.

important component of the North West Slope Trawl Fishery catch (Ref. 235). Fishing for scampi occurs over soft, muddy sediments or sandy habitats, using demersal trawl gear on the continental slope.

Fishing efforts decreased from 196 days, 3,950 trawl-hours and seven fishing permits in the 2021–22 fishing season to 218 days, 4,349 trawl-hours and seven fishing permits in 2022–23 season. Three vessels operated in the 2022–23 season (Ref. 236). Scampi stock are classified as not overfished and not subject to overfishing (Ref. 236).

Southern bluefin tuna management area has been identified within the OA and EMBA. The southern bluefin tuna Fishery is active within waters in the Great Australian Bight and south-eastern Australia (i.e. not within the OA or EMBA). A known spawning ground for southern bluefin tuna occurs in the Indian Ocean, between Java and northern WA (Ref. 236, Ref. 237, Ref. 410). The indicative spawning ground for the southern bluefin tuna (based on geospatial data provided by ABARES, and as shown in annual Commonwealth fishery status reports) extends into the northern part of the OA (i.e. petroleum titles WA-36-L and WA-39-L) and EMBAs. Two peaks have been observed in southern bluefin tuna spawning activity: September–October and February–March (Ref. 196; Ref. 197). Spawning typically occurs near the water surface. The fish then regularly dive into deeper waters to thermoregulate as they are cold-water fish and cannot tolerate warm waters for extended periods (Ref. 196). Individual fish probably stay in the spawning area for one month or so (Ref. 196; Ref. 238). The larvae drift passively before becoming entrained in the southwards flowing South Java and Leeuwin Currents and carried down the coast of Western Australia (Ref. 196). One to two-year old juveniles then head east to the Great Australian Bight, or west to the waters off South Africa (Ref. 197).

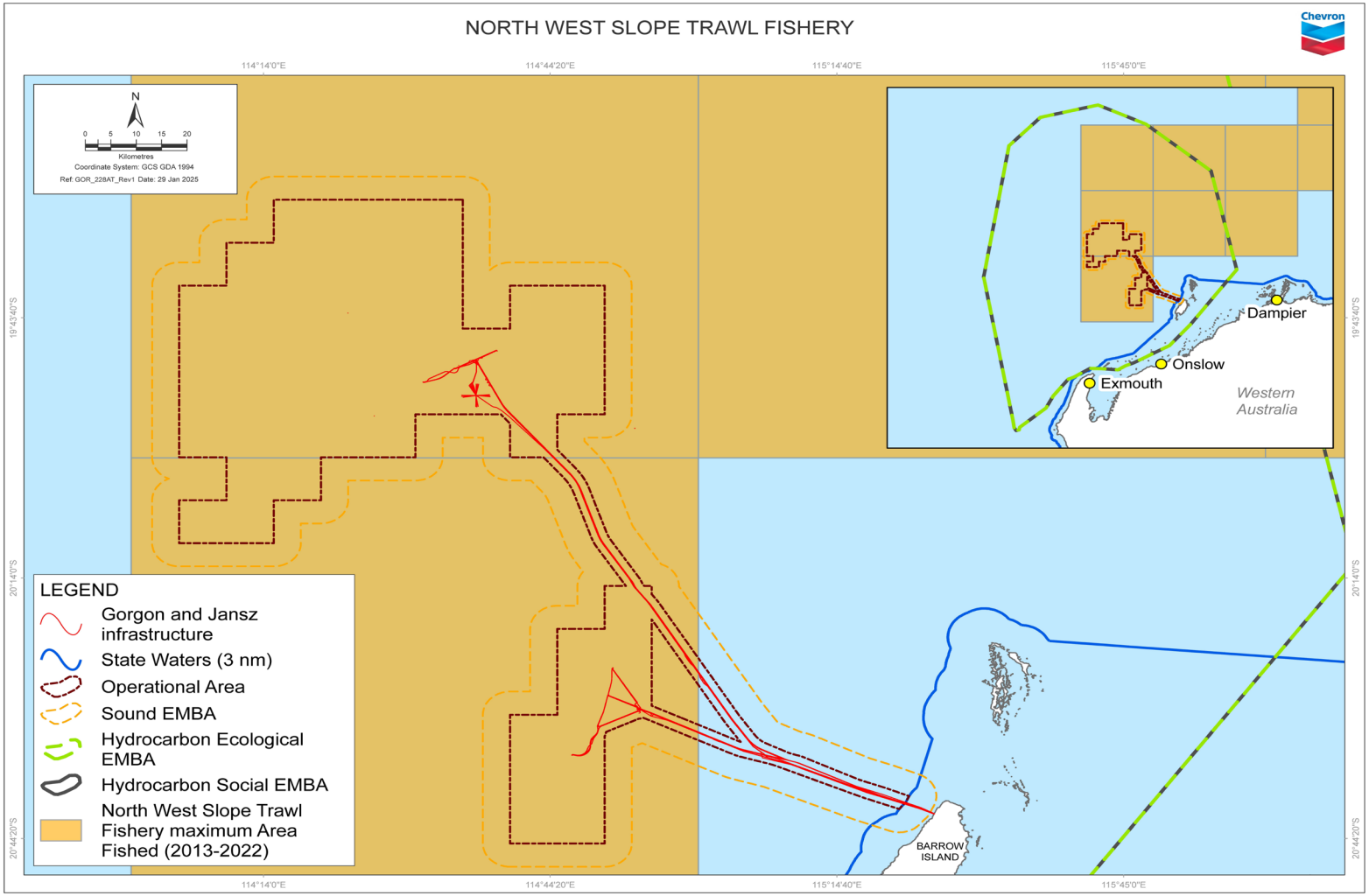


Figure 4-20: North West Slope Trawl Fishery—fishery management area, and records of fishing activity (based on 60 nm graticular reporting blocks) for 2017-2024, within the vicinity of the OA

4.4.1.2 State-managed fisheries

The State-managed commercial fisheries with fishery management areas that intersect the EMBA, and that have fishing effort recorded over a 10-year period (2014–2023) (Ref. 239) are listed in Table 4-18.

For the fisheries with fishing effort recorded within the OA or Sound EMBA, (i.e. EMBAs associated with planned activities) additional information has been provided below.

Table 4-18: Presence of fishing effort recorded during 2014–2023 within State-managed commercial fisheries

Fishery	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
North Coast Bioregion			
Mackerel Managed Fishery	✓	✓	✓
Onslow Prawn Managed Fishery	✓	✓	✓
Pilbara Crab Managed Fishery	✓	✓	✓
Pilbara Fish Trawl (Interim) Managed Fishery			✓
Pilbara Line Fishery	✓	✓	✓
Pilbara Trap Managed Fishery	✓	✓	✓
West Australian Sea Cucumber Fishery (Beche-De-Mer) Fishery	✓	✓	✓
Gascoyne Bioregion			
Exmouth Gulf Beach Seine and Mesh Net Managed Fishery			✓
Exmouth Gulf Prawn Managed Fishery			✓
West Coast Deep Sea Crustacean Managed Fishery	✓	✓	✓
Statewide			
Marine Aquarium Fish Managed Fishery			✓
Specimen Shell Managed Fishery			✓

Seven fisheries were identified with activity within the vicinity of the OA and Sound EMBA; these are shown in Figure 4-21 to Figure 4-25. None of the identified fisheries within the OA or Sound EMBA operated more than three vessels per year.

The Mackerel Managed Fishery utilises near-surface trolling or jig fishing methods, with vessels primarily active during May to November (Ref. 240), and with the bulk of the catch typically taken north of the OA within Kimberley waters (Ref. 240). The primary species target is Spanish mackerel (*Scomberomorus commerson*), with smaller quantities of grey mackerel (*S. semifasciatus*) and other species from the genus Scomberomorus. The Mackerel Managed fishery extends from the West Coast Bioregion to the WA/NT border. There are three managed fishing areas and during the 2022 season only 13 boats operated in these areas. The Pilbara catch is often below the tolerance range, and the Gascoyne Coast / West Coast Bioregions catch have been below the tolerance range for almost all years since 2006 (Ref. 240). The total catch of the Fishery in 2022-2023 was 246–430 t.

The Pilbara Crab Managed Fishery utilises hourglass trap fishing methods and primarily operated within inshore waters around Nickol Bay (Ref. 240). This fishery

primarily targets blue swimmer crab (*Portunus armatus*) and mud crabs (*Scylla spp*.). The 2020 fishing season reported a commercial catch of 11.2 t (Blue Swimmer Crab) (Ref. 240). The west areas of 115°06.50’ E within the fishery management area are currently closed to fishing (this closed area includes the offshore extent of the OA and Sound EMBA). During the ten-year period, active fishing effort was only recorded once (November 2016) within the 60 nm graticular block that intersects with the OA and Sound EMBA.

The Pilbara Line and Pilbara Trap fishery are part of the Pilbara Demersal Scalefish Fishery. Both the Pilbara Trap Managed Fishery and the Pilbara Line Fishery catch is made up around 45-50 different fish species as well as some deeper offshore species such as ruby snapper and eightbar groupe (Ref. 240). The main species targeted by the fisheries are bluespotted emperor (*Lethrinus punctulatus*), red emperor (*Lutjanus sebae*) and rankin cod (*Epinephelus multinotatus*), 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 (typically May- September) (Ref. 240). It is estimated that during the 2022 season only nine fishers on four vessels operated in the management area. The total catch of the Fishery in 2022/2023 was 104 t, decreasing by ~16% of the total catch during the last year (Ref. 240).

The Pilbara Trap Fishery (trap methods) is managed through area closures and effort allocations (Ref. 240). It is estimated that during the 2022 season only nine fishers on three vessels operated in the management area. The total catch of the Fishery in 2022/2023 was 597 t, decreasing by ~10% of the total during the last year (Ref. 240).

For the 2022 fishing year, the bulk of the catch within the Pilbara Demersal Scalefish Fishery was landed by the trawl sector (which does not occur within the OA); with a smaller contributions from the trap (24%) and line (4%) sectors (Ref. 240).

The West Australian Sea Cucumber (Beche-De-Mer) Fishery collects sea cucumbers (also known and bêche-de-mer or trepang). The fishery is primarily based in the northern half of WA, from Exmouth Gulf to the Northern Territory border, however fishers do have access to all WA waters. It is a hand-harvest fishery, with animals caught principally by diving, and a smaller amount by wading. Given the OA occurs in water depths of >25 m, and is >5 km from the coast, the use of this area by this fishery is expected to be limited. This is supported by the records for fishing effort, which show that within the ten-year period (2014–2023), only four months (January 2019, December 2018, November 2017, April 2014) recorded any presence within the 10 nm graticular reporting blocks that intersect with the OA. The intersect between the OA and fishing effort for the West Australian Sea Cucumber (Beche-De-Mer) Fishery occurs in the part of the OA associated with the nearshore pipeline (Figure 4-25).

.

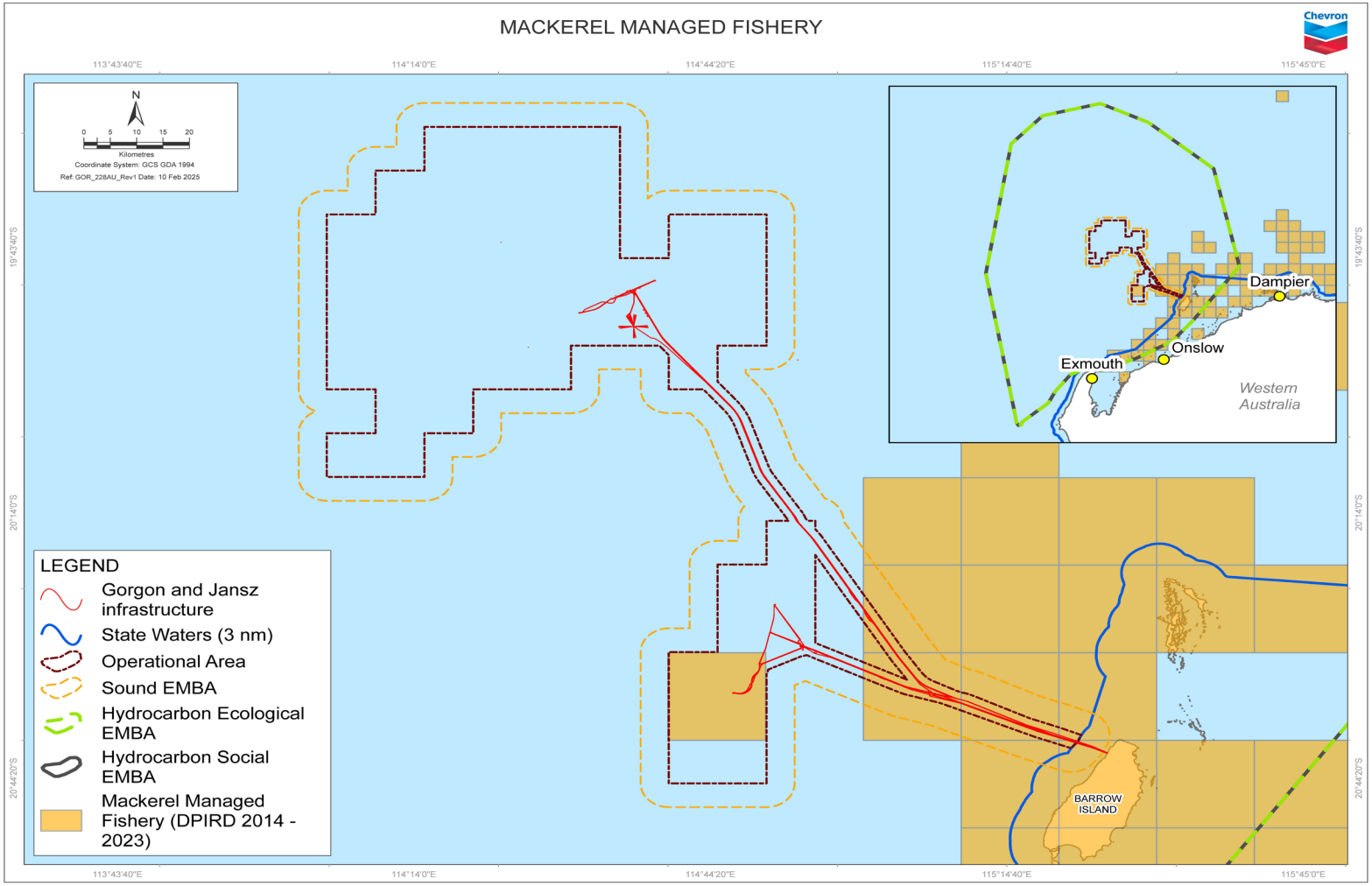


Figure 4-21: Mackerel Managed Fishery—recorded fishing effort (based on 10 nm graticular reporting blocks) for 2012–2021, within the vicinity of the EMBA

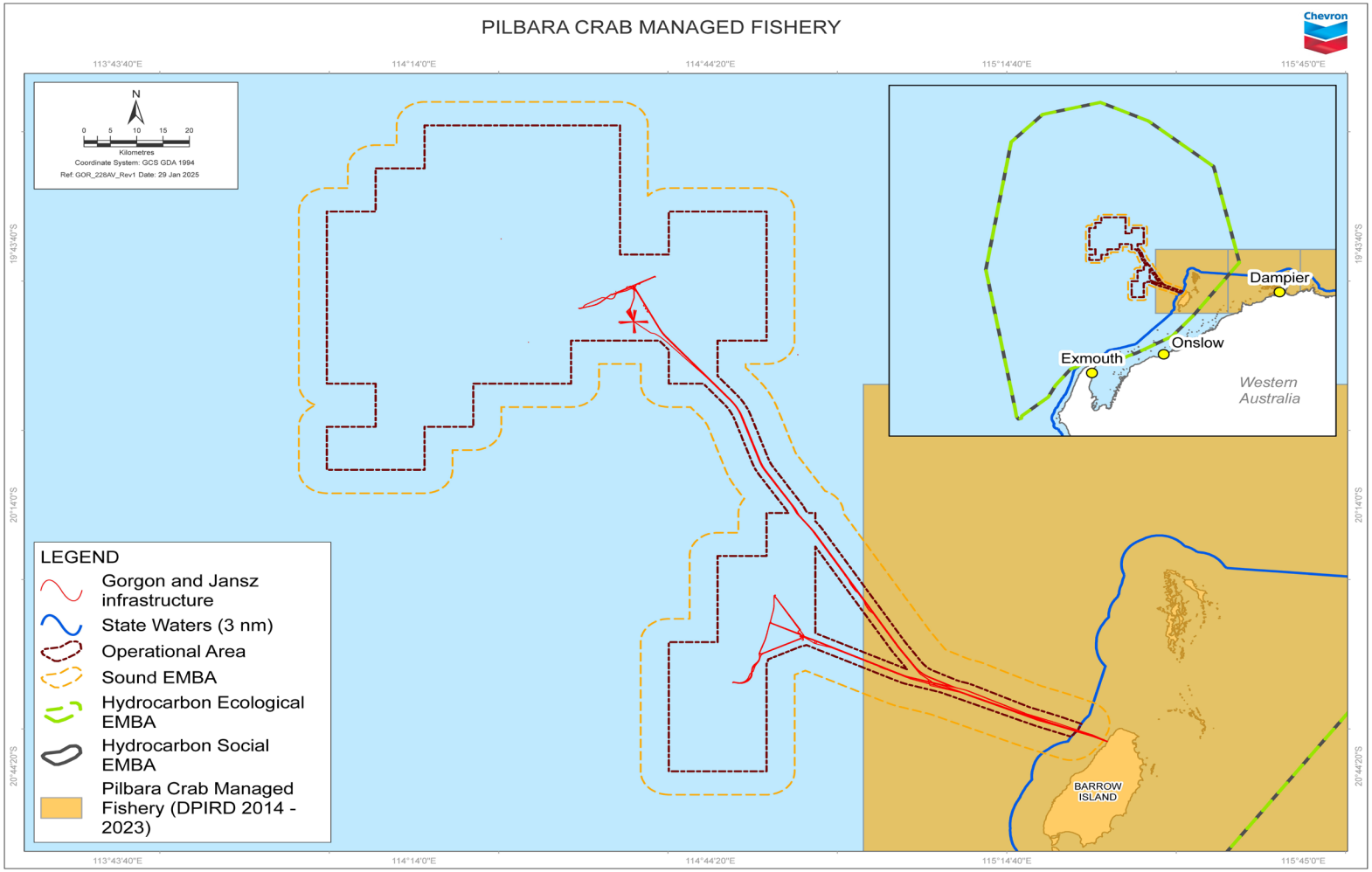


Figure 4-22: Pilbara Crab Managed Fishery—recorded fishing effort (based on 60 nm graticular reporting blocks) for 2014–2023, within the vicinity of the EMBA

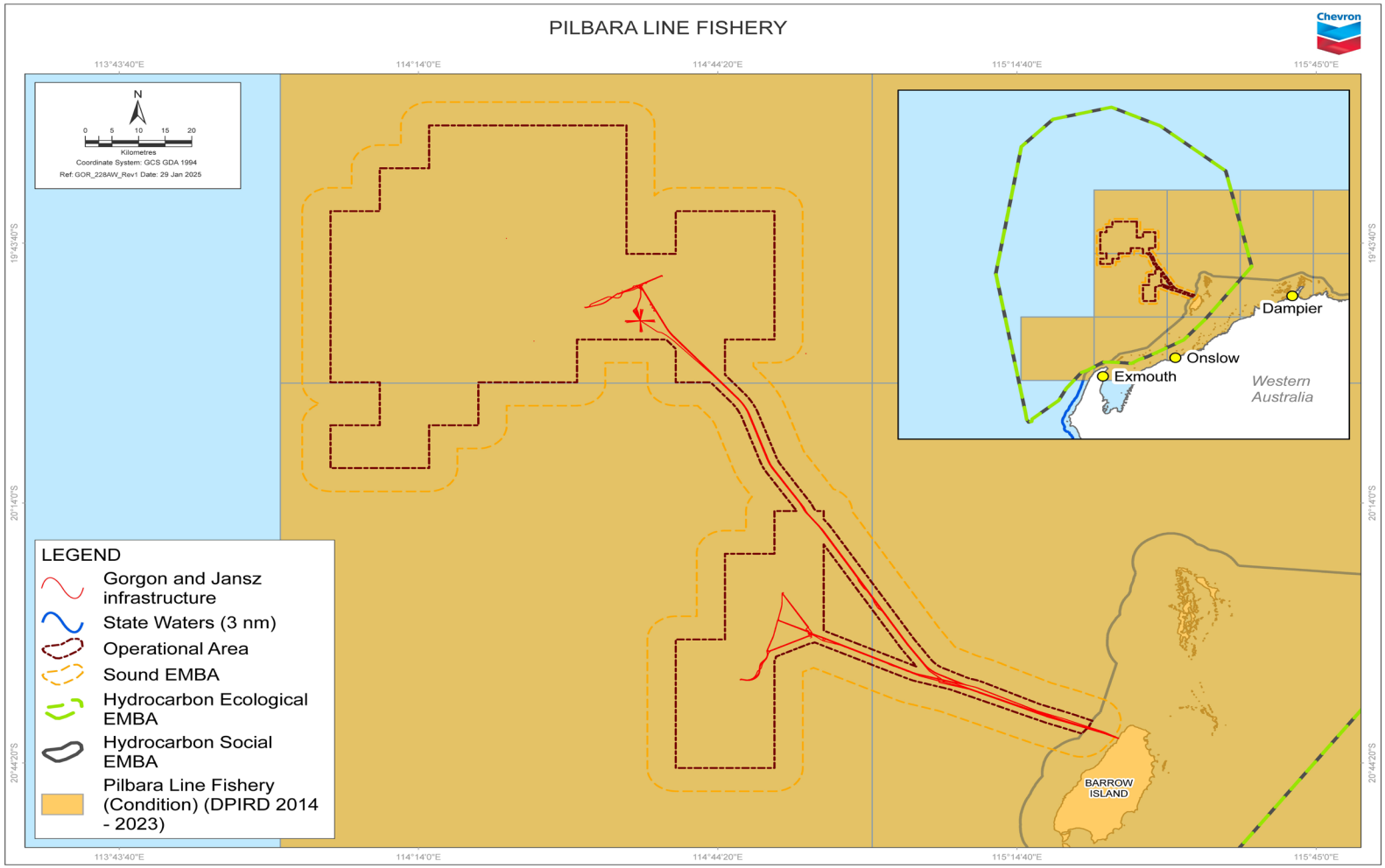


Figure 4-23: Pilbara Line Fishery—recorded fishing effort (based on 60 nm graticular reporting blocks) for 2014–2023, within the vicinity of the EMBA

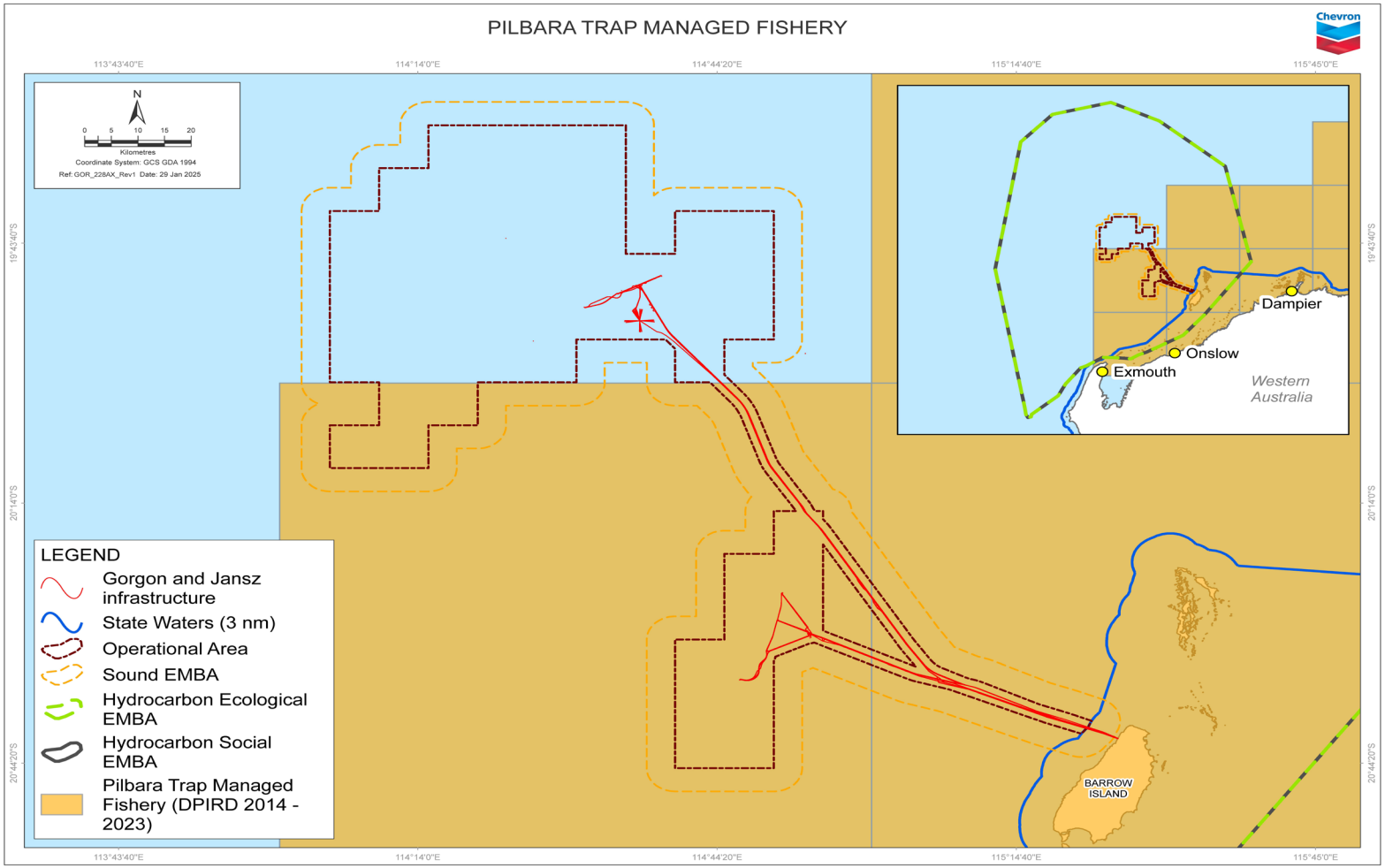


Figure 4-24: Pilbara Trap Managed Fishery—recorded fishing effort (based on 60 nm graticular reporting blocks) for 2014–2023, within the vicinity of the EMBA

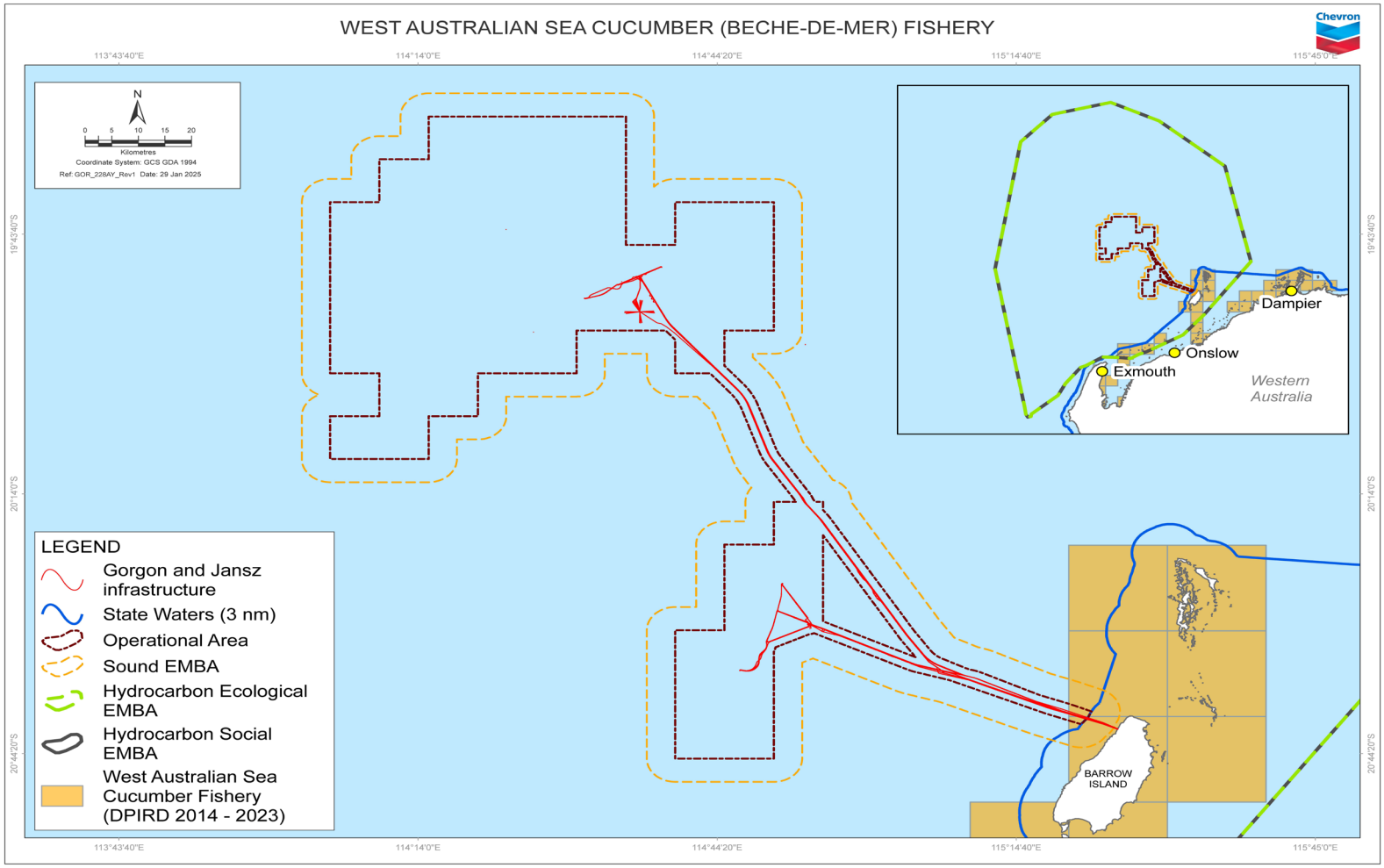


Figure 4-25: West Australian Sea Cucumber (Beche-De-Mer) Fishery—recorded fishing effort (based on 60 nm graticular reporting blocks) for 2014–2023, within the vicinity of the EMBA

4.4.1.3 Pearling and aquaculture

Pearling and aquaculture operations in the northwest are typically restricted to inland and shallow coastal waters.

The OA and Sound EMBA do not overlap with any known licenced aquaculture or pearling operations.

The Hydrocarbon EMBAs interface 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 Peninsula (Figure 4-1). There are known pearl farm leases in nearshore waters around Montebello Island and two licensed aquaculture sites northeast of Thevenard Island which intersect with the Hydrocarbon EMBAs.

4.4.2 Recreational fisheries

Recreational fishing is one of the most popular pastimes in WA with an estimated third of the population fishing recreationally (Ref. 242). The WA Department of Primary Industries and Regional Development (DPIRD) conducts state-wide recreational fishing surveys every two years, with the first survey completed in 2011. The survey collects information from more than 3,000 recreational fishers who record their catches in logbooks over a 12-month period with DPIRD also conducting interviews throughout the State and monitoring the number of boat launches and retrievals using cameras at various boat ramps.

The 2020–2021 survey report (Ref. 244) identified that most boat-based recreational fishing effort occurred in nearshore habitat (46% and 54% for North-Coast and Gascoyne Coast respectively), followed by inshore demersal habitats (32% and 39% for North-Coast and Gascoyne Coast respectively). Most fishing effort was attributed to line fishing (87% and 91% for North-Coast and Gascoyne Coast respectively).

Tour operator fishing efforts recorded over a 10-year period (2014–2023) (Ref. 239) identified there were up to eight vessels operating within the OA and Sound EMBA per year.

Some shore-based fishing may occur in the coastal regions within the Hydrocarbon EMBAs (Section 4.18.2).

4.4.3 Traditional fisheries

Customary fishing applies to person who has a traditional connection with the area being fished, and is fishing for personal, domestic, ceremonial, educational or non-commercial needs (Ref. 245). A Customary Fishing Policy has been incorporated into the *Fish Resources Management Act 1994* (WA), which allows for customary fishing by applicable persons to occur within a sustainable fisheries management framework. Customary fishing does not apply to other species of marine fauna (e.g. crocodile, turtle, or dugong).

Under amendments made in 2012 to the *Conservation and Land Management Act 1984* (WA), Aboriginal people can undertake customary activities which includes hunting (except in marine sanctuary zones or marine nature reserves) for dugong, turtle, or crocodiles in WA.

As described in Section 4.17.5.2.1, 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 EMBAs.

The EMBA does not intersect with the 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.

4.4.4 Commercial shipping

AMSA collects vessel traffic data from a variety of sources, including satellite shipborne automated identification system (AIS) data, across Australia's Search and Rescue region. This data has been used to develop Figure 4-26, which shows recent vessel traffic (October 2024) within the vicinity of the OA.

A small section of the OA intersects a NWS shipping fairway (Figure 4-26). However, vessel traffic within the fairway is relatively low (compared to other NWS shipping fairways). Vessel traffic within and around the OA is most likely to comprise offshore support vessels for petroleum activities.

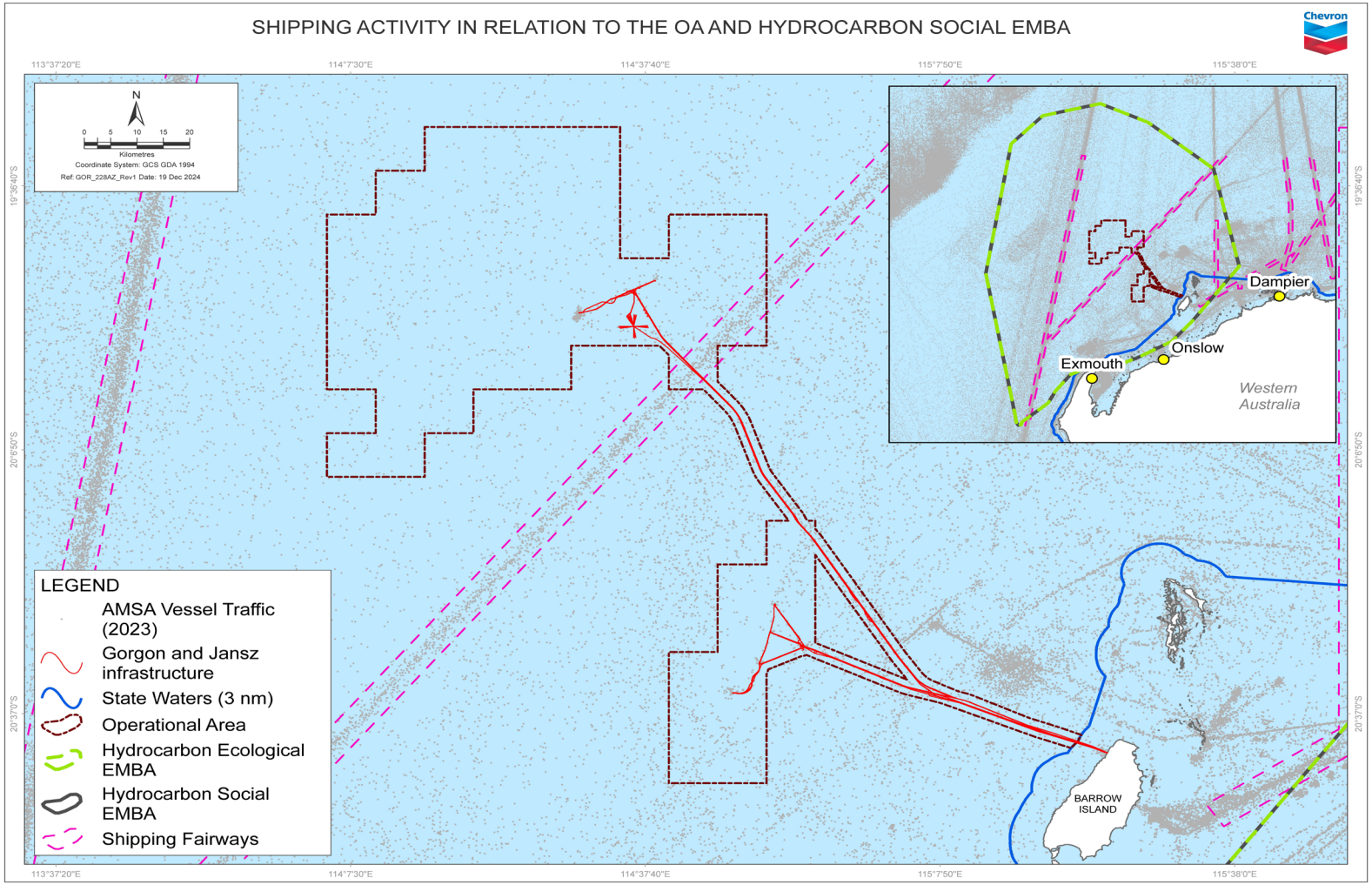


Figure 4-26: Vessel traffic within the vicinity of the EMBA

4.4.5 Tourism and recreation

Tourism is an important industry for WA, directly employing 61,500 people and indirectly employing a further 27,500 (Ref. 246). Charter fishing, diving, snorkelling, wildlife watching, and cruising are some of the commercial tourism activities in and adjacent to the NWMR (Ref. 59). With the exception of offshore fishing, most marine tourism and recreational activities occur in the shallower State waters (Ref. 59).

The OA and Sound EMBA occur offshore and as such there is limited tourism and recreational activities expected within these areas. As per Section 4.18.2, recreational fishing vessels have been recorded within the OA and Sound EMBA.

The Hydrocarbon EMBAs do interface 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 Peninsula (Figure 4-1). As described in Section 4.17.5.1, tourism and recreational activities may occur around the Montebello Islands and Exmouth areas.

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 (~96 km southwest of the OA; Section 4.20). Activities undertaken include recreational fishing, snorkelling and scuba diving, wildlife watching and encounters (including whale sharks, manta Rays, humpback whales and turtles) (Ref. 247), 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. 78).

4.4.6 Other marine and coastal industries

Several other marine and coastal industries may be present within the EMBA (Table 4-19). There were no offshore renewable energy facilities, salt mines, or onshore processing facilities identified within the EMBA.

Table 4-19: Presence of industries

Industry	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Petroleum exploration and production	✓	✓	✓
Defence			✓
Ports (Barrow Island and Varanus Island Port)			✓
Submarine cable (Darwin-Jakarta-Singapore Cable)	✓	✓	✓

The Northern Carnarvon Basin is one of the most heavily explored and developed petroleum basins in Australia. The Northern Carnarvon, Browse and Bonaparte basins together comprise most of Australia's natural gas reserves (Ref. 60). The Carnarvon Basin supports >95% of WA's oil and gas production, and accounts for ~63% of Australia's total production of crude oil, condensate, and natural gas (Ref. 60).

Infrastructure from the Gorgon Gas Development is located within the OA, including existing manifolds, pipelines, flowlines and umbilicals. Except for standard subsurface

operations, no other energy activities have been identified within the OA and Sound EMBA.

The Royal Australian Air Force (RAAF) have a base located at Learmonth, and there is a designated maritime firing practices and exercise area associated with this base (Ref. 248). The Australian Navy has three communication stations located on the North West Cape peninsula. The Harold E Hold 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 Hold Area A also includes the Point Murat Navy Pier, and the waters extending 400 m around the pier (Ref. 249). There are no known sites of unexploded ordnance within the OA (Ref. 250).

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. Only one submarine cable intersects with the OA, the Darwin-Jakarta-Singapore Cable (Table 4-19); this cable links the existing Australia Singapore Cable to the North-West Cable System.

Under Part 2 of the *Telecommunications Act 1997* (Cth), the Australian Communications and Media Authority 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 Darwin-Jakarta-Singapore Cable.

4.5 Qualities and characteristics of locations, places and areas

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

4.5.1 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. 251).

The North-west Marine Parks Network Management Plan (Ref. 252) 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. 252) 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).

Australian Marine Parks (AMPs) occur within Commonwealth waters and have been proclaimed under the EPBC Act in 2007 and 2013. The presence of AMPs within the EMBA, and a summary of values, is described in Table 4-20.

The southern part of the OA (i.e. first ~13 km of the pipeline) overlaps with ~1.23% of the Montebello Marine Park, as shown in Figure 4 21.

Table 4-20: Presence of AMPs

Australian Marine Park^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
Gascoyne (Multiple use zone [IUCN VI], Habitat Protection Zone [IUCN IV])			✓
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. 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 Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their Sea Country for tens of thousands of years. The Baiyungu, Thalanyji and Yinikurtura People have responsibilities for Sea Country in the 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, Commonwealth and national heritage. **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])	✓	✓	✓
The Montebello Marine Park is located offshore of Barrow Island and 80 km west of Dampier extending from the Western Australian state waters boundary, and is adjacent to the Western Australian 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.			

Australian Marine Park^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
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 (Section 4.17.6.1). 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 Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous 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. **Heritage values** No international, Commonwealth or national listings apply to the Marine Park, however the Marine Park is adjacent to the Western Australia 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])			✓
The Ningaloo Marine Park stretches ~300 km along the west coast of the Cape Range Peninsula, and is adjacent to the Western Australian 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 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			

Australian Marine Park^	OA	Sound EMBA	Hydrocarbon Ecological and Social EMBAs
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 Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous 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. **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 Murion 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. 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. 252.*

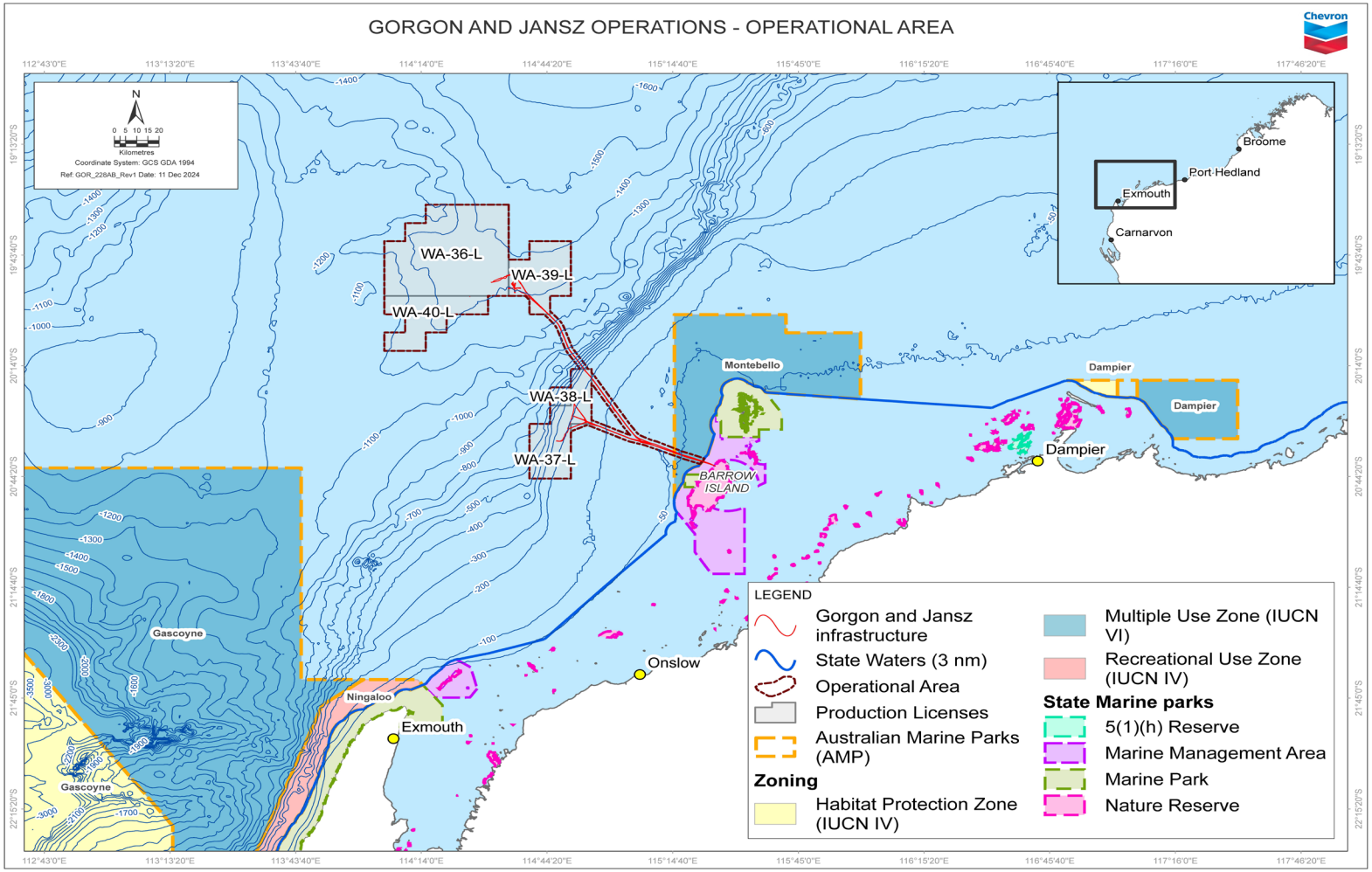


Figure 4-27: Commonwealth and State marine protected areas within the vicinity of the EMBA

4.5.2 State marine protected areas

State Marine Parks, and Marine Management Areas, proclaimed under the *Conservation and Land Management Act 1984* (WA) (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; however, it is adjacent to the Barrow Island Marine Management Area (Figure 4-27). The presence of State marine parks, and marine management areas within the EMBA is shown in Table 4-21.

Table 4-21: Presence of State marine protected areas

State marine protected areas	Zone Type (IUCN category)	OA	Sound EMBA	Hydrocarbon Ecological EMBAs	Hydrocarbon Social EMBAs
Barrow Island Marine Management Area	Unassigned (IUCN VI)		✓	✓	✓
Barrow Island Marine Park	Unassigned (IUCN IA)		✓	✓	✓
Montebello Islands Marine Park	General Use Zone (IUCN II)			✓	✓
	Recreation Zone (IUCN II)			✓	✓
	Sanctuary Zone (IUCN IA)		✓	✓	✓
	Special Purpose Zone (Benthic Protection) (IUCN IV)			✓	✓
	Special Purpose Zone (Pearling) (IUCN VI)			✓	✓
Montebello Islands Conservation Park	Unassigned (IUCN II)			✓	✓
Muiron Islands Marine Management Area	Conservation Area (IUCN IA)			✓	✓
	MMA (Unclassified) (IUCN VI)			✓	✓
Ningaloo Marine Park	General Use (IUCN II)			✓	✓
	Recreation Area (IUCN II)				✓
	Sanctuary Zone (IUCN IA)				✓
	Special Purpose Zone (Shore Based Activities) (IUCN II)				✓
	Unassigned (IUCN II)				✓
Thevenard Island Nature Reserve	Unassigned (IUCN IA)				✓

4.5.3 State terrestrial protected areas

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

The OA and Sound EMBA occur offshore and do not have any interface with the coast. The Hydrocarbon EMBAs do interface 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 Peninsula (Figure 4-1). The State

terrestrial protected areas that intersect with the Hydrocarbon EMBAs are shown in Table 4-22.

Table 4-22: Presence of State terrestrial protected areas

Terrestrial protected areas	Zone Type (IUCN category)	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Barrow Island Nature Reserve*	Nature Reserve (IUCN Ia)			✓	✓
Boodie, Double Middle Islands*	Nature Reserve (IUCN Ia)			✓	✓
Bundegi Coastal Park^	5(1)(h) Reserve (IUCN II)				✓
Cape Range National Park^	National Park (IUCN II)				✓
Montebello Islands Conservation Park^	Conservation Park (IUCN II)			✓	✓
Pilbara Islands[14] Nature Reserves*^	Nature Reserve (IUCN Ia)			✓	✓

** Protected area is landward of LWM.*

^ Protected area is landward of HWM.

4.6 Heritage value of places

Listed World Heritage properties, and National Heritage places, are MNES under the EPBC Act, and a particular value and sensitivity under the OPGGS(E)R. Table 4-23 identifies the presence of these, and other marine or coastal heritage protected places, within the EMBA.

Table 4-23: Presence of heritage value

Feature	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
World Heritage property				
Ningaloo Coast			✓	✓
National Heritage place				
Ningaloo Coast			✓	✓
Commonwealth Heritage place				
Learmonth Air Weapons Range Facility				✓
Ningaloo Coast			✓	✓
Indigenous Protected Areas				
N/A	(none identified within the EMBA)			
Sites or artefacts protected under the *Underwater Cultural Heritage Act 2018* (Cth)				

[14] 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 Hydrocarbon EMBAs interact with Airlie, Lowendal, Muiron, and Serrurier Islands. The Hydrocarbon Social EMBA also interacts with Bessieres and Round Islands.

Feature	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Historic shipwrecks (>75 years old)			✓	✓
Shipwrecks			✓	✓
Sunken aircraft	(none identified within the EMBA)			
In situ artefacts	(none identified within the EMBA)			
Sites or artefacts protected under the *Aboriginal Heritage Act 1972* (WA)[15]				
28 Mile Creek North 1 (Artefacts/Scatter, Midden/Scatter)				✓
28 Mile Creek North 2 (Artefacts/Scatter, Midden/Scatter)				✓
Barrow Island 03 (Artefacts/Scatter)				✓
Bloodwood Creek Midden 1 (Artefacts/Scatter, Midden/Scatter)				✓
Bloodwood Creek Midden 2 (Artefacts/Scatter, Midden/Scatter)				✓
Bloodwood Creek Midden 3 (Artefacts/Scatter, Midden/Scatter)				✓
Bloodwood Creek Shoreline (Artefacts/Scatter, Midden/Scatter)				✓
Camp 17 North Middens (Artefacts/Scatter, Midden/Scatter)				✓
Camp 17 South Middens (Artefacts/Scatter, Midden/Scatter)				✓
Camp Thirteen Burial (Skeletal Material / Burial)				✓
Flacourt Bay 01 (Rockshelter)			✓	✓
John Wayne Country Rockshelter (Artefacts / Scatter, Rockshelter)			✓	✓
Lake Side View (Artefacts/Scatter, Midden/Scatter)				✓
Lakeside Coastal Plain (Artefacts/Scatter, Midden/Scatter)				
Mandu Mandu Ck Rockshelters (Artefacts/Scatter)				✓
Mandu Mandu Creek North (Artefacts/Scatter, Midden/Scatter)				✓
Mandu Mandu Creek South (Artefacts/Scatter, Midden/Scatter)				✓
Mesa Camp (Artefacts/Scatter, Midden/Scatter)				✓
Milyering Midden (Artefacts/Scatter, Midden/Scatter)				✓
Milyering Rocks (Hunting Place)				✓
Montebello Island Haynes Cave (Artefacts / Scatter, Midden / Scatter, Rockshelter, Arch Deposit)				✓

[15] Only Aboriginal Sites, being a place described under Section 5 of the *Aboriginal Heritage Act 1972 (*WA), with a potential coastal and/or marine interface that intersects with the geographic extent of the 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 (DPLH) spatial dataset (Ref. 185) include a buffer around sites to protect privacy regarding the location. As such, the identified heritage sites may not be present within the EMBA.

Feature	OA	Sound EMBA	Hydrocarbon Ecological EMBA	Hydrocarbon Social EMBA
Montebello Island Noala Cave (Artefacts / Scatter, Midden / Scatter, Rockshelter, BP Dating: 27,220 +/- 640)				✓
North T-Bone Bay (Artefacts/Scatter, Midden/Scatter)				✓
Oyster Stacks Midden (Artefacts/Scatter, Midden/Scatter				✓
Point Murat (Artefacts/Scatter, Midden/Scatter, Skeletal Material / Burial, Camp, Other: ?)				✓
Point Murat 01 (Artefacts/Scatter, Midden/Scatter)				✓
Point Murat 02 (Artefacts/Scatter, Midden/Scatter)				✓
Point Murat 03 (Artefacts/Scatter, Midden/Scatter)				✓
Point Murat 04 (Artefacts/Scatter)				✓
Point Murat (Artefacts/Scatter, Midden/Scatter, Skeletal Material/Burial, Camp, Other)				✓
Pilgramunna Bay Midden (Artefacts/Scatter, Midden/Scatter)				✓
South End structures, Barrow Island (Historical, Man-Made Structure)				✓
Tulki Well Midden (Artefacts/Scatter, Midden/Scatter)				✓
Turquoise Bay North				✓
Warnangura (Cape Range) Cultural Precinct			✓	✓
Yardie Creek (Artefacts/Scatter, Midden/Scatter)				✓
Yardie Creek South 1 (Artefacts/Scatter, Midden/Scatter)				✓
Determined areas under the *Native Title Act 1993* (Cth)				
Native Title determination WCD2019/016				✓
Claim areas under the *Native Title Act 1993* (Cth)				
N/A	(none identified within the EMBA)			

4.6.1 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. 259). 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. 261).

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. 259). Intertidal systems such as rocky shores, sandy beaches, estuaries, and mangroves are also present (Ref. 259). The most dominant marine habitat is Ningaloo Reef, which sustains both tropical and temperate marine fauna and flora, including marine reptiles and mammals (Ref. 259).

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. 259). 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. 259). 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. 259).

In addition to the natural values of the Ningaloo Coast, Indigenous values are identified under the National Heritage listing (Ref. 261). Archaeological deposits in the rock shelters on Cape Range show First Nations people's sophisticated knowledge of marine resources between 35,000 and 17,000 years ago. The rock shelters are considered to provide the best evidence in Australia for the use of marine resources during the Pleistocene (Ref. 261).

4.6.2 Underwater cultural heritage

Australia's UCH is protected under the UCH Act; this legislation protects shipwrecks, sunken aircraft and other types of underwater heritage, including First Nations UCH in Australian waters[16].

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 heritage values with no physical component are not protected under the Act (Ref. 262).

A desktop analysis was undertaken to determine the presence of UCH within the EMBA. This analysis included:

- searches of the online Australasian Underwater Cultural Heritage Database (Ref. 263) for known underwater cultural heritage
- consultation with First Nations people and/or representative bodies (relevant persons) to identify presence of UCH artefacts.

Based on the database searches, both historic (>75 years old) shipwrecks and other shipwreck sites were identified in the EMBA (Table 4-23). No sunken aircraft, or other types or artefacts, were identified within the EMBA from the database searches.

The consultation undertaken during the preparation of this EP is summarised in Section 6. During this consultation, no specific First Nations UCH has been identified within the EMBA.

4.6.3 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 administer under the *Native Title Act 1993* (Cth).

4.6.3.1 Native Title 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. 209). 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

[16] 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).

spiritual involvement in that area (Ref. 209). The determination area contains places of special significance, such as cultural, spiritual, and ceremonial sites and natural resources (Ref. 209).

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

5 environmental impact and risk assessment methodology

This section provides a description of the methods used to identify and evaluate the environmental impacts and risks associated with the petroleum activities (as described in Section 3) and any potential emergency conditions associated with these activities. These methods support the environmental impact and risk assessment as required under regulation 21(5) of the OPGGS(E)R.

The impact and risk assessment for this EP was undertaken in accordance with the CAPL's *ABU OE Risk Management Process* (Ref. 25) and using Chevron Corporation's Integrated Risk Prioritization Matrix (Table 5-1). This approach generally aligns with the processes outlined in ISO 31000:2018 *Risk management – Principles and guidelines* (Ref. 26) and the HB 203:2012 *Managing environment-related risk* (Ref. 27).

The impact and risk assessment process and evaluation involved consulting with environmental, health, safety, commissioning, start-up, operations, maintenance, engineering, and emergency response personnel. The impacts and risks considered and covered in this EP were identified and informed by:

- experience gained during the development installation activities
- expertise and experience of CAPL personnel involved in operations
- relevant persons consultation (Section 6).

5.1 Identification and description of the petroleum activity

All components of the petroleum activity and potential emergency conditions relevant to the scope of this EP are described and evaluated during the impact and risk assessment. The petroleum activity is described in detail in Section 3.

5.2 Identification of particular values and sensitivities

The presence of environmental values and sensitivities within the EMBA is documented in Section 4. In accordance with regulation 21(3) of the OPGGS(E)R, the values and sensitivities include the following:

- the world heritage values of a declared World Heritage property
- the national heritage values of a National Heritage
- the ecological character of a declared Ramsar
- the presence of a listed threatened species or listed threatened ecological community (TEC)
- 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, rare, or endangered fauna have the potential to transit through the EMBA, the habitat and/or temporal area that supports protected and endangered fauna (including areas defined as BIAs for these species) is considered the particular value or sensitivity.

Environmental values and sensitivities are also considered to be associated with each of the receptor groups identified and described throughout Section 4 (i.e. in addition to

those particular values and sensitivities as identified under the OPGGS(E)R). All relevant environmental values and sensitivities have been taken into consideration during the consultation process (and identification in functions, interests, or activities; Section 6), and the impact and risk assessment (Section 6.15).

5.3 Identification of relevant aspects

CAPL defines an aspect as an element of CAPL's activities, products, or services related to an operation that has the potential to interact with the environment at present or later (e.g. wastewater discharge, greenhouse gas emission, legacy environmental obligations).

After describing the petroleum activity, an assessment was carried out to identify potential interactions between the petroleum activity and the receiving environment. The outcomes of relevant persons consultation also contributed to this scoping process.

Note: Potential interactions with safety, health, and assets is outside the scope of this EP.

Environmental aspects categorised for use in the impact and risk assessment of this petroleum activity include:

- physical presence
- seabed disturbance
- air emissions
- greenhouse gas emissions
- light emissions
- underwater sound
- electromagnetic emissions
- invasive marine pests
- planned discharges
- unplanned releases.

5.4 Identification of relevant environmental impacts and risks

Potential impacts and risks arising from the aspects were then identified during a scoping exercise and then evaluated in detail.

5.5 Evaluation of impacts and risks

5.5.1 Consequence

After identifying the aspects, and associated potential impacts and risks, the potential consequences were evaluated using the Integrated Risk Prioritization Matrix (Table 5-1). The consequence level is 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.

For aspects that have the potential to cause both impacts and risks, the highest level consequence was carried through the remainder of the assessment to ensure the most conservative analysis is presented.

Table 5-1: Chevron Corporation's Integrated Risk Prioritisation Matrix

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

5.5.2 Control measures and ALARP

The process for identifying control measures depends on the 'as low as reasonably practicable' (ALARP) decision context set for that particular aspect. Regardless of the process, control measures are assigned in accordance with the defined environmental performance outcomes, with the objective to eliminate, prevent, reduce, or mitigate consequences associated with each identified environmental impact and risk.

5.5.2.1 ALARP decision context

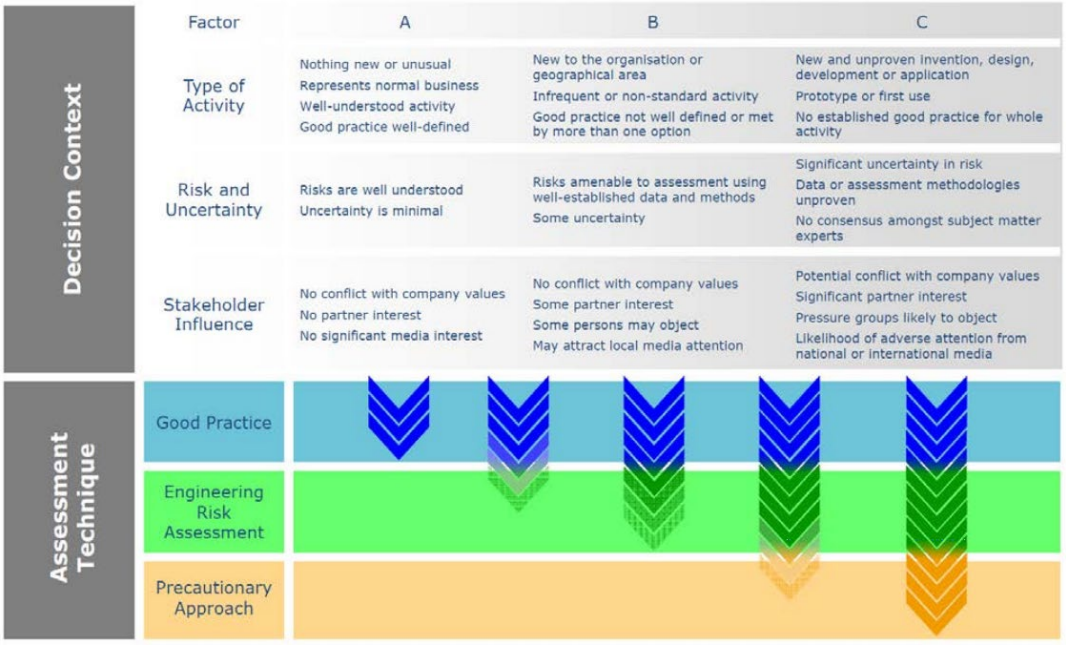
In alignment with NOPSEMA's ALARP guidance note (Ref. 28), CAPL has adapted the approach developed by Oil and Gas UK (OGUK) (Ref. 29) for use in an environmental context to determine the assessment technique required to demonstrate that impacts and risks are ALARP. Specifically, the framework considers the magnitude of impacts and risks along with these guiding factors:

- activity type
- risk and uncertainty
- stakeholder influence.

A Type A decision (Figure 5-1) is made for lower-order impacts and risks (Table 5-3) where they are relatively well understood, activities are well-practised, and there is no significant stakeholder interest. However, if good practice is not sufficiently well defined, additional assessment may be required. In addition, where an aspect associated with the activity is listed as either a key threat to a protected matter under a document made or implemented under the EPBC Act (such as recovery plans, conservation management plans, or a conservation advice), 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 will be undertaken.

A Type B decision (Figure 5-1) is made for higher-order impacts and risks (Table 5-3) if there is greater uncertainty or complexity around the activity, and there are relevant concerns from stakeholders. In this instance, established good practice is not considered sufficient and further assessment is required to support the decision and ensure the risk is ALARP.

A Type C decision (Figure 5-1) typically involves sufficient complexity, higher-order impact and risks (Table 5-3), uncertainty, or stakeholder interest to require a precautionary approach. In this case, relevant good practice still has to be met, additional assessment is required, and the precautionary approach must be considered for those controls that only have a marginal cost benefit.



(Source: Ref. 28)

Figure 5-1: ALARP decision support framework

In accordance with the regulatory requirement to demonstrate that environmental impacts and risks are ALARP, CAPL has considered the above decision context in determining the level of assessment required. This is applied to each aspect described in Sections 6.15. The assessment techniques considered include:

- good practice
- engineering risk assessment
- precautionary approach.

5.5.2.2 Good practice

OGUK (Ref. 29) defines ‘good practice’ as:

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

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

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

If the ALARP technique is determined to be good practice, further assessment (an engineering risk assessment) is not required to identify additional controls. However, additional controls that provide a suitable environmental benefit for an insignificant cost have been identified.

5.5.2.3 Engineering risk assessment

All impacts and risks that require further assessment are subject to an engineering risk assessment. Based on the various approaches recommended by OGUK (Ref. 29), CAPL believes the methodology most suited to this activity is a comparative assessment of risks, costs, and environmental benefit. A cost–benefit analysis should show the balance between the risk benefit (or environmental benefit) and the cost of implementing the identified measure, with differentiation required such that the benefit of the risk-reduction measure can be seen and the reason for the benefit understood.

5.5.2.4 Precautionary approach

After considering all available engineering and scientific evidence, OGUK (Ref. 29) state that if the assessment is insufficient, inconclusive, or uncertain, then a precautionary approach to hazard management is needed. A precautionary approach will mean that uncertain analysis is replaced by conservative assumptions that will result in control measures being more likely to be implemented.

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

5.5.3 Likelihood

For environmental impacts (where there is a planned emission or discharge resulting in a known change to the environment) likelihood is not considered.

For risks where the aspect or event may lead to environmental impacts under certain circumstances, the likelihood (probability) of the defined consequence occurring is determined. The likelihood is considered on the assumption that all control measures are in place. The likelihood of a consequence occurring was identified using one of the six likelihood categories shown in Table 5-1.

5.5.4 Quantification of the level of risk

The Integrated Risk Prioritization Matrix (Table 5-1) was applied during an environmental risk assessment workshop. This matrix uses consequence and likelihood rankings of 1 to 6, which when combined, result in a risk level between 1 (highest risk) and 10 (lowest risk). Risk assessment outcomes are based solely on assessment of risk to the environment (as defined under the OPGGS(E)R).

5.6 Impact and risk acceptance criteria

NOPSEMA provides guidance on demonstrating that impacts and risks will be of an ‘acceptable level’ (Ref. 30). This guidance indicates that an acceptable level is the level of impact or risk to the environment that may be considered broadly acceptable with regard to all relevant considerations, including:

- principles of ecologically sustainable development (ESD)
- legislative and other requirements (including laws, policies, standards, conventions)
- matters protected under Part 3 of the EPBC Act, consistent with relevant policies, guidelines, threatened species recovery plans, management plans, management principles etc.

- internal context (titleholder policy, culture, processes, standards and systems)
- external context (existing environment, relevant persons consultation).

5.6.1 Principles of ESD and precautionary principle

The principles of ESD are considered in Table 5-2 in relation to acceptability evaluations.

Under the EPBC Act, the Minister must also take into account the precautionary principle in determining whether or not 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 5-2: Principles of ESD in relation to petroleum activity acceptability evaluations

Principles of ESD	How they have been applied
(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 5-1), which includes provision for understanding the long-term and short-term impacts associated with its activities, and the ALARP process, which balances the economic cost against environmental benefit. As this principle is inherently met by applying the EP assessment process, it is not considered separately for each evaluation.
(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	Consider if there is serious or irreversible environmental damage (i.e. consequence level between Major [3] and Catastrophic [1]). If so, assess whether there is significant uncertainty associated with the aspect.
(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 risk assessment methodology ensures that impacts and risks are reduced to levels that are considered ALARP. If the impacts and risk are determined to be serious or irreversible, the precautionary principle is implemented to ensure that risks are managed to ensure that the environment is maintained for the benefit of future generations.
(d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making	Evaluate if there is the potential to affect biological diversity and ecological integrity.
(e) improved valuation, pricing, and incentive mechanisms should be promoted	Not considered relevant for petroleum activity acceptability demonstrations.

5.6.2 Defining an acceptable level of impact and risk

In alignment with NOPSEMA's ALARP guidance note (Ref. 28), CAPL has applied the approach that lower-order environmental impacts or risks (Table 5-3) assessed as

Decision Context A are 'broadly acceptable', while higher-order environmental impacts or risks determined to be Decision Context B or C require further evaluation against a defined acceptable level because they are not inherently 'broadly acceptable'. However, in alignment with NOPSEMA's decision making guidance (Ref. 30) even where the impact or risk is evaluated as being a lower-order impact or risk, but the aspect associated with the activity is listed as a threat to a protected matter under a document made or implemented under the EPBC Act, or identified as an aspect of concern to a listed conservation value under an EPBC Act Marine Bioregional Plans, and can result in a credible impact or risk, CAPL will define an acceptable level of impact and risk in accordance with a document made or implemented under the EPBC Act.

Table 5-3: CAPL definition of lower-order and higher-order impacts and risks

Magnitude	Impacts	Risk	Decision context
Lower-order	Consequence Level: 4–6	Risk Level: 7–10	A
Higher-order	Consequence Level: 1–3	Risk Level: 1–6	B or C

CAPL will consider these types of documents when defining the acceptable level of impact or risk:

- bioregional plans
- AMP plans
- conservation advice
- recovery plans
- government guidelines.

The objectives of the documents are identified and, having regard for the described activity, CAPL will set an acceptable level of impact that aligns with these objectives. Where the impact arising from the activity is inconsistent with the defined level (or objectives of the relevant documents), it is unacceptable.

5.6.3 Summary of acceptance criteria

Table 5-4 outlines the criteria that CAPL used to demonstrate that impacts and risks from each identified aspect are acceptable.

Table 5-4: Acceptability criteria

Criteria	Test
Principles of ESD	Is there the potential to affect biological diversity and ecological integrity? Do activities have the potential to result in permanent/irreversible, medium-large scale, and/or moderate-high intensity environmental damage?
	If yes: Is there significant scientific uncertainty associated with the aspect?
	If yes: Are there additional measures to prevent degradation of the environment from this aspect?
Relevant environmental legislation and other requirements	Confirm that impact and risk management is consistent with relevant Australian environmental management laws and other regulatory / statutory requirements.

Criteria	Test
Internal context	Confirm that all good practice control measures were identified for this aspect through CAPL's management systems and that impact and risk management is consistent with company policy, culture, and standards.
External context	What objections and claims regarding this aspect were made, and how were they considered / addressed?
Defined acceptable level	Is the impact and risk broadly acceptable (i.e. Decision Context A)?
	If no: For higher-order environmental impacts and risks (Decision Context B or C), what is the defined level of impact, and does the activity meet this level?

5.7 Environmental performance outcomes, standards, and measurement criteria

Environmental performance outcomes, performance standards, and measurement criteria were defined to address the environmental impacts and risks identified during the risk assessment.

CAPL is committed to conducting activities associated with 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. CAPL defines environmental performance outcomes, standards, and measurement criteria that relate to the management of the identified environmental risks as:

- **Environmental performance outcomes**—a measurable level of performance required for the management of environmental aspects of an activity to ensure that environmental impacts and risks will be of an acceptable level
- **Environmental performance standards**— a statement of the performance required of a control measure
  - These statements will consider the effectiveness of the control measures, and, in accordance with NOPSEMA's decision making guidance (Ref. 30), effectiveness will be considered with regards to the controls' functionality, availability, reliability, survivability, independence, and compatibility with other control measures
- **Measurement criteria**—compliance and assurance statement or records that detail how CAPL enacts the outlined performance standard; these are used to determine whether the environmental performance outcomes and standards were met and whether the implementation strategy was complied with. If no practicable quantitative target exists, a qualitative criterion is set.

6 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 8.17.4.1.

6.1 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."*[17]

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 of the environment which may be affected by a titleholder's proposed activities (Ref. 264). 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
- 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. 265 at paragraphs 55–57, and Ref. 475 at paragraph 48).

[17] Paragraph 89 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167). 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 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. 476 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. 264).

Consultation is undertaken in the course of preparing an EP (Ref. 476). Once consultation has been closed prior 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 8.17.4). 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.

6.2 Consistency with regulatory guidance

The consultation design for preparation of this EP was undertaken in accordance with CAPL's *Stakeholder Engagement and Issues Management Process: ABU Standardised OE Process* (Ref. 42) and further guided by:

- NOPSEMA's *Environment plan decision making guideline* (Ref. 30)
- NOPSEMA's *Environment plan content requirements guidance note* (Ref. 266)
- NOPSEMA's *Consultation in the course of preparing an environment plan guideline* (Ref. 264)
- NOPSEMA's *Consultation with Commonwealth agencies with responsibilities in the marine area guideline* (Ref. 267)
- NOPSEMA's *Petroleum activities and Australian Marine Parks guidance note* (Ref. 268)
- Full Court of the Federal Court of Australia's decision in *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 265)
- Colvin J of the Federal Court in *Cooper v National Offshore Petroleum and Safety Management Authority* [2023] FCA 1112 (Ref. 475)
- Colvin J of the Federal Court in *Cooper v National Offshore Petroleum and Safety Management Authority (No 2)* [2023] FCA 1158 (Ref. 476)
- Commonwealth of Australia's *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* (Ref. 269)
- WA Department of Energy, Mines, Industry Regulation and Safety (DEMIRS*) Guideline for the Development of Petroleum, Geothermal and Pipeline Environment Plans in Western Australia* (Ref. 271)
- Government of Western Australia *Consultation policy for Section 18 application* (Ref. 270)

- Australian Fisheries Management Authority's (AFMA) Petroleum industry consultation with the commercial fishing industry (Ref. 272)
- Western Australian Fishing Industry Council's (WAFIC) *Oil & Gas Consultation Approach for Unplanned Events* (Ref. 273)
- DPIRDs *Guidance statement for oil and gas industry consultation with the Department of Fisheries* (Ref. 274)
- WA Department of Transport's (DoT) *Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements* (Ref. 275).

6.2.1 Consultation principles

Consistent with NOPSEMA's Consultation in the course of preparing an environment plan guideline (Ref. 264), 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, 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, 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).

In addition, Chevron Corporation acknowledges the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and strives to obtain free, prior and informed consent of Indigenous communities as described in the 2012 International Finance Corporation Performance Standard 7 and supporting guidance, and consistent with the law (Ref. 477). In the context of the OPGGS(E)R, CAPL considers this to be consent to the effect of environmental impacts or risks of the petroleum activity on Aboriginal relevant person's functions, interests or activities, It is noted that CAPL is not required to obtain consent from a relevant person to engage in the petroleum activity.

6.2.2 Relevant person

In accordance with regulation 25(1) of the OPGGS(E)R, a relevant person is defined as:

- regulation 25(1)(a)—each department or agency of the Commonwealth to which the activities to be carried out under the EP, or the revision of the EP, may be relevant
- regulation 25(1)(b)—if the plan relates to activities in the offshore area of a State—the Department of the responsible State Minister
- regulation 25(1)(c)—if the plan relates to activities in the Principal Northern Territory offshore area—the Department of the responsible Northern Territory Minister
- regulation 25(1)(d)—a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the environment plan
- regulation 25(1)(e)— any other person or organisation that the titleholder considers relevant.

Following the direction given by the Full Court of the Federal Court in *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 265), and subsequent NOPSEMA guidance (Ref. 266), it is clear that the phrase "functions, interests or

activities" stated in regulation 25(1)(d) should be broadly construed[18] 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[19]
- **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"[20]
- **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[21].

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 potential relevants and contacted them to advise whether that individual or organization identifies themselves as a relevant person.

Where interests are held communally, CAPL has made a decisional choice to consult with representative bodies (Ref. 265 at paragraphs 96–102) and has sought to do so through meetings (Ref. 265 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. 265 at paragraph 47) and CAPL has also sought to identify those representative body organisations themselves as relevant persons (Ref. 265 at paragraph 48). As documented in the summary of consultation (appendix d), 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.

6.2.3 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 6.15, 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.

[18] Paragraph 51 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[19] Paragraph 60 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[20] Paragraphs 63 and 65 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[21] Paragraphs 58 and 59 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

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 necessary, 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 reimburses them for their time accordingly.

The agreement deals with consultation meetings (including meeting frequency and schedule) and consultation funding (and associated administrative and tax arrangements), and US extraterritorial Compliance law requirements. This may include payment for subject matter experts (e.g. environmental consultants, legal consultants) to advise the relevant person in relation to their consultation obligations, and assist with review and interpretation of technical information in consultation materials and discussion.

Further detail on consultation agreements, engagement plans, capacity building and relationship building is described in Section 8.17.4.3.

6.2.4 Sufficient information

Under regulation 25(2) of the OPGGS(E)R and NOPSEMA's guidelines (Ref. 30; Ref. 264), 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 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 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 or during consultation, to better enable relevant persons 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.

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

- CAPL issued an initial factsheet to identified relevant persons on 15 July 2024 and a follow up fact sheet on 16 December 2024; these factsheets included information about the proposed petroleum activity, potential impacts and risks, control measures, and included maps showing EMBA
- CAPL released information regarding the proposed Gorgon operations to the Online Consultation Hub (https://australia.chevron.com/our-businesses/upcoming-activities) on 15 July 2024 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 West Australian and The Australian on 22 July 2024, the Pilbara Times, Mid West Times and North West Telegraph on 24 July 2024, the National Indigenous Times on 29 July 2024 and the Business News on 5 August 2024
- CAPL published a LinkedIn post on 15 July 2024 with a link to the Online Consultation Hub
- CAPL developed posters, presentation materials, and handouts for use and distribution in face-to-face meetings
- CAPL attended various face-to-face meetings with relevant persons (see appendix d).

A copy of the consultation material is included in appendix c. A summary of the consultation strategy and information provided to each category of relevant persons is included in Table 6-1.

Table 6-1: 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

Category of persons or organisations	Consultation strategy and information provided
	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 6.16.5), 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.
First Nations people and/or representative bodies	• initial correspondence with relevant First Nations representative bodies to request a meeting with the board, Elders, and 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 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 6.16.5), 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.
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 6.16.4), 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 6.16.5), CAPL will determine whether further consultation is required • ongoing consultation with follow up correspondence, phone calls and meetings as required.

6.2.5 Reasonable period

Under regulation 25(3) of the OPGGS(E)R and NOPSEMA's guidelines (Ref. 30; Ref. 264), 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. 265), 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. 30) or up to eight weeks (Ref. 268).

Available guidance regarding consultation with State departments or agencies indicates a reasonable period for standard activities is no less than 20 business days (Ref. 274), and up to six weeks (Ref. 275).

Guidance taken from the *Aboriginal Cultural Heritage Act 2021—Consultation Guidelines* (Ref. 270) (no longer in force) suggested 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). More recent policy (Ref. 478) is less prescriptive and talks to "allowing sufficient time for genuine consultation to occur. This may include using multiple contact methods (e.g. phone and email) and providing a reasonable time for responses". Based on consultation undertaken to date feedback from First Nations peoples is that 12 weeks is a reasonable period of time. 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.

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 of the environmental impacts and risks of the petroleum activity with their functions, interests, or activities.

6.2.6 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 "[a]ll sensitive information (if any) in an environment plan, and the full text of any response by a relevant person to consultation under section 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.

6.2.7 Identification of relevant persons

In accordance with NOPSEMA's guideline for consultation (Ref. 264), titleholders must identify who is a relevant person 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 3)
- 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 EMBA
  - any intersection between the EMBA and BIAs
- the possible 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:

- research and triangulation
- identified what types of authorities, persons, or organisations may be relevant to the values and sensitivities present within the 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. 267; Ref. 268; Ref. 272; Ref. 273; Ref. 274; Ref. 275)
- 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 EMBAs 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 6-2, which lists the relevant persons that were identified for this EP, and CAPL's reasoning for determining their inclusion.

In addition to this process, individuals and organisations were also given the opportunity to self-identify as relevant persons, which is further outlined below at section 6.16.7.1. Where individuals or organisations have been identified as relevant persons for previous petroleum activities, but fall outside the 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 6.17.5 below).

Table 6-2: Potential authority, persons, or organisations that have functions, interests, or activities that are associated with environmental values or sensitivities present within the 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 – other marine users • permanent presence of the subsea hydrocarbon system within the OA • permanent presence of FCS (at the surface) and the associated mooring system and MV umbilicals within the OA • temporary presence of vessels within the OA during IMR activities • temporary presence of vessels with the OA during SCSt initial start-up and commissioning • temporary presence of vessels associated with temporary power supply if required.	Commercial shipping	Interest and activity – Commercial shipping	Presence of vessels or FCS has the potential to result in disruption to other marine users	Commercial vessel traffic density within the OA is relatively low, including within the part of the OA that intersects a NWS shipping fairway. Therefore, the presence of vessels or the FCS within the OA are not expected to have significant consequences for the functions, interests or activities of commercial shipping. Notwithstanding, there may be an intersection with commercial shipping activities and the OA.	Commercial shipping industry Government departments or agencies
	Commercial fishing	Interest and activity – Commercial fishing	Potential for unplanned interactions between other marine users with the subsea infrastructure Presence of vessels or FCS has the potential to result in disruption to other marine users	Subsea infrastructure has been in place within the OA since 2012, and to date, no incidences of commercial fishing activities interacting with the infrastructure has been communicated to CAPL. Although Commonwealth and State fisheries are present, the level of fishing effort within the OA is typically low. Fishing effort records obtained from DPIRD (Ref. 454) for the five State- managed commercial fisheries indicated that fishing effort within the OA varies each year, but is typically low with <3 vessels recorded as present within the graticular reporting blocks that intersect the OA (Ref. 454). Similarly, fishing activity within the OA associated with the Commonwealth- managed fishery is also low.	Commercial fishery licence holders and/or representative bodies 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
	Other commercial industries	Interest and activity – petroleum exploration / production	Concurrent petroleum activities have the potential to result in disruption to other marine users	The OA intersects petroleum titles held by other petroleum titleholders and therefore the functions, interests and activities of other petroleum titleholders may be affected.	Other petroleum titleholders
Physical presence – marine fauna • temporary presence of vessels within the OA during IMR activities • temporary presence of vessels with the OA during SCSt initial start-up and commissioning • temporary presence of vessels associated with temporary power supply if required.	Marine fauna Cultural values	Interest and activity – Environmental conservation Cultural connections	Unplanned interactions with marine fauna Changes to cultural heritage values	Several BIAs or habitat critical to the survival of a species also overlap with the OA, including: • humpback whale (migration BIA) • pygmy blue whale (migration BIA) • flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA, and internesting habitat critical to the survival of a species) • whale shark (foraging BIA). As vessels will be slow-moving whilst implementing the activities within the scope of this EP, incidences of fauna strike are not expected. If a fauna strike occurred and resulted in death, it is not expected to have a detrimental effect on the overall population of protected species; this event would result in a limited environmental impact. However, it is acknowledged that relevant persons may hold interests relating to the protection of marine fauna.	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
Seabed disturbance • IMR—as required (e.g. removal of sediment for inspections, span rectification, repairs etc.) • field support—contingency anchoring by vessels, wet parking of equipment within the OA	Marine environmental quality Benthic habitat and communities Cultural values	Interest and activity – Environmental conservation Cultural connections	Localised and temporary reduction in water quality Alteration of benthic communities and habitats Changes to cultural heritage values	The petroleum activity may result in disturbance when sediment on the seabed is disturbed and becomes suspended in the water column when infrastructure or equipment is placed on the seabed. The impacts are expected to be localised to around the area of seabed disturbance. After the activities are completed, sediments will settle back to the seabed and water quality will return to background levels. No 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, benthic habitats and communities and cultural values, in particular with respect to the protection of Sea Country.	Government departments or agencies First Nations people and/or representative bodies ENGOs
Air emissions • combustion of fuel from vessels within the OA associated with vessel activities undertaken as part of this petroleum activity. • combustion of aviation fuel associated helicopter activities associated with IMR and planned maintenance of the FCS	Marine environmental quality Cultural values	Interest and activity – Environmental conservation Cultural connections	A localised and temporary reduction in air quality. Contribution to the reduction of the global atmospheric carbon budget.	As reduction in air quality will be temporary and highly localised, and due to the overall *de minimis* contribution to the reduction of the global carbon budget from direct GHG emissions associated with the activities under this EP, 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 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
GHG emissions • direct emissions from planned activities within scope of this EP • indirect emissions from activities associated with processing of gas on Barrow Island • indirect emissions from the transport and third party end-use of LNG, condensate and domestic gas produced by the Gorgon Gas Development.	Marine environmental quality Cultural values	Interest and activity – Environmental conservation Cultural connections	A localised and temporary reduction in air quality. Contribution to the reduction of the global atmospheric carbon budget.		Government departments or agencies First Nations people and/or representative bodies ENGOs
Light emissions • navigation and operational lighting from the FCS • field support—navigation and operational lighting from vessels during the petroleum activity within the OA.	Marine environmental quality Marine fauna Cultural values	Interest and activity – Environmental conservation Cultural connections	A localised and temporary change in ambient light. Change in fauna behaviour for light sensitive species.	CAPL expects that its activities could result in temporary changes to ambient light emissions. Several BIAs and/or habitat critical to the survival of a species overlap with the OA, including: • flatback turtle (internesting buffer habitat critical to the survival of a species) • whale shark (foraging BIA) • wedge-tailed shearwater (breeding BIA). Given the OA is located ~65 km northwest from the nearest land and the distance in which potential impacts to marine fauna from lighting	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
				has been identified as ~5 km, impacts are expected to be temporary, localised and to limited to transient individuals. However, it is acknowledged that relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	
Underwater sound • vessel or helicopter operations during the petroleum activity (including installation and pre-commissioning, or IMR activities) within the OA. • SCSt operations • IMR— acoustic surveys (MBES and SSS). • Location Transponders	Marine environmental quality Marine fauna Cultural values	Interest and activity – Environmental conservation Cultural connections	Localised and temporary change in ambient underwater sound level. Auditory impairment, temporary threshold shift, permanent threshold shift, recoverable or non-recoverable injury to marine fauna.	A change in ambient underwater sound may result in behavioural disturbance, auditory impairment, recoverable or non-recoverable injury to marine fauna. Several BIAs or habitat critical to the survival of a species overlap with the Sound EMBA, including: • pygmy blue whale (migration BIA) • flatback, (internesting buffer BIA, internesting habitat critical to the survival of a species) • whale shark (foraging BIA). CAPL has undertaken underwater sound modelling which indicates localised and short-term behavioural impacts to transient individuals may arise (depending on the timing of the activity and seasonal presence of sensitive fauna. Temporary threshold shift (TTS) and auditory injury shift (AUD INJ) are considered highly unlikely to occur due to the need for fauna to remain in close proximity to for extended durations before auditory impairments or injuries occur. Notwithstanding, it is	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
				acknowledged that relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	
Planned discharges - surface • vessels operations within the OA during IMR activities • FCS operations and IMR activities.	Marine environmental quality Marine fauna Cultural values	Interest and activity – Environmental conservation Cultural connections	Localised and temporary reduction in water quality. Changes to predator-prey dynamics.	Impacts and risks associated with planned discharges 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 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 First Nations people and/or representative bodies
Planned discharges - subsea • commissioning and start-up activities • operational activities • IMR operations within the OA.	Marine environmental quality Benthic habitats and communities	Interest and activity – Environmental conservation	Localised and temporary reduction in water quality Alteration of benthic habitats and communities	Impacts and risks associated with planned subsea discharges 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 planned subsea discharges, however relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies First Nations people and/or representative bodies
Electromagnetic emissions • operation of the HVSC.	Marine fauna Cultural values	Interest and activity – Environmental conservation Cultural connections	Behavioural disturbance of marine fauna	Several BIAs or habitat critical to the survival of a species also overlap with the OA, including: • humpback whale (migration BIA) • pygmy blue whale (migration BIA) Flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA,	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
				internesting habitat critical to the survival of a species) • whale Shark (foraging BIA). Given the predicted small disturbance radius of the EMF (up to ~20 m) of the HVSC, significant adverse effects to marine fauna behaviour are not expected to occur. In areas where the HVSC is exposed there may be a localised change in the EMF and this may cause a very localised and temporary behavioural responses to fauna within close proximity to the HVSC, however the worst case response identified is minor movement deviation.	
Invasive marine pests • planned discharged of ballast water or the presence of biofouling on the FCS and vessels undertaking the petroleum activity within the OA.	Benthic habitat and communities Cultural values	Interest and activity – Environmental conservation Cultural connections	Displacement of, or competition with, native species.	The OA is in water depths of ~25–1,435 m, is located offshore from the mainland coast and large ports, and the seabed is dominated by soft sediments such as sand and clay. Thus, the more favourable requirements of expansive hard substrate and sufficient light for IMP survival are not common within the OA. Although it is highly unlikely the activities in this EP would result in the introduction of IMPs, once established, IMPs 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 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
Unplanned seabed disturbance • field support—dropped object (e.g. tools or equipment) from vessels, ROVs or AUVs (during IMR activities).	Benthic habitats and communities Cultural values	Interest and activity – Environmental conservation Cultural connections	Alteration of benthic communities and habitats	The potential impacts to benthic communities and habitats as a result of unplanned seabed disturbance would be limited to individual occurrences and localised impacts (i.e. area of impact limited to the size of dropped object or equipment). It is unlikely the functions and activities of relevant persons would be impacted by unplanned seabed disturbance, however relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies First Nations people and/or representative bodies
Unplanned release – waste • field support—waste lost overboard from vessels and FCS during IMR activities within the OA,	Marine fauna	Interest and activity – Environmental conservation	Marine pollution resulting in entanglement or injury/mortality of marine fauna.	Unplanned releases of waste may result in impacts to injury/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 relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies First Nations people and/or representative bodies
Unplanned release – loss of containment • using, handling, and transferring hazardous materials and chemicals on board vessels or the FCS (~1 m^3) • hydraulic line failure from equipment (~2 m^3)	Marine environmental quality Marine fauna	Interest and activity – Environmental conservation	Indirect impacts to fauna arising from chemical toxicity	Based on the nature of the unplanned release – loss of containment 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 an unplanned release, however relevant persons may hold interests relevant	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
• transferring hazardous materials between vessels and the FCS (~50 m^3) • thermal runaway resulting in the release of hazardous materials (~1 m^3) • dropped objects (and interaction with the subsea infrastructure) resulting in a loss of various fluids including treated sea water, hydraulic fluids, or MEG				to the values and sensitivities that may be impacted by this aspect.	
Unplanned release – vessel collision • field support—vessel operations within the OA. Unplanned release – well control event • LOC event associated with damage to a valve or similar • Loss of well integrity • Minor or major defect in flowline or production pipeline	Marine environmental quality Benthic habitat and communities Coastal communities Marine fauna Marine protected areas World heritage properties National heritage places Cultural values Tourism	Interest and activity – Environmental conservation Cultural connections Commercial fishing Commercial shipping Recreational fishing Marine recreation Petroleum exploration / production	Marine pollution resulting in sublethal or lethal effects to marine fauna. Indirect impacts to commercial fisheries. Reduction in amenity resulting in impacts to tourism and recreation. Changes to values and sensitivities of Australian Marine Parks	Although highly unlikely, an unplanned emergency event resulting in a hydrocarbon spill may affect the functions, interests and activities of relevant persons within the spatial extent of the EMBA. Refer to Section 4.15 for information on the EMBA for the activity.	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

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
	Recreation Commercial fishing Commercial shipping Other commercial industries		Changes to cultural heritage values.		Submarine cable operators Research organisations
Ground disturbance – shoreline spill response	Marine fauna Coastal communities Cultural values	Interest and activity – Environmental conservation Cultural connections	Potential to damage terrestrial habitats (including nests), with subsequent impacts to fauna such as turtles and birds	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 environmental benefit and therefore the functions, interests and activities of relevant persons are unlikely to be affected.	Government departments or agencies First Nations people and/or representative bodies Tourism and recreation operators
Physical presence – oiled wildlife response	Marine fauna Coastal communities Cultural values	Interest and activity – Environmental conservation Cultural connections	Potential to cause further harm to oiled fauna due to hazing, barriers, deterrents, and cleaning activities, and has the potential to cause injury/death	Oiled wildlife response has the potential to result in injury/mortality to fauna, however will only be undertaken where there is likely to be a net environmental benefit and therefore the functions, interests and activities of relevant persons are unlikely to be affected.	Government departments or agencies First Nations people and/or representative bodies Tourism and recreation operators

6.2.7.1 Self-identification

As part of the consultation process (Figure 6-1) CAPL publicly advertised upcoming petroleum activities (refer to Section 6.16.4), 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's process is to conduct an assessment to validate that they are a relevant person for an EP (aligned with the considerations described in Section 6.17.1 to 6.17.5); and if they are, an assessment of the merits of objections or claims and a response would be progressed (as per the process in Section 6.17.7).

Two relevant persons self-identified during consultation – the Shire of Ashburton and Kufpec.

6.3 Consultation process

The consultation undertaken during the preparation of this EP used the following process (Figure 6-1):

- described the petroleum activity
- identified environmental aspects
- defined the 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.

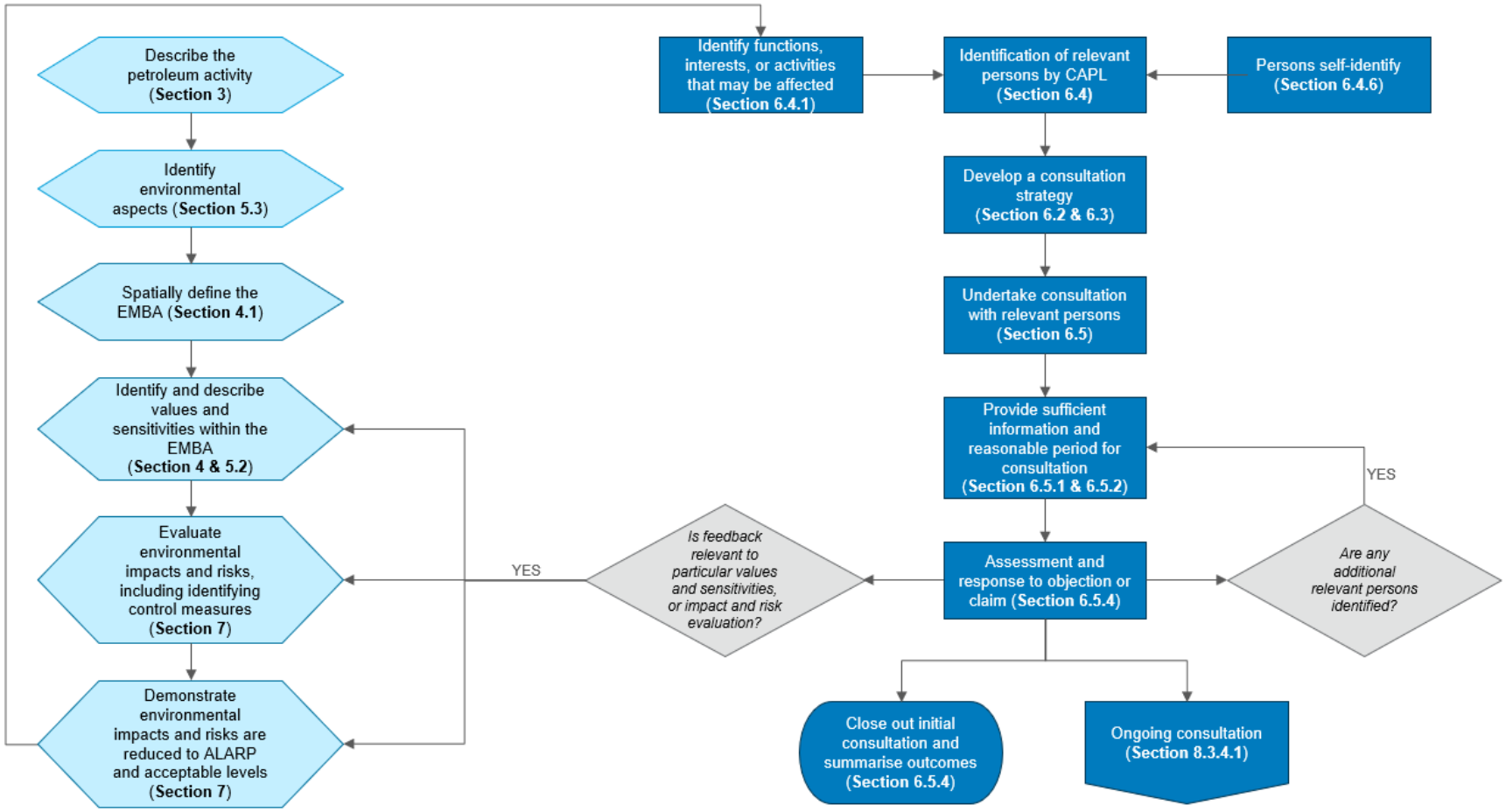


Figure 6-1: Relevant persons consultation process

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

In accordance with the OPGGS(E)R, relevant persons include the Commonwealth, State or Northern Territory agencies or authorities to which activities under this EP may be relevant (Section 6.16.2).

CAPL determined relevant persons under these regulations by considering:

- the spatial extent of the EMBA
- the environmental aspects, and potential environmental impacts and risks associated with the petroleum activity
- the responsibilities of the Commonwealth, State or Northern Territory agency or authority, 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. 267).

The Commonwealth, State or Northern Territory agencies or authorities that were identified as a relevant person for consultation during the preparation of this EP are presented Table 6-4.

6.3.2 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 6.16.2).

The petroleum activity within scope of this EP occurs in Commonwealth waters, off the coast of WA. As such, the Department of Energy, Mines, Industry, Regulation and Safety (DEMIRS) has been identified as a relevant person for consultation during the preparation of this EP (Table 6-4).

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

In accordance with the OPGGS(E)R, if the petroleum activity occurs in the Principal Northern Territory offshore area, the department of the responsible Northern Territory Minister is a relevant person (Section 6.16.2).

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

6.3.4 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 (Section 6.16.2). The considerations for determining the relevance of a person or organisation are described in Section 6.16.2 and Table 6-3.

The persons or organisations that were identified as a relevant person for consultation during the preparation of this EP are presented in Table 6-4.

Table 6-3: 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	State commercial fisheries: • guidance from WAFIC (Ref. 273) regarding separate consultation strategies for unplanned events such as oil spills, where the titleholder can demonstrate likelihood of an event is "extremely low" • fishery management area intersects with 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. Commonwealth commercial fisheries: • fishery management area intersects with the OA, and a record 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. 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 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 EMBA • where an AMP is present within the 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 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 with the EMBAs.

Category of persons or organisations	Considerations for identifying a relevant person
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 EMBA, and with current or proposed activities occurring (based on publicly available EPs from NOPSEMA's EP submission website) within the EMBA • other State (based on spatial data from DEMIRS) petroleum titles that intersect with the EMBA, and with current or proposed activities occurring (based on publicly available EP summaries from DEMIRS EARS database) within the EMBA • potential for temporal and/or spatial interaction between petroleum activity and the operator of another petroleum title.
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 EMBA • where an AMP is present within the EMBA, a review of the 'authorisations issued' from Parks Australia (Ref. 276) • 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 with the EMBA, and an Australian World Heritage advisory committee exists

6.3.5 Relevant persons under regulation 25(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(d) (using the process as described in Section 6.17.3), 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.

6.3.6 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 6-4. CAPL is confident that it has used multiple lines of evidence to identify all relevant persons.

Table 6-4: Relevant persons identified for consultation during preparation of the EP

Relevant person	Rationale
Commonwealth and State 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 4.18.6, the 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. 267) 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 EMBA (Section 4.18.1). Therefore, the activities under the EP may be relevant to the AFMA.
Australian Hydrographic Office (AHO)	As identified in NOPSEMA's consultation guideline (Ref. 267) 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 3.21.1), a safety exclusion zone will be requested around the vessels (Section 3.21.1). 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. 267) AMSA is a relevant agency for consultation where a proposed activity may impact on the safe navigation of commercial shipping in Australian waters. The EMBA for this EP intersects with shipping routes (Section 4.18.4). Therefore, the activities under the EP may be relevant to the AMSA.
Department of Agriculture, Fisheries and Forestry (DAFF)	As identified in NOPSEMA's consultation guideline (Ref 267) 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 EMBA (Section 4.18.1). Therefore, the activities under the EP may be relevant to DAFF.
Director of National Parks (DNP)	As identified in NOPSEMA's consultation guideline (Ref. 267) 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 • an environmental incident occurs in Commonwealth waters surrounding an AMP and may impact on the values within the park. The EMBA for this EP intersects with AMPs (Section 4.19.1). 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. 267) DCCEEW is a relevant agency for consultation where an activity has the potential to directly or indirectly adversely impact on protected UCH. The EMBA for this EP overlaps with UCH sites (shipwrecks) (Section 4.20.2). Therefore, the activities under the EP may be relevant to the DCCEEW.

Relevant person	Rationale
Department of Defence (DoD)	As identified in NOPSEMA's consultation guideline (Ref. 267) 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 do intersect with the EMBA (Section 4.18.6). Therefore, the activities under the EP may be relevant to the DoD.
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 EMBA for this EP intersects with State terrestrial and marine protected areas (Sections 4.19.2 and 4.19.3). 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. 274), 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 EMBA (Sections 4.18.1 and 4.18.2). Therefore, the activities under the EP may be relevant to DPIRD.
Department of Transport (DoT) - Maritime Environmental Emergency Response (MEER) - Marine Pollution	DoT (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. 275). While the unplanned hydrocarbon release events identified for this EP will occur in Commonwealth waters, some areas of State waters may be exposed (Section 7.15). Therefore, the activities under the EP may be relevant to DoT.
Department of Water and Environment (DWER)	DWER supports Western Australia'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.
Gascoyne Development Commission (GDC)	The GDC is a Western Australian Government statutory authority dedicated to the economic and social development of the Gascoyne region. The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, within the Pilbara and Gascoyne regions. Therefore, the activities under the EP may be relevant to the GDC under regulation 25(1)(a) of the OPGGS(E)R..
Pilbara Development Commission (PDC)	The PDC is a Western Australian Government statutory authority dedicated to the economic and social development of the Pilbara Region. The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, within the Pilbara and Gascoyne regions. Therefore, the activities under the EP may be relevant to the PDC under regulation 25(1)(a) of the OPGGS(E)R..

Relevant person	Rationale
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 Western Australia's Minister of Ports. The activity occurs within Commonwealth and State waters, requires vessels and ports for use. Therefore, the activities under the EP may be relevant to the Pilbara Ports Authority.
Tourism Western Australia	The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, within the Pilbara and Gascoyne regions. Therefore, the activities under the EP may be relevant to Tourism Western Australia under regulation 25(1)(a) of the OPGGS(E)R..
Department of the responsible State Minister (regulation 25(1)(b))	
Department of Energy, Mines, Industry, Regulation and Safety (DEMIRS)	DEMIRS is the department of the responsible State Minister. Therefore, they are considered a relevant person as per Regulation 25(1)(b) 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	
Baiyungu Aboriginal Corporation (BAC) Baiyungu people	Baiyungu Country extends from Point Cloates (north of Carnarvon) along the coast to Point Quobba, then stretches east to Manberry Station and north to Winning Pool Station. A major area of significance is Coral Bay and neighbouring Cardabia Station (a pastoral station run by BAC and the Baiyungu people). The EMBA does not directly intersect with this area of coast, however the EMBA does extend into the offshore waters of the Gascoyne. No Native Title determination currently exists within the EMBA and this representative body have not been identified in an AMP Management Plan. However, given that the EMBA occurs offshore from the Gascoyne coast, and engagement with BAC identified that Sea Country is of recognised value to the Baiyungu people, the activities under the EP may therefore be relevant to this organisation and the Baiyungu people. Note: CAPL has also consulted NTGAC who also represents the Baiyungu people for Natite Title rights and interests. BAC have advised CAPL to undertake EP engagement with them via NTGAC.
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 EMBA does not directly intersect with this area of coast, however the EMBA does extend into the offshore waters of the Pilbara. No Native Title determination currently exists within the EMBA and this group have not been identified in an AMP Management Plan. However, given that the EMBA occurs offshore from the Pilbara coast, and engagement with BTAC

Relevant person	Rationale
	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 Natite Title rights and interests.
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	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 EMBA intersects with part of this area of coast, and the EMBA also extends into the offshore waters of the Pilbara and Gascoyne. Native Title determination WCD2019/016 intersects with the EMBA (Section 4.20.3.1). The Baiyungu, Thalanyji and Yinggarda People were also identified within the North-west Marine Parks Network Management Plan (Ref. 251) as having responsibilities for Sea Country in the Commonwealth Gascoyne Marine Park (Section 4.19.1). Therefore, the activities under the EP may be relevant to this RNTBC and the Baiyungu, Thalanyji and Yinggarda people.
Baiyungu people	
Thalanyji people	
Yinggarda people	
Mardathoonera Cultural Heritage Pty Ltd (MCH)	The Mardathoonera people are a Pilbara language group, and engagement with the MCH identified that Barrow Island was culturally significant. Given that Barrow Island is within the EMBA (and within ~5.5 km to the OA) for this EP, CAPL considers that MCH 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.
Wirrawandi Aboriginal Corporation (WAC)	The WAC was registered in 2018 to hold and manage the native title rights and interests for the Mardudhunera and Yaburara people. Mardudhunera and Yaburara Country is in the Pilbara region (approximately between Maitland and Robe rivers). The 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) intersects with the EMBA (Section 4.20.3). Therefore, the activities under the EP may be relevant to this RNTBC and the Mardudhunera and Yaburara people.
Mardudhunera people	
Yaburara people	
Commercial fishery licence holders and/or representative bodies	
Aquaculture Council of Western Australia	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 EMBA (Section 4.18.1). As such, these organisations have functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Commonwealth Fisheries Association	
Tuna Australia	
Western Australian Fishing Industry Council (WAFIC)	
Tourism and recreation operators	

Relevant person	Rationale
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 EMBA (Section 4.18). 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 EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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.
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 EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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.
Ashburton Anglers	Ashburton Anglers are a local fishing club. The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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.
Apache Fishing Charters	Recreational fisheries, tourism and recreational activities have been identified as occurring within or adjacent to the EMBA (Section 4.18). As such, these businesses may have functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Aquatic Adventure Exmouth	
Archipelago Adventures	
Blue Horizon Charters	
Blue Juice Charters	
Blue Lightning Fishing Charters	
Bluesun 2 Boat Charters	
Cape Immersion Tours	
Exmouth Adventure Co	
Exmouth Dive and Whalesharks Ningaloo	
Exmouth Dive Centre	
Exmouth Fly Fishing	

Relevant person	Rationale
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 Visitor Centre	
Ningaloo Whaleshark n Dive	
Ningaloo Whaleshark Swim	
Ocean Eco Adventures	

Relevant person	Rationale
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 EMBA for this EP intersects with the small areas of coast (Section 4.17.5.1). Therefore, local governments may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Shire of Exmouth	
WA World Heritage advisory committees	
Ningaloo Coast World Heritage Advisory Committee (NCWHAC)	The NCWHAC provides advice to the Commonwealth and State Environment Ministers on the protection, conservation and management specific to Ningaloo Coast World Heritage Area. The EMBA for this EP does intersect with Ningaloo Coast World and National heritage areas (Section 4.20). Therefore, NCWHAC 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 EMBA (Section 4.18.6). 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	

Relevant person	Rationale
Kufpec	
Santos	
Telstra	
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 EMBA (Section 4). Therefore, NGOs 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 at Rankin Bank. The EMBA for this EP overlaps Rankin Bank (Section 4.17.1). Therefore, AIMS may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Care for Hedland Environmental Association	A representative from the Care for Hedland Environmental Association contacted CAPL via the Online Consultation Hub to self-identify for consultation. Care for Hedland 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 the EMBA is >200 km from Port Hedland, and any direct interaction with Port Hedland is not predicted to occur 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 (Ref. 118), 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, The EMBA for this EP intersects Commonwealth and State waters offshore of the Pilbara and Gascoyne regions. Therefore, ECCI 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 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.

Relevant person	Rationale
Telstra	Telstra 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.
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	
Australian Council of Prawn Fisheries	Australian Council of Prawn Fisheries is made up of industry bodies and companies that deal with wild prawns or the prawn industry. Commercial prawn fisheries operate outside the boundary of EMBA, however under regulation 25(1)(e) CAPL selected to include the council in consultation.
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 EMBA, however under regulation 25(1)(e) CAPL selected to include the council in consultation.
Western Rock Lobster Council	Western Rock Lobster (WRL) is the peak industry body representing the interests of the western rock lobster fishery. The WRL fishery operates outside the boundary of EMBA, however under regulation 25(1)(e) CAPL selected to include the WRL Council in consultation.
Tourism and recreation operators	
Karratha Tourism and Visitor Centre	The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Local government departments or agencies	
Carnarvon Chamber of Commerce	The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Shire of Carnarvon	
Other	
Exmouth Gulf Task Force	The Exmouth Gulf Taskforce provides high level advice to the Minister for Environment on the environmental management of the Exmouth Gulf and its surrounds, to help preserve the region's unique environmental, cultural and social values. The EMBA for this EP intersects Commonwealth and State waters around Exmouth, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.

Relevant person	Rationale
Gascoyne Junction Community Resource Centre	The EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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	
WA Marine Science Institute	The Western Australian Marine Science Institution (WAMSI) 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 EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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 EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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 EMBA for this EP intersects Commonwealth and State waters offshore, and some small areas of coast, 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 EMBA for this EP 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 (IFAW)	
Greenpeace	
Conservation Council of Western Australia	
Australian Conservation Foundation	

6.3.7 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 d. 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.

6.3.8 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 d. The consultation summary also describes what (if any) changes to the EP, including control measures, were made in response to each objection or claim.

6.3.9 Conclusion on consultation

The objective of consultation, which is referred to above in Section 6.15, 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."[22]

As stated above in Section 6.15, 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[23].

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 Tipakalipp*a "[*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*."[24]

Regulation 33(1)(a) of the OPGGS(E)R requires that if NOPSEMA is reasonably satisfied that the EP meets the EP acceptance criteria 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[25].

Colvin J in *Cooper v National Offshore Petroleum and Safety Management Authority (No 2)* stated that:

> *The term 'reasonably satisfied' must contemplate an evaluative judgment being formed by NOPSEMA as to whether each of the criteria has been met. They include whether the required consultation has been undertaken. Hence, there is a statutory duty imposed upon NOPSEMA to form a judgment as to whether or not the criteria have been met to its reasonable satisfaction. If an*

[22] Paragraph 89 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[23] Paragraphs 55–57 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[24] Paragraph 136 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

[25] Paragraphs 31 and 32 of *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Ref. 167).

affirmative judgment to that effect is formed by NOPSEMA then the plan must be accepted.

CAPL has undertaken the consultation process as described in Section 6, 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 information (Section 6.16.4) and a reasonable period of time (Section 6.16.5) 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 4) to include values and sensitivities raised by relevant persons
- updated its impact and risk assessment (Section 7) 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 appropriate 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 d 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. Through this process CAPL has identified two relevant persons.
- it has been over seven months since consultation on this EP commenced on 15 July 2024, 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, including, as outlined in Section 6.16.4
- CAPL has attended face-to-face meetings with First Nations representative bodies while consulting on this EP (as outlined in appendix d), and provided tailored and bespoke consultation material for consideration

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 8.17.4.1).

Based on the above, CAPL has discharged its duty under regulation 25. CAPL considers that consultation under regulation 25 is complete, and that NOPSEMA can be reasonably satisfied that it an accept the EP.

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 d 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).

7 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 that are used to reduce the risks to ALARP and to an acceptable level, and identifies the associated environmental performance outcomes, performance standards, and measurement criteria, as required under Regulations 21(5), 21(6) and 21(7) of the OPGGS(E)R.

Table 7-1 summarises the impacts and risks that were identified and evaluated for this activity.

Table 7-1: Summary of impact and risk evaluation

Section	Aspect	Impact	Risk			Decision context	ALARP	Acceptable
		C^	C^	L	R			
7.1	Physical presence—Other marine users	–	6	4	9	A	Yes	Yes
7.2	Physical presence—Marine fauna	–	6	3	8	A	Yes	Yes
7.3	Seabed disturbance	5	5	6	10	A	Yes	Yes
7.4	Air emissions	6	–	–	–	A	Yes	Yes
7.5	Greenhouse gas emissions	6	–	–	–	A	Yes	Yes
7.6	Light emissions	6	5	5	9	A	Yes	Yes
7.7	Underwater sound—Non impulsive	5	5	3	7	B	Yes	Yes
7.8	Underwater sound—Impulsive	6	6	4	9	A	Yes	Yes
7.9	Planned discharges—Surface	6	6	5	9	A	Yes	Yes
7.10	Planned discharges—Subsea	6	6	6	10	A	Yes	Yes
7.11	Electromagnetic emissions	–	6	4	9	A	Yes	Yes
7.12	Invasive marine pests	-	2	6	7	A	Yes	Yes
7.13	Unplanned seabed disturbance	–	6	4	9	A	Yes	Yes
7.14	Unplanned release—Waste	–	6	5	10	A	Yes	Yes
7.15	Unplanned release—Minor loss of containment	–	5	5	9	A	Yes	Yes
7.17	Unplanned release—Vessel collision event	–	4	5	8	A	Yes	Yes
7.18	Unplanned release—Hydrocarbon system	–	5	5	9	A	Yes	Yes
7.19.4.1	Ground disturbance—shoreline spill response	–	5	5	9	A	Yes	Yes

Section	Aspect	Impact	Risk			Decision context	ALARP	Acceptable
		C^	C^	L	R			
7.19.4.2	Physical presence—oiled wildlife response	–	5	5	9	A	Yes	Yes
7.20	Intangible cultural heritage	–	5	3	7	B	Yes	Yes

C = consequence, L = likelihood, R = risk

^ Where an aspect is identified as having both potential impacts and risks, the highest-level consequence was evaluated in detail to ensure that justification is provided to support the highest consequence level for that aspect.

7.1 Physical presence—Other marine users

Source

Activities identified as having the potential to result in an interaction with other marine users are:

- permanent presence of the subsea hydrocarbon system within the OA
- permanent presence of FCS (at the surface) and the associated mooring system and MV umbilicals within the OA
- temporary presence of vessels within the OA during IMR activities
- temporary presence of vessels with the OA during SCSt initial start-up and commissioning
- temporary presence of vessels associated with temporary power supply if required.

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	Unplanned interactions with other marine uses may result in:	
		• disruption to commercial shipping and fishing vessels	6
		• entanglement of trawl fishing gear on subsea infrastructure	6

Consequence evaluation

The physical presence of subsea and surface infrastructure associated with this petroleum activity is contained wholly within the OA. Support vessels undertaking IMR activities will also be present within the OA but only have a temporary presence. Vessel operations may occur for periods of ~10–200 days for inspections, maintenance and repairs (Section 3.19.3). In the event that subsea batteries are required, IMR vessels will be used every 2-4 weeks to retrieve, test, re-charge and re-deploy the subsea battery system. Commissioning and initial start-up of the SCSt will be undertaken over a combined period of up to ~200 days and will require a support vessel to be present at the surface over the SCSt during this period. The potential for unplanned interactions between other marine users and subsea structures may occur where these users interact with either the seafloor or water column where these structures exist. While most of the infrastructure has been or will be installed on the seafloor, the floating FCS will have mooring lines and MV umbilicals extending from the upper water column to the seafloor.

Marine users that have the potential to interact with the seafloor have been identified as commercial fisheries that utilise trawling or trap fishing methods. Marine users that have the potential to interact with the water column have been identified as commercial fisheries that use line fishing methods. The potential risks to fishing vessels from subsea infrastructure includes disruption to fishing efforts caused by the need for vessels to avoid the infrastructure, or physical damage (via entanglement) to fishing gear that contacts the infrastructure.

Of the commercial fisheries identified in Section 4.18.1 that have fishery management areas that intersect with the OA and reflect recent fishing effort recorded within the OA, one uses trawl, two use trap, and two use line fishing methods.

Source
The WA Mackerel Managed Fishery and Pilbara Line Fishery both use line fishing methods. The spatial extent of potential interaction for these fisheries is limited to within the vicinity of the FCS and its mooring system and MV umbilicals (in ~1,290 m water depth). However, the main species targeted within these fisheries (e.g. Bluespotted Emperor, Red Emperor, Rankin Cod, Ruby Snapper, and Spanish Mackerel) are typically found in water depths of <500 m (Ref. 284). Although State fisheries are present, the level of fishing effort within the OA is typically low with less than three vessels recorded in the fisheries per year between 2014-2023 (Ref. 239). Fishing effort within the vicinity of the FCS has not been active since 2016 (Ref. 239). As such, negligible interaction between these fisheries and the presence of the FCS mooring system is expected to occur this has not been evaluated further. The OA overlaps with 1.12% of the total fishery management area for the Commonwealth North-West Slope Trawl Fishery. The entire fishery has a small number of active permits and vessels (e.g. seven permits with three vessels active during the 2022-2023 season [Ref. 236]). The fishery also does not regularly record fishing effort within the OA (e.g. only one year [2020] out of the 2017-2024 period recorded fishing effort within a single [one block per year] 60 nm graticular reporting block that intersected with the OA (Section 4.18.1.1). The WA Pilbara Trap Managed Fishery and Pilbara Crab Managed Fishery also intersect with the OA. The Pilbara Crab Managed Fishery does not regularly record fishing effort within the OA (e.g. only one year [2016] out of the 2014–2023 period recorded fishing effort within a single 60 nm graticular reporting block that intersected with the OA. Recorded fishing effort for the Pilbara Trap Managed Fishery is also low with ≤3 vessels present within the 60 nm fishery grid blocks that intersect with the OA (Section 4.18.1.2). Subsea infrastructure associated with the Gorgon Project has been in place within the OA since 2012, and to date, no incidences of commercial fishing activities interacting with the infrastructure have 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). Any deviation required by fishing vessels around the subsea structures is not expected to impact on the functions, interests, or activities of commercial fisheries. The stationary presence of the FCS and the use of vessels during the petroleum activity also has the potential to result in a disruption to other marine users, including commercial shipping or fishing vessels. As identified in Section 4.18.1, there are five vessel-based commercial fisheries that have recent fishing effort that overlaps with the OA. Fishing effort records obtained from DPIRD (Ref. 285) for the four State-managed commercial fisheries indicated that fishing effort within the OA varies each year, but is typically low with <3 vessels recorded as present within the graticular reporting blocks that intersect the OA (Ref. 285). As noted above, fishing activity within the OA associated for the Commonwealth-managed fishery is also low. Commercial vessel traffic density within and around most of the OA is relatively low, and while part of the OA intersects one of AMSA's north-west coast shipping fairways (Figure 4-26), the FCS is >5 km northwest of this shipping fairway. Therefore, the presence of vessels or the FCS within the OA is not expected to significantly affect commercial fishing or shipping operations. Any deviation required by these vessels is not expected to impact on their respective functions, interests, or activities. In summary, the physical presence of the hydrocarbon system, consisting of the subsea infrastructure, FCS, or vessels is not expected to cause significant impacts to other marine users, and the risks are considered to have limited potential consequences. Therefore, CAPL has ranked the potential consequence to other marine users from physical presence as Incidental (6).
ALARP decision context justification
The operation of subsea and floating infrastructure and vessels are commonplace and well-practised 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. No objections or claims were raised during relevant persons consultation. The risks arising from the physical presence of subsea infrastructure, the FCS and support vessels to other marine users are considered lower-order risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures and source

Control measure	Source

Source		
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*, 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 for vessel-based activities as required; thus, enabling other marine users to also safely plan their activities.	
Marine Standard	Chevron's *Marine Standard Non-Tankers: Corporate OE Standard* (Ref. 35) ensures that various legislative and Chevron requirements and activities necessary for safe, reliable, and efficient marine services are met. These requirements include ensuring that crew meet the minimum competency requirements for safely operating a vessel.	
Vessel lights and signals	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.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of vessel activities within the scope of this EP, the slow-moving nature of vessels within the OA, and the limited area of operation, the likelihood of interaction with other marine users is considered low. Interaction with subsea infrastructure is expected to be limited based upon operating experience over the past five years. Equally, given its location, and minimal intersection with other marine users, interaction between marine users and the FCS is expected to be minimal. As such, CAPL consider that the likelihood of the consequence occurring is Unlikely (4).	
Risk level	Very low (9)	
Determination of acceptability		
Principles of ESD	The risks associated with this aspect are associated with unplanned interactions causing incidental disruption to other marine users, which is not considered as having the potential to affect biological diversity and ecological integrity. The consequence associated with this aspect is Incidental (6). Therefore, no further evaluation against the Principles of ESD is required.	
Relevant environmental legislation and other requirements	Legislation and other requirements considered relevant for this aspect include: • Commonwealth *Navigation Act 2012*. CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.	
	Requirement	**Demonstration**

Source		
	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 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 CAPL management processes or procedures were deemed relevant for this aspect: • *Marine Standard Non-Tankers: Corporate OE Standard* (Ref. 35) 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, AMSA raised claims relating to notice to mariners, JRCC and COLREGS requirements which are covered by the control measures **maritime safety information** and **vessel lights and signals**.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
Other marine users are aware of the petroleum activity	**Maritime safety information** Where required notify relevant agency of activities, vessel movements, and requested safety exclusion zone, to enable them to generate radio-navigation warnings and/or Notice to Mariners prior to commencing offshore activities	Records of lodgement of notification to relevant agency where required
	Marine Standard Vessel crew will meet the minimum competency requirements as per the Chevron Marine Standard	Records indicate that vessel crews meet the minimum competency requirements of the Chevron Marine Standard
	Vessel lights and signals In accordance with regulatory requirements, vessels will implement light and signals appropriate to the nature of their operations	Records indicate that vessel lights and signals were consistent with the requirements of COLREGS and the *Navigation Act 2012 (Cth)* during the petroleum activity

7.2 Physical presence—Marine fauna

Source

Activities identified as having the potential to result in an interaction with marine fauna are:

- temporary presence of vessels within the OA during IMR activities
- temporary presence of vessels with the OA during SCSt initial start-up and commissioning
- temporary presence of vessels associated with temporary power supply if required.

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	Unplanned interactions with marine fauna may result in: • injury or death of marine fauna	6

Consequence evaluation

Injury or death of marine fauna

Surface-dwelling fauna are most at risk from this aspect and thus are the focus of this evaluation. As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs or habitat critical to the survival of a species also overlap with the OA, including:

- humpback whale (migration BIA)
- pygmy blue whale (migration BIA)
- flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA and i habitat critical to the survival of a species)
- whale shark (foraging BIA).

A review of the documents made or implemented under the EPBC Act for all threatened and/or migratory cetacean, shark, and turtle species that may be present within the OA (i.e. fin whale (Ref. 67), sei whale (Ref. 68), blue whale (Ref. 95), whale sharks (Ref. 126), and flatback, green, and hawksbill turtles (Ref. 118),) indicates that either vessel disturbance or interaction (such as collisions) are a key threat to the recovery of the species.

For cetacean species that may be present within the OA, these documents indicate that management actions are limited to reporting of incidents via the national database (refer to incident reporting requirements in Section 8.18.2) and ensuring that the risk of vessel strike is assessed (see the text below).

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 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. 107).

The *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 95) 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. Laist et al. (Ref. 108) 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. Laist et al. (Ref. 108) showed that high speed vessels travelling >14 knots, were involved in 15% of the 40 accounts of ship strikes reported worldwide. Given that vessels will be stationary or slow moving (<5 knots) whilst undertaking the activities within the OA (e.g. SCSt commissioning and start-up and IMR), any interaction with marine fauna would not be expected to cause severe injuries.

Vessel disturbance and strike is listed as a known current and future threat for the humpback whales (Ref. 306). Humpback whales are one of the most frequently reported whale species involved in vessel strikes worldwide (Ref. 108).

The OA overlaps with the migration BIA for humpback whales, and as such, there is the potential for whales to be present within this area during the predicted migration periods (July to September). IMR activities may be undertaken at any time of year and therefore there is the potential for overlap with the predicted migration periods. Studies (Ref. 84) suggest that

Source
northbound humpback whales tend to travel around the 200 m water depth contour, while southbound humpback whales tend to travel closer to Barrow Island and generally occur between 50 m and 200 m water depths. The OA also overlaps with the migration BIA for pygmy blue whales. Depending on specific vessel activity timing, associated with IMR, there is the potential for overlaps with the predicted migration periods. However, it is expected based on satellite tracking and acoustic detection studies that pygmy blue whales are likely to travel predominantly to the north-west of the OA in deeper waters, particularly on their southern migration (November to December), but also during the northern migration (May to June) (Section 4.17.3.1.2). There have been few recorded instances of cetacean deaths in Australian waters. Mackay et al. (Ref. 307) 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. 162) was also recorded, noting this data indicates deaths are more likely to be associated with container ships and fast ferries. The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) 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. The OA within this EP occurs in Commonwealth waters (at its shallowest the OA is ~25 m water depth, and ~5.5 km from nearest coast), but is not within an area of high vessel usage or large coastal (e.g. ports) developments. The Recovery Plan (Ref. 118) defines the internesting habitat critical to the survival of a species as a distance seaward from nesting habitat critical to the survival of a species as 60 km for flatback turtles and 20 km for green and hawksbill turtles (Ref. 118). Recent studies (Ref. 119) have indicated that the internesting behaviour of flatback turtles on the NWS appears more spatially restricted than that suggested by the Recovery Plan (Ref. 118). Whittock et. al. (Ref. 119) reported that flatback turtles preference habitats within proximity of the coast and at relatively shallow depths during the internesting periods. Unsuitable flatback Turtle internesting habitat was defined as waters >25 m deep and >27 km from the coast (Ref. 119). This suggests that although the OA does overlap with some internesting habitat critical for the survival of flatback turtles, due to the OA being located offshore in water depths ranging between ~25–1,435 m, and given that flatback turtle nesting occurs on the east coast beaches of Barrow Island (Ref. 156) (i.e. opposite side of the island to the OA), the OA is not likely to provide preferred internesting habitat for this species. 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 (Ref. 120) and within shallow coastal waters (Ref. 120). Both green and hawksbill turtles are known to nest on the west coast of Barrow Island (Ref. 156). Given the depth and distance of the OA (>25 m water depth, and >5.5 km from Barrow Island), the majority of the OA is not likely to provide preferred internesting habitats for these species. A review of the documents made or implemented under the EPBC Act for whale sharks indicate 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. Whale sharks are known to spend considerable time close to the surface, thereby increasing their vulnerability to vessel strike. Whale sharks tagged off WA (Ref. 284; Ref. 285) spent ~25% of their time <2 m from the surface and >40% of their time in the upper 15 m of the water column, making them vulnerable to collisions with smaller vessels as well as larger commercial vessels that have drafts greater than 20 m below the surface. Although the OA overlaps the whale shark foraging BIA, vessels will be stationary or slow-moving (<5 knots) whilst implementing the activities within the scope of this EP. Dugongs occur throughout the shallow waters between the Pilbara offshore islands and the mainland and are generally associated with seagrass meadows (Ref. 308). Dugongs are known to occur around the islands of the Rowley Shelf such as Barrow Island, the Lowendal Islands and the Montebello Islands (Ref. 308); however, dugong populations are known to be greater in Exmouth Gulf or Shark Bay than around the offshore islands (Ref. 308, Ref. 309, Ref. 310). There are no known major seagrass meadows along the west coast of Barrow Island (Ref. 71) that are likely to be critical feeding habitats for dugongs and therefore any presence within the OA is expected to be intermittent and transitory. Studies in Queensland showed that dugongs spend around 47% of their time within ~1.5 m of the surface including ~3.5% resting at the surface (Ref. 311). As such,

Source		
similarly to whale sharks, this high proportion of time within surface waters makes dugongs vulnerable to vessel strikes. In addition, there is evidence to suggest that dugongs fail to flee or evade the approach of fast moving vessels until an interaction is unavoidable (Ref. 312, Ref. 313). Collision with vessels has been identified as a pressure 'of potential concern' within the NWMR, however it is noted that this risk is greatest in shallow nearshore waters and vessels operating at higher speeds (Ref. 314). The threatened short-nosed sea snake or leaf-scaled sea snake are not expected to be present within the OA given known habitat preferences for shallow water and reef habitat; vessel strike has also not been identified as a threat for either species (Ref. 115, Ref. 116). Other EPBC marine listed sea snake species may occur in broader habitats within the NWMR, and collision with vessels has been identified as a pressure 'of less concern' Vessels within the OA will be stationary or slow-moving (<5 knots) whilst implementing the activities within the scope of this EP. Consequently, incidences of fauna strike are not expected considering the slow vessel speeds, generally low number of vessels within the OA at any time, and that incidents have been demonstrated to be very rare. Nevertheless, if a fauna strike occurred and resulted in death, it is not expected to have a detrimental effect on the overall population and would result in a limited environmental impact (individual impacts); thus, fauna strike is evaluated as having the potential to result in an Incidental (6) consequence.		
ALARP decision context justification		
Offshore commercial 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 stakeholder consultation, no specific objections or claims were raised regarding interaction with marine fauna arising from the activity. The risks arising from the physical presence of vessels are considered lower-order risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.		
Good practice control measures and source		
Control measure	**Source**	
EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans	The requirements to manage interactions between vessels and cetaceans are detailed in the EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans. These regulations describe strategies to ensure cetaceans are not harmed during offshore interactions with people.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
Schedule all IMR outside of peak periods of seasonal presence of EPBC listed threatened and/or migratory species	By altering the timing of IMR to avoid the predicted seasonal presence of protected marine fauna within the OA, it may consequently reduce the likelihood (and residual risk) of auditory impairment or injuries occurring. However, as shown in Table 4-14, activities during any month of the year will result in the overlap of some protected marine fauna seasonal presence, and therefore avoidance of all seasonal sensitivities is not possible.	N/A
IMR activity schedule—Adjust to avoid turtle nesting period	Green turtles, flatback turtles, and to a lesser extent, hawksbill turtles, nest at Barrow Island (Ref. 156). The predicted peak nesting periods on Barrow Island	The cost of implementing temporal schedule restrictions is considered grossly disproportionate to the negligible environmental benefit (and no change in residual risk) they

Source		
	are December to February, November to January, and October for green, flatback, and hawksbill turtles respectively (Table 4-14). Green and hawksbill turtles nest on the west coast of Barrow Island, while flatback turtles nest on the east coast (Ref. 156). While part of the OA overlaps with internesting buffer BIAs and internesting habitat critical to the survival of a species for the flatback, green and hawksbill turtles, it is considered that internesting behaviour is likely to occur closer to shore and in shallower water depths than those within the OA (Sections 4.17.3.2.1 and 4.17.3.2.3). Scheduling the IMR activities to completely avoid the predicted peak turtle nesting season on Barrow Island would result in the petroleum activity coinciding with predicted peak periods for other marine fauna (e.g. migration for cetaceans, fledging of seabirds) (Table 4-14). Given the low frequency of IMR activities within the OA (and particularly within the OA nearest to Barrow Island), and preferred types of internesting habitats for marine turtles being located outside of the OA, any change to the approximate activity schedule (Section 3.15.2) is not expected to result in a reduction of residual risk level.	may provide for marine turtles. Therefore, control measure has not been adopted for use.
Separation distances—whale sharks	The schedule for IMR vessel operations within the OA may overlap with the predicted use of the foraging BIA for whale sharks (July to November) (Table 4-14). As such, transient whale sharks may be present within the OA. The implementation of separation distances (30 m between a vessel and a whale shark)[26] and speed limits between vessels and whale sharks would decrease the risk of adverse physical interactions.	The detection of whale sharks within the vicinity of vessel operations may lead to increased survey duration and overall costs. However, the benefit of reducing impacts to whale sharks is considered to outweigh the financial costs from not implementing this control. Therefore, control measure has been adopted for use.
Separation distances—marine turtles	The schedule for IMR vessel operations within the OA may coincide with the nesting and internesting periods of marine turtles on the NWS. In particular the temporal overlap occurs during the predicted peak nesting periods for flatback turtles (November to	The detection of marine turtles within the vicinity of vessel operations may lead to increased survey duration and overall costs. However, the benefit of reducing impacts to marine turtles is considered to outweigh the financial

[26] The separation distance for Whale Sharks has been selected to be consistent with requirements within the Biodiversity Conservation Regulations 2018 (WA).

Source		
	January), green turtles (December to February), and hawksbill turtles (October) on Barrow Island (Table 4-14). While part of the OA does overlap with internesting buffer BIAs and internesting habitat critical to the survival of a species for the flatback, green and hawksbill turtles, it is considered that internesting behaviour is likely to occur closer to shore and in shallower water depths than those within the OA (Section 4.17.3.2.1, Section 4.17.3.2 and Section 4.17.3.2.3). However, if marine turtles did occur within the OA, the use of separation distances (30 m between a vessel and a marine turtle) and vessel speed limits would decrease the risk of adverse physical interactions.	costs from not implementing this control. Therefore, control measure has been adopted for use.
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of vessel activities within the scope of this EP, the slow-moving nature of vessels within the OA, and the limited area of operation, the likelihood of a vessel collision with marine fauna is considered low. Based upon previous experience in the OA, CAPL consider that the likelihood of the consequence occurring is Seldom (3).	
Risk level	Low (8)	
Determination of acceptability		
Principles of ESD	The risks associated with this aspect are associated with unplanned interactions causing individual fauna injury or mortality, which is not considered as having the potential to affect biological diversity and ecological integrity. The consequence associated with this aspect is Incidental (6). Therefore, no further evaluation against the Principles of ESD is required.	

Relevant environmental legislation and other requirements	Legislation and other requirements considered relevant for this aspect include:
	• EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans
	• *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 95)
	  • *Conservation Advice Balaenoptera borealis Sei Whale* (Ref. 68)
	  • *Conservation Advice Balaenoptera physalus Fin Whale* (Ref. 67)
	  • *National Recovery Plan for the Southern Right Whale (Eubalaena australis)* (Ref. 224
	• *Recovery Plan for Marine Turtles in Australia* (Ref. 118)
	• *Conservation Advice for the Whale Shark 2015–2020* (Ref. 126)
	• Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) (Ref. 115)
	• *Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref. 116)
	  • *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna* (Ref. 312).	

Source		
	CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.	
	Requirement	**Demonstration**
	EPBC Regulations 2000 – 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 interacting with cetaceans has been incorporated into the **EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans** 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 is included in Section 8.18.2. This section 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 borealis Sei Whale Conservation action: Ensure all vessel strike incidents are reported in the National Vessel Strike Database	Requirements to report vessel strike incidents is included in Section 8.18.2. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Balaenoptera borealis Sei Whale.*
	Conservation Advice Balaenoptera physalus Fin Whale Conservation action: Ensure all vessel strike incidents are reported in the National Vessel Strike Database	Requirements to report vessel strike incidents is included in Section 8.18.2. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Balaenoptera physalus Fin Whale.*
	National Recovery Plan for the Southern Right Whale (Eubalaena australis) Management action A.6.5: Ensure all vessel strike incidents are reported in the National Ship Strike Database	Requirements to report vessel strike incidents is included in Section 8.18.2. Therefore, this activity is not considered to be inconsistent with the *National Recovery Plan for the Southern Right Whale (Eubalaena australis)*.
	Conservation Advice Rhincodon typus Whale Shark Conservation action: Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate	The OA is outside of whale shark aggregation areas (i.e. Ningaloo Reef, Christmas Island and the Coral Sea). Vessels associated with this petroleum activity will be IMR

Source		
	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	vessels travelling that will either stationary or low speed (>5 knots) in the OA. Based on both environmental and economic considerations, vessel activities are minimised to the smallest practicable extent. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Rhincodon typus Whale Shark.*
	Recovery Plan for Marine Turtles in Australia No specific management action identified.	N/A
	Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A
	National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna No specific action identified.	N/A
Internal context	No CAPL environmental performance standards or procedures were deemed relevant for this aspect.	
External context	During stakeholder consultation, no objections or claims were raised regarding interaction with marine fauna arising from the activity.	
Defined acceptable level	These risks are inherently acceptable as they are considered lower-order risks in accordance with 5.17. In addition, the potential risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan. However, in alignment with Section 5.20.2, given that vessel strike is listed as a threat to protected matters under documents made or implemented under the EPBC Act, CAPL has defined an acceptable level of impact such that it is not inconsistent with these documents. Objectives of the relevant documents are shown below:	
	Plan	**Objective**
	Conservation Management Plan for the Blue Whale 2015–2025	Recovery objective: 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 objective 4 Anthropogenic threats are demonstrably minimised.
	Recovery Plan for Marine Turtles in Australia	Recovery objective: The long-term recovery objective for marine turtles is to minimise anthropogenic threats to allow for the conservation status

Source		
		of marine turtles to improve so that they can be removed from the EPBC Act threatened species list. Interim objective 3: Anthropogenic threats are demonstrably minimised.
	North-west Marine Parks Network Management Plan 2018	As per Section 4.19.1.
	Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents: • impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species • no adverse change to the values of the Montebello Marine Park. CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the risk to values of the AMP are also subsequently managed to this acceptable level.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No injury or mortality to marine fauna within the OA from petroleum activities No adverse change to the values of Australian Marine Parks from the petroleum activity	**Marine fauna caution, approach and separation distances** Vessels will implement caution and no approach zones, where practicable: • caution zone (300 m either side of whales; 15 m either side of dolphins)–vessels must operate at ≤ 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; 100 m[27] 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 • a separation distance of 30 m from whale sharks and marine turtles, and 100 m from dugongs–vessels must operate at ≤6 knots when moving away to maintain these separation distances Helicopters will:	Induction materials include relevant marine fauna caution and no approach zone requirements Training records confirm offshore personnel involved in IMR activities have completed the induction Vessel records show if marine fauna interaction occurred within caution or approach zones, and what mitigation (e.g. divert or slow vessel) measure was implemented Helicopter records show if marine fauna interaction occurred, a mitigation measure was implemented

[27] The EPBC Regulations 2000 (Cth) require a 150 m separation distance from dolphins however CAPL has adopted a separation distance of 100 m based on the Biodiversity Conservation Regulations 2018 (WA).

Source		
	• not operate at a height lower than 1,650 feet or within a horizontal radius of 500 m for a cetacean (unless during take-off, landing or for safety reasons) • not approach a cetacean from head on • maintain a separation distance of 500 m for whale sharks, dugongs, and marine turtles	

7.3 Seabed disturbance

Source

Activities identified as having the potential to result in seabed disturbance are:

- IMR—as required (e.g. removal of sediment for inspections, span rectification, repairs etc.)
- field support—contingency anchoring by vessels, wet parking of equipment within the OA

Potential impacts and risks

Impacts	C	Risks	C
Seabed disturbance may result in: • localised and temporary reduction in water quality • alteration of benthic communities and habitats	6 5	Seabed disturbance may result in: • changes to tangible cultural heritage values	5

Consequence evaluation

Localised and temporary reduction in water quality

A reduction in water quality is expected to occur when sediment on the seabed is disturbed and becomes suspended in the water column when infrastructure or equipment, associated with IMR activities, is placed on the seabed. After the activities are completed, sediments will settle back to the seabed and water quality will return to background levels.

Both the Gorgon and Wheatstone projects have previously undertaken trenching and rock placement along parts of the Wheatstone Trunkline and the Gorgon and Jansz Feed Gas pipelines. Turbidity monitoring programs implemented during construction activities indicated plumes were highly localised and resulted in only short-term exposures (Ref. 315, Ref. 316, Ref. 317). In particular, turbidity monitoring during trenching for the Wheatstone Project indicated that a turbid plume may be evident up to ~70 m from the trench area, depending on environmental conditions (Ref. 315, Ref. 316). However, within two hours of ceasing trenching operations, the turbidity level had returned to background or very close to background level (Ref. 315, Ref. 316).

The nature and scale of the seabed disturbance for the petroleum activity covered by this EP is significantly smaller than that of the previous dredging and trenching campaigns, where water quality demonstrated rapid recovery after seabed disturbance. Therefore, turbidity resulting from the described activities is not expected to result in any significant environmental impacts.

Consequently, CAPL considers that the change in water quality from the activities covered in this EP is limited to a localised area immediately adjacent to the proposed activities and is expected to rapidly return to ambient conditions following completion of the activities; therefore, any impacts are Incidental (6).

Alteration of benthic communities and habitats

Subsea IMR activities are expected to result in disturbance to the seabed within close proximity of subsea infrastructure. This type of activity is targeted to the specific area above or adjacent to the infrastructure within the OA, typically resulting in only a small area being affected. The typical area of seabed disturbance predicted to occur from IMR activities is associated with a major pipeline repair, which could result in ~800 m^2 of seabed disturbance (Section 3.19.3.2). This indicative seabed disturbance area represents <0.02% of the OA.

Although, anchoring is not a planned activity, it has been carried through as a contingent activity in the event a different vessel is required onsite to conduct IMR activities, or anchoring is required within the OA due to a significant weather event. As detailed by NERA (Ref. 321), a vessel anchored within water depths greater than 70 m with a single anchor could result in a total disturbance area of up to 1,300 m^2. This indicative seabed disturbance area represents <0.03% of the OA.

Benthic communities and habitats may be altered via physical disturbance or indirectly by the temporary increase in suspended sediment near the seabed as a result of the physical seabed disturbance.

Source
As described in Section 4.17.1.1, benthic habitats within the OA mostly comprise unvegetated, soft, and unconsolidated sediments. The values and sensitivities within the OA with the potential to be impacted by seabed disturbance include the following KEFs: • continental slope demersal fish communities • ancient coastline at 125 m depth contour. Although these KEFs have been identified as having the potential to be impacted from IMR activities, any planned disturbance would be in close proximity of existing infrastructure. Recent surveys indicated that habitat within the ancient coastline at 125 m depth contour KEF in proximity to the OA consisted of smooth seabed with bioturbation and appeared devoid of biota (Ref. 73). Similarly habitat within the continental slope demersal fish communities KEF in proximity to the OA comprise irregular and smooth seabed with bare substrates, discrete depressions of bare substrate, and scarps with bare substrate (Ref. 73). As identified in Section 4.19.1, the southern part of the OA (i.e. first ~13 km of the pipeline) overlaps with ~1.23% of the Montebello Marine Park, with the seabed characterised by sands, clays, or gravels overlying subcropping cemented sediments (Figure 4-2). The habitat within the shallower parts of the OA are expected to be predominantly unvegetated sand, with patches of seagrass and macroalgae, and no associated sessile biota (Section 4.17.1). In addition, the physical presence of artificial structures on the seabed are known to provide hard substrate that can provide habitat for algae, fish, and invertebrates (Ref. 171, Ref. 172) Analysis of habitats on wellheads and associated infrastructure in water depths between 78–825 m on the NWS indicates that the presence of fish assemblages and invertebrate habitats were strongly influenced by depth, age and height of the structures (Ref. 173). Older, taller wellheads in depths <135 m possessed greater abundances of groupers, snappers, site-attached reef species, and transient pelagic fish species (Ref. 173). Beyond 350 m depth, the number of species and total fish abundance declined markedly, as did the percent cover of invertebrates (e.g. ascidians, black/octocorals, sponges) (Ref. 173). A review of ROV video footage recorded between 2015 and 2018 along the Jansz pipeline in water depths ~737–1,348 m also indicated some spatial differences in assemblage between non-infrastructure and infrastructure sites, with greater overall abundances, species richness, and species diversity generally associated with infrastructure (Ref. 318). The review also indicated a decrease in richness, abundance, and diversity with depth as found in other studies both in the north-west of Western Australia and elsewhere (Ref. 318). Given the water depth of infrastructure ranges from ~25 m to ~1,435 m, the infrastructure may provide a hard substrate for colonisation over time, with a greater diversity and abundance of benthic invertebrates and fish assemblages within the shallower areas. Given the nature of the receiving environment within the OA, ecosystem function or habitat connectivity is not expected to be affected by the planned seabed disturbance associated with IMR activities. As such, CAPL has ranked the consequence as Minor (5).
Changes to tangible cultural heritage values IMR activities that may disturb the seabed will occur within the OA. There are no World, National, or Commonwealth heritage listed places or sites within the OA (Section 4.20), and no protected UCH[28] sites or artefacts have been identified within the OA (Section 4.20.2). Therefore, no impacts to known protected seabed-based UCH (e.g. shipwrecks or archaeology), including First Nations UCH, are expected to occur. Given known sea level history, part of the OA (i.e. areas in water depths of <125 m) would have been emergent land during the extended history of First Nations occupation of Australia. Previous seafloor geomorphological analyses on the mid to outer shelf regions proximal to Barrow Island indicated that some (previously emergent) coastal landscape features represented significant geoheritage value (Ref. 319). At the time of writing, CAPL understands through consultation with the relevant First Nations people and/or representative bodies that there are no known artefacts or specific sites of cultural value associated with the seabed within the OA. As such, it is anticipated that tangible heritage features would not be significantly adversely affected from planned seabed disturbance within the OA. As identified from literature and/or consultation (Section 4.17.5.2.1), Sea Country is a value for First Nations people. One of the specific tangible values of Sea Country identified through

[28] 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”.

Source
consultation was the ocean (Table 4-15)—consequence evaluations to related receptors (i.e. marine environmental quality, benthic communities and habitats) are provided above. No impact pathway to a change in access to Country from planned seabed disturbance within the OA is anticipated. The consequence evaluation to benthic communities and habitats is provided above and was assessed as resulting in localised and minor environmental impacts. Further, as described in the above evaluation, changes to the benthic habitat within the disturbance footprint associated with seabed infrastructure is not expected to affect ecosystem function or connectivity. As such, it is anticipated that intangible heritage values such as songlines and connection to Country would not be significantly adversely affected from planned seabed disturbance within the OA. Given the relatively small footprint associated with the planned IMR activities (~800 m^2) and that it will be undertaken within the vicinity of other existing infrastructure, a significant adverse change to cultural heritage values attributed to the offshore marine area from planned seabed disturbance is not predicted to occur. As such, CAPL has ranked the consequence for tangible cultural heritage values as Minor (5).
ALARP decision context justification
Seabed disturbance from IMR 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. During stakeholder consultation, no objections or claims were raised regarding seabed disturbance arising from the activity. The impacts associated with seabed disturbance are considered lower-order impacts in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures

Control measure	Source
IMR work procedures	Activity specific work procedures are developed and address Hazard Identification and Risk Assessment (HIRA) findings, including any additional controls identified for implementation.
Activity-specific HIRA	A HIRA will be undertaken to identify and assess potential environmental impacts and risks associated with the specific maintenance or repair campaign proposed. The HIRA will consider relevant information, which may include: • proximity to potentially sensitive environmental receptors • other known activities and/or impacts that have occurred at that location • material minimisation • alternative materials • alternative execution methodologies • learnings from previous comparable IMR activities/campaigns. Where the HIRA identifies that risks and impacts are potentially greater than those assessed in this EP, the management of change process will be triggered (Section 8.17.2.2).
Marine Standard	Chevron's *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) ensures that various legislative and Chevron requirements and activities necessary for safe, reliable, and efficient marine services are met. These requirements include ensuring that crew meet the minimum competency requirements for safely operating a vessel.
Relevant persons consultation—Ongoing consultation (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 6), as part of ongoing consultation (as required by regulation 22(15) of the OPGGS(E)R, and described in Section 8.17.4) CAPL will continue to engage with First Nations people and/or representative bodies. This ongoing consultation relates to both the specific petroleum activity (Table 8-5) as well as broader engagement and relationship building (Section 8.17.4.3).

Source		
	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.	
First Nations UCH	As described in Section 4.20.2, no known First Nations artefacts or specific sites of cultural value associated with the seabed within the OA. CAPL acknowledge that the identification of First Nations UCH is an area of uncertainty, and as such, CAPL is committed to implementing an adaptive management process to ensure that impacts and risks associated with this receptor are continually reduced to ALARP and managed to acceptable levels. To address the uncertainty the following adaptive management process will be implemented: • implement ongoing consultation with First Nations people and/or representative bodies (as described in the above control measure). if ongoing consultation identifies the presence of First Nations UCH or potential UCH is identified during the petroleum activity, then CAPL will undertake an MoC evaluation that will include a consideration of whether other data (e.g. archaeological survey) or additional control measures (e.g. use of buffers around underwater artefacts) are required to ensure that impacts and risks to UCH are being reduced to ALARP and managed to an acceptable level.	
UCH finds protocol	In alignment with the *Guidelines for working in the near and offshore environment to protect Underwater Cultural Heritage* (Ref. 262) a UCH finds protocol will be implemented where there are activities interacting with the seabed with the risk of disturbing unlocated UCH. The purpose of the UCH finds protocol is to ensure that inadvertent discoveries of UCH (including First Nations UCH) are identified on site and responded to with adequate conservation and management actions. The protocol will identify actions to be taken should potential UCH be identified within the OA.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	Due to the limited area of seabed disturbance, and with the control measures in place, the likelihood of impacts to cultural values from seabed disturbance is Rare (6).	
Risk level	Very low (10)	
Determination of acceptability		
Principles of ESD	The potential impact associated with this aspect is limited to localised short-term effects that are not expected to affect biological diversity and ecological integrity. The consequence associated with this aspect is Incidental (6). Therefore, no further evaluation against the Principles of ESD is required.	
Relevant environmental legislation and other requirements	Legislation and other requirements considered for this aspect include: • *North-west Marine Parks Network Management Plan 2018* (Ref. 252). CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.	
	Requirement	**Demonstration**

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td>North-west Marine Parks Network Management Plan
No specific zone rules identified.</td><td>N/A</td></tr>
<tr><td>Internal context</td><td colspan="2">These CAPL management processes or procedures were deemed relevant for this aspect:
Marine Standard Non Tankers: Corporate OE Standard (Ref. 35).
Control measures related to the above management processes have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.</td></tr>
<tr><td>External context</td><td colspan="2">During stakeholder consultation, no objections or claims were raised regarding seabed disturbance arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below:</td></tr>
<tr><td></td><td>Plan</td><td>Objective</td></tr>
<tr><td></td><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1</td></tr>
<tr><td></td><td colspan="2">Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
no adverse change to the values of the Montebello Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the risk to values of the AMP are also subsequently managed to this acceptable level.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td rowspan="4">Reduce the risk of impacts to sensitive environmental receptors within the OA from petroleum activities

No adverse change to the values of Australian Marine Parks from the petroleum activity

No adverse change to First Nations cultural heritage values from the petroleum activity</td><td>IMR work procedures
IMR activity specific work procedures developed and implemented</td><td>Records show that activity specific work procedures are developed for each IMR activity and address HIRA findings, including any additional controls identified for implementation</td></tr>
<tr><td>Activity-specific HIRA
Activity-specific HIRA undertaken prior to maintenance or repair activity commencing</td><td>Records show that activity-specific HIRA undertaken prior to maintenance or repair activity commencing</td></tr>
<tr><td>Marine Standard
Vessel crew will meet the minimum competency requirements of the Chevron Marine Standard.</td><td>Records indicate that vessel crews meet the minimum competency requirements of the Chevron Marine Standard</td></tr>
<tr><td>Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies)</td><td>Relevant persons consultation records</td></tr>
</table>

Source		
	Ongoing consultation with First Nations people and/or representative bodies is undertaken as per the respective engagement plan and/or consultation protocol	
	Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies) If new information on cultural values or features within the OA or 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 required, records show that the MoC process was undertaken in response to any new information on cultural values or features within the OA or EMBA
No impacts or risks to underwater cultural heritage from the petroleum activity	**Underwater cultural heritage** If ongoing consultation identifies the presence of, or potential for, First Nations UCH, then CAPL will undertake a MoC (Section 8.17.2.2) evaluation to determine what, if any, further actions are required to ensure that impacts and risks to UCH are being reduced to ALARP and managed to an acceptable level	Where required, records show that the MoC process was undertaken in response to any identified First Nations UCH
	UCH finds protocol CAPL will implement a UCH finds protocol to identify and manage any potential UCH during the petroleum activity	
		Induction materials include relevant UCH requirements
		Training records confirm personnel involved in offshore vessel activities and/or ROV operations have completed the induction
		Records show if UCH (or potential UCH) were identified within the OA, and what conservation and management actions were implemented
	UCH finds protocol If First Nations UCH (or potential UCH) is identified during the petroleum activity, the finding is shared with the relevant First Nations representative bodies	Relevant persons consultation records
	UCH finds protocol Where required, UCH finds have been reported to the relevant agency (Table 8-13)	Record of lodgement of notification to relevant agency

7.4 Air emissions

Source

Activities identified as having the potential to result in air emissions are:

- combustion of fuel from vessels within the OA associated with vessel activities undertaken as part of this petroleum activity.
- combustion of aviation fuel associated helicopter activities associated with IMR and planned maintenance of the FCS

Potential impacts and risks

Impacts	C	Risks	C
Generation of air emissions may result in: • localised and temporary reduction in air quality	6	–	–

Consequence evaluation

Localised and temporary reduction in air quality

Atmospheric emission sources are limited to vessels and helicopters associated with IMR and maintenance activities on the FCS[29] (noting that the FCS will be powered by the HVSC post commissioning and start-up).

Atmospheric emissions will result in a decline in local air quality, within the immediate vicinity of the emissions source. The spatial extent and duration of this localised change in air quality will vary with emission volume and frequency.

Atmospheric emissions generated during the combustion of fuels typically include sulfur oxides (SOx), nitrogen oxides (NOx), particulates, and volatile organic compounds (VOCs). SOx and particulate matter emissions are influenced by the fuel used and its relative sulfur content (e.g. MGO usually has a lower sulfur content than MDO or HFO).

The National Environment Protection (Ambient Air Quality) Measure (NEPM AAQ) establishes quantifiable standards and goals against which ambient air quality can be assessed. The NEPM AAQ is aimed at achieving ambient air quality that allows for the adequate protection of human health and wellbeing. However, in the absence of other standards, it is considered appropriate to use these standards as the criteria for comparison.

Air emissions dispersion modelling undertaken for the Wheatstone Platform demonstrated the concentrations of NOx, carbon monoxide, particulate matter, and VOCs are predicted to be well below NEPM AAQ standards indicating there was no significant degradation of ambient air quality (Ref. 287). Given the total volume of air emissions from an operational platform are expected to be much larger than those produced from vessels and the FCS (noting there is no hydrocarbon processing on the FCS), no significant degradation of the local air shed around the vessels or FCS is expected to occur. Therefore, CAPL has ranked the potential consequence to air quality as Incidental (6).

ALARP decision context justification

Offshore commercial operations and subsequent atmospheric emissions arising from these activities are commonplace in offshore environments, both nationally and internationally. The control measures to manage the risk associated with atmospheric emissions 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 stakeholder consultation, no objections or claims were raised regarding air emissions arising from the activity.

The impacts arising from atmospheric emissions constitute lower-order impacts (Table 5-3). As such, CAPL applied ALARP Decision Context A for this aspect.

Good practice control measures and source

Control measure	Source

[29] The back-up diesel generators onboard the FCS may be used for short periods during planned maintenance campaigns

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Reduced sulfur content fuel</td><td colspan="2">Sulfur content of diesel/fuel oil complies with Marine Order 97 and Regulation 14 of MARPOL 73/78 Annex VI. Only low-sulfur (0.50 mass % concentration [m/m]) fuel oil will be used to minimise sulfur oxide (SOx) emissions.</td></tr>
<tr><td>Marine Order 97: Marine Pollution Prevention – Air Pollution</td><td colspan="2">Prior to commencement of the petroleum activity, Chevron's Offshore Vessel Information System (OVIS) assessment requirements within Marine Standard Non Tankers: Corporate OE Standard (Ref. 35) are used to verify that all vessels will comply with Marine Order 97—Marine pollution prevention—air pollution (appropriate to vessel class) for emissions from combusting fuel, including:
Vessels will hold a valid International Air Pollution Prevention (IAPP) certificate and a current international energy efficiency (IEE) certificate
All vessels (as appropriate to vessel class) will have a Ship Energy Efficiency Management Plan (SEEMP) as per MARPOL 73/78 Annex VI
Vessel engine nitrous oxides (NOx) emission levels will comply with Regulation 13 of MARPOL 73/78 Annex VI.</td></tr>
<tr><th colspan="3">Additional control measures and cost benefit analysis</th></tr>
<tr><th>Control measure</th><th>Benefit</th><th>Cost</th></tr>
<tr><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><th colspan="3">Likelihood and risk level summary</th></tr>
<tr><td>Likelihood</td><td colspan="2">N/A</td></tr>
<tr><td>Risk level</td><td colspan="2">N/A</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential impact associated with this aspect is limited to a direct reduction in air quality for a localised area for a short time, which is not considered to have the potential to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Incidental (6).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered relevant to this aspect include:
Marine Order 97
MARPOL 73/78
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.<table><tr><th>Requirement</th><th>Demonstration</th></tr><tr><td>Marine Order 97
Gives effect to Annex VI of MARPOL 73/78</td><td>Prescribed limits (as per Division 7) for sulfur content of fuel oil have been incorporated into the reduced sulfur content fuel control measure
IAPP and IEE certificate (as per Division 2), SEEMP (as per Division 6), and nitrogen oxides emission requirements (as per Division 3) have been incorporated into the Marine Order 97: Marine Pollution Prevention – Air Pollution control measure</td></tr></table></td></tr>
<tr><td>Internal context</td><td colspan="2">These CAPL management processes or procedures were deemed relevant for this aspect:</td></tr>
</table>

Source		
	• *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) • Control measures related to the above management processes or procedures 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 stakeholder consultation, no objections or claims were raised regarding atmospheric emissions arising from the activity.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
Planned air emissions from the petroleum activity will meet Marine Order 97 requirements	**Reduced sulfur content fuel** Only low-sulfur (0.50 mass % concentration [m/m]) fuel oil will be used to minimise SOx emissions	Bunker receipts verify the use of low-sulfur fuel oil
	Marine Order 97: Marine Pollution Prevention – Air Pollution Prior to commencement of activities, the following will be verified: • vessels will hold a valid IAPP certificate and a current IEE certificate • all vessels (as appropriate to vessel class) will have a SEEMP as per MARPOL 73/78 Annex VI • vessel engine nitrous oxides (NOx) emission levels will comply with regulation 13 of MARPOL 73/78 Annex VI	OVIS report / ABU Marine OE Inspection Checklist confirms vessels hold IAPP and IEE certificates, and a SEEMP is in place (as appropriate to class), and NOx emission levels comply with regulations

7.5 Greenhouse gas emissions

7.5.1 National strategies

In 2024, the Australian Government released its Future Gas Strategy (Ref. 414), an evidence-based framework that will underpin future government policies and actions. The strategy "establishes the role gas will play in the transition to net zero by 2050, securing affordable gas for Australia as we move to a more renewable grid, and confirming our commitment to being a reliable trading partner" (Ref. 415). The strategy identifies that Australia will need gas through to 2050 and beyond; noting that the role of gas will change, and gas-related emissions must decline, as Australia transitions to net zero (Ref. 414). Gas, however, is forecast to play an important role in firming renewable power generation and is needed in hard-to-abate sectors like manufacturing and minerals processing until such time as alternatives are viable and can be deployed at scale (Ref. 415).

Natural gas supports the standard of living and energy security (providing over a quarter of energy needs) in Australia (Ref. 414). Gas provides a "crucial role in

supporting our [the Australian] economy, with the sector employing 20,000 people across the country, including remote and regional communities" (Ref. 415). Gas is also considered crucial for a Future Made in Australia as it supports manufacturing, food processing, and refining of critical minerals (Ref. 415). The Future Made in Australia plan is about maximising the economic and industrial benefits of the move to national net zero and securing Australia's place in a changing global economic and strategic landscape (Ref. 416).

The Australian Government is developing a Net Zero Plan which will guide Australia's transition to the legislated target of net zero greenhouse gas (GHG) emissions by 2050 (Ref. 417). The Net Zero Plan seeks to set out government priorities, establish policies and measures to drive down emissions and support ongoing and new investment in low emissions and renewable activities (Ref. 417). As part of developing the Net Zero Plan, the Australian Government will also set Australia's 2035 GHG emission reduction targets (Ref 417).

Six sectoral emissions reduction plans will support the Net Zero Plan; one of these sectoral plans is for the electricity and energy sector. The Electricity and Energy Sector Plan will set out a credible pathway to decarbonise Australia's electricity and energy sector by 2050 while ensuring reliable, secure, and affordable energy supply (Ref. 418). A discussion paper was released for public comment in early-2024; feedback from this consultation will be incorporated into the development of the Electricity and Energy Sector Plan.

7.5.2 Regulatory framework for GHG emissions management

7.5.2.1 Paris Agreement

The Paris Agreement is an international treaty on climate change that entered into force in November 2016 (Ref. 419).

Australia is party to, and has ratified, the Paris Agreement. The Parties to the Paris Agreement acknowledge that "climate change is a common concern of humankind", and the Parties should "consider their respective obligations" (Ref. 420). The objectives of the Paris Agreement include "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. 420).

Under the Agreement, nationally determined contributions (NDCs) are submitted to communicate GHG emission reductions and adaptation plans. Australia submitted its first 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. 421). 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 emissions budget for this period is 4,353 Mt CO2-e). Within the NDC submission, Australia also reaffirmed its target to achieve net zero emissions by 2050 (Ref. 421).

Australia regularly reports to the UNFCCC on climate change policies and measures. The latest National Inventory Report (Ref. 423) was submitted to the UN Climate Change secretariat in April 2024. The estimated annual emissions for the 2021–2022 financial year were 432.6 Mt CO2-e; this is a 29.0% reduction compared to the 2004–2005 financial year (Ref. 423). Australia's net emissions peaked in 2005–2006 and have generally been on a long-term decline since that year (Ref. 423).

7.5.2.2 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 NDC under that Agreement.

Australia's GHG emissions reduction targets under this Act are:

- reduce Australia's net GHG emissions to 43% below 2005 levels by 2030
  - implemented as a point target, and as an emissions budget covering the period 2021–2030
- reduce Australia's net GHG emissions to zero by 2050.

Under the *Climate Change Act 2022* (Cth) the Minister must prepare an annual climate change statement. The latest report, prepared by the Department of Climate Change, Energy, Environment and Water and provided to the Minister in 2024 found that Australia is on track to deliver the 2030 emissions target of 43% below 2005 levels, and Australia is projected to beat its 2030 emissions budget target by 3% (Ref. 479). Flexible gas generation has a role in backing up renewable energy, which is the cheapest and quickest way to transforming our electricity system for households and businesses (Ref. 479).

7.5.2.3 National Greenhouse and Energy Reporting Scheme

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.

7.5.2.4 Safeguard Mechanism Scheme

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 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 *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth).

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 (Ref. 425). In general, baselines will decline by 4.9% each financial year from 2023–2034 through to 2029–2030. The subsequent decline rate will be set in 5-year blocks consistent with updates to Australia's NDC under the Paris Agreement (Ref. 425).

The 'Gorgon Operations Facility' is registered with the Clean Energy Regulator (CER) as a facility under both the NGER and Safeguard Mechanism schemes. The scope of the Gorgon Operations Facility includes GHG emissions from both the GTP and associated facilities on Barrow Island, as well as from any activities or facilities in Commonwealth waters. The Safeguard Mechanism baseline for the Gorgon Operations Facility for the 2022–2023 financial year was 8.34 Mt CO_2-e.

WA GHG emissions policy for major projects

The WA State Government released an amended *Greenhouse Gas Emissions Policy for Major Projects* in October 2024 (Ref. 426). The intent of this revised policy is to remove duplication in GHG emissions management by the State and Commonwealth governments. Where GHG emissions of a major proposal that is being (or has been) assessed under Part IV of the EP Act (WA), and that proposal is subject to alternative regulatory measures (i.e. the Safeguard Mechanism), the State will no longer apply conditions to reduce net GHG emissions

For existing projects, including the Gorgon Gas Development, the State Government will initiate a review of existing Ministerial Statements under section 46 of the EP Act (WA) to align requirements with the amended policy.

7.5.3 Corporate context

As outlined in Chevron Corporation's 2023 Climate Change Resilience Report (Ref. 427), Chevron Corporation supports the global ambitions of the Paris Agreement. Chevron Corporation believes that the optimal approach for society is to drive the most efficient and cost-effective reductions economywide, paired with natural and technological emissions removal. Chevron Corporation supports a price on carbon, applied as widely and broadly as possible, as the best approach to reduce emissions. To this end, Chevron Corporation works to encourage national policies to support international linkages (for example, through Article 6 of the Paris Agreement), with the goal of ultimately establishing a liquid and integrated global carbon market.

Chevron Corporation believes the future of energy is lower carbon. Chevron Corporation is investing to grow its oil and gas business, lower the carbon intensity of its operations and grow lower carbon businesses in renewable fuels, carbon capture and offsets, hydrogen, and other emerging technologies. Chevron Corporation's strategic planning process supports an ability to operate in a lower carbon policy environment. For example, Chevron Corporation use carbon prices and derived carbon costs in business planning, investment decisions, impairment reviews, reserves calculations, and evaluation of carbon-reduction and lower carbon business opportunities.

7.5.4 Primary environmental approvals

To date, the Gorgon Gas Development includes infrastructure and activities associated with the GFP, which also includes the GS2 infill development and J-IC Project. All of these are part of the Gorgon Gas Development proposed within existing environmental approvals as described below.

The scope of the Gorgon Gas Development, as described in the below environmental approvals, is the extraction and processing of hydrocarbons from the Greater Gorgon Area resources. The Greater Gorgon Area is defined within the *Barrow Island Act 2003* (WA) and Section 1.3.1 of the *Draft Environmental Impact Statement / Environmental Review and Management Programme for the Proposed Gorgon Development* (Draft EIS/ERMP) (Ref. 308). The Gorgon and Jansz–Io gas fields are within the Greater Gorgon Area and were the fields selected for development under the GFP.

The two-train Gorgon Gas Development was referred, pursuant to the EPBC Act (Cth) and EP Act (WA), on 23 November 2003 and 19 November 2003 respectively. The Ministers' delegates set the assessment approach as assessment by environmental impact statement (EIS) under the EPBC Act (Cth), and an environmental review and management programme (ERMP) under the EP Act (WA). The scope of the proposed development included development of the Greater Gorgon Area gas resource base

((Ref. 308). Section 13 of the Draft EIS/ERMP (Ref. 308) and the *Final Environmental Impact Statement / Response to Submissions on the Environmental Review and Management Programme for the Proposed Gorgon Development* (Ref. 308) set out the environmental impact assessment of GHG emissions. In that assessment it was estimated that the Gorgon Gas Development would emit ~4.01 Mtpa CO_2-e of direct GHG emissions. The Gorgon Gas Development was approved with conditions (EPBC 2003/1294 and MS 748) by the relevant Ministers on 3 October 2007 and 6 September 2007 respectively. The EPBC Act (Cth) approval has effect until 1 January 2070.

The Development of Jansz–Io Deepwater Gas Field was referred, pursuant to the EPBC Act (Cth), on 22 June 2005. The Ministers' delegate set the assessment approach as assessment by preliminary documentation. The scope of this referral was all physical elements of the Jansz–Io Deepwater within the Commonwealth marine area. The Development of Jansz–Io Deepwater Gas Field was approved with conditions (EPBC 2005/2184) by the Minister on 22 March 2006. This approval was transferred from Mobil Exploration and Producing Australia Pty Ltd to CAPL on 8 September 2009. This EPBC Act (Cth) approval has effect until 31 December 2050.

The Jansz Feed Gas Pipeline was referred, pursuant to the EP Act (WA), on 26 October 2007. The Ministers' delegate set the assessment approach as assessment on referral information. GHG emissions were not identified as an environmental factor requiring assessment. The Jansz Feed Gas Pipeline was approved with conditions (MS 769) by the relevant Minister 30 May 2008.

The three-train Revised Gorgon Gas Development was subsequently referred, pursuant to the EPBC Act (Cth) and EP Act (WA), on 14 April 2008 and 22 February 2008 respectively. The Ministers' delegates set the assessment approach as assessment by public environmental review (PER). Section 12 of the *Gorgon Gas Development Revised and Expanded Proposal Public Environmental Review* (Ref. 429) set out the environmental impact assessment of GHG emissions. The processing of gas from gas fields in the Greater Gorgon Area by the GTP was the development premise articulated in the PER. In that assessment it was estimated that the Gorgon Gas Development would emit ~5.45 Mtpa CO_2-e of direct GHG emissions. The Revised Gorgon Gas Development was approved with conditions (EPBC 2008/4178 and MS 800 [as amended from time to time[30]]) by the relevant Ministers on 26 August 2009 and 10 August 2009 respectively. The EPBC Act (Cth) approval has effect until 26 August 2070.

The Gorgon Gas Development Fourth Train Expansion Proposal was subsequently referred, pursuant to the EPBC Act (Cth) and EP Act (WA), on 27 April 2011 and 28 April 2011 respectively. The Ministers' delegate set the assessment approach as assessment by EIS under the EPBC Act (Cth) and PER under the EP Act (WA). Section 11 of the *Gorgon Gas Development Fourth Train Expansion Proposal Public Environmental Review / Draft Environmental Impact Statement* (Ref. 308) set out the environmental impact assessment of GHG emissions. In that assessment it was estimated that the Gorgon Gas Development would emit ~7.69 Mtpa CO_2-e of direct GHG emissions for four-trains. The Gorgon Gas Development Fourth Train Expansion was approved with conditions (EPBC 2011/5942 and MS 1002) by the relevant Ministers on 12 May 2016 and 30 April 2015. The EPBC Act (Cth) approval has effect until 1 January 2070.

[30] Since the Revised and Expanded Gorgon Gas Development was approved, further changes to the Gorgon Gas Development have been made and/or approved and are now also part of the Development. These include MS 965, MS 1136, and MS 1198.

Within the Fourth Train Expansion PER/Draft EIS, the GHG emissions estimated for the three-train proposal were revised to an average annual emissions footprint of ~9.47 Mtpa CO_2-e with no abatement in place, and ~6.07 Mtpa CO_2-e incorporating CO_2 reinjection estimates within the (now superseded) *Gorgon Gas Development and Jansz Feed Gas Pipeline: Greenhouse Gas Abatement Program* (Ref. 431), which was approved by the Ministers' delegate of the WA Environmental Protection Authority (EPA) in May 2015.

The Gorgon Gas Development is currently operating with three trains. As such, the Gorgon Gas Development currently has environmental approvals based on an total GHG emissions footprint of ~9.47 Mtpa CO_2-e with no abatement in place, and ~6.07 Mtpa CO_2-e incorporating CO_2 reinjection estimates.

7.5.4.1 Greenhouse gas management plan

The *Gorgon GTP Plant Greenhouse Gas Management Plan* (GHGMP) (Ref. 432) was developed to satisfy the requirements of condition 27 of MS 800 (as amended by MS 1198). The GHGMP is applicable to all direct GHG emissions from the current operational Gorgon Gas Development facilities (as outlined in MS 800), including the three LNG processing trains, domestic gas unit, and Carbon Dioxide Injection System. The objectives of the Gorgon GTP GHGMP are to outline:

- measures implemented through the design and early phase of operations to avoid or reduce GHG emissions
- measures to avoid, reduce and offset Proposal GHG Emissions[31] during operations over the life of the proposal
- emission limits, required by condition 27.1, for Net GHG Emissions[32] over the life of the proposal.

Note: While this GHGMP is currently in-force, it is understood that given the amended *Greenhouse Gas Emissions Policy for Major Projects* released by the WA State Government in October 2024 (see Section 0) that the requirements of condition 27 are likely to be subject to a section 46 review by the WA EPA.

7.5.5 GHG emissions inventory

7.5.5.1 Terminology

Within this EP the following terminology has been adopted to describe GHG emissions:

- direct emissions—these are GHG emissions resulting from the planned petroleum activity (as described in Section 3) from sources within the OA that are either owned by CAPL or under CAPL's operational control
- indirect GHG emissions—these are GHG emissions substantially associated with the planned petroleum activity from sources outside the OA.

7.5.5.2 Assessment boundary

One of the main principles of GHG accounting and reporting is relevance, of which an integral aspect is defining an appropriate GHG emissions inventory boundary (Ref. 433).

[31] Proposal GHG Emissions and Net GHG Emissions are defined within MS 1198.

[32] Proposal GHG Emissions and Net GHG Emissions are defined within MS 1198.

The primary environmental approvals under both the EPBC Act (Cth) and EP Act (WA) were assessments based on project-level emissions. Under a secondary environmental approval, such as this EP, the emissions boundary for a GHG assessment is inherently different from and more limited in scope than that of the primary approvals, as the EP covers only a subset of activities (as described in Section 3) associated with the Gorgon Gas Development. Consequently, the appropriate emissions boundary for this EP is also bound by this subset of activities.

It is also noted that when assessing at this activity-level, what may be characterised as an indirect emission under this EP, may become a direct emission associated with a different secondary approval (activity-level) or primary approval (project-level) boundary. The GHG emissions inventory in this EP may also not directly equate to values presented within primary environmental approvals, or to those reported under other (e.g. NGER Act) legislation due to the differing boundaries and facility definitions. The direct and indirect emission sources that form the inventory for this EP are identified within Section 7.5.5.37.5.5.3 and Section 7.5.5.4

While GHG emission assessment boundaries and inventories may vary, the control measures adopted to reduce the impacts and risks to ALARP and an acceptable level are predominantly the same across primary and secondary approvals, as management typically occurs at the project-level, and not at individual activity-level.

7.5.5.3 Direct GHG emissions

As described above, CAPL has defined the emissions boundary for the assessment of GHG emissions in relation to the planned petroleum activities[33] within the OA as described in Section 3 of this EP. Any contingency activities (including repairs, temporary power supply), or unplanned events (including emergency events), are considered out of scope of the emissions inventory.

The following activities have been identified as direct emission sources for planned activities under this EP:

- fuel combustion by vessels during planned activities within the OA
- fugitive emissions.

Any equipment (e.g. AUV, ROV) used to support vessel-based activities are powered by the support vessel itself, and as such these do not represent an additional emission source to that already accounted for by the vessel.

While helicopter operations are described within Section 3.21.2, these are not a routine planned activity and are only associated with longer IMR scopes (e.g. repairs). In addition, helicopters are neither owned by CAPL or under CAPL's operational control and therefore have not been accounted for within this emissions inventory.

CAPL acknowledge that fugitive emissions may occur from the subsea hydrocarbon system in Commonwealth waters, these are considered to represent a minor proportion of fugitive emissions for the entire Gorgon Gas Development. Fugitive emissions for the Gorgon Gas Development are estimated based on product throughput (as per accepted NGERS methodology), and therefore, any offshore component cannot easily be separated. As such, fugitive emissions estimates have been fully incorporated into the indirect GHG emissions inventory (Section 7.5.5.4).

[33] Where 'petroleum activity' is as defined within Regulation 4 of the OPGGS(E)R.

Based on the boundary and inventory described above, an estimate of annual direct GHG emissions for the activities under this EP is ~0.006 Mtpa CO_2-e[34]. Planned activities under this EP are not expected to significantly vary, such that it would result in a significant change to the above estimated annual direct emissions over the next five-year in-force period of this EP.

As described within the *Gorgon Gas Development Fourth Train Expansion Proposal Public Environmental Review / Draft Environmental Impact Statement* (Ref. 308) GHG emissions within the Commonwealth marine area[35] will be relatively low during the operations phase. The above annual estimate of GHG emissions for activities under this EP is consistent with this previous assessment.

7.5.5.4 Indirect GHG emissions

To determine the relevance of indirect emissions to the activities under this EP, CAPL undertook an assessment against the factors for determining what is an indirect consequence, in accordance with the *'Indirect consequences' of an action: Section 527E of the EPBC Act* Policy Statement (Ref. 434). As an outcome of this assessment, the following activities have been identified as indirect emission sources for planned activities under this EP:

- gas processing at the GTP on Barrow Island[36]
- transport and third party end-use of LNG, condensate and domestic gas products.

As the Gorgon Gas Development supplies both the Australian domestic market and the international market, these third-party indirect emissions may occur across multiple global regions. A large percentage of LNG produced by the Gorgon Gas Development is supplied internationally under long-term contracts. This long-term export market is primarily Japan, with some exports to other countries including Republic of Korea (South Korea), China, and Taiwan. These indirect emissions would be direct emissions for the end consumers and would also have to operate under their respective regulatory regimes, to manage their emissions and any associated potential impacts (see Section 7.5.5.4.1).

Based on the boundary and inventory described above, an estimate of annual indirect GHG emissions related to activities under this EP are shown in Table 7-2. Planned activities under this EP are not expected to significantly vary, such that it would result in a significant change to the above estimated annual indirect emissions over the next five-year in-force period of this EP.

Table 7-2: Estimated indirect emissions associated with activities under this EP

Source	Average annual estimated emissions (Mt CO_2e)
Gas processing at the GTP on Barrow Island [1]	9.47

[34] Emissions calculation is based on 200 days of vessel activity per year (upper limit of planned inspections as per Section 3.5) using NGER energy content and emissions factors (Ref. 197).

[35] Commonwealth marine areas are considered a MNES under the EPBC Act.

[36] The "gas processing at the GTP on Barrow Island" incorporates several emission sources, including gas turbine drivers, gas turbine generators, heating, flaring, venting, diesel consumption (e.g. firewater pumps, emergency diesel generators, vehicles, tugs, and pilot boats), and fugitive emissions. The gas turbine generators are also used to provide electricity to the offshore infrastructure within scope of this EP (Section 3.2).

Source	Average annual estimated emissions (Mt CO_2e)
Transport and third-party end use of products [2,3,4]	49.8

1. Source: Fourth Train PER/Draft EIS (Ref. 308), GHGAP (Ref. 431), GHGMP (Ref. 432) total unabated emissions footprint.

2. Transport emissions estimated from shipping fuel consumption scaled for a representative year of production. Emissions factors sourced from IMO Resolution MEPC.245(66) (Ref. 435)and IPCC AR5 100-year global warming potentials (GWPs) (Ref 436).

3. Emissions from third-party use of products calculated in alignment with methods in Category 11 of IPIECA's Estimating Petroleum Industry Value Chain (Scope 3) Greenhouse Gas Emissions (Ref. 437), including product quantity and fuel specific higher heating values, and the CO_2, CH_4 and N_2O combustion emissions factors for each fuel type. Evaluation based upon production data from a representative year (15.3 MT net LNG), applying API compendium methodologies and factors (Ref. 438; Ref. 439), and IPCC AR5 100-year GWPs (Ref. 436).

4. Estimated transport and third-party end-use values are consistent with those in the GHGMP (Ref. 432).

7.5.5.4.1 Paris Agreement (or equivalent) commitments from countries with main LNG sale purchase agreements

The Paris Agreement requires all signatory countries to put forward their best efforts through NDCs and report regularly on their GHG emissions and implementation efforts. As outlined in Section 7.5.2.1, Australia is a party to, and has ratified, the Paris Agreement.

Japan is a party to, and has ratified, the Paris Agreement. Japan has submitted an NDC to reduce its GHG emissions by 46% from 2013 levels by 2030 (Ref. 440). Japan's NDC submission stated that this target is aligned with the long-term goal of achieving net-zero by 2050 (Ref. 440). Japan's long-term strategy includes driving decarbonisation of the energy and transport sectors (Ref. 441). The strategy promotes the shift to decarbonised power sources (which includes using existing gas infrastructure [e.g. gas turbines] where relevant) and the development of "greener ships such as gas-fueled ships powered by LNG, hydrogen, ammonia and others" (Ref. 441).

The Republic of Korea is a party to, and has ratified, the Paris Agreement. In December 2021, the Republic of Korea submitted an updated NDC raising its emission reduction targets from 26.3% of 2018 levels to 40% from 2018 levels by 2030 (Ref. 442). The Republic of Korea's implementation plan includes to "dramatically phase down coal-fired power generation", shut down aged coal power plants or shift their fuels from coal to LNG, and focusing emission reduction efforts within the shipping sector on "distributing eco-friendly ships" (Ref. 442).

China is a party to, and has ratified, the Paris Agreement. In October 2021, China submitted revised NDC goals which include: "aims to have CO2 emissions peak before 2030 and achieve carbon neutrality before 2060; to lower CO2 emissions per unit of GDP by over 65% from the 2005 level" (Ref. 443). Part of China's implementation strategy includes the replacement and optimisation of transportation fuels; for water transportation this includes the use of LNG-powered ships (Ref. 443).

Taiwan is not a formal member of the United Nations (UN) and is not a party to the Paris Agreement. However, Taiwan submitted an Intended NDC to the UNFCCC secretariat in 2015 and revised this NDC in 2022. Taiwan's target aims to reduce GHG emissions by 23–25% from 2005 levels by 2030 (Ref. 444).

7.5.6 Risk assessment

Source

Activities identified as having the potential to result in GHG emissions are:

- direct emissions from planned activities within scope of this EP
- indirect emissions from activities associated with processing of gas on Barrow Island
- indirect emissions from the transport and third party end-use of LNG, condensate and domestic gas produced by the Gorgon Gas Development.

Potential impacts and risks

Impacts	C	Risks	C
GHG emissions may result in: • contribution to the reduction of the global atmospheric carbon budget (by the amount of the direct and indirect GHG emissions associated with activities under this EP)	6	A decrease in the global atmospheric carbon budget may result in: • contribution to the anthropogenic influence on the global climate system	—

Consequence evaluation

Contribution to the reduction of the atmospheric carbon budget (direct and indirect emissions)

Direct GHG emissions from activities within this EP are estimated to be ~0.006 Mtpa CO_2-e, and indirect GHG emissions from the processing of gas on Barrow Island are estimated to be ~9.47 Mtpa CO_2-e[37]. Combined these emissions represent ~2.2% (9.476 of 432.6 Mt CO_2-e) of Australia's net GHG emissions during 2021–2022 (Ref. 423) These total direct (from the activities within this EP) and indirect (from gas processing at the GTP on Barrow Island) GHG emissions are within levels previously assessed and approved for the Gorgon Gas Development pursuant to the EP Act (WA) and EPBC Act (Cth).

The indirect GHG emissions from the transport and third party end-use of LNG, condensate and domestic gas are estimated to be ~49.8 Mtpa CO_2-e[38,39,40]. Some of these transport and end-use GHG emissions would occur within Australia from domestic gas use, while the remainder would occur internationally.

According to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report for Working Group I (WG1 AR6), "the total anthropogenic effective radiative forcing (ERF) in 2019, relative to 1750, was 2.72 [1.96 to 3.48] Wm^{-2} (*medium confidence*) and has likely been growing at an increasing rate since the 1970s, [and] . . . Over 1750–2019, CO_2 increased by 131.6 ± 2.9 ppm (47.3%)."[41]

The IPCC defines the term "carbon budget" as "refer[ing] 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

[37] Source: Fourth Train PER/Draft EIS (Ref. 308), GHGAP (Ref. 431), GHGMP (Ref. 432) total unabated emissions footprint.

[38] Transport emissions estimated from shipping fuel consumption scaled for a representative year of production. Emissions factors sourced from IMO Resolution MEPC.245(66) (Ref. 435) and IPCC AR5 100-year GWPs (Ref. 436).

[39] Emissions from third-party use of products calculated in alignment with methods in Category 11 of IPIECA's *Estimating Petroleum Industry Value Chain (Scope 3) Greenhouse Gas Emissions* (Ref. 437), including product quantity and fuel specific higher heating values, and the CO_2, CH_4 and N_2O combustion emissions factors for each fuel type. Evaluation based upon production data from a representative year (15.3 MT net LNG), applying API compendium methodologies and factors (Ref. 438; Ref. 439), and IPCC AR5 100-year GWPs (Ref. 436).

[40] Estimated transport and third-party end-use values are consistent with those in the GHGMP (Ref. 432).

[41] IPCC, AR6, WG1, at TS-35.

Source
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."[42] The remaining carbon budget for a 50% likelihood to limit global warming to 1.5°C, 1.7°C, and 2°C is respectively, 500 Gt CO_2, 850 Gt CO_2, and 1350 Gt CO_2.[43]. If the total direct and indirect GHG emissions from activities associated with this EP are ~59.3 Mtpa CO_2-e, then the activities under this EP may contribute ~0.2–0.5% to the reduction in the total remaining global carbon budget, which is a *de minimis* decrease. It is noted that this estimated contribution to the total global carbon budget is based the current emissions estimates (as shown in this EP), operations continuing at maximum capacity through to ~2066 (i.e. proposed end of operations to allow for decommissioning before end of approval life in 2070), and with no allowance for future mitigation (including net zero aspirations, future technology or operational efficiencies, or future Australian regulatory or international policy requirements). According to the IEA, natural gas, "which emits less carbon than most other fossil fuels" accounts for about a quarter of global electricity generation (Ref. 445). Further, IEA acknowledge that while natural gas may have a "limited role as a transition fuel from coal to renewable energy sources", it may still be needed as a back-up for variable (e.g. wind, solar) renewable power sources (Ref. 445). Within Australia, the energy market operator considers that gas has a critical role in energy supply and security during the transition to lower carbon energy sources (Ref. 446, Ref. 447); and this is supported by the Australian Governments Future Gas Strategy (Ref. 414). As such, the use of natural gas produced from the Gorgon Gas Development supports Australia in providing emission reduction through the displacement of more emission intensive fuels. When used as a primary energy source, LNG has a number of benefits over other fossil fuels, including lower emissions of sulphur dioxide, particulate matter, and GHGs (Ref. 481). A benchmarking assessment for the LNG processing emissions was undertaken during the *Gorgon Gas Development Fourth Train Expansion Proposal Public Environmental Review / Draft Environmental Impact Statement* (Ref. 308). This benchmarking assessment showed that the GFP is within the range of GHG emissions intensities compared to other Australian projects benchmarked, e.g. it has a lower emissions intensity compared to Ichthys LNG and Prelude FLNG, but a higher emissions intensity compared to Curtis Island LNG (Ref. 308). Benchmarking was more recently undertaken during the development of the GHGMP (Ref. 432), which estimated a net GHG emissions intensity for the GFP as 0.17 t CO_2-e per t LNG. This net emissions intensity was similar or less than other comparable gas developments on the North West Shelf (Ref. 432). The proposed project end of life for the Gorgon Gas Development is also considered to be consistent with the intent of the Australian Government's *Future Gas Strategy* in that the use of gas is expected to continue through to 2050 and beyond (Ref. 414). Therefore, the continued use of natural gas from the Gorgon Gas Development is expected to contribute to the displacement of the use of higher carbon intensive fossil fuel energy sources, which will have a corresponding reduction in potential global fossil fuel emissions. Fossil fuels met 80% of global energy demand in 2023 (Ref. 449). While the demand for energy services is projected to continue to increase, the recent *2024 World Energy Outlook* (WEO) indicates that demand for oil, natural gas, and coal is set to peak by 2030; however, the demand for natural gas is expected to remain robust in emerging market and developing economies (Ref. 449). The 2024 WEO also indicated that by the end of this decade the increase in global energy demand could be met without additional amounts of oil, natural gas or coal; this differs from previous projections which needed a proportion of the increase in global energy demand to be met by fossil fuels (Ref. 449). The Gorgon Gas Development is an existing development that has been producing since 2016, supplying both Australian and international markets. Indirect emissions associated with the transport and third party end-use of LNG, condensate and domestic gas products is the largest category of emissions associated with Chevron Corporation's activities (Ref. 427). These types of indirect emissions are driven by global demand, which is in turn driven by economics, policy, regulation, and consumer behaviour on a global scale (Ref. 427). As described in Section 7.5.5.4.1, the countries with major sales agreements in place for products from the Gorgon Gas Development have submitted NDCs to the UNFCCC in alignment with the Paris Agreement (or have equivalent targets established in their country). In summary, given that

[42] IPCC, AR6, WG1, at SPM-48 footnote 43

[43] IPCC, AR6, WG1, at SPM-29 Table SPM.2.

Source
• natural gas has a relatively lower emissions intensity compared to other fossil fuel alternatives • natural gas has been recognised by the Australian Government as part of Australia's long-term energy security and transition plans • Australia and foreign jurisdictions have GHG emission reduction targets that align with intent of the Paris Agreement the potential impact of *a de minimis* contribution from the Gorgon Gas Development to the reduction of the global carbon budget (relative to the total carbon budget) has been evaluated as having the potential to result in an Incidental (6) consequence.
Contribution to anthropogenic influence on the global climate system (direct and indirect emissions) *Changes to climate systems* WGI AR6 of the IPCC acknowledges "[c]limate change is a global phenomenon, but manifests differently in different regions" (Ref. 465). Moreover, the *Summary for Policymakers* to the same report states that "[h]istorical cumulative CO_2 emissions determine to a large degree warming to date, while future emissions cause future additional warming" (Ref. 466). 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. 466). According to the IPCC ARC, 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. 449). 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 artic sea ice, changes to the intensity and frequency of certain extreme weather events and droughts (Ref. 467). Specifically, the IPCC projections for the Australia include: • **Droughts:** Additional regional changes in Australasia include a significant decrease in April to October rainfall in southwest Western Australia, observed from 1910 to 2019 and attributable to human influence (*high confidence*[44]), 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."[45] • **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.".[46]. Fire weather is projected to increase throughout Australia (high confidence).[47] • **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

[44] "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.

[45] IPCC AR6, WG1, TS-93.

[46] IPCC AR6, WG1, TS-74.

[47] IPCC AR6, WG1, TS-93.

Source

elsewhere in Australasia for global warming levels (GWLs) exceeding 2°C and with *medium confidence* for a 2°C GWL."[48]

- **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."[49]. "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*)."[50]
- **Snowfall:** "Snowfall is expected to decrease throughout the region at high altitudes in [] Australia (high confidence)."51, "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."52
- **Tropical Cyclones:** "In Australia, the number of [topical 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 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 I 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.'"[53]

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. 450). 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*)"[54] and that "[c]limate trends and extreme events have combined with exposure and vulnerabilities to cause major impacts for some human systems (*high confidence*)"[54]. 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*)
- 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*)

[48] IPCC AR6, WG1, TS-93.
[49] IPCC AR6, WG1, TS-93.
[50] IPCC AR6, WG1, 12-57.
[51] IPCC AR6, WG1, TS-93.
[52] IPCC AR6, WG1, TS-93-94.
[53] IPCC AR6, WG1, 12-54, 55.
[54] IPCC AR6, WGII, Australasia FS (Ref. 222).

Source

- 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*)." [54]

A previous (2009) report by Australia's Biodiversity and Climate Change Advisory Group (Ref. 468) 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. 468). 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. 468). 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. 468).

The 'loss of climatic habitat caused by anthropogenic emissions of greenhouse gases' has been listed as a key threatening process under the EPBC Act (Cth) (Ref. 451). 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. 452). 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 reefs, wetlands and coastal ecosystems, polar communities, tropical forests, temperate forests, and arid and semi-arid environments (Ref. 452). 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. 469). Actions identified within this *Threatened Species Action Plan* include updating conservation plans to mitigate climate change risk for susceptible species (Ref. 469).

Climate change has been identified as a threat to some protected species, including marine turtles, whales, seabirds and migratory shorebirds. 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. 118). 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. 95). The *Wildlife Conservation Plan for Seabirds* (Ref. 448) 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", and the *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 448) 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 *North-west Marine Parks Network Management Plan 2018* identifies climate change as a pressure that may impact marine park values (Ref. 252). The management plan 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" (Ref. 252).

Within the Marine Bioregional Plan for the NWMR (Ref. 454), 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.

Anthropogenic influence on the climate system

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

Source
global GHGs (emissions minus sinks) in the atmosphere since the industrial revolution. The 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. 427). The changing regulatory and international initiatives on climate change (e.g. which may result in changing reduction targets and timeframes) will also influence the total global GHG emissions into the future – making a future prediction of changes to climate systems, inaccurate. As a contribution to the anthropogenic influence on the global climate system cannot be directly attributed to any one development, no consequence ranking has been assigned.
ALARP decision context justification
Offshore subsea operations and associated field support are common both nationally and internationally. The control measures to manage the impacts and risks associated with GHG emissions 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 specific objections or claims were raised regarding GHG emissions arising from the petroleum activity. Currently, under international climate agreements (the Paris Agreement), and national legislated targets (under the *Climate Change Act* [Cth]), Australia has the following target to reduce GHG emissions: 43% below 2005 levels by 2030. This reduction target is both a single-year 'point' target and a multi-year 'emissions budget' target. The *Climate Change Act* (Cth) also includes a legislated target to reduce Australia's net GHG emissions to zero by 2050. CAPL's existing Gorgon GTP GHGMP (Ref. 432) (and as approved under the EP Act [WA]) outlines: • measures implemented through the design and early phase of operations to avoid or reduce GHG emissions • measures to avoid, reduce and offset Proposal GHG Emissions[55] during operations over the life of the proposal • emission limits, required by condition 27.1, for Net GHG Emissions[55] over the life of the proposal. The GHGMP is applicable to all direct GHG emissions from the current operational Gorgon Gas Development facilities (as outlined in MS 800), including the three LNG processing trains, domestic gas unit, and Carbon Dioxide Injection System. Similarly, the Carbon Dioxide Injection System is required to inject underground at least 80% of reservoir CO_2 (calculated on a 5-year rolling average) removed during gas processing operations on Barrow Island that would be otherwise vented to the atmosphere. These arrangements are documented under the primary approvals and associated conditions for the Gorgon Gas Development and detailed in control measures below. There are also other, non-petroleum related legislation that are related to GHG emissions reporting and management, such as the NGER Act (Cth) and Safeguard Mechanism, to which the Gorgon Gas Development is required to comply. Therefore, given there is sufficient legal mechanisms to monitor and report on the GHG emissions associated with the Gorgon Gas Development (to which the activities within scope of this EP are just a component of), there is no uncertainty regarding the appropriateness of GHG emissions reporting and management. CAPL is committed to conducting activities in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continuous improvement. This commitment to continuous improvement means that CAPL reviews the GHGMP periodically and considers measures to avoid, reduce and offset emissions, including advances in technology and/or operational processes, and considers adoption of those technologies that offer a practicable way of reducing GHG emissions per tonne of LNG. Reviews also address matters such as the overall design and effectiveness of the GHGMP, progress in environmental performance, changes in business conditions, and any relevant emerging environmental issues. Given the GHG emissions associated with the activities detailed in this EP result in a *de minimis* contribution to the reduction of the global carbon budget (relative to the total global carbon budget), CAPL considers this aspect to comprise a lower-order impact and risk (Table 5-3). As such, CAPL applied ALARP Decision Context A for this aspect. Notwithstanding this, CAPL has

[55] Proposal GHG Emissions and Net GHG Emissions are defined within MS 1198.

Source	
considered additional mitigation measures that could potentially lower the contribution to the reduction of the global carbon budget associated with the direct and indirect emissions arising from the activities covered in this EP.	
Good practice control measures and source	
Control measure	**Source**
EP Act approval	The Gorgon Gas Development was approved with conditions under the EP Act (WA) (see Section 7.5.4). Ministerial Statement 800 (and as amended by MS 1198) includes conditions relating to the management of GHG emissions for the Gorgon Gas Development, specifically the implementation of a Reservoir Carbon Dioxide Injection System (Condition 26) and a *Greenhouse Gas Management Plan* (Condition 27). The Carbon Dioxide Injection System was required to be designed and constructed so that it was capable of injecting 100% of reservoir carbon dioxide (CO_2) removed during gas processing operations. CAPL must implement all practicable means to inject all reservoir CO_2removed during gas processing operations. The Carbon Dioxide Injection System is required to inject underground at least 80% of reservoir CO_2 (calculated on a 5-year rolling average) removed during gas processing operations on Barrow Island that would be otherwise vented to the atmosphere. The objectives of the *Gorgon GTP Greenhouse Gas Management Plan* (Ref. 432) are to outline: • measures implemented through the design and early phase of operations to avoid or reduce GHG emissions • measures to avoid, reduce and offset Proposal GHG Emissions[56] during operations over the life of the proposal • emission limits, required by condition 27.1, for Net GHG Emissions[56] over the life of the proposal.
EPBC Act approval	The Gorgon Gas Development was approved with conditions under the EPBC Act (Cth) (see Section 7.5.4). Both EPBC References 2003/1294 and 2008/4178 included conditions relating to the management of the Carbon Dioxide Injection System for the Gorgon Gas Development, specifically the requirement to prepare and implement a monitoring program (Condition 19).
National Greenhouse and Energy Reporting and Safeguard Mechanism schemes	As described in Section 7.5.2.4, the 'Gorgon Operations Facility' is registered with the CER as a facility under both the NGER and Safeguard Mechanism schemes. The scope of the Gorgon Operations Facility includes both the GTP and any activities within Commonwealth waters. From July 2016 GHG emissions have been subject to a baseline in accordance with the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015. Under the 2023 Safeguard Mechanism reforms this baseline will decline by 4.9% each financial year from 2023–2034 through to 2029–2030. The subsequent baseline decline rates will be set in 5-year blocks consistent with updates to Australia's NDC under the Paris Agreement (Ref. 420). The Safeguard Mechanism baseline for the Gorgon Operations Facility for the 2022–2023 financial year was 8.34 Mt CO2-e. Consequently, CAPL will continue to monitor and report GHG emissions, and maintain a baseline, under this legislation.
GHG emissions reductions for the Gorgon Gas Development	As described above, there are currently several existing requirements for the management and reduction of GHG emissions from the Gorgon Gas Development. For the next 5-year in-force period of this EP, the following commitments are in place:

[56] Proposal GHG Emissions and Net GHG Emissions are defined within MS 1198.

Source	
	• condition 26 of MS 1198—at least 80% of Reservoir CO_2[57] is injected underground, and offsets acquired for the quantity of Reservoir CO_2 that is not injected underground • condition 27 of MS 1198—Net GHG Emissions[56] from the GTP do not exceed – 5.22 Mt CO_2-e per financial year until 30 June 2030 – 4.25 Mt CO_2-e per financial year for the period between 1 July 2030 and 30 June 2035 • safeguard mechanism—the GHG emissions 'baseline' for the Gorgon Operations Facility – declines by 4.9% per financial year between 2023–2034 and 2029–2030 – post 2029–2030, the baseline declines by 3.285% or at a rate defined within a revision to the *National Greenhous and Energy Reporting (Safeguard Mechanism) Rule 2015* – offsets are required for any GHG emissions above this baseline limit. As acknowledged in Section 0, it is anticipated that the State Government will initiate a review of existing Ministerial Statements under section 46 of the EP Act (WA) to align requirements with the amended *Greenhouse Gas Emissions Policy for Major Projects*. CAPL will comply with all requirements for the management and reduction of GHG emissions that are in-force at any given time.
Corporate governance	Chevron Corporation has set an aspirational target of net zero upstream Scope 1 and Scope 2 emissions by 2050, as well as reduction targets for two metrics: portfolio carbon intensity (PCI) and upstream carbon intensity (UCI) (Ref. 427) The PCI metric developed by Chevron Corporation represents the "[e]stimated energy-weighted average GHG emissions intensity from a simplified value chain from the production, manufacturing, distribution and end use of marketed energy products per unit of energy delivered"[58] (Ref. 427). The Chevron Corporation PCI target for 2028 (71 g CO_2-e/MJ)is a corporate level target incorporating GHG emissions from all Chevron operated assets and non-operated joint ventures. The timing of the Chevron Corporation PCI reduction target is aligned with the Global Stocktake process under the Paris Agreement (the second Global Stocktake will occur in 2028). Within CAPL operational control, Scope 1 and Scope 2 emissions, and Gorgon gas and liquids production data (used to calculate estimated Scope 3 emissions) are compiled, assured, and reported by CAPL to Chevron Corporation annually for inclusion in the PCI metric on an equity basis. Management strategies, projects or improvements that serve to reduce Gorgon Gas Development emissions per unit production will contribute to the overall PCI metric. The UCI metrics developed by Chevron Corporation are equity-based "emissions intensity metrics for oil production, gas production, flaring, and methane"[59] (Ref. 427). The Chevron Corporation UCI target for 2028 (24 kg CO_2-e/boe for gas carbon intensity) is a corporate level target incorporating GHG emissions from all Chevron operated assets and non-operated joint ventures. UCI includes Scope 1 and Scope 2 emissions. Within CAPL operational control, Gorgon gas and liquids production, and Scope 1 and Scope 2 emissions data, are compiled, assured, and reported by CAPL to Chevron Corporation annually for inclusion in the UCI metric, which is depicted on an equity basis. Management strategies, projects, or improvements that serve to reduce Gorgon Gas Development emissions per unit production will contribute to the overall UCI metric.

[57] Reservoir CO_2 and Net GHG Emissions are defined within MS 1198.

[58] PCI as defined within the *2023 Climate Change Resilience Report*, at pg 67.

[59] UCI as defined within the *2023 Climate Change Resilience Report*, at pg 69.

Source	
	Adopting intensity metrics provides Chevron Corporation the flexibility to grow their upstream and downstream businesses while aiming to become an increasingly carbon-efficient operator (Ref. 427). Chevron Corporation has also established several low-carbon business (e.g. carbon capture utilisation and storage [CCUS] and carbon offsets) related targets for 2030.
GHG optimisation process	Chevron Corporation uses several key strategic processes, including a marginal abatement cost curve (MACC) process, to support their ability to operate in a lower carbon future (Ref. 427). Chevron Corporation source GHG emissions reduction opportunities from operated and non-operated assets and applies both deterministic and probabilistic decision analysis practices. Chevron Corporation use portfolio theory and efficient frontier analysis to identify a portfolio of opportunities across the technology spectrum, segments, business units and geographies. The MACC tool is used to visualise this portfolio of carbon reduction opportunities by cost and by magnitude of emission reductions, which enables Chevron Corporation to prioritise the most cost-efficient reductions. MACC also refers to the internal enterprise process for optimised selection of the most efficient carbon reduction projects for corporate funding. Funding for carbon reduction projects is allocated to the business units during the annual business planning process, with the aim of supporting projects that most cost efficiently reduce carbon intensity across the enterprise. This enterprise-level MACC process enables Chevron Corporation to make progress towards its GHG reduction targets. CAPL regularly evaluates carbon emission reduction projects for opportunities to avoid, eliminate, or reduce emissions. Continual improvement processes, including but not limited to MACC evaluations, allow CAPL to rank emission reduction opportunities by their relative cost and abatement potentials. The scope of the MACC process is activities within CAPL operational control (e.g. with respect to Gorgon Gas Development operations, this includes the offshore hydrocarbon system and the GTP on Barrow Island). As described in the GHGMP, CAPL has already started implementing this GHG optimisation process for the Gorgon Gas Development (e.g. retrofitting of infrastructure so that there is no routine flaring or venting of MEG flash gas vapours during normal operations). The key stages in the enterprise-level MACC process, and the intersect points with CAPL include: • opportunity identification by CAPL cross-functional team (with input from all Gorgon Joint Venture participants) • opportunity development and submission by CAPL to Chevron Corporation • enterprise-wide analysis and portfolio optimisation by Chevron Corporation • opportunity selection for funding by Chevron Corporation • operationalisation and implementation of the opportunity by CAPL • project tracking and knowledge sharing to ensure constant learning and continuous improvement.
Marine Order 97: Marine Pollution Prevention – Air Pollution	Prior to commencement of vessel-based activities, Chevron Corporation's Offshore Vessel Information System (OVIS) assessment requirements within Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard (Ref. 35) is used to verify that all vessels comply with Marine Order 97: Marine Pollution Prevention – Air Pollution (appropriate to vessel class) for emissions from combusting fuel, including: • vessels will hold a valid International Air Pollution Prevention (IAPP) certificate and a current international energy efficiency (IEE) certificate • all vessels (as appropriate to vessel class) will have a Ship Energy Efficiency Management Plan (SEEMP) as per MARPOL 73/78 Annex VI

Source	
	• vessel engine nitrous oxides (NOx) emission levels will comply with Regulation 13 of MARPOL 73/78 Annex VI.
Vessel supply contract	IMR vessels are not on permanent hire by CAPL so there is an opportunity to evaluate vessel CO_2 emissions at the time of contracting. When looking to hire an IMR vessel, CAPL will incorporate an evaluation of CO_2 emissions within the tender evaluation process.
Fuel consumption	Vessel fuel usage will be monitored and recorded during the petroleum activity such that usage (and therefore associated GHG emissions) are managed to only those required to perform the petroleum activity.
Legislative and other requirements review	CAPL is committed to continual improvement and adaptive management processes, and regularly monitors for revised or contemporary Australian regulatory and/or relevant international guidelines or standards in relation to GHG and carbon management. With specific reference to international shipping, CAPL is aware that the IMO is continually updating their mandatory measures to reduce emissions from international shipping. The commercial arrangements governing all export shipping engaged in loading cargoes from the Gorgon Marine Terminal, requires CAPL and their partners to procure ships that comply with international and Australian standards, so to the extent that a ship's Flag State, or AMSA as Port State, adopts IMO resolutions for measures to reduce emissions, these will apply to those third-party vessels (as well as Chevron Shipping vessels).
Address uncertainty	CAPL acknowledges the residual uncertainty associated with evaluation of potential environmental impacts and risks from GHG emissions. Uncertainty arises from limitations in climate science, including climate modelling, revised forecasts in global energy mix, and subsequent changes in regulatory and policy requirements. These areas are expected to evolve and new information to become available over the in-force period of this EP. As such, CAPL is committed to implementing an adaptive management process to ensure that impacts and risks associated with this aspect are continually reduced to ALARP and managed to acceptable levels. To address the residual uncertainty associated with impacts and risks from the generation of GHG emissions, the following adaptive management process will be implemented: • Monitor: – contemporary climate science in relation to Corporate climate risk management (as sourced from the periodic release of Chevron Corporation's *Climate Change Resilience* report – historical and forecast global energy mix and associated emissions, including the role of Gorgon product types – revised or contemporary Australian regulatory and/or relevant international guidelines or standards (as per 'legislative and other requirements review' control measure) • Evaluate: – review the accuracy of, and validate, the estimated downstream indirect GHG emissions associated with the Gorgon Gas Development – review and validate the environmental impact and risk assessment for GHG emissions to ensure that GHG emissions are being reduced to ALARP and managed to an acceptable level • Adjust and implement: – identify improvements (e.g. to emission estimates, consequence evaluation, control measures, determination of acceptability, etc.) and implement changes as required. CAPL will implement this adaptive management process annually during the in-force period of this EP. The results of the annual monitoring and evaluation will be documented internally by CAPL. Where this annual

Source		
	review identifies improvements, any changes to the EP will be managed as per the MoC (Section 8.17.2.2) and Environment Plan review (Section 8.19) processes.	
Emissions management opportunities	Chevron Corporation supports the global ambitions of the Paris Agreement and continues to take actions to help lower the carbon intensity of our operations while continuing to meet the world's demand for energy (Ref. 427). Chevron Corporation supports well-designed climate policy to achieve global GHG emissions reductions as efficiently and effectively as possible. This approach is actioned through global engagement, research and innovation, balanced and measured policy, and transparency (Ref. 427). CAPL monitors new and evolving opportunities to work with business partners downstream of our operational control to seek to advance its ambition of managing emissions, including through industry partnerships, research agreements, and commercial opportunities for business diversification into lower carbon energy solutions and/or complimentary technologies for improved efficiency. This is an ongoing process, with opportunities identified, assessed, and implemented on an ad-hoc basis. With any significant technology development, these opportunities may develop over a medium to long term timeframe (i.e. greater than the 5-year in-force periods of EPs).	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
(Avoid) Use non-hydrocarbon powered vessels	If non-hydrocarbon (e.g. hydrogen, wind) powered vessels were used for the program, CAPL could avoid emissions associated with fuel combustion from IMR support vessels. However, for activities under this EP, this avoidance of emissions is minimal (fuel combustion from IMR vessels was estimated at 0.006 Mtpa CO_2-e; Section 7.5.5.3) on both a project and global scale. Consequently, the benefit would be negligible.	No commercially viable vessels are currently available to implement the activities discussed in this EP. Consequently, the practicability of using vessels with alternative fuel sources to avoid direct emissions is not considered practicable.
(Reduce) Always use lower carbon intensive vessels	If vessels utilising a lower carbon intensive power source (e.g. dual-fuel, LNG, hybrid, battery-supported, etc.) were always used for the program, CAPL could reduce emissions associated with typical marine fuel combustion from IMR support vessels. However, for activities under this EP, this reduction of emissions is minimal (fuel combustion from IMR vessels was estimated at 0.006 Mtpa CO_2-e; Section 7.5.5.3) on both a project and global scale. Consequently, the benefit would be negligible.	IMR vessels are supplied under an ongoing contract with CAPL. IMR vessels are considered vessels of opportunity from within the suppliers' fleet, with the selection based on the location, type, and availability of suitable vessels, for the individual IMR scope/s. Most IMR vessels are sourced from southeast Asia (e.g. Singapore) or within Australian waters; and have previously included diesel electric vessels (i.e. vessels with lower marine fuel consumption). Any delay to IMR schedules and operational activities due to waiting on the availability of a specific power-sourced vessel introduces the potential of production delays and safety costs that are disproportionate to the environmental benefit of reducing GHG emissions. In addition, sourcing vessels from other regions introduces greater transit

Source		
		emissions to relatively short-term IMR scopes. Consequently, it is not currently considered practicable to always use vessels with alternative power sources to reduce direct GHG emissions.
(Reduce) Use lower carbon intensive vessels	If non-hydrocarbon (e.g. hydrogen) powered vessels were used for the program, CAPL could avoid emissions associated with fuel combustion from IMR support vessels. However, for activities under this EP, this avoidance of emissions is minimal (fuel combustion from IMR vessels was estimated at 0.006 Mtpa CO2-e; Section 7.5.5.3) on both a project and global scale. Consequently, the benefit would be negligible.	No commercially viable vessels are currently available to implement the activities discussed in this EP. Consequently, the practicability of using vessels with alternative fuel sources to avoid direct emissions is not considered practicable.
(Avoid) Use renewable electricity to power the hydrocarbon system and GTP	If a renewable energy source (e.g. solar) was available then the associated emissions from power generation from the gas turbines on Barrow Island would be avoided. However, there is a limited Development Envelope allowed for use on Barrow Island, and the construction of any renewable energy source and supply would require an increase to the land disturbance allowed under existing environmental approvals and bring in new environmental impacts.	The cost of implementing this control is grossly disproportionate to the level of risk reduction achieved. Consequently, the practicability of using renewable energy sources to avoided emissions for the activities covered in this EP is not considered practicable.
(Avoid) Eliminate flaring	The design basis for the GTP specifies no routine flaring during normal operations other than flare pilots and purged gas. Three flare systems have been incorporated into the GTP design. The wet and dry flare systems safely and reliably collect and dispose of hydrocarbon vapour and liquids during commissioning, start-up, and operations, process upsets, or emergencies. The BOG flare system is an independent flare system that collects and disposes of emergency operational releases from the low-pressure LNG Storage and Loading System. The flare systems are considered a safety critical element and cannot be eliminated. Eliminating flaring would introduce safety and production risks and therefore is not a reasonably practicable alternative.	The potential production and safety costs are disproportionate to the environmental benefit of avoiding flaring emissions, and is therefore not a reasonably practicable alternative
Likelihood and risk level summary		

Source	
Likelihood	N/A
Risk level	N/A
Determination of acceptability	
Principles of ESD	The potential environmental impacts and risks associated with this aspect is a *de minimis* contribution to the reduction of the global carbon budget. The consequence associated with this aspect was evaluated as Incidental (6). One of the UN 2030 Agenda sustainable development goals (SDGs) is "ensure access to affordable, reliable, sustainable and modern energy for all" (Ref. 456). Chevron Corporation's purpose "is to provide the affordable, reliable, ever-cleaner energy that enables human progress" (Ref. 457). Chevron Corporation invests in health, education, and economic development with the goal of creating measurable and enduring value. Through membership in International Petroleum Industry Environmental Conservation Association (IPIECA), Chevron Corporation has worked with the World Business Council for Sustainable Development on the creation of an SDG Roadmap for the oil and gas sector. The Roadmap identifies how IPIECA, as an industry association, and Chevron Corporation can work toward a lower-emissions future while contributing to the 2030 Agenda. The principle of inter-generational equity is considered to be met for the Gorgon Gas Development. Energy is fundamental to society, and access to reliable and affordable energy sources is interlinked with their ability to sustainably develop and maintain health, diversity, and productivity for future generations (Ref. 458). Natural gas provides both a reliable and affordable energy source and is one of the lower emission fossil fuels. The continued use of natural gas is in line with Australia's *Future Gas Strategy* (Ref. 414), the natural gas from the Gorgon Gas Development is produced with similar or lower emissions intensity than other comparable gas supplies on the North West Shelf, the use of natural gas is considered to support Australia's transition to lower carbon intensive fuels, and the natural gas from the Gorgon Gas Development provides an ongoing supply of natural gas to meet continuing global energy demand. In addition, as described in Section 7.5.5.4.1, the current major sales markets for LNG from the Gorgon Gas Development are countries that have also ratified the Paris Agreement and established their own NDCs for managing emissions (or have equivalent targets established in their country). The Parties to the Paris Agreement acknowledge that climate change is a common concern of humankind and the Parties should consider their respective obligations, including intergenerational equity. If Australia achieves its efforts to meet net zero by 2050, then it will contribute to global efforts to keep warming to the Paris Agreement target of below 2°C above pre-industrial levels and reduce the risks and impacts of climate change. Through supporting Australian and global efforts to manage GHG emissions (including Paris Agreement targets) and associated risks and impacts of climate change, the risks of adverse impacts to access and connection to Country are managed thereby mitigating adverse risks to the rights of First Nations people to practice and revitalise their cultural traditions and customs (as per Article 11 of the United Nations Declaration on the Rights of Indigenous People; Ref. 229). Consequently, the principle of intergenerational equity is considered to be met because the Gorgon Gas Development is accounted for in Australia's carbon budget and therefore Australia's efforts to keep warming to the Paris Agreement target of below 2°C above pre-industrial levels and reduce the risks and impacts of climate change, thereby ensuring that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The control measures identified and described above are considered to reduce the impacts and risks to ALARP. In particular, that GHG emissions from the Gorgon Gas Development will be managed to within an emissions footprint of 9.47 Mtpa CO_2-e (Section 7.5.4) and also adaptively managed

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">via the GHGMP (Ref. 432), Safeguard Mechanism reforms (Section 7.5.2.4), and EP review process (Section 7.5), demonstrates CAPL's commitment to GHG management.
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered relevant to this aspect include:
Environment Protection and Biodiversity Conservation Act 1999 (Cth)
Environmental Protection Act 1986 (WA)
National Greenhouse and Energy Reporting Act 2007 (Cth)
National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth)
Marine Order 97
MARPOL 73/78
Conservation Management Plan for the Blue Whale 2015–2025 (Ref. 95)
Conservation Advice Balaenoptera borealis Sei Whale (Ref. 68)
Conservation Advice Balaenoptera physalus Fin Whale (Ref. 67)
National Recovery Plan for the Southern Right Whale (Ref. 224)
Conservation Advice Rhincodon typus Whale Shark (Ref. 164)
Recovery Plan for the White Shark (Carcharodon carcharias) (Ref. 459)
Recovery Plan for Marine Turtles in Australia (Ref. 118)
Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle) (Ref. 460)
Wildlife Conservation Plan for Seabirds (Ref. 453)
Wildlife Conservation Plan for Migratory Shorebirds (Ref. 302)
North-west Marine Parks Network Management Plan 2018 (Ref. 252)
Marine bioregional plan for the North-west Marine Region (Ref. 454).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>EPBC Act (Cth) and EP Act (WA)
The Gorgon Gas Development was approved with conditions under the EPBC Act (Cth) and EP Act (WA) (see Section 7.5.4). Approval conditions under the EP Act (WA), as described in MS 800 and MS 1198, include the use of the Carbon Dioxide Injection System and reducing Net GHG Emissions over time (to be net zero by 2050).</td><td>Primary environmental approvals for the Gorgon Gas Development are already in place. Implementation of approval conditions is ongoing. The requirements relating to GHG emissions have been incorporated into the EP Act approval, EPBC Act approval, and GHG emissions reductions for the Gorgon Gas Development control measures.</td></tr>
<tr><td>NGER Act and Safeguard Mechanism
The 'Gorgon Operations Facility' 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 2023 Safeguard</td><td>The requirements relating to GHG emissions reporting and reductions have been incorporated into the NGER and Safeguard Mechanism schemes, and GHG emissions reductions for the Gorgon Gas Development control measures.</td></tr>
</table></td></tr>
</table>

Source		
	Mechanism reforms also require that the baseline for the facility reduces annually at the prescribed rate (currently 4.9% per financial year).	
	Marine Order 97 Gives effect to Annex VI of MARPOL 73/78	IAPP and IEE certificate (as per Division 2), SEEMP (as per Division 6), and nitrogen oxides emission requirements (as per Division 3) have been incorporated into the **Marine Order 97—Marine pollution prevention—air pollution** control measure
	Conservation Management Plan for the Blue Whale 2015–2025 Management Action A.3.1: Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica	As described in the above consequence evaluation, the estimated direct and indirect GHG emissions associated with the petroleum activity are considered *de minimis* and are not considered to prevent Australia from meeting its international agreements (i.e. NDCs under the Paris Agreement). Therefore, this petroleum activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale 2015–2025*, *Conservation Advice for Sei Whale*, *Conservation Advice for Fin Whale*, *National Recovery Plan for the Southern Right Whale*, or the *Recovery Plan for Marine Turtles in Australia*.
	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	
	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	
	National Recovery Plan for the Southern Right Whale (Eubalaena australis) Management Action A3.1: Continue to meet Australia's international commitments to address causes of climate change, including greenhouse gas emissions	
	Recovery Plan for Marine Turtles in Australia Management Action A2.1: Continue to meet Australia's international commitments to address the causes of climate change.	
	Conservation Advice Rhincodon typus Whale Shark No specific conservation action identified.	N/A
	Recovery Plan for the White Shark (Carcharodon carcharias)	N/A

Source		
	No specific management action identified.	
	Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle) No specific conservation action identified.	N/A
	Wildlife Conservation Plan for Seabirds No specific conservation action identified.	N/A
	Wildlife Conservation Plan for Migratory Shorebirds No specific conservation action identified.	N/A
	North-west Marine Parks Network Management Plan 2018 No specific zone rules identified.	N/A
	Marine bioregional plan for the North-west Marine Region No specific strategies or actions identified.	N/A
Internal context	These management processes or procedures were deemed relevant for this aspect: • Chevron Corporation's Climate Change Resilience (Ref. 427) • Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard (Ref. 286). Control measures related to the above management processes or procedures 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 stakeholder consultation, no objections or claims were raised regarding greenhouse gas emissions arising from the activity	
Defined acceptable level	These risks are inherently acceptable as they are considered lower-order risks in accordance with Table 5-3 . In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan. However, in alignment with Section 5.20.2, given that climate is listed as a threat to protected matters under documents made or implemented under the EPBC Act, CAPL has defined an acceptable level of impact such that it is not inconsistent with these documents. Objectives of the relevant documents are shown below:	
	Plan	**Objective**
	Conservation Management Plan for the Blue Whale 2015–2025	Recovery objective: 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 objective 4: Anthropogenic threats are demonstrably minimised.

Source		
	National Recovery Plan for the Southern Right Whale (Eubalaena australis)	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 Interim objective 2: Anthropogenic threats are managed consistent with ecologically sustainable development principles to facilitate recovery of southern right whales
	Recovery Plan for Marine Turtles in Australia	Recovery objective: The long-term recovery objective for marine turtles is to 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 3: Anthropogenic threats are demonstrably minimised.
	North-west Marine Parks Network Management Plan 2018	As per Section 4.19.1
	Marine bioregional plan for the North-west Marine Region	Objective 1: Conserving biodiversity and maintaining ecosystem health Objective 2: Ensuring the recovery and protection of threatened species
	Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents: • not materially or substantially contributing to Australia's GHG emissions, and as such, subsequently not preventing Australia meeting international GHG emission commitments. CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the impacts and risks related to GHG emissions, that the risk to values of AMPs and the NWMR are also subsequently managed to this acceptable level. Australia is a party to the Paris Agreement and is currently committed to reducing GHG emissions by 43% below 2005 levels by 2030, and achieving net zero by 2050. The objective of the Paris Agreement includes to hold "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). Australia will submit its second NDC to the UNFCCC in 2025. The Australian Government acknowledges that "Australia is committed to supporting global emissions reductions to reduce the impacts of climate change and will reach net zero emissions by 2050" (Ref. 417). Moreover, by 2021–2022 Australia has already reduced GHG emissions by 29% since 2004–2005 (Ref. 423). Australia is "committed to remaining a reliable supplier of LNG" and "[h]onouring long-term LNG contractual obligations is essential to maintaining trusted relationships with our international partners, and to providing the energy security necessary to progress decarbonisation plans" (Ref. 414). By providing low emission energy exports (LNG) and by not materially or substantially contributing to Australia's GHG emissions, the Gorgon Gas Development is not inconsistent Australia's global efforts to reach net zero by 2050 based on Australia's carbon budget. If Australia achieves its efforts	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">to meet net zero by 2050, then it will contribute to global efforts to keep warming to the Paris Agreement target of well below 2°C above pre-industrial levels and significantly reduce the risks and impacts of climate change.
As discussed within the above consequence evaluation, based on the predicted emissions, the Gorgon Gas Development has a de minimis contribution to the reduction of the global carbon budget (relative to the total global carbon budget). Given that anthropogenic changes to the global climate system cannot be directly attributed to any one development or emission source or product, CAPL considers that the Gorgon Gas Development will meet the defined acceptable level of “not materially or substantially contributing to Australia’s GHG emissions, and as such, subsequently not preventing Australia meeting international GHG emission commitments” by managing their emissions to within the approved emissions footprint of 9.47 Mtpa CO_2-e (Section 7.5.4). Additionally, there are other regulatory management plans (i.e. the GHGMP), and other regulatory reporting and emission reduction mechanisms (i.e. the NGER and Safeguard Mechanism schemes) in place to ensure that GHG emissions from the Gorgon Gas Development are adaptively managed in line with best practice and contemporary legislative and other requirements.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td rowspan="5">Do not materially or substantially contribute to Australia not meeting its international GHG emissions commitments by managing direct and indirect GHG emissions associated with Gorgon Gas Development in Australia* to within an emissions footprint of 9.47 Mtpa CO_2-e</td><td colspan="2">EP Act approval
Because implementation of the EP Act Approval is a regulatory requirement, no EPS has been developed for this requirement.</td></tr>
<tr><td colspan="2">EPBC Act approval
Because implementation of the EPBC Act Approval is a regulatory requirement, no EPS has been developed for this requirement.</td></tr>
<tr><td colspan="2">NGER and Safeguard Mechanism schemes
Because NGER reporting is a regulatory requirement, no EPS has been developed for this requirement. The Safeguard Mechanism baseline is a requirement that needs to be met. The Safeguard Mechanism sets a GHG baseline, which declines annually at a prescribed rate. Any exceedance is required to be offset through multi-year averaging or the purchase of Australian carbon credit units (ACCUs) or Safeguard Mechanism credit units (SMCs).</td></tr>
<tr><td>GHG emissions reductions for the Gorgon Gas Development
CAPL will implement GHG emissions management and reductions aligned with any in-force requirements of approvals under the EP Act (WA) and Safeguard Mechanism, including:
injection underground of at least 80% of Reservoir CO_2
offsets for the quantity of Reservoir CO_2 not injected underground
Net GHG Emissions from the GTP are within the limits set in condition 27.1 of MS 1198
the Safeguard Mechanism baseline for the Gorgon Operations Facility</td><td>Records show that relevant GHG emission management targets have been met</td></tr>
</table>

Source		
	declines each financial year at rates as defined within the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 – offsets are required for any GHG emissions above this baseline limit. Note: The requirements under this control measure may be amended from time to time, and this control measure will be revised to reflect any contemporary requirements.	
	GHG emissions reduction review CAPL will implement its emissions reduction review to identify emissions reduction opportunities (within its operational control) for the Gorgon Gas Development to be included in an enterprise-wide selection process	Records show that annual review of emissions reduction opportunities was performed
	GHG optimisation process CAPL will measure and investigate >5% annual increases to absolute Scope 1 and Scope 2 emissions or emissions intensity	Records show that Gorgon asset total emissions (t CO_2-e) and upstream intensity (t CO_2-e/t LNG) are measured, root cause of annual increases >5% are investigated, and where practicable, improvement opportunities are evaluated through the MACC process
	Corporate governance CAPL will support Chevron Corporation's aspiration of managing global upstream emissions by implementing management strategies, projects, or improvements for the Gorgon Gas Development selected during an enterprise-wide selection process	Records show that when upstream emissions management strategies, projects, or improvements have been selected for the Gorgon Gas Development, these are implemented as soon as reasonably practicable (with consideration given to the scope, planned turnaround schedule, and scale of the activity)
	Corporate governance CAPL will report Scope 1 and Scope 2 emissions data from the Gorgon Gas Development to Chevron Corporation annually for inclusion in the calculation of its UCI metric	Records show that annual emissions data from the Gorgon Gas Development was provided to Chevron Corporation
	Corporate governance CAPL will support Chevron Corporation's aspiration of managing global portfolio emissions by implementing management strategies, projects, or improvements for the Gorgon Gas Development selected during an enterprise-wide selection process	Records show that when portfolio emissions management strategies, projects, or improvements have been selected for the Gorgon Gas Development, these are implemented as soon as reasonably practicable (with consideration given to the scope, planned turnaround schedule, and scale of the activity)

Source		
	Corporate governance CAPL will report Scope 1 and Scope 2 emissions data from the Gorgon Gas Development to Chevron Corporation annually for inclusion in the calculation of its PCI metric	Records show that annual emissions data from the Gorgon Gas Development was provided to Chevron Corporation
	Marine Order 97: Marine Pollution Prevention – Air Pollution Prior to commencement of vessel-based activities, the following will be verified: • vessels will hold a valid International Air Pollution Prevention (IAPP) certificate and a current international energy efficiency (IEE) certificate • all vessels (as appropriate to vessel class) will have a Ship Energy Efficiency Management Plan (SEEMP) as per MARPOL 73/78 Annex VI • Vessel engine nitrous oxides (NOx) emission levels will comply with Regulation 13 of MARPOL 73/78 Annex VI.	OVIS report / ABU Marine OE Inspection Checklist confirms vessels hold IAPP and IEE certificates, and a SEEMP is in place (as appropriate to class), and NOx emission levels comply with regulations
	Fuel combustion Vessel fuel usage will be recorded during the petroleum activity	Records confirm vessel fuel usage during the petroleum activity
	Vessel supply contract The tender evaluation for the vessel supply contracts will include an evaluation of CO_2 emissions	Records indicate that tender evaluation for vessel supply contracts included a consideration of vessel CO_2 emissions
Manage downstream indirect GHG emissions^ associated with Gorgon Gas Development	**Legislative and other requirements reviews** CAPL will undertake annual monitoring of revised or contemporary Australian regulatory requirements, and applicable international guidelines or standards, in relation to carbon management of downstream indirect GHG emissions	Records show that annual monitoring of revised or contemporary Australian regulatory requirements, and applicable international guidelines or standards, in relation to carbon management of downstream indirect GHG emissions was undertaken
	Address uncertainty CAPL will undertake an annual adaptive management process to address the residual uncertainty associated with impacts and risks from the generation of GHG emissions, specifically including: • monitoring the historical and forecast global energy mix and associated	Records show that an annual adaptive management process addressing downstream indirect GHG estimates was undertaken

Source		
	emissions, including the role of Gorgon product types • review of the accuracy of estimated downstream indirect GHG emissions associated with the Gorgon Gas Development to validate the estimates used as the basis for the impact and risk assessment • review of the environmental impact and risk assessment for GHG emissions to ensure that GHG emissions are being reduced to ALARP and managed to an acceptable level.	
	Address uncertainty If the above annual monitoring and evaluation identify improvement opportunities to manage downstream indirect GHG emissions, then CAPL will implement these changes within this EP in accordance with the MoC (Section 8.17.2.2) and EP Review (Section 8.19) processes	As required, records show that the MoC and/or EP review process were undertaken in response to any improvement opportunities related to the management of downstream indirect GHG emissions
	Emissions management opportunities CAPL will evaluate opportunities to partner with organizations that promote and address GHG emissions reduction and carbon offsets in the LNG value chain, and advocate for LNG and natural gas as fuels of choice	Records show that opportunities to promote and address greenhouse gas emissions reduction and carbon offsets in the LNG value chain, and advocating for LNG and natural gas as fuels of choice have been evaluated annually
	Corporate governance CAPL will report production and emissions data from the Gorgon Gas Development to Chevron Corporation annually for inclusion in the calculation of its PCI metric	Records show that annual production and emissions data from the Gorgon Gas Development was provided to Chevron Corporation

** Where 'direct and indirect GHG emissions associated with Gorgon Gas Development in Australia' refers to the direct emissions associated with activities within this EP plus the indirect emissions from processing gas at the GTP on Barrow Island.*

^ Where 'downstream indirect GHG emissions' refers to the emissions associated with transport, and third party end-use of LNG, condensate and domestic gas products.

7.6 Light emissions

Source

Activities identified as having the potential to result in light emissions include:

- navigation and operational lighting from the FCS
- field support—navigation and operational lighting from vessels during the petroleum activity within the OA.

Potential impacts and risks

Impacts	C	Risks	C
Light emissions may result in: • localised and temporary change in ambient light	6	A change in ambient light may result in: • attractant for light-sensitive species • change in predator-prey dynamics	5

Consequence evaluation

Localised and temporary change in ambient light

Vessels will be present within the OA during IMR and commissioning and start-up of the SCSt. As detailed in Section 3.19.3, vessels may be on site for up to ~200 days, for a given IMR activity, depending on the type and complexity of the activity. As activities under this EP may be undertaken 24 hours a day, lighting is required at night for navigation and to ensure safe operations when working on the vessels.

Similarly, lighting will be required on the FCS to maintain safe navigation for other marine users. Additional task lighting may be required during maintenance campaigns on the FCS.

Monitoring undertaken by Woodside (Ref. 323) indicates that light density from lighting on a drill rig attenuated to below 1.00 lux and 0.03 lux at distances of ~300 m and ~1.4 km, respectively. Light densities of 1.00 lux and 0.03 lux are comparable to natural light densities experienced during deep twilight and during a quarter moon.

Previous modelling of light emissions from a pipelay vessel indicated that at distances ~1.8–5.7 km from the pipelay vessel, light may be visible however is not expected to be biologically relevant and result in behavioural impacts (Ref. 325).

Lighting on the FCS and IMR vessels is expected to be similar or less intense than lighting on a drill rig and/or pipelay vessel, and therefore the use of previous monitoring (Ref. 323) and modelling (Ref. 325) is considered a conservative approach to inform this consequence evaluation.

CAPL expects that its activities will result in changes to ambient light conditions in the order of kilometres from the emission sources. While the vessels will be a temporary light source (of varying duration), the FCS is a permanent light source offshore. However, during routine operations, the lighting on the FCS will predominantly be for safe navigation purposes and the associated exposure footprint is expected to be smaller than during maintenance campaigns (up to ~14 days per campaign with approximately ~5 campaigns per year). Therefore, the impacts associated with a direct change in ambient light levels were determined to be Incidental (6).

Concurrent activities

For the purposes of this risk assessment, the most likely scenario that may involve concurrent activities would be an IMR activity occurring in proximity to the FCS during a period of campaign maintenance. The longest duration of potential concurrent activities in proximity to each other could occur would therefore be approximately ~14 days (the expected duration of a maintenance campaign), however the likelihood of overlap, is extremely unlikely given the frequency of IMR and campaign maintenance on the FCS. Furthermore, IMR activities typically involve a moving vessel such that the duration of overlap, if it was to occur is likely to significantly less than the duration of the FCS maintenance. Given that the light emissions sources from both activities are likely to only affect ambient lighting for a few kilometres, the very low likelihood of activity overlap as well having a very low duration of overlap, direct change in ambient light levels due to concurrent activities in not assessed as a credible risk and therefore is not considered further.

Change in fauna behaviour for light-sensitive species

Source
Light-sensitive fauna (including reptiles, birds and fish) are the species most at risk from this aspect and thus are the focus of this evaluation. As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs and/or habitat critical to the survival of a species also overlap with the OA, including: • fairy tern, lesser crested tern, roseate tern, wedge-tailed shearwater (breeding BIAs) • whale shark (foraging BIA) • flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA, and internesting habitat critical to the survival of a species). The *National Light Pollution Guidelines* (Ref. 16) indicate that a 20 km buffer or exposure area can provide a general precautionary light impact limit based on observed effects of sky glow on marine turtle hatchlings demonstrated to occur at 15–18 km (Ref 110, Ref 111) and fledgling seabirds grounded in response to artificial light 15 km away (Ref. 112). 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. 113) and that lighting can attract birds from large catchment areas (Ref. 114) Anthropogenic disturbance (including artificial lighting) is identified as a threat within the *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 178), and light pollution is identified as a threat within the *Wildlife Conservation Plan for Seabirds* (Ref. 178). 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. 114). The mechanism of birds being attracted to light is not proven, but it is proposed that the artificial lighting may override the internal magnetic compass of migratory shorebirds or nocturnal seabirds (Ref. 277). However, Marquenie (Ref. 278) estimated that a change in migratory behaviour of birds was limited to <5 km from the source. Further, previous light modelling (Ref. 325) of a pipelay installation vessel predicts that light emissions are expected to be visible, but not be biologically relevant or result in behavioural impacts at distances >1.8 km from a vessel. Therefore, this type of impact is expected to be spatially restricted to the immediate vicinity of the vessel/s or FCS and affect only individuals (rather than populations). *The Recovery Plan for Marine Turtles in Australia* (Ref. 118) identifies light emissions as a key threat because it can disrupt critical behaviours, such as nesting, hatchling orientation, sea finding, and hatchling dispersal behaviour. The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) defines the nesting habitat critical for the survival of each species at a stock level. The closest nesting habitat critical to the survival 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. 118). At its closest, the OA is located ~5.5 km from the coast of Barrow Island (i.e. the 3 nm coastal waters limit) and IMR activities may be undertaken in this area. As light emissions are expected to be visible, but not be biologically relevant or result in behavioural impacts at distances >1.8 km from an IMR vessel, no coastal areas (and therefore no adult nesting turtles, or turtle hatchlings) are expected to be exposed. Artificial light may result in varied ecological changes to fish, including changes to predatory behaviour and abundance (Ref. 253, Ref. 254), altering hatching success (Ref. 255), acting as an attractant for plankton (Ref. 256), or altering circadian behavioural rhythms (Ref 254). Changes in natural light conditions (i.e. constant light or darkness) also was shown to negatively affect normal larval development and resulted in increased malformations and poor survival in various fish species (Ref. 256). The whale shark BIA is associated with foraging behaviours during northward migration from the Ningaloo Reef seasonal aggregation area, along the 200 m isobath during July to November (Ref. 126). IMR activities may be undertaken within the whale shark foraging BIA, however the section of the OA associated with operation of the FCS does not intersect with the BIA. Light has not been identified as a key threat for the whale shark (Ref. 126) and it is expected that the effects of lighting will be limited to a temporary and localised impact on individual whale sharks when transiting in close proximity to IMR vessels. Cetaceans predominantly use acoustic senses rather than visual sources to monitor their environment (Ref. 66), so light is not considered to be a significant factor in cetacean behaviour or survival.

Source
The EPBC listed (migratory) dugong may have an intermittent and transitory presence within the OA. Artificial light has not been identified as a pressure within the NWMR for this species (Ref. 314). The EPBC threatened short-nosed sea snake or leaf-scaled sea snake are not expected to be present within the OA given known habitat preferences for shallow water and reef habitat; light has also not been identified as a threat for either species (Ref. 115, Ref. 116). While other EPBC marine listed sea snake species may occur in broader habitats within the NWMR, snakes are inactive at night (Ref. 117). As such, light is not considered to be a significant factor in sea snake behaviour or survival. Given that light emissions have the potential to cause localised and temporary impacts to individuals over the course of the petroleum activity, CAPL has ranked the consequence associated this impact as Minor (5).
ALARP decision context justification
Offshore commercial operations and subsequent light emissions arising from these activities are commonplace in offshore environments nationally and internationally. During stakeholder consultation, no objections or claims were raised regarding light emissions arising from the activity. The impacts and risks associated with light emissions are well understood and considered lower-order impacts and risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures and source

Control measure	Source
Marine Standard	Chevron's *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) ensures that various legislative requirements are met. This includes ensuring that lighting sufficient for navigational, safety and emergency requirements are met, as appropriate to vessel class.
Light management	Depending on activity-specific timing, activities may overlap with the predicted turtle nesting seasons, or seabird breeding seasons. As a conservative management measure, 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 vessels will also make use of window coverings (e.g. blinds) during night operations to shield internal lights from view. The OA is located ~5.5 km from the nearest coast (Barrow Island) and as such, no measurable change in light from the vessels will occur at coastal locations. Table 5, Table 8, and Table 11 within the *National Light Pollution Guidelines for Wildlife* (Ref. 16) 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 management options as identified within the *National Light Pollution Guidelines for Wildlife* (Ref. 16) for marine turtles, seabirds, and migratory shorebirds: • implement light management actions during nesting and hatchling (marine turtles), breeding (seabirds), or peak migration (migratory shorebirds) periods • aim lights downwards and direct them away from nesting areas (marine turtles, seabirds) • reduce unnecessary lighting at sea by restricting external lighting to the minimum required for safe operations and navigation
Activity-specific Hazard Identification and Risk Assessment	Where the petroleum activity is required to be undertaken at night within habitat critical to the survival of a marine turtle species and during predicted peak nesting periods (Table 4-14), an activity-specific HIRA will be conducted to identify and manage risks to marine turtles. If potential significant activity-related stressors to marine turtles are present, these management measures will be considered where practicable:

Source	
(HIRA)—marine turtles	• risk-based inspections of vessels will be undertaken before mobilisation to identify potential strategies to reduce artificial light spill from vessels • if marine turtles are sighted near the path of a vessel, vessels will divert to avoid them (if safe to do so), or slow down to idling speed • vessels working at night within critical habitat and during turtle season will be required to reduce lighting to the minimum required for safe operations. • Where the HIRA identifies that risks and impacts are potentially greater than those assessed in this EP, the management of change process will be triggered (Section 8.17.2.1)

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
External vessel lighting to use: • flashing or intermittent lights instead of fixed beam • motion sensors to turn on lights only when needed • luminaires with spectral content appropriate for the species present • avoid high intensity light of any colour.	Replacing external lighting on vessels with lighting that is flashing, intermittent, or motion triggered, or of a particular spectral signature and/or intensity, may have the potential to further reduce the impact of artificial light on marine fauna. Light emissions from vessels are not expected to be biologically relevant or result in behavioural impacts at distances >1.8 km from a vessel; and at its closest, the OA is located ~5.5 km from any coast and potential nesting area. The implementation of these additional light management controls are considered to be of limited environmental benefit, and would not result in a reduction of residual risk.	The cost of retrofitting external lighting of the vessels is considered grossly disproportionate to the limited environmental benefit (and no change in residual risk) they may provide for marine fauna. Therefore, this control measure has not been adopted for use.
Use curfews to manage lighting	The *National Light Pollution Guidelines* (Ref. 16) suggests the use of curfews may assist in managing artificial lighting around nesting beaches (marine turtles), rookeries during fledgling period (seabirds), or near nocturnal foraging and roosting areas in coastal habitats (migratory seabirds). One of the mechanisms for implementing this is the use of motion sensors—this has been considered in the above control measure, and is not repeated here. Other mitigation options refer to the user of timers to extinguish lighting around turtle nesting beaches after 8 pm, or near seabird or migratory shorebird rookeries after 7 pm.	The cost of implementing lighting curfews, either by retrofitting external lighting with motion sensors (as considered above), or by implementing restricted night operations (e.g., no operations after 7 pm or 8 pm) is considered grossly disproportionate to the limited environmental benefit (and no change in residual risk) they may provide for marine fauna. Therefore, control measure has not been adopted for use.

Source		
	The intent of the curfews is to manage artificial light in coastal areas to minimise any disruption to biological important behaviours. Given that light emissions from vessels are not expected to be biologically relevant or result in behavioural impacts at distances >1.8 km from a vessel, and at its closest, the OA is located ~5.5 km from any coast, the implementation of curfews are considered to be of limited environmental benefit and would not result in a reduction of residual risk.	
Petroleum activity schedule—Adjust to avoid seabird breeding periods	Seabird species with BIAs that intersect with the OA are known to nest on islands within the vicinity (e.g. Montebello Islands, Double Island) (Sections 4.17.3.4.1, 4.17.3.4.2, 4.17.3.4.3, 4.17.3.4.4). The predicted breeding periods for the Australian Fairy Tern, Lesser Crested Tern, Roseate Tern, and Wedge-tailed Shearwater collectively cover all months of the year (Table 4-14). As such, scheduling the petroleum activity to avoid the breeding period for all seabirds is not possible.	N/A
Petroleum activity schedule—Adjust to avoid predicted fledging period for Wedge-tailed Shearwaters	Wedge-tailed Shearwaters typically depart their WA colonies in early-April to early-May (Section 4.17.3.4.3, Table 4-14). The nearest known nesting colony is Double Island, ~15 km from the OA and on the opposite side (east coast) of Barrow Island. Given the location of the breeding colony on Double Island, the lighting from the installation vessels is unlikely to be visible from this island, or substantially contribute to existing skyglow from operating facilities on Barrow Island. As such, scheduling the petroleum activity to avoid the predicted fledging period for Wedge-tailed Shearwaters is considered to be of limited environmental benefit, and would not result in a reduction of residual risk.	The cost of implementing temporal schedule restrictions is considered grossly disproportionate to the limited environmental benefit (and no change in residual risk) they may provide for Wedge-tailed Shearwaters. Therefore, control measure has not been adopted for use.
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of this petroleum activity, vessel activities are likely to be focused within offshore waters away from the coast. As such the likelihood of exposing sensitive receptors resulting in the identified consequence was considered Remote (5).	
Risk level	Very low (9)	
Determination of acceptability		

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The impact associated with this aspect is disruption to light-sensitive species behaviour, which given the location, is not considered as having the potential to affect biological diversity and ecological integrity.
The impact associated with this aspect is Incidental (6).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered for this aspect include:
Commonwealth Navigation Act 2012
National Light Pollution Guidelines (Ref. 16)
Recovery Plan for Marine Turtles in Australia (Ref. 118)
Wildlife Conservation Plan for Migratory Shorebirds (Ref. 453)
Wildlife Conservation Plan for Seabirds (Ref. 448)
Conservation Advice Rhincodon typus Whale Shark (Ref. 164)
Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) (Ref. 115)
Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) (Ref. 116)
North-west Marine Parks Network Management Plan 2018 (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Navigation Act 2012 (Cth)
Use of lights and signals as per COLREGS and Marine Order 30</td><td>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.</td></tr>
<tr><td>National Light Pollution Guidelines
Undertake an environmental impact assessment</td><td>This section provides an impact assessment for artificial light exposure 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.</td></tr>
<tr><td>Recovery Plan for Marine Turtles in Australia
Management action A8.1: 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
Management action A8.3: Identify the cumulative impact on turtles from multiple sources of onshore and offshore light pollution</td><td>Exposure areas from light emissions from vessel activities (including any potential cumulative effects from concurrent activities), and any associated impacts or risks, have been described in the above consequence evaluation.
The control measures identified above are considered appropriate to manage the risk to marine turtles to ALARP. Given the unsuitability of the majority of the OA as internesting habitat, the extent of changes to ambient light exposures does not overlap with any nesting areas, and the control measures in place, the activity is not considered to be inconsistent with the Recovery Plan for Marine Turtles in Australia.</td></tr>
<tr><td>Wildlife Conservation Plan for Migratory Shorebirds
No specific action identified.</td><td>N/A</td></tr>
<tr><td>Wildlife Conservation Plan for Seabirds</td><td>N/A</td></tr>
</table></td></tr>
</table>

Source		
	No specific action identified.	
	Conservation Advice Rhincodon typus 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	This section provides an impact assessment and consideration of control measures for vessel light spill. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Rhincodon typus Whale Shark.*
	Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A
	North-west Marine Parks Network Management Plan No specific zone rules identified.	N/A
Internal context	CAPL's environmental performance standards / procedures considered relevant to this aspect include: • Gorgon Gas Development and Jansz Feed Gas Pipeline: Long-term Marine Turtle Management Plan (Ref. 156).	
External context	During stakeholder consultation, no objections or claims were raised regarding light emissions arising from the activity.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan. However, in alignment with Section 5.20.2 where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents. Objectives of the relevant documents are shown below:	
	Plan	**Objective**
	Recovery Plan for Marine Turtles in Australia	Recovery objective: The long-term recovery objective for marine turtles is to 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 3: Anthropogenic threats are demonstrably minimised.

Source		
	Wildlife Conservation Plan for Migratory Shorebirds	Objective 1: Protection of important habitats for migratory shorebirds has occurred throughout the East Asian-Australasian Flyway (EAAF) Objective 3: Anthropogenic threats to migratory shorebirds in Australia are minimised or, where possible, eliminated.
	Wildlife Conservation Plan for Seabirds	Objective 2: Seabirds and their habitats are identified, protected and managed in Australia.
	North-west Marine Parks Network Management Plan 2018	As per Section 4.19.1.
	Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents: • impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species • no displacement of marine turtles from habitat critical to the survival of a species • no disruption of biologically important behaviours of marine turtles within biologically important areas • no disruption of biologically important behaviours of migratory shorebirds or seabirds within important habitats • no adverse change to the values of the Montebello Marine Park. CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the risk to values of the AMP are also subsequently managed to this acceptable level.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No displacement of marine fauna, or disruption of biologically important behaviours of marine fauna, from biologically important areas, important habitats, or habitat critical to the survival of a species from the petroleum activity	**Vessel lights and signals** In accordance with regulatory requirements, vessels will implement light and signals appropriate to the nature of their operations	Records indicate that vessel lights and signals were consistent with the requirements of COLREGS and the *Navigation Act 2012 (Cth)* during the petroleum activity
	Light management 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 working deck area	Inspection records during night operations confirm only minimum lighting for safe operations and navigation is in use and, where practicable, operational lighting is directed downwards to working deck area.
No adverse change to the values of Australian Marine Parks	**Activity-specific HIRA** Where IMR activities are required to be undertaken at night within critical habitat and during turtle nesting season (September to March), an activity-specific HIRA will be	Records show that activity-specific HIRA undertaken prior to IMR activity commencing

Source		
from petroleum activity	undertaken prior to IMR activity commencing	
	Activity-specific HIRA—marine turtles Where required, these management measures will be considered where practicable: • risk-based inspections of vessels will be undertaken before mobilisation to identify potential strategies to reduce artificial light spill from vessels • if marine turtles are sighted near the path of a vessel, vessels will divert to avoid them (if safe to do so), or slow down to idling speed • vessels working at night within critical habitat and during turtle nesting season will be required to reduce lighting to the minimum required for safe operations	Where undertaken, vessel inspection records show identified opportunities to reduce vessel artificial light spill
		Vessel marine fauna sighting records show if marine turtle interactions occurred within habitat critical for survival during predicted peak nesting period and what mitigation (e.g., divert or slow vessel) measure was implemented
		Inspection records during night operations within habitat critical for survival during predicted peak nesting period and what mitigation confirm only minimum lighting for safe operations is used

7.7 Underwater sound—Non-impulsive

Non-impulsive underwater sound will be emitted by vessels undertaking activities within the OA, and from the SCSt. The impact and risk assessment for each activity is detailed in Section 7.7.1 and Section 7.7.2 respectively, with a cumulative impact assessment provided in Section 7.7.2.5.

The characteristics of sound emissions from vessels undertaking activities within the OA and the SCSt are different, with sound emissions from vessels typically temporary and spatially variable within the OA, whereas SCSt sound emissions will occur at the SCSt location on an ongoing basis. Consequently, separate Sound EMBAs related to the behavioural response threshold for marine mammals (i.e. the largest sound emission exposure for each sound source) are defined in the following manner.

- Sound EMBA associated with typical vessel-based IMR activities – 5 km[60] buffer around the OA (see Figure 7-1)
- Sound EMBA associated with SCSt maintenance using an Offshore Construction Vessel (OCV) – 17.1 km horizontal radius around the SCSt location (Figure 7-1)
- Sound EMBA associated with the operation of the SCSt 1.1 km horizontal radius around the SCSt location (Figure 7-1).

[60] Note that underwater sound modelling (Ref. 325) predicted the maximum horizontal distance to reach behavioural response noise effect criteria for a suitable analogue for vessel-based IMR activities to be 3.76 km (Table 7-5), however CAPL has conservatively applied a 5 km buffer around the OA to delineate the Sound EMBA associated with typical vessel-based IMR activities.

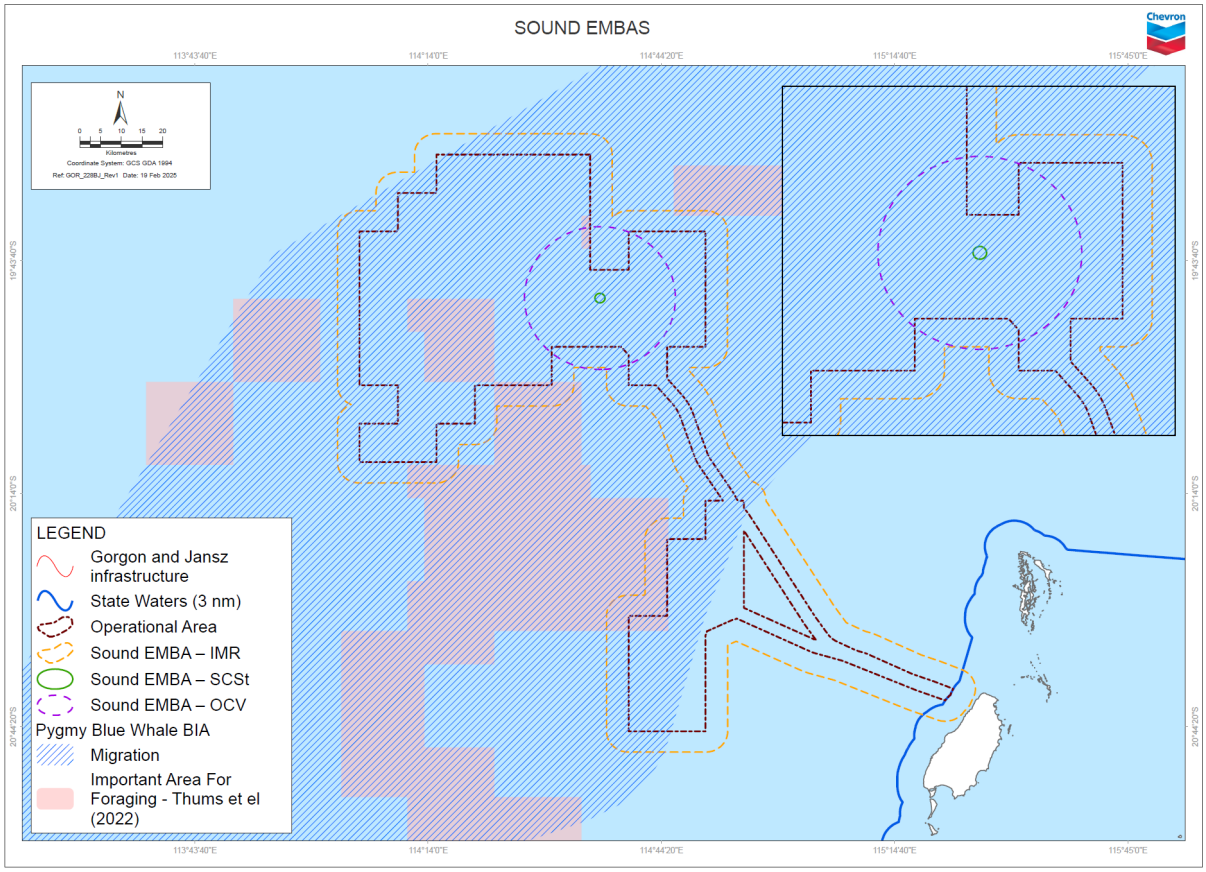


Figure 7-1: Sound EMBAs for non-impulsive underwater sound associated with vessels and the SCSt.

7.7.1 Underwater sound—Non-impulsive (field support)

7.7.1.1 Sound source level

CAPL commissioned JASCO Applied Sciences to conduct acoustic modelling to inform the risk assessment associated with underwater sound exposure from vessel operations for the *Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan* (Ref. 7) and the *Gorgon Backfill Fields Offshore Project Proposal* (Ref. 326). The scenarios modelled in the JASCO studies are used as suitable analogues for activities undertaken for this petroleum activity, given the similarity in water depth and sound source of vessels used, as summarised in Table 7-3.

Vessel broadband sound emissions are predominantly produced from propellers and thruster cavitations, with a smaller proportion of the emissions produced from vibrations transmitted through the hull from engines, gearing, and other mechanical systems. (Ref. 166)

The modelling was undertaken to assist in understanding the potential acoustic impact on receptors including marine mammals, sea turtles, and fish.

The modelling methodology considered scenario specific source levels and range dependent environmental properties. Estimated underwater received acoustic levels for non-impulsive (continuous) sound sources are presented as sound pressure level (SPL), and as accumulated sound exposure levels (SEL) as appropriate for different noise effect criteria (Ref. 166).

Table 7-3: Project vessel activities and their analogues activity for which acoustic modelling has previously been undertaken (Ref. 166 and Ref. 324).

Activity number	Activity type	Number of vessels required for the Activity	Analogue in JASCO acoustic modelling study	Water depth of acoustic modelling (m)[61]	Activity duration (days)[62]	Broadband source level of acoustic modelling (dB re 1 µPa^{2}m^{2}s)
1	IMR – Nearshore	1	Nearshore cable lay, under DP	27	~10-200	Cable lay vessel[63]: 178.9
2	IMR – Offshore	1	Offshore IMR vessel, under DP	1,275	~10-200	IMR vessel[64]: 180.87
3	IMR – Continental Shelf	1	Continental shelf IMR vessel, under DP	145	~10-200	IMR vessel: 180.87
4	J-IC SCSt commissioning	1	Offshore IMR vessel, under DP	1,211	~90	IMR vessel: 180.87
5	J-IC SCSt maintenance (compressor and pump module change-out)	1-2	OCV, and multi-purpose support vessel, all under DP	1,338	~5 days per module	OCV: 195.0 Support vessel: 182.7
6	Temporary power – subsea battery recharge and replacement	1	Offshore IMR vessel, under DP	1,211	~7	IMR vessel: 180.87
7	Temporary power – downline cable	1	Offshore IMR vessel, under DP	1,211	~200	IMR vessel: 180.87

[61] Approximate water depth is taken from JASCO modelling studies (Ref. 167 and Ref. 324), considered representative of vessel activities across the OA.

[62] Duration of the vessel activities in this EP as provided in Section 3.

[63] Cable lay vessel used to install the HVSC (Ref. 7), the vessel has a similar noise profile to a vessel typically used to undertake IMR.

[64] The *Skandi Hercules* has been used which is considered to be conservative given it is slightly larger than vessels used for typical IMR activities.

In the absence of modelling, the estimates of SPL from helicopter operations (149–162 dB re 1 µPa) (Ref. 167) have been used for the purposes of behavioural thresholds for this consequence evaluation. Given the nature of helicopter operations (i.e. crew transfers) covered under this EP, exposure to sound from this source for an extended period (e.g. 12 or 24 hours) is not credible, and as such, comparison against the cumulative SEL criteria is not relevant.

7.7.1.2 Exposure criteria

Species groups perceive and respond to sound differently, and so a variety of exposure criteria for the different types of impacts and species groups have been considered. The following noise effect thresholds, based on current best available science, have been used in the impact and risk assessment:

- frequency-weighted accumulated sound exposure levels (SEL_{24h}) for the onset of auditory injury (including but not limited to PTS[65]) and temporary threshold shift (TTS[66]) in marine mammals, based on the updated US National Marine Fisheries Service Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0)[67] (Ref. 413) (Table 7-4)
- un-weighted SPL for behavioural threshold for marine mammals based on the current interim US National Oceanic and Atmospheric Administration (NOAA) criteria (Ref. 101) (Table 7-4)
- frequency-weighted accumulated sound exposure levels (SEL_{24h}) from Finneran et al (Ref. 104) for the onset of PTS and TTS in marine turtles (Table 7-4)
- sound exposure guidelines for behavioural effects in marine turtles from Popper et al (Ref. 102) (Table 7-4)
- sound exposure guidelines for fish, fish eggs, and larvae from Popper et al (Ref. 102) (Table 7-4).

Commonwealth guidance has defined “injury to blue whales” as both AUD INJ and TTS hearing impairment, as well as any other form of physical harm arising from anthropogenic sources of underwater noise (Ref. 103).

[65] The updated guidance defines auditory injury (AUD INJ) as damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (Ref. 414). Auditory injury includes but is not limited to permanent threshold shift (PTS).

[66] TTS is a temporary reduction in an animal’s hearing sensitivity due to receptor hair cells in the cochlea becoming fatigued.

[67] CAPL commissioned CMST to complete a comparison (Ref. 327) of the underwater sound studies completed by JASCO (Ref. 325) against the updated National Marine Fisheries Service 2024 criteria. Note the revised criteria does not address the auditory weighting functions or threshold criteria for turtles or fish, nor behavioural disruption thresholds for impulsive or non-impulsive noise sources. Therefore, these criteria and the corresponding results remain unchanged from previous guidance referenced.

Table 7-4: Noise effect criteria for non-impulsive sound for different types of impacts and species groups

Receptor	Mortal or potential mortal injury	Recoverable injury	AUD INJ	TTS	Masking	Behavioural
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}: 181dB re 1 μPa^2s	N/A	SPL: 120 dB re 1 µPa
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	SPL: 120 dB re 1 µPa
Sirenians	N/A	N/A	SEL_{24h}: 206 dB re 1 μPa^2s	SEL_{24h}: 200 dB re 1 μPa^2s	N/A	SPL: 120 dB re 1 µPa
Marine turtles	N/A	N/A	SEL_{24h}: 220 dB re 1 μPa^2s	SEL_{24h}: 200 dB re 1 μPa^2s	N/A	(N) High (I) Moderate (F) Low
Fish (no swim bladder) (relevant to sharks)	(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)	(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)	(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
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) High (I) Moderate (F) Low

Relative risk (high, moderate, low) is given for fauna at three distances from the source (near [N], intermediate [I] and far [F]).

7.7.1.3 Modelling outputs

Underwater sound modelling studies (Ref. 166, Ref. 324 and Ref. 327) predicted the following maximum horizontal distances (R_{max}) to reach noise effect criteria for non-impulsive sound for marine fauna (see Table 7-5 and Table 7-6). Table 7-5 shows the worst case R_{max} distances for all vessel-based, typical IMR activities modelled except for Activity 5 (where an OCV is required – refer to Table 7-3). R_{max} distances for Activity 5 are shown in Table 7-6.

SEL_{24h} is a cumulative metric that reflects the dosimetric impact of noise levels on receptors based on the assumption that a receptor is continuously exposed to the predicted noise levels over 24 hours. Given the life-history and physiological traits of marine fauna, they are not expected to remain within the same location for a 24-hour period. Therefore, a modelled exposure area for the SEL_{24h} criteria does not mean that marine fauna present within this area will be impaired, but rather that they could be exposed to the sound level associated with auditory effects (either AUD INJ or TTS) if they remained within the ensonified location for 24 hours.

Table 7-5: Modelled maximum horizontal distances (R_{max}) to reach noise effect criteria for non-impulsive sound from all activities based on one support-sized vessel (i.e. all activities except Activity 5)

Receptor	Recoverable injury	Auditory Injury	Temporary threshold shift	Behavioural
Low-frequency cetaceans	N/A	SEL_{24h}: 0.05 km	SEL_{24h}: 0.32 km	SPL: 3.76 km
High-frequency cetaceans	N/A	SEL_{24h}: –	SEL_{24h}: 0.06 km	SPL: 3.76 km
Very high-frequency cetaceans	N/A	SEL_{24h}: 0.06 km	SEL_{24h}: 0.13 km	SPL: 3.76 km
Marine turtles	N/A	SEL_{24h}: –	SEL_{24h}: 0.05 km	N/A
Sirenians[68]	N/A	SEL_{24h}: –	SEL_{24h}: 0.05 km	SPL: 3.76 km
Fish (swim bladder involved in hearing)	SPL for 48 hours: –	N/A	SPL for 12 hours: –	N/A

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 7-6: Modelled maximum horizontal distances (R_{max}) to reach noise effect criteria for non-impulsive sound from Activity 5 based on a larger construction vessel

Receptor	Recoverable injury	Auditory Injury	Temporary threshold shift	Behavioural
Low-frequency cetaceans	N/A	SEL_{24h}: 0.30 km	SEL_{24h}: 1.95 km	SPL: 17.1 km
High-frequency cetaceans	N/A	SEL_{24h}: 0.02 km	SEL_{24h}: 0.12 km	SPL: 17.1 km
Very high-frequency cetaceans	N/A	SEL_{24h}: 0.13 km	SEL_{24h}: 2.27 km	SPL: 17.1 km
Marine turtles	N/A	SEL_{24h}: 0.02 km	SEL_{24h}: 0.15 km	N/A
Sirenians	N/A	SEL_{24h}: 0.02 km	SEL_{24h}: 0.15 km	SPL: 17.1 km
Fish (swim bladder involved in hearing)	SPL for 48 hours: –	N/A	SPL for 12 hours: 0.10 km	N/A

[68] Sirenians were not explicitly modelled as part of the study so the indicative distances in this table are based on having impairment thresholds similar to marine turtles (for TTS and PTS – see Table 7-4) and the same behavioural thresholds as other marine mammals (for SPL – see Table 7-4).

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

7.7.1.4 Pygmy blue whale exposure modelling

In addition to the acoustic modelling study, JASCO undertook an acoustic exposure analysis for migrating pygmy blue whales (Ref. 166), which describes the modelled predictions of sound levels that individual pygmy blue whales may receive when OCV use is required (Activity 5).

Sound exposure distribution estimates are determined by moving large numbers of simulated animals ('animats') undertaking 'biologically meaningful movements' through a modelled time-evolving sound field, computed using specialised sound source and sound propagation models (Ref. 166). This approach provides the most realistic prediction of the maximum expected SPL, and the temporal accumulation of sound exposure levels (SEL_{24h}) for comparison against the relevant thresholds (Ref. 166).

The JASCO Animal Simulation Model Including Noise Exposure (JASMINE) was used to model the movement of pygmy blue whales through the predicted sound field. Biologically meaningful movement rules were applied to each animat in the model to represent realistic whale behaviours. The parameters used for forecasting realistic behaviours (e.g. diving and foraging depths, swim speed and surface times) were determined and interpreted from studies of specific species (e.g. pygmy blue whale tagging studies) where available, or reasonably extrapolated from related or comparable species (Ref. 166).

Scenarios were run for migrating animats restricted to their respective migratory BIAs as well as unrestricted.

The modelled 95th percentile exposure ranges (ER95%) from sources associated with Activity 5 to the relevant noise effect criteria for pygmy blue whales is shown in Table 7-7 (Ref. 166).

Exposure ranges for SPL behavioural response criteria are typically comparable to the predicted acoustic ranges. Acoustic ranges are conservatively calculated using the maximum-over-depth sound fields while exposure ranges account for animats sampling the sound field vertically based on species-specific diving parameters, so exposure ranges are often slightly lower than acoustic ranges (Ref. 166).

Exposure ranges from animat modelling for AUD INJ and TTS criteria are typically shorter than those predicted using acoustic propagation modelling because of the generally shorter time ('dwell time') to accumulate sound energy of the moving animats (Ref. 166).

Table 7-7: Modelled 95th percentile exposure ranges ($ER_{95\%}$) and probability of exposure (P_{exp}), compared to modelled maximum horizontal distances maximum horizontal distances (R_{max}) from Activity 5 in Table 7-3 to reach pygmy blue whale noise effect criteria for non-impulsive sound (Ref. 166)

Modelling	Parameter	Auditory Injury	Temporary threshold shift	Behavioural
Acoustic modelling	R_{max}	SEL_{24h}: 0.30 km	SEL_{24h}: 1.95 km	SPL: 17.1 km
Pygmy blue whale (northern migration)^	$ER_{95\%}$	SEL_{24h}: 0.01 km	SEL_{24h}: 0.05 km	SPL: 13.1 km
	P_{exp}	6%	64%	99%

A dash indicates no animat was exposed above the threshold.

P_{exp} is the probability of animats travelling within the ER95% being exposed above the threshold.

^ Results are shown for animats not restricted to within a BIA boundary.

7.7.1.5 Risk Assessment

Source

Field support activities identified as having the potential to result in non-impulsive underwater sound include:

- vessel or helicopter operations during the petroleum activity (including installation and pre-commissioning, or IMR activities) within the OA.

Potential impacts and risks

Impacts	C	Risks	C
Underwater sound emissions may result in: • localised change in ambient underwater sound	5	A change in ambient underwater sound may result in: • behavioural disturbance • auditory impairment, TTS, AUD INJ, recoverable or non-recoverable injury to marine fauna • changes to values and sensitivities of marine protected areas	5 - 5

Consequence evaluation

Localised change in ambient underwater sound

Anthropogenic underwater sound emitted during the petroleum activity will result in a change in ambient noise levels.

Ambient underwater broadband 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 in areas with 'biological choruses' (many individuals of the same species vocalising near simultaneously in reasonably close proximity to each other) (Ref. 105). Low-frequency ambient sound levels (20–500 Hz) are frequently dominated by distant shipping and some great whale species. Light weather-related sounds are generally in the 300–400 Hz range, with waves and rainfall dominating the 500–50,000 Hz range (Ref. 105).

Studies of underwater sound generated from offshore vessels when holding position (on DP) demonstrate measured SPL up to 137 dB re 1 µPa at 405 m and 120 dB re 1 mPa at ~3-4 km from the sound source (Ref. 161). When underway at ~12 knots vessel sound of 120 dB re 1 µPa was recorded at 0.5–1 km (Ref. 161).

Sound emitted from helicopter operations is typically below 500 Hz (Ref 161). 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 161). Richardson et al (Ref. 107) 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 details above, the consequence of vessel or helicopter operations causing a change in ambient underwater sound has been assessed as Minor (5), as it will result in a localised environmental impact limited to the duration of vessel operations and returning to ambient levels on completion.

Concurrent activities

As outlined in Section 3.19, during routine operations, concurrent vessel-based activities may be required within the same field. For example, SCSt maintenance (e.g. module retrieval and replacement) and IMR activities associated with other subsea infrastructure within the Jansz–Io fields may be undertaken concurrently. Concurrent activities are expected to be infrequent and the period in which vessels are operating in close proximity is expected to be of short duration (days to weeks).

Source
Furthermore, typical IMR vessel operations occur at <5 knots such that this interaction would be of a limited duration (in the order of hours), with the IMR vessel moving away from the vessel holding station, such that the cumulative impacts associated with concurrent activities associated with underwater sounds emissions was determined to be Minor (5).
Marine Mammals *Behavioural response* Based on acoustic modelling (Table 7-5), the maximum radial distance in any direction to the behavioural effect noise criteria for marine mammals for typical, vessel-based IMR activities is 3.76 km from the sound source. Acoustic modelling for vessels associated with SCSt maintenance (where an OCV is required) indicates the maximum radial distance in any direction to the behavioural effect noise criteria for marine mammals is 17.1 km from the sound source (Table 7-6). As identified in (Section 4.17.3 and appendix e), several cetacean species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Sound EMBA. The threatened and/or migratory cetaceans that may be present within the Sound EMBA are low-frequency and high-frequency cetaceans (appendix e). A migration BIA for the pygmy blue whale overlaps with part of the offshore extent of the Sound EMBA (seaward of the Gorgon field); with peak migration periods occurring May to June, and November to December. The humpback whale migration BIA also overlaps part of the Sound EMBA (landward of the Gorgon field) with migration occurring between June and October. Very high-frequency cetaceans (e.g. *Kogia* spp.) were identified as species or species habitat that may occur within the Sound EMBA (appendix e) but are not listed as threatened and/or migratory under the EPBC Act. The PMST database also indicates that dugongs may be present within the Sound EMBA in shallower waters close to Barrow Island (Table 4-5). Except for pygmy blue whales and humpback whales, there are no known BIAs for other cetacean species within or adjacent to the Sound EMBA; and it is expected that any presence of other marine mammal species within the transient Sound EMBA would be of a transitory nature. As such the following consequence evaluation focusses on low-frequency cetaceans. As the Sound EMBA overlaps a migration BIA for humpback whales, there is the potential for whales to be present within this area during the predicted migration periods (June to October). IMR activities on the feedgas pipeline system located between the State and Commonwealth waters boundary and the Gorgon gas field may occur within the humpback whale migration BIA. Studies (Ref. 109) suggest that northbound humpback whales tend to travel around the 200 m water depth contour, while southbound humpback whales tend to travel closer to Barrow Island and generally occur between 50 m and 200 m water depths. The Sound EMBA overlaps the migration BIA for pygmy blue whales between the Gorgon and Jansz–Io fields, and there is the potential for this species to be present during migration periods (May to June, and November to December). Vessel-based IMR activities, FCS maintenance and SCSt maintenance may be undertaken in this area. The Sound EMBA also intersects with areas that have been identified as 'most important' and 'suitable areas' for pygmy blue whale migration along the west coast (Figure 4-8) (Ref. 106). However, it is expected based on satellite tracking and acoustic detection studies that pygmy blue whales are likely to travel further offshore than the defined BIA, particularly on their southern migration (November to December), but also during the northern migration (Section 4.17.3.1.2). The 'Possible Foraging Areas' as defined within the Conservation Management Plan for the Blue Whale (Ref. 95), and characterised as foraging BIAs, occur >120 km southwest and >870 km northeast of Sound EMBA. Data from a study (Ref. 96) identified 'most important areas' for foraging for the pygmy blue whale based on proxy indicators. A recent study identified suitable foraging habitat from the southern extent to the northeastern edge of WA (Ref. 106). This area occurred almost exclusively on the continental slope (91%), with a small amount of suitable habitat in the deep ocean floor (7%) and on the shelf (2%). There is overlap between these 'most important areas' and 'suitable areas' for foraging and the Sound EMBA ((see Figure 4-9). However, the use of this area is not expected to be continual throughout the year as it is associated with pygmy blue whale migration timing. Furthermore, foraging areas are known to be dynamic given their dependence on presence of prey (Ref. 96; Ref. 129) and oceanographic conditions (Ref. 106, Ref. 127, Ref. 128). Animat modelling for pygmy blue whales indicated that the maximum distance to the behavioural noise effect criteria from vessel-based activity associated with maintenance of the SCSt (where OCV use is required) was ~13.1 km (Table 7-7) which is not dissimilar to the distance (~17.1 km

Source
in Table 7-6) from acoustic modelling for low-frequency cetaceans. Note that SCSt maintenance using an OCV is only expected to occur every ~5 years. The duration of underwater sound emissions from vessels within the Sound EMBA will vary with activity, ranging from ~10 days for short inspections and maintenance to ~200 days for more significant maintenance and repairs (Activities 1-4, 6 and 7). SCSt module change-out requiring the use of an OCV is expected to be completed within ~10 days (Activity 5). Estimates of SPL for helicopters range 149–162 dB re 1 µPa (Ref. 161), which is above the noise exposure criterion for behavioural response. However, the spatial and temporal extent of the potential exposure to underwater sound from helicopters is limited (e.g. 38 seconds at 3 m depth, and 11 seconds at 18 m depth; (Ref. 107). The helicopter operations covered under this EP are short discrete trips (i.e. crew transfers to and from the FCS and IMR vessels, as required). Therefore, given the limited nature of the exposure, potential impacts from helicopters on cetacean behaviour are not evaluated further. Given that the behavioural response threshold for sirenians is the same as for cetaceans (see Table 7-4), the predicted ensonified area of impact is identical (see Table 7-5 and Table 7-6) and therefore the consequence evaluation for cetaceans applies for sirenians. Furthermore, sirenians typically inhabit shallower waters close to land so there is only a small part of the OA where they may be encountered and the OA and Sound EMBA do not overlap any BIAs for sirenians. Consequently, only localised short-term behavioural impacts to transient individual marine mammals have the potential to arise from these activities and have therefore been evaluated as Minor (5). *Behavioural response (concurrent activities)* As outined in Section 3.19, during routine operations, concurrent vessel-based activities may be required within the same field. For example, SCSt maintenance (e.g. module retrieval and replacement) and IMR activities associated with other subsea infrastructure within the Jansz–Io fields may be undertaken concurrently. Concurrent activities are expected to be infrequent and the period in which vessels are operating in close proximity is expected to be of short duration (days to weeks). Furthermore, typical IMR vessel operations occur at <5 knots such that this interaction would be of a limited duration (the order of hours), with the IMR vessel moving away from the vessel holding station, such that the cumulative impacts associated with concurrent activities associated with underwater sounds emissions was determined to be Minor (5). *TTS and AUD INJ* Acoustic modelling (Table 7-5) indicates that for typical vessel-based IMR activities the SEL_{24} R_{max} from the source to TTS and AUD INJ criteria for low-frequency cetaceans was 0.32 km and 0.05 km respectively; for high-frequency cetaceans was 0.06 km and the AUD INJ threshold was not met; and for very high-frequency cetaceans was 0.13 km and 0.06 km respectively. Given that SEL is a cumulative metric, this would require low frequency cetaceans to remain within close proximity to a typical IMR vessel for an extended period for TTS or AUD INJ to occur which is not considered credible. Table 7-6 indicates that for the maintenance of the SCSt (where an OCV is required), the R_{max} from the source to TTS and AUD INJ criteria for low-frequency cetaceans was 1.95 km and 0.30 km respectively; for high-frequency cetaceans was 0.12 km and 0.02 km respectively; and for very high-frequency cetaceans was 2.27 km and 0.13 km respectively. Animat exposure modelling indicated that the maximum distance to the TTS and AUD INJ noise effect criteria for pygmy blue whales was 0.05 km and 0.01 km from the acoustic source, respectively (Table 7-7). A pygmy blue whale would need to remain within close proximity to the OCV for an extended period for TTS or AUD INJ to occur and this not considered credible. Given that the TTS and AUD INJ thresholds for sirenians are higher than for cetaceans (see Table 7-5 and Table 7-6), the potential; impacts will be less than those described above in the consequence evaluation for cetaceans. As behavioural responses are predicted at distances much larger (in the scale of kilometres) than those predicted for TTS or AUD INJ (see Table 7-5 and Table 7-6) it is unlikely that marine mammals will remain within the immediate proximity of vessels for extended durations so that auditory impairment or injury would occur. As such the risk of TTS or AUD INJ to marine mammals is not considered credible and has not been evaluated further. **Marine reptiles** *Sea snakes*

Source
The threatened short-nosed sea snake or leaf-scaled sea snake are not expected to be present within the Sound EMBA given their known habitat preferences for shallow water and reef habitat; furthermore, underwater sound has also not been identified as a threat for either species (Ref. 115, Ref. 116). Other EPBC marine listed sea snake species may occur in broader habitats within the NWMR; however, noise pollution has not been identified as a pressure for sea snake species. As such, underwater sound is not considered to be a significant factor in sea snake behaviour or survival. *Marine turtles—Behavioural response* Non-impulsive sound sources have been identified as a high risk of causing behavioural changes within the near vicinity (tens of metres) of a sound source for marine turtles and a moderate risk within the intermediate vicinity (hundreds of metres), with the risk decreasing with increasing distance from the source (Table 7-4). Non-impulsive sound that is detectable by turtles can mask acoustic 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 turtles are unknown (Ref. 102). As identified in Section 4.17.3.2, marine turtle species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Sound EMBA. Internesting buffer BIAs and internesting habitat critical for the survival of flatback, green, and hawksbill turtles also overlap with the Sound EMBA The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) identifies noise interference as a key threat. Marine turtles do not have external ears, but potentially use sound for navigation, locating prey and avoiding predators (Ref. 118). Exposure to chronic (continuous) loud noise in the marine environment may lead to avoidance of important habitat (Ref. 118). The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) defines the nesting habitat critical for the survival of each species at a stock level. The closest nesting habitat critical to the survival of a species to the Sound EMBA includes the Barrow, Montebello, and Lowendal islands, which have been identified as nesting habitat for flatback, green, and hawksbill turtles (Ref. 118). At its closest, the OA is located ~5.5 km from the coast of Barrow Island (i.e. the 3 nm coastal waters limit). As potential behavioural effects are expected to be restricted to distances within hundreds of metres of a sound source, no nesting adults or hatchlings within coastal areas are expected to be exposed. The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) defines internesting habitat critical for survival of a species as a distance seaward (60 km for flatbacks and 20 km for green and hawksbill turtles) from nesting habitat critical for the survival of a species. Recent studies (Ref. 119) have indicated that the internesting behaviour of flatback turtles on the NWS appears more spatially restricted than that suggested by the Recovery Plan (Ref. 118). Whittock et al (Ref. 119) reported that flatback turtles prefer habitats within proximity of the coast (5-10 km) and at relatively shallow depths (<16 m water depth) during their internesting periods. (Section 4.17.3.2.1). This suggests that although the Sound EMBA overlaps with some internesting habitat critical for the survival of the species, due to the Sound EMBA being primarily located offshore in water depths ranging between ~25–1,435 m, and that flatback turtle nesting is more common on the east coast beaches of Barrow Island (i.e. opposite side of the island to the Sound EMBA), the majority of the Sound EMBA is not likely to encompass preferred internesting habitat for this species. Green and hawksbill turtles also demonstrate spatially restricted behaviour during interesting, with satellite tracking studies demonstrating that they stay with within 5 km of Barrow Island, in shallow coastal waters (Ref. 120). Consequently, only localised short-term behavioural impacts to transient individual marine turtles have the potential to arise from these activities and have therefore been evaluated as Minor (5). *Marine turtles—TTS and AUD INJ* Acoustic modelling (Table 7-5) indicates that for typical vessel-based IMR activities the R_{max} from the source to the TTS noise effect criteria was 0.05 km from the sound source, and the AUD INJ noise effect criteria was not predicted to be exceeded. TTS impact to marine turtles from vessels is not considered credible as it requires turtles to remain in the immediate vicinity (~50 m) of the vessel over a 24-hour period and therefore not been considered further. Acoustic modelling (Table 7-6) indicates that for activities associated with the maintenance of the SCSt (where an OCV is required), the R_{max} from the source to the TTS and AUD INJ noise effect criteria was 0.15 km and 0.02 km from the sound source. As noted above, interesting critical habitat for marine turtles is in relatively shallow water and within proximity of the coast. Given the SCSt is located over 100 km from Barrow Island, only localised short-term impacts to transient individual marine turtles have the potential to arise from this activity and TTS and AUD INJ have not been considered further.

Source
Fish, including sharks and rays *Behavioural response* Non-impulsive sound sources have been identified as a moderate or high risk of causing behavioural changes, and a high risk of causing masking changes, within the near (tens of metres) and intermediate (hundreds of metres) vicinity of a sound source for all fish groups, including eggs and larvae (Table 7-8), with risks decreasing with increasing distance from the source. Non-impulsive sound that is detectable by fish can mask acoustic 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. 102). It is expected that most fish (including sharks and rays) will exhibit avoidance behaviour from a sound source if it reaches levels that may cause behavioural or physiological effects. As identified in Section 4.17.3.3 several fish species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Sound EMBA. A foraging BIA for the whale shark also overlaps with shallower sections of the Sound EMBA (i.e. in water depths <200 m). Whale shark migration along the WA coast occurs mainly between July and November (Section 4.17.3.3.1). There is potential for temporal overlap with the whale shark migration period. IMR activities on the feedgas pipeline system located between the State and Commonwealth waters boundary and the Gorgon gas field may occur within the whale shark foraging BIA. The Sound EMBA associated with maintenance of the SCSt does not intersect with the whale shark BIA, which is located >50 km further offshore. It is expected that the potential impacts to whale sharks associated with underwater sound will be similar to impacts to other pelagic fish species. Pelagic fish species are likely pass through the Sound EMBA. If the fish are within the immediate vicinity of the sound source, behavioural responses are expected to be limited to an initial startle reaction before either returning to normal or moving away from the area (Ref. 170). Consequently, only localised short-term behavioural impacts to individuals have the potential to arise from these activities and have therefore been evaluated as Minor (5). *Behavioural response (concurrent activities)* Given the predicted distances for behavioural responses to occur (i.e. tens to hundreds of metres from a source), and the distances between operating vessels when and if they are operating in the OA concurrently, no spatial overlap in ensonified areas causing behavioural response are predicted. As such, the risk of behavioural responses to fish from concurrent activities is not considered credible and has not been evaluated further. *TTS and Recoverable injury* Non-impulsive sound sources have been identified as low risk of causing recoverable injury or mortal or potential mortality to all fish groups (Table 7-4). For fish species with a swim bladder involved in hearing, acoustic modelling for both typical vessel-based IMR activities and the SCSt maintenance using an OCV indicated that the criterion for recoverable injury was not predicted to be exceeded, and as such has not been evaluated further. For fish species with a swim bladder involved in hearing, the modelling indicates (Table 7-5) that for typical vessel-based IMR activities that the TTS criterion was not reached within the limits of the modelling resolution, and therefore this has not been considered further. While for the SCSt maintenance using an OCV, the maximum radial distance in any direction from the source to the TTS noise effect criteria was 0.10 km from the sound source (Table 7-6). As identified in Section 4.3.3.3 several fish species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Sound EMBA. A foraging BIA for the whale shark also overlaps with the shallower sections of the Sound EMBA (i.e. in water depths <200 m). The SCSt is located >50 km further offshore than the whale shark foraging BIA, and in deeper waters. Any presence of whale sharks in this area is expected to be of a transitory nature only. If present, the fish would need to remain within 100 m of the vessel during SCSt maintenance before auditory effects would start to occur. Given Popper et al (Ref. 102) indicates that within these sorts of distances (i.e. tens to hundreds of metres from a non-impulsive sound source) there is a moderate to high risk of behavioural effects on fish, it is unlikely that they will remain within close proximity of the vessel for extended durations. As such, the risk of TTS and recoverable injury to fish is not considered credible and has not been evaluated further. *TTS and Recoverable injury (concurrent activities)* As outlined in Section 3.19, during routine operations, concurrent vessel-based activities may be required within the same field. For example, SCSt maintenance (e.g. module retrieval and

Source
replacement) and IMR activities associated with other subsea infrastructure within the Jansz–Io fields may be undertaken concurrently. Concurrent activities are expected to be infrequent and the period in which vessels are operating in close proximity is expected to be of short duration (days to weeks). Furthermore, the distances for potential TTS effects were limited to fish remaining within 100 m of vessels for extended durations. It is not considered credible that vessels will be within this distance of each other for prolonged periods. As such, the risk of auditory impairment to fish from concurrent activities is not considered credible and has not been evaluated further.
Changes to values and sensitivities of marine protected areas *Changes to values and sensitivities of marine protected areas* The southern section of the Sound EMBA overlaps with the Commonwealth Montebello Marine Park. IMR activities on the feedgas pipeline system located between the State and Commonwealth waters boundary and the Gorgon gas field may occur within this AMP. The SCSt will be located >50 km further offshore from the Montebello Marine Park and therefore OCV use is not expected to be required in this area. The Montebello Marine Park is zoned as a Multiple Use Zone (IUCN VI), which is a zone "managed to allow ecologically sustainable use while conserving ecosystems, habitats and native species. The zone allows for a range of sustainable uses, including commercial fishing and mining where they are consistent with park values" (Ref. 252). The natural values of this AMP include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for regionally significant marine fauna. Potential impacts to the values of the Montebello Marine Park may occur due to impacts on marine fauna. The consequence evaluations to these receptors are provided above, and were risk assessed as Minor (5). It is therefore expected that there would also be no long-term or significant impacts to the values of the Montebello Marine Park. CAPL consider that the petroleum activity can be undertaken in a manner that is not inconsistent with the objectives of the *North-west Marine Parks Network Management Plan* (Ref. 252). As such, CAPL has ranked the consequence for cultural heritage values as Minor (5).
ALARP decision context justification
Offshore commercial vessel operations are commonplace and well-practised nationally and internationally. The application of control measures to manage impacts and risks arising from this aspect are well defined, understood by the industry, and are considered standard industry practice. During relevant persons consultation, a claim regarding the risk of disruption to songlines was received. This claim was responded to by CAPL (see summary in 'external context' below, and within appendix d). Although some species that are known to be sensitive to underwater sound have the potential to be exposed to underwater sound above exposure criteria during these activities, the impacts and risks arising from underwater sound emissions are considered lower-order impacts and risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect. However, as this aspect is listed as a key threat to protected matters under documents made or implemented under the EPBC Act, and can result in a credible impact or risk, additional control measures were also considered.
Good practice control measures

Control measure	Description
Marine fauna caution, approach and separation distances	For vessels under transit within the OA, the following caution, approach, or separation distances (and associated vessel speeds) will be maintained by the vessels: • caution and no approach zones for cetaceans as described in

Source	
	EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans (Cth) • separation distance of 30 m for whale sharks and 100 m for dugongs (as described in the Biodiversity Conservation Regulations 2018 [WA]) • separation distance of 30 m for marine turtles • vessels must operate at ≤6 knots within caution zones or when moving away to maintain a no-approach zone or separation distance. For helicopters under transit within the OA, the following marine fauna interaction requirements will be maintained by the helicopters: • height and distance from cetaceans as described in EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans (Cth) • separation distance of 500 m for whale sharks, dugongs, and marine turtles.

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
Schedule all IMR outside of peak periods of seasonal presence of EPBC listed threatened and/or migratory species	By altering the timing of IMR to avoid the predicted seasonal presence of protected marine fauna within the OA, it may consequently reduce the likelihood (and residual risk) of auditory impairment or injuries occurring. However, as shown in Table 4-14, activities during any month of the year will result in the overlap of some protected marine fauna seasonal presence, and therefore avoidance of all seasonal sensitivities is not possible.	N/A
Adaptive management—Pre start-up visual observations for pygmy blue whales	The following adaptative measures will be implemented prior to commencing IMR activities within the pygmy blue whale migration BIA during the peak migration period (i.e. May–June (northern) and November–December (southern); Table 4-14): • pre start-up visual observation period – during daylight hours, visual observations for the presence of any whale will be undertaken prior to	No additional personnel costs. However, the detection of whales may lead to increased activity duration and overall costs due to delayed start-ups of the activity. However, the benefit of reducing potential impacts to pygmy blue whales is considered to outweigh the financial costs from not implementing this control. Therefore, control measure has been adopted for use.

Source		
	commencement of activities – activity can only commence within the OA if no whale has been observed within the field-of-view of the bridge-watch crew.	
Adaptive management—Shutdown zones for marine fauna for slow moving or stationary vessels under DP	Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller fraction produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems (Ref. 149). 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. 149). Removing the use of vessel DP would therefore significantly reduce the sound emissions from the vessel. However, when a vessel is slow moving or stationary (e.g. during installation), the DP system is a critical safety device to avoid potential impact to existing subsea infrastructure, and therefore removing this would introduce a significant safety risk to the operation. Given the safety risks the use of DP is considered critical for vessel operations, and as such the implementation of shutdown zones to reduce sound emission risk to marine fauna is not considered a practicable mitigation measure. Note: transiting vessels are covered by the other controls.	Given the safety risks, the cost of implementing shutdown zones for vessels operating under DP is considered grossly disproportionate to the environmental benefit gained. Therefore, control measure has not been adopted for use.
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of the vessel activities within scope of this EP, the prediction of localised and temporary behavioural response, and the overlap with known BIAs for some fauna, the likelihood of exposing receptors resulting in the identified consequence was considered Seldom (3).	
Risk level	Low (7)	
Determination of acceptability		
Principles of ESD	The risk associated with this aspect is a localised and temporary behavioural response 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. The consequence associated with this aspect is Minor (5). Therefore, no further evaluation against the Principles of ESD is required.	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered applicable for this aspect include:
EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans
Conservation Management Plan for the Blue Whale 2015–2025 (Ref. 95)
Recovery Plan for Marine Turtles in Australia (Ref. 118)
Conservation Advice for the Whale Shark 2015–2020 (Ref. 126)
Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) (Ref. 115)
Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) (Ref. 116)
North-west Marine Parks Network Management Plan (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>EPBC Regulations 2000 – 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.</td><td>Requirements of Regulation 8.05 and 8.06 for vessels, and 8.07 for aircraft, interacting with cetaceans has been incorporated into the EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans control measure.</td></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025
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</td><td>The Sound EMBA does not intersect with designated Foraging Areas for the pygmy blue whale. The nearest foraging BIA is located offshore from North-West Cape peninsula; and as such is not exposed to underwater sound emissions resulting from the petroleum activity.
Based on proxy indicators, a recent study suggests that the ‘most important areas’ for foraging along the WA coast include discontinuous use of the shelf edge from Ningaloo Reef to Rowley Shoals (Ref. 96). During IMR activities the Sound EMBA may intersect with part of these ‘most important areas’ for foraging identified in Thums et.. al (Ref. 96) however foraging areas are dynamic given their dependence on presence of prey (Ref. 125), and hence it is likely that the OA may overlap with these ‘most important areas for foraging” at certain times
In accordance with Australian Government guidance (Ref. 103), activities occurring outside designated Foraging Areas must adopt adaptive management approaches should indicators of whale foraging be evident. Adaptive management control measures have been considered and adopted for use within this risk assessment.
TTS and AUD INJ from accumulated SEL_{24h} exposures from non-impulsive sounds from vessels or helicopters is not predicted to occur. Therefore, continued use of the BIA without injury is expected.</td></tr>
</table>
</td></tr>
</table>

Source		
		Therefore, this activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale.*
	Recovery Plan for Marine Turtles in Australia Management action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival Management action A1.6: Manage anthropogenic activities in Biologically Important Areas to ensure that biologically important behaviour can continue	TTS and AUD INJ from accumulated SEL_{24h} exposures from non-impulsive sounds from vessels or helicopters is not predicted to occur. Therefore, continued use of habitat critical to the survival of a species and BIAs without displacement or disruption to biologically important behaviours is expected. Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
	Conservation Advice for the Whale Shark 2015–2020 No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A
	North-west Marine Parks Network Management Plan 2018 The class approval for mining operations within a multiple use zone requires a NOPSEMA-accepted EP to be in place before activities commence.	This EP has been submitted to NOPSEMA for assessment. Therefore, the petroleum activity is not considered to be inconsistent with the *North-west Marine Parks Network Management Plan.*
Internal context	No CAPL management processes or procedures were deemed relevant for this aspect.	
External context	During consultation, relevant persons identified the potential for disruption to songlines from underwater sound (appendix d). CAPL responded confirming: • intangible heritage, including songlines, has been considered in the environment description and risk assessments within the EP • control measures to reduce the risk of impacts to marine fauna have been included in the EP • CAPL is committed to continue to learn about the values and sensitivities associated with Sea Country through ongoing consultation.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks associated with the petroleum activity are not inconsistent with any recovery plan, conservation advice, or relevant bioregional plan. However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">Objectives of the relevant documents are shown below:

<table><tr><th>Plan</th><th>Objective</th></tr><tr><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>Recovery objective: 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 objective 4 Anthropogenic threats are demonstrably minimised.</td></tr><tr><td>Recovery Plan for Marine Turtles in Australia</td><td>Recovery objective: The long-term recovery objective for marine turtles is to 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 3: Anthropogenic threats are demonstrably minimised.</td></tr><tr><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1</td></tr></table>Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species
no auditory injury (TTS or AUD INJ) to pygmy blue whales within a BIA resulting from underwater sound from the petroleum activity
no displacement of pygmy blue whales from foraging areas resulting from underwater sound from the petroleum activity
no displacement of marine turtles from habitat critical to the survival of a species resulting from underwater sound from the petroleum activity
no disruption of biologically important behaviours of marine turtles within biologically important areas resulting from underwater sound from the petroleum activity
no adverse change to the values of the Montebello Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the risk to values of the AMP are also subsequently managed to this acceptable level.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td rowspan="3">No injury to marine fauna from underwater sound emissions associated with the petroleum</td><td rowspan="3">Marine fauna caution, approach and separation distances
Vessels will implement caution and no approach zones, where practicable:
caution zone (300 m either side of whales; 15 m either side of dolphins)–vessels must</td><td>Induction materials include relevant marine fauna caution and no approach zone requirements</td></tr>
<tr><td>Training records confirm offshore personnel involved in IMR activities have completed the induction</td></tr>
<tr><td>Vessel records show if marine fauna interaction occurred within caution or approach zones, and what mitigation (e.g.</td></tr>
</table>

Source		
activity within the OA No displacement of marine fauna, or disruption of biologically important behaviours of marine fauna, from biologically important areas or habitat critical to the survival of a species from underwater sound emissions within the OA associated with the petroleum activity No adverse change to the values of Australian Marine Parks from the petroleum activity	operate at ≤ 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; 100 m[70] 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 • a separation distance of 30 m from whale sharks and marine turtles, and 100 m from Dugongs– vessels must operate at ≤6 knots when moving away to maintain these separation distances. Helicopters will: • not operate at a height lower than 1,650 feet or within a horizontal radius of 500 m for a cetacean (unless during take-off, landing or for safety reasons) • not approach a cetacean from head on • maintain a separation distance of 500 m for whale sharks, Dugongs, and marine turtles.	divert or slow vessel) measure was implemented Helicopter records show if marine fauna interaction occurred, a mitigation measure was implemented
	Adaptive management—Pre start-up visual observations for pygmy blue whales Prior to commencing IMR activities within the pygmy blue whale migration BIA during the peak migration period (i.e. May–June (northern) and November–December (southern): • a pre start-up visual observation period will be implemented – during daylight hours, visual observations for the presence of whales will be undertaken prior to	Records demonstrate that pre start-up visual observations were undertaken prior to commencement of IMR activities if undertaken in the peak pygmy blue whale migration period in the pygmy blue whale migration BIA

[70] The EPBC Regulations 2000 (Cth) require a 150 m separation distance from dolphins however CAPL has adopted a separation distance of 100 m based on the Biodiversity Conservation Regulations 2018 (WA).

Source		
	commencement of an activity – activity can only commence within the OA if no whales have been observed within the field-of-view of the bridge-watch crew	

7.7.2 Underwater sound—Non-impulsive (SCSt)

7.7.2.1 Sound source level

Multiple studies were undertaken to assist CAPL in determining an estimated underwater sound source level for the SCSt. Key steps in this process included:

- a review of subsea equipment to identify critical acoustic sources for the SCSt
  - the main acoustic sources identified for the SCSt were the compressors, pumps, transformers, and piping items; of these, the compressors and pumps were expected to dominate the acoustic source profile of the SCSt
- acoustic models were established by two independent acoustic expert groups; Curtin University's Centre for Marine Science and Technology (CMST) and Novicos GmbH, to determine sound source spectra and broadband source levels for the SCSt based on the available in-air data and conversion to in-water levels
  - CMST used the in-air measured data to estimate the in-air radiated sound power from a compressor and pump as a function of frequency, and then used a finite element model (FEM) to convert these to in-water sound power, and subsequently to source level spectra
  - initial modelling by CMST confirmed that the source spectra for the SCSt was dominated by the compressors (as was expected given the higher power rating and greater number of compressors compared to pumps on the SCSt)
  - Novicos GmbH developed a 3D FEM of the SCSt compressor modules incorporating the compressors, interconnecting piping and structures, as well as compressor internals
- in situ measurements of received underwater sound levels were undertaken at various distances and depths from a similar subsea compression facility in the North Sea
  - in situ measurements occurred during stable compressor operating conditions
  - results of the in-situ measurements and derived source spectra and broadband source level for the North Sea facility were independently reviewed
- acoustic models and estimated source spectra and sound levels for the SCSt were revised to incorporate the measured in-water data in place of the previous in-air measurements

- a Factory Acceptance Test (FAT) was undertaken for the SCSt compressor units and further in-air measurements were collected under differing operating conditions
  - acoustic models for the SCSt were revised to incorporate the FAT in-air data
  - source spectra and broadband source level for the SCSt compression units were independently modelled using the in-air measurements
  - broadband source levels were derived for varying operating conditions (e.g. start-up, maximum power, etc.)
- a Factory Acceptance Test (FAT) was undertaken for the SCSt pump units and in-water measurements were collected under different operating conditions
- source spectra and broadband source level for the SCSt pump units were independently modelled using the in-water measurementsthe range of source levels derived from the J-IC FAT in-air measurements aligned to source levels derived from the in-water data from the North Sea facility.

The outcome of these studies predicted the maximum broadband underwater sound source level from the SCSt as ~179 dB re 1 µPa @ 1 m (Ref. 472). It is noted that over the life of the SCSt, the compressors will be operated at different operating conditions and hence different speed and power levels. The underwater sound source level of the SCSt is expected to be as low as ~166 dB 1 µPa @ 1 m at low power and speed levels (i.e. the minimum estimated sound source level). However, for this assessment, a conservative approach has been adopted and thus the source level representing the maximum operating conditions has been used.

7.7.2.2 Predicted received levels

Multiple acoustic propagation studies by acoustic modelling specialists were undertaken to determine the received sound levels associated with the operation of the SCSt (i.e. the ensonified area above relevant exposure criteria) (Ref. 169).

The acoustic modelling studies considered both the source level of the SCSt (representing maximum operating conditions) as well as environmental properties that influence the propagation of subsea sound.

7.7.2.3 Exposure criteria

Different marine fauna perceive and respond to sound differently, and so a range of exposure criteria for the different types of impacts and fauna groups have been considered. The following noise effect thresholds for non-impulsive sound sources, based on current best available science, have been used in the impact and risk assessment:

- frequency-weighted accumulated sound exposure levels (SEL_{24h}) for the onset of auditory injury (including but not limited to PTS[71]) and temporary threshold shift (TTS[72]) in marine mammals, based on the updated US National Marine Fisheries Service Technical Guidance for Assessing the Effects of

[71] The updated guidance defines auditory injury (AUD INJ) as damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (Ref. 414). Auditory injury includes but is not limited to permanent threshold shift (PTS).

[72] TTS is a temporary reduction in an animal's hearing sensitivity due to receptor hair cells in the cochlea becoming fatigued.

Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) [73] (Ref. 413) (Table 7-8).

- un-weighted SPL for behavioural threshold for marine mammals based on the current interim US NOAA criteria (Ref. 101) (Table 7-8).
- frequency-weighted accumulated sound exposure levels (SEL_{24h}) from Finneran et al (Ref. 104) for the onset of PTS and TTS in marine turtles (Table 7-8).
- sound exposure guidelines for behavioural effects in marine turtles from Popper et al (Ref. 102) (Table 7-8).
- sound exposure guidelines for fish, fish eggs, and larvae from Popper et al (Ref. 102) ((Table 7-8).

Commonwealth guidance has defined “injury to blue whales” as both AUD INJ and TTS hearing impairment, as well as any other form of physical harm arising from anthropogenic sources of underwater noise (Ref. 103).

[73] The updated NMFS 2024 (Ref. 414) criteria does not address the auditory weighting functions or threshold criteria for turtles or fish, nor behavioural disruption thresholds for impulsive or non-impulsive noise sources. Therefore, these criteria and the corresponding results remain unchanged from previous guidance referenced.

Table 7-8: Noise effect criteria for non-impulsive sound for different types of impacts and species groups

Receptor	Mortal or potential mortal injury	Recoverable injury	AUD INJ	TTS	Masking	Behavioural
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	SPL: 120 dB re 1 µPa
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	SPL: 120 dB re 1 µPa
Marine turtles	N/A	N/A	SEL_{24h}: 220 dB re 1 μPa^2s	SEL_{24h}: 200 dB re 1 μPa^2s	N/A	(N) High (I) Moderate (F) Low
Fish (no swim bladder) (relevant to sharks)	(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)	(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)	(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
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) High (I) Moderate (F) Low

Relative risk (high, moderate, low) is given for fauna at three distances from the source (near [N], intermediate [I] and far [F]).

7.7.2.4 Modelling outputs

Horizontal maximum distances (R_{max}) from underwater noise emitted by the SCSt (see Section 7.7.2.1) to the relevant noise effect criteria for marine mammals, turtles, and fish (see Section 7.7.2.3) are shown in Table 7-9 (Ref. 169).

SEL_{24h} is a cumulative metric that reflects the dosimetric impact of noise levels within 24 hours based on the assumption that a receptor is consistently exposed to the predicted noise levels at a fixed position. Marine fauna are not expected to remain stationary within the predicted exposure area for a 24-hour period. Therefore, the modelled exposure area for the SEL_{24h} criteria does not mean that marine fauna travelling within this area will be impaired, but rather that they could be exposed to the sound level associated with auditory injury (either AUD INJ or TTS) if they remained within the exposure area for 24 hours.

Table 7-9: Modelled maximum horizontal distances (R_{max}) to reach noise effect criteria for non-impulsive sound emitted from the SCSt, with a sound source level of 179 dB re 1 µPa @ 1m (Ref. 169 and 472).

Receptor	Auditory Injury	Temporary threshold shift	Behavioural
Low-frequency cetaceans	SEL_{24h}: 30 m	SEL_{24h}: 400 m	SPL: 1.1 km
High-frequency cetaceans	SEL_{24h}: 10 m	SEL_{24h}: 150 m	SPL: 1.1 km
Very high-frequency cetaceans	SEL_{24h}: 60 m	SEL_{24h}: 680 m	SPL: 1.1 km
Marine turtles	SEL_{24h}: <10 m	SEL_{24h}: 10 m	N/A
Fish (swim bladder involved in hearing)	N/A	<10 m	N/A

The predicted unweighted received SPL as a function of depth and horizontal range[74] was modelled and is presented in Figure 7-2. The modelling results demonstrate that the maximum horizontal distance from the SCSt to the marine mammal behavioural response threshold is ~1.1 km, extending vertically ~950 m from the seabed to ~400 m from the sea surface.

[74] Underwater noise propagation is dependent on a number of factors, including on whether it is propagating vertically or horizontally. Density stratifications within the water column can act to reduce the distance of noise penetration vertically in comparison to horizontally.

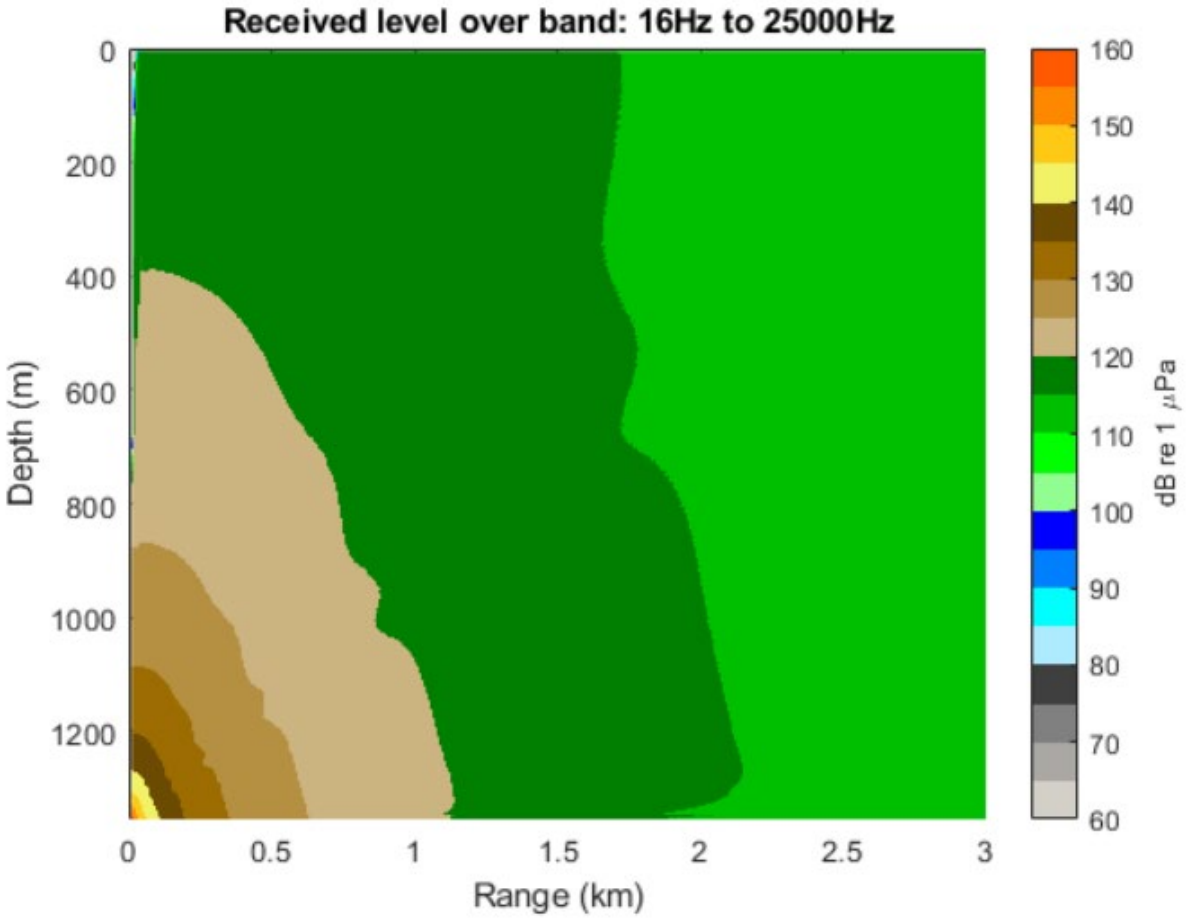


Figure 7-2: The predicted unweighted received SPL as a function of depth and horizontal range (Ref 169). The 120 dB re 1 µPa behavioural threshold corresponds to the transition from brown to green

7.7.2.5 Risk Assessment

Source			
SCSt operations have the potential to result in the emission of non-impulsive underwater sound.			
Potential impacts and risks			
Impacts	**C**	**Risks**	**C**
Underwater sound emissions may result in: • localised change in ambient underwater sound	5	A change in ambient underwater sound may result in: • behavioural disturbance • auditory impairment, TTS, AUD INJ, recoverable or non-recoverable injury to marine fauna	5 6
Consequence evaluation			
Localised change in ambient underwater sound Anthropogenic underwater sound emitted from the SCSt will result in a change in ambient noise levels. Ambient underwater broadband 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 in areas with 'biological choruses' (many individuals of the same species vocalising near simultaneously in reasonably close proximity to each other) (Ref. 105). Low-frequency ambient sound levels (20–500 Hz) are frequently dominated by distant shipping and some great whale species. Light weather-related sounds are generally in the 300–400 Hz range, with waves and rainfall dominating the 500–50,000 Hz range (Ref. 105). CAPL has undertaken a baseline monitoring study of underwater sound within and around the proposed SCSt location, deploying several deepwater, omni-directional acoustic receivers at various locations to allow for continuous passive acoustic monitoring (PAM) of whale vocalisations and other sounds to establish an accurate baseline. During the four-year monitoring period to-date, a broad range of sounds have been detected, including from a variety of cetaceans, waves, wind, earthquakes, seismic survey activity and vessel movements. Measurements close to the J-IC location indicate that the typical ambient sound level is ~100 dB re 1 µPa, ranging between ~90 and ~110 dB re 1 µPa. Acoustic modelling for the SCSt indicates the maximum radial distance to the behavioural effect noise criteria for marine mammals is ~1.1 km from the sound source(Table 7-9). Consequently, the impacts associated with change in ambient sound levels was determined to be Minor (5). *Concurrent activities* As outlined in Section 3.19, vessel-based IMR activities may be undertaken within proximity of the SCSt once it is operational. Based on acoustic modelling (Table 7-5), the maximum radial distance in any direction to the behavioural effect noise criteria for marine mammals for typical, vessel-based IMR activities is 2.96 km from the sound source. Should IMR activities occur within proximity to the SCSt, there may be an increase in ambient underwater sound at both the sea surface (from the IMR vessel) and closer to the seabed (from the SCSt) within a ~1.1 km radius of the SCSt. Given the effects of cumulative noise will be limited to the duration of IMR activities and spatially limited, the impacts associated with concurrent operations changing ambient sound levels was determined to be Minor (5).			
Marine Mammals			

Source
Behavioural response Acoustic modelling (Table 7-9 and Figure 7-2) indicates that the maximum distance from the SCSt to the marine mammal behavioural response threshold is ~1.1 km horizontally and ~950 m vertically (i.e. ~400 m from the sea surface). As identified in Section 7.7, the full spatial extent of WA-39-L was conservatively used for the PMST search (appendix e) (rather than a 1.1 km radius around the SCSt location) and has been used as the basis of the following evaluation. Cetaceans listed as threatened and/or migratory under the EPBC Act that may be present within the area are low-frequency and high-frequency cetaceans (appendix e). A migration BIA for the pygmy blue whale overlaps with the SCSt location, with peak migration periods occurring from May to June (northbound), and November to December (southbound). There are no other BIAs within or adjacent to the SCSt location. It is expected that any presence of marine mammal species within proximity to the SCSt location would be of a transitory nature. Very high-frequency cetaceans (e.g. *Kogia* spp.) were identified as species or species habitat that may occur at the SCSt location (appendix e) but are not listed as threatened and/or migratory under the EPBC Act. As such the following consequence evaluation focusses on pygmy blue whales. Pygmy blue whales are known to migrate along the west coast of Australia in the northern direction to their breeding grounds near the Indonesian Archipelago, and in the southern direction to the feeding grounds in the Southern Ocean, with peak migration periods occurring in the Montebello region May–June (northern), and November to December (southern). Foraging Areas are, generally associated with areas of high primary productivity that can support sufficient densities of krill, such as oceanographic upwellings or distinct seabed features (Ref. 127). Australia has two known seasonal feeding aggregations of pygmy blue whales supported by upwelling systems located at the Perth Canyon (Western Australia) and the Bonney Upwelling system and adjacent waters (South Australia, Victoria) (Ref. 127). Although foraging areas are described as static within the Conservation Management Plan for the Blue Whale, they are likely to be dynamic given their dependence on presence of prey (Ref. 96). Data from a study by Thums et al. (Ref. 96) identified 'most important areas' for foraging for the pygmy blue whale based on proxy indicators. There is no spatial overlap with the SCSt Sound EMBA and the most important areas for foraging, with the closest area located >5 km from the SCSt location (Figure 7-1). A recent study by Ferreira et al. identified suitable foraging habitat from the southern extent to the northeastern edge of WA (Ref. 106). This area occurred almost exclusively on slope (91%), with a small amount of suitable habitat in deep ocean floor (7%) and on the shelf (2%). The SCSt is located ~15 km from the closest area identified as suitable foraging habitat by Ferreira et al. Based on a tagging study of an individual pygmy blue whale[75] (Ref. 99) three types of primary movement behaviour was identified: • migratory movements were predominantly observed in water depths of <24 m (mean bottom depth of 14±4 m); and the depth of migratory dives was highly consistent over time and unrelated to local bathymetry • exploratory dives (with no feeding lunge) were identified with a mean maximum depth of 107±81 m (range 23–320 m) • foraging behaviours (lunge dives) were identified with 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. While pygmy blue whales have demonstrated the ability to dive to >500 m as part of foraging and exploratory dive behaviour (Ref. 99, Ref. 97), this behaviour appears to be largely a function of prey availability (zooplankton krill) (Ref. 96; Ref. 129) and their associated oceanographic drivers (i.e. surface currents, light attenuation, upwellings and seabed features) (Ref. 127, Ref. 128). Rennie et al. 2009 (Ref. 127) demonstrated that density of krill in the Perth canyon is generally highest at depth (>300 m), driven by the influence of the oligotrophic Leeuwin Current (which suppress upwellings at the surface) and the presence of localised eddies and circulation at the head and rim of the canyon. The University of Western Australia (UWA) was commissioned by CAPL to undertake a desktop analysis of oceanographic and environmental factors within a

[75] The pygmy blue whale was tagged ~35 nautical miles north of the Perth Canyon; after tagging the whale travelled north. Data was recorded for ~7.6 days until the tag fell off when the pygmy blue whale was off the coast of Geraldton (Ref. 98).

Source
100 km radius of the proposed location of the SCSt. Specialists from UWA reviewed oceanographic data (including bathymetry, ocean currents and eddies, sea surface temperature, and sea surface chlorophyll) and determined that there were no specific features within the vicinity of the SCSt location that may lead to higher primary productivity and/or an increased likelihood of foraging pygmy blue whales (or other marine mammals) (Ref. 127). More recent studies on pygmy blue whale behaviours (Ref. 96) suggests that pygmy blue whales within the waters off the NW Cape demonstrate surface foraging in response to the vertical distribution of krill within these waters, primarily within the upper 100 m of the water column. Thums et al. 2022 (Ref. 96) states that 10 of the 24 pygmy blue whales that were encountered during a 2020 field trip were observed to be surface feeding (implied by the visible baleen and pleats on the surface). These observations were further reinforced by data from a 2024 AIMS tagging study of six pygmy blue whales off Exmouth which demonstrated that the majority of dives (80%) were shallower than 100 m (based on 1768 recorded dives within waters off the NW Cape), though a maximum depth of 363 m was noted (Ref. 411). The predicted vertical sound footprint of the SCSt above the marine mammal behavioural response threshold is predicted to extend up to ~400 m below the sea surface (see Figure 7-1). Given the location of the SCSt (water depth of 1,345 m), and that foraging within this region has been observed to occur primarily within the upper water column (<100 m) where there is more likely to be krill, impacts affecting the foraging behaviour of pygmy blue whales are not considered credible. Some species of toothed whales (e.g. sperm whales and beaked whales) are known to dive more than 1,500 m (Ref. 386) and could potentially be exposed to sound from the SCSt at a level above the marine mammal behavioural response threshold; however, the SCSt ensonified area is highly localised and impacts would be limited to transient individuals only and there are no BIAs for toothed whales within proximity of the SCSt location. Given the limited extent of the predicted ensonified area for behavioural response (i.e. ~1.1 km horizontal radius around the SCSt location and at water depths >400 m) which is outside the observed maximum pygmy blue whale dive depth for the north west marine region and where krill is less likely to be densely distributed, only localised short-term behavioural impacts to transient individual marine mammals have the potential to arise from underwater sound emissions from the SCSt and any individual pygmy blue whale will not be displaced from a foraging area as a result of underwater sound emissions. Taking this into consideration, the consequence has been evaluated as Minor (5). *Concurrent Activities* As outlined in Section 3.19, vessel-based IMR activities may be undertaken within proximity of the SCSt once it is operational. Based on acoustic modelling (Table 7-5), the maximum radial distance in any direction to the behavioural effect noise criteria for marine mammals for typical, vessel-based IMR activities is 3.37 km from the sound source. Should IMR activities occur within proximity to the SCSt, there may be an increase in ambient underwater sound at both the sea surface (from the IMR vessel) and closer to the seabed (from the SCSt) within a ~1.1 km radius of the SCSt. Given the effects of cumulative noise will be limited to the duration of IMR activities and spatially limited, the impacts associated with concurrent operations resulting in behavioural disturbance were determined to be Minor (5). *TTS and AUD INJ* As outlined in Section 7.7.2.4, acoustic modelling indicates that the R_{max} from the source to TTS and AUD INJ criteria for low-frequency cetaceans was 400 m and 30 m respectively; for high-frequency cetaceans was 150 m and 10 m; and for very high-frequency cetaceans was 680 m and 60 m respectively. Both TTS and AUD INJ are not credible risks to cetaceans, including pygmy blue whales, given that a cetacean would need to remain within close proximity to the SCSt for an extended period to reach the TTS and AUD INJ criteria; which is not credible given that an individual would need to surface to breathe. As such, the risk of TTS and AUD INJ to marine mammals is not considered a credible risk and has not been evaluated further. **Marine reptiles** *Marine turtles—Behavioural response*

Source
Non-impulsive sound sources have been identified as a high risk of causing behavioural changes within a near vicinity (tens of metres) and a moderate risk within an intermediate vicinity (hundreds of metres) of a sound source for marine turtles. This risk decreases with increasing distance from the source (Table 7-8). Non-impulsive sound that is detectable by turtles can mask acoustic signal detection, and thus may have a pervasive effect on behaviour; however, the consequences of this masking and any associated behavioural changes for the survival turtles are unknown (Ref. 102). The PMST search for the petroleum title WA-39-L (appendix e) identified marine turtle species listed as threatened and/or migratory under the EPBC Act that have the potential to occur within the area. No BIAs or internesting habitat critical for the survival of species were identified. The *Recovery Plan for Marine Turtles in Australia* (Ref. 118) identifies noise interference as a key threat. While, marine turtles do not have external ears, they potentially use sound for navigation, locating prey and avoiding predators (Ref. 118). Exposure to chronic (continuous) loud noise in the marine environment may lead to avoidance of important habitat (Ref. 118). The *Recovery Plan for Marine Turtles in Australia* (Ref. 111) defines the nesting 'habitat critical for the survival of each species' at a stock level. The closest nesting 'habitat critical to the survival of a species' to the SCSt includes the Barrow, Montebello, and Lowendal islands, which have been identified as nesting habitat for flatback, green, and hawksbill turtles (Ref. 118). At its closest, the SCSt location is ~130 km from the coast of Barrow Island such that nesting habitat critical for the survival will not be impacted by underwater sound from the SCSt. The closest BIA (i.e. internesting buffer BIA for the flatback turtle) is ~30 km southeast of the SCSt location. Given the distance off the coast and water depths at the SCSt location, turtle presence is expected to be limited to transient individuals and any disruption to their behaviour is expected to be spatially limited as potential behaviour effects are predicted to be restricted to distances within hundreds of metres of a sound source. As such, the consequence has been evaluated to be Minor (5). *TTS and AUD INJ* Acoustic modelling (Section 7.7.2.4) indicates that the maximum radial distance to TTS and AUD INJ criteria for marine turtles was 10 m and <10 m respectively. Note that the TTS and AUD INJ is a cumulative metric based on the assumption that a receptor is consistently exposed to the relevant noise effect criteria for a 24-hour period before the associated auditory effect (TTS or AUD INJ) may occur. This would require an individual to remain within ~10 m of the sound source for an extended period before TTS or AUD INJ auditory impairments may occur; which is not credible given that an individual would need to surface to breathe. Therefore the risk of auditory impairment is not considered credible, and no further evaluation has been undertaken. **Fish including sharks and rays** *Behavioural disturbance* Non-impulsive sound sources have been identified as a moderate or high risk of causing behavioural changes or masking changes, within the near and intermediate vicinity of a sound source for all fish groups, including eggs and larvae (Table 7-8). The PMST search for the petroleum title WA-39-L (appendix e) identified fish and shark species listed as threatened and/or migratory under the EPBC Act that have the potential to occur within the area. No BIAs for fish were identified at the SCSt location. Pelagic and demersal fish species may be transient through the SCSt ensonified area. If fish were present within the immediate vicinity of the SCSt sound source, behavioural responses are expected to be limited to an initial startle reaction before either returning to normal or resulting in the fish moving away from the ensonified area (Ref. 170). Consequently, localised behavioural impacts have the potential to arise from SCSt sound emissions and the consequence has been evaluated as Minor (5). *TTS and recoverable injury* Acoustic modelling (Section 7.7.2.4) indicates that the maximum radial distance to the TTS criteria for fish with a swim bladder involved in hearing was <10 m and there is a low risk of mortal injury and recoverable injury. Similarly, for fish with no swim bladder or those with swim bladders that are not involved in hearing, non-impulsive sound sources may present a moderate risk of

Source
causing TTS in the near field, with the risk reducing at greater distances (Table 7-8). The risk of TTS to fish eggs and larvae is considered low for all distances from non-impulsive sound sources (Table 7-8). Consequently, only fish that remain within close proximity to the SCSt for extended periods may have the potential to receive sound above these thresholds, however impacts are not expected to be detectable at a population level. As such, the impact on fish associated with underwater sound emitted from the SCSt was determined to be Incidental (6).
ALARP decision context justification
Subsea compression is a relatively new technology and it will be the first time it is used in Australia. Multiple lines of evidence, comprising a range of measurement, monitoring and modelling studies have been undertaken by CAPL to predict the source level of the SCSt, which in turn has been used to assess the likely impacts on environmental receptors. Additionally, considerable effort to reduce the level of uncertainty in the predictions has been undertaken; and modelling has compared favourably to in-situ measurements from a similar facility presently in operation. CAPL has reviewed NOPSEMA's ALARP guidance note (Ref. 28) to determine the decision context and assessment technique required to demonstrate that impacts and risks are ALARP. The following points have been considered in coming to a decision: • SCSt technology is not an unproven invention, design or development as a facility is currently in operation in the North Sea and its use is being explored in other areas globally, however the application of the technology in deep water (1,345 m) and in Australia is a first • Good practice for managing ongoing, non-impulsive underwater noise is not well defined, and guidance on management for short-term underwater sound is not considered applicable (e.g. avoiding peak migration periods and shutting down when whales are present is not considered practicable). • Impacts and risks associated with underwater sound are commonly assessed using sound modelling as the basis and receptor exposure thresholds are well defined • While extensive work has been progressed to characterise the source level and independent modelling has been conducted by different subject matter experts (Novicos and CMST) and results have been similar, there remains a residual level of uncertainty. This residual level of uncertainty will be closed by in-water verification described in the control measures below. Taking the above into consideration and given there is some uncertainty and complexity associated with non-impulsive underwater sound emissions from the SCSt, CAPL has applied ALARP Decision Context B for this aspect and has completed a cost benefit analysis using the hierarchy of controls.
Good practice control measures and source

Control measure	Description
Good practice control measures have not yet been established given that subsea compression is a relatively new technology. Refer to the additional control measures and cost benefit analysis below.	

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
Eliminate – do not progress compression at the Jansz–Io field	If J-IC is not progressed and the SCSt is not installed, impacts and risks associated with the operation of the SCSt, including non-impulsive sound emissions, would be eliminated.	The cost of not progressing J-IC represents a significant economic opportunity loss and may leave the remaining resources in the Jansz–Io gas field as stranded assets. Reservoir gas in the Jansz–Io field has a low CO_2 content and a significant portion of the gas

Source		
		produced from the field is used for domestic gas supply in WA. The cost of implementing this control is grossly disproportionate to the level of risk reduction achieved and is not considered practicable.
Substitution – perform gas compression at sea-surface	Performing gas compression on a platform at the sea surface may reduce underwater sound emissions comparative to the operation of a SCSt. Studies indicate underwater sound resulting from platform operations is in the order of 110–130 dB re 1 µPa at 100 m from the platform (Ref. 135).	Subsea compression represents a significant reduction in health and safety risks comparative to a compression platform which would need to be a normally attended installation. It also eliminates environmental impacts associated with having a normally attended installation at sea surface (e.g. ongoing routine discharges) and would require hydrocarbon handling at surface (unlike the proposed FCS design), which introduces further complexity in managing HSE risks. In addition, although underwater sound emissions generated from an operating platform are expected to be lower than from the SCSt, platform sound emissions will ensonify the water column close to the sea surface where marine fauna sensitive to sound may be present in greater numbers comparative to the SCSt location at the seabed (~1,345 m). The cost of implementing this control is considered grossly disproportionate to the level of underwater sound risk reduction achieved, particularly given the potential increase in other HSE risks and financial cost.
Engineer – acoustic tiles on compressor housing	The three compressors are the main source of sound emitted from the SCSt (Ref. 138 and Ref. 139). CAPL has considered the installation of sound attenuating acoustic tiles on the compressor housing in order to reduce the transmission of sound from the compressor housing to the surrounding water column. To be able to quantify the potential sound source reduction benefits of acoustic tiles, Finite Element Modelling (FEM) was conducted for a variety of tile thicknesses and materials. Results of the	Modelling indicates that the installation of acoustic tiles may not only attenuate but also amplify acoustic radiation at certain frequencies. It is possible acoustic tiles could result in a marginal reduction in sound (~0.2 dB) over the entire frequency range, however this is unlikely to result in a material reduction in potential environmental impacts and risks and installation of tiles may result in adverse effects and potentially increase noise emissions. Taking this into consideration, this control measure has not been adopted.

Source		
	modelling (Ref. 140) demonstrated that the tiles: • in specific frequency ranges, especially above 700 Hz, the acoustic tiles lead to a sound power reduction of up to almost ~2 dB. However, in other frequency ranges, the acoustic tiles lead to an amplification in sound • provide a marginal attenuation of sound of ~0.2 dB over the entire frequency range.	
Engineer – Subsea noise attenuation modules (SSNAMs)	SSNAMs are panels consisting of polyurethane foam and a steel plate enclosure. The SSNAMs could be placed at the boundaries of the compressor modules and may attenuate radiated sound of the compressor. This could be achieved in two ways; the sound from the compressor housing is reflected and directed to the seabed which absorbs the sound and/or the SSNAMs absorb sound as they are excited and vibrate, with sound energy lost due to dissipation. To be able to quantify the potential sound source reduction of using SSNAMs, FEM was conducted for three different design options. Results of the modelling (Ref. 140) indicate that the SSNAMs may have an attenuating effect of up to: • ~0.5 dB with one SSNAM (only the top side of compressor modules fitted with SSNAM)	Attenuation modelling has been undertaken to predict the potential reduction in the extent of the SCSt Sound EMBA (Ref. 169). Modelling indicates that the installation of four SSNAMs may result in a ~0.2 km reduction in the horizontal extent in which the marine mammal behavioural response threshold is exceeded (i.e. a reduction from ~1.1 km to ~0.9 km). This represents a marginal reduction in the area in which a behavioural response may be elicited. The key cost associated with implementing this option is the increase in work required to conduct IMR activities on the SCSt. The SSNAMs would need to be removed to access other modules during IMR, which increases the number and types of lifts required.This results in an increase in offshore hours worked and the potential for an increase in HSE risks and asset damage risks as well as additional vessel time in the field and associated impacts and risks (e.g. routine discharges, underwater sound etc.). While use of SSNAMs may marginally reduce the SCSt Sound EMBA, the cost of implementing this control is grossly disproportionate to the level of risk reduction achieved, and therefore has not been adopted.

Source		
	• ~2.5 dB with four SSNAMs (top and three sides fitted with SSNAMs) • ~4 dB with five SSNAMs (top and three sides fully covered and fourth side half covered) – however this option was determined to not be feasible due to the location of module connections.	
Engineer – Pipe duct resonator arrays (PDRAs)	Pipe Duct Resonator Arrays (PDRAs) are used to reduce noise from topside compressor discharges piping but are considered novel for subsea use. PDRAs were investigated to determine if they may reduce the amount of sound introduced into the water column from the gas inside the pipes of the SCSt. PDRAs are one-piece solid steel tubes with acoustic chambers connected to the flow path by a series of perforations. To be able to quantify the potential source noise reduction of using PDRAs, FEM was conducted using three PDRAs on each compressor, one on the suction line into a compressor, and two on the discharge line from the compressor. Results of the modelling (Ref. 140) indicated that: • the sound path along the pipe can be reduced in the range of the blade passing frequency (1,000 Hz to 1,700 Hz) with a potential sound power reduction up to ~20 dB in the discharge pipe and up to ~10 dB in the suction pipe • the sound inside the pipe is also partly transmitted	Given that modelling indicates that use of PDRAs may result in an overall increase in the source level of the SCSt across the sound frequency range, there is no environmental benefit and this control measure has not been adopted.

Source		
	through the pipe into the surrounding water already at the station itself so the PDRAs increase the noise emissions in close vicinity of the station, due to vibrations of the resonators that excite the structural parts of the pipes and therefore radiate into the water • the net effect was that PDRAs increase the point source sound emissions by ~2.4 dB over the entire frequency range.	
Engineer – Gas filled resonator arrays (bubble curtains)	Bubble curtains are used to reduce the risk of underwater sound exposure to marine life from pile driving and blasting activities. Bubble curtains often use a resonator array system with a network of gas filled Helmholtz resonator cups that surround the noise source. The cups are configured to abate broad spectrum sound with gas filled at the target deployment depth. Fixed panels of resonator blocks contain various sizes of resonator cups that are injection moulded from high density polyethylene. The resonator array panels are inverted and attached to a steel supporting structure and high volume compressed gas is bubbled up from a seabed emitter ring and captured in the resonator cups to attenuate sound. Although commonly used in shallow waters, bubble curtains are unproven technology for deep water applications. CAPL has investigated the potential use of bubble curtains in deeper waters and major uncertainties remain around the effectiveness of this control	Deepwater applications of bubble curtains are not common practice and CAPL's investigations indicate limited potential broad spectrum noise attenuation of the SCSt source level, with no feasible solution for utility supply, fill/re-fill, and control and maintenance requirements. This control has not been adopted as it is not considered feasible to implement.

Source		
	measure due to the predicted high gas dissolution rate at the SCSt location which is likely to diminish the effectiveness of sound reduction.	
Engineer – Elastomeric dampener	CAPL has investigated use of a vibration isolation elastomeric dampener between structures to reduce structure borne sound emissions and associated propagation to mudmats from the SCSt. Modelling studies indicate that compressors are the main source of sound emitted from the SCSt, and structural borne sound emissions were determined to be a minor contributor to the overall sound emissions from the SCSt. Elastomeric dampeners were therefore considered unlikely to reduce the overall SCSt sound source level and have been assessed as not providing environmental benefit.	Elastomeric dampeners are unlikely to result in a material environmental benefit, and therefore this control measure has not been adopted.
Administrative – do not operate the SCSt during peak pygmy blue whale migration	Adopting this control would remove the SCSt underwater sound during the migration period; however, is unlikely to result in a material environmental benefit given pygmy blue whales are not expected to dive to depths where the SCSt Sound EMBA area would be encountered.	The cost of turning off the SCSt during the northern and southern peak pygmy blue whale migration period (i.e. for four months of the year) represents a significant economic opportunity loss and as described in the consequence evaluation above, pygmy blue whales are not expected to dive to depths where the SCSt Sound EMBA would be encountered. The cost of implementing this control is grossly disproportionate to the level of risk reduction achieved and therefore has not been adopted.
Administrative—adaptive management, the use of dedicated MFOs during peak pygmy blue whale migration period with sightings informing proactive turn down of the SCSt	Two dedicated MFOs aboard a dedicated spotter vessel at the SCSt location during peak pygmy blue whale migration may provide an adaptive management strategy. In this instance, if a whale is sighted, the MFO could communicate with the operations centre at Barrow Island to switch the SCSt mode of operation to minimise noise emissions	This control would incur the cost of having an additional vessel and personnel in the field for the duration of the peak pygmy blue whale migration period. This comes with an economic cost and also increases the potential likelihood of health and safety risks due to the additional vessel in the field as well as associated environmental impacts and risks (e.g. routine discharges, underwater sound etc.). It is unlikely this control would result in a material environmental benefit

Source		
	until such time as the whale is deemed to have moved away from the area. This control relies on favourable weather and sea state and could only be implemented during daylight hours. Additionally, given that pygmy blue whales are not anticipated to dive to depths at which they would be exposed to the SCSt Sound EMBA, it is unlikely this control would result in an environmental benefit and conversely would introduce more underwater sound associated with vessel operations.	and the cost is considered grossly disproportionate to any potential level of risk reduction achieved. Therefore this control has not been adopted.
Engineer and Administrative—adaptive management implement controls to ensure the SCSt will be operated in a manner that is not inconsistent with the *Blue Whale Conservative Management Plan*. This is to be achieved in the following manner: • during commissioning, the SCSt will be turned on in a phased approach and acoustic recorders deployed from a vessel will provide initial data to verify the sound levels of the SCSt • passive acoustic loggers will also be deployed to monitor and record sound levels while testing the full range of SCSt operating conditions (from minimum to maximum power loads)	While extensive work has been progressed to characterise the SCSt source level and independent modelling has been conducted by different subject matter experts and results have been similar, there remains a residual level of uncertainty. Acknowledging this uncertainty CAPL will conduct in-water verification of SCSt sound emissions during commissioning and if required implement an adaptive management measure to limit the power load of the SCSt. Implementation of this control will ensure that the marine mammal behavioural response threshold will not be exceeded at the relevant pygmy blue whale dive depths.	Although there are additional financial costs associated with in-water verification of the SCSt sound levels and limiting the power load of the SCSt may result in restrictions in operating parameters and subsequent impacts to gas supply, the costs are not considered grossly disproportionate to the potential environmental benefits gained. Therefore, this control measure has been adopted for use.

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td colspan="3">• if in-field sound monitoring during commissioning determines the received levels within relevant pygmy blue whale dive depths may exceed the marine mammal behavioural response threshold, a control measure will be implemented to limit the power load of the compressors and reduce sound levels</td></tr>
<tr><th colspan="3">Likelihood and risk level summary</th></tr>
<tr><td>Likelihood</td><td colspan="2">Non-impulsive underwater sound associated with the SCSt may cause localised and temporary impacts to marine fauna. Consequently, CAPL consider the likelihood of the consequence occurring as being Seldom (3).</td></tr>
<tr><td>Risk level</td><td colspan="2">Low (7)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The risk associated with this aspect is a localised behavioural response to individuals, as well as potentially recoverable injury to fish, 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.
The consequence associated with this aspect is Minor (5).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered relevant for this aspect include:
• Conservation Management Plan for the Blue Whale 2015–2025 (Ref. 95)
• Conservation Advice Balaenoptera borealis Sei Whale (Ref. 68)
• Conservation Advice Balaenoptera physalus Fin Whale (Ref. 67)
• Recovery Plan for Marine Turtles in Australia (Ref. 118).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.</td></tr>
<tr><td></td><td>Requirement</td><td>Demonstration</td></tr>
<tr><td></td><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>The SCSt Sound EMBA does not intersect with designated Foraging Areas for the pygmy blue whale as outlined in the Conservation Management Plan for the Blue</td></tr>
</table>

Source		
	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	Whale 2015–2025 (Ref. 94). The nearest foraging BIA is located offshore from North West Cape peninsula; and as such is not exposed to underwater sound emissions resulting from the petroleum activity. A recent study has indicated areas of probable foraging along the NWS based on proxy indicators and pygmy blue whale behaviour data (Section 4.17.3.1.2), however there is no overlap with the Sound EMBA associated with the operation of the SCSt. In addition, the Sound EMBA (~400 m from the sea surface at the SCSt location) is deeper than the deepest recorded dive of a pygmy blue whale in this bio-region (363 m, Ref. 411), with 99.5% of recorded dives during the recent tagging study <300 m in depth (Ref. 411) and therefore no impacts to pygmy blue whale foraging behaviour are predicted. Furthermore, adaptive management control measures have been considered and adopted for use within this risk assessment. TTS and AUD INJ is not predicted to occur. Therefore, continued use of the BIA without injury is expected. Therefore, this activity is not considered to be inconsistent with the Conservation Management Plan for the Blue Whale.
	Recovery Plan for Marine Turtles in Australia Management action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival Management action A1.6: Manage anthropogenic activities in Biologically Important Areas to ensure that biologically important behaviour can continue	TTS and AUD INJ is not predicted to occur. In addition, the SCSt Sound EMBA does not overlap any marine turtle BIAs or habitat critical to the survival of a species. Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
	Conservation Advice Balaenoptera borealis Sei Whale	N/A
	Conservation Advice Balaenoptera physalus Fin Whale	N/A

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Internal context</td><td colspan="2">No CAPL management processes or procedures were deemed relevant for this aspect.</td></tr>
<tr><td>External context</td><td colspan="2">During consultation, relevant persons identified the potential for disruption to songlines from underwater sound (appendix d). CAPL responded confirming:
intangible heritage, including songlines, has been considered in the environment description and risk assessments within the EP
control measures to reduce the risk of impacts to marine fauna have been included in the EP
CAPL is committed to continue to learn about the values and sensitivities associated with Sea Country through ongoing consultation.</td></tr>
<tr><td rowspan="4">Defined acceptable level</td><td colspan="2">The potential impacts and risks associated with the petroleum activity are not inconsistent with any recovery plan, conservation advice, or relevant bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below, however, given that underwater sound is listed as a threat to protected matters under documents made or implemented under the EPBC Act, CAPL has defined an acceptable level of impact such that it is not inconsistent with these documents.
Objectives of the relevant documents are shown below.</td></tr>
<tr><td>Plan</td><td>Objective</td></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td><u>Recovery objective</u>: Minimise anthropogenic threats to allow for their conservation status to improve so that they can be removed from the EPBC Act threatened species list.
<u>Interim objective 4</u> Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td>Recovery Plan for Marine Turtles in Australia</td><td><u>Recovery objective</u>: The long-term recovery objective for marine turtles is to 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.
<u>Interim objective 3</u>: Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td colspan="2">Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species
no auditory injury (TTS or AUD INJ) to pygmy blue whales within a BIA resulting from underwater sound from the petroleum activity</td></tr>
</table>

Source		
	• no displacement of pygmy blue whales from foraging areas resulting from underwater sound from the petroleum activity • no displacement of marine turtles from habitat critical to the survival of a species resulting from underwater sound from the petroleum activity • no disruption of biologically important behaviours of marine turtles within biologically important areas resulting from underwater sound from the petroleum activity.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No injury to marine fauna from underwater sound emissions associated with the petroleum activity within the OA No displacement of marine fauna, or disruption of biologically important behaviours of marine fauna, from biologically important areas or habitat critical to the survival of a species from underwater sound emissions within the OA associated with the petroleum activity	**Implement controls to ensure the SCSt will be operated in a manner that is not inconsistent with the *Blue Whale Conservative Management Plan*** The following controls will be implemented: • during commissioning, the SCSt will be turned on in a phased approach and acoustic recorders deployed from a vessel will provide initial data to verify the sound levels of the SCSt • passive acoustic loggers will be deployed to monitor and record sound levels while testing the full range of operating conditions (from minimum to maximum power loads) • if in-field testing during commissioning determines the received levels within relevant pygmy blue whale dive depths may exceed the marine mammal behavioural response threshold, the SCSt will be	Records show: • the SCSt was turned on in a phased approach and acoustic recorders were deployed to test the full range of operating conditions • if required, a control was implemented to limit the power load of the SCSt

Source		
	operated in a manner to limit the power load of the compressors and reduce sound levels	

7.8 Underwater sound—Impulsive

Source

Activities identified as having the potential to result in impulsive underwater sound are:

- IMR— acoustic surveys (MBES and SSS)
- Positioning transponders
- ATMs on the SBS

These are expected to emit various frequencies between ~5 and 500 kHz (Ref. 223). Examples of sound levels emitted from the equipment include:

- MBES
  - SPL 218–221 dB re 1 µPa RMS @ 1 m (Ref. 225, Ref. 227)
  - per-pulse SEL 173–188 dB re 1 µPa^{2}s @ 1 m (Ref. 227)
- SSS
  - SPL 229–234 dB re 1 µPa RMS @ 1 m (Ref. 225, Ref. 227)
  - per-pulse SEL 200 dB re 1 µPa2s @ 1 m (Ref. 227)
- Positioning transponders
  - SPL 180–200 dB re 1 µPa RMS @ 1 m (Ref. 136).
- ATMs
  - ~185 dB re 1 µPa (Ref. 471)

Potential impacts and risks

Impacts	C	Risks	C
Underwater sound emissions may result in:		A change in ambient underwater sound may result in:	
• localised change in ambient underwater sound.	6	• behavioural disturbance	6
		• auditory impairment, TTS, AUD INJ, recoverable or non-recoverable injury to marine fauna	-
		• changes to values and sensitivities of marine protected areas	6

Consequence evaluation

Anthropogenic underwater sound emitted during acoustic surveys will result in a temporary and highly localised change in ambient sound levels.

Source
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 vocalising near simultaneously in reasonably close proximity to each other) (Ref. 105). Low-frequency ambient sound levels (20–500 Hz) are frequently dominated by distant shipping plus some great whale species. Light weather-related sounds will be in the 300–400 Hz range, with wave conditions and rainfall dominating the 500–50,000 Hz range (Ref 105). Survey techniques are expected to emit various frequencies between 12 and 500 kHz; with a maximum SPL up to ~234 dB re 1 µPa RMS @ 1 m for SSS (Ref. 227). An array of transponders may be used for positioning during IMR activities. Transponders typically emit pulses of sound, generally within the frequency range of 21 to 31 kHz. The estimated SPL at source ranges from ~180 to 202 dB re 1 µPa SPL at 1 m (Ref. 136). The duration of underwater impulsive sound emissions from acoustic surveys within the OA will vary with activity. As outlined in Section 3.19, vessels may be on site during IMR activities for ~10 – 200 days depending on the complexity of the activity. Given the details above, the consequence of acoustic surveys causing a change in ambient underwater sound has been assessed as Incidental (6) as it will result in limited changes that are very localised and short-term in nature.
Marine Mammals *Behavioural response* The noise effect criteria for marine mammals for behavioural response from impulsive sound is an SPL of 160 dB re 1 µPa (Ref. 226). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted the maximum distance to reach this noise effect criteria from a MBES and SSS source was ~290 m and ~682 m respectively (Ref. 227). As IMR activities may be undertaken at any time of the year, there is the potential for overlap with the migration period for humpback whales. IMR activities on the feedgas pipeline system between Barrow Island and the Gorgon gas field may overlap the humpback whale migration BIA. Studies (Ref. 84) suggest that northbound humpback whales tend to travel around the 200 m water depth contour, while southbound humpback whales tend to travel closer to Barrow Island and generally occur between 50 m and 200 m water depths. Similarly, there is the potential for overlap with the migration period for pygmy blue whales. IMR activities undertaken between the Gorgon and Jansz–Io gas fields may overlap the pygmy blue whale migration BIA. However, it is expected based on satellite tracking and acoustic detection studies that pygmy blue whales are likely to travel further offshore than the defined BIA, particularly on their southern migration (November to December), but also during the northern migration (May to June) (Section 4.17.3.1.2). As outlined in Section 3.19, vessels may be on site during IMR activities for ~10 – 200 days depending on the complexity of the activity Transponders may also be used for positioning during IMR activities.. Based on empirical spreading loss estimates measured by Warner and McCrodan (Ref. 243), received levels from transponders may exceed the marine mammal behavioural response threshold out to ~42 m from the source. Transmissions are not continuous but consist of short 'chirps' with a duration that ranges from three to 40 milliseconds. Transponders do not emit sound when on standby. When required for general positioning, they emit one chirp every five seconds (estimated to be required for 4 hrs at a time). When required for precise positioning, they emit one chirp every second (estimated to be required for 2 hrs at a time). Given the limited temporal and spatial extent at which acoustic surveys and transponders may result in a change to ambient underwater sound, environmental impacts are expected to be negligible and therefore have been evaluated as Incidental (6). *TTS and AUD INJ* The noise effect criteria for marine mammals for TTS and AUD INJ from impulsive sound is an SEL_{24h} of 140–170 dB re 1 μPa^2s and 155–185 dB re 1 μPa^2s respectively depending on frequency hearing group (Ref. 79). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted the maximum distance to a per-pulse SEL (Ref. 227). The modelling study also showed that for a 2.5 hour MBES survey, the accumulated SEL would not exceed an unweighted 171 dB re 1 μPa^2s more than 2 m from the source (Ref. 227). Similarly, for a 2.5 hour SSS

Source
survey, the accumulated SEL would not exceed an unweighted 171 dB re 1 μPa^2s more than 3 m from the source (Ref. 227). The typical frequencies of 21 to 31 kHz produced by baseline transponders are most audible to HF cetaceans such as toothed whales and dolphins rather than LF cetaceans, and the source levels (180 to 202 dB re 1 µPa at 1 m SPL) rapidly attenuate within a very short distance from the source, such that AUD INJ or TTS are not considered credible. Given the small, predicted distances, and need for fauna to be exposed at these levels for extended durations before auditory impairments or injuries occur, TTS and AUD INJ to marine mammals from acoustic survey techniques and transponder deployment is not considered credible and is not evaluated further. **Marine reptiles** *Sea snakes* The threatened short-nosed sea snake or leaf-scaled sea snake are not expected to be present within the OA given known habitat preferences for shallow water and reef habitat; underwater sound has also not been identified as a threat for either species (Ref. 115, Ref. 116). Other EPBC marine listed sea snake species may occur in broader habitats within the NWMR, however noise pollution has not been identified as a pressure for sea snake species (Ref. 117). As such, underwater sound is not considered to be a significant factor in sea snake behaviour or survival. *Marine turtles—Behavioural response* The noise effect criteria for marine turtles for behavioural response and behavioural response from impulsive sound is an SPL of 166 dB re 1 µPa (Ref. 233) and 175 dB re 1 µPa (Ref 231, Ref. 232). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted the maximum distance to reach these sound levels from a MBES and SSS source was ~71–290 m and ~257–682 m respectively (Ref. 227). Transponders may also be used for positioning during IMR activities.. Based on empirical spreading loss estimates measured by Warner and McCrodan (Ref. 242243), received levels from transponders may exceed the marine turtle behavioural response threshold out to ~42 m from the source. Several listed threatened and/or migratory marine turtle species have the potential to occur within the predicted ensonified area. The predicted ensonified area for also overlaps with a internesting buffer BIAs and habitat critical to the survival of a species for flatback, green and hawksbill turtles. As IMR activities may be undertaken at any time of year, there is the potential for overlap with summer nesting seasons on Barrow Island. Green and hawksbill turtles are known to nest on the west coast of Barrow Island, whereas flatback turtles nest on the east coast of the island (i.e. away from the OA and predicted ensonifed area). It is also noted that acoustic surveys will occur in waters >5.5 km from Barrow Island, whereas studies suggest that Green and Hawksbill turtles prefer internesting within shallow waters and within 5 km of Barrow Island (Ref. 120). As outlined in Section 3.19, vessels may be on site during IMR activities for ~10 – 200 days depending on the complexity of the activity. Given the limited spatial and temporal exposures to marine reptiles from underwater impulsive sound above the noise effect criteria for acoustic surveys, limited environmental impacts are expected to occur and therefore have been evaluated as Incidental (6). *Marine Turtles—AUD INJ and TTS* The noise effect criteria for marine turtles for TTS and AUD INJ from impulsive sound is an SEL_{24h} of 189 dB re 1 μPa^2s and 204 dB re 1 μPa^2s respectively (Ref. 104). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted the maximum distance to a per-pulse SEL for within these ranges was <20 m for SSS; and that exposure was not predicted to occur from an MBES or transponders (Ref. 227). Given the small predicted distances, and need for fauna to be exposed at these levels for extended durations before auditory impairments or injuries occur, TTS and AUD INJ to marine turtles from acoustic survey techniques and deployment of transponders is not considered credible and is not evaluated further. **Fish, including sharks and rays** *Behavioural response* Impulsive sound sources have been identified as a high risk causing behavioural changes within the near vicinity of a sound source for all fish with no swim bladder or a bladder not involved in hearing; high at both near and intermediate vicinity for fish that use their swim bladder for hearing,

Source
and moderate for fish eggs and larvae within the near vicinity (Ref. 102). There is a low risk of causing masking behaviours for all fish groups from impulsive noise sources (Ref. 102). Several fish species have the potential to occur within the predicted ensonified area, including listed threatened and/or migratory species. The predicted ensonified area for behavioural response also overlaps with a foraging BIA of whale sharks. There are no other known areas of aggregation or biologically important behaviours for other fish species within the predicted ensonified area; as such it is expected that the presence of any fish species would be of a transitory nature. As IMR activities may be undertaken at any time of year, there is the potential for overlap with the seasonal presence of whale sharks within the foraging BIA (July to November). As outlined in Section 3.19, vessels may be on site during IMR activities for ~10 – 200 days depending on the complexity of the activity. Transmissions from transponders are not continuous but consist of short 'chirps' with a duration that ranges from three to 40 milliseconds. Transponders do not emit sound when on standby. When required for general positioning, they emit one chirp every five seconds (estimated to be required for 4 hrs at a time). When required for precise positioning, they emit one chirp every second (estimated to be required for 2 hrs at a time). Given the limited spatial and temporal exposures to fish from underwater impulsive sound, limited environmental impacts are expected to occur and therefore have been evaluated as Incidental (6). *TTS* The noise effect criteria for fish for TTS from impulsive sound is an SEL_{24h} of equal to or greater than 186 dB re 1 μPa^2s (Ref. 229). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted the maximum distance to a per-pulse SEL for within these ranges was <20 m for both MBES and SSS (Ref. 227). Given the small predicted distances, and need for fauna to be exposed at these levels for extended durations before auditory impairments or injuries occur, TTS to fish from acoustic survey techniques is not considered credible and is not evaluated further. *Mortal or potential mortal injury, and recoverable injury* The noise effect criteria for fish for recoverable injury and mortal or potential mortal injury from impulsive sound is an SEL_{24h} of 203–216 dB re 1 μPa^2s and of 207–219 dB re 1 μPa^2s respectively, depending on swim bladder hearing group (Ref. 229). Acoustic modelling undertaken for geophysical survey equipment in a sandy seabed environment predicted that a per-pulse SEL at these levels was not predicted to occur (Ref. Ref. 227). As such a cumulative exposure is not credible and this type of impact is not evaluated further.
Changes to values and sensitivities of marine protected areas IMR activities may be required on the section of the feedgas pipeline system that overlaps the Commonwealth Montebello Marine Park. The Montebello Marine Park is zoned as a Multiple Use Zone (IUCN VI), which is a zone "managed to allow ecologically sustainable use while conserving ecosystems, habitats and native species. The zone allows for a range of sustainable uses, including commercial fishing and mining where they are consistent with park values" (Ref. 252). The natural values of this AMP include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for regionally significant marine fauna. Potential impacts to the values of the Montebello Marine Park may occur due to impacts on marine fauna. The consequence evaluations to these receptors are provided above, and were risk assessed as Incidental (6). It is therefore expected that there would also be no long-term or significant impacts to the values of the Montebello Marine Park. CAPL consider that the petroleum activity can be undertaken in a manner that is not inconsistent with the objectives of the *North-west Marine Parks Network Management Plan* (Ref. 252).
ALARP decision context justification

Source		
Offshore acoustic surveys are commonplace and well-practised nationally and internationally. The application of control measures to manage impacts and risks arising from this aspect are well defined, understood by the industry, and are considered standard industry practice. During relevant persons consultation, a claim regarding the risk of disruption to songlines was received. This claim was responded to by CAPL (see summary in 'external context' below, and within appendix d). Although some species that are known to be sensitive to underwater sound have the potential to be exposed to underwater sound above exposure criteria during these activities, the impacts and risks arising from underwater sound emissions are considered lower-order impacts and risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.		
Good practice control measures		
Control measure	**Description**	
EPBC Regulations 2000 – 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 interacting with cetaceans has been incorporated into the **EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans** control measure.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of the acoustic surveys within scope of this EP, the prediction for localised and temporary behavioural response, and the overlap with known biologically important areas for some fauna, the likelihood of exposing receptors resulting in the identified consequence was considered Unlikely (4).	
Risk level	Very Low (9)	
Determination of acceptability		
Principles of ESD	The risk associated with this aspect is a localised and temporary behavioural response 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. The consequence associated with this aspect is Incidental (6). Therefore, no further evaluation against the Principles of ESD is required.	
Relevant environmental legislation and other requirements	Legislation and other requirements considered applicable for this aspect include: • EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans • *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 95) • *Recovery Plan for Marine Turtles in Australia* (Ref. 118) • *Conservation Advice for the Whale Shark 2015–2020* (Ref. 126) • *Approved Conservation Advice for Aipysurus apraefrontalis* (Short-nosed Sea Snake) (Ref 115) • *Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref 116) • *North-west Marine Parks Network Management Plan* (Ref. 252).	

Source		
	CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.	
	Requirement	**Demonstration**
	EPBC Regulations 2000 – 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 interacting with cetaceans has been incorporated into the **EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with cetaceans** control measure.
	Conservation Management Plan for the Blue Whale 2015–2025 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	The ensonified area does not intersect with designated Foraging Areas for the pygmy blue whale. The nearest foraging BIA is located offshore from North-West Cape peninsula; and as such is not exposed to underwater sound emissions resulting from the petroleum activity. The ensonified area does not intersect with designated Foraging Areas for the pygmy blue whale as defined in the *Conservation Management Plan for the Blue Whale 2015–2025*. The nearest foraging BIA is located offshore from North-West Cape peninsula; and as such is not exposed to underwater sound emissions resulting from the petroleum activity. Based on proxy indicators, a recent study suggests that the 'most important areas' for foraging along the WA coast include discontinuous use of the shelf edge from Ningaloo Reef to Rowley Shoals (Ref. 96). During IMR activities the Sound EMBA may intersect with part of these 'most important areas' for foraging identified in Thums et. al (Ref. 96) however foraging areas are dynamic given their dependence on presence of prey (Ref. 125), and hence it is likely that the OA may overlap with these 'most important areas for foraging" at certain times Furthermore, adaptive management control measures have been considered and adopted for use within this risk assessment. TTS and AUD INJ is not predicted to occur for pygmy blue whales Therefore, this activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale*.
	Recovery Plan for Marine Turtles in Australia Management action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from	Auditory impairment (TTS and AUD INJ) is not predicted to occur for marine turtles; however, some small (up to ~682 m from a source) area of potential behavioural response is possible. Studies indicate the green and hawksbill turtles (the species that nest on the east coast of Barrow Island) are more likely to stay in shallow waters within ~5 km of Barrow Island during their internesting period. As such, even though there is a small predicted overlap between the ensonifed area

Source		
	identified habitat critical to the survival Management action A1.6: Manage anthropogenic activities in Biologically Important Areas to ensure that biologically important behaviour can continue	for behavioural response and the internesting habitat critical to the survival of a species, displacement from these areas is not predicted to occur. Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
	Conservation Advice for the Whale Shark 2015–2020 No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) No specific conservation action identified.	N/A
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A
	North-west Marine Parks Network Management Plan 2018 The class approval for mining operations within a multiple use zone requires a NOPSEMA-accepted EP to be in place before activities commence.	This EP has been submitted to NOPSEMA for assessment. Therefore, the petroleum activity is not considered to be inconsistent with the *North-west Marine Parks Network Management Plan.*
Internal context	No CAPL management processes or procedures were deemed relevant for this aspect.	
External context	During consultation, relevant persons identified the potential for disruption to songlines from underwater sound (appendix d). CAPL responded confirming: • intangible heritage, including songlines, has been considered in the environment description and risk assessments within the EP • control measures to reduce the risk of impacts to marine fauna have been included in the EP	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">CAPL is committed to continue to learn about the values and sensitivities associated with Sea Country through ongoing consultation.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks associated with the petroleum activity are not inconsistent with any recovery plan, conservation advice, or relevant bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below:</td></tr>
<tr><td></td><td>Plan</td><td>Objective</td></tr>
<tr><td></td><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>Recovery objective: 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 objective 4 Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td></td><td>Recovery Plan for Marine Turtles in Australia</td><td>Recovery objective: The long-term recovery objective for marine turtles is to 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 3: Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td></td><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1.</td></tr>
<tr><td></td><td colspan="2">Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species
no auditory injury (TTS or AUD INJ) to pygmy blue whales within a BIA resulting from underwater sound from the petroleum activity
no displacement of pygmy blue whales from foraging areas resulting from underwater sound from the petroleum activity
no displacement of marine turtles from habitat critical to the survival of a species resulting from underwater sound from the petroleum activity
no disruption of biologically important behaviours of marine turtles within biologically important areas resulting from underwater sound from the petroleum activity
no adverse change to the values of the Montebello Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the risk to values of the AMP are also subsequently managed to this acceptable level.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
</table>

Source		
No injury to marine fauna from underwater sound emissions associated with the petroleum activity within the OA. No displacement of marine fauna, or disruption of biologically important behaviours of marine fauna, from biologically important areas or habitat critical to the survival of a species from underwater sound emissions within the OA associated with the petroleum activity No adverse change to the values of Australian Marine Parks from the petroleum activity	**Marine fauna caution, approach and separation distances** Vessels will implement caution and no approach zones, where practicable: • caution zone (300 m either side of whales; 15 m either side of dolphins)– vessels must operate at ≤ 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; 100 m[76] 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 • a separation distance of 30 m from whale sharks and marine turtles, and	Induction materials include relevant marine fauna caution and no approach zone requirements Training records confirm offshore personnel involved in IMR activities have completed the induction Vessel records show if marine fauna interaction occurred within caution or approach zones, and what mitigation (e.g. divert or slow vessel) measure was implemented

[76] The EPBC Regulations 2000 (Cth) require a 150 m separation distance from dolphins however CAPL has adopted a separation distance of 100 m based on the Biodiversity Conservation Regulations 2018 (WA).

Source		
	100 m from Dugongs– vessels must operate at ≤6 knots when moving away to maintain these separation distances.	

7.9 Planned discharges—Surface

Source

Activities identified as having the potential to result in planned discharges are:

- vessels operations within the OA during IMR activities
- FCS operations and IMR activities.

The types of planned discharges include deck wash-water, drainage, fire-fighting foam, sewage, greywater, ballast water, food wastes, cooling water, oily bilge water and water from the BSS recharging tank.

Potential impacts and risks

Impacts	C	Risks	C
Planned discharges from vessels or the FCS may result in: • localised and temporary reduction in water quality	6	A change in ambient water quality may result in: • changes to predator-prey dynamics	6

Consequence evaluation

Localised and temporary reduction to water quality

Open marine waters are typically influenced by regional wind and large-scale ocean current patterns resulting in the rapid mixing of surface and near-surface waters—where vessel discharges would occur (Ref. 335). Therefore, nutrients from sewage, or other similar, discharges will not accumulate or lead to eutrophication due to the highly dispersive environment (Ref. 335). This outcome was verified by sewage discharge monitoring for another offshore project (Ref. 310), which determined that a 10 m^3 sewage discharge reduced to ~1% of its original concentration within 50 m of the discharge location. In addition, monitoring at distances 50 m, 100 m, and 200 m downstream, and at five different water depths, confirmed that discharges were rapidly diluted and no elevations in water quality monitoring parameters (e.g. total nitrogen, total phosphorous, and selected metals) were recorded above background levels at any station. This modelling was based on volumes that far exceed volumes expected during vessel operations or during FCS IMR activities. Therefore, the extent of impacts are expected to be localised to the discharge location.

Discharge of macerated but untreated sewage can create a health hazard; however, given the volumes and expected dilution / dispersion upon release, this is not expected to occur. The FCS is also located >100 km (>54 nm) from the nearest coastline, which is much greater than the minimum >12 nm requirement for a vessel to discharge untreated sewage.

Monitoring of continuous wastewater discharges (including cooling water and desalination brine) 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. 310).

Source
A vessel's bilge system is designed to safely collect, contain and dispose of oily water so that discharge of hydrocarbons to the marine environment is minimised or avoided. Bilge water is processed via an oil-water separator before being discharged to sea. Discharge is intermittent and occurs at or near surface waters. As such, oily bilge discharges are expected to readily dilute and disperse under the action of waves and currents in surface waters. In addition, once exposed to air, any volatile components of the oil will readily evaporate. Testing of fire-fighting deluge systems onboard vessels and the FCS may result in the release of fire-fighting foams to the marine environment. Toxicological effects from these types of foams is typically only associated with prolonged or frequent exposures, such as on land and in watercourses near firefighting training areas (Ref. 336; Ref. 337). These conditions are not consistent with the use under this EP where use of the systems may arise infrequently and in offshore, open waters. In their diluted form (as applied in the event of a fire or test), fire-fighting foams are generally considered to have a relatively low toxicity to aquatic species (Ref 338; Ref. 339) and further dilution of the foam mixtures in dispersive aquatic environments may then occur before there is any substantial demand for dissolved oxygen (Ref. 340). Consequently, the change in water quality from these standard discharges is expected to be limited to a localised area and return to ambient conditions following completion of the discharge; therefore, any impacts have been assessed as Incidental (6).
Changes to predator / prey dynamics The overboard discharge of sewage and macerated food waste creates a localised and temporary food source for scavenging marine fauna or seabirds, whose numbers may temporarily increase as a result, thus increasing the food source for predatory species. However, the rapid consumption of this food waste by scavenging fauna, and physical and microbial breakdown, ensures that the impacts of food waste discharges are localised and temporary. As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs or habitat critical to the survival of a species also overlap with the OA. The values and sensitivities within the OA with the potential to be affected by changes in predator–prey dynamics include: • whale shark (foraging) • fish communities (associated with the various KEFs). Effects on environmental receptors along the food chain—fish, reptiles, birds, and cetaceans—are not expected beyond the immediate vicinity of the discharge in open waters (Ref. 335). Studies into the effects of nutrient enrichment from offshore sewage discharges indicate that the influence of nutrients in open marine areas is much less significant than that experienced in enclosed areas (Ref. 341) and suggest that zooplankton composition and distribution in areas associated with sewage discharges are not affected. However, if any changes in phytoplankton or zooplankton abundance and composition occur, they are expected to be localised, typically returning to background conditions within tens to a few hundred metres of the discharge location (Ref. 342; Ref. 343; Ref. 344). Although fish are likely to be attracted to these discharges, any attraction and consequent change to predator–prey dynamics is expected to be limited to close to the release and thus is expected to result in localised impacts to individuals. Any increased predation is not expected to result in more than a limited environmental impact; therefore, the consequence is Incidental (6).
ALARP decision context justification
Offshore commercial vessel operations, and subsequent planned discharges, are commonplace and well-practiced locally, nationally, and internationally. The control measures to manage the risk 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 stakeholder consultation, no objections or claims were raised regarding planned surface discharges arising from the activity. The impacts associated with these discharges are lower-order impacts in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.

Source		
However, as this aspect is listed as a key threat to protected matters under documents made or implemented under the EPBC Act, and can result in a credible impact or risk, additional control measures were also considered.		
Good practice control measures and source		
Control measure	**Source**	
Hazardous materials selection process	Hazardous materials that will be discharged to the environment will be subjected to a selection process as per CAPL's *Hazardous Materials Management Procedure* (Ref. 36).	
MARPOL 73/78	Prior to commencement of the petroleum activity, Chevron's OVIS assessment requirements within *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) are used to verify that all vessels will comply with relevant Marine Orders (as appropriate to vessel class) for discharges, including: • 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 • 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 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. 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. MARPOL 73/78 Annex IV requirements will also apply to the FCS where sewage will be untreated but macerated as discharges are >12 nm from the nearest land.	
FCS secondary containment	To prevent unplanned releases to the marine environment, secondary containment will be available for generators and the diesel storage tank and for hazardous materials storage onboard the FCS.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
Selection of firefighting foam for use on FCS	Formulations of aqueous firefighting foams can contain fluorinated surfactants. Finished fluorosurfactant foams are generally rather non-toxic; however, it is their polyfluorinated degradation products that are of environmental concern because of unfavourable persistence, bioaccumulation and toxicity (Ref. 345). As described in Section 3.16.11, the use of firefighting foam (e.g. during testing, or in event of emergency) would result in a discharge to the open ocean. Selection of a firefighting foam without fluorinated surfactants	The cost of selecting a non-fluorosurfactant firefighting foam for use on the FCS is not considered grossly disproportionate to the potential environmental benefit gained. Therefore, this control measure has been adopted for use.

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td>removes the potential impacts associated with their persistent presence in the environment.</td><td></td></tr>
<tr><th colspan="3">Likelihood and risk level summary</th></tr>
<tr><td>Likelihood</td><td colspan="2">Given the nature and scale of this activity with standard control measures in place, it is considered Remote (5) that these discharges would result in any impact to the ecological function of the particular values and sensitivities present within the OA.</td></tr>
<tr><td>Risk level</td><td colspan="2">Very low (9)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential impacts and risks associated with this aspect is limited to a short-term direct reduction in water quality in a localised area, which is not considered as having the potential to affect biological diversity and ecological integrity.
Accordingly, the consequence associated with this aspect is Incidental (6).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered relevant to this aspect include:
Marine Order 91
Marine Order 95
Marine Order 96
MARPOL 73/78 Annex I, IV and V
North-west Marine Parks Network Management Plan (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Marine Order 96
Gives effect to Annex IV of MARPOL 73/78</td><td>Requirements for offshore discharge of sewage have been incorporated into the MARPOL 73/78 sewage discharge control measure</td></tr>
<tr><td>Marine Order 95
Gives effect to Annex V of MARPOL 73/78</td><td>Requirements for offshore discharge of food have been incorporated into the MARPOL 73/78 food waste discharge control measure</td></tr>
<tr><td>Marine Order 91
Gives effect to Annex I of MARPOL 73/78</td><td>Requirements for offshore discharge of oily bilge water from vessels have been incorporated into the MARPOL 73/78 oily bilge water discharge control measure</td></tr>
<tr><td>North-west Marine Parks Network Management Plan 2018
The Plan requires that “waste from normal operations of vessels must be compliant with requirements under the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Maritime Organisation (IMO) convention covering prevention of pollution of the</td><td>The Montebello Marine Park is a multiple use zone (IUCN VI). The control measures identified for the management of planned discharges from vessel operations are in accordance with MARPOL requirements, and therefore also in accordance with the requirements of the multiple use zone of an Australian Marine Park.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th colspan="4">Source</th></tr>
<tr><td></td><td colspan="2">marine environment by ships from operational or accidental causes”.</td><td></td></tr>
<tr><td>Internal context</td><td colspan="3">These CAPL environmental performance standard / procedures were deemed relevant for this aspect:
Hazardous Materials Management Procedure (Ref. 36)
Marine Standard Non Tankers: Corporate OE Standard (Ref. 35).
Control measures related to each of the above management processes or procedures have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.</td></tr>
<tr><td>External context</td><td colspan="3">During stakeholder consultation, no objections or claims were raised regarding planned surface discharges from operations arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="3">These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below:<table><tr><th>Plan</th><th>Objective</th></tr><tr><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1</td></tr></table>Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
vessel discharges are compliant with MARPOL requirements
no adverse change to the values of the Montebello Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the planned vessel discharges, that the risk to values of the AMP are also subsequently managed.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td>Planned discharges from vessel operations within the OA during the petroleum activity will meet MARPOL requirements</td><td>MARPOL 73/78 sewage discharge
Offshore discharge of sewage from vessels will be in 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</td><td>Records show sewage is discharged in 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)</td></tr>
</table>

Source		
	while the vessel is proceeding at no less than 4 knots.	
	MARPOL 73/78 food waste discharge 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.	Records show food waste is discharged in accordance with MARPOL 73/78 Annex V
	MARPOL 73/78 oily bilge water discharge 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.	Records show oily bilge water is discharged in accordance with MARPOL 73/78 Annex I, including current International Oil Pollution Prevention (IOPP) Certificate
Sewage discharges from FCS operations will meet MARPOL requirements	**MARPOL 73/78 sewage discharge** Discharge of sewage from the FCS will be in accordance with MARPOL 73/78 Annex IV requirements, specifically: • untreated sewage discharged ≥12 nm from the nearest land.	Records show sewage is discharged from the FCS in accordance with the relevant requirements of MARPOL 73/78 Annex IV.
No impacts to marine habitats or marine fauna outside of the OA from surface discharges during the petroleum activity	**Hazardous materials selection process** Hazardous materials planned for discharge are subject to the selection process as per the CAPL *Hazardous Materials Management Procedure*	Hazardous materials selection process assessment records (or similar)
	FCS secondary containment Secondary containment will be available on board the FCS for: • generators and diesel storage • hazardous materials storage	Records show that secondary containment is available for generators, diesel storage and hazardous materials storage on board the FCS
	Selection of firefighting foam for use on FCS	Records show that the firefighting foam stored on the FCS is fluorine free

Source		
	Firefighting foams selected for use on the FCS will be fluorine free	

7.10 Planned discharges—Subsea

Source

Activities identified as having the potential to result in planned subsea operational discharges are:

- commissioning and start-up activities
- operational activities
- IMR operations within the OA.

The types of planned subsea operational discharges include control fluids, spacer fluids, hydrotest fluids, MEG, hydrocarbons, cleaning agents (acid wash or similar), brine treated water and chemical additives (e.g. biocides and oxygen scavengers).

Potential impacts and risks

Impacts	C	Risks	C
Planned subsea operational discharges may result in: • localised and temporary reduction in water quality	6	A change in ambient water quality may result in: • indirect impacts to fauna arising from chemical toxicity	6

Consequence evaluation

Localised and temporary reduction in water quality

Subsea operational fluid discharges are intermittent, non-continuous, and of short duration, and as such frequency of exposure is limited. These fluids have positive buoyancy, upon release the plume will dilute and disperse (Ref. 346). The discharges largely occur at the wells or near the drill centres, which are located in water depths of ~200–250 m for Gorgon and ~1315–1350 m for Jansz.

Previously completed fluid dispersion modelling for subsea releases of control fluids indicate that in similar water depths with a similar product the residence time or plume persistence was estimated to be in the order of 18 minutes (Ref. 347).

This suggests that the residence time associated with a release of control fluids from valve actuations is well below the release frequency. As the receiving environment is open and enables dispersion (i.e. water movement is not restricted), accumulation effects from this release are not expected.

Due to the small discharge volumes ((Section 3.18), within open marine waters (which are typically influenced by large-scale ocean currents), rapid dispersion of fluids is expected to occur and the spatial extent of the discharges is expected to be limited to a small area in the water column around the source. All other planned discharges will be similarly low and infrequent events.

As subsea discharges are highly influenced by natural dispersion and dilution processes, the extent of exposure is most influenced by the volume of the release. Consequently, the planned discharges are expected to result in a limited environmental impact, and the consequence level was determined as Incidental (6).

Indirect impacts to fauna arising from chemical toxicity

As described above, these discharges are expected to result in temporary reductions in water quality within the immediate surroundings of the release location. The extent of this water quality reduction is largely limited to around the subsea wells and drill centres.

The particular values and sensitivities identified as having the potential to be exposed to these discharges are:

- continental slope demersal fish communities (KEF)

Source

- commercial fisheries.

Although these KEFs have been identified as having the potential to be exposed, as described in Section 4.17.6.1, the benthic habitats within the OA mostly comprise unvegetated, soft, and unconsolidated sediments. Given that biologically important habitats tend to be found in areas of rocky escarpment rather than soft sediments (Ref. 440, Ref. 60), exposure to habitats comprising high levels of diversity are not expected. *The North-West Marine Bioregional Plan* (Ref. 440, Ref. 60) does not identify toxicity or chemical pollution/contaminants as a key threat to the continental slope demersal fish communities KEF.

Hydraulic control fluid discharges will be required for the actuation of valves associated with the subsea system, however discharges are low volume (Section 3.18), occur at discrete locations and the fluid used is water-based with low toxicity and is not known to bioaccumulate; and are therefore is not expected to result in adverse impacts to habitats or fauna..

Given the rapid dilution and dispersion conditions, low bioaccumulation potential and the high biodegradability of the control fluids, and intermittent frequency of discharges, bioaccumulation in the receiving environment and sublethal impacts are expected to be limited. Consequently, the release of subsea discharges are expected to result in a limited environmental impact, and the consequence level was determined as Incidental (6).

ALARP decision context justification

Discharges associated with the operation of subsea infrastructure are commonplace and well-practiced within the industry. The control measures to manage the risk associated with these planned discharges are considered standard industry practice. These are well understood and implemented by the petroleum industry and CAPL

During stakeholder consultation, no objections or claims were raised regarding planned discharges from subsea operations arising from the activity.

The impacts associated with these discharges are lower-order impacts in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.

Good practice control measures and source

Control measure	Source
Hazardous materials selection process	Hazardous materials that will be discharged to the environment will be subjected to a selection process as per CAPL's *Hazardous Materials Management Procedure* (Ref. 36)
IMR work procedures	Activity specific work procedures are developed and address HIRA findings, including any additional controls identified for implementation.
Activity-specific HIRA	A HIRA will be conducted to identify and assess potential environmental impacts and risks associated with the specific maintenance or repair campaign proposed. The HIRA will consider relevant information, which may include: • proximity to potentially sensitive environmental receptors • other known activities and/or impacts that have occurred at that location • material minimisation • alternative materials • alternative execution methodologies • learnings from previous comparable IMR activities/campaigns. Where the HIRA identifies that risks and impacts are potentially greater than those assessed in this EP, the management of change process will be triggered (Section 8.17.2.2).

Additional control measures and cost benefit analysis

Control measure	Benefit	Cost
N/A	N/A	N/A

Source		
Likelihood and risk level summary		
Likelihood	Given the nature and scale of this activity, and with standard control measures in place, it is considered Rare (6) that this discharge would result in any impact to the ecological function of the particular values and sensitivities present within the OA.	
Risk level	Very low (10)	
Determination of acceptability		
Principles of ESD	The potential impacts and risks associated with this aspect is limited to a short-term direct reduction in water quality in a localised area, which is not considered as having the potential to affect biological diversity and ecological integrity. Accordingly, the consequence associated with this aspect is Incidental (6). Therefore, no further evaluation against the Principles of ESD is required.	
Relevant environmental legislation and other requirements	No legislation or other requirements were considered relevant to this aspect.	
Internal context	This CAPL environmental performance standard / procedure was deemed relevant for this aspect: • *Hazardous Materials Management Procedure* (Ref. 36). 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 stakeholder consultation, no objections or claims were raised regarding planned discharges from subsea operations arising from the activity.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No impacts to marine habitats, or marine fauna outside of the OA from subsea discharges during petroleum activities	**Hazardous materials selection process** Hazardous materials planned for discharge are subject to the selection process as per the CAPL Hazardous Materials Management Procedure	Hazardous materials selection process assessment records (or similar)
	IMR work procedures IMR activity specific work procedures developed and implemented	Records show that activity specific work procedures are developed for each IMR activity and address HIRA findings, including any additional controls identified for implementation
	Activity-specific HIRA	Records show that activity-specific HIRA undertaken prior to

Source		
	Activity-specific HIRA undertaken prior to maintenance or repair activity commencing	maintenance or repair activity commencing

7.11 Electromagnetic emissions

Source

Activities identified as having the potential to result in the generation of an electromagnetic field include operation of the HVSC.

Potential impacts and risks

Impacts	C	Risks	C
N/A	-	An electromagnetic field may result in: • behavioural disturbance of marine fauna	6

Consequence evaluation

Behavioural disturbance of marine fauna

While in use, the HVSC will generate a small electromagnetic field (EMF). The field strength produced as a result of the operation of electricity transmission decreases rapidly with distance away from the source (the decay curve follows the inverse square law; (Ref. 258)

Previous modelling studies indicate that EMFs are limited spatially (both vertically and horizontally); however, are likely to reach at minimum up to a number of meters in the water column, possibly more (Ref. 288). Previous modelling of the magnetic fields from a 132kV cable found that the EMF (B field) decreased to background levels within 20 m of the cable (Ref. 289). Given that the HVSC is either rock-dumped or trenched within waters shallower than ~100 m this is expected to further reduce the EMF (by increasing the distance between the EMF source and any receptors) in these areas.

Magnetic and/or electric receptors have been reported for a wide range of taxa (Ref. 290). Many organisms, including elasmobranchs, some bony fish, decapods, marine mammals and turtles can detect both natural and artificial electric and/or magnetic fields and use them to navigate, orientate, and sense prey, mates and predators (Ref. 291, Ref. 292).

As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs or habitat critical to the survival of a species that may be affected by EMF also overlap with the OA, including:

- flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA, internesting habitat critical to the survival of a species)
- whale shark (foraging BIA).

Collins (Ref. 258) and Michel et al (Ref. 293) concluded that EMF may cause very localised disturbance within metres of the cable.

Given the HVSC is situated on the seabed in water depths of ~25–1,290 m, EMF exposure would require fauna to either be demersally foraging or diving within very close (~20 m) proximity of the HVSC.

The anticipated EMF emitted from the HVSC would be unlikely to have a significant impact (i.e. physiological or behavioural) to most bony fish, particularly when consideration is given to the high mobility of the species (Ref. 294). Fish embryos may be influenced by low level EMFs; although the levels at which these effects are found are generally much larger than that expected to be generated by the HVSC (Ref. 294). The approximate spawning ground for southern bluefin tuna extends between Java and northern WA, covering an area of ~1,850,534 km^2. The part of the OA that intersects with this spawning ground is predominantly associated with the FCS and SCSt location; only ~3.5 km of HVSC intersects with this spawning ground (and occurs in waters >1,250 m deep). Spawning for southern bluefin tuna typically occurs near the water surface.

Source		
Cartilaginous fish can use electroreception for orientation and navigation, detection of prey, detection of conspecifics, and potential predators (Ref. 294). Sharks use E and/or B fields as their primary mode of locating food, finding mates, and navigating (Ref. 294). Whale sharks are known to spend considerable time close to the surface. Whale sharks tagged off WA (Ref. 296, Ref. 297) spent ~25% of their time <2 m from the surface and >40% of their time in the upper 15 m of the water column. The whale shark foraging BIA is situated along the 200 m depth contour. Given whale sharks preferto remain in the upper layers of the water column, exposure to an EMF field from the seabed is expected to have limited effect on foraging effort or ability. Studies have demonstrated that turtles have magneto sensitivity and behavioural responses to EMF intensities for loggerhead and green turtles (Ref. 290). While the HVSC occurs within internesting BIAs and internesting habitat critical to the survival of marine turtles (Section 4.17.3.20), high use of the OA as internesting habitat is not expected by any of the species (green, hawksbill, or flatback turtles) given their internesting habitat preference for shallower nearshore areas. With consideration given to the HVSC profile and stabilisation techniques (rock dumping and trenching), the anticipated B field emitted from the HVSC is likely to have a negligible impact to migration and orientation movements of the marine turtle species (Ref. 294). Given the predicted small disturbance radius of the EMF (i.e. within metres) of the HVSC, significant adverse effects to marine fauna behaviour are not expected to occur. Within the shallower waters (<100 m) of the OA, the HVSC is either trenched or rock dumped, thereby further reducing the distance of EMF into the ocean. In areas where the HVSC is exposed there may be a localised change in the EMF and this may cause discrete and temporary behavioural responses to fauna within close proximity to the HVSC, however the worst-case response identified is minor movement deviation (Ref. 290). As such, CAPL has ranked the consequence associated this risk as Incidental (6).		
ALARP decision context justification		
Anthropogenic sources of EMFs are becoming increasingly common in the marine environment and are generally a result of offshore infrastructure, including subsea power cables. During relevant persons consultation, a claim regarding the risk of disruption to songlines was The risks associated with seabed disturbance are considered lower-order risks in accordance with Table 5-3 Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.		
Good practice control measures		
Control measure	**Description**	
Cable design	EMFs exist wherever electric current flows, the types of EMFs generated by electrical cables are classified as extremely low frequency E and B fields. The field strength decreases rapidly with distance away from the source (the decay curve follows the inverse square law). The occurrence of electric fields may be controlled by application of shielding such as steel plates or sheaths within the cable insulating the conductor. The HVSC includes an outer insulation layer (Section 3.16.7.1).	
Secondary stabilisation	Secondary stabilisation methods (including rock dumping and trenching) have been undertaken along part of the HVSC route This has reduced the area potential exposed to the generated EMF by increasing the distance to the EMF source.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	Due to the nature and scale of the EMF generated by the activities within the scope of this EP, the likelihood of causing a behavioural disturbance to marine fauna is considered low. As such, the likelihood of incidental consequences to values and sensitivities from the generation of an EMF is considered Unlikely (4).	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Risk level</td><td colspan="2">Very low (9)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential risk associated with this aspect is highly localised and limited to individual occurrences and is therefore not expected to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Incidental (6).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td rowspan="3">Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered for this aspect include:
• North-west Marine Parks Network Management Plan (Ref. 252)
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.</td></tr>
<tr><td>Requirement</td><td>Demonstration</td></tr>
<tr><td>North-west Marine Parks Network Management Plan
No specific zone rules identified.</td><td>N/A</td></tr>
<tr><td>Internal context</td><td colspan="2">No CAPL management processes or procedures were deemed relevant for this aspect.</td></tr>
<tr><td>External context</td><td colspan="2">During relevant persons consultation, no objections or claims were raised regarding EMF arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These risks are inherently acceptable as they are considered lower-order risks in accordance with risks. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td rowspan="2">Reduce the risk of impacts to sensitive environmental receptors within the OA from petroleum activity</td><td>Cable design
HVSC designed to include an outer insulation layer.</td><td>HVSC design records confirm that HVSC includes an outer insulation layer.</td></tr>
<tr><td>Secondary stabilisation
Rock dumping and trenching were undertaken along the HVSC route as planned.</td><td>As built records verify rock dumping and trenching were completed.</td></tr>
</table>

7.12 Invasive marine pests

Source

Activities identified as having the potential to result in the introduction of an invasive marine pest (IMP) are:

- planned discharged of ballast water or the presence of biofouling on the FCS and vessels undertaking the petroleum activity within the OA.

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	An introduction of an IMP may result in: • displacement of, or competition with, native species	2

Consequence evaluation

Displacement of, or competition with, native species

IMPs are likely to have little or no natural competition or predators, thus potentially outcompeting native species for food or space, preying on native species, or changing the nature of the environment. It is estimated that Australia has >250 introduced marine pests, and that approximately one in six introduced marine species becomes a pest (Ref. 328).

IMPs primarily occur in shallow waters with high levels of slow-moving or stationary shipping traffic (such as ports). The probability of successful IMP settlement and recruitment decreases in deep ocean waters away from coastal habitats or shallow benthic habitats. IMP colonisation also requires a suitable habitat in which to establish itself, such as rocky and hard substrates, or subsea infrastructure. The Australian Government Bureau of Resource Sciences (BRS) established that the relative risk of an IMP becoming established around Australia decreases with distance from the coast. Modelling conducted by BRS (Ref. 329) estimates that the median risk of establishment[77] at 3 nm, 12 nm and 24 nm is ~40%, ~28%, and ~9% respectively.

. The OA is also located >5 km offshore from the closest island (Barrow Island), and >85 km from the mainland coast and large ports.

The values and sensitivities within the OA with the potential to be impacted by the introduction of a marine pest include the following KEFs:

- ancient coastline at 125 m depth contour
- continental slope demersal fish communities

Although KEFs have been identified as having the potential to be exposed, as described in Section 4.17.6.1, the benthic habitats within the OA mostly comprise unvegetated, soft, and unconsolidated sediments.. Surveys indicate that habitat within the ancient coastline at 125 m depth contour KEF in proximity to the OA consisted of smooth seabed with bioturbation and appeared devoid of biota (Ref. 73, Table 4-16). Similarly habitat within the continental slope demersal fish communities KEF in proximity to the OA comprise irregular and smooth seabed with bare substrates, discrete depressions of bare substrate, and scarps with bare substrate (Ref. 73, Table 4-16).

. The OA is in water depths of ~25–1,435 m, is located offshore from the mainland coast and large ports, and the seabed in most sections of the OA is dominated by soft sediments such as sand and clay. Thus, the more favourable requirements of expansive hard substrate and sufficient light for IMP survival are not common within the OA. The FCS is located in 1.290 m of water and is 125 km from the nearest coastline

Once established, some IMPs can be difficult to eradicate (Ref. 330) and therefore there is the potential for a long-term change in habitat structure. Highly disturbed shallow water and coastal marine environments (such as marinas) have been found to be more susceptible to colonisation than open-water environments, where the number of dilutions and the degree of dispersal is high

[77] In this context, establishment refers to an organism being able to find suitable habitat and survive.

Source
(Ref. 331, Ref. 332, Ref. 333, Ref. 334). Although marine pests are identified as being of concern to marine reptile species under the North-west Marine Bioregional Plan (Ref. 59), the risk is associated with terrestrial based IMPs thus is not relevant to the activities covered under this EP. If an IMP was introduced, and if it did colonise an area, there is the potential for that colony to spread outside the OA resulting in a widespread long-term impact, therefore resulting in a Severe (2) consequence.
ALARP decision context justification
Offshore commercial vessel operations are commonplace and well-practiced locally, nationally, and internationally. The causes resulting in an introduction of an IMP from a planned release of ballast water or hull biofouling are well understood by the industry and CAPL. The control measures to manage the risk associated with the introduction of an IMP are well defined via legislative requirements that are considered standard industry practice. These control measures are well understood and implemented by the petroleum industry and CAPL. Specifically, CAPL has worked in the region for over 10 years, thus has a demonstrated understanding of industry requirements and their operational implementation in these areas. During relevant persons consultation, no objections or claims were raised regarding biosecurity risks arising from the petroleum activity. The risk of introducing an IMP is considered a lower-order risk in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures and source

Control measure	Source
Quarantine procedure	CAPL's Quarantine Procedure Marine Vessels (Ref. 41) 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. 12) • undertaking biofouling risk assessments in line with the with the *National Biofouling Management Guidance for the Petroleum Production and Exploration Industry* (Ref. 15) 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*) MPEC.207(62) 2011 (Ref. 14) and *Australian Biofouling Management Requirements* (Ref. 13). As described in Section 8.17.3.2, 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 are satisfied that the vessel meets marine quarantine requirements, CAPL will issue authorization to mobilise via the *Quarantine Certificate – Vessel Mobilisation*.
Ballast water management	The *Australian Ballast Water Management Requirements* (Ref. 12) describes the management requirements for ballast water exchange, including:

Source		
	• 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.	
Anti-fouling certificate	The Commonwealth *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* enacts Marine Order 98 (Marine pollution – anti-fouling systems). This marine order describes the conditions for when an antifouling certificate is required.	
Maritime Arrivals Reporting System (MARS)	Under the Commonwealth *Biosecurity Act 2015*, pre-arrival information must be reported through MARS before a vessel arrives in Australian waters. In accordance with the *Australian Biofouling Management Requirements* (Ref. 13), from 15 June 2022, 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.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	As vessel based activities predominantly occur in deeper Commonwealth waters, and with the well-known and implemented IMP control measures in place, it is considered Rare (6) that an IMP would be introduced resulting in impacts to the ecological functions of benthic habitats within or in close proximity to the OA.	
Risk level	Low (7)	
Determination of acceptability		
Principles of ESD	The potential risks associated with this aspect is a widespread long-term impact to benthic communities. The introduction of an IMP to these communities has the potential to affect biological diversity and ecological integrity. The consequence associated with this aspect is Severe (2). Therefore, further evaluation against the remaining Principles of ESD 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. The habitat within the OA is known from baseline studies, thus the understanding of benthic habitat at these locations is well understood. As such, there is limited scientific uncertainty associated with this aspect; consequently the precautionary principle has not been applied.	
Relevant environmental legislation and other requirements	Legislation and other requirements considered relevant for this aspect include: • *Biosecurity Act 2015* • *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (enacted by Marine Order 98 [Marine pollution – anti-fouling systems]) • *Australian Ballast Water Management Requirements* (Ref. 12) • *Australian Biofouling Management Requirements* (Ref. 13) • *Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Biofouling Guidelines)* MPEC.207(62)) 2011 (Ref. 14)	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">
National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Ref. 15).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Biosecurity Act 2015 (Cth)
Pre-arrival reporting through MARS</td><td>Requirement for pre-arrival reporting has been incorporated into the MARS control measure.</td></tr>
<tr><td>Protection of the Sea (Harmful Anti-fouling Systems) Act 2006 (Cth)
Gives effect to Marine Order 98</td><td>Anti-fouling certifications (as per Division 2) have been incorporated into the anti-fouling certificate control measure</td></tr>
<tr><td>Australian Ballast Water Management Requirements
Best practice guidance for ballast water management within Australian seas, including legislative obligations under Biosecurity Act 2015 (Cth)</td><td>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</td></tr>
<tr><td>Australian Biofouling Management Requirements
Best practice guidance for biofouling management within Australian seas, including legislative obligations under Biosecurity Act 2015 (Cth)</td><td>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</td></tr>
<tr><td>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</td><td>Proactive management of biofouling (e.g. use of biofouling management plan) has been incorporated into the quarantine procedure control measure</td></tr>
<tr><td>National Biofouling Management Guidance for the Petroleum Production and Exploration Industry
Undertake a biofouling risk assessment</td><td>Biofouling risk assessments for vessels have been incorporated into the quarantine procedure control measure</td></tr>
<tr><td>North-west Marine Parks Network Management Plan
The Plan requires that "[b]allast water discharge and exchange must be compliant with Australian ballast water management requirements administered by the Australian Maritime Safety Authority".</td><td>The Montebello Marine Park is a multiple use zone (IUCN VI). The control measures identified for the management of ballast water are in accordance with Australian requirements, and therefore also in accordance with the requirements of the multiple use zone of an Australian Marine Park.</td></tr>
</table>
</td></tr>
<tr><td>Internal context</td><td colspan="2">This CAPL environmental performance standard / procedure was deemed relevant for this aspect:
Quarantine Procedure Marine Vessels (Ref. 41)</td></tr>
</table>

Source		
	Control measures related to each of the above management processes or procedures 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 stakeholder consultation, no objections or claims were raised regarding IMP arising from the activity.	
Defined acceptable level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No introduction and establishment of invasive marine pests within the OA due to petroleum activities	**Quarantine procedure** All marine vessels undertaking activities in the OA must meet the relevant requirements of the *Quarantine Procedure Marine Vessels*, 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.	*The Quarantine Certificate – Vessel Mobilisation* issued by CAPL confirm that relevant vessels meet requirements of the *Quarantine Procedure Marine Vessels*
	Ballast water management International marine vessels will be required to comply with the key *Australian Ballast Water Management Requirements*, 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.	For international marine vessels, records show compliance with the *Australian Ballast Water Management Requirements*
	Anti-fouling certificate 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* and/or the International Convention on the Control of	Inspection reports confirm that international antifouling coating certifications are up-to-date

Source		
	Harmful Anti-fouling Systems on Ships	
	Maritime arrivals reporting system Vessels entering into the Australian territorial sea from outside Australian territory will complete pre-arrival reporting (unless Excepted under Biosecurity Determination 2016), in accordance with the *Biosecurity Act 2015*	Records confirm that international vessels completed pre-arrival reporting (or can demonstrate meeting conditions for an exception)

7.13 Unplanned seabed disturbance

Source

Activities identified as having the potential to result in unplanned seabed disturbance are:

- field support—dropped object (e.g. tools or equipment) from vessels, ROVs or AUVs (during IMR activities). The maximum footprint associated with this is expected to be ~10 m^2.
- SCSt compressor module change-out – dropped module. The maximum footprint associated with this is expected to be ~1,500 m^2 (including disturbance from crane wire).

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	Unplanned seabed disturbance may result in:	
		• alteration of benthic communities and habitats	6
		• change to cultural heritage values	6

Consequence evaluation

Alteration of benthic communities and habitats

In the event of object loss, potential environmental impacts would be limited to physical disturbance to benthic communities and habitats in the OA.

As described in Section 4.17.1, benthic habitats within the OA mostly comprise unvegetated, soft, and unconsolidated sediments. Recent survey over parts of the Jansz pipeline showed the predominant benthic habitat was bare substrate, with either a smooth (mostly flat) or irregular (mostly flat with minor features) surface (Ref. 73). The only area identified as a high likelihood of biota being present was some patches over the scarp (Ref. 73)

The values and sensitivities within the OA with the potential to be impacted by seabed disturbance include the following KEFs:

- continental slope demersal fish communities
- ancient coastline at 125 m depth contour.

The intersection between the OA and the above KEFs occurs through the parts of the OA associated with the pipeline corridor and associated umbilicals. Recent surveys indicated that habitat within the ancient coastline at 125 m depth contour KEF in proximity to the OA consisted of smooth seabed with bioturbation and appeared devoid of biota (Ref. 73)). Similarly, habitat within the continental slope demersal fish communities KEF in proximity to the OA comprise irregular and smooth seabed with bare substrates, discrete depressions of bare substrate, and scarps with bare substrate, were the most dominant benthic features (Ref. 73).

As identified in Section 4.19.1, the OA overlaps with the Montebello Marine Park. The overlap between the marine park and the OA occurs at the shallower (typically <50 m) end of the OA, which has been stabilized by sands, clays, or gravels overlying subcropping cemented sediments. The habitat within the shallower parts of the OA are expected to be predominantly unvegetated sand, with patches of seagrass and macroalgae, and no associated sessile biota (Section 4.17.1.1).

The potential impacts to benthic communities and habitats as a result of unplanned seabed disturbance would be limited to individual occurrences and localised impacts (i.e. area of impact limited to the size of dropped object or equipment). Thus, CAPL ranked this consequence as Incidental (6).

Changes to cultural heritage values

There are no World, National, or Commonwealth heritage listed places or sites within the OA (Section 4.20), and no protected UCH[78] sites or artefacts have been identified within the OA

[78] 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”.

Source
(Section 4.20.2). Therefore, no impacts to known protected seabed-based UCH (e.g. shipwrecks or archaeology), including First Nations UCH, are expected to occur. Given known sea level history, part of the OA (i.e. areas in water depths of <125 m) would have been emergent land during the extended history of First Nations occupation of Australia. Previous seafloor geomorphological analyses on the mid to outer shelf regions proximal to Barrow Island indicated that some (previously emergent) coastal landscape features represented significant geoheritage value (Ref. 319). At the time of writing, CAPL understands through consultation with the relevant First Nations people and/or representative bodies that there are no known artefacts or specific sites of cultural value associated with the seabed within the OA. As such, it is anticipated that tangible heritage features would not be significantly adversely affected from unplanned seabed disturbance within the OA. Given the expected small (~10–1,500 m^2) footprint associated with the unplanned seabed disturbance, a significant adverse change to cultural values attributed to the offshore marine area from unplanned seabed disturbance is not predicted to occur. As such, CAPL has ranked the consequence for cultural values as Incidental (6). There are no World, National, or Commonwealth heritage listed places or sites within the OA (Section 4.20).
ALARP decision context justification
Offshore vessel operations from petroleum activities are common; the activities causing this aspect are utilized nationally and internationally. The control measures to manage the risks associated with unplanned seabed disturbance are well understood and implemented by the industry. During relevant persons consultation, a claim regarding the risk of disruption to songlines was received. The risks associated with unplanned seabed disturbance are considered lower-order risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures

Control measure	Description
Relevant persons engagement	In the event of a loss of equipment that results in a navigational hazard, other marine users within the vicinity will be notified.
Marine incident report	Reporting marine incidents is an important part of ensuring the safety of people and vessels. In the event of a loss of equipment meeting the requirements of a marine incident, an incident alert report must be issued to AMSA within 4 hours of the incident.
Lost 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.).
Lifting procedure	Prior to commencement of the petroleum activity, the *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) is used to verify that all vessels undertaking complicated, complex, or heavy lifts have a Lifting Procedure (or equivalent) in place that complies with the requirements of the *ABU Operations Process: Control of Work Manual* (Ref. 34). The Lifting Procedure will reference safe lifting distances (offsets) from existing subsea infrastructure.

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies)</td><td colspan="2">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 6), as part of ongoing consultation (as required by regulation 22(15) of the OPGGS(E)R, and described in Section 8.17.4) CAPL will continue to engage with First Nations people and/or representative bodies. This ongoing consultation relates to both the specific petroleum activity (Table 8-5) as well as broader engagement and relationship building (Section 8.17.4.3).
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.</td></tr>
<tr><td></td><td colspan="2">If new information on cultural values or features within the OA or 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 8.17.2.2.</td></tr>
<tr><th colspan="3">Additional control measures and cost benefit analysis</th></tr>
<tr><th>Control measure</th><th>Benefit</th><th>Cost</th></tr>
<tr><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><th colspan="3">Likelihood and risk level summary</th></tr>
<tr><td>Likelihood</td><td colspan="2">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, the likelihood of incidental consequences to values and sensitivities from an unplanned loss of equipment is considered Unlikely (4).</td></tr>
<tr><td>Risk level</td><td colspan="2">Very low (9)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential risk associated with this aspect is likely to be highly localised and limited to individual occurrences and is therefore not expected to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Incidental (6).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td rowspan="3">Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered for this aspect include:
• North-west Marine Parks Network Management Plan (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.</td></tr>
<tr><td>Requirement</td><td>Demonstration</td></tr>
<tr><td>North-west Marine Parks Network Management Plan
No specific zone rules identified.</td><td>N/A</td></tr>
<tr><td>Internal context</td><td colspan="2">No CAPL management processes or procedures were deemed relevant for this aspect.</td></tr>
<tr><td>External context</td><td colspan="2">No further objections or claims were raised regarding seabed disturbance arising from the petroleum activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any</td></tr>
</table>

Source		
	relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No unplanned seabed disturbance from activities within the OA during the petroleum activity No adverse change to the values of Australian Marine Parks from the petroleum activity No adverse change to First Nations cultural heritage values from the petroleum activity	**Relevant persons engagement** In the event of a loss of equipment that results in a navigational hazard, other marine users within the vicinity will be notified	Vessel records confirms notification to other marine users
	Marine incident report In the event of a loss of equipment meeting the requirements of a marine incident, an incident alert report must be issued to AMSA within 4 hours of the incident	Records confirm incident alert issued to AMSA within 4 hours of a marine incident occurring
	Lifting procedure If a vessel is undertaking complicated, complex, or heavy lifts, a Lifting Procedure (or equivalent) will be in place prior to activities commencing that complies with the requirements of the *ABU Operations Process: Control of Work Manual*	Records confirm that a Lifting Procedure (or equivalent) is in place prior to complicated, complex, or heavy lifts being undertaken
	Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies) Ongoing consultation with First Nations people and/or representative bodies is undertaken as per the respective engagement plan and/or consultation protocol	Relevant persons consultation records
	Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies) If new information on cultural values or features within the OA or 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 required, records show that the MoC process was undertaken in response to any new information on cultural values or features within the OA or EMBA
Reduce the risk of impacts to the environment from the unplanned loss of equipment during the petroleum activity	**Lost equipment** Lost equipment will be retrieved, where safe and practicable to do so	Records show that where assessed as safe and practicable, the lost equipment has been retrieved

7.14 Unplanned release—Waste

Source

Activities identified as having the potential to result in the unplanned release of waste are:

- IMR activities on the FCS and on vessels within the OA.

Inappropriate management and storage of waste generated on board vessels and the FCS has the potential to be released to the environment

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	Unplanned release of waste to the environment may result in: • marine pollution resulting in entanglement or injury of marine fauna	6

Consequence evaluation

Marine pollution resulting in injury and entanglement of marine fauna

If hazardous or non-hazardous waste is lost overboard, the extent of exposure to the environment is limited.

Ingestion or entanglement has the potential to limit feeding or foraging behaviours and thus can result in marine fauna injury or death. In 2003, "[i]njury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris" was listed as a key threatening process under the EPBC Act (Ref. 295). However, the National Threat Abatement Plan (Ref. 295) identifies that harmful marine debris includes "land-sourced garbage, fishing gear from recreational and commercial fishing abandoned or lost to the sea, and vessel-sourced, solid, non-biodegradable floating materials disposed of or lost at sea".

As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs and habitat critical to the survival of a species also overlap with the OA, including:

- humpback whale (migration BIA)
- pygmy blue whale (migration BIA)
- flatback turtle, green turtle, hawksbill Turtle (internesting buffer BIA, internesting habitat critical to the survival of a species)
- whale shark (foraging BIA)
- fairy tern, lesser crested tern, roseate tern, wedge-tailed shearwater (breeding BIAs).

The southern extent of the OA is ~1 km from foraging BIAs for the flatback turtle, green turtle and hawksbill turtle.

The *Recovery Plan for Marine Turtles in Australia* (Ref. 118), the *Conservation Advice for Whale Sharks* (Ref. 125), and the *Wildlife Conservation Plan for Seabirds* (Ref. 126) identifies marine debris as a threat. Several species, including cetaceans, marine reptiles, and birds are also identified in the *Threat Abatement Plan for the Impacts of Marine Debris* (Ref. 295) as species adversely impacted by marine debris.

Marine debris ingested by marine reptiles may result in ecotoxicological effects, physical blockage and internal injuries. The throat structure of marine turtles prevents the turtles regurgitating swallowed items and therefore swallowed items are trapped in the gut where they decompose and leak gases into the body cavity, resulting in injury or mortality (Ref. 300).

Many species of seabirds ingest considerable quantities of plastic and other marine debris, which has a wide range of lethal or sublethal effects (Ref. 299). This debris can cause physical damage to the body, or perforate, block or impair the digestive system, resulting in starvation (Ref. 299).

Given the restricted exposures and the small quantity of waste with the potential to cause marine pollution that is expected to be generated from this petroleum activity, it is expected that any

Source		
impacts from marine pollution would result in impacts to a few individual fauna. Thus, CAPL ranked this consequence as Incidental (6).		
ALARP decision context justification		
Offshore commercial operations, and the subsequent management of waste, are commonplace and well-practiced activities within the industry. The control measures to manage the risk associated with an accidental release of waste are well defined via legislative requirements that are considered standard industry practice. There is a good understanding of the release pathways, and the control measures required to manage these events are well understood and implemented by the petroleum industry and CAPL. During stakeholder consultation, no objections or claims were raised regarding waste management arising from the activity. An unplanned release of waste is a lower-order risk in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.		
Good practice control measures and source		
Control measure	**Source**	
Marine Order 95 (Marine pollution prevention – garbage)	MARPOL 73/78 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 73/78 Annex V requires that a garbage management plan and garbage record book is in place and implemented, and describes various requirements that are to be applied when managing waste offshore. Marine Order 95 (Marine pollution prevention – garbage) gives effect to MARPOL 73/78 Annex V.	
FCS waste management	Waste management strategies will be in place for FCS IMR campaigns to prevent accidental pollution. This includes making lidded waste receptacles available for use in open areas of the FCS and sending garbage back to shore for disposal.	
Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A
Likelihood and risk level summary		
Likelihood	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, the likelihood of incidental consequences to values and sensitivities from an unplanned release of waste is considered Remote (5).	
Risk level	Very low (10)	
Determination of acceptability		
Principles of ESD	The potential impact associated with this aspect is limited to individuals and consequently is not expected to affect biological diversity and ecological integrity. The consequence associated with this aspect is Incidental (6). Therefore, no additional evaluation against the Principles of ESD is required.	
Relevant environmental legislation and	Legislation and other requirements considered relevant for this aspect include: • Marine Order 95 • MARPOL 73/78	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>other requirements</td><td colspan="2">

Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia’s coasts and oceans (2018) (Ref. 295)
North-west Marine Parks Network Management Plan (Ref. 252).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Marine Order 95
Gives effect to Annex V of MARPOL 73/78</td><td>Requirements for the prevention of pollution from garbage have been incorporated into the Marine Order 95—Marine pollution prevention—garbage control measure</td></tr>
<tr><td>Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia’s coasts and oceans
No specific action identified.</td><td>N/A</td></tr>
<tr><td>North-west Marine Parks Network Management Plan 2018
The Plan requires that “waste from normal operations of vessels must be compliant with requirements under the International Convention for the Prevention of Pollution from Ships (MARPOL), the International Maritime Organisation (IMO) convention covering prevention of pollution of the marine environment by ships from operational or accidental causes”.</td><td>The Montebello Marine Park is a multiple use zone (IUCN VI). The control measures identified for the management of planned discharges from vessel operations are in accordance with MARPOL requirements, and therefore also in accordance with the requirements of the multiple use zone of an Australian Marine Park.</td></tr>
</table>
</td></tr>
<tr><td>Internal context</td><td colspan="2">No CAPL environmental performance standards / procedures were deemed relevant for this aspect.</td></tr>
<tr><td>External context</td><td colspan="2">During stakeholder consultation, no objections or claims were raised regarding waste management arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below:
<table>
<tr><th>Plan</th><th>Objective</th></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>Recovery objective: 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 objective 4 Anthropogenic threats are demonstrably minimised.</td></tr>
</table>
</td></tr>
</table>

Source		
	Recovery Plan for Marine Turtles in Australia	Recovery objective: The long-term recovery objective for marine turtles is to minimize 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 3: Anthropogenic threats are demonstrably minimized.
	National Recovery Plan for Threatened Albatrosses and Giant Petrels 2011–2016	Overall objective: To ensure the long term survival and recovery of albatross and giant petrel populations breeding and foraging in Australian jurisdiction by reducing or eliminating human related threats at sea and on land
	Wildlife Conservation Plan for Migratory Shorebirds	Objective 3: Anthropogenic threats to migratory shorebirds in Australia are minimised or, where possible, eliminated.
	Wildlife Conservation Plan for Seabirds	Objective 2: Seabirds and their habitats are identified, protected and managed in Australia.
	North-west Marine Parks Network Management Plan 2018	As per Section 4.19.1
	Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents: • impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species • no adverse change to the values of the Montebello Marine Park. CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the unplanned release of waste, that the risk to marine fauna and/or values of the AMP are also subsequently managed.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No uncontrolled release of waste to the environment during petroleum activities No injury or mortality to marine fauna from an unplanned release of waste associated with the petroleum activity within the OA	**Marine Order 95 (Marine pollution prevention – garbage)** 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	OVIS report / ABU Marine OE Inspection Checklist verifies that a Garbage Management Plan is on board marine vessels >100 T or certified to carry >15 persons
	Marine Order 95 (Marine pollution prevention – garbage) 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	Current and completed Garbage Record Book (for marine vessels >400 T or certified to carry >15 persons)

Source		
	Marine Order 95 (Marine pollution prevention – garbage) 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	Current International Air Pollution Prevention (IAPP) Certificate (for marine vessels >400 T or certified to carry >15 persons)
		Current and completed Garbage Record Book (for marine vessels >400 T or certified to carry >15 persons).
	FCS waste management FCS waste is managed by: • lidded waste receptacles are provided in open areas of the FCS where waste has a risk of being blown in to the ocean (e.g. general waste, loose plastic) • garbage generated during IMR campaigns will be sent to shore for disposal	Records confirm lidded waste receptacles are provided and garbage generated during IMR campaigns is sent to shore for disposal

7.16 Unplanned release—Minor loss of containment

Source

IMR activities on the FCS and the operation of the hydrocarbon system and vessels includes handling, using, and transferring hazardous materials, and has the potential to result in a loss of containment (LOC) event. Based on the activities described in this EP, the following potential LOC scenarios were identified:

- using, handling, and transferring hazardous materials and chemicals on board vessels or the FCS (~1 m^3)[1].
- hydraulic line failure from equipment (~2 m^3)[2]
- transferring hazardous materials between vessels and the FCS (~50 m^3)[3]
- dropped objects (and interaction with the subsea infrastructure) resulting in a loss of various fluids including hydrocarbons, treated sea water, hydraulic fluids, or MEG[4].
- thermal runaway event resulting in the release of hazardous materials from the SBS (<1 m^3)[5]

[1] A range of hydrocarbons and other hazardous chemicals / materials are likely to be present onboard vessels and the FCS; 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.

[2] The volume of an unplanned release associated with a hydraulic line failure will vary with the equipment in use; however, the maximum credible volume associated with failure of a hydraulic power unit was estimated to be ~2 m^3 based on the loss of the full volume

[3] AMSA (Ref. 304) suggests the maximum credible spill volume from a refuelling incident with continuous supervision is approximately the transfer rate × 15 minutes. 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.

[4] Dropped objects may damage subsea infrastructure resulting in a release of hydrocarbons, treated sea water, hydraulic fluid, or MEG. CAPL defined the credible worst-case scenario during IMR activities as a ~50 m^3 release from one of the larger subsea valves (1" valve).

CAPL engaged RPS APASA to run the OILMAP DEEP model to understand the near-field plume dynamics to determine whether visible oil and gas, at levels of concern, would reach the surface (from each release location) (Ref. 303). Both Jansz-Io and Gorgon condensate properties were considered on the basis that when under pressure, a volume of 50 m^3 of hydrocarbon has the potential to be released over a 24-hour period until the release is controlled. Modelling indicated that due to the depth of water at the Jansz DC-1 release site (1,338 m), no visible oil was predicted to reach the sea surface and that oil/gas plume execution depths ranged from 977 to 1,224 m below the sea surface (Ref. 303). Modelling indicated that due to the depth of water at the Gorgon M3 release site (200 m), no visible oil was predicted to reach the sea surface and that oil/gas plume execution depths ranged from 69 to 172 m below the sea surface (Ref. 303). These droplets of oil will be removed from the environment through biodegradation processes.

[5] Thermal runaway effects modelling (Ref. 470) indicates the maximum credible release from the SBS infrastructure is estimated to be <1 m^3 of off gas (including hydrogen fluoride and hydrogen chloride) resulting from the failure of a BSS following a thermal runaway event. This release may occur subsea while the SBS is operational or at surface prior to or during BSS recharge. If a thermal runaway occurs onboard the vessel and before the BSS is placed in the water tank, the BSS may be submerged in the ocean to prevent further escalation of the runaway event. The submerged BSS will then be lowered to the mudmat location and left for ~48 hours prior to retrieval.

Potential impacts and risks

Impacts	C	Risks	C
N/A	–	Unplanned release of hazardous material to the environment may result in: • indirect impacts to fauna arising from chemical toxicity	5

Consequence evaluation

Upon release, a loss of 50 m^3 of marine fuel would be expected to result in a localised and short-term change to water quality within surface waters. Given the known weathering and fate behaviour of MDO (Section 7.17), it is expected a film would form on the surface of the ocean and

Source
rapidly evaporate and disperse following release. The environmental impacts associated with a surface release of 50 m^3 of MDO are expected to be much less than those associated with a loss of MDO from a vessel collision, and thus are not evaluated further in this section given that this risk is evaluated in Section 7.17. The remaining LOC scenarios are limited to low volume (~1–2 m^3) releases of hydraulic fluid or other hazardous materials. Modelling was conducted for a 50 m^3 subsea release of condensate from the Gorgon field to understand the potential impacts associated with a release arising from a dropped object damaging previously installed subsea infrastructure. Modelling predicts that the extent of exposure to hydrocarbons (from the Gorgon field) was limited to within 22 m of the release location and that a subsea release from the Jansz–Io field was not expected to result in any surface exposures and limited in-water exposure due to rapid dilution and dispersion (Ref. 303). As identified in Section 4.17.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. Several BIAs or habitat critical to the survival of a species also overlap with the OA, including: • humpback whale (migration BIA) • pygmy blue whale (migration BIA) • whale shark (foraging BIA) • flatback turtle, green turtle, hawksbill turtle (internesting buffer BIA, internesting habitat critical to the survival of a species). Based on the nature of these unplanned releases, which are low volume (~50 m^3), and instantaneous and intermittent, the extent and severity of any potential impact is expected to be spatially and temporally limited and 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 individuals, thus the consequence level was determined as Minor (5).
ALARP decision context justification
Offshore operations including IMR and vessel operations are commonplace and well-practiced industry activities. The control measures to manage the risk associated with LOC 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. Modelling was undertaken for several scenarios associated with this aspect to support the environmental risk evaluation. Modelling has removed some of the uncertainty associated with this aspect, and supports the evaluation that due to the distance offshore and distance to sensitive receptors, these risks are lower-order risks in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures and source

Control measure	Source
Marine Standard	Chevron's *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 34) ensures that various legislative requirements and CAPL standards are met. Specifically, pre-mobilisation inspections may include: • visual checks of accessible equipment and hydraulic hoses for defects • confirmation that dry-break couplings or similar automated stop devices are available for use on marine vessels that are refuelled at sea • secondary containment is available for hydrocarbons and chemicals stored on the deck of marine vessels • bunkering procedures are available.

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>FCS secondary containment</td><td colspan="2">To prevent unplanned releases to the marine environment, secondary containment will be available for generators and the diesel storage tank and for hazardous materials storage onboard the FCS.</td></tr>
<tr><td>Ship Oil Pollution Emergency Plan (SOPEP)/ Shipboard Marine Pollution Emergency Plan</td><td colspan="2">MARPOL 73/78 Annex I and Marine Order 91 (Marine pollution prevention – oil) requires that each vessel 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.</td></tr>
<tr><th colspan="3">Additional control measures and cost benefit analysis</th></tr>
<tr><th>Control measure</th><th>Benefit</th><th>Cost</th></tr>
<tr><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><th colspan="3">Likelihood and risk level summary</th></tr>
<tr><td>Likelihood</td><td colspan="2">The likelihood that a LOC event results in a Minor (5) consequence was determined to be Remote (5). With the control measures in place, it was considered very unlikely that a large LOC event associated with this activity would occur, and even more unlikely that such an event would impact any of the identified values and sensitivities, which are known to be transient and unlikely to be present at the exact location of the LOC.</td></tr>
<tr><td>Risk level</td><td colspan="2">Very low (9)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential impact associated with this aspect would be short term, apply to some individuals, and consequently is not expected to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Minor (5).
Therefore, no additional evaluation against the Principles of ESD is required.</td></tr>
<tr><td rowspan="3">Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements considered relevant for this aspect include:
• Marine Order 91, Marine pollution prevention – oil
• MARPOL 73/78
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.</td></tr>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Marine Order 91
Gives effect to Annex I of MARPOL 73/78</td><td>Requirements for a vessel to have a SOPEP have been incorporated into the SOPEP / Shipboard Marine Pollution Emergency Plan control measure</td></tr>
<tr><td>North-west Marine Parks Network Management Plan</td><td>The Montebello Marine Park is a multiple use zone (IUCN VI). The control measures identified for the management of an unplanned release provide for the response</td></tr>
</table>

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td>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.”</td><td>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 8.18.2.
Therefore, this activity is not considered to be inconsistent with the North-west Marine Parks Network Management Plan.</td></tr>
<tr><td>Internal context</td><td colspan="2">These CAPL management processes or procedures were deemed relevant for this aspect:
• Marine Standard Non Tankers: Corporate OE Standard (Ref. 34).</td></tr>
<tr><td>External context</td><td colspan="2">During stakeholder consultation, no objections or claims were raised regarding LOC management arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents.
Objectives of the relevant documents are shown below:
<table>
<tr><th>Plan</th><th>Objective</th></tr>
<tr><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1</td></tr>
</table>
Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
• no adverse change to the values of the Montebello Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the unplanned release, that the risk to values of the AMP are also subsequently managed.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td>No unplanned release of hydrocarbons or</td><td>Marine Standard
Prior to commencement of IMR activities, the</td><td>OVIS report / ABU Marine OE Inspection Checklist confirms that equipment and hydraulic hoses are visually free of defects,</td></tr>
</table>

Source		
hazardous materials to the environment during the petroleum activity No adverse change to the values of Australian Marine Parks from the petroleum activity	following will be undertaken during a pre-mobilisation vessel inspection: • visual checks of accessible equipment and hydraulic hoses for defects • confirmation that dry-break couplings or similar automated stop devices are available for use on marine vessels that are refuelled at sea • confirmation that secondary containment is available for hydrocarbons and chemicals stored on the deck of marine vessels	dry-break couplings or similar are available for use, and secondary containment is available on the deck of the marine vessel
	Marine Standard Refuelling is undertaken in accordance with CAPL-approved refuelling / bunkering procedures, which include the appropriate weather / sea / visibility conditions, as determined by the Vessel Master	Records confirm that refuelling is undertaken in accordance with CAPL-approved refuelling / bunkering procedure
	FCS secondary containment Secondary containment will be available on board the FCS for: • generators and diesel storage • hazardous materials storage	Records show that secondary containment is available for generators, diesel storage and hazardous materials storage on board the FCS
	SOPEP Marine vessels >400 T will carry on board a Shipboard Oil Pollution Emergency Plan	OVIS report / ABU Marine OE Inspection Checklist confirms an approved SOPEP is on board marine vessels >400 T
		Inspection records (or similar) show drills conducted in accordance with SOPEP

Source		
	(SOPEP) in accordance with MARPOL 73/78 Annex I – Prevention of Oil Pollution	Inspection records (or similar) show spill kits available in accordance with SOPEP
	SOPEP In the event of a vessel-based spill event, emergency response activities will be implemented in accordance with the vessel SOPEP (or equivalent)	Records confirm that emergency response activities were implemented in accordance with the vessel SOPEP in the event of a vessel-based spill.

7.17 Unplanned release—Vessel collision event

7.17.1 Credible scenario

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 likely to occur under exceptional circumstances (e.g. loss of DP, navigational error, inclement weather conditions). Given the location, water depths, and lack of submerged features within the OA, grounding is not considered credible, and is not considered further.

Based upon the types of vessels typically used for IMR activities (with the exception of major repairs), size of largest fuel tanks and fuel type to be utilised for the activities in this EP, CAPL was able to identify the typical credible worst-case scenario (as per AMSA guidelines; Ref. 348) as being a surface release of ~325 m^3 of MDO resulting from a vessel collision event. However, in the event that major repairs are undertaken, larger vessels would be required. Typical fuel tank sizes associated with construction or heavy lift vessels are expected to be in the order of ~1,000 m^3.

7.17.2 Spill modelling

CAPL commissioned RPS to conduct spill modelling to inform the risk assessment associated with a vessel collision event within the OA. Three scenarios were modelled to provide a conservative assessment and identify the worst-case scenario: one in the Gorgon field, one in the Jansz-Io field, and one at the State/Commonwealth Waters boundaries (Ref. 349).

A three-dimensional oil spill model (SIMAP) was used to simulate the drift, spread, weathering and fate of the spilled oil (Ref. 349). Modelling was conducted using a stochastic approach, where multiple simulations (using the same spill parameters) were conducted, but under varying meteorological and oceanographic conditions.

Table 7-10 summarises the model settings; Table 7-11 summarises the hydrocarbon properties for MDO; and Table 7-12 describe the modelled environmental impact thresholds.

Table 7-10: Vessel collision spill scenario model settings

Parameter	Details		
Release Location	State/Commonwealth Waters Boundaries	Gorgon	Jansz–Io

Parameter	Details		
Latitude	20°40.182" S	20°34'38.60" S	19°51'8.7" S
Longitude	115°21.859" E	114°46'38.39" E	114°30'57.8" E
Water Depth	~23 m	~267 m	~1,320 m
Oil type	MDO		
Simulation spill type	Surface		
Simulation spill volume	450 m^3	1,500 m^3	1,750 m^3
Simulation spill duration	6 hours	24 hours	
Total simulation duration	30 days	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)		

Table 7-11: Physical properties and boiling point ranges for MDO

Characteristic	Value			
Density	829.1 kg/m^3 (at 25 °C)			
Dynamic viscosity	4 cP (at 25 °C)			
Pour point	-14 °C			
API gravity	37.6			
Classification	Group II, light persistent oil			
Boiling point	Volatile <180 °C	Semi-volatile 180–265 °C	Low volatility 265–380 °C	Residual >380 °C
	6.0%	34.6%	54.4%	5.0%

Table 7-12: Hydrocarbon environmental thresholds

Environmental threshold	Hydrocarbon Ecological EMBA^	Hydrocarbon Social EMBA^	Planning Area for Scientific Monitoring*	Justification
Surface ≥1 g/m^2 (low)		✓	✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥1 g/m^2 surface impact threshold for social, economic, and cultural receptors This threshold is equivalent to ~1,000 L/km^2 or a layer thickness of ~1 µm. At this concentration, oil on the water surface is expected to be visible. The Bonn Agreement Oil Appearance Code (Ref. 351) describes a 0.3–5.0 µm thick oil layer as having a rainbow-coloured appearance. Due to this visibility, there is the potential to nature-based activities (such as

Environmental threshold	Hydrocarbon Ecological EMBA^	Hydrocarbon Social EMBA^	Planning Area for Scientific Monitoring*	Justification
				tourism) via a reduction in aesthetics. In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), this low threshold for surface oil establishes the planning area for scientific monitoring.
Surface ≥10 g/m^2 (moderate)	✓	✓	✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥10 g/m^2 surface impact threshold for ecological receptors. This threshold is equivalent to ~10,000 L/km^2 or a layer thickness of ~10 µm. The Bonn Agreement Oil Appearance Code (Ref. 351) describes a 5–50 µm thick oil layer as having a metallic appearance. This threshold is considered by NOPSEMA to approximate the lower limit of harmful effects to birds and marine mammals (Ref. 350). This threshold is consistent with observations ranging from physical oiling to toxicity effects for marine fauna within literature, including French et al. (Ref. 360), French-McCay (Ref. 361), Engelhardt (Ref. 354), Clark (Ref. 381), Geraci and St. Aubin (Ref. 358) and Jenssen (Ref. 360).
In-water (dissolved) ≥10 ppb (low)			✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), this low threshold for dissolved oil establishes the planning area for scientific monitoring based on potential for exceedances of water quality triggers.
In-water (dissolved) ≥50 ppb (moderate)	✓	✓	✓	Laboratory studies have shown that dissolved oil exert most of the toxic effects of oil on aquatic biota (e.g. Carls et al. [Ref. 362], Nordtug et al. [Ref. 363], Redman [Ref. 364]). Being soluble, the dissolved oil can be taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥50 ppb in-water (dissolved) impact threshold for sublethal ecological effects and for social, economic, and cultural receptors. This threshold is considered by NOPSEMA to approximate potential toxic effects, particularly sublethal effects to sensitive species (Ref. 350). This threshold is based on an instantaneous concentration, and therefore only requires the dissolved oil to be at this concentration for one-hour (based on minimum model time-step) to trigger this threshold.
In-water (entrained)			✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), this low threshold for entrained

Environmental threshold	Hydrocarbon Ecological EMBA^	Hydrocarbon Social EMBA^	Planning Area for Scientific Monitoring*	Justification
≥10 ppb (low)				oil establishes the planning area for scientific monitoring based on potential for exceedances of water quality triggers.
In-water (entrained) ≥100 ppb (high)	✓	✓	✓	Entrained oil are insoluble droplets suspended in the water column, and as such exposure pathways are direct contact with external tissue or direct oil consumption. In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥100 ppb in-water (entrained) impact threshold for sublethal ecological effects and for social, economic, and cultural receptors. This threshold is considered by NOPSEMA as appropriate for informing risk evaluation (Ref. 350). This threshold is based on an instantaneous concentration, and therefore only requires the entrained oil to be at this concentration for one-hour (based on minimum model time-step) to trigger this threshold. French-McCay (Ref. 365) identified that if total hydrocarbons in entrained oil droplets was to be evaluated as a risk, 100 ppb would be an extremely conservative sublethal threshold.
Shoreline ≥10 g/m^2 (low)		✓	✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥10 g/m^2 shoreline impact threshold for social, economic, and cultural receptors. This threshold is equivalent to ~10 mL/m^2 or ~2 teaspoons/m^2. At this concentration, oil on the shoreline is expected to be visible. Due to this visibility, there is the potential to impact nature-based activities (such as tourism or recreational use) via a reduction in aesthetics.
Shoreline ≥100 g/m^2 (moderate)	✓	✓	✓	In accordance with NOPSEMA's oil spill modelling bulletin (Ref. 350), CAPL has set the ≥100 g/m^2 shoreline impact threshold for ecological receptors. This threshold is equivalent to ~100 mL/m^2 or 20 teaspoons/m^2. French et al. (Ref. 360) and French-McCay (Ref. 361) define shoreline oil accumulation at ≥100 g/m^2 as potentially harmful to wildlife (including invertebrates, birds, furbearing aquatic mammals and marine reptiles), based on studies for sub-lethal and lethal impacts. Impacts on vegetated habitats (such as saltmarsh and mangroves) have been observed at higher concentrations of shoreline oil. Observations by Lin and Mendelssohn (Ref. 366) demonstrated that loadings of >1,000 g/m^2 of oil during the growing season would be required to impact marsh plants

Environmental threshold	Hydrocarbon Ecological EMBA^	Hydrocarbon Social EMBA^	Planning Area for Scientific Monitoring*	Justification
				significantly. Similar thresholds have been found in studies assessing oil impacts on mangroves (e.g. Grant et al. [Ref. 367], Suprayogi and Murray [Ref. 368]).

^ Environmental thresholds used to define the Hydrocarbon EMBAs, and the presence of environmental values and sensitivities within this area have been identified in Section 4. These thresholds and the spatial extent of the Hydrocarbon EMBAs are used as part of the environmental impact and risk assessment presented below.

** Environmental thresholds used to define the Planning Area for Scientific Monitoring, and the presence of environmental values and sensitivities within this area have been identified within the Operational and Scientific Monitoring Plan: Environmental Monitoring in the Event of an Oil Spill to Marine or Coastal Waters (Ref. 17).*

7.17.2.1 Weathering and fate

MDO is a light-persistent fuel oil used in the maritime industry. It has a density of 829.1 kg/m^3, an API of 37.6, and a low pour point (−14 °C) (Table 7-11). The low viscosity (4 cP) indicates that this oil will spread quickly when released and will form a thin film on the sea surface, increasing the evaporation rate.

Generally, about 6.0% of the MDO mass should evaporate within the first 12 hours (boiling point <180 °C); a further 34.6% should evaporate within the first 24 hours (boiling point 180°C–265 °C); and an additional 54.4% should evaporate over several days (boiling point 265°C–380 °C). Approximately 5% (by mass) of MDO will not evaporate at atmospheric temperatures. These compounds will persist in the environment.

7.17.2.2 Modelling outputs

Stochastic modelling outputs from RPS (Ref. 349) are summarised in Table 7-13 to Table 7-15 having regard to the particular values and sensitivities within the EMBA, as identified in Section 4.

For the 450 m^3 MDO release near the State/Commonwealth waters boundary:

- the maximum distance from the release location to the ≥1 g/m^2 and ≥10 g/m^2 surface impact thresholds was ~58 km (winter) and ~42.9 km south-southwest (winter), respectively
- the release location lies within the Montebello Marine Park, with the highest probabilities of floating oil reaching the ≥1 g/m^2 threshold being 98% in summer, 100 % in transitional season, and 99% in winter
- the probability of accumulation at ≥10 g/m^2 was greatest during summer (50%), with a minimum time to shoreline accumulation of 0.21 days and maximum volume of oil ashore of 185.2 m^3.

For the 1,500 m^3 MDO release within the Gorgon field:

- the maximum distance from the release location to the ≥1 g/m^2 and ≥10 g/m^2 surface impact thresholds was ~80.8 km (transitional) and ~43.5 km south-southwest (transitional), respectively
- the probability of contact with any shoreline at ≥10 g/m^2 was 5% during the transitional season. The minimum time to shoreline contact was ~5.73 days, and the maximum volume of oil ashore was 11.5 m^3 during winter
- Shoreline contact at the ≥100 g/m^2 threshold occurred only during winter, with a probability of 1%. No shoreline contact at the ≥1,000 g/m^2 threshold was predicted during any season.

For the 1,750 m^3 MDO release within the Jansz-Io field:

- the maximum distance from the release location to the ≥1 g/m^2 and ≥10 g/m^2 surface impact thresholds was ~167 km (transitional) and ~100.8 km north-northwest (winter), respectively
- the probability of accumulation on any shoreline at ≥ 10 g/m^2 was 1% during summer. The minimum time to shoreline accumulation was 25.5 days, and the maximum volume of oil ashore was 1.8 m^3. No contact was predicted during transitional and winter seasons
- No shoreline contact was predicted to occur at ≥100 g/m^2 or ≥1,000 g/m^2 threshold during any season.

Table 7-13: State/Commonwealth waters boundary vessel collision spill modelling EMBA receptor exposure summary

Sensitivity	Name	Surface^		In-water (dissolved)^	In-water (entrained)^	Shoreline^	
		≥1 g/m²	≥10 g/m²	≥50 ppb	≥100 ppb	≥10 g/m²	≥100 g/m²
		(probability of exposure, minimum time to exposure)		(probability of exposure)	(probability of exposure)	(probability of exposure, minimum time to exposure, mean length of shoreline)	
AMP	Montebello	98-100% 0.04 days	69-92% 0.04 days	7-14%	85-93%	—	—
	Ningaloo	—	—	—	1%	—	—
State protected area	Barrow Island group	100% 0.04 days	100% 0.04 days	7-14%	73-97%	32-34% 0.25-0.42 days 5.4-8.1 km	16-21% 0.46-0.96 days 3.1-3.6 km
	Montebello Islands	2-5% 1.08-1.92 days	0-1% 1.17-2.33 days	—	6-54%	3-50% 1.67-2.54 days 2.9-8.2 km	1-13% 2.21-3.21 days 2-3 km
	Pilbara Islands Group	—	—	—	1-21%	15-32% 0.21-8.33 days 3.7-4 km	5-8% 0.21-5.71 days 2.1-2.3 km
KEF	Ancient coastline at 125 m depth contour	—	—	—	1-4%	—	—
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	—	—	—	1-2%	—	—
	Commonwealth waters adjacent to Ningaloo Reef	—	—	—	1%	—	—
World Heritage Properties / National Heritage Places	The Ningaloo Coast *(inferred from Cape Range IBRA, Exmouth shoreline)*	6-14% 0.21-1.58 days	0-8% 0.38-0.54 days	0-1%	25-42%	4-15% 4.58-8.75 days 1.9-4.3 km	—
Commonwealth Heritage Properties	Ningaloo Marine Area – Commonwealth Waters *(inferred from Ningaloo IMCRA)*	—	—	—	1%	—	—

^ *Ranges in values shown are due to the different results between seasons.*

Table 7-14: Gorgon field vessel collision spill modelling EMBA receptor exposure summary

Sensitivity	Name	Surface^		In-water (dissolved)^	In-water (entrained)^	Shoreline^	
		≥1 g/m²	≥10 g/m²	≥50 ppb	≥100 ppb	≥10 g/m²	≥100 g/m²
		(probability of exposure, minimum time to exposure)		(probability of exposure)	(probability of exposure)	(probability of exposure, minimum time to exposure, mean length of shoreline)	
AMP	Gascoyne	—	—	—	1-4%	—	—
	Montebello	—	—	—	1%	—	—
	Ningaloo	—	—	—	1%	—	—
State protected area	Pilbara Islands Group	—	—	—	1%	2-5%, 5.77-16.46 days 1.4-4.3 km	1% 6.73 days 1.9 km
KEF	Ancient coastline at 125 m depth contour	5-18% 0.42-1 days	3-9% 0.48-1.02 days	—	8-19%	—	—
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	—	—	—	2-8%	—	—
	Commonwealth waters adjacent to Ningaloo Reef				1%		—
	Continental slope demersal fish communities	100% 0.02 days	100% 0.02 days	1%	93-96%	—	—
	Exmouth Plateau	—	—	—	1-5%	—	—
World Heritage Properties / National Heritage Places	The Ningaloo Coast *(inferred from Cape Range IBRA, Exmouth shoreline)*	—	—	—	2%	—	—
Commonwealth Heritage Properties	Ningaloo Marine Area – Commonwealth Waters *(inferred from Ningaloo IMCRA)*	—	—	—	1-2%	—	—

^ *Ranges in values shown are due to the different results between seasons.*

Table 7-15: Jansz field vessel collision spill modelling EMBA receptor exposure summary

Sensitivity	Name	Surface^		In-water (dissolved)^	In-water (entrained)^	Shoreline^	
		≥1 g/m²	≥10 g/m²	≥50 ppb	≥100 ppb	≥10 g/m²	≥100 g/m²
		(probability of exposure, minimum time to exposure)		(probability of exposure)	(probability of exposure)	(probability of exposure, minimum time to exposure, mean length of shoreline)	
AMP	Gascoyne	—	—	—	1-4%	—	—
KEF	Ancient coastline at 125 m depth contour	—	—	—	1%	—	—
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	—	—	—	1%	—	—
	Continental slope demersal fish communities	—	—	—	3-10%	—	—
	Exmouth Plateau	3-4% 0.83-1.58 days	—	—	10-12%	—	—
World Heritage Properties / National Heritage Places	The Ningaloo Coast *(inferred from Cape Range IBRA, Exmouth shoreline)*	—	—	—	—	1% 25.46 days 1.8 km	—

^ *Ranges in values shown are due to the different results between seasons.*

7.17.3 Risk Assessment

Source

Activities identified as having the potential to result in a vessel collision event are:

- vessels and IMR operations within the OA.

A vessel collision event may occur as a result of a loss of DP, navigational error or floundering due to weather.

Potential impacts and risks

Impacts	C	Risks	C
N/A	—	The potential environmental impacts associated with hydrocarbon exposures from a vessel collision event are:	
		• marine pollution resulting in sublethal or lethal effects to marine fauna	4
		• smothering of subtidal and intertidal habitats	4
		• indirect impacts to commercial fisheries	5
		• reduction in amenity resulting in impacts to tourism and recreation	5
		• Changes to values and sensitivities of marine protected areas	4

Consequence evaluation

Marine pollution resulting in sublethal or lethal effects to marine fauna

Marine mammals

Marine mammals may be exposed to hydrocarbons from an oil spill at the water surface or within the water column. Marine mammals can be exposed to oil externally (e.g. swimming through surface slick) or internally (e.g. swallowing the oil, consuming oil-affected prey, or inhaling of volatile oil related compounds) (Ref. 352; Ref. 353).

An avoidance response (i.e. avoiding spilled hydrocarbons) has been identified for several species of cetacean, suggesting that cetaceans have the ability to detect and avoid surface slicks (Ref. 354). However, detection seems to depend on oil thickness and colour (Ref. 355), and observations during large oil spill events (Deepwater Horizon [DWH] and the Mega Borg spills) have recorded whales and dolphins travelling through and feeding in oil slicks (Ref. 355; Ref. 356; Ref. 357).

Direct contact with hydrocarbons may result in skin and eye irritation, burns to mucous membranes of eyes and mouth, and increased susceptibility to infection (Ref. 358). The effect of oil on cetacean skin is likely minor and temporary (Ref. 358) due to the skins effectiveness as a barrier. However, it was observed that existing skin lesions, cuts, or abrasions could allow oil to be absorbed more readily into the bloodstream (Ref. 356). French-McCay (Ref. 360) identifies that a ≥10 g/m^2 oil thickness threshold has the potential to impart a lethal dose to the species; however, also estimates a probability of 0.1% mortality to cetaceans if they encounter these thresholds based on the proportion of the time spent at surface.

Dugongs have smooth skin surfaces and therefore are less likely to be affected by oil adhering to their skin. If surfacing in a slick, the dugongs may foul their sensory hairs (around their mouths) or their eyes; these could lead to inflammation/infections that then affect their ability to feed or breed (Ref. 370). Dugongs may also ingest oil (directly, or indirectly via oil-affected seagrass), and depending on the amount and type of oil, the effects could be short-term to long-term/chronic (e.g. organ damage). However, it is noted that reports on oil pollution damage to dugongs are rare (Ref. 378).

The physical impacts from ingested hydrocarbons with subsequent lethal or sublethal impacts are possible; however, the susceptibility of cetaceans varies with feeding habits. Baleen whales are not

Source

particularly susceptible to ingestion of oil in the water column as they feed by skimming the surface (i.e. they are more susceptible to surface slicks). Toothed whales and dolphins may be susceptible to ingestion of dissolved and entrained oil as they gulp feed at depth. 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.

Marine mammals are vulnerable if they inhale volatiles when they surface within a hydrocarbon slick. For the short period that they persist, vapours from the spill are a significant risk to mammal health, with the potential to damage mucous membranes of the airways and the eyes, which will reduce the health and potential survivability of an animal. Inhaled volatile hydrocarbons are transferred rapidly to the bloodstream and may also accumulate in tissues (Ref. 358).

As identified in Section 4.17.3.1, several marine mammal species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon Ecological EMBA. The following BIAs intersect the Hydrocarbon Ecological EMBA:

- dugong (breeding, calving, foraging, and nursing)
- humpback whale (migration and resting)
- pygmy blue whales (foraging, migration)
- southern right whale (migration and reproduction).

As these species are considered most sensitive to surface and entrained exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure in each scenario.

The deterministic scenarios identified are considered most relevant for offshore waters (where surface exposures were deemed to be larger) and subsequent for assessing potential impacts to offshore BIAs associated with cetaceans. The deterministic models for the largest swept area of floating oil ≥10 g/m^2 indicate the following:

- at the state/Commonwealth waters boundary: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~8 km^2. Using the humpback whale migration (north and south) BIA, which is the most relevant BIA for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to <0.01% of the entire BIA
- at Gorgon field: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~25 km^2. Using both the humpback whale migration (north and south) BIA and the pygmy blue whale migration BIA, which are the most relevant BIAs for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to <0.01% of the entire BIAs
- at Jansz field: floating oil is present for ~6 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the pygmy blue whale migration BIA, which is the most relevant BIA for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to <0.01% of the entire BIA.

The deterministic models for the largest area of entrained hydrocarbons >100 ppb, which is considered most relevant for offshore waters and subsequent for assessing potential impacts to cetaceans, indicate the following:

- at the state/Commonwealth waters boundary: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~70 km^2 occurring ~2 days after the spill commenced. Using the humpback whale migration (north and south) BIA, which is the most relevant BIA for this release location, the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIA
- at Gorgon field: entrained hydrocarbons are present for <11 days following the spill event, with a maximum area of coverage of ~160 km^2 occurring ~3 days after the spill commenced. Using both the humpback whale migration (north and south) BIA and the pygmy blue whale migration BIA, which are the most relevant BIAs for this release location, the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIAs
- at Jansz field: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~190 km^2 occurring ~3 days after the spill commenced. Using the pygmy blue whale migration BIA, which is the most relevant BIA for this release location, the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIA.

Source
Based on an assessment of the predicted magnitude and duration of surface and entrained oil, it is expected that only a small proportion of any marine mammal population would be exposed above the defined impact exposure thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively. *Reptiles* Marine reptiles may be exposed to hydrocarbons from an oil spill on the shoreline or at the water surface. Marine reptiles can be exposed to oil externally (e.g. swimming through surface slick) or internally (e.g. swallowing the oil, consuming oil-affected prey, or inhaling of volatile oil related compounds) (Ref. 369). Marine turtles are vulnerable to the effects of oil at all life stages: eggs, hatchlings, juveniles, and adults. Several aspects of turtle biology and behaviour place them at risk, including a lack of avoidance behaviour, indiscriminate feeding in convergence zones, and large pre-dive inhalations (Ref. 370). Oil effects on turtles can include impacts to the skin, blood, digestive, and immune systems, and increased mortality due to oiling. Shoreline hydrocarbons can impact turtles coming ashore at nesting beaches. Eggs may also be exposed during incubation, potentially resulting in increased egg mortality and detrimental effects on hatchlings. Hatchlings may be particularly vulnerable to toxicity and smothering as they emerge from the nests and make their way over the intertidal area to the water (Ref. 369). Habitat critical to the survival and BIAs for the flatback, green, hawksbill and loggerhead turtles were identified within the Hydrocarbon Ecological EMBA (Section 4.17.3.2). The behaviours associated with the BIAs include aggregation, basking, foraging, internesting, mating, and nesting. Stochastic models for shoreline accumulation ≥100 g/m^2 indicate the following: • at the state/Commonwealth waters boundary: Barrow Island group had the highest probability of being exposed to shoreline hydrocarbons accumulation, with a 21% probability of occurrence during summer. The deterministic model for the longest shoreline accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as 145.9 m^3, with a maximum shoreline length of ~24 km occurring ~4 days after the spill commenced. Barrow Island is identified as habitat critical to the survival of flatback, green, and hawksbill turtles (Section 4.17.3.2). Nesting adult turtles and hatchlings may be exposed as they traverse the intertidal area, potentially resulting in smothering and acute impacts to some hatchlings during that nesting season • at Gorgon field: The Pilbara Island group, specifically Serrurier Island, was the only location with a probability of shoreline hydrocarbon accumulation, at 1% during winter. The deterministic model for the longest shoreline accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as ~4.3 m^3, with a maximum shoreline length of ~3 km occurring ~9 days after the spill commenced. Although Serrurier Island falls within the habitat critical buffer, it is not identified as habitat critical to the survival of flatback, green, or hawksbill turtles (Section 4.17.3.2). Additionally, exposure was only predicted during winter, a period outside the seasonal presence of turtles (Table 4-8). Therefore, nesting adult turtles and hatchlings are not expected to be impacted, and no further assessment has been undertaken • at Jansz field: stochastic modelling did not predict any shoreline hydrocarbons accumulation; consequently, no further assessment has been undertaken. The deterministic models for the largest swept area of floating oil ≥10 g/m^2, considered most relevant for surface exposures were deemed to be larger, indicate the following: • at the state/Commonwealth waters boundary: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~8 km^2. Using the flatback turtle internesting buffer BIA around Barrow Island as an example, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.03% of the entire BIA • at Gorgon field: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the flatback turtle internesting buffer BIA around Barrow Island as an example, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.1% of the entire BIA • at Jansz field: floating oil is present for ~6 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the flatback turtle internesting buffer BIA around Barrow Island as an example, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.1% of the entire BIA. The EPBC threatened short-nosed sea snake and leaf-scaled sea snake, and other EPBC marine listed sea snake species, may be present within the Hydrocarbon Ecological EMBA. Oil pollution has

Source
been identified as a pressure 'of potential concern' (Ref. 314) to sea snakes[79]. Sea snakes are susceptible to oil on the sea surface (Ref. 314; Ref. 371; Ref. 372). Being air breathers and obligate bottom feeders oil may be either inhaled or ingested (Ref. 314; Ref. 373). Using the state/Commonwealth waters boundary scenario, which is most relevant to nearshore habitats, surface oil exposure above impact thresholds is predicted to be only be present for a short (~4 days) duration and over a relatively small (maximum ~8 km^2) area. Any exposure to benthic habitats is only predicted to occur within nearshore (<10 m water depth) areas. Using the shoreline exposure described above as indicative of oil presence in a nearshore environment, the duration and extent of exposure from a single spill event is predicted to be limited. Based on an assessment of the predicted magnitude and duration of surface and shoreline oil, it is expected that only a small proportion of any marine reptile population would be exposed above the defined impact thresholds. Consequently, the potential impacts of oil to cause sublethal or lethal effects were ranked as follows: • nearshore waters (i.e. at or close to the state/Commonwealth boundary): Minor (5) for sublethal effects and Moderate (4) for lethal effects • deeper offshore waters (around the Gorgon and Jansz fields): Incidental (6) for sublethal effects and Minor (5) for lethal effects. *Fishes, including sharks and rays* Fish, including sharks and rays, may be exposed to hydrocarbons from an oil spill within the water column. Most fish do not break the sea surface, and therefore the risk from surface oil is not relevant; however, some shark species (including whale sharks) feed in surface waters, so there is also the potential for surface hydrocarbons to be ingested. Potential effects include damage to the liver and lining of the stomach and intestine, and toxic effects on embryos (Ref. 374). Fish are most vulnerable to oil during embryonic, larval and juvenile life stages. However, very few studies have demonstrated increased mortality of fish as a result of oil spills (Ref. 375; Ref. 376; Ref. 377). Demersal fish are not expected to be impacted given the presence of entrained oil is predicted in the surface layers (<10 m water depth) only. Pelagic free-swimming fish and sharks are unlikely to suffer long-term damage from oil spill exposure because dissolved/entrained hydrocarbons are typically insufficient to cause harm (Ref. 378). Pelagic species are also generally highly mobile and as such are not likely to suffer extended exposure (e.g. >48–96 hours) at concentrations that would lead to chronic effects due to their patterns of movement. Near the sea surface, fish can detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Ref. 379). Fish that have been exposed to dissolved hydrocarbons can eliminate the toxicants once placed in clean water; hence, individuals exposed to a spill would recover (Ref. 380). Marine fauna with gill-based respiratory systems, including whale sharks, are expected to have higher sensitivity to exposures of entrained oil. BIAs for fishes including sharks and rays that were identified within the Hydrocarbon Ecological EMBA are (Section 4.17.3.3): • whale shark (foraging). As this species are considered most sensitive to surface and entrained hydrocarbon exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure. The deterministic models for the largest swept area of floating oil ≥10 g/m^2 indicate the following: • at the state/Commonwealth waters boundary: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~8 km^2. Using the whale shark foraging BIA the modelling indicates that the extent of surface exposures was predicted to be limited to <0.01% of the entire BIA • at Gorgon field: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the whale shark foraging BIA the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.01% of the entire BIA • at Jansz field: floating oil is present for ~6 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the whale shark foraging BIA the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.01% of the entire BIA.

[79] The pressure analysis distinguished between oil pollution from shipping ('of less concern') and oil rigs ('of potential concern') (Ref. 301). Although the aspect source for this risk assessment is a spill from a vessel, the higher pressure concern has been adopted.

Source

The deterministic models for the largest area of entrained hydrocarbons >100 ppb indicate the following:

- at the state/Commonwealth waters boundary: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~70 km^2 occurring ~2 days after the spill commenced. Using the whale shark foraging BIA the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIA
- at Gorgon field: entrained hydrocarbons are present for <11 days following the spill event, with a maximum area of coverage of ~160 km^2 occurring ~3 days after the spill commenced. Using the whale shark foraging BIA the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIA
- at Jansz field: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~190 km^2 occurring ~3 days after the spill commenced. Using the whale shark foraging BIA the modelling indicates that the extent of entrained exposures was predicted to be limited to <0.1% of the entire BIA.

Based on an assessment of the predicted magnitude and duration of surface and entrained oil it is expected that only a small proportion of any fish population would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively.

Seabirds and shorebirds

Birds may be exposed to hydrocarbons from an oil spill at the water surface (e.g. foraging, resting) or on the shoreline (e.g. roosting, nesting).

Birds that rest at the water's surface (e.g. shearwaters) or surface-plunging birds (e.g. terns, boobies) are particularly vulnerable to surface hydrocarbons (Ref. 371; Ref. 381). Damage to external tissues, including skin and eyes, can occur, along with internal tissue irritation in lungs and stomachs (Ref. 252). Acute and chronic toxic effects may result where the product is ingested as the bird attempts to preen its feathers (Ref. 382).

Breeding BIAs for the fairy tern, lesser crested tern, roseate tern, and wedge-tailed shearwater were identified within the Hydrocarbon Ecological EMBA (Section 4.17.3.4).

As this species are considered most sensitive to surface and shoreline hydrocarbon exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure.

The deterministic models for the largest swept area of floating oil ≥10 g/m^2 indicate the following:

- at the state/Commonwealth waters boundary: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~8 km^2. Using both the fairy tern and lesser crested tern breeding BIAs surrounding Lowendall and Barrow Islands, which are the most relevant BIAs for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.5% of the entire BIAs
- at Gorgon field: floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the wedge-tailed shearwater breeding BIA surrounding Montebello and Barrow Islands, which is the most relevant BIA for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.03% of the entire BIA
- at Jansz field: floating oil is present for ~6 days following the spill event, with a maximum area of coverage of ~25 km^2. Using the wedge-tailed shearwater breeding BIA surrounding Montebello and Barrow Island, which is the most relevant BIA for this release location, the modelling indicates that the extent of surface exposures was predicted to be limited to ~0.03% of the entire BIA.

Stochastic models for shoreline accumulation ≥100 g/m^2 indicate the following:

- at the state/Commonwealth waters boundary: Barrow Island group had the highest probability of being exposed to shoreline hydrocarbons accumulation, with a 21% probability of occurrence during summer. The deterministic model for the longest shoreline accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as 145.9 m^3, with a maximum shoreline length of ~24 km occurring ~4 days after the spill commenced
- at Gorgon field: The Pilbara Island group, specifically Serrurier Island, was the only location with a probability of shoreline hydrocarbon accumulation, at 1% during winter. The deterministic model for the longest shoreline accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as ~4.3 m^3, with a maximum shoreline length of ~3 km occurring ~9 days after the spill commenced

Source
• at Jansz field: stochastic modelling did not predict any shoreline hydrocarbons accumulation; consequently, no further assessment has been undertaken. Given the volatile and non-persistent nature of the hydrocarbons and low levels of shoreline accumulation at both locations, it is not expected to impact entire local populations of seabird or shorebird. Based on an assessment of the predicted magnitude and duration of surface and shoreline oil, it is expected that only a small proportion of any seabird population would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively.
Smothering of subtidal and intertidal habitats *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. 389; Ref. 390), act as a barrier to diffusion of CO_2 across cell walls in macroalgae (Ref. 391), and a decline in metabolic rate, bleaching or partial mortality in corals (Ref. 383; Ref. 384) and impair respiration and photosynthesis by symbiotic zooxanthellae (Ref. 392; Ref. 393). The recovery of benthic habitats can be slow, with studies following the Deepwater Horizon incident showing long-term non-acute effects of the spill on coral colonies seven years after the event (Ref. 394). Ningaloo Coast (World Heritage Property, National Heritage Place and Commonwealth Heritage Place) is known to support coral reef and macroalgae habitat (Section 4.20.1). Coral, seagrass, and macroalgae habitats are also known to occur around the Barrow and Montebello islands, as well as other Pilbara inshore islands. Stochastic models for entrained exposure ≥100 ppb indicate the following: • at the state/Commonwealth waters boundary: entrained hydrocarbons exposure was identified at Barrow (73-93%), Montebello (3-50%) and Pilbara inshore (1-21%) islands as well as the Ningaloo Coast (25-42%). Modelling showed that in-water (entrained or dissolved) hydrocarbons above impact thresholds (≥100 ppb and ≥50 ppb respectively) were predicted to remain within the surface layers (<10 m water depth) only. Therefore, exposure to coral reefs or other subtidal habitat types in waters deeper than 10 m are not predicted to occur and no further assessment has been undertaken • at Gorgon field: entrained hydrocarbons exposure was identified at Pilbara inshore islands (1%) and the Ningaloo Coast (2%). Modelling showed that in-water (entrained or dissolved) hydrocarbons above impact thresholds (≥100 ppb and ≥50 ppb respectively) were predicted to remain within the surface layers (<10 m water depth) only. Therefore, exposure to coral reefs or other subtidal habitat types in waters deeper than 10 m are not predicted to occur and no further assessment has been undertaken • at Jansz field: modelling did not predict any entrained hydrocarbon accumulation either in Ningaloo coast nor Barrow and Montebello islands; consequently, no further assessment has been undertaken. *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 impact thresholds occurs in the intertidal area. No surface exposure at the ≥10 g/m^2 impact threshold was predicted for the Ningaloo Coast heritage area in the Gorgon and Jansz modelled scenarios (Table 7-14, Table 7-15). Therefore, smothering impacts within Ningaloo intertidal areas due to surface oil at the deeper offshore waters are not expected. However, for the nearshore scenario (i.e. state/Commonwealth waters boundary), surface exposure of 0-8% at the ≥10 g/m^2 impact threshold was predicted for the Ningaloo Coast heritage. Deterministic modelling for the largest volume of oil ashore indicates that floating oil is present for ~4 days following the spill event, with a maximum area of coverage of ~8 km^2. Consequently, as the extent and duration of exposure are expected to be limited, the potential for environmental impacts is also expected to be limited. Stochastic modelling for shoreline accumulation ≥100 g/m^2 indicate the following: • at the state/Commonwealth waters boundary: Barrow Island group had the highest probability of being exposed to shoreline hydrocarbons accumulation, with a 21% probability of occurrence during summer. Coral, seagrass, and macroalgae habitats are known to occur around the Island. The deterministic model for the longest shoreline

Source
accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as 145.9 m^3, with a maximum shoreline length of ~24 km occurring ~4 days after the spill commenced • at Gorgon field: The Pilbara Island group, specifically Serruir Island, was the only location with a probability of shoreline hydrocarbon accumulation, at 1% during winter. Coral, seagrass, and macroalgae habitats are known to occur around the Pilbara inshore islands. The deterministic model for the longest shoreline accumulation above ≥100 g/m^2 predicted the largest volume of oil ashore as ~4.3 m^3, with a maximum shoreline length of ~3 km occurring ~9 days after the spill commenced • at Jansz field: stochastic modelling did not predict any shoreline hydrocarbons accumulation; consequently, no further assessment has been undertaken. These scenarios are considered most relevant for nearshore waters and subsequent impacts to nearshore corals or other intertidal habitats. As the extent and duration of exposure to nearshore environments are expected to be limited, the potential for environmental impacts is also expected to be limited. Consequently, the potential impacts to nearshore environments were ranked as follows: • release at or close to the state/Commonwealth boundary: Minor (5) • release at the Gorgon field: Minor (5) • release at the Jansz field: not expected to occur. *Coastal habitats (e.g. mangroves, mudflats)* 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. 385). 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. 385). As identified in Section 4.17.2, the Hydrocarbon Ecological EMBA includes the west coasts of Barrow, Middle and Boodie islands, as well as parts of Montebello, Airlie, Serrurier, Flat and east of Muiron islands. These islands include sandy beaches, rocky coasts, and mangroves. Coastal and marine baseline studies undertaken by CAPL (Ref. 70) identified that there are no mangrove stands on the west coast of Barrow Island, where the Hydrocarbon Ecological EMBA intersect with the coast; however there may be some intersect with the isolated patches of mangroves on the Montebello Islands. As previously mentioned, stochastic modelling for shoreline accumulation ≥100 g/m^2 was identified only for the state/Commonwealth waters boundary and Gorgon field scenarios (refer to Nearshore benthic habitats for the details). Based on an assessment of the predicted magnitude of shoreline exposure, it is expected that only a small proportion of any coastal habitat would be exposed above the defined impact thresholds. However, it is acknowledged that habitats on offshore islands represent important areas for fauna (e.g. turtles, birds) or that certain habitats (e.g. mangroves) are considered regionally significant. Therefore, the potential impacts of oil causing smothering were ranked as Moderate (4) for the state/Commonwealth boundary and Gorgon field locations, with no impact expected for the Jansz field location.
Indirect impacts to commercial fisheries As identified in Section 4.18.1, several commercial fisheries have management areas and recent fishing effort recorded within the EMBA. Direct impacts commercially targeted fish species are expected to occur from in-water exposures. Stochastic modelling showed that dissolved oil above impact thresholds (≥50 ppb) was predicted to occur for the state/Commonwealth boundary and Gorgon field scenarios. Entrained oil above impact thresholds (100 ppb) was predicted to occur for all scenarios. However, it was predicted to remain in the surface layers, with no exposure at depths >10 m below the surface predicted to occur during any season. As described above, very few studies have demonstrated increased mortality of fish as a result of oil spills. However, fish stocks may be especially vulnerable to oil spills close to the spawning grounds or egg and larval drift areas (Ref. 376 Ref. 395). 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. 395). Despite potential mortality of eggs and larvae following a spill, subsequent depletion of adult wild fish stocks is rarely recorded (Ref. 378). As identified in Section 4.18.1, the spawning grounds for the Southern bluefin tuna intersects with the Hydrocarbon Ecological EMBA. As such, the available deterministic analyses from the

Source
hydrocarbon spill modelling were utilised to understand the potential extent and duration of exposure to these spawning grounds. The deterministic models for the largest area of entrained hydrocarbons >100 ppb indicate the following: • at the state/Commonwealth waters boundary: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~70 km^2 occurring ~2 days after the spill commenced. Based on the spatial extent of the approximate Southern bluefin tuna spawning ground (~1,850,534 km^2), modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.004% of the entire spawning ground • at Gorgon field: entrained hydrocarbons are present for <11 days following the spill event, with a maximum area of coverage of ~160 km^2 occurring ~3 days after the spill commenced. Based on the spatial extent of the approximate Southern bluefin tuna spawning ground, modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.008% of the entire spawning ground • at Jansz field: entrained hydrocarbons are present for <6 days following the spill event, with a maximum area of coverage of ~190 km^2 occurring ~3 days after the spill commenced. Based on the spatial extent of the approximate Southern bluefin tuna spawning ground, modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.01% of the entire spawning ground. Although exposures above impact thresholds have the potential to affect the recruitment of targeted commercial and recreational fish species, any acute impacts are expected to be limited, given this event is singular, non-continuous, and will result in a limited volume of hydrocarbon being released over a short time. On this basis recruitment of targeted species is not expected to be impacted significantly given the extent of exposure to concentrations above impact thresholds are expected to be limited due to rapid dilution and dispersion upon release Spill events also have the potential to impact commercial fisheries through indirect impacts associated with tainting. Tainting is a change in the characteristic smell or flavour, and renders the catch unfit for human consumption or sale due to public perception. Tainting may not be a permanent condition but will persist if the organisms are continuously exposed; but when exposure is terminated, depuration will quickly occur (Ref. 395). Regardless of the small potential for tainting, customer perception that tainting has occurred may cause a larger impact then the direct impact itself. However, as this event is singular, non-continuous, and will result in a limited volume of hydrocarbon being released over a short time period, and the low persistence of the hydrocarbon in the environment, customer perceptions are not expected to be altered for a prolonged period. Modelling predicts that inshore exposure would be limited, whilst offshore exposures are expected to dilute and disperse over a longer period of time. In both instances, it is expected that any impacts from this type of event would likely be short term in duration. Therefore, CAPL assesses the consequence to commercial fisheries as localised and short term and it is ranked as Minor (5).
Reduction in amenity resulting in impacts to tourism and recreation Stochastic modelling predicts surface exposure ≥1 g/m^2 (visible impact threshold) from a vessel spill event indicate the following: • at the state/Commonwealth waters boundary: it has the potential to occur along the Montebello and Barrow islands, with smaller/patchier occurrences along the Ningaloo Coast, depending on the environmental conditions at the time of the event • at Gorgon and Jansz fields: it has the potential to occur along the release location within Commonwealth waters. Stochastic modelling predicts shoreline exposure ≥10 g/m^2 (visible impact threshold) from a vessel spill event indicate the following: • at the state/Commonwealth waters boundary: it has the potential to occur along the Montebello, Barrow and Pilbara inshore islands, with smaller/patchier occurrences along the Ningaloo Coast with an up to 50% of probability, depending on the environmental conditions at the time of the event. The deterministic model predicted the largest volume of oil ashore as ~180 m^3 occurring ~3 days after the spill commenced • at Gorgon field: it has the potential to occur along the Pilbara inshore islands, with a 2-5% of probability. The deterministic model predicted the largest volume of oil ashore as ~9.5 m^3 occurring ~9 days after the spill commenced

Source

- at Jansz field: it has the potential to occur along the Ningaloo Coast, with a 1% of probability.

Shoreline loading can impact the visual amenity of coastal areas and limit beach access for users, impacting tourism and recreation activities. However, given the short-term and localised disturbance to marine tourism and recreation activities, CAPL has ranked the consequence as Minor (5).

Changes to values and sensitivities of marine protected areas

Stochastic modelling predicts the following:

- at the state/Commonwealth waters boundary: Montebello AMP is predicted to surface exposure ≥10 g/m^2 and entrained exposure ≥100 ppb from a vessel spill event as having a high probability (69-92% and 85-93% respectively). Modelling also predicted a low probability (1%) of entrained oil exposure within the Ningaloo Marine Park. In addition, given the release location falls next to the State Barrow Island Marine Park, modelling predicted a 100% of surface exposure ≥10 g/m^2 and a 73-97% of entrained exposure ≥100 ppb
- at Gorgon field: Gascoyne, Montebello and Ningaloo AMP are predicted to be exposed to 1-4% of entrained exposure ≥100 ppb only
- at Jansz field: only Gascoyne AMP is predicted to be exposed to 1-4% of entrained exposure ≥100 ppb.

Given the much higher probability of exposure, the following evaluation is focused on the Barrow Island Marine Park.

Barrow Island and surrounding waters is known to support marine biota typical of the Indo West Pacific flora and fauna; however, there is a significant degree of endemism in the region (Ref. 396). the natural values of Barrow Island include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for regionally significant marine fauna. Social and economic values include commercial fishing.

The consequence evaluations for marine fauna and commercial fisheries are provided above.

Given the expected behaviour and weathering of the oil, limited spatial and temporal exposure to marine fauna or commercial fish species above impact exposure thresholds, the potential impacts of a vessel spill event to the values and sensitivities of the Marine Park has been ranked as Moderate (4).

ALARP decision context justification

Support vessels commonly operate near each other during offshore surveys, and these activities are well-practised nationally and internationally.

The control measures to manage the risk associated with vessel collisions 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 stakeholder consultation, no objections or claims were raised regarding vessel collision scenarios arising from the activity.

The risks associated with a vessel collision are considered lower-order risks in accordance with Table 5-3. As such, CAPL would apply ALARP Decision Context A for this aspect.

Good practice control measures and source

Control measure	Source
Marine Standard	Chevron's Marine Standard (Ref. 35) ensures that various legislative requirements are met. These include: • crew meet the minimum standards for safely operating a vessel, including watchkeeping requirements • navigation, radar equipment, and lighting meets industry standards. These requirements will ensure that direct vessel radio contact is available to other marine users operating in this area to enable ease of communication in highlighting risks and nearby exclusion zones.

Source	
Maritime safety information	Maritime safety information, such as AUSCOAST navigational warnings, are issued by the 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 for vessel-based activities as required; thus, enabling other marine users to also safely plan their activities.
SOPEP / SMPEP	MARPOL 73/78 Annex I and Marine Order 91 (Marine pollution prevention – oil) requires that each vessel 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.
OPEP	Under the OPGG(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. In the event of a Level 2 (or above) oil spill, the OPEP will be implemented. CAPL has developed an NOPSEMA-accepted OPEP (Ref. 2) to support all spill response activities across all its assets.
OSMP	The OSMP 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). CAPL has developed an NOPSEMA-accepted OSMP (Ref. 17) to support all spill monitoring activities across all its assets.

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A

Likelihood and risk level summary	
Likelihood	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 LOC 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 unlikely. Considering the inherent low likelihood of a collision occurring, the safeguards in place, and enactment of the OPEP, the potential likelihood of causing the consequences described in this section is Remote (5)
Risk level	Very low (8)
Determination of acceptability	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential impact associated with this aspect would be short term, apply to some individuals, and consequently is not expected to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Moderate (4).
Therefore, no additional evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements relevant for this aspect include:
Navigation Act 2012 (Cth)
Marine Order 91, Marine Pollution Prevention – oil
Marine Order 30, Prevention of collisions
Conservation Management Plan for the Blue Whale 2015–2025 (Ref. 95)
Conservation Advice Balaenoptera borealis Sei Whale (Ref. 68)
Conservation Advice Balaenoptera physalus Fin Whale (Ref. 67)
Recovery Plan for Marine Turtles in Australia (Ref. 118)
Approved Conservation Advice for Aipysurus apraefrontalis (Shortnosed Sea Snake) (Ref. 115)
Approved Conservation Advice for Aipysurus foliosquama (Leafscaled Sea Snake) (Ref. 116)
National Recovery Plan for the Southern Right Whale (Eubalaena australis) (Ref. 224)
Conservation Advice Rhincodon typus Whale Shark (Ref. 164)
North-west Marine Parks Network Management Plan (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Navigation Act 2012 (Cth)
Notice to Mariners.</td><td>Requirement to issue a Notice to Mariners has been incorporated into the maritime safety information control measure.</td></tr>
<tr><td>Navigation Act 2012 (Cth) and Protection of the Sea (Prevention of Pollution from Ships) Act Marine Order 91 and Annex I of MARPOL 73/78.</td><td>Requirements for a vessel to have a SOPEP have been incorporated into the SOPEP control measure</td></tr>
<tr><td>Marine Order 30
Gives effect to the Prevention of Collisions Convention.</td><td>Requirements for navigation, lights, and signals have been incorporated into the Marine Standard control measure.</td></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025
No specific management action identified.</td><td>N/A.</td></tr>
<tr><td>Conservation Advice Balaenoptera borealis Sei Whale
No specific conservation action identified.</td><td>N/A.</td></tr>
<tr><td>Conservation Advice Balaenoptera physalus Fin Whale
No specific conservation action identified</td><td>N/A.</td></tr>
</table>
</td></tr>
</table>

Source		
	Recovery Plan for Marine Turtles in Australia Management action A4.2: Ensure spill risk strategies and response programs adequately include management for marine turtles and their habitats, particularly in reference to 'slow to recover habitats', e.g. nesting habitat, seagrass meadows or coral reefs.	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSMP (Ref. 17). Therefore, this activity is not considered to be inconsistent with the Recovery Plan for Marine Turtles in Australia.
	Approved Conservation Advice for Aipysurus apraefrontalis (Shortnosed Sea Snake) No specific conservation action identified.	N/A.
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A.
	National Recovery Plan for the Southern Right Whale (Eubalaena australis) *No specific management action identified.*	N/A.
	Conservation Advice Rhincodon typus Whale Shark 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 Montebello and Gascoyne Marine Park are a multiple use zone (IUCN VI). The control measures identified for the management of 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 8.18.2. Therefore, this activity is not considered to be inconsistent with the North-west Marine Parks Network Management Plan.
Internal context	These CAPL environmental performance standards or procedures were deemed relevant for this aspect: • Chevron's *Marine Standard Non-Tankers: Corporate OE Standard* (Ref. 35) • OPEP (Ref. 2)	

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">• OSMP (Ref. 17).</td></tr>
<tr><td>External context</td><td colspan="2">During stakeholder consultation, no objections or claims were raised regarding a vessel collision event arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents. Objectives of the relevant documents are shown below:
<table>
<tr><th>Plan</th><th>Objective</th></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>Recovery objective: 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 objective 4 Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td>National Recovery Plan for the Southern Right Whale (Eubalaena australia)</td><td>Recovery objective: Minimise anthropogenic threats to allow the conservation status of the southern right whale to improve so that it can be removed from the threatened species list under the EPBC Act.
Interim objective 5 Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td>Recovery Plan for Marine Turtles in Australia</td><td>Recovery objective: The long-term recovery objective for marine turtles is to 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 3: Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td>North-west Marine Parks Network Management Plan 2018</td><td>As per Section 4.19.1</td></tr>
</table>
Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents:
• impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species
• no adverse change to the values of the Australian Marine Park.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the unplanned release, that the risk to marine fauna and/or values of the AMP are also subsequently managed.</td></tr>
<tr><th>Environmental performance outcome</th><th>Environmental performance standard</th><th>Measurement criteria</th></tr>
<tr><td>No unplanned release of hydrocarbons or hazardous materials to the environment</td><td>Marine standard
Vessels will meet the crew competency, navigation equipment, and radar requirements of the Chevron Marine Standard</td><td>Records indicate that vessels meet the crew competency, navigation equipment, and radar requirements of the Chevron Marine Standard</td></tr>
</table>

Source		
during the petroleum activity	**Maritime safety information** Where required notify relevant agency of activities, vessel movements, and requested safety exclusion zone, to enable them to generate radio-navigation warnings and/or Notice to Mariners prior to commencing offshore activities	Records of lodgement of notification to relevant agency where required
Reduce the risk of impacts to the environment from the unplanned release of hydrocarbons / hazardous materials during petroleum activities	**SOPEP** Marine vessels >400 T will carry on board a Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with MARPOL 73/78 Annex I – Prevention of Oil Pollution	OVIS report / ABU Marine OE Inspection Checklist confirms an approved SOPEP is on board marine vessels >400 T
		Records show drills conducted in accordance with SOPEP
	SOPEP In the event of a vessel-based spill event, emergency response activities will be implemented in accordance with the vessel SOPEP (or equivalent)	Records confirm that emergency response activities were implemented in accordance with the vessel SOPEP in the event of a vessel-based spill
	OPEP In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, response activities are implemented in accordance with the *ABU Consolidated OPEP*	Records confirm the OPEP has been activated and response activities implemented
	OPEP CAPL will maintain the following minimum preparedness capability: • number and type of response packages as identified in Table 7-22	Records confirm that CAPL has arrangements in place to access and maintain the minimum number and type of response packages required
	OPEP—Oil spill response organisation (OSRO) Capability Arrangements CAPL shall maintain service agreements with oil spill response organisations (as per Section 8.17.9.6.3) that have capabilities to support a response to an oil spill event	Records confirm that service agreements are in place
	OPEP Refer to the ABU Consolidated OPEP for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic	
	OSMP	Records confirm the OSMP has been activated

Source		
	In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, the OSMP will be activated, and: • operational and scientific monitoring program are initiated once the specific initiation criteria are met • operational and scientific monitoring program are implemented within the timeframes outlined in the OSMP • operational and scientific monitoring components are continued until respective termination criteria are met	Records confirm that once initial criteria have been met, operational and scientific monitoring programs were initiated
		Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSMP
		If any OSMP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OSMP component initiation activation
		If any OSMP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability through existing contracts within 12 hours of OSMP component initiation activation
		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)
		Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased
	OSMP Capability required to implement all operational and scientific monitoring programs are in place to meet the requirements outlined in the OSMP	Internal personnel capability is documented every six months in the ABU OSMP Capability Register
		External contractors self-assess their capability against the requirements and provide a Statement of Personnel Capability and Readiness every six months
		Hydrocarbon characterisation sample kits are maintained at Barrow Island and Karratha

7.18 Unplanned release—Hydrocarbon system defect

Operation of the Gorgon and Jansz subsea hydrocarbon system introduces the potential for an unplanned release of gas and condensate. An evaluation of all spill scenarios associated with the hydrocarbon system was completed and the following scenarios identified:

- LOC event associated with damage to a valve or similar (Section 7.18.1.1)
- loss of well integrity event (Section 7.18.1.2)
- loss of effective well control event (Section 7.18.1.3)
- minor defect in flowline or production pipeline (Section 7.18.1.4)
- major defect in flowline or production pipeline (Section 7.18.1.5).

Based upon the scenario evaluation, a major defect in flowline or production pipeline was deemed to present the worst-case credible spill scenario under this EP and has been used as the basis for the risk assessment.

7.18.1 Scenario evaluation

7.18.1.1 LOC event associated with damage to a valve or similar

Dropped objects may damage subsea infrastructure resulting in a release of hydrocarbons, treated sea water, hydraulic fluid, or MEG. CAPL defined the worst-case credible scenario during IMR activities as a ~50 m^3 release from one of the larger subsea valves (1” valve).

This scenario was deemed feasible for the activities undertaken in this EP, given the potential for IMR activities to occur within the Gorgon and Jansz– Io fields and subsequent potential for dropped objects. The risk associated with this scenario is evaluated in Section 7.15.

7.18.1.2 Loss of well integrity

Section 13.2.2 of the NOPSEMA-accepted *Gorgon Project: Producing Phase Well Operations Management Plan* (Ref. 18) describes the different well control events and levels of emergency response associated with these situations. Under the WOMP, 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).

Section 4.2.1 of the WOMP (Ref. 18) identifies that a loss of well integrity during start-up and production operations has the potential to occur by:

- mechanical failure (leaks in annulus or production casing)
- overpressure (overpressure of annulus leading to burst casing or collapsed tubing)
- corrosion (corrosions leading to loss of tubing or casing integrity)
- erosion of barriers through excessive solids production
- operating error (incorrect operation of valves or controls, or SIMOPS clashes)

- dropped objects onto the well envelope (potential damage to subsea tree).

As detailed in the WOMP, primary and secondary barriers are in place to mitigate well integrity impacts during start-up and production operations. These barriers include:

- subsea tree (primary)
- production conduit pressure envelope (primary)
- "A" annulus pressure envelope (secondary).

In addition to this, an emergency (tertiary) barrier is in place being the SCSSV flapper valve.

Based upon the activities within scope of this EP, CAPL has calculated that a worst-case credible spill scenario associated with a loss of well integrity event is limited to the contents of the well above the SCSSV flapper valve. This equates to 8.7 m^3 for Gorgon wells and 18 m^3 for the Jansz–Io Wells. These volumes are based on the capacity of the production tubing conduit between the SCSSV flapper valve and the subsea tree located at the wellhead.

If a loss of well integrity event was to occur, following any closing of valves by the Operations work group (managed from the control room on Barrow Island), the shut-in well would be handed over to the ABU Wells work group. Any subsequent works (e.g. well intervention) to address the well integrity issue would become planned activities implemented under the NOPSEMA-accepted *Gorgon and Jansz-Io Drilling, Completions and Well Maintenance Program Environment Plan* (Ref. 9). The risks, management measures, response and capability arrangements for well intervention activities are covered under the separate accepted EP (Ref. 9) and are not assessed here.

7.18.1.3 Loss of effective well control

As detailed in the WOMP, a loss of effective well control event is identified as a feasible risk during well interventions and drilling activities (Ref. 18). Well intervention and drilling activities are not within the scope of this EP (Section 2.17.2); they are covered within the NOPSEMA-accepted *Gorgon and Jansz-Io Drilling, Completions and Well Maintenance Program Environment Plan* (Ref. 9).

As well intervention and drilling activities are not included within the scope of this EP, CAPL does not consider a loss of effective well control to be a feasible risk associated with the activities within this EP. Consequently, this scenario is not assessed further here.

7.18.1.4 Minor defect in flowline or production pipeline

A 25 mm defect is considered indicative of the largest defect that can be fixed using pipe clamps; therefore, this defect provides an indication of the largest spill source that could be classed as a minor defect.

Modelling was undertaken by Intecsea (Ref. 387) to understand indicative release rates prior to isolation from 25 mm leaks from the Gorgon and Jansz pipelines. Results indicate that release rates of up to 41 m^3/day and 36 m^3/day of condensate, under normal operating conditions, may occur for the Gorgon and Jansz pipelines respectively (Ref. 387).

While the exact duration of a leak (until isolation) is unknown, it has been estimated as up to two weeks based on: a small flow reduction trend (i.e. <5% reduction) may take the Flow Management Tool (FMT) up to a week to detect, plus an additional week for inspection activities to identify the leak source. Upon identification, the leak would be

isolated, and therefore the release rate would significantly decline, prior to being repaired.

Therefore, based on a two-week un-isolated leak, a total of up to 574 m^3 of condensate may be release to the marine environment. However, due to the slow daily release rate (i.e. up to 41 m^3/day), the properties of the hydrocarbon fluid (including high volatile and evaporating once reaching the surface), and the high dispersion and dilution that would occur in an open ocean environment, the exposure due to a minor leak is considered to be limited in nature and scale.

7.18.1.5 Major defect in flowline or production pipeline

Upon evaluating the risks associated with activities covered under this EP, CAPL considers that a major defect in a flowline or production pipeline is the most credible (but unlikely) unplanned event. Specifically, a full-bore rupture was selected as the worst-case major defect event.

For the purpose of this risk assessment, identification of a location along the pipeline within the OA for a major rupture event was based on:

- the location with the greatest potential environmental consequence (closest to sensitive receptors)
- areas along the pipeline identified in engineering studies as most susceptible to potential materials fatigue or exposure to third-party interference.

Based on these considerations, three locations were identified and modelled to provide an indication of the EMBA from a major defect event. The locations were:

- Jansz–Io field (approximate location of Midline PTS)
- the base of the escarpment
- nearshore location (~15 km offshore from Barrow Island) in Commonwealth Waters.

Modelling was undertaken by Intecsea (Ref. 387) to understand potential volumes released during a major defect event. Model calculations were based upon:

- maximum allowable operating pressure (MAOP) of the pipeline
- water depth at the release location (and subsequent pressure differential)
- time to detect defect and enact emergency procedures
- time for pipeline to equalise with the ambient pressure at the release location.

Table 7-16 summarises the inputs and subsequent estimated volumes.

Table 7-16: Major defect volume calculations

Parameter	Release location			
	Jansz-Io field	Escarpment	Nearshore	Nearshore
Pipeline	Jansz	Jansz	Jansz	Gorgon
MAOP	260 bar	260 bar	260 bar	287 bar
Water depth	1,345 m	763 m	50 m	50 m
Time to detect defect and enact emergency procedures^	30 minutes	30 minutes	30 minutes	30 minutes

Parameter	Release location			
	Jansz-Io field	Escarpment	Nearshore	Nearshore
Time for pipeline to equalize with the ambient pressure at the release location	~7 hours	~6 hours	~12 hours	~5 hrs
Estimated volume	276 m^3	388 m^3	529 m^3	494 m^3

^ *Duration is based on 15 minutes detection for alarms from the FMT, and 15 minutes for the operator to enact emergency procedures.*

7.18.2 Spill modelling

CAPL commissioned RPS to conduct spill modelling to inform the risk assessment associated with a major defect event.

Two models were used as part of the spill modelling: OILMAP-DEEP was used to simulate the nearfield multiphase plume rise dynamics from the subsea release, and a three-dimensional oil spill model (SIMAP) was used to simulate the drift, spread, weathering and fate of the spilled oil (Ref. 388). Modelling was conducted using a stochastic approach, where multiple simulations (using the same spill parameters) were conducted, but under varying meteorological and oceanographic conditions.

Table 7-17 summarises the model settings; Table 7-18 and Table 7-19 summarises the hydrocarbon properties for Jansz and Gorgon condensates respectively; and Table 7-12 (in Section 7.17) describe the modelled environmental impact thresholds respectively.

Table 7-17: Major defect spill scenario model settings

Parameter	Details			
Release Location	Jansz-Io field	Escarpment	Nearshore	Nearshore
Latitude	19º48’34.09” S	20º12’55.273” S	20º38’19.099” S	20º38’25.549” S
Longitude	114º36’26.52” E	114º51’59.59” E	115º16’54.56” E	115º16’47.64” E
Water Depth	1,346 m	765 m	50 m	50 m
Oil type	Jansz condensate	Jansz condensate	Jansz condensate	Gorgon condensate
Simulation spill type	Subsea			
Simulation spill volume	276 m^3	388 m^3	529 m^3	494 m^3
Simulation spill duration	7.2 hours	5.8 hours	12.2 hours	4.7 hours
Total simulation duration	28 days			
Number of randomly selected spill simulation start times	100 per season (300 total)			
Seasons modelled	Summer (September to March) Transitional (April and August) Winter (May to July)			

Table 7-18: Physical properties and boiling point ranges for Jansz condensate

Characteristic	Value			
Density	772.8 kg/m^3 (at 25 °C)			
Dynamic viscosity	1.2 cP (at 25 °C)			
Pour point	-81 °C			
API gravity	51.4 API			
Classification	Group I, non persistent oil			
Boiling point	Volatile <180 °C	Semi-volatile 180–265 °C	Low volatility 265–380 °C	Residual >380 °C
	72.5%	13.0%	14.0%	0.5%

Table 7-19: Physical properties and boiling point ranges for Gorgon condensate

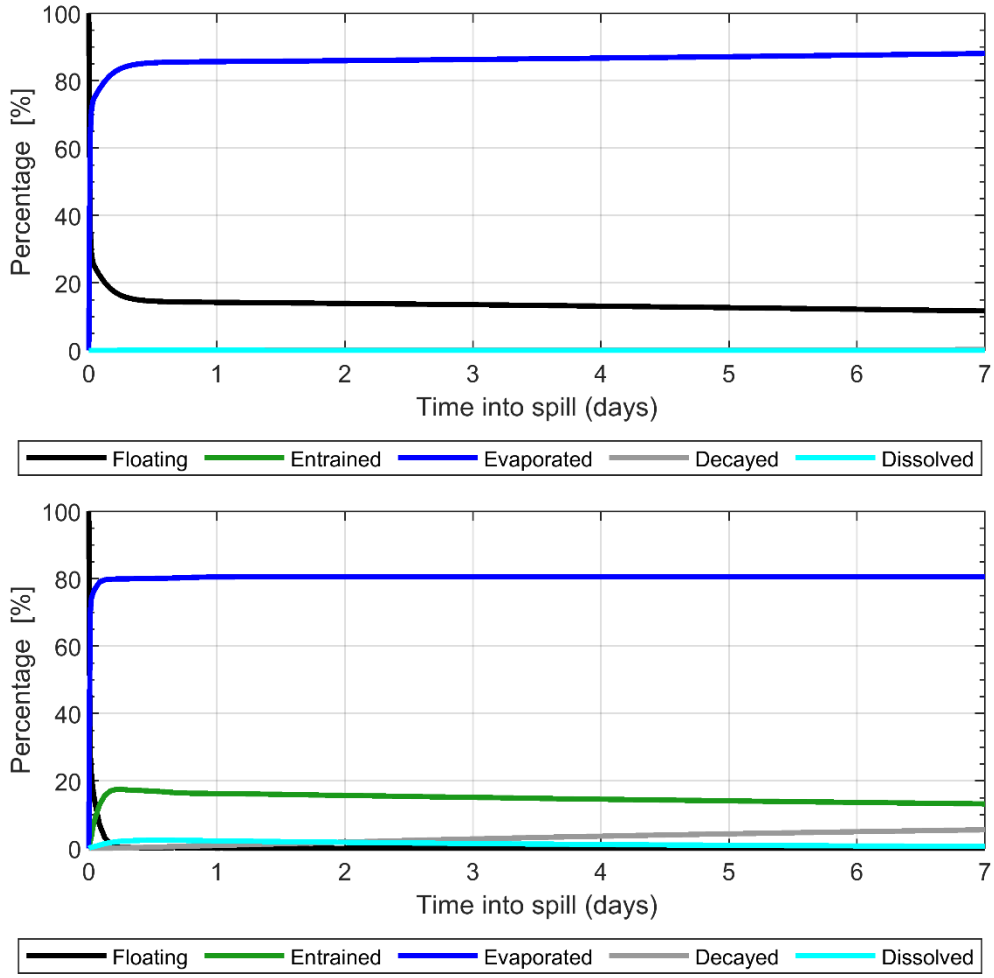
Characteristic	Value			
Density	847.8 kg/m^3 (at 15 °C)			
Dynamic viscosity	2.4 cP (at 20 °C)			
Pour point	-9 °C			
API gravity	35.3 API			
Classification	Group II, light persistent oil			
Boiling point	Volatile <180 °C	Semi-volatile 180–265 °C	Low volatility 265–380 °C	Residual >380 °C
	33.3%	28.5%	32.3%	5.9%

7.18.2.1 Weathering and fate

Jansz is a mixture of volatile and persistent hydrocarbons with high proportions of volatile and semi-volatile components, with a density of 772.8 kg/m^3, an API of 51.4, and a low pour point (−81 °C) (Table 7-18). The low viscosity (1.2 cP) indicates that this oil will spread quickly when released and will form a thin film on the sea surface, increasing the evaporation rate.

Generally, 72.5% of the Jansz condensate mass should evaporate within the first 12 hours (boiling point <180 °C); a further 13.0% should evaporate within the first 24 hours (boiling point 180°C–265 °C); and an additional 14% should evaporate over several days (boiling point 265°C–380 °C). Approximately 0.5% (by mass) of Jansz condensate will not evaporate at atmospheric temperatures. These compounds will persist in the environment.

Figure 7-3 shows predicted weathering for an instantaneous 50 m^3 surface release of Jansz condensate (tracked for 7 days) under calm and variable wind conditions. Predictions show that under calm conditions, ~86% of the slick volume evaporated within the initial 24 hours; and under variable conditions ~80% has evaporated and ~16% has entrained within the initial 24 hours.



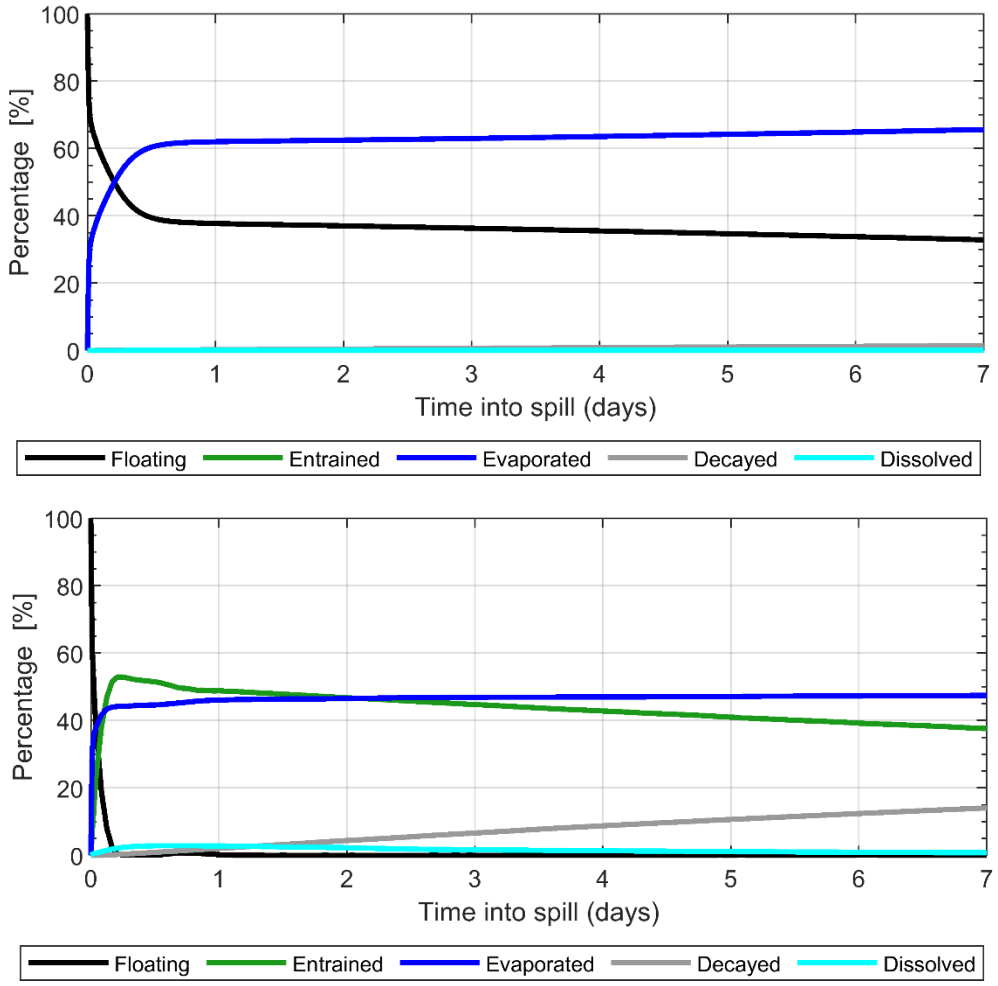
(Source: Ref. 388)

Figure 7-3: Predicted weather of an instantaneous surface release of 50 m^3 of Jansz condensate under calm (top image) and variable (bottom image) wind conditions

Gorgon condensate is light persistent oil, with a density of 847.8 kg/m^3, an API of 35.3, and a low pour point (−9 °C) (Table 7-18). The low viscosity (2.4 cP) indicates that this oil will spread quickly when released and will form a thin film on the sea surface, increasing the evaporation rate.

Generally, 33.3% of the Gorgon condensate mass should evaporate within the first 12 hours (boiling point <180 °C); a further 28.5% should evaporate within the first 24 hours (boiling point 180°C–265 °C); and an additional 32.3% should evaporate over several days (boiling point 265°C–380 °C). Approximately 5.9% (by mass) of Gorgon condensate will not evaporate at atmospheric temperatures. These compounds will persist in the environment.

Figure 7-4 shows predicted weathering for an instantaneous 50 m^3 surface release of Gorgon condensate (tracked for 7 days) under calm and variable wind conditions. Predictions show that under calm conditions, ~62% of the slick volume evaporated within the initial 24 hours; and under variable conditions ~46% has evaporated and ~49% has entrained within the initial 24 hours.



(Source: Ref. 388)

Figure 7-4: Predicted weathering of an instantaneous surface release of 50 m³ of Gorgon condensate under calm (top image) and variable (bottom image) wind conditions

7.18.2.2 Modelling outputs

Stochastic modelling outputs from RPS (Ref. 388) are summarised in Table 7-20 having regard to the particular values and sensitivities within the EMBA as identified in Section 4.

For the 276 m³ Jansz pipeline rupture within the Jansz-Io field:

- the maximum distance from the release location to the ≥1 g/m² threshold was ~28 km west-northwest (summer). No surface oil was predicted to occur at the ≥10 g/m² impact threshold
- no shoreline accumulation above the ≥10 g/m² thresholds was predicted to occur during any season
- no dissolved oil above ≥10 ppb thresholds was predicted to occur during any season
- no entrained oil above 100 ppb threshold was predicted to occur during any season.

For the 388 m³ Jansz pipeline rupture at the escarpment:

- the maximum distance from the release location to the ≥1 g/m^2 threshold was ~39 km south (summer), and ~2.5 km east (transitional) for the ≥10 g/m^2 threshold
- the probability of contact to any shoreline at ≥10 g/m^2 was 4% in summer, with no contact predicted in transitional and winter months. The minimum time before shoreline contact was ~5.5 days and the maximum volume of oil ashore was 1.8 m^3. No shoreline contact at the ≥100 g/m^2 threshold was predicted to occur during any season
- dissolved oil at ≥50 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 216 ppb
- entrained oil at ≥100 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 7,840 ppb.

For the 529 m^3 Jansz pipeline rupture nearshore:

- the maximum distance from the release location to the ≥1 g/m^2 threshold was ~21 km southwest (summer), and ~1.7 km west-southwest (transitional) for the ≥10 g/m^2 threshold
- the probability of contact to any shoreline at ≥10 g/m^2 was 8–21% (depending on the season). The minimum time before shoreline contact was ~1.4 day (transitional) and the maximum volume of oil ashore was 3 m^3 (summer). Shoreline contact at ≥100 g/m^2 was only predicted to occur during winter at Airlie Island, with a low probability of occurrence of 1%. The minimum time before shoreline contact was ~7 days and the maximum volume of oil ashore was 0.8 m^3
- dissolved oil at ≥50 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 285 ppb
- entrained oil at ≥100 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 5,821 ppb.

For the 494 m^3 Gorgon pipeline rupture nearshore:

- the maximum distance from the release location to the ≥1 g/m^2 threshold was ~47 km south-southwest (winter), and ~15 km southwest (transitional) for the ≥10 g/m^2 threshold
- the probability of contact to any shoreline at ≥10 g/m^2 was 6–31% (depending on the season). The minimum time before shoreline contact was <1 day (summer) and the maximum volume of oil ashore was 15.8 m^3 (summer)
- shoreline contact at ≥100 g/m^2 was only predicted to occur during summer at Barrow, Montebello and Serrurier islands, with low probability of occurrence of 2–4%. The minimum time before shoreline contact was ~1 day, the maximum volume of oil ashore was 15.8 m^3, and maximum length of shoreline accumulation was ~4.8 km
- dissolved oil at ≥50 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 9,015 ppb

- entrained oil at ≥100 ppb thresholds was predicted to occur; however, remained in the surface layer (<10 m water depth) only. The maximum instantaneous dissolved oil concentration was 13,916 ppb.

Table 7-20: Major defect spill modelling EMBA receptor exposure summary

Sensitivity	Name	Surface^		In-water (dissolved)^	In-water (entrained)^	Shoreline^	
		≥1 g/m²	≥10 g/m²	≥50 ppb	≥100 ppb	≥10 g/m²	≥100 g/m²
		(probability of exposure, minimum time to exposure)		(probability of exposure)	(probability of exposure)	(probability of exposure, minimum time to exposure, mean length of shoreline)	
State marine protected areas	Barrow Island Marine Management Area	4%, <1 day	—	2%	15%	—	—
	Barrow Island Marine Park	2%, <1 day	—	2%	8%	—	—
	Barrow Island Nature Reserve	—	—	—	—	11%, 1.4 days, 4.8 km	2%, 1.9 days, 4.8 km
	Montebello Islands Conservation Park	1%, 2 days	—	1%	4%	15%, <1 day, 17.6 km	4%, 1 day, 2.4 km
	Montebello Islands Marine Park	—	—	2%	13%	—	—
	Pilbara inshore Islands	—	—	—	1%	5% 1.75 days, 8.8 km	—
AMP	Montebello	100%, <1 day	100%, <1 day	78%	100%	—	—
	Ningaloo	—	—	—	1%	—	—
KEF	Ancient coastline at 125 m depth contour	1%, <1 day	—	2%	9%	—	—
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	—	—	1%	3%	—	—
	Commonwealth waters adjacent to Ningaloo Reef	—	—	—	1%	—	—
	Continental slope demersal fish communities	96%, <1 day	62%, <1 day	56%	98%	—	—

Sensitivity	Name	Surface^		In-water (dissolved)^	In-water (entrained)^	Shoreline^	
		≥1 g/m²	≥10 g/m²	≥50 ppb	≥100 ppb	≥10 g/m²	≥100 g/m²
		(probability of exposure, minimum time to exposure)		(probability of exposure)	(probability of exposure)	(probability of exposure, minimum time to exposure, mean length of shoreline)	
	Exmouth Plateau	—	—	—	—	—	—
World Heritage Properties / National Heritage Places	The Ningaloo Coast (inferred from Cape Range IBRA, Exmouth shoreline)	1%, 1.5 days	—	1%	6%	2%, 6.2 days, 13.6 km	—
Commonwealth Heritage Properties	Ningaloo Marine Area – Commonwealth Waters (inferred from Ningaloo IMCRA)	—	—	—	1%	—	—

^ *Values shown represent the highest probability, shortest minimum time to exposure, and longest mean length of shoreline from all four scenarios modelled. Actual probabilities of exposure for listed sensitivities vary greatly between each individual scenario (e.g. from 0% to 100% probability of exposure of Montebello Marine Park, depending on the location of the spill).*

7.18.3 Risk Assessment

Source

The operation of the subsea hydrocarbon system has the potential for an unplanned release of gas and condensate to occur. Based on the activities described in this EP, the following potential scenarios were identified:

- LOC event associated with damage to a valve or similiar[1]
- Loss of well integrity[2]
- Minor or major defect in flowline or production pipeline[3]

[1] Dropped objects may damage subsea infrastructure resulting in a release of hydrocarbons, treated sea water, hydraulic fluid, or MEG. CAPL defined the credible worst-case credible scenario during IMR activities as a ~50 m^3 release from one of the larger subsea valves (1" valve). This scenario is risk assessed within Section 7.15.

[2] As detailed in Section 7.18.1.2, a loss of well integrity scenario will result in a release limited to the volume of the production tubing conduit between the SCSSV flapper valve and the wellhead. This equates to 8.7 m^3 for Gorgon wells and 18 m^3 for the Jansz-Io wells.

[3] As detailed in Section 7.18.1.5, modelling indicates that a subsea release of up to 529 m^3 could result from a major defect scenario.

Potential impacts and risks

Impacts	C	Risks	C
N/A	—	The potential environmental impacts associated with hydrocarbon exposures from an unplanned release are:	
		• marine pollution resulting in acute and chronic impacts to marine fauna	5
		• smothering of subtidal and intertidal habitats	5
		• indirect impacts to commercial fisheries	5
		• reduction in amenity resulting in impacts to tourism and recreation.	5
		• Changes to values and sensitivities of marine protected areas	5

Consequence evaluation

Marine pollution resulting in acute and chronic impacts to marine fauna

Marine mammals

Marine mammals may be exposed to hydrocarbons from an oil spill at the water surface or within the water column. Marine mammals can be exposed to oil externally (e.g. swimming through surface slick) or internally (e.g. swallowing the oil, consuming oil-affected prey, or inhaling of volatile oil related compounds) (Ref. 352; Ref. 353).

An avoidance response (i.e. avoiding spilled hydrocarbons) has been identified for several species of cetacean, suggesting that cetaceans have the ability to detect and avoid surface slicks (Ref. 354). However, detection seems to depend on oil thickness and colour (Ref. 355), and observations during large oil spill events (Deepwater Horizon [DWH] and the Mega Borg spills) have recorded whales and dolphins travelling through and feeding in oil slicks (Ref. 355; Ref. 356; Ref. 357).

Direct contact with hydrocarbons may result in skin and eye irritation, burns to mucous membranes of eyes and mouth, and increased susceptibility to infection (Ref. 358). The effect of oil on cetacean skin is likely minor and temporary (Ref. 358) due to the skins effectiveness as a barrier. However, it was observed that existing skin lesions, cuts, or abrasions could allow oil to

Source
be absorbed more readily into the bloodstream (Ref. 356). French-McCay (Ref. 360) identifies that a ≥10 g/m^2 oil thickness threshold has the potential to impart a lethal dose to the species; however, also estimates a probability of 0.1% mortality to cetaceans if they encounter these thresholds based on the proportion of the time spent at surface. Dugongs have smooth skin surfaces and therefore are less likely to be affected by oil adhering to their skin. If surfacing in a slick, the dugongs may foul their sensory hairs (around their mouths) or their eyes; these could lead to inflammation/infections that then affect their ability to feed or breed (Ref. 370). Dugongs may also ingest oil (directly, or indirectly via oil-affected seagrass), and depending on the amount and type of oil, the effects could be short-term to long-term/chronic (e.g. organ damage). However, it is noted that reports on oil pollution damage to dugongs are rare (Ref. 378). The physical impacts from ingested hydrocarbons with subsequent lethal or sublethal impacts are applicable; however, the susceptibility of cetaceans varies with feeding habits. Baleen whales are not particularly susceptible to ingestion of oil in the water column as they feed by skimming the surface (i.e. they are more susceptible to surface slicks). Toothed whales and dolphins may be susceptible to ingestion of dissolved and entrained oil as they gulp feed at depth. As highly mobile species, in general it is very unlikely 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. Marine mammals are vulnerable if they inhale volatiles when they surface within a hydrocarbon slick. For the short period that they persist, vapours from the spill are a significant risk to mammal health, with the potential to damage mucous membranes of the airways and the eyes, which will reduce the health and potential survivability of an animal. Inhaled volatile hydrocarbons are transferred rapidly to the bloodstream and may also accumulate in tissues (Ref. 358). As identified in Section 4.17.3.1, several marine mammal species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon Ecological EMBA. The following BIAs intersect the Hydrocarbon Ecological EMBA: • dugong (breeding, calving, foraging, and nursing) • humpback whale (migration and resting) • pygmy blue whales (foraging, migration) • southern right whale (migration and reproduction). As these species are considered most sensitive to surface and entrained exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure in each scenario. Of the four scenarios modelled, deterministic analysis from the Gorgon condensate was selected for use as it is a slightly more persistent oil compared to Jansz condensate (Section 7.18.2.1). The deterministic model indicates that surface hydrocarbons concentrations ≥10 g/m^2 are present for <1 day following the spill event, with a maximum area of coverage of ~3 km^2. Using the pygmy blue whale migration BIA as an example, modelling indicates that the extent of surface exposures was predicted to be limited to <0.1% of the entire BIA. Similarly, deterministic analysis for the largest area of entrained hydrocarbon indicates that entrained hydrocarbons concentrations ≥100 ppb are present for ~4 days following the spill event, with a maximum area of coverage of ~50 km^2. Using the pygmy blue whale migration BIA as an example, modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.01% of the entire BIA. Based on an assessment of the predicted magnitude and duration of surface oil, and both instantaneous and time-integrated entrained oil, it is expected that only a small proportion of any marine mammal population would be exposed above the defined impact exposure thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively. *Reptiles* Marine reptiles may be exposed to hydrocarbons from an oil spill on the shoreline or at the water surface. Marine reptiles can be exposed to oil externally (e.g. swimming through surface slick) or internally (e.g. swallowing the oil, consuming oil-affected prey, or inhaling of volatile oil related compounds) (Ref. 369). Marine turtles are vulnerable to the effects of oil at all life stages: eggs, hatchlings, juveniles, and adults. Several aspects of turtle biology and behaviour place them at risk, including a lack of avoidance behaviour, indiscriminate feeding in convergence zones, and large pre-dive inhalations

Source
(Ref. 370). Oil effects on turtles can include impacts to the skin, blood, digestive, and immune systems, and increased mortality due to oiling. Shoreline hydrocarbons can impact turtles coming ashore at nesting beaches. Eggs may also be exposed during incubation, potentially resulting in increased egg mortality and detrimental effects on hatchlings. Hatchlings may be particularly vulnerable to toxicity and smothering as they emerge from the nests and make their way over the intertidal area to the water (Ref. 369). Habitat critical to the survival and BIAs for the flatback, green, hawksbill and loggerhead turtles were identified within the Hydrocarbon Ecological EMBA (Section 4.17.3.2). The behaviours associated with the BIAs include aggregation, basking, foraging, internesting, mating, and nesting. The deterministic analysis for the largest volume of oil ashore (from the Gorgon condensate scenario) indicates that shoreline hydrocarbons concentrations ≥100 g/m^2 are present within ~2 days following the spill event, with a maximum volume ashore of ~12 m^3. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥100 g/m^2 is ~4.8 km. Therefore, as the extent and duration of exposure to shorelines and associated nesting areas is expected to be limited, the potential for environmental impacts would also be limited. Deterministic analysis for largest sea surface swept area (from the Gorgon condensate scenario) indicates that surface hydrocarbons concentrations ≥10 g/m^2 are present for <1 day following the spill event, with a maximum area of coverage of ~3 km^2. Using the flatback turtle internesting buffer BIA around Barrow Island as an example, modelling indicates that the extent of surface exposures was predicted to be limited to ~0.01% of the entire BIA. This information indicates that if a vessel spill event occurred during the nesting season, it is unlikely to impact entire local nesting populations. Based on an assessment of the predicted magnitude and duration of surface and shoreline oil, it is expected that only a small proportion of any marine reptile population would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively. *Fishes, including sharks and rays* Fish, including sharks and rays, may be exposed to hydrocarbons from an oil spill within the water column. Most fish do not break the sea surface, and therefore the risk from surface oil is not relevant; however, some shark species (including whale sharks) feed in surface waters, so there is also the potential for surface hydrocarbons to be ingested. Potential effects include damage to the liver and lining of the stomach and intestine, and toxic effects on embryos (Ref. 374). Fish are most vulnerable to oil during embryonic, larval and juvenile life stages. However, very few studies have demonstrated increased mortality of fish as a result of oil spills (Ref. 375; Ref. 376; Ref. 377). Impacts to demersal fish are expected to be limited given the presence of entrained oil above impact threshold (≥100 ppb) is predicted in the surface layers (<10 m water depth).. Pelagic free-swimming fish and sharks are unlikely to suffer long-term damage from oil spill exposure because dissolved/entrained hydrocarbons are typically insufficient to cause harm (Ref. 378). Pelagic species are also generally highly mobile and as such are not likely to suffer extended exposure (e.g. >48–96 hours) at concentrations that would lead to chronic effects due to their patterns of movement. Near the sea surface, fish can detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Ref. 379). Fish that have been exposed to dissolved hydrocarbons can eliminate the toxicants once placed in clean water; hence, individuals exposed to a spill would recover (Ref. 380). Marine fauna with gill-based respiratory systems, including whale sharks, are expected to have higher sensitivity to exposures of entrained oil. BIAs for fishes including sharks and rays that were identified within the Hydrocarbon Ecological EMBA are (Section 4.17.3.3): • whale shark (foraging). As this species are considered most sensitive to surface and entrained hydrocarbon exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure. The deterministic model indicates that entrained hydrocarbons concentrations ≥100 ppb are present for ~4 days following the spill event, with a maximum area of coverage of ~50 km^2. Using the whale shark foraging BIA as an example, modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.02% of the entire BIA. As whale sharks are also sensitive to surface hydrocarbon exposures deterministic analysis for the largest sea surface swept area were analysed. The deterministic model indicates that surface

Source
hydrocarbons concentrations ≥10 g/m^2 are present for <1 day following the spill event, with a maximum area of coverage of ~3 km^2. Comparing this area to the whale shark foraging BIA, modelling indicates that the extent of surface exposures was predicted to be limited to <0.01% of the entire BIA. Based on an assessment of the predicted magnitude and duration of surface oil, and both instantaneous and time-integrated entrained oil, it is expected that only a small proportion of any fish population would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively. *Seabirds and shorebirds* Birds may be exposed to hydrocarbons from an oil spill at the water surface (e.g. foraging, resting) or on the shoreline (e.g. roosting, nesting). Birds that rest at the water's surface (e.g. shearwaters) or surface-plunging birds (e.g. terns, boobies) are particularly vulnerable to surface hydrocarbons (Ref. 371; Ref. 381). Damage to external tissues, including skin and eyes, can occur, along with internal tissue irritation in lungs and stomachs (Ref. 252). Acute and chronic toxic effects may result where the product is ingested as the bird attempts to preen its feathers (Ref. 382). Breeding BIAs for the fairy tern, lesser crested tern, roseate tern, and wedge-tailed shearwater were identified within the Hydrocarbon Ecological EMBA (Section 4.17.3.4). As this species are considered most sensitive to surface and shoreline hydrocarbon exposures, deterministic analysis were utilised to understand the potential extent and duration of exposure. The deterministic analysis for the largest volume of oil ashore (from the Gorgon condensate scenario) indicates that shoreline hydrocarbons concentrations ≥100 g/m^2 are present within ~2 days following the spill event, with a maximum volume ashore of ~12 m^3. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥100 g/m^2 is ~4.8 km. Therefore, as the extent and duration of exposure to shorelines and associated breeding environments is expected to be limited, the potential for environmental impacts would also be limited. Deterministic analysis for largest sea surface swept area (from the Gorgon condensate scenario) indicates that surface hydrocarbons concentrations ≥10 g/m^2 are present for <1 day following the spill event, with a maximum area of coverage of ~3 km^2. Using the roseate tern breeding BIA surrounding Lowendal Islands as an example, modelling indicates that the extent of surface exposures was predicted to be limited to ~0.1% of the entire BIA. This information indicates that if a spill event occurred during the nesting season, it is unlikely to impact entire local nesting populations. Based on an assessment of the predicted magnitude and duration of surface and shoreline oil, it is expected that only a small proportion of any seabird population would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Incidental (6) and Minor (5), respectively.
Smothering of subtidal and intertidal habitats *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. 389; Ref. 390), act as a barrier to diffusion of CO_2 across cell walls in macroalgae (Ref. 391), and a decline in metabolic rate, bleaching or partial mortality in corals (Ref. 383; Ref. 384) and impair respiration and photosynthesis by symbiotic zooxanthellae (Ref. 392; Ref. 393). The recovery of benthic habitats can be slow, with studies following the Deepwater Horizon incident showing long-term non-acute effects of the spill on coral colonies seven years after the event (Ref. 394). Ningaloo Coast (World Heritage Property, National Heritage Place and Commonwealth Heritage Place) is known to support coral reef and macroalgae habitat (Section 4.20.1). Coral, seagrass, and macroalgae habitats are also known to occur around the Barrow and Montebello islands, as well as other Pilbara inshore islands. No surface exposure at the ≥10 g/m^2 impact threshold was predicted for the Ningaloo Coast area (Table 7-20). Therefore, impacts from smothering within intertidal areas due to surface oil is not expected to occur. The probability of exposure to dissolved (≥50 ppb) or entrained oil (≥100 ppb) at the Ningaloo Coast area was low (l1% and 6%, respectively, Table 7-20); and stochastic modelling showed all dissolved and entrained oil remained in the surface waters layers. As such, exposure to coral reefs in deeper waters at Ningaloo is not predicted to occur.

Source
For assessment of other coral habitats that occur around some of the Pilbara islands (including Barrow Island), the deterministic analysis for the largest sea surface swept area (from the Gorgon condensate scenario) indicates that surface hydrocarbons concentrations ≥10 g/m^2 are present for <1 day following the spill event, with a maximum area of coverage of ~3 km^2. Similarly, the deterministic analysis for the largest area of entrained hydrocarbon indicates that entrained hydrocarbons concentrations ≥100 ppb are present for ~4 days following the spill event, with a maximum area of coverage of ~50 km^2. Therefore, 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 surface oil it is expected that only a small proportion of any coral habitat would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause smothering was ranked as Minor (5). *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 impact thresholds occurs in the intertidal area. No surface exposure at the ≥10 g/m^2 impact threshold was predicted for the Ningaloo Coast area (Table 7-20). Therefore, impacts from smothering within intertidal areas due to surface oil is not expected to occur. The probability of exposure to dissolved (≥50 ppb) or entrained oil (≥100 ppb) at the Ningaloo Coast area was low (1% and 6%, respectively, Table 7-20); and stochastic modelling showed all dissolved and entrained oil remained in the surface waters layers. As such, exposure to coral reefs in deeper waters at Ningaloo is not predicted to occur. For assessment of other coral habitats that occur around some of the Pilbara islands (including Barrow Island), the deterministic analysis for the largest volume of oil ashore (from the Gorgon condensate scenario) indicates that shoreline hydrocarbons concentrations ≥100 g/m^2 are present within ~2 days following the spill event, with a maximum volume ashore of ~12 m^3. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥100 g/m^2 is ~4.8 km. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥100 g/m^2 is ~4.8 km. Similarly, the deterministic analysis for the largest area of entrained hydrocarbon indicates that concentrations ≥100 ppb are present for ~4 days following the spill event, with a maximum area of coverage of ~50 km^2.Therefore, 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 surface oil, and entrained oil, it is expected that only a small proportion of any coral habitat would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause smothering was ranked as Minor (5). *Coastal habitats (e.g. mangroves, mudflats)* 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. 385). 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. 385). As identified in Section 4.17.2, the Hydrocarbon Ecological EMBA includes the west coasts of Barrow, Middle and Boodie islands, as well as parts of Montebello, Airlie, Serrurier, Flat and east of Muiron islands. These islands include sandy beaches, rocky coasts, and mangroves. Coastal and marine baseline studies undertaken by CAPL (Ref. 70) identified that there are no mangrove stands on the west coast of Barrow Island, where the Hydrocarbon Ecological EMBA intersect with the coast; however there may be some intersect with the isolated patches of mangroves on the Montebello Islands. Mangroves and intertidal mudflats associated with key values and sensitivities (e.g. the Ningaloo Coast; Table 4-10) within the EMBA were not predicted to be exposed to shoreline hydrocarbons above impact thresholds. For assessment of other mangrove and intertidal habitats that occur around some of the Pilbara islands (including Barrow Island), the deterministic analysis for the largest volume of oil ashore (from the Gorgon condensate scenario) indicates that shoreline hydrocarbons concentrations ≥100 g/m^2 are present within ~2 days following the spill event, with a maximum volume ashore of ~12 m^3. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥100 g/m^2 is ~4.8 km. Therefore, as the extent and duration of

Source
exposure to shorelines 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 shoreline oil, it is expected that only a small proportion of any mangrove and intertidal habitat would be exposed above the defined impact thresholds. Therefore, the potential impacts of oil to cause smothering was ranked as Minor (5).
Indirect impacts to commercial fisheries As identified in Section 4.18.1, several commercial fisheries have management areas and recent fishing effort recorded within the EMBA. Direct impacts commercially targeted fish species are expected to occur from in-water exposures. Stochastic modelling showed that when dissolved and entrained oil was predicted to occur above the impact thresholds, it remained in the surface layers (<10 m water depth) only. As described above, very few studies have demonstrated increased mortality of fish as a result of oil spills. However, fish stocks may be especially vulnerable to oil spills close to the spawning grounds or egg and larval drift areas (Ref. 376 Ref. 395). 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. 395). Despite potential mortality of eggs and larvae following a spill, subsequent depletion of adult wild fish stocks is rarely recorded (Ref. 378). As identified in Section 4.18.1, the spawning grounds for the Southern bluefin tuna intersects with the Hydrocarbon Ecological EMBA. As such, the available deterministic analyses from the hydrocarbon spill modelling were utilised to understand the potential extent and duration of exposure to these spawning grounds. The deterministic models for the largest area of entrained hydrocarbons >100 ppb indicate that hydrocarbon are present for ~4 days following the spill event, with a maximum area of coverage of ~50 km^2. Based on the spatial extent of the southern bluefin tuna spawning ground (~1,850,534 km^2), modelling indicates that the extent of entrained exposures was predicted to be limited to ~0.002% of the entire spawning ground. Although exposures above impact thresholds have the potential to affect the recruitment of targeted commercial and recreational fish species, any acute impacts are expected to be limited, given this event is singular, non-continuous, and will result in a limited volume of hydrocarbon being released over a short time. On this basis recruitment of targeted species is not expected to be impacted significantly given the extent of exposure to concentrations above impact thresholds are expected to be limited due to rapid dilution and dispersion upon release. Spill events also have the potential to impact commercial fisheries through indirect impacts associated with tainting. Tainting is a change in the characteristic smell or flavour, and renders the catch unfit for human consumption or sale due to public perception. Tainting may not be a permanent condition but will persist if the organisms are continuously exposed; but when exposure is terminated, depuration will quickly occur (Ref. 395). Regardless of the small potential for tainting, customer perception that tainting has occurred may cause a larger impact then the direct impact itself. However, as this event is singular, non-continuous, and will result in a limited volume of hydrocarbon being released over a short time period, and the low persistence of the hydrocarbon in the environment, customer perceptions are not expected to be altered for a prolonged period. Modelling predicts that inshore exposure would be limited, whilst offshore exposures are expected to dilute and disperse over a longer period of time. In both instances, it is expected that any impacts from this type of event would likely be short term in duration. Therefore, CAPL assesses the consequence to commercial fisheries as localised and short term and it is ranked as Minor (5).
Reduction in amenity resulting in impacts to tourism and recreation Stochastic modelling predicts surface exposure ≥1 g/m^2 (visible impact threshold) has the potential to occur along parts of Barrow and Montebello state marine protected areas, and Ningaloo Coast. Deterministic analysis for the largest swept area (from the Gorgon condensate scenario) indicates that floating hydrocarbon concentrations ≥1 g/m^2 are present from day one following the spill event, with a maximum area of coverage of 15 km^2. Modelling predicts shoreline exposure ≥10 g/m^2 (visible impact threshold) has the potential to occur along parts of Barrow, Montebello islands, several other Pilbara inshore islands and Ningaloo Coast. Deterministic analysis for the largest volume of oil ashore (from the Gorgon condensate scenario) indicates that shoreline hydrocarbons concentrations ≥10 g/m^2 are present within ~2 days

Source
following the spill event, with a maximum volume ashore of ~15.8 m^3. Stochastic modelling also showed that the longest length of shoreline with exposure of ≥10 g/m^2 is ~18 km. Therefore, as the extent and duration of exposure to shorelines is expected to be limited the potential for environmental impacts would also be limited. Shoreline loading can impact the visual amenity of coastal areas and limit beach access for users, impacting tourism and recreation activities. There is limited access to Barrow and Montebello islands; however, there is more likelihood of tourism or recreational activities occurring on some of the smaller islands closer to the mainland and Ningaloo Coast. Shoreline loading can impact the visual amenity of coastal areas and limit beach access for users, impacting tourism and recreation activities. However, given the short-term and localised disturbance to marine tourism and recreation activities, CAPL has ranked the consequence as Minor (5).
Changes to values and sensitivities of marine protected areas Given the release location (from Gorgon and Jansz nearshore scenarios) falls within the Montebello Marine Park, stochastic modelling predicts a high probability (78%) of dissolved exposure ≥50 ppb within the Park. In addition, a low probability (2%) within state marine protected areas was also predicted (Table 7-20). Modelling also predicted a moderate (up to 15%) probability of shoreline exposure above impact threshold (≥10 g/m^2) within the Montebello Islands Conservation Park. No interaction with seabed within any marine protected area was predicted to occur. The natural values of the Marine Parks include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for regionally significant marine fauna. Social and economic values of the Marine Parks include fishing and tourism and recreation. The consequence evaluations for marine fauna and commercial fisheries are provided above. Given the expected behaviour and weathering of the oil, limited spatial and temporal exposure to marine fauna or commercial fish species above impact exposure thresholds, the potential impacts of a vessel spill event to the values and sensitivities of the Marine Park has been ranked as Minor (5).
ALARP decision context justification
The operation of subsea production systems offshore is a well-practised nationally and internationally activity. The control measures to manage the risk associated with a major defect event 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 stakeholder consultation, no objections or claims were raised regarding major defect events arising from the activity. The risks associated with a major defect event are considered lower-order risks in accordance with Table 5-3. As such, CAPL would apply ALARP Decision Context A for this aspect.
Good practice control measures and source

Control measure	Source

Source	
IM Plan	Inspections provide assurance that assets are in good condition and proactively identify maintenance or repair activities that may be required. The type and frequency of inspections of the subsea hydrocarbon system will be undertaken in accordance with the Gorgon and Jansz Subsea and Pipelines Inspection and Monitoring Plan (IM Plan) (Ref. 32). The IM Plan also requires that hydrocarbon system process monitoring (pressure, temperature and flow rates), fluid composition monitoring, and corrosion monitoring are undertaken. Inspection and monitoring results are assessed against acceptance criteria to allow early identification and management of potential anomalies through engineering assessment, maintenance, and repairs to ensure the integrity of the hydrocarbon system and prevent a loss of containment. Inspections are tracked via the Computerised Maintenance Management System (CMMS).
Well handover	Should a loss of well integrity event occur, CAPL would implement the NOPSEMA-accepted WOMP. This would require a well handover between ABU Operations and ABU Wells work group. Once the well is handed over to the ABU Wells work group, all well integrity remedial activities will be conducted in accordance with the NOSEPMA-accepted *Gorgon and Jansz-Io Drilling, Completions and Well Maintenance Program Environment Plan* (Ref. 9).
EMT	An emergency management team (EMT) capable of managing a response to the credible spill discharge scenario described in this EP will be maintained.
OPEP	Under the OPGG(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. In the event of a Level 2 (or above) oil spill, the OPEP will be implemented. CAPL has developed an NOPSEMA-accepted OPEP (Ref. 2) to support all spill response activities across all its assets.
OSMP	The OSMP 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). CAPL has developed an NOPSEMA-accepted OSMP (Ref. 17) to support all spill monitoring activities across all its assets.

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A

Likelihood and risk level summary	
Likelihood	Analysis ofPARLOC database (Ref. 395) was used to evaluate the likelihood of a loss of containment from an individual offshore pipeline, which was determined to be equivalent to 0.189% per year (Ref. 395). This frequency was

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td colspan="2">used as a guide to inform the likelihood of consequence. Given these statistics are based on incident history, largely for North Sea and European operations, their use is considered conservative given the geographically remote location of the Gorgon and Jansz Feed Gas Pipeline and the reduced risk of potential external interference.
Because of the low probability of a major defect event, the likelihood of the event coinciding with the breeding or migration period of particular values and sensitivities, and the control measures in place, the likelihood of the worst-case environmental consequence occurring as described above was assessed as Remote (5).</td></tr>
<tr><td>Risk level</td><td colspan="2">Very low (9)</td></tr>
<tr><th colspan="3">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="2">The potential impact associated with this aspect would be short term, apply to some individuals, and consequently is not expected to affect biological diversity and ecological integrity.
The consequence associated with this aspect is Minor (5). Therefore, no additional evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Legislation and other requirements relevant for this aspect include:
Conservation Management Plan for the Blue Whale 2015–2025 (Ref. 95)
Conservation Advice Balaenoptera borealis Sei Whale (Ref. 68)
Conservation Advice Balaenoptera physalus Fin Whale (Ref. 67)
Recovery Plan for Marine Turtles in Australia (Ref. 118)
Approved Conservation Advice for Aipysurus apraefrontalis (Shortnosed Sea Snake) (Ref. 115)
Approved Conservation Advice for Aipysurus foliosquama (Leafscaled Sea Snake) (Ref. 116)
National Recovery Plan for the Southern Right Whale (Eubalaena australis) (Ref. 224)
Conservation Advice Rhincodon typus Whale Shark (Ref. 164)
North-west Marine Parks Network Management Plan (Ref. 252).
CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below.
<table>
<tr><th>Requirement</th><th>Demonstration</th></tr>
<tr><td>Conservation Management Plan for the Blue Whale 2015–2025
No specific management action identified.</td><td>N/A.</td></tr>
<tr><td>Conservation Advice Balaenoptera borealis Sei Whale
No specific conservation action identified.</td><td>N/A.</td></tr>
</table>
</td></tr>
</table>

Source		
	Conservation Advice Balaenoptera physalus Fin Whale No specific conservation action identified	N/A.
	Recovery Plan for Marine Turtles in Australia Management action A4.2: Ensure spill risk strategies and response programs adequately include management for marine turtles and their habitats, particularly in reference to 'slow to recover habitats', e.g. nesting habitat, seagrass meadows or coral reefs.	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSMP (Ref. 17). Therefore, this activity is not considered to be inconsistent with the Recovery Plan for Marine Turtles in Australia.
	Approved Conservation Advice for Aipysurus apraefrontalis (Shortnosed Sea Snake) No specific conservation action identified.	N/A.
	Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified.	N/A.
	National Recovery Plan for the Southern Right Whale (Eubalaena australis) *No specific management action identified.*	N/A.
	Conservation Advice Rhincodon typus Whale Shark 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	The Montebello and Gascoyne Marine Park are a multiple use zone (IUCN VI). The control measures identified for the management of 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 8.18.2. Therefore, this activity is not considered to be inconsistent

<table>
<tr><th colspan="3">Source</th></tr>
<tr><td></td><td>response action being taken within a marine park.”</td><td>with the North-west Marine Parks Network Management Plan.</td></tr>
<tr><td>Internal context</td><td colspan="2">These CAPL environmental performance standards or procedures were deemed relevant for this aspect:
IM Plan (Ref. 32)
OPEP (Ref. 2)
OSMP (Ref. 17).</td></tr>
<tr><td>External context</td><td colspan="2">During stakeholder consultation, no objections or claims were raised regarding major defect events arising from the activity.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="2">These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.
However, in alignment with Section 5.20.2, where the aspect is listed as threat to a protected matter, or identified as a concern to a listed conservation value, CAPL will define an acceptable level of impact that aligns with the objectives of these documents. Objectives of the relevant documents are shown below:</td></tr>
<tr><td></td><td>Plan</td><td>Objective</td></tr>
<tr><td></td><td>Conservation Management Plan for the Blue Whale 2015–2025</td><td>Recovery objective: 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 objective 4
Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td></td><td>National Recovery Plan for the Southern Right Whale (Eubalaena australia)</td><td>Recovery objective: Minimise anthropogenic threats to allow the conservation status of the southern right whale to improve so that it can be removed from the threatened species list under the EPBC Act.
Interim objective 5
Anthropogenic threats are demonstrably minimised.</td></tr>
<tr><td></td><td>Recovery Plan for Marine Turtles in Australia</td><td>Recovery objective: The long-term recovery objective for marine turtles is to 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 3:
Anthropogenic threats are demonstrably minimised.</td></tr>
</table>

Source		
	North-west Marine Parks Network Management Plan 2018	As per Section 4.19.1
	Therefore, CAPL has defined the following acceptable level of impact such that it is not inconsistent with these documents: • impacts from the petroleum activity are managed such that it would not prevent the long-term recovery of protected species • no adverse change to the values of the Australian Marine Park. CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the unplanned release, that the risk to marine fauna and/or values of the AMP are also subsequently managed.	
Environmental performance outcome	**Environmental performance standard**	**Measurement criteria**
No unplanned release of hydrocarbons or hazardous materials to the environment during the petroleum activity	**IM Plan** Inspection and maintenance will include, but not be limited to, visual or acoustic survey of the subsea pipeline, in accordance with the IM Plan	CMMS records confirm a visual or acoustic survey of the subsea pipeline was undertaken in accordance with the IM Plan
	IM Plan Monitoring of hydrocarbon system pressure, temperature, flow rates and fluid composition against acceptable criteria and limits will be aligned with the IM Plan	Records confirm monitoring of hydrocarbon system pressure, temperature, flow rates and fluid composition against acceptable criteria and limits are aligned with the IM Plan
Reduce the risk of impacts to the environment from the unplanned release of hydrocarbons / hazardous materials during petroleum activities	**Well handover** In the event of a well integrity failure event, well custodianship is handed over from CAPL's Gorgon Operations to the ABU Wells work group for management and subsequent remediation	Completed well handover certification confirms that the well has transferred into the custodianship of the ABU Wells work group. This process is outlined in the NOPSEMA-accepted *Gorgon Project: Producing Phase Well Operations Management Plan* (Ref. 18)
	OPEP In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, response activities are implemented in accordance with the *ABU Consolidated OPEP*	Records confirm the OPEP has been activated and response activities implemented
	OPEP CAPL will maintain the following minimum preparedness capability: • number and type of response packages	Records confirm that CAPL has arrangements in place to access the minimum number and type of responses packages required

Source		
	as identified in Table 7-22	
	OPEP—Oil spill response organisation (OSRO) Capability Arrangements CAPL shall maintain service agreements with oil spill response organisations (as per Section 8.17.9.6.3) that have capabilities to support a response to an oil spill event	Records confirm that service agreements are in place
	OPEP Refer to the ABU Consolidated OPEP for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic	
	OSMP In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, the OSMP will be activated, and: • operational and scientific monitoring program are initiated once the specific initiation criteria are met • operational and scientific monitoring program are implemented within the timeframes outlined in the OSMP • operational and scientific monitoring components are continued until respective termination criteria are met	Records confirm the OSMP has been activated
		Records confirm that once initial criteria have been met, operational and scientific monitoring programs were initiated.
		Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSMP.
		If any OSMP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OMSP component initiation activation
		If any OSMP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability through existing contracts within 12 hours of OMSP component initiation activation
		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)
		Records confirm that once termination criteria have been met, operational and

Source		
		scientific monitoring programs were ceased.
	OSMP Capability required to implement all operational and scientific monitoring programs are in place to meet the requirements outlined in the OSMP	Internal personnel capability is documented every six months in the ABU OSMP Capability Register.
		External contractors self-assess their capability against the requirements and provide a Statement of Personnel Capability and Readiness every six months
		Hydrocarbon characterisation sample kits are maintained at Barrow Island and Karratha.
	EMT ABU EMT exercises, including exercises to test source control response arrangements, will be conducted in accordance with Section 8.17.9.7	Records confirm exercises are conducted
CAPL will be prepared and ready to manage an oil spill event	**EMT** CAPL core and support EMT members will complete all hazards and oil spill training in accordance with the ABU Training and Exercise Program Procedure	Records confirm training is conducted
	EMT CAPL shall maintain an EMT duty roster with a minimum of 10 qualified EMT personnel to fulfil core CAPL EMT positions	EMT Duty Roster records
	EMT CAPL shall maintain the minimum required personnel within the ABU trained to fulfil core EMT functions as per Appendix F of the OPEP	Records confirm the minimum required personnel are trained
	EMT During any oil spill response, ABU EMT support personnel, including mutual aid personnel, joining the CAPL EMT will be provided with training in accordance with the ABU Training and Exercise Program Procedure before they join the EMT	Training / induction records
	EMT CAPL shall maintain Service Level Agreement / membership with OSROs enabling the provision of	Service Level Agreement / Membership

Source		
	technical specialists to supplement the CAPL EMT either directly or via industry mutual aid framework agreements	

7.19 Spill response

7.19.1 Response option selection

7.19.1.1 Strategic NEBA

CAPL has developed a series of strategic Net Environmental Benefit Analysis (NEBA) (Ref. 100) 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, Barrow Island crude and Gorgon/Jansz mixed trunkline fluids
- Group 3 / 4 – Including HFO and intermediate fuel oil (IFO) (depending on blend).

These 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. 407). After considering the benefits and drawbacks of each response option on the ecological, social, and economic receptors within the EMBA, the response options that were determined to minimise the impacts to the environment and people were pre-selected.

7.19.1.2 Protection prioritisation process

CAPL has developed a Protection Prioritisation Process (PPP) (Ref. 408) 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 spill scenario(s) EMBA, such as that described in Section 4. 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 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. 408) 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. 408) aligns with WA Department of Transport (DoT) PPP (Ref. 409) 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. 408)) considers all High (4) and Very High (5) ranked shoreline cells where contact above the moderate exposure threshold (from stochastic modelling across all seasons) is predicted within 4 days (96 hours). As described in the PPP (Ref. 408), the 4 day contact timeframe is based on the expected time it would take CAPL to develop and implement a Tactical Response Guide (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.

High and Very High value areas (DoT shoreline cells) identified for contact within this timeframe have been identified in Table 7-21 below. These priority planning areas, and the specific receptors identified within them, are considered to ensure that tactical planning and response option selection are appropriate.

Table 7-21: Priority planning areas for major defect spill scenario

Potential area of impact	Distance from source of spill	Shoreline values	Planned response tactics
DoT Shoreline Cell # 320 and #321 (Barrow Island)	15 km	Turtles – BIAs including nesting Seabirds – BIAs including breeding Coral and reef communities Australian Marine Park	Monitor, Evaluation and Surveillance Shoreline Protection and Deflection Shoreline Clean-up Oiled Wildlife Response
DoT Shoreline Cell # 318 (Montebello Islands)	30 km	Turtles – BIAs including nesting Seabirds – BIAs including breeding Mangroves Coral and reef communities Australian Marine Park	Monitor, Evaluation and Surveillance Shoreline Clean-up Oiled Wildlife Response

** Note that the modelling for both Gorgon and Jansz-Io vessel collision event did not predict any impact to High and Very High ranked areas within 4 days.*

7.19.2 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 1 – Jansz condensate
- Group 2 – Gorgon condensate, MDO.

The outcomes of the Strategic NEBA are outlined in Table 6-1 of the OPEP (Ref. 2). Taking into account the priority planning areas identified in Table 7-21 the outcomes of the Strategic NEBA determined that the recommended response options proposed to be used for the spill scenarios associated with this EP include:

- Monitoring, Evaluation, and Surveillance (MES)
- Shoreline Protection and Deflection (SPD)

- Shoreline Clean-up (SHC).

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.

7.19.3 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 as Appendix C of the OPEP (Ref. 2).

7.19.3.1 CAPL project-specific capability requirement assessment

To understand the spill response capability required for this 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. 100) and priority planning areas to understand the planned response to an event.
2. Predict the average surface hydrocarbon volume per day; and average volume of hydrocarbon 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.

7.19.3.2 CAPL planned response vessel collision and major defect

In accordance with the Strategic NEBA (Ref. 100), the response strategies proposed to be used for these spill scenarios and response package calculations are described below. Offshore CAR would not be effective because of the hydrocarbon properties (Group 1 and 2).

Implement MES response

A MES response will commence 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 an SPD response

Deterministic analysis for the largest volume of oil ashore indicates that 15.8 m^3 may wash ashore within ~2 days after release. 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.

Based on Appendix C of the OPEP (Ref. 2), each protection team is expected to recover 15.6 m^3 of hydrocarbon per day. On the assumption that 15.8 m^3 washes ashore on the second day, CAPL would need up to two SPD packages available on day two to implement the SPD response. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 7-22.

Modelling suggests there would only be a very short window to implement SPD on the west coast of Barrow Island (~1.7 days). This short timeframe, coupled with the remoteness, access constraints and the high energy environment of the western coastline would likely result in limited effectiveness, Regardless, a SPD response could be targeted at accessible areas of lower energy with known environmental sensitives, such as turtle nesting beaches.

A SPD response within the other Priority Planning area (Montebello Islands) would not be possible due to the predicted time to exposure (<1 day).

Implement an SHC response

For a spill event such as this (a non-continuous release), deterministic analysis indicates shoreline accumulation (if it occurs) occurs rapidly. CAPL will implement strategies to protect prioritised values and sensitivities; however, the focus would be on SHC operations.

Deterministic analysis for the largest volume of oil ashore indicates that 15.8 m^3 may wash ashore within ~2 days after release, and a maximum length of shoreline exposed to above actionable quantities was ~5 km. This scenario predicted exposure to the western coastlines of Barrow Islands.

The west-coast of Barrow Island comprises:

- High energy wave environment
- High / steep rocky cliffs
- Very limited vehicle access.

From a tactical planning perspective, based upon these conditions, it is unlikely that a shoreline clean-up would be feasible along most of the west coast. Consequently, priority areas for clean-up would be those west coast bays / beaches accessible by vehicles or vessels and those that support green turtle nesting populations. Regardless, a conservative planning approach taken by CAPL is that it would attempt to clean up the entire volume of oil washed ashore.

Based on Appendix C of the OPEP (Ref. 2), each SHC team is expected to recover 1.6 m^3 of hydrocarbon per day. If two clean-up teams are mobilised on day 3 and used each day, all hydrocarbons can be recovered within 5 days. If required, these efforts could be ramped up as directed and informed by MES activities.

Table 7-22: Response package deployment timeline

Response Technique	Days Following Event							Weeks Following Event				
	1	2	3	4	5	6	7	2	3	4	5	6
No. packages – planned MES	1	1	1	1	1	1	1	1	0	0	0	0
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y				
No. packages – planned SPD	0	2	2	0	0	0	0	0	0	0	0	0
Does CAPL have the required capability?		Y	Y									
No. packages – planned SHC	0	0	2	2	2	2	2	0	0	0	0	0
Does CAPL have the required capability?			Y	Y	Y	Y	Y					

7.19.4 Spill response environmental risk assessment

7.19.4.1 Ground disturbance—shoreline spill response

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.

Source			
In the event of a worst-case spill event (major defect event at a nearshore location releasing Gorgon condensate) or a vessel collision at the State/Commonwealth waters boundary (MDO) implementing SPD and SHC techniques involves people and equipment, which may disturb shoreline habitat.			
Potential Impacts and Risks			
Impacts	**C**	**Risks**	**C**
N/A	-	Conducting SPD and SHC, including moving personnel and equipment, has the potential to damage terrestrial habitats (including nests), with subsequent impacts to fauna such as turtles and birds.	5
Consequence Evaluation			
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.			

Particular 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).
ALARP Decision Context Justification
The risks associated with shoreline oil spill response techniques are well understood, with the techniques having been applied successfully for a number of large spill events. Although there is a good understanding of these response techniques, there is uncertainty regarding the specific location at which this may be undertaken, and the level of response that may be required in these areas. Spill modelling was used to inform the extent of such a spill, and thus provide a sound basis for response planning (including shoreline response) to such an incident. Control measures to manage the risks associated with shoreline spill response techniques are well defined with most being linked to detailed monitoring plans that feed into tactical planning requirements and NEBAs. During stakeholder consultation, no objections or claims were raised regarding spill response activities. The risks arising from implementing shoreline response techniques in the event of a spill are extremely low, and CAPL consider these to be lower-order risks in accordance with Table 5-3. As such, CAPL considers ALARP Decision Context A should be applied for this aspect.

Control Measure	Source of Good Practice Control Measure
OSMP	The OSMP 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). CAPL has developed an NOPSEMA-accepted OSMP (Ref. 17) to support all spill monitoring activities across all its assets. Specifically, Operational Study 6 – Rapid Seabird and Shorebird Assessment and Operational Study 7 – Rapid Marine Megafauna Assessment provide information on the presence of wildlife with regards to predicted trajectory to understand the level of oiled wildlife response (OWR) required.
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 a NOPSEMA-accepted OPEP (Ref. 2) to support all spill response activities across all its assets. The OPEP identifies the resource capability required to implement the strategy based on shoreline sensitivities and the magnitude of the spill.
Likelihood and Risk Level Summary	
Likelihood	Depending on the clean-up technique and habitat, potential consequences of shoreline cleaning are remote (Note: Mechanical methods are generally expected to have greater consequences than manual cleaning). With the

	control measures in place, CAPL assessed the likelihood of the consequence described above as Remote (5).	
Risk Level	Very low (9)	
Acceptability Summary		
Principles of ESD	The potential impact associated with this aspect is considered to have the potential to result in minor, localised, incidental damage to, or alteration of, habitats and ecological communities; however, this is not expected to affect biological diversity and ecological integrity. The consequence associated with this aspect is Minor (5). Therefore, no additional evaluation against the Principles of ESD is required.	
Relevant Environmental legislation and Other Requirements	No legislation and other requirements relevant to this aspect were identified.	
Internal Context	This CAPL environmental performance standard / procedure was considered relevant for this aspect: • OSMP (Ref. 17).	
External Context	During stakeholder consultation, no objections or claims were raised regarding spill response activities.	
Defined Acceptable Level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement Criteria**
Reduce the risk of impacts to the environment during event response	**OSMP** In the event of a Level 2 (or above) oil spill to marine or coastal waters occurring, the OSMP will be activated, and:	Records confirm the OSMP has been activated
	operational and scientific monitoring program are initiated [80] once the specific initiation criteria are met	Records confirm that once initial criteria have been met, operational monitoring programs were initiated.
	operational and scientific monitoring program are implemented within the timeframes outlined in the OSMP	Records confirm that once initial criteria have been met, scientific monitoring programs were initiated.
	operational and scientific monitoring components are continued until respective termination criteria are met	Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.
	OPEP In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, response activities are implemented in accordance with the *ABU Consolidated OPEP*	Records confirm the OPEP has been activated and response activities implemented

[80] As per Section 2.1 of the OSMP, for this plan initiation means starting preparation for implementation.

	OPEP Refer to the *ABU Consolidated OPEP* for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic

7.19.4.2 Physical presence—oiled wildlife response

Oiled wildlife response (OWR) activities are aimed at treating fauna that have encountered, or are likely to encounter, spilt hydrocarbons. OWR generates the environmental aspect of physical presence/interaction with fauna, through handling, treating, rehabilitating, and releasing fauna.

Source			
In the event of a worst-case spill event (major defect event at a nearshore location releasing Gorgon condensate), or a vessel collision at the State/Commonwealth waters boundary (MDO), the handling and treating marine fauna (through an OWR) will result in personnel interacting with marine fauna.			
Potential Impacts and Risks			
Impacts	**C**	**Risks**	**C**
N/A	-	Conducting OWR has the potential to cause further harm to oiled fauna due to hazing, barriers, deterrents, and cleaning activities, and has the potential to cause injury/death.	5
Consequence Evaluation			
Particular environmental values that may be affected by OWR activities include marine fauna such as turtles and birds. Due to the intensive nature of OWR activities and the fragile nature of many shore and wading birds, OWR activities can have high bird mortality rates. 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. Spill modelling indicates that areas along the coast frequented by fauna, such as the Ningaloo coast and Barrow and Montebello Islands, are areas where OWR is most likely to be undertaken. 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).			
ALARP Decision Context Justification			
The risks associated with OWR are well understood, with the technique having been applied successfully for a number of large spill events. Although there is a good understanding of the response technique, there is uncertainty regarding the specific location at which this may be undertaken, the number of animals that may be impacted, and thus the level of response that may be required. Spill modelling was used to inform the extent of such a spill, and thus provide a sound basis for response planning to such an incident. Control measures to manage the risks associated with OWR are well defined with most being linked to detailed monitoring plans that feed into tactical planning requirements and NEBAs. During stakeholder consultation, no objections or claims were raised regarding OWR activities. The risks arising from implementing OWR in the event of a spill are extremely low, and CAPL consider these to be lower-order risks in accordance with Table 5-3. As such, CAPL considers ALARP Decision Context A should be applied for this aspect.			
Control Measure	**Source of Good Practice Control Measure**		

OSMP	The OSMP 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). CAPL has developed an NOPSEMA-accepted OSMP (Ref. 17) to support all spill monitoring activities across all its assets. Specifically, Operational Study 6 – Rapid Seabird and Shorebird Assessment and Operational Study 7 – Rapid Marine Megafauna Assessment provide information on the presence of wildlife with regards to predicted trajectory to understand the level of OWR required.	
OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. Should a level 2 spill scenario occur, the OPEP will be implemented. CAPL has developed a NOPSEMA-accepted OPEP (Ref. 2) to support all spill response activities across all its assets. The OPEP identifies the resource capability required to implement the strategy based on shoreline sensitivities and the magnitude of the spill.	
Likelihood and Risk Level Summary		
Likelihood	Where there is the possibility for surface 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 consequences occurring from OWR activities was determined to be Remote (5).	
Risk Level	Very low (9)	
Acceptability Summary		
Principles of ESD	The potential impact associated with this aspect is considered as having the potential to result in a localised incidental impact and thus is not expected to affect biological diversity and ecological integrity. The consequence associated with this aspect is Minor (5). Therefore, no additional evaluation against the Principles of ESD is required.	
Relevant Environmental Legislation and Other Requirements	No legislation and other requirements considered relevant to this aspect were identified.	
Internal Context	The CAPL environmental performance standard / procedure considered relevant for this aspect is: • OSMP (Ref. 17).	
External Context	During stakeholder consultation, no objections or claims were raised regarding spill response activities.	
Defined Acceptable Level	These impacts and risks are inherently acceptable as they are considered lower-order impacts in accordance with Table 5-3. In addition, the potential impacts and risks evaluated for this aspect are not inconsistent with any relevant recovery or conservation management plan, conservation advice, or bioregional plan.	
Environmental performance outcome	**Environmental performance standard**	**Measurement Criteria**
Reduce the risk of impacts to the	**OSMP**	Records confirm the OSMP has been activated

environment during event response	In the event of a Level 2 (or above) oil spill to marine or coastal waters occurring, the OSMP will be activated, and: • operational and scientific monitoring program are initiated once the specific initiation criteria are met • operational and scientific monitoring program are implemented within the timeframes outlined in the OSMP • operational and scientific monitoring components are continued until respective termination criteria are met	Records confirm that once initial criteria have been met, operational monitoring programs were initiated.
		Records confirm that once initial criteria have been met, scientific monitoring programs were initiated.
		Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.
	OPEP In the event of a Level 2 (or above) oil spill occurring to marine or coastal waters, response activities are implemented in accordance with the *ABU Consolidated OPEP*	Records confirm the OPEP has been activated and response activities implemented.
	OPEP Refer to the *ABU Consolidated OPEP* for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic	

7.20 Intangible cultural heritage values

Source

Activities identified in Sections 7.1 to 7.19 have the potential to result in impacts on intangible cultural heritage values.

Potential impacts and risks

Impacts	C	Risks	C
–	–	• changes to intangible cultural heritage values	5

Consequence evaluation

Changes to intangible cultural heritage 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 recognize as part of their cultural heritage” (Ref. 260). As identified from literature and/or consultation (4.17.5.2), Sea Country is a value for First Nations people. It is understood that the term ‘Country’ refers to more than just a geographical area, and includes values, places, resources, stories, and cultural obligations associated with that geographical area. Specific intangible values of Sea Country identified through consultation include Dreamtime stories and songlines (Table 4-15). In particular, representatives of from MCH identified the existence of songlines that go through Barrow Island and offshore (Table 4-15). Songlines are paths that track across Country and skies, representing Indigenous knowledge that has been collected, protected and transmitted (Ref. 480). Songlines are living tools that embed and mediate history, ecological knowledge, relationships, ancestral beings, and cultural belonging on Country (Ref. 480). Certain songlines may be referred to as ‘Dreaming Pathways’ because of the tracks forged by Creator Spirits during the Dreaming (Ref. 220). Kearney et al (Ref. 222) describe that for saltwater peoples “stories and songlines

Source
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. 217). For example, representatives from MCH identified that there are songlines, including a whale songline, that go through Barrow Island and offshore and connect Barrow Island to the mainland (Table 4-16). Listening and talking with Country through stories, songlines, and other practices are ways First Nations care for, navigate, and connect with Country (Ref. 218). Songlines rely on the continued health of Country, and people's continued access and connection to it (Ref. 480). When Country is damaged or altered, so too are songlines and the knowledge they embody and enact (Ref. 480). Representatives from MCH described this as when songlines are disrupted, their widdart (heart) is disconnected (Table 4-16). All of the potential impacts and risks assessed in Section 7 have the potential to impact intangible cultural heritage, however, as all have been assessed as lower-order impacts and risks, that are ALARP and acceptable with suitable controls in place (see Table 7-1). As such, it is anticipated that intangible heritage values such as songlines and connection to Country would not be significantly adversely affected from the activities outlined in this EP and CAPL has ranked the consequence for intangible cultural heritage values as Minor (5).
ALARP decision context justification
Offshore petroleum activities are commonplace; and are practised nationally and internationally. The control measures to manage the impacts associated with intangible cultural heritage have been implemented by the industry. During relevant persons consultation, a claim regarding the risk of disruption to songlines was received. This claim was responded to by CAPL (see summary in 'external context' below, and within appendix d). The impacts on intangible cultural heritage are considered lower-order impacts in accordance with Table 5-3. As such, CAPL applied ALARP Decision Context A for this aspect.
Good practice control measures

Control measure	Source
Relevant persons consultation—Ongoing consultation (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 6), as part of ongoing consultation (as required by regulation 22(15) of the OPGGS(E)R, and described in Section 8.17.4) CAPL will continue to engage with First Nations people and/or representative bodies. This ongoing consultation relates to both the specific petroleum activity (Table 8-5) as well as broader engagement and relationship building (Section 8.17.4.3). 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 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 8.17.2.2.

Additional control measures and cost benefit analysis		
Control measure	**Benefit**	**Cost**
N/A	N/A	N/A

Likelihood and risk level summary	
Likelihood	The petroleum activity may cause localised and temporary impacts to intangible cultural heritage. Consequently, CAPL consider the likelihood of the consequence occurring as being Seldom (3).
Risk level	Low (7)

<table>
<tr><th colspan="4">Source</th></tr>
<tr><th colspan="4">Determination of acceptability</th></tr>
<tr><td>Principles of ESD</td><td colspan="3">The potential impact is limited to localised short-term effects that are not expected to affect biological diversity and ecological integrity and in turn intangible cultural heritage values
The consequence associated with this aspect is Minor (5).
Therefore, no further evaluation against the Principles of ESD is required.</td></tr>
<tr><td>Relevant environmental legislation and other requirements</td><td colspan="2">Requirement</td><td>Demonstration</td></tr>
<tr><td></td><td colspan="2">N/A</td><td>N/A</td></tr>
<tr><td>Internal context</td><td colspan="3">No CAPL environmental performance standards / procedures were deemed relevant for this aspect.</td></tr>
<tr><td>External context</td><td colspan="3">During consultation, relevant persons identified the potential for disruption to songlines (appendix d). CAPL responded confirming:
intangible heritage, including songlines, has been considered in the environment description and risk assessments within the EP
control measures to reduce the risk of impacts to marine fauna have been included in the EP
CAPL is committed to continue to learn about the values and sensitivities associated with Sea Country through ongoing consultation.</td></tr>
<tr><td>Defined acceptable level</td><td colspan="3">All potential impacts and risks evaluated in Section 7 are inherently acceptable as they are considered lower-order impacts and risks in accordance with Table 5-3. In addition, all potential impacts and risks evaluated in Section 7 are not inconsistent with any relevant recovery or conservation management plans, conservation advice, or bioregional plans.
CAPL considers that the petroleum activity, with the control measures as described for this aspect in place, meet this acceptable level. In particular that by managing the risk to marine fauna, that the impacts to intangible cultural heritage are also subsequently managed to this acceptable level.</td></tr>
<tr><th>Environmental performance outcome</th><th colspan="2">Performance standard / Control measure</th><th>Measurement criteria</th></tr>
<tr><td rowspan="2">No adverse change to First Nations intangible cultural heritage values from the petroleum activity</td><td colspan="2">Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies)
Ongoing consultation with First Nations people and/or representative bodies is undertaken as per the respective engagement plan and/or consultation protocol</td><td>Relevant persons consultation records</td></tr>
<tr><td colspan="2">Relevant persons consultation—Ongoing consultation (First Nations people and/or representative bodies)
If new information on cultural values or features within the OA or EMBA is identified during ongoing consultation or</td><td>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 EMBA</td></tr>
</table>

Source		
	relationship building, then any subsequent changes to activities or impacts/risks within the scope of the EP, will undergo an MoC evaluation	

8 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 environmental performance outcomes and standards detailed in Section 7 are achieved.

CAPL, as nominated titleholder, is responsible for ensuring the petroleum activity within scope of this EP is managed in accordance with this implementation strategy. The vessel contractors will be required to comply with the requirements of this EP to ensure that the environmental performance outcomes and standards are achieved.

8.1 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 systems - Requirements with guidance for use* (Ref. 31) 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 stakeholders to meet the OE objectives and ensure safe operations of CAPL facilities and projects. The OEMS comprises the following key components (Figure 8-1):

- **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 8-1) 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 8-1) provides the verification and validation that the safeguards are in place and functioning as intended.

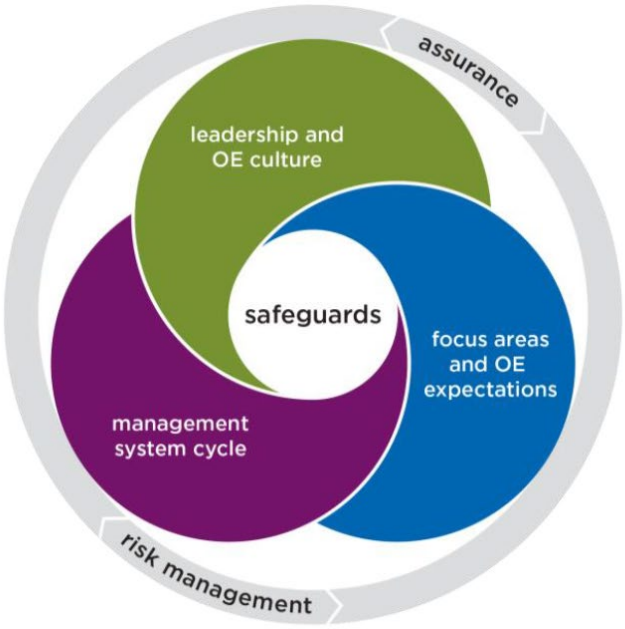


Figure 8-1: Overview of Chevron Corporation's OEMS

8.2 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.

8.2.1 Roles and accountability

CAPL leaders have the overall accountability for the implementation of the OEMS.

8.2.1.1 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 8-2.

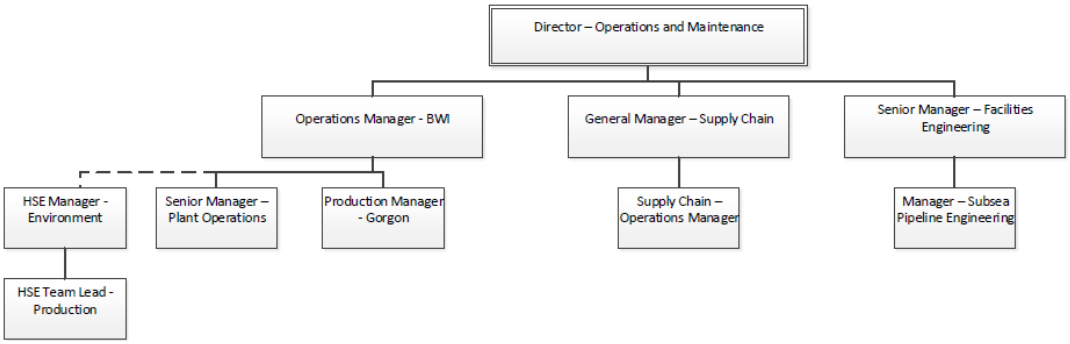


Figure 8-2: Chain of command—petroleum activities

8.2.1.2 Roles and responsibilities (petroleum activity)

The roles and responsibilities of key CAPL and contractor personnel for implementing task-specific control measures are detailed in Section 6.15, and are summarised in Table 8-1.

Table 8-1: Key roles and responsibilities—petroleum activities

Roles	Responsibilities
CAPL personnel	
Operations Manager - BWI	• Overall responsibility for implementing, managing, and reviewing this EP
Supply Chain – Operations Manager	• Ensure that all third-party vessels or contractors are aware of any requirements within this EP
Manager - Subsea Pipeline Engineering	• Ensure that inspection and monitoring of the hydrocarbon system is undertaken in accordance with the IM Plan (Ref. 32)
Production Manager - Gorgon	Ensure that: • hydrocarbon system is operated in accordance with NOPSEMA accepted *Gorgon Project: Producing Phase Well Operations Management Plan* (Ref. 18) • source control response is undertaken in accordance with the EOP – Loss of Containment (Hazardous or Environmental Release) Operating Procedure – Gorgon Operations (Ref. 33)
HSE Manager - Environment	Ensure that: • all personnel are made aware of their requirements under this EP • impacts and risks are continually reduced to ALARP by implementing this EP in accordance with Sections 6.15 and 7.20 • all changes to this EP are subject to a Management of Change assessment as described in Section 8.17.2.2 • compliance with this EP is verified in accordance with Section 8.17.6 • this EP is reviewed in accordance with Section 8.19
Contractor personnel	
Vessel Master	Ensure that:

Roles	Responsibilities
	• impacts and risks are continually reduced to ALARP by implementing this EP in accordance with Sections 6.15 and 7.20 • all necessary vessel-related documentation (e.g. SOPEPs, certificates, etc.) is available in accordance with Section 6.15 • all marine safety information notifications are issued in accordance with Section 6.15 • vessel 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 • establish and maintain radio contact with other vessels in the OA and adjacent waters • vessels implement cetacean interaction requirements in accordance with EPBC Regulations 2000 and additional marine fauna separation distances as per requirements of this EP • all incidents are immediately reported to CAPL Offshore Representative • all emissions and discharges are monitored and recorded in accordance with Sections 6.15 and 7.20 • a Vessel Master (or delegate) is on duty at all times.
Vessel crew	Ensure that: • the activity is undertaken in a professional and safe manner with attention to good housekeeping procedures and work practices • immediately report any incidents to the Vessel Master • immediately report any environmental incidents or spills to the Vessel Master • bridge-watch crew are to record marine fauna observations in accordance with Section 6.15 of this EP
ROV operator	Ensure that: • UCH finds protocol is implemented.

8.2.1.3 Training and competency (petroleum activity)

In accordance with regulation 22(4) of the OPGGS(E)R, each employee 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 vessel contractors will provide marine crew who are trained and competent to undertake their respective activities on board the vessel. All marine personnel will be qualified in accordance with the International Convention on Standards of Training Certification and Watch Keeping for Seafarers (STCW95).

Personnel with specific responsibilities under this EP (refer to Section 8.16.1.2) were included during the internal review of this EP and are made aware of their role-specific responsibilities under this EP.

All personnel (including contractors) are required to attend inductions that are relevant to their role (Table 8-2). Records of attendance at inductions will be maintained as per Section 8.17.2.1

Table 8-2: Inductions—petroleum activities

Induction	Required personnel	Scope
Induction	All relevant personnel	Before commencing operations, all personnel, including subcontractors, 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 the EPBC Regulations 2000 • good waste management and hazardous materials housekeeping requirements • incident reporting requirements • incident response arrangements.
UCH	ROV operators	Before commencing IMR in water depths <130 m, ROV operators will be provided with a UCH-specific induction. This induction will include an overview of the identification of potential UCH sites or artefacts, and the specific management requirements of the UCH finds protocol.
Marine fauna observations	Bridge-watch crew	All bridge-watch crew must have completed an MFO awareness session. This awareness session includes: • cetacean observation requirements under the EPBC Regulations 2000 • additional marine fauna observation requirements as specified within this EP • sighting process and forms.

8.3 Focus areas and OE expectations

The OE expectations are organised into six focus areas (Figure 8-3). 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 8-3.

Figure 8-3: 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 8-3. Each of these focus areas and common expectations are described in further detail in the following subsections.

Table 8-3: Relevant focus areas and common expectations

Focus area or common expectation	Key processes
Focus area	
Workplace safety and health	• *ABU Operations Process: Control of Work Manual* (Ref. 34) • *Chevron Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) • *ABU Hazardous Materials Management Procedure: ABU Standardised OE Procedure* (Ref. 36)
Process safety, reliability and integrity	• *OE Information Management: ABU Standardised OE Process* (Ref. 37) • *Management of Change for Facilities and Operations: ABU Standardised OE Process* (Ref. 38) • *ABU Surface Equipment Reliability and Integrity Process (SERIP) Base Business: Standardised OE Process* (Ref. 39)
Environment	• *Environment Risk Management Process* (Ref. 40) • *Quarantine Procedure Marine Vessels. ABU Standardised OE Process* (Ref. 41)
Stakeholders	• *Stakeholder Engagement and Issues Management: ABU Standardised OE Process* (Ref. 42)
Common expectation	
Risk management	• *ABU OE Risk Management Process* (Ref. 25)
Assurance	• *OE Assurance Corporate Process* (Ref. 43) • *OE Corporate Standard Incident Investigation* (Ref. 44) • *OE Data Reporting Standard* (Ref. 45)
Incident investigation and reporting	• *Incident Investigation and Reporting (II&R) Execution Manual* (Ref. 46)
Emergency management	• *Emergency Management OE Process* (Ref. 47) • OPEP (Ref. 2)

Focus area or common expectation	Key processes
	• Operational and Scientific Monitoring Plan (OSMP) (Ref. 17)

8.3.1 Workforce safety and health

8.3.1.1 Control of work

The Control of Work (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.34) and supporting Work Authorisation is implemented to ensure 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.

8.3.1.2 Marine

The *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 35) 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 (ASOG), based on their use and specification, which must be accepted by CAPL.

8.3.1.3 Hazardous materials

CAPL's *Hazardous Materials Management Procedure* (Ref. 36) 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. This environmental assessment is guided by the methodology and classification system used by the Offshore Chemical Notification Scheme (OCNS) and Chemical Hazard Assessment and Risk Management (CHARM). Hazardous materials not listed on OCNS or CHARM, are still subject to the environmental assessment described below.

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 8-4.

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.

Table 8-4: 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 DMIRS, from Hinwood et al. (Ref. 48).
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)

Assessment criteria	Selection rationale
	to finalise chemical hazard assessment scores under the OCNS system.
Bioaccumulation or bio-concentration	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.

8.3.2 Process safety, reliability and integrity

8.3.2.1 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. 37) 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.

Vessel contractors will maintain records as above and are required to make these available upon request.

Records relevant to this 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 vessel certificates, plans and log book records.

8.3.2.2 Management of change

Management of Change (MoC) expectations are to manage proposed changes to design, equipment, operations and products before they are implemented. In conjunction with the *ABU OE Risk Management Process* (Section 8.17.5), the *Management of Change for Facilities and Operations process* (Ref. 38) 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 EP, the following would trigger an MOC:

- change to the activity scope (e.g. timing, method, etc.)
- 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.)
- SCSt sound source profile is significantly different to the sound source profile predicted by modelling, and in turn affects the impact and risk evaluation in Section 7.7.2 of this EP
- 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 accordance with regulation 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 significantly 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.

8.3.2.3 Surface equipment reliability and integrity

The SERIP (Ref. 39) provides a systematic and staged approach to deploy and execute standardised surface equipment processes, sub-processes and procedures that enable operation and maintenance of facilities to sustain integrity and prevent incidents. The computerised maintenance management system (CMMS) is a key enabler for SERIP, used to prioritise, plan, schedule and complete necessary maintenance for all structures, equipment and protective devices. Each item (down to component level) is assessed, has a criticality assigned based on consequence of failure, and equipment whose failure may contribute to a major incident or event (MIE) is aligned to an operational performance standard with a start date and frequency for inspections and maintenance. Work orders for items of high consequence/criticality are to be completed by the due date, or managed under the deviation process. CAPL are commencing the transition from the upstream SERIP process to the enterprise Facilities Integrity and Reliability Management (FIRM) process. The principles of managing high consequence equipment are similar across these two processes.

8.3.3 Environment

The Environment 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.

8.3.3.1 Environmental risk management

The Environment Risk Management Process (Ref. 40) 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 Environment Risk Management Process.

8.3.3.2 Quarantine

The *Quarantine Procedure Marine Vessels* (Ref. 41) defines the procedure for marine vessels intending to approach or access Barrow Island or undertake activities in title areas outside the boundaries of the Montebello/Barrow Island Marine Management Area. It 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 marine pests. Regardless of the origin of the vessel or where it will be operating, all vessels must be free from marine pests when mobilised and the contractor must demonstrate the vessel meets low risk rating for biofouling.

As per the *Quarantine Procedure Marine Vessels* (Ref. 41), CAPL undertakes a risk assessment before any vessel is mobilised to title areas to confirm the vessel meets the requirements for approaching and 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, application of antifoul 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. The contractor must also submit the vessel details to the Vessel Check online risk assessment tool (https://www.vessel-check.com/) and provide CAPL with a copy of the resulting Risk Assessment Report demonstrating the vessel has achieved low risk rating. Only once a vessel has met the requirements of the *Quarantine Procedure Marine Vessels* (Ref. 41), will CAPL issue a Vessel Mobilisation Certificate.

8.3.4 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. 42) 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.

8.3.4.1 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 8-5.

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 CAPLs 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 Management of Change (MoC) process, in accordance with Section 8.17.2.2.

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 6.2.2) and will assess the merits of the objections or claims of that relevant person in accordance with Section 6.3.6 and CAPL's MoC process (Section 8.17.2.2).

Table 8-5: Notifications and ongoing consultation

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
Notifications			
AHO	Provide information to enable promulgation of Notice to Mariners if there needs to be dissemination of information important to safe navigation e.g. where an IMR activity involves extended periods of work on subsea infrastructure and will require other vessels in the area to take steps to avoid the area. 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.
AMSA	Provide information to enable promulgation of radionavigation warnings if there needs to be dissemination of information important to safe navigation e.g. where an IMR activity involves extended periods of work on subsea infrastructure and will require other vessels in the area to take steps to avoid the area and/or if works are to be undertaken in a major shipping fairway. 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.
Potentially affected relevant persons and/or relevant persons that have requested emergency event notifications, including: • Shire of Ashburton • 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			

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
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
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 8.17.2.2, that may potentially impact marine users functions, interests, or activities.	Prior to new or significant changes to activities or impacts/risks occurring	As required
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 EMBA (refer to Section 8.17.4.3).	Ongoing	Ongoing
	Any new information on cultural values or features within the EMBA, and subsequent changes to activities or impacts/risks within the scope of the EP, will undergo an MoC evaluation as per Section 8.17.2.2.	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 8.17.2.2, 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	Prior to new or significant changes to	As required

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
	activities or impacts/risks within the scope of the EP, following an evaluation as per Section 8.17.2.2, that may potentially impact UCH (as protected by the UCH Act).	activities or impacts/risks occurring.	

8.3.4.2 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 6 4, and any additional relevant persons identified under Section 8.17.4.1), 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 8.17.9), and consultation with required departments or agencies will occur as per regulatory requirements (e.g. refer to Table 8-12 for incident reporting requirements).

CAPL will also notify any relevant persons (as identified in Table 6 4, and any additional relevant persons identified under Section 8.17.4.1) that requested to be notified in the event of an oil spill or in the event of any other emergency event (Table 8-5).

8.3.4.3 Ongoing engagement with First Nations representative bodies

Through the consultation process in preparation of this EP (Section 6), 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.

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 8-6 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 8-7.

Table 8-6: 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 • utlines 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 8-7: First Nations representative bodies ongoing consultation and relationship building

First Nations representative body	Ongoing Consultation	Relationship Building
BAC	• BAC has requested that ongoing consultation be completed through the PBC, NTGAC • CAPL will keep BAC informed on the timing and status of its activities • CAPL will notify BAC in the event that a reportable incident occurs.	• CAPL provided opportunity to participate in Chevron Community Spirit Grant program and is now providing funding support for a community cultural event in 2024 • CAPL invited BAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023) • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
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 are implementing an agreed engagement plan • Cost recovery mechanisms in place for informal meetings with BTAC including on country meetings and events • CAPL invited BTAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023) • 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 • CAPL provided opportunity to participate in Chevron Community Spirit Grant program • CAPL and BTAC have commenced scoping a cultural mapping program • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.

First Nations representative body	Ongoing Consultation	Relationship Building
MCH	• CAPL has provided an engagement plan and consultation protocol which includes cost recovery • CAPL working with MCH to forecast consultation requirements and schedule for 2025.	• 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 visits) • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
MAC	• MAC has advised CAPL to consult with the relevant PBCs • CAPL will keep MAC informed on the timing and status of its activities • CAPL will notify MAC in the event that a reportable incident occurs • CAPL working with MAC to forecast consultation requirements and schedule for 2025.	• CAPL invited MAC 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 • CAPL provided opportunities for oil spill training in Perth.
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 2025.	• 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 • CAPL provided opportunities for oil spill training in Perth.
NAC	• CAPL and NAC have executed a consultation meeting protocol which provides cost recovery and agreed meeting schedule	• CAPL invited NAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023)

First Nations representative body	Ongoing Consultation	Relationship Building
	• CAPL working with NAC to co-design ongoing consultation • CAPL working with NAC to forecast consultation requirements and schedule for 2025.	• CAPL provided opportunity to participate in Chevron Community Spirit Grant program • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
NYFL	• CAPL has provided an Engagement Plan to NFYL which provides cost recovery for informal meetings with NYFL including on country meetings and events • CAPL working with NYFL to co-design ongoing consultation • CAPL working with NYFL to forecast consultation requirements and schedule for 2025.	• CAPL invited NYFL 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 and have provided financial support for a social benefits program in Roebourne • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
RRKAC	• RRKAC has requested that we inform them of activities occurring within 2 km of the mouth of the Fortescue River and to inform them of future activities for consideration by their Heritage and Culture Committee • CAPL working with RRKAC to forecast consultation requirements and schedule for 2025.	• CAPL invited WAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023) • CAPL has provided funding support to RRKAC through its community spirit grant program to invest in its ranger program • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
WAC	• CAPL and WAC have established a joint working group for ongoing consultation with cost recovery confirmed • CAPL working with WAC to forecast consultation requirements and schedule for 2025.	• 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

First Nations representative body	Ongoing Consultation	Relationship Building
		• CAPL has provided WAC funding support to employ a Ranger Coordinator • CAPL has 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 opportunity to participate in Chevron Community Spirit Grant program • Invitation to participate in MFO training in September 2024 • CAPL provided opportunities for oil spill training in Perth.
YAC	• CAPL has provided YAC with a consultation meeting protocol which provides cost recovery and agreed meeting schedule • CAPL is working with YAC to co-design ongoing consultation and forecast consultation requirements for 2025.	• CAPL has discussed ongoing engagement plan with YAC and opportunities to assist the corporation in the achievements of its strategic plan • CAPL invited YAC 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 • CAPL provided opportunities for oil spill training in Perth.

8.3.5 Risk management

The risk management process (Ref. 25) 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. 31) and *ISO 31000:2018 Risk management – Principles and guidelines* (Ref. 26).

This risk management process is summarised in Section 5 of this EP. Additional risk assessments must be undertaken if the MoC process (Section 8.17.2.2) is triggered. Risk assessments are undertaken in accordance with this process.

The *ABU OE Risk Management Process* (Ref. 25) and the *Management of Change for Facilities and Operations process* (Ref. 38) are the key systems CAPL use 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.

8.3.6 Assurance

Within the OEMS, assurance is a common expectation that supports the OE objective of each focus area. The *ABU OE Assurance Process* (Ref. 43) enables CAPL to deliver assurance that safeguards are established and functioning; it details:

- a framework for managing safeguards and verification activities that assure that CAPL complies with applicable legal and OEMS requirements
- a process to identify and resolve potential noncompliance
- the minimum qualifications and organisational capability to execute this process.

The *ABU OE Assurance Plan* (Ref. 49) is a multi-year plan that documents the CAPL ABU integrated assurance system and associated assurance activities (Figure 8-4). The *ABU 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 asset assurance plans that outline asset specific assurance activities and risk-based frequency (i.e. field inspection programs, audits, compliance reviews, performance reviews).

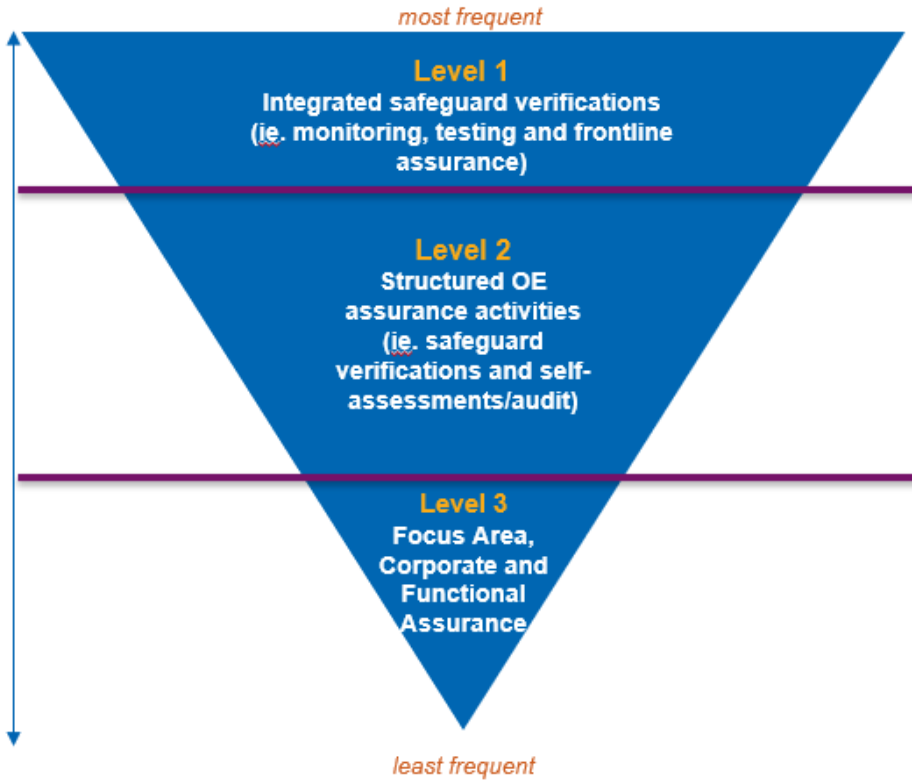


Figure 8-4: ABU integrated assurance system

To support the implementation of the ABU OE Assurance Process, CAPL have developed an ABU integrated assurance system (Figure 8-4), 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, Produce, 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 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 Environmental Performance Outcomes and Environmental Performance Standards have been met and the activity 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.

An assurance register will be developed and will detail the commitments established in the EP, including those related to the EPO/EPS, 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 *ABU OE Assurance Process* (Ref. 43). 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 8.17.2.1.

Environmental performance standards in the EP will undergo a compliance review and evidence will be gathered for each environmental performance standard to support the annual environmental report submitted to NOPSEMA (Section 8.18.3) and to ensure environmental impacts and risks are managed to ALARP and acceptable levels.

Field inspections are scheduled based on a risk-based assessment and conducted as documented in the *Gorgon OE Assurance Plan* (Ref. 50). These are planned and may range from monthly, quarterly, six monthly or annual depending on the risk assessment and the type of assurance activity and work being conducted in the field.

Note that hydrocarbon system integrity inspections (as described in Section 3.19) also have a role in verifying environmental performance. The type and frequency of these inspections is documented in the *Gorgon and Jansz Pipeline Inspection and Monitoring Plan* (IM Plan) (Ref. 32).

8.3.6.1 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. 44) and *OE Data Reporting Standard* (Ref. 45). 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 6.15.

Audit findings and corrective actions are recorded and tracked in a CAPL compliance assurance database for timely closure of actions. Audit findings that identify a breach of an environmental performance outcome or environmental performance standard will be reported in accordance with Section 8.18.2.

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 8.17.2.2.

8.3.7 Contractor operational excellence management

The Contractor Operational Excellence Management (COEM) Process (Ref. 305) 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.

8.3.8 Incident investigation and reporting

Incident investigation and reporting (IIR) expectations are to identify, report, record and investigate incidents, analyse trends, correct deficiencies, and share and adopt relevant lessons learned.

The *Incident Investigation and Reporting (II&R) Execution Manual* (Ref. 46) 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 IIR 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 8.18.2.

8.3.9 Emergency management

CAPL's emergency management implementation strategy is described in the following sub-sections.

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. Control measures and environmental performance standards relating to SOPEPs are described in Sections 7.15 and 7.17, and requirements have not been duplicated here.

8.3.9.1 Emergency management arrangements

The emergency management arrangements outline a systematic approach for preventing, planning, responding to, and recovering from emergency events and are intended to provide a standardised corporate 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-time professionals, but most will be part-time volunteers drawn from across the workforce.

The system used to organise CAPL's emergency management teams (EMTs) is based on the Incident Command System 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 (AIIMS), and the National Plan for Maritime Environmental Emergencies (National Plan; Ref. 51) and is consistent with the core aspects presented in the International Maritime Organisation (IMO) equivalent courses.

The ERO comprises the groups listed in Table 8-8; this table also describes the major functions of teams during an emergency.

Figure 8-5 to Figure 8-7 outline the organisational chart of the On-site Response Teams (ORTs) and EMTs. The Crisis Management Teams (CMTs), which focus on the business implications of incidents and events, are further described in the *ABU Crisis Management Plan* (Ref. 52).

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, 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 8-8: CAPL emergency management teams

Team	Description
Tier 1 (CAPL)	
On-site Response Teams (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.
Perth Emergency Management Team (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.
CAPL Crisis Management Team (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.

Team	Description
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.

8.3.9.2 Emergency management process

The *Emergency Management OE Process* (Ref. 47) 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. 47) comprises nine 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 incident management system (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. 53).

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.

8.3.9.3 Chain of command (emergency response)

A well-delineated EMT chain of command has been established for emergency response (Figure 8-5 to Figure 8-7). As incidents grow in size or complexity, command may transfer several times. Within the response structure, command may transfer between On-scene Commanders (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 over the course of 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 operations.

Throughout an incident, a formal handover will be conducted whenever any command or control position is transferred from one person to another.

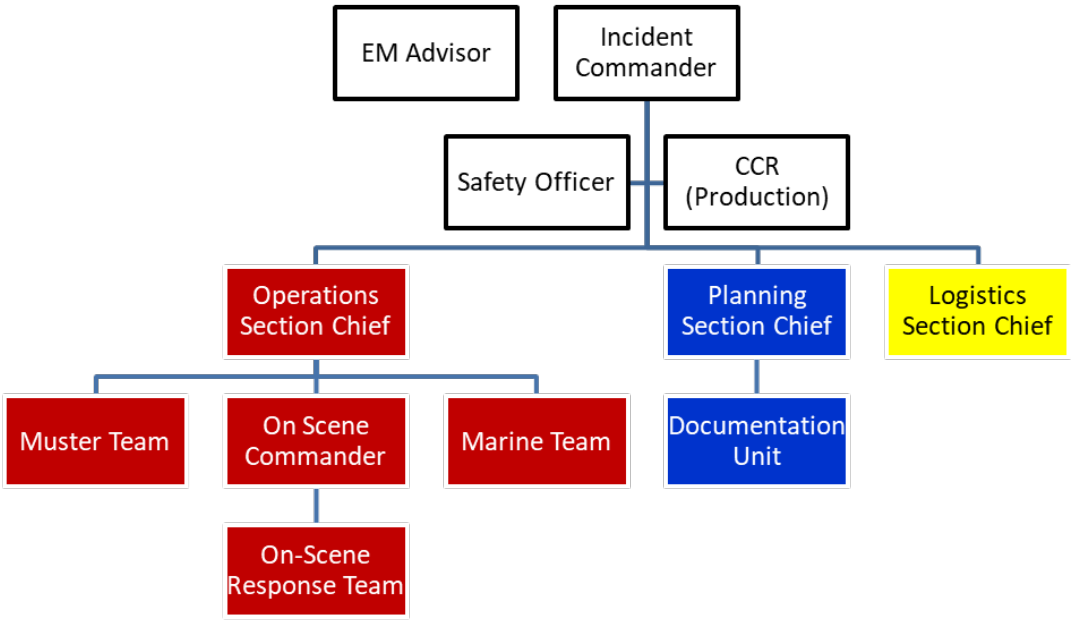


Figure 8-5: Basic installation EMT organisation chart

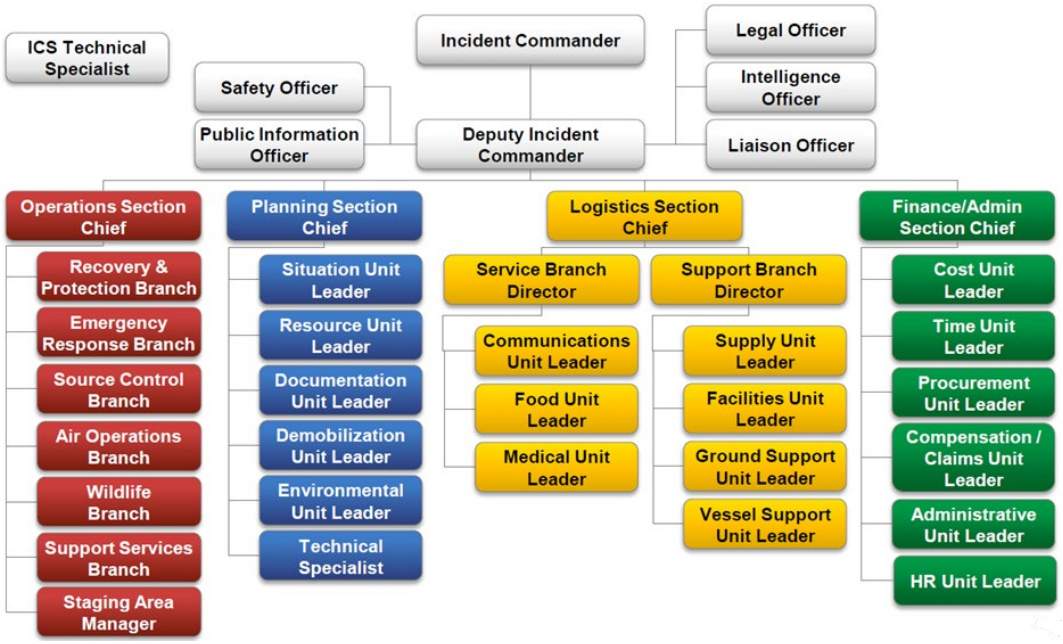


Figure 8-6: Expanded EMT organisation chart

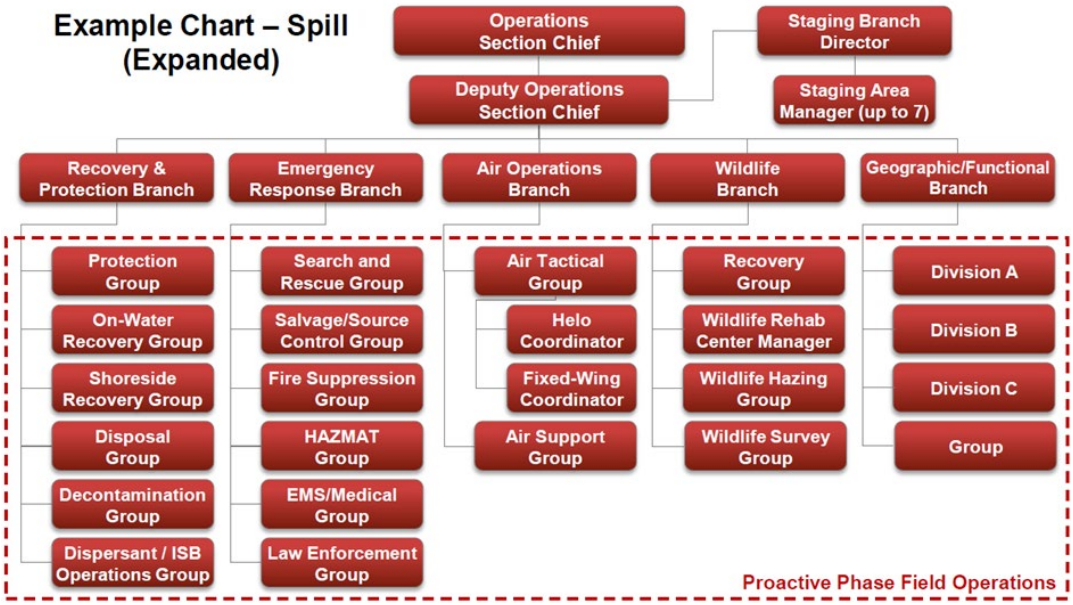


Figure 8-7: Example expanded operations section organisation chart

8.3.9.4 Roles and responsibilities (emergency response)

Table 8-9 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 8-5 to Figure 8-7 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 ABU Emergency Response Plan (Ref. 47)

Table 8-9: Key roles and responsibilities—emergency response

Role	Responsibilities
On-Site Response Team	
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.
Emergency Management Team	
Incident Commander (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 EMT 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.
Operations Section Chief (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 EMT.
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 IC in defining strategic objectives • Assists the IC in providing information to the Level 3 EMT • 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.

8.3.9.5 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 ABU Training and Exercise Program Procedure* [Ref. 461]. Competency and training records for personnel, including contractors and subcontractors, are maintained and available via live Oil Spill Response and Emergency Management readiness dashboards. 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. 461]). 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 the AEP *Guidance Document: Incident Management Teams – Knowledge Requirements for Responding to Marine Oil Spills* (Ref. 462), 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 can be found in the Chevron *Emergency Management ABU Training and Exercise Program Procedure* (Ref. 461).

8.3.9.6 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 ABU EMT capacity (inclusive of Source Control Section), Regional and Global CAPL support teams and functional groups, Oil Spill Response Organisations (OSROs) and industry mutual aid agreements.

Appendix F of the ABU Consolidated 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 loss of well control (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. 380) 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 ABU Consolidated OPEP [Ref. 2]). Using activity-specific worst-case spill scenarios (such as the MDO and condensate scenarios described in this EP), the tool can demonstrate that sufficient capability is in place.

The PEMT Oil Spill Response Resource Assessment Tool (Ref.462) 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. 462).

8.3.9.6.1 CAPL ABU 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. Each on-call PEMT member must be within 1 hour of the Perth office at all times, and the PEMT duty roster enables the formation of the PEMT within 2 hours of notification. Further information on the PEMT is contained in the ABU Emergency Response Plan (Ref. 47).

Current numbers of qualified EMT personnel, including those trained in accordance with the training requirements outlined in the Chevron Emergency Management ABU Training and Exercise Program Procedure (Ref. 461), are reflected in the PEMT Oil Spill Response Resource Assessment Tool (Ref. 462). 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 ABU Training and Exercise Program Procedure [Ref. 461]),

as the response transitions from a rapidly evolving reactive response phase to a more proactive, steady-state, project phase response.

8.3.9.6.2 CAPL regional and worldwide global teams

As per the Chevron Corporate *Emergency ABU Response Teams and Resources Procedure* (Ref. 464) 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 Incident Management System positions, access to industry owned response cooperatives, and access to internal experts and key external vendors. It includes the following services.

The 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 2 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.

Worldwide Emergency Response Team (WWERT)

The WWERT is a team of Chevron's most highly trained and experienced personnel capable of filling IMS 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

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. Functional team 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 2 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.

8.3.9.6.3 Oil spill response organisation arrangements

CAPL maintains contractual arrangements with oil spill response organisations (OSROs), which include providing technical specialists to supplement the CAPL EMT, as detailed in the OPEP (Ref. 2).

Australian Marine Oil Spill Centre (AMOSC)

CAPL is a participating company in AMOSC. This arrangement provides CAPL with access to the AMOSC personnel and the AMOSC Core-Group, under 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 based personnel.

AMOSC Core Group policy requires all Core-Group personnel to undertake initial training, followed by competency revalidation/training every 2 years. Typically, AMOSC manage the Core-Group revalidation/training by conducting 3 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 Centre (OSRL)

CAPL is a Participant member with OSRL, which guarantees access to Tier 3 technical advice, resources and expertise 365 days a year on a 24-hours a day basis. OSRL have capacity to mobilise additional equipment and personnel to ABU from their global bases. Anyone within the ABU 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 statements provides for:

- 24/7 call-out arrangements
- guaranteed initial response from OSRL of 5 technical support personnel (EMT or field personnel) for 5 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-person 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 Clean-up Assessment Technique (SCAT) and aerial surveillance / quantification surveys
- tactical response planning.

8.3.9.7 Oil spill exercise schedule

The CAPL *Emergency Management 5 Year Training and Exercise Schedule* (Ref. 54) 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 oiled wildlife and OSMP 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. 54) outlines the proposed testing arrangements to be completed, including the exercise types (Table 8-10) and proposed level of response to be tested (Table 8-11) that may be used to meet the defined objectives. A minimum of one test for each level will be conducted each year.

Table 8-10: 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 amongst 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 8-11: Exercise levels

Level	Details
Level 1 – ORT	• At least two ORT exercises held per year • May be held in conjunction with a Level 2 EMT exercise • Designed to evaluate the ability of ORTs to implement the Gorgon 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 the Gorgon 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 Gorgon 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 3 EMT exercise • Usual duration – 3–6 hours • Designed to evaluate the Oiled Wildlife Branch's ability to notify and activate oiled wildlife response teams and implement a response in line with ABU and DBCA oiled wildlife plans and manuals.
Operational and Scientific Monitoring (OSMP)	• Exercises may be held in conjunction with a Level 3 EMT exercise, or conducted as a standalone exercise • Usual duration – 3–6 hours • Designed to evaluate the EMT's ability to notify and activate OSMP 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.

8.4 Environmental monitoring and reporting

8.4.1 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 environmental performance outcomes and standards in the EP are being met.

CAPL and vessel contractors will monitor and record emissions and discharges as detailed in Section 7 to ensure that that this record can be used to assess whether the environmental performance outcomes and standards in this EP are being met.

If an emergency condition resulting in a Level 2 or 3 spill event occurs, CAPL will implement the OSMP (Ref. 17), which is identified as a control measure in Section 7.17 and 0. The OSMP 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.

8.4.2 Incident reporting

Environmental incidents will be reported by CAPL in accordance with Table 8-12.

Table 8-12: Incident reporting

Recordable Incident reporting – Regulation 50	
Legislative definition of 'recordable incident': *'Recordable incident, for an activity, means a breach of an environmental performance outcome or environmental performance standard, in the environment plan that applies to the activity, that is not a reportable incident'* Recordable incidents are breaches of the environmental performance outcomes and standards described in Section 5.21.	
Reporting requirements	**Report to / Timing**
Written notification to NOPSEMA by the 15th of each month As a minimum, the written incident report must describe: • the incidents and all material facts and circumstances concerning the incidents • any actions taken to avoid or mitigate any adverse environmental impacts • any corrective actions already taken, or that may be taken, to prevent a repeat of similar incidents. If no recordable incidents occur during the reporting month, a 'nil report' will be submitted.	Submit written report to NOPSEMA by the 15th of each month
Reportable Incident reporting – Regulations 47, 48, and 49	
Legislative definition of 'reportable incident': *'Reportable incident, for an activity means an incident relating to an activity that has caused, or has the potential to cause an adverse environmental impact; and under the environmental risk*	

assessment process the environmental impact is categorised as moderate or more serious than moderate.'

Therefore, reportable incidents under this EP are those events (not planned activities) that have a moderate or greater consequence (or risk) level. In accordance with this definition, the reportable incidents identified under this EP are:

- Introduction of an IMP (Section 7.12)
- Vessel collision emergency condition (Section 7.17)

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

Reporting requirements	**Report to**
Verbal or written notification must be undertaken within two hours of the incident or as soon as practicable. This information is required: • the incident and all material facts and circumstances known at the time • any actions taken to avoid or mitigate any adverse environmental impacts.	Report verbally to NOPSEMA within two hours or as soon as practicable and provide written record of notification by email. Phone: 1300 674 472 or From overseas: +61 8 6188 8990 | In Australia: 08 6188 8990 Email: submissions@nopsema.gov.au
Verbal notifications must be followed by a written report as soon as practicable, and not later than three days following the incident. At a minimum, the written incident report will include: • the incident and all material facts and circumstances • actions taken to avoid or mitigate any adverse environmental impacts • any corrective actions already taken, or that may be taken, to prevent a recurrence. If the initial notification of the reportable incident was verbal, this information must be included in the written report.	Written report to be provided to: • NOPSEMA: submissions@nopsema.gov.au • National Offshore Petroleum Titles Authority: info@nopta.gov.au • WA DEMIRS: petroleum.environment@dmp.wa.gov.au
Additional Reporting Requirements	
Reporting requirements	**Report to**
An oil/gas pollution incident that occurs within a marine park or is likely to impact on a marine park. The notification should include: • titleholder details • time and location of the incident (including name of marine park likely to be affected) • proposed response arrangements as per the OPEP (e.g. dispersant, containment, etc.) • confirmation of providing access to relevant monitoring and evaluation reports when available • contact details for the response coordinator.	DNP (24-hour) Marine Compliance Duty Officer Phone: 0419 293 465. Email: marine.compliance@environment.gov.au

Death or injury to individual(s) from an EPBC Act Listed Species as a result of the petroleum activities	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)	Reported as soon as practicable. https://data.marinemammals.gov.au/report/shipstrike
Presence of any suspected IMP or disease within 24 hours	DPIRD: • Email: biosecurity@fish.wa.gov.au • Phone: FishWatch 24-hour hotline: 1800 815 507
Unplanned release that is likely to impact land or water within Western Australian State jurisdiction	Reported as soon as practicable to DEMIRS. petroleum.environment@demirs.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 9480 9924 Email: marine.compliance@environment.gov.au.
	Reported within 24-hours to DPIRD: environment@dpird.wa.gov.au

8.4.3 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 8-13. Routine notifications required by Regulation 54 of the OPGGS(E)R and also included in Table 8-13.

Table 8-13: Routine external reporting requirements

Reporting requirement	Description	Reporting to	Timing
Environmental performance reporting (annual)	A report detailing environmental performance of the activity detailed in this EP	NOPSEMA submissions@nopsema.gov.au Phone: +61 8 6188 8990	Anually
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 (note this notification has already occurred)
End of EP notification	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

8.5 Environment Plan review

As required under Regulation 39 of the OPGGS(E)R, CAPL will submit a proposed revision of this EP to NOPSEMA at least 14 days before the end of the five-year period since the EP was last accepted.

An additional review of the EP will be undertaken following:

- an emergency event
- the identification of additional response strategies to emergency events
- the identification of deficiencies within the EP or OPEP following the review of emergency response exercises or other activities.

CAPL is committed to continual improvement and adaptive management processes, and in recognition of the changing regulatory and scientific information related to GHG and carbon management, will annually review Australian regulatory and/or relevant international guidelines or standards, including:

- the periodic release of the Chevron's Climate Change Resilience report which considers corporate climate risk management with regard to established, contemporary climate science and/or carbon management guidance from intergovernmental bodies (e.g. UN IPCC, IEA)
- the release of new/revised policies or guidance from the Australian government
- the release of new/revised applicable guidelines or standards from international bodies (e.g. IMO) that have been adopted by the relevant authority (e.g. AMSA)
- the outcomes of CAPL emission reduction reviews and Chevron Corporate governance processes specific to the Gorgon Gas Development.

Where these annual reviews result in the identification of additional and/or revised control measures to ensure environmental impacts and risks are managed to ALARP, a review of this EP will be undertaken.

Additional revisions and/or resubmission of this EP to NOPSEMA, in accordance with Regulation 39 of the OPGGS(E)R, will be undertaken in accordance with the OEMS, and particularly the MoC process (Section 8.17.2.2).

9 acronyms and abbreviations

Table 9-1 defines the acronyms and abbreviations used in this document.

Table 9-1: Acronyms and abbreviations

Acronym or abbreviation	Definition
ABU	Australian Business Unit
AFMA	Australian Fisheries Management Authority
AHO	Australian Hydrographic Office
AIIMS	Australasian Inter-service Incident Management System
AIS	Automated identification system
ALARP	As low as reasonably practicable
AMSA	Australian Maritime Safety Authority
AMSIS	Australian Marine Spatial Information System
AMP	Australian Marine Park
API	American petroleum index
APPEA	Australian Petroleum Production and Exploration Association
AR5	Fifth Assessment Report (AR5) of the United Nations Intergovernmental Panel on Climate Change (IPCC)
AR6	Sixth Assessment Report (AR6) of the United Nations Intergovernmental Panel on Climate Change (IPCC)
ASOG	Activity-specific operational guideline
ATM	Acoustic telemetry modems
AUD INJ	Auditory injury
AUV	Autonomous underwater vehicle
bar	Metric unit of atmospheric pressure
BCM	Battery control module
BFFL	Barrier fluid flying lead
BIAs	Biologically important areas
BSS	Battery storage skids
BSM	Battery storage module
CAPL	Chevron Australia Pty Ltd
CDU	Central Distribution Unit
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CHARM	Chemical Hazard Assessment and Risk Management
CMMS	Computerised Maintenance Management System
CMT	Crisis Management Team
COVID	Coronavirus disease
COLREGS	Convention on the International Regulations for Preventing Collisions at Sea

Acronym or abbreviation	Definition
CRA	Corrosion-resistant alloy
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DC	Drill Centre
DCCEEW	Department of Climate Change, Energy, Environment and Water
DEMIRS	Department of Energy, Mines, Industry Regulations and Safety
DoT	Western Australian Department of Transport
DP	Dynamic positioning
DPIRD	Western Australian Department of Primary Industries and Regional Development
EEZ	Exclusive economic zone
EFLs	Electrical flying leads
EHU	Electrohydraulic umbilical
EIS	Environmental Impact Statement
EJBs	Electrical junction boxes
EMBA	Environment that may be affected
EMT	Emergency Management Team
EOFL	End of facility life
EP	Environment Plan
EP Act	Western Australian *Environmental Protection Act 1986*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPRS	Emergency pipeline repair system
ERMP	Environmental Review and Management Programme
ESD	Ecologically sustainable development
FCS	Field control station
FE	Facilities Engineering
Feed Gas Pipeline	Pipeline system from the offshore gas wells to the Gas Treatment Plant
FIRM	Facilities Integrity and Reliability Management
FMT	Flow Management Tool
g/m^2	Grams per square metre
GFP	Gorgon Foundation Project
GHG	Greenhouse gas
GHGAP	Greenhouse Gas Abatement Plan
GS2	Gorgon Stage 2
GTP	Gas Treatment Plant
GWP	Global warming potential
HB	Handbook

Acronym or abbreviation	Definition
HCD	Hydrocarbon displacement
HDPE	High density polyethylene
HSE	Health, safety, and environment
HFO	Heavy fuel oil
HIRA	Hazard Identification and Risk Assessment
HWM	High water mark
HVSC	High voltage submarine cable
IAPP	International Air Pollution Prevention
IC	Incident Commander
IEE	International energy efficiency
IEMT	Installation Emergency Management Team
IIR	Incident investigation and reporting
IMO	International Maritime Organisation
IMR	Inspection, maintenance, and repair
IMC	Incident management system
IMCRA	Integrated Marine and Coastal Regionalisation of
IOPP	International Oil Pollution Prevention
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardisation
ISQG	Interim Sediment Quality Guideline
ITOPF	International Tanker Owners Pollution Federation Limited
IUCN	International Union for Conservation of Nature
JRCC	Joint Resource Coordination Centre
KEF	Key ecological feature
km	Kilometre
LC50	Lethal Concentration with the potential to result in a 50% mortality of a sample population
LGM	Last glacial maximum
LOC	Loss of containment
LNG	Liquefied Natural Gas
LWM	Low water mark
m	Metre
MAOP	Maximum allowable operating pressure
MARPOL	The International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978; also known as MARPOL 73/78.
MARS	Maritime Arrivals Reporting System
MBES	Multibeam echo sounder

Acronym or abbreviation	Definition
MCH	Mardathoonera Cultural Heritage Pty Ltd
MDO	Marine Diesel Oil
MEG	Monoethylene glycol
MGO	Marine Gas Oil
MES	Monitoring, evaluation, and surveillance
MNES	Matters of national environmental significance
MoC	Management of change
MODU	Mobile offshore drilling unit
MV	Medium voltage
MSC	Management System Cycle
MSF	Module support frame
MSRE	Marine Safety Reliability and Efficiency
MSW	Managing Safe Work
N/A	Not Applicable
NEBA	Net Environmental Benefit Analysis
NEPM	National Environmental Protection Measure
NGER Act	Commonwealth *National Greenhouse and Energy Reporting Act 2007*
NMFS	National Marine Fisheries Service
NO2	Nitrogen dioxide
NOx	Nitrous oxides
NOPSEMA	National Offshore Petroleum Safety and Environment Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
NUI	Normally unattended installation
NWMR	North-west marine region
NWS	North West Shelf (of Western Australia)
OA	Operational area
OC	On-Scene Commander
OCNS	Offshore Chemical Notification Scheme
OSC	Operations Section Chief
OE	Operational Excellence
OEMS	Operational Excellence Management System
OFLs	Optical Flying Leads
OPEP	Oil Pollution Emergency Plan
OPGGS Act	Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006*
OPGGS(E)R	Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009

Acronym or abbreviation	Definition
ORT	On-site Response Team
OSMP	Operational and Scientific Monitoring Plan
OWR	Oiled wildlife response
PAH	Polycyclic aromatic hydrocarbon
PAR	Pre-arrival report
PCDM	Power communications distribution module
PCPT	Piezocone penetration test
PEMT	Perth Emergency Management Team
PFA	Pipeline flange adaptor
PMST	Protected matters search tool
POB	Persons on board
ppb	Parts per billion
ppm	Parts per million
PPP	Protection Prioritisation Process
PTS	Pipeline termination structure
PTS	Permanent threshold shift
PTW	Permit to Work
Q2	Quarter 2 (April to June)
ROV	Remotely operated vehicle
SBS	Subsea battery system
SCM	Subsea control module
SCMS	Subsea compression manifold Structure
SDG	Sustainable Development Goal
SEEMP	Ship Energy Efficiency Management Plan
SEL	Sound exposure level
SERIP	Surface Equipment Reliability and Integrity Process
SHC	Shoreline Clean-up
SIMAP	Spill Impact Mapping and Analysis Program
SIMOPS	Simultaneous operations
SME	Subject matter expert
SOPEP	Ship Oil Pollution Emergency Plan
SO2	Sulfur oxides
SPD	Shoreline protection and deflection
SPL	Sound pressure level
SSS	Side scan sonar
TBT	Tributyltin

Acronym or abbreviation	Definition
TEC	Threatened ecological community
TPH	Total petroleum hydrocarbons
TRG	Tactical response guide
TTS	Temporary threshold shift
UCH	Underwater Cultural Heritage
UK	United Kingdom
UTA	Umbilical termination assembly
WA	Western Australia
WAFIC	Western Australian Fisheries Industry Council
WOMP	Well operations management plan

10 references

The following documentation is either directly referenced in this document or is a recommended source of background information.

Table 10-1: 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: February 2024].	N-04750-FM1848 A662605
2.	Chevron Australia. 2024. *Chevron ABU: Consolidated Oil Pollution Emergency Plan (OPEP)*. Chevron Australia, Perth, Western Australia.	ABU-COP-02788
3.	Chevron Australia. 2013. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Offshore Feed Gas Pipeline Installation Management Plan*. Chevron Australia, Perth, Western Australia. [Accepted by NOPSEMA on 27 September 2013]	G1-NT-PLNX0000298
4.	Chevron Australia. 2020. *Gorgon Gas Development: Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan*. Revision 3.0. Chevron Australia, Perth, Western Australia. [Accepted by NOPSEMA on 10 November 2020]	GOR-COP-02908
5.	Shell. 1999. *Gorgon Assay*. Shell Developments (Australia) Pty Ltd, Perth, Western Australia.	
6.	Chevron Australia. 2015. Gorgon Project: Gorgon Foundation Well Perforation and Flowbacks Campaign Summary. Chevron Australia, Perth, Western Australia	G1-NT-REPX000789 5
7.	Chevron Australia. 2024. *Gorgon Gas Development: Pipeline and Subsea Infrastructure Installation and Pre-commissioning Environment Plan*. Revision 6.0. Chevron Australia, Perth, Western Australia. [Accepted by NOPSEMA on 6 May 2024]	
8.	Chevron Australia. 2023. *Gorgon Gas Development: Gorgon Umbiliical Environment Plan.* Revision 3.0 . Chevron Australia, Perth, Western Australia [Accepted by NOPSEMA on 17 January 2024]	
9.	Chevron Australia. 2018. *Gorgon and Jansz–Io Drilling, Completions and Well Maintenance Program: Environment Plan*. Chevron Australia, Perth, Western Australia.	ABU140800133
10.	Chevron Australia. 2020. *Gorgon Operations: Gorgon and Jansz Feed Gas Pipeline Operations Environment Plan (State)*. Chevron Australia, Perth, Western Australia. [Accepted by DMIRS on 13 November 2020]	GOR-COP-0901
11.	Chevron Australia. 2023. *Gorgon and Jansz Feed Gas Pipeline: Umbilicals Installation Environment Plan.* Chevron Australia, Perth, Western Australia. [Accepted by DMIRS on 03 April 2023]	GOR-COP-03020
12.	DAWE. 2020. *Australian Ballast Water Management Requirements*. Version 8. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from: https://www.agriculture.gov.au/sites/default/files/documents/australian-ballast-water-management-requirements.pdf [Accessed: January 2024]	
13.	DAWE. 2022. *Australian biofouling management requirements*. Version 1. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from:	

Ref No	Description	Document ID
	https://www.agriculture.gov.au/sites/default/files/documents/Australian-biofouling-management-requirements.pdf [Accessed: January 2024]	
14.	IMO. 2012. *Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species*. 2012 Edition. International Maritime Organization, London, United Kingdom	
15.	Marine Pest Sectoral Committee. 2018. *National biofouling management guidelines for the petroleum production and exploration industry*. Department of Agriculture and Water Resources, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.marinepests.gov.au/sites/default/files/Documents/petroleum-exploration-biofouling-guidelines.pdf [Accessed February 2023].	
16.	DCCEEW. 2023. *National Light Pollution Guidelines for Wildlife*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/national-light-pollution-guidelines-wildlife.pdf [Accessed: June 2023]	
17.	Chevron Australia. 2023. *Operational and Scientific Monitoring Plan: Environmental Monitoring in the Event of an Oil Spill to Marine or Coastal Waters*. Chevron Australia, Perth, Western Australia.	ABU130700448
18.	Chevron Australia. 2020. *Gorgon Project: Producing Phase Well Operations Management Plan*. Chevron Australia, Perth, Western Australia.	G1-NT-REPX0005665
19.	IMO. 2012. *Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species*. 2012 Edition. International Maritime Organization, London, United Kingdom.	
20.	DCCEW. 2023. *National Light Pollution Guidelines for Wildlife*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/national-light-pollution-guidelines-wildlife.pdf [Accessed: January 2024]	
21.	NOPSEMA. 2022. *Policy: Section 572 Maintenance and removal of property*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/N-00500-PL1903%20-%20S572%20Maintenance%20and%20Removal%20of%20property%20%28A720369%29.pdf [Accessed: January 2024]	N-00500-PL1903
22.	Chevron Australia. 2024. *Gorgon Gas Development Gorgon Umbilical Environment Plan* Chevron Australia, Perth, Western Australia.	
23.	DISER. 2022. *Offshore Petroleum Decommissioning Guideline*. Department of Industry, Science, Energy and Resources, Canberra, Australian Capital Territory. Available from: https://www.nopta.gov.au/_documents/guidelines/decommissioning-guideline.pdf	
24.	Chevron Australia, 2019, *ABU Civil, Structural & Marine, Structural Integrity Management Strategy*, Rev 1, Perth Australia.	
25.	Chevron Australia. 2020. *ABU OE Risk Management Process*. Chevron Australia, Perth, Western Australia.	OE-03.01.01
26.	Standards Australia / Standards New Zealand. 2018. *ISO 31000:2009 Risk management – Principles and guidelines*. Sydney, Australia / Wellington, New Zealand	

Ref No	Description	Document ID
27.	Standards Australia / Standards New Zealand. 2012. *HB 203:2012. Managing environment-related risk*. Sydney, Australia / Wellington, New Zealand.	
28.	NOPSEMA. 2022. *Guidance Note: ALARP*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/N-04300-GN0166%20-%20ALARP%20%28A138249%29.pdf	N-04300-GN01660166
29.	OGUK. 2014. *Guidance on Risk Related Decision Making*. Issue 2, July 2014. Oil and Gas United Kingdom, London, England.	
30.	NOPSEMA. 2024. *Guideline: Environment plan decision making*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Environment%20plan%20decision%20making%20guideline.pdf [Accessed: January 2024]	N-04750-GL1721
31.	Standards Australia / Standards New Zealand. 2015. AS/NZS ISO 14001:2015 *Environmental management systems—Requirements with guidance for use*. Sydney, Australia / Wellington, New Zealand.	
32.	Chevron Australia. 2020. *Gorgon and Jansz Subsea and Pipelines Inspection and Monitoring Plan*. Chevron Australia, Perth, Western Australia.	G1-TE-O-UG00-PLN0002
33.	Chevron Australia. 2016. *Emergency Operating Procedure – Loss of Containment (Hazardous or Environmental Release): Operating Procedure – Gorgon Operations*. Chevron Australia, Perth, Western Australia.	GOR-0000-PRO-0088
34.	Chevron Australia. 2022. ABU – *Operations Process – Control of Work Manual*. Rev 9. Chevron Australia, Perth, Western Australia.	
35.	Chevron. 2023. *Chevron Marine Standard Non Tankers: Corporate OE Standard*. Chevron Corporation, United States of America.	
36.	Chevron Australia. 2020. *ABU Hazardous Materials Management Procedure: ABU Standardised OE Procedure*. Chevron Australia, Perth, Western Australia.	OE-03.11.1045
37.	Chevron Australia. 2016. *OE Information Management: ABU Standardised OE Process*. Chevron Australia, Perth, Western Australia	OE-03.02.01
38.	Chevron Australia. 2015. *ABU Management of Change for Facilities and Operations: Upstream and Gas Standardised OE Process*. Chevron Australia, Perth, Western Australia.	OE-04.00.01
39.	Chevron Australia. 2015. *ABU Surface Equipment Reliability and Integrity Process (SERIP) Base Business: Standardised OE Process*. Chevron Australia. Perth, Western Australia.	OE-05.03.01
40.	Chevron Australia. 2023. *Environment Risk Management Process*. Chevron Corporation. United States of America.	
41.	Chevron Australia. 2020. *Quarantine Procedure Marine Vessels. ABU Standardised OE Process*. Chevron Australia, Perth, Western Australia.	OE-07.08.1010
42.	Chevron Australia. 2019. *Stakeholder Engagement and Issues Management Process: ABU Standardised OE Process*. Chevron Australia, Perth, Western Australia.	OE-10.00.01
43.	Chevron Australia. 2018. *ABU – OE Assurance Corporate Process*. Chevron Australia, Perth, Western Australia.	OE-12.01.01

Ref No	Description	Document ID
44.	Chevron. 2020. *OE Corporate Standard Incident Investigation*. Chevron Corporation, United States of America.	
45.	Chevron. 2021. *OE Data Reporting Standard*. Chevron Corporation, United States of America.	
46.	Chevron Australia. 2021. *Incident Investigation and Reporting (II&R) Execution Manual: ABU Incident Investigation and Reporting*. Chevron Australia, Perth, Western Australia.	OE-09.00.01
47.	Chevron Australia. 2018. *Emergency Management Chevron Corporate ABU Standarised OE Process*. Chevron Australia, Perth, Western Australia.	OE-11.01.01
48.	Hinwood, J.B., Poots, A.E., Dennis, L.R., Carey, J.M., Houridis, H., Bell, R., Thomson, J.R., Boudreau, P. and Ayling, A.M. Australian Marine and Offshore Group Pty Ltd, 1994. The Environmental Implication of Drilling activities. In: Swan, J.M., Neff, J.M. and Young, P.C. (Eds) *Environmental Implications of Offshore Oil and Gas Development in Australia – The Findings of an Independent Scientific Review*. Australian Petroleum Exploration Association, Sydney, pp 123–207	
49.	Chevron Australia. 2019. *ABU OE Assurance Plan*. Chevron Australia, Perth, Western Australia.	ABU161100798
50.	Chevron Australia. 2020. *Gorgon OE Assurance Plan*. Chevron Australia, Perth, Western Australia	ABU200901265
51.	AMSA. 2020. *National Plan for Maritime Environmental Emergencies. 2020 Edition*. Australian Maritime Safety Authority, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.amsa.gov.au/sites/default/files/national-plan-maritime-envrironmental-emergencies-2020.pdf	
52.	Chevron Australia. 2019. *ABU: Crisis Management Plan*. Chevron Australia, Perth, Western Australia.	OE-11.01.10
53.	Chevron Australia. 2018. *Business Continuity Planning Chevron Corporation: ABU Standardized OE Process*. Chevron Australia, Perth, Western Australia.	OE-11.01.1110
54.	Chevron Australia. 2023. *ABU EM 5 Year Training and Exercise Schedule*	ABU230300030
55.	NOPSEMA. *2020. Environmental bulletin: Recording and reporting MMO data*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/2021-07/A652993.pdf [Accessed: January 2024] .	A652993
56.	NOPSEMA. 2019. *Environment Bulletin: Oil spill modelling*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/2021-04/A652993.pdf [Accessed: February 2024]	A652993
57.	DCCEEW. 2023. Protected Matters Search Tool. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool [Accessed: May 2024]	
58.	EPA. 2016. *Technical Guidance: Protection of Benthic Communities and Habitats*. Environmental Protection Authority, Government of Western Australia. Available from: https://www.epa.wa.gov.au/policies-guidance/technical-guidance-	

Ref No	Description	Document ID
	protection-benthic-communities-and-habitats [Accessed February 2024].	
59.	DSEWPC. 2012. *Marine bioregional plan for the North-west Marine Region*. Department of the Environment, Water, Heritage and the Arts, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/env/pages/1670366b-988b-4201-94a1-1f29175a4d65/files/north-west-marine-plan.pdf [Accessed February 2024].	
60.	DEWHA. 2008. *The North-west Marine Bioregional Plan: Bioregional Profile*. Parks Australia. Available at: https://parksaustralia.gov.au/marine/pub/scientific-publications/archive/north-west-bioregional-plan.pdf [Accessed: February 2024]	
61.	Harris, P., Heap, A., Passlow, V., Sbaffi, L., Fellows, M., Porter-Smith, R., Buchanan, C. and Daniell, J. 2005. *Geomorphic Features of the Continental Margin of Australia*, Geoscience Australia: Record 2003/30. 142pp.	
62.	Baker, Christina; Potter, Anna; Tran, Maggie; Heap, Andrew. 2008. *Sedimentology and Geomorphology of the North West Marine Region of Australia*. Geoscience Australia. Canberra.	
63.	Brewer, D.; Vincent, L; Skewes, T; Rothlisberg, P. 2007. *Trophic systems of the North-west Marine Region*. CSIRO Marine and Atmospheric Research. Cleveland	
64.	CSIRO. 2015. *Marine Benthic Substrate Database – CAMRIS* – Marsed – V.1.	
65.	DEH. 2006. A Guide to the Integrated Marine and Coastal Regionalisation of Australia - (IMCRA) Version v 4.0 - Provincial Bioregions. (c) Commonwealth of Australia, Department of the Environment and Energy and Heritage, Australian Government. (2006).	
66.	Simmonds, M., Dolman, S. and Weilgart, L. 2004. *Oceans of Noise*. Whale and Dolphin Conservation Society, Wiltshire, United Kingdom.	
67.	TSSC. 2015. *Conservation Advice Balaenoptera physalus fin whale*. Threatened Species Scientific Committee, Australian Government, Canberra, Australian Capital Territory. Available from: Conservation Advice Balaenoptera physalus (environment.gov.au) [Accessed February 2023].	
68.	TSSC. 2015. *Conservation Advice Balaenoptera borealis sei whale*. Threatened Species Scientific Committee, Australian Government, Canberra, Australian Capital Territory. Available from: Conservation Advice Balaenoptera borealis (environment.gov.au) [Accessed February 2023].	
69.	RPS. 2010. *Benthic Habitat Survey for Proposed Gorgon and Jansz Feed Gas Pipeline Routes and HDD Exit Points*. Report prepared for Chevron Australia. RPS Group, Perth, Western Australia.	
70.	CAPL. 2015. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Coastal and Marine Baseline State and Environmental Impact Report: Offshore Feed Gas Pipeline System and the Marine Component of the Shore Crossing*. Chevron Australia, Perth Western Australia.	G1-NT-REPX0002749
71.	CAPL. 2015. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Post-Development Coastal and Marine State and Environmental Impact Report: Offshore Feed Gas Pipeline System*	G1-NT-REPX0007241

Ref No	Description	Document ID
	and the Marine Component of the Shore Crossing, Year 2: 2014. Chevron Australia, Perth, Western Australia.	
72.	RPS. 2009. ROV Survey of Proposed Feed Gas Pipeline. Report prepared for Chevron Australia. RPS Group, Perth, Western Australia	
73.	Advisian. 2023. *Gorgon Backfill Fields Benthic Survey 2022*. Report prepared by Advisian Pty Ltd for Chevron Australia, Perth, Western Australia.	
74.	AIMS. 2014. AIMS 2013 Biodiversity Survey of Glomar Shoals and Rankin Bank. Report prepared by the Australian Institute of Marine Science for Woodside Energy Ltd. Australian Institute of Marine Science, Townsville, Queensland, July 2014 Rev 0, 153 pp.	
75.	Abdul Wahab, M.A., Radford, B., Cappo, M. et al. Biodiversity and spatial patterns of benthic habitat and associated demersal fish communities at two tropical submerged reef ecosystems. Coral Reefs 37, 327–343 (2018). https://doi.org/10.1007/s00338-017-1655-9. [Accessed May 2024]	
76.	Sharplies, C., Mount, R., Pedersen, R., Lacey, M., Newton, J., Jaskierniak, and Wallace, L. 2009. The Australian Coastal Smartline Geomorphic and Stability Map Version 1. Prepared by University of Tasmania, for Geoscience Australia and Department of Climate Change, Australian Government.	
77.	Claire Butler, Vanessa Lucieer, Peter Walsh, Emma Flukes, Craig Johnson. 2017. Seamap Australia [Version 1.0] the development of a national benthic marine classification scheme for the Australian continental shelf. ISBN: 978-1-925646-61-0	
78.	DEC. 2007. *Management Plan for the Montebello/Barrow Islands Marine Conservation Reserves 2007-2017*. Department of Environment and Conservation, Marine Parks and Reserves	
79.	Department of Parks and Wildlife 2015, Barrow group nature reserves management plan 82 2015, Department of Parks and Wildlife, Perth.	
80.	Commonwealth of Australia (Geoscience Australia) 2023. Australian Marine Spatial Information System (AMSIS), Available at: https://amsis-geoscience-au.hub.arcgis.com/ [Accessed September 2024]	
81.	DCCEEW no date. Find Environmental Data, Available at: https://fed.dcceew.gov.au/ [Accessed September 2024]	
82.	DCCEEW. 2024. Biologically Important Areas of Regionally Significant Marine Species (2024). Spatial database available from: https://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf [Accessed: February 2024]	
83.	DCCEEW. 2023. *Biologically Significant Areas of Regionally Significant Marine Fauna – Southern Right Whale*. Department of Climate Change, Energy, the Environment and Water, Canberra, ACT. Available from: https://fed.dcceew.gov.au/datasets/178921a7fe0a48188bc730ea26b528e5/about [Accessed August 2023].	
84.	Jenner, K.C.S., Jenner, M.N. and McCabe, K.A. 2001. *Geographical and Temporal Movements of Humpback Whales in Western Australian Waters*. APPEA Journal. pp749–765.	
85.	DCCEEW. [no date]. *Species Profile and Threat Database: Megaptera novaeangliae — Humpback Whale*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: https://www.environment.gov.au/cgi-	

Ref No	Description	Document ID
	bin/sprat/public/publicspecies.pl?taxon_id=38 [Accessed February 2024].	
86.	Irvine, L. G., Thums, M., Hanson, C. E., McMahon, C. R., & Hindell, M. A. (2018). *Evidence for a widely expanded humpback whale calving range along the Western Australian coast*. Marine Mammal Science, 34(2), 294-310	
87.	*Jansz-Io Soundscape Monitoring Marine fauna acoustic detections 1 Jan to 31 Dec 2019.* Chevron Energy Technology Pty Ltd, Perth, Western Australia.	ABU220200056
88.	Gavrilov A. N., McCauley R. D., Paskos G., and Alexey G. 2018. *Southbound migration corridor of Pygmy Blue Whales off the northwest coast of Australia based on data from ocean bottom seismographs*. The Journal of the Acoustical Society of America. https://doi.org/10.1121/1.5063452	
89.	Double, M.C. Jenner, K.C.S., Jenner, M-N., Ball, I., Laverick, S. and Gales, N., 2012. *Satellite tracking of pygmy blue whales (Balaenoptera musculus brevicauda) off Western Australia*. Final Report – May 2012. Australian Marine Mammal Centre.	
90.	Gales, N., Double, M. C., Robinson, S., Jenner, C., Jenner, M, King, E. & Paton, D. 2010. *Satellite tracking of Australian humpback (Megaptera novaeangliae) and Pygmy Blue Whales (Balaenoptera musculus brevicauda).* White paper presented to the Scientific Committee of the International Whaling Commission. Available for: https://www.marinemammals.gov.au/site/assets/files/1071/sc-62-sh21.pdf [Accessed February 2024].	
91.	Branch, T. A., Matsuoka, K. and Miyashita, T. 2004. *Evidence for increases in Antarctic blue whales based on Bayesian modelling*. Marine Mammal Science 20(4): 726-754.	
92.	Double, M.C., Andrews-Goff, V., Jenner, K.C.S., Jenner, M-N., Laverick, S.M., Branch, T.A. and Gales, N., 2014. *Migratory movements of pygmy blue whales (Balaenoptera musculus brevicauda) between Australia and Indonesia as revealed by satellite telemetry*. PLOS one, April 2014 9(4).	
93.	Kahn, B., 2007. *Blue whales of the Savu Sea, Indonesia*. In: Biannual Marine Mammal Conference - Blue Whale Workshop. Cape Town, South Africa. 28 Nov - 3 Dec 2007.	
94.	McCauley, R.D. and K.C. Jenner. 2010. *Migratory patterns and estimated population size of Pygmy Blue Whales (Balaenoptera musculus brevicauda) traversing the Western Australian coast based on passive acoustics.* Paper SC/62/SH26 presented to the International Whaling Committee Scientific Committee.	
95.	DoE. 2015. *Conservation Management Plan for the Blue Whale (2015-2025), A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/blue-whale-conservation-management-plan.pdf [Accessed February 2024].	
96.	Thums, M., Ferreira, L.C., Jenner, C., Jenner, M., Harris, D., Davenport, A., Andrews-Goff, V., Double, M., Moller, L., Attard, C.R.M., Bilgmann, K., Thomson, P.G., and McCauley, R. 2022. *Pygmy blue whale movement, distribution and important areas in the Eastern Indian Ocean*. Global Ecology and Conservation, 35 (2022). doi: https://doi.org/10.1016/j.gecco.2022.e02054	

Ref No	Description	Document ID
97.	Thums, M., Ferreira, L., Möller, l., Russell G.,t McCauley, R., Jenner, C., Davenport, A., Jenner, M., 2024 *Tracking Pygmy Blue Whale Diving Behaviour and Validation of Foraging Defined from Horizontal Movement Data.* SSRN	
98.	Southall, B.L., J.J. Finneran, C.J. Reichmuth, P.E. Nachtigall, D.R. Ketten, A.E. Bowles, W.T. Ellison, D.P. Nowacek, and P.L. Tyack. 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals* 45(2): 125-232. https://doi.org/10.1578/AM.45.2.2019.125.	
99.	Owen, K., Jenner, C., Jenner, M., and Andrews, R. 2016. A week in the life of a pygmy blue whale: migratory dive depth overlaps with large vessel drafts. *Animal Biotelemetry* 4:17. https://doi.org/10.1186/s40317-016-0109-4.	
100.	Chevron Australia. 2020. *Strategic Net Environmental Benefit Analysis*. Chevron Australia, Perth, Western Australia.	ABU 1908013 82
101.	NOAA. 2019. *ESA Section 7 Consultation Tools for Marine Mammals on the West Coast* (webpage), 27 Sep 2019. United States National Oceanic and Atmospheric Administration. Available from: https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/esa-section-7-consultation-tools-marine-mammals-west.	
102.	Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T. and Gentry, R.L. 2014. *Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI*. SpringerBriefs in Oceanography, Volume ASA S443/SC1.4 TR-2014. ASA Press. 87 pp.	
103.	DAWE and NOPSEMA. 2021. Guidance on key terms within the Blue Whale Conservation Management Plan. Department of Agriculture, Water and the Environment and the National Offshore Petroleum Safety and Environmental Management Authority, Canberra, Australia. Available from: https://www.dcceew.gov.au/sites/default/files/documents/guidance-key-terms-blue-whale-conservation-management-plan-2021.pdf [Accessed: March 2023]	
104.	Finneran, J.J., E. Henderson, D.S. Houser, K. Jenkins, S. Kotecki, and J. Mulsow. 2017. *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III).* Technical report by Space and Naval Warfare Systems Center Pacific (SSC Pacific). Available from: https://nwtteis.com/portals/nwtteis/files/technical_reports/Criteria_and_Thresholds_for_U.S._Navy_Acoustic_and_Explosive_Effects_Analysis_June2017.pdf	
105.	INPEX 2009. Ichthys Gas Filed Development Project: Appendix 15, Review of Literature on Sound in the Ocean and Effects of Noise on Marine Fauna. INPEX Browse Ltd.	
106.	Ferreira, L.C., Jenner, C., Jenner, M. et al. 2024. *Predicting suitable habitats for foraging and migration in Eastern Indian Ocean pygmy blue whales from satellite tracking data.* Movement Ecology 12, 42. https://doi.org/10.1186/s40462-024-00481-x	
107.	Richardson, W.J., Greene, C.R., Malme, C.I and Thomson, D.H. 1995. Marine Mammals and Noise. Academic Press, San Diego.	
108.	Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M. 2001. Collisions between ships and whales. *Marine Mammal Science*, 17(1), 35–75.	

Ref No	Description	Document ID
109.	Jenner, K.C.S., Jenner, M.N. and McCabe, K.A. 2001. Geographical and Temporal Movements of Humpback Whales in Western Australian Waters. APPeA Journal. pp749–765.	
110.	Kamrowski, R.L., Limpus, C.J., Pendoley, K. and Hamann, M. 2014. Influence of industrial light pollution on the sea-finding behaviour of flatback turtle hatchlings. Wildlife Research 41:421–434	
111.	Hodge, W., Limpus, C.J. and Smissen, P. 2007. Queensland turtle conservation project: Hummock Hill Island Nesting Turtle Study December 2006 Conservation Technical and Data Report Environmental Protection Agency, Queensland.	
112.	Rodríguez, A., Burgan, G., Dann, P., Jessop, R., Negro, J.J. and Chiaradia, A. 2014. Fatal attraction of short-tailed shearwaters to artificial lights. PLoS ONE 9(10):e110114	
113.	Marquenie, J., Donners, M., Poot, H., Steckel, W. and de Wit, B. 2008. Adapting the spectral composition of artificial lighting to safeguard the environment. *Petroleum and Chemical Industry Conference Europe – Electrical and Instrumentation Applications*, pp 1–6.	
114.	Wiese, F.K., Montevecci, W.A., Davoren, G.K., Huettmann, F., Diamond, A.W. and Linke, J. 2001. Seabirds at risk around off shore oil platforms in the northwest Atlantic. Marine Pollution Bulletin. 42:1285–1290.	
115.	DSEWPaC. 2011. *Approved Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake).* Department of Sustainability, Environment, Water, Population and Communities, Australian Government, Canberra, ACT. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1115-conservation-advice.pdf [Accessed August 2023].	
116.	DSEWPaC. 2011. *Approved Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake).* Department of Sustainability, Environment, Water, Population and Communities, Australian Government, Canberra, ACT. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1118-conservation-advice.pdf [Accessed August 2023].	
117.	DSEWPaC. 2012. *Species group report card – marine* reptiles: *supporting the marine bioregional plan for the North-west Marine Region.* Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT. Available from: https://www.dcceew.gov.au/sites/default/files/env/pages/1670366b-988b-4201-94a1-1f29175a4d65/files/north-west-report-card-reptiles.pdf [Accessed October 2023].	
118.	Commonwealth of Australia. 2017. Recovery Plan for Marine Turtles in Australia, 2017-2027. Department of the Environment and Energy, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/recovery-plan-marine-turtles-2017.pdf [Accessed February 2023].	
119.	Whittock, P. A., K. L. Pendoley, and M. Hamann. 2016. Using habitat suitability models in an industrial setting: the case for internesting flatback turtles. Ecosphere 7(11): e01551. 10.1002/ecs2.1551	
120.	Pendoley, K.L. 2005. Sea turtles and the environmental management of industrial activities in north-west Western Australia. Ph.D. Thesis. PhD Thesis, Murdoch University: Perth.	
121.	NOPSEMA. 2019. *Environmental Bulletin: Oil spill modelling.* National Offshore Petroleum Safety and Environmental Management Authority,	

Ref No	Description	Document ID
	Perth, Western Australia. Available from: https://www.nopsema.gov.au/assets/Bulletins/A652993.8.9.pdf [Accessed: May 2021]	
122.	O'Hara, T. 2023. *An assessment of the offshore natural values of Australia's Indian Ocean Territories*. Museums Victoria and Parks Australia, Melbourne, Victoria. Available from: https://parksaustralia.gov.au/marine/files/iots/OHara-2023-IOT-Offshore-Natural-Values-v3.02-(Final-for-publication).pdf [Accessed: November 2023]	
123.	Evans, K., Patterson, T., Reid, H., and Harley, S. 2012. Reproductive Schedules in Southern Bluefin Tuna: Are Current Assumptions Appropriate? *PLOS One* 7(4): e34550. https://doi.org/10.1371/journal.pone.0034550	
124.	TSSC. 2010. *Commonwealth Listing Advice on Thunnus maccoyii (Southern Bluefin Tuna).* Threatened Species Scientific Committee, Department of Sustainability, Environment, Water, Population and Communities. Canberra, Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/69402-listing-advice.pdf [Accessed: November 2023]	
125.	Styan C., Elsdon, T., Marnane M., Carey M., Morgan C., Rouphael T. and de Lestang, P. 2013. Knowledge gained from marine environmental monitoring during dredging at Barrow Island. The APPEA Journal, 53(2): 478. https://doi.org/10.1071/AJ12089	
126.	TSSC. 2015. *Conservation Advice Rhincodon typus whale shark*. Threatened Species Scientific Committee, Australian Government, Canberra, Australian Capital Territory. Available from: Conservation Advice Rhincodon typus (environment.gov.au) [Accessed February 2023].	
127.	Rennie, S.and Hanson, C.E. and McCauley, R.D. and Pattiaratchi, C. and Burton, C. and Bannister, J. and Jenner, C. and Jenner, M. 2009. Physical properties and processes in the Perth Canyon, Western Australia: Links to water column production and seasonal pygmy blue whale abundance. Journal of Marine Systems. 77 (1-2): pp. 21-44.	
128.	Truong G and Rogers TL. 2023. *La Niña conditions influence interannual call detections of pygmy blue whales in the eastern Indian Ocean.* Frontiers. Marine Science. 9:850162. doi: 10.3389/fmars.2022.850162	
129.	Pendleton, D.E., Holmes, E.E., Redfern, J., Zhang, J., 2020. Using modelled prey to predict the distribution of a highly mobile marine mammal. Divers. Distrib. 26, 1612–1626.	
130.	AIMS. 2019. *North West shoals to shore research program*. Australian Institute of Marine Science. Perth Office. Available from: https://www.aims.gov.au/sites/default/files/2019-11/AIMS%20NWSS%204pp%20newsletter%20December%2019_web.pdf [Accessed June 2024].	
131.	Torres LG, Barlow DR, Chandler TE, Burnett JD. 2020. *Insight into the kinematics of blue whale surface foraging through drone observations and prey data*. PeerJ 8:e8906 https://doi.org/10.7717/peerj.8906	
132.	Jill R. Schoenherr. 1991. *Blue whales feeding on high concentrations of euphausiids around Monterey Submarine Canyon.* Canadian Journal of Zoology. 69(3): 583-594. https://doi.org/10.1139/z91-088	
133.	Gill, P.C., 2002. *A blue whale (Balaenoptera musculus) feeding ground in a southern Australian coastal upwelling zone*. J. Cetacean Res. Manage., 4(2), pp.179-184.	

Ref No	Description	Document ID
134.	Thomas Doniol-Valcroze, Véronique Lesage, Janie Giard, Robert Michaud. 2011. *Optimal foraging theory predicts diving and feeding strategies of the largest marine predator*. Behavioral Ecology, Volume 22, Issue 4, Pages 880–888, https://doi.org/10.1093/beheco/arr038	
135.	Gales, R. (1982). *Effects Of Noise Of Offshore Oil And Gas Operations On Marine Mammals – An Introductory Assessment Volume 1.* Naval Oceans Systems Center Technical Report 844. Retrieved from https://apps.dtic.mil/dtic/tr/fulltext/u2/a123699.pdf	
136.	Jiménez-Arranz, G. G. (2017). *Review of existing data on underwater sound produced by the oil and gas industry.* Report by Seiche Ltd. Prepared for the E&P Sound & Marine Life (JIP).	
137.	Chevron. (2022). *Wheatstone Project start-up and operations environment plan.*	
138.	CMST. (2023a). *Jansz Io Compression Source Spectrum and Received Level Modelling for the Jansz-Io Compression (JIC) Facility: Compressor Casing Modelling.*	
139.	CMST. (2023b). *Jansz Io Compression Source Spectrum and Received Level Modelling for Underwater Noise Radiation.*	
140.	Novicos. (2024). *Jansz-Io Compression Project Underwater Acoustic Modelling – Novicos FAT Analysis and Consolidated Results.*	G7-TE-Z-USJ0-REPX011
141.	Janet R.D. Silk, Sally E. Thorpe, Sophie Fielding, Eugene J. Murphy, Philip N. Trathan, Jonathan L. Watkins, Simeon L. Hill. 2016. *Environmental correlates of Antarctic krill distribution in the Scotia Sea and southern Drake Passage*, ICES Journal of Marine Science, Volume 73, Issue 9, Pages 2288–2301, https://doi.org/10.1093/icesjms/fsw097	
142.	DCCEEW. 2023. Habitat critical to the survival of marine turtles in Australian waters. Spatial database available from: https://fed.dcceew.gov.au/datasets/erin::habitat-critical-to-the-survival-of-marine-turtles-in-australian-waters/about [Accessed: February 2024]	
143.	Pendoley, K.L. 2005. *Sea turtles and the environmental management of industrial activities in north-west Western Australia*. Ph.D. Thesis. PhD Thesis, Murdoch University: Perth.	
144.	Pendoley, K., Bell, C., McCracken, R., Ball, K., Sherborne, J., Oates, J., Becker, P., Vitenbergs, A. and Whittock, P. 2014. *Reproductive biology of the Flatback Turtle Natator depressus in Western Australia*. Endangered Species Research, 23: 115–123.	
145.	Pendoley Environmental. 2010. *Barrow Island Marine Turtle Track Census Monitoring 2004/05–2009/2010*. Unpublished report for Chevron Australia, Perth, Western Australia.	
146.	Whittock, P., Pendoley, K., Hamann, M., 2014. *Inter-nesting distribution of Flatback Turtles Natator depressus and industrial development in Western Australia*. Endangered Species Research 26, 25–38. doi:10.3354/esr00628	
147.	Whittock, P. A., K. L. Pendoley, and M. Hamann. 2016. *Using habitat suitability models in an industrial setting: the case for internesting flatback turtles.* Ecosphere 7(11):e01551. 10.1002/ecs2.1551	
148.	Thums, M., Waayers, D., Huang, Z., Pattiaratchi, C., Bernus, J. and Meekan, M., 2017. *Environmental predictors of foraging and transit behaviour of Flatback Turtles Natator depressus*. Endangered Species Research, 32: 333-349.	

Ref No	Description	Document ID
149.	Dobbs, K. 2007. *Marine turtle and dugong habitats in the Great Barrier Reef Marine Park used to implement biophysical operational principles for the Representative Areas Program*. Great Barrier Reer Marine Parks Authority, Australian Government.	
150.	Guinea, M., Sperling J.B., and Whiting S.D. 2006. *Flatback sea turtle inter-nesting habitat in Fog Bay Northern Territory, Australia*. In Proceedings of the 23rd Annual Sea Turtle Symposium on Sea Turtle Biology and Conservation 2003 Kuala Lumpur. 2006. Kuala Lumpur, Malaysia.	
151.	Pendoley Environmental. 2010. *Proposed Outer Harbour Development Port Hedland: Satellite Tracking of Flatback Turtles from Cemetery Beach 200–/2010 - Internesting Habitat*. Report prepared by Pendoley Environmental Pty Ltd for SKM/BHP Billiton Iron Ore.	
152.	Seminoff JA, Allen CD, Balazs GH, Dutton PH, Eguchi T, Haas HL, Hargrove SA, MP J, Klemm DL, Lauritsen AM, MacPherson SL, Opay P, Possardt EE, Pultz SL, Seney EE, Van Houtan RS and Waples RS. 2015. *Status Review of the Green Turtle (Chelonia mydas) under the U.S*. Endangered Species Act. NOAANMFS-SWFSc-539. pp 571.	
153.	Bjorndal, K.A. 1997. *Foraging Ecology and Nutrition in Sea Turtles*. In: P.L. Lutz and J.A. Musick (eds) The Biology of Sea Turtles, Vol. 1: 199–231. CRC Press, Boca Raton, Florida.	
154.	DCCEEW. 2023. *Species Profile and Threat Database: Caretta caretta — Loggerhead Turtle*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1763 [Accessed February 2024]	
155.	DCCEEW. 2023. *Species Profile and Threat Database: Eretmochelys imbricata — Hawksbill Turtle*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1766 [Accessed February 2024]	
156.	CAPL. 2018. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Long-term Marine Turtle Management Plan*. Chevron Australia, Perth, Western Australia.	GOR-COP-01728
157.	Plotkin, PT, MK Wicksten, and AF Amos. 1993. "*Feeding ecology of the loggerhead sea turtle Caretta caretta in the northwestern Gulf of Mexico*." Marine Biology 115(1):1.	
158.	Cogger, HG, EE Cameron, RA Sadlier, and P Eggler. 1993. *The Action Plan for Australian Reptiles*. Canberra, ACT: Australian Nature Conservation Agency	
159.	Limpus CJ. 2009. *A Biological Review of Australian Marine Turtles. Brisbane, Queensland*. Queensland Government Environmental Protection Agency. pp 324.	
160.	Baldwin, R., G. Hughes & R. Prince. 2003. *Loggerhead turtles in the Indian Ocean. In: Bolten, A. & B. Witherington, eds*. Loggerhead sea turtles. Washington: Smithsonian Books.	
161.	Western Australian Department of Environment and Conservation (WA DEC). 2009. *Marine turtles in Western Australia: Loggerhead Turtle*.	
162.	Whale and Dolphin Conservation Society. 2006. *Vessel Collisions and Cetaceans: What happens when they don't miss the boat*. Whale and Dolphin Society. United Kingdom. Available from: Microsoft Word -	

Ref No	Description	Document ID
	Collisions LATEST 18 Sept.doc (whales.org) [Accessed February 2023].	
163.	Chevron Australia. 2015. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Five-year Environmental Performance Report (August 2010– August 2015).* Chevron Australia, Perth, Western Australia.	G1-NTREPX0007517
164.	TSSC. 2015. *Conservation Advice Rhincodon typus whale shark.* Threatened Species Scientific Committee, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.environment.gov.au/biodiversity/threatened/species/pubs/66680-conservation-advice-01102015.pdf [Accessed February 2024].	
165.	DCCEEW. 2023. *Species Profile and Threat Database: Rhincodon typus — Whale Shark*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66680 [Accessed February 2024]	
166.	JASCO Applied Sciences. 2023. *JIC Construction Operations: Acoustic and Animal Movement Modelling for Assessing Marine Fauna Sound Exposures*. Document 02916, Version 2.0. Technical report by JASCO Applied Sciences for Chevron Australia Pty Ltd.	
167.	McCauley, R.D. 1998. *Radiated underwater noise measured from the drilling rig ocean general, rig tenders Pacific Ariki and Pacific Frontier, fishing vessel Reef Venture and natural sources in the Timor Sea, Northern Australia*. Prepared by Rob McCauley for Shell Australia.	
168.	Richardson W.J., Fraker, M.A., Wursig, B. and Wills, R.S. 1985. Behaviour of bowhead whales (Balaena mysticetus), summering in the Beaufort Sea: Reactions to industrial activities. Biological Conservation. 32. 195–230.	
169.	Duncan, A. 2024, Jansz-Io Compression Underwater Acoustic Modelling – CMST Results of analysis of JIC compressor FAT accelerometer measurements. Centre for Marine Science and Technology, Curtin University (01/05/2024 - p19). G7-TE-Z-USJ0-REPX012.	G7-TE-Z-USJ0-REPX012
170.	Wardle, C.S., Carter, T.J., Urquhart, G.G., Johnstone, A.D.F., Ziolkowski, A.M., Hampson, G. and Mackie, D. 2001. Effects of seismic air guns on marine fish, Continental Shelf Research 21 (2001) 1005–1027	
171.	Van Der Stap, T., Coolen, J. W., & Lindeboom, H. J. 2016. Marine fouling assemblages on offshore gas platforms in the southern North Sea: effects of depth and distance from shore on biodiversity. PLOS One, 11(1).	
172.	Arnould, J. P., Monk, J., Ierodiaconou, D., Hindell, M. A., & Semmens, J. 2015. Use of anthropogenic sea floor structures by Australian Fur Seals: potential positive ecological impacts of marine industrial developments. PLOS One, 10(7).	
173.	McLean, D. L., Taylor, M. D., Partridge, J. C., Gibbons, B., Langlois, T. J., Malseed, B. E., Bond, T. 2018. Fish and habitats on wellhead infrastructure on the north west shelf of Western Australia. Continental Shelf Research, 164, 10-27. doi:https://doi.org/10.1016/j.csr.2018.05.007	
174.	Pattiaratchi, C. (2023) *Environmental factors supporting probable foraging habitat of cetaceans in an area surrounding the proposed JIC subsea compression facility.* University of Western Australia. Report prepared for Chevron Australia	

Ref No	Description	Document ID
175.	Gleiss, A., Wright, S., Liebsch, N. and Wilson, R. 2013. *Contrasting diel patterns in vertical movement and locomotor activity of whale sharks at Ningaloo Reef.* Marine Biology 160(11).	
176.	Sleeman, J.C., Meekan, M.G., Fitzpatrick, B.J., Steinberg, C.R., Ancel, R. and Bradshaw, C.J.A., 2010. *Oceanographic and atmospheric phenomena influence the abundance of whale sharks at Ningaloo Reef, Western Australia*. Journal of Experimental Marine Biology and Ecology 382: 77–81.	
177.	Commonwealth of Australia. 2022. *Wildlife Conservation Plan for Seabirds.* Department of Agriculture, Water and Environment, Canberra, ACT. Available at: https://www.dcceew.gov.au/sites/default/files/documents/wildlife-conservation-plan-for-seabirds.pdf [Accessed: February 2024]	
178.	DoE. 2015. *Wildlife Conservation Plan for Migratory Shorebirds*. Department of the Environment, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/widlife-conservation-plan-migratory-shorebirds.pdf [Accessed February 2024]	
179.	Higgins, P.J. & S.J.J.F. Davies. 1996. *Handbook of Australian, New Zealand and Antarctic Birds*. Volume–Three - Snipe to Pigeons. Melbourne, Victoria: Oxford University Press.	
180.	DCCEEW. 2023. *Species Profile and Threat Database: Sternula nereis nereis — Australian Fairy Tern*. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82950 [Accessed February 2024]	
181.	Australian Government. 2020. *National Recovery Plan for the Australian Fairy Tern (Sternula nereis nereis).* Commonwealth of Australia, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-australian-fairy-tern.pdf [Accessed February 2024].	
182.	Chevron Australia. 2005. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Baseline State and Environmental Impact Report*. Chevron Australia, Perth, Western Australia	G1-TE-H-0000-REPX027
183.	Moro, D. and MacAulay, I. [no date]. A Guide to the Birds of Barrow Island. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/publications/documents/nature-book-birds.pdf [Accessed February 2024].	
184.	DEWHA. 2012. *Species group report card –seabirds and migratory shorebirds.* Department of Sustainability, Environment, Water, Population and Communities, Public Affairs, Canberra, ACT.	
185.	Marchant, S. and Higgins, P.J. (eds) 1990, *Handbook of Australian, New Zealand and Antarctic birds*, volume 1: ratites to ducks, part A: ratites to petrels, Oxford University Press, Melbourne.	
186.	DBCA. 2017. *Shorebirds and seabirds of the Pilbara coast and islands.* Department of Biodiversity, Conservation and Attractions, Government of Western Australia. Available from: https://exploreparks.dbca.wa.gov.au/sites/default/files/2023-03/shorebirds-and-seabirds-of-the-pilbara-coast-and-islands.pdf [Accessed February 2024].	
187.	Milton, D.A., G.C. Smith & S.J.M. Blaber. 1996. *Variable success in breeding of the Roseate Tern Stern dougallii on the northern Great Barrier Reef*. Emu. 6:123--131.	
188.	DBCA.2017. *Pilbara Inshore Islands Nature Reserves*. Parks and Wildlife Service, Department of Biodiversity, Conservation and	

Ref No	Description	Document ID
	Attractions. Government of Western Australia. Available at: https://exploreparks.dbca.wa.gov.au/park/pilbara-inshore-islands-nature-reserves [Accessed: September 2022]	
189.	Cannell, B., Hamilton, S. and Driessen, J. 2019. *Wedge-tailed shearwater foraging behaviour in the Exmouth region.* Report for Woodside Energy Ltd by University of Western Australia and Birdlife Australia.	
190.	Surman, C.A. and Nicholson, L.W. 2008. *A survey of the breeding seabirds and migratory shorebirds of the Houtman Abrolhos, Western Australia*. Corella 33(4): 81-98.	
191.	Surman, C. 1998. *Seabird breeding schedules at the Pelsaert Group of islands, Houtman Abrolhos, Western Australia between 1993 and 1998*. Records of the Western Australian Museum 19: 209-215.	
192.	Morris, K., Burbidge, A.A., Drew, M. and Kregor, G. 2002. *Mammal Monitoring, Barrow Island Nature Reserve October 2002*. Unpublished report for ChevronTexaco, Perth, Western Australia	
193.	Chevron Australia. 2005. *Draft Gorgon Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Gorgon Development*. Chevron Australia, Perth, Western Australia.	
194.	Surman, C. A., Nicholson, L. W., and Phillips, R. A. 2018. *Distribution and patterns of migration of a tropical seabird community in the Eastern Indian Ocean.* Journal of Ornithology. Vol 159(3), 867-877.	
195.	TSSC. 2015. *Conservation Advice: Megaptera novaeangliae humpback whale.* Threatened Species Scientific Committee, Australian Government, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/38-conservation-advice-10102015.pdf [Accessed February 2024]	
196.	O'Hara, T. 2023. *An assessment of the offshore natural values of Australia's Indian Ocean Territories*. Museums Victoria and Parks Australia, Melbourne, Victoria. Available from: https://parksaustralia.gov.au/marine/files/iots/OHara-2023-IOT-Offshore-Natural-Values-v3.02-(Final-for-publication).pdf [Accessed: February 2024]	
197.	Evans, K., Patterson, T., Reid, H., and Harley, S. 2012. *Reproductive Schedules in Southern Bluefin Tuna: Are Current Assumptions Appropriate?* PLOS One 7(4): e34550. https://doi.org/10.1371/journal.pone.0034550	
198.	EPA. 2016. *Environmental Factor Guideline – Marine Environmental Quality*. Environmental Protection Authority, Government of Western Australia. Available from: https://www.epa.wa.gov.au/policies-guidance/environmental-factor-guideline-marine-environmental-qualityhttps://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/TechnicalGuidance_ProtectionOfBenthicCommunitiesAndHabitats-131216.pdf [Accessed February 2024].	
199.	Chevron Australia. 2010. *Draft Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Wheatstone Project*. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/our-businesses/wheatstone-project/environmental-approval [Accessed: March 2023]	
200.	CAPL. 2018. *Gorgon Gas Development: Marine Environmental Quality Management Plan*. Chevron Australia, Perth, Western Australia.	GOR-COP-01110
201.	RPS. 2009. *Baseline Study of the Composition and Quality of Near-shore Waters – Barrow Island*. Unpublished report for Chevron Australia, Perth, Western Australia.	N09503

Ref No	Description	Document ID
202.	Wenziker, K., McAlpine, K., Apte, S. and Masini, R. 2006. *Background Quality for Coastal Marine Waters of the North West Shelf, Western Australia*. North West Shelf Joint Environmental Management Study, Technical Report 18.	
203.	DEC. 2006. *Background quality of the marine sediments of the Pilbara coast*. Department of Environment and Conservation, Marine Technical Report Series, No. MTR 1.	
204.	CAPL. 2022. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Environmental Performance Report 2022*. Chevron Australia, Perth, Western Australia.	ABU220700410
205.	DBCA. 2022. Islands in the Pilbara – Visitor Guide. Parks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, Western Australian Government. Available from: https://exploreparks.dbca.wa.gov.au/sites/default/files/2022-04/islands-in-the-pilbara-visitor-guide.pdf [Accessed May 2024]	
206.	DBCA. 2022. Islands in the Pilbara – Visitor Guide. Parks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, Western Australian Government. Available from: https://exploreparks.dbca.wa.gov.au/sites/default/files/2022-04/islands-in-the-pilbara-map.pdf [Accessed May 2024]	
207.	Explore Parks. 2023. Cape Range National Park. Available from: https://exploreparks.dbca.wa.gov.au/park/cape-range-national-park [Accessed May 2024].	
208.	Parks WA. Nndd. Jurabi and Bundegi Coastal Park. Available at: https://exploreparks.dbca.wa.gov.au/park/jurabi-and-bundegi-coastal-park [Accessed: May 2024]	
209.	Yamatji Marlpa Aboriginal Corporation. 2019. Gnulli native title group celebrates native title win. Available from: https://www.ymac.org.au/wp-content/uploads/2019/12/191218-Gnulli-Native-Title-Determination-MEDIA-RELEASE-FINAL.pdf [Accessed: May 2024]	
210.	DCCEEW. 2023. About Australia's heritage. Available at: https://www.dcceew.gov.au/parks-heritage/heritage/about [Accessed: February 2024]	
211.	Benjamin, J., O'Leary, M., McDonald, J, Wiseman, C., McCarthy, J., Beckett, E., Morrison, P., Stankiewicz, F., Leach, J., Hacker, J., Baggaley, P., Jerbic, K., Fowler, M., Fairweather, J., Jeffries, P., Ulm, S., and Bailey, G. 2020. *Aboriginal artefacts on the continental shelf reveal ancient drowned cultural landscapes in northwest Australia*. PLoS ONE 15(7): e0233912. https://doi.org/10.1371/journal.pone.0233912	
212.	O'Leary, M. J., Paumard, V. and Ward, I. 2020. *Exploring Sea Country through high-resolution 3D seismic imaging of Australia's NW shelf: Resolving early coastal landscapes and preservation of underwater cultural heritage*. Quaternary Science Reviews 239: 106353. https://doi.org/10.1016/j.quascirev.2020.106353	
213.	Veth, P., Ward, I., Manne, T., Ulm, S., Ditchfield, K., Dortch, J., Hook, F., Petchey, F., Hogg, Al., Questiaux, D., Demuro, M., Arnold, L., Spooner, N., Levchenko, V., Skippinton, J., Byrne, C., Basgall, M., Zeanah, D., Belton, D., Helmholz, P., Kendrick, P. 2017. *Early human occuplation of a maritime desert, Barrow Island, North-West Australia*. Quarternay Science Reviews 168: 19-29. https://doi.org/10.1016/j.quascirev.2017.05.002	

Ref No	Description	Document ID
214.	Deckker, P., Moros, M., Perner, K., Blanz, T., Wacker, L., Schneider, R., Barrows, T., O'Loingsigh, T., and Jansen, E. 2020. *Climatic evolution in the Australian region over the last 94 ka – spanning human occupancy - , and unvieling the Last Glacial Maximum*. Quaternary Science Reviews 249: 106593. https://doi.org/10.1016/j.quascirev.2020.106593.	
215.	Benjamin, J., O'Leary, M., McCarthy, J., Reynen, W., Wiseman, C., Leach, J., Bobeldyk, S., Buchler, J., Kermeen, P., Langley, M., Black, A., Yoshida, H., Parnum, I., Stevens, A., Ulm, S., McDonald, J., Veth, P. and Bailey, G. 2023. *Stone artefacts on the seabed at a submerged freshwater spring confirm a drowned cultural landscape in Murujuga, Western Australia*. Quaternary Science Reviews 313: 108190. https://doi.org/10.1016/j.quascirev.2023.108190	
216.	Smyth, D. 1994. *Understanding Country: The Importance of Land and Sea in Aboriginal and Torres Strait Islander Societies*. Canberra, Council for Aboriginal Reconciliation.	
217.	Smyth Dermot. 2007. *Sea Countries of the North-West. Literature review on Indigenous connection to and uses of the North West Marine Region*. Available at: https://www.agriculture.gov.au/sites/default/files/documents/nw-sea-countries.pd	
218.	AIATSIS. (n.d.). *The Marlaloo Songline. Australian Institute of Aboriginal and Torres Strait Islander Studies*. Available from: https://aiatsis.gov.au/explore/marlaloo-songline [Accessed: February 2024]	
219.	Zeanah, D., Veth, P., Basgall, M., Glover, D., Bradshaw, R., Ditchfield, K., Hook, F., Seah, I., Buurabalayji Thalanyji Aboriginal Corporation. 2024. Barrow Island lithic scatters: A unique record of occupation patterns on the North West Shelf before insularisation. *Quaternary Science Reviews*, 329: 108547. https://doi.org/10.1016/j.quascirev.2024.108547	
220.	Deadly Stoary (n.d.). *Songlines. Deadly Story*. Available from: https://deadlystory.com/page/culture/Life_Lore/Songlines [Accessed: February 2024]	
221.	Nunn, P. and Reid, N. 2015. *Aboriginal Memories of Inundation of the Australian Coast Dating from More than 7000 Years Ago*. Australian Geographer 47(1):11-47. https://doi.org/10.1080/00049182.2015.1077539.	
222.	Kearney, A., O'Leary, M. and Platten, S. 2023. *Sea Country: Plurality and knowledge of saltwater territories in Indigenous Australian contexts*. The Geographical Journal 189(1): 104-116. https://doi.org/10.1111/geoj.12466.	
223.	Scientific Committee of Antarctic Research. 2002. *Impacts of Marine Acoustic Technology on the Antarctic Environment*. Version 1.2. Geoscience Australia. Available from: http://www.geoscience.scar.org/geophysics/acoustics_1_2.pdf	
224.	DCCEEW. 2024.*National Recovery Plan for the Southern Right Whale (Eubalaena australis)*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australia. Available from: https://www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-southern-right-whale.pdf [Accessed February 2025].	
225.	MacGillivray, A O, R Racca, and L Zizheng. 2013. "Marine Mammal Audibility of Selected Shallow-water Survey Sources." The Journal of the Acoustical Society Of America. doi:0.1121/1.4838296.	

Ref No	Description	Document ID
226.	NOAA. 2019. *ESA Section 7 Consultation Tools for Marine Mammals on the West Coast* (webpage), 27 Sep 2019. United States National Oceanic and Atmospheric Administration. Available from: https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/esa-section-7-consultation-tools-marine-mammals-west.	
227.	Zykov. M. 2013. *Underwater Sound Modeling of Low Energy Geophysical Equipment Operations*. JASCO Document 00600, Version 2.0. Technical report by JASCO Applied Sciences for CSA Ocean Sciences Inc. Available from: CSA Low Energy Sources Modeling.docx (ca.gov) [Accessed June 2023]	
228.	National Oceanic and Atmospheric Administration, 2018 Revision to: *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts*. Available from: https://www.fisheries.noaa.gov/resource/document/technical-guidance-assessing-effects-anthropogenic-sound-marine-mammal-hearing	
229.	DAWE. (no date). Species Profile and Threat Database: Key Ecological Features. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from: https://www.environment.gov.au/sprat-public/action/kef/search [Accessed: May 2022]	
230.	Last, P, Lyne, V, Yearsley, G, Gledhill, D, Gomon, M, Rees, T & White, W. 2005. *Validation of national demersal fish datasets for the regionalisation of the Australian continental slope and outer shelf (>40 metres depth).* Department of the Environment and Heritage and CSIRO Marine and Atmospheric Research, Hobart. Available from: https://parksaustralia.gov.au/marine/pub/scientific-publications/archive/nmb-fish-report.pdf [Accessed: February 2024]	
231.	McCauley, R.D., Fewtrell, J., Duncan, A.J., Jenner, C., Jenner, M.-N., Penrose, J.D., Prince, R.I.T., Adihyta, A., Murdoch, J. *et al.* 2000. Marine seismic surveys: A study of environmental implications. *Australian Petroleum Production Exploration Association (APPEA) Journal* 40: 692-708.	
232.	Day, R.D., R.D. McCauley, Q.P. Fitzgibbon, and J.M. Semmens. 2016. Seismic air gun exposure during early-stage embryonic development does not negatively affect spiny lobster Jasus edwardsii larvae (Decapoda:Palinuridae). *Scientific Reports*. https://doi.org/10.1038/srep22723	
233.	National Science Foundation (U.S.), U.S. Geological Survey, and [NOAA] National Oceanic and Atmospheric Administration (U.S.). 2011. *Final Programmatic Environmental Impact Statement/Overseas*. Environmental Impact Statement for Marine Seismic Research Funded by the National Science Foundation or Conducted by the U.S. Geolo gical Survey. National Science Foundation, Arlington, VA	
234.	ABARES. 2020. *Commonwealth Fisheries Data Extract for 2010-2020*. Available by request from the Australian Bureau of Agricultural and Resource Economics and Sciences from data collected by the Australian Fisheries Management Authority.	
235.	AFMA. 2023. *North West Slope Trawl Fishery*. Australian Fisheries Management Authority. Available from: https://www.afma.gov.au/fisheries/north-west-slope-trawl-fishery [Accessed: February 2024]	
236.	Butler, I, Patterson, H, Bromhead, D, Galeano, D, Timmiss, T, Woodhams, J and Curtotti, R 2023, *Fishery status reports 2023,*	

Ref No	Description	Document ID
	Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.	
237.	DCCEEW. [no date] *Species Profile and Threats Database: Thunnus maccoyii — Southern Bluefin Tuna*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=69402 [Accessed: February 2024]	
238.	Farley, J., Davis, T., Bravington, M., Andamari, R., Davies, C. 2015. *Spawning Dynamics and Size Related Trends in Reproductive Parameters of Southern Bluefin Tuna, Thunnus maccoyii*. PLOS One 10(5): e0125744. https://doi.org/10.1371/journal.pone.0125744	
239.	DPIRD. 2024. *Fish Cube WA Data Extract for 2014–2023*. Available by request from DPIRD	
240.	Newman, S.J., Santoro, K.G. and Gaughan, D.J. (eds). 2023. *Status Reports of the Fisheries and Aquatic Resources of Western Australia 2022/23: The State of the Fisheries*. Department of Primary Industries and Regional Development, Western Australia	
241.	WAFIC. [no date] *North Coast Bioregion. North Coast Demersal Scalefish Fisheries*. Western Australian Fishing Industry Council. Available from: https://www.wafic.org.au/fishery/north-coast-demersal-scalefish-fisheries/ [Accessed: February 2024]	
242.	Department of Primary Industries and Regional Development (DPIRD). 2023. Recreational fishing. Available at: https://www.fish.wa.gov.au/Fishing-and-Aquaculture/Recreational-Fishing/Pages/default.aspx [Accessed: February 2024]	
243.	Warner, G., McCrodan, A., MacDonnell, J., and Lumsden, E. JASCO Applied Sciences, 2305-4464 Markham St., BC, Canada	
244.	Ryan KL, Lai EKM, Smallwood CB. 2022. *Boat-based recreational fishing in Western Australia 2020/21. Fisheries Research Report No. 327* Department of Primary Industries and Regional Development, Western Australia. 221pp. Available at: https://www.fish.wa.gov.au/Documents/research_reports/frr327.pdf [Accessed: February 2024]	
245.	Department of Primary Industries and Regional Development (DPIRD). 2015. *Customary fishing — frequently asked questions*. Available at: https://www.fish.wa.gov.au/Fishing-and-Aquaculture/Customary-Fishing/Pages/Customary-Fishing-FAQ.aspx [Accessed: February 2024]	
246.	Tourism Research Australia. [no date]. State Tourism Satellite Account: Western Australia summary. Available at: https://www.tra.gov.au/en/economic-analysis/tourism-satellite-accounts/state-tourism-satellite-account#ref12 [Accessed: February 2024]	
247.	Schianetz Karin, Jones Tod, Kavanagh Lydia, Walker Paul, Lockington David, Wood David. 2009. *The practicalities of a Learning Tourism Destination: a case study of the Ningaloo Coast*. International Journal of Tourism Research.	
248.	AHO. 2020. *Fact Sheet: Navigation – Maritime Military Firing Practice and Exercise Areas*. Australian Hydrographic Office, Department of Defence, Australian Government.	
249.	DoD. 2020. *Department of Defence Submission to EPA's Public Consultation in relation to Strategic Advice on Cumulative Impacts in Exmouth Gulf*. Department of Defence, Australian Government.	

Ref No	Description	Document ID
250.	Defence. 2022. *Defence UXO Mapping Application*. Available at: https://uxo-map.defence.gov.au/ [Accessed: February 2024]	
251.	Parks Australia. [n.d.]. Australian Marine Parks. Available at: https://parksaustralia.gov.au/marine/ [Accessed: February 2024]	
252.	DNP. 2018. *North-west Marine Parks Network Management Plan 2018*. Director of National Parks, Canberra.Available at: https://australianmarineparks.gov.au/static/effc79ac7104ae979053131c18e51478/amp-document-north-west-management-plan-2018.pdf [Accessed February 2024]	
253.	Bolton, D., Mayer-Pinto, M., Clark, G.F., Dafforn, K.A., Brassil, W.A., Becker, A., and Johnston, E.L. 2017. Coastal urban lighting has ecological consequences for multiple tropic levels under the sea, *Science of the Total Environment*, 576.	
254.	Marangoni, L.F.B., Davies, T., Smyth, T., Rodriguez, A., Hamann, M., Duarte, C., Pendoley, K., Berge, J., Maggi, E., and Levy, O. 2022. Impacts of artificial light at night in marine ecosystems – a review. *Global Change Biology*.	
255.	Fobert, E.K., Burke da Silva, K., and Swearer, S.E. 2019. Artificial light at night causes reproductive failure in clownfish. *Biology Letters*, 15: 20190272.	
256.	Keenan, S., Benfield, M. C., and Blackburn, J. 2007. Importance of the artificial light field around offshore petroleum platforms for the associated fish community. *Marine Ecological Progress Series*, 331, 219–231.	
257.	DPLH. 2023. *Aboriginal Heritage Places Database*. Available at: https://catalogue.data.wa.gov.au/dataset/aboriginal-heritage-places [Accessed: February 2024]	
258.	Collins, N. 2012. *Assessment of Potential Ecosystem Effects from Electromagnetic Fields (EMF) Associated with Subsea Power Cables and TISEC Devices in Minas Channel*. Prepared by CEF Consultants Ltd. Prepared for Fundy Ocean Resource Centre for Energy (FORCE), Halifax, NS: 39p.	
259.	UNESCO. n.d. Ningaloo Coast. Available from: https://whc.unesco.org/en/list/1369/ [Accessed: May 2024]	
260.	UNESCO. 2003. *Convention for the Safeguarding of the Intangible Cultural Heritage*. United Nations Educational, Scientific and Cultural Organization, Paris, France. Available from: https://ich.unesco.org/en/convention [Accessed December 2023]	
261.	DCCEEW. 2023. National Heritage Places - The Ningaloo Coast. Available from: https://www.dcceew.gov.au/parks-heritage/heritage/places/national/ningaloo [Accessed: May 2024]	
262.	DCCEEW. 2023. DRAFT *Guidelines for working in the near and offshore environment to protect Underwater Cultural Heritage*. Department of Climate Change, Energy, the Environment and Water, Australian Government. Available from: https://consult.dcceew.gov.au/draft-guidelines-to-protect-uc-heritage [Accessed February 2024]	
263.	DCCEEW. [n.d.] *Australasian Underwater Cultural Heritage Database*. Department of Climate Change, Energy, the Environment and Water, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/parks-heritage/heritage/underwater-heritage/auchd [Accessed: February 2024]	

Ref No	Description	Document ID
264.	NOPSEMA. 2023. *Guideline: Consultation in the course of preparing an environment plan*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Consultation%20in%20the%20course%20of%20preparing%20an%20Environment%20Plan%20guideline.pdf [Accessed: February 2024]	N-04750-GL2086 A900179
265.	Federal Court of Australia. 2022. *Santos NA Barossa Pty Ltd vs Tipakalippa [2022] FCAFC 193*. Australia. Available from: https://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/full/2022/2022fcafc0193 [Accessed: February 2024]	
266.	NOPSEMA. 2024. *Guidance note: Environment plan content requirement*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Environment%20Plan%20Content%20Requirements%20Guidance%20Note.pdf [Accessed: February 2024]	N-04750-GN1344 A339814
267.	NOPSEMA. 2024. *Guideline: Consultation with Commonwealth agencies with responsibilities in the marine area*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Consultation%20with%20agencies%20with%20responsibilities%20in%20the%20Commonwealth%20marine%20area.pdf [Accessed: February 2024]	N-04750-GL1887 A705589
268.	NOPSEMA. 2024. *Petroleum activities and Australian Marine Parks: A guidance note to support environmental protection and effective consultation*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Guidance%20note%20-%20Petroleum%20Activities%20and%20Australian%20Marine%20Parks.pdf [Accessed: February 2024]	N-04750 - GN1785 A620236
269.	DCCEEW. 2023. *Interim Engaging with First Nations People and Communities on Assessments and Approvals Under the Environment Protection and Biodiversity Conservation Act 1999*. Department of Climate Change, Energy, the Environment and Water, Canberra, ACT. Available from: https://www.dcceew.gov.au/sites/default/files/documents/interim-engaging-with-first-nations-people-and-communities-assessments-and-approvals-under-epbc-act.pdf [Accessed: February 2024]	
270.	Government of Western Australia. 2023. *Aboriginal Cultural Heritage Act 2021: Consultation Guidelines*. Perth, Western Australia. Available from: https://www.wa.gov.au/system/files/2023-06/20230428-consultation-guidelines.pdf [Accessed: May 2023]	
271.	DMIRS. 2022. Guideline for the Development of Petroleum, Geothermal and Pipeline Environment Plans in Western Australia. Department of Mines, Industry Regulation and Safety, Perth, Western Australia. Available from: https://www.dmp.wa.gov.au/Documents/Environment/ENV-PEB-177.pdf [Accessed: February 2024]	
272.	AFMA. 2023. *Petroleum industry consultation with the commercial fishing industry*. Australian Fisheries Management Authority, Australian Government. Available from: https://www.afma.gov.au/afmas-research/petroleum-industry-consultation-commercial-fishing-industry [Accessed: February 2024]	

Ref No	Description	Document ID
273.	WAFIC. 2023. *Oil & Gas Consultation Approach for Unplanned Events*. Western Australian Fishing Industry Council Inc. Fremantle, Western Australia. Available from: https://www.wafic.org.au/what-we-do/access-sustainability/oil-gas/consultation-approach-for-unplanned-events/ [Accessed: February 2024]	
274.	DoF. 2013. *Guidance statement for oil and gas industry consultation with the Department of Fisheries*. Department of Fisheries, Western Australian Government. Available from: https://www.fish.wa.gov.au/Documents/occasional_publications/fop113.pdf [Accessed: February 2024]	
275.	DoT. 2020. *Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements*. Department of Transport, Western Australian Government. Available from: https://www.transport.wa.gov.au/mediaFiles/marine/MAC_P_Westplan_MOP_OffshorePetroleumIndGuidance.pdf [Accessed: February 2024]	
276.	Parks Australia. 2024. Australian Marine Parks – Access and Use – List of Authorisations Issued. Parks Australia, Australian Government, Cabrera, ACT. Available from: https://parksaustralia.gov.au/marine/activities/authorisations-issued/ [Accessed: February 2024]	
277.	Gauthreaux, S.A. and Belser, C.G. 2006. Effects of artificial night lighting on migrating birds. In: Ec*ological Consequences of Artificial Night Lighting*, Rich C and Longcore T, Editors. Island Press: Washington, D.C., USA, p:67–93	
278.	Marquenie J., Donners M., Poot H., Steckel W de Wit B. 2013. *Bird-Friendly Light Sources: Adapting the Spectral Composition of Artificial Lighting*. Industry Applications Magazine, IEEE. 19. 56–62. 10.1109/MIAS.2012.2215991.	
279.	CMACS. 2003. A baseline assessment of electromagnetic fields generated by offshore wind farm cables. COWRIE Report EMF - 01-200266.	
280.	NOPSEMA. 2024. *Information Paper: Planning for proactive decommissioning*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/Planning%20for%20proactive%20decommissioning%20information%20paper.pdf [Accessed: March 2024]	
281.	Chevron. 2018. *Global Upstream Asset Retirement Strategic Framework*. Chevron Corporation.	
282.	DISER. 2022. *Guideline: Offshore Petroleum Decommissioning*. Department of Industry, Science, Energy and Resources, Canberra, Australian Capital Territory. Available from: https://www.nopta.gov.au/_documents/guidelines/decommissioning-guideline.pdf [Accessed: November 2023].	
283.	NOPSEMA. 2022. *Policy: Section 572 Maintenance and removal or property*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/N-00500-PL1903%20-%20S572%20Maintenance%20and%20Removal%20of%20property%20%28A720369%29.pdf [Accessed: September 2023]	
284.	CAPL. 2023. *Wheatstone 4D Marine Seismic Survey Environment Plan*. Chevron Australia, Perth, Western Australia.	WS2-COP-00614

Ref No	Description	Document ID
285.	DPIRD. 2022. Fish Cube WA Data Extract for 2012-2021. Available by request from DPIRD.	
286.	Chevron. 2023. *Chevron Marine Standard Non Tankers: Corporate OE Standard*. Chevron Corporation, United States of America.	
287.	Chevron Australia. 2012. *Environmental Discharge Modelling*. Chevron Australia, Perth, Western Australia.	WS2-1000-HES-RPT-DME-000-00028-000
288.	Snoek, R., de Swart, R., Didderen K., Lengkeek, W. and Teunis, M.A. 2016. *Potential effects of electromagnetic fields in the Dutch North Sea Phase 1 – Desk Study*.	
289.	CMACS. 2003. *A baseline assessment of electromagnetic fields generated by offshore wind farm cables*. COWRIE Report EMF - 01-200266	
290.	Normandeau, Exponent, Tricas T and Gill A. 2011. *Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species*. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study BOEMRE 2011-09.	
291.	Baruah E. 2016. A review of the Evidence of Electromagnetic Field (EMF) Effects on Marine Organisms. Research & Reviews: *Journal of Ecology and Environmental Sciences*, Vol 4, Issue 4.	
292.	Claisse, J.T., D.J. Pondella, C.M. Williams, L.A. Zahn, and J.P. Williams. 2015. *Current ability to assess impacts of electromagnetic fields associated with marine and hydrokinetic technologies on marine fishes in Hawaii.* Final Technical Report, OCS Study BOEM 2015-042. U.S. Department of Energy, Energy Efficiency and Renewable Energy, Golden, Colorado	
293.	Michel, J., H. Dunagan, C. Boring, E. Healy, W. Evans, J.M. Dean, A. McGillis and J. Hain. 2000. *Worldwide Synthesis and Analysis of Existing Information Regarding Environmental Effects of Alternative Energy Uses on the Outer Continental Shelf*. U.S. Department of the Interior, Minerals Management Service, Herndon, VA. MMS OCS Report 2007-038.	
294.	AECOM. 2019. *Jansz Io Compression Marine Electromagnetic Field Literature Review*. Unpublished report prepared by AECOM Australia for Chevron Australia, Perth, Western Australia.	
295.	DotEE. 2018. *Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (2018).* Department of the Environment and Energy, Australian Government, Canberra, Australia. Available from: Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (2018) (awe.gov.au) [Accessed June 2023]	
296.	Wilson, S.G., Polovina, J.J., Stewart, B.S. and Meekan, M.G 2006. Movements of whale sharks (Rhincodon typus) tagged at Ningaloo Reef, Western Australia. *Marine Biology* 148:1157-1166.	
297.	Gleiss, A., Wright, S., Liebsch, N. and Wilson, R. 2013. Contrasting diel patterns in vertical movement and locomotor activity of whale sharks at Ningaloo Reef. *Marine Biology* 160(11).	
298.	Advisian. 2023. *Gorgon Backfill Fields Benthic Survey 2022*. Report prepared by Advisian Pty Ltd for Chevron Australia, Perth, Western Australia.	

Ref No	Description	Document ID
299.	Commonwealth of Australia. 2022. *Wildlife Conservation Plan for Seabirds*. Department of Agriculture, Water and Environment, Canberra, ACT. Available at: https://www.dcceew.gov.au/sites/default/files/documents/wildlife-conservation-plan-for-seabirds.pdf [Accessed: June 2023]	
300.	Derraik, JGB, 2002, 'The pollution of the marine environment by plastic debris: a review', Marine Pollution Bulletin, vol. 44, pp. 842–852.	
301.	DSEWPaC. 2011. *National recovery plan for threatened albatrosses and giant petrels 2011-2016.* Department of Sustainability, Environment, Water, Population and Communities, Australian Government, Canberra, Australian Capital Territory. Available from: National recovery plan for threatened albatrosses and giant petrels 2011-2016 (dcceew.gov.au) [Accessed February 2023].	
302.	DoE. 2015. Wildlife Conservation Plan for Migratory Shorebirds. Department of the Environment, Australian Government, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/widlife-conservation-plan-migratory-shorebirds.pdf [Accessed February 2023].	
303.	RPS APASA. 2017. Quantitative Subsea Release Modelling. Unpublished report prepared for Chevron Australia Pty Ltd.	
304.	AMSA. 2015. *Technical guideline for preparing contingency plans for Marine and Coastal Facilities*. Australian Maritime Safety Authority, Australian Government, Canberra, Australian Capital Territory. Available from: 2015-04-np-gui012-contingency-planning.pdf (amsa.gov.au) [Accessed February 2023].	
305.	Chevron Australia. 2021. Contractor Operational Excellence Management: ABU OE Process. Chevron Australia, Perth, Western Australia.OE-06.00.01	
306.	DAWE. 2022. Listing Advice Megaptera novaeangliae Humpback Whale. Department of Agriculture, Water and the Environment, Australian Government, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/38-listing-advice-26022022.pdf [Accessed June 2023]	
307.	Mackay, A.I., Bailluel, F., Childerhouse, S., Donnelly, D., Harcourt, R., Parra, G.J. and Goldsworthy, S.D. 2015. Offshore migratory movement of southern right whales: addressing critical conservation and management needs. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2015/000526-1. SARDI Research Report Series No. 859.	
308.	Chevron Australia. 2005. *Draft Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Gorgon Development*. Chevron Australia, Perth, Western Australia.	
309.	Prince, R.I.T. 1986. *Dugong in Northern Waters of Western Australia – 1984*. Technical Report No. 7. Department of Conservation and Land Management, Perth, WA	
310.	Prince, R.I.T. 2001. *Aerial Survey of the Distribution and Abundance of Dugongs and Associated Macrovertebrate Fauna – Pilbara Coastal and Offshore Region, WA, Completion Report*. Unpublished Report to the Marine Species Protection Program, Environment Australia, by the Department of Conservation and Land Management, WA	

Ref No	Description	Document ID
311.	Hodgson, A., J. 2004. *Dugong behaviour and responses to human influences*. Thesis submission November 2004, James Cook University	
312.	CoA. 2017. *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna 2017*. Department of the Environment and Energy, Commonwealth of Australia, Canberra, ACT.	
313.	Groom, R.A., Lawler, I.R. & Marsh, H. 2004. *The risk to dugongs of vessel strike in the Southern Bay Islands area of Moreton Bay*. Report to Queensland Parks and Wildlife Service.	
314.	DSEWPaC. 2012. *Species group report card – dugongs*: *supporting the marine bioregional plan for the North-west Marine Region.* Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT. Available from: https://www.dcceew.gov.au/sites/default/files/env/pages/1670366b-988b-4201-94a1-1f29175a4d65/files/north-west-report-card-dugongs.pdf [Accessed November 2024].	
315.	Chevron Australia. 2010. Chevron Wheatstone RT-1 Trials: Trench 2 & 4 – RT-1 Turbidity Measurements Field Report. Chevron Australia, Perth, Western Australia.	
316.	Chevron Australia. 2010. Chevron Wheatstone RT-1 Trials: Trench 3 – RT-1 Turbidity Measurements Field Report. Chevron Australia, Perth, Western Australia.	
317.	Chevron Australia. 2013. Gorgon Gas Development and Jansz Feed Gas Pipeline: Post-Development Coastal and Marine State and Environment Impact Report: Offshore Feed Gas Pipeline System and Marine Component of the Shore Crossing, Year 1: 2013. Rev. 0. Chevron Australia, Perth, Western Australia.	
318.	BMT. 2019. *Jansz-Io Compression Benthic Video Footage Review*. Unpublished report prepared by BMT for Chevron Australia, Perth, Western Australia.	
319.	O'Leary, M. J., Paumard, V. and Ward, I. 2020. Exploring Sea Country through high-resolution 3D seismic imaging of Australia's NW shelf: Resolving early coastal landscapes and preservation of underwater cultural heritage. *Quaternary Science Reviews* 239: 106353. https://doi.org/10.1016/j.quascirev.2020.106353	
320.	UNESCO. 2003. *Convention for the Safeguarding of the Intangible Cultural Heritage*. United Nations Educational, Scientific and Cultural Organization, Paris, France. Available from: https://ich.unesco.org/en/convention [Accessed December 2023]	
321.	NERA. 2017. Environment Plan Reference Case: Anchoring of Vessels and Floating Facilities. National Energy Resources Australia, Perth, Western Australia. Available from: Attachment (nera.org.au) [Accessed March 2021].	
322.	Woodward, E., Hill, R., Harkness, P. and Archer, R. (eds). 2020. *Our Knowledge Our Way in caring for Country: Indigenous-led approaches to strengthening and sharing our knowledge for land and sea management. Best Practice Guidelines from Australian experiences*. NAILSMA and CSIRO.	
323.	Woodside Energy Ltd. 2014. *Browse FLNG Development, Draft Environmental Impact Statement*. EPBC 2013/7079. November 2014. Woodside Energy, Perth, Western Australia.	
324.	Warren, V. E., M.W. Koessler, A. M. Muellenmeister, D. H. Stroot and C.R. McPherson. 2023. *Gorgon Gas Development: Backfill Fields:*	

Ref No	Description	Document ID
	Acoustic and Animal Movement Modelling for Assessing Marine Fauna Sound Exposures. Document 02937, Version 1.0 DRAFT. Technical report by JASCO Applied Sciences for Xodus Group. Appendix D	
325.	Pendoley Environmental. 2020. *Scarborough Light Modelling*. Perth, Western Australia: Report prepared by Pendoley Environmental Pty Ltd for Advisian (on behalf of Woodside Energy Limited).	
326.	Chevron Australia. 2024. *Gorgon Gas Development: Backill Fields Offshore Project Proposal.* Revision 2. Chevron Australia, Perth, Western Australia	
327.	Erbe C, Wei C. 2025 *Comparison of Impact Ranges for Vessel-Noise-Induced Hearing Loss estimated under NOAA's 2018 vs. 2024 Guidance* Centre for Marine Science and Technology Perth. Australia.	
328.	DAWE. [n.d.] *The Introduction of Marine Pests to the Australian Environment via Shipping*. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from: The Introduction of Marine Pests to the Australian Environment via Shipping | Department of Agriculture, Water and the Environment [Accessed February 2023].	
329.	BRS 2007. Designated Exchange Areas Project – Providing Informed Decision on the Discharge of Ballast Water in Australia (Phase II) Ed. Knight, E., Barry, S., Summerson, R., Cameron S., Darbyshire R. report for the Bureau of Rural sciences	
330.	Hewitt, C.L., Martin, R.B., Sliwa, C., McEnnulty, F.R., Murphy, N.E., Jones, T. and Cooper, S. (eds). 2002. *National introduced marine pest information system*. Available from: NIMPIS Final report.PDF (csiro.au) [Accessed February 2023].	
331.	Paulay, G. Kirkendale, L. Lambert, G. and Meyer, C. 2002. Anthropogenic biotic interchange in a coral reef ecosystem: A case study from Guam. *Pacific Science* 56(4): 403–422	
332.	Glasby, T.M., Connell, S.D., Holloway, M.G. and Hewitt, C.L., 2007. Nonindigenous biota on artificial structures: could habitat creation facilitate biological invasions. *Marine Biology* 151: 887–895	
333.	Dafforn, K.A., Glasby, T.M., and Johnston, E.L., 2009. Links between estuarine condition and spatial distributions of marine invaders. *Diversity and Distributions* 15(5): 807–821.	
334.	Dafforn, K.A., Johnston, E.L. and Glasby, T.M., 2009. Shallow moving structures promote marine invader dominance. *Biofouling* 25:3, 277-287.	
335.	NERA. 2017. *Environment Plan Reference Case – Planned discharge of sewage, putrescible waste and grey-water*. Available from https://referencecases.nopsema.gov.au/assets/reference-case-project/2017-1001-Sewage-grey-water-and-putrescible-waste-discharges.pdf Accessed [Accessed 01 December 2019]	
336.	McDonald, S. F., Hamilton, S. J., Buhl, K. J. and Heisinger, J. F. 1996. Acute toxicity of fire control chemicals to *Daphnia magna* (Straus) and *Selenastrum capricornutum* (Printz). *Ecotoxicology and Environmental Safety,* 33:62–72.	
337.	Moody, C.A. and Field, J.A. 2000. Perfluorinated Surfactants and the Environmental Implications of Their Use in Fire-Fighting Foams. *Environmental Science and Technology*, 34 (18):3864–3870.	

Ref No	Description	Document ID
338.	Schaefer, T. 2013. *Aquatic Impacts of Firefighting Foams*. Whitepaper. Form Number F-2012007, Solberg.	
339.	IFSEC Global. 2014. *Environmental impact of foam*. Available from: Environmental impact of foam (ifsecglobal.com) [Accessed March 2021].	
340.	ANSUL. 2007. *Environmental Impact of ANSULITE® AFFF Products*, Technical Bulletin Number 52. Form No. F 82289-3, Ansul Incorporated.	
341.	McIntyre, A.D. and Johnson, R. 1975. Effects of nutrient enrichment from sewage in the sea. In: ALH Gameson, ed. *Discharge of sewage from sea outfalls*. New York, Pergamon Press. pp. 131–141	
342.	Abdellatif, E.M., Ali, O.M., Khalil, I.F., and Nyonje, B.M. 1993. Effects of SewageDisposal into the White Nile on the Plankton Community. *Hydrobiologia*, Vol 259, pp 195-201	
343.	Axelrad, D.M., Poore, G.C.B., Arnott, G.H., Bault, J., Brown, V., Edwards, R.R.C, and Hickman, N. 1981. *The Effects of Treated Sewage Discharge on the Biota of Port Phillip Bay, Victoria, Australia*. Estuaries and Nutrients, Contemporary Issues in Science and Society. The Human Press Inc.	
344.	Parnell, P.E. 2003. The effects of sewage discharge on water quality and phytoplankton of Hawai'ian Coastal Waters. *Marine Environmental Research*, Vol. 44, pp 293-311.	
345.	Klein, R. 2008. The Environmental Impact of Fire Fighting Foams – Operational and Legal Implications. *Proceedings of the International Bushfire Research Conference 2008*. Australian and New Zealand National Council for Fire and Emergency Services (AFAC) and Bushire CRC.	
346.	Asia Pacific Applied Science Associates. 2014. *Quantitative Oil Spill Modelling* – Jansz. Q0331. Unpublished report prepared for Chevron Australia, Perth, Western Australia	
347.	BP. 2013. Shah Deniz 2 Project: Environmental & Socio-Economic Impact Assessment. BP Development Pty Ltd, Azerbaijan. Available from: Shah Deniz | News | Home (bp.com) [Accessed March 2021].	
348.	AMSA. 2015. Technical guidelines for preparing contingency plans for Marine and coastal facilities. Australian Maritime Safety Authority, January 2015.	
349.	RPS. 2024. Gorgon-Jansz Remodelling Oil Spill Modelling. Rev 1.	
350.	NOPSEMA. 2019. *Environment Bulletin: Oil spill modelling*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/sites/default/files/documents/2021-04/A652993.pdf [Accessed: December 2024].	
351.	Bonn Agreement. 2016. *Bonn Agreement Aerial Operations Handbook*. Bonn Agreement, London, United Kingdom. Available from: https://www.bonnagreement.org/site/assets/files/1081/aerial_operations_handbook.pdf [Accessed: December 2024]	
352.	Shell. 2010. Prelude Floating LNG Project EIS Supplement—Response to Submissions. Shell Developments (Australia) Pty Ltd, Perth, Western Australia.	
353.	IPIECA. 1995. Biological Impacts of Oil Pollution: Rocky Shores, International Petroleum Industry Environmental Conservation	

Ref No	Description	Document ID
	Association, No. 7. 209–215 Blackfriars Road, London, SE1 8NL, United Kingdom	
354.	Engelhardt, F. 1983. Petroleum effects on marine mammals. Aquatic Toxicology, 4: 199–217.	
355.	Smultea, MA., Würsig, B. 1995. Behavioral reactions of bottlenose dolphins to the Mega Borg oil spill, Gulf of Mexico 1990. Aquatic Mammals 21(3):171-181. Available at: https://www.researchgate.net/publication/244478062_Behavioral_reactions_of_bottlenose_dolphins_to_the_Mega_Borg_oil_spill_Gulf_of_Mexico_1990%20Accessed%20October%202023 [Accessed: November 2024]	
356.	Deepwater Horizon Natural Resource Damage Assessment Trustees. (2016). Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement. Available at: https://repository.library.noaa.gov/view/noaa/18084/noaa_18084_DS1.pdf [Accessed: November 2024]	
357.	Aichinger Dias, L. Litz, J., Garrison, L., Martinez, A., Barry, K., Speakman, T. 2017. Exposure of cetaceans to petroleum products following the Deepwater Horizon oil spill in the Gulf of Mexico. January 2017 Endangered Species Research 33(1):119-125. Available at:(PDF) Exposure of cetaceans to petroleum products following the Deepwater Horizon oil spill in the Gulf of Mexico (researchgate.net) [Accessed: November 2024]	
358.	Geraci, J.R. and St. Aubin, D.J. 1988. Synthesis of Effects of Oil on Marine Mammals. Report to U.S. Department of the Interior, Minerals Management Service, Atlantic OCS Region, OCS Study. Ventura, California	
359.	Jenssen, B.M. 1994. Effects of Oil Pollution, Chemically Treated Oil, and Cleaning on the Thermal Balance of Birds. Environmental Pollution, 86	
360.	French, D., Reed, M., Jayko, K., Feng, S., Rines, H., Pavignano, S.1996. The CERCLA Type A Natural Resource Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME), Technical Documentation, Vol. I - Model Description, Final Report. Office of Environmental Policy and Compliance, United States Department of the Interior. Washington, United States of America.	
361.	French, D.P. 2009. State-of-the-art and research needs for oil spill impact assessment modelling. In: Proceedings of 32nd Arctic and Marine Oil Spill Program (AMOP) Technical Seminar. pp. 601–653. Ottawa, Ontario, Canada	
362.	Carls, M.G., Holland, L., Larsen, M., Collier, T.K., Scholz, N.L. and Incardona, J.P. 2008. Fish embryos are damaged by dissolved PAHs, not oil particles. Aquatic Toxicology, 88(2): 121-127.	
363.	Nordtug, T., Olsen, A.J., Altin, D., Overrein, I., Storøy, W., Hansen, B.H. and De Laender, F. 2011. Oil droplets do not affect assimilation and survival probability of first feeding larvae of North-East Arctic cod. Science of the Total Environment, 412, pp.148-153.	
364.	Redman, A.D. 2015. Role of entrained droplet oil on the bioavailability of petroleum substances in aqueous exposures. Marine Pollution Bulletin, 97(1-2): 342–348	
365.	French-McCay D. 2018. Aquatic Toxicity Thresholds for Oil Spill Risk Assessments. RPS Ocean Science, Rhode Island.	

Ref No	Description	Document ID
366.	Lin, Q. and Mendelssohn, I.A. 1996. A comparative investigation of the effect of South Louisiana crude oil on the vegetation of freshwater, brackish, and salt marshes. Marine Pollution Bulletin, 32: 202–209	
367.	Grant, D.L., Clarke, P.J. and Allaway, W.G. 1993. The response of grey mangrove (Avicennia marina (Forsk.) Vierh) seedlings to spills of crude oil. The Journal of Experimental Marine Biological Ecology, 171(2): 273–295.	
368.	Suprayogi, B. and Murray, F. 1999. A field experiment of the physical and chemical effects of two oils on mangroves. Environmental and Experimental Botany, 42(3): 221–229.	
369.	National Oceanic and Atmospheric Administration. 2010. Oil and sea turtles: biology planning and response. US Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration.	
370.	Australian Maritime Safety Authority. 2015. The Effects of Maritime Oil Spills on Wildlife including Non-avian Marine Life.	
371.	AMSA. 2010. Response to the Pacific adventurer: operational and technical issues reports. Australian Maritime Safety Authority, Canberra, ACT.	
372.	Watson, J.E.M., Joseph, L.N., and Watson, A.W.T. 2009. A rapid assessment of the impacts of the Montara oil leak on birds, cetaceans and marine reptiles. Prepared on behalf of the Australian Government Department of the Environment, Water, Heritage and the Arts by the Spatial Ecology Laboratory, University of Queensland, Brisbane.	
373.	Gagnon, M.M. 2009. Report on biopsy collections from specimens collected from the surrounds of the West Atlas oil leak – sea snake specimen. Curtin University, Perth, Western Australia.	
374.	Lee, K., King, T.L., Robinson, B., Li, Z., Burridge, L., Lyons, M., Wong, D., MacKeigan, K., Courtenay, S., Johnson, S., Boudreau, M., Hodson, P., Greer, C. and Venosa, A.D. 2011. Toxicity Effects of Chemically Dispersed Crude Oil on Fish. In: International Oil Spill Conference Proceedings: March 2011, 2011(1): 163.	
375.	Fodrie F.J., Able K.W., Galvez F., Heck K.L., Jensen O.P., LópezDuarte P.C., Martin C.W., Turner R.E., Whitehead A. 2014. Integrating Organismal and Population Responses of Estuarine Fishes in Macondo Spill Research. BioScience, Volume 64, Issue 9, September 2014, Pages 778–788.	
376.	Hjermann D.Ø., Melsom A., Dingsør G.E., Durant J.M., Eikeset A.M., Roed L.P., Ottersen G., Storvik G., Stenseth N. 2007. Fish and oil in the Lofoten-Barents Sea system: synoptic review of the effect of oil spills on fish populations. Mar. Ecol. Prog. Ser., 339 (2007), pp. 283–299	
377.	IPIECA 1999. IPIECA Report Series. Volume Nine. Biological impacts of oil pollution: Sedimentary shores. International Petroleum Industry Environmental Conservation Association. London	
378.	ITOPF 2014. Effects of oil pollution on fisheries and mariculture. Technical Information Paper No. 11. The International Tanker Owners Pollution Federation Limited. London, United Kingdom.	
379.	Volkman J.K., Miller, G.J., Revill, A.T. and Connell, D.W. 2004. 'Oil spills.' In Environmental Implications of offshore oil and gas development in Australia – the findings of an independent scientific review. Edited by Swan, J.M., Neff, J.M. and Young, P.C. Australian Petroleum Exploration Association. Sydney	

Ref No	Description	Document ID
380.	King D.J., Lyne R.L., Girling A., Peterson D.R., Stephenson R., Short D. 1996. Environmental risk assessment of petroleum substances: the hydrocarbon block method. Prepared by members of CONCAWE's Petroleum Products Ecology Group. Report 95/62	
381.	Clark R. 1984. Impacts of oil pollution on seabirds. Environmental Pollution Series: Ecology and Biology. 33: 1–22.	
382.	Peakall, D.B., Wells, P.G. and Mackay, D. 1987. A hazard assessment of chemically dispersed oil spills and seabirds. Marine Environmental Research 22(2):91–106.	
383.	Shigenaka, G. 2001. Toxicity of oil to reef building corals: a spill response perspective. National Oceanic and Atmospheric Administration (NOAA) Technical Memorandum, National Ocean Service, Office of Research and Restoration 8, Seattle, USA	
384.	Negri, A.P. and Heyward, A.J. 2000. Inhibition of fertilization and larval metamorphosis of the coral Acropora millepora (Ehrenberg, 1834) by petroleum products. Marine Pollution Bulletin 41(7-12): 420–427.	
385.	Baca, B., Rosch, E., DeMicco, E.D. and Schuler, P.A. 2014. TROPICS: 30-year Follow-up and Analysis of Mangroves, Invertebrates, and Hydrocarbons. International Oil Spill Conference Proceedings: May 2014, Vol. 2014, No. 1, pp. 1734–1748.	
386.	Rice DW (1989) Sperm whale. In: Ridgeway SH, Harrison R (eds) Handbook of marine mammals. Dolphins and the larger toothed whales, Vol 4. Academic Press, London, p 177–233	
387.	Intecsea. 2015. Gorgon Development: Liquid Release Modelling – Gorgon and Jansz Flowline Release modelling for spill assessment. Intecsea, WorleyParsons Group. Unpublished report prepared for Chevron Australia Pty Ltd.	
388.	RPS. 2021. Gorgon Jansz Operations Update: Oil Spill Modelling. Unpublished report prepared for Chevron Australia Pty Ltd.	
389.	Zieman J.C., Orth R., Phillips R.C., Thayer G.W., Thorhaug A. 1984. “The effects of oil on seagrass ecosystems”. In: Cairns J, Buikema AL (eds) Restoration of habitats impacted by oil spills. Butterworth-Heinemann, Boston, MA, p37−64.	
390.	Peters, E.C., Gassman, N.J., Firman, J.C., Richmond, R.H., Power, E.A. 1997. Ecotoxicology of tropical marine ecosystems. Environmental Toxicology and Chemistry 16, 12–40	
391.	O'Brien P.Y. and Dixon P.S. 1976. The Effects of Oil and Oil Components on Algae: A review. British Phycological Journal 11:115–142	
392.	Peters, E.C. 1981. Bioaccumulation and histopathological effects of oil on a stony coral. Marine Pollution Bulletin 12(10):333–339	
393.	Knap A.H, Wyers S.C, Dodge R.E, Sleeter T.D, Frith H.R, Smith S.R, Cook C.B. 1985. The effects of chemically and physically dispersed oil on the brain coral Diploria strigosa. 1985 Oil Spill Conf, Publ 4385. Am Petroleum Inst, Washington, DC: 547–551	
394.	Girard, F. and Fisher, C.R. 2018. Long-term impact of the Deepwater Horizon oil spill on deep-sea corals detected after seven years of monitoring. Biological Conservation 225: 117-127.	
395.	Mott MacDonald. 2003. PARLOC 2001: The Update of Loss of Containment Data for Offshore Pipelines. July 2003, 5th Edition. Energy Institute, London.	

Ref No	Description	Document ID
396.	DEC. 2007. Management Plan for the Montebello/Barrow Islands Marine Conservation Reserves 2007-2017. Department of Environment and Conservation, Marine Parks and Reserves	
397.	Katherine A. Dafforn,Tim and Glasby,Emma L. J. 2009. Links between estuarine condition and spatial distributions of marine invaders. Diversity and distributions p 807-821. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1472-4642.2009.00587.x [Accessed November 2024].	
398.	DPW. 2015. *Spring news 2015. Ningaloo coast*, Available at: https://library.dbca.wa.gov.au/static/Journals/080954/080954-2015.09.pdf [Accessed November 2024]	
399.	DSEWPaC. 2012. Conservation Management Plan for the Southern Right Whale. A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999 2011-2021. Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT. Available from: http://www.environment.gov.au/resource/conservation-management-plansouthern-right-whale-recovery-plan-under-environment [Accessed October 2023]	
400.	DCCEEW. 2022. Draft National Recovery Plan for the Southern Right Whale. Department of Climate Change, Energy, the Environment and Water, Canberra, ACT. Available from: https://www.dcceew.gov.au/sites/default/files/documents/draft-nationalrecovery- plan-southern-right-whale.pdf [Accessed October 2023]	
401.	DEWHA. 2008. The North-west Marine Bioregional Plan: Bioregional Profile. Parks Australia. Department of the Environment, Water, Heritage and the Arts, Australian Government, Canberra, Australian Capital Territory. Available from: https://parksaustralia.gov.au/marine/pub/scientific-publications/archive/northwest-bioregional-plan.pdf [Accessed: August 2023].	
402.	DoE. 2023. Species Profile and Threats Database: Dugong dugon - Dugong. Department of the Environment, Canberra, Australian Capital Territory. Available from: http://www.environment.gov.au/cgibin/sprat/public/publicspecies.pl?taxon_id=28 [Accessed December 2023].	
403.	DCCEEW. 2024. Dugongs. Department of Climate Change, Energy, the Environment and Water. Available from: https://www.dcceew.gov.au/environment/marine/marine-species/dugongs [Accessed March 2024].	
404.	DAWE. 2020. Wildlife Conservation Plan for Seabirds, Commonwealth of Australia 2020. Department of Agriculture, Water and the Environment, Canberra, Australian Capital Territory. Available from: https://www.dcceew.gov.au/sites/default/files/documents/wildlife-conservationplan-for-seabirds.pdf [Accessed: September 2023].	
405.	NCVA (2024). NCVA- Interactive Map. National Conservation Values Atlas: Interactive Map. Department of Climate Change, Energy, the Environment and Water. Government of Australia, Canberra, Australian Capital Territory. Available from: https://www.environment.gov.au/webgisframework/apps/ncva/ncva.jsf [Accessed March 2024].	
406.	Del Hoyo, J., Elliott, A., Sargatal, J. 1996. Handbook of the Birds of the World, vol. 3: Hoatzin to Auks. Lynx Edicions, Barcelona, Spain.	
407.	IPIECA. 2017. Guidelines on implementing spill impact mitigation	

Ref No	Description	Document ID
	assessment (SIMA). International Petroleum Industry Environmental Conservation Association, London, United Kingdom.	
408.	Chevron Australia. 2020. Oil Spill Protection Prioritisation Process – North West Shelf. Chevron Australia, Perth, Western Australia.	ABU1805002 32
409.	DoT. 2017. DOT307215 Provision of Western Australian Marine Oil Pollution Risk Assessment – Protection Priorities: Protection Priority Assessment for Zone 2: Pilbara – Final Report.	
410.	Butler, I, Patterson, H, Bromhead, D, Galeano, D, Timmiss, T, Woodhams, J and Curtotti, R 2024, Fishery status reports 2024, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.	
411.	Michele Thums, Luciana C. Ferreira, Andrew Davenport, Micheline Jenner, Luciana Möller, Grace Russell, Robert D. McCauley, Curt Jenner, *Tracking pygmy blue whale diving behaviour and validation of foraging areas defined from horizontal movement data*, Global Ecology and Conservation, Volume 57, 2025, e03362, ISSN 2351-9894, https://doi.org/10.1016/j.gecco.2024.e03362. (https://www.sciencedirect.com/science/article/pii/S2351989424005663)	
412.	N. Villamizar, B. Blanco-Vives, H. Migaud, A. Davie, S. Carboni, F.J. Sánchez-Vázquez, 2011. Effects of light during early larval development of some aquacultured teleosts: A review, Aquaculture, Volume 315, Issues 1–2, Pages 86-94, ISSN 0044-8486.	
413.	National Marine Fisheries Service. 2024. *Update to: Technical Guidance for Assessing the 4 Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-5 Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts*. U.S. Dept. of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-71, 182p	
414.	DISR. 2024. Future Gas Strategy. Department of Industry, Science and Resources, Australian Government, Canberra, Australia. Available from: https://www.industry.gov.au/publications/future-gas-strategy [Accessed October 2024]	GOR-COP-00902
415.	Minister for Resources and Minister for Northern Australia. 2024. Media Release: Australia's Future Gas Strategy (9 May 2024). Available from: https://www.minister.industry.gov.au/ministers/king/media-releases/australias-future-gas-strategy [Accessed October 2024]	
416.	The Treasury. 2024. Factsheet: A Future Made in Australia. The Treasury, Australian Government, Canberra, Australia. Available from: https://budget.gov.au/content/factsheets/download/factsheet-fmia.pdf [Accessed October 2024]	
417.	DCCEEW. 2024. Net Zero. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero#toc_1 [Accessed October 2024]	
418.	DCCEEW. 2024. Electricity and Energy Sector Plan: Discussion Paper. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero/electricity-and-energy-sector-plan [Accessed October 2024]	
419.	UN Climate Change. [no date]. The Paris Agreement: What is the Paris Agreement?. United Nations Framework Convention on Climate Change secretariat, Bonn, Germany. Available from:	

Ref No	Description	Document ID
	https://unfccc.int/process-and-meetings/the-paris-agreement [Accessed October 2024]	
420.	UN Climate Change. 2016. Paris Agreement. United Nations Framework Convention on Climate Change, Bonn, Germany. Available from: https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf [Accessed October 2024]	
421.	DISER. 2022. Australia's Nationally Determined Contribution Communication 2022. Department of Industry, Science, Energy and Resources, Australian Government, Canberra, Australia. Available from: https://unfccc.int/sites/default/files/NDC/2022-06/Australias%20NDC%20June%202022%20Update%20%283%29.pdf [Accessed October 2024]	
422.	Chevron Australia. .G7-VE-O-USJ2-A16C18458310004-Jansz-Io Compression Phase 4 – Field Control Station Asset Integrity Management Plan. Chevron Australia, Perth, Western Australia.	
423.	DCCEEW. 2024. National Inventory Report 2022: The Australian Government Submission to the United Nations Framework Convention on Climate Change. Volume 1. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/climate-change/publications/national-inventory-report-2022 [Accessed October 2024]	
424.	Climate Change Authority. 2023. 2023 Annual Progress Report. Climate Change Authority, Australian Government, Canberra, Australia. Available from: https://www.climatechangeauthority.gov.au/2023-annual-progress-report [Accessed October 2024]	
425.	DCCEEW. 2024. Factsheet: Safeguard Mechanism. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/sites/default/files/documents/safeguard-mechanism-reforms-factsheet.pdf [Accessed October 2024]	
426.	Government of Western Australia. 2024. Greenhouse Gas Emissions Policy for Major Projects. Government of Western Australia, Perth, Western Australia. Available from: https://www.wa.gov.au/government/publications/greenhouse-gas-emissions-policy-major-projects [Accessed October 2024]	
427.	Chevron. 2024. 2023 Climate Change Resilience Report – Advancing Energy Progress. Chevron Corporation, San Ramon, CA.	
428.	Chevron Australia. 2006. Final Environmental Impact Statement / Response to Submission on the Environmental Review and Management Programme for the Proposed Gorgon Development. Chevron Australia, Perth, Western Australia.	
429.	Chevron Australia. 2008. Gorgon Gas Development Revised and Expanded Proposal Public Environmental Review. Chevron Australia, Perth, Western Australia.	
430.	Chevron Australia. 2014. Gorgon Gas Development Fourth Train Expansion Proposal Public Environmental Review / Draft Environmental Impact Statement. Chevron Australia, Perth, Western Australia.	G4-NT-REPX0000286
431.	Chevron Australia. 2015. Gorgon Gas Development and Jansz Feed Gas Pipeline: Greenhouse Gas Abatement Program. Chevron Australia, Perth, Western Australia.	G1-NT-PLNX0000012

Ref No	Description	Document ID
432.	Chevron Australia. 2024. Gorgon Gas Treatment Plant Greenhouse Gas Management Plan. Chevron Australia, Perth, Western Australia.	GOR-COP-03025
433.	WRI and WBCSD. 2013. The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition). World Resources Institute and World Business Council for Sustainable Development.	
434.	DSWEPaC. 2013. EPBC Act Policy Statement: 'Indirect consequences' of an action: Section 527E of the EPBC Act. Department of Sustainability, Environment, Water, Population and Communities, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-policy-statement-indirect-consequences-action-section-527e-epbc-act [Accessed October 2024].	
435.	IMO. 2014. Resolution MEPC.245(66) – 2014 Guidelines on the method of calculation of the attained energy efficiency design index (EEDI) for new ships. Available from: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/245(66).pdf [Accessed November 2021]	
436.	IPCC. 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp	
437.	IPIECA. 2016. Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions – Overview of methodologies. International Petroleum Industry Environmental Conservation Association, London, United Kingdom.	
438.	API. 2021. Compendium of greenhouse gas emissions methodologies for the natural gas and oil industry (2021). American Petroleum Institute, Washington, United States of America.	
439.	API. 2009. Compendium of greenhouse gas emissions methodologies for the natural gas and oil industry (2009). American Petroleum Institute, Washington, United States of America.	
440.	The Government of Japan Japan's Nationally Determined Contribution. Available from: https://unfccc.int/sites/default/files/NDC/2022-06/JAPAN_FIRST%20NDC%20%28UPDATED%20SUBMISSION%29.pdf [Accessed October 2024]	
441.	The Government of Japan. 2021. The Long-term Strategy under the Paris Agreement. Available from: https://unfccc.int/sites/default/files/resource/Japan_LTS2021.pdf [Accessed October 2024]	
442.	The Republic of Korea. 2021. The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution, December 23, 2021. Available from: https://unfccc.int/sites/default/files/NDC/2022-06/211223_The%20Republic%20of%20Korea%27s%20Enhanced%20Update%20of%20its%20First%20Nationally%20Determined%20Contribution_211227_editorial%20change.pdf [Accessed October 2024]	
443.	The Government of China. 2021. China's Achievements, New Goals and New Measures for Nationally Determined Contributions. Available from: https://unfccc.int/sites/default/files/NDC/2022-06/China%E2%80%99s%20Achievements%2C%20New%20Goals%2	

Ref No	Description	Document ID
	0and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf [Accessed October 2024]	
444.	Republic of China (Taiwan). 2022. Update of Taiwan's Nationally Determined Contribution. Available from: https://service.cca.gov.tw/File/Get/climatetalks/en/s6CKUJns2HqZMl7 [Accessed October 2024]	
445.	IEA. 2023. Energy System – Fossil Fuels – Natural Gas. International Energy Agency, Paris, France. Available from: https://www.iea.org/energy-system/fossil-fuels/natural-gas [Accessed October 2024]	
446.	AEMO. 2022. 2022 Integrated System Plan for the National Electricity Market. Australian Energy Market Operator Limited, Melbourne, Victoria. Available from:. https://aemo.com.au/-/media/files/majorpublications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en [Accessed October 2024].	
447.	AEMO. 2023. 2023 Western Australia Gas Statement of Opportunities. Australian Energy Market Operator Limited, Melbourne, Victoria. Available from: https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gasstatement-of-opportunities-wagsoo.pdf?la=en&hash=71B9040F2097FF4552429FF8F61C62A4 [Accessed October 2024].	
448.	CoA. 2020. Wildlife Conservation Plan for Seabirds. Department of Agriculture, Water and the Environment, Australian Government, Canberra, Australian Capital Territory.	
449.	IEA. 2024. World Energy Outlook 2024. International Energy Agency, Paris, France. Available from: https://www.iea.org/reports/world-energy-outlook-2024 [Accessed October 2024].	
450.	Chiew, F., Costello M.J., Hennessy K., Lansbury N., Bhaskar Nidumolu U., Peci, G., Rickards L., Tapper N., Woodward A., Wreford A. 2022. Chapter 11: Australasia. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.	
451.	DCCEEW. 2024. Key threatening processes under the EPBC Act. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/environment/biodiversity/threatened/key-threatening-processes [Accessed October 2024].	
452.	DCCEEW. 2024. Loss of terrestrial climatic habitat caused by anthropogenic emissions of greenhouse gases. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia. Available from: https://www.dcceew.gov.au/environment/biodiversity/threatened/key-threatening-processes/loss-of-habitat-caused-by-greenhouse-gases#:~:text=The%20'Loss%20of%20climatic%20habitat,human%20activities%20of%20greenhouse%20gases [Accessed October 2024].	
453.	DoE. 2015. Wildlife Conservation Plan for Migratory Shorebirds. Department of the Environment, Australian Government, Canberra, Australian Capital Territory. Available from: Wildlife Conservation Plan for Migratory Shorebirds (environment.gov.au) [Accessed March 2021].	
454.	DEWHA. 2012. Marine bioregional plan for the North-west Marine Region. Department of the Environment, Water, Heritage and the Arts,	

Ref No	Description	Document ID
	Australian Government, Canberra, Australian Capital Territory. Available from: Marine bioregional plan for the North-west Marine Region (environment.gov.au) [Accessed March 2021].	
455.	Chevron Australia. 2018. ABU Marine Safety, Reliability and Efficiency (MSRE): Corporate OE Process. Chevron Australia, Perth, Western Australia.	
456.	United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. United Nations, Paris, France. Available from: https://sdgs.un.org/2030agenda [Accessed October 2024]	
457.	Chevron Australia. 2024. 2023 Corporate Sustainability Report. Chevron Corporation, San Ramon, CA	
458.	Jeff Waage, J., Yap, C., Bell, S., Levy, C., Mace, G., Pegram, T., Unterhalter, E., Dasandi, N., Hudson, D., Kock, R., Mayhew, S., Marx, C., and Poole, N. 2015. Governing the UN Sustainable Development Goals: interactions, infrastructures, and institutions. Lancet. 2010; 376: 991-1023.	
459.	DSEWPaC. 2013. *Recovery Plan for the White Shark (Carcharodon carcharias)*. Department of Sustainability, Environment, Water, Population and Communities, Australian Government, Canberra, Australian Capital Territory.	
460.	DEWHA. 2008. Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle). Department of the Environment, Water, Heritage and the Arts, Australian Government, Canberra, Australian Capital Territory. Available from: Approved conservation advice for Dermochelys coriacea (Leatherback Turtle) (environment.gov.au) [Accessed March 2021].	
461.	Chevron Australia, 2024. Chevron Emergency Management ABU Training ab=nd Exercise program Procedure (Contained within Appendix G of the ABU Consolidated OPEP)	
462.	APPEA 2021. Guidance Document: Incident Management Teams – Knowledge Requirements for Responding to Marine Oil Spills	
463.	Chevron, 2023. PEMT Oil Spill Response Resource Assessment Tool	ABU231100481
464.	Chevron 2018. Corporate Emergency ABU Response Teams and Resources Procedure	OE-11.01.1111
465.	Arias, P. A., N. Bellouin, E. Coppola, R. G. Jones, G. Krinner, J. Marotzke, V. Naik, M. D. Palmer, G-K. Plattner, J. Rogelj, M. Rojas, J. Sillmann, T. Storelvmo, P. W. Thorne, B. Trewin, K. Achuta Rao, B. Adhikary, R. P. Allan, K. Armour, G. Bala, R. Barimalala, S. Berger, J. G. Canadell, C. Cassou, A. Cherchi, W. Collins, W. D. Collins, S. L. Connors, S. Corti, F. Cruz, F. J. Dentener, C. Dereczynski, A. Di Luca, A. Diongue Niang, F. J. Doblas-Reyes, A. Dosio, H. Douville, F. Engelbrecht, V. Eyring, E. Fischer, P. Forster, B. Fox-Kemper, J. S. Fuglestvedt, J. C. Fyfe, N. P. Gillett, L. Goldfarb, I. Gorodetskaya, J. M. Gutierrez, R. Hamdi, E. Hawkins, H. T. Hewitt, P. Hope, A. S. Islam, C. Jones, D. S. Kaufman, R. E. Kopp, Y. Kosaka, J. Kossin, S. Krakovska, J-Y. Lee, J. Li, T. Mauritsen, T. K. Maycock, M. Meinshausen, S-K. Min, P. M. S. Monteiro, T. Ngo-Duc, F. Otto, I. Pinto, A. Pirani, K. Raghavan, R. Ranasinghe, A. C. Ruane, L. Ruiz, J-B. Sallée, B. H. Samset, S. Sathyendranath, S. I. Seneviratne, A. A. Sörensson, S. Szopa, I. Takayabu, A-M. Treguier, B. van den Hurk, R. Vautard, K. von Schuckmann, S. Zaehle, X. Zhang, K. Zickfeld, 2021, Technical Summary. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E.	

Ref No	Description	Document ID
	Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press, page 26	
466.	IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [MassonDelmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].Cambridge University Press. In Press.	
467.	IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.	
468.	Will Steffen, Andrew Burbidge, Lesley Hughes, Roger Kitching, David Lindenmayer, Warren Musgrave, Mark Stafford Smith and Patricia Werner. 2009. Australia's Biodiversity and Climate Change: Summary for Policy Makers 2009. Prepared for the Australian Government by the Biodiversity and Climate Change Expert Advisory Group.	
469.	DCCEEW.2022. Threatened Species Action Plan 2022-2032. Department of Climate Change, Energy, the Environment and Water, Australian Government, Canberra, Australia.	
470.	Thorton Tomasetti. 2023. Lithium Battery Skid Thermal Runaway Effects Modelling. Perth, Australia.	GORUS00-SUB-RPT-CVX-00039
471.	SubCtech. 2024. Teledyne Benthos Accoustic Telemetry Modems User's Manual. North Falmouth, USA.	GOR-US00-SUB-MAN-SCT-00020
472.	Chevron Australia. 2025. Jansz-Io Compression SCSt - Underwater Acoustic Modelling Technical Note. Perth, Australia.	G7-TE-U-USJ0-TCNX018
473.	McCauley, R, Erbe, C, Jenner, C, Jenner, M, Browne, C and Gavrilov, A (2025) Pygmy Blue and Omura's Whale Acoustic Detections, JIC and surrounding regions, 2019–2023. A report prepared by CMST for Chevron Australia.	
474.	McCauley and Erbe (2025) Sonar Biomass Surveys at JIC. A report prepared by CMST for Chevron Australia.	
475.	Federal Court of Australia (2023) New Ref Cooper v National Offshore Petroleum Safety and Environmental Management Authority & Ors [2023] FCA 1112	
476.	Federal Court of Australia (2023) New Ref Cooper v National Offshore Petroleum and Safety Management Authority (No 2) [2023] FCA 1158. Available at: https://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/single/2023/2023fca1158	
477.	Business & Human Rights Resource Centre (2021) Chevron's response to IPRI-IWGIA 2021 report. Available from: https://www.business-humanrights.org/en/latest-news/chevrons-response-to-ipri-iwgia-2021-report/	

Ref No	Description	Document ID
478.	Department of Planning, Lands and Heritage (2023) Aboriginal Heritage Act 1972 Guidelines. Available from: https://www.wa.gov.au/system/files/2023-11/aboriginal_heritage_act_1972_guidelines.pdf	
479.	DCCEEW. 2024.Annual Climate Change Statement 2024. Available from: https://www.dcceew.gov.au/sites/default/files/documents/annual-climate-change-statement-2024.pdf	
480.	DCCEEW. 2021. Australia, state of the Environment, Indigenous heritage. Available from: https://soe.dcceew.gov.au/heritage/environment/indigenous-heritage	
481.	Chevron Australia. 2005. Draft Environmental Impact Statement / Environmental Review and Management Programme for the Proposed Gorgon Development. Chevron Australia, Perth, Western Australia	

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.

Mark Hatfield
Managing Director, Australasia Business Unit

the human energy company™

appendix b subsea inventory summary

The following table provides the status of subsea infrastructure associated with the Gorgon Gas Development (current as of March 2025), including infrastructure to be installed in the 5-year validity period of the EP.

Item	Petroleum title infrastructure overlaps	Status	IM Plan	EP reference
Wells				
Gorgon field				
GOR-1A	WA-37-L	Operational	In place	3.2.2
GOR-1B	WA-37-L	Operational	In place	3.2.2
GOR-1C	WA-37-L	Operational	In place	3.2.2
GOR-1D	WA-37-L	Operational	In place	3.2.2
GOR-1E	WA-37-L	Operational	In place	3.2.2
GOR-1F	WA-37-L	Operational	In place	3.2.2
GOR-1G	WA-37-L	Operational	In place	3.2.2
GOR-2B	WA-37-L	Operational	In place	3.2.2
GOR-2C	WA-37-L	Operational	In place	3.2.2
GOR-3B	WA-37-L	Operational	In place	3.2.2
GOR-3C	WA-37-L	Operational	In place	3.2.2
GOR-4C	WA-37-L	Operational	In place	3.2.2
GOR-4D	WA-37-L	Operational	In place	3.2.2
GOR-4E	WA-37-L	Operational	In place	3.2.2
GOR-4F	WA-37-L	Operational	In place	3.2.2
Jansz–Io field				
JZI-1B	WA-36-L	Operational	In place	3.2.2
JZI-1C	WA-36-L	Operational	In place	3.2.2
JZI-1D	WA-36-L	Operational	In place	3.2.2
JZI-1E	WA-36-L	Operational	In place	3.2.2
JZI-1F	WA-36-L	Operational	In place	3.2.2
JZI-2B	WA-39-L	Operational	In place	3.2.2
JZI-2C	WA-39-L	Operational	In place	3.2.2
JZI-2D	WA-39-L	Operational	In place	3.2.2
JZI-2E	WA-39-L	Operational	In place	3.2.2
JZI-2F	WA-39-L	Operational	In place	3.2.2
JZI-3C	WA-36-L	Operational	In place	3.2.2
JZI-3D	WA-36-L	Operational	In place	3.2.2
JZI-3E	WA-36-L	Operational	In place	3.2.2
JZI-3F	WA-36-L	Operational	In place	3.2.2

Item	Petroleum title infrastructure overlaps	Status	IM Plan	EP reference
Manifolds				
Gorgon field				
Gorgon M1 manifold	WA-37-L	Operational	In place	3.2.3
Gorgon M2 manifold	WA-37-L	Operational	In place	3.2.3
Gorgon M3 manifold	WA-37-L	Operational	In place	3.2.3
Gorgon M4 manifold	WA-37-L	Operational	In place	3.2.3
Jansz–Io field				
Jansz DC-1 combined manifold/PTS	WA-36-L	Operational	In place	3.2.3
Jansz DC-2 combined manifold/PTS	WA-39-L	Operational	In place	3.2.3
Jansz DC-3 combined manifold/PTS	WA-36-L	Operational	In place	3.2.3
Pipeline termination structures				
Gorgon field				
Gorgon Midline PTS	WA-37-L	Operational	In place	3.2.4
Gorgon M1 PTS	WA-37-L	Operational	In place	3.2.4
Gorgon M2 PTS	WA-37-L	Operational	In place	3.2.4
Gorgon M3 PTS	WA-37-L	Operational	In place	3.2.4
Gorgon M4 PTS	WA-37-L	Operational	In place	3.2.4
Jansz–Io field				
Jansz-Io Midline PTS	WA-39-L	Operational	In place	3.2.4
Jansz DC-1 combined manifold/PTS	WA-39-L	Operational	In place	3.2.4
Jansz DC-2 combined manifold/PTS	WA-39-L	Operational	In place	3.2.4
Jansz DC-3 combined manifold/PTS module	WA-36-L	Operational	In place	3.2.4
Production pipelines and support infrastructure				
Gorgon field				
Production pipeline (1)	WA-37-L, WA-50-R, WA-510-P, WA-63-L	Operational	In place	3.2.8
8” MEG pipeline (1)	WA-37-L, WA-50-R, WA-510-P, WA-63-L	Operational	In place	3.2.5
6” utility pipeline (1)	WA-37-L, WA-50-R, WA-510-P, WA-63-L	Operational	In place	3.2.5

Item	Petroleum title infrastructure overlaps	Status	IM Plan	EP reference
Gorgon umbilical (1)	WA-37-L, WA-50-R, WA-510-P, WA-63-L	Operational	In place	3.2.7
GBUP umbilical (1)	WA-37-L, WA-50-R, WA-510-P, WA-63-L	Operational	In place	3.2.7
Gorgon CDU (1)	WA-37-L	Operational	In place	3.2.6
Jansz–Io field				
Production pipeline (1)	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Operational	In place	3.2.8
8” MEG pipeline (1)	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Operational	In place	3.2.5
6” utility pipeline (1)	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Operational	In place	3.2.5
Jansz umbilical (1)	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Operational	In place	3.2.7
JBUP umbilical (1)	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Not yet installed	To be developed	3.2.7
Jansz CDU (1)	WA-39-L	Operational	In place	3.2.6
Infield flowlines				
Gorgon field				
26” CRA infield production flowlines (3)	WA-37-L	Operational	In place	3.2.5
24” M4 CRA infield production flowline	WA-37-L	Operational	In place	3.2.5
8” MEG pipelines (4)	WA-37-L	Operational	In place	3.2.5
6” utility pipelines (4)	WA-37-L	Operational	In place	3.2.5
Jansz–Io field				
24” CRA infield production flowlines (2)	WA-36-L, WA-39-L	Operational	In place	3.2.5

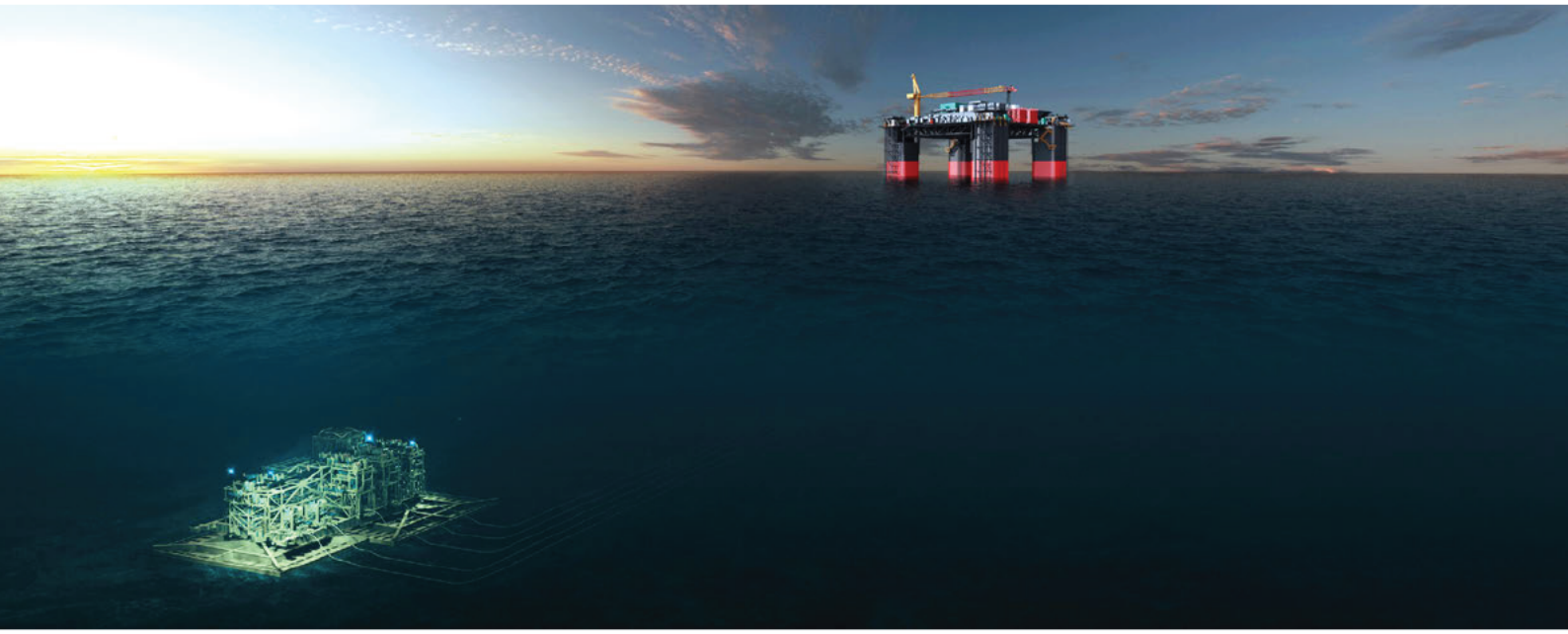
Item	Petroleum title infrastructure overlaps	Status	IM Plan	EP reference
18” DC-3 CRA infield production flowline (2)	WA-36-L	Operational	In place	3.2.5
6” MEG pipelines (3)	WA-36-L, WA-39-L	Operational	In place	3.2.5
6” utility pipelines (3)	WA-36-L, WA-39-L	Operational	In place	3.2.5
J-IC infrastructure				
Jansz–Io field				
SCSt	WA-39-L, WA-19-PL	Not yet installed	Ready	3.2.10
SCMS	WA-39-L, WA-19-PL	Installed (not yet operational)	In place	3.2.10
FCS	WA-39-L, WA-19-PL	Not yet installed	Ready	3.2.11
FCS suction piles (12)	WA-39-L	Installed (not yet operational)	In place	3.2.11
J-IC MV umbilicals (5)	WA-39-L, WA-19-PL	Not yet installed	Ready	3.2.11
HVSC	WA-14-R, WA-19-R, WA-20-R, WA-24-R, WA-29-L, WA-37-L, WA-39-L, WA-42-R, WA-510-P, WA-63-L	Not yet installed	Ready	3.2.7
J-IC seabed spools (9)	WA-39-L, WA-19-PL	Not yet installed	Ready	3.2.10

appendix c relevant persons consultation material

information sheet

gorgon and jansz feed gas pipeline and wells operations

(including jansz-io compression)



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, offshore production wells and pipeline infrastructure have gathered natural gas from the Jansz-Io and Gorgon gas fields and transported it to the Gorgon Gas Facility on Barrow Island. From the Gorgon Gas Facility, gas is processed for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

As predicted, the Jansz-Io gas field reservoir pressure has declined over time. To enhance the recoverability of gas and maintain current rates of production at the Gorgon Gas Facility, Chevron Australia plans to install and operate a subsea compression station (SCSt), floating field control station (FCS) and associated infrastructure [Table 1].

Installation of compression infrastructure in the Jansz-Io field was always contemplated as a means of maintaining current production levels over the approved life of the Gorgon development and will support the ongoing delivery of energy to customers in WA and the Asia Pacific region for decades to come.

Chevron Australia is currently undertaking a revision of the Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) Environment Plan (EP), to include the operation of the Jansz-Io Compression (J-IC) infrastructure.

A separate EP, which addresses J-IC installation activities was accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in May 2024.

This information sheet is intended to assist 'relevant persons' to make an informed assessment of the environmental impact and risks of our activities and to provide input and feedback to enhance the revision of the EP.

Relevant persons are those whose functions, interests or activities may be affected by our activities. This includes

Traditional Owners and Custodians' spiritual and cultural connection to Country, commercial and recreational fishing, tourism, 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.

location and water depth

The Jansz-Io gas field is located within production licences WA-36-L, WA-39-L and WA-40-L, approximately 200 kilometres (km) off the northwest coast of WA in water depths of approximately 1,350 metres (m).

The Gorgon gas field is located within production licences WA-37-L and WA-38-L, approximately 130 km off the northwest coast of WA, and 65 km northwest of Barrow Island in water depths of approximately 200 m.

The Gorgon and Jansz pipelines are located in Commonwealth waters within pipeline licences WA-19-PL and WA-20-PL.

The operational area (OA) in which the petroleum activities described in the EP will be undertaken is shown in Figure 1.

The location of Gorgon Project infrastructure is shown in Table 1 (coordinates) and Figure 2 (map).

activity summary

The revised EP will include the commissioning and start-up of the SCSt and ongoing operations of the new J-IC subsea and floating infrastructure [Table 1].

The FCS will be normally unattended, with personnel onboard during periodic inspection, maintenance and repair (IMR) campaigns. Personnel will be transferred to the FCS via helicopter or a support vessel. The SCSt will be operated and monitored remotely from a control room on Barrow Island.

The routine operation of the existing Gorgon and Jansz-Io hydrocarbon systems will continue under the revised EP. Primary activities include the flow and transportation of hydrocarbon and other produced fluids from the wells to the Gorgon Gas Facility on Barrow Island, via infield flowlines and pipelines. Periodic IMR activities will be undertaken to ensure the integrity of infrastructure is maintained.

IMR activities may include:

- visual inspections – may involve the use of remotely operated vehicles (ROVs) or similar and divers and a dive support vessel
- marine surveys
- testing and measurements
- pigging (e.g. cleaning) of pipelines
- module/component change-out, stabilisation, removal of marine growth etc.

During normal operations, vessels will typically be limited to supply/support vessels and IMR vessels. The vessel size and type will be dependent on the work scope. It is anticipated vessels will operate 24 hours per day for the duration of activities.

schedule and duration

The revised EP will cover the ongoing operation of the hydrocarbon system (production wells, pipelines, and associated infrastructure) in Commonwealth waters for the Gorgon and Jansz-Io gas fields.

IMR activities may occur at any time, with the frequency determined using a broad risk-based approach, which will include an assessment of safety, environmental and commercial risks. The duration will depend on the scope of the activities, however works will typically be completed within 10 to 200 days.

Subject to relevant approvals and other factors, J-IC operational activities, including commissioning and start-up, were expected to commence from 2026.

As of December 2024, the indicative schedule for the J-IC Project has been updated, with commissioning activities expected to commence from 2026, and start-up and operational activities expected from 2027 or 2028.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, we create an EMBA map to provide geographical context for stakeholders to determine if their functions, interests or activities may be affected by an offshore activity during operations or in an emergency scenario.

Figure 1 shows the EMBA, which is based on a worst-case environmental scenario, which in this case is an unplanned release (oil spill) from the hydrocarbon system and/or a vessel collision. Shoreline loading refers to areas of the coast that may be impacted by hydrocarbons.

The EMBA has been defined through combining 300 simulations for each unplanned release scenario 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 or risks directly arising from activities, or from an emergency scenario, would occur within close 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.

Table 2 summarises the key impacts or 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 extensive environmental and modelling studies and considered scientific advice and government guidance (including conservation management and recovery plans) in assessing impacts and risks to marine fauna.

The SCSt will be situated at a water depth of ~1,350 m on the seabed, where operations will result in a localised change to ambient underwater sound.

Marine fauna found at the SCSt location are predominantly pelagic and deep-sea demersal fish species. Some threatened and/or migratory fish species (e.g. whale sharks, other sharks and manta rays) may be present in the area; however, these are primarily coastal species or are associated with shallower water or features (e.g. seamounts and reefs).

Biologically Important Areas (BIAs) for several marine fauna species overlap the EMBA. Additionally, the pygmy blue whale migration BIA overlaps with the SCSt location [Figure 2].

As with most offshore areas in WA, a range of other marine mammal species are known to transit the J-IC area including Antarctic minke whales, Bryde's whales, fin whales, humpback whales, sei whales, sperm whales, killer whales and spotted bottlenose dolphins.

The closest turtle nesting habitats to J-IC are Barrow, Montebello, and Lowendal islands, over 135 km away. Similarly, shallower internesting BIAs extend a maximum of 60 km from these nesting beaches, more than 70 km from the SCSt and FCS.

safe navigation area and marine exclusion zone

The following infrastructure is subject to a 500 m radius petroleum safety exclusion zone:

- Gorgon midline pipeline termination structure
- Gorgon M1 – production manifold and wells
- Gorgon M2 – production manifold and wells
- Gorgon M3 – production manifold and wells
- Gorgon M4 – production manifold and wells
- Jansz umbilical midline connection assembly

A new 500 m radius exclusion zone will be sought for the FCS once installed.

No other exclusion zones will be sought for the subsea infrastructure.

first nations cultural values

We acknowledge that Traditional Owner groups in the northwest region of WA have identified Sea Country as an important value and expressed a deep obligation to protect songlines, dreaming stories and the marine fauna connected to them.

Chevron Australia is committed to ongoing engagement and consultation with Traditional Owners and their representative bodies. This process will continue to inform our understanding of cultural values and features and help facilitate the co-design of appropriate controls to avoid impacts.

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 to NOPSEMA a revised version of the Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP, which will:

- describe the environment in which operations, including the operation of the J-IC infrastructure, are planned to take place;
- include an assessment of environmental impacts and risks arising from those operations;
- identify control measures to manage the potential impacts and risks to levels that are acceptable and ALARP; 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 operations will be managed so that they are acceptable and ALARP 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 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 Monday, 17 February 2025.

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

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, Chevron Australia will collect your name and contact details, for the purposes of maintaining contact with you and including 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. Chevron may transfer your information to NOPSEMA if required and, if you do not identify it as sensitive, to other Chevron affiliates including our head office 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**

Table 1: Gorgon Project Infrastructure Details

Infrastructure	Details	Latitude South	Longitude East	Depth (~m)
Existing infrastructure				
Gorgon Midline pipeline termination structure	Connects the infield production flowlines (running from the subsea production manifolds) and the main production pipeline to the Gorgon Gas Facility.	20° 29′ 11.20″	114° 53′ 53.29″	130
Gorgon M1 – Production manifold and wells	Gorgon Drill Centre M1 has 7 production wells and a manifold (manifolds allows for commingling of well fluids before entering infield production flowlines).	20° 24′ 29.58″	114° 50′ 57.27″	215
Gorgon M2 – Production manifold and wells	Gorgon Drill Centre M2 has 2 production wells and a manifold.	20° 27′ 37.44″	114° 50′ 30.99″	200
Gorgon M3 – Production manifold and wells	Gorgon Drill Centre M3 has 2 production wells and a manifold.	20° 31′ 12.18″	114° 49′ 25.45″	200
Gorgon M4 – Production manifold and wells	Gorgon Drill Centre M4 has 4 production wells, a manifold and pipeline termination structure.	20° 34′ 37.38”	114° 46′ 37.97”	250
Jansz Umbilical Midline Connection Assembly	Due to the length of the Jansz umbilical, it was installed in two sections and required the installation of a midline connection assembly.	20° 23′ 35.19″	114° 58′ 58.61″	107
Jansz Midline pipeline termination structure	Connects the infield production flowlines (running from the subsea production manifolds) and the main production pipeline to the Gorgon Gas Facility.	19°48’33.90”	114º36’26.26”	1,275
Jansz Drill Centre 1 and wells	Jansz Drill Centre 1 has 5 production wells and a manifold.	19° 49′ 35.16”	114° 34′ 14.31″	1,338
Jansz Drill Centre 2 and wells	Jansz Drill Centre 2 has 5 production wells and a manifold.	19° 47′ 29.65″	114° 38′ 39.66″	1,349
Jansz Drill Centre 3 and wells	Jansz Drill Centre 3 has 4 production wells and a combined manifold/pipeline termination structure.	19° 51′ 10.44″	114° 30′ 56.19″	1,315
Pipelines	The pipelines facilitate the flow of hydrocarbons and other produced fluids from the Gorgon and Jansz fields to the gas facility on Barrow Island.	Refer to Figure 2 for location		12 – 1,275
Umbilicals	Umbilicals run from Barrow Island to the Gorgon and Jansz fields and provide power, fibre optics and chemical supplies.	Refer to Figure 2 for location		12 – 1,275
Contingency Power Supply Infrastructure	Contingency power supply infrastructure including a subsea battery system and a downline from a vessel may be used as required in the Gorgon and Jansz fields.	**Gorgon**: 19° 48’ 45.971” **Jansz**: 19° 48’ 45.971”	114° 36’ 28.008” 114° 36’ 28.008”	**Gorgon**: 130 **Jansz**: 1,345
New J-IC infrastructure				
Subsea Compression Station (SCSt)	Electric powered SCSt for the Jansz-Io field, including compressors and pumps. Receives power via the FCS.	19° 48’ 35.00”	114° 36’ 20.84”	1,345
Subsea Compression Manifold Station (SCMS)	A manifold located between the SCSt and existing Jansz infrastructure containing piping, sensors and connection systems.	19° 48’ 32.44”	114° 36’ 20.24”	1,345
Field Control Station (FCS)	A normally unattended, moored floating facility that will accommodate electrical equipment, anchored to the seabed by 12 mooring lines. Accommodation is available on board when required during IMR campaigns.	19° 52’ 43.67”	114° 36’ 28.91”	1,275
J-IC umbilical	Additional umbilical installed between Barrow Island and the FCS adjacent to the existing Jansz feed gas pipeline. Conveys power and fibre optics.	Refer to Figure 2 for location		12 – 1,275

Table 2: Summary of key impacts and risks and key proposed control measures for operational activities.

Aspect	Key impacts/risks	Key proposed control measures[1]
First Nations cultural values (tangible and intangible)	• Potential disturbance to underwater cultural heritage (UCH) during IMR activities. • Potential changes to cultural values, including songlines, dreaming stories and culturally important marine fauna.	• A UCH 'finds protocol' will be implemented where there are activities interacting with the seabed with the risk of disturbing unlocated First Nations UCH, to ensure discoveries are identified and responded to with adequate conservation and management actions. • Control measures related to marine fauna and other cultural values and features are outlined in sections below. • Chevron Australia is committed to ongoing engagement and consultation with Traditional Owners and their representative bodies. This will continue to inform our understanding of cultural values and features and facilitate the co-design of appropriate controls to avoid impacts.
Planned activities		
Physical presence of subsea infrastructure, FCS and vessels within the OA	• Presence of subsea infrastructure, FCS and vessels within the OA may interact with and disrupt commercial shipping, fishing vessels and marine fauna. • Potential interaction with fishing vessels may result in entanglement of trawl fishing gear on subsea infrastructure.	• Relevant parties will be advised of the commencement of key phases of the activity. • Marine safety information to be issued via AUSCOAST and/or Notice to Mariners (where required) prior to commencing the IMR activity. • Vessels will meet Chevron Australia's crew competency, navigation equipment, and radar requirements as per the Chevron Corporation Marine Standard. • In accordance with EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with Cetaceans, vessels will implement caution and no approach zones, where practicable. • Where required, a simultaneous operation plan will be developed and implemented to manage the activity.
Electromagnetic field (EMF) from J-IC umbilical	• Cables and transformers create electromagnetic field, which may cause disruption to behaviour of EMF-sensitive species.	• Cable shielding will be installed to enclose the electrical cores, reducing the transmission of EMFs into the water column.
Seabed disturbance from IMR activities	• Seabed disturbance from IMR activities may result in the alteration of marine habitat and a localised and temporary change in water quality.	• Hazard Identification and Risk Assessment (HIRA) undertaken to identify and assess potential environmental impacts and risks associated with the proposed IMR activity. • Activity specific work procedures implemented as required, including any additional controls identified for implementation (e.g. pre-activity surveys of the seabed). • Vessels will be required to meet Chevron's crew competency, navigation equipment and radar requirements in accordance with the Chevron Corporation Marine Standard.
Underwater sound from SCSt operations *For more detailed information, **view the J-IC Underwater Sound information sheet >**	• SCSt operations will result in a localised change to ambient underwater sound. • A change in ambient underwater sound may result in behavioural disturbance or auditory impairment to marine fauna.	• In-field sound source level verification will be undertaken during SCSt startup and commissioning to ensure sound levels remain within the expected operating parameters of the SCSt. • A control measure will be implemented to limit the power load of the compressors, if required, to ensure sound levels are not inconsistent with the Blue Whale Conservation Management Plan.
Underwater sound from vessel, IMR and helicopter operations	• Vessel, IMR and helicopter operations within the OA may result in a localised and temporary change to ambient underwater sound. • A change in ambient underwater sound may result in behavioural disturbance or auditory impairment to marine fauna.	• In accordance with EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with Cetaceans, vessels and helicopters will implement caution and no approach zones, and interaction management action.
Light emissions	• Navigation and operational lighting from vessels and the FCS may result in a localised change in ambient light. • Change in ambient light may result in the temporary attraction or deterrence of light-sensitive species.	• Vessels will meet lighting requirements of the Chevron Corporation Marine Standard. • HIRA undertaken prior to vessels working at night within critical habitats and during turtle nesting season.

1 | Proposed control measures are subject to change through consultation with relevant persons and the subsequent NOPSEMA assessment process.

Aspect	Key impacts/risks	Key proposed control measures[1]
Air and Greenhouse Gas (GHG) emissions	• Combustion of fuel from vessels and on the FCS may result in a localised and temporary reduction in air quality. • Direct GHG emissions within the OA and indirect GHG emissions from activities associated with processing of gas at the Gorgon Gas Facility on Barrow Island, transport and third-party end use of products, may result in contribution to the reduction of the global atmospheric carbon budget.	• Reduced sulphur content fuel will be used. Vessels will comply with the requirements of Marine Order 97 (MARPOL 73/78 Annex VI) in relation to air pollution. • Scope 1 GHG emissions will be managed in accordance with Ministerial Statement 800 (as amended by MS 1198) and are subject to the Federal Government's Safeguard Mechanism. • For a full list of control measures, refer to the current NOPSEMA accepted revision of the Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) EP.
Planned discharges from vessel operations	• Planned discharges from vessel operations may result in localised and temporary change in water quality.	• Vessels will comply with the requirements of Marine Order 96 (MARPOL 73/78 Annex IV) in relation to sewage discharge. • Vessels will comply with the requirements of Marine Order 95 (MARPOL 73/78 Annex V) in relation to food waste discharge. • Vessels will comply with the requirements of Marine Order 91 (MARPOL 73/78 Annex I) in relation to oily bilge water discharges.
Planned discharges from FCS operations	• Planned discharges (sewage, greywater, oily water and drainage from the deck and integrated firefighting system) from the FCS may result in a localised and temporary change in water quality.	• Hazardous materials will be selected and managed in accordance with the Chevron Australia Hazardous Materials Management Procedure.
Planned discharges from subsea operations and IMR activities	• Planned discharges from subsea operations and IMR activities may result in a localised and temporary reduction in water quality.	• Hazardous materials will be selected and managed in accordance with the Chevron Australia Hazardous Materials Management Procedure. • HIRA undertaken to identify and assess potential environmental impacts and risks associated with the proposed IMR activity. • Activity specific work procedures developed to address HIRA findings, including any additional controls identified for implementation.
Unplanned events activities		
Invasive marine pests	• Planned discharge of ballast water or the presence of biofouling on vessels may result in the introduction of an invasive marine pest.	• Vessels will meet the requirements of the Chevron Australia Quarantine Management Procedure for Marine Vessels. • Ballast water exchanges will be managed in accordance with the Australian Ballast Water Management Requirements. • Vessels greater than 400 gross tonnes with an antifoul coating are to maintain an up-to-date international antifouling coating certification in accordance with the Protection of the Sea (Harmful Anti-fouling Systems) Act 2006 and/or relevant codes and standards. • Where required, vessel pre-arrival information will be reported through the Maritime Arrivals Reporting System as per the Commonwealth Biosecurity Act 2015.
Accidental release – waste	• Unplanned release of waste to environment causing marine pollution.	• Vessels will comply with the requirements of Marine Order 95 (MARPOL 73/78 Annex V) in relation to managing waste (garbage) offshore.
Accidental release – hazardous materials (fuel bunkering, hydraulic line failure etc.)	• Unplanned release of hazardous material may result in indirect impacts to the marine environment and fauna arising from chemical toxicity.	• Hazardous materials will be selected and managed in accordance with the Chevron Australia Hazardous Materials Management Procedure. • Vessels will meet the requirements of the Chevron Corporation Marine Standard, including the pre-mobilisation inspections of equipment, couplings and secondary containment availability and refuelling/bunkering process. • Vessels will comply with the requirements of Marine Order 91 (MARPOL 73/78 Annex I) in relation to having an approved Ship Oil Pollution Emergency Plan in place.

Aspect	Key impacts/risks	Key proposed control measures[1]
Accidental release – vessel collision	• Hydrocarbon exposure from an accidental vessel collision event may result in marine pollution, smothering of subtidal and intertidal habitats, indirect impacts to fisheries, and reduction in amenity.	• Vessels will meet the crew competency, navigation equipment, and radar requirements of the Chevron Corporation Marine Standard. • Marine safety information to be issued via AUSCOAST and/or Notice to Mariners (where required) prior to commencing the IMR activity. **Spill response** • Vessels will comply with the requirements of Marine Order 91 (MARPOL 73/78 Annex I) in relation to having an approved Ship Oil Pollution Emergency Plan in place. • Emergency response will be implemented in accordance with the arrangements and strategies detailed in the Chevron Australia Oil Pollution Emergency Plan (OPEP). • Where required, operational and scientific monitoring will be undertaken in line with the Chevron Australia Operational and Scientific Monitoring Plan (OSMP).
Accidental release from subsea infrastructure	• Hydrocarbon exposure from an accidental subsea release may result in marine pollution, shoreline impacts of subtidal and intertidal habitats, indirect impacts to fisheries, and a reduction in amenity.	• Lifting procedure in place that complies with the requirements of the Managing Safe Work ABU Standardised OE Process. • Inspection, maintenance and monitoring of the hydrocarbon system to maintain integrity will be undertaken in accordance with the relevant Inspection and Monitoring Plan. **Spill response** • Emergency response will be implemented in accordance with the arrangements and strategies detailed in the Chevron Australia OPEP. • Where required, operational and scientific monitoring will be undertaken in line with the Chevron Australia OSMP.
Emergency response		
Ground disturbance – shoreline spill response	• In the event of an oil spill which impacts the shoreline, implementing shoreline clean-up techniques will involve people and equipment, which may disturb shoreline habitat with subsequent impacts to fauna.	• Where required, operational and scientific monitoring will be undertaken in accordance with the Chevron Australia OSMP.
Physical presence – oiled wildlife response	• In the event of an oil spill which impacts fauna the handling and treating of marine fauna will result in personnel interacting with marine fauna.	• Where required, operational and scientific monitoring will be undertaken in accordance with the Chevron Australia OSMP.

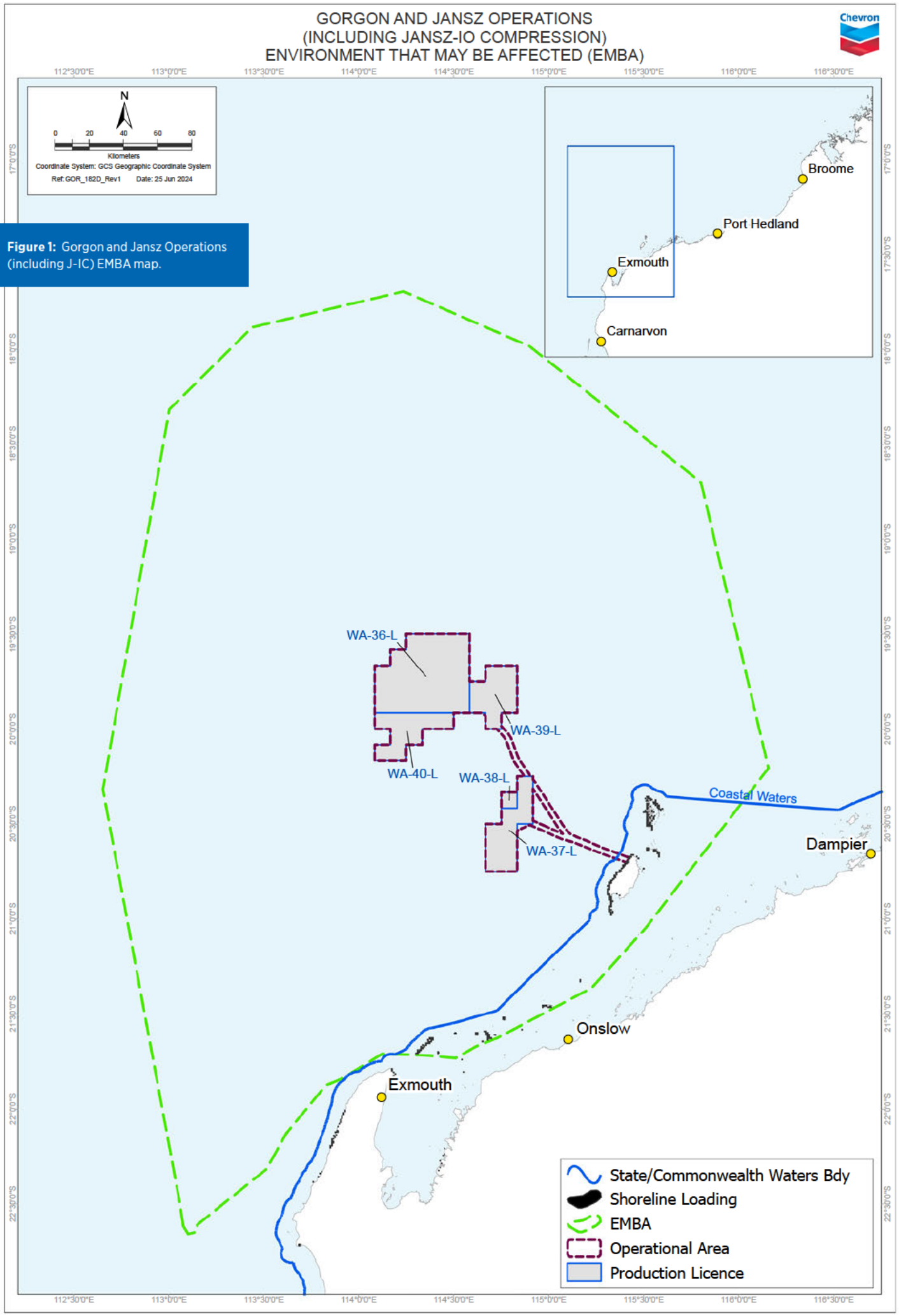
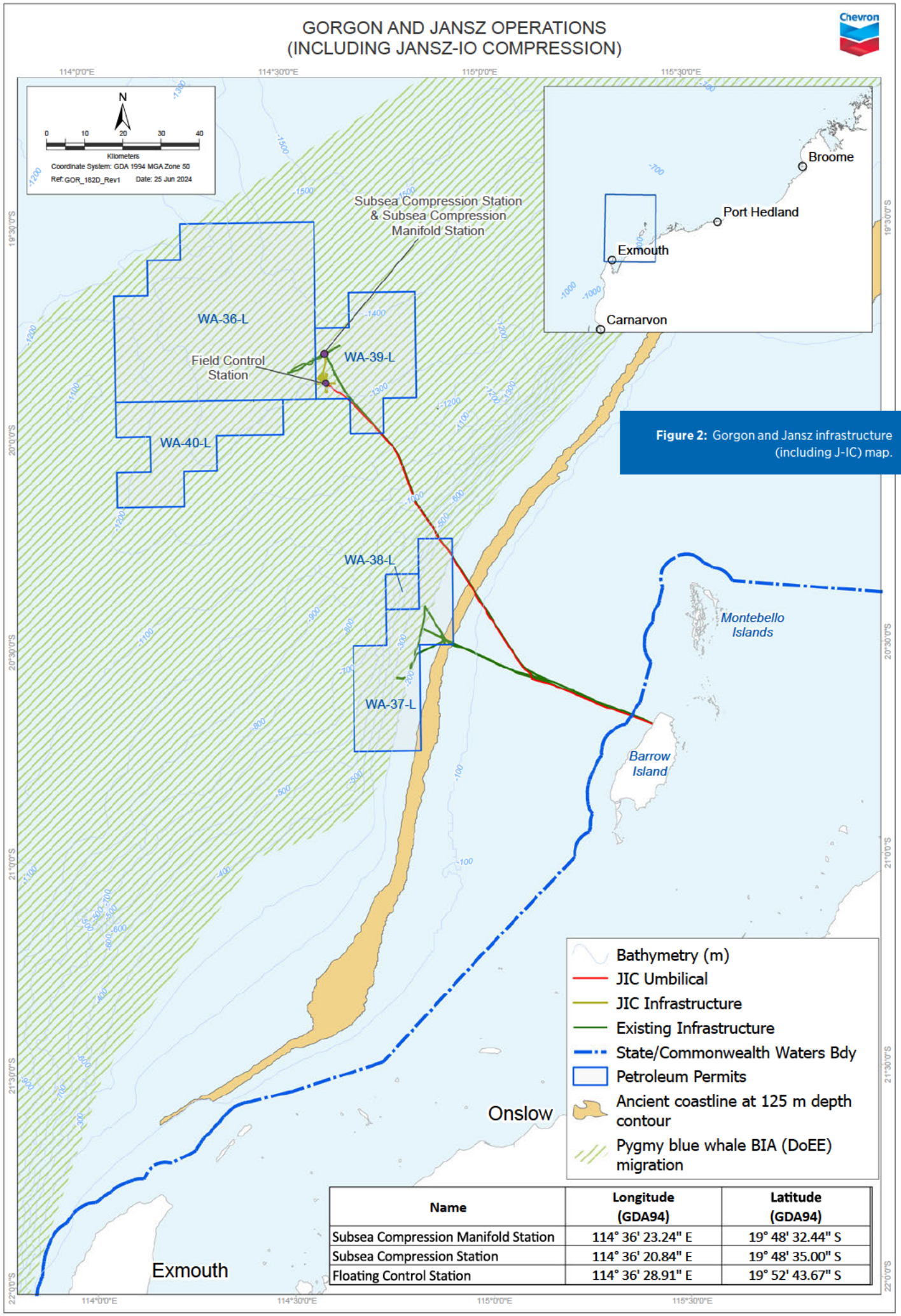


Figure 1: Gorgon and Jansz Operations (including J-IC) EMBA map.



Name	Longitude (GDA94)	Latitude (GDA94)
Subsea Compression Manifold Station	114° 36' 23.24" E	19° 48' 32.44" S
Subsea Compression Station	114° 36' 20.84" E	19° 48' 35.00" S
Floating Control Station	114° 36' 28.91" E	19° 52' 43.67" S

Figure 2: Gorgon and Jansz infrastructure (including J-IC) map.

australia.chevron.com

information sheet

jansz-io compression underwater sound

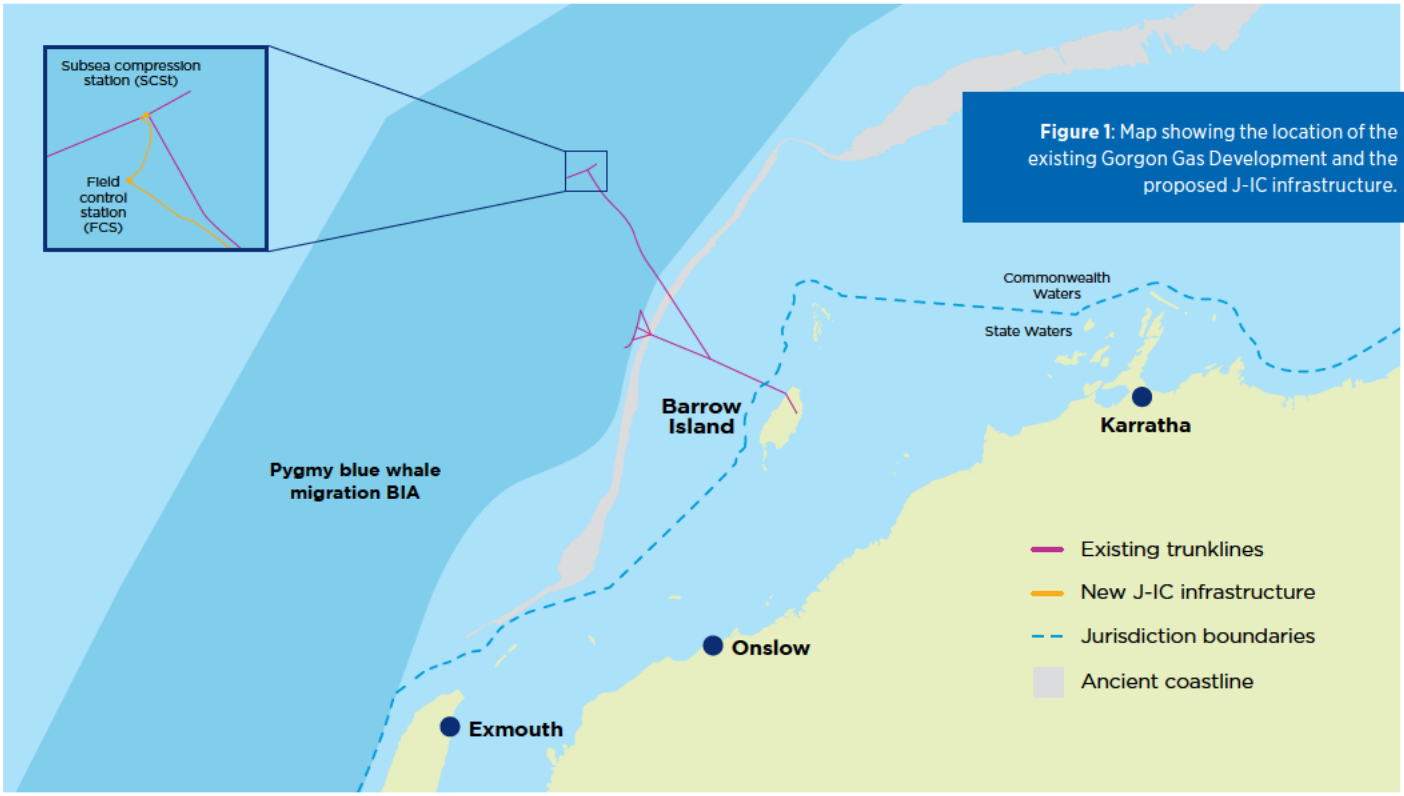


Figure 1: Map showing the location of the existing Gorgon Gas Development and the proposed J-IC infrastructure.

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, offshore production wells and pipeline infrastructure have gathered natural gas from the Jansz-Io and Gorgon gas fields and transported it to the Gorgon Gas Facility on Barrow Island. From the Gorgon Gas Facility, gas is processed for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

As predicted, the Jansz-Io gas field reservoir pressure has declined over time. To enhance the recoverability of gas and maintain current rates of production at the Gorgon Gas Facility, Chevron Australia plans to install and operate a subsea compression station (SCSt), floating field control station (FCS) and associated infrastructure.

Installation of compression infrastructure in the Jansz-Io field was always contemplated as a means of maintaining current production levels over the approved life of the Gorgon development and will support the ongoing delivery of energy to customers in WA and the Asia Pacific region for decades to come.

Chevron Australia has undertaken extensive consultation for the Jansz-Io Compression (J-IC) infrastructure installation activities, with the corresponding Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-Commissioning Environment Plan accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in May 2024.

We are now undertaking further consultation to inform a revision of the Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) Environment Plan (referred to in this fact sheet as 'the EP'), to account for the operation of J-IC infrastructure.

Together with the Gorgon and Jansz Feed Gas Pipeline and Wells Operations (including J-IC) information sheet, the purpose of this fact sheet is to support consultation with relevant persons prior to the submission of the EP to NOPSEMA for assessment.

key information

- Chevron Australia has undertaken a robust environmental impact and risk assessment of J-IC operational activities, however there may still be considerations we are not yet aware of but need to understand to fully assess the potential impacts and risks.
- Through consultation, we are seeking feedback and input from relevant persons to ensure we have considered all relevant information and to incorporate into our proposed controls, or co-design further control measures if required.
- To date, Chevron Australia's environmental assessment has identified that:
  - Traditional Owner groups in the northwest region of WA have identified Sea Country as an important value and expressed a deep obligation to protect songlines, dreaming stories and the marine fauna connected to them, including whales, dugong and turtles.
  - The SCSt will be situated on the seabed, approximately 200 kilometres (km) offshore at a water depth of ~1,350 metres (m).
  - Operation of the SCSt will result in a localised change to underwater sound.
  - A number of cetaceans (whales and dolphins) are likely to transit the area surrounding the SCSt and may be particularly sensitive to underwater sound.
  - The SCSt will be located within the pygmy blue whale migration Biologically Important Area (BIA). BIAs are spatially defined areas for marine species listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), where the species are known to display biologically important behaviours such as breeding, foraging, resting or migrating.
  - Pygmy blue whales are also subject to an Australian Government Blue Whale Conservation Management Plan (CMP), which states that anthropogenic (human-made) noise in a BIA will be managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area.
  - Chevron Australia has committed to operate the SCSt in a manner that is not inconsistent with the CMP. This includes ensuring received underwater sound levels within relevant pygmy blue whale foraging dive depths remain below the behavioural response threshold for marine mammals (120 dB re 1 µPa).

how is underwater sound measured?

It is important to note that underwater sound levels are not directly comparable to in-air sound levels.

The intensity, or 'loudness,' of a sound wave is influenced by the speed of the sound wave and the density of the medium through which the sound is travelling. Water has a much greater density than air, and the speed of sound in water is greater than the speed of sound in air. The higher density and higher sound speed result in a lower intensity sound wave.

The intensity of sound is measured using a decibel (dB) scale. The dB is a ratio between two values – a measured value and a reference value.

In water, the reference value of 1 micropascal (µPa) is used, so when abbreviated, underwater sound levels are presented as *dB re 1 µPa*. In air, a different reference value of 20 µPa is used, and sound levels are presented as *dB re 20 µPa*.

To obtain an approximate comparison between underwater and in-air sound, 61.5 dB can be subtracted from the underwater sound level to obtain the in-air equivalent.

To understand the difference between sound levels in water and air, consider this example – a sound of 100 dB re 1 µPa in water is within the range of ambient (background) ocean sound levels. However, a sound of 100 dB re 20 µPa in air is about equivalent to standing next to an operating lawnmower.

Sound source level: refers to the estimated sound level at a nominal distance of one metre from the sound source (presented as *dB re 1 µPa @ 1m*).

Received sound level: refers to the estimated sound level that would be measured at a defined distance from the source. Received sound levels are considered when assessing the sound levels that may be heard by marine fauna. The received sound level will vary depending on the distance between the source (e.g. the SCSt) and the animal that is hearing it.

Table 1: approximate source level of some common underwater sounds in the northwest WA marine area.

Sound source	Sound source level (dB re 1µPa)
Natural seismic activity (earthquake)	75-212
Jet ski	149
Container vessel	186
Pygmy blue whale song	179
Sperm whale clicks	163 – 223

Frequency: The frequency of a sound refers to the number of vibrations that occur in a sound wave per second and is measured in hertz (Hz). Low-pitched sounds have lower frequencies and high-pitched sounds have higher frequencies.

Different cetaceans have different hearing ranges, for example pygmy blue whales and other baleen whales are considered low frequency cetaceans as they have a lower frequency hearing range when compared to toothed whales, such as sperm whales, which have a higher frequency hearing range.

SCSt sound source level and operating conditions

The SCSt is based on proven design and technology used in an existing facility currently operating in the North Sea, near Norway. During operations, it will generate low frequency, continuous sound that will add to the existing ambient ocean soundscape.

To predict underwater sound source levels at the SCSt, technical acoustic experts at the Centre for Marine Science and Technology (CMST) at Curtin University and Novicos GmbH were engaged to conduct extensive modelling and measurement studies, using data acquired from the similar operating facility and the in-air sound measurement of the actual J-IC compressors taken during the manufacturing and testing process.

Modelling has predicted an underwater sound source level between 166 dB and 179 dB re 1 µPa @ 1m, depending on operating conditions.

Over the life of the SCSt, the compressors will be operated at different power loads.

- When operated at maximum power load, modelling has predicted a maximum sound source level of 179 dB re 1 µPa @ 1m with a high degree of certainty.
- When operated at lower power loads, a sound source level of 166 dB re 1 µPa @ 1m is predicted (minimum sound source level).

As of December 2024, it is expected the initial and more typical operating conditions over the life of the SCSt will be at power loads closer to the mid range between maximum and minimum sound source levels [Figure 2].

how can underwater sound impact marine fauna?

Regulators in Australia assess the impacts or risks of anthropogenic (human-made) underwater sound on marine fauna based on sound effect thresholds derived from best available science, and consideration of associated areas for biologically important behaviour.

Continuous, non-impulsive underwater sound from offshore activities has the potential to impact marine fauna in a range of ways, including:

- Physical injury, including permanent hearing loss (known as permanent threshold shift, or PTS), and temporary hearing loss (known as temporary threshold shift, or TTS).
- Behavioural changes, ranging from avoidance of the area, increased swimming speeds, disruption of foraging behaviour, and changes to or cessation of vocalisations.

While this fact sheet has a particular focus on pygmy blue whales, potential impacts to other EPBC Act listed and culturally important marine fauna (e.g. whales, dugong, turtles and fish) are also being considered and assessed in the preparation of the EP and are summarised in Table 2.

When determining the potential effects of sound exposure, animals are placed into hearing groups to account for the fact that different species do not hear equally well at all frequencies and therefore do not have the same potential for effects to their hearing at all frequencies.

For cetaceans, PTS and TTS impacts for non-impulsive (continuous) underwater sound are assessed based on accumulated sound exposure levels over a 24-hour period (SEL24h), which is weighted for each hearing group.

For low-frequency cetaceans such as the pygmy blue whale, the PTS and TTS thresholds are $SEL_{24h\ weighted}$ 199 dB re 1 μPa^2s and $SEL_{24h\ weighted}$ 179 dB re 1 μPa^2s respectively.

Both PTS and TTS are not considered a credible risk, as a low frequency cetacean would need to remain within close proximity to the SCSt for an extended period of time, and given that marine mammals need to surface regularly to breathe air, such sound exposure would not be possible.

Further to this, research has shown pygmy blue whales spend most of their time within the top 15 m of the sea surface when migrating through offshore WA waters.

The marine mammal behavioural response threshold refers to the sound level at which marine mammals may exhibit changes in behaviour, which is 120 dB re 1 µPa for non-impulsive sound sources.

As shown in Figure 2 and Figure 3, modelling has predicted the received sound level will remain below 120 dB re 1 µPa at the maximum recorded dive depth (306 m) of a pygmy blue whale in the northwest marine region of WA.

partnering with leading research scientists

Chevron Australia has a proud history of partnering with leading science and research institutions to protect biodiversity and manage conservation on Barrow Island and in offshore waters.

We have made significant investments in research and technology to inform our environmental impact and risk assessment for J-IC, and to monitor and manage the operation of the SCSt to minimise environmental impacts and risks.

Through key partnerships with CMST and the Australian Institute of Marine Science (AIMS), we have invested more than $A6 million in research studies in the northwest marine region, and we are committed to sharing data to build industry knowledge.

CMST – understanding the existing underwater soundscape

Chevron Australia has engaged scientists at CMST to undertake a baseline monitoring study of underwater sound within and around the proposed J-IC operational area.

CMST deployed several deepwater, omni-directional acoustic receivers at various locations to allow for continuous passive acoustic monitoring (PAM) of whale vocalisations and other sounds and to establish an accurate baseline.

The background soundscape of the ocean is referred to as ‘ambient sound’ and is highly variable depending on location. Ambient sound can be made up of a range of sources including biotic sounds (e.g. from whales, dolphins, fish and crustaceans) and abiotic sounds (e.g. from wind, rain, earthquakes, vessels, marine construction activities).

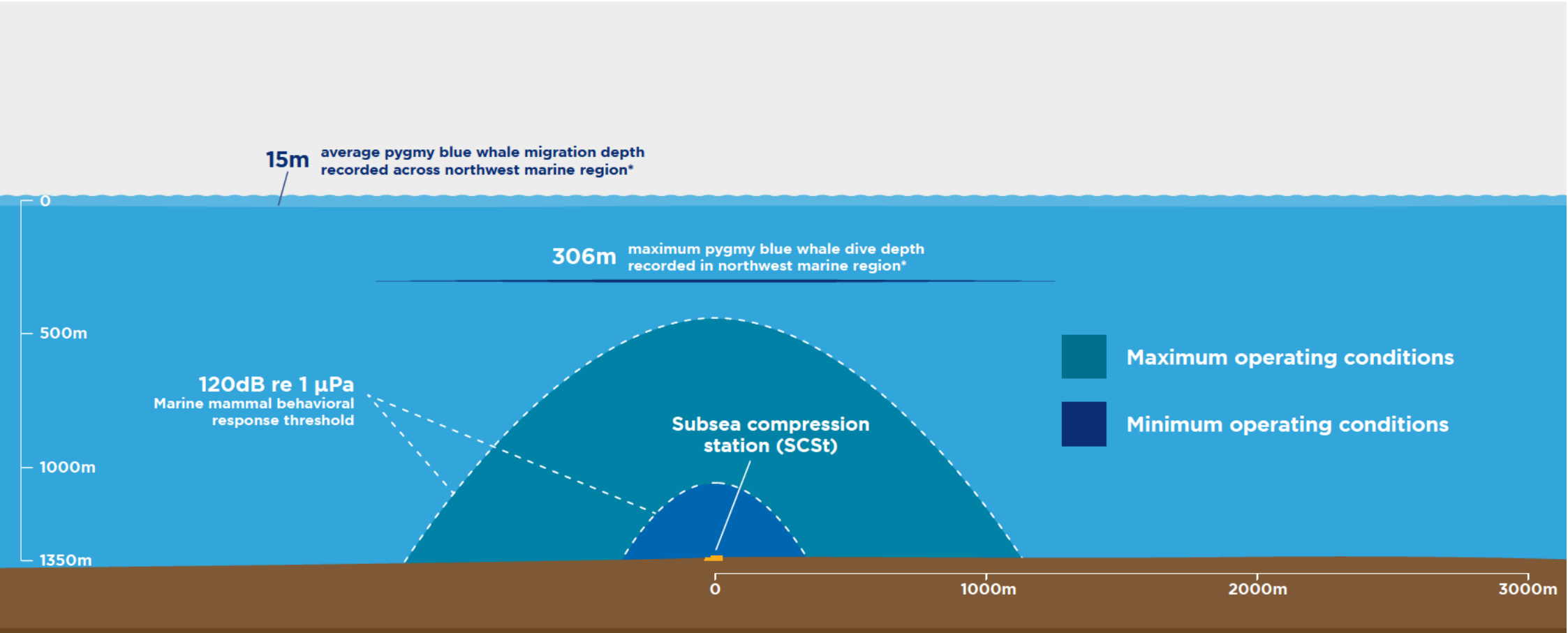
During the four-year monitoring period to-date, a broad range of sounds were detected, including from a variety of marine mammals, waves, wind, earthquakes, and vessel movements. CMST measurements close to the J-IC location indicate the typical ambient ocean sound level is approximately 100 dB re 1 µPa, ranging between 90 dB and 110 dB re 1 µPa.

The acoustic monitoring program will continue over the next two years and for the first three years of J-IC operations to build the scientific data on marine fauna in the region.

AIMS - pygmy blue whale research

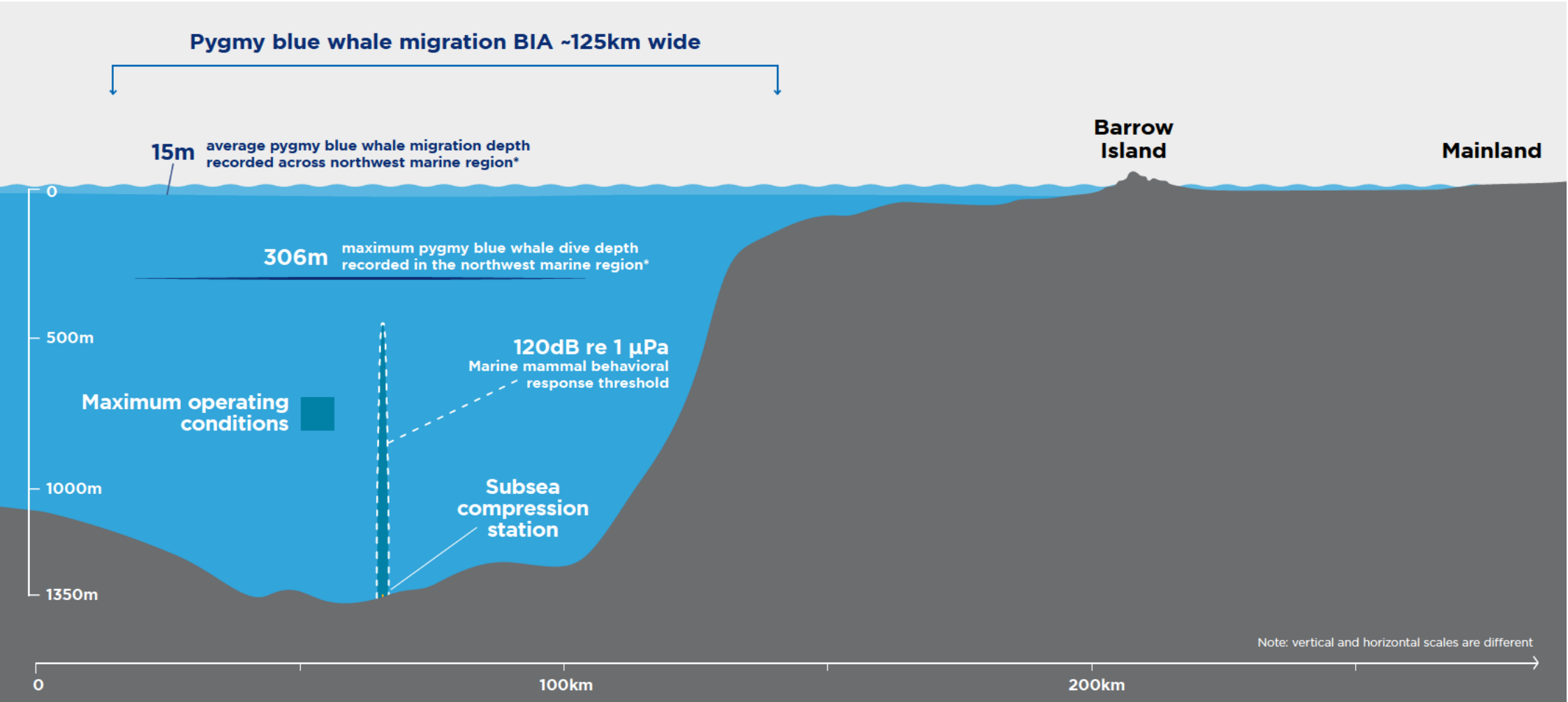
Since 2019, AIMS, in collaboration with the Centre for Whale Research has been undertaking pygmy blue whale tagging research to better understand their distribution, migration and feeding behaviours in the offshore waters of WA.

Figure 2: Schematic illustrating the predicted horizontal and vertical extent of the SCSt underwater sound footprint above the marine mammal behavioural response threshold of 120 dB re 1 µPa.



*Relevant pygmy blue whale data is derived from current scientific research, which may change over time.

Figure 3: Schematic illustrating the predicted SCSt underwater sound footprint above the marine mammal behavioural response threshold of 120 dB re 1 µPa at maximum operating conditions, which represents less than two percent of the horizontal width of the ~125 km wide pygmy blue whale migration BIA.



*Relevant pygmy blue whale data is derived from current scientific research, which may change over time.

Chevron Australia is supporting AIMS to continue this work throughout 2024-2026, with a focus on collecting more data on diving and feeding behaviour in the northwest marine region.

In the waters off the northwest marine region, scientific studies have found pygmy blue whales show a preference to forage in the top 100 m from the sea surface, where krill density may be higher. Here, the maximum dive depth recorded is 306 m from the sea surface.

In the Perth Canyon, where there are nutrient rich upwellings, pygmy blue whales are known to forage at greater depth. In this region, the maximum dive depth recorded is 506 m from the sea surface.

This ongoing research allows AIMS to identify where pygmy blue whale movement patterns overlap with industrial activity and provides government regulators and operators, like Chevron Australia, more data to inform decision-making and avoid potential impacts from offshore activities.

SCSt underwater sound: proposed control measures[1]

While scientific modelling has predicted the maximum sound source level with a high degree of certainty, a conservative error margin (plus or minus 4 dB) has been considered in the development of appropriate control measures, including:

- An Environmental Performance Standard will be in place that commits to operating the SCSt in a manner that is not inconsistent with the Blue Whale CMP. This includes ensuring received sound levels within relevant pygmy blue whale foraging dive depths remain below the behavioural response threshold for marine mammals (120 dB re 1 µPa).
  - During commissioning, the SCSt will be turned on in a phased approach and acoustic recorders deployed from a vessel will provide initial data in near real-time to ensure sound levels remain within the expected operating parameters of the SCSt.
  - Passive acoustic loggers will also be deployed to monitor and record sound source levels while testing the full range of operating conditions (from minimum to maximum power loads).
  - If in-field testing during commissioning determines the received levels within relevant pygmy blue whale dive depths may exceed 120 dB re 1 µPa, a control measure will be implemented to limit the power load of the compressors and reduce sound levels.

underwater sound and marine fauna

Table 2: Summary of potential impacts and risks of SCSt underwater sound on key EPBC listed and culturally important marine fauna.

Species	Summary of potential impacts and risks
Marine mammals	
Pygmy blue whale (baleen whale)	Underwater sound modelling indicates both PTS and TTS are not credible risks to pygmy blue whales: – given a low frequency cetacean would need to remain within close proximity to the SCSt for an extended period of time, and given that marine mammals need to surface regularly to breathe air, such sound exposure would not be possible. In addition, pygmy blue whales are unlikely to encounter the predicted SCSt sound footprint above the marine mammal behavioural response threshold: – recent research has shown pygmy blue whales spend most of their time within the top 15 m of the sea surface when migrating through offshore WA waters. – in the northwest marine region, scientific studies have found pygmy blue whales show a preference to forage in the top 100 m from the sea surface. Here, the maximum dive depth recorded is 306 m from the sea surface. Taking the above into consideration, Chevron Australia considers that the SCSt can be operated in a manner that is not inconsistent with the Blue Whale CMP.
Other baleen whales e.g. Antarctic minke whale, dwarf minke whale, Antarctic blue whale, Bryde's whale, fin whale, humpback whale, sei whale and Omura's whale	For the same reasons outlined above for pygmy blue whales, PTS and TTS to other baleen whales are not considered a credible risk. It is also considered unlikely that other baleen whales would encounter the predicted SCSt sound footprint above the marine mammal behavioural response threshold. Baleen whales primarily feed on krill and prefer to migrate and feed within the upper water column, where prey availability is densest. Further to this, there are no known biologically important areas for other baleen whales within proximity to the J-IC location.

1 | These proposed control measures are subject to change through consultation with relevant persons and the subsequent NOPSEMA assessment process.

Species	Summary of potential impacts and risks
Toothed whales e.g. Sperm whale, dwarf sperm whale, pygmy sperm whale, beaked whales, killer whale, Australian humpback dolphin, Australian snubfin dolphin and spotted bottlenose dolphin	Underwater sound modelling indicates both PTS and TTS are not credible risks, given a toothed whale would need to remain within proximity to the SCSt for an extended period of time, which is not possible as it would need to surface to breathe air. Some species of toothed whales (such as sperm whales) may dive to depths where they would encounter the predicted SCSt sound footprint above the marine mammal behavioural response threshold. However, potential behavioural responses are only expected to occur in proximity to the SCSt. Further to this, toothed whales are known to opportunistically forage over wide ranging areas in pursuit of mobile prey (e.g. squid and fish). The J-IC location does not represent key foraging habitat and does not overlap any biologically important areas for toothed whales.
Dugong	Dugongs are primarily coastal animals, associated with shallow seagrass meadows. Any presence within deep offshore waters (more than 100 km from the nearest coastline) would be unexpected and likely to be of a transitory nature. As dugongs are known to be a shallow diving species, they would be highly unlikely to encounter the predicted SCSt sound footprint above the marine mammal response threshold.
Other marine fauna	
Marine turtles	While marine turtles are known to travel considerable distances from their nesting habitats, they spend most of their time within shallow coastal waters, where they feed and rest. Any presence within deep, offshore waters is expected to be of a transitory nature. The closest turtle nesting habitats to the SCSt are Barrow, Montebello, and Lowendal islands, over 135 km away. Further to this, most turtle species are shallow divers, rarely exceeding 40 to 50 m water depth and would therefore be unlikely to encounter the predicted SCSt sound footprint at a level that would result in a behavioural response.
Fish	Underwater sound modelling indicates the SCSt poses a low risk of causing injury or mortality to highly mobile pelagic fish. Bottom dwelling demersal fish may reside in and around the SCSt, and those fish that remain within close proximity to the SCSt for extended periods may receive sound above the non-impulsive (continuous) sound TTS threshold, however impacts are not expected to be detectable at a population level. Fish may elicit a behavioural response when swimming in proximity to the SCSt, however behavioural responses are unlikely at greater distances from the SCSt.

In addition to the summary of potential impacts and risks outlined above, Chevron Australia acknowledges that Traditional Owner groups in the northwest region have identified Sea Country as an important value and expressed a deep obligation to protect songlines, dreaming stories and the marine fauna connected to them.

We are committed to ongoing engagement and consultation with Traditional Owners and their representative bodies. This will continue to inform our understanding of cultural values and features and facilitate the co-design of appropriate controls to avoid impacts.

your input

We are seeking your feedback and input if you consider your functions, interests, or activities may be affected based on the information provided in this fact sheet or on our website.

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.

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

Relevant persons may request that the information provided 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.

references and related reading

The following sources are either directly referenced in this document or provide additional background information.

Chevron Australia. 2024. Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-Commissioning Environment Plan. https://info.nopsema.gov.au/environment_plans/638/show_public

DoE. 2015. Conservation Management Plan for the Blue Whale (2015-2025), A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Australian Government, Canberra, Australian Capital Territory. https://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/blue-whale-conservation-management-plan

[NOAA] National Oceanic and Atmospheric Administration (US). 2019. ESA Section 7 Consultation Tools for Marine Mammals on the West Coast (webpage), 27 Sep 2019. United States National Oceanic and Atmospheric Administration. https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/esa-section-7-consultation-tools-marine-mammals-west

Owen, K., Jenner, C., Jenner, M., and Andrews, R. 2016. A week in the life of a pygmy blue whale: migratory dive depth overlaps with large vessel drafts. Animal Biotelemetry 4:17. https://doi.org/10.1186/s40317-016-0109-4

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J., Coombs, S., Ellison, W.T. and Gentry, R.L. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. SpringerBriefs in Oceanography, Volume ASA S443/SC1.4 TR-2014. ASA Press. 87 pp.

Prince, R.I.T. 2001. Aerial Survey of the Distribution and Abundance of Dugongs and Associated Macrovertebrate Fauna – Pilbara Coastal and Offshore Region, WA, Completion Report. Unpublished Report to the Marine Species Protection Program, Environment Australia, by the Department of Conservation and Land Management, WA.

Southall, B.L., J.J. Finneran, C.J. Reichmuth, P.E. Nachtigall, D.R. Ketten, A.E. Bowles, W.T. Ellison, D.P. Nowacek, and P.L. Tyack. 2019. Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals 45(2): 125-232. https://doi.org/10.1578/AM.45.2.2019.125

Southall, B.L., A.E. Bowles, W.T. Ellison, J.J. Finneran, R.L. Gentry, C.R. Greene, Jr., D. Kastak, D.R. Ketten, J.H. Miller, et al. 2007. Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations. Aquatic Mammals 33(4): 411-521. https://doi.org/10.1578/AM.33.4.2007.411

Thums, M., Ferreira, L.C., Jenner, C., Jenner, M., Harris, D., Davenport, A., Andrews-Goff, V., Double, M., Moller, L., Attard, C.R.M., Bilgmann, K., Thomson, P.G., and McCauley, R. 2022, Pygmy blue whale movement, distribution and important areas in the Eastern Indian Ocean. Global Ecology and Conservation, 35 (2022). https://doi.org/10.1016/j.gecco.2022.e02054

Wardle, C.S., Carter, T.J., Urquhart, G.G., Johnstone, A.D.F., Ziolkowski, A.M., Hampson, G. and Mackie, D. 2001. Effects of seismic air guns on marine fish, Continental Shelf Research 21 (2001) 1005–1027.

the human energy company®

australia.chevron.com

activity information

gorgon gas development gorgon and jansz feed gas pipeline and wells operations

(including jansz-io compression)

Chevron Australia, on behalf of the Gorgon Joint Venture, operates the Gorgon Project located off the northwest coast of Western Australia (WA).

Since 2015, offshore production wells and pipeline infrastructure have gathered natural gas from the Jansz-Io and Gorgon gas fields and transported it to the Gorgon Gas Facility on Barrow Island. From the Gorgon Gas Facility, gas is processed for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

As predicted, the Jansz-Io gas field reservoir pressure has declined over time. To enhance the recoverability of gas and maintain current rates of production at the Gorgon Gas Facility, Chevron Australia plans to install and operate a subsea compression station (SCSt), floating field control station (FCS) and associated infrastructure [Table 1].

Installation of compression infrastructure in the Jansz-Io field was always contemplated as a means of maintaining current production levels over the approved life of the Gorgon development and will support the ongoing delivery of energy to customers in WA and the Asia Pacific region for decades to come.

Chevron Australia is currently undertaking a revision of the Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) Environment Plan (EP), to include the operation of the Jansz-Io Compression (J-IC) infrastructure.

A separate EP, which addresses J-IC installation activities was accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in May 2024.

This information is intended to assist ‘relevant persons’ to make an informed assessment of the environmental impact and risks of our activities and to provide input and feedback to enhance the revision of the EP.

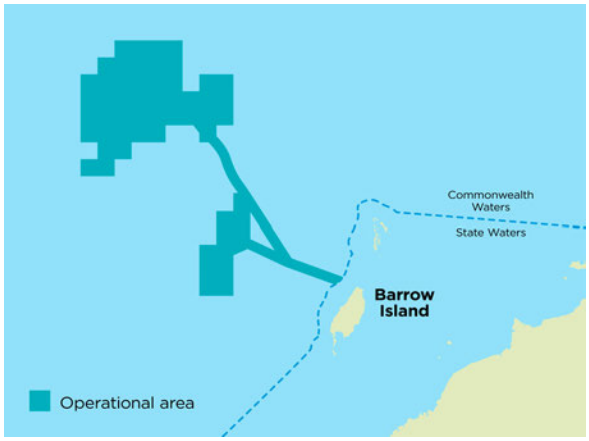
Relevant persons are those whose functions, interests or activities may be affected by our activities. This includes Traditional Owners and Custodians’ spiritual and cultural connection to Country, commercial and recreational fishing, tourism, individuals or groups in local communities.

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.

location and water depth



The Jansz-Io gas field is located within production licences WA-36-L, WA-39-L and WA-40-L, approximately 200 kilometres (km) off the northwest coast of WA in water depths of approximately 1,350 metres (m). The Gorgon gas field is located within production licences WA-37-L and WA-38-L, approximately 130 km off the northwest coast of WA, and 65 km northwest of Barrow Island in water depths of approximately 200 m.

The Gorgon and Jansz pipelines are located in Commonwealth waters within pipeline licences WA-19-PL and WA-20-PL. The operational area (OA) in which the petroleum activities described in the EP will be undertaken is shown in Figure 1. The location of Gorgon Project infrastructure is shown in Table 1 (coordinates) and and Figure 2 (map).

Jump to detailed maps below

activity summary

The revised EP will include the commissioning and start-up of the SCSt and ongoing operations of the new J-IC subsea and floating infrastructure [Table

1].

The FCS will be normally unattended, with personnel onboard during periodic inspection, maintenance and repair (IMR) campaigns. Personnel will be transferred to the FCS via helicopter or a support vessel. The SCSt will be operated and monitored remotely from a control room on Barrow Island.

The routine operation of the existing Gorgon and Jansz-Io hydrocarbon systems will continue under the revised EP. Primary activities include the flow and transportation of hydrocarbon and other produced fluids from the wells to the Gorgon Gas Facility on Barrow Island, via infield flowlines and pipelines. Periodic IMR activities will be undertaken to ensure the integrity of infrastructure is maintained.

IMR activities may include:

- visual inspections – may involve the use of remotely operated vehicles (ROVs) or similar and divers and a dive support vessel
- marine surveys
- testing and measurements
- pigging (e.g. cleaning) of pipelines
- module/component change-out, stabilisation, removal of marine growth etc.

During normal operations, vessels will typically be limited to supply/support vessels and IMR vessels. The vessel size and type will be dependent on the work scope. It is anticipated vessels will operate 24 hours per day for the duration of activities.

schedule and duration

The revised EP will cover the ongoing operation of the hydrocarbon system (production wells, pipelines, and associated infrastructure) in Commonwealth waters for the Gorgon and Jansz-Io gas fields.

IMR activities may occur at any time, with the frequency determined using a broad risk-based approach, which will include an assessment of safety, environmental and commercial risks. The duration will depend on the scope of the activities, however works will typically be completed within 10 to 200 days.

Subject to relevant approvals and other factors, J-IC operational activities, including commissioning and start-up, were expected to commence from 2026.

As of December 2024, the indicative schedule for the J-IC Project has been updated, with commissioning activities expected to commence from 2026, and start-up and operational activities expected from 2027 or 2028.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, we create an EMBA map to provide geographical context for stakeholders to determine if their functions, interests or activities may be affected by an offshore activity during operations or in an emergency scenario.

Figure 1 shows the EMBA, which is based on a worst-case environmental scenario, which in this case is an unplanned release (oil spill) from the hydrocarbon system and/or a vessel collision. Shoreline loading refers to areas of the coast that may be impacted by hydrocarbons.

The EMBA has been defined through combining 300 simulations for each unplanned release scenario 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 or risks directly arising from activities, or from an emergency scenario, would occur within close 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.

Table 2 summarises the key impacts or 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 extensive environmental and modelling studies and considered scientific advice and government guidance (including conservation management and recovery plans) in assessing impacts and risks to marine fauna.

The SCSt will be situated at a water depth of ~1,350 m on the seabed, where operations will result in a localised change to ambient underwater sound.

Marine fauna found at the SCSt location are predominantly pelagic and deep-sea demersal fish species. Some threatened and/or migratory fish species (e.g. whale sharks, other sharks and manta rays) may be present in the area; however, these are primarily coastal species or are associated with shallower water or features (e.g. seamounts and reefs).

Biologically Important Areas (BIAs) for several marine fauna species overlap the EMBA. Additionally, the pygmy blue whale migration BIA overlaps with the SCSt location [Figure 2].

As with most offshore areas in WA, a range of other marine mammal species are known to transit the J-IC area including Antarctic minke whales, Bryde's whales, fin whales, humpback whales, sei whales, sperm whales, killer whales and spotted bottlenose dolphins.

The closest turtle nesting habitats to J-IC are Barrow, Montebello, and Lowendal islands, over 135 km away. Similarly, shallower internesting BIAs extend a maximum of 60 km from these nesting beaches, more than 70 km from the SCSt and FCS.

safe navigation area and marine exclusion zone

The following infrastructure is subject to a 500 m radius petroleum safety exclusion zone:

- Gorgon midline pipeline termination structure
- Gorgon M1 – production manifold and wells
- Gorgon M2 – production manifold and wells
- Gorgon M3 – production manifold and wells
- Gorgon M4 – production manifold and wells
- Jansz umbilical midline connection assembly

A new 500 m radius exclusion zone will be sought for the FCS once installed.

No other exclusion zones will be sought for the subsea infrastructure.

first nations cultural values

We acknowledge that Traditional Owner groups in the northwest region of WA have identified Sea Country as an important value and expressed a deep obligation to protect songlines, dreaming stories and the marine fauna connected to them.

Chevron Australia is committed to ongoing engagement and consultation with Traditional Owners and their representative bodies. This process will continue to inform our understanding of cultural values and features and help facilitate the co-design of appropriate controls to avoid impacts.

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 to NOPSEMA a revised version of the Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP, which will:

- describe the environment in which operations, including the operation of the J-IC infrastructure, are planned to take place;
- include an assessment of environmental impacts and risks arising from those operations;
- identify control measures to manage the potential impacts and risks to levels that are acceptable and ALARP; 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 operations will be managed so that they are acceptable and ALARP 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 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 **Monday 17 February 2025**.

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.

You can contact us with any questions, requests for information, or feedback by calling tollfree on **1800 225 195** or online below.

To begin providing feedback for **Gorgon and Jansz feed gas pipeline and wells operations (including Jansz-io compression)**, select a feedback category

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, Chevron Australia will collect your name and contact details, for the purposes of maintaining contact with you and including 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. Chevron may transfer your information to NOPSEMA if required and, if you do not identify it as sensitive, to other Chevron affiliates including our head office 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, tables and information sheets

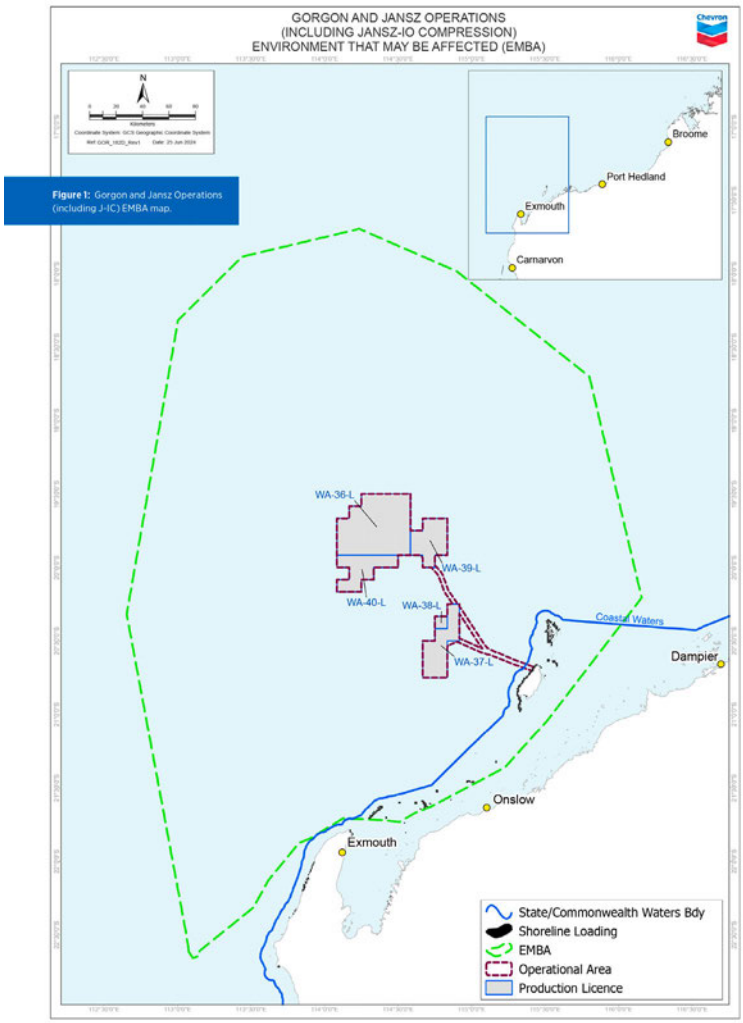


Figure 1. Gorgon and Jansz Operations (including J-IC) EMBA map.

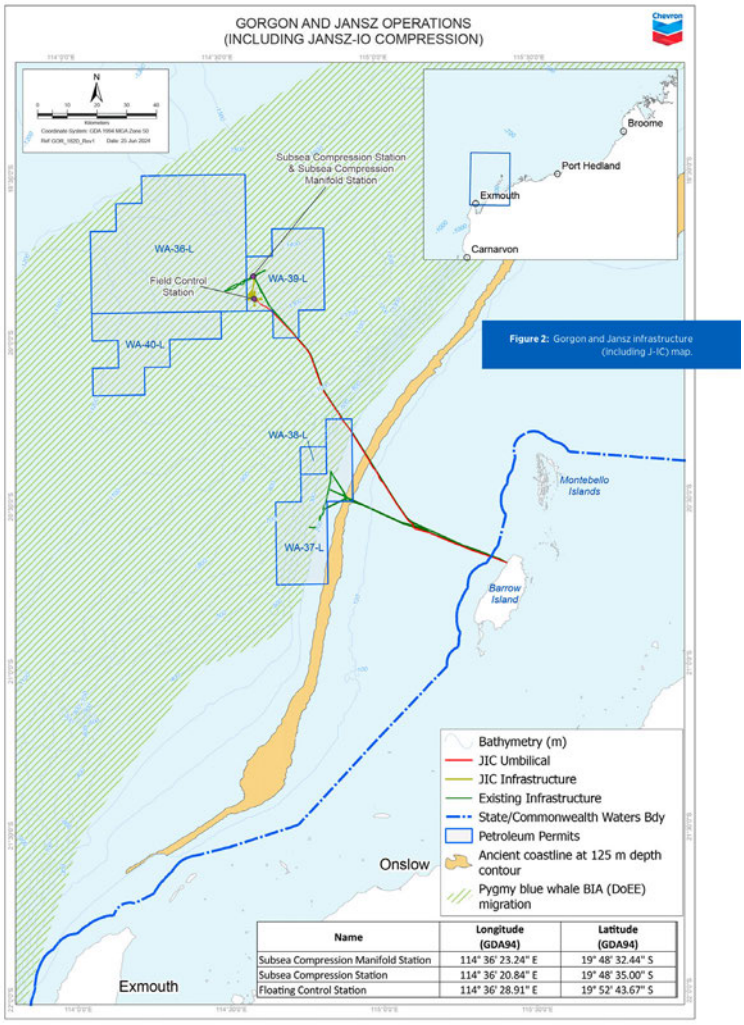


Figure 2. Gorgon and Jansz infrastructure (including J-IC) map.

Table 1: Gorgon Project Infrastructure Details – view table 1 here.
Table 2: Summary of key impacts and risks and key proposed control measures for operational activities – view table 2 here.

information sheets

Gorgon and Jansz feed gas pipeline and wells operations (including jansz-io compression) information sheet > **PDF**

Jansz-Io Compression underwater sound information sheet > **PDF**

resources

- Consultation on Offshore Petroleum Environment Plans – NOPSEMA
- Consultation in the course of preparing an environment plan – NOPSEMA
- Environment plan content requirements – NOPSEMA
- Environmental requirements – NOPSEMA
- Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations
- NOPSEMA Assessment Process Environment Plans
- Chevron Operational Excellence Management System (OEMS)
- Jansz-Io Compression underwater sound information sheet
- Gorgon and Jansz feed gas pipeline and wells operations (including jansz-io compression) information sheet

Like Comment Repost Send

Chevron Australia
33,282 followers
6mo •

We're undertaking a revision of our Gorgon and Jansz Feed Gas Pipeline and Wells Operations Environment Plan to include the operation of new compression infrastructure in the Jansz-Io gas fields.

We'd like to consult with people and organisations whose functions, interests or activities may be affected by this activity.

More information that can help you identify if you are a relevant person and on how to provide your input can be found at https://lnkd.in/gbTYhTYp

128 2 comments

Like Comment Repost Send

[redacted]
Admin Top contributor · 6 days ago ·

[redacted]
Admin Top contributor · 6 days ago ·

Chevron Australia is currently undertaking consultation on an environment plan for the operation of new subsea compression infrastructure in the Jansz-Io gas fields, approximately 200 km off the northwest coast of WA .

Chevron is seeking your input on whether your functions, interests or activities may be affected by this activity. These may include spiritual and cultural connections to land and sea Country, commercial and recreational fishing, tourism and local communities.

More information that can help you identify if you are a relevant person and on how to provide your input can be found here: https://australia.chevron.com/.../gorgon-and-jansz-feed...

View insights 624 post reach

environment plan

seeking relevant persons' input

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

To maintain current rates of gas supply to the Gorgon Gas Facility on Barrow Island, we are planning to install and operate a subsea compression station, floating field control station and associated infrastructure in the Jansz-Io gas field off the northwest coast of WA.

Chevron Australia has previously consulted with relevant persons on Jansz-Io Compression (J-IC) installation activities and the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), accepted the corresponding environment plan in May 2024. We are now seeking to consult on operational activities.

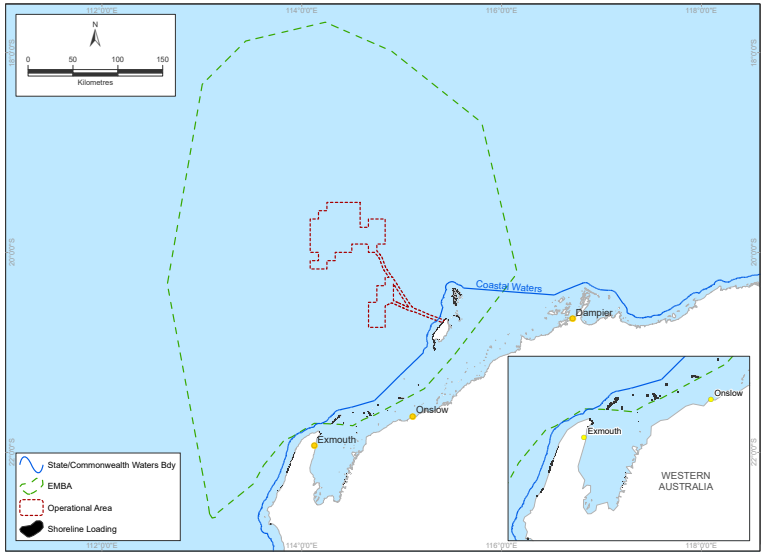
The feedback we receive during consultation will inform and enhance the revision of the Gorgon and Jansz Feed Gas Pipeline and Wells Operations Environment Plan, which must be accepted by NOPSEMA before J-IC operations may commence.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, we create an EMBA map to provide geographical context for stakeholders to determine if their functions, interests or activities may be affected by an offshore activity during operations or in an emergency scenario.

The map shows the operational area (OA) and the EMBA, which is based on a worst-case environmental scenario, which in this case is an unplanned release (oil spill) from the hydrocarbon system and/or a vessel collision. Shoreline loading refers to areas of the coast that may be impacted by hydrocarbons.

The EMBA has been defined through combining 300 simulations for each unplanned release scenario under different weather and ocean conditions. This means that in the highly unlikely event an unplanned release does occur, a much smaller geographical area would be affected. The majority of the impacts and risks directly arising from operations, or from an emergency scenario, would occur within close 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.

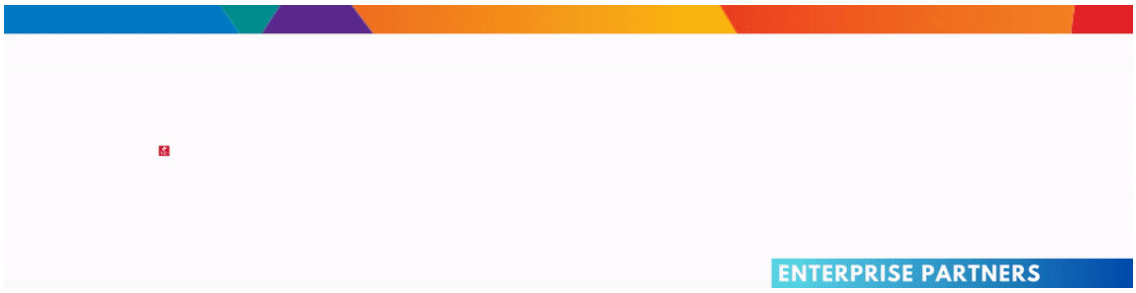
we want to hear from you

We are now seeking feedback and input if you consider your functions, interests, or activities may be affected. This may include Traditional Owners with spiritual and cultural connections to land and sea Country, local community members, and those involved in commercial or recreational fishing and tourism.

Please contact us by Friday **30 August 2024** to be included in consultations. Visit **australia.chevron.com/feedback**, call tollfree on **1800 225 195** or scan the **QR code** for more information.

KDCCI
KARRATHA & DISTRICTS
CHAMBER OF COMMERCE & INDUSTRY

THANK YOU TO OUR SPONSORS



KDCCI

14 Aug 2024

NEWSLETTER

Karratha & Districts Chamber of Commerce and Industry

The highly anticipated Developing Northern Australia Conference (DNAC) is coming up.

More Info

commencement of its **Vesta Project**, a **$122 million housing development in Karratha** to accommodate 100 employees from its upcoming Project Ceres. The project aims to support a non-FIFO workforce, contributing to the local community and economy. Construction is set to begin in late 2024 and be completed by 2027, with local contractors leading the build.
Beyond the initial 100 homes, **Perdaman is exploring opportunities to expand housing in Karratha**, potentially partnering with the government to address the region's housing shortage. The company is committed to long-term investment in the community and fostering a strong local workforce.

More Details

Chevron Australia is currently undertaking consultation on an environment plan for the operation of new subsea compression infrastructure in the Jansz-Io gas fields, approximately 200 km off the northwest coast of WA.

Chevron is seeking your input on whether your functions, interests or activities may be affected by this activity. These may include spiritual and cultural connections to land and sea Country, commercial and recreational fishing, tourism and local communities.

More information that can help you identify if you are a relevant person and on how to provide your input can be found at australia.chevron.com/feedback or call tollfree on 1800225 195 before 30 August 2024.

KDCCI
KARRATHA & DISTRICTS
CHAMBER OF COMMERCE & INDUSTRY

Our mailing address is:

Want to change how you receive these emails?

You can update your preferences or unsubscribe

appendix d summary of relevant persons consultation

Table of Contents

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)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	22/07/2024-16/09/2024	001847	Email	ACMA advised CAPL that its operational area and EMBA are not in the vicinity of any existing protection zones declared by the ACMA. However, ACMA advised the presence of submarine cable infrastructure in the vicinity of these areas, specifically Telstra operated subsea infrastructure in the waters offshore Onslow and Devil Creek (WA), and the North-west Cable System operated by Vocus. CAPL noted ACMAs advice regarding the presence of submarine cable infrastructure in the vicinity of its operational area. CAPL confirmed that it is currently engaging with Vocus and Telstra for this activity. CAPL is also engaging with the AHO.	ACMA raised presence of submarine cable infrastructure.	**Claim has merit:** CAPL notes the presence of submarine cable infrastructure within the vicinity of the operational area.	Vocus and Telstra were engaged with (Record ID 001577 and 001849 respectively. Section 4.4.6 of the EP describes submarine cables within the operational area. Submarine cables offshore of Onslow and Devil Creek are not located within the vicinity of the operational area.
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACMA on 16 July 2024 via formal written notification which provided an overview of the activity, information sheet and link to the Consultation Hub on CAPL's website. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by ACMA. • ACMA has not raised any objections or claims relating to the activity. However, ACMA did provide feedback to CAPL and raised potential receptors in the area. Further engagement with additional relevant persons was conducted. • CAPL has provided a reasonable period and sufficient information to ACMA 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 8.3.4.1).			
Australian Fisheries Management Authority (AFMA)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPL's consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. 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
				CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.			
				Summary: • CAPL commenced consultation with AFMA on 16 July 2024 via formal written notification 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 information sheet. CAPL provided additional formal notification on 6 August and 18 October. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by AFMA. • AFMA did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to AFMA 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 8.3.4.1).			
Australian Hydrographic Office (AHO)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	11/09/2024	002030	Email	AHO thanked CAPL for their email and advised they had no additional comments. AHO requested CAPL to report any developments impacting maritime safety or traffic to the AHO once the activity is underway. These will be included in the Notice To Mariners. After completion, send the final positions of any permanent features to the AHO for charting. AHO advised it is preparing a fact sheet on reporting requirements for such projects and will inform CAPL once it is available on the AHO - Maritime Safety Information website.	AHO raised notification requirements.	**Claim has merit:** The notification requirements raised are relevant to the activity.	No change to the EP. Notification requirements are standard within CAPL EPs, are already included within the document.
	08/10/2024	002029	Email	CAPL has acknowledged the receipt of the email from AHO. CAPL confirmed that they will reach out to AHO when it becomes necessary to share information pertinent to safe navigation, as specified in the Notice to Mariners section on the AHO website. CAPL acknowledged the AHO fact sheet.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2024	002043	Email	AHO sent an email to CAPL to acknowledge receipt of the email sent 16 December 2024 (Record ID 001965).	No objection or claim raised		
	18/02/2025	002084	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AHO on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				impacts and risks and control measures to enable an informed assessment by AHO. • AHO did not raise any objections or claims relating to the activity. AHO notified CAPL of the notification requirements. These notification requirements are standard, and are included in the EP. • CAPL has provided a reasonable period and sufficient information to AHO 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 8.3.4.1)			
Australian Maritime Safety Authority (AMSA)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email	No objection or claim raised		
	29/07/2024-10/09/2024	001863	Email	AMSA responded and raised vessel traffic in the region, notification requirements and the need for anti-collision measures. CAPL acknowledged the requirements to notify AMSA's Response Centre 24-48 hours before operations commence as well as AHO four working weeks before operations commence (or as otherwise agreed with AHO). CAPL confirmed that notification requirements have been incorporated into the EP. CAPL noted that its vessels will comply with the International Rules for Preventing Collisions at Sea (COLREGs). In addition, collision risk mitigation measures described below are considered in the EP to mitigate the risk of a collision within the Operational Area.	AMSA raised notification requirements and the need for anti-collision measures.	**Claims have merit:** Notification requirements and vessel collision controls are relevant and applicable to this activity.	No change to the EP. Notification requirements and vessel collision controls are standard within CAPL EPs, are already included within the EP.
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001896	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	21/10/2024	001977	Email	AMSA responded and referred to email previously sent in regard to the activity (Record ID 001863). AMSA asked for confirmation that this response had been received and that their feedback was reaching the appropriate departments. CAPL responded and confirmed that the submission is being forwarded to the appropriate departments.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	20/12/2024	002039	Email	AMSA acknowledged the email from CAPL regarding commissioning activities, which are expected to begin in 2026, with startup and operations projected for either 2027 or 2028. AMSA confirmed that the original advice sent to CAPL on 29 July 2024 (Record ID 001863) remains unchanged.	No objection or claim raised		
	31/12/2024	002044	Email	CAPL responded to AMSA to confirm receipt of their email and acknowledged NavSafety's requirements as sent to CAPL on 29 July 2024 (Record ID 001863). CAPL referred to previous correspondence sent to AMSA on 10 September 2024 (Record ID 001863) to confirm the feedback has been addressed.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AMSA on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by AMSA. CAPL also provided AMSA with shapefiles for the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• AMSA did not raise any objections or claims relating to the activity. AMSA raised notification requirements and the need for anti-collision measures which have been addressed in the EP. • CAPL has provided a reasonable period and sufficient information to AMSA 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 8.3.4.1).			
Department of Agriculture, Fisheries and Forestry (DAFF)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DAFF via sent a formal written notification on 16 July 2024 which provided an overview of the activity, information sheet and link to the Consultation Hub on CAPL's website. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DAFF. • DAFF did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to DAFF 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 8.3.4.1)			
Department of Climate Change, Energy, the Environment and Water - DCCEEW	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	01/12/2024	002034	Email	DCCEEW raised the presence of the Montebello Marine Park and advised the notification requirements in the event of a spill near or likely to impact a marine park.	DCCEEW raised the presence of the Montebello Marine Park and listed the notification requirements in a spill event.	**Claims have merit:** The receptor and the notification requirements raised are deemed relevant and applicable to the activity.	No change made to the EP. The Montebello Marine Park is already included and considered as a receptor within the EP. The notification requirements in a spill event are included in Section 8.4.2.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	24/12/2024	002109	Email	DCCEEW advised that it had no objections or claims associated with the revised activity information.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DCCEEW on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DCCEEW. • DCCEEW did not raise any objections or claims relating to the activity. However, DCCEEW raised the presence of the Montebello Marine Park and listed the notification requirements in a spill event, both of which are already captured within the EP. • CAPL has provided a reasonable period and sufficient information to DCCEEW 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 8.3.4.1).			
Department of Climate Change, Energy, the Environment and Water - Director of National Parks (DNP)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/08/2024	001713	Email	CAPL sent a follow up email to DNP and provided additional information regarding the EP, in accordance with the Petroleum activities and Australian Marine Parks Guidance Note (N-04750-GN1785 A620236) (Guidance Note), specifically relating to: • The Operational Area for the revised EP overlaps the Montebello Marine Park and includes other nearby Australian Marine Parks within the EMBA. • The EP advised its proposed activities may have potential impacts to AMPs from physical presence, underwater sound, and planned discharges, as well as risks from accidental releases. • CAPL will ensure the revised EP identifies and manages all impacts and risks to AMP values to an acceptable level and demonstrates consistency with relevant AMP management plan. • CAPL will notify the DNP if an environmental incident occurs.	No objection or claim raised		
	27/10/2024- 01/12/2024	002078	Email	DNP responded, and confirmed they did not have any further comments or questions. DNP noted the presence of the Montebello Marine Park and the notification requirements to DNP in the event of an emergency situation. CAPL thanked DNP for their response.	DNP noted the presence of the Montebello Marine Park and the notification requirements to DNP in the event of an emergency situation.	**Claims have merit:** The receptor and the notification requirements raised are relevant to this activity.	No change made to the EP. The Montebello Marine Park is considered as a receptor within the EP. Incident reporting requirements are listed in Table 8-13, including DNP notifications.
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. 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
				CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.			
				Summary: • CAPL commenced consultation with DNP on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DNP. • DNP did not raise any objections or claims relating to the activity. CAPL provided further information in accordance with the Petroleum activities and Australian Marine Parks Guidance Note. DNP noted the presence of the Montebello Marine Park and emergency notification requirements, both of which are captured within the EP. • CAPL has provided a reasonable period and sufficient information to DNP 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 8.3.4.1).			
Department of Defence (DoD)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DoD on 16 July 2024 via formal written notification 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 link to the Consultation Hub on CAPL's website. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures. • DoD did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to DNP 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 8.3.4.1).			

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)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	10/10/2024	001821	Email	DBCA raised presence of ecologically important areas within the EMBA, including the Montebello Islands Marine Park and Muiron Islands Marine Management Area. DBCA raised importance of baseline data. DBCA recommended that CAPL refer to the *National Light Pollution Guidelines for Wildlife* for managing potential impacts from light emissions. DBCA requested notification in the event of a hydrocarbon release, and provided additional information regarding marine pollution. CAPL provided confirmation to DBCA on its OPEP and that it would notify them in the event of a hydrocarbon release.	DBCA raised the following: • Potential receptors • Light emission guidelines • Notification requestions.	**Claims have merit:** All raised receptors, guidelines and notification requirements are relevant and applicable to the activity.	No change made to the EP. The EP includes and considers ecological areas within the EMBA, including the raised protected areas. The National Light Pollution Guidelines for Wildlife is referred to in the risk assessment for light emissions (Section 7.6). The notification requirements are addressed within the OPEP.
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DBCA on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DBCA. • DBCA did not raise any objections or claims relating to the activity. DBCA raised the presence of ecologically important areas within the EMBA, relevant guidelines and notification requirements. The EP includes and considers ecological areas within the EMBA, including the raised protected areas. The National Light Pollution Guidelines for Wildlife is referred to in the risk assessment for light emissions. The notification requirements are addressed within the OPEP. • CAPL has provided a reasonable period and sufficient information to DBCA 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 8.3.4.1).			
Department of Primary Industries and Regional Development (WA DPIRD): Fisheries	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/02/2025-24/02/2025	002120	Email	DPIRD provided a response, and raised advice regarding: • Fishing activities in the area • Oil spill contingency	DPIRD provided advice regarding: • Fishing activities in the area • Oil spill contingency	**Claims have merit:**	No change made to the EP.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Biosecurity • Protected species and areas • Implementation. DPIRD recommended consulting with WAFIC, Recfishwest, Aquaculture Council of Western Australia, individual fishers and Traditional Owners in the area. CAPL provided a response to acknowledge their recommendations and to address all subjects raised by DPIRD. CAPL noted that the revised EP will include further details regarding consultation and outlined the OPEP and OSMP documents that are in place in the event of a spill scenario. CAPL noted that impacts and risks to fauna, fisheries, and fish spawning are addressed within the EP. CAPL confirmed that the revised EP will now be finalised, including consideration of feedback received during consultation, before it is submitted to the NOPSEMA for assessment.	• Biosecurity • Protected species and areas • Implementation, and • Additional relevant persons to consider.	The information and advice raised by DPIRD is relevant to the activity.	CAPL has engaged with WAFIC, Recfishwest, Aquaculture Council of Western Australia, and Traditional Owners in the area as part of the development of this EP. Section 4 of the EP outlines the environment that may be affected, and includes fishing activities, protected species and areas. The risk and impact to receptors is considered within Section 7.
				Summary: • CAPL commenced consultation with WA DPIRD on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WA DPIRD. • WA DPIRD did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to WA DPIRD 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 8.3.4.1).			
Department of Transport (DoT) - Maritime Environmental Emergency Response (MEER) - Marine Pollution	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	24/07/2024	001705	Email	DoT responded to CAPL and directed they consult the DoT Industry Guidance Note regarding consultation requirements if there is a risk of a spill impacting State waters.	DoT raised notification requirements in the event of a spill.	**Claim has merit:** DoT notification requirements are relevant and applicable to the activity.	No change made to the EP. DoT notification requirements are already captured within Section 8.4.2 of the EP.
	02/09/2024	001986	Email	CAPL provided a response to DOT in accordance with the guidance note. DoT advised CAPL it will review the provided information and will respond with comments within the next two weeks.	No objection or claim raised		
	04/10/2024-07/10/2024	002079	Email	DoT thanked CAPL for providing the notification. They noted that the State Hazard Plan – Maritime Environmental Emergencies (SHP-MEE) was updated in 2024.	Raised that there is a more recent version of the State Hazard Plan – Maritime Environmental Emergencies (SHP-MEE) document.	**Claim has merit:** This document is relevant to the activity, and the most recent version should be considered.	The updated SHP-MEE was reviewed and no changes to the EP were identified.
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 DoT on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DoT. CAPL also provided additional information to DoT in accordance with the Department of Transport Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (July 2020) including EMBA figures for potential spill scenarios, and timeframes for potential impacts to state waters. • DoT did not raise any objections or claims relating to the activity. DoT raised the consultation requirements of the Department of Transport Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (July 2020). Incident reporting requirement to DoT for spills potentially affecting State waters or land is already captured in Table 8-13 of the EP. • CAPL has provided a reasonable period and sufficient information to DoT 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 8.3.4.1).			
Department of Water & Environmental Regulation (DWER)	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DWER on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by DWER. • DWER did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to DWER 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 8.3.4.1).			
Gascoyne Development Commission (GDC)	15/07/2024	001608	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	01/08/2024	001677	Email	CAPL resent its notification of consultation launch for the EP via email. CAPL notified GDC they will be in the Gascoyne and requested to meet in person.	No objection or claim raised		
	06/09/2024	001776	Email	CAPL sent a follow up email requesting feedback on the EP. No response 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
	14/10/2024	001870	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with GDC on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by GDC. • GDC did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to GDC 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 8.3.4.1).			
Pilbara Development Commission (PDC)	15/07/2024	001617	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001779	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001871	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/10/2024	001875	Email	PDC responded and confirmed that they do not have any comments.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002083	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with PDC on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by PDC. • PDC did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to PDC 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 8.3.4.1).			
Pilbara Ports Authority	16/07/2024	001566	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001770	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001895	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPL's consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Pilbara Ports Authority on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Pilbara Ports Authority. • Pilbara Ports Authority did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Pilbara Ports Authority 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 8.3.4.1).			
Tourism Western Australia	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Tourism Western Australia on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Tourism Western Australia. • Tourism Western Australia did not raise 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 a reasonable period and sufficient information to Tourism Western Australia 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 8.3.4.1).			

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 Energy, Mines, Industry Regulation and Safety (WA DEMIRS)	16/07/2024	001567	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001771	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001897	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WA DEMIRS on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WA DEMIRS. • WA DEMIRS did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to DEMIRS 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 8.3.4.1).			

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)	15/07/2024	001597	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	17/07/2024	001604	Face-to-face	CAPL met with BTAC at the BTAC offices with the following being discussed: • Cultural Mapping Project • Co-design of consultation for Gorgon and Jansz Feed Gas Pipeline and Wells Operations Environment Plan (this EP) • Co-design of consultation for future Barrow Island EP's. CAPL provided BTAC with a presentation on consultation as well as JIC Operations Information Sheet and JIC underwater sound information sheet.	No objection or claim raised		
	29/07/2024	001626	Phone	CAPL contacted BTAC representative to discuss how to move ahead with consultation. BTAC representative advised that it was his understanding that consultation would occur with the Board for the moment, however he was agreeable to a CAPL proposal to plan set sessions throughout the year with the Other Projects Committee or Cultural Mapping Project Reference Group.	No objection or claim raised		
	09/08/2024	001648	Email	BTAC sent an email to CAPL confirming the Cultural Mapping proposal and expressing the importance of progressing it as a priority. BTAC mentioned that the proposal for ranger program support for Chevron's consideration is forthcoming.	No objection or claim raised		
	09/08/2024	001892	Email	CAPL requested opportunity to consult with the Board on upcoming EPs, including this EP.	No objection or claim raised		
	29/08/2024-30/08/2024	001722	Email	BTAC confirmed interest in participating in consultation and that it would respond to CAPL shortly with date options.	No objection or claim raised		
	02/09/2024	001946	Email	CAPL provided BTAC with August Communication Update which included references to requests for EP consultation.	No objection or claim raised		
	18/09/2024-07/10/2024	001816	Email	CAPL wrote to BTAC requesting opportunity to consult with the board on upcoming EPs, including this EP.	No objection or claim raised		
	03/10/2024	001947	Email	CAPL provided BTAC with September Communication Update which included references to requests for EP consultation.	No objection or claim raised		
	10/10/2024	001812	Phone	CAPL spoke to BTAC representative by telephone. BTAC confirmed invitation for CAPL to consult on upcoming EPs (including this EP) to the Board on 7 November 2024. BTAC confirmed interest in CAPL presenting on WA Oil Decommissioning at the Common Law Holders Meeting on 19 November 2024.	No objection or claim raised		
	11/10/2024-10/10/2024	001813	Email	CAPL wrote to BTAC seeking clarification of meeting details with the BTAC Board to consult on upcoming EPs, including this EP.	No objection or claim raised		
	25/10/2024-30/10/2024	001945	Email	CAPL confirmed attendance at BTAC board meeting on 8 November 2024 via email. CAPL provided copies of the presentations as well as NOPSEMA consultation guideline and brochure. BTAC confirmed that it would have a quorum of 3 BTAC directors.	No objection or claim raised		
	05/11/2024	001948	Email	CAPL provided BTAC with October Communication Update which included references to requests for EP consultation.	No objection or claim raised		
	08/11/2024	001952	Face-to-face	CAPL presented on the Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP (this EP) to the BTAC Board. • CAPL provided printed copies of information sheets and NOPSEMA Community Consultation Brochure. • CAPL and BTAC discussed ongoing monitoring around the JIC Location. • BTAC requested to be kept informed about the performance of JIC and ongoing monitoring post commissioning.	BTAC requested to be kept informed about the performance of JIC and ongoing monitoring post commissioning.	**Claim has merit**: As a relevant person, the request for ongoing engagement is considered fair and reasonable.	No change made to the EP. CAPL's commitment to ongoing engagement with First Nations representative bodies is captured within Section 8.3.4.3 of 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 presented to the BTAC Board on the other CAPL State EPs. CAPL reiterated opportunity to participate in MFO training and Turtle Monitoring on BWI.			
	13/11/2024	002108	Email	CAPL sent an email requesting feedback from BTAC following the board meeting. CAPL attached the Consultation Summary to be included in the EP.	No objection or claim raised		
	05/12/2024-16/01/2025	002058	Email	BTAC provided CAPL with feedback on the consultation summary. CAPL responded to BTAC with further edits. CAPL provided BTAC with published paper on Whale Tagging research. CAPL requested advice on opportunity to present to Common Law Holders Meeting as indicated by BTAC.	No objection or claim raised		
	16/12/2024	001970	Email	CAPL advised of the changes to the consultation material provided and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	06/02/2025	002106	Email	CAPL sent an email advising the minor adjustments to the consultation summary.	No objection or claim raised		
	18/02/2025	002103	Email	CAPL has sent an email notifying that the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation and discussions relating to the EP with BTAC on 15 July 2024 (Record ID 001597). Updated consultation material was provided via email on 16 December 2024. • CAPL has provided BTAC the opportunity to provide feedback and CAPL has presented sufficient information in accordance with Section 6.2.2 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 three months 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 6.2.3 of the EP. • CAPL has met with BTAC on multiple occasions as well as maintaining contact through multiple calls and 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 provided BTAC with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • CAPL and BTAC continue to engage separately to EP consultations in relation to their Wheatstone Native Title Agreement and onshore Cultural Heritage activities at Wheatstone and Barrow Island. • 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. CAPL will continue to engage BTAC as part of its ongoing consultation for environment plans, including progressing cultural mapping, as outlined in Section 8.3.4.1 of the EP.			
Mardathoonera Cultural Heritage Pty Ltd (MCH)	15/07/2024	001569	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	24/07/2024	001675	Email	CAPL sent email to MCH to propose meetings in August. CAPL advised MCH they will be consulting on J-IC and decommissioning activities from an environment plan perspective, as well as request a heritage survey in September. CAPL requested a Teams call to discuss as well as the cultural mapping proposal.	No objection or claim raised		
	06/08/2024	001642	Phone	MCH contacted CAPL to discuss EP feedback and consultation conference planned for August.	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
	08/08/2024	001665	Email	MCH emailed CAPL regarding the EP consultation summary, noting their preference to include a copy of full questions and responses. MCH referred to NOPSEMA consultation guidelines. CAPL confirmed that a summary of consultation is provided in the public consultation summary and full text questions and responses will be provided as part of the sensitive information record.	No objection or claim raised		
	12/08/2024	001669	Email	CAPL emailed MCH the monthly report and engagement schedule. CAPL advised the Agenda for the Consultation should be provided to MCH on 15 August 2025.	No objection or claim raised		
	20/08/2024	001706	Face-to-face	CAPL met with MCH to consult on its EPs, including this EP. Questions raised by MCH included: • Ongoing maintenance of J-IC • Decommissioning at end of life. Physical information sheets were provided explaining J-IC and Underwater Sound. MCH advised that they would respond to CAPL with comments by 30 August 2024 but they had no fundamental issues with the activity.	MCH raised questions relating to ongoing maintenance of J-IC and decommissioning.	**Claim has merit:** As a relevant person, the request for information regarding the ongoing maintenance of JIC and decommissioning is considered fair and reasonable.	No change made to the EP. Questions raised during the meeting were addressed.
	04/09/2024	001774	Virtual Meeting	CAPL and MCH met for monthly meeting and discussed the following matters: • CAPL confirmed closure of Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP consultation period (15 October 2024). MCH advised that they hoped to have comments back to CAPL by 6 September 2024. • CAPL confirmed that it couldn't provide a copy of the Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP because it is still in draft. • Arrangements for Cultural Heritage Survey on BWI (6-13 September 2024).	No objection or claim raised		
	11/09/2024	001785	Phone	CAPL followed up with MCH representative to enquire about progress being made on comments for EP. MCH representative advised that would be sending through shortly.	No objection or claim raised		
	11/10/2024	001810	Face-to-face	CAPL met with MCH and the following matters were discussed: • Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP Consultation Summary • 2025 Planning • MCH Cultural Mapping proposal • DCCEEW Consultation on First Nations Engagement • Place naming on BWI • Process for closing consultation on other CAPL State EPs • Upcoming CAPL State EPs. MCH provided feedback to CAPL in relation to the scope of the EP. They shared that: – They are concerned about the impact of underwater noise, vibrations and energy (for example, the use of sonar) and the potential for it to impact the frequency of whale communication, specifically when that noise is closer to the surface. MCH requests CAPL use Marine Fauna Observers (MFOs) in situations where there is an increase risk to marine fauna from its operations. – MCH is concerned about climate change and the impact on water temperatures, citing recent increases in crocodile sightings in the Pilbara region. – MCH have requested the opportunity to be notified in the event of an emergency and to continue participating in training related to Marine Fauna Observer qualifications and Oil Spill Response. • During consultation, MCH sought clarification regarding: 1. Noise and vibration of JIC during typical operating conditions 2. Research and understanding of the Pygmy Blue Whale	MCH raised claims relating to: • Underwater sound, including the noise profile of the subsea compression station • Other underwater sound sources, particularly at the sea surface and the use of MFOs • Climate change • Notification in the event of an emergency and oil spill response and MFO training • Krill • Pygmy blue whales • Integrity of the Jansz reservoir • Decommissioning • Seabed disturbance	**Claims have merit** Questions raised by MCH are considered fair and reasonable are as they relate to MCH's functions, interests and activities.	CAPL explained the information that has been included in the EP including: • Information on the sound source profile of the subsea compression station and how CAPL will operate it in a manner that is not inconsistent with the pygmy blue whale management plan • Assessment of underwater sound for other non-impulsive (e.g. vessels) and impulsive sources. CAPL also explained that an MFO will be used for JIC Installation activities should works be undertaken in the peak pygmy blue whale migration period in the BIA • Assessment of direct and indirect greenhouse gas emissions • Information on krill in the JIC area noting abundance is greater in depths <100 m • Latest science on pygmy blue whale behaviour and ecology • Regulatory framework for decommissioning

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				3. Sources of krill in the JIC area 4. Timing of installation and management of migratory periods 5. Integrity of Jansz reservoir once gas is removed 6. Plans for decommissioning of the JIC infrastructure 7. Presence of and impacts to marine fauna on the seabed CAPL advised MCH that the consultation summary will be made public and if there was any information that MCH would like them to record but not publish, CAPL can advise NOPSEMA. CAPL included a link to the NOPSEMA Managing Gender-Restricted Information Policy.			• Benthic surveys and seabed disturbance CAPL also responded to MCH's question on reservoir management noting this is beyond the scope of the EP. Note that no gender restricted information was identified.
	11/10/2024	001811	Email	CAPL emailed MCH with a copy of the draft EP consultation summary, based on feedback provided on 11 October 2024 (Record ID 001810) for review and comment.	No objection or claim raised		
	16/10/2024	001834	Phone	CAPL contacted MCH to confirm meeting in Karratha on October 25 to finalise EP consultation summary and to discuss cultural mapping proposal.	No objection or claim raised		
	25/10/2024	001944	Face-to-face	CAPL met with MCH in Karratha to discuss consultation, engagement and survey planning for 2025. MCH confirmed that it would respond with additional men's cultural information for the Gorgon and Jansz Feed Gas Pipeline and Wells Operations consultation summary within the next week. CAPL confirmed submission dates and draft process for its State EPs.	No objection or claim raised		
	08/11/2024	001953	Phone	CAPL contacted MCH to confirm additional information to include in EP consultation summary. No response received.	No objection or claim raised		
	16/12/2024	001969	Email	CAPL advised of the changes to the consultation material provided and provided updated information sheet and a link to CAPL's consultation webpage.	No objection or claim raised		
	31/01/2025	002107	Email	CAPL sent a follow-up email to MCH regarding input to be received for the Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP. CAPL shared the EP consultation summary for reference, based on feedback received at the meeting on 11 October 2024 (Record ID 001810) and requested MCH to advise if they wanted any additional changes.	No objection or claim raised		
	18/02/2025	002102	Email	CAPL has sent an email notifying that the consultation period for the EP had closed. CAPL advised as they had not received any further updates from MCH to include in the EP consultation summary and will use the input that CAPL and MCH have already worked on together.	No objection or claim raised		
				Summary: • CAPL commenced consultation and discussions relating to the EP with MCH on 15 July 2024 via formal written notification advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. Updated consultation material was provided via email on 16 December 2024. • MCH provided feedback to CAPL (Record ID 001810) in relation to the scope of the EP and CAPL responded to MCH's comments during the meeting. • In relation to MCH interests regarding songlines, oceans and marine fauna that may be impacted by the activities subject of the EPs, MCH has previously communicated that they would like to inform CAPL of the following: – The sea is the source of energy for all life, it holds the codes that are encrypted in each person's body and the songlines and is the lifeforce for the world. – The places where the saltwater from the sea and the freshwater from the land connect are where the biggest energy lines are, and that connection is a force of creation relevant to a Dreaming story. – Songlines extend out from the land, through the sea and around the globe, connecting places, people and animals to each other, creating migratory patterns for animals and telling animals of the right time to birth and eat.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				– Marine fauna, such as whales, dugongs, dolphins and turtles hold cultural significance for Mardathoonera people. – There is a large energy line that exists off the coast of Murujuga and runs through the area that Chevron operates in and MCH is aware that this area is in the whales' migration line. Both whales that migrate north to south and south to north pass through this area. Whales may be disrupted by activities occurring along the songline and their migration pathway, including the activities the subject of the EPs. – MCH is connected to the songlines. If the songlines are disrupted, MCH and its people are disrupted – their widdart (heart) is disconnected – like the whales, their feet get lost and they don't know where to go anymore. • 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 provided MCH with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by MCH. • CAPL has provided a reasonable period and sufficient information to allow MCH to identify the effect of the proposed activity on their functions, interests and activities, and to provide any objections or claims as set out in Section 6.2.3 of the EP. CAPL will continue to engage MCH as part of its ongoing consultation for environment plans, as outlined in Section 8.3.4.1 of the EP.			
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	15/07/2024	001615	Email	CAPL sent a formal written notification advising NTGAC that 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. CAPL notified NTGAC that they are committed to ongoing consultation communication and welcome meaningful feedback.	No objection or claim raised		
	16/07/2024	001845	Email	CAPL emailed NTGAC to confirm consultation meeting details for Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	No objection or claim raised		
	24/07/2024	001624	Virtual Meeting	CAPL and YMAC (on behalf of NTGAC) met to discuss draft consultation agreement. CAPL provided clarity on comments about matters raised. YMAC mentioned all track changes seemed to be reasonable and could be accepted. They advised they will come back to CAPL with updated wording on FPIC relevant to consultation. CAPL and YMAC discussed the agenda for Board meeting on 7 August 2024. Details to be sent this week to confirm timing.	No objection or claim raised		
	31/07/2024-04/08/2024	001676	Email	CAPL emailed NTGAC representative to confirm consultation meeting details with NTGAC board. CAPL agreed to time, location and information that had been provided to attend the NTGAC board meeting. CAPL were advised the meeting will not go ahead. CAPL acknowledged the meeting cancellation and openness to reschedule when appropriate.	No objection or claim raised		
	26/08/2024	001781	Email	NTGAC invited CAPL to attend a board meeting on 16 October 2024 to consult on Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP. CAPL accepted the invitation.	No objection or claim raised		
	01/10/2024	001846	Email	CAPL emailed NTGAC regarding consultation meeting for Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	No objection or claim raised		
	09/10/2024	001850	Email	CAPL sent a follow up email regarding the consultation meeting with NTGAC on Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	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
	09/10/2024	001851	Email	CAPL shared presentation for upcoming consultation meeting with NTGAC for Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	No objection or claim raised		
	16/10/2024	001837	Face-to-face	CAPL met with NTGAC to consult on the Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP. CAPL provided the Board with hard copies of the NOPSEMA Consultation Guidelines, outlining the regulatory requirements as well as their ability to advise CAPL what information could be published or held as sensitive information, such as gender specific cultural information. NTGAC confirmed significance of sea country and coastal locations on the Ningaloo coast. NTGAC confirmed interest in participating in MFO and Oil Spill training. CAPL confirmed that it would continue to work with NTGAC on opportunities that would help the corporation to achieve their strategic objectives.	NTGAC raised significance of sea country and Ningaloo coast.	**Claim has merit:** CAPL acknowledge the significance of areas identified by NTGAC.	No change made to the EP. Table 4-15 in the EP details cultural values or features identified through consultation. This includes the sensitivities raised by NTGAC.
	18/10/2024	001877	Email	CAPL sent a follow up email after consultation meeting with NTGAC on Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	No objection or claim raised		
	20/10/2024-24/10/2024	002002	Email	CAPL engaged with NTGAC on an opportunity to be part of Pygmy Blue Whale research. Letter of support was given by NTGAC	No objection or claim raised		
	16/12/2024	001995	Email	CAPL provided NTGAC a revised information sheet for the Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP, indicating the change in operational activity.	No objection or claim raised		
	18/12/2024	002036	Email	CAPL sent an email to NTGAC to follow up on previous engagement (Record ID 001877) and enquired as to whether NTGAC had any feedback.	No objection or claim raised		
	04/02/2025	002072	Virtual Meeting	CAPL met with NTGAC to discuss 2025 engagements and follow up on Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP Consultation summary. CAPL sent a follow up email to NTGAC requesting feedback on summary of consultation. No response received.	No objection or claim raised		
	20/02/2025	002098	Email	CAPL sent an email advising the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL provided NTGAC with a written notification and information sheet on 15 July 2024. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by NTGAC. • CAPL has considered feedback provided by NTGAC during consultation, including information on NTGAC's functions, interests and activities within the EMBA and all claims raised have been addressed. • CAPL has informed NTGAC 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 NTGAC with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • NTGAC did not raise any objections or claims relating to the activity. NTGAC did discuss the significance of sea country and Ningaloo coast. This is captured and considered within the EP. • CAPL has provided a reasonable period and sufficient information to allow NTGAC 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 6.2.3 of the EP. CAPL will continue to engage NTGAC as part of its ongoing consultation for environment plans, as outlined in Section 8.3.4.1 of the EP.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Wirrawandi Aboriginal Corporation RNTBC (WAC)	15/07/2024	001598	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	07/08/2024-09/08/2024	001933	Email	CAPL provided WAC information on: • EP shared in the consultation with the board. • OPP	No objection or claim raised		
	09/08/2024	001657	Virtual Meeting	CAPL provided a presentation to the WAC board via teams. Items discussed in the presentation included: • Gorgon Gas Development Gorgon and Jansz Feed Gas Pipeline and Wells Operations Environment Plan to account for the operation of Jansz-Io Compression infrastructure. • Barrow Island decommissioning and CO2 • Cultural Heritage. CAPL also advised that the Gorgon Gas Development OPP was now available for public comment on the NOPSEMA website	No objection or claim raised		
	16/08/2024	001701	Phone	CAPL requested opportunity to consult on other EPs relating to activities occurring on Barrow Island, advising that it was able to do this in Perth or Karratha.	No objection or claim raised		
	18/08/2024	001885	Email	CAPL requested opportunity to consult further with the board on other EPs. CAPL also provided WAC with copy of letter sent to WAC board on 21 March 2024 in relation to BWI connection.	No objection or claim raised		
	26/08/2024	001725	Email	CAPL provided written response to report provided by WAC in relation to 2023 Ethnographic Survey conducted on Barrow Island.	No objection or claim raised		
	29/08/2024	001709	Phone	WAC contacted CAPL to discuss recent emails with respect to Barrow Island.	No objection or claim raised		
	29/08/2024	001724	Email	CAPL contacted WAC to confirm interest in being consulted further on EP, following earlier requests made in August.	No objection or claim raised		
	05/09/2024-12/09/2024	001784	Email	WAC confirmed that they had no further questions or comments on Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP. CAPL confirmed that WAC did not have further comments and consultation is closed. CAPL confirmed that it would be available to meet with the WAC board to discuss other activities.	No objection or claim raised		
	01/10/2024-02/10/2024	001817	Email	CAPL and WAC exchanged emails in regards to consulting on the EP. WAC advised that it would respond with confirmation shortly. WAC provided CAPL with rates schedule.	No objection or claim raised		
	11/12/2024	001964	Face to Face	CAPL met with WAC and WAC Legal Representative to discuss Ranger Coordinator Funding Agreement and ongoing relationship	No objection or claim raised		
	16/12/2024	001972	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002121	Face-to-face	CAPL met with WAC to discuss ongoing engagement, consultations and approach to participation on surveys.	No objection or claim raised		
	19/02/2025	002100	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation and discussions relating to the EP with WAC on 15 July 2024 via formal written notification advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WAC.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• 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. WAC confirmed that it did not have any comments on the EP (Record ID 001784). • CAPL has provided a reasonable period and sufficient information to allow WAC 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 6.2.3 of the EP. CAPL will continue to engage WAC as part of its ongoing consultation for environment plans, as outlined in Section 8.3.4.1 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	15/07/2024	001579	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	16/07/2024-23/07/2024	001649	Email	Aquacultural Council of WA responded to CAPL's written notice email requesting further information on time period of consultation. CAPL responded via email providing time period for consultation.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	12/09/2024	001899	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001853	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001900	Email	Aquaculture Council Western Australia responded to CAPL advising they did not have any objections or claims to the proposed activity.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to the consultation material provided and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Aquaculture Council Western Australia on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Aquaculture Council Western Australia. • Aquaculture Council Western Australia did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Aquaculture Council Western Australia 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 8.3.4.1).			
Commonwealth Fisheries Association (CFA)	12/09/2024	001902	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	18/10/2024	001855	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to the consultation material provided and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CFA on 12 September 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by CFA. • CFA did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to CFA 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 8.3.4.1).			
Tuna Australia	16/07/2024	001580	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001924	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001859	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to the consultation material provided and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	29/01/2025	002068	Email	Tuna Australia advised that unless there were large changes to the project (such as increase to area or new activities) no further consultation was required. CAPL thanked Tuna Australia for their response, and confirmed that there were no significant changes to the activities for this EP.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Tuna Australia on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Tuna Australia. • Tuna Australia did not raise any objections or claims relating to the activity. Tuna Australia confirmed that no further consultation input was required unless significant changes to the project occurred (Record ID 002068).			

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 a reasonable period and sufficient information to Tuna Australia 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 8.3.4.1).			
Western Australian Fishing Industry Council (WAFIC)	26/04/2024	001309	Email	CAPL wrote to WAFIC to summarise meeting and action items for a future meeting to build fluency of each other's industries, as well as consultation needs. Future EPs were raised.	No objection or claim raised		
	16/072024	002080	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	09/09/2024	001783	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	11/09/2024-14/10/2024	001819	Email	CAPL contacted WAFIC for advice on whether feedback had been received from their members of its EP.	No objection or claim raised		
	11/09/2024	001820	Email	WAFIC provided CAPL with email sent to its license holders with respect to the EP.	No objection or claim raised		
	15/10/2024	001979	Email	WAFIC advised CAPL that it had not received any feedback from its license holders regarding the proposed EP. WAFIC raised concerns and asked follow up questions about: • impacts of planned discharges • preparation for unplanned events (specifically notifications) • impacts of noise emissions on the marine environment.	WAFIC raised concerns and asked follow up questions about the following: • impacts of planned discharges • preparation for unplanned events (specifically notifications) • impacts of noise emissions on the marine environment.	**Claims have merit**: All concerns and questions raised are relevant to the activity.	CAPL provided a response to WAFIC (Record ID 001974) answering all questions. Planned discharges, unplanned releases and underwater sound have all been addressed in Section 7 of the EP.
	22/10/2024	001974	Email	CAPL provided a response to WAFIC's queries. CAPL emailed WAFIC requesting the list of fisheries that were consulted for the EP. CAPL observed that the North West Slope Trawl Fishery (NWSTF) was not included in the previous correspondence. CAPL noted that WAFIC has since confirmed their ability to consult with the NWSTF in this matter.	No objection or claim raised		
	22/10/2024	002033	Email	WAFIC thanked CAPL for their response, and confirmed that they had no further comments. CAPL confirmed close of consultation with Relevant Person. WAFIC confirmed that the following fisheries had been consulted: • Mackerel Managed Fishery (Area 2) • Pilbara Crab Managed Fishery • Pilbara Line Fishery • Pilbara Trap Managed Fishery • West Australian Sea Cucumber Fishery (Beche-De-Mer) Fishery • North West Slope Trawl Fishery.	No objection or claim raised		
	12/11/2024	002111	Email	CAPL advised WAFIC of the need to extend consultation and sought WAFIC's advice on their recommended consultation period for their members in this circumstance. WAFIC provided a response, indicating that 4 weeks was the standard timeframe for consultation. WAFIC suggested that an activity update could be sent to fishers via notification, with the opportunity to provide feedback. WAFIC confirmed that no feedback from fishers had yet been received on the activity. CAPL has sent an email to WAFIC to confirm receipt of their recommendations. CAPL will take their feedback into account and respond accordingly.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of the changes to the consultation material provided and provided updated 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
	17/12/2024	002031	Email	WAFIC advised CAPL it had provided the following license holders with the revised EP information: • Mackerel Managed Fishery (Area 2) • Pilbara Crab Managed Fishery • Pilbara Line Fishery • Pilbara Trap Managed Fishery • West Australian Sea Cucumber Fishery (Beche-De-Mer) Fishery • Northwest Slope Trawl.	No objection or claim raised		
	18/02/2025	002104	Email	CAPL advised the consultation period for the EP has closed. WAFIC thanked CAPL for the opportunity to provide feedback, and confirmed they did not receive any feedback concerning the adjustment in the schedule for Jansz-Io Compression operational activities, and had no further comment.	No objection or claim raised		
				Summary: • CAPL commenced consultation and discussions relating to the EP with WAFIC on 26 April 2024. On 16 July 2024 CAPL provided formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WAFIC. • WAFIC did not raise any objections or claims relating to the activity. WAFIC raised concerns and asked for further information regarding planned discharges, unplanned events and noise emissions. CAPL provided a response to each query raised, and this engagement was closed out with WAFIC, ensuring that WAFIC was able to make an informed assessment of the possible consequences of the activity on its functions, interests or activities. CAPL allowed a reasonable time after provision of this information for WAIFC to respond with any concerns. • CAPL has provided a reasonable period and sufficient information to WAFIC 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 8.3.4.1).			

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 (Apache)	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Apache on 16 July 2024 via formal written notification advising they 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 provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Apache. • Apache did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Apache 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 8.3.4.1).			
Aquatic Adventure Exmouth	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Aquatic Adventure Exmouth on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Aquatic Adventure Exmouth. • Aquatic Adventure Exmouth did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Aquatic Adventure Exmouth 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 8.3.4.1).			
Archipelago Adventures	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Archipelago Adventures on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Archipelago Adventures. • Archipelago Adventures did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Archipelago Adventures 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 8.3.4.1).			
Ashburton Anglers	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ashburton Anglers on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ashburton Anglers. • Ashburton Anglers did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ashburton Anglers 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 8.3.4.1).			
Blue Horizon Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	06/09/2024	001982	Email	Blue Horizon Charters has sent an email to request the removal from all EP communications.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Blue Horizon Charters on 16 July 2024 via formal written notification 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 information sheet. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				impacts and risks and control measures to enable an informed assessment by Blue Horizon Charters. • Blue Horizon Charters did not raise any objections or claims relating to the activity. Blue Horizon Charters chose to opt out of consultation (Record ID 001982). • CAPL has provided a reasonable period and sufficient information to Blue Horizon Charters 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 8.3.4.1).			
Blue Juice Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001768	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Blue Juice Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Blue Juice Charters. • Blue Juice Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Blue Juice Charters 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 8.3.4.1).			
Blue Lightning Fishing Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Blue Lightning Fishing Charters on 16 July 2024 via formal written notification advising they 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 provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Blue Lightning Fishing Charters. • Blue Lightning Fishing Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Blue Lightning Fishing Charters 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 8.3.4.1).			
Bluesun2 Boat Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Bluesun2 Boat Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Bluesun2 Boat Charters. • Bluesun2 Boat Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Bluesun2 Boat Charters 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 8.3.4.1).			
Boating Industry Association WA (BIAWA)	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 BIAWA on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by BIAWA. • BIAWA did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to BIAWA 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 8.3.4.1).			
Cape Immersion Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Cape Immersion Tours on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Cape Immersion Tours. • Cape Immersion Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Cape Immersion Tours 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 8.3.4.1).			
Exmouth Adventure Co	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	06/09/2024	001981	Email	Exmouth Adventure has sent an email to request the removal from all EP communications.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Adventure Co on 16 July 2024via formal written notification 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 information sheet. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				impacts and risks and control measures to enable an informed assessment by Exmouth Adventure Co. • Exmouth Adventure Co did not raise any objections or claims relating to the activity. Exmouth Adventure Co chose to opt out of consultation (Record ID 001981). • CAPL has provided a reasonable period and sufficient information to Exmouth Adventure Co 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 8.3.4.1).			
Exmouth Dive & Whalesharks Ningaloo	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Dive & Whalesharks Ningaloo on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exmouth Dive & Whalesharks Ningaloo. • Exmouth Dive & Whalesharks Ningaloo did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Exmouth Dive & Whalesharks Ningaloo 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 8.3.4.1).			
Exmouth Dive Centre	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Dive Centre on 16 July 2024 via formal written notification advising they had been identified as a relevant person with functions, interests or activities that may be affected by the			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				activity. CAPL provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exmouth Dive Centre. • Exmouth Dive Centre did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Exmouth Dive Centre 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 8.3.4.1).			
Exmouth Fly Fishing	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Fly Fishing on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exmouth Fly Fishing. • Exmouth Fly Fishing did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Exmouth Dive Centre 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 8.3.4.1).			
Exmouth Game Fishing Club	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Game Fishing Club on 16 July 2024 via formal written notification advising they 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 provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exmouth Game Fishing Club. • Exmouth Game Fishing Club did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Exmouth Game Fishing Club 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 8.3.4.1).			
Image Dive and Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024-	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Image Dive and Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Image Dive and Charters. • Image Dive and Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Image Dive and Charters 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 8.3.4.1).			
Innkeeper Sport Fishing Charter	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Innkeeper Sport Fishing Charter on 16 July 2024via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Innkeeper Sport Fishing Charter. • Innkeeper Sport Fishing Charter did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Innkeeper Sport Fishing Charter 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 8.3.4.1).			
Kings Ningaloo Reef Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Kings Ningaloo Reef Tours on 16 July 2024via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Kings Ningaloo Reef Tours. • Kings Ningaloo Reef Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Kings Ningaloo Reef Tours 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 8.3.4.1).			
Live Ningaloo	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Live Ningaloo on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Live Ningaloo. • Live Ningaloo did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Live Ningaloo 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 8.3.4.1).			
Mackerel Islands & Onslow Beach Resort	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Mackerel Islands & Onslow Beach Resort on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Mackerel Islands & Onslow Beach Resort. • Mackerel Islands & Onslow Beach Resort did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Mackerel Islands & Onslow Beach Resort 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 8.3.4.1).			
Mahi Mahi Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Mahi Mahi Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Mahi Mahi Charters. • Mahi Mahi Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Mahi Mahi Charters 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 8.3.4.1).			
Montebello Island Safaris	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Montebello Island Safaris on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Montebello Island Safaris. • Montebello Island Safaris did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Montebello Island Safaris 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 8.3.4.1).			
Ningaloo Blue Dive	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. 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
				CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.			
				Summary: • CAPL commenced consultation with Ningaloo Blue Dive on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Blue Dive. • Ningaloo Blue Dive did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Blue Dive 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 8.3.4.1).			
Ningaloo Coral Bay Boats	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Coral Bay Boats on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Coral Bay Boats. • Ningaloo Coral Bay Boats did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Coral Bay Boats 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 8.3.4.1).			
Ningaloo Discovery	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response 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
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Discovery on 16 July 2024via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Discovery. • Ningaloo Discovery did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Discovery 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 8.3.4.1).			
Ningaloo Fly Fishing	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	06/09/2024	001980	Email	Ningaloo Fly Fishing sent an email to request the removal from all EP communications.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Fly Fishing on 16 July 2024 via formal written notification 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 information sheet. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Fly Fishing. • Ningaloo Fly Fishing did not raise any objections or claims relating to the activity. Ningaloo Fly Fishing chose to opt out of consultation (Record ID 001980). • CAPL has provided a reasonable period and sufficient information to Ningaloo Fly Fishing 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 8.3.4.1).			
Ningaloo Glass Bottom Boat	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Glass Bottom Boat on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Glass Bottom Boat. • Ningaloo Glass Bottom Boat did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Glass Bottom Boat 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 8.3.4.1).			
Ningaloo Marine Interaction	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Marine Interaction on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Marine Interaction. • Ningaloo Marine Interaction did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Marine Interaction 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 8.3.4.1).			
Ningaloo Reef Dive	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 Reef Dive on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Reef Dive. • Ningaloo Reef Dive did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Reef Dive 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 8.3.4.1).			
Ningaloo Reef to Range Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Reef to Range Tours on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Reef to Range Tours. • Ningaloo Reef to Range Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Reef to Range Tours 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 8.3.4.1).			
Ningaloo Safari Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. 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
				CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.			
				Summary: • CAPL commenced consultation with Ningaloo Safari Tours on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Safari Tours. • Ningaloo Safari Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Safari Tours 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 8.3.4.1).			
Ningaloo Sportfishing Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Sportfishing Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Sportfishing Charters. • Ningaloo Sportfishing Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Sportfishing Charters 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 8.3.4.1).			
Ningaloo Visitor Centre	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response 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
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Visitor Centre on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Visitor Centre. • Ningaloo Visitor Centre did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Visitor Centre 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 8.3.4.1).			
Ningaloo Whaleshark n Dive	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Whaleshark n Dive on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Whaleshark n Dive. • Ningaloo Whaleshark n Dive did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Whaleshark n Dive 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 8.3.4.1).			
Ningaloo Whaleshark Swim	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated 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
				No response received.			
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Whaleshark Swim on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ningaloo Whaleshark Swim. • Ningaloo Whaleshark Swim did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ningaloo Whaleshark Swim 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 8.3.4.1).			
Ocean Eco Adventures	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ocean Eco Adventures on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ocean Eco Adventures. • Ocean Eco Adventures did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ocean Eco Adventures 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 8.3.4.1).			
On Strike Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response 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
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with On Strike Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by On Strike Charters. • On Strike Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to On Strike Charters 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 8.3.4.1).			
Peak Sportfishing Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Peak Sportfishing Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Peak Sportsfishing Charters. • Peak Sportfishing Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Peak Sportfishing Charters 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 8.3.4.1).			
Recfishwest (WA)	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	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
	23/07/2024	001719	Email	Recfishwest provided written response to CAPL advising that due to the JIC location, it would have negligible impact on recreational fishers. Recfishwest requested CAPL continue to engage with them.	Recfishwest requested CAPL continue to engage with them.	**Claim has merit:** As a relevant person, CAPL will continue to engage with Recfishwest.	No change made to EP. CAPL will continue to engage with Recfishwest.
	23/07/2024-09/09/2024	001867	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	06/01/2025	002041	Email	Recfishwest confirmed that there are no concerns regarding the revised schedule, and there are no further comments beyond those submitted on 23 July 2024 (Record ID 001719).	No objection or claim raised		
	18/02/2025	002084	Email	CAPL has sent an email notifying that the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Recfishwest on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Recfishwest. • Recfishwest did not raise any objections or claims relating to the activity. Recfishwest did request to be kept informed. CAPL will continue to engage with Recfishwest as a relevant person as required. • CAPL has provided a reasonable period and sufficient information to Recfishwest 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 8.3.4.1).			
Sail Ningaloo	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Sail Ningaloo on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Sail Ningaloo. • Sail Ningaloo did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Sail Ningaloo to make an informed assessment of the possible consequences of			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				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 8.3.4.1).			
Three Islands Whale Shark Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Three Islands Whale Shark Tours on 16 July 2024via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures. • Three Islands Whale Shark Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Three Islands Whale Shark Tours 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 8.3.4.1).			
Top Gun Charters	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Top Gun Charters on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Top Gun Charters. • Top Gun Charters did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Top Gun Charters to make an informed assessment of the possible consequences of			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				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 8.3.4.1).			
Ultimate WaterSports	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ultimate WaterSports on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Ultimate WaterSports. • Ultimate WaterSports did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Ultimate WaterSports 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 8.3.4.1).			
View Ningaloo	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with View Ningaloo on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by View Ningaloo. • View Ningaloo did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to View Ningaloo to make an informed assessment of the possible consequences of			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				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 8.3.4.1).			
Wilderness Island	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001838	Email	Wilderness Island requested activity information in or adjacent the Exmouth Gulf region. CAPL confirmed that no activity was planned within this area and directed them to the activity and location information on the CAPL website.	Wilderness Island requested clarification on activity location.	**Claim has merit**: As a relevant person, the request for further information is considered fair and reasonable.	No change made to the EP. CAPL responded to Wilderness Island and provided clarification regarding activity location, and a link to further information.
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Wilderness Island on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Wilderness Island. • Wilderness Island did not raise any objections or claims relating to the activity. Wilderness Island asked for clarification regarding activity location, to which CAPL provided a response and further information ensuring that Wilderness Island was able to make an informed assessment of the possible consequences of the activity on its functions, interests or activities. CAPL allowed a reasonable time after provision of this information for Wilderness Island to respond with any concerns.. • CAPL has provided a reasonable period and sufficient information to Wilderness Island 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 8.3.4.1).			
Yardi Creek Boat Tours	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Yardi Creek Boat Tours on 16 July 2024 via formal written notification advising they had been identified as a relevant person with functions, interests or activities that may be affected by the			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				activity. CAPL provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Yardi Creek Boat Tours. • Yardi Creek Boat Tours did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Yardi Creek Boat Tours 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 8.3.4.1).			

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 (Pilbara)	17/07/2024	001840	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	15/10/2024	001840	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	21/10/2024	002115	Email	CAPL has sent an email to confirm the receipt of their previous email response. CAPL acknowledges the email addresses that will be used for future communications.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	12/02/2025-18/02/2025	002101	Email	The Shire of Ashburton provided a response, and requested clarity and further information regarding: • Environmental Management and Risk Mitigation • Consultation with Traditional Owners and Community Engagement • Economic and Social Considerations • Marine Safety and Navigation • Monitoring and Reporting. CAPL sent an email to acknowledge the letter dated 12 February 2025 regarding the revision of the EP. CAPL provided a response with further information and addressed all queries raised.	The Shire of Ashburton requested clarity and further information regarding multiple factors of the activity.	**Claim has merit:** As a relevant person, it is considered fair and reasonable to request clarification on the activity.	No change made to the EP. CAPL provided a response with further information and addressed all queries raised.
				Summary: • CAPL commenced consultation with Shire of Ashburton on 17 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Shire of Ashburton. • Shire of Ashburton did not raise any objections or claims relating to the activity. The Shire of Ashburton requested further information, to which CAPL provided a response and addressed all queries raised ensuring that Shire of Ashburton was able to make an informed assessment of the possible consequences of the activity on its functions, interests or activities. CAPL allowed a reasonable time after provision of this information for the Shire of Ashburton to respond with any concerns. • CAPL has provided a reasonable period and sufficient information to Shire of Ashburton 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 8.3.4.1).			
Shire of Exmouth (Gascoyne)	19/07/2024	001620	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	19/07/2024	001988	Email	The Shire of Exmouth acknowledged CAPLs correspondence and advised they forwarded it to their Communications Officer.	No objection or claim raised		
	04/09/2024	001767	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001865	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	24/02/2025	002117	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Shire of Exmouth on 19 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Shire of Exmouth. • Shire of Exmouth did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Shire of Exmouth 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 8.3.4.1).			

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)	15/07/2024	001614	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001778	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	14/10/2024	001872	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	19/12/2024	002037	Email	NCWHAC emailed CAPL and raised the Ningaloo Coast World Heritage Area and outstanding universal values of World Heritage Properties. NCWHAC identified threats to the values of the Ningaloo Coast World Heritage Area, including: • Climate Change • Oil Spill / Other Discharges	NCWHAC raised the Ningaloo Coast World Heritage Area and outstanding universal values of World Heritage Properties	**Claim has merit:** The activity EMBA intersects with the Ningaloo Coast World Heritage Area, as such it is relevant and should be	The Ningaloo Coast World Heritage Area is identified within the EP and is considered within the Risk Assessment.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Atmospheric emissions • Oil and gas exploration • Noise • Invasive Marine Species • Cumulative Impacts • Collisions.		considered as a receptor in the EP.	
	18/02/2025	002084	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
	27/02/2025	002123	Email	CAPL responded to NCWHA correspondence (Record ID 002037). CAPL acknowledged NCWHA advice and confirmed that the risk assessment did not identify any significant impacts or risks to the NCWHA. CAPL sought clarification on whether the committee would like CAPL to continue to treat them as relevant person for the purpose of consultation.	No objection or claim raised		
				Summary: • CAPL commenced consultation with NCWHAC on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by NCWHAC. • NCWHAC did not raise any objections or claims relating to the activity. NCWHAC raised the Ningaloo Coast World Heritage Area and the outstanding universal values of World Heritage Properties, and threats to these properties. The Ningaloo Coast World Heritage Area is described in the EP, and is addressed in the Risk Assessment Section. • CAPL has provided a reasonable period and sufficient information to NCWHAC 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 8.3.4.1).			

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	15/07/2024	001574	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	16/07/2024-23/07/2024	002081	Email	Carnarvon Energy responded and confirmed they had no feedback. CAPL thanked them for their response.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Carnarvon Energy on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Carnarvon Energy. • Carnarvon Energy did not raise 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 a reasonable period and sufficient information to Carnarvon Energy 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 8.3.4.1).			
Eni Australia	15/07/2024	001990	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	16/07/2024	001905	Email	Eni Australia responded to CAPL and did not raise any objections or claims to the proposed activity.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Eni Australia on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by ENI Australia. • Eni Australia did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Eni Australia 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 8.3.4.1).			
Exxon Mobil	15/07/2024	001576	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001906	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exxon Mobil on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exxon Mobil. • Exxon Mobil did not raise 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 a reasonable period and sufficient information to Exxon Mobil 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 8.3.4.1).			
Jadestone Energy	15/07/2024	001575	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001907	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001856	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Jadestone Energy on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Jadestone Energy. • Jadestone Energy did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Jadestone Energy 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 8.3.4.1).			
Kato Energy / Kato NWS Pty Ltd (Kato Energy)	15/07/2024	001572	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001909	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001857	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Kato Energy on 15 July 2024 via formal written notification advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Kato Energy. • Kato Energy did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Kato Energy 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 8.3.4.1).			
Kufpec	15/07/2024	001992	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	25/07/2024	001718	Email	CAPL emailed Kufpec to request their most updated Company contact information.	No objection or claim raised		
	30/07/2024	001717	Email	CAPL emailed Kufpec to confirm they had received their contact details and updated their records.	No objection or claim raised		
	31/07/2024	001714	Email	Kufpec emailed CAPL to confirm they would like to receive EP notifications in the future.	No objection or claim raised		
	31/07/2024	001716	Email	CAPL responded to Kufpec and confirmed Kufpec's preferred contact emails.	No objection or claim raised		
	09/08/2024	001715	Email	Kufpec thanked CAPL for the email and confirmed they had no objections on the proposed activities.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	20/12/2024-16/01/2025	002057	Email	Kufpec emailed CAPL with questions on the activity. CAPL provided Kufpec with a response to their questions and a link to information sheets on the activity that provided detail on the response. CAPL invited Kufpec to contact them with any further questions.	Kufpec requested further information regarding underwater sound.	**Claim has merit:** Request for further information is considered fair and reasonable.	CAPL provided Kufpec with a response clarifying all questions raised.
	18/02/2025	002084	Email	CAPL has sent an email notifying that the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Kufpec on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Kufpec. • Kufpec did not raise any objections or claims relating to the activity. Kufpec requested further information regarding underwater sound, to which CAPL provided a response addressing all queries ensuring that Kuf[ec was able to make an informed assessment of the possible consequences of the activity on its functions, interests or activities. CAPL allowed a reasonable time after provision of this information for Kufpec to respond with any concerns. • CAPL has provided a reasonable period and sufficient information to Kufpec 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 8.3.4.1).			
Santos	15/07/2024-12/09/2024	001923	Email	Notification of consultation launch for EP sent via email. CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	18/10/2024	001858	Email	CAPL sent a follow up email requesting feedback on the EP.	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
	29/10/2024	001973	Email	Santos responded and requested notification from CAPL on planned vessel movements. Santos did not have any additional feedback concerning planned activities.	Requested notification on planned vessel movements.	**Claim has merit:** As Santos has activities within the vicinity, further information regarding vessel movement is considered reasonable.	No change made to the EP. CAPL responded to Santos and confirmed CAPL will include Santos in the Biannual update, which include in-field activities (Record ID 002049).
	27/11/2024	002049	Email	CAPL responded to Santos and acknowledged the request and added their contact details to CAPL's Biannual updates.			
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	19/12/2024- 10/01/2025-	002046	Email	Santos acknowledged the updated consultation materials. Santos had no objects or claims.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL has sent an email notifying that the consultation period for the EP has closed.	No objection or claim raised		
	19/02/2025	002095	Email	Santos sent an email to CAPL advising it acknowledges the closure of the consultation period and has no objections or claims regarding revisions in operations.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Santos on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Santos. • Santos did not raise any objections or claims relating to the activity. Santos request notification for vessel movements. CAPL included Santos in CAPL's Biannual updates which provides a 3-month lookahead for in-field activities. • CAPL has provided a reasonable period and sufficient information to Santos 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 8.3.4.1).			
Western Gas	15/07/2024	001570	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	18/10/2024	001860	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Western Gas on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Western Gas.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Western Gas did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Western Gas 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 8.3.4.1).			
Woodside	15/07/2024	001578	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001917	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001862	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Woodside on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Woodside. • Woodside did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Woodside 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 8.3.4.1).			

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)	15/07/2024	001586	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	14/10/2024	001823	Phone	CAPL contacted with AMCS via telephone in relation to consultation on the EP and left a voicemail message.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. 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
				CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.			
				Summary: • CAPL commenced consultation with AMCS on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by AMCS. • AMCS did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to AMCS 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 8.3.4.1).			
Cape Conservation Group	15/07/2024	001590	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001842	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	24/02/2025	002117	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Cape Conservation Group on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Cape Conservation Group. • Cape Conservation Group did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Cape Conservation Group 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 8.3.4.1).			
Protect Ningaloo	15/07/2024	001593	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001831	Email	CAPL sent a follow up email requesting feedback on the EP.	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
				No response received.			
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Protect Ningaloo on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures. • Protect Ningaloo did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Protect Ningaloo 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 8.3.4.1).			

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)	15/07/2024	001591	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	05/09/2024	001985	Email	AIMS has sent an email to CAPL requesting removal from EP communication.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AIMS on 15 July 2024 via formal written notification 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 information sheet. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by AIMS. • AIMS did not raise any objections or claims relating to the activity. AIMS chose to opt out of consultation (Record ID 001985). • CAPL has provided a reasonable period and sufficient information to AIMS 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 8.3.4.1).			
Care For Hedland Environmental Association	15/07/2024	001589	Email	Notification of consultation launch for EP sent via email.	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
	18/07/2024	001989	Email	Care for Hedland responded and acknowledged the provided information. They provided updated contact information, and enquired about the deadline for comments submission. CAPL emailed Care for Hedland and confirmed they will update their contacts list and followed up about the Community Spirit Grant, which Care for Hedland is eligible for. CAPL noted they would appreciate receiving a response by end of September.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Care For Hedland on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Care for Hedland. • Care For Hedland did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Care For Hedland 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 8.3.4.1).			
Exmouth Chamber of Commerce and Industry (ECCI)	15/07/2024	001607	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001773	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	24/02/2025	002117	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ECCI on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by ECCI. • ECCI did not raise 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 a reasonable period and sufficient information to ECCI 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 8.3.4.1).			
Telstra	16/09/2024	001849	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	18/10/2024	001898	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Telstra following advice from ACMA (Record ID 001847). Consultation commenced on 16 September 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Telstra. • Telstra did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Telstra 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 8.3.4.1).			
Onslow Chamber of Commerce and Industry (OCCI)	16/07/2024-15/10/2024	001839	Email	Notification of consultation launch for EP sent via email. OCCI acknowledged receipt. CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	24/02/2025	002117	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with OCCI on 16 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by OCCI. • OCCI did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to OCCI 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 8.3.4.1).			
Vocus Communications	15/07/2024	001577	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001927	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	12/09/2024	001925	Email	Vocus responded and stated intent to provide feedback.	No objection or claim raised		
	13/09/2024	001926	Email	Vocus responded to CAPL and did not raise any objections or claims to the proposed activity.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Vocus Communications on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Vocus Communications. • Vocus Communications did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Vocus Communications 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 8.3.4.1).			

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
Australian Council of Prawn Fisheries (ACPF) Ltd.	15/07/2024	001991	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001901	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001854	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACPF on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by ACPF. • ACPF did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to ACPF 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 8.3.4.1).			
Pearl Producers Association (PPA)	15/07/2024	001573	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001920	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with PPA on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by PPA. • PPA did not raise 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 a reasonable period and sufficient information to PPA 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 8.3.4.1).			
Western Rock Lobster Council	15/07/2024	001571	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	12/09/2024	001916	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	18/10/2024	001861	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Western Rock Lobster Council on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Western Rock Lobster Council. • Western Rock Lobster Council did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Western Rock Lobster Council 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 8.3.4.1).			

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
Karratha Tourism and Visitor Centre	16/07/2024	001581	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised	Karratha Tourism and Visitor Centre	16/07/2024-16/07/2024
	06/09/2024	001772	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		06/09/2024-06/09/2024
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		16/12/2024-16/12/2024
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Karratha Tourism and Visitor Centre on 16 July 2024 via formal written notification advising they 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 provided an overview of the activity and information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Karratha Tourism and Visitor Centre. • Karratha Tourism and Visitor Centre did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Karratha Tourism and Visitor Centre 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 8.3.4.1).			

1.4.3 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
Carnarvon Chamber of Commerce Inc. (CCCI)	15/07/2024	001606	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001775	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	14/10/2024	001866	Email	CAPL email for follow up number 2 to CCCI for Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP.	No objection or claim raised		
	15/10/2024	001878	Face-to-face	CAPL met with CCCI President to discuss Gorgon and Jansz Feed Gas Pipeline and Wells Operations EP. CCCI commented no businesses should be impacted and no further consultation required. CCCI have a member meeting on 16 Oct 2024 which they will share details and refer back if consultation is required. CCCI confirmed email address to direct future consultation information.	No objection or claim raised		
	15/10/2024	001874	Email	CAPL sent a follow up email to CCCI following their meeting (Record ID 001878), and requested CCCI reach out if any members wish to be consulted with as a relevant person.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	24/02/2025	002117	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CCCI on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by CCCI. • CCCI did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to CCCI 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 8.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Shire of Carnarvon (Gascoyne)	15/07/2024	001619	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001780	Email	CAPL sent a follow up email requesting feedback on the EP. Shire of Carnarvon advised they have no comment at this stage due to the project area appearing to be north of SoC with no direct impact. However, Shire of Carnarvon wish to continue to be provided with updates as the project progresses.	No objection or claim raised		
	06/09/2024	001903	Email	CAPL acknowledged closure of consultation with Shire of Carnarvon. Shire of Carnarvon confirmed no further information was required.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Shire of Carnarvon on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures. • Shire of Carnarvon did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Shire of Carnarvon 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 8.3.4.1).			

1.4.4 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)	15/07/2024	001596	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001822	Phone and email	CAPL contacted ACP via telephone requesting feedback on the EP. ACF requested CAPL to resend the consultation email. CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	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 ACF on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by ACF. • ACF did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to ACF 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 8.3.4.1).			
Centre for Whale Research Western Australia (CWR)	15/07/2024	001585	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001833	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CWR on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures. • CWR did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to CWR 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 8.3.4.1).			
Conservation Council of WA (CCWA)	15/07/2024	001594	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	07/08/2024	001667	Email	CCWA responded and stated they would like to engage further. CAPL thanked CCWA for their email, and confirmed with CCWA that CAPL accept receive feedback by letter. CAPL advised CCWA about upcoming public comment periods for its other NOPSEMA EPs	No objection or claim raised		
	07/08/2024	001711	Email	CCWA responded and indicated that they would review the consultation material, and would reach out to CAPL if further engagement was required. CAPL thanked CCWA for their response.	No objection or claim raised		
	14/10/2024	001824	Phone	CAPL contacted CCWA by telephone to confirm that the consultation period for the EP would be closing on the 18th of October. CAPL sent CCWA an email to confirm.	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
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CCWA on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by CCWA. • CCWA did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to CCWA 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 8.3.4.1).			
Exmouth Gulf Task Force - DWER	16/07/2024	001584	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001832	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Gulf Task Force on 16 July 2024 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. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Exmouth Gulf Task Force. • Exmouth Gulf Task Force has not raised any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Exmouth Gulf Task Force 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 8.3.4.1).			
Gascoyne Junction Community Resource Centre (GJCRC)	15/07/2024	001609	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	06/09/2024	001777	Email	CAPL sent a follow up email requesting feedback on the EP.	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
	18/10/2024	001876	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	21/10/2024	001950	Email	GJCRC responded and noted incorrect email address used in previous correspondence. CAPL acknowledged email address to be used for consultation emails.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with GJCRC on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by GJCRC. • GJCRC did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to GJCRC 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 8.3.4.1).			
Greenpeace	15/07/2024	001595	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001766	Email	CAPL sent a follow up email requesting feedback on the EP. Greenpeace acknowledged receipt of email and launch email from 15 July 2024. CAPL extended invitation for a meeting.	No objection or claim raised		
	14/10/2024	001828	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Greenpeace on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Greenpeace. • Greenpeace did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Greenpeace 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.			

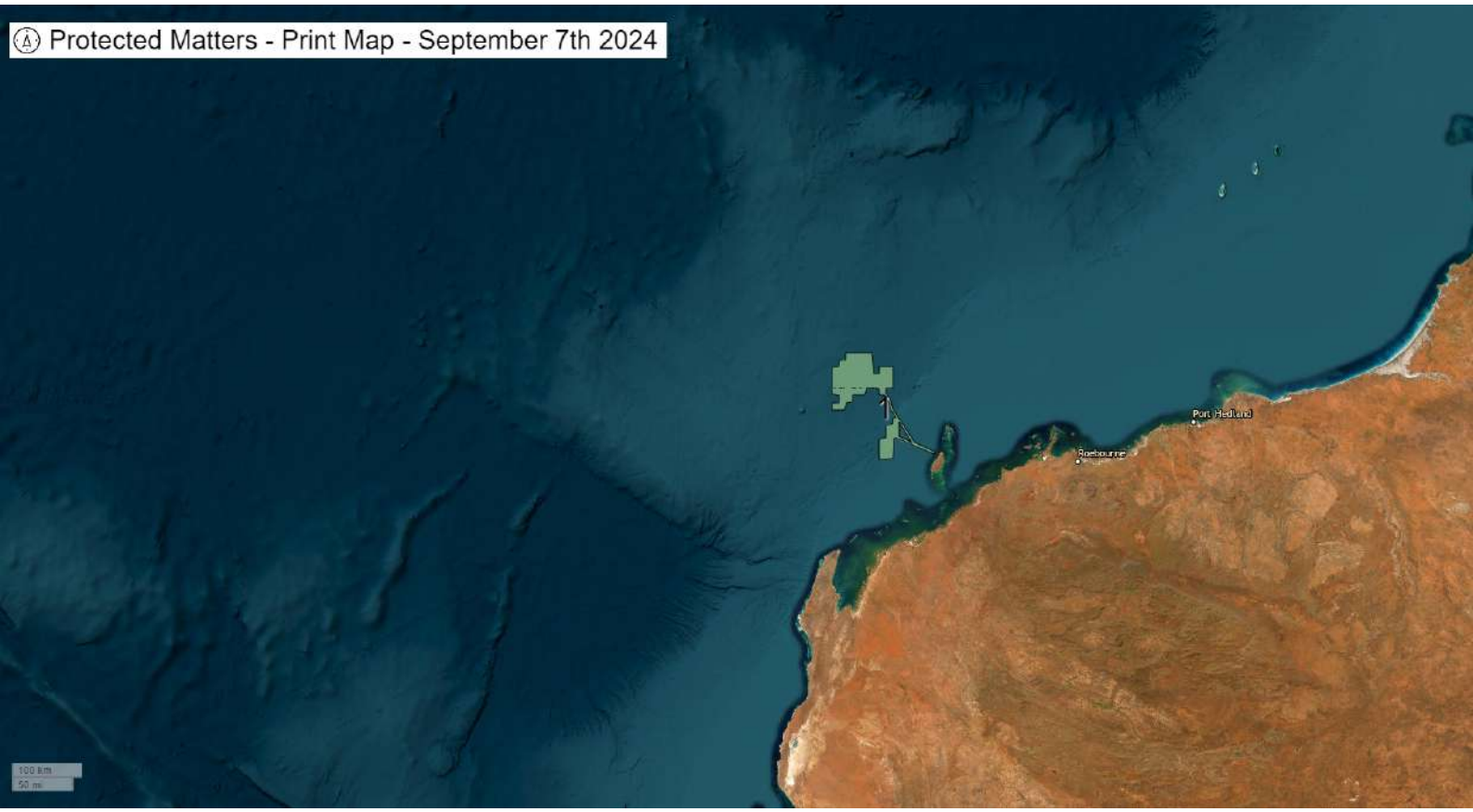
Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 8.3.4.1).			
International Fund for Animal Welfare (IFAW) - Oceania	15/07/2024	001592	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001827	Phone	CAPL contacted IFAW by telephone to confirm end of consultation period. IFAW confirmed via email that it would not be providing comments on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with IFAW on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by IFAW. • IFAW did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to IFAW 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 8.3.4.1).			
WA Coastal and Marine Community Network (WACMCN)	15/07/2024-15/07/2024	001583	Email	Notification of consultation launch for EP sent via email	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001830	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WACMCN on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WACMCN. • WACMCN did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to WACMCN 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 8.3.4.1).			
WA Marine Science Institute (WAMSI)	15/07/2024	001587	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP. No response received.	No objection or claim raised		
	14/10/2024	001829	Phone	CAPL contacted WAMSI via phone requesting feedback on the EP.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WAMSI on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WAMSI. • WAMSI did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to WAMSI 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 8.3.4.1).			
Western Australian Museum (WAM)	15/07/2024	001582	Email	Notification of consultation launch for EP sent via email	No objection or claim raised		
	19/08/2024	001710	Email	WAM provided CAPL with a written response to the activity information sheet. WAM advised CAPL of the following: • Requirements under the Underwater Cultural Heritage Act 2018 (Cwth), and the requirement to engage with the DCCEEW. • Raised Draft Guidelines for Working in the Near and Offshore Environment to Protect Underwater Cultural Heritage. • Suggested engaging with maritime archaeologist to undertake underwater cultural heritage (UCH) desktop assessment. • Suggested consulting with Traditional Owners	WAM advised: • Requirements under the Underwater Cultural Heritage Act 2018 (Cwth), and the requirement to engage with the DCCEEW • Raised Draft Guidelines for Working in the Near and Offshore Environment to Protect Underwater Cultural Heritage • Suggested engaging with maritime archaeologist to undertake underwater cultural heritage (UCH) desktop assessment • Suggested consulting with Traditional Owners	**Claims have merit:** The legislation and suggested relevant persons are considered relevant to the activity.	No change made to the EP. Both DCCEEW and Traditional Owners have been engaged with over the course of the consultation period for this EP. The *Draft Guidelines for Working in the Near and Offshore Environment to Protect Underwater Cultural Heritage* is referred to in the EP. The requirements of the Underwater Cultural Heritage Act 2018 (Cwth) are captured within the EP. A desktop analysis was undertaken to determine the presence of UCH within the EMBA (Section 4.6.2).

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	19/08/2024-10/09/2024	001852	Email	CAPL acknowledged WAM advice on: • Engagement with DCCEEW in relation to EP. • Underwater cultural heritage (UCH) and the consultation with Traditional Owners. CAPL confirmed consultation with relevant Traditional Owners and compliance with the applicable UCH guidance where appropriate	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Western Australian Museum on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WAM. • Western Australian Museum did not raise any objections or claims relating to the activity. They raised the requirements of the Underwater Cultural Heritage Act 2018 (Cwth) and the Draft Guidelines for Working in the Near and Offshore Environment to Protect Underwater Cultural Heritage. They also suggested engaging with a maritime archaeologist and Traditional Owners. These requirements and suggestions are addressed within the EP. • CAPL has provided a reasonable period and sufficient information to Western Australian Museum 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 8.3.4.1).			
Whale and Dolphin Conservation Society (WDCA)	15/07/2024	001599	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	14/10/2024	001826	Phone	CAPL attempted contact with WDCA by telephone however the number listed on the website was incorrect.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WDCA on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by WDCA.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• WDCA did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to WDCA 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 8.3.4.1).			
Wilderness Society	15/07/2024	001588	Email	Notification of consultation launch for EP sent via email.	No objection or claim raised		
	05/09/2024	001765	Email	CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	14/10/2024	001825	Phone	CAPL contacted the Wilderness Society by telephone but was unable to leave a message. CAPL sent a follow up email requesting feedback on the EP.	No objection or claim raised		
	14/10/2024	001894	Email	Wilderness Society confirmed: • Receipt of EP information • They are a Relevant Person • They will not provide feedback on the activity at this time.	No objection or claim raised		
	16/12/2024	001965	Email	CAPL advised of changes to the consultation material and provided updated information sheet and a link to CAPLs consultation webpage. No response received.	No objection or claim raised		
	18/02/2025	002084	Email	CAPL sent an email advising it had attempted to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL noted it would welcome engagement for upcoming activities and feedback for future environmental plans.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Wilderness Society on 15 July 2024 via formal written notification 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 information sheet. Updated consultation material was provided via email on 16 December 2024. • CAPL has presented sufficient information in accordance with Section 6.2.2 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by Wilderness Society. • Wilderness Society did not raise any objections or claims relating to the activity. • CAPL has provided a reasonable period and sufficient information to Wilderness Society 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 8.3.4.1).			

appendix e protected matters search reports


Protected Matters - Print Map - September 7th 2024
Port Hedland
Roebourne
100 km
50 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: 07-Sep-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	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:	69
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	3

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	44
Key Ecological Features (Marine):	3
Biologically Important Areas:	19
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
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	Breeding known to 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
REPTILE		
[Aipysurus apraefrontalis](#) Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely 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	Congregation or aggregation known to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Congregation or aggregation 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	Congregation or aggregation 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 likely to 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		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	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
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to 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 likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		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
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to 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	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

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to 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	Congregation or aggregation known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Congregation or aggregation 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
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Congregation or aggregation 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

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 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]		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 Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	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

Scientific Name	Threatened Category	Presence Text
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		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 likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine 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 likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		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

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Phaethon lepturus		
White-tailed Tropicbird [1014]		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
Sterna dougallii		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thalasseus bengalensis as Sterna bengalensis		
Lesser Crested Tern [66546]		Breeding known to 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

Scientific Name	Threatened Category	Presence Text
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		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 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

Scientific Name	Threatened Category	Presence Text
[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]		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 likely 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
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Congregation or aggregation known to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Congregation or aggregation known to occur within area

Scientific Name	Threatened Category	Presence Text
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
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Congregation or aggregation 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

Scientific Name	Threatened Category	Presence Text
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
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 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

Current Scientific Name	Status	Type of Presence
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
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]		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

Current Scientific Name	Status	Type of Presence
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]		Species or species habitat may 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 likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks [Resource Information]

Park Name	Zone & IUCN Categories
Montebello	Multiple Use Zone (IUCN VI)

Habitat Critical to the Survival of Marine Turtles [Resource Information]

Scientific Name	Behaviour	Presence
Aug - Sep		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Dec - Jan		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur
Nov - May		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Nesting	Known to occur

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Barrow Island	Marine Management Area	WA

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Gorgon Gas Development	2003/1294		Post-Approval
Project Highclere Cable Lay and Operation	2022/09203		Completed
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

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Pluto Gas Project	2005/2258	Controlled Action	Completed
Not controlled action			
Bollinger 2D Seismic Survey 200km North of North West Cape WA	2004/1868	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
Hess Exploration Drilling Programme	2007/3566	Not Controlled Action	Completed
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	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 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 Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260	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
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	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
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	Not Controlled Action (Particular Manner)	Post-Approval
Klimt 2D Marine Seismic Survey	2007/3856	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
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
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	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 Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	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
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	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
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	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
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Known to occur
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]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
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
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	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 are 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

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

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

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
- 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

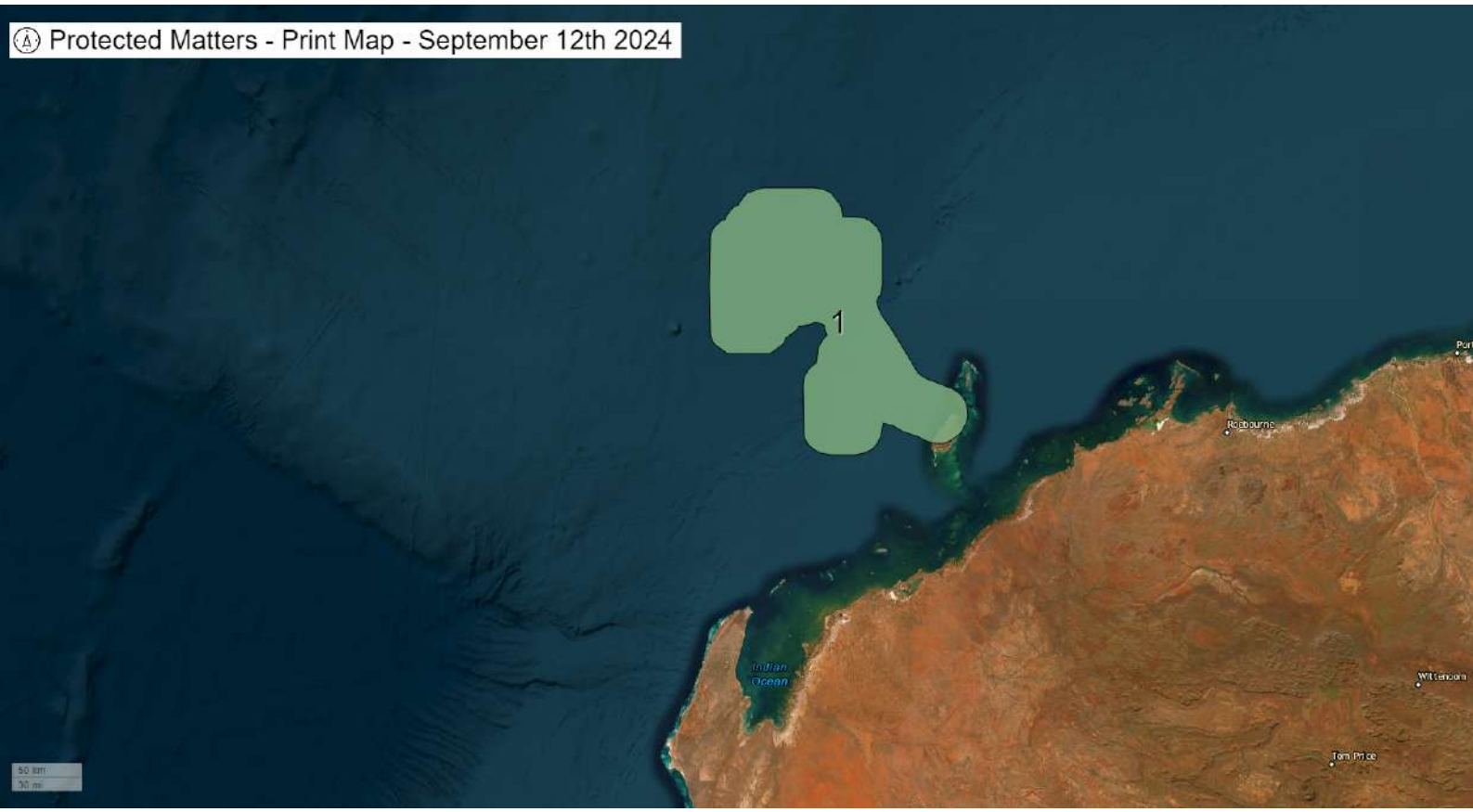
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111


Protected Matters - Print Map - September 12th 2024
1
Roebourne
Indian Ocean
Tom Price
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: 12-Sep-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	43
Listed Migratory Species:	59

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:	94
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	3

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	6
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	59
Key Ecological Features (Marine):	3
Biologically Important Areas:	26
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
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 likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to 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 likely to occur within area

Scientific Name	Threatened Category	Presence Text
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 likely 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 westralis		
Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat likely to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may 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
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
FISH		
Milyeringa veritas		
Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat may occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
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
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
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat may 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
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat likely 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 may 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 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	Breeding likely to occur within area
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	Species or species habitat likely to 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 Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
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 likely 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

Scientific Name	Threatened Category	Presence Text
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	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	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
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	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	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat 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 may 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]		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

Scientific Name	Threatened Category	Presence Text
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat likely 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 Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	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]		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

Scientific Name	Threatened Category	Presence Text
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 likely 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 likely 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
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

Scientific Name	Threatened Category	Presence Text
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		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

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely 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 pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
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 likely 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
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
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 likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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 likely 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 likely 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
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

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely 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
Phaethon lepturus White-tailed Tropicbird [1014]		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
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area
Sterna dougallii Roseate Tern [817]		Breeding likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		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
Thalasseus bengalensis as Sterna bengalensis Lesser Crested Tern [66546]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[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
[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

Scientific Name	Threatened Category	Presence Text
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
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
[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]		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 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
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
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	Breeding likely to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
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 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

Scientific Name	Threatened Category	Presence Text
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	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
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 may 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]		Species or species habitat likely 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]		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
Montebello	Multiple Use Zone (IUCN VI)

Habitat Critical to the Survival of Marine Turtles [Resource Information]

Scientific Name	Behaviour	Presence
Aug - Sep		
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur
Dec - Jan		
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur
Nov - May		
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Barrow Island	Nature Reserve	WA
Barrow Island	Marine Management Area	WA
Barrow Island	Marine Park	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Marine Park	WA

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Gorgon Gas Development	2003/1294		Post-Approval
Project Highclere Cable Lay and Operation	2022/09203		Completed
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

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
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
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
Simpson Oil Field Development	2001/227	Controlled Action	Post-Approval
Not controlled action			
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
Carnarvon 3D Marine Seismic Survey	2004/1890	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
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
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed
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)			
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval
"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 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 Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081	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	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Charon 3D Marine Seismic Survey	2007/3477	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260	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
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	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
Harmony 3D Marine Seismic Survey	2012/6699	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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	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
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	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
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	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 Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	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	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	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
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	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

Scientific Name	Behaviour	Presence
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
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

Scientific Name	Behaviour	Presence
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
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	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 are 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

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

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

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
- 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

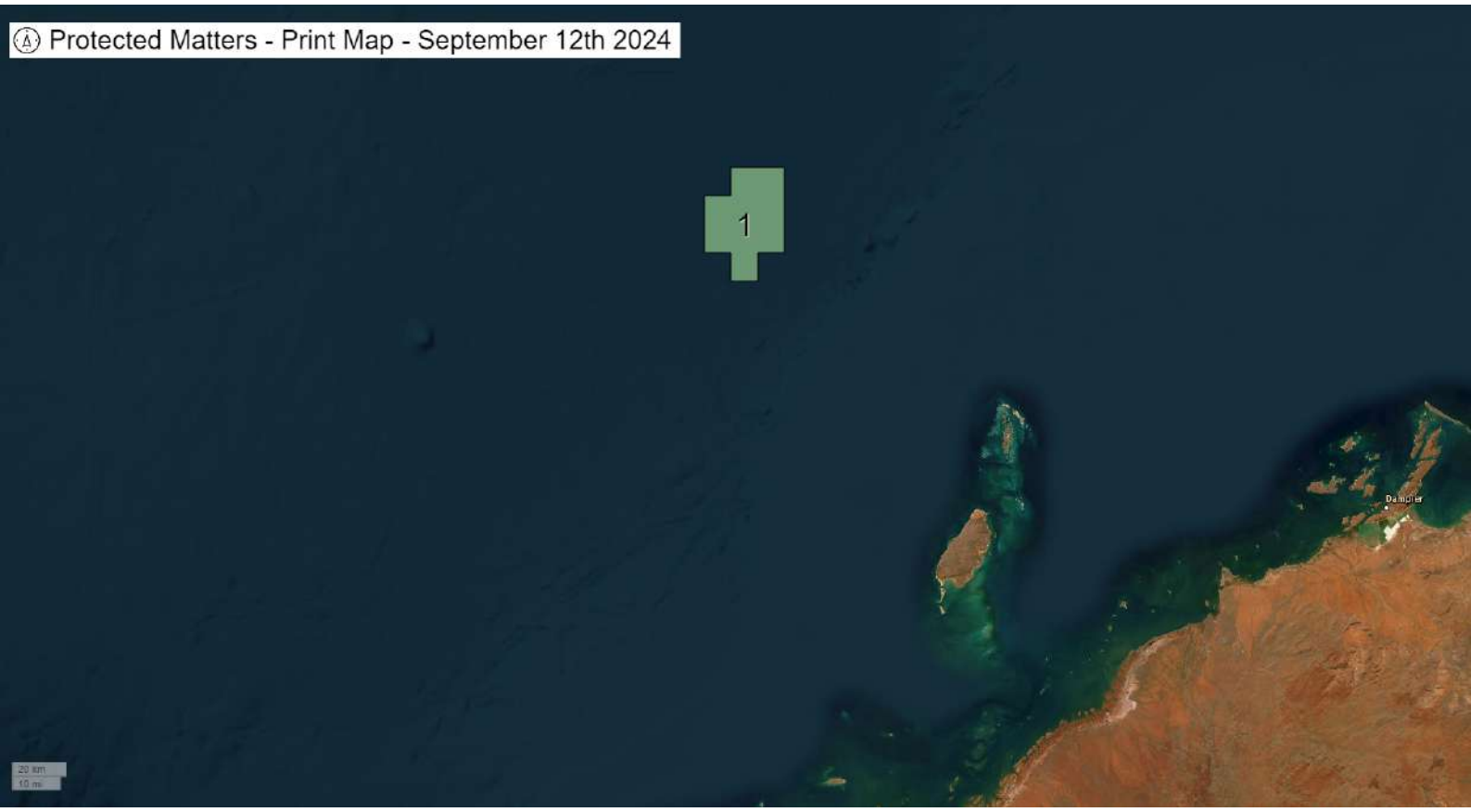
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111


Protected Matters - Print Map - September 12th 2024
1
Dampier
20 km
10 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: 12-Sep-2024

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:	17
Listed Migratory Species:	31

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:	24
Whales and Other Cetaceans:	26
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	17
Key Ecological Features (Marine):	1
Biologically Important Areas:	2
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
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
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
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
[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
REPTILE		
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat likely 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 likely to occur within area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
SHARK		
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
[Sphyrna lewini](#) Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat may 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 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
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
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 likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely 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 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
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Natator depressus		
Flatback Turtle [59257]	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
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 melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		

Scientific Name	Threatened Category	Presence Text
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[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 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
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		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
Reptile		

Scientific Name	Threatened Category	Presence Text
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely 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
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 likely 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

Scientific Name	Threatened Category	Presence Text
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat 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	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
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

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]		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
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

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 (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

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Gorgon Gas Development	2003/1294		Post-Approval
Project Highclere Cable Lay and Operation	2022/09203		Completed
Controlled action			
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

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Not controlled action			
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Not controlled action (particular manner)			
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
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260	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
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	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	

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
Continental Slope Demersal Fish Communities	North-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	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 are 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

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

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

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
- 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

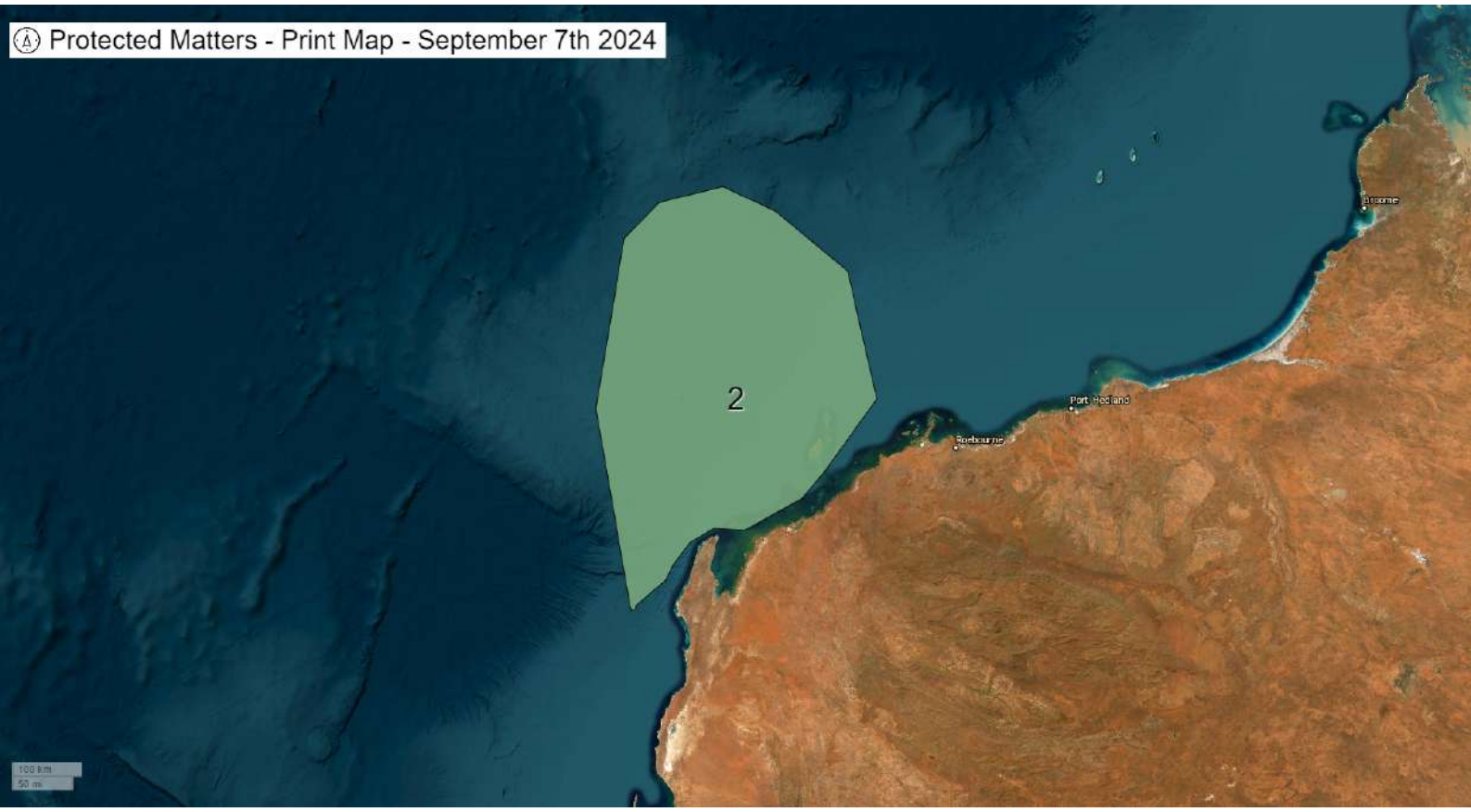
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111


Protected Matters - Print Map - September 7th 2024
2
Broome
Port Hedland
Roebourne
100 km
50 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: 07-Sep-2024

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:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	51
Listed Migratory Species:	62

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:	1
Listed Marine Species:	104
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	4
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:	22
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	176
Key Ecological Features (Marine):	5
Biologically Important Areas:	33
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)

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
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
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]	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
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
[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 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
FISH		
[Milyeringa veritas](#) Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat known to occur within area
[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

Scientific Name	Threatened Category	Presence Text
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 may 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
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat likely 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
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 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	Species or species habitat known to occur within area
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	Species or species habitat likely 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 Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
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
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
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 likely 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

Scientific Name	Threatened Category	Presence Text
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
Sterna dougallii Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons Little Tern [82849]		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

Scientific Name	Threatened Category	Presence Text
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
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	Species or species habitat 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

Scientific Name	Threatened Category	Presence Text
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
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]		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 Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	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

Scientific Name	Threatened Category	Presence Text
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]		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

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius 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 Heritage Places		[Resource Information]
Name	State	Status
Natural		
Ningaloo Marine Area - Commonwealth Waters	WA	Listed place

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		

Scientific Name	Threatened Category	Presence Text
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
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

Scientific Name	Threatened Category	Presence Text
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 likely 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
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 likely 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 likely 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

Scientific Name	Threatened Category	Presence Text
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
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

Scientific Name	Threatened Category	Presence Text
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
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Sterna dougallii Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		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

Scientific Name	Threatened Category	Presence Text
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
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

Scientific Name	Threatened Category	Presence Text
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
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

Scientific Name	Threatened Category	Presence Text
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
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

Scientific Name	Threatened Category	Presence Text
[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		
[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

Scientific Name	Threatened Category	Presence Text
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 known to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
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
Hydrelaps darwiniensis Port Darwin Sea Snake, Black-ringed Mangrove Sea Snake [1100]		Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text
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

Current Scientific Name	Status	Type of Presence
[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
[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

Current Scientific Name	Status	Type of Presence
Orcaella heinsohni Australian Snubfin Dolphin [81322]		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
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]		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

Current Scientific Name	Status	Type of Presence
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)
Gascoyne	Multiple Use Zone (IUCN VI)
Montebello	Multiple Use Zone (IUCN VI)
Ningaloo	Recreational Use Zone (IUCN IV)

Habitat Critical to the Survival of Marine Turtles [Resource Information]

Scientific Name	Behaviour	Presence
Aug - Sep		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Dec - Jan		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur
Nov-Feb		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Nov - May		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	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 Management Area	WA
Barrow Island	Marine Park	WA
Bessieres Island	Nature Reserve	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Great Sandy Island	Nature Reserve	WA
Jurabi Coastal Park	5(1)(h) Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Marine Park	WA
Muiron Islands	Nature Reserve	WA
Muiron Islands	Marine Management Area	WA
Ningaloo	Marine Park	WA
Round Island	Nature Reserve	WA
Serrurier Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Unnamed WA40322	5(1)(h) Reserve	WA
Unnamed WA40828	5(1)(h) Reserve	WA
Unnamed WA41080	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

Title of referral	Reference	Referral Outcome	Assessment Status
Browse to North West Shelf Development, Indian Ocean, WA	2018/8319		Approval
Gorgon Gas Development	2003/1294		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
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 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
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

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
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
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
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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
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
Drilling of an exploration well Gats-1 in Permit Area WA-261-P	2004/1701	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
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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
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)			
'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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
"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
2D Seismic Survey	2005/2146	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey	2008/4281	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 Manner)	Post-Approval
3D Seismic Survey, WA	2008/4428	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey in the Carnarvon Bsin on the North West Shelf	2002/778	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Acheron Non-Exclusive 2D Seismic Survey	2009/4968	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2008/4565	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
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081	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
Cerberus exploration drilling campaign, Carnarvon Basin, WA	2016/7645	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
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
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
DAVROS MC 3D marine seismic survey northwaet of Dampier, WA	2013/7092	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260	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	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
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 Manner)	Post-Approval
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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
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
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	2008/4630	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
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
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 Manner)	Post-Approval
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
Orcus 3D Marine Seismic Survey in WA-450-P	2010/5723	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
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
Pyrenees-Macedon 3D marine seismic survey	2005/2325	Not Controlled Action (Particular Manner)	Post-Approval
Quiberon 2D Seismic Survey, permit area WA-385P, offshore of Carnarvon	2009/5077	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	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Stag 4D & Reindeer MAZ Marine Seismic Surveys, WA	2013/7080	Not Controlled Action (Particular Manner)	Post-Approval
Stag Off-bottom Cable Seismic Survey	2007/3696	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 Manner)	Post-Approval
Undertake a 3D marine seismic survey	2010/5695	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5679	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	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

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
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
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

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
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
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

Scientific Name	Behaviour	Presence
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
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

Scientific Name	Behaviour	Presence
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
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
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	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 are 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

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

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

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
- 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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111