Environment Plan Summary

2013-2016 Exmouth Plateau / Greater Gorgon Deepwater Drilling Program

Document ID:	ABU180800356	Revision ID:	0
Revision Date:	03 August 2018	Next Revision Due:	03 August 2023
Information Sensitivity:	Public		

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1 Introduction

1.1 Overview

Chevron Australia Pty Ltd (CAPL) has completed its Exmouth Plateau / Greater Gorgon Deepwater Drilling Program (drilling program) in 2016. The drilling program included a variety of activities including exploration drilling, well testing and well abandonment activities. In total, the drilling program (completed under previous versions of the Environment Plan [EP]) drilled and abandoned seven exploration wells between 2013 and 2016.

During abandonment most of the wellheads were recovered, however, three wellheads remain *in situ*.

Consequently, at the behest of NOPSEMA, CAPL has revised the EP to evaluate the impacts and risks associated with permanently leaving the wellhead of these three wells *in-situ*.

1.2 Scope

As the abandonment program has been successfully completed, the revised EP only comprises the impacts and risks associated with the three wellheads remaining *in-situ*. Those wellheads are:

- Blake-1
- Satyr-5
- Io-2

The location of these wellheads is provided as Figure 1-1.

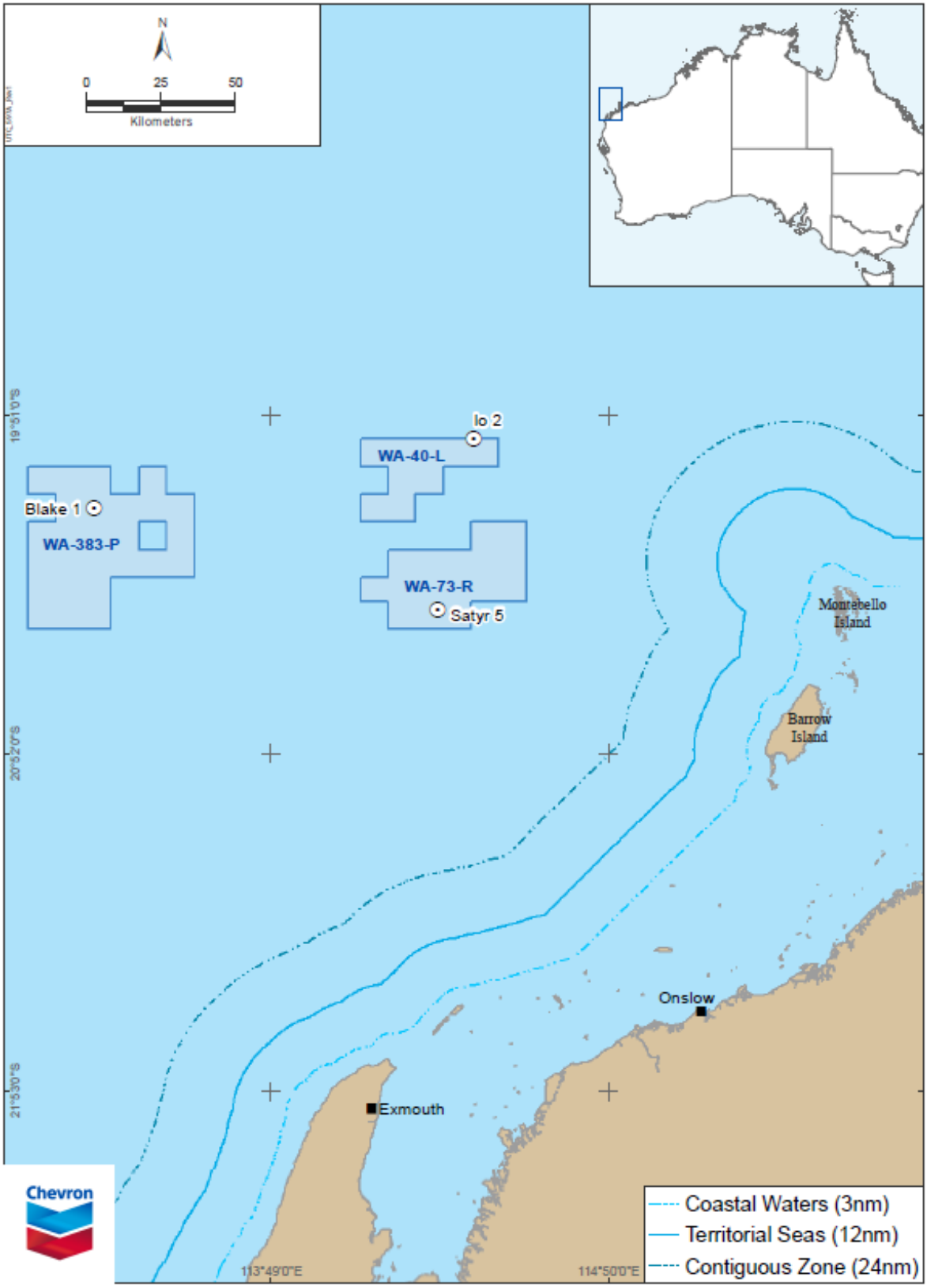

Figure 1-1: Location of wells within the scope of the plan

1.3 Titleholder Nominated Liaison Person

In accordance with Regulation 15(2) of the OPGGS(E)R, details of the titleholder's nominated liaison person are listed in Table 1-1.

Table 1-1: Titleholder Liaison Person Contact Details

Company Name	Chevron Australia Pty Ltd
Nominated Liaison Person	John Connor
Position	Drilling and Completions (D&C) Manager
Business Address	QV1, 250 St Georges Terrace, Perth, WA, 6000
Telephone Number	+61 8 9216 4254
Fax Number	+61 8 9216 4223
Email Address	austdrillingops@chevron.com

1.4 Stakeholder Engagement

CAPL applied the following methodology to undertake consultation for the activity:

- identify relevant stakeholders
- provide sufficient information to enable stakeholders to understand how the activity may affect their functions, interests, or activities
- assess the merit of any objections or claims raised by the stakeholders
- provide a response to the objection or claim, and ensure it is captured within the EP.

This methodology is based on:

- NOPSEMA Decision-Making Guideline – Criterion-10A(g) Consultation Requirements (Ref. 1)
- Australian Petroleum Production and Exploration Association (APPEA) Stakeholder Consultation and Engagement Principles and Methodology – Draft (Ref. 2).

1.4.1 Identification of Relevant Stakeholders

CAPL first engaged with Stakeholders regarding the activity in February 2013 and has since has engaged with stakeholders again as required by the projects Stakeholder Consultation Plan.

Table 1-2 summarises the stakeholders considered relevant to the activity.

Table 1-2: List of Relevant Stakeholders Consulted

Stakeholder Type	Functions, Interests / Activities, and Stakeholders Consulted

Commonwealth and State Fisheries (and peak body associations)	The activity has the potential to interact with fisheries that trawl the seabed. Based upon the location of the wellheads and fishing licenses that were identified to overlap these locations, the following stakeholders were considered relevant:
	• Western Australian Fishing Industry Council (WAFIC)
	• Commonwealth Fisheries Association
	• Individual fishery licence holders within these fisheries:
	  • Pilbara Trap Managed Fishery (State)
	  • Pilbara Fish Trawl Interim Managed Fishery (State)
	  • Pilbara Line (State)
	  • North West Slope Trawl Fishery (Commonwealth)
	  o Western Deepwater Trawl Fishery (Commonwealth)

Stakeholder Type	Functions, Interests / Activities, and Stakeholders Consulted
Recreational fishers (and peak body associations)	• No recreational fishers and peak bodies were considered relevant given the distance offshore and deep waters of the wellhead locations.
Other petroleum operators in the area	• Given no hydrocarbon spills were identified as being credible, and as Chevron is the titleholder of the titles, no other petroleum operators were considered relevant.
Government agencies	Government agencies responsible for managing commercial fisheries that may be affected, along with those agencies responsible for recording subsea benthic hazards were also considered relevant including: • former Department of Fisheries, (from 1 July 2017: (from 1 July 2017: WA Department of Primary Industries and Regional Development [DPIRD]) • Australian Maritime Safety Authority (AMSA) • Australasian Hydrographic Service (AHS) • Australian Communications and Media Authority (ACMA) • Australian Fisheries Management Authority

1.4.2 Assessment of Merit of any Objections or Claims

Table 1-3 summarises the objections and claims made by relevant stakeholders, assesses their merits, and how the objection or claim has been managed in the EP.

1.4.3 Ongoing Consultation

From the stakeholder consultation undertaken, a single requirement to notify the AHS of the well head locations was identified (captured in Section 6.1). CAPL has engaged and will continue to consult with the Department of Environment Energy to understand CAPL's requirements under the *Environment Protection (Sea Dumping) Act 1981* and ensure that all obligations under the Act (as required) are met. No additional consultation is required.

Table 1-3: Summary of Stakeholder Response and Objections and Claims

Date	Stakeholder	Objection or Claim	Assessment of Merits	Additional actions
13 December 2017	DPIRD	Stated that: Upon consideration of the risks and potential impacts on WA aquatic resources and fisheries associated with the proposed well abandonments, the department did not deem these likely to be significant and subsequently the Department does not have an objection to the proposal as presented in the consultation package provided by Chevron.	No objection or claim identified	N/a
15 December 2017	WAFIC	Stated that: • There is no risk from commercial trawl fishing activities, trawl fishing does not occur at the water depths noted above, it is too deep for trawling activities. • There is no risk from any other commercial fishing activities, any other non-trawl commercial fishing activities do not occur at these water depths, vessels may transit, there will not be any sea floor engagement from any commercial fisheries at the water depths detailed above. • Noting these sites are not in trawl fishing (or other fishing) water depth ranges, can Chevron please advise when the exclusion zones will be lifted for these three sites if not already done so.	No objection or claim identified	Responded to WAFIC stating no exclusion zones currently exist for the three wellheads described.
15 December 2017	AMSA	Stated that: Due to the charted depths, there is no risk to surface navigation; and requested that Chevron confirm with the Australian Hydrographic Service that all sites have been properly charted.	No objection or claim identified	Section 6.1 provides the requirement to confirm wellhead locations have been provided to the AHS.

2 Assessment of Spill Scenarios

The proposed activity as described in Section 3.0 was evaluated to identify potential spill sources and subsequently determine credible spill scenarios for the EP. The categories of spill identified in the previous EP were:

- Single point failure
- Loss of containment during transfer
- Failure of drill fluid system
- Vessel collision
- Loss of well control (LOWC).

These categories were then subject to an evaluation to determine if any credible spill scenarios were present for the activity. During the evaluation, an additional scenario was identified; Accidental release of fluid contained in the wellbore.

The evaluation determined that the activity poses no credible spill risks with justification for this determination provided in Table 2-1.

Table 2-1: Spill Scenario Evaluation

Category	Spill Source	Consideration
Single Point Failure	Support Vessel	Minor spill events categorised as a single point failure in the earlier version of the plan were associated with the servicing and routine operation of the MODU and support vessels. As the drilling program has finished, and no further drilling or monitoring activities are planned or required under the NOPSEMA accepted documentation (Ref. 3; Ref. 4; Ref. 5), there will be no MODU or vessel on location. Consequently, no accidental release categorised as single point failure, has been identified as being credible for the activity.
	Drill Rig	
Loss of containment during transfer	Support Vessel	Spill events categorised as a loss of containment during transfer in the earlier version of the plan were associated with the bulk transfer of diesel fuel and drilling fluids between the MODU and support vessels. As the drilling program has finished, and no further drilling or monitoring activities are planned or required under the NOPSEMA accepted documentation (Ref. 3; Ref. 4; Ref. 5), there will be no MODU or vessel on location. Consequently, no accidental release categorised as loss of containment during transfer, has been identified as being credible for the activity
	Drill Rig	
Failure of drill fluid system	Drill Rig	Spill events categorised as a failure of the drill fluid system transfer in the earlier version of the plan were associated with a riser failure or unplanned disconnect of the riser during MODU drilling activities. As the drilling program has finished, and no further drilling or monitoring activities are planned or required under the NOPSEMA accepted documentation (Ref. 3; Ref. 4; Ref. 5), there will be no MODU or vessel on location. Consequently, no accidental release categorised as a failure of drill fluid system, has been identified as being credible for the activity

<table>
<tr><th>Category</th><th>Spill Source</th><th>Consideration</th></tr>
<tr><td>Vessel collision</td><td>Support Vessel</td><td>Spill events categorised as a vessel collision in the earlier version of the plan were associated with interaction between the support vessels and MODU whilst operating within the 500 m exclusion.
As the drilling program has finished, and no further drilling or monitoring activities are planned or required under the NOPSEMA accepted documentation (Ref. 3; Ref. 4; Ref. 5), there will be no MODU or vessel on location.
Consequently, no accidental release categorised as a vessel collision, has been identified as being credible for the activity.</td></tr>
<tr><td>Loss of well control</td><td>Drill Rig / wellbore</td><td>Spill events categorised as a LOWC event in the earlier version of the plan were associated with the complete loss of containment, and open hole flow of hydrocarbons to the environment whilst drilling the exploration wells with the MODU.
The exploration wells were drilled and subsequently abandoned in accordance with documentation (Ref. 3; Ref. 4; Ref. 5), accepted by NOPSEMA accepted under the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011. This document describes the minimum abandonment requirements as per guidelines outlined in the Chevrons Australasian Strategic Business Unit, Well Control and Well Integrity Standard Operating Procedure (Ref. 6) in force at the time of well abandonment.
Upon completion of the abandonment program, an End Of Well Report (EOWR) for each well was submitted to NOPSEMA which provides a general description of the abandonment operations, the objectives including the nature of formations to be separated/isolated, verified outcomes achieved (Ref. 7; Ref. 8; Ref. 9). The EOWR also provides a final abandonment schematic of the various well barriers and the verification methods used to assure the integrity of the barriers.
To understand if interaction with the wellhead could result in a loss of well control event wellhead structural analyses was undertaken for all wells which includes elements such as fatigue from cyclic loading, vortex induced vibrations and trawling. The lateral force exerted by trawling activities were not deemed sufficient to dis-lodge a wellhead and cause well control issues. Regardless if trawl fishers operate in the area or not, interaction with the wellhead is not expected to exert enough force to affect well integrity and thus a loss of containment now that the wells have been abandoned is not considered credible.</td></tr>
<tr><td>Accidental release of fluid contained in the wellbore</td><td>Wellbore</td><td>At the completion of the drilling program, the wells were abandoned in accordance with documentation (Ref. 3; Ref. 4; Ref. 5), accepted by NOPSEMA accepted under the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011. CAPL can confirm that the wellbore fluids contained below the surface / environmental cement plug for each of the wells is described in the table below.
<table>
<tr><th>Well</th><th>Wellbore Fluid</th><th>Reference</th></tr>
<tr><td>BLAKE-5</td><td>The wellbore contains uninhibited seawater</td><td>Ref. 7</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Category</th><th>Spill Source</th><th>Consideration</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>IO-2</td><td>The wellbore contains uninhibited seawater</td><td>Ref. 8</td></tr>
<tr><td>SATYR-5</td><td>The wellbore contains uninhibited NaCl brine 1.20 SG (10.0 ppg)</td><td>Ref. 9</td></tr>
</table>
With the exception of SATYR-5, wellbore contents are comprised entirely of uninhibited seawater, thus in the event any leaching is experienced, no additional chemicals or contaminants are expected to be released to the environment.

For SATYR-5, the well bore contents (NaCl brine) has a higher density then the seawater above. As such, in the very unlikely event that the integrity of the surface plug was compromised, the brine within the wellbore is not expected to leach to the surrounding environment given its density is such that it will remain within the wellbore.
</td></tr>
</table>

3 Description of the Activity

3.1 Overview

As described in Section 1.1, the drilling program was completed in 2016. At the completion of drilling, the wells were abandoned in accordance the relevant WOMP, accepted by NOPSEMA accepted under the *Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011*.

The petroleum activity associated with the revised EP is limited to permanently (in perpetuity) leaving three wellheads on the seabed.

3.1.1 Location

The location of the three wellheads within the scope of the plan are described in Table 3-1 and displayed in Figure 1-1.

Table 3-1: Location of the wellheads that remain in-situ

Well Name	Title	Latitude	Longitude	Water Depth (m)	Wellhead height above the seabed (m)
Blake-1	WA-383-P	-20.125796	113.285011	925	3.39
Satyr-5	WA-73-R	-20.432325	114.319044	1062	3.36
Io-2	WA-40-L	-19.918336	114.42849	1300	14.77m

3.1.2 Time Frame

As the abandonment program has been completed, no further activities are proposed, with the wellheads to remain permanently (in perpetuity) on the seafloor.

In the event that CAPL plan to relinquish the Titles identified in Table 3-1 in the future, approval to leave the wellheads in situ for perpetuity will be sought from NOPTA.

3.1.3 Operational Area

The operational area associated with the activity is limited to the footprint of the specific wellhead locations. For the purposes of the risk assessment, the operational area is considered to be a 500 m around the wellhead.

3.1.4 Activity Description

The activity comprises permanently (in perpetuity) leaving the three wellheads identified in Table 3-1 on the seabed. As the integrity of the wells has been assured by the previous WOMP activities, no further onsite operations are proposed and the wells, including wellheads, will be passively left *in-situ*. Schematics of the wellheads are provided in Figure 3-1, Figure 3-2 and Figure 3-3.

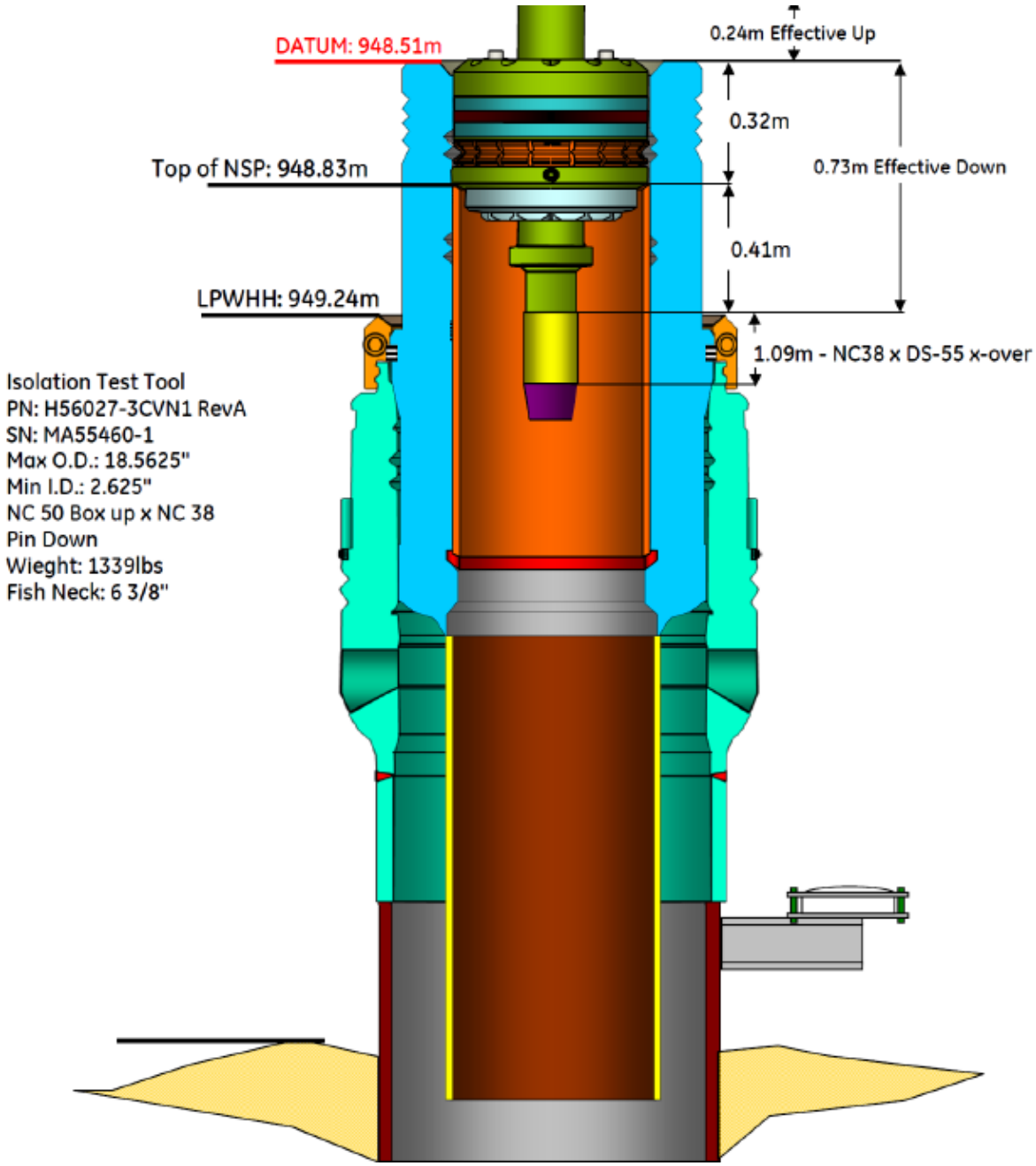

Figure 3-1: Blake-1 Wellhead Schematic

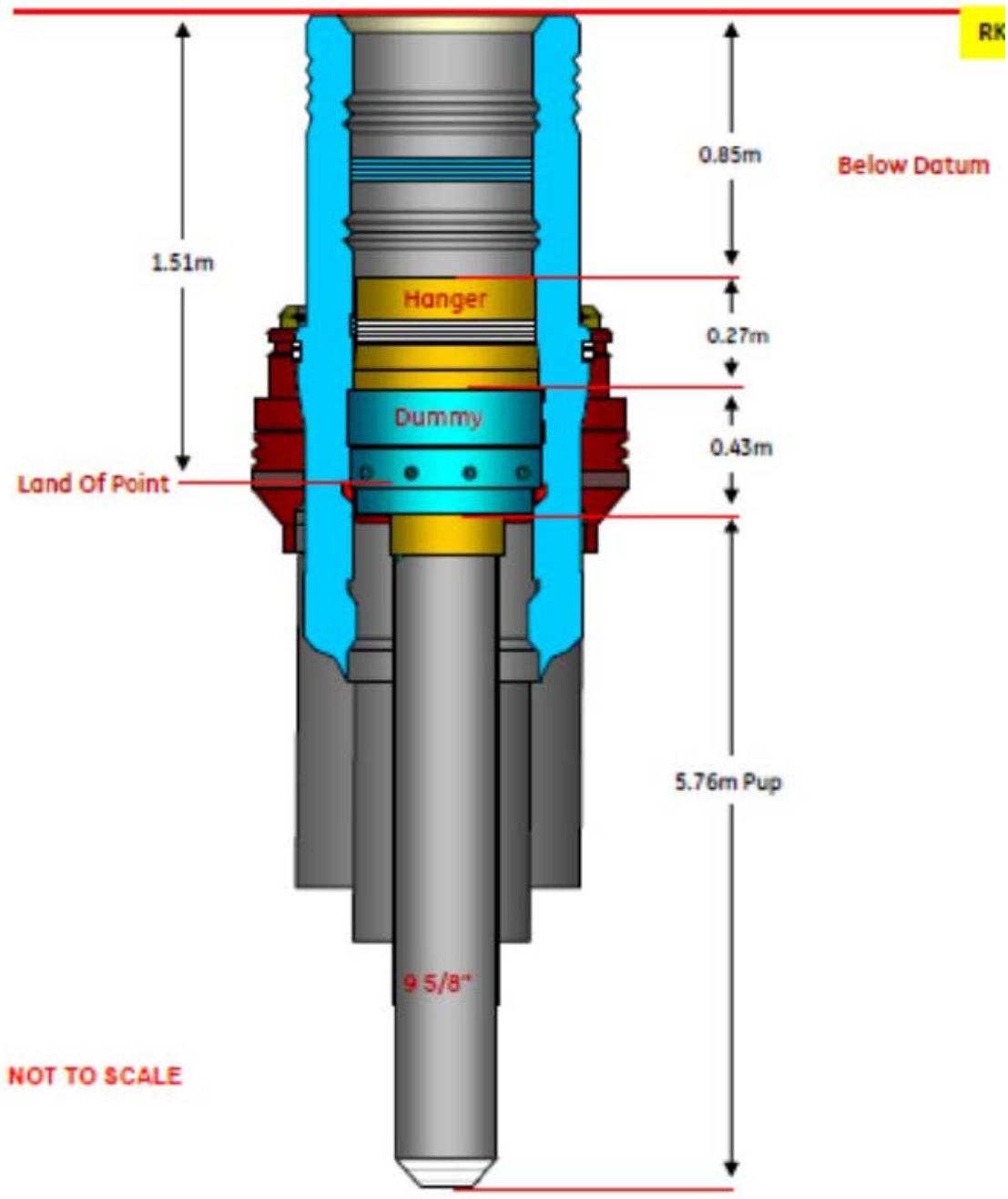

Figure 3-2: Satyr- 5 Wellhead Schematic

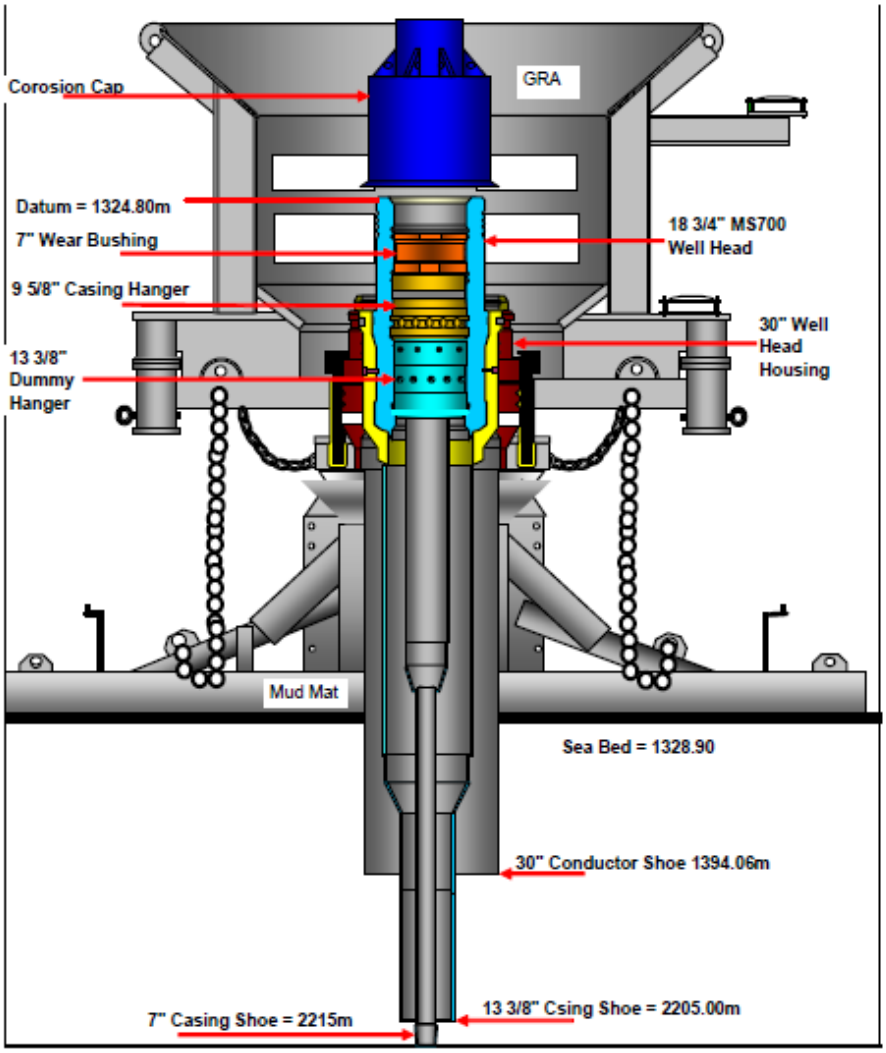

Figure 3-3: Io-2 Wellhead Schematic

4 Description of the Environment

As described in Section 2.0, no credible spill scenarios were identified as being associated with the activity. As described in Section 3.1.3, the operational area is limited to the physical footprint of the wellheads, but for the purposes of the risk assessment is considered to be a 500m area around the wellheads.

4.1 Regional Overview

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA) is an ecosystem-based classification of Australia's marine and coastal environments that has been developed by the Commonwealth Government as a regional framework for planning resources development and biodiversity protection (Ref. 10). The IMCRA divides Australia's marine environment into 41 provincial bioregions; a 'bioregion' is a biogeographical area defined by similar ecological characteristics.

All of the wellheads are located within the North-west Marine Region, which encompasses the Commonwealth waters from the WA /Northern Territory border in the north to the waters off Kalbarri in the south. A Marine Bioregional Plan for the North-west Marine Region (Ref. 11) was released in 2012; it aims to strengthen the operation of the EPBC Act in the region by improving the way the marine environment is managed and protected. The bioregional plan outlines the conservation values of the region, the associated pressures affecting those values, the priorities and strategies to address the pressures, and useful advice for industry planners looking to undertake activities in the region (Ref. 11). Information within the bioregional plan has been referenced in this Section where relevant.

The North-west Marine Region is further divided into eight provincial bioregions based on fish, benthic habitat, and oceanographic data at a scale that is useful for regional conservation planning and management (Ref. 11). The wellheads are all located within Northwest Province (see Figure 4-1). Table 4-1 summarises this provincial bioregion.

Table 4-1: Description of Provincial Bioregions

Bioregion	Area Description
Northwest Province	Offshore waters between Exmouth and Port Hedland, occurring entirely on the continental slope. Water depths are predominantly between 1000 m and 3000 m (Ref. 11).

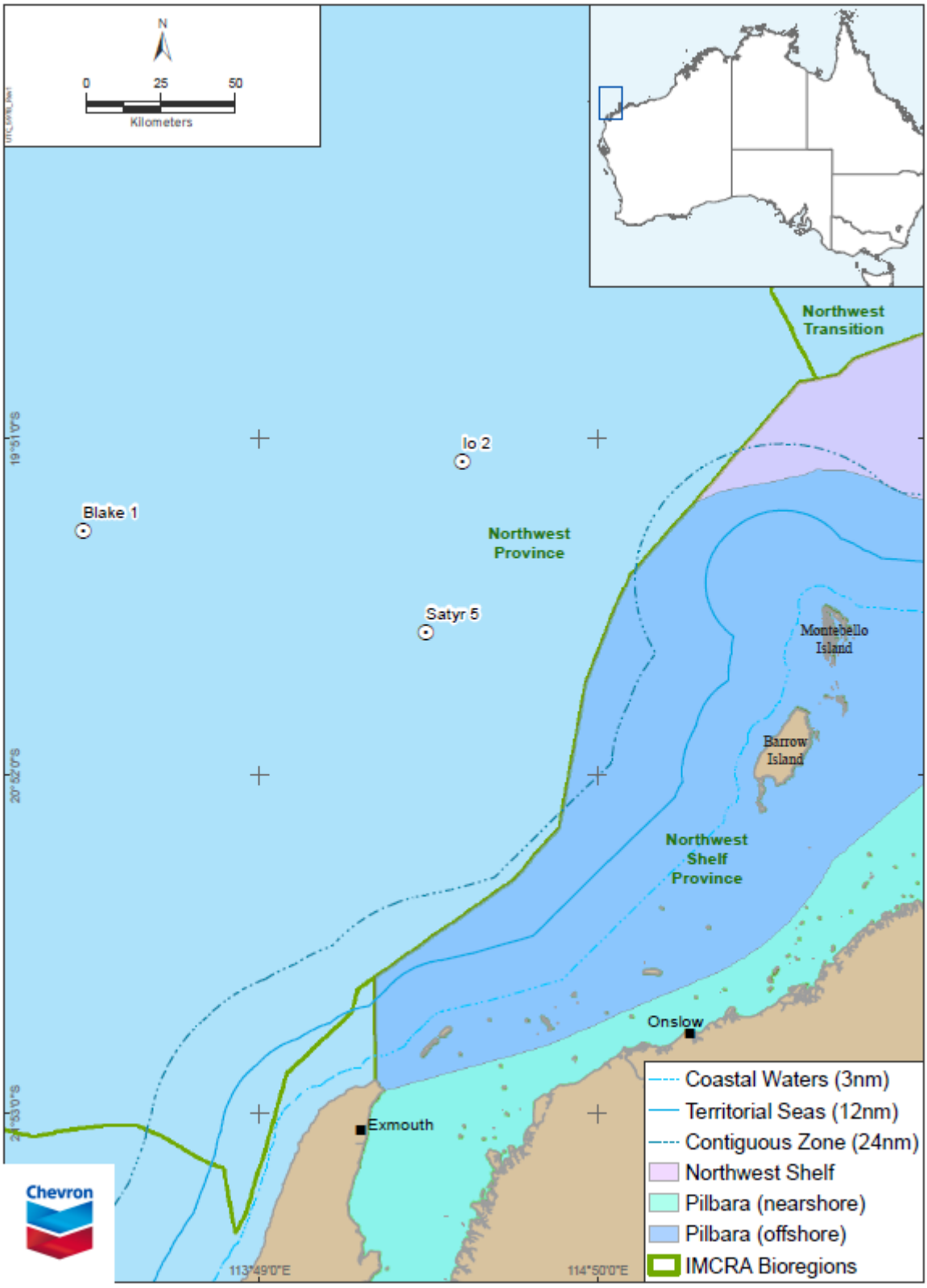

Figure 4-1: Wellhead Locations and Marine Regions

4.1.1 Marine Environment

Marine Habitats

The depth of water associated with the operational area precludes the establishment of benthic primary producer habitat (i.e. macroalgae and seagrass). The benthic

environments (as identified in the EOWR) identified all locations as comprising soft mud (Ref. 7; Ref. 8; Ref. 9)

Of the three wellheads described in the plan, a single wellhead (Blake-1) is situated within a Key Ecological Feature (KEF); the Exmouth Plateau (Figure 4-2). A description of this KEF is provided below.

Exmouth Plateau

The Exmouth Plateau is a regionally and nationally unique deep-sea plateau 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. 11).

The marine bioregional plan states; this key ecological feature is recognised for its biodiversity values (unique sea-floor feature with ecological properties of regional significance), which apply to both the benthic and pelagic habitats within the feature (Ref. 11).

The only pressures identified for this KEF in the plan is: Ocean acidification as a result of climate change, and states that generally, most actions in or adjacent to the North-west Marine Region are unlikely to impact adversely on the ecosystem functioning and integrity of the Exmouth Plateau (Ref. 11).

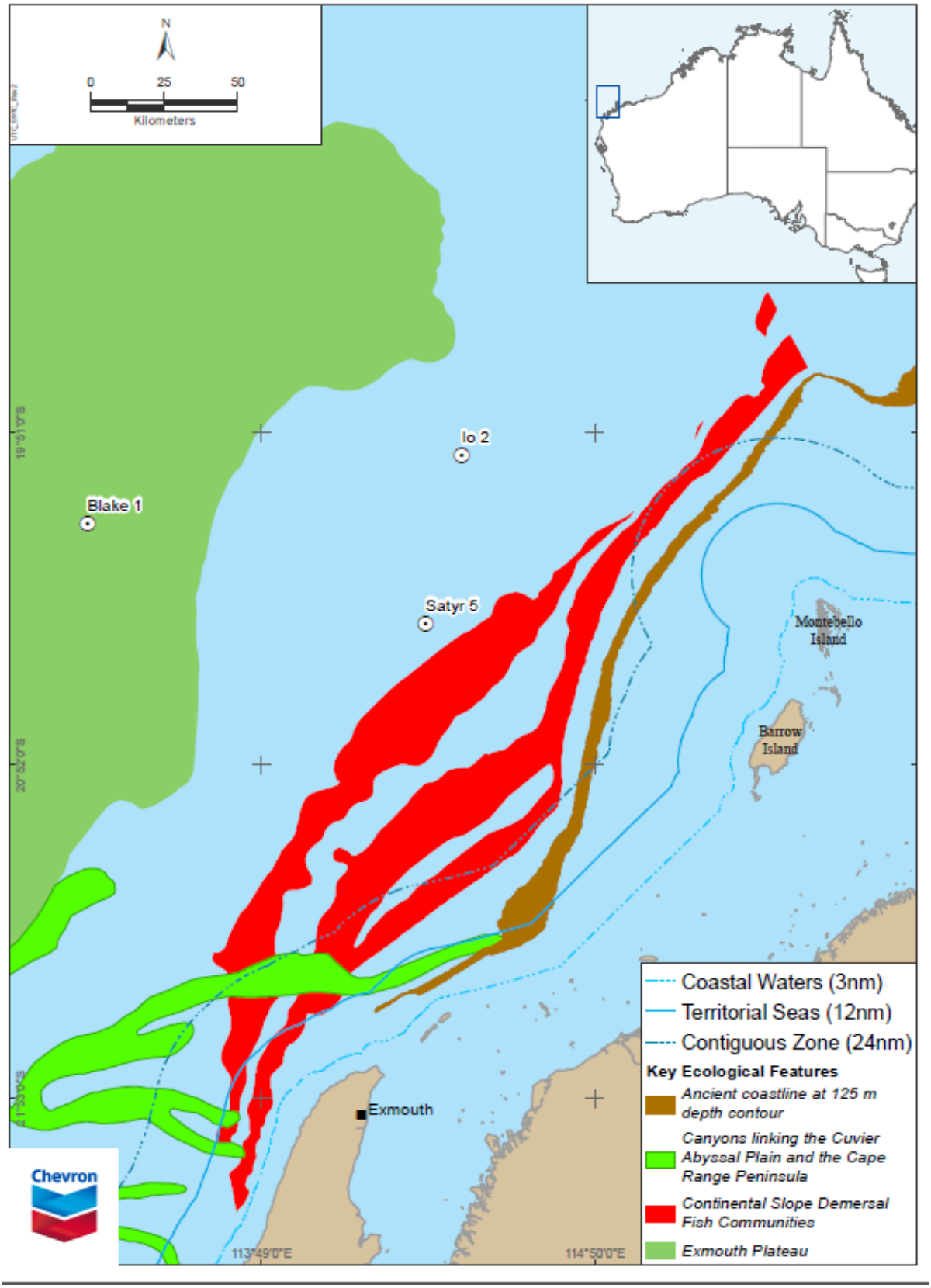

Figure 4-2: Operational Area and Proximity to Key Ecological Features

4.1.2 Marine Fauna

Based upon a search of the protected matters database (Ref. 12; Ref. 13; Ref. 14), several Threatened or Migratory species may be present within the operational area. These are described in the various subsections below.

Marine Mammals

Several Threatened or Migratory marine mammals may be present within the operational area, including:

- Humpback Whale
- Blue Whale (including Pygmy Blue Whale)
- Sei Whale
- Fin Whale
- Antarctic Minke Whale
- Br'de's Whale
- Killer Whale
- Sperm Whale

As there are no known feeding, calving, and resting areas within the operational area, most of these species are expected to be transient. However, the operational area intersects the Blue Whale Presence Biologically Important Area (BIA).

The Pygmy Blue Whale uses the north-west WA as a key migratory route between summer foraging grounds off south-west WA and breeding grounds in equatorial regions. Blue Whales migrate north from April to August and south from September to November. Although the operational area does not overlap the defined migration BIA, presence in the area is expected to be seasonally high during migration periods. In addition to Threatened and Migratory marine mammals identified above, several other Whale and dolphin species have been identified by the protected matters database search as having the potential to be present within the operational area. However, no biologically important areas associated with these species has been identified.

Reptiles

Five Threatened or Migratory species of marine turtles may be present within the operational area, including:

- Green Turtle
- Hawksbill Turtle
- Flatback Turtle
- Loggerhead Turtle
- Leatherback Turtle.

All five species are listed as Vulnerable, with Loggerhead Turtles also listed as Endangered, under the EPBC Act. Some turtle species may be found foraging throughout the water column all year round in the North West Shelf waters within the operational area (Ref. 15; Ref. 16; Ref. 17).

Barrow Island and the Montebello Islands (and 60 km radius buffer) provides critical habitat for the Flatback Turtle (Ref. 18). However, the operational area is well outside of this critical habitat (as at its closest it is over 100 km away from either Barrow Island and the Montebello Islands.

A number of sea snake species were identified via the EPBC search as having the potential to be present in the operational area. However, Cogger (Ref. 19; Ref. 20) state that most sea snakes have shallow benthic feeding patterns and are rarely

observed in water depths exceeding 30 m. As such, sea snakes are not expected to be common within the operational area, which has water depths of >900 m.

Fishes, including Sharks and Rays

A number of Threatened or Migratory fish, shark, and ray species may be present within the operational area, including:

- Great White Shark
- Shortfin Mako Shark
- Longfin Mako Shark
- Giant Manta Ray

No BIAs were identified for these or any other species.

Seabirds and Shorebirds

A number of Threatened or Migratory seabirds or shorebirds may be present within the operational area including:

- Common Noddy
- Common Sandpiper
- Lesser Frigatebird
- Pectoral Sandpiper
- Red Knot
- Sharp-tailed Sandpiper
- Southern Giant Petrel
- Streaked Shearwater.

No BIAs were identified for these or any other species.

4.1.3 Shoreline Habitats

No shoreline habitats occur within the operational area.

4.2 Socioeconomic Environment

4.2.1 Commercial Shipping

Given the nature of the EP, commercial shipping operations are not expected to interact with the wellheads as they are located in water depths greater than 900 m.

4.2.2 Commercial Fishing and Aquaculture

Given the nature of the EP, only trawl fisheries have the potential to interact with the wellheads. However, in accordance with stakeholder consultation (Section 1.5.3) no commercial fisheries are expected to be impacted, with WAFIC confirming that the water depths associated with these wellheads preclude commercial trawl fisheries, and other non-trawl commercial fishing activities do not occur at these depths.

Those fisheries with license that overlap the wellheads are:

- North-west Slope Trawl Fishery
- Western Deepwater Trawl Fishery

North-west Slope Trawl Fishery

The North-west slope Trawl Fishery had two vessels active in 2011-2012 with approximately 1432 hours of fishing effort (Ref. 24). Between the years 2012 and 2013 only one vessel was operational with 1861 trawl hours during this time (Ref. 24).

The 2014-2015 season saw landings totalling 18,284 t of target and 6,624 t of by-product caught (Ref. 25) with 7 permits and a single vessel active for this period (Ref. 26). The annual take of deep-water prawn between 2012 and 2017 ranged from three to six tonnes (Ref. 25).

The target species scampi are found on soft, muddy substrates at depths between 250 and 500 m, which generally equates to the upper continental slope mainly localising trawling operations to this section of the marine environment (Ref. 27).

Western Deepwater Trawl Fishery

The Western Deepwater Trawl Fishery had two operational vessels from 2012-2013 although in recent (2014-2015) years despite 11 granted permits have not been operational (Ref. 26). Operators catch more than 50 species in waters seaward of a line approximating the 200 m depth contour, in habitats ranging from temperate–subtropical in the south to tropical in the north (Ref. 24).

4.2.3 Marine-based Tourism and Recreation

Given the nature of the EP, Marine based tourism and recreation are not expected to interact with the wellheads as they are located in water depths greater than 900 m.

No specific values or sensitivities associated with marine based tourism have been identified as having the potential to interact with the activity / occurring within the operational area.

4.2.4 Other socioeconomic values and sensitivities

The operational area does not overlap any:

- National heritage place
- World heritage property
- RAMSAR wetland
- Australian Marine Parks.

Given the nature of the EP, and the location of activities there-in cultural heritage is not expected to interact with or be impacted by the wellheads as they are located in water depths greater than 900 m.

In addition to this, there are no known wrecks within the operational area according to the Australian National Shipwreck Database (Ref. 28).

Values of a National Heritage place or World heritage property, Ecological Character of a Ramsar wetland or Values and sensitivities of a Commonwealth marine area (including CMRs/ now Australian Marine Parks) and Commonwealth land.

4.3 Particular Values and Sensitivities

The particular values and sensitivities identified for the operational area are:

- Blue and pygmy blue whale presence

5 Environmental Risk Assessment Methodology

In accordance with Regulation 13(5) of the OPGGS(E)R, this Section summarises the methodology used to identify and assess the environmental impacts and risks associated with the activities described in Section 2.

The risk assessment for the EP was undertaken in accordance with CAPL's Health, Environment, and Safety (HES) Risk Management Process (Ref. 29) using the Chevron Corporation Integrated Risk Prioritization Matrix (Figure 5-1). This approach generally aligns with the processes outlined in ISO 31000:2009 Risk Management – Principles and Guidelines (Ref. 30) and Handbook 203:2012 Managing Environment-Related Risk (Ref. 31).

The risk assessment process and evaluation involved consultation with environmental, health, safety, commissioning, start-up, operations, maintenance, and engineering personnel. Risks considered and covered in the EP were identified and informed by:

- expertise and experience of CAPL personnel
- stakeholder engagement (Section 1.4).

The impact and risk assessment process comprised these tasks:

- identifying and describing the petroleum activity
- identifying particular environmental values
- identifying relevant environmental aspects
- identifying relevant environmental hazards
- evaluating impacts and risk
- consequence evaluation
- control measure identification and ALARP evaluation
- likelihood evaluation
- quantifying the level of risk
- risk and impact acceptance
- environmental performance outcomes, standards, and measurement criteria.

After describing the activity and identifying the environmental values, aspects, and hazards, the potential consequences were assessed and evaluated. Consequence is defined using the Integrated Risk Prioritization Matrix (Figure 5-1). The level of consequence is determined by the potential level of impact based on:

- the spatial scale or extent of potential hazards of the environmental aspect within the receiving environment
- the nature of the receiving environment (from Section 3) (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 environmental hazard 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 criteria of acceptability.

Chevron Integrated Risk Prioritization Matrix

For the Assessment of HES & Asset Risks from Event or Activity

Likelihood Descriptions & Index (with confirmed safeguards)

Likelihood Descriptions	Likelihood Indices		Legend					
			Legend applies to identified HES risks (see guidance documents for additional explanations)					
			1, 2 , 3, 4 - Short-term, interim risk reduction required. Long term risk reduction plan must be developed and implemented.					
			5 - Additional long term risk reduction required. If no further action can be reasonably taken, SBU management approval must be sought to continue the activity.					
			6 - Risk is tolerable if reasonable safeguards / management systems are confirmed to be in place and consistent with relevant requirements of the Risk Mitigation Closure Guidelines.					
			7, 8, 9, 10 - Manage risk. No further risk reduction required. Risk reduction at management / team discretion.					
Event can reasonably be expected to occur in life of facility	1	Likely	6	5	4	3	2	1
Conditions may allow the event to occur at the facility during its lifetime, or the event has occurred within the Business Unit	2	Occasional	7	6	5	4	3	2
Exceptional conditions may allow consequences to occur within the facility lifetime, or has occurred within the OPCO	3	Seldom	8	7	6	5	4	3
Reasonable to expect that the event will not occur at this facility. Has occurred several times in the industry, but not in the OPCO	4	Unlikely	9	8	7	6	5	4
Has occurred once or twice within industry	5	Remote	10	9	8	7	6	5
Rare or unheard of	6	Rare	10	10	9	8	7	6

Decreasing Likelihood ↓

Consequence Descriptions & Index (without safeguards)

Consequence Indices			Decreasing Consequence/Impact →					
			6	5	4	3	2	1
			Incidental	Minor	Moderate	Major	Severe	Catastrophic
Consequence Descriptions	Safety		**Workforce:** Minor injury such as a first-aid. *AND* **Public**: No impact	**Workforce:** One or more injuries, not severe. *OR* **Public**: One or more minor injuries such as a first-aid.	**Workforce**: One or more severe injuries including permanently disabling injuries. *OR* **Public**: One or more injuries, not severe.	**Workforce:** (1-4) Fatalities *OR* **Public**: One or more severe injuries including permanently disabling injuries.	**Workforce**: Multiple fatalities (5-50) *OR* **Public**: multiple fatalities (1-10)	**Workforce**: Multiple fatalities (>50) *OR* **Public**: multiple fatalities (>10)
	Health (Adverse effects resulting from chronic chemical or physical exposures or exposure to biological agents)		**Workforce:** Minor illness or effect with limited or no impacts on ability to function and treatment is very limited or not necessary *AND* **Public:** No impact	**Workforce**: Mild to moderate illness or effect with some treatment and/or functional impairment but is medically managable *OR* **Public**: Illness or adverse effect with limited or no impacts on ability to function and medical treatment is limited or not	**Workforce**: Serious illness or severe adverse health effect requiring a high level of medical treatment or management *OR* **Public**: Illness or adverse effects with mild to moderate functional impairment requring medical treatment.	**Workforce** (1-4): Serious illness or chronic exposure resulting in fatality or significant life shortening effects OR **Public**: Serious illness or severe adverse health effect requiring a high level of medical treatment or management.	**Workforce** (5-50): Serious illness or chronic exposure resulting in fatality or significant life shortening effects *OR* **Public** (1-10): Serious illness or chronic exposure resulting in fatality or significant life shortening effects.	**Workforce** (>50): Serious illness or chronic exposure resulting in fatality or significant life shortening effects *OR* **Public** *(>10)*: Serious illness or chronic exposure resulting in fatality or significant life shortening effects.
	Environment		Impacts such as localized or short term effects on habitat, species or environmental media.	Impacts such as localized, long term degradation of sensitive habitat or widespread, short-term impacts to habitat, species or environmental media	Impacts such as localized but irreversible habitat loss or widespread, long-term effects on habitat, species or environmental media	Impacts such as significant, widespread and persistant changes in habitat, species or environmental media (e.g. widespread habitat degradation) .	Impacts such as persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.	Loss of a significant portion of a valued species or loss of effective ecosystem function on a landscape scale.

The above legend applies only to HES risks, where risk levels 1-6 are actionable and mandatory.
For risks that may result in facility damage, business interruption, loss of product, the "Assets" category below should be used.
Asset risk reduction is at the discretion of management. Under no circumstances may a direct or indirect translation of Asset loss to HES consequences, or between any discrete categories of HES consequences be inferred.

Consequence Descriptions & Index (without safeguards)

Consequence Indices			6	5	4	3	2	1
			Incidental	Minor	Moderate	Major	Severe	Catastrophic
Consequence Descriptions	**Assets** (Facility Damage, Business Interruption, Loss of Product)		Minimal damage. Negligible down time or asset loss. Costs < $100,000.	Some asset loss, damage and/or downtime. Costs $100,000 to $1 Million.	Serious asset loss, damage to facility and/or downtime. Costs of $1-10Million.	Major asset loss, damage to facility and/or downtime. Cost >$10 Million but <$100 Million.	Severe asset loss or damage to facility. Significant downtime, with appreciable economic impact. Cost >$100MM but <$1billion.	Total destruction or damage. Potential for permanent loss of production. Costs >$1billion

This matrix is endorsed for use across the Company.
It is not a substitute for, and does not override any relevant legal obligations.
Under no circumstances should any part of this matrix be changed or modified, adapted or customized.
This matrix identifies health, safety, environmental and asset risks and is to be used only by qualified and competent personnel.
Where applicable it is to be used within the Riskman2 structure and governance of an OE Risk Management Process. If applied outside of these Processes, it is also mandatory to manage identified intolerable risks and comply with the Risk Mitigation Closure Guidelines.

Figure 5-1: Chevron Corporation Integrated Risk Prioritization Matrix

5.1 Control Measure Identification and ALARP Evaluation

The process for identifying control measures depends on the ALARP decision context set for that particular hazard and 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.

In alignment with NOPSEMA's ALARP Guidance Note (Ref. 33; GN0166), CAPL's D&C Team have adapted the approach developed by Oil and Gas UK (Ref. 34) for use in an environmental context to determine the assessment technique required to demonstrate that potential impacts and risks are ALARP (Figure 5-2). Specifically, the framework considers impact severity and several guiding factors:

- activity type
- risk and uncertainty
- stakeholder influence.

A Type A decision is made if the risk is relatively well understood, the potential impacts are low, 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.

A Type B decision is made if there is greater uncertainty or complexity around the activity and/or risk, the potential impact is moderate, and the risk generates several 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 typically involves sufficient complexity, high potential impact, 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 applied for those controls that only have a marginal cost benefit.

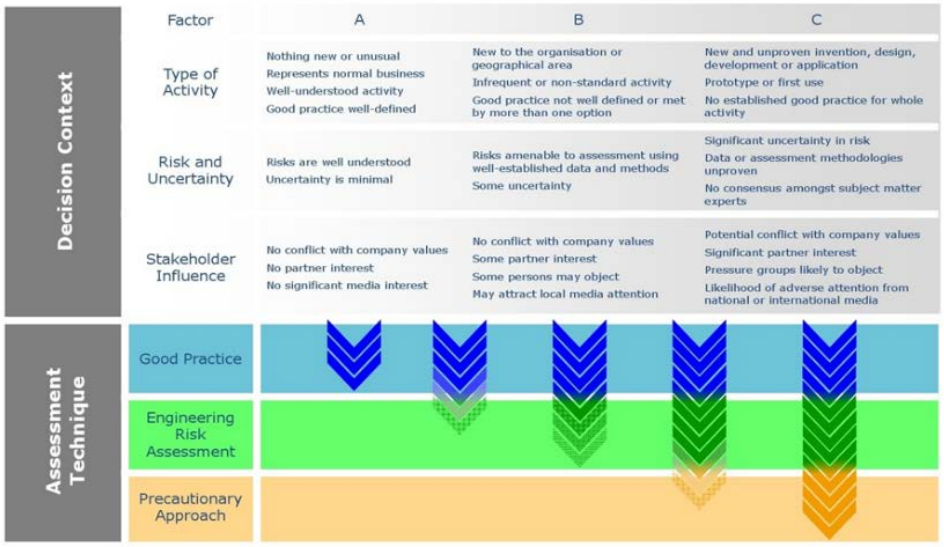

Figure 5-2: ALARP Decision Support Framework

(Source: Ref. 33)

5.2 Risk and Impact Acceptance Criteria

NOPSEMA provides guidance on demonstrating that impacts and risks will be of an acceptable level (Ref. 35). 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, plans of management, management principles etc.
- internal context (e.g. consistent with titleholder policy, culture, and company standards)
- external context (the existing environment and stakeholder expectations)
- defined level of acceptability.

These principles generally align with Chevron Corporations RiskMan2 procedure, which states that a level of potential impact or risk is acceptable where:

- world-class performance can be achieved (as indicated by applying best applicable industry practices and standards that are consistent with titleholder policy, culture, and company standards)
- all practicable control measures have been identified to protect people and the environment (including those identified via consultation with relevant persons)
- all regulatory and statutory requirements are to be implemented (including an assessment of whether the activity is consistent with the principles of ESD outlined in section 3A of the EPBC Act; and the precautionary principle set out in section 391 of the EPBC Act)
- a determination that all reasonable risk reduction measures have been taken.

Table 5-1 outlines the criteria that CAPL have used to demonstrate that impacts and risks from each of the identified aspects are acceptable.

Table 5-1: Acceptability Criteria

Acceptability Test	How Applied
Principles of ESD	Is there the potential to affect biological diversity and ecological integrity? (Consequence Level between Moderate [4] and Catastrophic [1]) Do activities have the potential to result in permanent/ irreversible; **medium- to large-** scale; moderate- to high-intensity environmental damage?
	If yes: Is there significant scientific uncertainty associated with aspect?
	If yes: Are there additional measures to prevent degradation of the environment from this aspect?
Relevant environmental legislation and other requirements	Confirm that the management of impacts and risks is consistent with relevant Australian environmental management laws and other regulatory and statutory requirements.
Internal context	Confirm that all good practice control measures have been identified for this aspect through CAPL's management systems and that the management of impacts and risks is consistent with company policy, culture, and standards.
External context	What objections and claims regarding this aspect have been made, and how have they been considered / addressed?

Acceptability Test	How Applied
Defined acceptable level	For environmental impacts arising from planned aspects / activities, is the consequence less than Severe – 2 (i.e. is the Consequence ranked between 3 and 6)? For potential environmental impacts and risks, is the risk level ranked lower than 4 (i.e. between 5 and 10)?

6 Environmental Risk Assessment and Management Strategy – Petroleum Activity

To meet the requirements of the OPGGS(E)R, Regulation 13(5) and (6), *Evaluation of environmental impacts and risks* and Regulation 13(7) *Environmental performance outcomes and standards,* this Section evaluates the impacts and risks associated with the petroleum activity appropriate to the nature and scale of each impact and risk, and details the control measures that are used to reduce the risks to ALARP and an acceptable level. Additionally, Environmental Performance Outcomes, Environmental Performance Standards, and Measurement Criteria have been developed and are described in the following sections.

6.1 Physical Presence (Marine Users)

Cause of Aspect
The physical presence of the wellheads were identified as having the potential to result in physical interaction with other marine users within the operational area; specifically trawl fisheries.

Hazard
Physical interaction has the potential to result in: • Exclusion of fishing effort / damage to fishing (trawl) equipment)

Potential Consequence Summary	Ranking
Exclusion of fishing effort / damage to fishing (trawl) equipment) Although several fisheries have licences that overlap the operational area associated with the EP; consultation with these fisheries indicate that interaction with commercial fisheries is not expected. Specifically, WAFIC confirmed water depths associated with these wellheads preclude commercial trawl fisheries, and other non-trawl commercial fishing activities do not occur at these depths (Section 1.5.3). Assuming that fishing in this area may occur in the future, it was evaluated that potential interaction from leaving wellheads in-situ would be localised to the specific area of the wellhead and any need to avoid this small area is considered to be a normal maritime activity and is not expected to impact on the functions, interests or activities of other marine users (as confirmed from stakeholder consultation records). Thus was assigned a consequence rating of Incidental (6).	**Incidental (6)**

Decision Context	Summary of Control Measures	Risk Level Summary	
B	• Coordinates for any suspended wells provided to the Australian Hydrographical Service (AHS) • Ongoing consultation (with DoEE)	**Consequence**	Incidental (6)
		Likelihood	Rare (6)
		Risk Level	Low (10)

6.2 Seabed Disturbance

Cause of Aspect
The physical presence of the wellheads were identified as having the potential to result in seabed disturbance through the alteration of marine habitat and potential contamination from wellhead corrosion.

Hazard
Leaving the wellhead in-situ interaction has the potential to result in: • Seabed contamination • Alteration of marine habitat

Potential Consequence Summary	Ranking
Seabed contamination The wellhead structures are predominantly steel and some cement. Over time, corrosion of the structure may contribute to an increase in breakdown products (mostly iron compounds) in the sediments surrounding the wellheads. Due to the robustness of the materials involved and the deep-water location of the wells, degradation is likely to be a relatively slow process. Iron compounds generally have no to very low toxicity to marine organisms (Ref. 36) and any build up in the sediments surrounding the wellheads through ongoing deposition would be counteracted by gradual dissipation as a result of local sediment movements. Any exposure would be limited to the immediate vicinity of each wellhead, with no impacts expected to the values and sensitivities identified in Section 4.0.	N/a
Alteration of marine habitat The wellheads may locally alter marine habitat by providing an area of hard substrate with vertical structural complexity in place of the relatively flat, soft sediments that were present prior to drilling. This effect is likely to have already occurred given the period the wellheads have been in place (Blake-1: 2014; Satyr-5: 2015; and Io-2:2006), but in-situ abandonment may allow further development and will retain the changes for the life of the structures. The physical presence of anthropogenic structures on the seabed in an area of generally flat, soft sediments is known to provide hard substrate that becomes colonised with fouling organisms and may support increased fish communities (Ref. 37). In some circumstances, these areas may in turn also support foraging by marine megafauna (Ref. 38). Each of the wellheads was located in an area devoid of vertical structure and comprising soft sediments. If they have not become covered or partially covered by mobile sediments, the wellheads may have been colonised by a diverse epibenthic assemblage and may now support a range of fish species. Studies on wellheads in shallower water depths on the North-West Shelf after 16 to 22 years on the seabed have found the structures to be heavily encrusted with soft corals, sponges and barnacles and to support diverse fish taxa, ranging from small site-attached species to large pelagic species (Ref. 39). The extent of any effects on habitats (and associated communities) is expected to be limited to the immediate vicinity of the wellhead structures and may ultimately decline as these structures degrade over time. While some positive effects on local biodiversity are likely to have resulted, this effect is expected to be negligible in a regional context given the small scale of the structures. Given the widespread occurrence of similar soft sediment communities in the region, and as no negative impacts resulting from localised changes to the marine habitat this has not been evaluated further.	N/a

7 Management Approach

To meet the requirements of the OPGGS(E)R, Division 2.3, Regulation 14, *Implementation strategy for the environment plan*, this Section summarises the management approach documented in the EP as the Implementation Strategy, which identifies the systems, practices, and procedures used to ensure the environmental impacts and risks of the activities are continuously reduced to ALARP.

7.1 Systems, Practices, and Procedures

CAPL's operations are managed in accordance with the Operational Excellence Management System (OEMS), which is a comprehensive management framework that supports the corporate commitment to protect the safety and health of people and the environment. This framework ensures a systematic approach to environmental management, with the environmental aspects of each project addressed from project conception, throughout project planning, and as an integral component of implementation, as shown in Figure 7-1.

Figure 7-1: CAPL OEMS Process Overview

Under the OEMS are 13 elements that enable implementation of CAPL's activities in a manner that is consistent with its Operational Excellence Policy 530. Of the elements described under the OEMS, those relevant to the EP are detailed in Table 7-1. The following subsections summarise the key processes that help demonstrate how CAPL is effective in reducing environmental impacts and risks to ALARP and an acceptable level.

A few of the key processes within the EP are summarised further in the subsections below.

Table 7-1: OEMS Elements Relevant to the Activity

OEMS Element	Element Description	Key Processes Relevant to the Activity
Safe Operations (OE-03)	Operate and maintain facilities to prevent injuries, illness, and incidents	• (OE-03.01.01) ABU HES Risk Management (Ref. 29)
Management of Change (OE-04)	Manage both permanent and temporary changes to prevent incidents	• (OE-04.00.01) Management of Change for Facilities and Operations – ABU Standardised OE Process (Ref. 40)
Incident Investigation (OE-09)	Investigate and identify root causes of incidents to reduce or eliminate systemic causes to prevent future incidents	• (OE-09.00.01) Incident Investigation and Reporting – ABU Standardised OE Process (Ref. 41)
Community and Stakeholder Engagement (OE-10)	Reach out to the community and engage in open dialogue to build trust	• (OE-10.00.01) Community and Stakeholder Engagement – ABU Standardised OE Process (Ref. 42)
Compliance Assurance (OE-12)	Verify conformance with OE requirements in applicable company policy and government laws and regulations	• (OE-12.01.19) Compliance Assurance Audit Program ABU Standardised OE Procedure (Ref. 43)

7.2 Management of Change for Facilities and Operations

The Management of Change for Facilities and Operations Process (Ref. 40) manages changes to facilities, operations, products, and the organisation so as to prevent incidents, support reliable and efficient operations, and keep unacceptable risks from being introduced into CAPL's business.

In conjunction with the HES Risk Management Process, this process is followed to document and assess the impact of changes to activities described in Section 3. 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 the EP. If these changes do not trigger relevant petroleum regulations, as detailed below, the EP will be revised, and changes recorded within the EP without resubmission.

The EP must be resubmitted to NOPSEMA for acceptance/approval before:

- starting any new activity, or any significant modification to, change, or new stage of an existing activity, not provided for in the EP
- changing an instrument holder for, or operator of, the activity
- the occurrence of a significant new environmental impact or risk, or significant increase in an existing environmental impact or risk, not provided for in the EP
- the occurrence of a series of new environmental impacts or risks, or a series of increases in existing environmental impacts or risks, 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 the EP.

7.3 Compliance Assurance Audit Program ABU Standardised OE Procedure

The Compliance Assurance Audit Program ABU Standardised OE Procedure (OE-12.01.19) addresses the establishment of audit programs to verify the effectiveness of controls and the extent to which requirements are met by CAPL (Ref. 43).

Routine audits and inspections of activities within the scope of the EP will be undertaken in accordance with the audit program/schedule, which will be regularly reviewed and updated to ensure effective verification of environmental compliance requirements. The program/schedule will include the timeframes, location, and scope of the audits.

Given the nature of the activity no audits are proposed to be undertaken.

7.4 Environment Plan Review

In accordance with Regulation 19 of the OPGGS(E)R, CAPL will submit a proposed revision of the EP at least 14 days before the end of a five-year period that commences on the date the EP is accepted.

Additional revisions and/or resubmission of the EP to NOPSEMA, in accordance with Regulation 17 of the OPGGS(E)R, will be undertaken in accordance with Section 7.1.2.

8 Abbreviations and Definitions

Table 8-1 lists definitions for the terms and abbreviations used in this document.

Table 8-1: Abbreviations and Definitions

Acronym / Abbreviation	Definition
ABU	Australian Business Unit
AHS	Australian Hydrographic Service
ALARP	As Low As Reasonably Practicable
AMSA	Australian Maritime Safety Authority
APPEA	Australian Petroleum Production and Exploration Association
BIA	Biologically Important Area
CAPL	Chevron Australia Pty Ltd
D&C	Drilling and Completion
DMIRS	Western Australian Department of Mines, Industry Regulation, and Safety (formerly Department of Mines and Petroleum [DMP] and Department of Commerce (from 1 July 2017)
DPIRD	WA Department of Primary Industries and Regional Development (formerly Department of Fisheries)
DotEE	Commonwealth Department of the Environment and Energy
EMBA	Environment that May Be Affected
Endangered Species	A species that is not critically endangered, but is facing a very high risk of extinction in the wild in the near future.
EOWR	End Of Well Report
EP	Environment Plan
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ESD	Ecologically Sustainable Development
HES	Health, Environment, and Safety
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
ISO	International Organization for Standardization
KEF	Key Ecological Feature
km	Kilometre
LOWC	Loss of Well Control
Migratory Species	Species listed as migratory under section 209 of the EPBC Act.
MODU	Mobile Offshore Drilling Unit, Drill Ship, or Intervention Vessel (collectively termed MODU)
N/A	Not Applicable
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority (Australia)

Acronym / Abbreviation	Definition
OE	Operational Excellence
OEMS	Operational Excellence Management System
OGUK	Oil and Gas UK
OPGGS Act	Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006*
OPGGS(E)R	Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
Protected Species	Species protected under the EPBC Act
TAPL	Texaco Australia Pty Ltd
Threatened Species	Species listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable or conservation dependent under section 178 of the EPBC Act.
Vulnerable Species	A species is listed as vulnerable under the EPBC Act if it is not critically endangered or endangered and it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
WA	Western Australia
WAFIC	Western Australian Fishing Industry Council
WOMP	Well Operations Management Plan

9 References

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