East Spar Inspection and Removal EP Summary

ES-35-VB-20001.03

PROJECT / FACILITY	East Spar Inspection and Removal	
REVIEW INTERVAL (MONTHS)	N/A	
SAFETY CRITICAL DOCUMENT	~~YES~~	NO

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ACRONYMS

Abbreviation	Description
AFZ	Australian Fishing Zone
AHO	Australian Hydrographic Office
ALARP	As Low as Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
BIAs	Biologically Important Areas
DAWR	Department of Agriculture and Water Resources
DBCA	Department of Biodiversity, Conservation and Attractions
DER	Department of Environmental Regulation
DMIRS	Department of Mines, Industry Regulation and Safety
DoD	Department of Defence
DoEE	Department of Energy and Environment
DoT	Department of Transport (WA)
DP	Dynamic Positioning
DPIRD	Department of Primary Industries and Regional Development
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DoEE)
DSV	Dive Support Vessel
EHFL	Electric Hydraulic Flying Lead
EHU	Electro-Hydraulic Umbilical
EMBA	Environment that May Be Affected
EP	Environment Plan
EPBC	Environment Protection and Biodiversity Conservation
EPO	Environmental Performance Objective
EPS	Environmental Performance Standard
ES	East Spar
GES	Greater East Spar
HFO	Heavy Fuel Oil
HRV	Hyperbaric Rescue Vessel
HSE	Health Safety Environment
IAP	Incident Action Plan
ISV	Installation Support Vessel
IMCRA	Integrated Marine and Coastal Regionalisation of Australia

Abbreviation	Description
IMDG	International Maritime Dangerous Goods
IMS	Invasive Marine Species
IMT	Incident Management Team
IUCN	International Union for Conservation of Nature
KEF	Key Ecological Feature
km	Kilometre
m	Metres
m^3	Cubic Metres
MARPOL	International Convention for the Prevention of Pollution from Ships
MC	Measurement Criteria
MGO	Marine Gas Oil
MoC	Management of Change
MoU	Memorandum of Understanding
NCC	Navigation, Communication and Control
NEBA	Net Environmental Benefit Analysis
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOx	Oxides of Nitrogen
NWMR	North West Marine Region
NWS	North West Shelf
ODS	Ozone Depleting Substance
OPEP	Oil Pollution Emergency Plan
OPGGS (E) R	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OSCP	Oil Spill Contingency Plan
OWA	Oiled Wildlife Advisors
OWRP	Oiled Wildlife Response Plan
PLEM	Pipeline End Manifold
PLET	Pipeline End Termination
QOA	Quadrant Oil Australia
ROV	Remote Operated Vehicle
SFRT	Subsea First Response Tool Kit
SMPEP	Shipboard Marine Pollution Emergency Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
SOx	Oxides of Sulphur

Abbreviation	Description
VI	Varanus Island
WA	Western Australia
WAFIC	Western Australian Fishing Industry Council
WAOWRP	WA Oiled Wildlife Response Plan
XT	Xmas Tree

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1. INTRODUCTION

Quadrant Oil Australia Pty Ltd (QOA) is the registered operator for Petroleum Production Licence WA-13-L in offshore Commonwealth waters on the North West Shelf (NWS) of Western Australia (WA). QOA is 100% owned subsidiary of Quadrant Energy Australia Ltd (Quadrant). Quadrant proposes to install infrastructure required to perform intelligent pigging activities of the East Spar system, and remove flowlines and associated infrastructure which are at the end of design life and no longer used in production. The East Spar 1, 3 and 6 Christmas trees (XT), will not be removed during the proposed activities and permanent abandonment of the XTs is not considered as part of the activity.

1.1 Compliance

The overall purpose of the *East Spar Inspection and Removal Environment Plan (ES-35-VB-20001.01)* (the EP) is to comply with statutory requirements of the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (E) Regulations); and to ensure that the activity is planned and conducted in line with Quadrant environmental policies and standards, including the corporate Environmental Policy. The EP was assessed and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) on 16 July 2018. A revision to the EP was accepted 12th December to allow for activities to occur in 2019 instead of 2018. This EP summary has been prepared in accordance with the requirements of regulation 11 (4) of the OPGGS (E) Regulations.

1.2 Activity durations and timing

Activities will be conducted 24 hours per day, seven days per week. It is envisaged that the total duration of all activities covered by the EP within the operational area will be up to 35 days. However with potential for weather and operational delays this could extend the project duration to a period of 60 days in the operational area. Activities may not be continuous during these time frames, and the vessels may depart and then re-enter the operational area on a number of occasions.

The earliest date for commencement of the activity is February 2019, the activity is planned to occur during any period of the year, as timing is subject to vessel availability. Therefore, this EP assesses the activities occurring during any period of the year.

2. ACTIVITY LOCATION

The activities will occur in Petroleum Production Licence WA-13-L. The pipeline licence area is contained within a smaller 'operational area' defined in **Table 2-1** and **Figure 2-1**.

Table 2-1: Coordinates of the operational area

Parameter	Latitude	Longitude
Operational Area	20° 41' 53.864" S	114° 59' 9.454" E
	20° 43' 52.047" S	115° 00' 9.781" E
	20° 44' 47.158" S	114° 58' 7.777" E
	20° 42' 48.966" S	114° 57' 7.473" E

The operational area is located approximately 34 km west of Barrow Island (nearest land) and approximately 99 km northwest of Onslow. The nearest protected area is the Commonwealth Montebello Australian Marine Park located approximately 30 km to the east. Water depth within the operational area ranges between approximately 90 m to 118 m.

Existing facilities and infrastructure within the operational area include:

- 14” East Spar pipeline from East Spar Manifold to Varanus Island (part of);
- East Spar Manifold and 14” tie-in Spool with the East Spar pipeline end manifold (PLEM);
- 10” flowline connecting the Greater East Spar (GES) cooling skid to the ES PLEM;
- Gravity base structure, clump weight and iron ore ballast from the Navigation, Communication and Controls (NCC) Buoy (buoy removed in 2015);
- East Spar 4, 7 and 9 wellheads; and
- East Spar 1, 3 and 6 Christmas trees (XTs) and production and control systems.

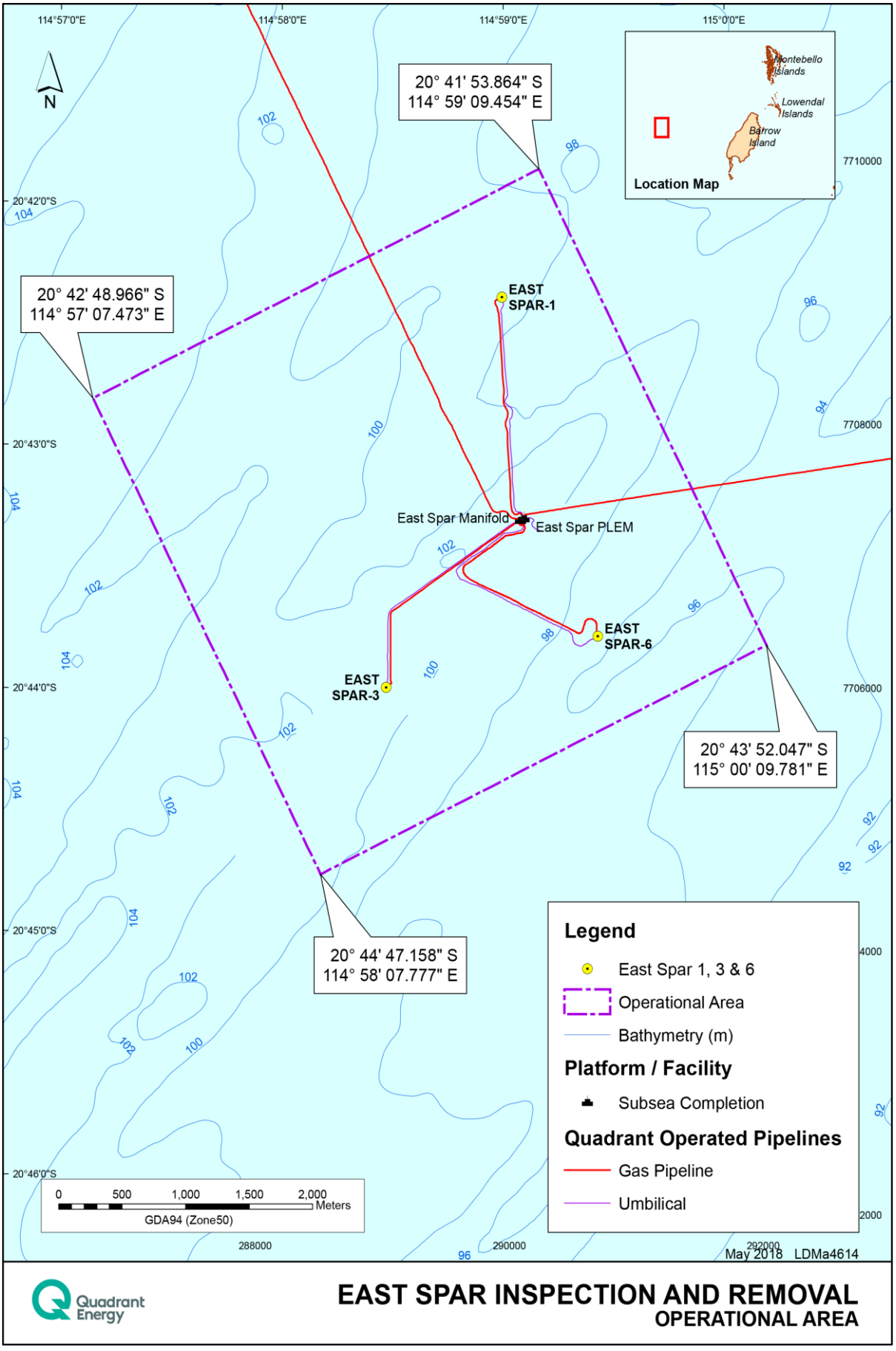

Figure 2-1: Location of the operational area

3. DESCRIPTION OF THE ACTIVITY

3.1 Overview

The activity will be carried out by a dive support vessel (DSV) or installation support vessel (ISV) and supported by at least one support vessel. The DSV/ISV will be a dynamic positioning (DP) Class 2 or 3 vessel with heavy lift on-board crane and two (2) work class remote operated vehicles (ROVs) and in-built saturation dive system. The exact vessels are yet to be confirmed although they will use Marine Gas Oil (MGO) or marine diesel fuel (i.e. no Heavy Fuel Oil (HFO)).

During diving operations there will be a Hyperbaric Rescue Vessel (HRV) within two hours of the DSV (i.e. it may not be within the operational area), which is only required in case of emergencies whereupon the divers will be evacuated from the DSV.

Support vessel(s) will provide logistical, safety and equipment management support and will be used on an ad-hoc basis such that it will not be in the operational area throughout the entire duration of the activity.

Vessel refuelling at sea may occur during the activity. Helicopters will be used to transfer crew and equipment, and assist in Health Safety Environment (HSE) as required.

3.2 Inspection and Removal Activities

3.2.1 Halyard / Spar-2 Shutdown and Isolation

Prior to the DSV/ISV arriving in field, production from Halyard-1 and Spar-2 will be ramped down, and the production from Halyard-1 and Spar-2 will be shut in and isolated. The DSV/ISV will carry out valve operations on the East Spar PLEM to isolate the production fluids in the Halyard flowline and test the isolations prior to breaking containment.

3.2.2 East Spar Pipeline and East Spar 1, 3 and 6 Production System De-pressurisation

On completion of a successful isolation test on the East Spar PLEM, de-pressurisation of the East Spar Pipeline will be carried out. The East Spar 1, 3 and 6 Production systems will require de-pressurisation into the East Spar Pipeline. This will be carried out via ROV, to enable the pressure to be released into the East Spar Pipeline.

3.2.3 Purge and Flush East Spar PLEM

In order to install the East Spar pipeline end termination (PLET) to the East Spar PLEM, the East Spar PLEM is required to be purged and flushed to enable disconnection of the blind flange. The East Spar PLEM will be flushed via downline from the DSV to the East Spar PLEM. The fluids will be displaced into the East Spar pipeline and will later flow through to Varanus Island (VI). On completion of all flushing activities, an ROV will close the valves on the East Spar PLEM to isolate the production fluids in the East Spar pipeline from the East Spar PLEM.

3.2.4 East Spar PLET Installation

A pre-installation seabed survey will be completed to ensure the seabed is suitable for installation of new infrastructure. On completion of a successful isolation test on the East Spar PLEM, divers will operate the double block and bleed valves on the East Spar PLEM blind flange to release any pressure from behind the blind flange. Divers will then remove the blind flange and install the new East Spar PLET Spool and frame. The PLET (**Figure 3-1**) is supported by the existing PLEM structure without making contact with the seabed.

3.2.5 Hot Tap East Spar 1, 3 and 6 Production System

In order to carry out the purge and flush activities of the East Spar 1, 3 and 6 production systems, there is a requirement to install hot taps onto each horizontal rigid spool section as close as possible to the Christmas trees (XTs) as there is no tie-in point on the XTs to allow the purge and flushing to take place. Installation

will require dredging of approximately 50 cm deep over an area of approximately 2 m^2 under the spool for each hot tap.

The hot tap tool will be lowered from the DSV with the crane and divers will position and install the tool on the rigid spool. On successful completion of a seal test, the ROV will operate the hot tap tool to puncture the rigid spool.

3.2.6 Contingency Hot Tap of East Spar 1, 3 and 6 Production System

Should it be found that there is still pressure within the East Spar 1, 3 or 6 production systems following Hot Tap operations near the XT, this means that the previous valve operations on the East Spar manifold have not worked correctly in depressurising the flowlines into the East Spar pipeline. As a result a second hot tap tool (of different design, but similar size) will be required to be installed to enable depressurisation and purging and flushing activities.

3.2.7 East Spar 1, 3 and 6 Production System Purge and Flush

In order to recover the East Spar 1, 3 and 6 production system infrastructure the systems are required to be purged and flushed. This will occur via downline from the DSV to the hot tap tool installed on the rigid spools. The fluids will be displaced into the East Spar pipeline and will later flow through to VI. On completion of all flushing activities, an ROV will close the valves on the East Spar manifold.

3.2.8 East Spar Pipeline Flooding

On completion of East Spar 1, 3 and 6 production systems purge and flush activities the East Spar Pipeline will be flooded with treated seawater. A pig launcher will be installed using the DSV crane onto the East Spar PLET to send a flooding pig behind the East Spar 1, 3 and 6 production system contents. The pig launcher weighs 8-10 tonnes with a seabed footprint of approximately 6.4 x 2.4 m. The flooding operations will be carried out utilising treated seawater via a downline from the DSV connected to the East Spar Pig Launcher. Once the line is flooded, a valve inspection of the three in-line valves will be carried out utilising an internal inspection tool. This will be carried out with the pipeline end PLET open to sea. The treated seawater will be displaced to VI via the East Spar pipeline.

3.2.9 Valve Inspection

A valve inspection of selected in-line valves in the ES subsea production system will be carried out utilising an internal inspection tool. This will be carried out with the PLET open to sea. The treated seawater will be displaced to VI via the East Spar pipeline.

3.2.10 ES Manifold Replacement

In the case that the valve inspection identifies a partially closed valve that may obstruct pipeline pigging, and it cannot be opened with ROV, a contingency plan has been developed to replace the East Spar manifold with a spool.

The ES manifold will be recovered to deck utilising the vessel crane. The new spool will be installed utilising the vessel crane. However should the East Spar manifold remain in place for intelligent pigging and production restart operations, the flowlines and umbilicals will be disconnected as per **Section 3.2.12**.

3.2.11 Intelligent Pigging Operations

On completion of a successful valve inspection the pigging operations can commence. The pigging operations will be carried out utilising treated seawater via a downline from the DSV connected to the East Spar Pig Launcher.

3.2.12 East Spar 1, 3 and 6 Flowline and Umbilical Disconnections

Prior to restart of production activities, the East Spar 1, 3 and 6 flowlines and umbilicals will be either be cut and capped or disconnected from the East Spar manifold. If the flowlines are cut, the flowline end

fittings will be disconnected from the East Spar manifold and laid down on the seabed away from the immediate proximity of the manifold with the flowlines and umbilicals for recovery, to minimise potential for dropped object impacts on the manifold during recovery (as described in Section 6.4.2). A blind flange will be installed on each East Spar manifold connection and back seal tested to allow production restart. These activities will also be required to be carried out prior to production restart.

3.2.13 Production Re-start Activities

On confirmation that the intelligent pig data has been confirmed as successful, production will be able to be recommenced. The East Spar Pig Launcher will be used to push a foam pig into the East Spar pipeline utilising treated seawater. The pig launcher will then be disengaged and recovered to the DSV and the diverless connector door closed and back seal tested.

On completion of a successful test, the East Spar pipeline will be re-pressurised from VI utilising production gas to equal the pressure with the Halyard and Spar production systems. Once re-pressurised, the DSV will perform valve operations to de-isolate the Halyard flowline allowing production to recommence whilst the recovery activities continue. A dropped object protection frame (Figure 3-1) will be installed permanently to the East Spar PLET, which can be removed later for future pigging operations.

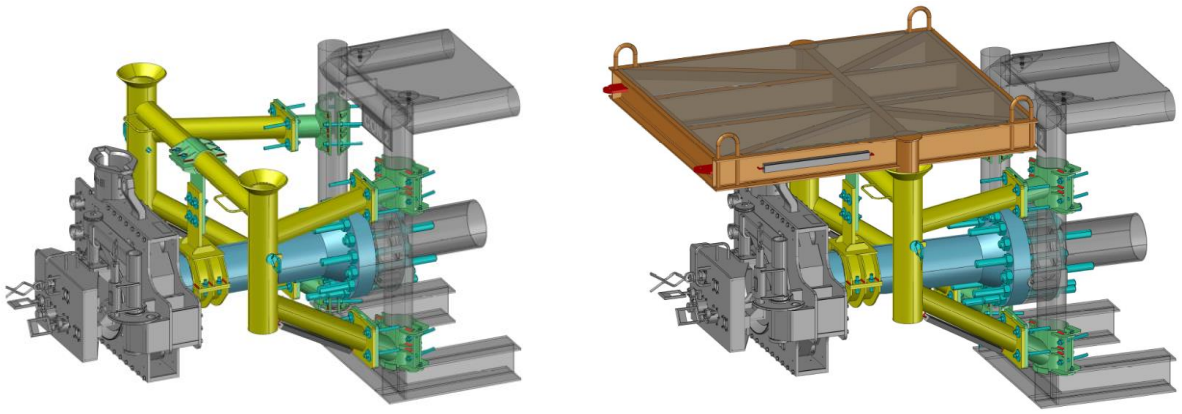

Figure 3-1: East Spar PLET (left) with dropped object protection frame (right)

3.2.14 East Spar 1, 3 and 6 Recovery Operations

Once production has re-started, the recovery of the East Spar 1, 3 and 6 infrastructure will occur. The following infrastructure will be recovered:

- Hot taps (and contingency hot taps if required) installed as described in **Section 3.2.5**;
- Three flexible flowlines from ES-1, ES-3 & ES-6 to the East Spar Manifold;
- Three Electro-Hydraulic Umbilicals (EHUs) from ES-1, ES-3 & ES-6 to the East Spar Manifold;
- Two Electric Hydraulic Flying Leads (EHFLs) connecting ES-1 and ES-3 XTs to heat exchangers;
- Three rigid spools connecting the ES-1, ES-3 and ES-6 XTs to their respective heat exchangers or cooling coil skid; and
- Sand bags or grout bags (if encountered).

These will be recovered to the ISV utilising a variety of methods. Any other infrastructure remaining in the operational area (as listed in Section 2 above) will remain in situ following the end of this activity, including the East Spar 1, 3 and 6 XTs.

The XTs will remain in situ until Quadrant consider the removal of subsea infrastructure in field when undertaking whole field decommissioning of Spar (WA-45-L) and East Spar (WA-13-L) combined. This will result in a more cost effective decommissioning approach for the whole field and would be included in separate approvals for the activity. There is no ongoing maintenance required to preserve the subsea XTs in

a condition suitable to allow removal in-line with the decommissioning time-line. Ongoing visual inspection of the XTs will be maintained in-line with the Well Operations Management Plan (DR-91-ZG-10051 Rev 2).

3.2.15 Surveys

A detailed biological seabed survey has already been completed in the project area; however, an as-found survey is conducted to document the status on site, including checks for debris and natural features (i.e. rocks or spans) prior to installation activities commencing. The survey will also visually inspect all existing infrastructure that is required to be recovered and also any subsea infrastructure that the recovered equipment is connected to.

Following completion of the infrastructure installation and recovery operations, an as-built / as-left survey will be conducted to document the status of the field, including visual inspection of the installed infrastructure and areas of seabed where infrastructure was removed. All surveys will be conducted using a divers or ROV.

4. DESCRIPTION OF ENVIRONMENT

4.1 Environment That May Be Affected (EMBA)

Annualised stochastic hydrocarbon dispersion and fate modelling undertaken for the credible 'worst-case' hydrocarbon spill scenarios indicated that the largest spatial extent of potential impact to fauna and/or habitat would result from a vessel collision rupturing a fuel tank and releasing MGO.

The spill trajectory area for this scenario was therefore considered to represent the greatest extent of the Environment That May Be Affected (EMBA) and was used to identify the environmental values and sensitivities within the existing environment that may be at risk, including by searches of the EPBC Act Protected Matters Database. The EMBA encompasses the predicted extent of surface, entrained and dissolved hydrocarbons for the defined thresholds at which impact to fauna and/or habitat could result.

The existing environment within the operational area and EMBA is summarised in the following sections.

4.2 Physical Environment and Habitat

4.2.1 Physical environment

The operational area is situated within Commonwealth waters of the North-west Marine Region (DSEWPaC, 2008). The North-west Marine Region (NWMR) is further divided into eight provincial bioregions defined under the Integrated and Marine and Coastal Regionalisation of Australia (IMCRA) Version 4.0 (DSEWPaC, 2008). The operational area overlaps the Northwest Shelf Province and the EMBA overlaps the Northwest Shelf Province and Northwest Province bioregions. The presence of marine and coastal habitats within the operational area and EMBA is summarised in **Table 4-1**.

4.2.2 Habitats

The presence of marine and coastal habitats within the EMBA is summarised in **Table 4-1**.

Table 4-1: Habitats within the EMBA listed according to presence within the operational area and IMCRA Provincial Bioregions of Australia

Category	Receptor	Operational area Presence	EMBA Presence		Relevant Events that may impact on the receptors
			Northwest Province	Northwest Shelf Province	
Benthic Habitats	Coral reefs			✓	Unplanned • Marine gas oil release from vessel collision • Condensate release due to damaged subsea infrastructure
	Seagrass			✓	Unplanned • Marine gas oil release from vessel collision • Condensate release due to damaged subsea infrastructure
	Macroalgae			✓	Unplanned • Marine gas oil release from vessel collision • Condensate release due to damaged subsea infrastructure
	Non-coral benthic invertebrates	✓	✓	✓	Planned • Seabed disturbance • Planned operational discharges Unplanned • Non-hydrocarbon release (surface) - solid • Marine gas oil release from vessel collision • Condensate release due to damaged subsea infrastructure
Shoreline habitats	Mangroves			✓	Unplanned • Marine gas oil release from vessel collision
	Intertidal mud / sand flats			✓	

Category	Receptor	Operational area Presence	EMBA Presence		Relevant Events that may impact on the receptors
			Northwest Province	Northwest Shelf Province	
	Intertidal platforms			✓	• Condensate release due to damaged subsea infrastructure
	Sandy beaches			✓	
	Rocky shorelines			✓	

4.3 Protected/Significant Areas

Protected/significant areas identified in the EMBA are detailed in **Table 4-2**, **Figure 4-1** and **Figure 4-2**. The management zones, associated with the Australian Marine Parks identified in the EMBA, and the relevant objectives are detailed in **Table 4-3**.

Table 4-2: Distance from the operational area boundary to protected areas, key ecological features and threatened ecological communities within the EMBA

Value/Sensitivity	Distance from operational area (km)	EMBA Presence
Australian Marine Parks	30	Montebello Australian Marine Park (Multiple Use Zone - IUCN Category VI)
	130	Ningaloo Marine Park* (Recreational Use Zone – IUCN Category IV) and Marine National Park Zone (IUCN II))
State Marine Parks and Marine Management Areas	30.5	Barrow Island Marine Park
	28	Barrow Island Marine Management Area
	50	Montebello Islands Marine Park
World & National Heritage Places	-	None
Commonwealth Heritage Places	-	None
Wetlands of International Importance	-	None
Wetlands of National Importance	-	None
Key Ecological Features	8	Ancient Coastline at 125 m Contour;
	86	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula; and
	20	Continental Slope Demersal Fish Communities.
Threatened Ecological Communities	-	None

*Ningaloo Marine Park is not within the EMBA but has been included based on the predicted shoreline accumulation modelling outputs.

Table 4-3: Management Zones for the Australian Marine Parks found within the EMBA and the associated objectives

Management Zones	Objective
Multiple Use (IUCN VI)	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.
Recreational Use (IUCN IV)	Managed to allow recreational use while conserving ecosystems, habitats and native species in as natural a state as possible. The zone allows for recreational fishing, but not commercial fishing.

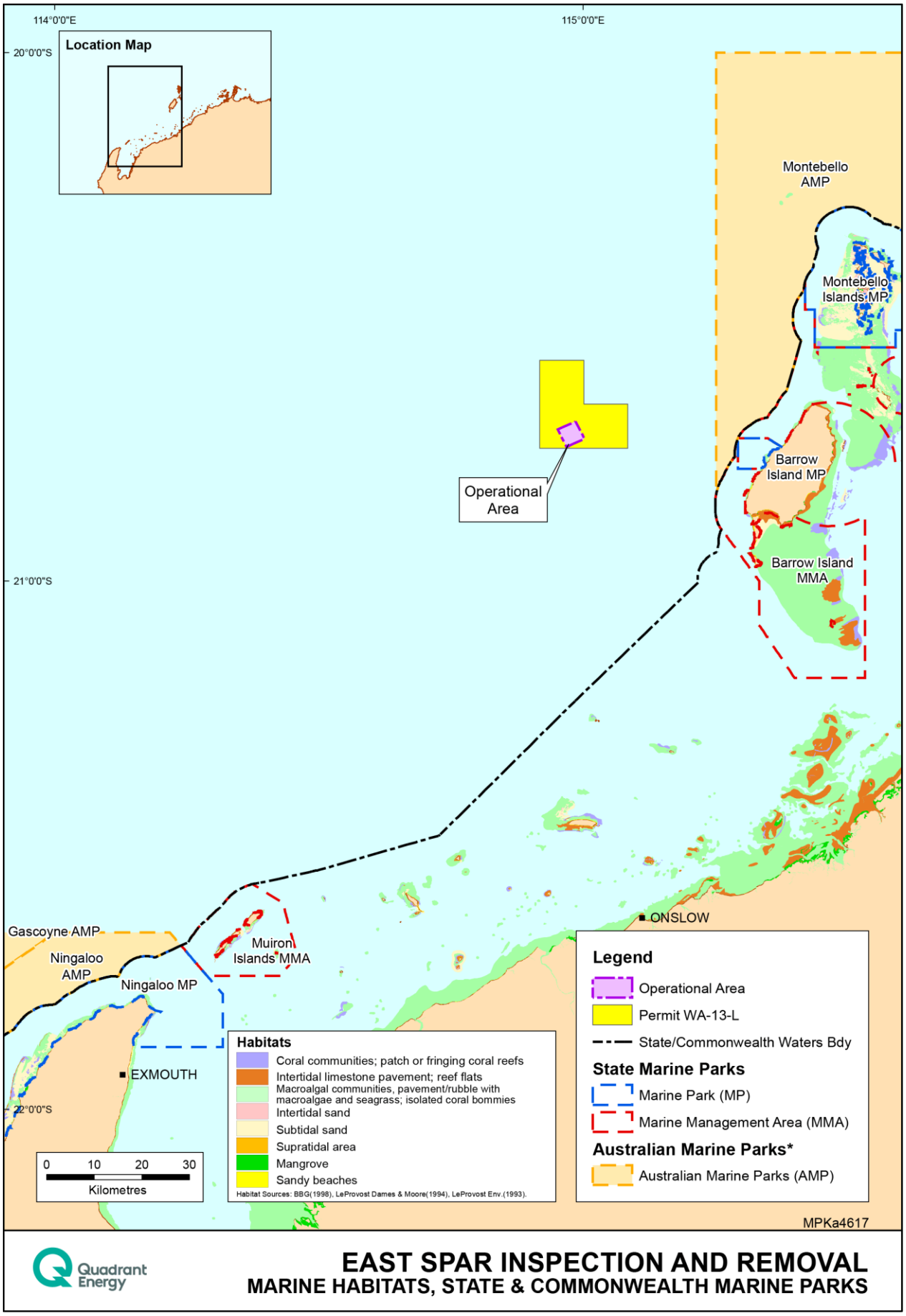

Figure 4-1: Protected areas within and near the EMBA

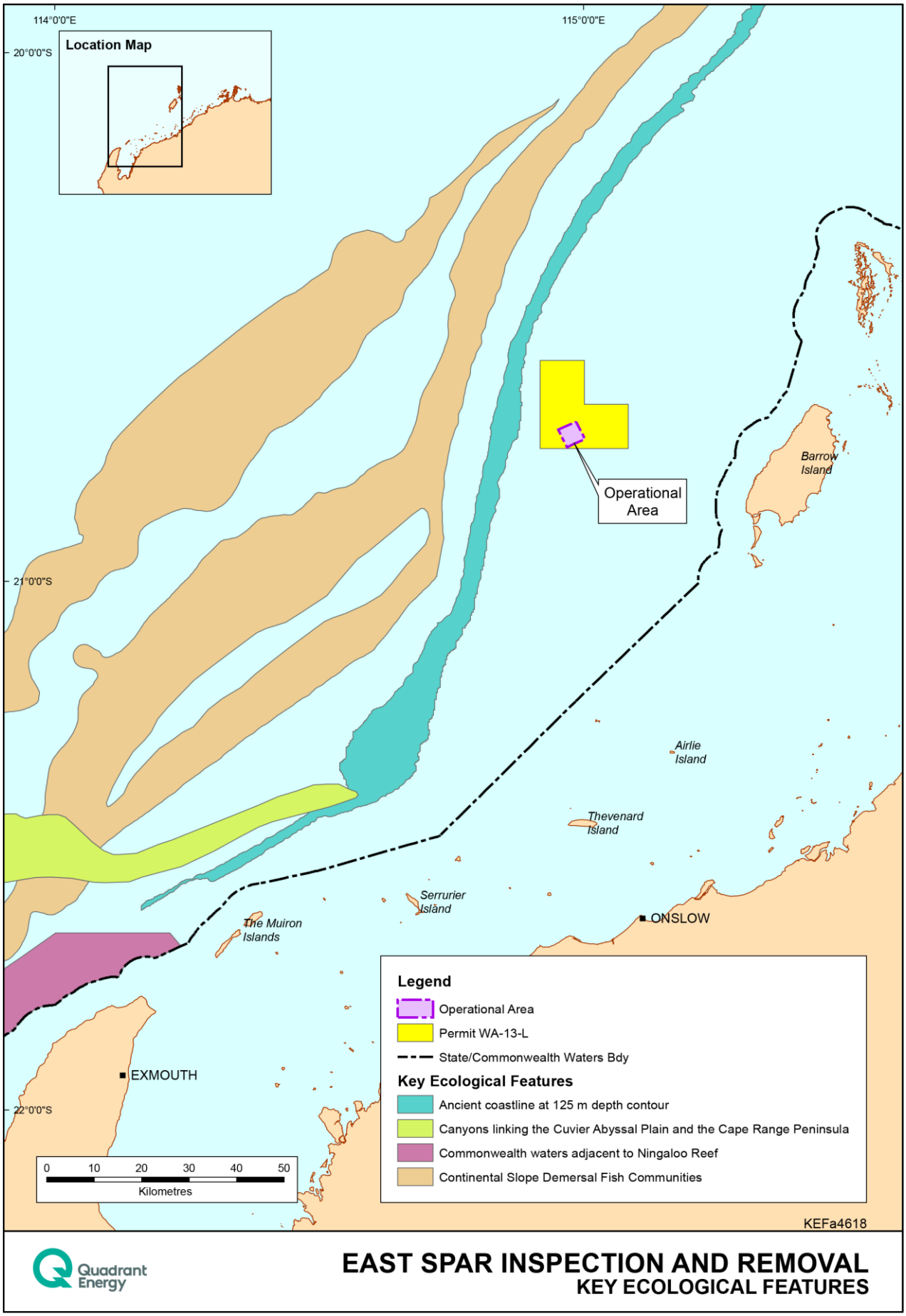

Figure 4-2: Key ecological features near the operational area

4.3.1 Threatened and Migratory Marine Fauna

The most recent search of the Protected Matters Search Tool (PMST) for the EMBA identified 32 Listed Threatened Species (LTS) and 47 Listed Migratory Species (LMS) as having the potential to occur within the EMBA (**Table 4-4**). For each species identified, the nature of likely presence is provided, including any overlap with designated Biologically Important Areas (BIAs).

4.3.2 Marine Mammals

A search of the EPBC Act Protected Matters Database identified 12 cetacean species within the operational area and/or EMBA. Of these, all are listed as migratory and five are listed as threatened under the EPBC Act.

4.3.3 Fish, Sharks and Rays

A search of the EPBC Act Protected Matters Database identified 11 fish species within the operational area and/or EMBA. Of these, nine are listed as migratory and five are listed as threatened under the EPBC Act. Two conservation dependent species were also identified as potentially occurring within the EMBA.

4.3.4 Marine Reptiles

A search of the EPBC Act Protected Matters Database identified five marine turtle species listed as threatened and migratory, and one seasnake listed as threatened, which may occur within the operational area and/or EMBA.

4.3.5 Seabirds

A search of the EPBC Act Protected Matters Database identified 12 seabirds which have a recognized range that overlaps the operational area and/or EMBA. Of these, 11 are migratory and four are listed as threatened under the EPBC Act.

4.3.6 Shorebirds

A search of the EPBC Act Protected Matters Database identified 11 seabirds which have a recognized range that overlaps the operational area and/or EMBA. Of these, 10 are migratory and four are listed as threatened under the EPBC Act.

Table 4-4: Environmental values and sensitivities – threatened and migratory marine fauna (CE=Critically Endangered, E=Endangered, V=Vulnerable, M=Migratory, CD = Conservation Dependent)

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
Protected Species and Communities: Fish, Sharks and Rays							
Blind gudgeon	*Milyeringa veritas*	V			✓	Species or habitat may occur	<u>Planned</u> Interaction with other marine users Light emissions Noise emissions Planned operational discharges Spill response operations <u>Unplanned</u> Marine fauna collision Non-hydrocarbon and chemicals release – liquid Non-hydrocarbon release (surface) - solid Minor hydrocarbon release Condensate release due to damaged subsea infrastructure Marine gas oil release from vessel collision
Dwarf sawfish	*Pristis clavata*	V, M			✓	Species or habitat known to occur	
Giant manta ray	*Manta birostris*	M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Great white shark	*Carcharodon carcharias*	V, M	✓	Species or habitat may occur	✓	Species or habitat may occur	
Green sawfish	*Pristis zijsron*	V, M	✓	Species or habitat known to occur	✓	Species or habitat known to occur	
Grey nurse shark	*Carcharias taurus*	V	✓	Species or habitat may occur	✓	Species or habitat known to occur	
Longfin mako	*Isurus paucus*	M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Narrow sawfish	*Anoxypristis cuspidata*	M	✓	Species or habitat may occur	✓	Species or habitat likely to occur	
Reef manta ray	*Manta alfredi*	M	✓	Species or habitat may occur	✓	Species or habitat known to occur	
Shortfin mako	*Isurus oxyrinchus*	M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Whale shark	*Rhincodon typus*	V, M	✓	Foraging, feeding or related behaviour known to occur	✓	Foraging, feeding or related behaviour known to occur	

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
				BIA for foraging		BIA for foraging	
Scalloped hammerhead	*Sphyrna lewini*	CD	✓	Species or habitat may occur	✓	Species or habitat may occur	
Bluefin tuna	*Thunnus maccoyii*	CD	✓	Species or habitat may occur	✓	Species or habitat may occur	
Protected Species and Communities: Marine Mammals							
Antarctic minke whale	*Balaenoptera bonaerensis*	M			✓	Species or habitat likely to occur	<u>Planned</u> Interaction with other marine users Noise emissions Planned operational discharges Spill response operations <u>Unplanned</u> Marine gas oil release from vessel collision Marine fauna collision Condensate release due to damaged subsea infrastructure
Blue whale	*Balaenoptera musculus*	E, M	✓	Species or habitat likely to occur BIA for distribution	✓	Migration route known to occur BIAs for distribution and migration	
Bryde's whale	*Balaenoptera edeni*	M	✓	Species or habitat may occur	✓	Species or habitat likely to occur	
Dugong	*Dugong*	M			✓	Species or habitat known to occur	
Fin whale	*Balaenoptera physalus*	V, M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Humpback whale	*Megaptera novaeangliae*	V, M	✓	Species or habitat known to occur BIA for migration	✓	Species or habitat known to occur BIA for migration	
Indo-pacific humpback dolphin	*Sousa chinensis*	M			✓	Species or habitat may occur	

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
Killer whale	*Orcinus orca*	M	✓	Species or habitat may occur	✓	Species or habitat may occur	
Sei whale	*Balaenoptera borealis*	V, M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Southern right whale	*Eubalaena australis*	E, M			✓	Species or habitat may occur	
Sperm whale	*Physeter macrocephalus*	M			✓	Species or habitat may occur	
Spotted bottlenose dolphin	*Turdiops aduncus*	M	✓	Species or habitat may occur	✓	Species or habitat known to occur	
Protected Species and Communities: Marine Reptiles							
Flatback turtle	*Natator depressus*	V, M	✓	Congregation or aggregation known to occur BIA for internesting	✓	Breeding known to occur BIAs for aggregation, foraging, internesting, nesting and mating	<u>Planned</u> Interaction with other marine users Light emissions Noise emissions Planned operational discharges Spill response operations <u>Unplanned</u> Marine fauna collision Marine gas oil release from vessel collision Condensate release due to damaged subsea infrastructure
Green turtle	*Chelonia mydas*	V, M	✓	Species or species habitat known to occur	✓	Breeding known to occur BIAs for aggregation, basking, foraging, nesting, internesting and mating	
Leatherback turtle	*Dermochelys coriacea*	E, M	✓	Species or species habitat likely to occur	✓	Breeding likely to occur	
Hawksbill turtle	*Eretmochelys imbricata*	V, M	✓	Species or species habitat known to occur	✓	Breeding known to occur BIAs for foraging, nesting, internesting, and nesting	

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
Loggerhead turtle	*Caretta caretta*	E, M	✓	Species or species habitat known to occur	✓	Breeding known to occur BIA for internesting	
Short-nosed seasnake	*Aipysurus apraefrontalis*	CE			✓	Species or species habitat likely to occur	
Protected Species and Communities: Birds (Seabirds)							
Australian fairy tern	*Sternula nereis*	V	✓	Foraging, feeding or related behaviour likely to occur	✓	Breeding known to occur BIA for breeding	<u>Planned</u> Interaction with other marine users Light emissions Noise emissions Atmospheric emissions Planned operational discharges Spill response operations <u>Unplanned</u> Non-hydrocarbon release (surface) - solid Marine gas oil release from vessel collision Condensate release due to damaged subsea infrastructure
Bar-tailed godwit	*Limosa lapponica baueri*	V, M			✓	Species or habitat may occur	
Common noddy	*Anous stolidus*	M	✓	Species or habitat may occur	✓	Species or habitat likely to occur	
Flesh-footed shearwater	*Ardenna carneipes*	M			✓	Species or habitat may occur	
Fork-tailed swift	*Apus pacificus*	M			✓	Species or habitat likely to occur	
Lesser crested tern[1]	*Thalasseus bengalensis*	M			✓	BIA for breeding	
Lesser frigatebird	*Fregata ariel*	M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Northern Siberian bar-	*Limosa lapponica menzbierii*	CE, M			✓	Species or habitat likely to occur	

[1] Lesser crested tern identified in EPBC protected matters search under 'other matters protected', BIA overlaps with the EMBA

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
tailed godwit							
Roseate tern	*Sterna dougallii*	M			✓	Breeding likely to occur BIA for breeding	
Southern giant-petrel	*Macronectes giganteus*	E, M	✓	Species or habitat may occur	✓	Species or habitat may occur	
Streaked shearwater	*Calonectris leucomelas*	M	✓	Species or habitat likely to occur	✓	Species or habitat likely to occur	
Wedge-tailed shearwater[2]	*Ardenna pacifica*	M		BIA for breeding		BIA for breeding	
Protected Species and Communities: Birds (Shorebirds)							
Bar-tailed godwit	*Limosa lapponica*	M			✓	Species or habitat known to occur	<u>Planned</u> Interaction with other marine users Light emissions Noise emissions Atmospheric emissions Planned operational discharges Spill response operations <u>Unplanned</u> Non-hydrocarbon release (surface) - solid
Common greenshank	*Tringa nebularia*	M			✓	Species or habitat likely to occur	
Common sandpiper	*Actitis hypoleucos*	M	✓	Species or habitat may occur	✓	Species or habitat likely to occur	
Curlew sandpiper	*Calidris ferruginea*	CE, M	✓	Species or habitat may occur	✓	Species or habitat likely to occur	
Eastern curlew	*Numenius madagascariensis*	CE, M	✓	Species or habitat may occur	✓	Species or habitat may occur	
Oriental plover	*Charadrius veredus*	M			✓	Species or habitat may occur	

[2] Wedge-tailed shearwater not identified in EPBC protected matters search, however, BIA overlaps with operational area and EMBA

Value/Sensitivity		EPBC Act Status	Operational area Presence	Particular values or sensitivities within the operational area	EMBA presence	Particular values or sensitivities within EMBA	Relevant Events
Common Name	**Scientific Name**						
Oriental pratincole	*Glareola maldivarum*	M			✓	Species or habitat may occur	Marine gas oil release from vessel collision Condensate release due to damaged subsea infrastructure
Osprey	*Pandion haliaetus*	M	✓	Species or habitat may occur	✓	Breeding known to occur	
Pectoral sandpiper	*Calidris melanotos*	M	✓	Species or habitat may occur	✓	Species or habitat may occur	
Red knot	*Calidris canutus*	E, M	✓	Species or habitat may occur	✓	Species or habitat known to occur	
Sharp-tailed sandpiper	*Calidris acuminate*	M	✓	Species or habitat may occur	✓	Species or habitat known to occur	
White-winged Fairy-wren (Barrow Island)	*Malurus leucopterus edouardi*	V			✓	Species or habitat likely to occur	

4.4 Socio-Economic Receptors

Table 4-5 identifies the relevant State and Commonwealth fisheries that overlap the operational area and EMBA. Active fisheries were identified in consultation with the Department of Primary Industries and Regional Development (DPIRD).

Other socio-economic considerations such as shipping, recreational fishing, oil and gas industry, tourism and cultural heritage in relation to the operational area and EMBA are summarised in **Table 4-6**.

Table 4-5: State and Commonwealth fisheries in the vicinity of the operational area and EMBA

Value/Sensitivity	Description	Operational area presence	EMBA presence	Relevant events within the operational area and EMBA
Commonwealth Managed Fisheries				
North West Slope Trawl	Extends from 114° E to approximately 125° E off the WA coast between the 200 m isobath and the outer limit of the Australian Fishing Zone (AFZ).	✓	✓	Historical effort within the EMBA, targeting scampi and prawns.
Southern Bluefin Tuna Fishery	No current effort on NWS.	✓	✓	No active commercial fishing within the area in the past years; however fisheries overlap the EMBA and therefore fishing vessels could be encountered in low density.
Western Tuna and Billfish Fishery	Extends westward from Cape York Peninsula (142°30’ E) off Queensland to 34° S off the WA west coast. It also extends eastward from 34° S off the west coast of WA across the Great Australian Bight to 141° E at the South Australian–Victorian border. No current effort on NWS	✓	✓	
Western Skipjack Tuna Fishery	No current effort on NWS.	✓	✓	
State Managed Fisheries (North Coast Bioregion)				
Pearl Oyster Managed Fishery	Mostly operate March to June. Operational area does occur within the boundaries of the fishery, but is restricted to shallow diving depths.	✓	✓	Given the water depths of the operational area, disruption to fishing activities are unlikely to occur Unplanned events which may occur in the operational area and EMBA could disrupt fishing activities, however the likelihood of these events is low.
Onslow Prawn Limited Entry Fishery	The boundaries are ‘all the Western Australian waters between the Exmouth Prawn Fishery and the Nickol Bay prawn fishery east of 114º39.9' on the landward side of the 200 m depth isobath.	✓	✓	Significant disruption unlikely to occur due to vast area fished.
Pilbara Demersal Scalefish Fisheries - includes trap and trawl (zone 1) fisheries	Use a combination of vessels, effort allocations (time), gear limits, plus spatial zones (including extensive trawl closures) as management measures. The Trawl Fishery lands the largest	✓	✓	The Trawl Fishery is seaward of the 50 m isobath and landward of the 200 m isobath. The Trap Fishery is seaward of the 30 m isobaths and landward of the 200 m isobaths.

Value/Sensitivity	Description	Operational area presence	EMBA presence	Relevant events within the operational area and EMBA
	component of the catch of demersal finfish in the Pilbara (and North Coast Bioregion) comprising more than 50 scalefish species. In comparison, the trap fishery retains a subset of about 45 to 50 scalefish species, and while the Line Fishery catch comprises a similar number it also includes some deeper offshore species.			The Trawl Fishery (Zone 1) that intercepts the operational area is closed to fish trawling. As the maximum water depth in the operational area is ~100 m, significant impacts are not expected. Unplanned events which may occur in the operational area and EMBA could disrupt trap fishing activities, however the likelihood of these events is low.
State Managed Fisheries (Whole of State)				
Marine Aquarium Fish Fishery	All year. Effort within the operational area and EMBA is unknown, but is unlikely due to the depth and the dive-based method of collection. Unlikely to occur.	✓	✓	Disruption to fishing activities unlikely given water depths fisheries operate within. Unplanned events which may occur in the EMBA could disrupt fishing activities, however the likelihood of these events is low.
Specimen Shell Managed Fishery	All year. Effort within the operational area and EMBA is unknown, but it is unlikely due to the depth and the dive based method of collection Unlikely to occur.	✓	✓	
Sea cucumber fishery (formerly Beche-de-mer Fishery)	All year. Although permitted to fish within the operational area and EMBA, the fishery is restricted to shallow coastal waters suitable for diving and wading Unlikely to occur.	✓	✓	
Mackerel Managed Fishery	Trolling or handline. Near-surface trolling gear from vessels in coastal areas around reefs, shoals and headlands.	✓	✓	The majority of the catch is taken in the Kimberley area and therefore disruption is unlikely.
Octopus	Caught as a by-product in region.	✓	✓	Fishery is in development phase. Effort within the operational area and EMBA is unknown, but is

Value/Sensitivity	Description	Operational area presence	EMBA presence	Relevant events within the operational area and EMBA
				unlikely to be significant due to effort levels and pot collection method.
Abalone Managed Fishery	The commercial fishery harvest method is a single diver working off a 'hookah' (surface-supplied breathing apparatus) using an abalone 'iron' to prise the shellfish off rocks.	✓	✓	Disruption is unlikely to occur in the operational area due to depths and method of collection. Unplanned events which may occur in the EMBA could disrupt fishing activities, however the likelihood of these events is low.

Table 4-6: Socio-economic activities in the vicinity of the operational area and EMBA

Value/Sensitivity	Description	Operational area Presence	Relevant events within the operational area	Relevant events within the EMBA
Shipping	Shipping using NWS waters includes iron ore carriers, oil tankers and other vessels proceeding to or from the ports of Dampier, Port Walcott and Port Hedland; however, these are predominantly heading north from these ports. The proposed operational area does not overlap any major shipping, although vessel traffic may be encountered throughout the operational area as commercial vessels transit around the Montebello Islands and support vessel(s) conduct operations with the offshore infrastructure.	✓	<u>Planned</u> Interaction with marine users Spill response operations	<u>Planned</u> Spill response operations <u>Unplanned</u> Marine gas oil release from vessel collision Condensate release due to damaged subsea infrastructure
Recreational and charter boat fishing	Within the operational area there are no known natural seabed features that would aggregate fishes and which are typically targeted by recreational fishers. Given the water depths and distance from the nearest mainland, it is unlikely recreational fishing would occur in the vicinity.			
Indigenous, subsistence or traditional fishing	Indigenous marine users or subsistence/traditional fishing could occur in the operational area. However there are no recorded seabed aboriginal sites in the waters of the Montebello and Barrow Island Reserves (DEC, 2007) and no interactions with traditional fishers has been recorded during previous activities in the operational area.			
Oil and gas infrastructure	Various petroleum exploration and production activities have been undertaken within the northwest shelf, however there are none in the vicinity of the operational area. Vessels servicing oil and gas operations in the region may pass through the area *en route* to facilities, which is discussed under 'Shipping' above.			

Value/Sensitivity	Description	Operational area Presence	Relevant events within the operational area	Relevant events within the EMBA
	Oil and gas facilities occur within the EMBA as do permits operated by other titleholders. As such, oil and gas activities could be impacted by unplanned events.			
Tourism	Aquatic recreational activities such as boating, diving and fishing occur near the coast and Montebello Islands. These activities are concentrated in the vicinity of the population centres such as Exmouth, Dampier and Onslow. Owing to the water depths of the operational area, planned events are not predicted to have an impact on tourism. The EMBA overlaps a portion with the Montebello Marine Park and also the Barrow Island Marine Park, as such eco-tourism based on specific local values (whale sharks, game fish, nearshore reef snorkelling and diving) could be impacted by unplanned events.			
Cultural Heritage	No known sites of Cultural Heritage significance or National Heritage places exist within the EMBA. One historic shipwreck (older than 75 years) is located within the EMBA: • Lady Ann (1982)			Events relevant to historic shipwrecks are: <u>Planned</u> Spill response operations <u>Unplanned</u> Hydrocarbon Release – vessel collision

4.5 Windows of Sensitivity

The timing of peak activity for threatened species and other relevant, significant sensitivities is given in **Table 4-7**.

Table 4-7: Windows of sensitivity in the vicinity of the EMBA (note activity may occur any period during the year)

CATEGORY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Benthic Habitats												
Non-coral benthic invertebrates												
Fauna												
Plankton												
Fish/sharks	Timing of spawning activity varies between species.											
Whale shark												
Short-nosed sea snake	Can occur at low density year round.											
Hawksbill turtles resident adult and juveniles[1]	Widespread throughout NW Shelf waters, highest density of adults and juveniles over hard bottom habitat (coral reef, rocky reef, pipelines etc.)											
Hawksbill turtle mating aggregations[1]												
Hawksbill turtle nesting and internesting[1]												
Hawksbill turtle hatching[1]												
Flatback turtles resident adult and juveniles[1]	Widespread throughout NW Shelf waters, increased density over soft bottom habitat 10 – 60m deep, post hatchling age classes and juveniles spread across shelf waters.											
Flatback turtle mating aggregations[1]												
Flatback turtle nesting and internesting[1]												
Flatback turtle hatching[1]												
Flatback turtle nesting[1]												
Green turtles resident adult and juveniles[1]	Widespread throughout the NW Shelf waters, highest density associated with seagrass beds and macro algae communities, high density juveniles in shallow waters off beaches, amongst mangroves and in creeks.											
Green turtle mating												

CATEGORY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
aggregations[1]												
Green turtle nesting and internesting[1]												
Green turtle hatching[1]												
Loggerhead turtles resident adult and juveniles[1]	Widespread throughout the NW Shelf waters, increased density associated with soft bottom habitat supporting their bivalve food source, juveniles associated with nearshore reef habitat.											
Loggerhead turtle mating aggregations[1]												
Loggerhead turtle nesting and internesting[1]												
Loggerhead turtle hatching[1]												
Leatherback turtles	Can occur at low density across the NWS year round.											
Humpback whale migration						northern			southern			
Blue whale migration					northern							southern
Southern giant petrels	breeding							breeding				
Australian fairy tern	breeding							breeding				
Socio-economic												
Commercial Managed Fisheries												
Oil and gas												
Shipping												
Tourism/ recreational fishing (none applicable)												
KEY / NOTES												

	Peak activity, presence reliable and predictable	[1]Information provided by K. Pendoley
	Lower level of abundance/activity/presence	
	Very low activity/presence	
	Activity can occur throughout year	

5. STAKEHOLDER CONSULTATION

Quadrant understands retaining a broad licence to operate depends on the development and maintenance of positive and constructive relationships with a comprehensive set of stakeholders across the community, Government, non-government and business sectors.

To allow an informed assessment by stakeholders of the potential impact of Quadrant's activities, Quadrant has established long-term and meaningful dialogue with those stakeholders who have demonstrated an interest in its present and planned future activities in Australia.

For the activities to be undertaken under the EP, a standardised approach was applied to identify key stakeholders for the activity, beginning with a review of Quadrant's stakeholder list, and of the stakeholders consulted over other recent activities in the area. In particular, the operational area for the activity was used to identify relevant persons on an activity-by-activity basis, and will be used throughout the duration of the EP. The key stakeholders identified for the activity are based on the operational area and EMBA and are provided in **Table 5-1**.

5.1 Summary

Stakeholders (refer **Table 5-1**) were informed of activities covered by the EP via an activity specific consultation package distributed by email on May 8, 2018. A wider stakeholder group was informed of the proposed activity in Quadrant's Quarterly Consultation Update since December 2017, most recently distributed on September 28, 2018.

Stakeholders identified in **Table 5-1** were reassessed in November 2018, to combat stakeholder fatigue. A select group of relevant stakeholders were provided a pre-start notification which additionally advised stakeholders the activity EP is being revised to allow the activity to occur in 2019.

Given the short anticipated duration (35 days) and nature of the activity, Quadrant anticipates minimal interaction with mariners. Despite this Quadrant will provide relevant marine notices detailed in **Table 5-2**.

All correspondence with external stakeholders is recorded and Quadrant will remain available before, during and after the activity. Consultation material and feedback received will be provided to the appropriate internal Quadrant personnel when relevant.

Consultation, agreements or contracts that support Quadrant's oil spill response strategies and tactics have been put into place with agencies and organisations throughout the development of the OPEP so that roles and responsibilities are understood and accepted. These are outlined in **Table 5-3**.

Table 5-1: Summary of stakeholders consulted

GROUP	STAKEHOLDER
Fishers and representative bodies	• Australian Fisheries Management Authority (AFMA) • Australian Southern Bluefin Tuna Association (ASBTIA) • Commonwealth Fisheries Association (CFA) • Fat Marine • Marine Tourism WA • MG Kailis • Pearl Producers Association • Recfishwest • Western Australian Fishing Industry Council (WAFIC)
Marine conservation	• Department of Primary Industries and Regional Development (DPIRD) • Department of Biodiversity, Conservation and Attractions (DBCA)
Shipping safety and security	• Australian Maritime Safety Authority (AMSA) • Department of Defence (DoD) • Department of Transport (DoT) • Pilbara Port Authority

Adjacent regulator	• Department of Mines, Industry Regulation and Safety (DMIRS)
Commonwealth Government departments	• Department of Agriculture and Water Resources – Biosecurity • Department of Agriculture and Water Resources – Fisheries • Director of National Parks
Neighbouring operators	• Chevron • Eni Australia • Woodside

Table 5-2: Consultation summary for activity

STAKEHOLDER	ASSESSMENT OF CONSULTATION UNDERTAKEN
Fishers and representative bodies – fishers identified by Quadrant as possibly being active in the area, and their representative bodies.	
AFMA	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Australian Southern Bluefin Tuna Association	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Commonwealth Fishing Association	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Fat Marine	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Marine Tourism WA	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
MG Kailis	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Pearl Producers Association	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.

STAKEHOLDER	ASSESSMENT OF CONSULTATION UNDERTAKEN
Recfishwest	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Western Australian Fishing Industry Council	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Marine Conservation – relevant Government departments	
Department of Primary Industries and Regional Development (Fisheries)	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. Quadrant has considered advice previously provided by the Department for activities in the area, particularly for the Greater East Spar activity, received on May 10, 2017. This advice has been considered when preparing sections of this EP, including fishing activities, pollution emergency plan advice (OPEP) and information on biosecurity.
Department of Biodiversity, Conservation and Attractions	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Shipping safety and security – stakeholders who provide information on shipping and vessel traffic, or may be involved in a response to an unplanned event.	
Australian Maritime Safety Authority	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. AMSA responded to consultation on May 10, 2018, noting vessel traffic in the operational area will be lighter when compared to Northern sections of WA-13-L. On assessment Quadrant anticipates majority of vessel traffic encountered will be industry traffic. Following advice from AMSA provided for all Quadrant activities, Quadrant commits to relevant marine notices.
Department of Defence	This stakeholder was provided the East Spar Inspection and Removal consultation package on January 4, 2018, and receive all Quadrant's Quarterly Consultation Update documents. The Department responded to consultation on January 24, 2018, advising of no concern with the activity and requesting notification prior to commencement to the Defence Airspace and AHO branch of the Department.
Department of Transport	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. The Department responded via email on May 8, 2018, querying whether a spill during this activity would impact State waters. Quadrant confirmed this was the case in an email response on May 18, 2018. Quadrant provided the activity OPEP to DoT for review on May 30, 2018. Additional information was provided to DoT on request in an email on July 17, 2018, and DoT confirmed no further

STAKEHOLDER	ASSESSMENT OF CONSULTATION UNDERTAKEN
	information was required in an email dated August 10, 2018.
Pilbara Port Authority	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Adjacent Regulators	
State Department of Mines, Industry Regulation and Safety	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. DMIRS responded by email on May 10, 2018, with thanks noting all activities impacting Varanus Island are to be conducted in line with Quadrant's DMIRS approved Varanus Island Hub Operations Environment Plan (State waters). DMIRS requested updates on the schedule of the Ensco-107 rig, which is outside the scope of this Environment Plan. Therefore Quadrant has no comment in relation to this East Spar Inspection and Removal Environment Plan and consultation is considered closed out for this document.
Commonwealth Government Departments	
Department of Agriculture and Water Resources – Biosecurity	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, as requested in the Australian Government Guidance on Offshore Petroleum and Greenhouse Gas Activities Consultation. No response had been received at the time of submission, and is not anticipated as Quadrant has consulted regularly with the State agency DPIRD.
Department of Agriculture and Water Resources – Fisheries	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, as requested in the Australian Government Guidance on Offshore Petroleum and Greenhouse Gas Activities Consultation. Quadrant will provide ongoing consultation as outlined in **Section** Error! Reference source not found..
Director of National Parks	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, given the proximity to the Barrow Island Marine Park - and as requested in the Australian Government Guidance on Offshore Petroleum and Greenhouse Gas Activities Consultation. An email response was received on June 18, 2018, and the activity OPEP has been updated accordingly.
Neighbouring operators	
Chevron	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, and receive all Quadrant's *Quarterly Consultation Update* documents. No response regarding the activity has been received to date. No action arising from this consultation for this EP.
Eni	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, for information only and Quadrant does not anticipate a response.
Woodside	This stakeholder was provided the East Spar Inspection and Removal consultation package on May 8, 2018, for information only and Quadrant does not anticipate a response.

5.2 Ongoing Consultation

Consultation associated with the activities covered by the EP comprises three tiers, the Activity Consultation Package distributed prior to EP acceptance (sent on May 8, 2018), a notification prior to activity commencement when timing and other details are confirmed, and within Quadrant's Quarterly Consultation Updates (last issued September 2018, next planned for December 2018).

Stakeholder consultation will be ongoing and Quadrant will work with stakeholders to address any future concerns if they arise throughout the duration of the EP. Should any new stakeholders be identified, they will be added to the stakeholder database and included in all future correspondence as required, including specific activity notifications.

5.3 OPEP consultation

In preparing OPEPs, a number of parties are identified to provide spill response services and actions to support the implementation of the OPEP. These OPEP stakeholders are identified through evaluation of the activity and spill potential for all Quadrant OPEPs, including the *East Spar Inspection and Removal OPEP* (ES-35-VB-20001.02).

Consultation, agreements or contracts have been put into place with agencies and organisations throughout the development of Quadrant oil spill response strategies and tactics so that roles and responsibilities are understood and accepted as outlined in **Table 5-3**.

Table 5-3: OPEP consultation summary

ENGAGED WITH		ASSESSMENT OF CONSULTATION UNDERTAKEN
Function	**Stakeholder**	
Australian Marine Oil Spill Centre (AMOSC)		Historically AMOSC reviewed Oil Spill Contingency Plans (OSCPs) and OPEPs and are satisfied with the description of their support. AMOSC now request to only view OPEPs once they are accepted by the regulator and before the activity commences. Roles and responsibilities defined in the OPEP reflect the arrangements established under contract conditions as a Participating Member of AMOSC under the AMOSCPlan.
Australian Marine Safety Authority (AMSA)		Historically AMSA reviewed OPEPs and are satisfied with the description of their support. AMSA now request to only view OPEPs once they are accepted by the regulator and before the activity commences. Roles and responsibilities defined in the OPEP reflect the arrangements established within a Memorandum of Understanding (MOU) between AMSA and Quadrant. Quadrant continue to undertake an annual workshop with AMSA as required under Sections 22 and 24 of the Quadrant/AMSA MOU. This enables the open flow of information relevant to the oil spill response arrangements: *Ongoing consultation and cooperation* AMSA and the titleholder will nominate contact points for the ongoing management of this MOU. AMSA and the Titleholder agree to maintain a cooperative approach to preparing and responding to marine pollution incidents, including the open exchange of information and technical advice. AMSA will facilitate an annual workshop to provide an open forum to exchange information on best practice and review and update operational procedure.
Logistics provider	CH Robinson	CH Robinson provide a global freight forwarding service under contract conditions to Quadrant. All arrangements defined in the OPEP reflecting freight forwarding services reflect contracted services.
	Toll Logistics	Toll Logistics operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating Toll Logistics reflect contracted services.
Field support organisation	Exmouth Freight & Logistics Services (EF&LS)	EF&LS operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating EF&LS reflect contracted services.
Department of Environmental Regulation (DER) (Waste Management Branch)		The DER Waste Management Branch have reviewed and have had input in defining the Waste Management Plan contained in Quadrant OSCP/OPEPs. The waste management processes do not change between OPEPs, so the original consultation is sufficient for the OPEP.
Department of Biodiversity, Conservation and Attractions (DBCA)		DBCA were contributors to development of the WA Oiled Wildlife Response Plan (OWRP) defined in the OPEP. Descriptions of the Quadrant interface with the WAOWRP contained within the OPEP are consistent with the intent of DBCA (and AMOSC) for oiled wildlife response. No further consultation is required.
Department of Transport (Hazard Management Authority)		All roles and responsibilities defined within the OPEP for DoT reflect the arrangements for the Westplan MOP as further defined by the DoT

ENGAGED WITH		ASSESSMENT OF CONSULTATION UNDERTAKEN
Function	**Stakeholder**	
		Offshore Petroleum Industry Guidance Note, Marine Oil Pollution: Response and Consultation Arrangements. Quadrant commits to ongoing consultation with DoT on all Quadrant activities as per DoT's Industry Guidance Note.
Subsea response service provider	Oceaneering	Oceaneering operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating Oceaneering reflect contracted services.
Oil Spill Response Limited (OSRL)		OSRL operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating OSRL reflect contracted services.
Vessel providers	Go Marine	Go Marine operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating Go Marine reflect contracted services.
	Jet Wave Marine (JWM)	JWM operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating JWM reflect contracted services.
	Bhagwan Marine	Bhagwan Marine operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating Bhagwan Marine reflect contracted services.
Aircraft providers		Aircraft providers operate under contract conditions with Quadrant. All arrangements defined in this OPEP nominating aircraft providers reflect contracted services.
Spill modelling provider	RPS APASA	APASA operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating APASA reflect contracted services.
Waste contractor	North West Alliance (NWA)	NWA operate under contract conditions with Quadrant. All arrangements defined in the OPEP nominating NWA reflect contracted services.

6. ENVIRONMENTAL HAZARDS AND CONTROLS

Quadrant operates under an overarching risk management policy (QE-91-IF-10050). The Quadrant risk management framework (QE-91-IF-10051) underpins the risk management policy and is consistent with the requirements of *AS/NZS ISO 31000 Risk Management – Guidelines* (2018). The key steps to risk management are illustrated in **Figure 6-1** below.

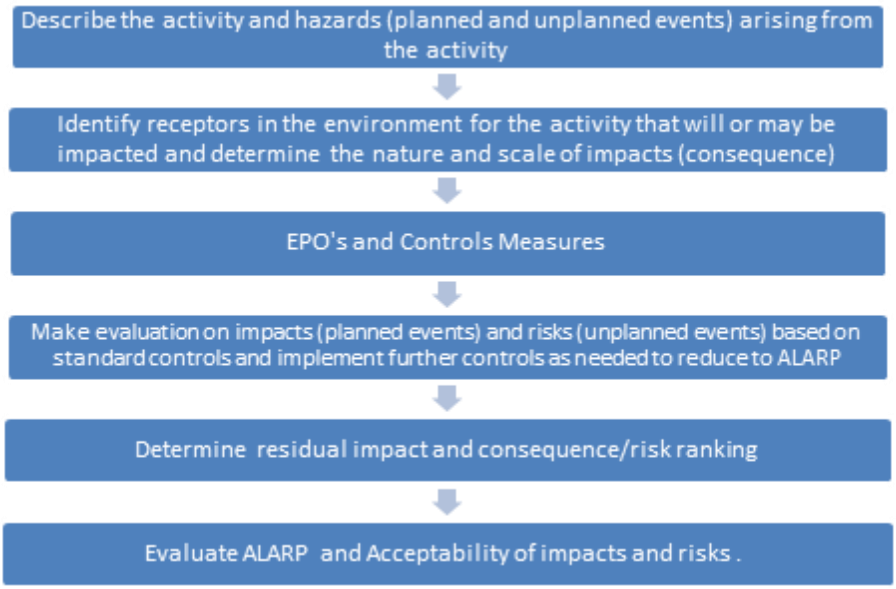

Figure 6-1: Environmental impact and risk assessment process

An assessment against the activity was undertaken and the environmental hazards or aspects were then identified. The risk assessment identified seven potential unplanned events and seven planned events.

The extent of actual or potential impacts from each planned or unplanned event is assessed using, where required, predictive information such as modelling (e.g. hydrocarbon spills). Impact mechanisms and thresholds for impacts where relevant are determined and described, using scientific literature and modelling where required. The duration of the event is also described including the potential duration of any impacts should they occur. The consequence level of the impact is then determined for each planned and unplanned event based on the severity of the impact to relevant receptor.

This process determines a consequence level based on set criteria for each receptor category and takes into consideration the duration and extent of the impact, receptor recovery time and the effect of the impact at a population, ecosystem or industry level. The consequence definitions are outlined in **Table 6-1** below.

Table 6-1: Consequence level description

Consequence Level		Consequence Level Description
A	Negligible	No impact or negligible impact.
B	Minor	Detectable but insignificant change to local population, industry or ecosystem factors. Localised effect with rapid recovery.
C	Moderate	Significant impact to local population, industry or ecosystem factors. Medium term recovery.
D	Major	Major long-term effect on local population, industry or ecosystem factors. Slow recovery over decades.
E	Critical	Complete loss of local population, industry or ecosystem factors AND/ OR major wide-spread regional impacts with slow recovery.

For unplanned events, a risk ranking is also determined using an assessment of the likelihood (likelihood ranking) of the event as well as the consequence level of the potential impact should that event occur. A description of likelihood as per Quadrant's Risk Matrix as shown in **Table 6-2** below.

Table 6-2: Likelihood description

No.	Matrix	Description
5	Probable	1. Event has occurred frequently within the Company. 2. Between 1 and 10 incidents every 10 years (i.e. up to frequency 1/year).
4	Likely	1. Event has occurred frequently within the Industry. 2. Between 1 and 10 incidents every 100 years (i.e. up to frequency 10^{-1}/year).
3	Unlikely	1. Event has occurred occasionally within the Company. 2. Between 1 and 10 incidents every 1000 years (i.e. up to frequency 10^{-2}/year).
2	Very Unlikely	1. Has occasionally occurred within the Industry. 2. Between 1 and 10 incidents every 10,000 years (i.e. up to frequency 10^{-3}/ year).
1	Rare	1. Could happen under exceptional circumstances only. 2. Between 1 and 10 incidents every 100,000 years (i.e. up to frequency 10^{-4}/ year).

Risk rankings (consequence x likelihood) are assigned in accordance with Quadrant Energy's Risk Matrix as shown in **Figure 6-2** below.

		SEVERITY				
		Negligible	Minor	Moderate	Major	Critical
LIKELIHOOD	5. Probable					
	4. Likely					
	3. Unlikely					
	2. Very Unlikely					
	1. Rare					

High Risk - reduction of risk required

Medium Risk - reduction of risk required based on ALARP principle

Low Risk - deemed acceptable based on standard risk controls in place

Figure 6-2: Quadrant Energy risk matrix

For each planned and unplanned event, a set of Environmental Performance Outcome(s) (EPOs), Environmental Performance Standards (EPS) and Measurement Criteria (MC) are identified. The definitions of the performance outcomes, standards and measurement criteria are consistent with the OPGGS (E) Regulations. For planned and unplanned events, an ALARP and Acceptability assessment is also undertaken.

6.1 ALARP Evaluation

The ALARP principle is that the residual impacts and risk shall be 'as low as reasonably practicable'. It has particular connotations as a route to reduce risks when considering law, regulation and standards.

For an impact or risk to be ALARP it must be possible to demonstrate that the cost involved in reducing the impact or risk further would be grossly disproportionate to the benefit gained. The ALARP principle arises from the fact that infinite time, effort and money could be spent on the attempt of reducing a risk to zero. It should not be understood as simply a quantitative measure of benefit against detriment. It is more a best common practice of judgement of the balance of impact or risk and societal benefit.

For planned and unplanned events, an ALARP assessment is undertaken to demonstrate that the standard control measures adopted reduce the impact (consequence level) or risk to ALARP. This process relies on demonstrating that further potential control measures would require a disproportionate level of cost/effort in order to reduce the level of impact or risk. If this cannot be demonstrated then further controls are adopted. The level of detail included within the ALARP assessment is based upon the nature and scale of the potential impact or risk.

6.2 Acceptability Evaluation

Quadrant considers an impact or risk associated with the proposed activity to be acceptable if the following criteria are met:

- The consequence from a planned event is ranked as A or B; or a risk of impact from an unplanned event is ranked low to medium;
- An assessment has been completed to determine if further information/studies are required to support or validate the consequence assessment;
- Assessment and management of risks has addressed the principles of ecologically sustainable development (ESD);
- Demonstration that the acceptable levels of impact and risks have been informed by relevant species recovery plans, threat abatement plans and conservation advice;
- Performance standards are consistent with legal and regulatory requirements;
- Performance standards are consistent with Quadrant Environmental Management Policy;
- Performance standards are consistent with industry standards and best practice guidance (e.g. National Biofouling Guidance for the Petroleum Industry);
- Performance outcomes and standards are consistent with stakeholder expectations, and
- Performance standards have been demonstrated to reduce the impact or risk to ALARP.

6.3 Environmental Risk Treatment Summary for Planned Events

6.3.1 Interaction with other marine users

Potential Receptors	Marine user groups such as: commercial fishers, tourism, shipping traffic and other oil and gas activities
Impact Assessment	
Receptors	**Assessment**
Socio-economic Receptors	A review of shipping data indicates that there will not be a significant disruption to commercial shipping due to the distance of the activity from the nearest shipping lane and lack of concerns raised through consultation. Tourism activity in the area is expected to be low, although a minimal amount of displacement could occur due to the activity. There may be some commercial fishing activities occurring in the area. Marine users currently plan their activities in consideration of other petroleum activities and other marine users (fisheries and shipping) in the region. It is possible that indigenous users of the marine environment may be present, although there are no recorded seabed aboriginal sites in the waters of the Montebello and Barrow Island Reserves (DEC, 2007). Given the distance of Barrow Island and the Montebello Islands from the mainland, traditional use of this area is expected to be low. Consultation has been undertaken with indigenous users and no concerns have been raised about the activity in offshore waters.
Overall Consequence Ranking	A – Negligible
Management Control	**Effectiveness of Control**
Maritime notices	Ensure other marine users are aware of the presence of vessels and the relative low mobility of the DSV/ISV to suddenly change course or to avoid other vessels. Ensure other marine users are provided with information on timings of the activity including vessel arrival and departure, so that the maritime industry is aware of the activities (including how the site is left).
Quadrant Stakeholder Consultation	
Exclusion zone	Exclusion zones around the project vessels prevent other vessels from getting too close and causing damage to equipment of either party.
Navigation equipment and procedures	Reduces risk of environmental impact from vessel collisions due to ensuring safety requirements are fulfilled.

6.3.2 Seabed disturbance

Potential Receptors	Soft sediments and benthic fauna and commercial fisheries
Impact Assessment	
Receptor	**Assessment**
Threatened / Migratory/ Local Fauna	No sensitive seabed features have been identified in any of the surveys conducted within the operational area or in similar water depths within the permit area. Disturbance to the seabed may have indirect impacts to protected fauna if the disturbance leads to a reduction on habitat quality or food availability. The areas of seabed that are expected to be impacted included soft sediments with little epifauna. These sediments are un-vegetated and densely bioturbated (mounds

	and burrows), epibenthic biota is sparse (<5% cover abundance) and includes invertebrates, such as anemones, urchins, anthozoans and glass sponges (Dames and Moore, 1995 referenced in AEL, 2001; RPS, 2011a). Therefore significant loss of habitat is not expected. Marine invertebrates may inhabit soft sediments and can contribute to the diet of some fauna. The area of soft sediment habitat that is potentially impacted is small compared to the amount of habitat available and therefore the disturbance is not expected to affect prey availability, and therefore protected fauna species, significantly.
Physical Environment/ Habitat	The physical environment and habitat has been previously disturbed due to Quadrant's activities, and will be further impacted during the proposed activities. However, the area impacted is small compared to the wider environment and in the majority of cases the disturbed area is expected to recolonise. As such, long-term disturbance and negative impacts to the wider ecosystem are not expected.
Socio-economic Receptors	Disturbance of the seabed will have no impact on shipping. Installation of infrastructure will occur within an area of existing infrastructure and therefore fishers will not be excluded from additional areas. Removal of habitats (through removal of colonised infrastructure) and subsequently to associated fish species is likely to be localised with the impact to, and displacement of, fish insignificant at a population level. Therefore impacts to commercial fisheries are unlikely. No stakeholder concerns have been raised regarding this aspect.
Overall Consequence Ranking	A – Negligible
Management Control	**Effectiveness of Control**
Pre-and post-installation and removal seabed surveys	To understand the seabed conditions and minimise any potential risks caused by subsea hazards (e.g. infrastructure) and inform final location of infrastructure.
Installation and recovery procedures	Ensure accurate positioning during installation and prevent multiple disturbances to the seabed due to incorrect placement, recovery and re-placement of infrastructure.

6.3.3 Light emissions

Potential Receptors	Threatened / migratory fauna – fish, marine turtles and seabirds
Impact Assessment	
Receptors	**Assessment**
Threatened / Migratory / Local Fauna	Continuous lighting in the same location for an extended period of time may result in alterations to normal marine fauna behaviour. Sensitive receptors that may be impacted include fish at surface, marine turtles and mammals, and seabirds. Given that the activity will be a once off, for a limited duration, and is located 34 km from the nearest coastline, at these distances lighting is unlikely to be at a level that could impact nesting turtles or hatchlings. Impacts to transient fauna will be limited to short-term behavioural effects with no decrease in local population size, area of occupancy of species or loss or disruption of habitat critical / disruption to the breeding cycle.
Overall Consequence Ranking	A – Negligible

Management Control	Effectiveness of Control
None - During the evaluation of the potential impacts of light emissions as a result of the activity, it was determined that no control measures were required as the inherent consequence of light emissions is expected to be negligible and does not compromise any management plans or objectives in place for protected fauna	

6.3.4 Noise emissions

Potential Receptors	Threatened / migratory fauna – cetaceans, marine turtles and fish
Impact Assessment	
Receptors	**Assessment**
Threatened / Migratory / Protected Fauna	Given the low level of noise expected from the activities, and the short and temporary duration of noise emissions, significant impact to threatened or migratory species are not expected. Some behavioural response may be expected from the noise levels emitted, but not at levels that could cause mortality or injury to marine fauna.
Physical Environment/ Habitat	No decrease in local population size / area of occupancy of species / loss or disruption of habitat critical / disruption to the breeding cycle / introduction of disease is expected.
Socio-economic Receptors	Noise levels are not expected to impact on socio-economic receptors due to their low activity level within the vicinity of the operational area.
Overall Consequence Ranking	A – Negligible
Management Control	**Effectiveness of Control**
Procedure for interacting with marine fauna	Reduces risk of physical and behavioural impacts to marine fauna from vessels and helicopters.
Marine fauna observations undertaken	

6.3.5 Planned discharges

Potential Receptors	Water quality, fish (pelagic) & sharks, marine mammals, marine turtles and seabirds
Impact assessment	
Receptors	**Assessment**
Threatened / Migratory / Local Fauna	Operational discharges in the same release location may result in temporary water quality perturbations and alteration to marine fauna behaviour. Given that the activity will be for a limited duration, in offshore waters, impacts will be limited to short-term water quality impacts and temporary behavioural effects observed in fish and seabirds. Impacts to water quality will be experienced in the discharge mixing zone which will be localised and will occur only as long as the discharges occur (i.e. no sustained impacts), therefore, recovery will be measured in hours to days. Only short term behavioural impacts are expected with no decrease in local population size / area of occupancy of species / loss or disruption of habitat critical / disruption to the breeding cycle / introduction of disease.
Physical Environment/ Habitat	

Overall Consequence Ranking	A - Negligible
Management Control	**Effectiveness of Control**
General chemical management procedures	Potential impacts to the environment are reduced through following correct procedures for the safe handling and storage of chemicals
Hazardous chemical management procedures	Reduces the risk of spills and leaks (discharges) of hazardous chemicals to the sea by controlling the storage, handling and clean up
Chemical selection procedure	Reduced toxicity to marine environment. Only environmentally acceptable chemicals would be released to sea from planned activities
Equipment pressure tested	Reduces hydrocarbon or chemical leaks during commissioning and operation of equipment
Sewage treatment system	Reduces potential impacts of inappropriate discharge of sewage. Ensure compliance with MARPOL requirements.
Waste (garbage) management procedure	Reduces probability of garbage being discharged to sea, reducing potential impacts to marine fauna. Stipulates putrescible waste disposal conditions and limitations. Ensure compliance with MARPOL requirements.
Oily water treatment system	Reduces potential impacts of planned discharge of oily water to the environment. Ensure compliance with MARPOL requirements.
Deck cleaning product selection procedure	Improves water quality discharge (reduces toxicity) to the marine environment. Only environmentally acceptable chemicals would be released overboard.

6.3.6 Atmospheric emissions

Potential Receptors	Seabirds and Humans
Impact Assessment	
Receptors	**Assessment**
Threatened / Migratory / Local Fauna	Short term behavioural impacts to seabirds could be expected if they overfly the location; they may avoid the area. No decrease in local population size / area of occupancy of species / loss or disruption of habitat critical / disruption to the breeding cycle / introduction of disease.
Physical Environment / Habitat	No or negligible reduction in physical environment/ habitat area/ function.
Socio-economic Receptors	As the activities occur in offshore waters, the combustion of fuels in such remote locations will not impact on air quality in coastal towns. The highly dispersive nature of local winds (i.e. strong and consistent) is expected to reduce potentially harmful or 'noticeable' gaseous concentrations within a short distance from the vessels.
Overall Consequence Ranking	A – Negligible
Management Control	**Effectiveness of Control**

Waste incineration managed in accordance MARPOL	Reduces potential impacts due to inappropriate incineration (e.g. wastes not burning correctly), inadequately maintained machinery
Fuel use	Reduces potential impacts of sulphur discharge into the environment
Air pollution prevention certification	Reduces probability of potential impacts to air quality due to ODS emissions, high NO_x, SO_x and incineration emissions
Ozone-depleting substance handling procedures	Reduces probability of potential impacts to air quality due to ODS emissions

6.3.7 Spill response operations

Potential Receptors	Threatened / migratory / local fauna - fish, marine mammals, marine turtles and seabirds. Protected Areas. Socio-economic receptors.
Impact Assessment	
Receptors	**Assessment**
Threatened / Migratory / Local Fauna	While response strategies are intended to reduce the environmental consequences of a hydrocarbon spill, poorly planned and coordinated response activities can result in a lack of, or inadequate, information being available upon which poor decisions can be made, exacerbating or causing further environmental harm. An inadequate level of training and guidance during the implementation of spill response strategies can also result in environmental harm over and above that already caused by the spill. Given spill response operations will be within offshore waters using vessels and aircraft, the type of impacts are consistent with vessel and aircraft operations described within this EP for the routine operations. The greatest potential for impacts additional to those described for routine operations is from oiled wildlife response operations where disturbance and handling of wildlife may be undertaken intentionally.
Overall Consequence Ranking	A – Negligible (Light, noise and atmospheric emissions; Operational discharges and wastes)
	B – Minor (Physical presence and disturbance; Disruption to other users of marine and coastal areas and townships)

Management Control	**Effectiveness of Control**
Competent personnel	Ensures that spill response strategy selection and operational activities consider the potential for additional environmental impacts
NEBA	Provides a systematic and repeatable process for evaluating strategies with net least environmental impact
Compliance with EPBC Act Regulation 8	Reduce noise and atmospheric emissions
MARPOL compliance	
MARPOL compliance	Reduce Operational discharges and waste
Ballast water management	
Oily waste handling	
compliance with EPBC Act Regulation 8	Reduce Physical presence and disturbance

IMS risk assessment	
Appropriate vessel /vehicle selection	
Shoreline habitat assessments	
demarcation zones for vehicle and personnel movement	
Prioritise use of existing roads and tracks	
Soil profile assessment prior to earthworks	
Pre-cleaning and inspection of equipment (quarantine)	
Use of Heritage Advisor if required	
Adhere to WA Oiled Wildlife Response Plan and Pilbara Regional Oiled Wildlife Response Plan	
Stakeholder consultation	Reduce Disruption to other users of marine and coastal area and townships
Accommodation assessment	
Security Management Plan	
Transport Management Plan	

6.4 Environmental Risk Treatment Summary – Unplanned Events

Quadrant's environmental risk identification procedure identified seven potential sources of environmental impacts associated with the unplanned events.

6.4.1 Marine gas oil release from vessel collision (surface)

Potential Receptors	Fish, sharks, cetaceans, marine reptiles and seabirds. Shorelines habitats and associated fauna and flora.
Impact Assessment	
Receptors	**Assessment**
Threatened / Migratory / Local Fauna; **Protected Areas;** **Socio-economic Receptors**	In the event of a vessel collision, the volume of hydrocarbons released would be a finite amount limited to the maximum credible spill of a full tank inventory release. Given the nature of the MGO and the distance from shorelines, dilution and dispersion from natural weathering processes such as ocean currents indicate that the extent of exposure will be limited in area and duration. The susceptibility of marine fauna to hydrocarbons is dependent on hydrocarbon type and exposure duration however given that exposures would be limited in extent and duration, exposure to marine fauna from this hazard is not expected to result in a fatality. Hydrocarbon spills will cause a decline in water quality and can cause chemical (e.g. toxic) and physical (e.g. coating of emergent habitats, oiling of wildlife at sea surface) and impacts to marine species. Marine habitats may also be impacted as discussed in **Section 4.2**. Small volumes (<1 tonne) of MGO may accumulate on shorelines. Indigenous users may be impacted in the event that a land based response is required, however consultation will ensure potential impacts are reduced to acceptable levels. Given that a vessel collision hydrocarbon spill would not result in a decreased

	population size at a local or regional scale, it is expected that a spill of this nature would result in a **minor** consequence.		
Likelihood	A hydrocarbon release resulting from a vessel collision is unlikely to have widespread ecological effects given the nature of the hydrocarbons on-board, the finite volumes that could be released, the depth and transient nature of marine fauna in this area. The likelihood of a hydrocarbon release occurring due to a vessel collision is limited given the set of mitigation and management controls in place for this program. Subsequently the likelihood of a vessel collision releasing hydrocarbons to the environment which results in a minor consequence is considered to be **rare**.		
Likelihood Ranking	1- Rare	**Consequence ranking**	B - Minor
Residual risk	Low		
Management Control	**Effectiveness of Control**		
Maritime notices	Ensure other marine users are aware of the presence of the vessels and the relative low mobility of vessels to suddenly change course or avoid other vessels.		
Stakeholder Consultation			
Exclusion zone	Exclusion zones around the vessels prevent other vessels from getting too close and causing damage to equipment of either party.		
Navigation equipment and procedures	Reduces risk of environmental impact from vessel collisions due to ensuring safety requirements are fulfilled.		
Dynamic positioning system	Prevents unintentional movements by vessels decreasing risk of collision, reducing the risk of hydrocarbons being discharged to the marine environment		
Oil pollution emergency plan (OPEP)	Implements response plans to deal with an unplanned hydrocarbon release quickly and efficiently in order to reduce impacts to the marine environment.		
Vessel spill response plans (SOPEP/SMPEP)			
Fuel type used	Reduces the potential impacts to marine environment in the event of a vessel collision		

6.4.2 Condensate release due to damaged subsea infrastructure (Halyard-1 flowline and East Spar Pipeline)

Potential Receptors	Marine fauna – plankton, fish, cetaceans, marine mammals, marine reptiles, seabirds/shorebirds; Protected areas and socio-economic receptors		
Impact Assessment			
Receptors	**Assessment**		
Marine fauna – plankton, fish, cetaceans, marine mammals, marine reptiles, seabirds / shorebirds; Protected areas and socio-economic receptors	In the event of a hydrocarbon release due to flowline rupture, the volume of hydrocarbons released would be a finite amount limited to the maximum credible spill of a full content of the ruptured pipeline/ flowline. Given the nature of the Halyard condensate and the distance from shorelines, dilution and dispersion from natural weathering processes such as ocean currents indicate that the extent of exposure will be limited in area and duration. The susceptibility of marine fauna to hydrocarbons is dependent on hydrocarbon type and exposure duration however given that exposures would be limited in extent and duration, exposure to marine fauna from this hazard is not expected to result in a fatality. Hydrocarbon spills will cause a decline in water quality and can cause chemical (e.g. toxic) and physical (e.g. coating of emergent habitats, oiling of wildlife at sea surface) and impacts to marine species. There will be no shoreline contact in any season at the defined thresholds. Given that a hydrocarbon spill due to pipeline rupture would not result in a decreased population size at a local or regional scale, it is expected that a spill of this nature would result in a **minor** consequence.		
Likelihood	The likelihood of a hydrocarbon release occurring due to pipeline/ flowline rupture caused by a dropped object is limited given the set of mitigation and management controls in place for this program. Subsequently the likelihood of a pipeline/ flowline rupture releasing hydrocarbons to the environment which results in a minor consequence is considered to be **rare**.		
Likelihood Ranking	1-Rare	**Consequence ranking**	B –Minor
Residual risk	Low		
Management Control	**Effectiveness of Control**		
Pre-and post-installation and removal seabed survey	Ensures any subsea hazards that may cause pipeline/ flowline rupture during installation resulting in hydrocarbon release are identified		
Installation and removal procedures	Adhering to installation procedures (e.g. setting a pre-determined distance clear of subsea infrastructure) and approval of critical lifts helps prevent damage to subsea infrastructure which results in hydrocarbon release		
Dynamic positioning	Prevents unintentional movements by vessel, decreasing risk of dropped object reducing the risk of hydrocarbons being discharged to the marine environment		
Oil pollution emergency plan (OPEP)	Implements response plans to deal with an unplanned hydrocarbon release quickly and efficiently in order to reduce impacts to the marine environment.		
Vessel SOPEP/SMPEP			
Dropped object	Minimises drop risk during lifting operations that may cause pipeline/ flowline rupture		

prevention	resulting in hydrocarbon release

6.4.3 Minor hydrocarbon release (surface)

Potential Receptors	Marine fauna – Fish, cetaceans, marine mammals, marine reptiles and seabirds		
Impact Assessment			
Receptors	**Assessment**		
Marine Fauna – Fish, cetaceans, marine mammals, marine reptiles, and seabirds	In the event of a minor hydrocarbon spill, the quantities would be limited to approximately 37.5 m^3. The small volumes and dilution and dispersion from natural weathering processes such as ocean currents indicate that the extent of exposure will be limited in area and duration. The number of receptors present at the activity location is expected to be limited to a small number of transient individuals. The susceptibility of marine fauna to hydrocarbons is dependent on hydrocarbon type and exposure duration however given that exposures would be limited in extent and duration, exposure to marine fauna from this hazard is considered to be low. As the MGO is a moderately volatile substance, the impacts to receptors will decline rapidly with time and distance at the sea surface. Rapid dilution at depth would also result in the impacts to receptors declining rapidly with time and distance. Hydrocarbon spills will cause a decline in water quality and can cause chemical (e.g. toxic) and physical (e.g. coating of emergent habitats, oiling of wildlife at sea surface) and impacts to marine species. Given that a small hydrocarbon spill would not result in a decreased population size at a local or regional scale, it is expected that a spill of this nature would result in a **negligible** consequence.		
Likelihood	The likelihood of a small hydrocarbon release occurring is limited given the set of management controls in place for this activity.		
Likelihood Ranking	3- Unlikely	**Consequence ranking**	A- Negligible
Residual risk	Low		
Management Control	**Effectiveness of Control**		
General chemical management procedures	Potential impacts to the environment are reduced through following correct procedures for the safe handling and storage of chemicals		
Hazardous chemical management procedures	Reduces the risk of spills and leaks (discharges)of hazardous chemicals to the sea by controlling the storage, handling and clean up		
Oil pollution emergency plan (OPEP)	Implements response plans to deal with an unplanned hydrocarbon release quickly and efficiently in order to reduce impacts to the marine environment.		
Vessel spill response plan (SOPEP)			
Maritime dangerous goods code	Dangerous goods managed in accordance with International Maritime Dangerous Goods Code (IMDG Code) to reduce the risk of an environmental incident, such as an accidental release to sea or unintended chemical reaction		
ROV inspection and maintenance	Minimises the risk of unplanned hydraulic fluid release to sea e.g. by ensuring hose integrity is maintained		

procedures	
Deck drainage	Reduces potential for hydrocarbon release to the marine environment
Bulk refuelling transfer procedures	Prevents probability of unplanned hydrocarbon spills or leaks occurring during bunkering leading to negative impacts to the marine environment.
Fuel use	Reduces the potential impacts to marine environment in the event of unplanned hydrocarbon spills or leaks during bunkering

6.4.4 Non-hydrocarbon and chemicals release - liquid

Potential Receptors	Fish, sharks, marine mammals, marine reptiles and seabirds including benthic habitats from vessel spills		
Impact Assessment			
Receptors	**Assessment**		
Marine fauna – Fish, sharks, marine mammals, marine reptiles, and seabirds	In the event of a non-hydrocarbon liquid spill, the quantities would be limited to approximately 1m^3 of stern oil. The small volumes, dilution and dispersion from natural weathering processes such as ocean currents indicate that the extent of exposure will be limited in area and duration. The susceptibility of marine fauna to chemicals is dependent on the type and exposure duration however given that exposures would be limited in extent and duration, exposure to marine fauna from this hazard is not expected to result in a fatality. Impacts from small volumes (1 m^3) discharged to the marine environment to water quality would be short-term and localised, due to the nature and behaviour of the chemicals / liquid wastes identified as being at risk of spilling; only pelagic fauna present in the immediate vicinity of the spill would likely be at risk of impact. Given that a small chemical spill would not result in a decreased population size at a local or regional scale, it is expected that a spill of this nature would result in a **negligible** consequence.		
Likelihood	The likelihood of a small non-hydrocarbon release occurring is limited given the set of mitigation and management controls in place for this program. Subsequently the likelihood of releasing non-hydrocarbon liquids to the environment which results in a negligible consequence is considered to be **very unlikely**.		
Likelihood Ranking	2- Very Unlikely	**Consequence ranking**	A – Negligible
Residual Risk	Low		
Management Control	**Effectiveness of Control**		
General chemical management procedures	Potential impacts to the environment are reduced through following correct procedures for the safe handling and storage of chemicals		
Hazardous chemical management procedures	Reduces the risk of spills and leaks (discharges) to the sea by controlling the storage, handling and clean-up of hazardous chemicals		
Chemical selection procedure	Reduced toxicity to marine environment. Only environmentally acceptable flushing and testing chemicals would be released in the event of an accidental discharge to sea		
Vessel spill response plans (SOPEP/SMPEP)	Implements response plans to deal with an unplanned hydrocarbon release quickly and efficiently in order to reduce impacts to the marine environment.		

Dropped object prevention	Minimises dropped object risk during vessel lifting operations that may cause secondary spill (discharges) resulting in reduction in water quality
Maritime Dangerous Goods Code	Dangerous goods managed in accordance with International Maritime Dangerous Goods Code (IMDG Code) to reduce the risk of an environmental incident, such as an accidental release to sea or unintended chemical reaction

6.4.5 Non-Hydrocarbon release (surface) – solids

Potential Receptors	Benthic habitats; Marine fauna – marine mammals, marine reptiles, seabirds, sharks and fish; Socioeconomic – other sea users (fisheries)		
Impact Assessment			
Receptors	**Assessment**		
Physical Environment – Seabed disturbance	In the event of a lost equipment/dropped object, it is expected to result in localised damage to the seabed. Any localised disturbance to benthic habitat is not expected to have an impact to any fishes attracted to the subsea infrastructure although, localised and temporary avoidance or attraction could occur during the activities. Therefore, no impacts are expected on the Continental Slope Demersal Fish Communities KEF. The extent of the seabed damage will be limited to the size of the dropped object and given the size of standard materials lifted overboard, any impact is expected to be very small. Any impact to seabed through dropped objects would result in a negligible reduction in habitat area/function impacted.		
Marine Fauna- cetaceans, marine turtles, seabirds and fish	In the event of a non-hazardous or hazardous solid waste loss, the quantities would be limited. This waste stream could cause localised impacts to water quality and the benthic environment if the solid can degrade, leading to impacts on localised flora and fauna species. Ingestion of solid wastes could occur in small quantities. The limited quantities associated with this event indicate that even in a worst case release of solid waste, fatalities would be limited to individuals and is not expected to result in a decrease of the local population size and the consequence level is therefore, **negligible**.		
Socio-economic – Interference from a buoyant object	In the event of a release of a buoyant object that cannot be recovered, it could present an obstacle to other sea users or have aesthetic impacts to tourism. Given the likely size of buoyant equipment and it will drift with the currents, it is considered unlikely to present a significant hazard to other sea users or significant aesthetic impact and the consequence level is therefore **negligible**.		
Likelihood	A set of control measures and checks have been proposed to ensure that the risks of dropped objects, lost equipment or release of solid waste to the environment has been minimised. The likelihood of releasing non-hydrocarbon solids to the environment resulting in a negligible consequence is considered **very unlikely** (assumes potential for a single loss of solid waste incident during the activity).		
Likelihood Ranking	2 – Very Unlikely	**Consequence Ranking**	A – Negligible
Residual Risk	Low		
Management Control	**Effectiveness of Control**		
Waste (garbage) management procedure	Reduces probability of waste being discharged to sea, reducing potential impacts to marine fauna. Ensures compliance with MARPOL requirements		
Dropped object prevention controls	Impacts to environment are reduced by preventing dropped objects and by retrieving dropped objects where possible and where environmental consequence outweighs		

	safety risks
Maritime Dangerous Goods Code	Dangerous goods managed in accordance with International Maritime Dangerous Goods Code (IMDG Code) to reduce the risk of an environmental incident, such as an accidental release to sea or unintended chemical reaction

6.4.6 Marine fauna collisions

Potential Receptors	Fish, Sharks, Marine Mammals and Marine Reptiles		
Impact Assessment			
Receptors	**Assessment**		
Marine fauna – Fish, sharks, cetaceans, marine reptiles, seabirds	In the event of a collision with marine fauna, there is the potential for injury or death to an individual. The receptors present in the operational area are expected to be limited to a small number of transient individuals. Overall, the consequence of a striking an individual is not expected to decrease the local population size and therefore is assessed as **negligible**.		
Likelihood	As the duration of the activity falls within activity periods for the humpback whale southern migration and blue whale southern migration (**Section 4.5**), individual humpback and pygmy blue whales may pass through the area and may exhibit avoidance behaviour, however any potential disturbances are expected to be temporary (limited to the duration of the activity Whale sharks may be encountered in the operational area given the overlap with the foraging BIA. Given that the nearest nesting beaches for flatback turtles are located 34 km from the operational area (and are located on the other side of Barrow Island to the operational area), it is unlikely that large numbers of aggregating turtles will be encountered during the activities Vessels will be moving very slowly whilst inside the operational area, posing a low risk of collision with marine fauna. Subsequently the likelihood of a collision with marine fauna resulting in a minor consequence is considered to be **rare**.		
Likelihood Ranking	1 - Rare	**Consequence Ranking**	A - Negligible
Residual Risk	Low		
Management Control	**Effectiveness of Control**		
Procedure for interacting with cetaceans	Reduces risk of vessel collision with cetaceans (and causing harm) by limiting speeds and approach distances in the presence of cetaceans and other marine fauna Ensures compliance with reporting requirements		
Marine fauna observations			
Constant bridge watch	Monitoring of surrounding marine environment to identify potential collision risks (and reducing harm) to cetaceans and other marine fauna		

6.4.7 Introduction of invasive marine species (IMS)

Potential Receptors	Marine ecosystem as a whole and commercial / recreational users of the marine environment

Impact Assessment			
Receptors	**Consequence**		
Marine fauna – Fish and benthic habitats; **Physical environment/ habitat**	Ballast water is responsible for up to 30% of all IMS incursions into Australian waters, however, research indicates that biofouling (the accumulation of aquatic micro-organisms, algae, plants and animals on vessel hulls and submerged surfaces) has been responsible for more foreign marine introductions than ballast water (DAWR 2017). IMS, if they successfully establish, can out-compete native species for food or space, preying on native species or changing the nature of the environment and can subsequently impact on fisheries or aquaculture. In the event that an IMS is introduced into the operational area, given the lack of diversity and extensiveness of similar benthic habitat in the region, there would only be a minor reduction in the physical environment. The overall consequence level was assessed as **moderate**.		
Likelihood	Given the depth of the operational area (90 - 118 m), it is unlikely that an IMS would be able to successfully translocate from the operational area to surrounding shallower habitats. With controls in place to reduce the risk of introduction of IMS the likelihood of introducing an IMS is considered **rare**.		
Likelihood Ranking	1 - Rare	**Consequence Ranking**	C – Moderate
Residual Risk	Low		
Management Control	**Effectiveness of Control**		
DPIRD vessel check tool applied to vessels	The risk of introducing IMS are reduced due to assessment procedure Immersible equipment to be cleaned to 'low risk'		
Anti-foulant system	The risk of introducing IMS are reduced due to anti-foulant systems		
Ballast water management plan	Reduces the risk of introducing IMS through procedures managing ballast water exchange and identifying high risk ballast water		

7. MANAGEMENT APPROACH

The East Spar inspection and removal activity will be managed in compliance with all measures and controls detailed within the EP accepted by NOPSEMA under the OPGGS (E) Regulations, other environmental legislation and Quadrant's Management System (e.g. Environmental Management Policy).

The objective of the EP is to ensure that potential adverse environmental impacts from planned and unplanned events associated with the activity are identified and assessed, and to stipulate mitigation measures to avoid and/or reduce any adverse impacts to the environment to ALARP and acceptable levels.

The EP details specific performance outcomes, standards and procedures, and identifies the range of controls to be implemented (consistent with the standards) to achieve the performance outcomes. The EP also identifies the specific measurement criteria and records to be kept to demonstrate the achievement of each performance outcome.

As described in the EP, the implementation strategy includes the relevant details of the following:

1. Environmental Management System;
2. Environmental Management Policy;
3. Leadership, accountability and responsibility;
4. Workforce training and competency;

5. Hazard identification, risk and impact assessment and controls;
6. Environmental performance outcomes, control measures and performance standards;
7. Workforce involvement and stakeholder communications;
8. Information management and document control; and
9. Operations management.

During the period that activities described in the EP are undertaken, Quadrant will ensure environmental performance is monitored and managed through an inspection and monitoring regime undertaken by Quadrant representatives or delegates based on the DSV/ISV.

Environmental compliance of an activity with the EP (and the EPOs) is measured using planned and systematic audits or inspections to identify weaknesses and non-conformances in the system and processes so that they can be identified. Continuous improvement opportunities identified through monitoring, audits and incident investigations are implemented in a controlled manner and communicated to all relevant workforce, contractors and relevant third parties. Audits and inspections are in place to identify possible incidents and actions taken to prevent them from happening.

Non-conformances found are addressed and resolved by a systematic corrective action process and are reported to NOPSEMA where relevant.

Senior Quadrant and vessel contractor personnel will be accountable for ensuring conformance with environmental performance outcomes and standards and all personnel will be empowered to 'stop-the-job' to ensure the activity is being implemented in an environmentally responsible manner. The EP identifies specific responsibilities for each role during the activity.

Incident notification and reporting to NOPSEMA and other regulators will be conducted as per the OPGGS (E) Regulations, as detailed within the EP. Reported HSE incidents and hazards will be communicated to personnel during daily operational meetings, and HSE incidents and hazards will be documented in the incident management systems as appropriate. Significant HSE incidents will be investigated using root cause analysis.

7.1 Management of Change

Quadrant's *Environmental Management of Change Procedure (EA-91-IQ-10001)* (MoC) process provides a systematic approach to initiate, assess, document, approve, communicate and implement changes to EPs and OPEPs (currently in force) whilst meeting the requirements of the OPGGS (E) Regulations.

The MoC process considers Regulation 7, 8 and 17 of the OPGGS(E) Regulations, and determines if a proposed change can proceed and the manner in which it can proceed. The MoC procedure will determine whether a revision of the EP is required and whether that revision is to be submitted to NOPSEMA. For a change to proceed, the associated environmental impacts and risks must be demonstrated to be acceptable and ALARP. Additional stakeholder consultation may be required depending on the nature and scale of the change.

8. HYDROCARBON SPILL RESPONSE ARRANGEMENTS

In the event of a hydrocarbon spill, oil spill response strategies will be implemented where possible to reduce environmental impacts to ALARP and acceptable levels. The selection of strategies will be undertaken through the Net Environmental Benefit Analysis (NEBA) process, outlined in the OPEP.

The following response strategies may be applicable to the identified credible spill scenarios:

- Source control activities; including;
    - Vessel spill kits, secondary containment, pumping procedures, and applicable strategies contained within the Vessel's Shipboard Oil Pollution Emergency Plan (SOPEP);
    - Drilling a relief well (primary control);
    - Direct intervention using well control experts (if safe and technically feasible to do so);

  - Deployment of capping stack (if safe and technically feasible to do so);
  - Deployment of subsea first response tool kit (SFRT) – survey only (supporting control dependent on safety and technical considerations).
- Mechanical dispersion;
- Shoreline protection;
- Shoreline clean-up;
- Operational monitoring, including:
  - Vessel surveillance;
  - Aerial surveillance;
  - Tracking buoys;
  - Spill fate trajectory modelling;
  - Satellite imagery;
  - Initial oil characterisation;
  - Operational water quality monitoring; and
  - Shoreline and coastal habitat assessments.
- Scientific monitoring, could include:
  - Water and sediment quality;
  - Shoreline and coastal habitat monitoring (sandy beaches, rocky shores and intertidal mudflats);
  - Mangrove monitoring;
  - Benthic habitat monitoring (seagrass, algae, corals);
  - Marine fauna monitoring (seabirds, shorebirds, marine mammals, marine reptiles including turtles)
  - Seafood quality; and
  - Fish, fisheries and aquaculture.
- Waste management; and
- Wildlife response operations including hazing and capture and rehabilitation.

8.1 Preparedness and Implementation of Response Arrangements

The project vessels are required to have and implement incident response plans, such as an emergency response plan and SMPEP/ SOPEP. Regular incident response drills and exercises (e.g. as defined in emergency response plan, SMPEP/ SOPEP etc.) will be carried out on project vessels to refresh the crew in using equipment and implementing incident response procedures.

Quadrant will implement the *East Spar Inspection and Removal Oil Pollution Emergency Plan (ES-35-VB-20001.02)* in the event of a significant hydrocarbon spill (level 2 or 3). To maintain a state of oil spill preparedness, personnel with OPEP responsibilities will be made aware of their obligations, oil spill response equipment will be maintained, contracts with critical equipment and personnel suppliers will be managed, and agreements will be in place with national regulatory agencies for support in oil spill response. Quadrant will also implement its oil spill response exercise and training schedule.

8.2 Net Environmental Analysis Benefits (NEBA)

During any response incident, there is a documented decision making process to ensure that response strategies are identified and evaluated prior to implementation via the Incident Action Plan (IAP). The Controlling Agency Incident Management Team (IMT) will use a Net Environmental Benefit Analysis (NEBA) process to inform the development and refinement of the IAPs, so the most effective response strategies with the least detrimental environmental impacts are identified, documented and executed.

The application of the NEBA is to:

- Identify sensitivities within the area potentially affected by a spill at that time of the year;
- Assist in prioritising and allocating resources to sensitivities with a higher ranking; and
- Assist in determining appropriate response strategies with support of real time metocean conditions, oil spill tracking and fate modelling.

8.3 Oil Spill Response Resources

Oil spill response equipment and resources are a combination of Quadrant, AMOSC (Australian Marine Oil Spill Centre Pty Ltd), AMSA, DoT, National Plan (NatPlan), OSRL (Oil Spill Response Limited), and other operator resources available through the AMOSPlan mutual aid arrangements. Under the Memorandum of Understanding (MOU) between AMSA and Quadrant, AMSA will provide all resources available through NatPlan to support a Quadrant spill response.

In the event of an oiled wildlife response, Quadrant will activate the West Australian Oiled Wildlife Response Plan (WAOWRP) and work with DBCA in determining resources and capability requirements. DBCA and Industry (AMOSC) Oiled Wildlife Advisors (OWAs) ensure minimum standards for oiled wildlife response, as outlined within the WAOWRP, are met and ensure timely mobilisation of appropriate resources (equipment and personnel) through communication with the wildlife logistics team.

During and post-spill scientific response monitoring activities require resources external to Quadrant and include specialist technical capabilities. If additional support is required, Quadrant has Master Service Agreements with other service providers to support scientific response monitoring activities.

9. CONTACT DETAILS

Further information about the East Spar Inspection and Removal activity can be obtained from:

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