Exploration Permit WA-481-P Drilling Environment Plan Summary

MAO-DRL-PN-0005-120S

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ACRONYMS

Abbreviation	Description
AFMA	Australian Fisheries Management Authority
AHS	Australian Hydrographic Service
ALARP	As low as reasonably practicable
AMSA	Australian Maritime Safety Authority
APPEA	Australian Petroleum Production and Exploration Association
AQIS	Australian Quarantine and Inspection Service
BMP	Ballast Management Plan
BOP	Blowout preventer
CMR	Commonwealth Marine Reserve
DAFF	Department of Agriculture, Fisheries and Forestry
DoE (formerly DSEWPaC)	Commonwealth Department of the Environment
DMS	Drilling Management System
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EP	Environment Plan
ERA	Environmental Risk Assessment
ERP	Emergency response plan
HSEMS	Health, Safety, Environmental Management Systems
IMT	Incident Management Team
KEF	Key Ecological Feature
MARPOL	International Convention for the Prevention of Pollution from Ships
m	Metre
MOA	Marine Operations Advisor
MODU	Mobile offshore drilling unit
NEBA	Net Environmental Benefit Assessment
NOPSEMA	National Offshore Petroleum Safety and Environment Authority
NO_x	Nitrous Oxides
OPEP	Oil Pollution Emergency Plan
OPGGS (E) Regs	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OPEP	Oil Pollution Emergency Plan
PMS	Preventive Management System
ppm	parts per million
Q1	1st Quarter (first)
RCC	Rescue Coordination Centre
SOLAS	Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan
VSP	Vertical Seismic Profiling
VRASS	Vessel risk assessment

Abbreviation	Description
WA	Western Australia
WBM	Water based mud (drilling fluid)
WOMP	Well Operations Management Plan

1 INTRODUCTION

Murphy Australia WA-481-P Oil (Murphy), a subsidiary of Murphy Oil Corporation, on behalf of its joint venture partners Kufpec (Perth) Pty Ltd and Samsung Oil and Gas Australia Pty Ltd, proposes to undertake drilling activities (herein referred to as the 'Activity') within the offshore petroleum exploration licence area WA-481-P commencing during Q1 2015, in order to test for the presence of hydrocarbon resources.

1.1 EP SCOPE

Murphy has completed a seismic survey in the permit and now plans to drill up to 3 exploration wells. **Figure 2-1** shows the two areas within which wells will be drilled within Commonwealth waters. The drilling programme is planned to commence within Q1 2015 and is expected to last a total of 70 days, including drilling time and transit between well locations, dependent on weather conditions and operational efficiency.

A geophysical site survey has been undertaken within the drilling areas; five locations were surveyed between August and September 2014. This activity was covered under a separate Environment Plan (EP) accepted by the National Offshore Petroleum Safety and Environment Authority (NOPSEMA) (MAO-DRL-PN-0005-087).

2 DESCRIPTION OF THE ACTIVITY

2.1 LOCATION

The wells will be drilled within Commonwealth waters in water depths between 50 m and 350 m. The minimum distances of the wells could be approximately 38 km from the Western Australian coast and approximately 25 km from the Abrolhos Islands. Well locations will be within the polygons shown in Figure 2-1, co-ordinates for these two polygons are provided in Table 2-1. These polygon boundaries are based on a review of previous seismic data.

As a result of ongoing interpretation of recently acquired seismic data, the proposed drilling locations may be moved to any location within the marked green polygons in Figure 2-1. The northern area is located within the Abrolhos Commonwealth Marine Reserve, however some or all of the wells may be drilled in the southern area. During the Activity the Operational Area is the 500 m exclusion zone surrounding the mobile offshore drilling unit (MODU) once anchored at each well location.

2.2 SCHEDULE

The MODU is expected to be situated at each drilling location for two to three weeks per well commencing Q1 2015 at the earliest, with the total time on location dependent on weather conditions and operational efficiency. Active drilling takes place 24 hours per day, 7 days per week and is expected to last 12 days for each well. The entire Activity is expected to last a total of 70 days, including drilling time and transit between well locations

2.3 OPERATIONAL DETAILS

The wells will be drilled using a semi-submersible MODU. Up to 3 support vessels will be utilised during the Activity and helicopters for personnel transfer. Water Based mud (WBM) will be utilised to drill the wells and well formation evaluation will occur during the Activity which may include any of the following: mud logging, wireline logging and vertical seismic profiling (VSP). Following final evaluation of the wells they will be plugged and abandoned.

Verified barriers will be in place to ensure well integrity as per the NOPSEMA accepted Well Operation Management Plan (WOMP) and Murphy's drilling management system (DMS). The same barrier philosophy and integrity testing will be applied for abandonment operations. The abandoned well casing will be cut below the seabed and all wellhead infrastructure removed.

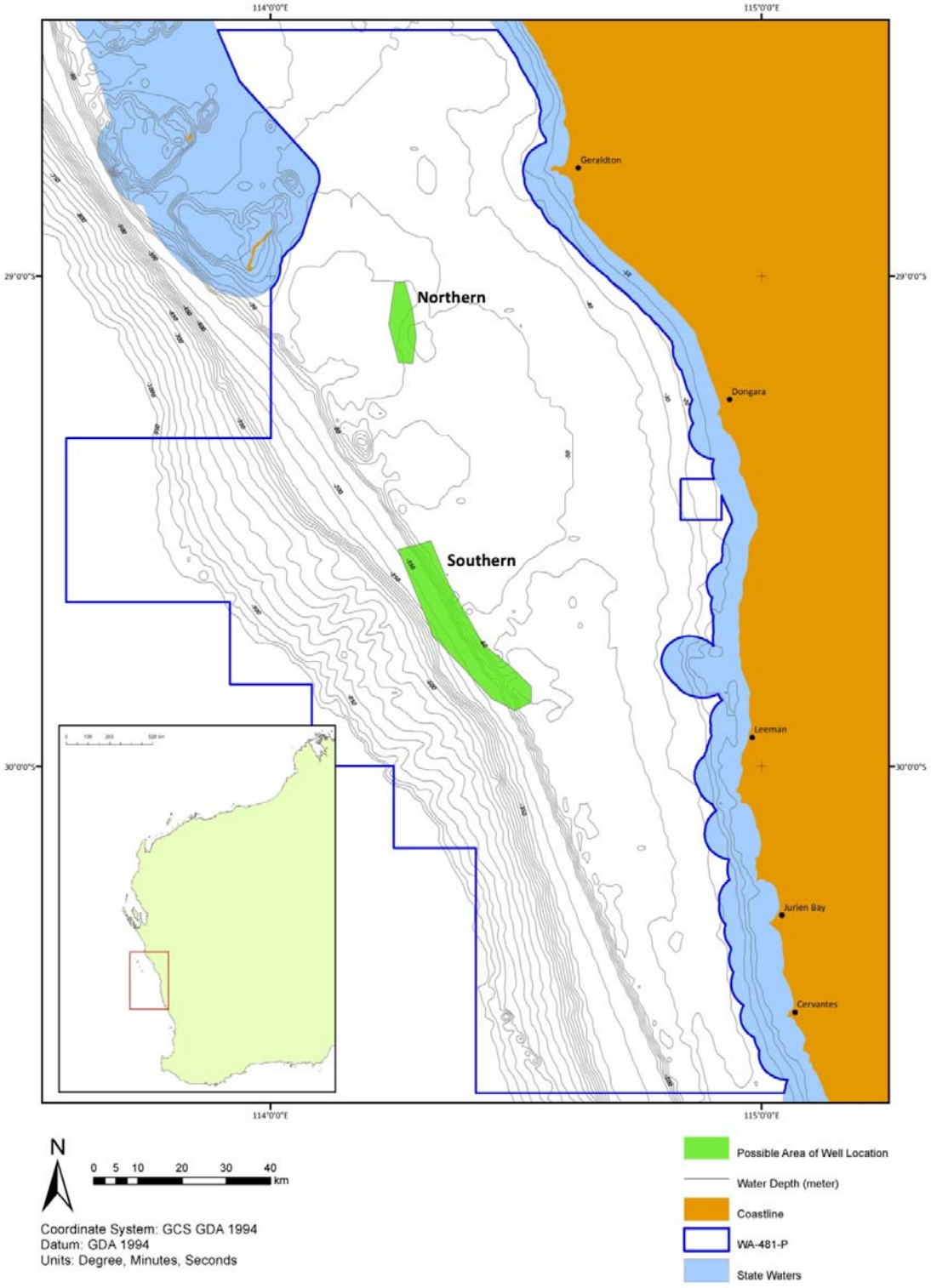

Figure 2-1: Schematic Diagram to Show the Northern Area and Southern Area Polygons within Permit Area WA-481-P

Table 2-1: Co-ordinates of Northern and Southern Area Polygons

Latitude	Longitude
northern area	
-29.011	114.274
-29.067	114.289
-29.122	114.297
-29.178	114.29
-29.176	114.261
-29.099	114.241
-29.013	114.253
southern area	
-29.829	114.42
-29.733	114.331
-29.559	114.26
-29.55	114.294
-29.541	114.327
-29.627	114.362
-29.751	114.433
-29.797	114.49
-29.837	114.531
-29.869	114.531
-29.885	114.497
-29.861	114.45

3 DESCRIPTION OF THE ENVIRONMENT

3.1 REGIONAL SETTING

Licence area WA-481-P is located in offshore waters adjacent to the towns of Jurien Bay, Dongara and Geraldton. Approximately two-thirds of the permit is in water depths less than 500 m. The proposed Activity will be undertaken within the Perth Basin, which is a large, elongate, north to northwest-trending sedimentary basin extending about 1,300 km along the south-western coast of Australia. The permit area is within the South West Marine Bioregion with hotspots for diversity including the Houtman Abrolhos Islands.

3.2 PHYSICAL ENVIRONMENT

The northern Perth Basin has a Mediterranean Climate, with warm dry summers and cooler, wet winters. It also exhibits a windy climate, during summer a high pressure ridge lies to the south, causing persistent winds from the southeast or southwest, at speeds exceeding 15 m/s almost half the time.

The northern Perth Basin lies in the path of the Leeuwin Current, which draws warm, low-salinity water of tropical origin southwards along the coast of Western Australia. This current flows all year round, but is strongest during the southern hemisphere winter. Although the direction of the Leeuwin Current is predominantly southerly, Shark Bay and the Houtman Abrolhos together act as a topographical trigger for the forming of eddies, so the northern area can experience currents from any direction, even when the Leeuwin Current is flowing strongly (McClathie et al., 2006).

Unlike most other major ocean currents, there is no large-scale coastal upwelling associated with the Leeuwin Current. There is limited evidence for some sporadic, localised upwelling in the vicinity of the Abrolhos, but it appears to have little effect on the extremely low levels of nutrients in the water (Pearce, 1997).

The operational area overlaps the Abrolhos Commonwealth Marine Reserve and is adjacent to the Jurien Bay Commonwealth Marine Reserve and State managed Jurien Bay Marine Park and Houtman Abrolhos Islands Fish Habitat Area.

The Jurien Bay Commonwealth Marine Reserve adjacent to the operational area contains a complex seabed and coastal topography consisting of islands, sub-tidal and inter-tidal limestone reefs, protected inshore lagoons and deeper basins, beaches and headlands (Morrison *et al*., 2006). The complex geomorphology of the area supports a wide diversity of habitats and ecological niches that in turn contribute to the high marine biodiversity of the area. Within habitats, benthic diversity is positively correlated with seabed “roughness” (Morrison *et al*., 2006).

The operational area varies in water depths from 50 m to approximately 350 m, with the majority of the area in less than 80 m of water.

The nearshore areas in the Jurien region are known to contain seagrass meadows that are comprised of a variety of species and are found in varying densities.

Within the operational area benthic habitats are comprised of primarily soft sediments with sparse epifauna. Seabed relief in areas of bare sediment consists mainly of 'small ripples' less than 0.1 m high, which is consistent with tidally driven bottom currents. Possible cemented sediments may also occur; these features occur in water depths of less than 80 m and comprise a far smaller proportion of the operational area than the soft sediment habitat. The cemented sediments support a medium density, mixed benthic invertebrate community including large sea fans, sponges, soft corals, sea whips and ascidians. These filter feeding epifauna are similar to epifauna found elsewhere in the region and are not considered regionally significant. The cemented sediments themselves are also not unique to the region and are present across the Perth Basin.

The Houtman Abrolhos Islands, located adjacent to the operational area, compared with other reefs of a similar latitude, have a high diversity of hermatypic coral. Other faunal groups are composed of mixed southern temperate, west-coast endemic and northern tropical species. The high energy outer reef slopes support rich and dense macrophyte communities characterised by large brown algae and including kelp, mixed with fleshy red and green algae. Seasonally changing macroalgae communities dominate many protected reef areas within lagoons (Crossland *et al*., 1984)

3.3 PARTICULAR VALUES AND SENSITIVITIES

There are no World Heritage Properties in or adjacent to the proposed WA-481-P drilling locations. There are no National Heritage Places within the proposed drilling locations. No indigenous or non-indigenous heritage values have been identified in the operational area. No RAMSAR wetlands have been identified within the operational area as it is offshore.

A number of State and Commonwealth protected areas are overlapped, or in close proximity, to the operational area. These include:

- Abrolhos Commonwealth Marine Reserve (CMR);
- Abrolhos A-Class Nature Reserve (onshore);
- Abrolhos State Fish Habitat Protection Area;
- Jurien Bay CMR; and
- Jurien Bay Marine Park

Four Key Ecological Features (KEFs) were identified in the vicinity of the drilling locations:

- Western Demersal Slope and Associated Fish Populations
- Western Rock Lobster
- Ancient Coastline at 90-125 m depth contour
- Commonwealth marine environment surrounding the Houtman Abrolhos Islands

There are 25 threatened species and/or 33 migratory species listed on the EPBC Act Protected Matters Database (search was conducted on 11/06/2014 for the northern and southern areas (DoE, 2014)) which may occur within the proposed drilling locations. It should be noted that some migratory species are also listed as threatened.

Table 3-1: Threatened and listed migratory species that may occur within the northern and southern operational areas

Category	Scientific Name	Common Name	Threatened Status	Migratory	Type of Presence
Cetaceans	*Balaenoptera musculus*	Blue Whale	Endangered	✓	Species or species habitat may occur within area
	Eubalaena australis	Southern Right Whale	Endangered	✓	Species or species habitat likely occur within area
	Megaptera novaeangliae	Humpback Whale	Vulnerable	✓	Species or species habitat known to occur within area
	Balaenoptera bonaerensis	Antarctic Minke Whale	N/a	✓	Species or species habitat known to occur within area
	Balaenoptera edeni	Bryde's Whale	N/a	✓	Species or species habitat known to occur within area
	Orcinus orca	Killer Whale	N/a	✓	Species or species habitat known to occur within area
	Physeter macrocephalus	Sperm Whale	N/a	✓	Species or species habitat known to occur within area
	Lagenorhynchus obscurus	Dusky Dolphin	N/a	✓	Species or species habitat known to occur within area
Pinnipeds	*Neophoca cinerea*	Australian Sea-lion	Vulnerable	×	Species or species habitat may occur within area
Sharks and rays(Fish)	*Rhincodon typus*	Whale Shark	Vulnerable	✓	Species or species habitat may occur within area
	Carcharias taurus	Grey Nurse Shark (west coast population)	Vulnerable	×	Species or species habitat may occur within area
	Carcharodon carcharias	Great White Shark	Vulnerable	✓	Species or species habitat may occur within area
	Isurus oxyrinchus	Shortfin Mako, Mako Shark	N/a	✓	Species or species habitat may occur within area
	Isurus paucus	Longfin Mako	N/a	✓	Species or species habitat may occur within area
	Lamna nasus	Porbeagle, Mackerel Shark	N/a	✓	Species or species habitat may occur within area
	Manta birostris	Manta Ray	N/a	✓	Species or species habitat may occur within area
Marine Reptiles	*Caretta caretta*	Loggerhead Turtle	Endangered	✓	Species or species habitat known to occur within area
	Chelonia mydas	Green Turtle	Vulnerable	✓	Species or species habitat known to occur within area
	Dermochelys coriacea	Leatherback Turtle	Endangered	✓	Species or species habitat known to occur within area
	Natator depressus	Flatback Turtle	Vulnerable	✓	Species or species habitat known to occur within area
Birds	*Anous tenuirostris melanops*	Australian Lesser Noddy	Vulnerable	×	Foraging, feeding or related behaviour likely to occur within area
	Diomedea epomophora epomophora	Southern Royal Albatross	Vulnerable	✓	Species or species habitat may occur within area

Category	Scientific Name	Common Name	Threatened Status	Migratory	Type of Presence
	Diomedea epomophora sanfordi	Northern Royal Albatross	Endangered	✓	Species or species habitat may occur within area
	Diomedea exulans amsterdamensis	Amsterdam Albatross	Endangered	✓	Species or species habitat may occur within area
	Diomedea exulans exulans	Tristan Albatross	Endangered	✓	Species or species habitat may occur within area
	Diomedea exulans (sensu lato)	Wandering Albatross	Vulnerable	✓	Species or species habitat may occur within area
	Macronectes giganteus	Southern Giant-Petrel	Endangered	✓	Species or species habitat may occur within area
	Macronectes halli	Northern Giant-Petrel	Vulnerable	✓	Species or species habitat may occur within area
	Pterodroma mollis	Soft-plumaged Petrel	Vulnerable	×	Species or species habitat may occur within area
	Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable	✓	Foraging, feeding or related behaviour may occur within area
	Thalassarche cauta cauta	Shy Albatross	Vulnerable	✓	Species or species habitat may occur within area
	Thalassarche cauta steadi	White-capped Albatross	Vulnerable	✓	Foraging, feeding or related behaviour may occur within area
	Thalassarche melanophris	Black-browed Albatross	Vulnerable	✓	Species or species habitat may occur within area
	Thalassarche melanophris impavida	Campbell Albatross	Vulnerable	✓	Species or species habitat may occur within area
	Puffinus carneipes	Flesh-footed Shearwater	N/a	✓	Foraging, feeding or related behaviour may occur within area
	Sterna anaethetus	Bridled Tern	N/a	✓	Foraging, feeding or related behaviour may occur within area
	Sterna caspia	Caspian Tern	N/a	✓	Foraging, feeding or related behaviour may occur within area

The majority of the marine species identified are likely to transit through the region, and it is unlikely that the proposed drilling locations support habitats critical to the survival of these species. There are no known nesting and breeding areas for these listed species within the vicinity of the proposed drilling locations. Furthermore no threatened ecological communities listed under the EPBC Act were identified within the search area. In addition to those species listed as threatened or migratory, a further 50 species were also listed as marine species.

3.4 SOCIO-ECONOMIC VALUES

Medium levels of shipping are expected to occur close to the proposed Activity due to adjacent ports and shipping channels. The main west coast shipping route passes through WA-481-P and there will be traffic entering the area to access Geraldton Port and Port Denison directly. However, consultation with Australian Maritime Safety Authority (AMSA) indicates that the proposed drilling locations are in between two lanes of higher activity.

Tourism operations occur in the Abrolhos Islands and Jurien Bay Marine Park. Tourism at the Abrolhos Islands includes scuba diving, fishing and sightseeing activities. These activities are mainly confined within the more sheltered waters of the islands. Similar activities also occur in the Jurien Bay Marine Park which is a multiple use reserve that caters for a wide range of activities.

Recreational fishing is a key activity around the Abrolhos Islands, mostly within the islands state waters and charter fishing is a growing activity in the area. Interaction with recreational fishers is possible during the proposed drilling activity. However, vessel presence is variable and seasonal peaks will exist.

Licence area WA-481-P overlaps with a Military Exercise Area (the West Australia Exercise Area) R146A, R148, R157 and R184A. Undertaking the activity could impact upon naval and air force weapons practices.

The commercial fin fisheries have a limited number of permit holders who can operate over a large fishery area that extends well beyond the bounds of the WA-481-P Permit area.

There are several Commonwealth and State administered fisheries that operate within the operational area.

3.5 WIDER ENVIRONMENT

The wider environment that may be affected as a result of an unplanned event is summarised below. This wider area that may be affected has been assumed based on worst case scenarios identified in the EP and stochastic modelling of a hypothetical loss of well control.

Marine Fauna

An EPBC search was conducted on the potential area of impact in the event of a loss of well control event. A number of threatened species were identified from this search that were not found within the northern and southern operational area as listed in the table below. An additional 7 threatened species and 8 migratory species were identified in the area.

Table 3-2: Threatened and listed migratory species that may occur outside of the northern and southern operational area but within the potential area of impact

Category	Scientific Name	Common Name	Threatened Status	Migratory	Type of Presence
Cetaceans	*Balaenoptera physalus*	Fin Whale	Vulnerable	✓	Species or species habitat may occur within area
	Balaenoptera borealis	Sei Whale	Vulnerable	✓	Species or species habitat may occur within area
	Caperea marginata	Pygmy Right Whale	N/a	✓	Species or species habitat may occur within area
Sirenian	*Dugong dugon*	Dugong	N/a	✓	Species or species habitat known to occur within area
Marine Reptile	*Eretmochelys imbircata*	Hawksbill turtle	Vulnerable	✓	Species or species habitat likely to occur within area
Birds	*Diomedea exulans antipodensis*	Antipodean Albatross	Vulnerable	✓	Foraging, feeding or related behaviour likely to occur within area
	Halobaena caerulea	Blue Petrel	Vulnerable	×	Species or species habitat may occur within area
	Phoebetria fusca	Sooty Albatross	Vulnerable	✓	Species or species habitat may occur within area
	Sternula nereis nereis	Australian Fairy Tern	Vulnerable	×	Species or species habitat known to occur within area
	Anous stolidus	Common noddy	N/a	✓	Breeding known to occur within area
	Apus pacificus	Fork-tailed swift	N/a	✓	Species or species habitat known to occur within area
	Puffinus pacificus	Wedge-tailed shearwater	N/a	✓	Breeding known to occur within area
	Puffinus Tenuirostris	Short-tailed shearwater	N/a	✓	Breeding known to occur within area
	Sterna bengalensis	Lesser Crested tern	N/a	✓	Breeding known to occur within area
	Sterna dougallii	Roseate tern	N/a	✓	Breeding known to occur within area

Particular Values and Sensitivities

A number of protected areas and sensitivities were further identified within the wider environment:

- World Heritage Area:
    - Shark Bay World Heritage Area: included on the World Heritage List in 1991 primarily on the basis of three natural features: vast seagrass beds, dugong population, and stromatolites.
- Commonwealth Marine Reserves:
    - Bremer Commonwealth Marine Reserve
    - Eastern Recherche Commonwealth Marine Reserve
    - Gascoyne Commonwealth Marine Reserve
    - Geographe Commonwealth Marine Reserve
    - Perth Canyon Commonwealth Marine Reserve
    - Shark Bay Commonwealth Marine Reserve
    - South West Corner Commonwealth Marine Reserve
    - Two Rocks Commonwealth Marine Reserve
- Key Ecological Features:
    - Wallaby Saddle
    - Albany canyons group and adjacent shelf break
    - Cape Mentelle Upwelling
    - Commonwealth waters surrounding the Recherche Archipelago
    - Commonwealth waters within and adjacent to Geographe Bay
    - Commonwealth waters within and adjacent to the west coast inshore lagoons
    - West Coast Canyons and adjacent shelf break
    - Diamantina Fracture Zone
    - Naturaliste Plateau
- Listed Threatened Ecological Community (marine):

  - Coastal areas under regular or intermittent tidal influence - subtropical and temperate coastal saltmarsh

- Wetlands of International Importance (Ramsar):
  - Becher Point wetland
  - Peel-Yalgorup system
- Recreational and Commercial values:
- Tourism: Vessel and shoreline based activities such as fishing, whale watching diving and yachting with hotspots around Shark Bay, Jurien Bay, Perth, Albany and Esperance.
- Commercial fishing: widespread and varied with both shallow water diver based fisheries and deep water commercial fisheries

4 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS AND RISKS

4.1 ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

An Environmental Risk Assessment (ERA) has been undertaken to understand and manage the environmental risks associated with the Activity to a level that minimises impacts on the environment and meets the objectives of the Activity. The risk assessment has been undertaken to identify the sources of risk (events) and potential environmental impacts associated with the Activity and to assign a level of significance or risk to each impact. This subsequently assists in prioritising control measures to ensure that the environmental impacts are managed to as low as reasonably practicable (ALARP).

The risk has been measured in terms of likelihood and consequence, where consequence is defined as the outcome or impact of an event, and likelihood as a description of the probability or frequency of the identified event occurring with the specified consequence. The risk workshop was conducted for the Activity with key Murphy personnel, Community liaison personnel and Environmental advisers. A step by step process was then implemented as per **Figure 4-1**.

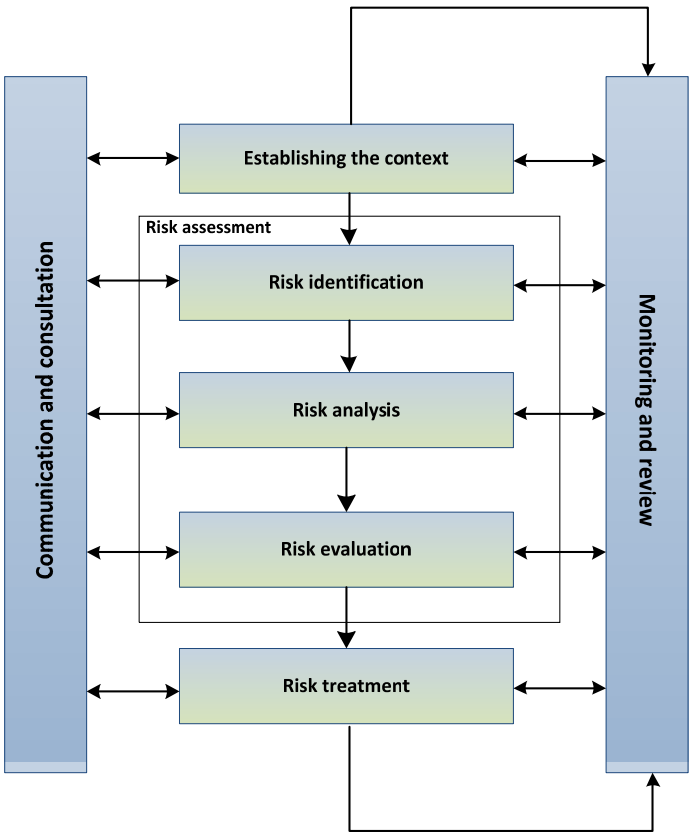

Figure 4-1: Key Steps Used for Risk Assessment[1]

[1] Source: Modified from AS/NZS ISO 31000:2009 Risk Management

4.2 IMPACT ANALYSIS

The impact analysis was undertaken for identified values and sensitivities within the environment potentially impacted by planned and unplanned hazards. Consequence levels for receptors due to planned events were assessed, should any of the outcomes be assessed as unacceptable, the event leading to the impact cannot progress as planned.

4.3 RISK ANALYSIS

During the risk workshop, the risk level was assessed as high, medium or low. Where risk is assessed as high, further consideration was given to control measures to prevent the risk or reduce its consequences to ensure reduction to ALARP. Table 4-1 provides a definition of the risk levels used during the risk workshop.

Table 4-1: Risk Acceptance and Management

Risk Level	Risk Management Requirements
High	Unacceptably high. This level of risk exposes Murphy to intolerable losses to people, Environment, Assets or reputation. The hazard(s) must be eliminated or its risk reduced to tolerable levels before commencing the Activity
Medium	Must be managed to ALARP. The hazard(s) must be managed to reduce the frequency and/or severity to ALARP. Risk reduction measures must be planned and documented
Low	Acceptable without requiring further action Corrections may be applied as resources allow

It should be noted that the WA-481-P drilling campaign is using a drilling rig and drilling techniques that have been assessed for HS and E risks many times already. The demonstration of ALARP therefore centres on whether those techniques are still ALARP in the environment within which the drilling campaign is planned. Following determination of ALARP, the environmental impact and risk of each identified hazard for the activity was assessed to ensure it was acceptable.

4.4 OVERALL CAMPAIGN ENVIRONMENTAL RISK ASSESSMENT

Murphy undertook an environmental risk assessment for routine and non-routine events for WA-481-P Exploration drilling campaign and associated activities following the above key steps.

The management and mitigation actions are used to ensure the potential environmental risks are reduced to ALARP. These actions have been developed based on Australian petroleum industry best practice environmental management guidelines, as defined by the APPEA Code of Environmental Practice (2008).

The key environmental hazards and control measures to be applied during the drilling campaign and its associated activities are summarised in **Table 4-2**. These are consistent with project specific performance outcomes, standards and criteria. All commitments associated with these will be used to reduce Environmental risk to ALARP and will be of an acceptable level.

Table 4-2: Summary of the environmental risk assessment

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
Planned Events							
Disturbance to marine fauna	Vessel collisions during transit between well locations and during drilling activity	Injury or death to marine fauna (cetaceans)	• Watch maintained at all times during MODU and vessel movements • Vessels will adhere to Part 8 of the EPBC regulations (vessels) which includes the following controls: • A vessel must not: ▪ Travel at greater than 6 knots within 300 m (caution zone) of a cetacean / whale shark known to be in the area; ▪ Approach closer than 100 m of a cetacean / whale shark known to be in the area; ▪ Change course or speed suddenly if a dolphin approaches the vessel or comes within 100 m • Vessel masters and MODU crew will participate in environmental induction • Any vessel interactions with marine fauna will be recorded and reported to DoE, a summary will be reported via the End of Activity Report • Vessel-whale interaction procedures and action flowchart	**Low**	**Low**	✓	✓
		Injury or death to other marine fauna (e.g. marine turtles, seabirds etc.)		**Low**	**Low**	✓	✓
	Light generation from MODU and vessels	Disturbance to behaviour/physiology of marine mammals, marine turtles and marine birds	• Lighting on vessel and for navigation/safety purposes only (some projected light onto waters) • Lighting maintained to ensure it meets safety and navigational requirements	**Low**	**Low**	✓	✓
				Low	**Low**	✓	✓
	Noise generation from vessels: machinery, VSP	Adverse disturbance / alarm behaviour and/or physiological damage to marine mammals	• Helicopters and vessels will be operated in accordance with Part 8 of EPBC Regulations • VSP activities will implement mitigation measures outlined in EPBC Act Policy Statement 2.1 Part A (DEWHA, 2008b) as appropriate for the activity(see below in section for details) • Vessel masters and MODU crew will participate in environmental induction • Any vessel interactions with marine fauna will be recorded and reported to	**Medium**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
			DoE, a summary will be reported via the End of Activity Report • Equipment will be appropriately maintained and selected to minimise noise emissions				
Disturbance to benthic habitats	Vessel anchoring (floating MODU)	Physical disturbance to seabed, potential localised damage or loss of infauna	• Mooring analysis is completed prior to MODU arrival on location • Lifting equipment certified and tested • No anchoring in operational area unless an emergency • All personnel will receive an environmental induction • Recording and reporting of any dropped objects • Retrieval of dropped objects where feasible • Murphy DMS details lifting procedures to be adhered to during Activity	**Medium**	**Low**	✓	✓
	Vessel anchoring (Jack-up MODU)			**N/a**	**N/a**		
	Dropped objects	Physical disturbance to seabed		**Low**	**Low**	✓	✓
Impacts and Risks to Water Quality	Discharge of ballast water from vessels (and/or bio-fouling of hulls)	Introduction and/or spread of invasive marine species (and potential displacement/impact to native species)	• Vessels adhere to requirements of the Department of Agriculture, Fisheries and Forestry (DAFF) *Australian Ballast Water Management*: • Mandatory ballast exchange in deep water where sediment is not visible; • Tank flooding and flushing at least three times during the exchange process; and • Documentation of all ballast exchange activities (including DAFF clearances). • For international vessels, the vessel will carry a current Statement of Compliance for International Anti-fouling Inspection Systems and will be assessed for bio-fouling risk prior to entry into Australian waters • Vessel Ballast Management Plan (BMP) compliant with Australian Ballast Water Management Requirements onboard vessels and DAFF requirements • Vessel anti-foulant systems are maintained • A biofouling vessel risk assessment (VRASS) is completed prior to mobilisation to Australia • MODU has AQIS clearance to be in Australian waters • Vessels will be sourced and work routinely from local ports (Geraldton and	**Medium**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
			Port Denison) where possible • No hull cleaning in the operational area • FishWatch will be contacted by phone (1800 815 507) and email (biosecurity@fish.wa.gov.au) should any known or suspected introduced aquatic pests be observed				
Marine pollution from routine drilling discharges	Continuous discharge of drill cuttings and drilling fluids from MODU when drilling	Temporary increase in water turbidity within vicinity of discharge point; seabed disturbance as cuttings settle smothering of the seabed in initial open well drilling phase and once settled	• All equipment utilised to process drill cuttings is maintained in accordance with Preventive Management System (PMS) • Cuttings management system inspected daily during drilling • Cuttings treatment system utilised • Quantities of mud and cement discharge are tracked as per DMS • Only WBM utilised during the drilling activity • Only low risk chemicals (rated Gold/Silver/D/E) are selected for use and discharge to the marine environment • Any concerns raised by stakeholders are addressed and closed out	**Low**	**Low**	✓	✓
Marine pollution from routine discharges	Continuous discharge of drill cuttings and drilling fluids from MODU when drilling	Temporary increase in water turbidity within vicinity of discharge point; seabed disturbance as cuttings settle smothering of the seabed in initial open well drilling phase and once settled	• All equipment utilised to process drill cuttings is maintained in accordance with Preventive Management System (PMS) • cuttings management system inspected daily during drilling • Cuttings treatment system utilised • Quantities of mud and cement discharge are tracked • Only WBM utilised during the drilling activity • Only low risk chemicals (rated Gold/Silver/D/E) are selected for use and discharge to the marine environment	**Low**	**Low**	✓	✓
	Discharge of greywater/sewage and /or putrescibles outside legal limits (e.g. >25mm	Reduction in water quality with potential impacts to marine fauna and benthic habitat	• Sewage and food waste is treated as per MARPOL compliant Garbage Management Plan • Sewage Treatment Plant is MARPOL Compliant (regulation 9 of MARPOL Annex IV) and is maintained in accordance with Preventive Maintenance System • Oily water discharged meets MARPOL Annex I regulations (<15ppm)	**Low**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
	maceration)		• If oily water discharge cannot meet MARPOL requirements, oily water is stored and transferred to a licensed carrier for disposal • Oil Record book maintained				
	Discharge of greywater/sewage and /or putrescibles within legal limits (e.g. <25mm maceration)		• Supply vessel is travelling at a speed of at least 7 knots when discharging oily water in accordance with MARPOL 73/78 Annex I and Annex II • Oily water discharges are made below the waterline in accordance with MARPOL 73/78 Annex I and Annex II • High standards of waste management maintained at all times on MODU and vessels • Permanent or temporary bunding is present on the MODU and vessels in appropriate locations, and temporary bunding (e.g. drip trays/pans) available for appropriate use in other areas • Equipment and machinery spaces are contained in fully bunded area with dedicated drains to bilge system. • Spill clean-up equipment readily available • Only chemicals which are rated as Gold/Silver/D/E are utilised if they will be discharged to the marine environment • Maintenance records for engines are current in accordance with PMS • Maintenance and calibration records for oily water systems are current	**Low**	**Low**	✓	✓
	Discharge of deck drainage and treated oily water (bilge water) outside legal limits (>15ppm oil in water)	Reduction in water quality with potential impacts to marine fauna and benthic habitat		**Low**	**Low**	✓	✓
	Discharge of deck drainage and treated oily water (bilge water) within legal limits (<15ppm oil in water)			**Low**	**Low**	✓	✓
Impacts to Air Quality	Emissions of exhaust gases and particulate matter from fossil fuel	Contribution of greenhouse gas (CO_2) to climate change; localised acidification of atmosphere (oxides of sulphur and nitrogen);	• MODU and vessel engines meet NOx emission levels as required by MARPOL 73/78 Annex VI • Use of marine gas oil (diesel) and not intermediate or heavy fuel oil • Emission producing equipment including engines are maintained	**Low**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
	combustion	haze (oxides of nitrogen) and potential human health impacts from particulates.	• No incineration will occur in the operational area • Ozone Depletion Substances managed appropriately				
Disturbance to social and community values	Adverse disturbance to Commercial Fishing	Impact to commercial fishing activities (including fish take, damage to equipment etc.) from timing/location Temporary navigation hazard	• MODU is identified on Navigation Charts via Notice to Mariners • Navigation equipment and vessel procedures compliant with all marine navigation and vessel safety requirements under the SOLAS 1974 and *Navigation Act 2012* • The AMSA Rescue Coordination Centre (RCC) notified of operational area, activity and duration prior to mobilisation, which triggers RCC to issue an AusCoast Warning • Consultation with relevant stakeholders undertaken prior to and throughout activity • 500 m exclusion zone maintained and enforced at all times around the MODU • Aviation consultation if aviation activities are required within restricted airspace • Marine Operations Adviser (MOA) participates in community awareness sessions and pertinent meetings to keep stakeholders informed and liaise with them regarding well locations • On-going consultation during operations is conducted	**Medium**	**Low**	✓	✓
	Adverse disturbance to Recreational Fishing	Impact to recreational fishing activities from timing/location		**Low**	**Low**	✓	✓
	Adverse disturbance to Tourism	Impact to tourism activities from timing/location		**Low**	**Low**	✓	✓
	Defence activities (e.g. WAXA)	Coordination of activity around DOD activities - potential conflict with defence activities		**Low**	**Low**	✓	✓
	Shipping activities	Disturbance to commercial and recreational shipping activities		**Low**	**Low**	✓	✓
	Disturbance to heritage values/sites	Disturbance to archaeological/historical sites		**N/a**	**N/a**		

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
		Disturbance to aboriginal cultural heritage sites and/or values		**N/a**	**N/a**		
Unplanned events							
Marine pollution from accidental discharges	Release of solid or hazardous wastes overboard	Reduction in water quality. Possible toxic effects to marine habitat and fauna. Potential ingestion or entanglement and physiological harm to fauna.	• Waste managed in accordance with MARPOL compliant waste management plan • No incineration will occur in operational area • Hazardous waste segregated, labelled and stored appropriately • Hazardous waste disposed of at appropriate onshore waste facility • Waste is segregated for re-use and recycling where practicable e.g. scrap metal • Disposal of any oil sludges/slops in port must be recorded in the vessel Oil Record Book • All waste returned to shore will be recorded in vessel waste log • Waste accidentally discharged overboard will be recorded and reported • Any equipment used to treat or transfer waste is maintained to reduce risk of breakdown and accidental discharge of solid wastes	**Low**	**Low**	✓	✓
	Accidental release overboard of domestic waste or inappropriate handling or disposal onshore	Marine pollution from inappropriate handling and disposal of waste. Long term liabilities associated with disposal method (e.g. sediment oil and water contamination). Inefficient waste reuse and recycling due to inappropriate waste separation.		**Low**	**Low**	✓	✓
	Loss of Containment : Refuelling (helicopter and MODU – Diesel Spills, from hose	Reduction in water quality Toxic effects to marine habitat and fauna	• All shipboard chemical spills and hydrocarbon spills managed in accordance with SOPEP/OPEP • SOPEP/OPEP tested in accordance with testing schedule • Onboard spill response executed in accordance with OPEP/SOPEP	**Low**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
	/ connection failure, or bunkering overflow<10 t		• Spill clean-up equipment readily available • Vessel Operating Procedures for the refuelling in place including deck drain check prior to fuel transfer, bunding checks, equipment inspection, dry break couplings and checklists • Deck drains are closed on the MODU prior to fuel transfer • Refuelling is commenced during daylight hours • Communication maintained throughout refuelling activity between MODU and support vessel				
	Loss of containment of diesel from vessel fuel tanks due to vessel-vessel or vessel-MODU collision within exclusion zone.	Reduction in water quality Toxic effects to marine habitat and fauna	• Communication and navigation aids on vessels are compliant with navigational requirements (SOLAS/Class/AMSA Regulations) and tested in accordance with PMS • Contractor selection process ensures contractor selected is competent • All shipboard chemical spills and hydrocarbon spills managed in accordance with SOPEP/OPEP • SOPEP/OPEP tested in accordance with testing schedule • Onboard spill response executed in accordance with OPEP/SOPEP • Fuel stored within dedicated storage areas and bunded • Consultation with relevant stakeholders undertaken prior to and throughout activity to communicate vessel movements • Vessel master ensures marine operations in proximity to the MODU are undertaken within vessel defined operating parameters	**Low**	**Low**	✓	✓
	Loss of containment: deck spills of oil, lubricants, detergents and chemicals to sea. Vessels and MODU Small	Reduction in water quality Toxic effects to marine habitat and fauna	• Oily water discharged meets MARPOL Annex I regulations (<15ppm) • Oily water discharge that cannot meet MARPOL requirements is stored and transferred to a licensed carrier for disposal • Oil Record book maintained • All shipboard chemical spills and hydrocarbon spills managed in accordance with SOPEP • SOPEP tested in accordance with testing schedule	**Low**	**Low**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
	containers, typically less than 205 L		• Permanent or temporary bunding is present on the MODU and vessels in appropriate locations, and temporary bunding (e.g. drip trays/pans) available for appropriate use in other areas • Vessel Operating Procedures for the activity in place including deck drain check prior to fuel transfer, bunding checks and checklists • Equipment and machinery spaces are contained in fully bunded area with dedicated drains to bilge system. • Spill clean-up equipment readily available • Pre-drill survey conducted • Spills which are classified as Tier 1 or above are managed in accordance with campaign specific OPEP • Incident reports completed for spill incidents • Bunding, containment areas, hoses and other equipment used when handling chemicals and hydrocarbons are maintained • maintenance and calibration records for oily water systems are current				
	Loss of hydrocarbons from subsea infrastructure through dropped objects	Reduction in water quality Toxic effects to marine habitat and fauna Physical effects of smothering on marine	N/a – as no existing infrastructure in the operational area	**N/a**	**N/a**		
	Loss of well control – uncontrolled release of hydrocarbons (crude and/or condensate	Reduction in water quality Toxic effects to marine habitat and fauna Physical effects of smothering on marine habitats and fauna	• Continuous monitoring for abnormal pressure during drilling and observation of drilling parameters • Job safety analysis completed for activities as required including two barrier policy • Murphy contractor selection process includes consideration of contractor environmental management systems • MODU safety case revision accepted by NOPSEMA	**Medium**	**Medium**	✓	✓

Hazard	Environmental aspect	Potential environmental impacts	Management controls	Unmitigated risk level	Residual risk level	Acceptable	ALARP
			• Weather and cyclone monitoring occurs throughout drilling programme • WOMP details specific well control standards for the activity to manage well blowout • Competent personnel • Regular well control drills • BOP function testing completed during campaign • Well control audit by third party • Two verified, independent barriers between the formation and the environment must be in place at all times and during all phases of the well life cycle • Capability for ROV control of BOP				
	Oil Spill response strategies	Disturbance to marine fauna and flora from increased vessel movements, unnecessary application of dispersants, inappropriate response implementation	• Campaign specific OPEP developed to provide Incident Management Team (IMT) with clear directions on response strategies • Net Environmental Benefit Analysis (NEBA) provides input to the IAP planning process to achieve the most effective response • Consultation undertaken with stakeholders potentially impacted by spill response activities and spill	**Low**	**Low**	✓	✓

5 Management Approach

The operation of WA-481-P Exploration Drilling activities will be managed in compliance with the Exploration Permit WA-481-P Drilling EP accepted by NOPSEMA under the OPGGS(E) Regulations (as amended 2014), other environmental legislation and Murphy's Health, Safety and Environmental Management System (HSEMS).

The objective of the EP is to ensure that potential adverse environmental impacts associated with operating the facility during both planned and accidental activities, are identified and assessed and to stipulate mitigation measures to avoid and/or reduce any adverse environmental impacts to ALARP.

For each environmental impact identified (and assessed in the Environmental Risk Assessment), the EP details specific performance outcomes, standards and procedures and identifies the range of controls to be implemented. The EP also identifies the specific measurement criteria and records to be kept to demonstrate the achievement of each performance outcome. Table 4-2 details the controls adopted during the activity for each hazard identified.

The goal of the environmental implementation strategy detailed in the EP is to direct, review and manage activities so that environmental impacts and risks are continually being reduced to ALARP, and performance outcomes and standards are met over the duration of the drilling activity. It includes the following;

1. Details on the Murphy HSE Management System and Contractor Management systems to be implemented
2. Key roles and responsibilities
3. Training and competencies for all personnel (Murphy and contractors)
4. Monitoring, auditing, record keeping and review
5. Emergency response including Oil Pollution Emergency Plan (OPEP)

5.1 Ongoing Monitoring of Environmental Performance

The reporting requirements for routine activities and environmental incidents (recordable and reportable) and reporting on overall compliance of the activity with the EP (e.g. end of activity report submitted to NOPSEMA) are also detailed. All records relevant to the EP must be stored and made available in accordance with Regulation 27 and 28 of the OPGGS(E)R. Murphy will generate and store records for a period of five years upon completion of the Activity including the items detailed in Regulation 27.

5.1.1 Audits

Murphy conducts reviews and audits of contractors at various stages including pre-award of contract, pre-activity and during activity, in accordance with its HSE management system and auditing procedure and aligns with the WA-481-P Drilling Campaign Contractor Management Plan (CMP).

Environmental audits of the MODU will be undertaken by Murphy drilling and HSE personnel during operations to ensure the program is being undertaken in accordance with the EP, and relevant legislation.

All audits will be documented and corrective actions will be tracked to completion in accordance with the Murphy Incident Reporting and Investigation Procedure.

Each contractor's internal environmental performance monitoring and auditing commitments are detailed in its HSE Management System, including identification and management of non-conformance; these processes ensure that continual monitoring and improvement occurs to ensure HSE performance meets the requirements of the organisation's HSE policies and Safety Case, as well as applicable requirements from the EP (as documented in the commitments register).

5.1.2 Review

Non-conformances comprise incidents, audit findings, failures to meet defined objectives and deviations from standards and procedures. Other potential improvements may be identified via observations of potential risk reductions or improved performance.

Depending on the nature and level of non-conformance, the issue may be recorded in the drilling contractor's and / or Murphy's non-conformance process (Master Corrective Actions Register).

In the event of identification of changes to scope (e.g. timing, location or operational details described in the EP) a risk assessment will be undertaken for any change in scope in order to assess potential impacts of the change. If the change represents a significant modification that is not provided for in the accepted EP in force for the Activity, a revision of the EP will be conducted in accordance with Regulation 17(6) of the Environment Regulations.

6 EMERGENCY RESPONSE

6.1 EMERGENCY RESPONSE PREPARATION

A program-specific Emergency Response Plan (ERP) will be developed. The ERP will contain instructions for MODU/ vessel emergency, medical emergency, search and rescue, reportable incidents, incident notification and contact information. The drilling contractor maintains primary responsibility for emergency response within the 500 m exclusion zone surrounding the MODU, as outlined in the MODU Safety Case, with emergency response support provided by Murphy as required e.g. additional logistics support. Emergency response roles and responsibilities between Murphy and the drilling contractor will be detailed further in the MODU's Safety Case.

The MODU and support vessels will have equipment aboard for responding to emergencies, including but not limited to medical equipment, fire-fighting equipment and oil spill equipment.

6.2 OIL POLLUTION EMERGENCY PLAN

The program-specific OPEP will serve as a stand-alone interface between spill response plans of Murphy and the drilling contractor and with relevant state (WA) and national plans. These relationships are set out in the OPEP.

Should any liquid hydrocarbon spill occur during drilling, the actual and potential impacts associated with such a spill will be managed in accordance with the procedures set out in the OPEP. The selection of an appropriate response strategy for the control and treatment of a spill will be dependent on a number of factors, such as prevailing weather, size and type of spill.

Fuel and oil spills from vessels will be managed according to the oil spill arrangements and procedures outlined in the vessel SOPEP.

A desk-based test of the OPEP will be carried out prior to mobilisation to the drilling location and a well containment exercise will also be conducted in Perth prior to the campaign to test deployment of well control equipment. Any lessons learned from the OPEP test and well containment exercise will be applied and the OPEP revised as required via the Murphy Corrective Actions Register.

In addition, regular incident response drills as outlined in the contractor's management systems and safety case will be completed on the MODU and support vessels which will aid in refreshing crew members in the use of emergency procedures and equipment. Well control drills will be conducted as outlined in the EP.

Murphy also engages and assesses capability of oil spill response service providers who will provide support in the event of oil spill. Further detail on service providers is provided in the OPEP with an initial assessment of whether a provider is critical or non-critical. Critical service providers will have contracts in place prior to the commencement of the campaign.

6.3 SPILL RESPONSE STRATEGIES AND ARRANGEMENTS

Murphy's response priorities in the event of a spill are based on the NatPlan objectives and include:

- Priority 1: Human life, health and personal safety
- Priority 2: Habitat and cultural resources
- Priority 3: Rare and endangered flora and fauna
- Priority 4: Commercial resources
- Priority 5: Amenities

6.4 CONTROL/RESPONSE AGENCY

The allocation of Control Agency is determined by the source and location of the spill and is summarised below.

Spills from the MODU when at drilling site

Murphy is the Control Agency for all spills to sea from the MODU while on location including those spills which threaten state waters, and therefore has the operational responsibility to respond to the oil spill in accordance with this OPEP.

Spills from the MODU when in transit to drilling site

When in transit to the drilling site the MODU is classified as a vessel. The Control Agency is determined as per text below.

Vessel Spills (Commonwealth Waters: >3nm from land)

AMSA is the Control Agency for all spills from vessels in Commonwealth Waters as per the *National Plan for Maritime Environmental Emergencies (NatPlan)*. AMSA's *National Marine Oil Spill Contingency Plan* is the operational response plan for the management of ship-sourced incidents. If requested by AMSA or the Vessel Master, Murphy will provide appropriate assistance. Spills from vessels within the 500 m zone of the MODU will be reported to NOPSEMA by Murphy in addition to any regulatory reports by the Vessel Master.

Vessel Spills Threatening State Waters (<3nm from land)

Murphy retains Control Agency (CA) role until AMSA and Murphy negotiates with DoT the CA role for any vessel spills in Commonwealth waters which threaten WA State waters.

Jurisdictional Authorities, Control and Support Agencies Overview

Table 6-1 Jurisdictional, Control and Support Authorities and Agencies

Location of Incident	Spill Source/ Location	Jurisdictional Authority	Control Agency	
			Tier 1	Tier 2/Tier 3
Commonwealth Waters (>3nm offshore)	MODU on Location	NOPSEMA	Murphy	
	Vessel at sea (or MODU in transit)	AMSA	Murphy until AMSA assumes command	
State Waters (<3nm from land)	Vessel at sea (or MODU in transit)	WA DoT	Murphy until WA DoT assumes command	
Support Agencies			Not Required	AMOSC, AMSA, WA DoT & Contracted Resources e.g. OSRL

6.5 ADDITIONAL SUPPORT

Murphy is a large organisation that operates internationally and is consistently trained in incident command systems. In short, Murphy has strength and depth to internally source incident management staffing requirements.

In the event of a spill requiring resources exceeding those of the Murphy organisation, additional personnel and resources will be obtained from:

- Third party contract services and spot hire;
- Industry organisations e.g. AMOSC; and
- Government support organisations e.g. AMSA and WA DoT

6.6 IMMEDIATE ACTIONS

Immediate actions have been planned to expedite oil spill response. These actions are to be undertaken while the incident action plan (IAP) is updated. Immediate actions are coordinated by the Incident Management Team (IMT), namely:

- Control the source;
- Implement first strike offshore containment and recovery effort;
- Implement first strike shoreline protection and deflection effort;
- Execute notification plan;
- Initiate monitor and evaluate plan ; and
- Inform oiled wildlife response (OWR) and shoreline clean-up resources to be on immediate stand-by.

Murphy's arrangements have been prepared for a set of response strategies identified as appropriate to mitigate impacts from credible worst case spills based on expected/calculated release rates, known information of hydrocarbon types and metocean conditions as outlined in the EP. A summary of applicability of oil spill response strategies is presented in **Table 6-2** depending on the release volumes and type of hydrocarbon. Furthermore Murphy has specific emergency response equipment on stand-by throughout certain aspects of the campaign.

Table 6-2: Summary of applicability of oil spill response strategies

Response strategy	Marine Diesel Fuel Oil (Tier 1 or 2)	Tier 3 (Corybas-1 Condensate)	Tier 3 (Dunsborough-1 Crude)
Immediate Actions	✔	✔	✔
Source control	✔	✔	✔
Mechanical Breakup	✔	✔	NS
Dispersant application	NS	NS	NS
Monitor & evaluate	✔	✔	✔
Offshore containment & recovery	NR	NS	✔
Shoreline protection and deflection	NS	✔	✔
In-situ burning	NS	NS	NS
Shoreline clean-up	NR	NR	✔
Oiled wildlife response	✔	✔	✔
Waste Management	✔	✔	✔
Operational and Scientific Monitoring (OSMP)	✔	✔	✔

NS: Not suitable NR: Not required

6.7 MONITORING – OSMP

Operational monitoring activities and scientific monitoring studies will be the principle tools to determine the extent, severity and persistence of environmental impacts from a hydrocarbon spill. In the event of a hydrocarbon spill incident, the Operational and Scientific Monitoring Plan (OSMP) will be implemented to:

- Determine whether their environmental protection goals have been met during a response (scientific monitoring activities), and
- Inform the IMT to plan appropriate response measures and to evaluate whether response strategy environmental goals are being achieved (operational monitoring activities).

Operational monitoring activities and scientific monitoring studies will be undertaken in the event of a Tier 2 or Tier 3 hydrocarbon spill incident at an appropriate scale:

- Type I (operational) monitoring must be undertaken during the spill response to support planning and operations. This type of monitoring is used to inform the IMT on the behaviour of the spilt hydrocarbons and to track the effectiveness of the response measures. Operational monitoring also informs scientific monitoring efforts of the temporal and spatial distributions of hydrocarbons to incorporate into planning, logistics and focusing study locations, and

- Type II (scientific) monitoring is used to characterise the short (impact) and long term (recovery) environmental effects from a hydrocarbon release incident. Scientific monitoring is also used to assess if oil spill response strategies have been effective in protecting/mitigating environmental sensitivities under threat from an incident.

An overview of Murphy's response is depicted in **Figure 6-1**. Following notification and initial classification of the spill, the response will be managed by allocated on-site personnel for small spills or an IMT for large spills. The IMT will coordinate effective implementation of response strategies as required.

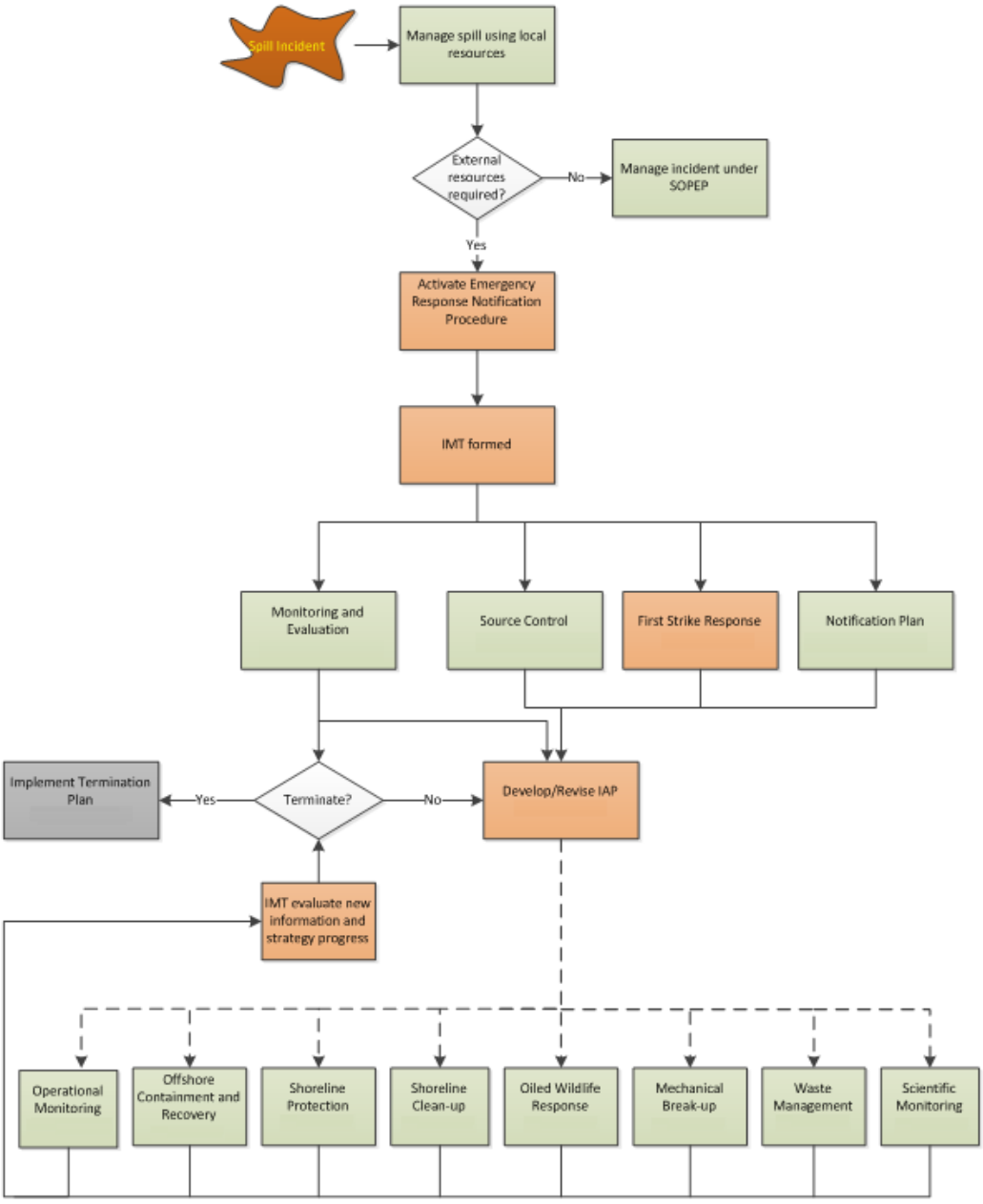

Figure 6-1 Response process for Murphy oil spill management

7 CONSULTATION

Consultation regarding the Activity commenced in July 2013, however Murphy have been in contact with stakeholders since September 2012 as a result of the previously completed seismic survey. To date Murphy has consulted more than 40 organisations and over 200 individuals.

Organisations formally consulted during the planning of the drilling have included all of those listed in **Table 7-1**. Murphy also undertakes regular engagement with political stakeholders whose areas of responsibility are relevant to the permit area. During consultation no matters of major concern were raised by stakeholders, for a summary of further queries raised by stakeholders please refer to **Table 7-2**.

A Marine Operations Advisor (MOA), an individual with experience of supporting oil and gas operators in a similar capacity in the area, was engaged by Murphy for the seismic campaign and will remain in the role for the duration of the drilling campaign.

To date, no significant objection has been raised in relation to the proposed Activity. The greatest potential impact on any stakeholder is considered to be disruption to the Western Rock Lobster Fishery given the density of fishing that occurs within permit WA-481-P. As of January 2013, the fishing season was declared to be open all year, as compared to previous years when there has been a defined open and closed season in different zones. This may also be the case in 2015 when this Activity will commence. While this means there is potential for fishermen to be out at any time of year, it also offers flexibility in engaging with fishermen and agreeing times and locations where the drilling can take place and which the fishermen agree to avoid.

By discussing the planned Activity with the fishermen in advance, supported by frequent information updates during the drilling regarding the MODU location including a plot of the drilling area over bathymetric charts and 72 hours' notice of changes to the proposed zoning, impacts on the fishing industry will be reduced to an acceptable level which is ALARP. Notices to Mariners will be issued by the Australian Hydrographic Office prior to and during the activity, notifying other sea users of the presence and location of the vessels. Other means of informing sea users include the update of a website (www.offshoredongaradrilling.com.au) throughout the activity informing them of progress of Activity and location of MODU. Letters will also be sent out with further information on well locations and timing once this is agreed.

Consultation will be an ongoing process throughout the Activity and Murphy will continually review its approach to the Activity in light of feedback received.

Table 7-1: Relevant stakeholders identified for WA-481-P Drilling Campaign

Stakeholders Identified	
Australian Fisheries Management Authority (AFMA) - Policy, Economics, Environment and Research	Shire of Irwin
Australian Hydrographic Service (AHS) (Dept of Defence)	Shire of Northampton
Australian Institute of Marine Science	WA Department of Environment Regulation
Australian Marine Mammal Centre	WA Dept of Fisheries - Perth
Australian Maritime Safety Authority	WA Dept of Fisheries - Geraldton
Border Protection Command (including Coastwatch)	WA Dept of Mines and Petroleum – Environment Section
BROLOS: Geraldton Fishermen's Co-operative Ltd	WA Dept of Mines and Petroleum – Petroleum Titles and Land Access Section
City of Geraldton	WA Department of Transport
Commonwealth Fisheries Association	WA Environmental Protection Authority
Department of Broadband, Communications and the Digital Economy	WA Fishing Industry Council
Dept of Defence Property Management Branch	WA Marine Parks and Reserves Authority
Dept of Sustainability, Environment, Water, Population and Communities – Offshore Petroleum Section	Western Rock Lobster Council WA Northern Trawl Owners Association All licence holders in State Fisheries: • Abrolhos Islands and Mid-West Trawl Fishery; • Abalone Managed Fishery; • Mackerel Fishery; • Marine Aquarium Fishery; • Specimen Shell Fishery; • West Coast Demersal Suite; • West Coast Deep Sea Crustacean Fishery; • West Coast Demersal Gillnet & Demersal Longline Fishery; • Octopus Fishery • Western Rock Lobster Fishery (Zones A and B); and • WA Charter Boat Industry.
Dept of Sustainability, Environment, Water, Population and Communities – Director of National Parks	
Dongara Professional Fishermen's Association	
FESA volunteer marine rescue services	
Geraldton and District Offshore Fishing Club	
Geraldton Port Authority	
Geraldton Professional Fishermen's' Association	
Jurien Charters	
Mid-West Development Commission	
Northern Fishing Companies Association, Austral Fisheries Pty Ltd	
RecFishWest	
Seasport Tackle Fishing Charters	
Shire of Carnamah	
Shire of Chapman Valley	
Shire of Coorow	
Shire of Dandaragan	

Table 7-2: Summary of Stakeholder Interests Raised

Stakeholder	Stakeholder Comments	Murphy Response and Follow-up
WA Department of Fisheries (DoF)	DoF requested specific items to be addressed: 1. Ongoing consultation with fishermen, including start and end dates, and spatial extent of activity. 2. DoF is to be kept informed of final timeframes and spatial extent of activities and spills within 24 hours of reporting incident to appropriate authority. 3. Collect baseline marine data against which post spill monitoring can be compared to determine nature and extent of impacts. 4. Requires all vessel managers and operators of immersible equipment review and minimise the risk of vessels/equipment translocating pests into/within WA waters. 5. Spawning grounds and nursery areas to be considered as provided by DoF and to develop strategies to mitigate impacts of spills to these areas.	1. Ongoing consultation with DoF and fisheries. 2. Consultation commitments outlined in EP. 3. Development of the OSMP results in database of data sources for spill impact monitoring. 4. Biosecurity risks identified in the EP. 5. Spawning areas and strategies to mitigate impacts of fish species included in the EP.
WA Department of Parks and Wildlife (DPaW)	DPaW comments include: 1. Comment provided on the number of ecologically sensitive receptors in the general area and advised Murphy that they could consult with them with regards to appropriate levels of baseline survey work. 2. Advised the baseline state of the environment is assumed to be pristine. 3. Provided advice on utilising DPaW in a response situation and provided the latest DPaW contact list.	1. Evidence of contracting strategy relevant to the nature and scale of the activity provided. 2. Murphy confirmed DPaW requests have been incorporated into OSMP. 3. Acknowledgement of reporting (e.g. DER Hazard branch) within EP in event of an incident.
Western Australian Fishing Industry Council (WAFIC)	WAFIC suggestions: 1. Further detail provided to fishermen prior to submission of EP. 2. Inclusion of consideration of feeding and spawning events and other environmental processes. 3. Request to be sent all consultation material provided to fishing enterprise stakeholders.	1. Consultation will continue leading up to the commencement of the activity to ensure that correct information is provided. 2. Murphy has completed an environmental impact assessment for the activity and includes feeding and spawning events. Consultation was also undertaken with DoF for further detail on potential impacts. 3. Consultation letters and engagement with communities will be cc'd to WAFIC when sent.

8 DETAILS OF TITLEHOLDER AND NOMINATED LIAISON PERSON

Further information about the WA-481-P activity can be obtained from:

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