BAROSSA APPRAISAL DRILLING CAMPAIGN

ENVIRONMENT PLAN SUMMARY

ALL/HSE/RPT/065

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Revision History

Revision	Date	Description	Preparer & Title	Reviewer & Title	Approver & Title *
0	23/11/2016	Submitted to NOPSEMA	ConocoPhillips	Dr Brenton Chatfield (Senior Environmental Specialist)	Dr Brenton Chatfield (Senior Environmental Specialist)
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1. INTRODUCTION

1.1 OVERVIEW

ConocoPhillips Australia Exploration Pty Ltd (ConocoPhillips), as titleholder, proposes to drill, evaluate, test and abandon hydrocarbon appraisal wells in petroleum retention lease area NT/RL5 (NT/RL5), to further define the hydrocarbon resources within the Barossa gas field. A total of up to three appraisal wells may be drilled. NT/RL5 is located in the Bonaparte Basin, solely in Commonwealth waters, approximately 300 kilometres (km) offshore of Darwin, Northern Territory (NT) (**Figure 1-1**).

The drilling campaign will consist of the drilling, evaluation, testing and abandonment of three appraisal wells in NT/RL5. The activity will be undertaken by a mobile offshore drilling unit (MODU), supported by up to three support vessels. Refer to **Section 2** for a detailed description of the activity.

1.2 DESCRIPTION OF THE TITLEHOLDER

ConocoPhillips (United States) is the world's largest independent exploration and production company. Through various Australia registered company subsidiaries, ConocoPhillips undertakes exploration activities and holds and operates assets in the Timor Sea, NT, Western Australia (WA) and Queensland. ConocoPhillips has been operating in Australia since the mid-1970s and its activities in Australia are currently managed, operated and administered through its Australian Business Units (ABUs); Australia Business Unit-West (ABU-W) and Australia Business Unit-East (ABU-E). ABU-W is responsible for the Bayu-Undan gas condensate field in the Timor Sea, the Darwin liquefied natural gas (LNG) plant in the NT and a 500 km subsea pipeline that links the two facilities. ABU-E is responsible for the Australia Pacific LNG facilities located on Curtis Island. ConocoPhillips Australia Exploration Pty Ltd (ConocoPhillips), the operator of NT/RL5, has previously successfully undertaken three separate drilling campaigns in the current retention lease area of NT/RL5 as well as three-dimensional seismic survey across NT/RL5 and some adjacent open acreage.

Further information about ConocoPhillips in Australia can be found at: http://www.conocophillips.com.au.

Details of the titleholder and liaison person are described below in accordance with Regulation 15 of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (E) Regulations). ConocoPhillips will notify NOPSEMA should there be a change in the titleholder, a change in the titleholder's nominated liaison person or a change in the contact details for either the titleholder or the liaison person.

1.2.1 Titleholder

ConocoPhillips Australia Exploration Pty Ltd

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Phone: + 61 8 9423 6666

Australian company number: 109 974 932

Santos Offshore Pty Ltd

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Australian company number: 005 475 589

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1.2.2 Liaison person

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1.2.3 Relevant parties and interfaces

ConocoPhillips (37.5%) is the operator of NT/RL5 with co-venturers SK E&S Australia Pty Ltd (37.5%), an affiliate of South Korean conglomerate SK Group, and Santos Offshore Pty Ltd (25%).

While each co-venturer participant of this activity is the petroleum titleholder (i.e. registered holder of the petroleum retention lease area), ConocoPhillips has been nominated as the nominee titleholder for taking eligible voluntary actions for the activity, such as making submissions, under Subsection 775B of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGS Act).

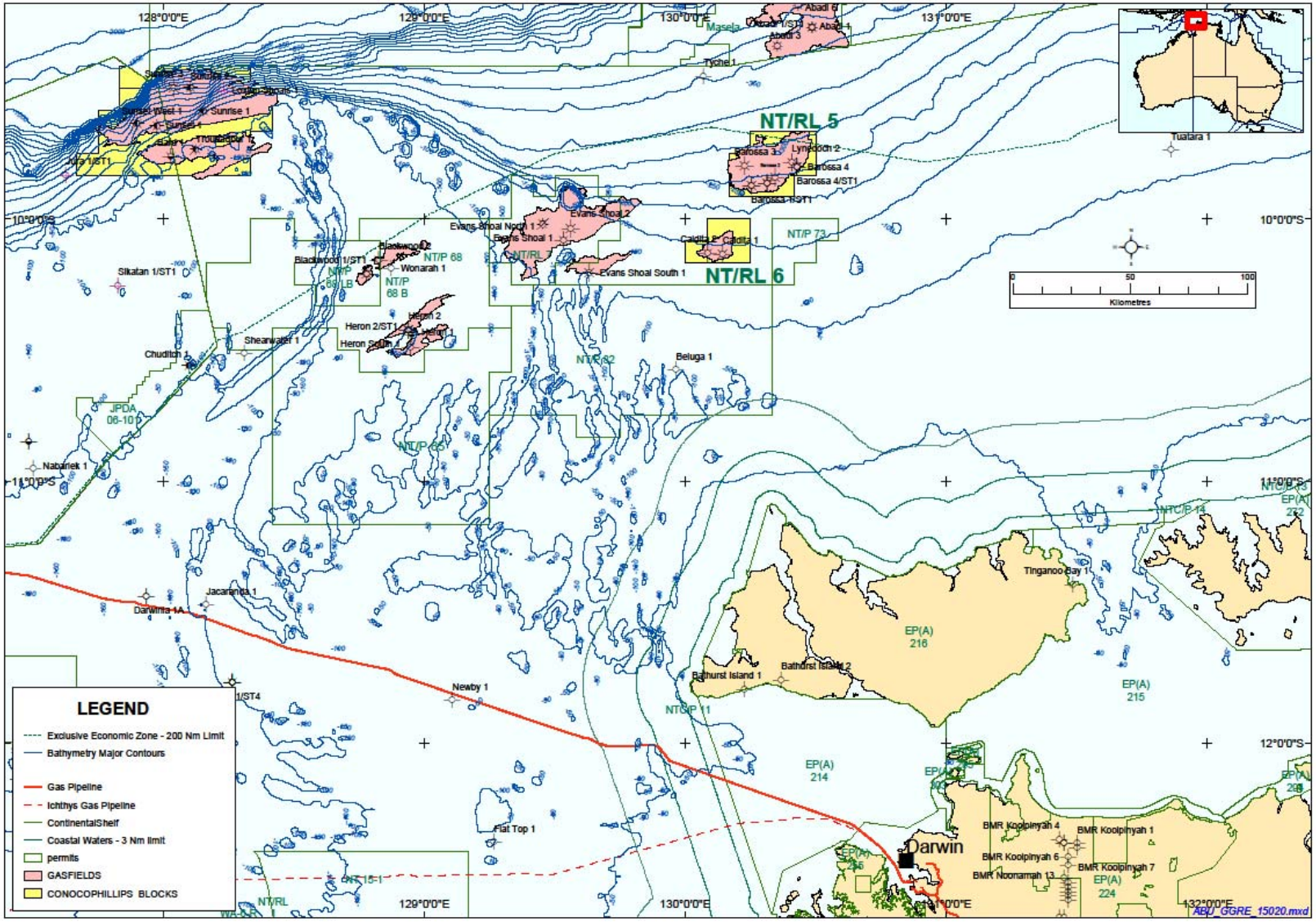


Figure 1-1: ConocoPhillips petroleum retention lease areas, including the Barossa gas field (NT/RL5)

2. DESCRIPTION OF THE ACTIVITIY

An overview of the drilling campaign is detailed in **Table 2-1**.

Table 2-1: Activity summary

Petroleum retention lease	NT/RL5
Location	Bonaparte Basin, Timor Sea
Number of appraisal wells	Up to three (3) wells may be drilled in NT/RL5
Proposed schedule	Three appraisal wells to be drilled between 1 December 2016 –30 June 2018
Well water depth	Approximately 120 m - 350 m
Drill rig type	MODU - moored or dynamic positioning (DP) semi-submersible
Vessels	Typically, at least three support vessels consisting of a combination of anchor-handling support vessels (moored semi-submersible MODU only), and platform support vessels
Key activities	Drilling of the upper well sections Installation of blowout preventer (BOP) and marine riser Drilling of the lower well sections Well testing and evaluation (may comprise vertical seismic profiling) Well abandonment

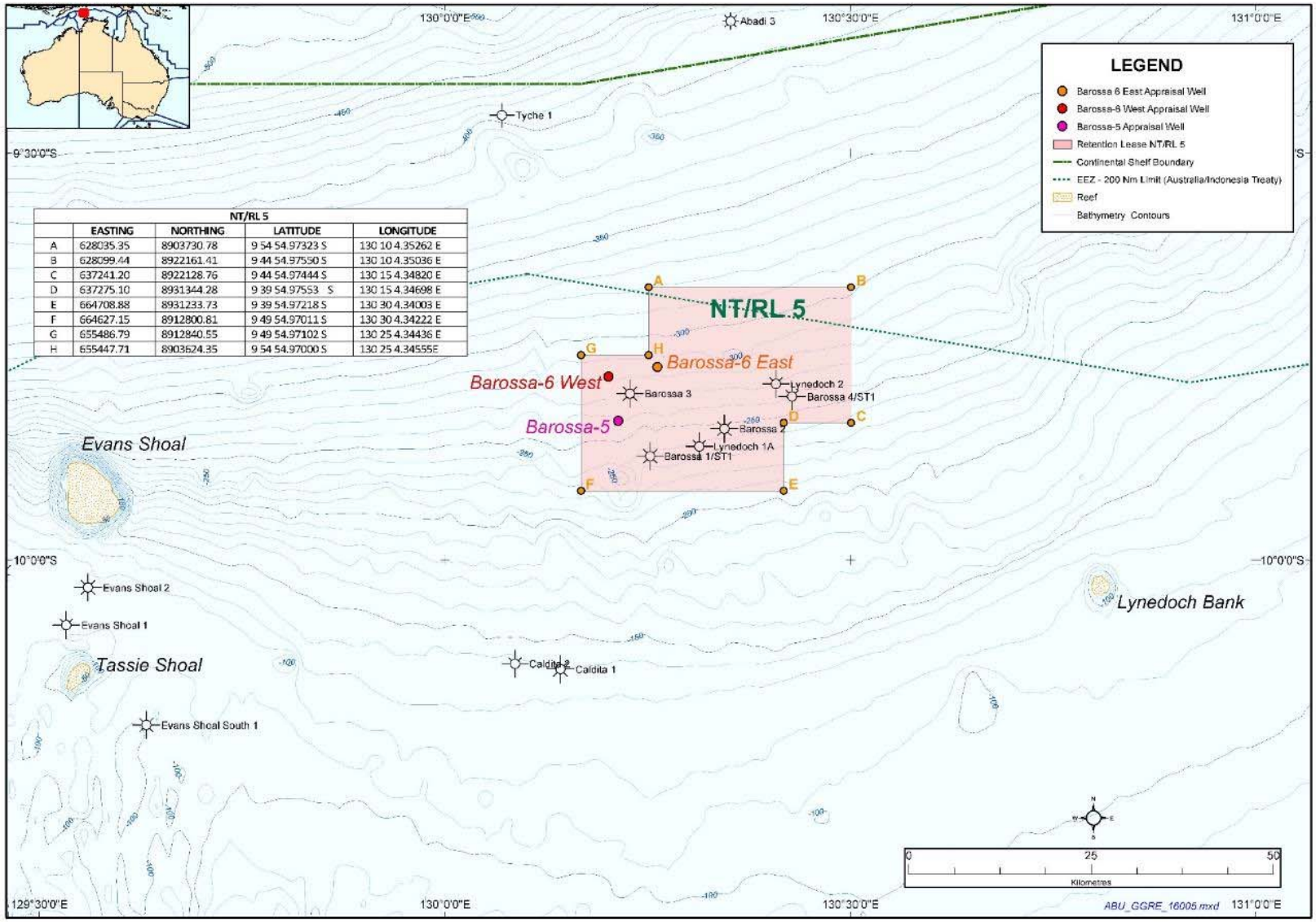
2.1 LOCATION OF THE ACTIVITY

The appraisal wells will be drilled within the petroleum retention lease area NT/RL5 which is located in Commonwealth waters within the Bonaparte Basin. NT/RL5 is located approximately 300 km north of Darwin (**Figure 1-1**) and covers an area of approximately 847 Sq Kms. The size of the actual activity footprint associated with drilling the wells will be significantly smaller, i.e. < 1% of the total size of the NT/RL5. Water depths at the proposed wells range between approximately 120 m - 350 m. Provisional well locations are provided in **Table 2-2** and shown in **Figure 2-1**.

The operational area is the geographic extent of the drilling campaign, which is considered and risk assessed in this EP. The operational area is defined based on a circle with a 1,500 m radius around the Mobile Offshore Drilling Unit (MODU), when located at the well centre. This radius has been chosen as it encompasses both the 500 m petroleum safety zone (PSZ) around the MODU and accommodates the installation of the anchor moorings and support vessel movements in the immediate vicinity of the MODU.

Table 2-2: Provisional well locations – NT/RL5

Well name	Latitude	Longitude
Barossa-5	*9° 49' 46.03" S*	*130° 12' 49.87" E*
Barossa-6 West	*9° 46' 29.16" S*	*130° 12' 07.18" E*
Barossa-6 East	*9° 45' 47.14" S*	*130° 15' 43.62" E*



NT/RL 5				
	EASTING	NORTHING	LATITUDE	LONGITUDE
A	628035.35	8903730.78	9 54 54.97323 S	130 10 4.35262 E
B	628099.44	8922161.41	9 44 54.97550 S	130 10 4.35036 E
C	637241.20	8922128.76	9 44 54.97444 S	130 15 4.34820 E
D	637275.10	8931344.28	9 39 54.97553 S	130 15 4.34698 E
E	664708.88	8931233.73	9 39 54.97218 S	130 30 4.34003 E
F	664627.15	8912800.81	9 49 54.97011 S	130 30 4.34222 E
G	655486.79	8912840.55	9 49 54.97102 S	130 25 4.34436 E
H	655447.71	8903624.35	9 54 54.97000 S	130 25 4.34555E

Figure 2-1: Retention lease area and provisional appraisal well locations

2.2 SCHEDULE

The drilling campaign is expected to include up to three wells, with drilling of each well expected to take approximately 104 days (including moving the MODU between wells, anchoring, well testing/evaluation and well abandonment).

The drilling campaign could commence as early as 1 December 2016, but this is subject to weather and MODU availability. It is anticipated that the drilling campaign would be completed within approximately 18 months, noting that the exact timing for completion is subject to weather conditions and operational efficiencies.

2.3 DRILLING CAMPAIGN ACTIVITIES

The appraisal wells will be drilled using anchored or dynamically positioned (DP) semi-submersible mobile offshore drilling unit (MODU) to target depths approximately 4,000 m below the seabed.

For the purposes of this summary, all of the potential drilling rig configurations are collectively referred to as a 'MODU' for the remainder of the document, unless specific differentiation is required.

While on location, the 500 m radius petroleum safety zone (PSZ) around the MODU will be maintained and managed by the MODU Offshore Installation Manager (OIM) to control activities (e.g. vessel movements) and reduce the risk of marine collisions, as required under the OPGGS Act. The Australian Maritime Safety Authority (AMSA) Rescue Coordination Centre (RCC) and any relevant stakeholders will be notified of the drilling campaign activities.

While the details of the semi-submersible MODU are yet to be confirmed, general design features of environmental note include:

- typical maximum personnel on board of up to 200 persons
- a DP MODU will generally have at least four thrusters, located on the bottom of the pontoons. However, if a DP MODU is contracted, the DP thrusters are likely to be removed or locked out for the duration of the drilling campaign
- well control equipment consisting of a 10,000 or 15,000 pounds per square inch (psi) design rated BOP system with associated equipment which can be operated from the main BOP control station as well as from remote stations
- additional safety features include closed circuit television monitoring of the drill floor and slip joint, and mud seal pressure monitor. A remotely operated vehicle (ROV) will be used to monitor relevant subsea equipment and drilling activities
- mud system capable of handling completion fluids, water-based and synthetic based drilling fluids
- main power generation system comprising diesel generators
- bulk diesel fuel storage is provided in the lower sections of the columns and pontoons of the MODU
- bulk storage of drill water and brine is provided in the columns and pontoons of the MODU.

Table 2-3: Indicative seabed disturbance from moored semi-submersible MODU mooring system

Wellhead	
Surface hole area	0.7 m^2 (36" – surface hole)
Mooring system (moored semi-submersible MODU)	
Approximate chain diameter	76 mm
Approximate grounded chain length (depends on water depth and conditions)	150 m to 550 m per chain
Approximate chain disturbance area (total per well)	135 to 500 m^2 (0.0135 to 0.0500 ha)
Approximate anchor area	22 m^2 per anchor
Approximate number of anchors	up to 12
Approximate anchor disturbance area	176 m^2 (0.0176 ha)
Approximate total disturbance for mooring system*	267 to 510 m^2 (0.0267 ha-0.051 ha)

If a moored semi-submersible MODU is used for the drilling campaign, it would be held in position with a mooring spread, typically consisting of eight mooring lines with an anchor fitted to the end of each line and set into the seabed. **Table 2-3** outlines the potential area of seabed disturbance from a typical mooring spread.

The MODU and support vessels will have operational safety and navigational lighting in place, as specified by safety case assessments under the OPGGS Act and relevant legislation, specifically the *Navigation Act 2012*.

The MODU will be supported by up to three support vessels operating out of Darwin, consisting of a combination of anchor-handling support vessels (AHSV) for moving the MODU (semi-submersible MODU only) and platform support vessels (PSV). Refueling/bunkering may be required at sea to allow operational requirements to be met (e.g. during an extended MODU tow) and will be undertaken in accordance with a permit to work (PTW) system defined in the EP.

Helicopters based in Darwin will be used to transfer personnel to and from the MODU. Helicopter transfers will occur several days per week, with the frequency depending on the MODU manning and operational requirements.

2.3.1 Drilling fluid selection

Drilling fluids for which the chemical products meet at least one of the following environmental criteria are considered suitable for use and can be discharged to the marine environment:

- rated as Gold or Silver under OCNS CHARM model.
- if not rated under the CHARM model, has an OCNS group rating of D or E.

The use of non-rated drilling fluids will only be considered following approval from the Lead Drilling Engineer, in consultation with the ABU-W Environmental Supervisor, after the completion of an environmental risk assessment. ConocoPhillips will utilise chemical products considered to be ALARP following the risk assessment.

2.3.2 Well evaluation

Vertical seismic profiling

Following the drilling of each appraisal well, the near-well bore geology may be imaged using vertical seismic profiling (VSP). This technique involves deploying a sound source from the MODU below the water surface, while receivers are positioned at different depths within the drilled hole. VSP provides a seismic image of the geology in the immediate vicinity of the well, with the survey taking approximately eight hours per well (12 hours maximum) (i.e. < three days in total over the duration of the activity). The sound source used for VSP will be an airgun array of approximately 450 cubic inch (three by 150 cubic inch) capacity.

Well testing

Well flow testing may be undertaken on individual appraisal wells, depending on the results of the well evaluation. Well testing will involve flowing the well fluids through temporary test equipment located on the MODU. It is anticipated that up to seven days of well test flaring will be needed for each of the wells drilled in NT/RL5.

Well testing will be undertaken in accordance with the accepted Well Operations Management Plan (WOMP) as required under the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011 (Commonwealth) (OPGGS (RMA) Regulations) and the accepted MODU Safety Case Revision for Well Testing as required under the Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 (OPGGS(S).

2.3.3 Well abandonment

All wells drilled in the drilling campaign will be permanently plugged and abandoned (P&A) after completion of data acquisition and evaluation programs, in accordance with the OPGGS Act and OPGGS (RMA) Regulations. P&A operations will involve setting a series of cement and mechanical plugs within the wellbore; plugs above the hydrocarbon bearing interval, at appropriate barrier depths in the well and at

the surface. For each well, the casing will be cut below the seabed and the wellhead will be removed prior to completion of the drilling campaign.

2.4 OTHER MODU AND SUPPORT VESSEL ACTIVITIES

The MODU and support vessels will generate a number of routine/planned discharges and emissions during the drilling campaign, including the following:

- cooling water discharges
- reverse osmosis (RO) brine discharges
- wastewater discharges (including sewage, grey-water, bilge and deck runoff)
- hazardous and non-hazardous solid wastes
- atmospheric emissions

3. DESCRIPTION OF THE ENVIRONMENT

In accordance with Regulation 13(2) and 13(3) of the OPGGS (E) Regulations, a description of the existing environment, including details of any particular relevant values and sensitivities[1], that may be affected (environment that may be affected - EMBA) by the drilling campaign is described in this section. The EMBA encompasses the marine environment that could be affected by both routine/planned and non-routine/unplanned activities. The boundary of the EMBA has been defined using the adverse exposure zone (as derived from stochastic modelling) for entrained hydrocarbons (i.e. moderate threshold of 100 parts per billion (ppb)) from the credible hydrocarbon spill scenario of a long-term well blowout (**Section 4.3.5**), as this represents the largest geographic extent of the environment that may be affected by the drilling campaign activities.

3.1 REGIONAL SETTING

NT/RL5 is located within Commonwealth waters of the Timor Sea, approximately 150 km north of the Tiwi Islands (Melville Island and Bathurst Island) and approximately 300 km north of Darwin, in water depths of approximately 120 m to 350 m.

NT/RL5 is located within the North Marine Region (NMR), as defined in DoE's Marine Bioregional Plan for the North Marine Region (formerly the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

The key physical characteristics of the NMR include:

- a wide continental shelf, with water depths averaging less than 70 m
- the Van Diemen Rise, which provides an important link between the Joseph Bonaparte Gulf and the Timor Trough. This feature includes a range of geomorphological features, such as shelves, shoals, banks, terraces and valleys
- a series of shallow calcium carbonate-based canyons (approximately 80 m - 100 m deep and 20 km wide) in the northern section of the region
- numerous limestone pinnacles within the Bonaparte Basin that can extend up to tens of kilometres in length and width
- the Arafura Shelf, which is up to 350 km wide and has an average water depth of 50 m - 80 m. The shelf is characterised by features such as canyons and terraces
- reefs around the perimeter of the Gulf of Carpentaria
- the Gulf of Carpentaria coastal zone, which is characterised by comparatively high levels of productivity and biodiversity
- currents driven predominantly by strong winds and tides.

[1] Also referred to in the Environment Plan as receptors, i.e. relevant natural, socio-economic and cultural features of the environment.

3.2 BAROSSA MARINE STUDIES PROGRAM

ConocoPhillips has undertaken an extensive and robust environmental baseline studies program to characterise the existing marine environment within and surrounding NT/RL5, within which the Barossa field is located. The baseline studies have involved the collection of detailed baseline data over 12 months (July 2014 to July 2015) in order to capture seasonal variability in the area. Field based studies included metocean, water and sediment quality, benthic habitat and underwater noise data collection.

The results of these baseline studies have been used to inform the understanding of the existing baseline environment.

3.3 PHYSICAL ENVIRONMENT

The North West Marine Region (NWMR) experiences a tropical climate and a distinct summer monsoonal “wet” season from October to March followed by a typically cooler winter “dry” season from April to September. During the wet season the south-westerly winds can generate thunderstorm activity, high rainfall and cyclones, while in the dry season the easterly winds result in dry and warm conditions with very little rainfall. In addition, the region may also be subject to tropical squalls which are characterised by very high short period wind gusts.

The variation in seasonal air temperatures in the region is small. The mean maximum summer and winter air temperatures recorded at Melville Island (the closest meteorological station to NT/RL5) range between 32.8ºC in December to 31.2ºC in June/July. The annual maximum temperature is 32.4ºC and the minimum temperature 22.2ºC. The average tropical cyclone frequency for the Timor Sea is one cyclone per year.

The large scale currents of the Timor Sea are dominated by the Indonesian Throughflow (ITF) current system. This current is generally strongest during the south-east monsoon from May to September. The ITF brings warm, low salinity, oligotrophic waters through a complex system of currents, linking the Pacific and Indian Ocean via the Indonesian Archipelago. The strength of the ITF fluctuates seasonally, reaching maximum strength during the south-east monsoon, and weakening during the north-west monsoon. The Holloway Current, a relatively narrow boundary current that flows along the north-west shelf of Australia between 100 m-200 m depth, also influences the seas in the area. The direction of the current changes seasonally with the monsoon, flowing towards the north-east in summer and the south-west in winter.

Tide activity across the region is complex, resulting in a combination of both diurnal and semi-diurnal tides. Tidal activity is typically dominated by semi diurnal tides, with two daily high tides and two daily low tides. The mean tidal range is 2.2 m at spring tides and 0.3 m at neaps. Measurements of ocean currents at Tassie Shoal show water movement is strongly tidal with typical speeds in the range of 0.1 to 0.4 m/s and peak speeds up to 0.8 m/s. Waves in the region are composed of locally generated sea waves in response to local wind activity and swell waves created by distant wind activity. Wave height is generally between 0.6 m-0.8 m, coming from the west in the wet season and from the east in the dry season. Cyclones and tropical storms can greatly increase wave heights by up to 8 m in the outer Timor Sea during cyclone season.

Surface water temperatures in the area generally ranged between 27°C-30°C while temperatures above the seabed ranged between 11°C-13°C. Thermoclines were encountered at all sites sampled during the Barossa Marine Studies Program, indicating the potential presence of separate subsurface current streams. The thermocline (considered to lie in the zone in which the greatest temperature decrease occurs) was closest to the surface during the wet season (between 40 m–70 m) and deeper in the water column during the dry and transitional seasons (between 70 m–150 m and between 100 m–150 m respectively). This is thought to be due to strong, continual winds during the dry and transitional seasons causing the depth of the mixed layer to be greater. Extreme weather events, such as cyclones, also promote mixing of water layers across the thermocline.

The water depths in NT/RL5 are between approximately 120 m - 350 m. The seabed within the area is generally flat as the field is located on a plain feature that is devoid of any significant bathymetric features. In general, the benthic habitats observed in NT/RL5 were typical of those expected in offshore environments and were consistent with studies conducted both in areas with similar features and in areas of a similar geographic location.

Water quality studies conducted as part of the Barossa Marine Studies Program, found that temperature, pH, salinity and dissolved oxygen remained relatively consistent throughout the seasons. The pH in the

surface waters ranged from 8.1-8.3 pH units while the pH at the seabed was ranged from 7.7-7.9 pH units. There was little difference in salinity between the surface water and the bottom water at all sites during all seasons. Salinity at the surface waters were approximately 34 parts per thousand (ppt), which was approximately 0.7 ppt lower than the bottom water of the deepest sites. Dissolved oxygen was high in the surface water (90%-100% saturation at all sites for each season) decreasing to approximately 35% saturation in the bottom water of the deepest sites. Turbidity was very low throughout the water column and displayed minimal seasonal variability. Nutrient concentrations increase with depth and light penetration is greater in summer therefore the depth of maximum productivity would be greater in summer than winter.

Sediments sampled showed a gradual transition in composition over large spatial areas, particularly between the deep open waters within NT/RL5 and the shallow shoals. In general, sediments transitioned from the finer deep sediments in NT/RL5 to the coarse shallow water sediments (gravelly sands) around the shoals/banks. The sediment types surveyed are considered comparable with found in other studies undertaken in the Eastern Joseph Bonaparte Gulf and Timor Sea.

A long-term (12 months, July 2014 – July 2015) baseline acoustic environment study program within the Barossa field and surrounds was conducted, which included noise moorings located in NT/RL5.

Key conclusions from the results of the baseline noise study were:

- The soundscape was dominated by naturally occurring sources (i.e. wind and waves), with some contributions from biological sources (primarily fish).
- There were minor daily variations in ambient sound levels (due to fish chorusing events), with weather events being the main influence.
- The ambient sound levels were typical of shallow ocean basins with low anthropogenic sound presence.

In terms of biological presence, it was determined that:

- Omura's whale (or dwarf fin whale - *Balaenoptera omurai*) were frequently present in the area between April and September 2015, with a peak in June and July.
- Pygmy blue whales (*B. musculus brevicauda*) were detected in August 2014 and between late May to July 2015, during their northward migration.
- Bryde's whales were present in the region from January to early October
- Humpback whales (*Megaptera novaeangliae*) were absent from the area. These data align with currently recognised migration patterns for this species.
- Fish chorusing at dawn and dusk occurred throughout the year.

3.4 BIOLOGICAL ENVIRONMENT

3.4.1 EPBC matters of national environmental significance (MNES)

A search of the online EPBC Act Protected Matters Database (dated 31 October 2016) identified 25 listed threatened and 51 listed migratory species that may occur within the EMBA. The results of the Protected Matters search are summarised in **Table 4-2**.

3.4.2 Habitats and communities

3.4.2.1 EPBC listed critical habitat or threatened ecological communities

No critical habitats or threatened ecological communities, as listed under the EPBC Act, are known to occur within NT/RL5 or the EMBA, as indicated by the EPBC Act Protected Matters search.

3.4.2.2 Intertidal and benthic primary producers

Coral reef

There are a number of coral reef habitats within the NMR. Lynedoch Bank (approximately 56 km south-east of the centrepoint of NT/RL5) and Evans Shoal (approximately 81 km west) and Tassie Shoal (approximately 89 km to the south-west) are the nearest coral reef habitats from NT/RL5.

Within the EMBA, coral reef habitats are associated with Ashmore Reef, Hibernia Reef, Cartier Island,

Seringapatam Reef and various shoals/banks.

Seagrass/macroalgae

Seagrass and macroalgae communities provide important habitat for various marine species. Sufficient light is required to support these communities, a characteristic that is absent from the deep offshore waters in NT/RL5 (approximately 120 m to 350 m). Therefore, these benthic primary producer groups do not occur in NT/RL5.

These communities occur within the EMBA, such as the offshore shoals/banks, Ashmore Reef, Hibernia Reef, Cartier Island and Seringapatam Reef and Commonwealth Marine Reserves.

Mangroves/saltmarshes

There are no shorelines within NT/RL5 that support mangroves or saltmarsh communities. However, within the EMBA these communities occur along sections of the north Kimberley coastline.

3.4.2.3 Other benthic communities

The benthic habitat within NT/RL5 was surveyed as part of the Barossa Marine Studies Program. The most common benthic macrofauna groups, albeit recorded in relatively low numbers, included octocorals (particularly sea pens) and motile decapod crustaceans (mostly prawns and squat lobsters). Other biota observed included anemones, starfish, brittle star and soft corals. The frequent bioturbations (burrows, mounds and tracks) observed suggest a number of burrow-living decapods (such as prawns) may be present.

Infaunal communities were characterised by burrowing taxa, namely foraminifera (an amoeboid protist), nematodes, *Bregmaceros sp*. (codlets), tube-forming onuphid polychaetes and the superb nut shell *Ennucula superba*. The communities were characterised by low abundance (5 - 15 individuals) and species diversity (5 - 9 taxa). The most commonly represented phylum within the infaunal communities were Annelida (eight individuals), Mollusca and Foraminifera (seven individuals) and Crustacea (six individuals). Due to the lack of hard substrate, the associated epibenthos was expected to be sparse.

Within the EMBA, diverse benthic communities are commonly associated with shoals, banks, offshore islands and other seabed features (e.g. shelf breaks, pinnacles etc.).

3.4.2.4 Other communities/habitats

Plankton

During the Barossa Marine Studies Program, phytoplankton and zooplankton species were sampled during the field surveys. Diatoms (Bacillariophyceae), blue-green algae (Cyanobacteria) and dinoflagellates (Dinophyceae) were recorded in all seasons, cryptomonads (Crytophyceae) in two seasons (summer and autumn), and silicoflagellates (Dictyochophyceae) and green algae (Chlorophyceae) in only a single season (winter and autumn respectively). The zooplankton assemblage composition was similar across the seasons, with summer and winter being most similar. The summer survey recorded the most diverse assemblage (14 Classes of organisms) while autumn was the least diverse (eight Classes). Across all seasons copepods displayed the highest number of different species whereas most other Classes contained only one species.

Pelagic and demersal fish communities

Numerous pelagic and demersal fish communities occur within the NMR and NWMR. Fish occupy a range of habitats, such as coral reefs to open offshore waters, and play an important ecological role with many species being of conservation value and important for commercial and recreational fishing.

The continental slope demersal fish communities key ecological feature (KEF) intersects the EMBA.

3.4.3 Marine fauna of conservation significance

3.4.3.1 Threatened and migratory fauna

The EPBC Act Protected Matters database search identified 59 EPBC Act listed marine species as potentially occurring within EMBA. Of those listed 25 are considered threatened species and 51 are considered migratory (**Table 3-1**).

Table 3-1: EPBC threatened and listed migratory marine species potentially occurring within or adjacent to NT/RL5

Scientific name	Common name	Threatened status	Listed as migratory
Cetaceans and Sirenians			
Balaenoptera borealis	Sei whale	Vulnerable	x
Balaenoptera physalus	Fin whale	Vulnerable	x
Balaenoptera musculus	Blue whale	Endangered	x
Megaptera novaeangliae	Humpback whale	Vulnerable	x
Balaenoptera bonaerensis	Antarctic minke whale		x
Balaenoptera edeni	Bryde's whale		x
Orcaella brevirostis	Irrawaddy dolphin		x
Orcinus orca	Killer whale		x
Physeter macrocephalus	Sperm whale		x
Tursiops aduncus	Spotted bottlenose dolphin (Arafura/Timor Sea populations)		x
Sousa chinensis	Indo-Pacific humpback dolphin		x
Dugong dugon	Dugong		x
Marine reptiles			
Aipysurus apraefrontalis	Short-nosed seasnake	Critically Endangered	
Aipysurus foliosquama	Leaf-scaled seasnake	Critically Endangered	
Caretta	Loggerhead turtle	Endangered	x
Chelonia mydas	Green turtle	Vulnerable	x
Crocodylus porosus	Salt-water crocodile, estuarine crocodile		x
Dermochelys coriacea	Leatherback turtle	Endangered	x
Eretmochelys imbricata	Hawksbill turtle	Vulnerable	x
Lepidochelys olivacea	Olive ridley turtle	Endangered	x
Natator depressus	Flatback turtle	Vulnerable	x
Sharks and rays			
Carcharodon carcharias	Great white shark	Vulnerable	x
Pristis clavata	Dwarf sawfish, Queensland sawfish	Vulnerable	x
Pristis zijsron	Green sawfish	Vulnerable	x
Pristis	Largetooth sawfish	Vulnerable	x
Glyphis	Speartooth shark	Critically Endangered	
Anoxypristis cuspidata	Narrow sawfish		x
Glyphis garricki	Northern river shark	Endangered	
Isurus oxyrinchus	Shortfin mako, mako shark		x
Isurus paucus	Longfin mako		x
Manta alfredi	Reef manta ray		x
Manta birostris	Giant manta ray		x
Fish			
Rhincodon typus	Whale shark	Vulnerable	x
Birds (seabirds and migratory shorebirds)			
Calonectris leucomelas	Streaked shearwater		x
Acrocephalus orientalis	Oriental Reed-Warbler		x
Anous stolidus	Common Noddy		x

Scientific name	Common name	Threatened status	Listed as migratory
Anous tenuirostris melanops	Australian Lesser Noddy	Vulnerable	
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	x
Charadrius veredus	Oriental Plover, Oriental Dotterel		x
Fregata ariel	Lesser Frigatebird, Least Frigatebird		x
Fregata minor	Great Frigatebird, Greater Frigatebird		x
Glareola maldivarum	Oriental Pratincole		x
Limosa lapponica	Bar-tailed Godwit		x
Limosa lapponica baueri	Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit	Vulnerable	
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri)	Critically Endangered	
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered	x
Pandion haliaetus	Osprey		x
Phaethon lepturus	White-tailed tropic bird		x
Phaethon rubricauda	Red-tailed tropic bird		x
Puffinus pacificus	Wedge-tailed shearwater		x
Rostratula australis	Australian Painted Snipe	Endangered	
Sterna albifrons	Little Tern		x
Sterna anaethetus	Bridled Tern		x
Sterna caspia	Caspian Tern		x
Sterna dougallii	Roseate tern		x
Sula dactylatra	Masked Booby		x
Sula leucogaster	Brown booby		x
Sula	Red-footed booby		x
Thalasseus bergii	Crested Tern		x

3.4.3.2 Biologically important areas

There are no biologically important areas (BIAs) within NT/RL5. BIAs within the EMBA include foraging areas and internesting areas for marine turtles, a migration corridor for pygmy blue whales, migration area for humpback whales, foraging areas for whale sharks and breeding/foraging/resting for a number of seabird species. **Figure 3-1** and **Figure 3-2** show the BIAs that occur within the EMBA.

3.4.3.3 Marine mammals

Cetaceans

Pygmy blue whales

The species undertakes a northerly migration from April to August, with a peak between July to August (migration to the equator calving grounds), with the southerly migration occurring between October to December. Noise monitoring undertaken for the Barossa Marine Studies Program recorded pygmy blue whales moving in a northward direction in August 2014 and between late-May to early July 2015. These detections are approximately 210 km south-east of the BIA associated with the pygmy blue whale migration corridor. No detections of the species were made during the period of their southward migration, indicating that they may utilise a different migration path.

Humpback whales

Humpback whales (*Megaptera novaeangliae*) have a wide distribution, with recordings throughout Australian Antarctic waters and offshore from all Australian states. Humpback whales breed and calve in the NWMR between Broome (outside of the EMBA) and the northern end of Camden Sound in the months

of June to September each year. The northbound migration peaks between late July and early August, and the southbound migration peaks between late August and early September. Relatively few humpback whales have been known to travel north of Camden Sound, which is located more than approximately 920 km south-west of NT/RL5. In addition, no humpback whales were recorded during the 12 months of noise monitoring undertaken as part of the Barossa Marine Studies Program. Therefore, the species is considered unlikely to transit through NT/RL5. However, the species may occur within the EMBA.

Sei whales

Sei whales are a large species of baleen whales with a cosmopolitan distribution, inhabiting temperate to subpolar oceans. Given the preference for temperate, sub-temperate and polar environments, sei whales are not expected to occur within NT/RL5 or the EMBA. The Barossa baseline studies program did not detect the presence of sei whales.

Fin whales

Fin whales are a large baleen whale that are widely distributed in both the northern and southern hemispheres between latitudes 20-75°. The species has been documented in waters off all coastal Australian states except New South Wales and the Northern Territory. Fin whales, like other large baleen whales, were exploited by commercial whalers, leading to a significant reduction in fin whale numbers. Fin whales are not known to follow coastal migratory paths, with migratory paths thought to be oceanic. Fin whales were not observed during the Barossa baseline studies program and are not expected to occur within NT/RL5 or the EMBA.

Antarctic minke whale

Antarctic minke whales occur worldwide and have been recorded off all Australian states in both oceanic and inshore waters. The species has not been recorded in the NT. It is suggested that Antarctic minke whales migrate up the WA coast as far north as 20°S (outside of the EMBA). Based on the extent of the species range, it is considered unlikely that they will be present in NT/RL5 and the EMBA. However, if they do occur it is expected that only a few individuals may transit through the area.

Bryde's whales

Bryde’s whales are considered the least migratory of the whale species found in Australian waters, as they do not appear to undertake long distance low-high latitude migrations. In general, the species is restricted to waters between 40° south and 40° north year round.

A few individuals of Bryde’s whale were potentially detected in the Barossa Marine Studies Program from January to early October. Therefore, it is possible that Bryde’s whale may transit through NT/RL5 and the EMBA, but they are not expected to be present in significant numbers.

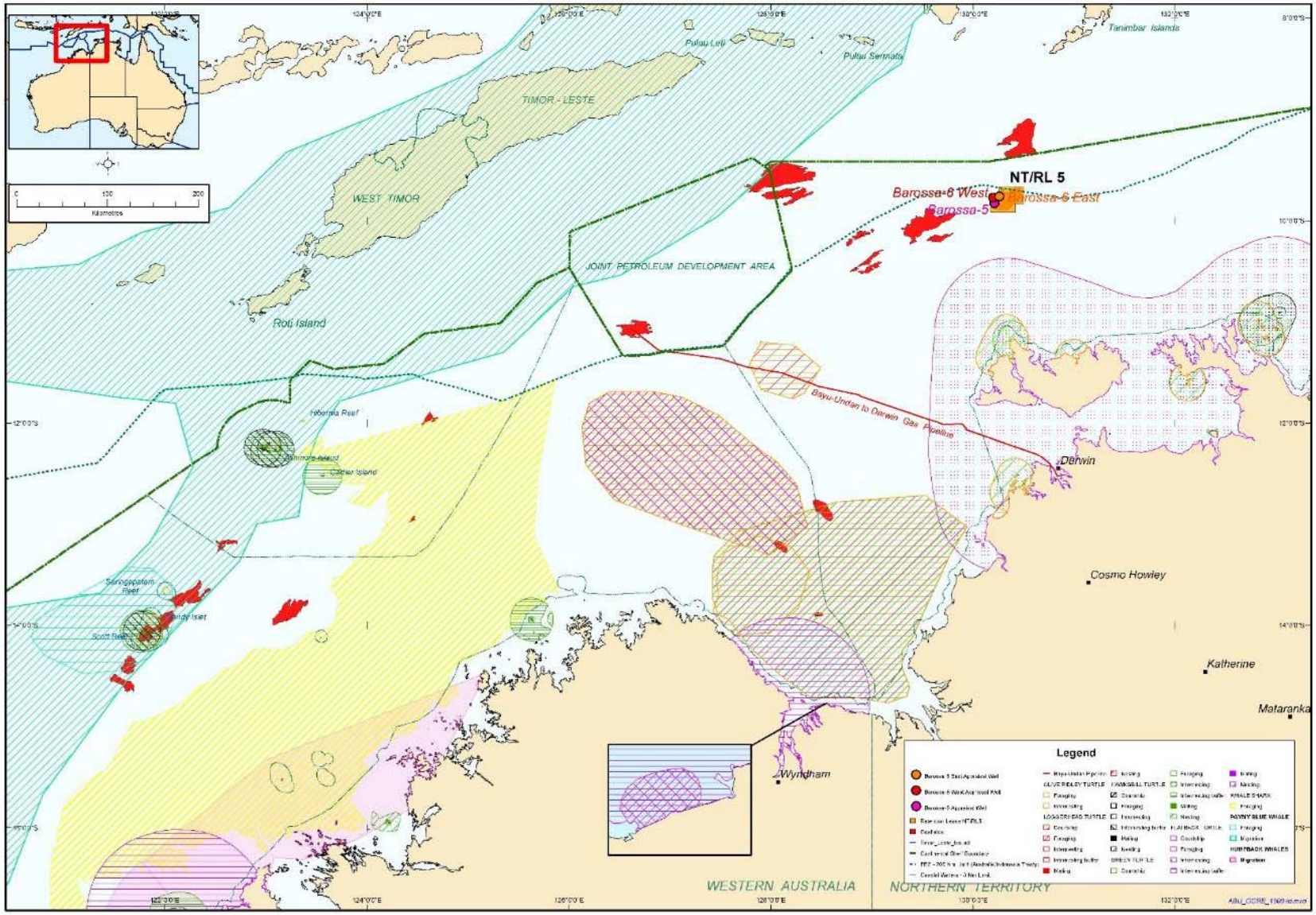


Figure 3-1: Biologically important areas for marine mammals, marine turtles and fish

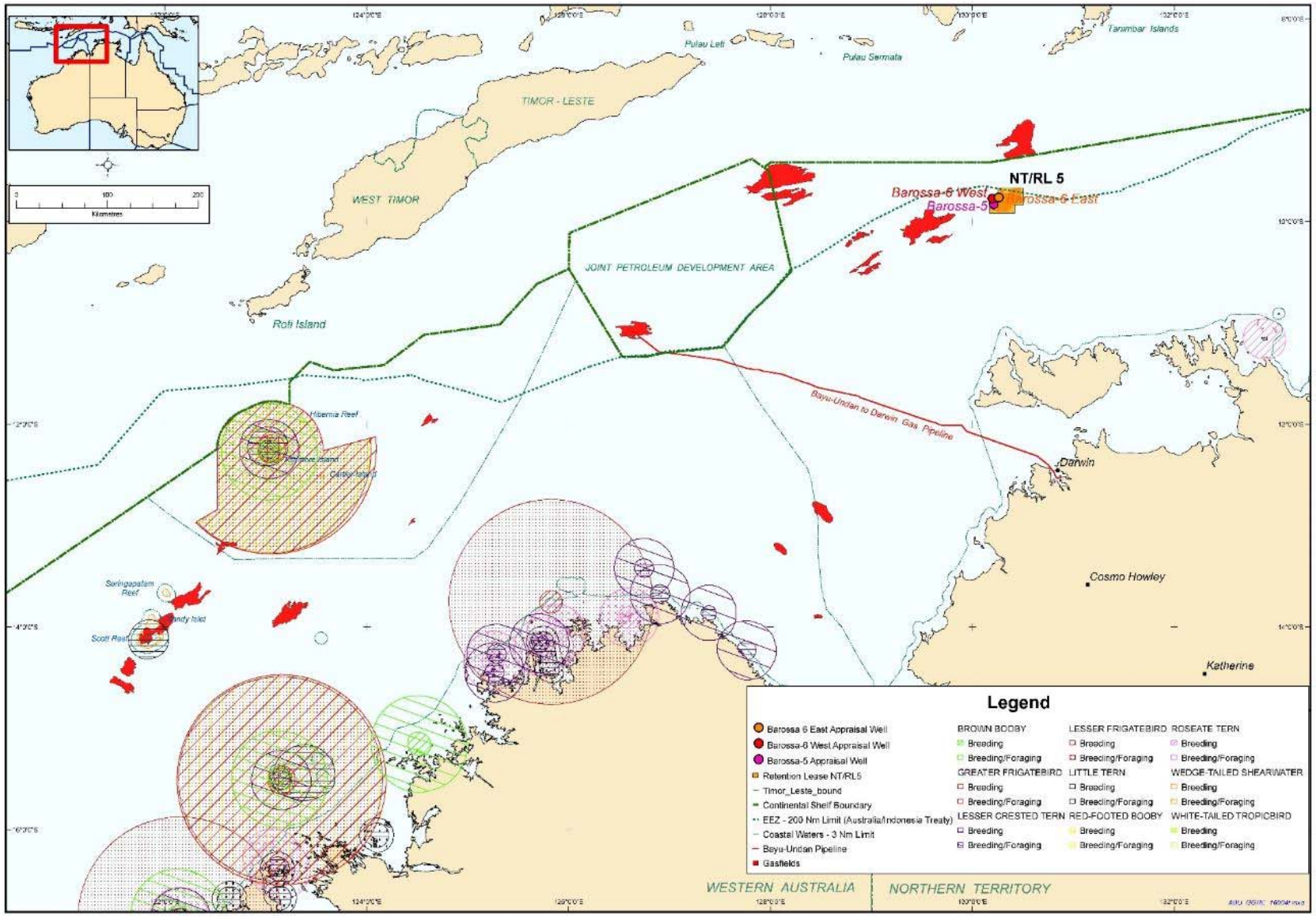


Figure 3-2: Biologically important areas for seabirds

Killer whale

The killer whale is found in all the world's oceans and has been recorded in waters of all Australian states/territories. It is possible that killer whales may transit through NT/RL5 and the EMBA but they are not expected to be present in significant numbers.

Sperm whale

Sperm whales are found worldwide in deep waters (> 200 m) off continental shelves and shelf edges. NT/RL5 and the EMBA are unlikely to represent important habitat for this species, and it is therefore, expected that only very low numbers of individuals may be present.

Dolphins

Dolphins have been reported as being abundant in some offshore areas of the Timor Sea and are regularly seen by commercial fishers near Evans Shoal. Species known to occur in the region include the spotted bottlenose dolphin (Arafura/Timor Sea populations), common dolphins and Risso's dolphin.

Other species identified by the protected matters search tool (PMST) included the Irrawaddy dolphin and the Indo-Pacific humpback dolphin, both of which are listed as migratory under the EPBC Act. No breeding areas are known to occur within NT/RL5 or the EMBA and neither species is likely to be encountered within the retention lease area.

Omura's whale

The Omura's whale was only described as a new species basal to the Bryde's whale group in 2003, and remains poorly understood in terms of its spatial and temporal distribution. Omura's whales are not listed under the EPBC Act but are listed on the IUCN Red List as Data Deficient (International Union for Conservation of Nature (IUCN) 2015).

Omura's whales were recorded to be present within NT/RL5 throughout April to September inclusive, with a peak in June and July (JASCO 2015). Based on the recordings, the whales appeared to pass through the region along a south-west to north-east gradient. A higher number of recordings were observed in the vicinity of Evans Shoal during the autumn and winter months. Therefore, it is likely that Omura's whales may transit through NT/RL5.

Sirenians

Dugong

Dugong (*Dugong dugon*) are broadly distributed across the Indo-Pacific region, as well as the Red Sea, Persian Gulf and the east coast of Africa. In Australia, dugong are associated with shallow benthic seagrass and macroalgal habitats, which are widely distributed in coastal waters. The species is also known to occur in relatively low numbers at more remote offshore locations where seagrasses occur, such as Ashmore Reef and the remote banks of the Sahul Shelf. Duong are not expected to occur in NT/RL5 due to the lack of suitable habitat, but are expected to be associated with seagrass habitat in the EMBA, e.g. Ashmore Reef.

3.4.3.4 Marine reptiles

Marine turtles

A search of the EPBC Act Protected Matters database identified six species of marine turtle that may occur in, or adjacent to, NT/RL5 (**Table 3-1**). The nesting season is species-dependent and varies along the NT coastline in response to the different seasonal conditions.

Key aggregation/nesting/feeding areas

- The NT coastal region is considered significant for turtle breeding, feeding and nesting aggregations. In particular, the northern coast of Melville Island (adjacent to the EMBA) is a nationally and internationally important nesting area.
- Biologically important internesting areas for the flatback turtle encompass a large area of nearshore

waters between approximately the Daly River to the west and Goulbourn Island to the east and surround the entire Tiwi Islands coastline. Important foraging areas for the species have been identified in open offshore waters in the NWMR.

- Flatback turtles are the most widespread nesting species in the NMR. The west coast of Bathurst Island (outside of the EMBA) is an important nesting area for flatbacks.
- Green turtles have not been recorded nesting in the Bonaparte or Van Diemen Gulf bioregions, with the exception of two significant nesting sites: Black/Smith Point and Lawson Island, which are east of the Tiwi Islands and adjacent to the EMBA. The nesting period varies along the NT coast, however, the peak nesting period generally occurs between July and December.
- Green turtles forage on shallow benthic habitats containing seagrass and/or algae, including coral and rocky reefs, and inshore seagrass beds. All foraging areas linked to the NT breeding assemblage occur within the Gulf of Carpentaria, outside of the EMBA.
- Olive ridley turtles nest in nationally-significant numbers along the northern coast of the Tiwi Islands (adjacent to the EMBA), peaking in March-May. They feed on both benthic and pelagic foraging habitats, in water depths of several metres to over 100 m.
- Loggerhead turtles have been recorded occasionally offshore from the NT, but nesting has not been observed for this species on the coastline. The species occurs in waters surrounding coral and rocky reefs, seagrass beds and muddy bays, as they feed primarily on benthic invertebrates in nearshore waters.
- Leatherback turtles feed in coastal waters around Australia, however, nesting has only been confirmed at a single site on Cobourg Peninsula, outside of the EMBA.
- The NT sub-population of the hawksbill turtle is one of the few very large nesting populations remaining in the world, breeding year-round. However, there are no recorded nesting sites along the western NT coast.

NT/RL5 does not contain any emergent land or shallow features that may be of importance to turtles and therefore, they are unlikely to be present in the area in significant numbers. Low numbers may transit through the area as they move from nesting beaches and offshore areas. A small number of individual turtles, including flatback, olive ridley and hawksbill (juvenile) turtles, were also opportunistically observed during the Barossa Marine Studies Program in both open waters and in close proximity to shoals/banks and Bathurst Island.

Sea snakes

Sea snakes are typically distributed in shallow inshore regions and islands that provide suitable seabed Recent surveys undertaken for the Barossa Marine Studies Program observed several sea snake individuals at Tassie Shoal and Lynedoch Bank, and also made a number of opportunistic sightings (species unknown) in open offshore waters in the Timor Sea. A study undertaken at Tassie Shoal and five surrounding shoals identified two species of sea snake at the surface and foraging on the seabed: the olive sea snake and the turtle headed sea snake.

Sea snakes are typically distributed in shallow inshore regions and islands that provide suitable seabed habitat and clear waters. However, they are also found at nearby islands and further offshore at atolls, including the shoals/banks in the Timor Sea. The majority of sea snakes have been observed in water depths ranging between 10 - 50 m deep and generally have shallow, benthic feeding patterns. Some species are known to dive deeper, but non-pelagic species seldom, if ever, dive deeper than 100 m. As air-breathing animals, very few species are known to inhabit deep pelagic environments.

Two species of sea snakes considered to be MNES were identified by the PMST; the short-nosed sea snake and the leaf-scales sea snake. Both of these species are considered to be confined to shallow reef habitats on the Sahul Shelf, such as Ashmore Reef, Cartier Island and shallow banks. Neither species is expected to occur in NT/RL5, but may be associated with shallow reef habitats of the Sahul Shelf in the EMBA.

Crocodiles

The saltwater crocodile is broadly distributed through the Indo-Pacific region and is listed as migratory under the EPBC Act. The species typically occurs in riverine and estuarine environments, but is occasionally found in coastal marine environments. While not expected to occur in NT/RL5, saltwater crocodiles may occur in coastal waters near mainland Australia within the EMBA.

3.4.3.5 Sharks and rays

Great white shark

The great white shark is not known to have significant populations with regular migratory routes or breeding/foraging aggregations within NT/RL5 or the EMBA. No EPBC listed critical habitat or BIAs for great white sharks has been identified within NT/RL5 and EMBA. Sightings of great white shark within the operational area and EMBA are not expected to be common. Their presence is likely to be remote and limited to infrequent individuals transiting through the EMBA.

Grey nurse shark

The grey nurse shark was not identified in the EPBC Protected Matters search but was recorded at a seamount approximately 67 km south-west of NT/RL5 during the Barossa Marine Studies Program. The species is believed to be in rare abundance off the NT. Based on the findings of the Barossa Marine Studies Program and the species' habitat preference, it is considered possible that individuals may be encountered in low numbers within NT/RL5 and EMBA.

Sawfish

Green sawfish are widely distributed in Australian waters and have been recorded in inshore marine waters, estuaries, river mouths, embankments and along sandy and muddy beaches. While the species has predominantly been recorded in inshore coastal areas, it has been recorded hundreds of kilometres offshore in relatively deep waters. Sightings of green sawfish are considered highly unlikely within NT/RL5; however, may be found within the EMBA in coastal waters of the north Kimberley.

Largetooth sawfish have been recorded in both inshore marine waters (including rivers and estuaries) and offshore waters in northern Australia. The dwarf sawfish is known to occur in similar habitats; while these species are unlikely to occur in NT/RL5, they may be found in coastal habitats in the EMBA.

Northern river shark and speartooth shark

Within Australia, northern river sharks and speartooth sharks have predominantly been recorded in tidal rivers and estuaries in north and north-western Australia. Only adults have been sighted in offshore waters as either bycatch in offshore net fisheries (northern river shark) or unconfirmed sightings (speartooth shark).

Based on the habitat preferences of these species and the location of NT/RL5 (i.e. deep offshore marine environment), it is considered highly unlikely that speartooth or northern river sharks will occur with NT/RL5 in significant numbers. However, they may be found within the EMBA in northern coastal waters.

Longfin mako

The longfin mako is a widely distributed, but rarely encountered, oceanic tropical shark found in Australian waters off the WA, NT, Queensland and NSW coasts. The longfin mako is a highly migratory epipelagic species that can inhabit waters up to 500 m deep. Their occurrence within NT/RL5 is likely to be infrequent and restricted to individuals transiting through the area. However, it is likely that they will be present within the EMBA.

Shortfin Mako

The shortfin mako is a pelagic species with a circumglobal, wide-ranging oceanic distribution in tropical and temperate seas. The shortfin mako may occur in NT/RL5 and the EMBA, but would be expected to occur in relatively low densities given it is an apex predator.

Whale shark

The whale shark is known to occur in both tropical and temperate waters and have a wide distribution in Australian waters. A seasonal aggregation of whale sharks occurs in the waters off the Ningaloo coast (outside of the EMBA) each year between late March and July, with the highest frequency of sightings occurring in April. Whale sharks are highly migratory and generally depart Ningaloo Reef sometime between May and June, travelling northeast along the continental shelf and then moving offshore into the north-eastern Indian Ocean.

Due to their widespread distribution and highly migratory nature, individual whale sharks may occur infrequently within NT/RL5 and EMBA. No EPBC listed critical habitat or BIAs for whale sharks has been identified in the vicinity of NT/RL5. The nearest BIA for this species is approximately 530 km to the south-west; in the vicinity of the Timor Sea and EMBA (**Figure 3-1**).

Rays

The reef manta ray is commonly sighted in or along productive near-shore environments, such as island groups, atolls or continental coastlines. However, the species has also been recorded around offshore coral reefs, rocky reefs and seamounts. The giant manta ray is common in tropical waters of Australia and primarily inhabits near-shore environments along productive coastlines with regular upwelling. However, they do appear to be seasonal visitors to coastal or offshore areas (e.g. islands, pinnacles and seamounts). Based on the habitat preference of these species and the location of NT/RL5 (i.e. deep offshore marine environment with no significant benthic features), it is considered highly unlikely that either species of manta ray will occur with NT/RL5 in significant numbers. However, they may be found within the EMBA in the coastal waters of the north Kimberley.

3.4.3.6 Fish

Thirty six species of pipefish and seahorses (family *Syngnathidae*) may occur in or have habitat in the EMBA. Pipefish and seahorses occur widely in association with reefs, seagrass beds, rubble and deepwater sponge, sea whip and gorgonian gardens.

Although the tropical waters off the NT coast contain a diverse range (approximately 1,400 species) of fish of tropical Indo-West Pacific affinity, fish abundance is considered low in the deep, relatively featureless waters that characterise NT/RL5 and adjacent areas.

3.4.3.7 Birds (seabirds and migratory shorebirds)

No emergent land exists in the shoals or surrounding offshore areas in the vicinity of NT/RL5 to support breeding populations of oceanic seabirds or migratory shorebirds. Therefore, most seabird activity would be restricted to foraging, as opposed to seabird stopover and roosting points during annual migrations due to the absence of landing areas. The PMST report indicated that a number of migratory birds may be present within the EMBA; these species are associated with the Ramsar-listed Ashmore Reef location, which lies in the western extent of the EMBA.

The streaked shearwater was identified as potentially occurring within NT/RL5 by the EPBC Act Protected Matters search. The streaked shearwater is a migratory seabird that breeds on islands in the north-west Pacific Ocean near Japan. The bird migrates from this region into the tropical west Pacific during the non-breeding season. In Australia, the streaked shearwater has been recorded from Broome to the Timor Sea, and from Barrow Island to the Houtman Abrolhos Islands (which are outside of the EMBA). As such, NT/RL5 and EMBA is not considered to provide critical habitat for the streaked shearwater, but it is likely to be present in the area on occasion during the Australian summer. There are also no BIAs recognised in the NMR for this species.

There are a few notable offshore island locations within the EMBA that support important seabird (e.g. terns, shearwaters, boobies and tropicbirds) and shorebird (e.g. sandpipers and greenshanks) feeding, breeding and nesting sites including Ashmore Reef and Cartier Island (Clarke 2010). There are a number of BIAs for seabirds within the EMBA, as shown in **Figure 3-2**.

3.4.4 Other values and sensitivities

3.4.4.1 Shoals and banks

There are a number of shoals and banks in the NMR and NWMR that occur within the EMBA. In general, the submerged features are characterised by abrupt bathymetry, rising steeply from the surrounding outer continental shelf at depths of 100 m–200 m. The shoals and banks tend to flatten at depths of 40 m-50 m, with horizontal plateau areas of several square kilometres generally present at 20 m-30 m depths. The shoals/banks support a diverse and varied range of benthic communities, including algae, reef-building soft corals, hard corals and filter-feeders.

The shoals and banks that occur within the EMBA have been grouped into three broad groups based on their geographical location. The broad shoal/bank groupings are summarised in **Table 3-2**.

Table 3-2: Shoal/bank groupings

Grouping	Name of shoal/bank	Approximate distance *
Shoals and banks of the NMR	Sunset Shoal	189 km
	Loxton Shoal	174 km
	Martin Shoal	147 km
	Sunrise Bank	234 km
	Flinders Shoal	109 km
	Evans Shoal	81 km
	Tassie Shoal	89 km
	Franklin Shoal	111 km
	Blackwood Shoal	97 km
	Lynedoch Bank	56 km
	Margaret Harries Bank	179 km
	Bellona Bank	322 km
	Money Shoal	265 km
	Troubadour Shoals	179 km
	Cootamundra Shoal	147 km
	Calder Shoal	150 km
	Marie Shoal	122 km
	Parry Shoal	162 km
	Moss Shoal	153 km
	The Boxers	256 km
	Flat Top Bank	273 km
Shoals and banks of the NWMR	Deep Shoal 1	462 km
	Johnson Bank	804 km
	Woodbine Bank	793 km
	Barracouta Shoal	751 km
	Van Cloon Shoal	527 km

Grouping	Name of shoal/bank	Approximate distance *
	Favell Bank	559 km
	Penguin Shoal	596 km
	Holothuria Banks	582 km
	East Holothuria Reef	622 km
	Branch Banks	616 km
	Tait Bank	619 km
	Vulcan Shoal	737 km
	Otway Bank	631 km
Shoals and banks of the Sahul Shelf complex	Echo Shoals	341 km
	Big Bank Shoals	447 km
	Karmt Shoal	488 km
	Sahul Bank	536 km
	Dillon Shoal	533 km
	Barton Shoal	576 km
	Fantome Shoal	728 km
	Mangola Shoal	607 km
	Jabiru Shoals	606 km
	Pee Shoal	639 km
	Vee Shoal	744 km

* From the centrepoint of NT/RL5

3.4.4.2 Ashmore Reef

Ashmore Reef lies approximately 817 km to the south-west of NT/RL5 (centrepoint) and is protected by the Commonwealth managed Ashmore Reef National Nature Reserve and Ashmore Reef Commonwealth Marine Reserve. Ashmore Reef is also a designated Ramsar wetland of international significance.

3.4.4.3 Cartier Island

Cartier Island lies approximately 793 km to the south-west of NT/RL5. The island and surrounding reefs are protected by Cartier Island Commonwealth Marine Reserve.

3.4.4.4 Hibernia Reef

Although part of the same group as Ashmore Reef and Cartier Island, Hibernia Reef does not form part of the Ashmore Reef and Cartier Island External Territory of Australia. Hibernia Reef is approximately 795 km to the south-west of NT/RL5 and is situated approximately 40 km north-east from Ashmore Reef and 60 km north-west of Cartier Island. Hibernia Reef consists of an approximately oval-shaped reef that tapers to a point on the western side. The reef covers an area of approximately 11.5 Sq Kms and has no permanent land, but large areas of the reef can become exposed at low tide. Hibernia Reef is also characterised by a deep central lagoon and drying sand flats.

3.4.4.5 Seringapatam Reef

Seringapatam Reef (approximately 997 km from NT/RL5) is a remote atoll covering an area of approximately 55 Sq Kms and encloses a lagoon of relatively consistent depth of approximately 20 m (maximum depth of 30 m). The lagoon is connected to the ocean by a narrow passage in the northeast

part of the reef. Seringapatam Reef is recognised as a KEF. The reef is a regionally important scleractinian coral reef as it has a high biodiversity, which is comparable to Ningaloo Reef.

3.4.4.6 North Kimberley coastline

While the north Kimberley coastline in WA is approximately 575 km south-west of NT/RL5, some areas occur within the EMBA, specifically the Bonaparte archipelago, Kimberley coast, Eclipse archipelago, Troughton Island and Stewarts Islands.

The nearshore and coastal environment of the north Kimberley supports a diverse array of marine habitats and communities including coral reefs, sandy beaches, rocky shores, seagrass meadows, mangroves, sponge gardens, wetlands and estuaries. These communities provide important habitat for a number of marine fauna, including specially protected and culturally and commercially important species such as marine turtles, cetaceans, dugongs, fish, prawns and birds.

3.4.4.7 Key ecological features

KEFs are considered to be of regional importance for either the marine region's biodiversity or ecosystem function and integrity.

NT/RL5 occurs within one of the KEFs; the shelf break and slope of the Arafura Shelf. The EMBA also overlaps this KEF and a number of others, as described in **Table 3-3**.

Table 3-3: KEFs of relevance to the drilling campaign

KEF	Approximate distance *	Description
Shelf break and slope of the Arafura Shelf	Within the operation areas	*Unique seafloor feature with ecological properties of regional significance* As outlined above, this KEF occurs within the operational area and the EMBA.
Carbonate bank and terrace system of the Van Diemen Rise	65 km (south-west)	*Unique seafloor feature with ecological properties of regional significance* The KEF occurs within the EMBA.
Pinnacles of the Bonaparte Basin	213 km (south-west)	*Unique seafloor feature with ecological properties of regional significance* The KEF occurs within the EMBA.
Tributary canyons of the Arafura Depression	262 km (south-west)	*Unique seafloor feature with ecological properties of regional significance* The KEF occurs within the EMBA.
Carbonate bank and terrace system of the Sahul Shelf	344 km (south-west)	*Unique seafloor feature with ecological properties of regional significance* The KEF occurs within the EMBA.
Continental slope demersal fish communities	793 km (south-west)	*Communities with high species biodiversity and endemism* The KEF occurs within the EMBA.
Ashmore Reef and Cartier Island and surrounding Commonwealth waters	817 km (south-west)	*High productivity and aggregations of marine life* The KEF occurs within the EMBA.
Seringapatam Reef and Commonwealth waters in the Scott Reef complex	997 km (south-west)	*High productivity and aggregations of marine life* The KEF occurs within the EMBA.

* From the centrepoint of NT/RL5

3.5 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

3.5.1 World Heritage properties

There are no World Heritage properties in, or in the immediate surrounds of, NT/RL5 or the EMBA.

3.5.2 National Heritage places

There are no National Heritage places in, or in the immediate surrounds of, NT/RL5. However, the EMBA intersects a small portion of the West Kimberley National Heritage place, which is approximately 6,270 km south-west of NT/RL5 at its closest point. While the majority of the National Heritage Site encompasses the Kimberley mainland, it does include nearshore waters and islands of the Kimberley coastline.

The EMBA also intersects the Ashmore Reef and Cartier Island National Nature Reserve (listed on the Register of National Estate; place identification: 14689), which is approximately 792 km south-west of NT/RL5 at its closest point.

3.5.3 Commonwealth Heritage places

There are no Commonwealth Heritage places in, or in the immediate surrounds of, NT/RL5. However, the EMBA intersects the Seringapatam Reef and Surrounds (place identification: 17567) which is located approximately 997 km to the south-west of NT/RL5.

The EMBA also intersects the Commonwealth Heritage place of the Ashmore Reef National Nature Reserve (place identification: 105218).

3.5.4 Declared Ramsar wetlands

There are no “Wetlands of International Importance” under the Convention on Wetlands of International Importance (Ramsar 1975) in, or in the immediate surrounds of, NT/RL5. However, the EMBA encompasses Ashmore Reef. Ashmore Reef was designated as a Ramsar wetland due to its importance in providing a resting place for migratory shorebirds and supporting large seabird breeding colonies.

3.5.5 Commonwealth marine area

NT/RL5 and EMBA are located within the Commonwealth marine area, which includes “any part of the sea, including the waters, seabed and airspace, within Australia’s exclusive economic zone and/or over the continental shelf of Australia, that is not state or Northern Territory waters. The Commonwealth marine area stretches from “three to 200 nautical miles from the coast” (DoE 2015e).

3.5.6 Commonwealth marine reserves

While NT/RL5 is not within any of the CMRs which form part of the North Commonwealth Marine Reserves Network, the EMBA overlaps the CMRs listed in **Table 3-4**.

Table 3-4 Summary of CMRs within the EMBA.

Commonwealth Marine Reserve (CMR)	Current Zoning: IUCN Category	Key Conservation Values
Oceanic Shoals CMR	VI – Multiple Use Zone	• Important internesting area for threatened flatback turtle and olive ridley turtle • Important foraging area for the threatened loggerhead turtle and olive ridley turtle
Arafura CMR	VI – Multiple Use Zone	• Important internesting area for threatened flatback, green turtle, hawksbill turtle and olive ridley turtle • Important foraging habitat for breeding aggregations of the migratory roseate tern • Tributary canyons of the Arafura Depression
Joseph Bonaparte Gulf CMR	VI – Multiple Use Zone VI – Special Purpose Zone	• Important foraging area for threatened and migratory marine turtles (green and olive ridley) • Important foraging area for the Australian snubfin dolphin • Carbonate banks of the Joseph Bonaparte Gulf
Kimberley CMR	II – Marine National Park Zone IV – Habitat Protection Zone VI – Multiple Use Zone	• Important foraging areas for migratory seabirds, migratory dugongs, dolphins and threatened and migratory marine turtles • Important migration pathway and nursery areas for protected humpback whale • Adjacent to important foraging and pupping areas for sawfish important nesting sites for green turtles • The reserve provides protection for the communities and habitats of waters offshore of the Kimberley coastline ranging in depths from less than 15 metres to 800 metres • Continental shelf, slope plateau, pinnacle, terrace, banks and shoals and deep hole/valley seafloor features are all represented in this reserve • Ancient coastline (an area of enhanced productivity attracting baitfish which, in turn, supplies food for migrating species) • Continental slope demersal fish communities (the second richest area for demersal fish species in Australia)
Ashmore Reef CMR	Ia – Sanctuary Zone II – Recreational Use Zone	• Ecosystems, habitats and communities associated with the North West Shelf, Timor Province and emergent oceanic reefs • Internationally significant for its abundance and diversity of sea snakes • Critical nesting and internesting habitat for green turtles, supporting one of three genetically distinct breeding populations in the North-west Marine Region. Low level nesting activity by loggerhead turtles has also been recorded. • Large and significant feeding populations of green, hawksbill and loggerhead turtles occur around the reefs. It is estimated that approximately 11 000 marine turtles feed in the area throughout the year

Commonwealth Marine Reserve (CMR)	Current Zoning: IUCN Category	Key Conservation Values
		• Supports a small dugong population of less than 50 individuals that breeds and feeds around the reef. This population is thought to be genetically distinct from other Australian populations • Support some of the most important seabird rookeries on the North West Shelf including colonies of bridled terns, common noddies, brown boobies, eastern reef egrets, frigatebirds, tropicbirds, red-footed boobies, roseate terns, crested terns and lesser crested terns • Important staging points/feeding areas for many migratory seabirds • Cultural and heritage sites for Indonesian artefacts and grave sites
Cartier Island CMR	Ia – Sanctuary Zone	• Ecosystems, habitats and communities associated with the North West Shelf, Timor Province, emergent oceanic reefs • Internationally significant for its abundance and diversity of sea snakes • Large and significant feeding populations of green, hawksbill and loggerhead turtles occur around the reefs • Supports some of the most important seabird rookeries on the North West Shelf including colonies of bridled terns, common noddies, brown boobies, eastern reef egrets, frigatebirds, tropicbirds, red-footed boobies, roseate terns, crested terns and lesser crested terns • Important staging points/feeding areas for many migratory seabirds • Cultural and heritage site for the Ann Millicent historic shipwreck

3.5.7 European heritage

There are no known shipwreck protected zones or shipwrecks within, or in the immediate surrounds of, NT/RL5 or the EMBA.

3.5.8 Indigenous heritage

There are no recorded Indigenous heritage sites within, or in the immediate surrounds of, NT/RL5 or the EMBA.

3.5.9 Commercial fisheries

The Timor and Arafura Seas support a variety of shark, pelagic finfish and crustacean species of commercial importance. NT/RL5 and EMBA is within or adjacent to a number of Commonwealth, NT and WA managed fisheries areas.

Commonwealth managed fisheries

Five Commonwealth managed commercial fisheries, which are managed by the Australian Fisheries Management Authority (AFMA) overlap NT/RL5 and/or EMBA:

- Northern Prawn Fishery
- North West Slope Trawl Fishery (NWSTF)
- Southern Bluefin Tuna Fishery
- Western Skipjack Fishery
- Western Tuna and Billfish Fishery.

NT managed fisheries

Five NT managed commercial fisheries overlap NT/RL5 and/or EMBA:

- Aquarium Fishery
- Demersal Fishery
- Offshore Net and Line Fishery
- Spanish Mackerel Fishery
- Timor Reef Fishery.

WA managed fisheries

Three WA managed commercial fisheries overlap the EMBA:

- Mackerel Managed Fishery
- Northern Demersal Scalefish Managed Fishery (NDSMF)
- Northern shark fisheries – comprising the state managed WA North Coast Shark Fishery in the Pilbara and western Kimberley, and the Joint Authority Northern Shark Fishery in the eastern Kimberley.

3.5.10 Traditional Indonesian fishing

NT/RL5 is located in remote offshore waters that are unlikely to be regularly accessed by traditional Indonesian fishing activities. However, the EMBA intersects an area which is formally recognised; the MoU box. Under a MoU signed between Australia and Indonesia in November 1974, Indonesian and Timorese fishermen are legally permitted to harvest marine products. This MoU box covers Scott Reef and surrounds, Seringapatam Reef, Browse Island, Ashmore Reef, Cartier Island and various banks, representing an area of approximately 50,000 km^2.

3.5.11 Tourism and recreational activities

NT/RL5 is located in offshore waters and ConocoPhillips is only aware of one guided fishing operator that

advised it may be active at Evans Shoal, located approximately 50 kilometres from NT/RL5. The majority of tourism activities (recreational fishing and boating and charter boats operations) tend to be centred around nearshore waters, islands and coastal areas.

3.5.12 Ports and commercial shipping

The closest major commercial port to NT/RL5 is Darwin, approximately 300 km south of NT/RL5.

3.5.13 Offshore petroleum exploration and operations

There are a number of oil and gas companies holding petroleum permits in the vicinity of NT/RL5. However, there are no established oil and gas operations within, or in the immediate surrounds of, the operational or retention lease area.

The closest operational production facilities and in-field subsea infrastructure are associated with the ConocoPhillips operated Bayu-Undan platform approximately 430 km to the south-west.

3.5.14 Defence activities

There are no designated military/defence exercise areas in the immediate vicinity of NT/RL5. However, the EMBA intersects the North Australian Exercise Area (NAXA).

3.5.15 Indonesia and Timor Leste

NT/RL5 is located approximately 780 km west of Indonesia, 460 km west-north-west of Timor (within Indonesia) and 425 km west-north-west of Timor Leste.

The following values and environmental sensitivities in international waters have been identified.

Mangroves

- North-west and south east Bali
- North coast of Nusa Lembongan
- North-east and east Sumba
- South-west, north-west, north and east Flores and Maumere
- Komodo Island, and nearby islands
- South west, south, central and north Timor Leste.

Intertidal Mud/Sandflats

- Lombok
- Sumba
- Central south and central north coasts of Sumbawa
- North-east coast of Flores
- South-west coast of Timor (Indonesian Timor).

Coral Reefs

There are an estimated 75,000 km^2 of coral reef ecosystem distributed throughout the Indonesian archipelago, including the Lesser Sunda Ecoregion, particularly the areas of Bali-Lombok, Komodo and East Flores.

Seagrass

- North-west Bali
- South-west and west Lombok
- North-east Sumbawa
- Komodo Islands
- Savu
- South coast of Timor Leste.

Sandy Shorelines

The southern coastlines of the islands of the Lesser Sunda Ecoregion of Indonesia and Timor Leste are known to contain sandy beaches consisting of soft black sand, formed by volcanic activity. Within this region, a number of National Parks are considered important sites for turtle nesting beaches, including the Meru Betiri National Park.

Rocky Shorelines

- The Bukit Peninsula and Nusa Penida areas of Bali
- South Lombok
- South-east Sumbawa
- Nusa Tengara
- Sumba
- Roti Island
- Atapupu
- Timor Leste.

Heritage Values

Within Indonesia there are a total of fifty National parks of which six are World Heritage Sites, seven are part of the World Network of Biosphere Reserves and five are wetlands of international importance under the Ramsar convention. Nine of these marine parks have large marine components. **Table 3-5** provides a summary of the protected areas that fall within the EMBA.

Table 3-5 Protected areas in Indonesian and Timor-Leste waters in the EMBA

Name	Year	km²	Marine Area km²	International status
Java				
Karimunjawa	1986	1,116	majority	
Kepulauan Seribu	1982	1,080	majority	
Meru Betiri National Park	1982	580	8.45	IUCN Category II
Alas Purwo National Park	1919	439	0	IUCN Category II
Lesser Sunda Islands				
Manupeu Tanadaru National Park	1998	762	0	IUCN Category II
Laiwangi Wanggameti National Park	1998	396	0	IUCN Category II
Laut Sawu Marine National Park	2009	30,069	30,069	IUCN Category II
Ujung Kulon	1992	1,206	443	World Heritage Site
Bali Barat	1995	190	32	
Komodo National Park – World Heritage Site	1980	1,817	1,199	World Heritage Site World Network of Biosphere Reserves
Timor Leste				
Nino Konis	2007	1236	556	IUCN Category II

3.6 SUMMARY OF KEY ENVIRONMENTAL, SOCIO-ECONOMIC AND CULTURAL VALUES AND SENSITIVITIES

Table 3-6 summarises the environmental, socio-economic and cultural values and sensitivities within NT/RL5 and EMBA.

Table 3-6: Existing environment summary

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
Physical environment	Water quality	✓	-	✓	Water quality information obtained from the Barossa Marine Studies Program indicated that water quality of NT/RL5 was consistent with that expected in open offshore waters of the NMR.
	Sediment quality	✓	-	✓	The sediment types observed during the Barossa Marine Studies Program were comparable with those found in local and broader regional seabed habitat mapping studies undertaken in the eastern Joseph Bonaparte Gulf and Timor Sea. Sediment characteristics of NT/RL5 is expected to be similar to those of the deep water sediment within the broader NMR.
	Air quality	✓	-	✓	Air quality within NT/RL5 is expected to be pristine with only localised anthropogenic influences.
Intertidal and benthic primary producers	Coral reefs		> 56 km	✓	The seabed in deeper offshore waters, such as those in NT/RL5 (approximately 120 m - 350 m), receive insufficient light to support coral reef communities. Within the EMBA, coral reef habitats are associated with the Ashmore Reef, Hibernia Reef, Cartier Island, Seringapatam Reef and the shallower areas of offshore shoals/banks.
	Seagrasses and macroalgae		> 56 km	✓	The deeper offshore waters of NT/RL5 (approximately 120 m - 350 m) receive insufficient light to support seagrass and macroalgae communities. These communities occur within the EMBA, including at the locations of Ashmore Reef, Hibernia Reef, Cartier Island, Seringapatam Reef and other offshore shoals/banks.
	Mangroves and saltmarshes		575 km	✓	There are no shorelines within NT/RL5 that support mangroves or saltmarsh communities. However, these communities occur along sections of the north Kimberley coastline which is within the EMBA.
	Infaunal communities	✓	-	✓	Infaunal communities of NT/RL5 is characterised by low abundance and species diversity of burrowing taxa and demersal fish. Within the EMBA, diverse benthic communities are commonly associated with shoals, banks, offshore islands and other seabed features (e.g. shelf breaks, pinnacles etc.).
	Filter-feeding communities	✓	-	✓	Due to the lack of hard substrate within NT/RL5, the associated epibenthos is expected to be sparse. Within the EMBA, Ashmore Reef, Hibernia Reef, Cartier Island, Seringapatam Reef and other offshore shoals/banks provide substrate that enables settling and attachment of epibenthic communities.

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
Other offshore communities	Plankton	✓	-	✓	Plankton communities in NT/RL5 is likely to reflect those of the offshore waters of the NMR and NWMR, which includes a patchy distribution that is often linked to seasonal productivity.
	Pelagic and demersal fish communities	✓	-	✓	Fish abundance and species diversity is expected to be limited in NT/RL5, due to the lack of hard substrate and habitat complexity. Waters within the NMR and NWMR contain a diverse range of fish communities, including the continental slope demersal fish communities KEF, which intersects the EMBA.
Marine fauna	Marine mammals	✓	-	✓	The EPBC Act Protected Matters search identified two species of Threatened cetaceans (the pygmy blue whale and humpback whale) and seven species of migratory cetaceans that may be present in NT/RL5. No BIAs for marine mammals occur in NT/RL5, however they are present within the EMBA (humpback whale and pygmy blue whale). Within the EMBA, humpback whales migrate annually along seasonal northern and southern routes to and from the Camden Sound area of the west Kimberley (outside of the EMBA) in the winter and spring months. The migration route is not expected to extend further north from Camden Sound into NT/RL5. The Omura's whale is likely to transit through NT/RL5 as the species was recorded during the Barossa Marine Studies Program. Cetacean species that are likely to occur in NT/RL5 and may occasionally transit the EMBA include the Antarctic minke whale, Bryde's whales, killer whales, sperm whales and spotted bottlenose dolphins.
	Turtles (including foraging, internesting areas and nesting beaches)	✓	-	✓	Six marine turtle species may occur in NT/RL5 including: green, leatherback, loggerhead, hawksbill, olive ridley and flatback turtles. No BIAs for marine turtles occur in NT/RL5, however they are present within the EMBA.
	Sea snakes	✓	-	✓	Seasnakes are unlikely to occur in significant numbers within the deeper offshore waters of NT/RL5. Within the EMBA, sea snakes have been observed at Tassie Shoal, Lyndoch Bank and other shoals/banks of the NMR and NWMR, and offshore reefs.

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
	Sharks and rays	✓	-	✓	Nine shark and ray species were identified as potentially occurring in NT/RL5. This includes great white sharks, green, largetooth and narrow sawfish, speartooth and northern river shark, longfin mako and reef and giant manta rays. The grey nurse shark is also likely to transit through NT/RL5 and EMBA as the species was recorded during the Barossa Marine Studies Program. No BIAs for sharks and rays occur in NT/RL5, however they are present in the EMBA (whale sharks).
	Fish (pelagic and demersal)	✓	-	✓	Fish abundance is considered low in the deep, relatively featureless waters that characterise NT/RL5 and adjacent areas. One fish species, the whale shark, was identified in the EPBC Protected Matters search as potentially occurring in NT/RL5. Within the EMBA, the tropical waters off the NT coast contain a diverse range (approximately 1,400 species) of fish of tropical Indo-West Pacific affinity. Higher abundance is commonly associated with shoals, banks, offshore reefs/islands and other seabed features that support diverse benthic habitats. No BIAs for fish occur in NT/RL5 or EMBA.
	Birds (seabirds and migratory shorebirds; including significant nesting sites)	✓	-	✓	NT/RL5 may occasionally be visited by migratory and oceanic birds but does not contain critical habitats for any species. No roosting or nesting habitat exists within NT/RL5. Within the EMBA there are notable seabird and migratory shorebird feeding, breeding and nesting sites including Ashmore Reef (Ramsar location) and Cartier Island.
Other values and sensitivities	Shoals and banks		56 km – 804 km	✓	The shoals and banks that occur within the EMBA have been grouped into three broad groups based on their geographical location. The closest shoals to NT/RL5 is Lynedoch Bank, Evans Shoal and Tassie Shoal. The shoals/banks support a diverse and varied range of benthic communities, including algae, reef-building soft corals, hard corals and filter-feeders.
	Ashmore Reef (includes KEF, national heritage place, Commonwealth heritage place, Ramsar wetland and CMR)		817 km	✓	Ashmore Reef is a large platform reef, consisting of an atoll-like structure with three low, vegetated islands. Regionally significant as it contains ecosystems, habitat and communities representative of the NWMR and emergent oceanic reefs. Ashmore Reef is designated as a Ramsar wetland as its islands provide a resting place for migratory shorebirds and support large seabird breeding colonies.

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
	Cartier Island (includes KEF, National heritage place and CMR)		792 km	✓	Cartier Island includes a vegetated sand island, extensive reef flat, subtidal reef system, a small submerged pinnacle and two shallow pools to the north-east of the island. It is regionally significant as it contains ecosystems, habitat and communities representative of the NWMR and emergent oceanic reefs. Cartier Island also supports important seabird rookeries, significant populations of feeding and nesting marine turtles and a high abundance and diversity of sea snakes.
	Hibernia Reef		777 km	✓	Hibernia Reef supports high biodiversity shallow reef ecosystem, habitats and communities.
	Seringapatam Reef (includes KEF and Commonwealth heritage place)		997 km	✓	Seringapatam Reef consists of a narrow reef atoll structure and is regionally important as it has a high biodiversity scleractinian coral reef.
	North Kimberley coastline		575 km	✓	The north Kimberley coastline is within the EMBA, specifically the Bonaparte archipelago, Kimberley coast, Eclipse archipelago, Troughton Island and Stewarts Islands. The nearshore and coastal environment of the north Kimberley supports a diverse array of marine habitats and communities including coral reefs, sandy beaches, rocky shores, seagrass meadows, mangroves, sponge gardens, wetlands and estuaries.
	KEFs	✓ (shelf break and slope of the Arafura Shelf only)	65 km-997 km	✓	The following KEFs occur within NT/RL5 and EMBA: • *Shelf break and slope of the Arafura Shelf, a unique seafloor feature) (within NT/RL5 and operational area)* • *Carbonate bank and terrace system of the Van Diemen Rise, a unique seafloor feature* • *Pinnacles of the Bonaparte Basin, a unique seafloor feature* • *Tributary canyons of the Arafura Depression, a unique seafloor feature* • *Carbonate bank and terrace system of the Sahul Shelf, a unique seafloor feature* • *Continental slope demersal fish communities, characterised by high species diversity and endemism* • *Ashmore Reef and Cartier Island and surrounding Commonwealth waters, characterised by high productivity and aggregations of marine fauna* • *Seringapatam Reef and Commonwealth waters in the Scott Reef complex, characterised by high productivity and aggregations of marine fauna.*

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
Socio-economic and cultural environment	National heritage place - West Kimberley		6,270 km	✓	The EMBA intersects a small portion of the West Kimberley National Heritage place; the nearshore waters and islands of the Kimberley coastline. The place is listed as it supports significant biological richness and provides important geological and fossil evidence of Australia's evolutionary history.
	Oceanic Shoals CMR		49 km	✓	Key conservation values of the reserve include: • *important resting and internesting area for flatback turtles and olive ridley turtles* • *important foraging area for loggerhead turtles and olive ridley turtles.*
	Arafura CMR		248 km	✓	Key conservation values of the reserve include: • *important internesting area for a number of marine turtles* • *important foraging habitat for breeding aggregations of the migratory roseate tern*
	Joseph Bonaparte Gulf CMR		476 km	✓	Key conservation values of the reserve include: • *important foraging area for green and olive ridley marine turtles and the Australian snubfin dolphin*
	Kimberley CMR		569 km	✓	Key conservation values of the reserve include: • *important foraging areas for migratory seabirds, dugongs, dolphins and marine turtles* • *migration pathway and nursery areas for humpback whales*
	European or Indigenous heritage		-		A search of the National Shipwrecks Database listed no historic shipwrecks within NT/RL5 or EMBA. The islands of Ashmore Reef are considered significant archeologically due to Indonesian artefacts and grave sites related to a long history of use by Indonesian fisherman (DoEE 2016a).
	Commercial fisheries	✓	-	✓	NT/RL5 and EMBA is within or adjacent to a number of Commonwealth, NT and WA managed fisheries areas. However, there is no active fishing in NT/RL5. *Fisheries overlapping NT/RL5* • *Commonwealth managed fisheries: Northern Prawn Fishery, Southern Bluefin Tuna Fishery, Western Skipjack Tuna Fishery and Western Tuna and Billfish Fishery* • *NT managed fisheries: Aquarium Fishery, Demersal Fishery, Offshore Net and Line Fishery, Spanish Mackerel Fishery and Timor Reef Fishery* *Fisheries within the EMBA*

Key values/ sensitivities/ receptors		Present in retention lease area	Approximate distance from NT/RL5*	Present in EMBA	Summary description
					• *Mackerel Managed Fishery (WA)* • *Northern Demersal Scalefish Managed Fishery (WA)* • *Northern Shark Fisheries (WA)*
	Traditional Indonesian fishing		-	✓	NT/RL5 is located in remote offshore waters that are unlikely to be regularly accessed by traditional Indonesian fishing activities. The Australia-Indonesia MoU Box, which permits fishing by traditional methods in the vicinity of Scott Reef, Seringapatam Reef, Browse Island, Ashmore Reef, Cartier Island, is located within the EMBA.
	Tourism, recreational activities (including fishing) and research		-	✓	Due the offshore deep water location, no tourism activities are known to take place within NT/RL5. Within the EMBA, commercial tour operators and recreational fishing charters visit the Scott Reef, Seringapatam Reef, Ashmore Reef and Cartier Island areas intermittently, primarily for scuba diving, bird watching and game fishing.
	Commercial shipping		-	✓	NT/RL5 does not intersect any major commercial shipping routes. The closest main commercial shipping channel is to the west of the area. Within the EMBA, significant commercial shipping activity occurs. Major shipping routes in the area are associated with entry to the ports of Darwin, Broome, Port Hedland and Dampier.
	Offshore petroleum exploration and operations		-	✓	There are no established oil and gas operations within, or in the immediate surrounds of, NT/RL5. The closest subsea infrastructure includes flowlines, umbilicals, manifolds and wellheads associated with the ConocoPhillips operated Bayu-Undan platform approximately 430 km to the south-west, and other subsea infrastructure includes the Bayu-Undan gas pipeline and Ichthys gas pipeline to the south-west.
	Defence		88 km	✓	There are no designated military/defence exercise areas located within NT/RL5. However, the EMBA intersects the NAXA.

***** Centrepoint of NT/RL5

4. DESCRIPTION OF ENVIRONMENTAL RISKS AND IMPACTS

4.1 OVERVIEW

The following steps outline the environmental and risk management framework for the drilling campaign, which are developed in accordance with the ABU-W HSEMS:

- establish the context with regard to relevant legislation/guidance, ConocoPhillips and Contractor management systems, existing environment and any relevant stakeholder values and feedback
- identify the risks/hazards/aspects associated with the activity, with consideration of ConocoPhillips' operational experience, the existing environment and relevant stakeholder context. In the context of this activity, sound propagation modelling for underwater noise emissions, and stochastic modelling for unplanned hydrocarbon releases were also used to inform the risks/aspects associated with the activity
- define the credible risk source scenarios and the existing control measures associated with each aspect
- assess the risk associated with the existing control measures in place to determine the inherent risk
- identify and consider potential additional control measures to reduce the risk to ALARP
- assess the risk with any additional control measures in place to determine the residual risk and evaluate if the risk has been reduced to ALARP and is acceptable
- if not ALARP, consider potential additional control measures until the risk has been reduced to ALARP and is acceptable
- define environmental performance outcomes, environmental performance standards, measurement criteria and roles and responsibilities for managing the potential impacts and risks
- implement environment performance standards through the management strategies
- monitor key performance standards as part of the compliance assurance process
- audit and report on compliance with the EP
- update documentation as required based on management review.

The risk assessment process applied for this activity was based on the ConocoPhillips corporate risk assessment process as outlined in the ABU-W Risk Management Procedure (ALL/HSE/PRO/040) and the ConocoPhillips Risk Assessment Guidelines for Upstream Operations. This risk assessment process is consistent with the *AS/NZS ISO 31000:2009: Risk Management – Principles and Guidelines* and *Handbook (HB) 203:2006 Environmental risk management – Principles and process (Guide) (AS/NZS 2006)*. The core steps of ConocoPhillips' risk assessment process are summarised in **Figure 4-1**.

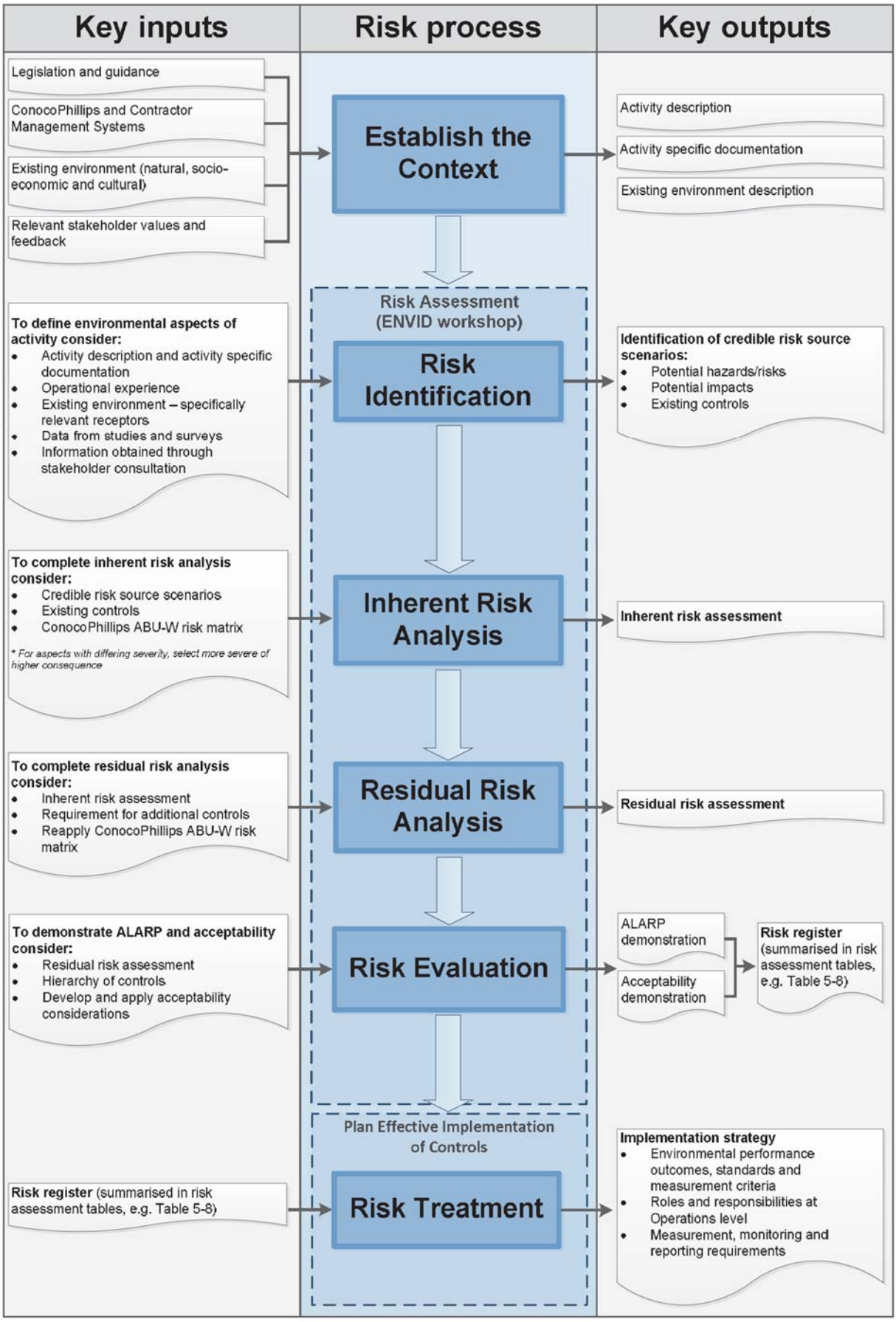


Figure 4-1: ConocoPhillips environmental risk assessment process

4.1.1 Risk identification

The environmental hazard (ENVID) workshop was undertaken in October 2015 in accordance with the ABU-W Risk Management Procedure (ALL/HSE/PRO/040) to identify and assess risks associated with the activity. The ENVID workshop was aligned with NOPSEMAs Hazard Identification Guidance Note (N-04300-GN0107) and attended by a multidisciplinary team consisting of relevant ConocoPhillips drilling team members and environmental advisors, and external environmental advisors. The core team of specialists had sufficient breadth of knowledge, training and experience to reasonably assure that risks and associated impacts were identified and assessed.

4.1.2 Risk analysis

The environmental risk assessment process is a qualitative risk-screening tool for evaluating the environmental risk posed by the drilling campaign. ConocoPhillips assess the risk in two key stages:

- inherent risk analysis – assessment of the potential environment, socio-economic and cultural consequences and the likelihood of that consequence occurring with the application of existing control measures (e.g. relevant legislation, ConocoPhillips and contractor procedures/standards etc.) for each credible risk source scenarios

- residual risk analysis – reassessment of the inherent risk following the application of additional controls/mitigation measures. The residual risk is an indication of the significance of an environmental, socio-economic or cultural impact, taking into account the management approach expected to be applied throughout the activity to achieve acceptable outcomes.

Two key factors underpin the environmental risk assessment:

- the severity of the consequences in the event that impact does occur; and

- the likelihood of receptors at risk being impacted.

The level of risk is determined by establishing the potential consequence of an impact on an environmental, socio-economic or cultural receptor resulting from an aspect of the drilling campaign. Following the determination of the level of risk, the likelihood of the consequence occurring is then assigned. The assigned consequence and likelihood is mapped on the risk matrix to determine the level of risk, as illustrated in **Table 4-1**.

Assessment of consequence of potential impacts

In evaluating the level of consequence of a potential event, the following factors have been considered:

- extent of impacts – whether the impact affects the local or wider regional environment

- duration of the impact – how long it will interact with the receiving environment

- sensitivity of the receiving environment (including seasonal sensitivities) – nature, importance (local, national or international significance) and the sensitivity or resilience to change of the receptor that could be affected. This also considers any relevant laws, regulations or standards aimed at protecting the receiving environment, including the EPBC Act.

The consequence definitions in the ABU-W Risk Management Procedure (ALL/HSE/PRO/040) have been applied to this risk assessment, as shown in **Table 4-2**. While the risk assessment process was undertaken with a primarily environmental focus, other potential cultural, socio-economic and business impacts were also considered in determining the consequence rating. The consequence rating is based on a consequence when no safeguards are in place. As a conservative approach the consequence that results in the highest risk consequence rating by these definitions is carried through for each potential impact.

Table 4-1: ConocoPhillips ABU-W risk matrix

Risk matrix					
Likelihood	Consequence				
	Negligible (1)	Minor (2)	Moderate (3)	Significant (4)	Major (5)
Frequent (5)	*5*	*10*	*15*	*20*	*25*
Probable (4)	*4*	*8*	*12*	*16*	*20*
Rare (3)	*3*	*6*	*9*	*12*	*15*
Remote (2)	*2*	*4*	*6*	*8*	*10*
Improbable (1)	*1*	*2*	*3*	*4*	*5*

Risk rating		
Risk score	Risk rating	Description of risk level
IV (17-25)	*High*	*High risk. Manage risk utilising prevention and/or mitigation with highest priority. Promote issue to appropriate management level with commensurate risk assessment details.*
III (12-16)	*Significant*	*Significant risk. Manage risk utilising prevention and/or mitigation with priority. Promote issue to appropriate management level with commensurate risk assessment detail.*
II (5-10)	*Medium*	*Moderate risk with controls verified. No mitigation required where controls can be verified as functional. ALARP should be evaluated, as necessary.*
I (1-4)	*Low*	*Low risk. No mitigation controls required. Risk is considered inherently ALARP.*

Table 4-2: Risk assessment consequence definitions

Consequence severity description			
Rating	**Biodiversity**	**Socio-cultural and economic**	**Business impact**
5	Catastrophic permanent loss/extinction (100%) of species, habitat or ecosystem. Irrevocable loss, no mitigation possible.	Permanent lost access or use of area with permanent reduction in community or tribal quality of life; major economic impact to surrounding community; irrevocable loss of culture resources. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs will probably exceed $10 million.	Complete area evacuation. and/or National and global negative media exposure and/or Business interruption costs likely to exceed $10 million.
4	Serious loss or migration (> 50%) of species population, habitat or ecosystem. Partial mitigation only possible through prolonged and resource intensive effort (greater than 50 years).	Permanent partial restriction on access or use, or use, or total restriction > 10 years in duration; temporary reduction in quality of life > 10 years duration; harm to cultural resources requiring major mitigation. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $1 million and $10 million.	Selected areas require evacuation. and/or Regional Asia-pacific and national negative media exposure and/or Business interruption costs likely to be between $1 million and $10 million.
3	Temporary, but reversible	Temporary restriction < 10 years in duration with a moderate reduction in usage levels or quality of	Shelters in place but evacuation not mandatory.

Consequence severity description			
Rating	**Biodiversity**	**Socio-cultural and economic**	**Business impact**
	loss/migration of species population (< 25%), habitat or ecosystem. Moderate mitigation efforts required for total reversal.	life; harm to cultural resources recoverable through moderate mitigation efforts. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $100,000 and $1 million.	and/or Regional negative media exposure and/or Business interruption costs likely to be between $100,000 and $1 million.
2	Brief, but reversible loss/migration of species population (< 15%), habitat or ecosystem. Minor mitigation efforts required for total reversal.	Brief restriction < 5 years in duration with a minor reduction in usage levels or quality of life; minor harm to cultural resources that are recoverable through minor mitigation efforts. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $10,000 and $100,000.	Local notification only (selected phone calls, letter notification). and/or State and local negative media exposure and/or Business interruption costs likely to be between $10,000 and $100,000.
1	Some minor loss/migration of species population (<10%) habitat or ecosystem that are short term and immediately and completely reversible.	Restrictions on access without loss of resources; temporary but fully reversible impacts on quality of life; minor impact on cultural resources, landscapes, traditions that are fully reversible without lost value. and/or The remediation associated with the environmental harm, asset damage and/or litigation/resolution costs are between $0 and $10,000.	No communication to the public. and/or No media exposure and/or Business interruption costs likely to be between $0 and $10,000.

Likelihood of impact occurrence

The likelihood of an impact occurring takes into account the effective implementation of industry standard mitigation measures. The likelihood of the top level event occurring that could give rise to the impact is based on industry experience.

The likelihood selection is based on the likelihood of a consequence occurring with safeguards in place; it is not based on how often the cause occurs.

Table 4-3 provides the likelihood descriptions that have been used for the risk review, which are based on the ConocoPhillips' ABU-W Risk Management Procedure (ALL/HSE/PRO/040). As outlined above, this process reflects the risk management process detailed within AS/NZS ISO 31000:2009 (AS/NZS 2009) and HB 203:2006 (AS/NZS 2006).

Table 4-3: Risk assessment likelihood definitions

Level	Descriptor	Quantitative range per year*	Description	Enhanced description
1	*Improbable*	*< 10^{-6}*	*Virtually improbable and unrealistic*	*Unheard of in the industry*
2	*Remote*	*10^{-6} – 10^{-4}*	*Not expected nor anticipated to occur*	*Has occurred once or twice in the industry*
3	*Rare*	*10^{-4} – 10^{-3}*	*Occurrence considered rare*	*Has occurred many times in the industry but not in the company*
4	*Probable*	*10^{-3} – 10^{-1}*	*Expected to occur at least once in 10 years*	*Has occurred once or twice in the company*
5	*Frequent*	*> 10^{-1}*	*Likely to occur several times a year*	*Has occurred several times on the location*

* The values in the quantitative range should be used as guidance in selecting the appropriate likelihood category. These values should not be used in the risk calculation.

4.1.3 Risk evaluation

The evaluation of the environmental risks was undertaken in the context of ALARP and acceptability, which are described in detail below.

Demonstration of ALARP

ConocoPhillips demonstrates risks are reduced to ALARP when the cost and effort required to further reduce risk is grossly disproportionate to the risk benefit gained. This demonstration shall include the following:

- compliance with relevant legislation, accepted industry codes and standards, including standard industry practice and guidelines
- implementation of effective management system controls
- incorporation of barriers/control measures commensurate with the potential impact and risk from the activity
- confirmation that the cost/benefit/sacrifice and effort of adding further barriers/control measures is grossly disproportionate to the potential reduction in risk. This is achieved through the identification and evaluation of further measures to determine those appropriate for implementation (i.e. practicable).

For inherently significant and high risk activities, significant effort is made to assess and implement risk reduction opportunities such as quantitative studies and cost benefit analyses and undertaking a more detailed review of the risk in consultation with management. For inherently low or medium risk activities, further controls are assessed qualitatively/semi-quantitatively (as per ConocoPhillips' ABU-W Risk Management Procedure (ALL/HSE/PRO/040)) based on the nature and scale of the risk and taking into consideration regulator expectations. All assessments shall be recorded for demonstration purposes.

Demonstration of acceptability

ConocoPhillips considers an activity to be acceptable when the level of impact and risk to the environment may be considered broadly acceptable with regard to all relevant considerations including:

- the principles of ecologically sustainable development (ESD)
- relevant environmental legislation, international agreements and conventions, guidelines and codes of practice
- internal context - alignment with ConocoPhillips ABU-W HSEMS, ABU-W HSE and Sustainable Development (HSE&SD) Policy, culture and company standards and systems
- external context - potential environmental consequence and stakeholder expectations.

The linkage of the ConocoPhillips residual risk rankings and the demonstration of acceptability is outlined in **Table 4-4**.

Table 4-4: Residual risk ranking and acceptability

ConocoPhillips residual risk ranking	Acceptability
Low	*Broadly acceptable* *Alignment with ConocoPhillips HSEMS and company standards/systems. Relevant environmental legislation and standard industry practice will be applied to manage the risk and address reasonable regulator and stakeholder expectations. Management controls have been implemented to address the acceptability considerations*
Medium	*Acceptable* *If risks have been reduced to ALARP and management controls have been implemented to address the acceptability considerations, a medium residual risk ranking can be considered acceptable.*
Significant and high	*Unacceptable* The activity (or element of) should not be undertaken as the risk is intolerable and does not meet the principles of ESD, legal requirements, ConocoPhillips' requirements or regulator and stakeholder expectations. The activity requires further assessment to reduce the risk to an acceptable level. *If the residual risk is unable to be lowered to a more acceptable level, managerial review and approval is required.*

A summary of the risk identification and analysis process is provided in **Table 4-5**. This provides a summary of:

- the sources of risk associated with routine/planned and non-routine/unplanned activities that may have an impact or risk on the identified receptors
- the identified environmental, socio-economic and cultural receptors
- the inherent and residual risk ranking for interaction between the activities and the receptors as determined through the risk assessment process.

Table 4-5: Activity aspect and receptor interaction matrix

Aspect and sources of risk		Environmental, socio-economic or cultural receptor																	
		Physical environment (including water, sediment and air quality and seabed features)	Marine mammals	Marine reptiles (turtles and sea snakes)	Sharks and rays	Fish (pelagic and demersal)	Birds (seabirds and migratory shorebirds)	Shoals and banks of the NMR, NWMR and Sahul Shelf complex	Offshore reefs and islands (Ashmore Reef, Cartier Island, Hibernia Reef and Seringapatam Reef)[1]	North Kimberley coastline [2]	Key ecological features	Commonwealth marine reserves	Commercial fisheries (Commonwealth, NT and WA managed) and traditional Indonesian fishing	Tourism, recreational activities (including fishing) and research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities (NAXA)	Heritage (European/Indigenous)
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Routine/planned activities																		
Physical presence of MODU and support vessels																		
1	*Proximity of MODU and support vessel presence to other marine users*												*1L*		*1N*	*1O*	*1P*	
2	*Disturbance to the seabed*	*2A*									*2J*							
Routine discharges to the marine environment																		
3	*Discharge of drilling cuttings and drilling fluids*	*3A*	*3B*	*3C*	*3D*	*3E*					*3J*							
4	*Discharge of cooling water and RO brine*	*4A*	*4B*	*4C*	*4D*	*4E*												
5	*Discharge of treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well circulated brine*	*5A*	*5B*	*5C*	*5D*	*5E*												
6	*Discharge of cement, cementing fluids, BOP control fluids and hydraulic fluids*	*6A*	*6B*	*6C*	*6D*	*6E*												
Routine emissions																		
7	*Atmospheric emissions from internal MODU and support vessel combustion engines and well test flaring*	*7A*																
8	*Light emissions*			*8C*	*8D*	*8E*	*8F*											
9	*Noise emissions – normal drilling operations*		*9B*	*9C*	*9D*	*9E*												
10	*Noise emissions – VSP*		*10B*	*10C*	*10D*	*10E*							*10L*					
11	*Ozone depleting substances*	*11A*																
Non-routine/unplanned activities																		
Physical presence of MODU and support vessels																		
12	*Interference and/or collision with marine fauna*		*12B*	*12C*														
13	*Introduction of IMS*		*13B*	*13C*	*13D*	*13E*												
14	*Accidental loss of equipment overboard*	*14A*									*14J*							
Unplanned discharge of waste																		
15	*Accidental loss of hazardous and non-hazardous waste*	*15A*	*15B*	*15C*	*15D*	*15E*	*15F*											
Unplanned hydrocarbon discharges																		
16	*Release of hydrocarbons during bunkering or transfer operations*	*16A*	*16B*	*16C*	*16D*	*16E*	*16F*											
17	*Release of hydrocarbons due to a vessel collision*	*17A*	*17B*	*17C*	*17D*	*17E*	*17F*	*17G*			*17J*	*17K*	*17L*				*17P*	

Aspect and sources of risk		Environmental, socio-economic or cultural receptor																
		Physical environment (including water, sediment and air quality and seabed features)	Marine mammals	Marine reptiles (turtles and sea snakes)	Sharks and rays	Fish (pelagic and demersal)	Birds (seabirds and migratory shorebirds)	Shoals and banks of the NMR, NWMR and Sahul Shelf complex	Offshore reefs and islands (Ashmore Reef, Cartier Island, Hibernia Reef and Seringapatam Reef)[1]	North Kimberley coastline [2]	Key ecological features	Commonwealth marine reserves	Commercial fisheries (Commonwealth, NT and WA managed) and traditional Indonesian fishing	Tourism, recreational activities (including fishing) and research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities (NAXA)	Heritage (European/Indigenous)
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
18	*Release of hydrocarbons due to a long-term well blowout*	*18A*	*18B*	*18C*	*18D*	*18E*	*18F*	*18G*	*18H*	*18I*	*18J*	*18K*	*18L*	*18M*	*18N*	*18O*	*18P*	*18Q*
19	*Hydrocarbon fallout during well testing*	*19A*																
Unplanned atmospheric emissions																		
20	*Unplanned venting of gas during drilling (well kick)*	*20A*																
Response strategy implementation																		
21	*Inappropriate response strategies or inappropriate implementation of selected response strategies*	*21A*	*21B*	*21C*	*21D*	*21E*	*21F*	*21G*				*21K*						

Key

	Interaction reasonably possible – low residual risk
	Interaction reasonably possible – medium residual risk
	Interaction reasonably possible – significant residual risk
	Interaction reasonably possible – high residual risk
	Interaction not reasonably expected

[1] Includes the associated socio-economic values, e.g. KEFs, national heritage places, Commonwealth heritage places, Ramsar wetland and CMRs

[2] Encompasses the West Kimberley National Heritage Place

4.2 ROUTINE/PLANNED ACTIVITIES

4.2.1 Physical presence: proximity of MODU and support vessel presence to other marine users

The physical presence of MODU and support vessels has the potential to impact other marine users, particularly commercial shipping and fishing. The risk assessment for potential impacts is summarised in **Table 4-6**.

Table 4-6: Risk assessment of physical presence: proximity of MODU and support vessels to other marine users

Risk	Proximity of MODU (and associated exclusion zone) and support vessel presence to other marine users		
Aspect-receptor reference (see Table 4-5)	1L – commercial fisheries and traditional Indonesian fishing	1O – offshore petroleum exploration operations	
	1N – commercial shipping	1P – defence activities	
Potential impacts	• Interference with and/or exclusion of commercial fishing or shipping vessels • Interaction with other petroleum titleholder operations		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• OPGGS Act – Section 616 (2) Petroleum safety zones • International Regulations for Preventing Collisions at Sea 1972 (COLREGS) • Chapter V of Safety of Life at Sea (SOLAS) • Marine Order 21 (Safety of navigational and emergency procedures) (as appropriate to vessel class) • Marine Order 30 (Prevention of collisions) (as appropriate to vessel class) International Association of Marine Aids Navigation and Lighthouse Authorities (IALA) Recommendations 0–139 – The marking of man-made offshore structures (applicable only to the MODU) • Automatic Identification System (AIS) and approved electronic navigation systems and radar on support vessels • Marine radio channels and other communication systems • Notify Australian Hydrographic Service (AHS) to generate Maritime Safety Information Notifications (MSIN) • Notify AMSA RCC and any relevant stakeholders of the MODU movements as per the MODU contractors' rig move procedure • Support vessel entry and movements within the 500 m PSZ will be undertaken in accordance with the MODU Marine Operations Manual • Stakeholder Engagement Plan which will include consultation with commercial fisheries, shipping and other relevant stakeholders operating in NT/RL5 and surrounds to inform them of the proposed drilling campaign. Ongoing consultation will also be undertaken throughout the drilling campaign.			

Impact assessment and risk evaluation

Interactions with other marine users are considered remote given the minor physical scale and temporary nature of the activity, combined with the relatively low level of activity within NT/RL5. ConocoPhillips has identified, through engagement with commercial fisheries that intersect NT/RL5, that the area is not actively fished. Traditional and recreational fishing practices are typically observed near/around the shoal and reef features in the NMR region and are consequently, expected to be geographically removed from the area.

The presence of the MODU and support vessels has the potential to cause temporary disruption to commercial shipping. However, NT/RL5 does not overlap with any major commercial shipping channels.

ConocoPhillips has also engaged with other offshore petroleum titleholders in the area and the Department of Defence and confirmed that the proposed activities will not impact on other operations.

In summary, the potential impacts and risks to other marine users are considered low.

4.2.2 Physical presence: disturbance to the seabed

The drilling campaign and anchoring of the moored semi-submersible MODU will directly contact the seafloor and therefore, will cause localised impact to seabed features and the benthic environment. The risk assessment for potential impacts is summarised in **Table 4-7**.

Table 4-7: Risk assessment of physical presence: disturbance to the seabed

Risk	Appraisal well footprint and anchoring of the moored semi-submersible MODU		
Aspect-receptor reference (see Table 4-5)	2A – physical environment	2J – KEFs	
Potential impacts	• Localised physical damage (e.g. temporary physical scarring of the seabed) and/or disturbance to marine substrates and benthic habitats, including KEFs		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	4 Probable	4 Low
Residual risk	1 Negligible	4 Probable	4 Low
Summary of control measures			
• Drilling constraints appraisal report – includes review of substrate characteristics to inform well design • MODU contractors' rig move procedure – includes a Site Anchoring Plan			

Impact assessment and risk evaluation

NT/RL5 is situated on a plain comprising relatively homogenous flat, soft sediments and do not contain any significant areas of benthic habitat.COP is not aware of any information indicating that the operational area contains any critical or sensitive habitat that is not represented across other areas and or regions.

Sediments resuspended during anchor deployment and recovery are expected to be re-deposited locally, with finer sediments being advected further than coarser sediments. Any resuspension from anchor deployment or recovery would not be expected to mobilise sediment contaminants that fauna in the vicinity of the moorings are not already exposed to.

NT/RL5 intersects the KEF of the shelf break and slope of the Arafura Shelf which is recognised as a unique seafloor feature with ecological properties of regional significance. However, the seabed footprint that would be impacted by the activity only represents a very small portion of this feature. Furthermore, benthic surveys undertaken for the Barossa Marine Studies Program did not observe any patch reefs or hard substrate pinnacles which are characteristic of the unique seafloor feature identified for this KEF. Therefore, it is highly unlikely that the physical presence of the activity will cause a significant impact to the ecological values associated with this seabed feature.

Overall, the seabed disturbance from the drilling campaign (for a moored semi-submersible MODU) is expected to cause very localised disturbance (< 0.1 ha) of benthic habitats and short-term changes to invertebrate communities in the immediate vicinity of disturbance area.

4.2.3 Routine discharges: drilling cuttings and drilling fluids

The drilling campaign will require the routine discharge of drilling cuttings and drilling fluids (WBM and residual SBM on drill cuttings) to the marine environment. The risk assessment for potential impacts is summarised in **Table 4-8**.

Table 4-8: Risk assessment of routine discharges: drilling cuttings and drilling fluids

Risk	Routine discharge of drilling cuttings and drilling fluids (whole WBM and residual SBM) to the marine environment (seabed or at the sea surface)		
Aspect-receptor reference (see Table 4-5)	3A – physical environment	3D – sharks and rays	
	3B – marine mammals	3E – fish	
	3C – marine reptiles	3J – KEFs	
Potential impacts	• Localised and temporary reduction in water quality associated with increased turbidity leading to impacts to marine fauna (e.g. marine mammals, reptiles, sharks/rays and fish) • Localised displacement, smothering or toxicity of benthic habitats/communities that are regionally widespread		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	2 Minor	2 Remote	4 Low
Residual risk	2 Minor	2 Remote	4 Low
Summary of control measures			
• MODU drilling procedures include the following - SCE (e.g. shale shakers) will be used to recover SBM from the cuttings when drilling with a riser in place, to reduce the oil on cuttings content of drill cuttings discharged overboard - well sections that require SBM will be drilled using a closed loop mud system via a marine riser - positively locking pit dump valves will be used (including trip tanks and mud pits) whilst drilling lower hole sections that require SBM • MODU drilling procedures will include the following - SBM procedures including solids control, handling and storage requirements - all discharges of SBM residual base fluid on cuttings discharged to the marine environment will be measured as < 10% oil-on-cuttings w/w averaged over the entire well - percentage of oil-on-cuttings measured and recorded when drilling with SBM - no discharge of whole SBM fluids overboard (i.e. returned to shore) - unlocking of pit dump valves subject to PTW system - monitor, record and report performance of solids control equipment • ConocoPhillips will confirm that the selection of drilling fluids follows a chemical selection process – all drilling fluid chemicals discharged to the marine environment will be selected to be least hazardous and will have an OCNS grouping of D or E or a CHARM Hazard Quotient (HQ) colour banding of Silver or Gold, or the use of non-rated chemicals will only be used subject to the approval of the ConocoPhillips Lead Drilling Engineer following the completion of an environmental risk assessment.			

Impact assessment and risk evaluation

The discharge of drilling cuttings and drilling fluids to the seabed (during riserless drilling using WBM) is expected to result in a cuttings pile developing immediately around the appraisal well site.

Potential impacts from the discharge of drilling cuttings include localised, temporary reduction in water quality associated with increased turbidity leading to impacts to marine fauna, planktonic communities and displacement, smothering or toxicity of benthic habitats/communities.

The discharge of drilling cuttings and fluids is expected to result in a localised and temporary (i.e. duration of active drilling) increase in turbidity levels in the water column. Considering NT/RL5 is located in open, offshore waters any elevated suspended solids concentrations are expected to rapidly dilute with increasing distance from the well location as a result of the action of currents. Pelagic fauna species, including fish species targeted by commercial fisheries, marine mammals, marine reptiles and sharks/ray, that may be transiting the area are unlikely to be significantly impacted as they are likely to exhibit avoidance behaviour. If any contact does occur, it will be for a short duration due to the rapid dispersion of the plume and the transient movement of marine fauna.

In addition, there is currently very limited fishing effort associated with commercial fisheries in the vicinity of the Operational Areas. As such, impacts to commercial fishing activities are not envisaged in the vicinity of the localised footprint of drill cuttings around each well.

The potential complete displacement or smothering of benthic organisms is expected to be limited to the immediate vicinity of the cuttings pile with minor sediment loading anticipated to reach background levels within several kilometres (with most of the sediment deposited within several hundred metres of the release location). No significant benthic communities within, or in the vicinity of, NT/RL5 have been identified or are considered likely to be present at the depths (approximately 120 m - 350 m) in which drilling will occur.

While NT/RL5 occurs within the bounds of the KEF of the shelf break and slope of the Arafura Shelf, the ecological values associated with this seafloor feature (i.e. patch reefs and hard substrate pinnacles) were not observed during the Barossa Marine Studies Program. Therefore, it is considered highly unlikely that the discharge of drill cuttings and fluids will significantly impact the benthic habitat values associated with this feature. The potential area of impact will also be very small in comparison to the overall area covered by the shelf break and slope of the Arafura Shelf (approximately 10,844 km^2).

In summary, based on the volumes discharged and the management controls that will be implemented, it is considered that the discharge of drilling cutting and fluids will not result in a potential impact beyond temporary minor effects to water quality (e.g. turbidity increase) and localised burial, smothering and displacement of commonly represented benthic habitats and communities.

4.2.4 Routine discharges: cooling water and RO brine

The drilling campaign will require the routine discharge of cooling water and brine from the MODU and support vessels to the marine environment. The risk assessment for potential impacts is summarised in **Table 4-9**.

Table 4-9: Risk assessment of routine discharges: cooling water and RO brine

Risk	*Routine discharge of cooling water produced by cooling machinery and brine produced by the RO process from the MODU and support vessels*		
Aspect-receptor reference (see Table 4-5)	4A – physical environment	4D – sharks and rays	
	4B – marine mammals	4E – fish	
	4C – marine reptiles		
Potential impacts	Localised and temporary reduction in water quality associated with an increase in water temperature or salinity leading to impacts on marine fauna (e.g. marine mammals, reptiles, sharks/rays and fish)		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• The open-loop cooling water system is segregated from contact with hydrocarbons to limit potential cross-contamination of discharge streams • Preventative maintenance will be undertaken on the cooling water system and RO plant as per manufacturer's specifications			

Impact assessment and risk evaluation

The discharge of cooling water and RO brine is expected to result in a localised and temporary increase in water temperature and salinity in the upper to mid water column. Considering NT/RL5 is located in open, offshore waters, which are subject to large scale currents and mixing, the elevated water temperatures and salinities are expected to rapidly dilute and reach the background levels. In summary, the potential impacts and risks to the marine environment from cooling water and RO brine discharges are considered low.

4.2.5 Routine discharges: treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well cirulated brine

The drilling campaign will require the discharge of treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well circulated brine from the MODU/support vessels to the marine environment. The risk assessment for potential impacts is summarised in **Table 4-10**.

Table 4-10: Risk assessment of routine discharges: treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well circulated brine

Risk	Routine discharge of treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well circulated brine from the MODU and support vessels		
Aspect-receptor reference (see Table 4-5)	5A – physical environment	5D – sharks and rays	
	5B – marine mammals	5E – fish	
	5C – marine reptiles		
Potential impacts	• Localised and temporary reduction in water quality leading to toxic effects on marine fauna (e.g. marine mammals, reptiles sharks/rays and fish)		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			

Sewage discharges from the MODU and support vessels must comply with the requirements of:

- MARPOL Annex IV – Sewage. MARPOL is an IMO convention and will be adhered to by all vessels regardless of their Flag or Class
- Marine Order 96 (Marine pollution prevention — sewage)
- The MODU and support vessels must have a valid International Sewage Pollution Prevention Certificate (ISPPC) applicable to vessel class

Food waste discharges from the MODU and support vessels must comply with the requirements of:

- MARPOL Annex V – Garbage. MARPOL is an IMO convention and will be adhered to by all vessels regardless of their Flag or Class
- Marine Order 95 (Marine pollution prevention - garbage)

Bilge water discharges (machinery space bilges) from the MODU and support vessels must comply with the requirements of:

- MARPOL Annex I – Oil. MARPOL is an IMO convention and will be adhered to by all vessels regardless of their Flag or Class
- Vessels must have a valid International Oil Pollution Prevention Certificate (IOPPC) applicable to vessel class
- MODU and support vessels equipped with MARPOL compliant sewage treatment plant, sewage comminuting and disinfecting system and holding tank
- MODU and support vessels equipped with grinder/comminuter for maceration of food wastes
- MODU and support vessels equipped with MARPOL/International Maritime Organisation (IMO) compliant oil/water treatment system (as appropriate to vessel class)
- ConocoPhillips will confirm that the MODU/support vessels have a functioning deck drainage system that includes:
    - MODU drill floor drainage routed to the containment tank when using SBM
    - run-off from the pump rooms, engine rooms and bilges transfers routed to a holding tank/s
    - a dedicated holding tank in the engine room for the collection of drained material prior to transfer to the sludge tank
    - deck areas managed to keep areas clean.
- If after treatment by the oil/water separator, the oil-in-water content is >15 ppm it will be pumped to storage tanks and transferred to shore. Residual oil from the oil/water separator is collected into tanks and transferred to shore for appropriate disposal.

- The macerator will be maintained as per manufacturer's specifications (or replaced when blades are blunt or the motor is non-functional)
- Preventative maintenance will be undertaken on the sewage treatment plant as per manufacturer's specifications
- ISPPC and IOPPC in place for MODU and support vessels

Garbage Log and Oil Record Book in place for MODU and support vessels.

Impact assessment and risk evaluation

Considering NT/RL5 is located in open, offshore waters which are subject to large scale currents and high dilution forces, and that relatively small volumes will be discharged, no significant impacts to the marine environment are expected from the routine discharge of treated sewage, grey-water, putrescible waste, deck drainage, bilge water and well circulated brine associated with the activity. Any potential impacts are also expected to be highly localised and temporary. Furthermore, NT/RL5 does not contain any significant feeding, breeding or aggregation areas for marine fauna. In summary, the potential impacts and risks to the marine environment from routine discharges described above are considered low.

4.2.6 Routine discharges: cement, cementing fluids and BOP control fluids

The drilling campaign will require the discharge of cement, cementing fluids and BOP control fluids from the MODU and associated subsea drilling equipment to the marine environment. The risk assessment for potential impacts is summarised in **Table 4-11**.

Table 4-11: Risk assessment of routine discharges: cement, cementing fluids and BOP control fluids

Risk	Routine discharge of cement (including any bulk discharges), cementing fluids and BOP control fluids		
Aspect-receptor reference (see Table 4-5)	6A – physical environment	6D – sharks and rays	
	6B – marine mammals	6E – fish	
	6C – marine reptiles		
Potential impacts	• Localised and temporary reduction in water quality leading to toxic effects on marine fauna (e.g. marine mammals, reptiles sharks/rays and fish)		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• The volume of cement to be used will be planned as per the drilling well plan • ConocoPhillips will confirm that the selection of cementing fluids and BOP control fluids follows a chemical selection process and the products selected will be least hazardous and will be Silver or Gold (CHARM) or have an OCNS grouping of D or E, or the use of non-rated chemicals will only be used subject to the approval of the ConocoPhillips Lead Drilling Engineer following the completion of an environmental risk assessment			

Impact assessment and risk evaluation

Cementing fluids are not routinely discharged to the environment, however small amounts (approximately 8 m^3 per well) may be unavoidably released when the cement mixture is circulated to the seabed during grouting of the conductor or when surplus fluids require disposal after cementing operations. The cementing slurry is inert to the environment and will contain no additional chemical additives.

Function and pressure tests of the BOP are required to meet operational and legislative requirements and will result in the release of approximately 250 L-300 L of the BOP fluid (i.e. base chemical diluted in water) to the marine environment. The BOP fluids used in the drilling campaign will be assessed in accordance with OCNS (CHARM model) to confirm the least hazardous fluid is selected, while maintaining technical feasibility.

Considering NT/RL5 is located in open, offshore waters, which are subject to large scale currents and mixing, with a relatively featureless seabed, and that relatively small volumes will be discharged, no significant impacts to the marine environment are expected from the discharge of cement, cementing fluids and BOP control fluids associated with the activity. Any potential impacts are also expected to be highly localised and temporary, and may include localised burial, smothering and displacement of commonly represented benthic habitats and communities. Furthermore, NT/RL5 does not contain any significant feeding, breeding or aggregation areas for marine fauna. In summary, the potential impacts and risks to the marine environment from routine discharges of cement, cementing fluids and BOP control fluids are considered to be negligible.

4.2.7 Routine emissions: atmospheric emissions from internal MODU and support vessel combustion engines and well test flaring

Atmospheric emissions will be generated by the MODU and support vessels from the combustion of fuel and from flaring during well testing. The risk assessment for potential impacts is summarised in **Table 4-12**.

Table 4-12: Risk assessment of routine emissions: atmospheric emissions from internal MODU and support vessel combustion engines and well test flaring

Risk	Atmospheric emissions from internal MODU and support vessel combustion engines and through flaring during well testing		
Aspect-receptor reference (see Table 4-5)	7A – physical environment		
Potential impacts	• Localised reduction in air quality • Contribution to the incremental build-up of greenhouse gas (GHG) in the atmosphere		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	2 Minor	1 Improbable	2 Low
Residual risk	2 Minor	1 Improbable	2 Low
Summary of control measures			
• Marine Order 97 (Marine pollution prevention – air pollution): - optimisation of fuel use to increase efficiency and minimise emissions - use of low sulphur fuel when it is available to minimise emissions from combustible sources • Valid International Air Pollution Prevention (IAPP) Certificate (as appropriate to vessel class) • Use of low sulphur diesel fuel in MODU and support vessel engines when possible • All power generation equipment will be maintained in accordance with manufacturer's specifications • Third party inspection to certify operability of flaring equipment • ConocoPhillips Well Test Program			

Impact assessment and risk evaluation

Emissions to atmosphere from the drilling campaign will be primarily from the combustion of fossil fuels, the main emissions identified include carbon dioxide (CO_2), carbon monoxide (CO), oxides of nitrogen (NO_X), sulphur dioxide (SO_2), particulate matter, non-methane volatile organic compounds (VOCs) and BTEX (benzene, ethylbenzene, toluene and xylenes). Flaring will only occur for up to seven days during well testing of each well (i.e. 21 days in total).

Atmospheric emissions will result in a minor deterioration in local air quality, while emissions of GHG will cause an incremental increase in global GHG concentrations, however, they are not considered to have a determinable local-scale impact.

Considering the location of NT/RL5 in the open ocean, which is well-removed from nearest residential or sensitive populations, it is considered highly unlikely that atmospheric emissions will result in significant impacts.

4.2.8 Routine emissions: light emissions

Light emissions will be generated by the MODU and support vessels. The risk assessment for potential impacts is summarised in **Table 4-13**.

Table 4-13: Risk assessment of routine emissions: light emissions

Risk	Light emissions from the MODU and support vessels		
Aspect-receptor reference (see Table 4-5)	8C – marine reptiles	8E – fish	
	8D – sharks and rays	8F – birds	
Potential impacts	• Change in fauna movements and/or behaviour, such as attraction or disorientation of marine reptiles, sharks/rays, fish and birds		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• Navigation Act 2012 – Marine Order 21 (Safety of navigational and emergency procedures) and Marine Order 30 (Prevention of collisions) (as appropriate to vessel class) • COLREGS • Chapter V of SOLAS • IALA Recommendations 0–139 – The marking of man-made offshore structures (applicable only to the MODU • External lighting will be minimised to that required for navigation, vessel safety and safety of deck operations, except in the case of an emergency			

Impact assessment and risk evaluation

Light emissions associated with the drilling campaign may present a potential risk to marine fauna in the open waters adjacent to the activity and cause a temporary change in movement patterns and/or behaviour, such as the attraction or disorientation of individuals.

As NT/RL5 does not contain any significant feeding, breeding or aggregation areas for, marine reptiles, sharks/rays, fish or birds, there is limited potential for marine fauna individuals to be impacted by light emissions. Considering the location of NT/RL5 in the open ocean, the relatively short duration of the activity and the limited extent of any light spill (i.e. immediate vicinity), it is considered highly unlikely that light emissions associated with the MODU and support vessels will result in any significant impacts.

4.2.9 Routine emissions: underwater noise emissions from MODU and support vessels

Underwater noise emissions will be generated by the MODU and support vessels. The risk assessment for potential impacts is summarised in **Table 4-14**.

Table 4-14: Risk assessment of routine emissions: underwater noise emissions from MODU and support vessels

Risk	Underwater noise emissions associated with the MODU and support vessels		
Aspect-receptor reference (see Table 4-5)	9B – marine mammals	9D – sharks and rays	
	9C – marine reptiles	9E – fish	
Potential impacts	• Behavioural disturbance to sensitive marine fauna (e.g. marine mammals, marine reptiles, sharks/rays and fish) • Masking or interference with marine fauna communications or echolocation		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans • MODU and support vessel equipment (engines, thrusters, generators etc.) will be maintained in accordance with the Planned Maintenance System (PMS)			

Impact assessment and risk evaluation

The drilling campaign will generate underwater noise through drilling operations and associated vessel activity (e.g. vessel thrusters and engines, and propeller movement). Marine fauna that may be impacted by underwater noise from the activity, include marine mammals (cetaceans), reptiles, sharks/rays and fish.

Broadly, the effects of sounds on marine fauna can be categorised as:

- acoustic masking – anthropogenic sounds may interfere, or mask, biological signals therefore reducing the communication and perceptual space of an individual
- behavioural response – behavioural changes vary significantly and may include temporary avoidance, increased vigilance, reduction in foraging and reduced vocalisations. For continuous sounds, a review by Southall et al. (2007) concluded that there were no or limited responses by low-frequency cetaceans to continuous received levels up to 120 dB re 1 µPa (rms SPL). However, an increasing probability of avoidance and other behavioural responses began at 120 to 160 dB re 1 µPa (rms SPL)
- auditory threshold shift (temporary and permanent hearing loss) – marine fauna exposed to intense sound may experience a loss of hearing sensitivity. Hearing loss may be in the form of a temporary threshold shift (TTS) from which an animal recovers within minutes or hours, or a permanent threshold shift (PTS) from which the animal does not recover
- non-auditory physiological effects – include increased stress or physiological injury as a result of behavioural response.

Studies have indicated that physical damage to the auditory system of cetaceans is likely to occur is between 230-240 dB re 1 µPa (rms SPL) (Southall 2007; Gausland 2000). McCauley et al. (2000) reported that noise levels of 175 dB re 1 µPa (rms SPL) cause avoidance behaviour in green turtles and that baleen whales display avoidance behaviour at levels of 160 dB re 1 µPa (rms SPL). Popper et al. (2014) reported that continuous noise levels of 170 dB rms SPL result in recoverable injury to fish, with TTS occurring at 158 dB (rms SPL).

McCauley and Duncan (2003) recorded underwater noise at 5 km from a drilling rig and found broadband levels of noise during drilling were normally below 110 dB re 1µPa (rms SPL), with support vessel noise exceeding 120 dB re 1 µPa (rms SPL) at 5 km for only 0.7% of the time. Another study of a drilling campaign (drilling and supply vessel movements) found that noise levels at 2 km from the drilling rig exceeded 120 dB re 1µPa (rms SPL) for only 2% of the time and estimated that significant effects of underwater noise may be confined to within 3 km of the rig (APPEA 2005). To put these anthropogenic noise sources into context, the average ambient sound levels for this region were recorded as ranging between approximately

97-119 dB re 1 µPa (rms SPL) (JASCO 2015).

The potential for limited numbers of marine fauna individuals to be impacted by underwater noise emissions for duration of the activity is low. NT/RL5 does not contain any significant feeding, breeding or aggregation areas for marine mammals and reptiles. Furthermore, the nearest shoal/bank habitat feature is located approximately 56 km to the south-east, with the closest BIA located approximately 89 km to the south. Therefore, there is likely to be a limited number of individuals present in the area at any time with individuals likely to be traversing through the area.

Most pelagic fish species which may transit through the area are expected to demonstrate avoidance behaviour if noise levels approach those that could cause pathological effects. Commercial fishing activities are unlikely to be affected as the area is not actively fished by commercial fisheries.

In summary, considering the remote offshore location of NT/RL5, the potential impacts and risks to marine fauna from underwater noise emissions generated by the MODU or support vessels are assessed as low.

4.2.10 Routine emissions: noise emissions from VSP

Underwater noise emissions will be generated during VSP operations. The risk assessment for potential impacts is summarised in **Table 4-15**.

Table 4-15: Risk assessment of routine emissions: underwater noise emissions from VSP

Risk	Underwater noise emissions associated with VSP		
Aspect-receptor reference (see Table 4-5)	10B – marine mammals	10D – sharks and rays	
	10C – marine reptiles	10E – fish	
	10L – Commercial fisheries		
Potential impacts	• Behavioural disturbance to sensitive marine fauna (e.g. marine mammals, marine reptiles, sharks/rays and fish) • Masking or interference with marine fauna communications or echolocation • Adverse effects on commercial diving operations at nearby seabed features		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales: Industry guidelines • Contractor's VSP procedure – aligns with the standard management measures detailed in EPBC Act Policy Statement 2.1 – Part A – Standard Management Measures- Interaction between offshore seismic exploration and whales: Industry guidelines, including: - Pre-start up visual observations - Soft start procedure - Start up delay procedure - Operations procedure - Stop work procedure - Night-time and low visibility procedure • For the above controls will be implemented in accordance with the EPBC Act Policy Statement 2.1 – Part A standard management measures. For the purposes of implementing Part A, ConocoPhillips considers the low power zone to be 1km radius from the VSP source and the shutdown zone to be a 500m radius • Visual observations for marine fauna by trained crew member maintained for duration of VSP operations			

Impact assessment and risk evaluation

The sound source used for VSP will be an airgun array of approximately 450 cubic inch (three by 150 cubic

inch) capacity. A study undertaken by Curtin University of Technology (2013) estimated that for a small seismic array of 440 cubic inch, the expected SEL per shot received would be 180 dB re μPa^2·s at 100 m and dissipate to 160 dB re 1 μPa^2·s at 500 m, and 144 dB re 1 μPa^2·s at 2 km.

As discussed in **Section 4.2.9**, marine fauna responds variably when exposed to underwater noise from anthropogenic sources. Studies have indicated that physical damage to the auditory system of cetaceans from multiple pulse sound types[2] (e.g. VSP) is likely to occur is above 198 dB re 1 μPa^2·s (Southall et al. 2007). A technical report providing sound exposure guidelines for fishes and sea turtles was published by Popper et al. (2014) and defined thresholds for seismic airguns (based on 960 sound events and 1.2 second intervals). TTS for fish were defined as 186 dB re 1 μPa^2·s (SEL) with mortality/injury expected at 207 dB re 1 μPa^2·s. The mortality/injury threshold defined for marine turtles was > 210 dB re 1 μPa^2·s.

The potential for limited numbers of marine fauna individuals to be impacted by underwater noise emissions from VSP is considered to be low. NT/RL5 and immediate surrounds do not contain any significant feeding, breeding or aggregation areas for marine mammals and reptiles. Furthermore, the nearest shoal/bank habitat feature is located 56 km to the south-east. Therefore, there is likely to be a limited abundance of individuals present in the area at any time with individuals likely to be traversing through the area.

There is no potential for mortality to fish, and the potential for TTS effects is likely to be restricted to the very close proximity of the source (within metres). There is the potential for behavioural change responses to fish in close proximity to the source. It is difficult to predict behaviour response in fish as the response is specific to the context in which an individual receives the sound, and the individual itself.

The Operational Area represents a relatively small portion of habitat available to fish populations in the Timor Sea. Consequently, behavioural responses as a result of acoustic emissions from VSP are unlikely to affect any species at the population level, and impacts to spawning populations are not expected. Although the Operational Area is within the TRF, it represents a small portion of the total area available to both the fishery and the habitat for key target species. Stakeholder consultation did not raise any specific concerns in relation to the drilling campaign and commercial fishing operations. Therefore, impacts to commercial fisheries, including catchability impacts, are not expected.

There is the potential for divers participating in the NT aquarium fishery to be active during VSP, which may expose divers to acoustic energy generated by the array. Diving activities are typically restricted to relatively shallow waters (<30 m) due to safe diving depth restrictions. As such, divers within the aquarium fishery will be restricted to shallow shoals, banks and reefs in the region. The nearest such seabed features are Lynedoch Shoal (56 km), Evans Shoal (81 km) and Tassie Shoal (89 km). The fishery may be active year-round and is known to have been active at Evans Shoal.

The following simple cylindrical transmission loss model was used to estimate the received energy level at the nearest location at which the aquarium fishery may be active (Lynedoch Bank):

$$TL = 20 \times \log_{10} r$$

Using a source level of 190 dB re 1 μPa @ 1 m (considered to be representative of the seismic array used for VSP), the transmission loss to the nearest receptor is approximately 95 dB, with the resultant received energy level estimated to be 95 dB re 1 μPa @ 1 m. This is considered to be a conservative estimate in that:

- The model considers only cylindrical spreading rather than spherical spreading (although given the water depth of the Operational Area the cylindrical model is considered appropriate).
- The sound would be propagating up slope, resulting greater sound absorption
- No allowance is made for the absorption of sound in seawater (although this component of transmission loss is small for low frequency sound such as airgun array impulses).

When considering the impacts of low frequency sound from a seismic array, the majority of the acoustic energy is concentrated below 100 Hz. Studies of human ability to perceive sound in water at this frequency are between 85 and 98 dB; as such a diver may be able to perceive the sound. However, this level is well below that required for a diver to perceive body vibration (130 dB) and the levels at which divers experience clearly audible noise (136-140 dB) for low frequency sound (100 - 500 Hz) (Parvin n.d.). This is also well below the 160 dB re 1 μPa @ 1 m exposure threshold for divers proposed by Fothergill et al. (1998). Given the short duration of VSP (12 hrs per well) and the precautionary received energy level at the nearest site where divers may be active is at the threshold for the perception of sound for divers and well below the

[2] Units for multiple pulse sources are presented in SEL in relation to species thresholds.

levels at which adverse exposure effects may occur, no impacts to divers in the region are expected due to VSP.

In summary, considering the remote offshore location of NT/RL5 and very short duration of VSP (maximum of up 12 hours per well), the potential impacts and to marine fauna from underwater noise emissions generated by VSP are assessed as low.

4.2.11 Routine emissions: ODS

While the release and handling of ODS is not expected given the short duration of the drilling campaign, ODS may be present onboard the MODU/support vessels in old refrigeration and air conditioning equipment. The risk assessment for potential impacts is summarised in **Table 4-16**.

Table 4-16: Risk assessment of routine emissions: ODS

Risk	Release of ODS that may be present onboard the MODU/support vessels in old refrigeration and air conditioning equipment		
Aspect-receptor reference (see Table 4-5)	11A – physical environment		
Potential impacts	• Contribution to the incremental build-up of ODS in the atmosphere		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	1 Improbable	1 Low
Residual risk	1 Negligible	1 Improbable	1 Low
Summary of control measures			
• MARPOL 73/78 Annex VI (Prevention of air pollution from ships), Regulation 12 – Emissions from ozone depleting substances from refrigerating plants and firefighting equipment (as appropriate to vessel class) • Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and Synthetic Greenhouse Gas Management Regulations 1995 – including valid Restricted Refrigerant Trading Authorisation (RRTA and refrigerant handling licences, and reporting of any importation of ODSs and synthetic greenhouse gases (SGGs) • Destruction of any refrigerant is undertaken by a licensed operator of a refrigerant destruction facility			

Impact assessment and risk evaluation

Considering the location of NT/RL5 in the open ocean, the relatively short duration of the activity and the controls that will be implemented, it is considered highly unlikely that ODS emissions associated with the MODU and support vessels will result in significant environmental impacts.

4.3 NON-ROUTINE/UNPLANNED ACTIVITIES

4.3.1 Physical presence: interference and/or collision with marine fauna

The presence of MODU and support vessels has the potential to interact with marine fauna. The risk assessment for potential impacts is summarised in **Table 4-17**.

Table 4-17: Risk assessment of physical presence: interference and/or collision with marine fauna

Risk	Accidental interference and/or collision between support vessels and conservation significant marine fauna		
Aspect-receptor reference (see Table 4-5)	12B – marine mammals	12C – marine reptiles	
Potential impacts	• Injury and/or mortality to marine mammals or marine reptiles from vessel collision • Behavioural disruption to cetaceans		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	2 Minor	2 Remote	4 Low
Residual risk	2 Minor	2 Remote	4 Low
Summary of control measures			
• EPBC Regulations 2000 - Part 8 Division 8.1 Interacting with cetaceans			

Impact assessment and risk evaluation

Vessels associated with the activity may present a potential physical risk to marine fauna. The impact from vessel interactions with marine fauna can be as minimal as temporary behavioural changes, ranging to severe impacts, such as injury or mortality resulting from vessel strikes. The potential risk of a collision with marine fauna is directly related to the abundance of fauna in NT/RL5 and the actual likelihood of a collision occurring.

The potential for limited numbers of marine fauna individuals to be impacted by vessel movements during the duration of the activity is low. NT/RL5 does not contain any significant feeding, breeding or aggregation areas, including BIAs, for marine mammals, reptiles and sharks/rays. Therefore, there is a limited abundance of individuals present in the area at any time with individuals likely to be traversing through the area. Support vessels within the operational area will also generally travel at speeds of $\leq$ 5 knots. Consequently, the likelihood of a vessel strike and the possibility of mortality within operational area is low.

In summary, the potential impacts and risks to marine fauna from an interaction with the MODU or support vessels are assessed as low.

4.3.2 Physical presence: introduction of IMS

The activity has the potential to translocate and/or introduce invasive marine species (IMS) to the marine environment, particularly through the discharge of vessel ballast water or marine biofouling on the MODU/support vessels. The risk assessment for potential for impacts to the marine environment due to IMS is summarised in **Table 4-18**.

Table 4-18: Risk assessment of physical presence: introduction of IMS

Risk	Introduction of IMS from vessel ballast water discharge and biofouling on the MODU/support vessels		
Aspect-receptor reference (see Table 4-5)	13B – marine mammals	13D – sharks and rays	
	13C – marine reptiles	13E – fish	
Potential impacts	• Displacement of native marine species (e.g. marine mammals, marine reptiles, sharks/rays and fish) • Reduction in species biodiversity and decline in ecosystem integrity of the surrounding marine environment		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	3 Moderate	1 Improbable	3 Low
Residual risk	3 Moderate	1 Improbable	3 Low
Summary of control measures			
• Ballast water discharges from the MODU and support vessels must comply with the requirements of the Australian Ballast Water Management Requirements (as enforced under the Quarantine Act 1908 [Section 27A]; Quarantine Regulations 2000; and Biosecurity Act 2015 [Chapter 5]): - no discharge of high-risk ballast water within Australian territorial seas (within 12 nautical miles of coastline) including any ports - completion of Department of Agriculture and Water Resources (DoAWR) Ballast Water Management Summary (BWMS) forms for any ballast water discharge in Australian waters. • Offshore Installations Quarantine Guide (DAFF 2011) International Convention on the Control of Harmful Anti-fouling Systems on Ships – valid International Anti-Fouling Systems (IAFS) Certificate (as appropriate to vessel class) Application of approved antifoulant coating to MODU and support vessel hulls prior to operating in Australian waters Department of Agriculture and Water Resources electronic Quarantine Pre-arrival Report (QPAR) completed for all vessels entering into Australian waters Implementation of MODU/support vessel contractor Biofouling Management Plan – includes requirement for biofouling record book, in-water inspections/cleaning and anti-fouling coating Application of guidelines detailed in the National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Commonwealth of Australia 2009), and in the IMO Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species If any support vessels are sourced from outside Australia, it will have a valid class certificate (including antifouling certificate) from the International Association of Classification Societies prior to mobilising to Australian waters.			

Impact assessment and risk evaluation

Potential impacts caused by IMS can include impact to benthos via competition for space and food, change in species composition resulting in altered community structures, increased predation pressure to native species, introduction of pathogens, a reduction of biodiversity and biofouling of fishing equipment.

The most common transfer mechanisms for IMS include:

- discharge of vessel ballast water taken up from high risk international or domestic offshore waters
- marine biofouling:
    - on equipment that is regularly submerged in water, such as drilling equipment and ROVs
    - on hulls of the MODU or support vessels and other external niches, such as propulsion units and thruster tunnels
    - of internal niches of MODU or support vessels, such as anchor chain lockers, sea chests, strainers and seawater pipework.

The risk of introducing IMS is considered low due to the location of the activity in deep waters (approximately 120 m - 350 m). IMS are generally unable to successfully establish in deep water ecosystems (Geiling 2014), most likely due to a lack of light and suitable habitat to sustain the growth and survival of IMS. In addition, the risk of introducing IMS is considered to be inherently low due to the remote location of NT/RL5 (i.e. 152 km from the nearest shoreline of the Tiwi Islands) and > 12 nm from the nearest coastal waters).

4.3.3 Physical presence: accidental loss of equipment overboard

The activity has the potential to result in the accidental loss of equipment overboard from the MODU/support vessels. The risk assessment for potential for impacts to the marine environment due the loss of equipment overboard is summarised in **Table 4-19**.

Table 4-19: Risk assessment of physical presence: accidental loss of equipment overboard

Risk	Accidental loss of equipment overboard		
Aspect-receptor reference (see Table 4-5)	14A – physical environment	14J – KEFs	
Potential impacts	• Localised physical damage and/or disturbance to marine substrates and benthic habitats		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• MODU procedures for lifting operations – including use of appropriate and certified lifting equipment, lifting undertaken by competent personnel, preventative maintenance, consideration of weather conditions.			

Impact assessment and risk evaluation

There is potential for objects, such as PPE, small tools and drill equipment (e.g. drill pipe), to be accidentally lost overboard to the marine environment from the MODU and support vessels. It is anticipated that any potential impacts would be limited to minor and localised disturbance of the seabed and benthic habitats. As the benthic habitat in NT/RL5 comprises relatively homogenous flat, soft sediments that are broadly consistent with deep water habitats, it is considered highly unlikely that any disturbance to the seabed will cause significant impacts.

Objects dropped overboard may impact the KEF of the shelf break and slope of the Arafura Shelf, a unique seafloor feature that intersects NT/RL5. However, the seabed footprint that would be impacted by the potential dropped objects would only represent a very small portion of this feature. Therefore, it is highly unlikely that any objects dropped during the activity would cause a significant impact to the ecological values associated with this seabed feature.

4.3.4 Non-routine discharge of waste: accidental loss of hazardous and non-hazardous waste

The risk assessment for potential impacts to the marine environment due the accidental loss of hazardous and non-hazardous waste from the MODU/support vessels is shown in **Table 4-20**.

Table 4-20: Risk assessment of physical presence: accidental loss of hazardous and non-hazardous waste

Risk	Accidental loss of hazardous and non-hazardous waste from the MODU/support vessels		
Aspect-receptor reference (see Table 4-5)	15A – physical environment	15D – sharks and rays	
	15B – marine mammals	15E – fish	
	15C –marine reptiles	15F – birds	
Potential impacts	• Pollution or contamination of the marine environment • Localised and temporary reduction in water quality resulting in toxic effects on marine fauna (e.g. marine mammals, marine reptiles, sharks/rays, fish and birds) • Injury or mortality of marine fauna through ingestion or entanglement		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	3 Rare	3 Low
Residual risk	1 Negligible	3 Rare	3 Low
Summary of control measures			
• MARPOL73/78 Annex V (Pollution by garbage from ships) and Marine Order 95 (Marine pollution prevention – garbage) (as appropriate to vessel class) • MARPOL 73/78 Annex III (Prevention of pollution by harmful substances carried by sea in packaged form) and Marine Order 94 (Pollution prevention – packaged harmful substances) (as appropriate to vessel class) • MARPOL 73/78 Annex II (Control of pollution by noxious liquid substances in bulk) (as appropriate to vessel class) – valid International Pollution Prevention Certificate (IPPC) • International Maritime Dangerous Goods (IMDG) Code – including completion of Multimodal Dangerous Goods Form • Provision of appropriate segregation facilities on MODU and support vessels for storage of hazardous wastes • All waste receptacles aboard MODU and vessels covered with tightly fitting, secure lids to prevent any solid wastes from blowing overboard • ConocoPhillips will confirm that the MODU and support vessels have a Garbage Management Plan which requires the segregation of waste, maintenance of a Garbage Record Book, appropriate labelling and storage, no overboard discharge of solid waste (except macerated food waste) and use of licensed waste contractors • ConocoPhillips will confirm that the MODU/support vessel operational procedures include appropriate storage (including loss prevention features) and transport of bulk hydrocarbons and chemicals, up to date MSDS available on board for all hazardous substances, stocks of Shipboard Oil Pollution Emergency Plan (SOPEP) spill response kits readily available and PMS • Garbage, solid and liquid wastes handling and disposal will be managed in accordance with the vessel specific garbage management plan, specifying that: - Wastes are segregated for onshore recycling, wherever practicable. - A Garbage Record Book will be maintained, recording the types and volumes of waste incinerated and offloaded. - Incinerator ash will be compacted, bagged and stored on board for onshore disposal. - Wastes will be compacted where possible and stored in covered waste receptacles. - All waste receptacles are appropriately labelled and secured. - No solid waste will be discharged overboard (except macerated food waste). - Only licensed shore-based waste contractors will be used.		

Impact assessment and risk evaluation

The MODU and support vessels will generate a variety of solid and liquid wastes, including packaging, domestic wastes such as paper, plastic, bottles, scrap materials and industrial wastes such as chemicals, chemical drums, waste oil and consumables.

It is considered highly unlikely that any unplanned discharges of waste will result in significant impacts to the marine environment. NT/RL5 does not contain any significant feeding, breeding or aggregation areas for marine fauna, any potential impacts are expected to be limited to a small number of individuals that may be transiting the area. The potential impacts to water quality from unplanned liquid waste discharges are likely to be for a short duration only due to the rapid dispersion of the fluids as a result of ocean currents. In summary, the potential impacts and risks to the marine environment from the accidental loss of hazardous and non-hazardous waste are considered low.

4.3.5 Unplanned hydrocarbon discharges

Identification of credible hydrocarbon spill scenarios

Three credible hydrocarbon spill scenarios were identified for the drilling campaign. These scenarios also represent a range of spill volumes which allow for appropriate planning and assessment of emergency response capabilities and resources.

Scenario 1 – An instantaneous surface release of 10 m^3 of Marine Diesel Oil (MDO) to represent a refuelling incident

Scenario 2 – A 6 hour surface release of 250 m^3 of MDO to represent a support vessel collision and a single fuel tank rupture

Scenario 3 – An 80 day subsurface release of condensate to represent a long-term blowout scenario

Modelling method

ConocoPhillips commissioned RPS APASA (2015b) to undertake a hydrocarbon spill modelling study for the drilling campaign to assess the potential exposure from surface and in-water hydrocarbons (entrained and dissolved aromatics) to the marine environment, particularly key environmental, socio-economic and cultural receptors, as discussed in **Section 3**.

The hydrocarbon spill modelling was performed using a three-dimensional spill trajectory and weathering modelling, spill impact mapping and analysis program (SIMAP), which is designed to simulate the transport, spreading and weathering of specific oil types under the influence of changing meteorological and oceanographic forces. The fate of the subsea discharge of condensate and gas was assessed using the blowout model OILMAP-Deep.

The modelling study was undertaken in several stages. Firstly, a five year current dataset (2010–2014) was developed combining the influence of the ocean and tidal currents, as informed by the CSIRO Bluelink ReANalysis (BRAN) ocean model (for ocean currents) and HYDROMAP model (for tidal currents) which has been thoroughly tested and verified by field measurements. Secondly, the currents, local winds and detailed hydrocarbon characteristics were input into the three-dimensional spill model to replicate the drift, spread, weathering and fate of the spilled hydrocarbons. The decay rates used to inform the modelling were defined based on the hydrocarbon type and ambient environmental conditions, and varied between 1%-3% depending on the hydrocarbon type and expression in the marine environment (i.e. sea surface, entrained or dissolved aromatics). The decay rates used are considered conservative as natural decay rates are approximated to be between 2%-7% in the NMR.

The model also considered the data collected during the extensive and robust Barossa Marine Studies Program. This data is considered the most accurate for this particular area and has been used to validate the models applied and provide confirmation of their accuracy (APASA 2015a). As a result of the validation process, the models and inputs used to inform the modelling are considered best available and highly representative of the characteristics influencing the marine environment, particularly within NT/RL5 and surrounds (APASA 2015a).

For each spill scenario, 100 single trajectories per season were modelled with each trajectory characterised by the same spill information (i.e. release location, spill volume, duration and composition of hydrocarbons) but varying start times. This ensured that each spill trajectory was subjected to a range of varying wind and current conditions. Modelling was undertaken for each of the three seasons to account for different combinations of wind, current and water temperatures that occur throughout annual cycles: summer (December to February), winter (April to August) and the transitional (March and September to November) seasons. This approach assists in identifying the key receptors and values/sensitivities that would be at risk

of exposure on a seasonal basis.

The stochastic model outputs used to inform the risk assessment does not represent the actual extent of any single spill trajectory but rather, provides a summary of all trajectories run for each scenario and each season. In general, the potential extent and duration of exposure from an individual spill would be significantly smaller, shorter and unlikely to extend simultaneously over vast areas (with the exception of a long-term well blowout).

The credible hydrocarbon spill scenarios were simulated for 10 days for Scenario 1 (refuelling incident – 10 m^3), 20 days for Scenario 2 (vessel collision – 250 m^3) and 90 days for Scenario 3 (long term well blowout). The simulation lengths were carefully selected for each scenario based on the spill information, including release volume, release duration, release type (surface or subsea) and the weathering of the hydrocarbon released (RPS APASA 2015b).

Therefore, the stochastic modelling results for the credible spill scenarios are considered highly conservative in terms of the potential impacts and risks arising from these scenarios.

Sea surface and sub-surface thresholds

Sea-surface and sub-surface (entrained and dissolved hydrocarbon) thresholds were defined based on available scientific literature and applied to the hydrocarbon spill modelling to assess the environmental impacts and biological consequences in the unlikely event of a hydrocarbon spill. These thresholds have been used to show the environment that may be affected in the event of a spill (as denoted by the outer boundary of the adverse exposure zone for entrained hydrocarbons), both in terms of contact and impact. The area that may be affected has been shown using low, moderate and high exposure zones, with the outer limit of the adverse exposure zone (i.e. area within which impact may occur) represented by the moderate threshold boundary. The thresholds for the surface and sub-surface hydrocarbons, and their correlation with the zones of exposure, are presented in **Table 4-21**.

Table 4-21: Sea surface and sub-surface thresholds and zones of exposure

Exposure zone	Threshold
Sea surface film threshold	
Low exposure (1 g/m^2–10 g/m^2)	1 g/m^2
Moderate exposure (10 g/m^2–25 g/m^2)	10 g/m^2
High exposure (>25 g/m^2)	25 g/m^2
Entrained hydrocarbon threshold	
Low exposure (10 ppb–100 ppb)	10 ppb
Moderate exposure (100 ppb–500 ppb)	100 ppb
High exposure (> 500 ppb)	500 ppb
Dissolved aromatic hydrocarbon threshold	
Low exposure (6 ppb–50 ppb)	6 ppb
Moderate exposure (50 ppb–100 ppb)	50 ppb
High exposure (>100 ppb)	100 ppb

4.3.5.1 Release of hydrocarbons during bunkering or transfer operations

The potential for hydrocarbon impacts arising during bunkering or transfer operations and the associated risk rating is shown in **Table 4-22**.

Table 4-22: Risk assessment of unplanned hydrocarbon discharges: release of hydrocarbons during bunkering or transfer operations

Risk	A release of hydrocarbons to the marine environment during bunkering or transfer operations, for example the release of MDO as a result of hose break or coupling failure during refuelling of the MODU		
Aspect-receptor reference (see Table 4-5)	16A – physical environment	16D – sharks and rays	
	16B – marine mammals	16E – fish	
	16C – marine reptiles	16F – birds	
Potential impacts	• Temporary and localised reduction in water quality leading to toxic effects on marine biota • Direct toxic or physiological effects on marine biota, particularly marine mammals, reptiles, sharks/rays, fish and birds		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	2 Remote	2 Low
Summary of control measures			
• MARPOL 73/78, Annex I (Prevention of pollution by oil) and Marine Order 91 (Marine pollution prevention – oil) (as appropriate for vessel class), which requires a SOPEP for managing spills aboard • MARPOL 73/78 Annex II (Control of pollution by noxious liquid substances in bulk) (as appropriate to vessel class), which requires a Shipboard Marine Pollution Emergency Plan (SMPEP) • Use of bulk hoses that have dry break couplings, weak link break-away connections, vacuum breakers and floats, transfer pump emergency shutdown • Bunkering will be undertaken under a PTW system that will be reviewed and approved by the OIM (or appropriate delegate) • Internal transfers will be undertaken by trained staff and require a Job Hazard Analysis (JHA) or equivalent to be in place and reviewed before each internal transfer • SOPEP material (e.g. stocks of spill response bins/kits) readily available onboard to respond to a chemical or hydrocarbon spill and personnel are trained to use them • Crew SOPEP training • Prior to bunkering activities, the volume will be determined by the Barge Engineer and during transfer the volume is monitored by the vessel monitoring system (VMS)		

Risk analysis

Bunkering or internal transfers have the potential to result in an unplanned release of hydrocarbons to the marine environment. On release to the marine environment, MDO is expected to rapidly spread out and evaporate.

Based on stochastic modelling, the maximum distance the sea surface adverse exposure zone (>10 g/m^2) is predicted to travel from the release location is approximately 2.8 km in winter conditions (RPS APASA 2015b). The area of high sea surface exposure (> 25 g/m^2) is expected to be restricted to within 0.3 km of the release location for all seasons. Therefore, no shoreline contact was predicted.

No entrained or dissolved aromatic hydrocarbons exposure is predicted and therefore, no submerged shoals/banks are expected to be affected.

The potential for significant environmental impacts associated with a bunkering/transfer spill is limited given

the location of NT/RL5 (i.e. deep open offshore waters), small spill volume and rapid weathering of the released hydrocarbon. The potential biological and ecological impacts associated with a MDO spill resulting from bunkering or transfer operations is presented in **Table 4-23**.

Given the deep waters in NT/RL5 (approximately 120 m - 350 m), a small surface spill of MDO is not expected to impact benthic habitats and communities, including the seafloor feature of the shelf break and slope of the Arafura Shelf (KEF).

In summary, considering the controls that will be implemented, the potential impacts associated with a 10 m^3 MDO spill are anticipated to the temporary, minor and localised.

Table 4-23: Summary of potential impacts to key values/sensitivities from a 10 m^3 MDO spill

Environmental values/ sensitivities	Summary of potential impacts
Physical environment	*Water quality* It is likely that water quality will be reduced at the location of the spill due to hydrocarbon contamination; however, such impacts would be temporary and highly localised in nature due to the small spill volume and rapid weathering of the released MDO.
Marine fauna	In the immediate vicinity of the spill site, a 10 m^3 MDO spill could result in a localised and temporary toxic impact to biota that reside in, or transit, the surface layer of the water column, including: *Mammals* Marine mammals that come into direct physical contact with surface and in-water (entrained or dissolved aromatic) hydrocarbons at or above a moderate threshold may become coated, ingest or inhale the hydrocarbons. This may cause irritation of sensitive membranes (e.g. eyes, mouth, digestive and respiratory tracts, and organs), impairment of the immune system or neurological damage (Etkins 1997, IPIECA 1995). Cetaceans are highly mobile and field observations suggest that dolphins and whales may be able to detect and avoid hydrocarbons spills (Geraci and St. Aubin 1988). Impacts to dugong are not expected, given the nearest habitat within the EMBA known to support dugong (Ashmore Reef) is distant from the EMBA associated with a 10 m^3 MDO spill. *Reptiles* Adult sea turtles do not appear to exhibit avoidance behaviour on encountering hydrocarbon spills (Odell and MacMurray 1986). Contact with spilt hydrocarbons can result in coating of body surfaces causing irritation of mucous membranes in the nose, throat and eyes which can then cause inflammation and infection. Potential impacts to the respiratory system may also result from inhalation of toxic vapours when they come to the surface to breathe. Considering the remote offshore location and lack of potential nesting/internesting habitat in the vicinity of the predicted EMBA for the spill scenario (the closest BIA relating to nesting/internesting habitat is approximately 89 km to the south), impacts to important habitat for marine turtles is unlikely. It is, however, acknowledged that individual marine turtles may be present in low densities in deep offshore open waters within the EMBA of the spill. Impacts to saltwater crocodiles are not expected, given their preference for shallow, coastal and estuarine habitats and the EMBA is predicted to remain offshore, distant from these areas. *Sea snakes* Impacts to sea snakes from direct contact with surface hydrocarbons are likely to be similar to those experienced by marine turtles, such as potential skin damage and irritation of mucous membranes of the eyes, nose and throat. They may also be impacted when coming to the sea surface to breathe through the inhalation of the toxic vapours associated with the hydrocarbons, thereby causing damage to the respiratory system. In general, sea snakes appear to favour waters in the vicinity of offshore islands/reefs and potentially submerged shoals/banks (which are located > 56 km from NT/RL5). However, they have been observed transiting through open waters. Therefore, while individuals may occur in NT/RL5 and EMBA, their abundance is likely to be limited to a small number. *Seabirds and migratory shorebirds* Seabirds may forage in offshore waters as they transit over the open ocean. The abundance of seabirds in NT/RL5 is likely to be limited to a small number of individuals due to the remote offshore location of NT/RL5 and lack of shorelines in the vicinity of the predicted adverse

Environmental values/ sensitivities	Summary of potential impacts
	exposure zone for the 10 m^3 MDO spill (i.e.152 km from the nearest shoreline of the Tiwi Islands). Seabirds do not appear to exhibit avoidance behaviour to surface hydrocarbons and may come into contact with the spill while feeding or resting on the sea surface. Seabirds may be exposed to hydrocarbon spills through several pathways, primarily immersion, ingestion and inhalation. The adherence of hydrocarbons feathers can cause them to matt, lose their insulation (and therefore lead to hypothermia) or buoyancy or water repellent characteristics, which may result in the inability to fly or feed and lead to drowning (IPIECA 2004). Physical contact with hydrocarbons may also result in anaemia, pneumonia and irritation of eyes, skin, nasal cavities and mouths (IPIECA 2004) and result in mortality from the ingestion of hydrocarbons. *Sharks and rays* Sharks and rays may be affected by hydrocarbons as a result of direct contact or through contamination of tissues and internal organs (including via the food chain through consumption of prey). As with fish (see discussion below), it is likely that pelagic species are able to detect and avoid surface expressions of a hydrocarbon spill by swimming into deeper water or away from the affected areas. *Fish* Fish mortalities are rarely observed as a result of hydrocarbon spills (ITOPF 2015), especially in open water environments. It is thought that pelagic fish do not generally experience acute mortality from hydrocarbon spills as they are able to detect and avoid surface waters underneath hydrocarbon spills by swimming into deeper water or away from the affected areas (Scholtz et al. 1992). Hydrocarbon contact has the potential to affect whale sharks through direct physical coating (surface hydrocarbons) and ingestion (in-water hydrocarbons), particularly if feeding. While individual whale sharks may occur infrequently within NT/RL5, they are unlikely to be significantly impacted considering the nature of the spill (i.e. small and localised). Commercial fisheries are also unlikely to be affected as there is no active fishing in NT/RL5. *Summary* The extent and duration of potential exposure to marine waters and marine fauna would be limited due to the relatively small volume, rapid evaporation rates for volatile components of MDO and its rapid natural degradation and dispersion in the open ocean (Neff et al. 2000). Furthermore, as the adverse exposure zone for the sea surface hydrocarbons does not intersect any BIAs, the number of individuals of marine fauna transiting NT/RL5 and EMBA associated with the spill is expected to be low. As discussed above, modelling for this spill scenario does not predict any adverse exposure for entrained or dissolved aromatic hydrocarbons. Therefore, it is considered that any potential surface impacts will be temporary, minor and localised in nature.

4.3.5.2 Release of hydrocarbons due to a vessel collision

The potential for hydrocarbon impacts arising from the loss of a support vessel fuel tank, due to a vessel collision, and the associated controls risk rating is shown in **Table 4-24**.

Table 4-24: Risk assessment of unplanned hydrocarbon discharges: release of hydrocarbons due to a vessel collision

Risk	Support vessel collision resulting in the release of up to 250 m^3 of marine diesel as a result of the rupture of fuel tanks		
Aspect-receptor reference (see Table 4-5)	17A – physical environment	17G – shoals and banks	
	17B – marine mammals	17J – KEFs	
	17C – marine reptiles	17K – CMRs	
	17D – sharks and rays	17L – commercial fisheries and traditional Indonesian fishing	
	17E – fish	17P – defence activities	
	17F – birds		
Potential impacts	• Temporary and localised reduction in water quality leading to toxic effects on marine biota, including that associated with shoals and banks, KEFs and CMRs • Direct toxic or physiological effects on marine biota, particularly marine mammals, reptiles, sharks/rays, fish and birds • Socio-economic impacts on commercial fishing and defence activities		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	2 Minor	2 Remote	4 Low
Residual risk	2 Minor	2 Remote	4 Low
Summary of control measures			
• OPGGS Act – Section 616 (2) Petroleum safety zones • International Regulations for Preventing Collisions at Sea 1972 (COLREGS) • Chapter V of Safety of Life at Sea (SOLAS) • Marine Order 21 (Safety of navigational and emergency procedures) (as appropriate to vessel class) • Marine Order 30 (Prevention of collisions) (as appropriate to vessel class) • International Association of Marine Aids Navigation and Lighthouse Authorities (IALA) Recommendations 0–139 – The marking of man-made offshore structures (applicable only to the MODU) • MARPOL 73/78, Annex I (Prevention of pollution by oil) and Marine Order 91 (Marine pollution prevention – oil) (as appropriate for vessel class), which requires a SOPEP for managing spills aboard • MARPOL 73/78 Annex II (Control of pollution by noxious liquid substances in bulk) (as appropriate to vessel class), which requires a Shipboard Marine Pollution Emergency Plan (SMPEP) • Marine radio channels and other communication systems • Notify AMSA RCC and any relevant stakeholders of the MODU movements as per the MODU rig move procedure • Support vessel entry and movements within the 500 m PSZ will be undertaken in accordance with the MODU Marine Operations Manual • MODU/support vessels Cyclone Response Plan • ConocoPhillips ABU-W Support Vessel Requirements (IOSC/OPS/GLN/0001) Mitigation measures • Implementation of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013), which includes a priority protection analysis, appropriate response strategies, triggering of operational and scientific monitoring plans, and notifications • Undertaking operational monitoring to understand the nature and extent of the spill to inform situational awareness in accordance with in Attachment F of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013) • Undertaking scientific monitoring to understand evaluate the geographic extent, fate, persistence and severity of the environmental impacts of the spill in accordance with in Attachment F of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013)		

- Implementation of the ConocoPhillips ABU-W Crisis and Incident Management Plan (CIMP) (ALL/HSE/ER/001), which includes emergency response planning, emergency management structure, incident notification, emergency response responsibilities and support providers. The geographic extent of the spill will be taken into consideration when making all necessary notifications as outlined in Table 2.4 of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013). This includes contacting DFAT, in the event that the spill is predicted to contact Indonesian or Timor Leste waters

Risk analysis

Vessel collisions have the potential to result in an unplanned release of hydrocarbons to the marine environment. On release to the marine environment, MDO is expected to rapidly spread out and evaporate with some entrainment in the upper column likely in the presence of moderate winds and wave conditions.

The results of the stochastic modelling are summarised below with the key outputs relating to the adverse exposure zone (i.e. at or above a moderate threshold, as defined in **Table 4-21**). **Table 4-25** presents the full extent of the EMBA and the sensitive receptors and their locations exposed to hydrocarbons (surface, entrained and dissolved) at or above moderate threshold concentrations.

Sea surface

The maximum distance the sea surface adverse exposure zone (> 10 g/m^2) is predicted to travel from the release location varied greatly between seasons. Based on the stochastic modelling outputs, the hydrocarbon was predicted to travel approximately 28.1 km (east-southeast), 132 km (west) and 71 km (west) during summer, transitional and winter conditions, respectively (RPS APASA 2015b). The area of high sea surface exposure (> 25 g/m^2) is expected to be restricted to within 16.4 km of the release location for all seasons. Therefore, no shoreline contact was predicted.

The only receptor predicted to be contacted at a moderate exposure threshold is the surface waters of the commercial fisheries.

Entrained hydrocarbons

The stochastic modelling outputs show that the adverse exposure zone for entrained hydrocarbons may extend up to approximately 745 km from the release location, depending on the prevailing oceanic conditions (i.e. winds and currents) influencing the released hydrocarbon. However, the majority of the area (as shown by the stochastic modelling) is within approximately 435 km of the release location. In general, the entrained hydrocarbon travels along either a north-north-east or north-north-west gradient.

Dissolved aromatic hydrocarbons

The stochastic modelling outputs show that the adverse exposure zone for dissolved aromatic hydrocarbons is limited in area and extent; occurring only in winter and transitional months within 25 km from the release location. No contact with any sensitive receptors was predicted.

Table 4-25: Summary of key sensitive receptors and associated environmental values/sensitivities and hydrocarbon contact from a 250 m³ MDO spill

Receptor	Environmental values/sensitivities																								Hydrocarbon contact above a moderate threshold *		
	Physical	Intertidal and benthic primary producers		Benthic communities/ habitats				Intertidal communities				Marine fauna						Socio-economic and cultural									
	Water/ sediment quality	Corals	Seagrass/ macroalgae	Mangroves	Infauna communities	Filter-feeding communities	Coral communities/reefs	Reef flats	Sandy shores	Rocky shores	Creeks/ rivers/ wetlands	Mammals	Turtles (incl. foraging, internesting and nesting	Sea snakes	Seabirds and migratory shorebirds (incl. significant nesting sites)	Fish	Sharks and rays	Protected areas	Indigenous/European heritage	Commercial and recreational fishing	Traditional Indonesian fishing	Tourism, recreation and scientific research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities	Sea surface hydrocarbon film (> 10 g/m²)	Entrained hydrocarbons (100 ppb)	Dissolved aromatic hydrocarbons (50 ppb)
Commonwealth waters	✓											✓	✓	✓	✓	✓	✓			✓		✓	✓	✓		x	x	x
Shoals and banks of the NMR[1]	✓	✓	✓		✓	✓	✓					✓	✓	✓		✓	✓			✓	✓		✓	✓			x	
Shoals and banks of the Sahul Shelf complex[1]	✓	✓	✓		✓	✓	✓					✓	✓	✓		✓	✓			✓	✓		✓	✓			x	
KEF – Shelf break and slope of the Arafura Shelf	✓	✓					✓									✓										x	x	
KEF – Carbonate bank and terrace system of the Van Diemen Rise	✓	✓			✓	✓	✓						✓	✓			✓									x	x	
KEF – Pinnacles of the Bonaparte Basin	✓	✓			✓	✓	✓						✓		✓	✓											x	

Receptor	Environmental values/sensitivities																									Hydrocarbon contact above a moderate threshold *		
	Physical	Intertidal and benthic primary producers		Benthic communities/ habitats				Intertidal communities				Marine fauna						Socio-economic and cultural										
	Water/ sediment quality	Corals	Seagrass/ macroalgae	Mangroves	Infauna communities	Filter-feeding communities	Coral communities/reefs	Reef flats	Sandy shores	Rocky shores	Creeks/ rivers/ wetlands	Mammals	Turtles (incl. foraging, internesting and nesting	Sea snakes	Seabirds and migratory shorebirds (incl. significant nesting sites)	Fish	Sharks and rays	Protected areas	Indigenous/European heritage	Commercial and recreational fishing	Traditional Indonesian fishing	Tourism, recreation and scientific research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities	Sea surface hydrocarbon film (> 10 g/m^2)	Entrained hydrocarbons (100 ppb)	Dissolved aromatic hydrocarbons (50 ppb)
Oceanic Shoals CMR	✓	✓	✓		✓	✓						✓	✓	✓	✓	✓	✓	✓									x	
Arafura CMR	✓	✓	✓		✓	✓						✓	✓	✓	✓	✓	✓	✓									x	
Commercial fisheries																✓										x	x	
NAXA																									✓		x	x

* Hydrocarbon contact is presented in the modelling report (RPS APASA 2015b) at depth specific intervals for receptors. For reefs, shoals and banks this is the minimum depth of the feature, CMRs use the upper water column (0 m-10 m) while KEFs and the commercial fisheries were assessed at the 20 m-30 m depth layer.

[1] Grouping of shoals and banks summarised in **Table 3-2**.

Impact assessment and risk evaluation

The potential for significant environmental impacts associated with a spill of MDO due to a vessel collision is limited considering the location of NT/RL5 (i.e. deep open offshore waters), relatively small spill volume and rapid weathering of the released hydrocarbon.

The potential biological, ecological and socio-economic impacts of an unplanned hydrocarbon discharge, arising from the loss of a support vessel fuel tank, due to a vessel collision are presented in **Table 4-26**.

Given the deep waters in NT/RL5 (approximately 120 m - 350 m), a surface spill of MDO is not expected to impact benthic habitats and communities, including those associated with the seafloor feature KEFs.

In summary, considering the controls that will be implemented, the potential impacts associated with a 250 m^3 MDO spill are anticipated to the temporary, minor and relatively localised.

Table 4-26: Summary of potential impacts to key values/sensitivities from a 250 m^3 MDO spill

Environmental values/ sensitivities	Summary of potential impacts
Physical environment	*Water quality* It is likely that water quality will be reduced due to hydrocarbon contamination (both at the sea surface and in the upper water column as a result of entrained and dissolved hydrocarbons) at the location of the spill and extend to the surrounding marine waters over the shoals and banks of the NMR, shoals and banks of the Sahul Shelf, open waters of the Oceanic Shoals CMR, and waters over the KEFs of the shelf break and slope of the Arafura Shelf, carbonate bank and terrace system of the Van Diemen Rise and pinnacles of the Bonaparte Basin. However, such impacts are expected to be temporary in nature due to rapid evaporation, natural degradation and dispersion of MDO in the open ocean (Neff et al. 2000).
Habitats and communities	*Intertidal, benthic primary producers and benthic communities/habitats* Benthic communities, such as macrofauna and infauna, and benthic primary producer habitat (BPPH) (e.g. seagrass, macroalgae and corals) are vulnerable to hydrocarbons; from both lethal and/or sub-lethal effects including mortality, and changes in population recruitment, growth and reproduction, leading to changes in community composition and structure. Filter feeders are particularly susceptible as they are likely to directly ingest hydrocarbons while feeding. This may cause mortality or sublethal impacts such as alteration in respiration rates, decreases in filter feeding activity and reduced growth rates, biochemical effects. The impact of hydrocarbons on macroalgae and seagrass varies depending on the type of hydrocarbon, degree of contact and species morphology, which influences the amount of hydrocarbon that may adhere to the algae. Potential impacts may include smothering or coating (intertidal areas), reduced photosynthesis (due to direct contact or through absorption of the water soluble fraction) and a reduction in tolerance to other stress factors (Runcie et al. 2004, Taylor and Rasheed 2011). Studies have shown that impacts on algae and seagrasses are variable, however they do not appear to be significantly affected by hydrocarbon spills and generally recover quickly (Runcie et al. 2004, Taylor and Rasheed 2011). No contact with surface films was predicted by the stochastic modelling outputs at offshore reefs and islands, which support these communities/habitats. Stochastic modelling also predicted that there would be no contact with dissolved aromatic hydrocarbons at any shoal/bank or offshore reef and island. In terms of the entrained hydrocarbons, given the relatively long time to contact (> 2 days for all shoals/banks and offshore reefs/islands with the exception of Evans Shoal – winter conditions only) and taking into account the weathering/decay of the released hydrocarbon the potential impacts associated with these hydrocarbons at these features are expected to be minimal. *Coral reefs* Studies and field observations have shown that coral species are susceptible, at varying degrees, to hydrocarbons and display a range of effects including mortality, decreases in coral reproduction (i.e. reduction in coral fertility), inhibited growth rates, reduced colonisation capacity; and feeding and behavioural responses (Shigenaka 2001; National Oceanic and Atmospheric Administration (NOAA) 2010)). Specific stress responses observed have included excessive mucous production, polyp retraction, changes in calcification rates, changes in primary production rates, bleaching (loss of zooxanthellae) and muscle atrophy (NOAA 2010). It is thought that many of the sublethal effects are the result of affected corals trading off normal physiological functions (e.g. reproduction and growth) for exposure related responses, such as

Environmental values/ sensitivities	Summary of potential impacts
	cleaning and damaged tissue regeneration (Shigenaka 2001). This reallocation of energy ultimately reduces the fitness of the affected corals, therefore making them more susceptible to mortality and natural stressors. The mortality of a number of coral species may result in the reduction of coral cover and longer term effects on the coral community structure and habitat. For example, branching corals (e.g. Acropora species) appear to be more sensitive to oil coating and retention when compared with massive corals (Shigenaka 2001). The location of the coral community in the water column may influence the level and type of hydrocarbon exposure. In general, shallow water communities (< 20 m–30 m) are more likely to be at risk of being contacted by hydrocarbons than those in deeper waters, considering that most hydrocarbon spills are surface releases and based on the nature of most hydrocarbons. Corals present on reef flats are more likely to be directly contacted by surface hydrocarbons while subtidal corals may be exposed to entrained and dissolved aromatic hydrocarbons Impacts to coral communities have the potential be more pronounced if the hydrocarbon spill occurs during a coral spawning event as it has been noted that the early life stages of corals may be more sensitive than adult colonies (Negri and Heyward 2000). Coral gametes and larvae are susceptible to surface hydrocarbons as they display a tendency to float or remain near in the upper water column, where they may be contacted by the water-accommodated fraction (Villanueva et al. 2008). Hydrocarbons may cause the premature release of underdeveloped larvae, reduce survivorship, fertilisation, metamorphosis and inhibit settlement of larvae, and decrease growth rates (Goodbody-Gringley et al. 2013; van Dam et al. 2011; Villanueva et al. 2008). Studies have reported that the dispersed oil (i.e. combination of hydrocarbons and chemical dispersants) is significantly more toxic to larvae than the water-accommodated fraction (Goodbody-Gringley et al. 2013; Lane and Harrison 2000). The vulnerability of coral gametes and larvae would be expected to be largely confined to a period of up to two weeks after spawning events. As above, stochastic modelling did not predict any contact with surface or dissolved aromatic hydrocarbons at shoals/banks or offshore reefs and islands, which support coral reefs. In terms of the entrained hydrocarbons, given the relatively long time to contact (> 2 days for all shoals/banks and offshore reefs/islands with the exception of Evans Shoal – winter conditions only) and taking into account the weathering/decay of the released hydrocarbon, the potential impacts associated with these hydrocarbons at these features are expected to be minimal. *Plankton* Plankton communities are not considered to be highly sensitive to disturbance as they are variable in space and time and undergo regular recruitment (American Petroleum Institute (API) 2001). In general, surface hydrocarbons spills that do not entrain or dissolve in the water column have a reduced impact on plankton as only a small proportion of the community is close to the surface and therefore susceptible to exposure from hydrocarbons (Chamberlain et al. 1999). The main pathways for direct exposure and contamination of plankton are ingestion, absorption and adherence of hydrocarbons to the external body wall or gills. The short regeneration time of plankton (9–12 hours) and rapid replacement of stocks from adjacent areas due to water circulation will usually prevent any impact at the population or community level (Batten et al. 1998). However, this does depend upon the geographical scale of the spill and plankton distribution within the area. Indirect impacts include smothering, ingestion of contaminated food, changes to behaviour, loss of recruitment, and changes to trophic dynamics that impact productivity. Derivatives of hydrocarbons have been observed to decrease feeding and growth rates of copepods (Hjorth and Nielsen 2011). Considering the open ocean location and spatial and temporal variation of phytoplankton communities within offshore waters, significant impacts to plankton communities are unlikely.
Marine fauna	A 250 m^3 MDO spill due to a vessel collision may result in a localised and temporary toxic impact to biota that reside in, or transit, the surface layer of the water column, including: *Mammals* Impacts to marine mammals from direct contact from hydrocarbons on the sea surface and in-water will be similar to that described in **Section 4.3.5.1** (**Table 4-23**). Based on the stochastic modelling outputs, the spill is not predicted to contact any important feeding, breeding or aggregation areas, including BIAs, for marine mammals. Therefore, any potential impacts are likely to be limited to a few individuals that may be transiting through the EMBA.

Environmental values/ sensitivities	Summary of potential impacts
	Impacts to dugong are not expected, given the nearest habitat within the EMBA known to support dugong (Ashmore Reef) is distant from the EMBA associated with a 250 m^3 MDO spill. *Reptiles* There is the potential for turtles to be foraging at submerged shoals and banks, such as those of the shoals and banks of the NMR (i.e. Tassie Shoal, Evans Shoal and Franklin Shoal), shoals and banks of the Sahul Shelf (i.e. Echo Shoal), or transiting through open waters including those of the Oceanic Shoals and Arafura CMR, which are predicted to have contact with entrained hydrocarbons above a moderate threshold. Impacts to turtles from direct contact with sea surface hydrocarbons will be similar to that described in **Section 4.3.5.1** (**Table 4-23**). Turtles that come into contact with hydrocarbons in the water column (i.e. entrained or dissolved aromatics) may experience oiling of the body as well as irritations of sensitive membranes (e.g. eyes, mouth, digestive and respiratory tracts and organs) or possibly poisoning through ingestion. Based on the stochastic modelling outputs, the spill is not predicted to contact any important feeding, breeding or aggregation areas, including BIAs, for turtles. Considering this, and the lack of potential nesting/internesting habitat in the predicted EMBA for the spill scenario (the closest BIA relating to nesting/internesting habitat is approximately 89 km to the south of NT/RL5), any potential impacts are likely to be limited to a few individuals that may be transiting through the EMBA. Impacts to saltwater crocodiles are not expected, given their preference for shallow, coastal and estuarine habitats and the EMBA is predicted to remain offshore, distant from these areas. *Sea snakes* There is the potential for sea snakes to be present at submerged shoals and banks, such as those of the shoals and banks of the NMR (i.e. Tassie Shoal, Evans Shoal and Franklin Shoal), shoals and banks of the Sahul Shelf (i.e. Echo Shoal), or transiting open waters including those in the Oceanic Shoals CMR, which are predicted to have contact with entrained hydrocarbons above a moderate threshold. Impacts to sea snakes from direct contact with hydrocarbons will be similar to that described in **Section 4.3.5.1** (**Table 4-23**). While there are no studies on the susceptibility/sensitivity of sea snakes to in-water hydrocarbons (i.e. entrained or dissolved aromatics), it is considered likely that that they may experience irritations of sensitive membranes (e.g. eyes, mouth, digestive and respiratory tracts and organs) or possibly poisoning through ingestion. Considering the remote offshore location, it is expected that any potential impacts to sea snakes would be limited to a few transient individuals that may occur in the EMBA. *Sharks and rays* Impacts to sharks and rays from direct contact with hydrocarbons will be similar to that described in **Section 4.3.5.1** (**Table 4-23**). In addition, sharks/rays that come into contact with hydrocarbons in the water column (i.e. entrained or dissolved aromatics) may experience irritations of sensitive membranes (e.g. eyes, mouth, digestive and respiratory tracts and organs) or possibly poisoning through ingestion of prey. Considering the remote offshore location and given that there are no BIAs in the area, it is expected that any potential impacts to sharks/rays would be limited to a few transient individuals that may occur in the EMBA. *Seabirds and migratory shorebirds* Seabirds may forage in offshore waters as they transit over the open ocean. The abundance of seabirds in NT/RL5 and surrounding open waters is likely to be limited to a small number of individuals due to the remote offshore location and lack of shorelines in the predicted EMBA for the spill scenario (i.e. NT/RL5 is 152 km from the nearest shoreline of the Tiwi Islands) but may include migratory roseate terns in Arafura CMR. Seabirds do not appear to exhibit avoidance behaviour to surface hydrocarbons and may come into contact with the spill while feeding or resting on the sea surface. Seabirds may also be exposed to in-water hydrocarbons through diving and feeding. Impacts to seabirds and migratory shorebirds from direct contact with hydrocarbons will be similar to that discussed in **Section 4.3.5.1** (**Table 4-23**). Considering that there is no hydrocarbon contact predicted with shorelines or BIAs, it is expected that there will be no impacts to bird populations breeding, feeding and roosting in these areas.

Environmental values/ sensitivities	Summary of potential impacts
	Fish Fish mortalities are rarely observed to occur as a result of hydrocarbon spills (ITOPF 2015), especially in open water environments. It is thought that pelagic fish do not generally experience acute mortality from hydrocarbon spills as they are able to detect and avoid surface waters underneath hydrocarbon spills by swimming into deeper water or away from the affected areas (Scholtz et al. 1992). Potential impacts to whale sharks are considered highly unlikely as the adverse exposure zone for the 250 m^3 MDO spill does not intersect any BIAs for this species. *Summary* The extent and duration of potential exposure to marine fauna would be limited due to the rapid evaporation rates of the volatile components of MDO and its rapid natural degradation and dispersion in the open ocean (Neff et al. 2000). Furthermore, as the adverse exposure zone does not intersect any BIAs, the number of individuals of marine fauna transiting NT/RL5 and EMBA associated with the spill are expected to be low.
Other biological values	*Shoals and banks of the NMR and Sahul Shelf complex* Shoals and banks support a diverse and varied range of benthic communities, including algae, reef-building soft corals, hard corals and filter-feeders (Heyward et al. 1997, Heyward et al. 2011). Some of the shoals/banks in the NMR and Sahul Shelf complex have the potential to be contacted by entrained hydrocarbons at a moderate exposure level at relatively low probabilities (1%-11%), as predicted by stochastic modelling. Given the surface nature of the release the maximum depth that hydrocarbons associated with a 250 m^3 spill of MDO may entrain is 20 m-30 m. Considering this, and the broad depth range of the shoals/banks, any potential impacts will be limited to the upper water column layers which these features extend into. Potential impacts that may occur as a result of hydrocarbon exposure could include sub-lethal stress and, in some cases, total or partial mortality of sensitive benthic organisms (e.g. corals) and the early life stages of resident fish and invertebrate species. Exposure to dissolved aromatic hydrocarbons may also increase mortality in the early life stages of benthic species affected and could cause localised and long term effects to the shallow hard coral communities at these shoals/banks. The extent and duration of potential exposure to shoals and banks is likely to be limited due to the rapid dispersion of the MDO as a result of ocean currents and mixing of the upper water column. *KEFs* Stochastic modelling predicts that the adverse exposure zone for sea surface and entrained hydrocarbons may contact waters above the shelf break and slope of the Arafura Shelf, carbonate bank and terrace system of the Van Diemen Rise and pinnacles of the Bonaparte Basin. Impacts to these KEFs are considered highly unlikely given their location on the seabed, while the source of the spill is on the sea surface. The maximum depth that hydrocarbons associated with a surface release of 250 m^3 of MDO may entrain is 20 m-30 m, which is well above these seabed features (> 150 m water depth).
Socio-economic and cultural	*CMRs* The stochastic modelling results indicate that the open water environment within the Oceanic Shoals CMR and Arafura CMR may be affected by a 250 m^3 release of MDO at or above a moderate threshold. In the unlikely event of a vessel collision resulting in a loss of a fuel tank, entrained hydrocarbons may contact the upper surface waters in these areas, which may result in the actual or perceived contamination of these areas. However, any potential impacts are anticipated to be temporary and localised due to the rapid evaporation rates of the volatile components of MDO and its rapid natural degradation and dispersion in the open ocean. *Commercial and recreational fishing* A 250 m^3 surface spill of MDO is considered unlikely to cause significant direct impacts on the target species fished by commercial fisheries of relevance to NT/RL5 and EMBA associated with the spill. There is potential that a fishing exclusion zone may be applied in the immediate vicinity of the spill. This would implement a temporary ban on fishing activities and potentially result in economic impacts on commercial fishing operators if they were planning on undertaking fishing within the area of the spill. Recreational fishing within the NMR tends to be concentrated in NT waters adjacent to coastal population areas. No recreational fishing is known to take place in the offshore waters of NT/RL5.

Environmental values/ sensitivities	Summary of potential impacts
	Defence The stochastic modelling results indicate that the open waters of the NAXA may be affected by a 250 m^3 release of MDO at or above a moderate threshold for entrained hydrocarbons. However, any potential exclusion zones that would be implemented in the event of a vessel collision would not extend into the NAXA.

4.3.5.3 Release of hydrocarbons due to a long-term well blowout

The potential for hydrocarbon impacts resulting from the unlikely event of a long-term well blowout of Barossa condensate and the associated controls risk rating is shown in **Table 4-27**.

Table 4-27: Risk assessment of unplanned hydrocarbon discharges: release of hydrocarbons due to a long-term well blowout

Risk	Loss of well integrity leading to a long-term subsurface well blowout		
Aspect-receptor reference (see Table 4-5)	18A – physical environment	18I – north Kimberley coastline	
	18B – marine mammals	18J – KEFs	
	18C – marine reptiles	18K – CMRs	
	18D – sharks and rays	18L – commercial fisheries and traditional Indonesian fishing	
	18E – fish	18M – tourism, recreational activities and research	
	18F – birds	18N – commercial shipping	
	18G – shoals and banks	18O – offshore petroleum exploration and operations	
	18H – offshore reefs and islands	18P – defence activities	
		18 Q Heritage (Indigenous and European)	
Potential impacts	• Temporary and localised reduction in water quality leading to toxic effects on marine biota, including that associated with shoals and banks, offshore reefs and islands, north Kimberley coastline, KEFs and CMRs • Direct toxic or physiological effects on marine biota, particularly marine mammals, reptiles, sharks/rays, fish and birds • Socio-economic impacts on commercial and traditional Indonesian fishing, commercial shipping and defence activities		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	4 Significant	2 Rare	8 Medium
Residual risk	4 Significant	2 Remote	8 Medium
Summary of control measures			
• Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011 – WOMP and approval to undertake well activity accepted by NOPSEMA prior to the commencement of the drilling campaign			
• ConocoPhillips Wells Management System, which includes the requirement for a minimum of two barriers during all well operation			
Administrative			
• MODU Safety Case Revision describes ConocoPhillips and MODU Operators agreed well control interface • Approved ConocoPhillips Well Design and Delivery Process documentation including Engineering Basis of Design, Critical Well Review and Shallow Hazard Study			

- ConocoPhillips Wells Management System Training and Competency Requirements – well control certification from International Well Control Forum (IWCF), or equivalent, held by ConocoPhillips and/or MODU contractor personnel who fill a well engineering or well site supervisory position. The well control certification will be appropriate for the type of well work

Mitigation measures

The mitigation measures discussed below are tailored to the drilling campaign (i.e. OPEP) and provide ConocoPhillips' with a range of comprehensive source control measures. In taking these into consideration the potential impacts associated with the risk are considered to be remote.

- Implement the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013), which includes a priority protection analysis, appropriate response strategies and operational and scientific monitoring plans
- Undertaking operational monitoring to understand the nature and extent of the spill to inform situational awareness in accordance with in Attachment F of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013)
- Undertaking scientific monitoring to understand evaluate the geographic extent, fate, persistence and severity of the environmental impacts of the spill in accordance with in Attachment F of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013)
- ConocoPhillips ABU-W CIMP (ALL/HSE/ER/001), which includes emergency response planning, emergency management structure, incident notification, emergency response responsibilities and support providers. The geographic extent of the spill will be taken into consideration when making all necessary notifications as outlined in Table 2.4 of the ConocoPhillips Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013). This includes contacting DFAT, in the event that the spill is predicted to contact Indonesian or Timor Leste waters
- Source Control and Containment Plan prepared that incorporates requirements and considerations for delivering a response to contain a loss of well control for the drilling campaign
- APPEA MoU for Mutual Assistance (for relief well drilling) in place prior and during the drilling campaign

Risk analysis

A loss of well integrity has the potential to result in a long-term well blowout releasing Barossa condensate to the marine environment. Barossa condensate is a light hydrocarbon which will rapidly spread out and evaporate on reaching the sea surface with the entrained component undergoing extensive decay while in the water column (RPS APASA 2015b).

The results of the stochastic modelling are summarised below with the key outputs relating to the adverse exposure zone (i.e. at or above a moderate threshold, as defined in **Table 4-21**). **Table 4-28** presents the full extent of the EMBA and the sensitive receptors and their locations exposed to hydrocarbons (surface, entrained and dissolved) at or above moderate threshold concentrations.

Sea surface

Based on the stochastic modelling outputs, the maximum distance the sea surface adverse exposure zone (>10 g/m^2) is predicted to travel from the release location varied between seasons with approximately 78 km (southwest), 323 km (west) and 496 km (west-southwest) during summer, transitional and winter conditions, respectively (RPS APASA 2015b). The area of high sea surface exposure (> 25 g/m^2) is expected to be limited to within 6.4 km of the release location for all seasons. No shoreline contact was predicted.

The only receptor predicted to be contacted at a moderate exposure threshold is the surface waters of the commercial fisheries.

Entrained hydrocarbons

Stochastic modelling outputs show that the adverse exposure zone for entrained hydrocarbons may extend over 1,000 km from the release location, depending on the prevailing oceanic conditions (i.e. winds and currents) influencing the released hydrocarbon. In general, the entrained hydrocarbon travels along either a north-north-east or north-north-west gradient. The entrained hydrocarbon would undergo significant decay over time, thereby reducing impacts.

Dissolved aromatic hydrocarbons

Stochastic modelling outputs show that the adverse exposure zone for dissolved aromatic hydrocarbons may extend over 1,000 km from the release location, depending on the prevailing oceanic conditions (i.e. winds and currents) influencing the released hydrocarbon. In general, the dissolved hydrocarbon travels along either a north-north-east or north-north-west gradient. The dissolved aromatic hydrocarbon would undergo significant decay over time, thereby reducing impacts.

Table 4-28: Summary of key sensitive receptors and associated environmental values/sensitivities and hydrocarbon contact from a long-term well blowout of Barossa condensate

Receptor	Environmental values/sensitivities																								Hydrocarbon contact above a moderate threshold *		
	Physical	Intertidal and benthic primary producers		Benthic communities/ habitats				Intertidal communities				Marine fauna						Socio-economic and cultural									
	Water/ sediment quality	Corals	Seagrass/macroalgae	Mangroves	Infauna communities	Filter-feeding communities	Coral communities/reefs	Reef flats	Sandy shores	Rocky shores	Creeks/ rivers/ wetlands	Mammals	Turtles (incl. foraging, internesting and nesting	Sea snakes	Seabirds and migratory shorebirds (incl. significant nesting sites)	Fish	Sharks and rays	Protected areas	Indigenous/ European heritage	Commercial and recreational fishing	Traditional Indonesian fishing	Tourism, recreation and scientific research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities	Sea surface hydrocarbon film (> 10 g/m^2)	Entrained hydrocarbons (100 ppb)	Dissolved aromatic hydrocarbons (50 ppb)
Commonwealth waters	✓											✓	✓	✓	✓	✓	✓			✓		✓	✓	✓		x	x	x
Shoals and banks of the NMR[1]	✓	✓	✓		✓	✓	✓					✓	✓	✓		✓	✓			✓	✓		✓	✓		x	x	x
Shoals and banks of the NWMR[1]	✓	✓	✓		✓	✓	✓					✓	✓	✓		✓	✓			✓	✓		✓	✓			x	x
Shoals and banks of the Sahul Shelf complex[1]	✓	✓	✓		✓	✓	✓					✓	✓	✓		✓	✓			✓	✓		✓	✓			x	
Ashmore Reef[2]	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			x	x
Cartier Island[2]	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			x	
Hibernia Reef	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓				✓	✓	✓	✓			x	x
Seringapatam Reef[2]	✓	✓	✓		✓	✓	✓	✓				✓	✓	✓		✓	✓	✓			✓	✓	✓	✓			x	
North Kimberley Coast[3]		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓					x	

Receptor	Environmental values/sensitivities																							Hydrocarbon contact above a moderate threshold *		
	Physical	Intertidal and benthic primary producers		Benthic communities/ habitats				Intertidal communities				Marine fauna						Socio-economic and cultural								
	Water/ sediment quality	Corals	Seagrass/macroalgae	Mangroves	Infauna communities	Filter-feeding communities	Coral communities/reefs	Reef flats	Sandy shores	Rocky shores	Creeks/ rivers/ wetlands	Mammals	Turtles (incl. foraging, internesting and nesting	Sea snakes	Seabirds and migratory shorebirds (incl. significant nesting sites)	Fish	Sharks and rays	Protected areas	Indigenous/ European heritage	Commercial and recreational fishing	Traditional Indonesian fishing	Tourism, recreation and scientific research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities	Sea surface hydrocarbon film (> 10 g/m^2)	Entrained hydrocarbons (100 ppb)	Dissolved aromatic hydrocarbons (50 ppb)
KEF – Shelf break and slope of the Arafura Shelf	✓	✓					✓									✓										x	x	x
KEF – Carbonate bank and terrace system of the Van Diemen Rise	✓	✓			✓	✓	✓						✓	✓			✓									x	x	x
KEF – Tributary canyons of the Arafura Depression	✓	✓			✓	✓	✓					✓	✓			✓	✓											x
KEF – Pinnacles of the Bonaparte Basin	✓	✓			✓	✓	✓						✓		✓	✓												x
KEF – Carbonate bank and terrace system of the Sahul Shelf	✓	✓			✓	✓	✓					✓	✓			✓	✓											x
KEF – Continental slope demersal fish communities[4]	✓															✓											x	

Receptor	Environmental values/sensitivities																							Hydrocarbon contact above a moderate threshold *		
	Physical	Intertidal and benthic primary producers		Benthic communities/ habitats				Intertidal communities				Marine fauna						Socio-economic and cultural								
	Water/ sediment quality	Corals	Seagrass/macroalgae	Mangroves	Infauna communities	Filter-feeding communities	Coral communities/reefs	Reef flats	Sandy shores	Rocky shores	Creeks/ rivers/ wetlands	Mammals	Turtles (incl. foraging, internesting and nesting	Sea snakes	Seabirds and migratory shorebirds (incl. significant nesting sites)	Fish	Sharks and rays	Protected areas	Indigenous/ European heritage	Commercial and recreational fishing	Traditional Indonesian fishing	Tourism, recreation and scientific research	Commercial shipping	Offshore petroleum exploration and operations	Defence activities	Sea surface hydrocarbon film (> 10 g/m^2)	Entrained hydrocarbons (100 ppb)	Dissolved aromatic hydrocarbons (50 ppb)
Oceanic Shoals CMR	✓	✓	✓		✓	✓						✓	✓	✓	✓	✓	✓	✓								x	x
Joseph Bonaparte Gulf CMR	✓				✓	✓						✓	✓					✓								x	
Arafura CMR	✓	✓	✓		✓	✓						✓	✓	✓	✓	✓	✓	✓								x	x
Commercial fisheries																✓									x	x	x
NAXA																								✓		x	x
Indonesia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				x	x
Timor Leste	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			x	x

* Hydrocarbon contact is presented in the modelling report (RPS APASA 2015b) at depth specific intervals for receptors. For reefs, shoals and banks this is the minimum depth of the feature, CMRs use the upper water column (0 m-10 m) while KEFs and the commercial fisheries were assessed at the 90 m-100 m depth layer.

[1] Grouping of shoals and banks summarised in **Table 3-2.**

[2] Includes the associated socio-economic/cultural values, e.g. KEFs, national heritage place, Ramsar wetland and CMRs.

[3] Encompasses the West Kimberley National Heritage Place and Kimberley CMR.

[4] Modelling outputs for Cartier Island are considered to appropriately represent the potential impacts to this KEF.

Impact assessment and risk evaluation

The potential biological, ecological and socio-economic impacts of an unplanned hydrocarbon discharge, arising from a long-term well blowout of Barossa condensate, due to a loss of well integrity are presented in **Table 4-29**.

Table 4-29: Summary of potential impacts to key values/sensitivities from a long-term well blowout of Barossa condensate

Environmental values/ sensitivities	Summary of potential impacts
Physical environment	*Water quality* It is likely water quality will be reduced due to hydrocarbon contamination, with stochastic modelling indicating that the adverse exposure zone for surface, entrained and dissolved aromatic hydrocarbons at open ocean locations, shoals/banks, offshore islands, Indonesian/Timor Leste waters and reefs and nearshore coastal waters adjacent to the north Kimberley coastline.
Habitats and communities	Impacts to marine habitats and communities from direct contact with hydrocarbons will be similar to that described in **Section 0** (**Table** 4-24). Further detail on impacts specific to a release of Barossa condensate from a long-term well blowout is provided below. *Intertidal, benthic primary producers and benthic communities/habitats* Benthic communities are vulnerable to hydrocarbons; from both lethal and/or sub-lethal effects. Potential impacts include mortality, alteration in respiration rates, decreases in filter feeding activity, reduced growth and reproduction rates, biochemical effects, reduced photosynthesis, reduction in tolerance to other stress factors and changes in population recruitment. No contact with surface films was predicted by the stochastic modelling outputs at offshore reefs/islands or Indonesian/Timor Leste waters, which support these communities/habitats. In terms of the in-water hydrocarbons, given the relatively long time to contact (> 2 days for all shoals/banks and offshore reefs/islands and Indonesian/Timor Leste waters, with the exception of Lynedoch Bank – summer and transitional conditions for entrained hydrocarbons; and Flinders Shoal and Franklin Shoal – transitional conditions for dissolved aromatic hydrocarbons) and taking into account the hydrocarbon characteristics (i.e. very low levels of aromatics in the three ring PAHs and above) and weathering/decay of the entrained and dissolved hydrocarbons of the released condensate, the potential impacts associated with these hydrocarbons at these features are expected to be minimal. *Coral reefs* Corals are susceptible, at varying degrees, to hydrocarbons and display a range of effects including mortality, decreases in coral reproduction, inhibited growth rates, reduced colonisation capacity; and feeding and behavioural responses (Shigenaka 2001; NOAA 2010). Specific stress responses observed have included excessive mucous production, polyp retraction, changes in calcification rates, changes in primary production rates, bleaching and muscle atrophy (NOAA 2010). The early life stages of corals may be more sensitive than adult colonies (Negri and Heyward 2000). As above, stochastic modelling did not predict contact by surface films at offshore reefs and islands. In terms of the in-water hydrocarbons, considering the relatively long time to contact (> 2 days for all shoals/banks and offshore reefs/islands and Indonesian/Timor Leste waters, with the exception of Lynedoch Bank, Flinders Shoal and Franklin Shoal – see discussion above) and taking into account the hydrocarbon characteristics (i.e. very low levels of aromatics in the three ring PAHs and above) and weathering/decay of the entrained and dissolved hydrocarbons of the released condensate, the potential impacts associated with these hydrocarbons at these features are expected to be minimal. *Plankton* Plankton communities are not considered to be highly sensitive to disturbance as they are variable in space and time and undergo regular recruitment (American Petroleum Institute 2001). In general, surface hydrocarbons spills that do not entrain or dissolve in the water column have a reduced impact on plankton as only a small proportion of the community is close to the surface and therefore susceptible to exposure from hydrocarbons (Chamberlain et al. 1999). The main pathways for direct exposure and contamination of plankton are ingestion, absorption and adherence of hydrocarbons to the external body wall or gills. The short regeneration time of

Environmental values/ sensitivities	Summary of potential impacts
	plankton (9–12 hours) and rapid replacement of stocks from adjacent areas due to water circulation will usually prevent any impact at the population or community level (Batten et al. 1998). However, this does depend upon the geographical scale of the spill and plankton distribution within the area. Considering the open ocean location and spatial and temporal variation of phytoplankton communities within offshore waters, significant impacts to plankton communities are unlikely.
Marine fauna	Impacts to marine fauna from direct contact with hydrocarbons will be similar to that described in **Section 0** (**Table** 4-24). Further detail on impacts specific to a release of Barossa condensate from a long-term well blowout is provided below. *Mammals* Cetaceans are highly mobile and field observations suggest that dolphins and whales may be able to detect and avoid hydrocarbons spills (Geraci and St. Aubin 1988). Studies of bottlenose dolphins found that they were able to detect and actively avoid a surface slick after a few brief contacts and that there were no observed adverse effects with surface hydrocarbons (Smith et al. 1983). It is not known if other marine mammals likely to be in the area are able to similarly detect and avoid hydrocarbons. Cetaceans that have direct physical contact with surface slicks and entrained or dissolved aromatic hydrocarbons may suffer following ingestion of hydrocarbons and inhalation of toxic vapours, or from surface fouling. This may result in the irritation of sensitive membranes such as the eyes, mouth, digestive and respiratory tracts and organs, impairment of the immune system or neurological damage (Etkins, 1997; IPIECA, 1995). Fouling of baleen whales (which includes humpback and pygmy blue whales) may disrupt feeding by decreasing the ability to intake prey. If prey (fish and plankton) is also contaminated, this can result in the absorption of toxic components of the hydrocarbons (PAHs). In the event of a well blowout, there is the potential that the adverse exposure zone for entrained and dissolved aromatics hydrocarbons may intersect the migratory routes of EPBC Act listed whale species, including pygmy blue whales and humpback whales or for oceanic dolphin species. Coastal dolphins in the Kimberley CMR and dugongs at Ashmore reef and along the Kimberley CMR may be affected, with low probabilities of contact predicted. The adverse exposure zone affects the migration corridor BIA for pygmy blue whales in the vicinity of Ashmore Reef, Cartier Island and international waters towards Indonesia/ Timor/ Timor Lester. Only a small portion of the pygmy blue whale foraging BIA in the vicinity of Seringapatam Reef is contacted by the entrained hydrocarbon exposure zone (winter conditions only with a 1% probability of contact predicted from stochastic modelling). A small area in the far north section of the migration BIA for humpback whales is intersected by the entrained adverse exposure zone (summer conditions only with a 1% probability of contact predicted from stochastic modelling). Feeding during migrations is generally low level and opportunistic and, as such, the opportunity for ingestion of hydrocarbons is reduced. Migrations of both pygmy blue whales and humpback whales extend over several months and encompass a large geographical area. Therefore, the whole population of the species is unlikely to be within the adverse exposure zone and, as such, a spill from a long-term well blowout is not expected to affect an entire population. A well blowout could result in a disruption to a significant portion of the pygmy blue whale populations, including behavioural impacts (e.g. avoidance of impacted areas), sub-lethal biological effects (e.g. skin irritation, irritation from ingestion or inhalation) and, in rare circumstances, death. However, such disruptions or impacts are not predicted to impact on the overall population viability of the species within the adverse exposure zone. The entrained exposure zone includes potential dugong habitat; as such dugongs may be exposed to spilled hydrocarbons. Suitable dugong habitat and known dugong populations in the EMBA (e.g. Ashmore Reef, mainland coast) are a considerable distance from NT/RL5, and spilled hydrocarbons are expected to be highly weathered prior to reaching these areas with little to no volatile fraction remaining (typically the most toxic component of a hydrocarbon spill). Mechanisms for impacts to dugongs are expected to be similar to cetaceans given the similarities in their biology (i.e. obligate marine air-breathing vertebrates with a thick blubber layer), as are exposure pathways. Note that dugongs are not expected to be exposed to surface hydrocarbons given the predicted surface expression from a hydrocarbon spill does not overlap suitable dugong habitat. As such, potential impacts may include sub-lethal biological effects (e.g. skin irritation). Indirect impacts such as changes to seagrass habitat are not expected. The EMBA does not encompass significant dugong populations such as Exmouth Gulf, Shark Bay or

Environmental values/ sensitivities	Summary of potential impacts
	Moreton Bay; any potential impacts would be restricted to small populations or individual animals. *Reptiles* In the unlikely event of a long-term well blowout, stochastic modelling indicates that the adverse exposure zone may extend up to 496 km on the sea surface and more than 1,000 km for entrained/dissolved aromatic hydrocarbons from the release location. Therefore, a hydrocarbon spill may have a minor disruption to a portion of the population of marine turtles. However, there is no threat to overall population viability and it is more likely that only transient individuals may be affected by the spill. Breathing and inhalation of toxic vapours may occur from exposure to hydrocarbons in surface waters. Their breathing pattern, involving large 'tidal' volumes and rapid inhalation before diving, results in direct exposure to petroleum vapours which are the most toxic component of the hydrocarbon spill (Milton and Lutz, 2002). This can lead to neurological impairment, interstitial emphysema, lung damage and congestion, inhalant pneumonia and (Etkins, 1997 and IPIECA, 1995). Adult sea turtles exhibit no avoidance behaviour when they encounter hydrocarbon slicks (Odell and MacMurray, 1986), therefore contact with surface or entrained hydrocarbons, can result in hydrocarbon adherence to body surfaces (Gagnon and Rawson, 2010). The open waters of the sea surface adverse exposure zone do not contain significant breeding and feeding habitats for significant numbers of marine turtles to be exposed to hydrocarbons in the unlikely event of a well blowout. In addition, the lack of surface expression of the hydrocarbon results in a lack of impact on breeding turtles. The adverse exposure zone for entrained and dissolved hydrocarbons may intersect various BIAs for turtles, in particular the internesting areas for flatback, green and hawksbill turtles and foraging areas for flatback, green, olive ridley and loggerhead turtles. Protected areas that are predicted to be contacted by the entrained or dissolved adverse exposure zone that support turtles include: • Kimberley CMR (foraging - green turtle) • Oceanic shoals CMR (internesting – flatback and olive ridley turtles, foraging – loggerhead and olive ridley turtles) • Arafura CMR (internesting – flatback, green, hawksbill and olive ridley turtles) • Joseph Bonaparte CMR – (foraging – green and olive ridley turtles) • Ashmore Reef CMR (nesting and internesting – green turtles, foraging – green, hawksbill, loggerhead) • Cartier Island CMR (nesting and internesting – green turtles, foraging – green, hawksbill, loggerhead) Hydrocarbon impacts on saltwater crocodiles are largely unknown, however it is expected mechanisms for impact and exposure pathways would be similar to those described above for marine turtles. Given the species' preference for shallow, coastal and estuarine habitats and that stochastic modelling indicates these habitats have a very low probability of being contacted by hydrocarbons above threshold levels, population level impacts are not expected. *Sea snakes* The distribution and movements of sea snakes is largely species-dependent with some species, such as the pelagic yellow-bellied sea snake, known to travel large distances, while others, such as the olive sea snake, are usually more residential to a particular area. Overall, the presence of sea snakes within the offshore waters is likely to be infrequent and comprise relatively few individuals. However, higher numbers are expected to be present at submerged shoals/banks (contact predicted at a range of probabilities between 1% and 86%), and offshore reefs/islands such as Ashmore Reef, Cartier Island and Seringapatam Reef (contacted at low probabilities of 1%-6%) within the adverse exposure zone. Those species that have preferred habitats associated with submerged shoals and banks may be disproportionately affected by a hydrocarbon spill affecting these habitats. Localised impacts to seasnakes may be possible from direct contact with surface hydrocarbons. Impacts are likely to be similar to those recorded for marine turtles and may include potential damage to the dermis and irritation to mucous membranes of the eyes, nose and throat (ITOPF, 2011).

Environmental values/ sensitivities	Summary of potential impacts
	A hydrocarbon spill may have a minor disruption to a portion of the population, however, threats to overall population viability of sea snakes is considered highly unlikely. *Sharks, sawfish and rays* Open waters of the adverse exposure zone do not contain significant breeding and feeding habitats for significant numbers of sharks and rays to be exposed to hydrocarbons in the unlikely event of a well blowout. Furthermore, it is expected that any potential impacts to sharks and rays would be limited to a few transient individuals that may occur in the EMBA. Transient individual sawfish may be present in coastal areas along the North Kimberley and the Kimberley CMR. No threat to the overall population viability is anticipated. For whale sharks, the adverse exposure zone for entrained and dissolved hydrocarbons intersects the northern section of the foraging BIA. Whale sharks may be affected through direct physical coating (surface spills) and ingestion (surface slicks and entrained/dissolved aromatic hydrocarbons), particularly if feeding. While individual whale sharks that have direct contact with hydrocarbons within the EMBA may be impacted, significant impacts to migratory whale shark populations are not expected as the species is highly migratory and forages over a broad geographical area. *Seabirds and migratory shorebirds* A hydrocarbon spill, particularly that on the sea surface, may result in considerable mortality of seabirds in the event that it overlaps foraging areas at a threshold which may cause harm (>10 g/m^2). Stochastic modelling indicates that the sea surface adverse exposure zone does not intersect any key breeding foraging/feeding areas for seabirds with possible individual migratory roseate tern foraging in the Arafura CMR. Migratory birds/shorebirds are less likely to be affected, with entrained hydrocarbons potentially affecting birds through oiling of feet or impacts to prey species. BIAs for breeding/foraging and nesting seabirds are identified in **Figure 3-2**. In general, suitable habitat for seabirds and migratory shorebirds is broadly distributed along the mainland and nearshore island coasts, and offshore emergent reefs/ islands and Indonesian/Timor Leste shorelines and islands, within the adverse exposure zone for in-water hydrocarbons. Of note are important breeding/nesting and resting areas, including Ashmore Reef, Cartier Island (including the CMRs and Ashmore Reef Ramsar site) and the north Kimberley coast. Stochastic modelling predicts that these areas will be contacted by entrained and dissolved hydrocarbons at very low probabilities (1%-6%). While impacts on individual birds may occur in the event of a well blowout, impact at a population level is considered highly unlikely. In addition, no significant impacts to MNES, including at a population level, are expected. *Fish* Pelagic fish generally do not experience acute mortality from hydrocarbon spills (ITOPF, 2011), as they are able to detect and avoid surface waters underneath hydrocarbon spills by swimming into deeper water or away from the affected areas (Scholz et al.1992). Fish that have been exposed to dissolved aromatic hydrocarbons can eliminate the toxicants once placed in clean water, hence individuals exposed to a spill are likely to recover (Concawe, 1996). Although larvae, gametes and juveniles are considered sensitive to hydrocarbons, there is no definite evidence reported in literature to suggest hydrocarbon spills have significant effects on fish populations in the open sea. Hydrocarbon induced deaths of young fish are often of little significance compared to losses each year through natural predation and fishing (sometimes reaching 99.99% (Dicks 1999).
Other biological environmental values	*Shoals and banks of the NMR, NWMR and Sahul Shelf complex* Shoals and banks support a diverse and varied range of benthic communities, including algae, reef-building soft corals, hard corals and filter-feeders (Heyward et al. 1997, Heyward et al. 2011). Various shoals/banks in the NMR, NWMR and Sahul Shelf complex have the potential to be contacted by entrained and dissolved hydrocarbons at a moderate exposure level at a range of probabilities (1%-86%), as predicted by stochastic modelling. As outlined above, potential impacts that may occur as a result of hydrocarbon exposure could include sub-lethal stress and, in some cases, total or partial mortality of sensitive benthic organisms (e.g. corals) and the early life stages of resident fish and invertebrate species. Exposure to dissolved aromatic hydrocarbons may also increase mortality in the early life stages

Environmental values/ sensitivities	Summary of potential impacts
	of benthic species affected and could cause localised and long term effects to the shallow hard coral communities at these shoals/banks. Given the relatively long time to contact (> 2 days for all shoals/banks with the exception of Lynedoch Bank – summer and transitional conditions for entrained hydrocarbons; and Flinders Shoal and Franklin Shoal – transitional conditions for dissolved aromatic hydrocarbons), and taking into account the weathering/decay of the entrained and dissolved hydrocarbons of the released condensate, the potential impacts associated with in-water hydrocarbons at these features is expected to be minimal. Offshore reefs and islands (i.e. Ashmore Reef, Cartier Island, Hibernia Reef and Seringapatam Reef) In general, offshore reefs and islands support a biodiverse reef ecosystem, habitats and communities (including EPBC listed threatened and migratory species, such as marine turtles and sea snakes). Stochastic modelling outputs predict that Ashmore Reef, Cartier Island, Hibernia Reef and Seringapatam Reef will be contacted by entrained and dissolved hydrocarbons (Ashmore Reef and Hibernia Reef only) at very low probabilities (1%-6%), with a minimum time to contact > 30 days. Given the low probability and long time to contact, and taking into account the decay of the entrained and dissolved hydrocarbons of the released condensate, the potential impacts associated with in-water hydrocarbons at these features is expected to be minimal. No significant impacts to MNES are anticipated. *North Kimberley coastline* The nearshore and coastal environment of the north Kimberley supports a diverse array of marine habitats and communities including coral reefs, sandy beaches, rocky shores, seagrass meadows, mangroves, sponge gardens, wetlands and estuaries (DEC 2009). Stochastic modelling outputs predict that the Bonaparte archipelago, Kimberley coast, Eclipse archipelago, Troughton Island and Stewarts Islands will be contacted by entrained hydrocarbons at very low probabilities (1%), with a minimum time to contact of > 46 days. Given the low probability and long time to contact, and taking into account the weathering/decay of the entrained hydrocarbons of the released condensate, the potential impacts associated with in-water hydrocarbons at these features is expected to be minimal. No significant impacts to MNES are anticipated. *KEFs* Stochastic modelling predicts that the adverse exposure zone for sea surface, entrained and dissolved hydrocarbons may contact waters above the unique seabed KEFs of the shelf break and slope of the Arafura Shelf, carbonate bank and terrace system of the Van Diemen Rise, tributary canyons of the Arafura Depression, pinnacles of the Bonaparte Basin and carbonate bank and terrace system of the Sahul Shelf. Stochastic modelling outputs predict these features will be contacted by entrained and dissolved hydrocarbons at relatively low probabilities (1%-37%). Impacts to these KEFs are considered to be minimal given their location on the seabed and the behaviour of the Barossa condensate plume, in which the concentration of the entrained and dissolved hydrocarbons increases within decreasing water depth as the plume trapping depth almost reaches the sea surface. The KEF of the continental slope demersal fish communities in the NWMR (approximately 793 km to the south-west) has been identified as being contacted by the entrained adverse exposure zone at low probabilities (1%-2%), with a minimum time to contact of > 38 days. Given the low probability and long time to contact, and taking into account the decay of the entrained hydrocarbons of the released condensate, the potential impacts associated with in-water hydrocarbons at this feature is expected to be minimal. *Indonesia/Timor Leste* The coastline and marine waters of Indonesian and Timor support a diverse range of benthic communities including mangroves (DeVantier et al. 2008), estuarine sand and mud flats (Wilson et al. 2011), coral reefs (Tomascik et al. 1997, DeVantier et al. 2008) and seagrass (Hutumo and Moosa 2005, DeVantier et al. 2008). Aquaculture is prominent in the coastal areas of Indonesia, producing high volumes of seaweed (Valderrama et al. 2013) along with milkfish, tilapia, shrimp and tuna (Phillips et al. 2015). Subsistence fishing by Indonesian and Timorese fisherman occurs at Seringapatam Reef, Ashmore Reef and Cartier Island. These fishermen are legally

Environmental values/ sensitivities	Summary of potential impacts
	permitted to harvest marine products including Trochus, sea cucumbers (holothurians), abalone, green snail, sponges, giant clams and finfish including sharks. Indonesian waters have been identified as being contacted by the entrained spill above the adverse exposure threshold at low probabilities (9-20%), with a minimum time to contact of >11 days. Additionally, contact above the dissolved aromatic adverse exposure threshold are predicted to occur at low probabilities (1-7%), with a minimum time to contact of >15 days. Given the low probability and long time to contact, and taking into account the weathering/decay of the entrained hydrocarbons of the released condensate, the potential impacts associated with in-water hydrocarbons at these features is expected to be minimal. No significant impacts on Indonesian and Timor Leste waters and habitats are anticipated.
Socio-economic and cultural	*CMRs* Stochastic modelling results indicate that the open water environment within the Oceanic Shoals CMR (17%-80% probability), Arafura CMR (4%-37% probability), Joseph Bonaparte Gulf CMR (1% probability) and Kimberley CMR (1% probability) may be affected by the adverse exposure zone for entrained and dissolved aromatic hydrocarbons. Potential impacts to the key values and sensitivities that may occur within the CMRs, such as marine fauna, shoals/banks and offshore reefs and islands, are discussed in detail above. *Commercial and recreational fishing* The predicted adverse exposure zone resulting from a long-term well blowout may impact the area fished by a number of commonwealth and NT/WA fisheries. These fisheries generally target demersal and pelagic finfish species, and prawns. Fish exposure to hydrocarbons can result in 'tainting' of their tissues. Even low levels of hydrocarbons can impart a taint or 'off' flavour or smell in seafood. However, tainting is generally reversible, although it is influenced by level of hydrocarbon contamination. Adult fish exposed to low entrained hydrocarbon thresholds are likely to metabolise the hydrocarbons and excrete the derivatives with studies showing that fish have the ability to metabolise petroleum hydrocarbons, although it is dependent upon the magnitude of the hydrocarbon contamination (Eisler 1987). Crustaceans (e.g. prawns) have a reduced ability to metabolise these hydrocarbons (NOAA 2002). Seafood safety is a major concern associated with spill incidents. Therefore, actual or potential contamination of seafood can affect commercial and recreational fishing, and can impact seafood markets long after any actual risk to seafood from a spill has subsided (NOAA 2002). A major spill would result in the establishment of an exclusion zone around the area affected by the spill and a temporary prohibition on fishing activities implemented for a period of time. Therefore, there is potential for subsequent economic impacts to affected commercial fishing operators. *Tourism, recreation and research* As outlined in **Section 3.5.11**, there is limited tourism and recreation in remote, offshore waters. However, specimen shell collection occurs around Ashmore Reef and Cartier Island, Indonesian/Timor Leste islands and diving charters operate in the vicinity of Seringapatam Reef, Ashmore Reef, Hibernia Reef and Cartier Island. Potential impacts to these offshore islands and reefs are discussed above. In summary, it is considered highly unlikely that there will be long term impacts to tourism, recreation and research activities. *Commercial shipping* The main commercial shipping channel is to the west of NT/RL5. Based on stochastic modelling, the sea surface adverse exposure zone does not intersect this commercial shipping channel. Offshore petroleum exploration and operations Any exclusion zones that would be implemented in the event of a well blowout would not extend into any other petroleum retention lease area and exploration permit leases. *Indonesian traditional fisheries* in the event of a large scale spill, hydrocarbon above the potential adverse exposure thresholds for entrained (100 ppb) and dissolved (50 ppb) may reach the MoU box and the area subject to the Perth Treaty. A loss of well control may result in impacts to fishing activity in the MoU box and Perth Treaty area, with a possible exclusion zone being implemented during and after the spill. *Indigenous Heritage*

Environmental values/ sensitivities	Summary of potential impacts
	A worst-case credible spill has been identified as potentially extending to Ashmore Reef, which hosts Indonesian cultural heritage values (grave sites and historical wells). The quantities of hydrocarbons that may reach Ashmore Reef are considered to be very small, and would be highly weathered. No shoreline accumulations are expected to occur. No impacts to the cultural heritage values of Ashmore Reef are expected. *Defence activities* The stochastic modelling results indicate that the open waters of the NAXA may be affected in the event of a long-term well blowout at or above a moderate threshold for entrained and dissolved aromatic hydrocarbons. However, any potential exclusion zones that would be implemented are unlikely to extend into the NAXA considering the sea surface exposure zone does not intersect the area.

4.3.5.4 Hydrocarbon fallout during well testing

The activity has the potential to result in the unplanned fallout of hydrocarbons during well testing. The risk assessment for potential for impacts to the marine environment is summarised in **Table 4-30**.

Table 4-30: Risk assessment of unplanned hydrocarbon discharges: hydrocarbon fallout during well testing

Risk	Fallout of hydrocarbons from flaring during well testing		
Aspect-receptor reference (see Table 4-5)	19A – physical environment		
Potential impacts	• Temporary and localised reduction in water quality		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	3 Rare	3 Low
Residual risk	1 Negligible	3 Rare	3 Low
Summary of control measures			
• ConocoPhillips Appraisal Well Test Program for each well – includes Well Test Scope of Validation Statement, maintenance of a pilot light to assist in the efficient combustion of gas and consideration of weather conditions (i.e. wind speeds) and MODU orientation when flaring during well testing			

Impact assessment and risk evaluation

The potential impact from the fallout of hydrocarbons from flaring during well testing is expected to result in a very localised and temporary decline in water quality. Considering the control measures that will be implemented and the location of NT/RL5 (i.e. open ocean environment that does not support any key breeding, feeding or aggregation areas for marine fauna, including BIAs), the potential impacts and risks to the marine environment are assessed as low.

4.3.6 Unplanned atmospheric emissions: unplanned venting of gas during drilling

The activity has the potential to result in the unplanned venting of gas during drilling due to the influx of gas from shallow gas pockets in the geological formation. The risk assessment for potential for impacts to the marine environment is summarised in **Table 4-31**.

Table 4-31: Risk assessment of unplanned atmospheric emissions: unplanned venting of gas during drilling

Risk	Unplanned venting of gas due to release of gas from shallow gas pockets		
Aspect-receptor reference (see Table 4-5)	20A – physical environment		
Potential impacts	• Localised reduction in air quality • Contribution to the incremental build-up of GHG in the atmosphere		
Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	1 Negligible	2 Remote	2 Low
Residual risk	1 Negligible	1 Improbable	1 Low
Summary of control measures			
• MODU Safety Case Revision describes ConocoPhillips and MODU Operators agreed well control interface • Approved ConocoPhillips Well Design and Delivery Process documentation including Engineering Basis of Design, Critical Well Review and Shallow Hazard Study • ConocoPhillips Wells Management System Training and Competency Requirements – well control certification from International Well Control Forum (IWCF), or equivalent, held by ConocoPhillips and/or MODU contractor personnel who fill a well engineering or well site supervisory position. The well control certification will be appropriate for the type of well work			

Impact assessment and risk evaluation

Atmospheric emissions associated with the unplanned venting of gas in the unlikely event of the well intersecting a shallow gas pocket will result in a minor deterioration in local air quality while emissions of GHG will cause an incremental increase in global GHG concentrations. However, they are not considered to have a determinable local-scale impact.

Considering the location of NT/RL5 in the open ocean, which are well-removed from nearest residential or sensitive populations, it is considered highly unlikely that atmospheric emissions will result in significant impacts.

4.3.7 Response strategy implementation

The drilling campaign has the potential to result in unplanned/non-routine hydrocarbon spills to the marine environment which requires the implementation of spill response strategies to maintain situational awareness or reduce impacts and risks of a spill. For planning purposes, the maximum worst case credible scenario of a long-term well blowout has been used when assessing response strategies. The risk assessment for potential for impacts to the marine environment from response strategy implementation is summarised in **Table 4-32**.

Table 4-32: Risk assessment of response strategy implementation

Risk	Inappropriate response strategies or inappropriate implementation of selected response strategies	
Aspect-receptor reference (see Table 4-5)	21A – physical environment	21E – fish
	21B – marine mammals	21F – birds
	21C – marine reptiles	21G – shoals and banks
	21D – sharks/rays	21K – CMRs
Potential impacts	• Temporary and localised reduction in water quality, including waters of submerged shoals/banks and CMRs • Direct toxic or physiological effects on marine biota, particularly marine mammals, reptiles, sharks/rays, fish and birds	

Risk assessment			
	Consequence	*Likelihood*	*Risk rating*
Inherent risk	2 Minor	3 Rare	6 Medium
Residual risk	2 Minor	2 Remote	4 Low

- pre-spill NEBA identifies response strategies considered to provide a net environmental benefit
    - The pre-spill NEBA identifies the potential impacts of response strategies
- in the event of a spill, a daily spill response net environmental benefit analysis (NEBA) will be conducted, according to the process described in the Attachment C of the Barossa Appraisal Drilling OPEP (ALL/HSE/ER/013)
- Deliver the OPEP in accordance with the OPEP performance outcomes and standards.

Additional Controls: Tailored Spill Response Strategies

A tailored response will be implemented, as informed by the considerations discussed below.

Surface dispersant application

Dispersant use would result in increased entrainment in the water column and may result in additional impacts to submerged receptors, particularly shoals/banks. As there is no predicted surface hydrocarbon contact with any shoreline from any credible hydrocarbon spill scenario, it is considered that this strategy would be of no net environment benefit.

The strategy is unlikely to be effective in treating volatile/light hydrocarbons, such as MDO and Barossa condensate, that form thin films and would be expected to evaporate and weather rapidly once exposed to atmospheric conditions on the sea surface.

There are logistical challenges in mounting a surface dispersant response in a remote offshore location, such as NT/RL5. Flying times for aircraft out of Darwin are approximately 2 hours 40 minutes for a round trip, with typical aircraft for dispersant operations capable of three hours flying time, before refuelling. Consequently, aerial dispersant operations at the spill location would not be feasible. Aircraft may be able to refuel on Bathurst Island en-route to the spill location, however, given the lack of environmental benefit from surface application, this option is not considered feasible/practicable.

Steaming time for vessels from Darwin is approximately 12 hours. However, given the characteristics of Barossa condensate when released to the sea surface, surface dispersant application is unlikely to be a suitable response strategy, and the window of opportunity for dispersant application to be effective would be very limited (expected to be within a few hours of the spill being exposed to the atmosphere). Therefore, surface dispersant application is not considered feasible/practicable.

There is also a HSE risk from the gas plume associated with a condensate release and the VOCs associated with a MDO spill that would limit the ability for personnel to safely access fresh hydrocarbon available for treatment with surface dispersant.

Therefore, ConocoPhillips considers that the implementation of a surface dispersant response is not ALARP and acceptable.

Mechanical dispersion

Mechanical dispersion involves the use of a vessel's propeller wash and/or fire hose to target areas of spills to achieve favourable dispersion. However, this strategy is of limited benefit in open ocean locations where wave action is likely to deliver similar advantages. Additionally, this technique may pose unacceptable health and safety risks to response personnel given the highly volatile nature of MDO and Barossa condensate. It is considered that the environmental benefits of implementing mechanical dispersion do not outweigh the risk to human health and safety, and therefore, mechanical dispersion is not considered a suitable response strategy for the Barossa appraisal drilling campaign.

Pre-emptive/post-contact wildlife response

For pre-emptive/post-contact wildlife response to be considered ALARP and acceptable, wildlife (e.g. migratory birds) would need to be present in significant numbers. The release location is in a remote offshore area and distant from any sensitivities that may include aggregations of wildlife. There are no known significant aggregations, feeding and breeding areas for wildlife within the EMBA that may be at risk of being contacted by surface hydrocarbons.

The following marine wildlife groups may be amenable to pre-emptive/post contact wildlife response:

Cetaceans: Baleen whales and toothed whales including dolphins are likely to be present within the adverse exposure zone during a hydrocarbon spill. However, cetaceans are thought to be able to detect and avoid hydrocarbon spills (**Table 4-29**). The entrained Barossa condensate is likely to readily decay, and the dissolved portion contains very low levels of PAHs, reducing the potential for ecotoxological effects in the water column. Additionally, the Western Australian Oiled Wildlife Response Plan (WA OWRP) (AMOSC 2014) indicates that there are no viable in-water rescue strategies for cetaceans. Therefore, a pre-emptive/post-contact wildlife response is not considered to have any net environmental benefit for cetaceans.

Marine reptiles (turtles and sea snakes): Marine turtles and sea snakes may be present within the adverse exposure zone during a hydrocarbon spill. Neither marine turtles nor sea snakes are thought to show avoidance behaviour to hydrocarbon spills. However, surface hydrocarbons are likely to evaporate quickly (within hours) and entrain readily in normal metocean conditions of the Timor Sea, and are therefore unlikely to threaten nesting and internesting populations of marine turtles (**Table 4-29**). As discussed above, the entrained Barossa condensate is likely to readily decay, and the dissolved portion contains very low levels of PAHs, reducing the potential for ecotoxological effects in the water column. Additionally, the WA OWRP indicates that there are no viable in-water rescue strategies for adult marine turtles, whilst sea snakes may be captured and treated; although the majority are venomous and become aggressive when aroused. Therefore, a pre-emptive/post-contact wildlife response for marine turtles and sea snakes is not considered to have any net environmental benefit, and is not ALARP due to health and safety considerations.

Birds (seabirds and migratory shorebirds): The offshore waters of NT/RL5 is likely to be infrequently visited by seabirds, while migratory shorebirds are unlikely given the distance from any shorelines. However, locations within the adverse exposure zone such as Ashmore Reef, Cartier Island, the north Kimberley coast and associated islands, provide important habitat for seabirds and migratory shorebirds (**Section 3.4.3.7**). Most species of seabirds are likely to spend some time on the sea surface, and feed by shallow plunge diving (less than 4 m deep) or surface seizing of prey. The majority of foraging activity would be expected in nearby waters to nesting and roosting sites, with only the red-footed booby and wedge-tailed shearwater known to forage more than 100 km from nesting or roosting sites.

Therefore, given that surface hydrocarbons associated with a spill of Barossa condensate are likely to evaporate quickly (within hours), and entrain readily, impacts from surface oil to foraging seabirds and migratory shorebirds are unlikely. The entrained Barossa condensate is likely to readily decay, and the dissolved portion contains very low levels of PAHs, thereby reducing the potential for ecotoxological effects in the water column. Therefore, it is unlikely that significant numbers of birds would be at risk from oiling (**Table 4-29**) and the environmental benefit of pre-emptive/post contact wildlife response is considered very low compared to the cost sacrifice.

There are also significant health and safety considerations for responders implementing an offshore pre-emptive/post-contact oiled wildlife response in a remote region such as the Timor Sea, including lack of suitable sites for basic amenities, exposure risk, and safety risks posed by handling venomous or large marine fauna.

Therefore, ConocoPhillips considers that the implementation of a pre-emptive/post-contact wildlife response is not ALARP and acceptable.

Wildlife response – hazing

Wildlife hazing would be undertaken as necessary and practicable, and any ongoing hazing of wildlife at risk would be informed through operational monitoring.

Protection and deflection

There is no shoreline contact at or above surface hydrocarbon thresholds predicted for any emergent receptor. Therefore, the strategy is of no value.

Shoreline clean-up

There is no shoreline contact at or above any surface hydrocarbon thresholds predicted for any emergent receptor. Therefore, the strategy is of no value.

In-situ burning

In-situ burning requires calm sea state conditions, which limits its feasibility in the NMR. Optimum weather conditions are < 20 knot wind speed and waves < 1 m-1.5 m. Considering the oceanic conditions in the NMR it is likely that the ability to corral hydrocarbon may be limited as the sea state may exceed the optimum conditions.

Health and safety risks for response personnel associated with the containment and subsequent burning of light, volatile hydrocarbon is not an acceptable risk to ConocoPhillips. Additionally, there is no in-situ burning boom available for use in Australia.

Therefore, ConocoPhillips considers that the implementation of in situ burning is not ALARP and acceptable.

Impact assessment and risk evaluation

Monitor and evaluate

Monitor and evaluate will not provide any changes to the trajectory of the hydrocarbon spill. However, this strategy provides information on the fate, nature and weathering of the spill. The outputs and data from the monitor and evaluate strategy are used to inform other response strategies, emergency response priorities and any ongoing response.

As this strategy does not provide any changes to the trajectory of the spill, the potential impacts of a hydrocarbon spill on marine fauna, submerged banks and shoals, and other open ocean receptors in the trajectory of the spill will remain until other response strategies or natural degradation reduces the impacts of the spill.

Wildlife hazing

Wildlife hazing has the potential to reduce the risk of hydrocarbon exposure to wildlife. However, there are no known aggregation areas for wildlife within, or in proximity to NT/RL5 and retention lease area. The implementation of any wildlife response would be dependent on the monitor and evaluate response identifying aggregations of wildlife at risk. Given the remote, offshore location of the release site, significant time lag is expected between identifying wildlife aggregations potentially at risk from surface hydrocarbons and the time to mobilise a response to the spill location. Therefore, response effectiveness is likely to be limited due to the potential for wildlife that is exposed to hydrocarbons to have moved or dispersed during the time taken to mobilise a response. However, the response is retained as it may be employed on an opportunistic basis, if aggregations of wildlife were encountered by vessels near the spill location and a vessel(s) were available for hazing activities.

Containment and recovery

Containment and recovery may reduce the volume of hydrocarbons on the sea surface, potentially reducing the impact of a hydrocarbon spill. However, the strategy is unlikely to be effective in conditions with strong currents (above 0.8 knots), winds (above 15 knots) or high sea states (Beaufort scale 3 to 4). Additionally, skimmers are likely to be less effective on light, volatile hydrocarbons, and there are HSE considerations if considering deploying this strategy close to the spill location. Although containment and recovery is unlikely to be utilised in a spill in the open ocean, where natural degradation is likely to achieve greater net environmental benefits, there may be certain situations where an environmental benefit may be achieved, and therefore, the strategy is retained.

All response strategies involve vessel activities, resulting in the physical presence of vessels during implementation. Therefore, implementing response strategies has the potential for routine vessel discharges, introduction of IMS, a vessel collision resulting in a hydrocarbon spill, or a collision with marine fauna occurring.

The potential impacts from these risks and identified control measures are detailed in the following sections:

- discharge of treated sewage, grey-water and putrescible, deck drainage and bilge (**Section 4.2.5**)
- atmospheric emissions (**Section 4.2.7**)
- light emissions (**Section 4.2.8**)
- underwater noise emissions (**Section 4.2.9**)
- interference and/or collision with marine fauna (**Section 4.3.1**)
- introduction of IMS (**Section 4.3.2**)
- accidental loss of non-hazardous and hazardous waste (**Sections 4.3.4**)
- release of hydrocarbons due to a vessel collision (**Section 0**).

The response strategies of monitor and evaluate, wildlife hazing and containment and recovery are considered appropriate response strategies based on the outcomes of a pre-spill NEBA. However, the deployment of any response strategy would be subject to a spill response NEBA.

5. IMPLEMENTATION STRATEGY

The drilling campaign will be managed in compliance with the Barossa Appraisal Drilling Campaign EP accepted by NOPSEMA under the Environment Regulations, other relevant environmental legislation and ConocoPhillips' Health, Safety and Environmental Management System (HSEMS).

The ConocoPhillips HSEMS consists of a number of elements, including *Element 2: Risk Assessment and Management*, that have the objective of implementing a systematic and integrated approach to risk management in order to reduce risk to a level that is ALARP.

The implementation strategy includes roles/responsibilities and training/competency requirements for all personnel (ConocoPhillips and contractors) in relation to implementing the controls summarised in **Section 5**, managing non-conformance and emergency response preparedness. The implementation strategy also describes the arrangements for measuring, monitoring and reporting environment performance to confirm that controls are implemented, maintained and effective for the drilling campaign.

Processes are in place to confirm that these controls and requirements are being implemented to manage environmental impacts and risks associated with the survey to ALARP. Some of the key processes/practices used include:

- comprehensive HSE evaluation and contracting process prior to the contractual engagement of MODU and/or support vessels. The key procedure that outlines these requirements is the ConocoPhillips ABU-W Contractor HSE Management Process (ALL/HSE/PRO/016), which includes the following:
    - a preliminary HSE risk assessment
    - requirement for contractors to comply with all applicable HSE laws and regulations, and any additional guidelines, operating standards and policies provided to the Contractor
    - detailed review and ConocoPhillips acceptance of Contractor HSEMS
    - development of appropriate HSE Bridging Documents (as required)
    - provision for ConocoPhillips to conduct audits/inspections of the Contractor's operations, equipment and emergency procedures at any time.
- marine vessel vetting process prior to the use of any support vessel to confirm it meets ConocoPhillips requirements
- routine site inspections undertaken by ConocoPhillips personnel
- JHA, task specific toolbox meetings and associated procedures/checklists
- contractor specific procedures and checklists (e.g. PTW system, lifting procedures, MODU/support vessel operational procedures)
- scheduled PMS, tracked through dedicated software packages
- provision of commitments register (containing commitments detailed in this EP) to the contractor.

5.1 MONITORING, AUDITING, MANAGEMENT OF NON-CONFORMANCE AND REVIEW

5.1.1 Environmental monitoring

ConocoPhillips and the MODU contractor will monitor and review HSE performance for the duration of the drilling campaign. Specific monitoring activities related to the management of environmental risks identified will collect, as a minimum, the information required to measure environmental performance against the environment performance outcomes, performance standards and measurement criteria in the accepted EP.

5.1.3 Environmental audits and review

Environmental performance auditing and review programs will be completed to:

- confirm impacts and risks are being effectively managed
- confirm relevant standards and procedures are being followed
- demonstrate compliance with regulatory requirements, approval commitments and conditions within this EP
- monitor, review and evaluate the effectiveness of ConocoPhillips' HSEMS
- confirm a senior management review of performance via consideration of the audit reports.

Environmental audits

ConocoPhillips' HSEMS establishes requirements for audit programs that assess the adequacy and effectiveness of HSE controls.

The ABU-W HSE auditing process consists of a three tier auditing hierarchy:

- tier 3 – external (to the BU) audits (corporate, regulatory bodies and other external bodies such as contractors)
- tier 2 – internal (to the BU) audits (HSEMS and Asset and Operational Integrity Management System policies and procedures)
- tier 1 – workplace inspections (workplace hazard identification and control).

An environmental auditing program will be implemented for the drilling campaign and will include the key elements and frequencies outlined in **Table 5-1**.

Table 5-1: Barossa appraisal drilling EP auditing and review program summary

Audit type	Description	Scope	Frequency
Tier 1	Pre-use SBM audit	Review compliance with SBM procedures including solids control, handling and storage	Prior to acceptance of SBM on the MODU
Tier 1	Weekly containment and performance checklist for the MODU	Site inspection of mud pits, bunds, chemical and hydrocarbon storage areas, drill floor, deck and bilge drainage and waste segregation	Weekly
Tier 2	Internal environmental compliance audit	Audit of MODU contractor HSEMS, which will include an audit of implementation of the requirements of the EP, specifically performance against the EPOs, EPSs and MC	As per ABUW HSE Audit Schedule (i.e. minimum of annually)
Tier 3	NOPSEMA audits	Regulatory compliance	Unscheduled (i.e. on notification by NOPSEMA)
Management review	ABU HSE Steering Committee performance reviews	Management team mid-year and annual review of HSE performance	Mid-year/annually
Incident investigation review	Review in line with ConocoPhillips ABU – HSE procedures incident reporting and investigation procedure (ALL/HSE/PRO/003)	The objective of the incident investigation is to establish the root cause(s) of an incident and to raise and close-out corrective actions to prevent recurrence.	Following an incident or training exercise

The results of monitoring and auditing are regularly reported to the senior management team via the HSE steering committee to ensure that action items are addressed.

ConocoPhillips will undertake internal audits of compliance against this EP with the outcomes of these audits included in the annual report submitted to NOPSEMA.

Environmental review

The review process considers applicable HSEMS data and outputs and includes a consideration of:

- results of internal audits and evaluations of compliance with legal and other requirements
- communications from external interested parties, including complaints
- the environmental performance of the organisation
- the extent to which objectives and targets have been met in light of changing circumstances and commitment to continuous improvement
- status of corrective and preventive actions from investigations and audits
- follow-up actions from previous management reviews
- significant issues from risk assessments
- resource allocation for system implementation and maintenance
- incidents
- recommendations for improvement.

The outcomes and decisions made in these reviews are distributed to appropriate management and planning teams to facilitate a cycle of continuous improvement.

5.1.4 Management of non conformance investigation and corrective action

Through the ConocoPhillips HSEMS (Element 10), ConocoPhillips ABU-W implements a systematic approach so that all incidents and near misses are consistently, methodically and effectively investigated, as appropriate to their risk or potential severity. All incidents including near misses are reported, investigated in a timely manner and analysed to identify corrective actions/preventive measures to prevent recurrence and continuously improve HSE performance. Incident investigations are documented using a database to track actions and enable sharing of learnings.

Non-conformances may be identified through audits, observations or incident reports. Actions required to address non-conforming incidents (including those associated with spill response drills, tests and exercises) and to prevent the escalation of pollution or environmental damage will be appropriate to the nature and scale of the event. All HSE hazards and incidents are reported in accordance with the ConocoPhillips ABU Incident Reporting and Investigation Procedure (ALL/HSE/PRO/003). Root cause analysis of incidents is performed to determine the cause and aid identification of appropriate corrective actions.

5.1.5 Management of change

ConocoPhillips has a management of change process as an element of the Wells Management System (ALL/DR/STD/006). The purpose of this document is to ensure there is a structured and consistent approach so any significant elements of the operation do not compromise the safety and environmental standards of the operations.

Significant changes to the drilling campaign operations include:

- any material change to the ‘engineering intent’ or the ‘well objectives’, e.g. change of drilling strategy or major variation to the original plan for processing of drilling cuttings

- change in the scope of the drilling campaign that affects the 'well objectives'
- change of MODU contractor or well control equipment
- any process change that is deemed will increase the risk to the marine environment.

Significant changes are reviewed and must demonstrate compliance with ConocoPhillips' standards and recommended practices. Significant changes which deviate from the approved Well Program require a Well Program Amendment, which is subject to the same internal review and approval process as the original Well Program.

A risk assessment may also be completed to determine if there is an increased risk to the marine environment. In all cases, where a potential release to the marine environment has been identified, assessment of implementing additional risk control measures to lower the potential risk to ALARP will be undertaken. Any significant changes to the drilling campaign may necessitate amendment to the EP and OPEP, as appropriate to the level of change.

5.2 OIL POLLUTION EMERGENCIES AND RESPONSE STRATEGIES

Overview

A significant hydrocarbon spill during the proposed drilling campaign is unlikely, but should such an event occur, the First Strike Plan (contained in the Barossa Appraisal Drilling OPEP) which provides response guidance to the activity/area and the OPEP covers spill response for this activity.

The First Strike Plan provides immediate actions required to commence a response. The MODU and support vessels will have SOPEPs and SMPEPs in accordance with the requirements of MARPOL 73/78 Annex I (as appropriate to vessel class). These plans outline responsibilities, specify procedures and identify resources available in the event of a hydrocarbon or chemical spill from vessel activities. The drilling campaign First Strike Plan is intended to work in conjunction with the SOPEPs/SMPEPs, if hydrocarbons are released to the marine environment from a vessel.

The OPEP provides the information required for an effective response in the unlikely event of an unplanned release of hydrocarbon used in the drilling operations and associated activities. The OPEP details actions to be taken in response to the incident, describes arrangements and reporting relationships for command, control and communication, and provides interfaces to emergency specialist response groups, statutory authorities and other external bodies.

Response strategies

ConocoPhillips' response objectives are to develop and implement appropriate and effective response strategies commensurate to the scale, nature and risk of the spill, including the following:

- Minimise the volume or duration of a hydrocarbon spill
- Obtain and situational awareness as soon as practicable, and maintain situational awareness for the duration of the response
- Protect wildlife aggregations from hydrocarbon impacts, if identified within the adverse exposure zone and at potential risk from the spill trajectory.

The following response strategies have been pre-selected for the drilling campaign:

Primary Response – monitor and evaluate

Monitor and evaluate is the only primary response strategy selected for the drilling campaign. Monitor and evaluate involves the collection and evaluation of information and data to provide and maintain situational awareness in the event of a spill. This strategy includes fate and trajectory monitoring, spill tracking and field observations, while allowing natural processes to break up, degrade and weather the spill. Whilst this strategy involves no direct response actions to mitigate the spill, it is considered the most appropriate response strategy for spills of non-persistent and more persistent hydrocarbons such as MDO and Barossa condensate, in a remote offshore location with no likelihood of shoreline contact from surface hydrocarbons above threshold levels.

Monitor and evaluate will include the following components:

- Deployment of tracking buoy(s)
- Satellite surveillance and data capture
- Aerial surveillance
- Initial (coarse) spill trajectory modelling
- Oil spill trajectory modelling.

Secondary (or optional) responses that may be implemented have also been identified, and include containment and recovery and wildlife hazing.

Operational and Scientific Monitoring

In the event of a Tier 2 or above hydrocarbon spill to the marine environment, ConocoPhillips may implement a number of operational monitoring plans (OMPs) and scientific monitoring plans (SMPs), used to guide the spill response, assess potential environmental impacts and inform any remediation activities.

The objectives of the OSMP are to:

- Provide the overarching structure for operational monitoring to support situational awareness, to define the adverse exposure zone and inform spill response strategies to reduce risks of the spill to ALARP
- Inform a practical scientific monitoring process that can be implemented in the event of a spill to allow scientifically robust investigation of the extent and impacts of the spill over the short and long term.

Operational Monitoring

The focus of operational monitoring is to maintain situational awareness, to obtain and process information regarding the nature and scale of a spill, and the resources at risk; so that it can be acted upon in an adaptive manner to inform secondary response (if required), evaluating response effectiveness and informing response termination. Operational monitoring would supplement the monitor and evaluate response strategy in the event of an ongoing response.

Scientific Monitoring

Scientific monitoring is focused on objectives that do not influence response operations, but on evaluating the impact from a spill. It may include reactive baseline collection (post-spill pre-impact), evaluating environmental damage and post-response recovery. Reactive scientific monitoring may commence during the spill response phase where an assessment of the available baseline data in comparison with the nature and scale of the spill (e.g. spill trajectory and extent) and resources at risk identify a potential gap.

Emergency and spill response drills, exercises and audits

As required by Regulation 14 (8A) of the OPGGS (E) Regulations, ConocoPhillips will test this OPEP in order to confirm response readiness.

The following exercises and drills will be conducted to specifically test response preparedness outlined within the scope of the OPEP:

- a desktop drill carried out on board the MODU
- an IMT desktop exercise conducted at least annually. This desktop exercise will test the corporate arrangements in place for a Tier 2 or Tier 3 level spill.

Testing/training will be undertaken upon any significant change to the OPEP, the addition of a new drilling location to the EP, or the addition of new facilities or structures prior to becoming operational.

6. STAKEHOLDER CONSULTATION

6.1 IDENTIFICATION AND CLASSIFICATION

Consistent with Regulation 11A of the OPGGS (E) Regulations, ConocoPhillips defines 'relevant' stakeholders as:

- persons or organisations whose functions, interests or activities may be affected by the drilling campaign activity; and
- those that have a regulatory role (Commonwealth or State/Territory).

Prior to development of this EP, ConocoPhillips reviewed its Caldita-Barossa stakeholder database to confirm all existing stakeholders that would be relevant to this activity and ensure any new stakeholders (relevant or interested parties) were captured.

Relevant and interested stakeholder groups identified include Commonwealth and NT Government Departments, fishing industry councils and commercial fisheries operating within or near the appraisal drilling locations. Spill response agencies were also consulted for preparation of the OPEP.

6.2 CONSULTATION OUTCOMES

The following is a summary of the consultation outcomes for each relevant stakeholder group while further detail is provided in the consultation summary **Table 6-1**.

The remote location of the proposed activity means the number of relevant stakeholders who will or may be impacted in their ability to conduct their activities during the appraisal drilling period is almost wholly restricted to the commercial fishing sector.

While a range of Commonwealth and NT managed commercial fisheries are permitted to operate in the area the consultation conducted by ConocoPhillips with relevant and interested stakeholders identified that in practice three commercial fisheries will or may be active in or near NT/RL5 for part or all of the period when appraisal drilling would also occur.

These fisheries are the Timor Reef Fishery (TRF) and the NT Aquarium Fishery, represented by the Northern Territory Seafood Council (NTSC) and regulated by the NT Department of Primary Industry and Fisheries (NTDPIF) and the Northern Prawn Fishery, represented by the Northern Prawn Fishery (NPF) Inc. and regulated by the Australian Fisheries Management Authority (AFMA). Outcomes from these consultations are discussed below.

Due to the remote location, the Amateur Fisherman's Association of the NT and the NT Guided Fishing Industry Association advised that no recreational fishing activity occurred in NT/RL5 or wider surrounds. However, one guided fishing operator, Arafura Bluewater Charters, advised it may be active at Evans Shoal, located approximately 50 kilometres from NT/RL5. Outcomes from consultations are discussed below.

Commercial fishing interests are key relevant stakeholders in their capacity as co-users of the Commonwealth waters within which the retention lease is located and the appraisal drilling activities would occur.

Only two fisheries, the Northern Prawn Fishery (NPF) and the Timor Reef Fishery (TRF), were identified by ConocoPhillips and confirmed by stakeholders as being potentially impacted. Consultation occurred with the representative industry bodies, government departments with regulatory responsibilities for these fisheries and key licence holders. At the request of the Northern Territory Seafood Council, all licence holders for four other fisheries (Spanish Mackerel, Aquarium, Offshore Net and Line and Pearl Oyster) were also provided information and afforded the opportunity to engage with ConocoPhillips and provide feedback.

Following the consultation period, no concerns had been raised by commercial fishers. As per the practice during previous appraisal drilling programs, ConocoPhillips advised the relevant stakeholders that ongoing communication and consultation opportunity would take place prior to the MODU and support vessels entering the field, as well as advice on drilling completion and departure from the field.

All commercial fishing stakeholders were provided initial information and any additional information requested in a fair and reasonable timeframe for the discussion and assessment of any issue or concern raised during the extended consultation period. This process and discussions have been accurately represented in the EP and presented in the detailed summary of consultation (**Table 6-1**).

The remote location of the activity means there is no recreational fishing activity, according to the Amateur Fishermen's Association of the Northern Territory (AFANT) and the NT Guided Fishing Association (NTGFA).

One fishing charter operator identified themselves as being a potential occasional visitor to shoals located approximately 50 km from the appraisal drilling locations. The operator expressed concerns at the impact of appraisal activities on fish and the marine environment generally and the resulting impact on their livelihood.

Upon review of the issues and concerns they had raised, ConocoPhillips determined they either applied to seismic survey activities, as opposed to appraisal drilling, or they referred to drilling activity but did not apply in this instance due to the small footprint, the techniques involved and the distance of the activity from the banks and shoals for which concern was expressed. The operator was provided with a full, written explanation of how their concerns had been considered and afforded further opportunity to discuss the issues if required.

No further feedback was received from this Operator. In September, in light of the previous consultations, in addition to the updated fact sheet and separate Risk Assessment Fact Sheet sent to all relevant stakeholders, ConocoPhillips provided the Operator with further information specifically related to the vertical seismic profiling (VSP) involved in the work program for each well to address the concerns raised about impacts from underwater noise. Again, no feedback was received.

There are no established oil and gas operations within the surrounds of the retention lease for the proposed appraisal drilling. Therefore, there is no impact expected to other operators. Notwithstanding this, ConocoPhillips engaged with a range of adjacent or nearby operators and no concerns were raised.

During the environmental risk assessment for a worst case loss of well control, ConocoPhillips identified that while the wells are entirely located within Australian waters, there is the potential for spilled hydrocarbons to reach the territorial waters of neighbouring countries, namely the Democratic Republic of Timor-Leste (East Timor) and the Republic of Indonesia (Indonesia).

Spilled hydrocarbons may also reach the area described in Treaty between the Government of Australia and the Government of the Republic of Indonesia establishing an Exclusive Economic Zone Boundary and Certain Seabed Boundaries (the Perth Treaty area) and the Joint Petroleum Development Area described in the Timor Sea Treaty.

In the event of a spill, ongoing communication and consultation that may be required with neighbouring countries would be conducted in consultation and conjunction with the Department of Foreign Affairs and Trade (DFAT) and the Department of Industry, Innovation and Science (DIIS).

In September, ConocoPhillips provided both departments with additional detailed information related to the hydrocarbon spill risk assessment and response arrangements. ConocoPhillips' also requested more detailed guidance and confirmation of processes and protocols. ConocoPhillips' public information process for incident response will reflect the process and protocols advised by DFAT.

At the completion of the consultation period there had been minimal interest shown in this EP. In issuing letters and a consultation fact sheet to all stakeholders, ConocoPhillips sought feedback at the earliest opportunity in order to inform on-going decision-making and planning.

Given the consultation efforts made by ConocoPhillips and the limited feedback received in response, ConocoPhillips considers that all stakeholders have been appropriately consulted and been afforded an appropriate timeframe to have any issues or concerns addressed. All feedback has been captured and recorded in ConocoPhillips' stakeholder management records system and is summarised in the consultation table (**Table 6-1**). However, if any comments are received from relevant stakeholders following the re-submission of the EP, ConocoPhillips will assess the merits of the claims and/or objections and respond accordingly.

6.3 ONGOING PROCESS

Notifications

ConocoPhillips is committed to open and proactive engagement with stakeholders for the duration of its drilling campaign.

The ongoing communication and consultation activities are listed below:

- advise all relevant and interested stakeholders (refer to Table) (via email) following EP acceptance and advise that summary will be available on NOPSEMA website once approved
- provide link to approved EP summary (via email) to all relevant and interested stakeholders once posted by NOPSEMA
- provide notification to AHS for Notice to Mariners and AMSA Joint Rescue Coordination Centre (JRCC) for Auscoast warning broadcasts four (4) weeks prior to commencement date of activity at each well location
- provide notification to all relevant and interested stakeholders (via email) three (3) weeks prior to commencement date of activity at the first well, including updated information on well locations, schedule, rig and other vessel details, safety measures and radio communication channels
- provide notification to all relevant stakeholders (as listed above) who will or may be active in the area during the drilling activity period (via email) prior to commencement date of activity at each well location, including schedule, rig and other vessel details, safety measures and radio communication channels
- provide notification to all identified commercial fisheries licence holders (via letter) three (3) weeks prior to commencement date of activity at first well location
- provide required notifications to NOPSEMA, NT Department of Transport and NT Department of Mines and Energy prior to commencement date and at completion of activity as per regulatory processes and statutory timeframes
- provide required notifications of reportable and/or recordable incidents to NOPSEMA, NT Department of Transport, NT Department of Mines and Energy and other identified agencies as per regulatory processes. In the event of a reportable incident, ConocoPhillips will provide the NT DME a copy of the incident report supplied to NOPSEMA and NOPTA within seven days of NOPSEMA being provided the report
- provide notification (via email) to all interested and relevant stakeholders that campaign has been completed
- manage stakeholder queries as per process stated below.

Enquiry Process

This process will be linked to ConocoPhillips' Capital Projects Management System (CPMS) Stakeholder Management Procedure and Stakeholder Engagement Planning Guidance. At all times ConocoPhillips manages external enquiries and concerns on an ongoing basis through active and transparent engagement to ensure issues are identified and resolved in a mutually satisfactory manner. Stakeholders are encouraged to make contact with ConocoPhillips directly and immediately if a concern is identified.

6.4 CONSULTATION SUMMARY TABLE

A detailed summary of the consultation conducted between October 2015 and October 2016 is provided below in **Table 6-1**.

Table 6-1: Summary of consultation undertaken between October 2015 and May 2016, the issues raised and the outcomes proposed/achieved

Note: ConocoPhillips undertook specific consultation in relation to the proposed activities as relevant to this EP, as well as more broad consultation about the wider Caldita-Barossa development and ConocoPhillips' activities more generally. Only those topics and issues relevant to this EP are provided in the table below.

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
A Raptis and Sons – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits • the environmental approval and supporting consultation process • contact and date details to provide feedback.	No comments received.	No response required. COP to provide update and further opportunity (see next entry) for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP and included the following information: • The Environment Plan (EP was submitted to NOPSEMA on 10 August 2016, and is currently under assessment. The activity description and current status of assessment is available on the NOPSEMA website • Notable changes in the submitted EP, as outlined in an updated fact sheet (attached and available on COP website), include the activity being conducted only in NT/RL5 (rather than NT/RL5 and NT/RL6), part of the Caldita-Barossa assets in Commonwealth waters of the Bonaparte Basin, with potential drilling of up to three appraisal wells (rather than five) to be completed from 2016 to 2018 (rather than over a 5-year period). • The drilling campaign is scheduled to commence in quarter 4 of 2016, and it is anticipated that the drilling campaign would be completed in 2018, noting that the exact timing for completion is subject to weather conditions and operational efficiencies. • Stakeholders are welcome to seek further information or provide comment.	No comments received	No response required. COP to provide update and further opportunity (see next entry) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP to relevant stakeholders and included the following information: • The EP is being revised by ConocoPhillips in response to an Opportunity to Modify provided by NOPSEMA on 8 September 2016. The activity description and current status of assessment is available on the NOPSEMA website • The latest version of the Appraisal Drilling fact sheet (attached and on COP website) includes additional detail on the proposed work activities and environmental management measures. • A separate Risk Assessment Fact Sheet (also attached) details the identified environmental risks, potential impacts and the management controls that will be applied. • ConocoPhillips values your feedback on this activity welcomes any additional comment by Tuesday, 4 October 2016. Please consult the fact sheet for details on how to comment. We will continue to communicate at key stages throughout the process.	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Alpha Natural Resources – Relevant, adjacent titleholder				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons	No comments received	No response required.	
Amateur Fisherman's Association NT (AFANT) – Interested, potential users (represents recreational fishers)				
6 Nov 2015	Initial phone call by COP to AFANT giving advance notification of EP being prepared for appraisal drilling. AFANT advised: • No recreational fishing occurs in the areas of the proposed appraisal activities due to the remote location 300 kilometres offshore • They therefore had no issues or concerns re the proposed activity • Would like to meet with COP to discuss offshore environmental management and assessment process generally	No issues raised. AFANT has advised that the permit area and general location are too remote for recreational fishing. AFANT advised it would like to discuss the offshore environmental assessment process generally.	Organise meeting to provide full update on all appraisal activities and further opportunity for AFANT to provide input.	No issues/concerns have been raised. AFANT has advised that the permit area and general location are too remote for recreational fishing to occur. COP has consulted with the NTGFIA and Arafura Bluewater Charters as suggested by AFANT. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
12 Nov 2015	COP met with AFANT on November 12: • AFANT advised there were no recreational fishing in the areas of the proposed appraisal drilling due to the remote location • They therefore had no concerns re the proposed activity • COP's permit areas were mainly an issue for the commercial fishing sector as the area was too remote for recreational fishers. • However, the guided fishing industry is tending to go out further and stay in areas for longer and suggested COP contact the NT Guided Fishing Industry Association to check whether they may be active in the area • Suggested the O&G industry needed to provide more information sooner in the process of preparing an EP	No issues raised. AFANT suggested COP also engage for the proposed appraisal activities with the NT Guided Fishing Industry Association (NTGFIA) which represents the charter boat industry. AFANT comments related to environmental management and assessment process were of a general nature and therefore not relevant to this EP. COP, however, notes that COP's early notification of these activities is in keeping with AFANT's request for the industry to provide information earlier in the process.	COP subsequently initiated engagement with NTGFIA and Arafura Charters (see separate entries). For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved.	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP (as per full entry for A Raptis and Sons).	COP also consulted with NTGFIA and Arafura Bluewater Charters, as requested by AFANT. No issues raised.	COP to provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
12 Jan 2016	AFANT responded via email thanking COP for the information.	No issues raised.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons).	No comments received	No response required.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP to all interested stakeholders and included the following information:	No comments received	No response required	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	• The EP is being revised by ConocoPhillips in response to an Opportunity to Modify provided by NOPSEMA on 8 September 2016. The activity description and current status of assessment is available on the NOPSEMA website • The latest version of the Appraisal Drilling fact sheet (attached and on COP website) includes additional detail on the proposed work activities and environmental management measures. • ConocoPhillips values your feedback on this activity welcomes any additional comment by Tuesday, 4 October 2016. Please consult the fact sheet for details on how to comment. We will continue to communicate at key stages throughout the process.			
APPEA - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for AFANT).	No comments received	No response required.	
Aquarium Fishery – Relevant, Commercial Licence Holders/potential users				
18 Jan 2016	Covering letter on appraisal activities and fact sheet on appraisal drilling provided to all licence holders by COP, at request of NTSC. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits • the environmental approval and supporting consultation process • contact and date details to provide feedback.	NTDPIF Aquarium Fishery Manager advised that only one licence-holder (Monsoon Aquatics) would be relevant, however NTSC requested all licence-holders be provided the initial notification. No comments were received by any licence-holder other than Monsoon Aquatics. Monsoon is being directly consulted by COP (see separate entry).	No response required. COP to continue consultation directly with Monsoon Aquatics (see separate entry) and via NTSC (see separate entry).	No issues/concerns have been raised. COP believes it has provided the stakeholders with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholders re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the sole relevant licence-holder Monsoon Aquatics, NTSC and NTDPIF closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
19 April 2016	Update re submission date for Appraisal Drilling EP provided by COP via letter on appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering letter and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Aquarium Fishery Manager (NT-DPIF) – Relevant, regulatory				
1 Dec 2015	Phone discussion with NT-DPIF Program Manager: • Confirmed that Monsoon Aquatics was the only NT Aquarium Fishery licence holder that may be operating at nearby shoals and should be consulted directly. • Manager assisted regarding sourcing of licence holder contact lists required for initial notification (as requested by NTSC)	COP will consult with Monsoon Aquatics direct and communicate with all licence holders as required.	COP consulted directly with Monsoon Aquatics as per advice (see entry for Monsoon). Provide update and further opportunity for stakeholders to provide input prior to EP submittal. No other response required.	COP acknowledge the feedback provided by NT-DPIF's fishery manager and has consulted directly with Monsoon Aquatics as requested. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the sole relevant licence-holder Monsoon Aquatics, NTSC and NTDPIF closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	COP is also consulting with Monsoon Aquatics, as requested by Manager. No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
15-18 Jan 2016	Written correspondence (email) with NT-DPIF representatives on 15-18 January 2016 regarding confirming the Aquarium and Pearling Fishery license holders (an action requested of COP by NTSC).	Licensee lists for Aquarium Fishing and Pearl Fishing were provided by NT-DPIF.	COP also provided the 8 January 2016 information to all licence holders (via email or letter and fact sheet) as per request from NTSC	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Arafura Bluewater Charters – Relevant, user				
9 Dec 2015	Phone call to Arafura on December 9 advising of EP being prepared for appraisal activities. Arafura advised: • They conduct a few tours each year as far north as Evans and Goodrich shoals during the main season from September to December • Provided COP's activities occur outside these times he saw no issues and was prepared to work with COP to ensure both could operate safely and efficiently	COP acknowledges Arafura's willingness to work with COP. COP believe that Arafura's business occurs too far from the activity area (approx. 60 kilometres) for them to be impacted by the appraisal drilling. Arafura advised they may be active in the area between September and December. Appraisal drilling is proposed to commence in December and therefore would only occur for a short period of the time that Arafura may be active at adjacent shoals.	COP to provide written information when available and opportunity for stakeholder to provide input prior to EP submittal.	COP acknowledges the feedback and issues raised by Arafura Bluewater Charters as relevant to this EP. In particular, Arafura raised concerns regarding potential interference to their operations from the physical presence of the MODU and support vessels during the drilling campaign and potential damage to reef from the drilling activity. COP has provided the stakeholder with additional information to clarify that the location of the drilling campaign is distant from any reefs or hard substrate benthic habitat, and that the exclusion zones will be in place around the MODU. These are relatively small in area and distant from the areas where Arafura has indicated they may operate (approximately 60 km from Evans Shoal). Stakeholder concerns have been considered in impact assessment and acceptability for Physical Presence of the MODU and support vessels. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re
12 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP (as per full entry for A Raptis and Sons).	COP believes that Arafura's comments are mixing the information provided in two separate fact sheets that were sent on the same day, one for the	COP to provide written response addressing issues raised. COP advised Arafura as follows:	
20 Jan 2016	Arafura Bluewater Charters provided response to fact sheets via email to COP. Arafura advised:			

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	• did not support marine seismic data acquisition occurring at all due to the impact it would cause to marine life • the NT's offshore reefs are pristine and full of marine life which are fished sustainably by commercial fisherman and also fishing charter operators • seismic blasting (and drilling) on the reefs would have devastating effect on the fish stocks and is total contradiction to the NT governments fisheries legislation • oil rig platforms and exclusion zones would affect his business and the areas they fished	appraisal drilling campaign and one for a marine seismic data acquisition. In the Caldita-Barossa permits we are proposing two different appraisal activities during 2016 and 2017 and two different sets of written information were provided on 8 January – one for the drilling of two appraisal wells and the other for the marine seismic data acquisition. The fact sheets listed a range of measures that will be employed to reduce and manage potential impacts on the environment. Please note, the issues raised by the stakeholder are primarily related to the proposed marine seismic data acquisition. Note: No further comments were received from Arafura following COP's response of 28 January 2016.	• The area within which the two appraisal wells would be drilled is approximately 845km2 in size. Within that area, the size of the footprint associated with the drilling of each well is quite small with the total area likely to cover less than1% of the drilling area. • No drilling occurs on reefs. The drilling area is located approx. 60kms from Evans Shoal and 70kms from Tassie Shoal. • The appraisal drilling is undertaken by a single Mobile Offshore Drilling Unit (MODU) supported by two vessels. The exclusion zone for drilling is small with a 500 metre radius traffic exclusion zone around the MODU required for the duration of the campaign. ConocoPhillips will liaise with relevant stakeholders and provide details of the forward schedule when necessary, to assist in coordinating vessel movements. • The drilling occurs in an area of soft sediment where there are no sensitive habitats. ConocoPhillips conducted two similar appraisal drilling campaigns in the same area during 2013 and 2014. Based on assessments conducted during and after these campaigns, no environmental impact was observed or evident. • Based on all these factors, it is ConocoPhillips' view that the planned drilling campaign, as with the previous campaigns, would not have an impact on the limited guided fishing activities that occurs in the wider area. In responding to Arafura's comments, COP advised that it hoped the information had given Arafura confidence in the regulatory process and ConocoPhillips' commitment to environmental management of the proposed activities. COP also assured Arafura that the issues raised had been identified and addressed within the environmental documentation that will be submitted to NOPSEMA for both activities. This includes copies of all correspondence, as per NOPSEMA's requirements. Arafura will continue to be included on further communications related to these activities, including advance notifications as to vessel movements. COP to provide update and further opportunity for Arafura to comment prior to EP submittal.	progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with Arafura closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
28 Jan 2016	COP provided response via email to Arafura Bluewater Charters' email of 20 January 2016. NOTE: Entire attachment referenced in covering email has been attached but specific reference to appraisal drilling and relevance to this EP is provided on final page only. Remainder of the attachment was considered not relevant to this EP as it related to marine seismic data acquisition only.			
18, 19 Apr 2016	COP sought to provide Arafura via phone with update regarding timing of Caldita-Barossa appraisal activities. Attempts over two days to contact stakeholder were unsuccessful.	No call back or comments received.	No response required.	
19 April 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
21 Sept	Additional information provided by COP further to the updated fact sheets in light of stakeholder's previously raised concerns in relation to underwater noise from marine seismic related appraisal activities. Information included the following: • As part of the well testing program, COP is seeking the option to undertake vertical seismic profiling (VSP). VSP is conducted once the well has been drilled and involves lowering a receiver down the well bore and releasing a series of seismic impulses generated by a small air gun array suspended from the drilling rig. • While the technique used during VSP is similar to that used during a marine seismic survey, there are notable differences between the two activities (listed in the email). • VSP is an integral component of the well appraisal process and is routinely undertaken for both offshore and onshore petroleum wells worldwide. • The VSP program for each well will use a small array of three air guns (total array volume 450 cubic inches), which will discharge impulses at approximately 20 second intervals for up to 12 hours per well (i.e. maximum of 36 hours of VSP for entire campaign). • COP recognises the potential impacts and risks to marine fauna, as outlined in the risk assessment fact sheet, including displacement of marine fauna from the vicinity of the air gun and behavioural changes while the array is active. COP has assessed these risks and impacts in the EP for the drilling program, which is under assessment by NOPSEMA. • Based on the results of the sound propagation modelling undertaken for the Caldita-Barossa 3D Marine Seismic Survey EP, it is estimated that the horizontal distances from the source within which fish could be injured is approximately 10 m. • Furthermore, while there may be some localised and temporary behavioural impact during the VSP operation, the potential impact to fish and other marine fauna due to the VSP activity is considered low. • COP has committed to management measures to reduce the environmental risks and impacts from VSP, including procedures aligned with Environment Protection and Biodiversity Conservation Act Policy Statement 2.1 (listed in email): • We are seeking further feedback by 4 October 2016. Should you still have questions or concerns or wish to provide additional feedback, please contact COP on the details provided.	No comments received	No further response required. The following assessment and information has been provided to the stakeholder: • The nature and scale of VSP is significantly smaller than broad scale vessel based seismic survey programs, as: o The VSP seismic source, and emitted energy, is considerably smaller (450 cubic inches compared to the 4,130 cubic inch array being used during the Caldita-Barossa 3D marine seismic survey) o The duration is considerably shorter (approximately 12 hours per well compared to continuous 24 hour operations over a period of weeks for a typical marine seismic survey) o The VSP array is stationary compared to a marine seismic survey where a vessel typically tows the seismic array and streamer-mounted hydrophones while sailing transect lines • COP recognises the potential impacts and risks to marine fauna, including displacement of marine fauna from the vicinity of the air gun and behavioural changes while the array is active. • COP has assessed these risks and impacts in the EP for the drilling program, which is under assessment by NOPSEMA. • Based on the results of the sound propagation modelling undertaken for the Caldita-Barossa 3D Marine Seismic Survey EP, it is estimated that the horizontal distances from the source within which fish could be injured is approximately 10 m • Furthermore, while there may be some localised and temporary behavioural impact during the VSP operation, the potential impact to fish and other marine fauna due to the VSP activity is considered low. • COP has committed to management measures to reduce the environmental risks and impacts from VSP, including procedures aligned with Environment Protection and Biodiversity Conservation Act Policy Statement 2.1: o Pre-start up visual observations o Soft start procedure o Start-up delay procedure o Operations procedure o Stop work procedure o Night-time and low visibility procedure	
29 Sept 2016	COP made telephone call attempt and provided follow-up email to Arafura ensuring they had received information on 21 September and had feedback.	No comments received	No response required	
Austral Fisheries – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Australia Bay Seafood – Relevant, potential user (commercial licence holder)				
15 Oct 2015	Initial phone notification by COP of proposed appraisal activities including appraisal drilling. Stakeholder advised they would not be relevant for the Timor Reef Fishery and this activity. However, the stakeholder appreciated the early notice and would welcome further information.	No comments received. Stakeholder operates in the Demersal Fishery and advised they would not be relevant for the appraisal drilling.	COP to consult with stakeholder further to ensure correct understanding of his operations. COP to provide written information when available. No response required.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Australia MEO - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Australian Fisheries Management Authority (AFMA) – Relevant, regulatory				
7 Oct 2015	Initial phone call to AFMA giving advance notification of EP being prepared for Caldita-Barossa appraisal activities in 2016/2017.	No comments received.	COP and AFMA to organise initial meeting. Note: Northern Prawn Fishery (NPF) and Commonwealth Fisheries Association (CFA) invited to attend and declined	COP acknowledge the feedback provided by AFMA and requested consultation which has been conducted as requested. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re
8 Oct 2015	Email exchange between COP and AFMA organising meeting for October 19.	No comments received.	Initial meeting organised for 19 October 2016.	
19 Oct 2015	Meeting between COP and AFMA held October 19. • Satisfied with COP's proposed consultation plan. • The two relevant fisheries involved were the Timor Reef Fishery (TRF) and the Northern Prawn Fishery (NPF) and consultation	No comments received. COP consultation plan conforms with stakeholder's expectations including	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	should be concentrated accordingly • COP should ensure it liaises with NPF regarding any potential impact on scampi fishers • No concerns raised re appraisal drilling	consultation with TRF and NPF as relevant fisheries. While TRF operates year round, NPF is closed from December 1, 2016 to March 30, 2017 which is likely to mean closure for most of the period when the first well would be drilled. Note: COP advised AFMA at meeting that it was aware of potential for activity by an NPF license holder from previous appraisal drilling campaign and had already advised NPF.	The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to consult directly with the Northern Territory Seafood Council (NTSC) and NPF representing commercial licence holders for the two relevant fisheries advised by AFMA. COP to provide written information to AFMA when available.	progress of the EP and activities prior to, during and post the drilling campaign.. Ongoing consultation will occur with AFMA, NPF, CFA, NTSC, NTDPIF and relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received. COP advised is also consulting with NPF, CFA, NTSC and NTDPIF, as requested by AFMA.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
18 Apr 2016	COP sought to provide AFMA via phone with update regarding timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling but EP would now be submitted in May. AFMA Manager was unavailable so an update was provided via message on phone number, alternative phone number requested and COP advised that an email update would be provided the next day	No comments received.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by (as per full entry for A Raptis and Sons).	No comments received	No response required.	
Australian Hydrographic Office (AHO) – Relevant, regulator (Department of Defence)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	COP acknowledge the feedback provided by AHO and will ensure the required notifications are made closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
11 Jan 2016	Email response received from AHO requesting AHO be included on information re the rig movements and a Notice to Mariners will be issued on receipt.	Other than request re notification of rig movements, No comments received.	COP to provide AHO with required information on rig movements when confirmed.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons).	No comments received	No response required.	
Australian Institute of Marine Science (AIMS) - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Australian Marine Conservation Society - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Australian Marine Oil Spill Centre (AMOSC) – Relevant, contractor				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	AMOSC attended the spill response strategy workshop that informed the OPEP development, and provided input and review throughout the OPEP development process. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Australian Maritime Safety Authority (AMSA) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. COP will ensure AMSA is consulted closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
11 Jan, 2016.	Generic auto-response email received from AMSA	No comments received.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons).	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons).	No comments received	No response required.	
Australian Southern Bluefin Tuna Industry Association – Relevant, potential user (represents commercial licence holders)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	Stakeholder has advised it has no concerns. COP therefore believes no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
20 Sep 2016	Email reply thanking COP for continuing to provide quality information and advising the Association has no concerns.	Stakeholder has advised it has no concerns.	No response required.	
Relevant, potential user (commercial fishing licence holder)				
5 Nov 2015	Initial phone call to stakeholder giving advance notification of EP being prepared for appraisal activities • Stakeholder advised his general concerns around MSS • Stakeholder was less concerned about plans to conduct further appraisal drilling • COP offered opportunity to meet during the week of NTSC AGM in Darwin or a convenient time • Stakeholder advised they would let COP know if they planned to attend AGM and whether required a meeting	Stakeholder advised they are not relevant for this activity. No comments received.	No other response required. COP to provide written information when available	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
5 Nov 2015	Email exchange between COP and stakeholder: • Follow up email from COP on November 5 re meeting with stakeholder at NTSC AGM the following week in Darwin • Reply email from stakeholder on November 6 advising they wouldn't be attending the AGM and requesting to be kept informed of proposed activities	No comments received.		

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
6 Nov 2016	Reply email from COP advising will keep stakeholder informed	No comments received.		
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Relevant, user (commercial fishing licence holder)				
5 Nov 2015	Initial phone call to stakeholder giving advance notification of EP being prepared for appraisal activities. No comments received re appraisal drilling	No comments received.	No response required. COP to provide written information when available.	COP acknowledges the feedback provided for this activity, specifically related to the difficulty in re-locating traps and need for advance notification of where COP's activity will be occurring. No other issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with stakeholders direct as well as with the NTSC and NTDPIF closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
5 Nov 2015	Follow up email from COP asking whether stakeholder would be present at the Northern Territory Seafood Council (NTSC) AGM in Darwin the following week. Advised that COP were seeking to provide an update regarding activity proposed for 2016.	No comments received.	COP offered to catch up separately with stakeholder if they were unable to make the joint meeting with the NTSC. Further discussion occurred with stakeholder on 13 November as part of NTSC meeting and has been included in summary of NTSC consultation	
13 Nov 2015	Stakeholder attended meeting between COP and NTSC. Stakeholder advised concerns related to marina seismic data acquisition and appraisal drilling was not much of an issue for him Stakeholder advised there was more effect on them as a trap fisher than trawl fishers as it is harder for him to move his traps out of the area and there is a cost involved. Stakeholder requested that consultation be conducted on their behalf with the NTSC Chair.	COP acknowledges main concern in terms of moving his traps relates to marine seismic data acquisition and not appraisal drilling which occurs in a much smaller area and involves the use of exclusion zones. COP also acknowledges NTDPIF advice that trap fisher does not operate in area of locations for first two appraisal wells, i.e. within NT/RL5 permit Notwithstanding this, in addition to the early notification being provided through the EP consultation process, COP will provide stakeholder with the maximum advance notification possible of the commencement of appraisal drilling activity in case they are operating in area.	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to consult with NTSC, as requested by stakeholder. COP to provide written information when available.	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug	Covering email and updated Activity Fact Sheet provided by COP (as	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
2016	per full entry for A Raptis and Sons)		COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Bonaparte Fisheries Group - Interested				
10 Dec 2015	Bonaparte Fish Group Roundtable #5 held 10 December • Along with other BFG members, COP provided an update on all its planned activities in the Bonaparte Basin, including availability of environmental studies and all proposed activities and timing, including an overview of the appraisal drilling.	No issues raised	COP to provide written information to BFG members when available.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
29 Dec 2015	Minutes of Roundtable #5 held December 10 distributed on December 29.	No issues raised	No response required	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Centre for Whale Research - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Chamber of Commerce, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug	Covering email and updated fact sheet re Appraisal Drilling activities	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
2016	sent to stakeholder (as per full entry for A Raptis and Sons)		COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Charles Darwin University (CDU) - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Climate Action Darwin - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF) – Relevant, regulator (AFMA)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. Primary consultation occurs directly through AFMA. No other response required.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Note: This stakeholder is represented on an ongoing basis by AFMA.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Commonwealth Department of Industry, Innovation and Science (DIIS) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. In addition, COP will maintain dialogue with the department to ensure required protocols and procedures in the unlikely event of a loss of well control during appraisal drilling are incorporated in COP's incident response plan.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
21 Sep 2016	COP provided additional detail, further to that provided in the Risk Assessment Fact Sheet, re spill management and response measures and the potential for impact on neighbouring countries in the unlikely event that a loss of well control should occur during appraisal drilling. COP requested DFAT provide any additional information that it believes COP should include in its incident management process in relation to the protocols and procedures used by the departments in consulting with foreign governments. COP also sought further dialogue to ensure COP's internal documentation contains all necessary details and offered to further clarify any of the material provided.	Response provided by DFAT on behalf of department (see DFAT entries below)	During the environmental risk assessment for a worst case loss of well control, ConocoPhillips identified that while the wells are entirely located within Australian waters, there is the potential for spilled hydrocarbons to reach the territorial waters of neighbouring countries, namely the Democratic Republic of Timor-Leste (East Timor) and the Republic of Indonesia (Indonesia). Spilled hydrocarbons may also reach the area described in Treaty between the Government of Australia and the Government of the Republic of Indonesia establishing an Exclusive Economic Zone Boundary and Certain Seabed Boundaries (the Perth Treaty area) and the Joint Petroleum Development Area described in the Timor Sea Treaty. COP's incident management process includes provision to contact DFAT and DIIS and provide information to the DFAT to facilitate communication with neighboring countries in the event of a loss of well control. COP is aware that ongoing communication and consultation that may be required with neighbouring countries in such circumstances should be conducted in consultation and conjunction with the Department of Foreign Affairs and Trade (DFAT) and/or the Department of Industry, Innovation and Science (DIIS).	
Commonwealth Department of the Environment (DoE) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Commonwealth Fisheries Association (CFA) – Relevant, potential users (represents commercial licence holders)				
7 Oct 2015	Initial phone call to CFA giving advance notification of EP being prepared for Barossa appraisal drilling: • No concerns raised re appraisal drilling • COP offered meeting	No comments received.	COP offered further meeting to discuss any potential issues or concerns.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the CFA and AFMA closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to provide input prior to EP submittal.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to provide input prior to EP submittal.	
18 Apr 2016	COP sought to provide CFA via phone with update regarding timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling but EP would now be submitted in May. CFA CEO was unavailable so an update was provided via message on phone number, alternative phone number requested and COP advised that an email update would be provided the next day	No comments received.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
CSIRO - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Darwin Port Corporation - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal.

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Department of Chief Minister, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Department of Foreign Affairs & Trade (DFAT) – Relevant				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. In addition, COP will maintain dialogue with the department to ensure required protocols and procedures in the unlikely event of a loss of well control during appraisal drilling are incorporated in COP's incident response plan.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
21 Sep 2016	COP provided additional detail, further to that provided in the Risk Assessment Fact Sheet, re spill management and response measures and the potential for impact on neighbouring countries in the unlikely event that a loss of well control should occur during appraisal drilling. COP requested DFAT provide any additional information that it believes COP should include in its incident management process in relation to the protocols and procedures used by the departments in consulting with foreign governments. COP also sought further dialogue to ensure COP's internal documentation contains all necessary details and offered to further clarify any of the material provided.	COP and DFAT to continue ongoing dialogue..	During the environmental risk assessment for a worst case loss of well control, ConocoPhillips identified that while the wells are entirely located within Australian waters, there is the potential for spilled hydrocarbons to reach the territorial waters of neighbouring countries, namely the Democratic Republic of Timor-Leste (East Timor) and the Republic of Indonesia (Indonesia). Spilled hydrocarbons may also reach the area described in Treaty between the Government of Australia and the Government of the Republic of Indonesia establishing an Exclusive Economic Zone Boundary and Certain Seabed Boundaries (the Perth Treaty area) and the Joint Petroleum Development Area described in the Timor Sea Treaty.	
22 Sep 2016	DFAT responded via email stating it appreciated the additional information and request for more detailed guidance and confirmation of			

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	processes and protocols from DFAT's perspective, in the event of a spill. DFAT advised it would coordinate internally (Legal Division, Indonesia and Timor-Leste teams) and respond with a meeting time.		COP's incident management process includes provision to contact DFAT and DIIS and provide information to the DFAT to facilitate communication with neighboring countries in the event of a loss of well control. COP is aware that ongoing communication and consultation that may be required with neighbouring countries in such circumstances should be conducted in consultation and conjunction with the Department of Foreign Affairs and Trade (DFAT) and/or the Department of Industry, Innovation and Science (DIIS).	
29 Sept 2016	COP phone and email exchange with DFAT re guidance on process and protocols in the event of a spill. DFAT advised it would provide a written response.			
Department of Lands, Planning and Environment, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for AFANT)	No comments received	No response required	
Department of Mines & Energy, Northern Territory (NT-DME) – Relevant, regulatory				
7 Oct 2015	Initial phone call to NT-DME giving advance notification of EP being prepared for appraisal drilling.	No comments received.	No response required. COP organised meeting with NT-DME	COP acknowledge the NT-DME's advice re consultation required and has ensured this has been conducted.. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with NT-DME closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
20 Oct 2015	Meeting held with NT-DME on October 20. • Pleased to see further work taking place on development of the field • Supportive of activity and has no specific concerns but would wait for written information • Main stakeholder activity in area is fisheries and COP engagement should concentrate on that, in particular understanding the risks to fish recruitment • The amateur fishers' organisation should also be consulted.	No issues raised re appraisal drilling. COP consultation plan conforms with stakeholder's expectations	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP will consult directly with NTSC and NPF, representing commercial licence holders, NT-DPIF and AFANT, as requested by NT-DME COP to provide written information to NT-DME when available.	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP (as per full entry for A Raptis and Sons).	COP advised had held discussions with NTSC, NPF, CFA, NTDPIF and AFANT, as requested by NTDME No comments received.	COP requested further meeting to discuss any potential issues or concerns. Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Jan 2016	Meeting held January 19, 2016: NT-DME advised: • Has no specific concerns regarding fact sheets provided 8 January 2016 • Reiterated that NT-DPIF was appropriate agency for consultation	COP consultation plan conforms with stakeholder's expectations	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
19 Jjan 2016	Further information as to relationship of appraisal activities with the potential development project emailed by COP to NT-DME.	No issues received	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Department of Primary Industry & Fisheries, Northern Territory (NT-DPIF) – Relevant, regulatory				
8 Oct 2015	Initial call with NT-DPIF Research giving advance notification of EP being prepared for appraisal activities.	No comments received.	No response required COP organised meeting for 20 October 2016	COP has consulted with the NTSC and relevant licence-holders direct, as per NT-DPIF's request. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Oct 2015	Initial call with NT-DPIF Research/Compliance giving advance notification of EP being prepared for appraisal activities			
8 Oct 2015	Initial call to NT-DPIF Executive offering to provide briefing re appraisal activities.	No comments received. Briefing offer was initially accepted but was subsequently not able to attend on 20 October 2016.	No response required COP organised meeting for 20 October 2016	
12 Oct 2015	Phone call to NT-DPIF Research giving advance notification of EP being prepared for appraisal activities.	No comments received.	No response required COP organised meeting for 20 October 2016	
20 Oct 2015	Meeting held with NT-DPIF • No issues raised re appraisal drilling • Department advised that trap fishers would not be operating in the vicinity of NT/RL5 permit and trawl fisher should be consulted separately through NTSC	COP consultation plan conforms with stakeholder's expectations. Trawl and trap fisher are being consulted separately on their specific requirements. COP acknowledges advice that trap fisher will not be operating in locations for first two wells of appraisal drilling campaign, i.e. in permit NT/RL5.	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to provide written information when available. COP to consult directly with NTSC and licence holders.	
1 Dec 2015	Phone call to NT-DPIF Aquaculture Program Manager advising of appraisal activities. • Manager advised that only one license holder in the Aquarium Fishery, Monsoon Aquatics, may be active in nearby shoals (see also specific entry for Aquarium Fishery Manager) • No concerns raised re appraisal drilling	No issues raised. COP consultation plan conforms with stakeholder's expectations	No response required COP to provide written information when available.	
9 Dec 2015	Meeting held on December 9 with NT-DPIF • No concerns raised re appraisal drilling • Department advised that trap fishers would not be in operating in the vicinity of NT/RL5	No comments received. COP consultation plan conforms with stakeholder's expectations. COP is consulting directly with the NTSC and the NTSC Chair on behalf of trawl	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	• The main trawl fisher should be consulted re his gear trial movements	fisher. In addition to the early notification being provided through the EP consultation process, COP will provide stakeholder with the maximum advance notification possible of the commencement of appraisal drilling activity in case they are operating in area.	general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. No response required COP to provide written information when available. COP to consult directly with NTSC and licence holders.	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	COP requested further meeting to discuss any potential issues or concerns. Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
15-18 Jan 2016	Written correspondence (email) with NT-DPIF representatives on 15-18 January 2016 regarding confirming the Aquarium and Pearling Fishery license holders (an action requested of COP by NTSC).	Licensee lists for Aquarium Fishing and Pearl Fishing were provided by NT-DPIF.	COP also provided the 8 January 2016 information to all licence holders (via email or letter and fact sheet) as per request from NTSC	
20 Jan 2016	Meeting held on 20 January 2016 as requested by COP to gain input from Department regarding fact sheets emailed on 8 January and provide update regarding COP consultation with relevant stakeholders to date. Department advised it would provide written response to the fact sheets email ASAP. Department requested whether habitat mapping information gained from baseline studies could be provided to assist with its ongoing review of fishing gear trial in TRF.	COP consultation plan conforms with stakeholder's expectations Department request for habitat mapping is outside scope of this EP. NOTE: COP provided information to Department. Note: No response received from the Department on the appraisal drilling fact sheet as of EP submittal date.	Cop to provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further. NOTE: Attachment referenced in covering email was not relevant to this EP as it related to marine seismic data acquisition only.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
4 Apr 2016	NT-DPIF executive responded to COP email of 22 February on behalf of the Minister thanking COP for update and confirming staff are available to discuss the proposals if needed.	No comments received.	No response required.	
18 Apr 2016	Telephone call from COP to NT-DPIF with update re timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling but EP would now be submitted in May.	No comments received	No response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Department of Transport (DoT), NT – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with NT Department of Transport and AMSA closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	Department provided email thanking COP for information and referring enquiries to AMSA	AMSA is also being consulted directly by COP.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Eni Australia – Relevant, user (adjacent operator)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Environment Centre, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Environmental Defenders Office NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Relevant, user (commercial fishing licence holder)				
Ongoing	Note: Consultation conducted by NTSC Chair on licence holder's behalf, therefore general comments are also documented under NTSC.	Please refer to the NTSC entries above as license holder stated that the NTSC could represent his interests/ consult on his behalf Note: Notwithstanding the above, during the consultation process, COP offered to meet and/or speak directly with Mr. Fischer on a range of occasions but all were declined.	Please refer to the NTSC entries above as license holder stated that the NTSC could represent his interests/ consult on his behalf	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF, NTSC and directly with stakeholder closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	COP is continuing to consult with the NTSC Chair on stakeholder's behalf. No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Geoscience Australia – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
INPEX – Relevant, user (adjacent operator)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Jamaclan Marine Services – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Magellan – Relevant, user (adjacent titleholder)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Maritime Border Protection (MBP) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the MBP closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
13 Jan 2016	Email response from MBA advising: Information has been distributed to relevant Australian navy personnel Maintain communication with both MTO section and MBC Engagement to provide further updates	COP advised it will ensure both divisions are kept informed, as requested, and offered to meet with MBP personnel if required.	No other response required	
13 Jan 2016	COP provided email response to 13 Jan 2016 email from MBC		Ensure both MTO and MBC are kept informed of any further updates	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Monash University - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Monsoon Aquatics – Relevant, user				
30 Nov 2015	Initial phone and email notification by COP giving advance notification of EP being prepared for appraisal activities and requesting meeting with Monsoon.	No comments received.	COP to organise meeting with Monsoon Aquatics on 10 December 2016	COP acknowledges the advice received from Monsoon re its activities. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with Monsoon closer to
10 Dec 2015	Meeting with Monsoon held on December 10, COP explained the nature of the proposed appraisal activities planned for 2016 and 2017 and the engagement process that was occurring as part of NOPSEMA approvals. Monsoon advised: • Conducts activities on several reefs in the region, with particular focus on Evans Shoal • During September to May they rotate between two shoals and are	No concerns raised re appraisal drilling COP believe that Monsoon's business occurs too far from the appraisal drilling locations for them to be impacted by the activities (25 to 50km	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	usually active for one week each month • Was prepared to work with COP to ensure both could operate safely and efficiently • Was comfortable with the information provided at the meeting by COP which appeared reasonable • Would do their own further research and review COP's written information once it is provided.	away from nearby shoals and would not impact the fish populations at the shoals	drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to provide written information when available	commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	COP offered further meeting to discuss any issue or concerns. COP to provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	Monsoon responded via email thanking COP for the updated information.			
18 Apr 2016	Telephone call from COP to Monsoon with update regarding timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling, but EP would now be submitted in May. Monsoon advised it remained comfortable with the information and consultation to date and would continue to work with COP.	COP acknowledged comments.	No response required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
National Offshore Petroleum Titles Authority (NOPTA) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
10 Feb 2016	Briefing provided to NOPTA by COP regarding proposed appraisal activities	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
North Australian Centre for Oil and Gas (CDU) - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
North Australian Indigenous Land & Sea Management Alliance - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Northern Fishing Companies Association – Relevant, potential users				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Northern Prawn Fishery (NPF) – Relevant, user (represents commercial licence holders)				
7, 8 Oct 2015	Initial phone call to NPF giving advance notification of EP being prepared for appraisal activities: • Confirmed the two closure periods for the fishery, including from Dec 1 2016 – March 31 2017 • Would pass the written information on to license holdersonce it had been received and direct any who had concerns to COP	No comments received. NPF declined offer from COP and AFMA to join meeting on 19 October 2016	No response required COP to provide written information when available	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	• Did not need to a briefing at this stage and would wait for the written information with the co-ordinates • No concerns raised re appraisal drilling	Note: COP aware of potential for activity by an NPF license holder from previous appraisal drilling campaign and advised NPF.		progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NPF, AFMA and the identified licence-holder closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	COP offered further meeting to discuss any potential issues or concerns. Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
18 Apr 2016	COP sought to provide NPF via phone with update regarding timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling, but EP would now be submitted in May. NPF CEO was unavailable so an update was provided via message on phone number, alternative phone number requested and COP advised that an email update would be provided the next day NOTE: NPF advised via email the same day (April 18) that they would reply once they received the written update on April 19.	No comments received	COP to provide written update via email on 19 April 2016	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Northern Territory Seafood Council (NTSC) – Relevant, user (represents commercial licence holders)				
7 Oct 2015	Initial phone call to NTSC giving advance notification of EP being prepared for appraisal activities • No concerns raised re appraisal drilling • COP requested meeting	No comments received.	COP organised initial meeting with NTSC COP to ensure TRF commercial licence holders are included in consultation and kept informed both through NTSC and directly, as appropriate. No response required	COP acknowledges the feedback received related to providing advance notification of activities for trap fishers. No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
7 Oct 2015	Follow up phone call to NTSC Chair • NTSC Chair advised name of main commercial licence holder in TRF who is a trawl fisher • No concerns raised re appraisal drilling	No comments received. Confirmation of NTSC, identified trawl fisher and TRF licence holders as relevant stakeholders		
8 Oct 2015	Follow up phone call to NTSC CEO • COP requested a meeting and awaiting advice from NTSC as to most suitable date	No comments received.		
12 Oct 2015	Follow up call to NTSC requesting availability for meeting time/date to suit NTSC members. • NTSC initially advised best time was during Seafood Directions conference in Perth in late October and around their AGM in	No comments received.		

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	Darwin in mid-November • Only one fisher was able to attend seafood directions conference. • Informal discussions were held with NTSC CEO and Chair and COP at Seafood conference. • Meeting was scheduled in Darwin for November 13.			
26 Oct 2015	Informal discussions with NTSC held at Seafood Directions conference in Darwin on October 26. • Discussions mainly centered on the most non-intrusive way for COP to engage with commercial fishing licence holders during consultation process, ensuring appropriate time and opportunity for them to provide input. • Agreed the week of NTSC's next AGM in Darwin could be a good opportunity.	COP has chosen to commence the consultation process as early as possible to assist commercial fishing stakeholders with their assessment in terms of time and resources.	No response required	
28 Oct 2015	Email exchange between COP and NTSC: • Email from COP on October 28 following informal discussion at Seafood Directions conference confirming COP's intention to meet with NTSC and licence holders, either at their upcoming AGM in Darwin or another time that suits NTSC. • Reply email from NTSC on October 28 advising AGM on November 13, 2015 best suited them. •	No comments received.	COP acknowledged the availability of NTSC members at the Seafood Directions conference in Perth in October At the Seafood Conference, COP acknowledged requests regarding engagement process and organised to meet in Darwin during week of NTSC's next AGM to enable identified TRF licence-holders to also attend.	
13 Nov 2015	Meeting held November 13, 2015. NTSC advised: • Main impact can be on trap fishers who have to remove their gear whereas trawl fishers can work around COP's activities • Appraisal drilling is not as much of an issue (as marine seismic data acquisition) as it doesn't have the same impact on the fish nor does it force us out of as big an area	COP acknowledges that TRF trap fishers main concern in terms of moving his traps relates to marine seismic data acquisition and not appraisal drilling which occurs in a much smaller area and involves the use of exclusion zones. COP also acknowledges NTDPIF advice that trap fisher does not operate in area of locations for first two appraisal wells, i.e. within NT/RL5 permit Notwithstanding this, in addition to the early notification being provided through the EP consultation process, COP will provide stakeholder with the maximum advance notification possible of the commencement of appraisal drilling activity in case they are operating in area.	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to provide written information when available.	
11 Dec 2015	Meeting with NTSC CEO held in Darwin on December 11 • COP advised written information relating to proposed appraisal activities would be distributed once internal approvals had been finalised • No specific concerns raised re proposed appraisal drilling	No comments received.	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. COP to provide written information when available.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
16 Dec 2015	Email to NTSC on 16 December requesting an update and whether any further conversations had occurred with trawl fisher. No response received.	No comments received	No response required	
8 Jan 2016	Email to NTSC advising written information would be provided to all stakeholders that day and requested a meeting for the week of January 18 in Darwin.	No comments received	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	COP requested further meeting to discuss any potential issues or concerns. Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
15 Jan 2016	Email received from NTSC on 15 January 2016 asking whether all licence holders from the following fisheries had been provided with written information: • Timor Reef Fishery • Spanish Mackerel Fishery • Aquarium Fishery • Offshore Net and Line Fishery • Pearling Fishery	COP advised NTSC that Timor Reef, Spanish Mackerel and Offshore Net and Line Fishery license holders had already been advised or would be advised that day via email or post.	Pearl and Aquarium Fishery licence holders provided with fact sheet via email or post sent on 18 January	
21 Jan 2016	Meeting requested by COP and held 21 January 2016 to request feedback re fact sheet and information provided. NTSC advised it would seek to provide a formal response in writing asap.	No comments received re appraisal drilling as of submittal date. Note: Discussions related to collaborative research within the TRF are ongoing and outside the scope of this EP	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
21 Jan 2016	Follow up email from COP to NTSC thanking them for attending the meeting to discuss the planned appraisal activities.			
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further. NOTE: Attachment referenced in covering email was not relevant to this EP as it related to marine seismic data acquisition only.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
18 Apr 2016	Telephone call from COP to NTSC with update re timing of Caldita-Barossa appraisal activities. COP advised there was no schedule change for appraisal drilling but EP would now be submitted in May.	No comments received	No response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
9 May 2016	Meeting held between NTSC and COP: • NTSC acknowledged COP's latest correspondence of 19 April 2016 stating the current likely timeframes and raised no issues re appraisal drilling • NTSC advised it had no concerns related to oil spill response planning or preparedness and communication between vessels during activities	No issues raised.	No response required	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Northern Trawl Owners Association – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Northern Wildcatch Seafood Australia – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
NT Environmental Protection Authority (NT-EPA) - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide EP summary to NT-EPA when approved by NOPSEMA, as requested. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
12 Jan 2016	NT-EPA responded via email advising that as the Barossa project is outside the jurisdiction of the Environmental Act the EPA had no comment at this time, but requested copy of Environment Plan.	EP summary will be provided when available, as per offshore regulatory system administered by NOPSEMA	COP to provide EP summary to NT-EPA when summary is approved by NOPSEMA	
13 Jan 2016	COP responded via email to confirm that EP summary would be provided once approved	EP summary will be provided when available, as per offshore regulatory system administered by NOPSEMA	COP to provide EP summary to NT-EPA when summary is approved by NOPSEMA	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	COP to advise stakeholder of NOPSEMA decision re EP submission once received.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for AFANT)			

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
NT Guided Fishing Industry Association (NTGFIA) – Relevant, potential user (represents fishing charter operators)				
30 Nov 2016	Phone call to NTGFIA giving advance notification of EP being prepared for Barossa appraisal drilling: • Did not see any concerns at all due to the remote location and believed a meeting with COP was not required • Does not know of any members operating in the vicinity of the proposed operations other than Arafura Bluewater Charters which may operate a few tours per year around some of the nearby shoals. • Suggested COP talk directly to Arafura Bluewater Charters and provide written information to the association when it becomes available.	COP consultation plan generally conforms with stakeholder's expectations. Will ensure the potential single operator advised by NT-GFIA is consulted	COP consulted directly with Arafura Bluewater Charters, as per NT-GFIA request Provide written information and further opportunity for stakeholder to provide input prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP has consulted directly with the potential relevant operator, Arafura Bluewater Charters, as requested by NTGFIA. will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	COP consulted with Arafura Bluewater Charters, as requested by NTGFIA. No comments received.	Not required	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Office of Commonwealth Minister for Resources, Energy and Northern Australia – Relevant, regulator (NOPSEMA)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Office of Minister for Mines & Energy, NT – Relevant, regulatory (NT-DME)				
7 Oct 2015	Initial phone call to Minister's office giving advance notification of EP being prepared for appraisal activities. • No concerns raised re appraisal drilling • COP offered meeting	No comments received.	COP to organise meeting	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the Minister's department, the NT-DME, closer to commencement of appraisal drilling activities, including
7, 12 Oct 2015	Email exchange between COP and Minister's office • COP advised of initial briefing being given to DME and offered for Minister's office to also receive a briefing. • Minister's office advised they could not attend briefing, and would seek feedback from DME post-briefing.	No comments received.	No response required. COP to consult directly with Department personnel who will keep Minister's office informed as required. COP to provide written information when available.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	advance notifications as to vessel movements.
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
22 Feb 2016	Office advised COP via email that correspondence had been referred to the Minister for his consideration.			
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Office of Minister for Primary Industry & Fisheries, NT – Relevant, regulatory (NT-DPIF)				
7 Oct 2015	Initial phone call to Minister's office giving advance notification of EP being prepared for Caldita-Barossa appraisal drilling: • No concerns raised re appraisal drilling • COP offered meeting •	No comments received.	COP to organise meeting	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the Minister's department, the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
8, 19 Oct 2015	Email exchange between COP and Minister's office • Oct 8: COP request to speak to Minister's fisheries policy officer and advising of briefing to department on October 20 • Oct 19: Email from Minister's office arranging time for COP to brief Minister on October 20. •	No comments received.	COP to meet with Minister	
20 Oct 2015	Meeting held with Minister's office in Darwin to provide briefing on proposed appraisal activities • Minister's office suggested COP contact the NT Guided Fishing Association, Arafura Tours, and the Amateur Fishers Association to discuss potential impact to them. • Supportive of activities and engagement plan	No comments received. COP will make additions to consultation program, as proposed by Minister's office	For the meetings conducted prior to January 2016, the exact locations for the first two wells in the proposed 2016/2017 appraisal drilling campaign had not been finalised internally. The stakeholders consulted were advised of the proposed general locations for appraisal drilling within the permit area, the methods that would be used, the proposed timing for drilling of the first two wells, the reasons behind the need for appraisal drilling and the environmental assessment process that would be involved. Consultation undertaken by COP with stakeholders as requested by Minister's office (refer to separate entries) COP to consult directly with Department personnel who will keep Minister's office informed as required. No other response required	
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received. COP advised had held discussions with NTSC, AFANT, NTGFIA and Arafura Tours, as requested by Minister.	COP offered further meeting to discuss any potential issues or concerns. Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
22 Feb 2016	COP provided update via email on Caldita-Barossa appraisal activities. Information included advice that appraisal drilling EP would be submitted to NOPSEMA during Q1 2016 and offered to discuss any issues further.	COP provided offer to meet with Minister in his new capacity. No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	
23 Feb 2016	Minister's office provided acknowledgement letter			
4 Apr 2016	NT-DPIF executive responded to COP email of 22 February on behalf of the Minister thanking COP for update and confirming staff are available to discuss the proposals if needed.	No further comments received.	No response required.	
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Office of Minister for the Environment, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
13 Jan 2016	Minister's office provided acknowledgement letter			
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	COP to advise stakeholder of NOPSEMA decision re EP submission once received.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for AFANT)			
Office of Minister for Transport (C) – Relevant, regulator				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Required notifications will be provided to the relevant regulator body, the NT Department of Transport, closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Office of Opposition Leader, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Office of Opposition Spokesperson for Mines & Energy, NT - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Offshore Net and Line Fishery – Relevant, Commercial Licence Holders/potential users				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits • the environmental approval and supporting consultation process • contact and date details to provide feedback.	No comments received. No licence-holders have been identified by the NTSC or NT-DPIF as being relevant from this fishery.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised. No licence-holders from this fishery have identified themselves, or been identified by the NTSC or NT-DPIF, as being relevant for this activity. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF and NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering letter and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Oil Spill Response Ltd – Relevant, contractor				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Origin Energy – Interested, user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Osaka Gas - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Paspaley Pearling Company – Relevant, potential user (commercial licence holder)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. No issues/concerns have been raised. No licence-holders from this fishery have identified themselves, or been identified by the NTSC or NT-DPIF, as being relevant for this activity.

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF and NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Pearl Oyster Fishery – Relevant, Commercial Licence Holders/potential users				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits • the environmental approval and supporting consultation process • contact and date details to provide feedback.	No comments received. No licence-holders have been identified by the NTSC or NT-DPIF as being relevant from this fishery	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised. No issues/concerns have been raised. No licence-holders from this fishery have identified themselves, or been identified by the NTSC or NT-DPIF, as being relevant for this activity. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF and NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering letter and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Pearl Producers Association – Relevant, potential user (represents commercial licence holders)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received. No licence-holders have been identified by the NTSC or NT-DPIF as being relevant from this fishery.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised. No licence-holders have been identified by the NTSC or NT-DPIF as being relevant from this fishery. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons):	No comments received	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Pendoley Environmental - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Petronas Carigali – Relevant, user (adjacent titleholder)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
RPS Asia Pacific Applied Science Associates (APASA) - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Santos – Relevant, user, JV Partner				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May	No comments received.	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	and offered to discuss any issues further.			progress of the EP and activities prior to, during and post the drilling campaign.
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Shell Development Australia – Relevant, user (adjacent titleholder)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
SK E&S Relevant – Relevant, user (JV Partner)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Spanish Mackerel Fishery – Relevant, Commercial Licence Holders/potential users				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits	No comments received. No licence-holders have been identified by the NTSC or NT-DPIF as being relevant from this fishery.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised No issues/concerns have been raised. No licence-holders from this fishery have identified themselves, or been identified by the NTSC or NT-DPIF, as being relevant for this activity. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
	• the environmental approval and supporting consultation process • contact and date details to provide feedback.			Ongoing consultation will occur with the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering letter and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Timor Reef Fishery – Relevant, Commercial Licence Holders/users				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP. Information included: • a map of the petroleum retention lease areas • a map of the appraisal well locations; • indicative co-ordinates for the two well locations; • the range of water depths at the locations • the drilling depth of the wells • the proposed use of a Mobile Offshore Drilling Unit (MODU) • application of a 500m radius exclusion zone for safety purposes • the environmental baseline studies program supporting the Caldita-Barossa fields • recent appraisal drilling history in the permits • the environmental approval and supporting consultation process • contact and date details to provide feedback.	No comments received other than from licence-holders previously identified by the NTSC and NT-DPIF.	Provide update and further opportunity for stakeholder to provide input prior to EP submittal. No other response required.	No issues/concerns have been raised. No licence-holders from this fishery, other than two relevant users included above, have identified themselves, or been identified by the NTSC or NT-DPIF, as being relevant from this fishery. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign. Ongoing consultation will occur with the NT-DPIF, NTSC and directly with relevant licence-holders closer to commencement of appraisal drilling activities, including advance notifications as to vessel movements.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering letter and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering letter, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Tokyo Electric – Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
Tokyo Gas – Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
WA Seafood Exporters – Relevant, potential user				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
Whale and Dolphin Conservation Society - Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	
Woodside – Relevant, user (adjacent titleholder)				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	

Date	Contact made/feedback received/issues raised	COP assessment of issues raised	COP response (including outcomes proposed/achieved)	Summary of COP assessment/response
25 Aug 2016	Covering email and updated Activity Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity (see entry below) for stakeholder to comment prior to EP re-submittal.	
20 Sep 2016	Covering email, updated Activity Fact Sheet and additional Risk Assessment Fact Sheet provided by COP (as per full entry for A Raptis and Sons)	No comments received	No response required.	
World Wildlife Fund – Interested				
8 Jan 2016	Fact sheet on appraisal drilling and covering email provided by COP to all interested and relevant stakeholders (as per full entry for A Raptis and Sons).	No comments received.	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	No issues/concerns have been raised. COP believes it has provided the stakeholder with reasonable and adequate time and information to provide feedback and no further action is required prior to EP re-submittal. COP will provide ongoing, updated information to the stakeholder re progress of the EP and activities prior to, during and post the drilling campaign.
19 Apr 2016	COP provided update re Caldita-Barossa appraisal activities. Update included advice that appraisal drilling EP would be submitted in May and offered to discuss any issues further.	No comments received.	No response required.	
25 Aug 2016	Covering email and updated fact sheet re Appraisal Drilling activities sent to stakeholder (as per full entry for A Raptis and Sons)	No comments received	No response required. COP to provide update and further opportunity for stakeholder to comment prior to EP submittal.	
20 Sep 2016	Covering email and updated Activity Fact Sheet provided by COP. (as per full entry for AFANT)	No comments received	No response required	

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