

NGUJIMA-YIN FLOATING PRODUCTION STORAGE AND OFFLOADING FACILITY OPERATIONS AND PYRENEES FACILITY OPERATIONS ENVIRONMENT PLANS

CARNARVON BASIN, NORTH-WEST AUSTRALIA

Woodside consults relevant persons in the course of preparing an environment plan (EP) to notify them, obtain their input and to assist Woodside to confirm current measures or identify additional measures, if any, that may be taken to lessen or avoid potential adverse effects of the proposed activity on the environment. This is the intended outcome of consultation.

Woodside's aim is to ensure activities are carried out in a manner that is consistent with the principles of ecologically sustainable development (ESD), by which the environmental impacts and risks of the activity are reduced to as low as reasonably practicable (ALARP) and of an acceptable level. Woodside want relevant persons whose functions, interests or activities that may be affected by the proposed activity to have the opportunity to identify themselves and provide feedback on our proposed activity, in accordance with the intended outcome of consultation.

Woodside is consulting for both the:

- Pyrenees Floating Production, Storage and Offloading (FPSO) and associated subsea infrastructure (Pyrenees Facilities) Operations EP; and
- Ngujima-Yin Floating Production, Storage and Offloading (FPSO) and associated subsea infrastructure (Ngujima-Yin Facilities) Operations EP, together as their operations and associated activities are similar, and located 13 km apart in adjacent title areas.

Overview

Woodside will submit a five year revision of the Operations EPs for the Pyrenees and Ngujima-Yin Facilities located in Commonwealth waters, in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Cth) (regulations).

Operations began in 2008 for the Ngujima-Yin Facilities and 2010 for Pyrenees Facilities.

Activity Overview

Woodside plans to continue producing crude oil at the Pyrenees and Ngujima-Yin Facilities.

The activities that will continue at the Pyrenees and Ngujima-Yin Facilities are:

- Routine oil production, crude oil offloading and associated activities;
- Routine inspection, monitoring, maintenance and repair (IMMR) of the FPSOs and associated subsea infrastructure; and
- Disconnection and sail-away of the FPSOs with the turret mooring and subsea infrastructure remaining in place.

In addition to the above, the revised Ngujima-Yin Facility EP will also include:

- Production from an additional two wells via a subsea tieback to existing infrastructure and the operation of a new fuel gas flowline. The proposed wells will be located within the Operational Area (Figure 2). The location of the proposed flowline can be seen in Figure 2 and will originate from either the Pyrenees or Macedon field.

Drilling, construction and installation activities associated with the Ngujima-Yin tieback and fuel gas project will be subject to separate future EPs.

Stylised figures showing the existing Pyrenees Facilities are shown in Figure 3. Figure 4 shows the existing Ngujima-Yin Facilities. These figures are not to scale and are for illustration purposes.

Future decommissioning of infrastructure will be subject to separate future EPs.

Vessels

During normal operations, vessels will typically be limited to supply/support vessels and IMMR vessels. The vessel size and type will be dependent on the work scope. Vessels are not planned to anchor/moor on the seabed except in emergency situations. Offtake tankers will be used for offloading operations in both fields. It is anticipated vessels will operate 24 hours per day for the duration of activities.

Location and Operations

The Pyrenees FPSO is located about 45 km north of Exmouth, Western Australia, with the subsea facilities located within the Production Licenses WA-42-L and WA-43-L, and in water depths ranging from approximately 180 to 215 m (Figure 1). The Pyrenees FPSO is connected to the adjacent Macedon gas field located approximately 6 km southeast of the FPSO. The Macedon field is also operated by Woodside, and the connection allows gas to be supplied from the Macedon gas field for fuel gas on the FPSO, or produced via the Macedon subsea infrastructure to the onshore Macedon Gas Plant for domestic gas production.

The Ngujima-Yin FPSO is located about 57 km north of Exmouth, Western Australia, with the subsea facilities located within Production Licenses WA-28-L, WA-59-L and Pipeline License WA-28-PL, in water depths ranging from approximately 340 to 850 m (Figure 2).

Communication with mariners

The locations of the Pyrenees FPSO and the Ngujima-Yin FPSO as well as associated subsea infrastructure are marked on nautical charts. Nautical charts also include a 500 m radius petroleum safety zone (exclusion zone). For the Pyrenees FPSO, this is measured in addition to the FPSO length (260 m), resulting in a 760 m exclusion zone. The Ngujima-Yin FPSO petroleum safety zone is measured from the riser turret mooring at the bow of the vessel. Vessels are not permitted within the exclusion zone without permission. In addition, a 2.5 nm (4.6 km) radius cautionary zone is also marked on nautical charts around both FPSOs.

Assessment

Woodside has undertaken an assessment of the potential impacts and risks to the environment, as well as to relevant persons arising from the planned activities and unplanned events. This assessment considers timing, duration and location of activities and events. A number of mitigation and management measures will be implemented and are summarised in Table 3. Further details will be provided in each EP being revised to manage proposed activities.

In preparing the EPs, our intent is to minimise environmental, social or cultural impacts associated with the proposed activities, and Woodside are seeking any interest or comments you may have to inform our decision making.

For the potential impacts, Woodside has defined an 'Operational Area' within which the impacts from planned activities could occur.

Both the Pyrenees FPSO and Ngujima-Yin FPSO Operational Areas comprises a 1500 m radius around the FPSO to allow for offtake activities, as well as an area within 1500 m of the subsea infrastructure including wells, flowlines, umbilicals and pipeline (for Ngujima-Yin only).

The Operational Area for the Ngujima-Yin FPSO also includes an area around the potential installation of a flowline, with two options, one with

the flowline originating from Pyrenees field and one originating from Macedon field. No infrastructure exists within the area currently, and if installed, the infrastructure would be added to nautical charts, including the introduction of any associated petroleum safety zone.

Joint Venture

Woodside is the Operator for both the Pyrenees and Ngujima-Yin Facilities, on behalf of Joint Ventures comprising of Santos and Inpex for Pyrenees Facilities and Mitsui for Ngujima-Yin Facilities.

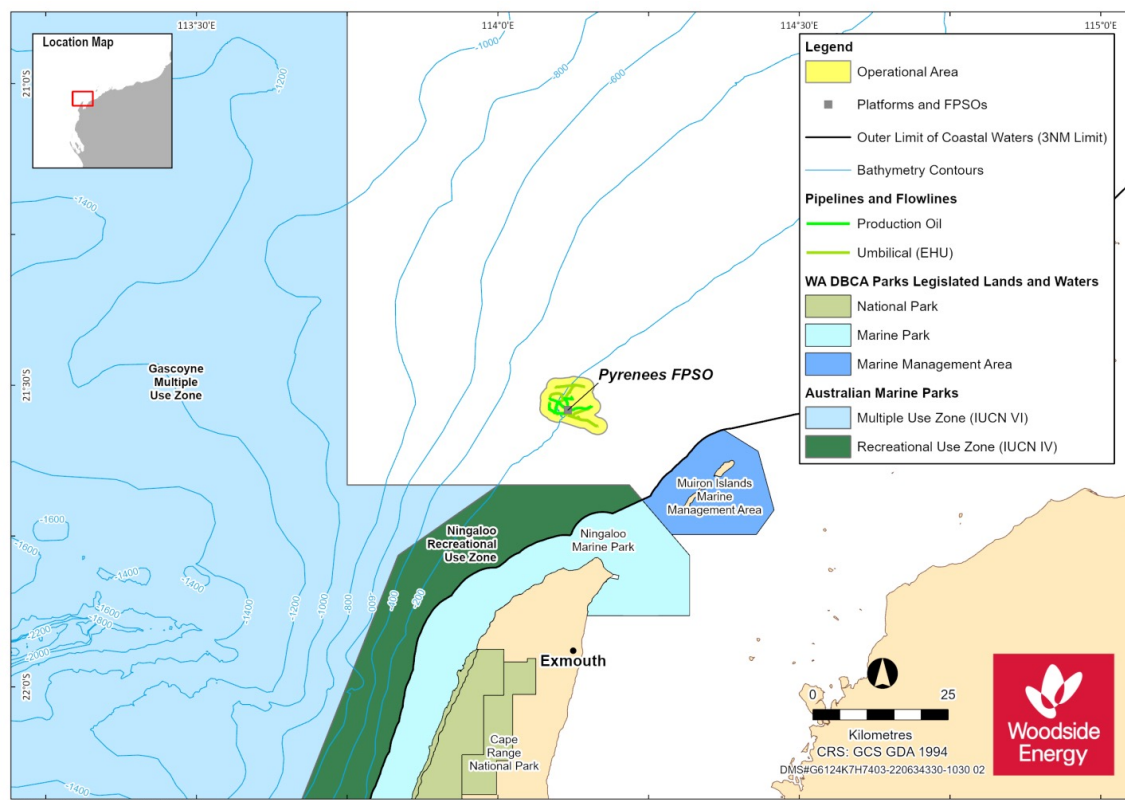


Figure 1. Pyrenees Facility Location and Operational Area

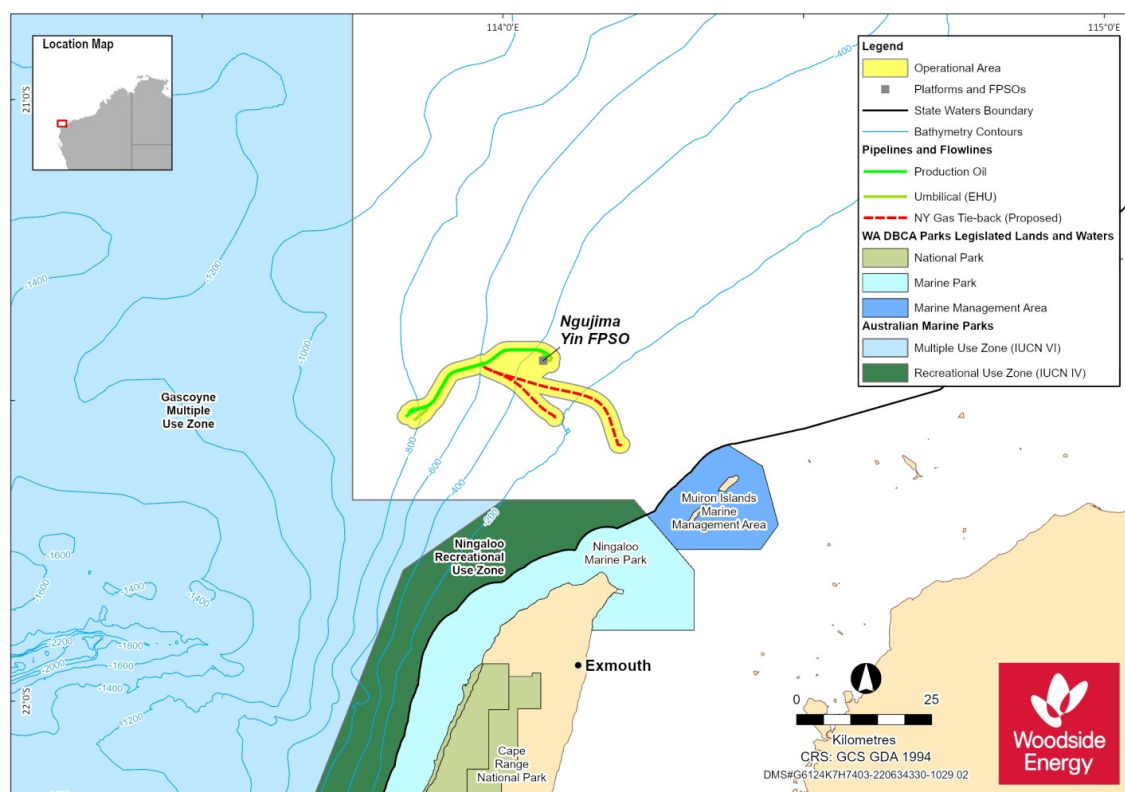


Figure 2. Ngujima-Yin Facility Location and Operational Area

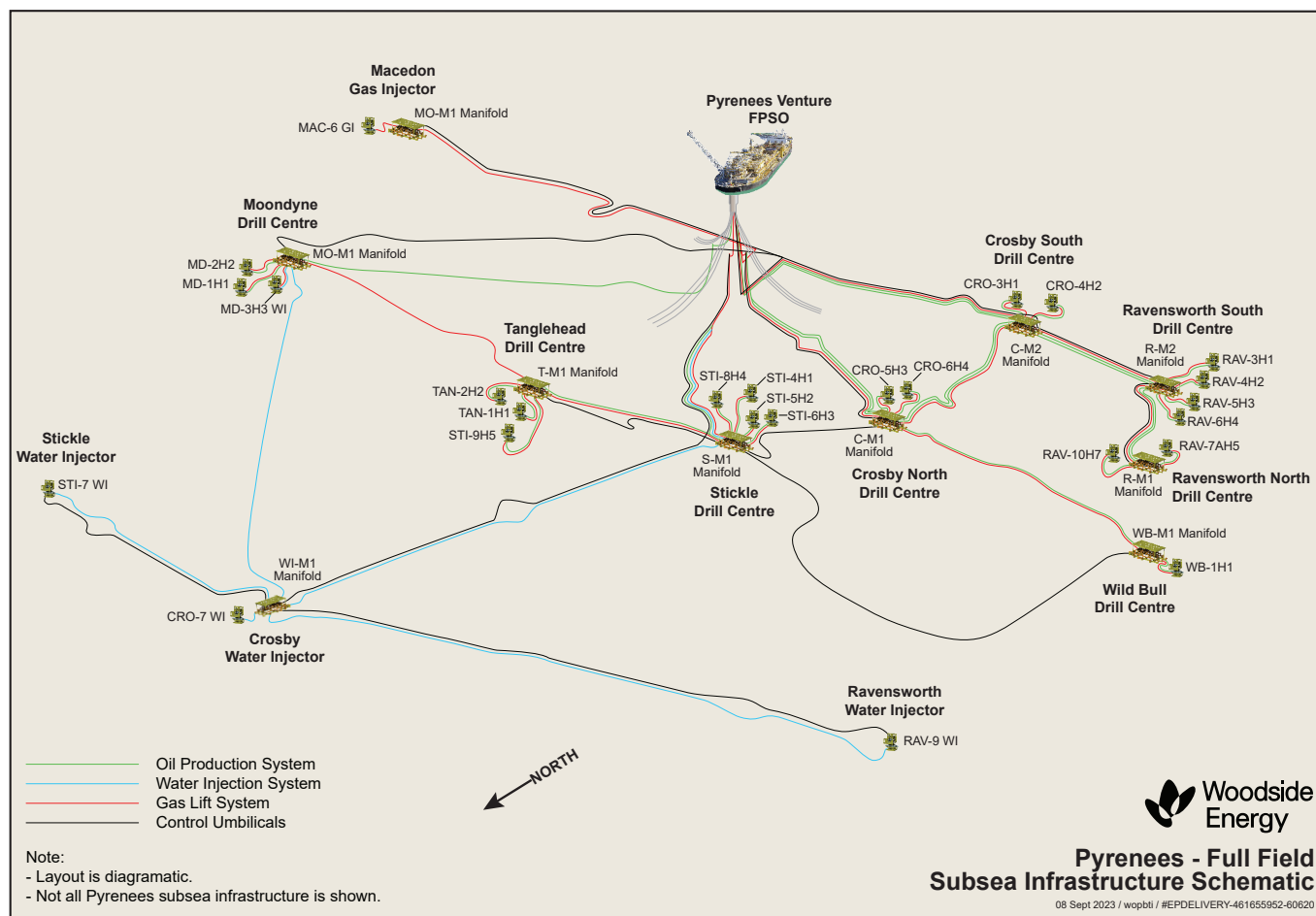


Figure 3. Overview of subsea infrastructure layout associated with the Pyrenees FPSO (not to scale)

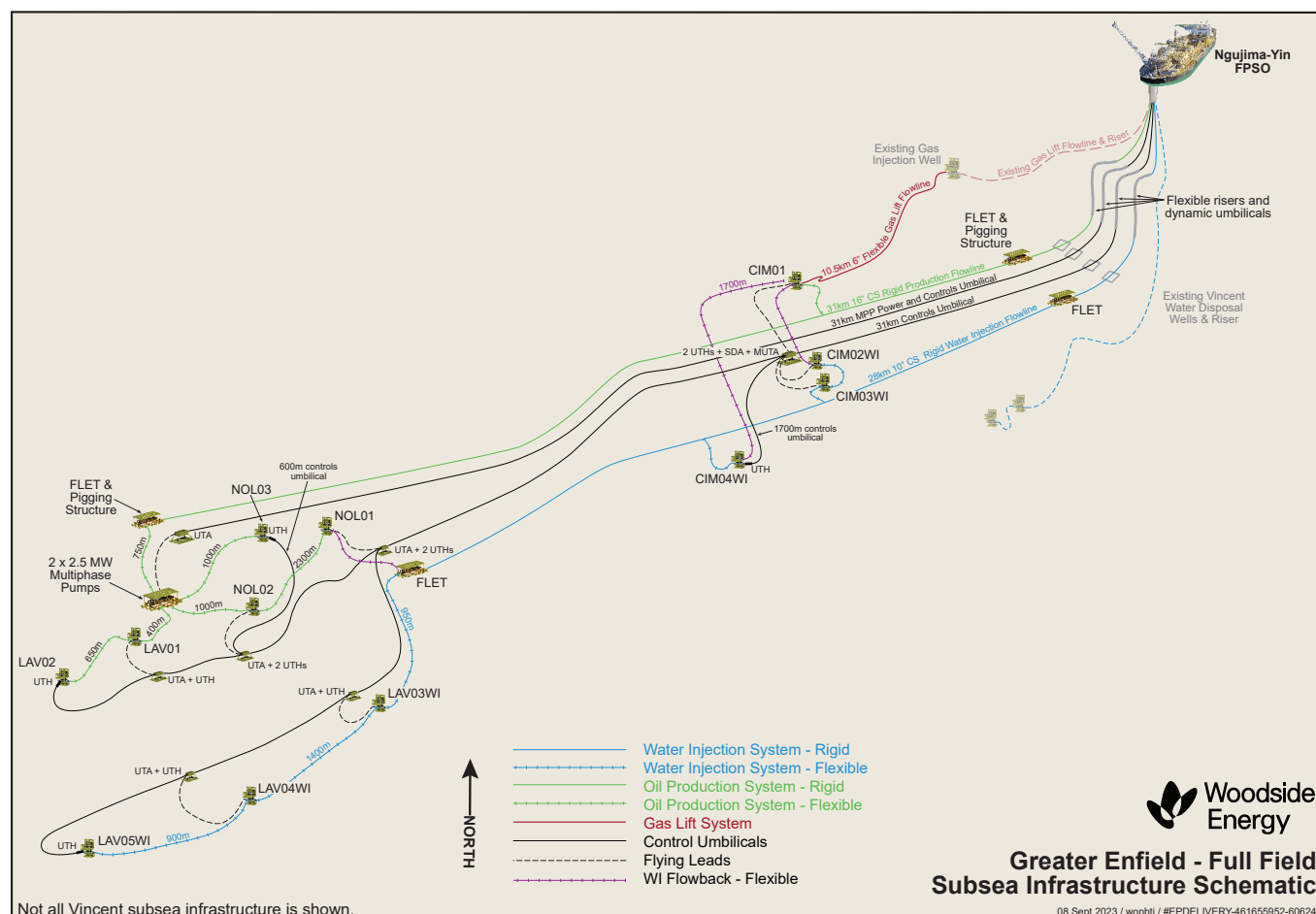


Figure 4. Overview of the subsea infrastructure layout associated with the Ngujima-Yin FPSO (not to scale)

Table 1. Activity summary

	Pyrenees Facility Operations Environment Plan	Ngujima-Yin Facility Operations Environment Plan
Facility type	Floating Production Storage and Offloading (FPSO) and associated subsea infrastructure	Floating Production Storage and Offloading (FPSO) and associated subsea infrastructure
Production License Areas	WA-42-L and WA-43-L	WA-28-L, WA-59-L and WA-28-PL
Approximate water depth	Ranging from approximately 180 to 215 m	Ranging from approximately 340 to 850 m
Commencement date	Production Commenced: 2010	Production Commenced: 2008
Approximate estimated duration	Routine Operations: Ongoing Estimated End of Field Life: 2035	Routine Operations: Ongoing Estimated End of Field Life: 2028
Infrastructure connected to the facility	Key infrastructure includes, but is not limited to: • 1 Disconnectable Turret Mooring system, incorporating the risers • 11 flexible risers and 2 umbilical risers distributed across 4 midwater arches and 1 flexible riser with buoyancy modules • 27 Xmas trees/wells • 10 Manifolds • Power and Control umbilicals • Umbilical Termination Assembly (UTA) • Flexible Flowlines and Jumpers • Subsea support structures	Key infrastructure includes, but is not limited to: • 1 Disconnectable Turret Mooring system, incorporating the risers • 6 flexible risers with buoyancy modules • 28 Xmas trees/wells • 4 Manifolds • Power and Control umbilicals • Umbilical Termination Assembly • Flexible Flowlines and Jumpers • Multi-Phase Pumps • Subsea pig launch and receiver facility • Subsea support structures Potential new infrastructure that could be installed in the next 5 years: • Two new wells • One new flowline supplying fuel gas from either Pyrenees or Macedon
Vessels	Key vessels include, but are not limited to: • Supply and support vessels • Oil tanker • IMMR support vessels including multi-purpose support vessels and dive support vessels	Key vessels include, but are not limited to: • Supply and support vessels • Offloading tanker • IMMR support vessels including multi-purpose support vessels
Operational Areas and Exclusion zones	Operational Area comprises: • Pyrenees FPSO and an area extending out to 1500 m to allow for offtake activities • Pyrenees subsea infrastructure, including wells, flowlines and associated infrastructure, and an area within 1500 m around the infrastructure Exclusion Zones: • A petroleum safety zone, comprising the length of the FPSO which is 260 m plus a 500 m safety zone, which extends to a distance of 760 m radius from the internal Turret of the Pyrenees FPSO	Operational Area comprises: • Ngujima-Yin FPSO and an area extending out to 1500 m to allow for offtake activities • Ngujima-Yin subsea infrastructure including wells, flowlines, a pipeline and associated infrastructure, and an area within 1500 m around the infrastructure. • An area within 1500 m around the proposed route of a subsea flowline either from Pyrenees or from Macedon Exclusion Zones: • A 500 m petroleum safety zone around the Ngujima-Yin FPSO
Distance to nearest town from FPSO	45 km north of Exmouth, Western Australia	57 km north of Exmouth, Western Australia
Distance to nearest marine park/nature reserve from FPSO	<i>Pyrenees FPSO:</i> • -14 km from the northern boundary of the Commonwealth Ningaloo Marine Park	<i>Ngujima-Yin FPSO:</i> • -26 km from the northern boundary of the Commonwealth Ningaloo Marine Park

Table 2. Approximate Locations

Structure	Approximate Water depth	Approximate Latitude	Approximate Longitude	Petroleum Titles
Pyrenees Facility FPSO				
Pyrenees Facility	200	21° 32' 28.12671822" S	114° 06' 58.55946505" E	WA-42-L
Production wells				
Crosby - 3H1	204	21° 32' 43.06267192" S	114° 05' 42.50447160" E	WA-42-L
Crosby - 4H2	204	21° 32' 42.98265112" S	114° 05' 40.46821800" E	WA-42-L
Crosby - 5H3	202	21° 31' 44.49422152" S	114° 06' 05.84823600" E	WA-42-L
Crosby - 6H4	202	21° 31' 44.59731472" S	114° 06' 03.83841720" E	WA-42-L
Moondyne-1H1	191	21° 32' 05.45036872" S	114° 09' 17.97139800" E	WA-42-L
Moondyne-2H2	191	21° 32' 05.47982032" S	114° 09' 19.71615240" E	WA-42-L
Ravensworth - 3H1	209	21° 32' 19.94805832" S	114° 05' 03.26322240" E	WA-43-L
Ravensworth - 4H2	209	21° 32' 18.92186752" S	114° 05' 03.37507800" E	WA-43-L
Ravensworth - 5H3	208	21° 32' 17.27543992" S	114° 05' 04.40305800" E	WA-43-L
Ravensworth - 6H4	208	21° 32' 16.56928912" S	114° 05' 04.34562360" E	WA-43-L
Ravensworth - 7H5	210	21° 31' 48.52389952" S	114° 05' 05.83185840" E	WA-42-L
Ravensworth - 8H6	210	21° 31' 46.28295712" S	114° 05' 06.99909360" E	WA-42-L
Ravensworth- 10H7	209	21° 31' 48.36774232" S	114° 05' 09.24021240" E	WA-42-L
Stickle - 4H1	199	21° 31' 23.67887032" S	114° 06' 35.28941400" E	WA-42-L
Stickle - 5H2	199	21° 31' 22.04032312" S	114° 06' 33.72709320" E	WA-42-L
Stickle - 6H3	199	21° 31' 21.55597912" S	114° 06' 33.11816040" E	WA-42-L
Stickle - 8H4	198	21° 31' 23.96606752" S	114° 06' 37.27612440" E	WA-42-L
Stickle-9H5	195	21° 31' 09.48247552" S	114° 07' 23.40927120" E	WA-42-L
Tanglehead-1H1	195	21° 31' 21.41918992" S	114° 07' 26.10295680" E	WA-42-L
Tanglehead-2H2	195	21° 31' 21.58738192" S	114° 07' 27.71560200" E	WA-42-L
Wildbull-1H1	212	21° 31' 13.20441112" S	114° 05' 06.05845680" E	WA-42-L
Gas Injection Well				
Macedon - 6	181	21° 34' 03.49066432" S	114° 10' 00.84305640" E	WA-42-L
Water Injection Well				
Crosby - 7WI	197	21° 29' 57.59613112" S	114° 07' 36.30057960" E	WA-42-L
Moondyne-3WI	191	21° 32' 03.80817832" S	114° 09' 18.00202680" E	WA-42-L
Ravensworth - 9WI	213	21° 30' 09.55413592" S	114° 05' 43.14401520" E	WA-42-L
Stickle - 7WI	191	21° 30' 09.27344032" S	114° 08' 41.61371280" E	WA-42-L

Table 3. Approximate Locations

Structure	Approximate Water depth	Approximate Latitude	Approximate Longitude	Petroleum Titles
Ngujima-Yin Facility FPSO				
Ngujima-Yin FPSO	340	21° 26' 02.661" S	114° 04' 01.325" E	WA-28-L
Production wells*				
CIM01	529	21°26'23.354004" S	113°57'56.158998" E	WA-59-L
LAV01	845	21°31'22.872000" S	113°50'39.948000" E	WA-59-L
LAV02	849	21°31'35.595996" S	113°50'22.416000" E	WA-59-L
NOL01	804	21°30'41.998998" S	113°52'18.573000" E	WA-59-L
NOL02	823	21°31'0.739998" S	113°51'13.304004" E	WA-59-L
NOL03	826	21°30'48.586998" S	113°51'5.697000" E	WA-59-L
VNA-H1 (ST2)	362	21°26'23.309988" S	114°2'48.390000" E	WA-28-L
VNA-H2 (L1ST3)	362	21°26'22.629984" S	114°2'47.670000" E	WA-28-L
VNA-H3 (ST2)	362	21°26'22.160004" S	114°2'48.120000" E	WA-28-L
VNA-H4 (L1)	362	21°26'22.850016" S	114°2'48.850008" E	WA-28-L
VNA-H5 (ST1)	362	21°26'22.232364" S	114°2'49.346988" E	WA-28-L
VNA-H6A (L1 & L2ST1)	362	21°26'23.669988" S	114°2'47.824008" E	WA-28-L
VNB-H1 (L1ST2)	392	21°26'2.289984" S	114°1'59.070000" E	WA-28-L
VNB-H2 (ST3)	392	21°26'1.759992" S	114°1'58.258992" E	WA-28-L
VNB-H3 (L1)	392	21°26'1.150008" S	114°1'58.590012" E	WA-28-L
VNB-H4 (L1ST3 & L2ST1)	392	21°26'1.659984" S	114°1'59.409984" E	WA-28-L
VNB-H5 (L1ST3 & L2ST1)	392	21°26'1.214916" S	114°2'0.073212" E	WA-28-L
VNA-H5 (ST1)	362	21°26'22.232364" S	114°2'49.346988" E	WA-28-L
VNA-H6A (L1 & L2ST1)	362	21°26'23.669988" S	114°2'47.824008" E	WA-28-L
Gas Injection Well				
VN-G1	371	21°25'1.940016" S	114°3'16.949988" E	WA-28-L
Water Injection Well				
CIM02WI	527	21°26'25.038000" S	113°58'0.284004" E	WA-59-L
CIM03WI	526	21°26'25.842000" S	113°58'0.529998" E	WA-59-L
CIM04WI	562	21°26'41.202000" S	113°57'1.305000" E	WA-59-L
LAV03WI	805	21°31'15.075000" S	113°52'8.851002" E	WA-59-L
LAV04WI	805	21°31'42.630000" S	113°51'33.424998" E	WA-59-L
LAV05WI	820	21°32'0.107004" S	113°51'12.102000" E	WA-59-L
VNC-W2	346	21°27'33.210000" S	114°2'32.529984" E	WA-28-L
Production Wells Permanently Plugged				
VNC-W1	346	21°27'32.069988" S	114°2'33.770004" E	WA-28-L

* Two additional production wells may be developed within the Operational Area shown in Figure 4.

Environment That May Be Affected (EMBA)

The environment that may be affected (EMBA) is the largest spatial extent where the Pyrenees Facility Operations activities and the Ngujima-Yin Facility Operations activities could potentially have an environmental consequence (direct or indirect). The broadest extent of the EMBA takes into consideration planned and unplanned activities, and for these EPs, is determined by modelling the highly unlikely event of a hydrocarbon release. The worst-case credible spill scenario for these EPs is a release from a loss of well control or a vessel collision with the FPSO with enough force to breach the hull, releasing crude to the environment.

The EMBA does not represent the extent of the predicted impact of the highly unlikely unplanned release of hydrocarbons. Rather, the EMBA represents the merged area of many possible paths a highly unlikely hydrocarbon release could travel depending on the weather and ocean conditions at the time of the release. This means in the highly unlikely event a hydrocarbon release does occur, the whole EMBA will not be affected - the specific and minimal part of the EMBA that is affected will only be known at the time of the release.

Figure 5 displays the EMBA for the Ngujima-Yin EP and Figure 5 displays the EMBA for the Pyrenees EP.

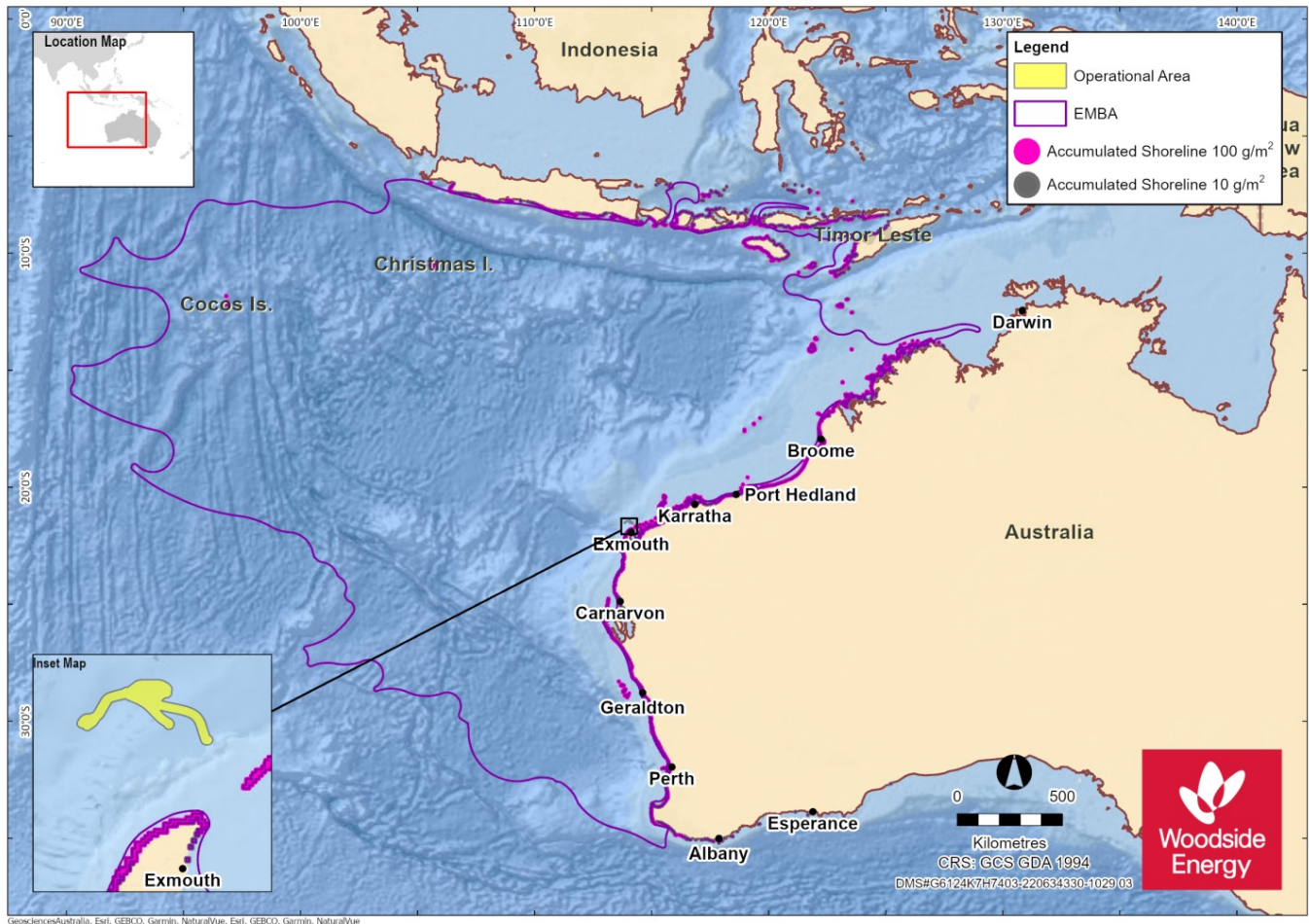


Figure 5. Ngujima-Yin FPSO Operations Environment that May Be Affected (EMBA) by an unplanned hydrocarbon release from an accident/incident during the Petroleum Activities Program.

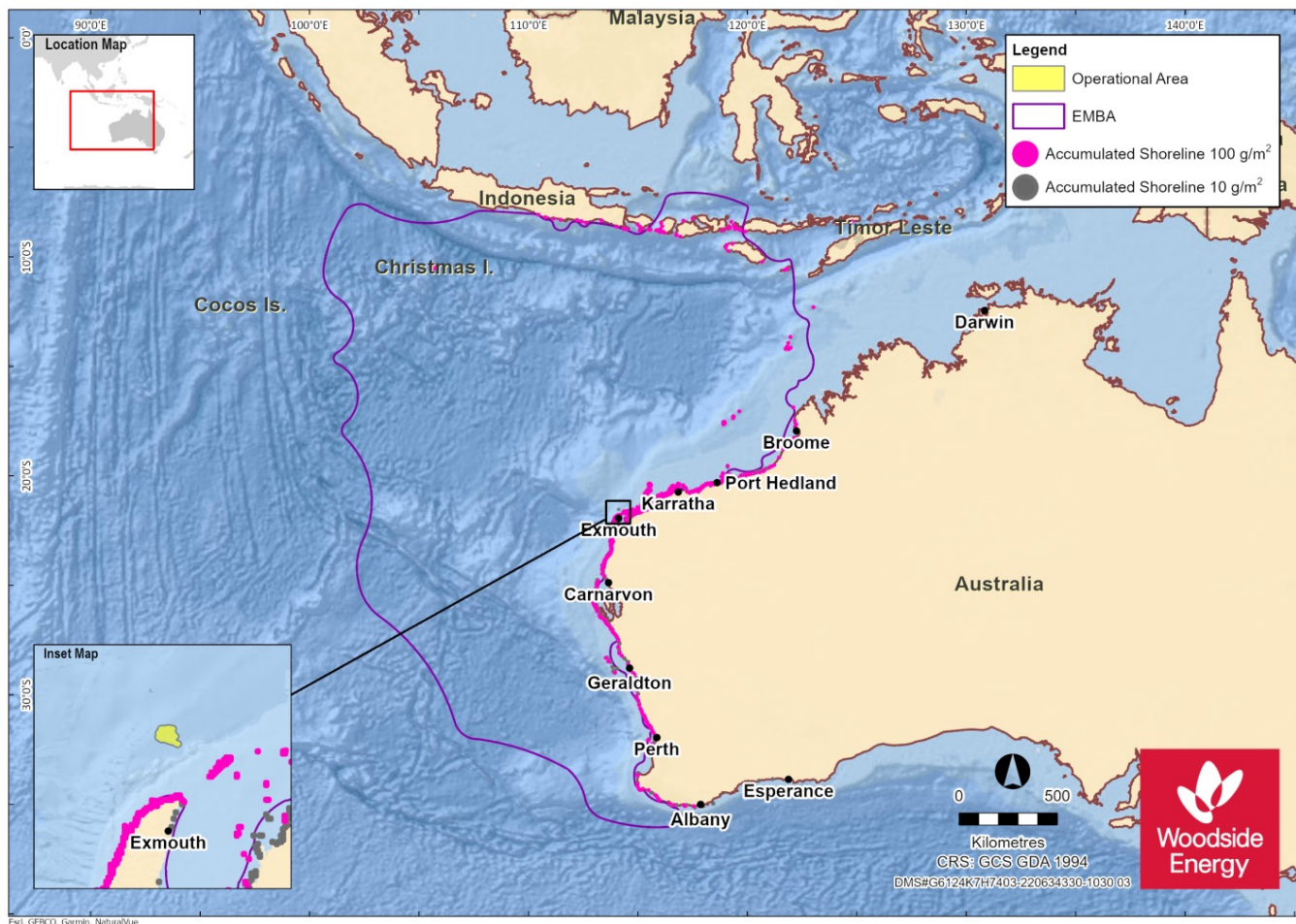


Figure 6. Pyrenees FPSO Operations Environment that May Be Affected (EMBA) by an unplanned hydrocarbon release from an accident/ incident during the Petroleum Activities Program.

Mitigation and management measures

Woodside has undertaken an assessment to identify potential impacts and risks to the environment arising from the Pyrenees and Ngujima-Yin facilities operations activity, including IMMR activities and other contingent activities. A number of mitigation and management measures for the activity are outlined in Table 4. Further details will be provided in the EPs.

Table 4. Summary of key risks and/or impacts and preliminary management measures for the Activity*

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Planned Activities (Routine and Non-routine)			
Physical Presence: Interaction with other Marine Users, Cultural Values & Heritage	- The presence of FPSOs, other vessels and subsea infrastructure has the potential to exclude and/or displace other users from the Pyrenees or Ngujima-Yin Petroleum Safety Zone and Operational Areas respectively. - Physical presence of project vessels and activities may have potential to impact cultural values and heritage.	- Localised displacement of commercial fishing from the Operational Area. - Displacement of recreational fishing activity is likely to be low level due to the distance from boating facilities, lack of natural attractions (e.g. reefs or shoals) and water depth of Operational Area. - The presence of support vessels could cause temporary disruption to commercial shipping. No recognised shipping lanes overlap the Operational Areas. - Tourism and recreation within the Operational Areas is expected to be infrequent due to the lack of emergent features or natural attractions (eg. reefs or shoals) and water depth.	- Vessels adhere to regulatory requirements for navigational safety. - Maintain a permanent Petroleum Safety Zone around the FPSO. - Notify Australian Hydrographic Office (AHO) of locations of new permanent infrastructures to enable update of maritime charts. - Consult with relevant persons so that they are informed of the proposed activities. - FPSO collision prevention system implemented to alert marine vessels of the facility location. - Woodside will actively support the capacity of Traditional Custodians for ongoing engagement and consultation on environment plans, for the purpose of avoiding impacts to cultural heritage values.
Physical Presence: Seabed disturbance	Seabed disturbance may result from the following activities: - Presence of FPSO, wells and subsea infrastructure (including moorings) modifying marine habitats. - Subsea operations, inspection, maintenance and repair activities resulting. - Anchoring as required in emergency conditions.	- Localised modification of seabed habitat within the Operational area through seabed scouring around subsea infrastructure or formation of artificial reef. - The infrastructure provides hard substrate for marine organisms and a fouling community. This may result in local increase biological productivity and diversity within the Operational Area. - During IMMR activities, a localised and temporary decline in water quality due to an increase of suspended sediment concentration and sediment deposition may occur.	- Monitoring and maintenance of all subsea infrastructure completed as per IMMR process. - Any new subsea infrastructure to have an as-left survey completed and location to be recorded.
Routine Light Emissions: Light Emissions from FPSO, Vessel Operations and Operational Flaring	- The FPSOs, vessels (including IMMR) and Remote Operation Vehicles (ROV) will use external lighting to conduct safe operations. - Light emissions from FPSO during flaring.	Light emissions have the potential to temporarily affect fauna such as fish, marine reptiles and seabirds by influencing changes in their behaviour or impacting orientation in close proximity to the FPSOs or vessels.	- Lighting limited to the minimum required for navigational and safety requirements, except for emergency events. - Flare management through reinjection to reduce flare intensity. - Implementation of appropriate measures based on recommendations of the National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Routine Acoustic Emissions: Generation of Noise During Routine Operations	Noise generated within the Operational Areas from: - FPSOs and associated subsea infrastructure; - Vessels; - Helicopters; and - IMMR activities (e.g. ROVs, AUVs, side scan sonar, echo sounder, vessels on DP).	- Elevated underwater noise can potentially disturb marine fauna, including marine mammals, turtles, and fish through behavioural effects, masking or interfering with other biologically important sounds (echolocation, vocal communication, signals, and sounds produced by predators or prey) or as direct physical damage. - The migration corridor (Biologically Important Area (BIA)) for pygmy blue whales and humpback whales overlaps with a small portion of the Operational Areas and may expose the mammals to underwater noise during seasonal migrations. Given the underwater noise levels and low likelihood of the whales being present in the Operational Area, the potential for impact is considered highly unlikely.	Comply with regulatory requirements for interactions with marine megafauna in attempt to prevent adverse interactions.
Routine and Non-routine Atmospheric and Greenhouse Gas (GHG) Emissions	Atmospheric emission and GHG emissions generated through fuel combustion from FPSO, vessels and helicopters, FPSO operational flaring and fugitive emissions (e.g. compressors, generators etc.).	- Emissions could result in temporary, localised reductions in air quality in the immediate vicinity. - Contribution to GHG emissions.	- Comply with regulatory requirements for GHG emissions and reporting. - Monitoring, review and optimisation of facility fuel and flaring emissions where possible.
Routine and Non-Routine Discharges: Subsea Operations and Activities	- Discharge of subsea control fluids from the actuation of valves or during subsea operations and activities. - Potential discharge of hydrocarbons or chemicals remaining in subsea pipework and equipment due to subsea intervention works (including pigging) and/or IMMR activities.	- Localised, short-term decrease in water quality around the subsea system within Operational Area due to relatively small volumes discharged and rapid dilution of release. - Any impacts to fauna should be minor and the potential for bioaccumulation in organisms or accumulation in sediments is considered negligible. - The Operational Area overlaps Key Ecological Features (KEFs), namely the Continental Slope Demersal Fish Communities and Canyons Linking the Cuvier Abyssal Plain and the Cape Range Peninsula. Discharges are not likely to have impacts to the ecosystem function of the KEFs.	- Marine discharges managed according to regulatory requirements. - Chemicals selected with lowest practicable environmental impacts and risks subject to technical constraints and approved through the Woodside chemical assessment process. - Subsea infrastructure flushed and isolated where practicable during IMMR activities.
Routine and Non-routine Discharges: Utility Systems and Drains	- Discharge of sewage, grey water and putrescible waste from FPSOs or vessels to the marine environment. - Discharge of deck, bilge and drain water from FPSOs or vessels to marine environment.	- Potential slight, short-term, localised ongoing increase in nutrients and oxygen demand around FPSOs and vessels with no lasting effect. - Potential slight, short-term, localised ongoing decrease in water quality at discharge location. - Discharges are not likely to impact on the overlapping KEFs in the Operational Areas.	- Marine discharges managed according to regulatory requirements. - Chemicals selected with lowest practicable environmental impacts and risks subject to technical constraints and approved through the Woodside chemical assessment process. - Onboard treatment and open / closed draining systems are monitored and maintained.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Routine and Non-Routine Discharges: FPSO production waste (Pyrenees only)	- Discharge of production waste from Pyrenees FPSO (produced water). - Note: All produced water from Ngujima-Yin FPSO is reinjected to the reservoir and discharge is not permitted in this EP.	Overboard discharges causing localised changes in water quality may result in potential environmental impacts to biota within the Operational Areas	- Marine discharges managed according to regulatory requirements. - Continuous measurements and monitoring of Produced Water (PW) Systems. Diversion of PW if measurements exceed acceptable baseline levels. - Chemicals selected with lowest practicable environmental impacts and risks subject to technical constraints and approved through the Woodside chemical assessment process. - Maximise the reinjection of produced water.

Unplanned Events (Accidents / Incidents)

Unplanned Hydrocarbon or Chemical Release: Hydrocarbon release during Bunkering / Refuelling and Chemical release during transfer, storage, and use	- Accidental spill of hydrocarbons (diesel) to the marine environment during bunkering / refuelling. - Chemical release to marine environment during transfer, storage and use.	- Potential to cause localised and temporary changes to water quality from a marine diesel or chemical spill. - Marine diesel is a relatively volatile, nonpersistent hydrocarbon with up to approximately 40% evaporating within the first 24 hours for a surface spill. - Potential impacts across the EMBA may include injury/mortality to seabirds, fish, plankton, marine mammals and marine reptiles. Mortality of larger fauna is not expected to occur. - No impacts to KEFs are expected, as these KEFs are mainly benthic and will therefore not be affected by a small surface release.	- Vessels compliant with regulatory guidelines for safe operations including bunkering / refuelling and emergency response. - Chemicals selected with lowest practicable environmental impacts and risks subject to technical constraints and approved through the Woodside chemical assessment process. - Safe storage of chemicals with spill clean-up equipment available. - Equipment for bunkering / refuelling regularly inspected / maintained and replaced as required. - Reporting of unplanned releases.
Unplanned Hydrocarbon Release: Loss of Hazardous and Non-Hazardous Waste / Equipment	Incorrect disposal or accidental discharge of non-hazardous and hazardous waste / equipment from FPSOs or vessels to the marine environment.	- The potential impacts of waste accidentally discharged to the marine environment include localised direct pollution and contamination of the environment, and secondary impacts potentially leading to injury and/or death to marine fauna (e.g. entanglement or ingestion). - The temporary or permanent loss of waste materials/equipment into the marine environment is not likely to have a significant environmental impact, based on the location of the Operational Area, the types, size and frequency of waste that could occur and species present.	- Compliance with regulatory requirements for the prevention of marine pollution and handling of hazardous wastes (i.e. Marine Orders 95 and 94). - Compliance with Waste Management Plans for the storage, handling and transportation of wastes. - Attempted recovery of dropped waste objects where safe and practicable.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Physical Presence (Unplanned): Vessel Collision with Marine Fauna	Vessel movements have the potential to result in collisions between the vessel (hull and propellers) and marine fauna.	- Vessel interaction presents a potential threat to marine mammals, marine reptiles and fish, sharks and rays. - Whilst a portion of both Operational Areas overlap the pygmy blue whale and humpback whale migration BIAs, this overlap represents a very small proportion of the BIA. Given the slow speeds at which project vessels generally operate, interactions with whales are considered unlikely. - Whale shark presence in the Operational Areas is likely during their migrations to and from Ningaloo Reef. Whale sharks are only expected in the area for short durations and their presence would be migratory. - The Pyrenees Operational Area overlaps BIAs for sensitive turtle areas but given the water depth and absence of potential for nesting, turtles are likely to only use the area infrequently for transit. - Vessel activities are unlikely to result in a consequence greater than short-term disruption to fauna, with no expected impact on critical habitat.	Comply with regulatory requirements for interactions (e.g., EPBC Regulations 2000 – Part 8 Division 8.1) with marine fauna to reduce the likelihood of a collision occurring.
Physical Presence (Unplanned): Introduction of Invasive Marine Species (IMS)	- Vessels transiting to the Operational Area may be subject to marine fouling whereby organisms attach to the vessel hull. - Organisms can also be drawn into ballast tanks during onboarding of ballast water. - IMS can also be present as biofouling on subsea structures.	- Transfer of IMS from infected vessels to the Operational Areas and establishment on the seafloor or subsea infrastructure is not likely due to the deep offshore waters which are not conducive to the settlement and establishment of IMS. - There is potential for IMS to transfer from infected vessels and attach to FPSO or turret. - Risk is considered remote that IMS will secondarily transfer from the FPSO or turret to another vessel given the offshore open ocean environment.	- Ballast water and biofouling will be managed according to regulatory requirements, including the Australian Ballast Water Management Requirements, and the Australian Biofouling Management Requirements, as applicable. - Woodside's IMS risk assessment process applied to project vessels and immersible equipment entering the Operational Areas. - Inspection of FPSOs by IMS Inspector prior to return from international sail away.
Unplanned Hydrocarbon Release: Subsea Infrastructure	Accidental release of hydrocarbons resulting from loss of containment of subsea infrastructure.	Potential significant impacts to marine environment including: - Long-term impacts to sensitive nearshore areas of offshore islands and coastal shorelines. - Disruption to marine fauna, including protected species. - Potential interference with or displacement of other sea users including fisheries and tourism and recreation.	- Compliance with Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009: Accepted Safety Case. - The Subsea Infrastructure design includes a range of measures that specifically aid in minimising the risk of external damage. - Woodside management system implemented during operations to maintain infrastructure integrity, communication systems and safety instrumented systems to an acceptable standard. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Maintain a permanent Petroleum Safety Zone around FPSO. - Reporting of unplanned releases.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Unplanned Discharges: Loss of Well Containment	Accidental release of hydrocarbons to the marine environment due to loss of well containment.	- Long-term impacts to sensitive nearshore areas of offshore islands and coastal shorelines. - Disruption to marine fauna, including protected species. - Potential interference with or displacement of other sea users including fisheries, tourism and recreation.	- Compliance with Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011: WOMP, which describes the well design and barriers to be used to prevent a loss of well control and to Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009: Accepted Safety Case. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Maintain Well Safety Instrumented Systems to detect and act on events that have potential to cause a hydrocarbon event. - Reporting of unplanned releases.
Unplanned Hydrocarbon Release: Vessel Collision	Vessel collision involving a project vessel or third-party vessel, resulting in the release of marine diesel fuel if the collision has enough force to penetrate the vessel hull in the exact fuel location.	- In the highly unlikely event of a vessel collision it may cause a release of hydrocarbons, impacts to water quality and marine ecosystems could occur. - Marine diesel is a relatively volatile, nonpersistent hydrocarbon with up to approximately 40% evaporating within the first 24 hours for a surface spill. - Potential impacts to sensitive nearshore areas of offshore islands and coastal shorelines. - Potential disruption to marine fauna, including protected species. - Potential interference with or displacement of other sea users including fisheries, tourism and recreation.	- Compliance with regulatory requirements for safe vessel operations (i.e. Marine Orders 21, 27 and 30). - Maintain a permanent Petroleum Safety Zone around FPSO. - Management plans for simultaneous operations in place when working in vicinity of other Woodside operations / activities. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Reporting of unplanned releases.
Unplanned Hydrocarbon Release: Turret Operations	Release of hydrocarbons from turret operations, including spill from failure to connect / disconnect from turret, failure of mooring system, accidental leaks from storage and equipment, including ROVs.	Potential localised decline in water quality caused by accidental pollution/contamination.	- Implemented Turret Mooring System Connect and Disconnect Procedure. - Monitor the mooring system to identify potential issues with a mooring line. - Management of wells in accordance with Well Integrity Management System to prevent loss of well control and associated overpressure of turret equipment. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Reporting of unplanned releases.

Potential Impact/Risk	Description of Source of Potential Impact/Risk	Description of Potential Impacts/Risks	Proposed Mitigation and/or Management Measure
Unplanned Hydrocarbon Release: Offtake Operations	Release of hydrocarbons from FPSO offloading equipment to the marine environment and atmosphere during offloading / transferring operations.	- Long-term impacts to sensitive nearshore areas of offshore islands and coastal shorelines. - Disruption to marine fauna, including protected species. - Potential interference with or displacement of other sea users including fisheries and tourism and recreation	- Compliance to Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009: Accepted Safety Case. - Implemented offloading procedures and all offtake tankers vetted to ensure they meet Woodside requirements. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Maintain a permanent Petroleum Safety Zone around FPSO. - Reporting of unplanned releases.
Unplanned Hydrocarbon Release: Loss of Containment of Crude Oil from FPSO	Release of hydrocarbons from FPSO to the marine environment due to loss of containment from bulk storage, topsides processing equipment, non-process topsides equipment or loss of structural integrity.	- Long-term impacts to sensitive nearshore areas of offshore islands and coastal shorelines. - Disruption to marine fauna, including protected species. - Potential interference with or displacement of other sea users including fisheries and tourism and recreation.	- Compliance to Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009: Accepted Safety Case. - Maintain a permanent Petroleum Safety Zone around FPSO. - Maintenance of facility as per Performance Standard requirements. - Implemented Emergency Response and Spill Management Plans and maintained environmental response equipment. - Reporting of unplanned releases.

**These mitigation and management measures are subject to change through the consultation and subsequent assessment process and may not represent content in the publicly available EP or in the final plan once accepted.*

Feedback

Woodside consults relevant persons in the course of preparing Environment Plans to notify them of the activity and to obtain relevant feedback to inform its planning for proposed petroleum activities in the region.

If you would like to comment on the proposed activities outlined in this information sheet, or would like additional information, please contact Woodside before **27 October 2023** via:

E: Feedback@woodside.com

Toll free: 1800 442 977

You can subscribe on our website to receive Consultation Information Sheets for proposed activities:

www.woodside.com/sustainability/consultation-activities.

Please note that stakeholder feedback will be communicated to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) as required under legislation. Woodside will communicate any material changes to the proposed activity to affected stakeholders as they arise.

Please note that your feedback and our response will be included in our Environment Plan for the proposed activity, which will be submitted to NOPSEMA for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Cth) and support other regulatory processes associated with the planned activities (which may or may not be confidential).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.