ICHTHYS DEVELOPMENT DRILLING CAMPAIGN WA-50-L

Environment Plan Summary

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1 INTRODUCTION

INPEX Ichthys Pty Ltd. (INPEX), as titleholder on behalf of its joint venture partners, is proposing to continue the existing drilling, well flowback and completions campaign, in the Browse Basin.

Project activities will consist of drilling and completion of 20 wells within petroleum production licence WA-50-L, associated with the development of gas and condensate reserves for Ichthys Liquefied Natural Gas (LNG) Project.

The drilling campaign will be conducted in accordance with the Ichthys Development Drilling Campaign WA-50-L Environment Plan (EP) that has been prepared to comply with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (E) Regulations). The EP has been accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) under Regulation 10A of the OPGGS (E) Regulations.

This document (EP Summary) provides an overview of the key elements of the EP and has been prepared to meet the requirements of Regulation 11(3) and 11(4) of the OPGGS (E) Regulations.

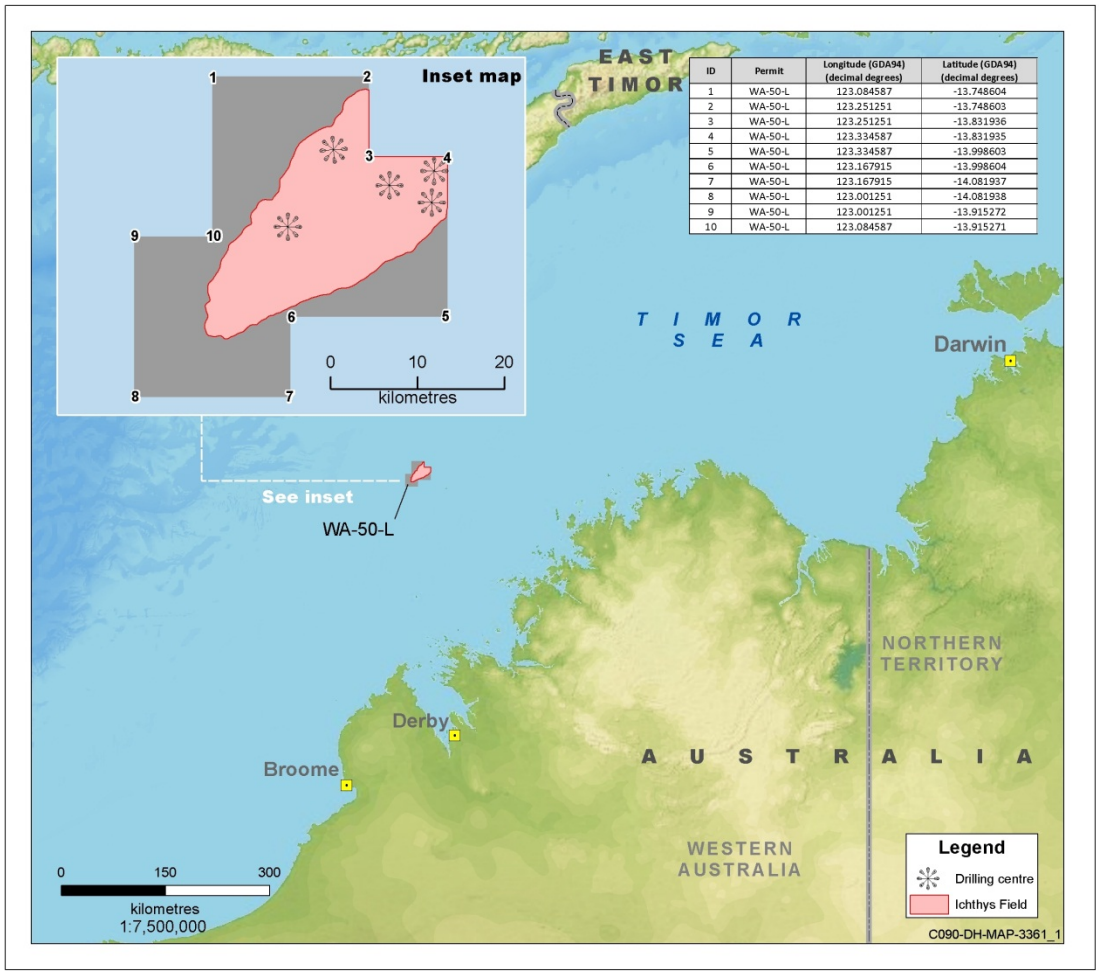
2 LOCATION AND TIMING OF THE ACTIVITY

The Project area is production licence WA-50-L, which is located in Commonwealth waters approximately 230 km north-west of the Kimberley coastline at its closest point (Figure 2-1). Water depths at the proposed well locations range between 235 m and 275 m at Lowest Astronomical Tide (LAT). The closest major town is Derby, located approximately 390 km south of the southern boundary of the Project area.

Coordinates of the indicative development well locations and boundary coordinates for WA-50-L are shown in Figure 2-1.

The drilling of each well is expected to take between 65 - 120 days.

Project activities were commenced in early 2015 under previously accepted environment plans (EPs). Activities will continue under this EP from the fourth quarter of 2015, with completion expected within three to four years.



ID	Permit	Longitude (GDA94) (decimal degrees)	Latitude (GDA94) (decimal degrees)
1	WA-50-L	123.084587	-13.748604
2	WA-50-L	123.251251	-13.748603
3	WA-50-L	123.251251	-13.831936
4	WA-50-L	123.334587	-13.831935
5	WA-50-L	123.334587	-13.998603
6	WA-50-L	123.167915	-13.998604
7	WA-50-L	123.167915	-14.081937
8	WA-50-L	123.001251	-14.081938
9	WA-50-L	123.001251	-13.915272
10	WA-50-L	123.084587	-13.915271

Figure 2-1: Location map of the Project

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3 DESCRIPTION OF THE ACTIVITY

The Project is the continuation of approved activities as described in the INPEX Development Drilling Campaign WA-50-L Environment Plan Rev 1 (C020-AD-PLN-00004) (*former development drilling EP)* and Pre-reservoir Drilling Campaign WA-50-L Environment Plan Rev 0 (D020-AD-PLN-10073) (*pre-reservoir drilling EP*). The current Ichthys Development Drilling Campaign WA-50-L Environment Plan Rev 1 (D020-AD-PLN-10116) serves as a combined revision of these EPs and is intended to permit and consolidate the execution of the drilling, well flowback and completion activities approved in the *former development drilling EP* and *pre-reservoir drilling EP* under a single EP. These two previous EPs will be closed out in accordance with Regulation 25A of the OPGGS (Environment) Regulations, now that the Ichthys Development Drilling Campaign WA-50-L Environment Plan Rev 1 (D020-AD-PLN-10116) has been accepted.

The following provides a summary of the activities proposed to be undertaken under the accepted EP.

3.1 MODU, support vessels and aircraft

Drilling, well flowback and completion activities will be conducted using a semi-submersible mobile offshore drilling unit (MODU)[1] which will be moored to the seabed using a minimum of eight anchors. Typically, two anchor-handling supply vessels (AHSVs) will provide support for the MODU undertaking development drilling activities. The MODU is routinely supported by a platform supply vessel (PSV), as well as regular helicopter flights from the mainland.

3.2 Drilling method

The wells will be drilled in phases using water based mud (WBM) in upper sections of wells and synthetic-based mud (SBM) systems in lower sections.

Drilling, completion, post well suspension and subsea infrastructure installation of each development well will include the following steps:

1) Drilling of conductor hole using seawater and high viscosity sweeps
2) Cementing of steel casings to line hole
3) Installation of blowout preventer (BOP) on the well head
4) Capture and recirculation of drilling fluids
5) Subsequent drilling of bottom of hole sections to target depth
6) Installation and cementing of steel casing
7) Installation of lower, intermediate and upper completion
8) Well flowback and subsequent flaring
9) Installation of subsea infrastructure including christmas tree, safety valves and a choke valve
10) Function testing of subsea christmas tree valves.

[1] More than one MODU may undertake the activities described in this EP. Any MODU or supply vessels undertaking these activities will be required to comply with the relevant requirements of the EP and accompanying Oil Pollution Emergency Plan (OPEP).

3.3 Drilling discharges

There will be a number of discharges a result of drilling activities; these include drill cuttings, fluids and cements.

While using WBM, drill cuttings will be either discharged directly to the seabed (during drilling of the riserless sections of the well) or bought up to the MODU, directed over solids control equipment and then discharged overboard.

Where SBM is used, the solids control equipment will include cuttings dryers. Except for residual fluid on drill cuttings, no SBM will be discharged into the marine environment.

The estimated volume of both WBM and SBM drill cuttings discharged is 600 m^3. The volumes of drilling fluids have been estimated at 3200 m^3 of WBM, and 55 m^3 SBM.

Cement will be used during drilling in order to deliver well integrity. To meet the technical requirements of the well it is estimated that approximately 100 m^3 of cement will be discharged per well.

All drilling fluids, cements and additives will be selected in accordance with the INPEX drilling process for chemical selection and approval.

3.4 Completions and well flowback

In order to prepare for well production, once wells have been drilled to full depth and penetrated the reservoir, completions and well flowback will be undertaken.

3.5 Well clean up and testing

Before well handover to operations, the development wells will be cleaned up to remove drilling mud, debris and completion fluids in order to make the well ready for production start up.

The well clean-up will be followed by flow tests to establish baseline well deliverability, obtain reservoir fluid samples and estimate key formation pressures.

3.6 Well suspension and abandonment

In some circumstances, drilling of a well may cease before the hydrocarbon reservoir is penetrated and the well will be temporarily suspended for re-entry at a later date. Development wells may also be suspended following well testing and completions, prior to installation of the subsea infrastructure.

If abandonment of a well is required, a combination of verified barriers will be used to isolate and abandon the well. The well casings will be cut below the seafloor so that nothing remains above the seabed level and all equipment will be removed.

If a well is suspended or abandoned, it will be done in accordance with the *INPEX Well Control Standard* and the *Well Operations Management Plan*.

3.7 Wastes

Waste streams from the MODU and support vessels are likely to include:

- Atmospheric emissions from the operation of vessel and MODU engines
- Deck drainage
- Brine produced from the reverse osmosis process
- Cooling water
- Sewage, greywater and putrescible waste
- Ballast water
- Solid and liquid wastes.

3.8 Vertical seismic profiling

Further profiling of the subsurface geology may be undertaken using vertical seismic profiling (VSP). This will involve the release of a small acoustic source 5-10 m below the sea surface with recordings taken down-hole. The total duration of the VSP activities is estimated at about 7-10 hours per well.

3.9 Remotely operated underwater vehicle (ROV)

The MODU will be equipped with a ROV, which will be used during pre-spud surveys, and in the monitoring of BOPs, cementing operations, subsurface infrastructure installation, shallow gas and in the event of any unplanned discharges.

3.10 Other activities

In addition to the activities directly related to the drilling of wells, various support activities are within the scope of the Environment Plan. These include:

- rig acoustic positioning
- vertical seismic profiling
- well inspection, maintenance and repair (IMR)
- bunkering and drilling support activities.

4 DESCRIPTION OF THE ENVIRONMENT

4.1 Physical environment

The Project area lies in the Timor Province bioregion, located within the broader North West Marine Region (NWMR). The climate in the Project area is monsoonal with two distinct seasons; summer (October to February) and winter (May to June). Air temperatures in the Project area remain warm throughout the year with means and maximums ranging from 26–30°C and 32–35°C respectively (RPS 2007).

Water depths in the Project area range from approximately from 235–275 m (INPEX 2010). The seabed within the drilling area is expected to be generally flat and devoid of any significant bathymetric features. Studies have indicated that seabed topography is relatively flat and featureless and the geology is generally homogeneous through the Browse Basin. In general, the seabed sediments in the Ichthys Field (in which WA-50-L is located) grade from soft featureless sandy silts in the north, to gravelly sand in the south (INPEX 2010). Sand forms a cover over the silt and is generally represented in the form of sand waves.

During surveys of the Ichthys Field, no obstructions were noted on the seafloor and no features, such as boulders, reef pinnacles or outcropping hard layers were identified (Fugro 2005). The closest known submerged features to the Project area are Heywood and Echuca shoals which are located approximately 85 km to the east and 60 km to the north-east of the Project area (centre of permit area WA-50-L), at their closest points.

The primary ocean current is the Indonesian Throughflow (ITF), which drives cooler oceanic water southerly direction. Regional surface currents show a strong tidal influence with a net westward drift during the monsoon season and a new eastward drift during the dry season. Barotropic tidal currents predominantly flow in the cross-shelf direction at the shelf break and in the shelf direction when approaching the coast (McLoughlin et al.1988).

4.2 Biological environment

The seabed at the Project area is well below the photic zone and consequently, no benthic macrophytes are expected to be present. Surveys in the Ichthys Field, in close proximity to the permit area, indicate that the sediments of the Project area are expected to range from bare substrate to soft sandy silts and support benthic invertebrate species dominated by polychaetes and crustaceans.

A search of the Commonwealth Protected Matters Database has identified 18 Threatened species and 140 listed Migratory/Marine species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that may occur in low abundance within, or transit through, the Project area or broader environment that may be affected (EMBA) for a hydrocarbon spill. These species include cetaceans, fish, dolphins, sea snakes, turtles, dugongs, seabirds and migratory shorebirds (Table 4-1).

There are no conservation areas within, or adjacent to the Project area. The nearest conservation area is the Cartier Island Commonwealth Marine Reserve, located approximately 137 km north of the Project area, at the closest point (Figure 4-1).

No known biologically important areas are identified by the Department of Environment Conservation Values Atlas as occurring within, or adjacent to, the Project area. The closest biologically important area (BIA) in the wider region is whale shark foraging area approximately 11 km to the south of the Project area, followed by a foraging area for green turtles around Browse Island, approximately 24 km south of the Project area (Figure 4-2).

A search of the Department of the Environment (DoE) Conservation Values Atlas (Department of Environment, Sustainability, Water, Population and Communities (DSEWPaC) 2013) identified four key ecological features (KEFs) which occur near WA-50-L or within the potential adverse exposure zone based on the maximum credible hydrocarbon spill scenarios (which are highly unlikely to occur based on the control measures to be implemented). These KEFs include the following:

- Ashmore Reef and Cartier Island and surrounding Commonwealth waters (approximately 160 km and 137 km north of WA-50-L respectively)
- Seringapatam Reef (approximately 102 km west of WA-50-L) and Commonwealth waters in the Scott Reef complex (approximately 112km west of WA-50-L)
- Continental slope demersal fish communities (intersects with the edge of WA-50-L and is approximately 12 km from the centre of WA-50-L)
- Ancient coastline at 125 m depth contour (approximately 18 km south-east of WA-50-L).

Table 4-1: EPBC Act listed species that may occur within or adjacent to the Project area

Scientific name	Common name	Threatened status	Migratory status	Listed marine species
Birds				
Anous tenuirostris melanops	Australian lesser noddy	Vulnerable	–	X
Anous minutus	Black noddy	–	–	X
Anous stolidus	Common noddy	–	X	X
Apus pacificus	Fork-tailed swift	–	X	X
Calonectris leucomelas	Streaked shearwater	–	X	X
Fregata ariel	Lesser frigatebird	–	X	X
Fregata minor	Great frigatebird	–	X	X
Phaethon lepturus	White-tailed tropicbird	–	X	X
Phaethon rubicauda	Red-tailed tropicbird	–	X	X
Puffinus pacificus	Wedge-tailed	–	X	X

Scientific name	Common name	Threatened status	Migratory status	Listed marine species
	shearwater			
Sternula albifrons	Little tern	–	X	X
Sterna anaethetus	Bridled Tern	–	X	X
Sterna bengalensis	Lesser crested tern	–	–	X
Sterna caspia	Caspian tern	–	X	X
Sterna dougallii	Roseate tern	–	X	X
Sula dactylatra	Masked booby	–	X	X
Sula leucogaster	Brown booby	–	X	X
Sula sula	Red-footed booby	–	X	X
Acrocephalus orientalis	Oriental reed-warbler	–	X (wetland species)	X
Ardea modesta	Great egret	–	X (wetland species)	X
Limosa lapponica	Bar-tailed godwit	–	X (wetland species)	X
Pandion cristatus	Eastern osprey	–	X (wetland species)	X
Reptiles				
Aipysurus apraefrontalis (also named *Smithohydrophis apraefrontalis*)	Short-nosed seasnake	Critically Endangered	–	X
Aipysurus foliosquama	Leaf-scaled seasnake	Critically Endangered	–	X
Caretta caretta	Loggerhead turtle	Endangered	X	X
Chelonia mydas	Green turtle	Vulnerable	X	X
Dermochelys coriacea	Leatherback turtle	Endangered	X	X
Eretmochelys imbricata	Hawksbill turtle	Vulnerable	X	X
Lepidochelys olivacea	Olive ridley turtle	Endangered	X	X

Scientific name	Common name	Threatened status	Migratory status	Listed marine species
Natator depressus	Flatback turtle	Vulnerable	X	X
Crocodylus porosus	Saltwater crocodile	–	X	X
Various seasnakes	Various seasnakes	–	–	19 listed (incl. two threatened species, as outlined above)
Mammals				
Balaenoptera musculus brevicauda	Pygmy blue whale	Endangered	X	Cetacean
Balaenoptera borealis	Sei whale	Vulnerable	X	Cetacean
Megaptera novaeangliae	Humpback whale	Vulnerable	X	Cetacean
Balaenoptera bonaerensis	Antarctic minke whale	–	X	Cetacean
Balaenoptera edeni	Bryde's whale	–	X	Cetacean
Feresa attenuata	Pygmy killer whale	–	–	Cetacean
Globicephala macrorhynchus	Short-finned pilot whale	–	–	Cetacean
Kogia breviceps	Pygmy sperm whale	–	–	Cetacean
Kogia simus	Dwarf sperm whale	–	–	Cetacean
Mesoplodon densirostris	Dense-beaked whale	–	–	Cetacean
Orcinus orca	Killer whale	–	X	Cetacean
Peponocephala electra	Melon-headed whale	–	–	Cetacean
Physeter macrocephalus	Sperm whale	–	X	Cetacean
Pseudorca crassidens	False killer whale	–	–	Cetacean
Ziphius cavirostris	Cuvier's beaked whale	–	–	Cetacean

Scientific name	Common name	Threatened status	Migratory status	Listed marine species
Dugong dugon	Dugong	–	X	X
Delphinus delphis	Common dolphin	–	–	Cetacean
Grampus griseus	Risso's dolphin	–	–	Cetacean
Lagenodelphis hosei	Fraser's dolphin	–	–	Cetacean
Orcaella brevirostris[2]	Irrawaddy dolphin	–	X	Cetacean
Sousa chinensis	Indo-Pacific humpback dolphin	–	X	Cetacean
Stenella attenuata	Spotted dolphin, pantropical spotted dolphin	–	–	Cetacean
Stenella coeruleoalba	Striped dolphin	–	–	Cetacean
Stenella longirostris	Long-snouted spinner dolphin	–	–	Cetacean
Steno bredanensis	Rough-toothed dolphin	–	–	Cetacean
Tursiops aduncus	Indo-Pacific bottlenose dolphin (Arafura/Timor seas populations)	–	X	Cetacean
Tursiops truncatus s. str.	Bottlenose dolphin	–	–	Cetacean
Fish				
Glyphis garricki	Northern river shark	Endangered	–	–
Carcharodon carcharias	Great white shark	Vulnerable	X	–
Pristis clavata	Dwarf sawfish	Vulnerable	X	–
Pristis pristis	Largetooth sawfish	Vulnerable	X	–
Pristis zijsron	Green sawfish	Vulnerable	X	–
Rhincodon typus	Whale shark	Vulnerable	X	–

[2] *Orcaella heinsohni* (previously *O.brevirostris*) common name Australian snubfin dolphin (Department of Environment 2015)

Scientific name	Common name	Threatened status	Migratory status	Listed marine species
Isurus oxyrinchus	Shortfin mako	–	X	–
Isurus paucus	Longfin mako	–	X	–
Manta alfredi	Reef manta ray	–	X	–
Manta birostris	Giant manta ray	–	X	–
Various pipefish, pipehorse, seahorse	Various pipefish, pipehorse, seahorse	–	–	32 listed

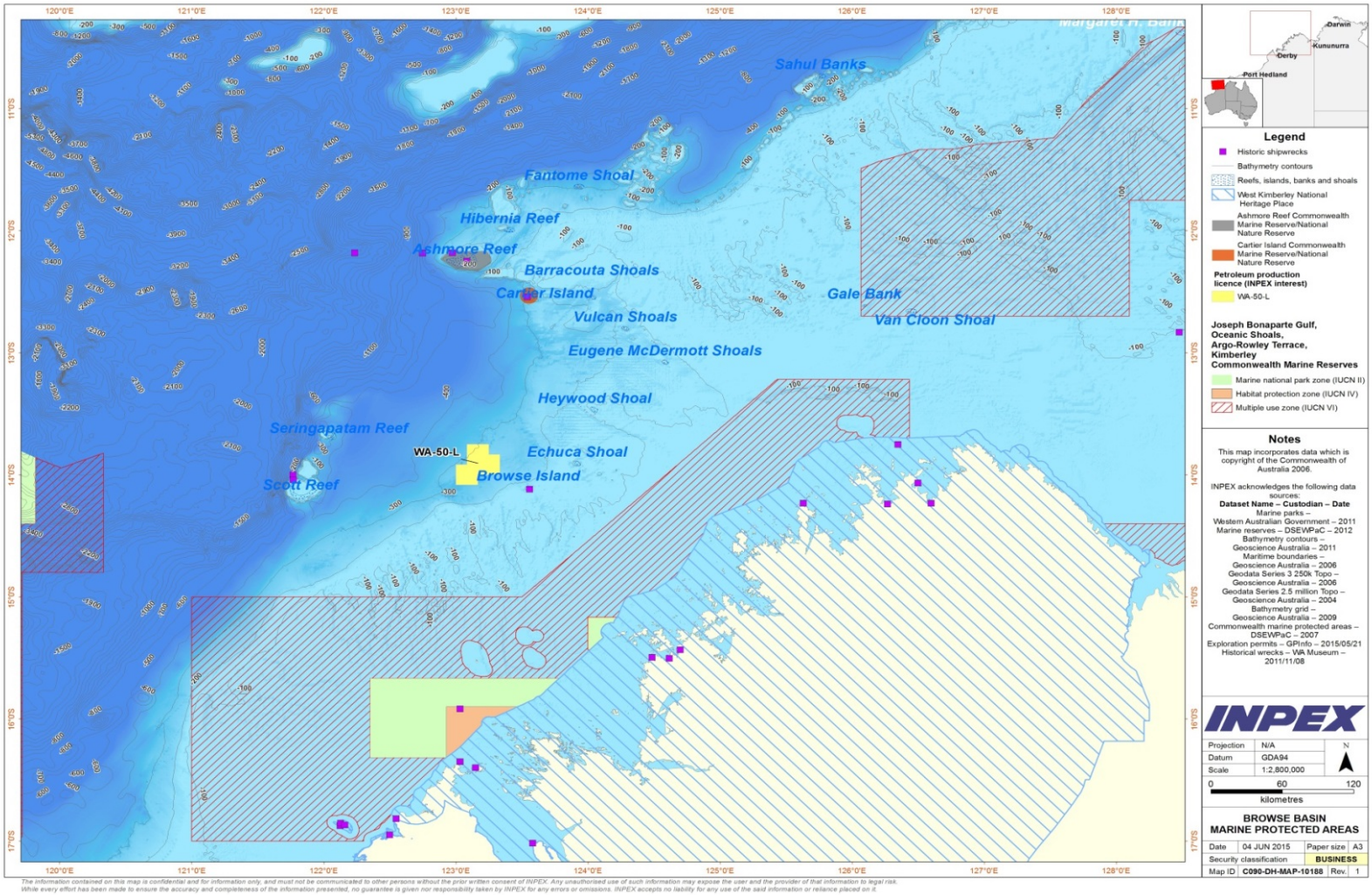

Figure 4-1: Environmental sensitivities including Browse Island habitats

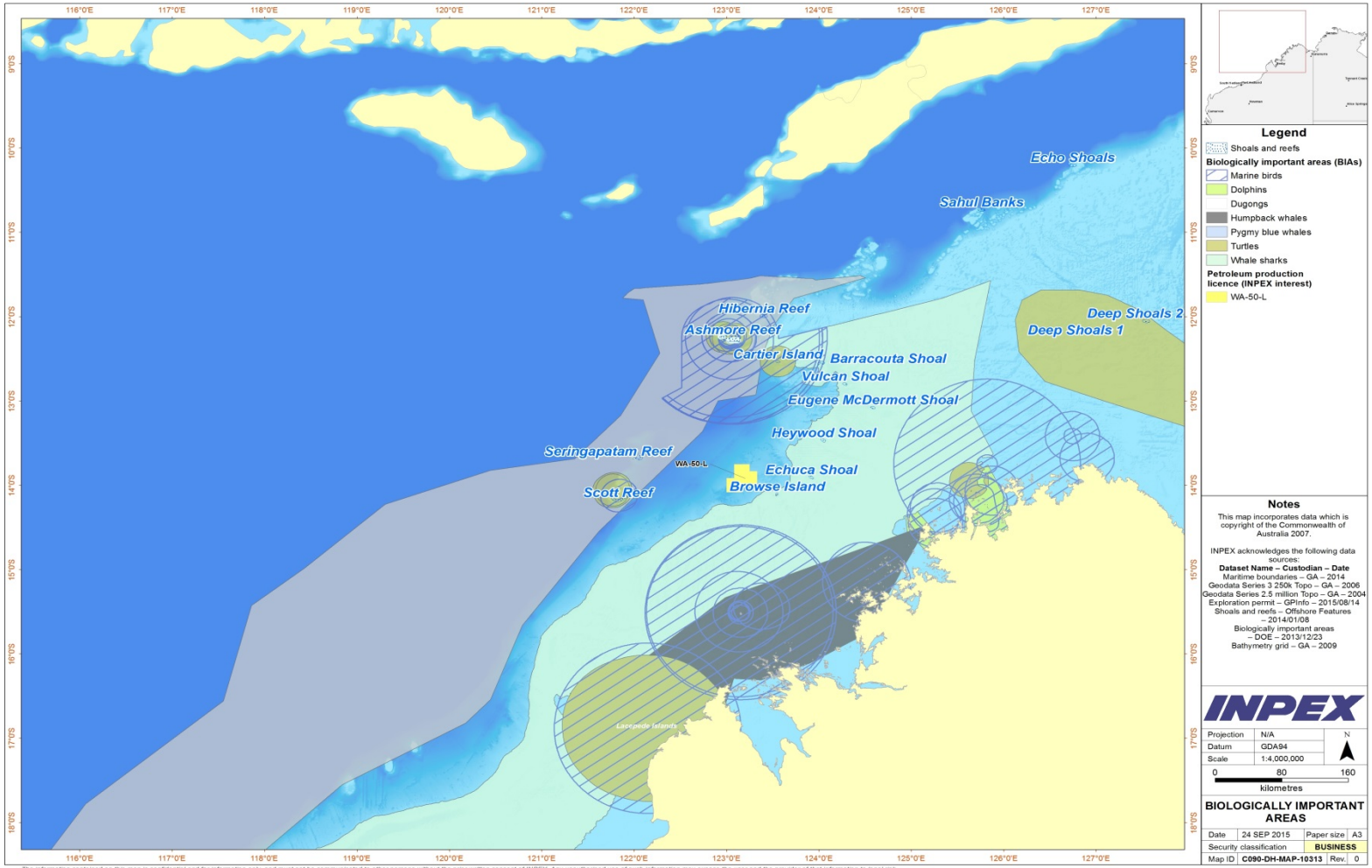

Figure 4-2: Biologically important areas

4.3 Socio-economic environment

The Project area is not located in, or immediately adjacent to, any national heritage, world heritage, wetland of international importance, Commonwealth marine reserve, maritime heritage or indigenous heritage places.

Traditional Indonesian fishing, under the Memorandum of Understanding (MoU) signed by Indonesia and Australia in 1974, may occur in the Project area, however, the area traditionally fished does not directly overlap with WA-50-L.

Three Commonwealth-managed commercial fishery and three State-managed commercial fisheries overlap the Project area or broader EMBA and include the:

- North West Slope Trawl Fishery (Commonwealth)
- Southern Bluefin Tuna Fishery (SBTF) (Commonwealth)
- Western Skipjack Tuna Fishery (Commonwealth)
- Northern Shark Fisheries, including the West Australian North Coast Shark Fishery and the Joint Authority Northern Shark Fishery (State)
- Mackerel Managed Fishery (State)
- Northern Demersal Scalefish Fishery (State).

While these fisheries overlap the Project area/EMBA, no concerns were raised by the Australian Fisheries Management Authority (AFMA) or individual stakeholders during stakeholder consultation.

The Project area is located in deeper, offshore waters that are not expected to be accessed for tourism activities including recreational fishing and boating, and charter boat operations, which are typically centred around nearshore waters, islands and coastal areas.

Although there are no oil and gas production facilities currently in operation within the Browse Basin, the region is subject to considerable exploration activity. Shell is in the process of constructing a floating liquefied natural gas (FLNG) facility (for its Prelude and Concerto gas fields) which will be located to the north east of the Project area within the Browse Basin. Additionally, the Browse Joint Venture proposes to commercialise three fields, Brecknock, Calliance and Torosa, as part of the Browse FLNG Development in the vicinity of Scott Reef.

The closest major commercial port to the Project area is Broome, approximately 450 km south-south-west of the Project area. No shipping routes traverse the Project area, with the main shipping channel located to the north-west.

The Royal Australian Air Force (RAAF) Base Curtin air to air weapons range training area is located approximately 100 km south-west of the Project area. Helicopter transfer of personnel between Broome and the Project area would always comply with any restrictions of movement in airspace. Helicopter transfer will be re-routed to avoid the restricted area when necessary and therefore, there will be no interaction with RAAF activities.

5 ENVIRONMENTAL IMPACTS AND RISKS

INPEX has a risk management process to verify that activities are undertaken such that risks are managed to 'as low as reasonably practicable' (ALARP) and acceptable levels. The risk assessment has been undertaken for all drilling activities, in accordance with the procedures outlined in the Australian and New Zealand Standards *AS/NZS ISO 31000:2009, Risk management—Principles and guidelines* and *HB 203:2012, Managing environment—Related risk*. The process is documented at various levels throughout the organisation and is supported by risk management standards, procedures and tools.

Key elements of the risk management process are as follows:

- **Identification of sources of risk/ hazard:** identifies the sources of risks (hazards) and their environmental and socio-economic impacts.
  - Identification of hazards – the identification of planned and credible unplanned interactions between aspects of the Project and environmental and socio economic receptors that represent a hazard with the potential to impact on the described environment.
  - Identification of impacts – the identification of adverse or beneficial changes to environmental and socio-economic receptors resulting from hazards (planned and credible unplanned interactions).
- **Risk analysis:** determines the level of risk (which is the product of the consequence and likelihood of an impact occurring) of an environmental impact. Inherent and residual risk analyses have been undertaken and are defined as:
  - Inherent risk – the analysis of pre-treatment (management or mitigation) risk levels demonstrates the risk of a particular impact should management or mitigation measures fail.
  - Residual risk – the analysis of post-treatment risk levels identifies all measures applied to reduce the risk to residual level.
- **Risk evaluation:** compares the level of risk found during the risk analysis process against acceptability and tolerability, and determines whether further management measures are required to reduce a risk to ALARP. The evaluation of risks has been undertaken in two stages to completely demonstrate that the environmental impacts and risks will be reduced to ALARP, these being:
  - Preliminary risk evaluation – the evaluation of planned risks (arising from planned hazards). If the preliminary risk evaluation identifies the need for a risk to be further evaluated (i.e. the risk is deemed unacceptable, intolerable and requires further management measures to be ALARP), the risk is further evaluated in the detailed risk evaluation.
  - Detailed risk evaluation – the detailed evaluation of planned risks requiring further investigation and unplanned risks (arising from unplanned hazards). The detailed risk evaluation further analyses the impacts associated with a risk, additional management measures required for the risk to be ALARP and provides a description of acceptability.

Table 5-1 provides a summary of the risks assessed for the Project.

Table 5-1: Preliminary and detailed risk evaluation of Project risks

Sources of risk (hazard)	Preliminary risk evaluation	Detailed risk evaluation
Physical presence		
Physical presence of MODU, supply vessels and helicopters	✓	
Anchoring of MODU	✓	
Introduction of invasive marine species (IMS)		✓
Interference and/or collision with marine fauna		✓
Physical presence of seabed infrastructure, rig acoustic positioning and IMR activities	✓	
Well abandonment	✓	
Waste management		
Non-hazardous waste	✓	
Hazardous waste	✓	
Discharges to the marine environment: planned		
Cooling water	✓	
Treated sewage, grey-water and putrescible waste	✓	
Deck drainage and bilge	✓	
Disposal of drilling fluids and cuttings		✓
Cementing fluids and additives	✓	
Blowout preventer control fluids and subsea control fluids	✓	
Brine discharge from reverse osmosis (RO) plant onboard the MODU	✓	
Discharges to the marine environment: unplanned		
Spill of marine diesel/SBM during bunkering or transfer operations		✓
Vessel collision resulting in a marine diesel spill		✓
Loss of well containment leading to release of gas with low condensate content		✓

Sources of risk (hazard)	Preliminary risk evaluation	Detailed risk evaluation
Inappropriate hydrocarbon spill response strategies		✓
Emissions: planned		
Atmospheric emissions	✓	
Light emissions	✓	
Noise emissions: general drilling operations	✓	
Sound generation: VSP		✓
Ozone depleting substances (ODS)	✓	✓
Emissions: unplanned		
Unplanned well control resulting in venting of gas during drilling		✓
Unplanned venting of gas during testing activities		✓
Drop-out of hydrocarbons while flaring wells		✓
Implementation strategy administration		
Failure to employ implementation strategy and performance outcomes, standards and measurement criteria		✓
Poor environmental awareness		✓
Failure to undertake scheduled audits, inspections, monitoring and review of environmental performance		✓

The preliminary and detailed risk assessments were informed by relevant documentation pertaining to matters of national environmental significance (MNES) contained in the following:

- Department of Environment Conservation Values Atlas
- species recovery and conservation management plans
- species factsheets, gazettes and referral guidelines.

5.1 Control measures

The key environmental risks and control measures to be applied to the Project are provided in Appendix A. These are consistent with INPEX's Corporate and Project-specific objectives, standards and measurement criteria. All control measures associated with the hazards will be used to reduce environmental risk to ALARP and all risks will be of an acceptable level.

6 ONGOING MONITORING OF ENVIRONMENTAL PERFORMANCE

The Project will be managed in compliance with the *Ichthys Development Drilling Campaign WA-50-L EP* accepted by NOPSEMA under the Environment Regulations, other relevant environmental legislation and the INPEX Environment Policy.

The implementation strategy is the key mechanism of monitoring environmental performance throughout the life of the Project, with a particular focus on determining that environmental performance outcomes and standards in the EP are being met.

The implementation strategy will be undertaken in accordance with the INPEX Health Safety and Environment – Management System, which provides a foundation of standards, procedures and tools that support the implementation of the EP in accordance with Regulation 14 of the OPGGS (E) Regulations.

The key components of implementation of the EP are:

- **Policy:** provides a statement of INPEX's Environment Policy which sets the framework for the INPEX Health Safety and Environment Management System (HSE-MS) under which the Project will be managed to ensure that the environmental impacts and risks of the Project area continuously reduced to ALARP.
- **Plan:** specific INPEX standards and guidelines to be used to ensure the Project will be managed such that risks are ALARP.
- **Do:** details roles and responsibilities, training and competency measures, INPEX emergency response framework including incident management, references to the INPEX Oil Pollution and Emergency Plan (OPEP) (D020-AD-PLN-10072) and contractor Shipboard Oil Pollution Emergency Plan (SOPEP), cyclone response and emergency response training which in turn provides for the maintenance for the INPEX OPEP and contractor SOPEP, and provides details on INPEX document control procedures.
- **Check:** monitoring, audit and management of non-conformance of INPEX environmental performance and the implementation strategy.
- **Act:** management review of the Project's environmental performance and the implementation strategy.

At a high level, monitoring of environmental performance is evaluated through the following:

- annual environmental performance report which is submitted to NOPSEMA for assessment to confirm compliance with the environmental performance objectives, standards and measurement criteria outlined in the EP.
- formal INPEX annual management review to (among other matters) verify the implementation, adequacy and effectiveness of the EP.
- internal INPEX monthly performance reports which include review of HSE incidents, HSE incidents, total recordable case frequencies compared with the previous twelve months, performance against key performance indicator targets, which include environmental metrics and outstanding actions as a result of audits or incident investigations
- emissions and discharges monitoring data.

6.1 Environment plan revision

Any revisions of the EP will be conducted in accordance with Regulation 17 of the OPGGS (E) Regulations and submitted to NOPSEMA for approval. Revision of the EP will occur if there is a change, or proposed change, of circumstances or operations, for example the introduction of a new significant environmental impact/risk or increase in an existing environmental impact/risk.

7 RESPONSE ARRANGEMENTS IN THE OIL POLLUTION EMERGENCY PLAN

The INPEX *Ichthys Development Drilling Campaign WA-50-L OPEP* (D020-AD-PLN-10115) details the spill response activities and arrangements, and provides a framework for response to any accidental hydrocarbon discharge from the MODU and supply vessels engaged in the drilling campaign within licence area WA-50-L. Contractors (MODU and vessel) are required to comply with this OPEP. Contractors are also required to maintain emergency response plans and trained personnel as appropriate to their scope of work. INPEX will manage its contractors to verify effective spill response strategies are implemented safely.

INPEX have existing contracts in place with Australian Marine Oil Spill Centre (AMOSC), Oil Spill Response Limited (OSRL) and RPS Asia Pacific Applied Science Associates (RPS APASA) for the supply of spill response resources, personnel and oil spill trajectory modelling (OSTM). INPEX has also entered into a MoU with the Australian Maritime Safety Authority (AMSA) which details each party's understanding of their respective roles and responsibilities when responding to marine pollution incidents, including provision of aerial response services and cost recovery.

The OPEP for the Project provides:

- protocols for response escalation and the interfacing of this OPEP with federal and state plans – most notably for vessel based spills and the interface with the National Plan for Maritime Environmental Emergencies (AMSA 2014)
- guidance and direction to the site emergency response team (ERT), incident management team (IMT) and crisis management team (CMT) in relation to all aspects of the response activities
- descriptions of the specific roles and responsibilities for spill response support roles for contractors' ERTs, INPEX IMT and CMT personnel in the event of a marine hydrocarbon spill
- an outline of the proposed schedule for the testing of spill response arrangements (i.e. exercises, drills and audits)
- an outline of the primary and secondary response strategies, including detailed response action plans which provide practical "action based" resource guides for implementation of response strategies in the event of a spill. The response actions plans outline the specific actions and outcomes, resources required and suppliers, and persons/ organisations responsible for implementing the response. Refer to Section 7.1 for further details
- for effective operational and scientific monitoring in response to an oil spill event, if required based on the nature and scale of the spill. Plans contained in the Operational and Scientific Monitoring Program (OSMP) will be implemented as part of the response strategies detailed in Section 7.1.

7.1 Primary and secondary response strategies

Primary response strategies

The primary response strategies considered ALARP and acceptable (depending on the tier of spill) for the credible spill scenarios that could occur as a result of the Project are:

- *Monitoring and evaluation:*
  - Overarching outcome: Spills monitored and evaluated (based on the adverse exposure zone) throughout the course of the spill until there are no visible signs of pollution at the sea surface.
  - The following techniques will be used to deliver the response strategy, as appropriate to the tier of spill: vessel surveillance, OSTM, tracking buoy deployment and subsequent tracking, aerial and satellite spill surveillance, satellite imagery analysis and operational monitoring program surveys.
- *Pre-contact wildlife response*
  - Overarching outcome: Protect wildlife from hydrocarbon impact.
  - The following hazing practices to exclude wildlife from the spill area may be adopted depending on nature of the spill threat and wildlife affected - artificial visual, auditory threat stimuli or exclusion devices.

Secondary response strategies

Secondary response strategies are provided to present options to reflect required flexibility for response planning in actual spill circumstances. These secondary response strategies may be enacted in the unlikely event that results of modelling an incident indicate that the behaviour and fate of a spill is significantly different to the modelled credible spill scenarios presented in this OPEP. Secondary responses would also only be implemented if they satisfy all conditions of the secondary response strategy decision making process and may be activated in conjunction with the primary response strategies (as appropriate).

Secondary response strategies which may be implemented include:

- protect and deflect
- post-contact wildlife response
- containment and recovery
- shoreline clean-up.

An assessment of the impacts and risks associated with implementation of response strategies has been undertaken with only response strategies considered ALARP and acceptable being considered in the event of a hydrocarbon spill from Project activities. In the event of an actual spill, the implementation of the response strategies will be subject to an operational Net Environmental Benefit Assessment (NEBA) prior to commencement to further verify benefits from implementation. Key impacts and risks identified include:

- monitor and evaluate – vessel collision with marine fauna/third party vessels, HSE risks and lack of material changes to spill trajectory
- pre-contact wildlife response – potential stress to wildlife, vessel collision with marine fauna/third party vessels, potential to haze wildlife towards a spill and undue harm for certain seasonal sensitivities
- post contact wildlife response – access to shorelines for wildlife retrieval can result in shoreline damage, injury, stress or damage during treatment and premature release of captured wildlife

- containment and recovery – damage to submerged benthic habitat during boom deployment/recovery, vessel collision with marine fauna/third party vessels and reduces natural degradation
- protect and deflect – damage to submerged benthic habitat during boom deployment/recovery/dislodgement and vessel collision with marine fauna/third party vessels
- shoreline clean-up – damage to sensitive shorelines during clean up and may cause remobilisation of hydrocarbons in sediment.

Environmental controls and mitigation measures associated with reducing impacts and risks of response strategies are detailed in Appendix A.

8 CONSULTATION

INPEX has been a member of the Australian business community since 1986 and during this time has engaged with stakeholders on a regular basis for a broad range of activities. As such, INPEX has utilised well-developed stakeholder engagement procedures in order to consult in an appropriate manner with a variety of stakeholders relevant to the Project. The engagement planning process included the following tasks:

- convene stakeholder identification and classification workshop
- compile list of stakeholders
- rate stakeholder levels of interest and expectations
- rate stakeholder levels of influence
- determine appropriate method of stakeholder engagement
- finalise and approve stakeholder register.

INPEX has utilised this process to engage with relevant stakeholders that have an interest in or the potential to be affected by the Project, as consistent with Regulation 11A of the OPGGS (E) Regulations. Stakeholder groups that were identified as relevant are presented in Table 8-1, which additionally describes whether or not the stakeholder has raised a relevant matter since 2013.

Table 8-1: Relevant Stakeholders engaged for Ichthys development drilling activities (2013/15)

Stakeholder	Matter raised
Australian Government departments and agencies; Ministers of relevant portfolios	
Australian Maritime Safety Authority (AMSA)	No
Australian Fisheries Management Authority	No
Parliamentary Secretary to the Minister for Agriculture *(jurisdiction for Fisheries)*	No
Department of Agriculture (Biosecurity)	No
Department of Industry	No
National Offshore Petroleum Titles Administrator	No
Minister for Industry	No
Department of the Environment	No
Minister for the Environment	No
Australian Institute of Marine Science (AIMS)	No
Department of Defence (Northern Command)	No
Australian Customs and Border Protection Service (Broome Office)	No
Australian Hydrographic Service (AHS)	No

Stakeholder	Matter raised
Western Australian Government departments and agencies; Ministers of relevant portfolios	
Department of Environment Regulation – Hazard Management and Contaminated Sites branches	Yes
Department of Parks and Wildlife – Environmental Management Branch	Yes
Minister for the Environment	No
Department of Transport – Marine Safety Branch	No
Department of Fisheries	No
Minister for Fisheries	No
Department of Mines and Petroleum	No
Minister for Mines and Petroleum	No
Minister for Energy	No
Kimberley Ports Authority	No
Local government authorities	
Shire Of Broome	No
Shire of Derby/West Kimberley	No
Shire of Wyndham/ East Kimberley	No
National Native Title Tribunal, relevant Aboriginal and Torres Strait Islander land councils and prescribed bodies corporate, traditional owners and relevant land councils in areas potentially impacted by the operations activities	
National Native Title Tribunal	No
Kimberley Land Council	No
Indigenous Land Corporation	No
Bardi and Jawi Niimidiman Aboriginal Corporation (Prescribed Body Corporate) *-represents traditional owners in Dampier Pensinsula and other areas*	No
Wanjina-Wunggurr (Native Title) AC *-represents traditional owners in Kalumburu and other areas*	No
Nyamba Buru Yawuru Ltd (Yawuru Native Title Holders AC) *-represents traditional owners of Broome*	No
Djarindjin Community (Dampier Peninsula)	No
Lombadina Community (Dampier Peninsula)	No
Kooljaman at Cape Leveque (Dampier Peninsula)	No
Commonwealth-managed Fisheries stakeholders	
Commonwealth Fisheries Association	No

Stakeholder	Matter raised
Australian Southern Bluefin Tuna Industry Association	No
Jamaclan Marine Services	No
Individual licence/permit holders in the following fisheries: • North West Slope Trawl Fishery • Western Skipjack Fishery • Western Tuna and Billfish Fisheries	No
Western Australian-managed Fisheries stakeholders	
Western Australian Fishing Industry Council *(also represents Commonwealth-managed Fisheries located offshore of WA)*	No
Pearl Producers Association of Western Australia	No
Individual licence/permit holders in the following fisheries: • Kimberley Prawn Managed Fishery • Mackerel Managed Fishery • Northern (North Coast) Shark Fishery • Northern Demersal Scalefish Fishery • Pearl Oyster Managed Fishery *(through Pearl Producers Association)*	No
Recreational fishing associations	
Recfishwest (WA)	No
Environmental, heritage and marine research groups	
Centre for Whale Research (WA) Inc.	No
Australian Conservation Foundation (ACF)	No
World Wildlife Fund for Nature (WWF)	No
Conservation Council of WA	No
Oil spill response	
Australian Marine Oil Spill Centre	No
RPS Asia–Pacific Applied Science Associates (RAPASA)	No
Oil Spill Response Limited	No
Other business	
Mermaid Marine Australia Limited	No

8.1 Consultation undertaken

A stakeholder engagement plan (register) was developed in 2013 and reviewed in 2014 and 2015 to capture the identified stakeholders, their assigned classification and the proposed manner of engagement (i.e. how, when, where, by whom), in accordance with INPEX's formal engagement protocol and taking guidance from the International Association for Public Participation (IAP2) Participation Spectrum.

To facilitate the engagement process with stakeholders, INPEX produced consultation fact sheets and communicated with stakeholders through face-to-face meetings, emails and phone calls, as needed, to provide additional information on the Project and the consultation process.

In February 2015, the general Ichthys Project overview fact sheet was updated for all offshore activities and distributed to all previously identified (relevant) stakeholders (Table 8-1) as part of ongoing engagement on those particular activities. The updated fact sheet describes the use of a second MODU to assist in the Ichthys development drilling activities.

8.2 Assessment of responses from relevant stakeholders

Relevant stakeholders were consulted as outlined in Table 8-1, and a summary of the matters raised are provided in Table 8-2 below.

Table 8-2: Summary of matters raised

Category, jurisdiction, subcategory	Stakeholder organisation	Stakeholder Comment	INPEX Response
Authority, Western Australia, State/local authority	**Department of Parks and Wildlife (DPAW)** *(previously Department of Environment & Conservation)*	DPAW advised INPEX would require a permit to haze birds from the Department of Transport (DOT) as this is considered a pre-emptive action.	Advice was noted by INPEX, and the OPEP notes that fauna hazing will be conducted under the direction of the wildlife response commander (sourced from AMOSC), in accordance with the INPEX Oiled Wildlife Response Operations Plan (C020-AD-TCN-00018).
	Department of Environment Regulation (DER)	DER requested that, should there be an oil spill with the potential to impact upon Browse Island in WA state waters, INPEX should notify DER about the oil spill as soon as possible, as per Section 72 of the WA *Environmental Protection Act 1986*.	OPEP species that in the event of a hydrocarbon spill which is predicted to impact on Browse Island that the DER will be notified via WA's DoT in accordance with WestPlan-MOP.

8.3 Ongoing consultation

As appropriate to the nature and the scale of the Project, INPEX has planned for only a low level of ongoing consultation during the operational phase of the activities.

A further update on Ichthys development drilling activities (as described in this EP summary) is planned prior to the additional MODU conducting completion and well flowback activities. The next update is scheduled for early 2016, as part of the ongoing consultation commitment.

Stakeholders will be notified of any proposed changes, and how they may be affected, verbally and/or by e-mail or letter.

Ongoing stakeholder feedback and concerns have been encouraged during previous consultation efforts and, through, use of the INPEX contact details provided in fact sheets, stakeholders can continue to contact INPEX with feedback.

Should any concern be raised that would have the potential to result in a change to the Project or the EP, the change would be managed in accordance with the INPEX MOC standard and related procedures and guidelines.

Where a change is proposed as a result of stakeholder claims/concerns, internal notification will be communicated via a MOC request. The request will identify the proposed change along with the underlying reasons, and highlight potential areas of risk or impact. Where the change could affect the environment, in accordance with the INPEX business rules, it is mandatory to undertake an environmental risk assessment in every case. The MOC request will be circulated to an Environmental Advisor who will then determine the necessary approval/endorsement pathway.

This process for assessing change primarily determines whether the change/ variance to the activity is considered a significant modification or new stage of the activity, or if it results in a new or increased environmental impact or risk. If either of these criteria is triggered, a revised or new EP is required for acceptance, prior to implementing the change, and stakeholders will be further consulted in accordance with the OPGGS (Environment) Regulations.

8.4 Stakeholder issues and grievance management

Any queries or complaints received in response to the Project have been treated as issues and dealt with in the course of developing the relevant EP and OPEP. INPEX has documented in the relevant EP or OPEP any change to the proposed activity, where management or resolution of an issue raised by a stakeholder during engagement has required such change.

Any complaints or grievances raised in relation to the conduct of engagement would be treated as grievances and managed in accordance with the process defined in the INPEX Community Grievance Management Procedure. Positive feedback in relation to the proposed activities or the engagement performed is also recorded where received to date, this has typically been appreciation for updated information on activities.

No grievances have been recorded during Ichthys development drilling activities.

9 TITLEHOLDER'S NOMINATED LIAISON PERSON

The main point of contact for further information regarding this EP or the Project is:

Dawn MacInnes
HSE Manager, Drilling
INPEX
Level 22, 100 Saint Georges Terrace, Perth, WA 6000
T + 61 8 6213 6477
Dawn.macinnes@inpex.com.au

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APPENDIX A: ENVIRONMENTAL IMPACTS, RISKS AND CONTROL MEASURES

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
Physical presence		
Physical presence of MODU, supply vessels and helicopters	Interference with and/or exclusion of other commercial users. Loss of access within 500 m safety exclusion zone leading to loss of revenue.	• Establishment and maintenance of a 500 m petroleum safety zone around the MODU. • Notification of Australian Hydrographic Service (AHS), AMSA and marine users in the Project area. AHS will issue a Notice to Mariners while AMSA will issue MSI notifications (coastal and NAVAREA X warnings). • Implementation of a stakeholder engagement procedure and consultation with relevant stakeholders. • To reduce the potential for vessel collision, specific measures will be implemented, including use of lights and signals in accordance with *Marine Orders - Part 30: Prevention of collisions, Issue 8* (Order *No. 5 of 2009).* • Adherence of contractors to relevant standard maritime safety or navigation procedures, as per *Navigation Act 2012*, *Convention on the International Regulations for Preventing Collisions at Sea 1972*, Part B – Steering and Sailing (Rules 4–19), International Finance Corporation (IFC) *Environment, Health and Safety Guidelines for Offshore Oil and Gas Development* – Ship collision and *Marine Orders – Part 30: Prevention of collisions, Issue 8* (Order No. 5 of 2009) (as implemented by the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*), as appropriate to vessel class.
Anchoring of MODU	Temporary physical scarring of benthic habitats.	• Pre-drilling surveys to verify MODU anchoring takes place in areas which do not support sensitive benthic primary producer habitat. • Preparation and implementation of a Rig Move and Positioning Plan prior to the MODU arriving in the Project area.
Physical presence of seabed infrastructure, rig acoustic positioning and IMR activities	Temporary minor loss of benthic habitats. Interaction with other users.	• Installation of IMR equipment (for example, leak detection systems or acoustic rig positioning will not occur in areas supporting sensitive benthic primary producers). • Conduct assessment of existing bathymetry and pre-drilling surveys to verify sensitive habitats are absent.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
Introduction of IMS	Reduction in species biodiversity of surrounding environment. Displacement of native marine species. Socio-economic impacts on commercial resources (e.g. fisheries).	• Adherence of contractors to the INPEX *Quarantine (Environmental) Management Standard* (C075-AH-STD-0020) and INPEX *Marine Quarantine Guidelines* (C075-AH-GLN-0016). • Pre-mobilisation IMS risk assessment completed for selected MODU or relevant vessels (vessel mobilised from outside of Australian waters and required to enter and operate within nearshore Australian waters defined as being with 12 nautical miles of land and waters less than 50 m depth). • Based on the outcomes of the IMS risk assessment, implement management measures commensurate with the risk, such as inspections, movement restrictions, etc. • Maintenance of a biofouling record book • Compliance with all Australian legislation and current guidance from Department of Agriculture and WA Department of Fisheries associated with quarantine matters, including Australian Ballast Water Management Requirements – Version 5 (as defined under the *Quarantine Act 1908, Biosecurity Act 2015* (and any exemptions INPEX may have in place) and aligned with the IMO International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 – MARPOL 73/78) when necessary. • Compliance with *International Convention on the Control of Harmful Anti-fouling Systems on Ships* (IMO 2001) and *National Biofouling Management Guidance for the Petroleum Production and Exploration Industry* (Commonwealth of Australia 2009).
Interference/ collision with marine fauna	Marine fauna behavioural change. Injury or mortality of significant fauna from vessel strike.	• Vessels will comply with EPBC Regulations 2000 – Part 8 Division 8.1. • Implementation of the INPEX *Marine Megafauna Interaction and Observation Procedure* (C075-AH-PRC-0029). • Maintain low speeds in the area of operations. Supply vessels in the 500 m safety exclusion zone will be travelling < 6 knots. • Crew briefings and vessel master inductions.
Well abandonment	Temporary localised damage/ disturbance of benthic habitats.	• Implement the INPEX *Well Construction and Integrity Well Design Standard* (PER-00227668) and drilling campaign Well Operations Management Plan (WOMP). • Casings will be cut below the seafloor with a post-well ROV survey will be conducted to verify this is conducted.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
Waste management		
Improper management of non-hazardous waste	Pollution and contamination of the environment. Injury or mortality of marine biota (ingestion, or entanglement with litter).	• Compliance with the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Parts IIIA and IIIC and MARPOL Annex V • Adherence to INPEX *Waste Management Standard* (C075-AH-STD-0018) *Drilling Waste Management Procedure* (D020-AD-PRC-10034).
Improper management of hazardous waste	Pollution and contamination of the environment. Temporary and localised reduction in water quality leading to toxic effects on marine biota. Injury or mortality of marine biota.	• Compliance with the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Parts IIIA and IIIC. • Compliance with *Marine Orders – Part 94: Marine Pollution Prevention* – Packaged Harmful Substances (as appropriate to vessel class). • Adherence to INPEX *Waste Management Standard* (C075-AH-STD-0018) *Drilling Waste Management Procedure* (D020-AD-PRC-10034).
Discharges to the marine environment: planned		
Cooling water discharge	Localised increase in ambient sea water temperature. Reduced water quality leading to physiological damage and/or toxic effects on fish.	• Cooling water will be <3 ^{o}C from background temperature 100 m from the source • Implement an operational preventative maintenance system for cooling water system. • INPEX to verify that the MODU/vessel contractor complies with INPEX *Liquid Discharge Standard (C075-AH-STD-0019)*.
Treated sewage, grey water and putrescible waste discharge	Reduced water quality. Toxic effects on marine flora and fauna.	• Manage and dispose of sewage and putrescible wastes in accordance with MARPOL 73/78 Annex IV, Marine Orders – Part 96: Marine Pollution Prevention – Sewage as enacted in the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Part IIIB (as appropriate to vessel class). • Manage and disposal of sewage in accordance with INPEX *Liquid Discharges Standard* (C075-AH-STD-0019). • Manage and dispose of garbage in accordance with: MARPOL 73/78 Annex III, Marine Orders – Part 95: Marine Pollution Prevention – Garbage, as enacted in the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Parts IIIA and IIIC (as appropriate to vessel class) • Current International Sewage Pollution Prevention Certificate.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
		• Sewage and putrescible wastes macerated to a diameter of less than 25 mm prior to disposal. • Discharge records maintained.
Drainage overboard of treated bilge and treated and untreated deck drainage	Temporary and localised reduction in water quality.	• Compliance with *Marine Orders – Part 91: Marine Pollution Prevention* – Oil; *and Marine Orders – Part 94: Marine Pollution Prevention* – Packaged Harmful Substances, as appropriate to vessel class, *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* – Part II. • Liquids with oil-in-water content exceeding 15 ppm will be contained and disposed of onshore. • Liquids from drains will be discharged only if the oil-in-water content does not exceed 15 ppm. • MODU/vessel contractors to verify a functioning deck drainage system.
Disposal of drill fluids and drill cuttings (residual SBM on drill cuttings and WBM)	Increased water turbidity. Smothering of significant benthic fauna. Temporary and localised reduction in water quality.	• Contractor compliance with the Drilling and Completion Fluid Selection Procedure (C020-AD-PRC-10000). • Discharges of SBM drill cuttings in accordance with the WA Department of Mines and Petroleum Guidelines: *Drilling Fluids Management,* specifically SBM drill cuttings to average <10% wt/wt oil on cuttings. • No planned discharge of whole SBM drilling fluids offshore. • INPEX will verify the barite in drilling fluids used by the MODU will contain: Mercury < 1 mg/kg (dry weight); and Cadmium (< 3 mg/kg (dry weight)). • Well completion fluids - All oil contaminated fluids will be contained and returned to shore for suitable disposal. • Capture and recirculation of drilling fluids following installation of the BOP. • Use of riserless fluid return following setting of the 508 mm casing. • Assess impacts of drill cuttings discharge through the sea serpent project with the University of Technology Sydney. • Verify that the drilling fluids contractor procedures for discharge and treatment of SBM and WBM cuttings will be prepared and implemented.
Discharge of cementing fluids and additives	Increased water turbidity. Smothering of significant benthic fauna. Temporary and localised reduction in water quality.	• Verification that the MODU contractor complies with NOHSC: 1008 (2004) – *Approved Criteria for Classifying Hazardous Substances),* INPEX *Offshore Development Drilling Liquid Standard* (C020-AH-STD-0019*), INPEX Drilling and Completion Fluid Selection Procedure (C020-AD-PRC-10000),.* • Selection process for new cementing chemicals. • Use dye to provide a pre indicator of cement overflow to seabed surface.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
BOP, subsea control and well suspension fluid	Temporary and localised reduction in water quality. Temporary localised damage/ disturbance of benthic habitats.	• Contractor compliance with the *INPEX Drilling and Completion Fluid Selection Procedure* (C020-AD-PRC-10000) and INPEX *Liquid Discharges Standard* (C075-AH-STD-0019), *NOHSC: 1008 (2004) - Approved Criteria for Classifying Hazardous Substances*), low toxicity BOP well suspension, subsea control and subsea control fluids.
Brine discharge from RO plant onboard the MODU	Temporary and localised reduction in water quality.	• Adhere to INPEX *Offshore Development Drilling Liquid Discharge Standard* (C020-AH-STD-0019).
Emissions: planned		
Atmospheric emissions combustion of fuel or incineration of waste	Reduction in localised air quality. Contribution to global greenhouse gas emissions.	• Use of low sulfur diesel. • Compliance with the *Navigation Act 2012 – Marine Orders – Part 97: Marine Pollution Prevention – Air Pollution,* Annex VI, as appropriate to vessel class, MARPOL 73/78 (*Annex VI Regulations for the Prevention of Air Pollution from Ships)*. • Compliance with IFC Environment, Health and Safety Guidelines – Offshore Oil and Gas Development (Section 1.1) and INPEX *Atmospheric Emissions Standard* (C075-AH-STD-0035). • All power generation equipment is maintained and operated in accordance with manufacturer's specifications through the implementation of an operational preventative maintenance system.
Light emissions from MODU and support vessels	Attraction, disorientation or repulsion of migratory seabirds, fish and marine turtles.	• Lighting will be kept at the lowest acceptable level for safe operating but be consistent with the requirements of the *Navigational Act 1912*, AMSA's *Marine Orders – Part 30 Prevention of Collision Convention, Issue 8* (Order No. 5 of 2009) and International Association of Marine Aids Navigation and Lighthouse Authorities (IALA) Recommendations 0–139: *The marking of man-made offshore structures*. • HSE inspection of the MODU includes consideration of lighting in terms of safe working conditions and minimising impact on marine fauna, in compliance with INPEX *HSE-MS Requirements* (C075-AH-MAN-0001).
Noise emissions: general drilling operations	Behavioural change and increased stress levels to marine fauna.	• Operations to be undertaken in accordance with EPBC Regulations 2000 – Part 8, Division 1. • Implement the INPEX *Marine Megafauna Interaction and Observation Procedure* (C075-AH-PRC-0029).
Noise emissions: VSP	Behavioural change and increased stress levels to marine fauna.	• VSP operations will be undertaken in accordance with EPBC Act Policy Statement 2.1 *Interaction between offshore seismic exploration and whales*. • Implement and comply with the INPEX *Marine Megafauna Interaction and Observation Procedure* (C075-AH-PRC-0029).

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
		• Induct all site personnel and contractors associated with equipment or procedures.
ODS	Contribution to global ozone depletion.	• Maintenance of an ODS Record Book, as required by MARPOL Annex VI (Regulation 12) - Ozone-Depleting Substances from refrigerating plants and firefighting equipment. • Compliance with the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and Regulations 1995. • No new systems or processes should be installed on the MODU using chlorofluorocarbons (CFCs), halons, 1,1,1-trichloroethane, carbon tetrachloride, methyl bromide or hydrobromofluorocarbons (HBFCs).
Discharges to the marine environment: unplanned		
Spill of MGO/SBM during transfer operations	Temporary and localised reduction in water quality. Potential hydrocarbon contact with marine wildlife.	• *Contractor implements MODU and vessel bunkering procedures for MGO and SBM transfers* • Adherence to vessel bunkering procedures, INPEX *Contractor and Supplier HSE Management Procedure (C075-AH-PRC-0004*) and supporting *Contractor and Supplier HSE Management Standard (C075-AH-STD-0004),* MARPOL 73/78, Annex I and II, SOPEP/SMPEP, as appropriate for vessel class and as implemented by the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983.* • Verification that the MODU drilling fluids contractor complies with the INPEX Drilling and Completion Fluid Selection Procedure (C020-AD-PRC-10000), including selection of low toxicity SBM • Implement *INPEX Ichthys Development Drilling Campaign WA-50-L OPEP* (D020-AD-PLN-10115) which includes appropriate notifications and spill response strategies.
Vessel collision, resulting in spill of MGO	Temporary and localised reduction in water quality. Potential hydrocarbon contact with marine wildlife.	• MODU and vessels equipped with appropriate navigational systems, training, practices depth sounders and aids consistent with the *Convention on the International Regulations for Preventing Collisions at Sea 1972* (COLREGS), Part B – Steering and Sailing *Marine Orders – Part 30: Prevention of collisions, and Navigation Act 2012* (as appropriate to vessel class), including standard AMSA maritime safety/navigation procedures. • A 'Notice to Mariners' issued through AMSA. • Implementation of a stakeholder engagement procedure and consultation with relevant stakeholders consistent with the OPGGS (Environment) Regulations 11A – *Consultation with relevant authorities, persons and organisations*. • Establishment and maintenance a 500 m safety exclusion zone around the MODU in line with the OPGGS Act 2006 – Section 616. • Simultaneous operations in the Ichthys field managed in accordance with the INPEX *Ichthys Field Management Plan* (X071-AB-PLN-00001) and INPEX *Offshore Construction and*

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
		Installation SIMOPS Procedure (A063-AY-PRC-0001). • Vessel selection will be conducted with regard to the INPEX *Contractor and Supplier HSE Management Standard* (C075-AH-STD-0004) and supporting INPEX *Contractor and Supplier HSE Management Procedure* (C075-AH-PRC-0004) and INPEX *Vessel Inspection Procedure* (C062-AW-PRC-0001). • INPEX's *Support and Supply Vessel Cyclone Response Procedure* (A060-AW-PRC-0002) and the Contractor Emergency Procedure – Cyclone Abandonment for managing vessel movements in extreme weather conditions (i.e. cyclones). • Implement operational monitoring defined in the *INPEX Development Drilling Operational and Scientific Monitoring Program (OSMP)* (C075-AH-REP-00088).
Loss of well containment	Toxic effects to marine biota. Hydrocarbon contact with marine wildlife. Entrained hydrocarbon contact with coastlines/ islands/ shoals.	• Compliance with INPEX *Well Construction and Integrity Well Control Standard* (PER-002276699) which covers all aspects of primary and secondary well control for floating drilling operations, the *Well Construction and Integrity Well Design Standard* (PER-00227668), *OPGGS (Resource Management and Administration) Regulations 2011* and *OPGGS (Safety) Regulations 2009*. • Wellhead subsea infrastructure is designed in a manner which reduces the likelihood of failure and subsequent blowout (e.g. as a result of dropped objects), in line with the WOMP. • During well completion and well test, the riser system will have the ability to emergency quick disconnect from the subsea tree. • Adherence to the INPEX *HSE Training and Competency Standard* (C075-AH-STD-0011) and *Offshore Construction and Installation SIMOPS Procedure* (A063-AY-PRC-001). • Implement INPEX Emergency Management Manual (X075-AH-MAN-0001), INPEX Crisis Management Procedure (C075-AH-PRC-0026) and the Drilling contractor ERP. • Implement INPEX *Ichthys Development Drilling Campaign WA-50-L OPEP* (D020-AD-PLN-10115). • Implement INPEX *Development Drilling Operational and Scientific Monitoring Program (OSMP)* (C075-AH-REP-00088). • Design the wellhead subsea infrastructure (to limit damage from SIMOPS activities related to drilling) to reduce the likelihood of failure and subsequent blowout, in line with the WOMP.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
Inappropriate hydrocarbon spill response strategies	Toxic effects to marine biota. Hydrocarbon contact with marine wildlife. Entrained hydrocarbon contact with coastlines/ islands/ shoals.	• Initiate a spill response appropriate to the nature and scale of the spill to avoid impacts to key sensitive receptors, to reduce impacts and risks to ALARP and acceptable levels, through the INPEX *Emergency Management Manual* (X075-AH-MAN-0001). • Compliance with *INPEX Emergency and Crisis Management Standard (PER-00193661).* • Verify the drilling contractor emergency response plan is developed and implemented. • INPEX will implement the INPEX Drilling Incident Action Plan. • Conduct operations in accordance with INPEX *Ichthys Development Drilling Campaign WA-50-L OPEP* (D020-AD-PLN-10115). • Implement INPEX *Development Drilling Operational and Scientific Monitoring Program (OSMP)* (C075-AH-REP-00088). • Key contracts in place for OSMP delivery prior to commencement of the activity, with all contractual arrangements finalise within one month of activity commencement.
Emissions: unplanned		
Unplanned venting of gas during drilling	Reduction in localised air quality. Contribution to global greenhouse gas emissions.	• Develop and implement a well test procedure. • Prepare MODU Safety Case and Safety Case Revision to verify well-testing equipment is appropriate.

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
Drop-out of hydrocarbons while flaring	Reduction in localised air quality. Contribution to global greenhouse gas emissions.	• Develop and implement a well test procedure. • Prepare MODU Safety Case and Safety Case Revision to verify well-testing equipment is appropriate.
Implementation strategy administration		
Failure to execute the implementation strategy and performance objectives, standards and measurement criteria	Environmental impacts dependent on the nature of the non-conformance action or incident.	• Compliance with INPEX *HSE-MS Requirements* (C075-75-AH-MAN-001) which includes measurement, monitoring and reporting of HSE performance • Verify MODU/ vessel contactor compliance with the INPEX *Incident Reporting, Recording and Investigation Standard* (C075-AH-STD-0006) and supporting INPEX *Incident/Hazard Reporting and Investigation Procedure* (C075-AH-PRC0020), • Comply with the INPEX *HSE Training and Competency Standard* (C075-AH-STD-0011) to ensure personnel are competent. • Significant changes are managed in accordance with the INPEX *Ichthys Project Management of Change Standard* (C075-AH-STD-0027). • Compliance with INPEX Contractor and Supplier HSE Management Procedure (C075-AH-PRC-0004), Contractor and Supplier HSE Management Standard (C075-AH-STD-0004) and Ichthys Development Drilling Campaign WA-50-L OPEP (D020-AD-PLN-10115)) which includes OPEP exercises, drills and audits. • Compliance with external reporting of incidents and nonconformances as stipulated under OPGGS (Environment) Regulations 2009 and MARPOL 73/78 convention (as appropriate to vessel class).
Poor environmental awareness	Environmental impacts dependent on the nature of the non-conformance action or incident.	• Compliance with INPEX *HSE-MS Requirements* (C075-AH-MAN-0001), including HSE inductions for all employees, contractors and visitors arriving on site. • INPEX and contractors will achieve environmental awareness of the issues outlined in this

Source of risk (hazard)	Potential environmental impact	Control/ mitigation measures
		environment plan for the Project by adhering to the OPGGS (Environment) Regulations 2009 – Regulation 14 (5).
Failure to undertake scheduled audits, inspections, monitoring and review of environmental performance	Environmental impacts dependent on the nature of the non-conformance action or incident.	Adherence to the INPEX *HSE Audit, Inspection, Monitoring and Review Standard* (C075-AH-STD-0025) and the drilling department action tracking system.