

**INPEX BROWSE, LTD.
ICHTHYS GAS FIELD DEVELOPMENT**

**ENVIRONMENT PLAN SUMMARY
MIMIA-1 EXPLORATION WELL**

**Document No.
344-EXT-PL-0001**

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1 BACKGROUND

INPEX Browse, Ltd. (INPEX) proposes to drill three exploration and appraisal wells during the 2008 / 2009 Drilling Campaign. The second of the three wells to be drilled, Mimia-1, is located in Permit Area WA-344-P.

INPEX previously prepared an Environment Plan (EP) for the 2008/2009 Drilling Campaign. The purpose of this EP is to describe the drilling program and the receiving environment, identify and assess potential environmental impacts to the receiving environment and to outline the management measures proposed to ensure that environmental performance objectives and standards are met for the wells of this drilling campaign.

Western Australia's Department of Industry and Resources (DoIR) previously approved this EP under the *Commonwealth Petroleum (Submerged Lands) Act 1967 [P(SL)A]* and the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*.


INPEX subsequently submitted an Addendum to the EP to the DoIR and obtained environmental approval to drill the Mimia-1 exploration well on the 23rd May 2008.

This document is a summary of the EP and Addendum for the Mimia-1 exploration well.

1.1 The Plan

This plan:

- describes the environmental setting in which the drilling campaign will take place
- describes the proposed activities of the drilling campaign that have the potential to affect the environment
- presents an analysis of the effects on the environment and describes the management measures to be used to minimise the environmental impacts of the drilling campaign.

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2 PROJECT DESCRIPTION

2.1 Location

INPEX proposes to drill the Mimia-1 exploration well during the 2008 2009 Drilling Campaign. Permit Area WA-344-P is located approximately 250 nautical miles north of Broome off the Kimberley coast, within the Browse Basin, in Commonwealth waters.

Mimia-1 is located in the south western corner of Permit Area WA-344-P (Refer Figure 1), 54838.90mE, 8483671.58mN.

2.2 Details of Drilling Campaign

The drilling period is expected to be approximately 100 days, commencing in June 2008.

Vertical seismic profiling (VSP) will be conducted on this well.

Mimia-1 will be drilled by the semi-submersible mobile offshore drilling unit (MODU) *Songa Venus* operated by Songa Offshore. The *Songa Venus* will be moored to the seafloor by eight anchors and mooring chains.

The wells will be drilled using water-based mud and synthetic-based mud ('Syn-teq'). The drilling program proposes to use the following fluids as the basis of the mud:

- Seawater with gel sweeps in the 36" hole section. At the end of this hole section, the seawater and sweeps will be discharged to the sea.
- The 17½" and 16" hole sections will be drilled with a water-based mud (WBM) system. At the end of this hole section the WBM will be discharged to the sea.
- The 12¼" and 8½" hole sections will be drilled with a synthetic-based mud (SBM) system of low toxicity. The drilling fluid from the 12¼" and 8½" hole sections will be recycled and reused.

Drill cuttings from all hole sections will be discharged into the sea after appropriate processing with solids control equipment.

Subsequent to completion of drilling and testing (if required), the Proponent will abandon the wells in accordance with the requirements of the *Petroleum (Submerged Lands) Acts 1967*, Schedule: Specific Requirements as to Offshore Petroleum Exploration and Production – 2005.



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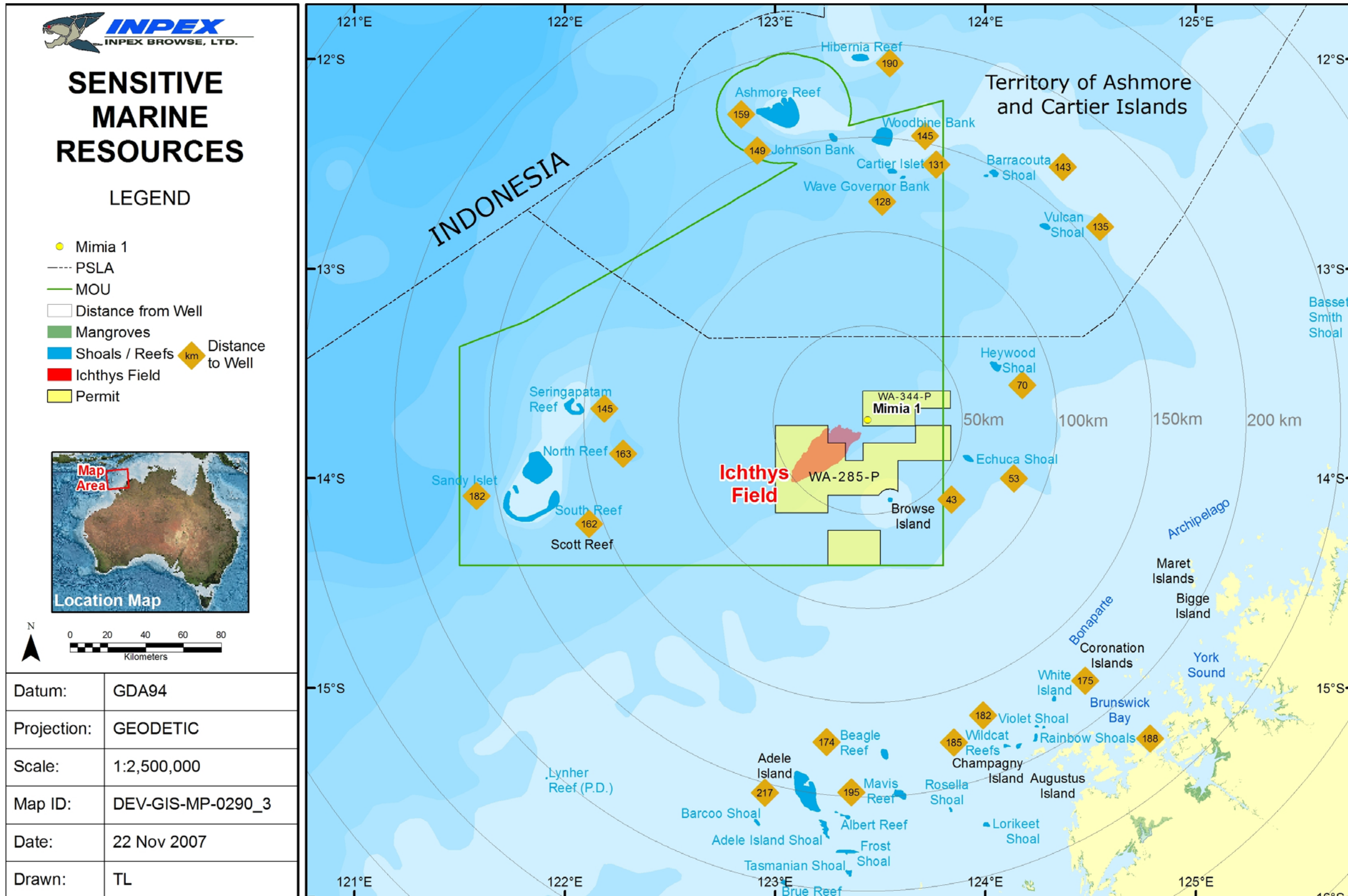
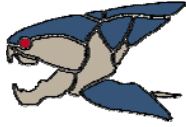


Figure 1: Mimia-1 Location and Environmental Sensitivities Map



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3 THE RECEIVING ENVIRONMENT

3.1 Regional Setting

INPEX operated permit areas relevant to the Environment Plan are located in the Timor Sea within the Browse Basin on the Australian continental shelf in water depths between 90 m to 340 m. In general, the continental shelf is a flat featureless plain that dips gently northward toward the edge of the shelf, but scattered throughout the area are shoals and occasional islands that support a diverse flora and fauna (Figure 1). To the north, the Timor Trough, with water depths of up to 9000 m, marks the outer boundary of the continental shelf.

3.2 Climate and Oceanography

The Browse Basin is situated in the tropics and experiences a monsoonal climate with two predominant seasons: a summer wet season (October - April) and a winter dry season (May–September). During the wet season, prevailing winds are typically from the west and south-west, and during the dry season, winds are from the north-east, through east and south-east.

The wave climate reflects the seasonal wind regime, with waves predominantly from the west in summer and from the east in winter. Seawater temperature in the region ranges from 25 C to 31 C at the surface and 22 C to 25 C at the seafloor. The maximum tidal range is 5.7m.

3.3 Bathymetry and Seafloor Geology

Bathymetry of the permit areas and surrounds is displayed in Figure 1. The seabed topography is relatively flat and featureless and the geology is relatively contiguous though the region. A number of shoals including Hewyard, Echuca and Vulcan Shoals are located within 100 km of the INPEX operated permit areas.

3.4 Marine Ecology

The marine fauna of northern Australia is part of the vast Indo-West Pacific biogeographical province. Diversity in most components of the coastal northern Australian biota is relatively impoverished compared with assemblages found along the coastlines of Timor and neighbouring Nusa Tenggara islands.

Continental shelf – open waters

The Timor Sea supports a variety of shark and pelagic finfish species of commercial and recreational game-fishing importance (e.g. tunas, mackerels and swordfishes). The Timor Sea also supports five species of turtles and a variety of cetaceans.

Epibenthic flora and fauna



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Epibenthic fauna are abundant and diverse in shallower coastal waters of the continental shelf. However, sea floor communities in deeper waters are generally depauperate. Species found in these areas include sponges, gorgonians (sea whips and sea fans), ascidians (sea squirts), echinoderms, crustaceans, bryozoans (lace corals), and soft corals.

Benthic Infauna

Across the northern continental shelf, the predominant animals living within sea floor sediments are polychaetes (burrowing worms) and crustaceans (prawns, shrimps, crabs, etc.). Other species include echinoderms (sea stars, sea urchins, feather stars, etc.), molluscs (both gastropods and bivalves), nemertean (ribbon worms), sponges and fish.

Shoals

Two small subtidal shoals or pinnacles, Heywood and Echuca Shoals, occur near the permit area. The flora and fauna of the shoals has not been studied. However, work on other shoals in the region shows that subsea mounts and shoals can be quite productive areas supporting corals, halimeda algae, sponges and a range of associated reef fish species.

Islands and reefs

There are over 2000 islands of all sizes and shapes along the Kimberley coast.

The closest of these is Browse Island, which is located 43km from Mimia-1. Browse Island is believed to be an important turtle and seabird nesting site, and is surrounded by extensive coral reefs.

Shallow subtidal and intertidal habitats also occur in the region, however, these reefs and islands are not located in close proximity to the permit area. They include Ashmore Reef, Hibernia Reef, Cartier Reef, Seringapatam Reef and Scott Reef. Important assemblages and species with high conservation and protection significance are found in all of these areas as summarised below.

Seagrass and macroalgae

Macroalgae form the basis of many food webs in the marine environment and also contribute to reef structure and to sediment formation. Algal meadows grow on shallow limestone pavement while seagrass beds are generally located on sandy patches in the lagoons.

Corals

The offshore atolls have major assemblages of reef-building corals. Coral reefs are ecologically important due to their high biological productivity and the high diversity and abundance of marine organisms that they support.

Giant clams



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All species of giant clam protected in Australian waters are common on the reefs and surrounding atolls.

Dugongs and turtles

Reefs in the region may be feeding grounds for dugongs and turtles. Turtles nest above the high-water mark on many sandy beaches in the West Kimberley.

Seabirds

Seabird feeding grounds, roosting and nesting areas are found on the offshore atolls. Migratory seabirds, a number of which are protected by international agreements (e.g. the Bonn Convention, JAMBA and CAMBA), including a number of albatross species, may pass through the study area.

Cetaceans

The blue whale is a migratory species which migrates through the general area. The annual migration of the humpback whale occurs closer to shore, with numbers peaking in August and September. Key areas on the Kimberley coast for humpback whales are Camden Sound and Pender Bay.

Endangered and Vulnerable Species

Eight species of marine organisms are listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) EPBC Act), of which two endangered species (blue whale and loggerhead turtle) are known to occur in offshore areas of northern Western Australia and may pass through the permit areas. A further six species, listed as vulnerable under the EPBC Act, have been recorded from this region (whale shark, green turtle, leatherback turtle, humpback whale, hawksbill turtle and flatback turtle).

It is reasonable to conclude that some of these species may pass through the permit areas; however the permit areas are unlikely to provide any critical habitat for these species.

3.5 Socio-Economic Environment

The Browse Basin is the focus for a number of activities including commercial and traditional fisheries and oil exploration and production. In addition, a number of major shipping routes pass through the area.

Other uses near the Kimberley coast, some 200 km inshore from the permit area, include marine tourism, pearling and aquaculture.

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4 ENVIRONMENTAL HAZARDS AND MANAGEMENT ACTIONS

Table 1 presents the environmental risk assessment for each effect on the natural environment that is known to occur from routine drilling activities in offshore areas. It also presents a summary of the management actions that INPEX and its contractors will undertake for protection of the environment during the drilling campaign.



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Table 1: Environmental Risk Assessment and Management Actions

	Likelihood	Consequence	Measure of consequence	Environmental risk	Management action
Routine					
Noise from the MODU, tenders and helicopters. Short periods of high noise levels within 2 to 5 km of the MODU and audible noise up to 20 km from the MODU.	Highly likely	Possible avoidance/disturbance behaviour or marine megafauna and possible behavioural impacts on cetaceans if they are present.	Minor	Medium	Cetacean Interaction and Observation Procedure distributed and adhered to by anchor handling support vessel (AHSV) masters and helicopter pilots. Helicopters will not approach at a height lower than 1650 feet (500 m) and within a horizontal radius of 500 m of a cetacean unless necessary for take-off and landings on the MODU.
Noise from vertical seismic profiling (VSP). Short periods of acoustic pulses.	Highly likely	Possible avoidance/disturbance behaviour of marine megafauna and possible physiological impact on cetaceans if they are present.	Minor	Medium	Visual observations during pre-start procedures and during survey Soft start procedure (prior to the firing of the air gun for the VSP) Delay start-up procedures and shut down any operating acoustic source if whales are observed within 3 km of the survey vessel.
Anchors and moorings	Highly likely	Very small area of soft- sediment benthos disturbed temporarily	Slight	Low	Minimise the amount of seabed disturbance by utilising normal operating procedures.
Drill cuttings disposal	Highly likely	Cuttings will settle and modify grain size. No cuttings pile likely.	Slight	Low	Disposed of to sea in accordance with normal operating procedures.



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	Likelihood	Consequence	Measure of consequence	Environmental risk	Management action
		Minimal impact on or modification of benthos.			
Non-toxic water-based mud will be disposed of to the marine environment.	Highly likely	Minor leaching of hydrocarbons and mud chemicals into the water column. Uptake by marine microbes but of low toxicity and not bioaccumulative.	Minor	Medium	<p>Minimise volume disposed of by optimisation of the solids control equipment (shale shakers); by the application of sound drilling fluid engineering practices; by the recovery of SBM for use in future drilling programs.</p> <p>MODU shale shaker to be tested and operational to design specifications during drilling program.</p> <p>Warning alarms for shale-shaker shutdown operational throughout drilling.</p> <p>Fixed and portable mud recovery pumps located around the MODU to recover accidental spills.</p> <p>Target of <10% dry weight fluid on cuttings discharge.</p> <p>Auditable record of volume of drilling fluids discharged overboard maintained (through mass balance at end of well).</p>
Deck washdown	Highly likely	Localised oil/chemical contamination of water around the MODU	Slight	Low	<p>Spill kits distributed on the MODU. At least one placed at each of the following areas: engine room, shakers, port and starboard main deck, and pipe deck.</p> <p>Drill-string cleaning and pipe dopping to occur onshore to</p>



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	Likelihood	Consequence	Measure of consequence	Environmental risk	Management action
					<p>minimise spills of pipe dope.</p> <p>Songa to ensure that MODU personnel are adequately trained to contain spills that occur and to ensure that significant accumulations of oil, grease and other contaminants are collected and removed from the decks prior to every washdown.</p>
Sewage, grey water and putrescible waste management	Highly likely	Localised low-level contamination of water around MODU by sewage and/or grey water and food scraps	Minor	Medium	<p>Sewage and food scraps will be discharged via direct overboard drain after being macerated and pulverised in accordance with <i>Petroleum (Submerged Lands) Act 1967</i> (Cwlth) and the requirements of MARPOL 73/78 (the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978).</p> <p>Domestic wastewater treatment apparatus to be tested and checked to be operational during drilling program.</p>


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Conclusions:

The conclusions of the environmental effects appraisal and risk assessment are as follows:

- The proposed wells are located in areas of low environmental and socio-economic sensitivity.
- Routine drilling operations pose low to moderate environmental risks.
- Where moderate risks do occur, detailed management measures, procedures and appropriate technology are in place to minimise risks to as low as reasonably practicable.
- The use of low-toxicity, rapidly biodegradable synthetic-based drilling fluids ensures that minimal impact will be experienced from drilling discharges on the marine environment.
- The implementation of a comprehensive waste management program will result in no significant environmental impact from waste disposal.
- The risk of a significant oil spill occurring is considered to be extremely small, given the following:
 - INPEX has a detailed understanding of the reservoir from eight previous wells.
 - Drilling will take place adjacent to a discovered gas basin, therefore representing a low risk of significant accidental releases of oil to the marine environment
 - Technology and standard practices will be implemented to minimise such risk.
 - The results of spill trajectory modelling for the 2007 drilling period indicate that it would be highly unlikely that there would be an impact on the sensitive resources within the region as a result of a spill.

Therefore, the proposed Mimia-1 exploration well is unlikely to result in significant adverse environmental impacts or to adversely affect matters of national environmental significance as defined by the EPBC Act.

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5 CONSULTATIONS

The following companies, organisations and individuals were consulted during the preparation of this Environment Plan or its predecessor upon which this has been based:

Mr Pierre Achour, Department of Industry and Resources

Dr John Bannister, Western Australian Museum

Mr James Bond, Australian Maritime Safety Authority

Mr Graham Cobby, Department of Industry and Resources

Mr Chris Done, Department of Conservation and Land Management (now DEC)

Mr Dale Harvey, Department of Conservation and Land Management (now DEC)

Mr Lindsay Joel, Department of Fisheries

Mr Mike Lapwood, Department of Conservation and Land Management (now DEC)

Mr Paul Revell, Department of Industry and Resources



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6 CONTACT DETAILS

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