



## WA-390-P DEEP WATER DRILLING PROGRAM ENVIRONMENT PLAN: PUBLIC SUMMARY

This summary of the Hess Exploration Australia Pty Ltd (Hess) deep water drilling program Environment Plan (EP) has been submitted to the Western Australia Department of Industry and Resources (DoIR) to comply with Regulations 11(7) and 11(8) of the Petroleum (Submerged Lands) (Management of Environment) Regulations 1999.

### INTRODUCTION

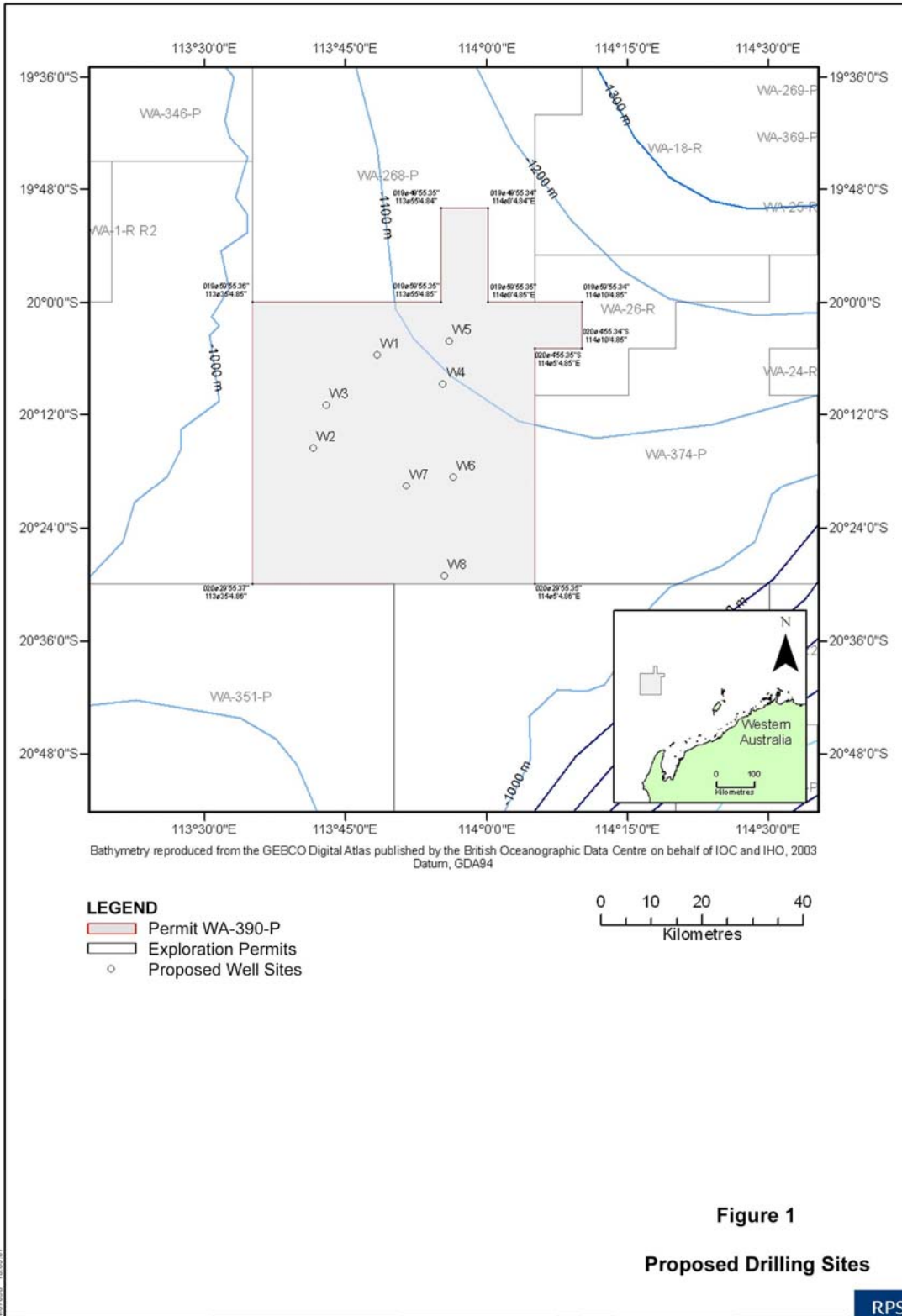
Hess proposes to drill up to 16 offshore exploration wells during 2007 - 2010 to investigate potential gas reserves within petroleum Exploration Permit WA-390-P. The exploration wells are located on the North West Shelf in Commonwealth marine waters approximately 145 km from the mainland of Western Australia. Drilling will be undertaken by the semi-submersible drill rig 'Jack Bates', which is currently operating in other permits on the North West Shelf.

### COORDINATES OF THE PETROLEUM ACTIVITY

The exploration wells are located in Commonwealth marine waters within Exploration Permit WA-390-P. Preliminary drilling locations have been identified for eight of the 16 wells (Table 1; Figure 1), the locations within the permit area for the remaining 8 wells are dependant on further geological interpretation.

**Table 1: Preliminary Well Locations (first 8 wells)**

Well	Latitude (South, GDA94)			Longitude (East, GDA94)		
	degrees	minutes	seconds	degrees	minutes	seconds
W1	020	05	33	113	48	22
W2	020	15	28	113	41	34
W3	020	10	56	113	42	57
W4	020	08	43	113	55	23
W5	020	04	06	113	56	03
W6	020	18	32	113	56	27
W7	020	19	34	113	51	28
W8	020	29	2.5	113	55	30.9



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## DESCRIPTION OF THE ACTION

Hess proposes to drill up to 16 offshore exploration wells during 2007 - 2010 to investigate potential gas reserves within petroleum Exploration Permit WA-390-P. Drilling will be undertaken by the semi-submersible drill rig 'Jack Bates', which is currently operating on the North West Shelf.

The program is scheduled to commence in November 2007 and likely to be undertaken in two stages, the first involving 4 wells only. The second stage will commence up to 12 months after completion of the fourth well. Drilling will take approximately 30 to 40 days at each location, inclusive of downtime and mobilisation/demobilisation between each wellsite. Preliminary locations have been identified for eight of the 16 wells (Figure 1), the locations within the permit area for the remaining 8 wells will be dependant on further geological interpretation.

The base-case to be applied to the initial wells in the program calls for jetting of the 762mm (30") conductor and riserless drilling of the 444mm (17½") section. After the 340mm (13⅜") casing is run, the riser will be installed and the remaining hole sections will be drilled using a closed fluid system. The wells would have similar design, as follows:

- 762 mm (30") casing jetted in using seawater with high viscosity sweeps (water-based mud – WBM) to approximately 70m Below Mud Line (BML);
- 445 mm (17-1/2") hole drilled riserless for 340 mm (13-3/8") casing set at approximately 450 to 700mBML. Drilled with sea water and high viscosity sweeps;
- 311 mm (12-1/4") hole drilled for 244 mm (9-5/8") casing set at approximately 1575 mBML. This section will be drilled with a synthetic-based drilling fluid (synthetic-based mud, SBM); and
- 216 mm (8-1/2") hole to well total depth (2200-3485m BML). Drilled with SBM.

After the initial wells in the program, the base-case well design will be re-assessed and the riserless drilling in subsequent wells may be extended to approximately 1575mBML, reducing the requirement for SBM use to the 216 mm (8-1/2") hole.

The wells will be engineered with primary and secondary blowout prevention suitable for all conditions that might be experienced in the program.

Sections of the wells drilled riserless will use seawater with high viscosity (bentonite/guar gum) sweeps. The water based drilling fluids that will be used at shallower depths are recognised to have minimal offshore environmental impact.

For sections drilled with a closed-fluid system, SBM has been selected for improved safety, environmental (reduced time on location, better well control), operational and economic performance. The SBM has low environmental toxicity to Western Australian species and is biodegradable under both aerobic and anaerobic conditions. Following connection of the risers, drill cuttings will be returned to the surface and SBM recovered for recycling. No whole SBM will be discharged during the drilling program.

After reaching total depth, electrical wireline logs will be run in the well to determine the presence of any hydrocarbons. Vertical seismic profiling (VSP) may also be conducted. There will be no flaring or other testing on the first 4 wells. However, flow and drill stem tests may be carried out on a limited number of subsequently drilled wells.

At the completion of drilling, the well(s) will be abandoned in accordance with the requirements of the Petroleum (Submerged Land) Act 1967 and industry best practice.

## DESCRIPTION OF THE RECEIVING ENVIRONMENT

### Physical Environment

The proposed exploration wells are located on the continental slope of north-western Australia, over 145 km north of North West Cape. Water depths in the area range from 1000 to 1200 m. There are no islands, emergent land or shallow seabed features in the permit area, the nearest landfall being Barrow Island, some 135 km to the south-east.

The substrate over the permit area is expected to comprise loose, silty carbonate sands with occasional exposed hard substrate and is likely to be broadly homogenous over extensive areas of similar water depth and distance offshore along the continental slope of the North West Shelf.

### Biological Environment

The deep offshore environment of the permit area is typical of wide expanses of the continental slope and is not expected to represent habitat of particular significance for any macrofauna.

Some marine migratory species with broad distributions such as cetaceans, fish, sharks, sea turtles and seabirds may traverse the permit area, at least on occasion. Ten species included on the Threatened and/or Migratory species lists of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) could occur in the area. However, the permit area does not contain recognised critical habitat for any Threatened or Migratory fish, sharks, sea turtles, cetaceans or seabirds.

Further detail regarding the main fauna groups that might occur in the area is provided in the following.

#### Fish

A number of sharks and pelagic finfish, including mackerels, tunas and billfishes, occur in the waters of the North West Shelf and would be expected to occur in the area of drilling. The deep offshore environment of the permit area is typical of the continental slope of north-western Australia and is not expected to represent habitat of particular significance to sharks and finfish.

#### Cetaceans

Several species of whale and dolphin are known to frequent the waters of the North West Shelf, including the blue whale (*Balaenoptera musculus*), listed as Endangered, and the humpback whale (*Megaptera novaeangliae*) listed as Vulnerable under the EPBC Act.

The humpback, which is the most common whale species in the region, migrates between Antarctic waters and the Kimberley each winter to mate and breed. The peak of the northbound migration passes Barrow Island and Montebello Islands (135 km to the south-east of the permit area) around the end of July, the southbound peak occurs between late August and early September, although the exact timing of migration may vary by up to three weeks.

The permit area is outside (seaward) of the main humpback migration routes and distant from known feeding, breeding and resting areas. Although drilling of some wells is expected to overlap with the migration periods, the likelihood of humpback whales occurring in significant numbers in the area of drilling is very low.

Blue whale migration patterns are similar to the humpback, with the species feeding in mid-high latitudes (south of Australia) during the summer months and temperate/tropical waters in the winter for mating and breeding. Blue whales tend to be more widely dispersed and rarely present in large numbers outside aggregation areas. The permit area does not include any recognised blue whale migratory routes or known feeding, breeding or resting areas, hence the likelihood of encountering significant numbers of blue whales during the drilling operations is low.

Four other whale species listed as migratory species under the EPBC Act may occur in the permit area on occasion; the Antarctic minke (*Balaenoptera bonaerensis*), Bryde's (*Balaenoptera edeni*), killer (*Orcinus orca*) and the sperm whale (*Physeter macrocephalus*). Given their widespread distributions and the absence of particular bathymetric features in the area, the permit area is unlikely to represent an important habitat for any of these species.

Dolphin species known to occur in depths greater than 500m are the striped (*Stenella coeruleoalba*), Risso's (*Grampus griseus*) and rough-toothed (*Steno bredanensis*) dolphins, although a number of other dolphins also occur in the region and could be encountered during the program. None of these species are considered threatened or likely to occur in significant numbers in the permit area.

#### Marine turtles

Three species of marine turtles may occur in the permit area; green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*) and flatback (*Natator depressus*), all of which are listed as Vulnerable and Migratory under the EPBC Act. Sea turtles, particularly green turtles, undertake extensive migrations and low numbers of individuals may transit the permit area. Migration and nesting activity generally occurs between September and April. The permit area does not contain any emergent land or shallow reef and the nearest areas of known turtle breeding or feeding importance are more than 135 km distant. The likelihood of significant numbers of any turtle species occurring at a given drilling location during operations is very low.

#### Birds

The southern giant petrel (*Macronectes giganteus*) is listed as Endangered under the EPBC Act and may be found in the drilling area. The southern giant petrel breeds in sub-Antarctic waters during the summer, while in winter most disperse north from 50°S to the Tropic of Capricorn and sometimes beyond. The Tropic of Capricorn is located over 300 km south of the permit area, hence the southern giant petrel is not expected to be present in significant numbers during any time of the year.

#### Benthic Assemblages

The biological productivity of the benthic environment is expected to be limited due to low nutrient availability and limited extent of exposed hard substrates. The water depths preclude photosynthetic benthic habitats that might have significance as fauna habitat, such as coral reefs or seagrass/algae communities.

The seafloor is likely to comprise predominantly unconsolidated soft sediments inhabited by sparse communities of relatively larger benthic species (urchins, seastars and crustaceans). Infaunal communities are likely to be comprised of smaller burrowing invertebrates. Any areas of exposed hard substrate that occur may support more diverse assemblages, including deep water filter feeding organisms, such as hydroids and sponges.

## Socio-Economic Environment

Extensive petroleum exploration and production activity occurs in the region, however, there is no existing petroleum infrastructure in WA-390-P or adjacent permit areas. The nearest land based production facility is situated on Barrow Island, 135km south-east of the proposed drilling operations.

Consultation with Commonwealth and State fishing authorities and commercial operators, indicates that fishing activity in the area is likely to be low. No tourism, recreational or game fishing is known for the area.

Commercial shipping is known to traverse the area, however, there are no bathymetric features or other navigational hazards in the area that will restrict ships avoiding the drill rig and support vessels.

The nearest conservation reserves include the Barrow Island Marine Management Area, Muiron Islands Nature Reserve and the Ningaloo Marine Park, which are over 130 km south and south-east of the permit area. These areas are not likely to be affected by the proposed action.

## MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Risk analysis has been used to determine risk likelihood and severity and to evaluate the environmental risks and effects, as summarised in Table 2.

The risk analysis indicates that because of the short term nature of the drilling for each well, coupled with the low volumes of discharges and high dilution and dispersion rates, drilling at the well locations is unlikely to have any discernible effect on the environment beyond a small area beneath and adjacent to the drilling rig. The localised nature of the impact and the uniformity of the seafloor and associated biota over broad expanses in the vicinity of the wells suggest that any impacts associated with the drilling program will be insignificant on a regional scale.

**Table 2: Summary of Environmental Risks and Management Approach**

Hazard/Event	Potential Hazard Consequence	Risk and Mitigation Methods
<b>Anchoring</b>	Localised reduction in benthos.	Low. Adherence to anchoring procedures and minimise anchor drag.
<b>Artificial lighting</b>	Potential attractant or disturbance to marine life.	Low. Lighting minimum required for navigation and safety requirements.
<b>Underwater noise generated by operations.</b>	Physiological damage or disruption to behaviour patterns of sensitive marine fauna.	Low. DEWR seismic cetacean guidelines implemented during VSP operations. Minimise use of thrusters to maintain position during whale migration periods. Vessels report sightings of cetaceans and marine turtles to DEWR.
<b>Discharge of drilling fluid</b>	Localised and temporary acute / chronic toxicity effects to marine life.	Low. Selection of low toxicity, biodegradable muds. Use of shakers and dryer to optimise recovery from cuttings. Recycling or return of recovered SBM to shore based storage, no discharge to sea.
<b>Discharge of cuttings</b>	Localised reduction in benthic productivity and damage to sensitive benthic habitats.	Low. Discharge at surface to maximise dispersion. Use of cuttings dryer to reduce potential for cuttings aggregates.

Hazard/Event	Potential Hazard Consequence	Risk and Mitigation Methods
<b>Grey water, sewage and putrescible wastes.</b>	Adverse effects on marine life due to reduction in water quality (eg nutrient enrichment )	Low. Biodegradable detergents only. Approved onboard sewage treatment plant. Treat in accordance with <i>P(SL)A</i> schedule clause 222 and MARPOL 73/78 prior to discharge. Offshore discharge (>12 nm from land) only.
<b>Solid Wastes disposal.</b>	Reduction in habitat/water quality from incorrect disposal.	Low. Wastes segregated and recycled where possible. Disposal to licensed facility via licensed wastes contractor.
<b>Discharge of oily water</b>	Potential localised and temporary acute toxic effects.	Low. All contaminated water collected and passed through an oil/water separator prior to discharge at <15ppm. Discharge quality automatically monitored with alarm.
<b>Flaring of hydrocarbons</b>	Potential for hydrocarbon loss to sea surface with localised and temporary acute toxic effects.	Low. Use of "green" type burners to optimise efficiency. Continuous monitoring and test shut-in if fallout observed.
<b>Atmospheric emissions</b>	Localised reduction in air quality.	Low. Engines maintained to operate at optimum efficiency to minimise emissions.
<b>Navigation hazard - Collision</b>	Potential for hydrocarbon or debris discharge to environment following collision.	Low. 500m exclusion zone. Rig and vessels carry all appropriate navigation lighting and well lit for operations. All vessels operated by accredited seamen maintaining 24 hour visual, radio and radar watch for other vessels. Notification of rig presence via Notice to Mariners.
<b>Drilling blow out</b>	Potential smothering or acute/chronic toxic effects on marine organisms from liquid hydrocarbons.	Low. Approved well application. Adherence to well integrity standards / best practice. Blow Out Preventers (BOP). Approved Oil Spill Contingency Plan (OSCP). AMOSC oil spill response resources available offshore. Oil spill modelling indicates spills would be unlikely to reach the shore.
<b>Hydrocarbon loss during transfer</b>	Potential acute/chronic toxic effects on marine organisms from hydrocarbon loss.	Low. All fluid transfers undertaken in compliance with refuelling procedure and in daylight wherever possible. Reinforced hoses with dry break couplings and fail-safe fittings. Approved OSCP and AMOSC oil spill resources available.
<b>Chemical spill runoff to sea</b>	Localised and temporary acute toxic effects.	Low. All materials stored and handled in accordance with relevant procedures and Material Safety Data Sheets (MSDS). Absorbent materials available onboard and spill plan in place.
<b>Quarantine - Introduction of exotic marine species</b>	Alteration to community composition and function - competition with indigenous species.	Low. All vessels will comply with Australian quarantine laws. Ballast exchanges conducted outside the Australian 12 nm limit.
<b>Displacement of other users of marine environment</b>	Disruption of commercial fishing/shipping activity	Low. Notice to Mariners issued. Liaison with AMSA, AFMA, fishermen and other commercial mariners to minimise conflict.

## **MANAGEMENT APPROACH**

The drilling program has been planned and will be implemented in accordance with the strategy for managing Environment, Health, Safety and Social Responsibility (EHS&SR) risks that has been established by Hess Corporation's Exploration and Production Leadership Team (EPLT). Hess' overall environmental objective for the program is to avoid or minimise environmental risks to as low as reasonably practicable (ALARP).

The environmental management approaches relevant to each aspect of the drilling program are summarised in Table 2. All activities will be conducted to the satisfaction of the DoIR and in accordance with relevant legislative and regulatory requirements.

## **CONSULTATIONS**

Consultations and/or notifications regarding the proposed drilling program have been undertaken with all relevant stakeholders, including:

- Department of Environment and Water Resources (DEWR)
- Australian Maritime Safety Authority (AMSA), Canberra
- Australian Fisheries Management Authority (AFMA)
- Department of Defence (Royal Australian Air Force)
- Department of Industry and Resources (DoIR)
- Western Australia Department of Fisheries
- Western Australia Fishing Industry Council (WAFIC)
- Commonwealth Fisheries Association
- Recfishwest

These consultations have indicated that conflicts with other users of the area are unlikely as commercial and recreational fishing activity in the area is absent or at low levels, the Learmonth military restricted airspace areas will not be active during the drilling program, no commercial tourism activity occurs in the area and no sensitive environmental resources are known for the area.

## **FURTHER DETAILS**

For further information about the exploration drilling program, please contact:

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