Turtle-3 Geophysical & Geotechnical Survey Summary Environmental Plan

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Executive Summary

Introduction

This Environment Plan (EP) has been prepared for the Geophysical and Geotechnical Survey preceding the drilling of Turtle-3 Development Well in permit WA-13-R. This permit is located approximately 60 km offshore from the north-west coast of Western Australia in the Joseph Bonaparte Gulf (see Figure 1).

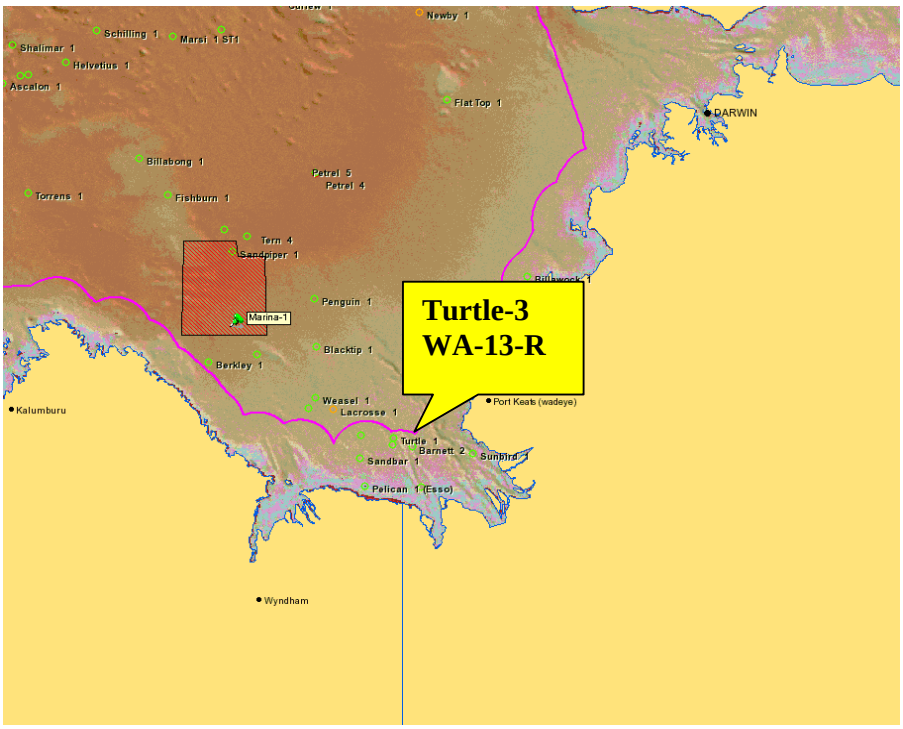
Location

The geophysical and geotechnical study will be undertaken within permit area WA-13-R in Commonwealth waters of the Joseph Bonaparte Gulf, located near the boundary between Western Australia and Northern Territory. Water depths within the region vary can vary from 20 – 50m. The proposed Turtle-3 Development Well site is located approximately 150km northeast of Wyndham and 300km southwest of Darwin. The shortest distance from the proposed Turtle-3 Development Well location to the mainland is about 60km.

The location of proposed survey at the Turtle-3 location is as follows:

Lat: -14° 28’ 36” Long: 128° 51’ 31”

Figure 1: Location Map for Turtle-3 Geophysical and Geotechnical Survey



Description of Action

The geophysical and geotechnical survey to be undertaken in WA-13-R aims to:

- Collect sufficient seabed and shallow geology data to assist in the planning and operations for the drilling of an exploration well within the permit;
- Identify seabed terrain features and hazards that may impact the location of the drilling rig for the Turtle-3 exploration well; and
- Confirm the absence of any anomalous features at the site.

To achieve the above goals the following data will be collected:

- Measurement of water depth and mapping of seabed topography;
- Analysis of the nature and composition of seabed sediments;
- Identification of any seabed obstructions or features within the site survey area;
- Mapping the shallow geology, to identify any shallow geological impediments to drilling; and
- Obtaining subsea cores to ground truth the geophysical data.

The survey will cover an area measuring 1km by 1km at the proposed well site. The line interval for bathymetry will be 100m with full side scan coverage of the seabed being achieved by using a 125m scan range.

A nominal 3 seabed samples will be taken at the site. This will be achieved by coring the seabed to a depth of 20-30 m with a bore hole of 8.5 inches. The drilling fluid that will be used during coring will be guar gum combined with seawater.

The vessel will mobilise from Darwin (NT) and demobilise at Broome (WA). It is expected that the geophysical and geotechnical survey will be undertaken in July/August 2007 and will be on location for a period of approximately 12 hours (excluding any weather delays).

The following systems/services will be used for the purpose of acquiring the data:

- Conventional single beam echo sounding for measuring water depths;
- High resolution sidescan sonar for delineating seabed features and identifying hazardous debris;
- Towfish positioning to ensure improved mapping for any features;
- High resolution sub bottom profiler for determining shallow geology; and
- Soil Investigation using samplers installed on the vessel.

Description of Receiving Environment

Physical

WA-13-R lies within the northern continental shelf of Australia. The geophysical and geotechnical survey will occur offshore within the Bonaparte Depression, a geomorphic feature of the Sahul Shelf. This area is part of the Joseph Bonaparte Gulf located in Commonwealth waters. The nearest shore line is about 60km away and is a remote and sparsely populated region of the WA Kimberley coast.

Key environmental features of the survey area are:

- The water depth generally ranges from 20 to 50m and is subject to the seasonal Leeuwin Current and is also affected by discharges from the Ord and Victoria Rivers.
- Sediments are likely to be very soft clayey silt and silty clay at the Turtle-3 survey area.
- As part of the interim marine and coastal regionalisation for Australia, the IMCRA Technical Group has classified the area where the survey is located as part of the meso-scale region defined as the 'Bonaparte Gulf'.
- During the survey period the mean daily maximum and minimum temperatures are likely to be in the order of 28.1^{o} C and 22.1 C respectively.
- As the area has a tropical monsoonal climate the majority of rain falls in the summer months. The mean monthly rainfall during July is 3.6mm.
- During the dry season (April to July), winds are predominantly from northeast, through east and southeast
- The shelf is macro-tidal between Dampier and Darwin, with mean spring tides increasing up to 9m towards the coast. The tidal currents flow northeast-southwest across the shelf.

Benthic Fauna

Limited information is available on benthic fauna in the immediate vicinity of WA-13-R, However, samples have been taken at the Blacktip Permit area which is located approximately 75km northwest from the proposed survey location. At this location infauna was found to be diverse and abundant, with two major phyla, Arthropoda (crustaceans) and Annelida (polychaete worms) contributing over 80% of the total number of individuals. Other studies in the area near the Victoria River mouth had a greater proportion of crustaceans and cnidarians compared to sites further offshore mostly likely due to coarser sediments.

Seabirds

There are no seabird breeding colonies located within the permit area. However, it would be expected that various species would overfly the area.

Fish

In general, the fishes offshore of northwestern Australia are typical of the Indo-Pacific region. The dominant groups across this region usually include such families as gobies, wrasses, damselfishes, gropers, moray eels, cardinalfishes, and surgeonfishes.

Seasnakes

The seas of tropical Australia support a rich sea snake fauna, with a strong endemic component and have greater species diversity than any other region. There are potentially 16 species that could occur in the Joseph Bonaparte Gulf. Sea snakes would be present in the survey area.

Crocodiles

Estuarine crocodiles or salt water crocodiles (*Crocodylus porosus*) are migratory species under EPBC Act and may occur in the area.

Environmentally Sensitive Resources

There are no environmentally sensitive resources identified within the surrounding area such as coral reefs, sea grass beds, nesting areas for turtles, suitable habitat for dugongs or migratory paths for whales. The area does not contain any marine parks, reserves, Ramsar or world heritage areas. The area is not known as an aggregation area for whale sharks.

Socio-economic

The main socio-economic activity in the area includes a number of commercial fisheries, and oil and gas production across the greater region. The area does not lie in any major shipping routes. Due to the remoteness of the area it is not expected that any significant recreational fishing would occur in the area.

Details of Major Environmental Hazards & Controls

A risk assessment has been undertaken for all the environmental aspects associated with the geophysical and geotechnical survey activities (aspects) planned in WA-13-R. This process is consistent with the requirements of AS/NZ4360:2004 (Risk Management) and HB203: Environmental Risk Management (Principles and Processes). The analysis indicates that, with the identified management and mitigation measures implemented, no significant environmental impacts are expected and the activities carry a low residual environmental risk. Further details of key environmental aspects of the drilling activities are provided in Table 1. This table also summarizes the management/mitigation measures and applicable standards for each aspect of the geophysical/geotechnical operation.

Table 1: Summary of Performance Objectives, Standards, and Criteria

Environmental Aspects	Environmental Objectives	Management Measures	Management Standards	Risk
Physical Presence of Survey Vessel (Marine Fauna)	Minimise impacts to marine mammals and turtles	Anchoring Procedures minimise anchor dragging Adherence to National Guidelines for Whale & Dolphin Watching (2005) Environmental Induction for crew	Australian National Guidelines for Whale and Dolphin Watching (2005) Cetacean Sighting Reports to DEW	Low
Physical Presence of Survey Vessel (shipping Incidents)	Eliminate incidents which may have adverse water quality impacts Minimise impacts to fisheries	Navigation lights on vessel and continuous radio and radar watch Emergency Response and oil spill Incident reporting Consultation with Fishing Industry	Emergency Response Plan (including oil spill response) implemented and all personnel trained in response requirements Incident Management System Log Consultation	Low
Discharge of Drilling (coring) Fluids	Minimise impact on pelagic and benthic communities	Use of low toxicity drilling fluid	Geotechnical Survey EP P(SL) Act 1967	Low
Discharge of Food scraps and sewage & general waste	Avoid negative impacts on surrounding marine waters	Food scraps macerated to 25mm Sewage and grey water treated Equipment inspected daily Biodegradable Cleaning agents (detergents) selected	Waste Management Procedures Compliance with MARPOL - Annex IV (Sewage)	Low
Discharge of effluent from equipment/ machinery spaces	Avoid negative impacts on surrounding marine waters	Area collected in bilge tank Oil directed onshore for disposal Oily water discharge stream 15ppm oil-in-water Water discharge monitored & directed onboard if spec. exceeded Monitors calibrated and certified	MARPOL 73/78 – Annex 1 (Oil) & Annex II (Noxious Liquid Substances)	Low

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Discharge from Deck Drainage	Avoid negative impacts on surrounding marine waters	Oil and chemical stores contained with no residues/spills discharged overboard Desks kept free of oil, grease, and other residues Deck spill equipment available and used prior to deck washing Chemical selection considers environmental impacts & ensures MSDS availability Oily/water deck drainage to oil/water separation unit Oil-in-water discharge monitored, monitor calibrated, and records retained Oils collected for onshore disposal Mud handling areas contained & directed to mud holding tanks Biodegradable detergents used	MARPOL 73/78 – Annex 1 (Oil) & Annex II (Noxious Liquid Substances)	Low
Storage & Disposal of Environmentally Hazardous and General Wastes	Avoid negative impacts on surrounding marine waters	Waste minimised as part of job planning (JSA's) (as appropriate) Wastes segregated, containerised and labelled Waste storage areas are covered and contained Environmentally hazardous/ general waste is returned to shore for disposal Documented waste management procedures and disposal records Personnel trained in waste management Storage areas inspected daily	MARPOL 73/78 – Annex 1 (Oil) & Annex II (Noxious Liquid Substances)	Low

Environmental Aspects	Environmental Objectives	Management Measures	Management Standards	Risk
Combustion emissions from marine diesel	Minimise emissions, use energy efficiently and avoid aesthetic impacts of combustion	Equipment maintained to maximise combustion efficiencies Equipment fuel consumption monitored and assessed for performance	MARPOL 73/78 – Annex VI (Air Emissions) Marine Diesel use is minimised. Machinery is maintained to achieve maximum practical efficiency	Low
Generation of Noise	Avoid or minimise adverse effects of noise on sensitive species	Vessel approach to cetaceans greater than 300m Cetacean sighting forms completed and forwarded to DEW	P(SL) Act 1967 Australian National Guidelines for Whale and Dolphin Watching (2005)	Low
Ballast Water	Avoid negative impacts on surrounding marine waters	Vessel mobilising from within Australian waters	Australian Ballast Water Requirements (AQIS, 2001)	Low
Hydrocarbon Spills from vessel grounding or collision or fuelling	Avoid negative impacts on surrounding marine waters	Any refuelling incident resulting in an oil spill whilst in port will be immediately reported via the Incident Management System to AGR-AP/Drillsearch. Vessel equipped with navigation aides and competent crew maintaining visual, radio and radar watch for other vessels or other hazards such as submerged reefs or shoals. Spills in excess of 80 litres are reported immediately to DOIR The availability of an implemented and tested Shipboard Oil Pollution Emergency Plan.	P(SL) Act 1967	Low

Management System Approach

Drillsearch has engaged AGR as the project manager for the WA-13-R Geotechnical and Geophysical Program. All activities are conducted in accordance with AGR's comprehensive Integrated Management System (IMS) which implements the AGR HSEQ Policy and associated objectives. The key features of the AGR Health, Safety Environment and Quality Policy includes:

- responsibly managing impacts to the environment in all their activities;
- ensuring compliance with legislative requirements and industry standards;
- implementation of an effective safety and environment management system; and
- continual improvement in environmental performance by setting objectives and monitoring against targets.

Consultation

AGR on behalf of Drillsearch has consulted with fishery groups, fishing industry groups and regulatory agencies in preparation for the Turtle-3 Exploration Well and for the preceding geophysical and geotechnical Survey.

Key points raised during consultation with AFMA are detailed below:

- Area is a major fishing area for Northern Prawn fishery; and
- AFMA requested that various industry representatives (list provided) are consulted prior to mobilising. This was duly undertaken.

Contact details

Further information may be obtained from Drillsearch by writing to:

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