



1	0	CNOOC EP – Executive Summary	QHSE Coordinator	QHSE Advisor	Drilling Engineering Superintendent	14-08-09
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1 EXECUTIVE SUMMARY

1.1 The Proponent

CNOOC Australia E&P Pty Ltd (CNOOC) is the proponent for the Songa Venus CNOOC WA-406-P Drilling Campaign. ADA is an international well engineering and project management company, conducting the drilling operations on behalf of CNOOC.

1.2 The Proposal

CNOOC Australia E&P Pty Ltd (CNOOC) proposes to undertake an exploration drilling program of three wells, Jin Niu-1, Hong Niu-1 and Fu Niu-1, in Commonwealth waters of the Bonaparte Basin, off the northwest coast of Western Australia. All three wells will be located in petroleum exploration permit WA-406-P, of which CNOOC is the sole title holder and operator. Water depths for the three wells range from approximately 110 m to 300 m.

The Songa Venus Semi-submersible rig will be used to drill the three CNOOC wells at the locations shown in Figure 1. Coordinates of the well location and permit area are listed in Table 1 below. Drilling will occur 24 hours per day.

Two Anchor Handling Supply Vessels (AHSV) will service the rig with approximately 30 support vessel trips per month during the drilling program. Both vessels will return to port (Darwin) for refuelling. There will be helicopter support to the drill rig.

At the Jin Niu-1 location, the well will be drilled vertically to an approximate depth of 3525 metres. The well will be drilled primarily using a combination of water based mud and seawater, but one hole section is planned with synthetic based mud. Overall, approximately 543 m³ of drill cuttings will be discharged overboard. Production testing of Jin Niu-1 will not be undertaken.

At the Hong Niu-1 location, the well will be drilled vertically to an approximate depth of 3625 metres. The well will be drilled primarily using a combination of water based mud and seawater, but one hole section is planned with synthetic based mud. Overall, approximately 285 m³ of drill cuttings will be discharged overboard. No production testing is planned for Hong Niu-1 and the well will be permanently plugged and abandoned when all data gathering is complete.

Fu Niu-1 will be a vertical well will be drilled vertically to an approximate depth of 3625 metres. It is expected that the volume of drill cuttings from this well will be 285 m³. The well will be drilled primarily using a combination of water based mud and seawater, but one hole section is planned with synthetic based mud. Production testing is not planned at this location and on completion of data gathering it will be permanently plugged and abandoned.

The drilling program is scheduled to commence in the third quarter of 2009 and is expected to continue for approximately 100 days.

This EP was approved by the Department of Mines and Petroleum (DMP) on 12 August 2009. The Commonwealth Department of Environment, Water, Heritage and Arts (DEWHA) assessed a referral under the Environment Protection and Biodiversity Conservation Act as 'not a controlled action' on 7 August 2009.

Table 1 Well location and permit area

Location Name	Permit Area	Latitude	Longitude
Jin Niu-1	WA-406-P	10°49'45.91788"	126°13'10.91575"
Hong Niu-1	WA-406-P	10°49'2.32377"	126°09'21.03815"
Fu Niu-1	WA-406-P	10°42' 42.99"	126° 03' 26.87"

Projection: GDA94

Figure 1 CNOOC WA-406-P well locations



1.3 Description of the Environment

Physical Environment

The climate within the vicinity of the proposed drilling campaign is characterised as arid sub-tropical. There are two distinct seasons in the area, summer (September to March) and winter (May to July). Summers are hot and humid, with winds mainly from the south west, and occasional heavy rainfall events associated with tropical cyclones – which occur on average twice a year between January and March. The summer season is characterised by predominantly west to southwest winds of 5 m/s for periods of 5 to 10 days with surges in the airflow of 8 to 12 m/s for periods of 1 to 3 days (MetOcean, 2009).

The WA-406-P drilling site is characterised by shallow water depths on the continental shelf with a range of water depth of 30 m to 300 m.

Biological Environment

The Bonaparte Basin is a large, predominantly offshore sedimentary basin that covers approximately 270,000 square kilometres of Australia's northwest continental margin. The basin contains up to 15 kilometres of Phanerozoic, marine and fluvial, siliciclastic and carbonate sediments.

Benthic infauna is likely to be present in the drilling program area. It is likely that sea stars, worms and crustaceans will also be present. Substrate composition, water depth, temperature and season all effect the spatial distribution of these species.

Five species of marine turtle occur within the project region. These are the green turtle (*Chelonia mydas*), flatback turtle (*Natator depressus*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*) and the leatherback turtle (*Dermochelys coriacia*). All species, but the leatherback turtle, are on the National List of Threatened Species. The green, flatback and hawksbill turtles exhibit a summer nesting period on deep sandy beaches (Pendoley, 2005). The drilling location does not contain any emergent land or shallow reef in which the turtles usually breed and reside in. The likelihood of encountering significant numbers of turtles is low.

Whales and Dolphins are common to the Western Australian coast. However, the project area resides in deep offshore waters where there is small potential for interaction between drilling-related activities and whales. Particularly due to the short period required for the drilling at the CNOOC location and its stationary nature of the activity. The drilling program will be undertaken in third and fourth quarter of 2009, which is on the outskirts of the calving periods and entering the migratory periods for the Blue Whale and Humpback Whale, where the whales will be heading south or sighted in southern Australian waters.

The project area does not reside in a know world heritage, national heritage place or near a wetland of international importance.

Socio-economic Environment

The Bonaparte Basin is a large, predominantly offshore sedimentary basin that covers approximately 270,000 square kilometres of Australia's northwest continental margin. The basin contains up to 15 kilometres of Phanerozoic, marine and fluvial, siliciclastic and carbonate sediments. The Bonaparte Basin is a proven petroleum province. The main activities in the project area include recreational fishing and tourism, petroleum exploration and production, commercial shipping and commercial fishing.

1.4 Stakeholder Consultation

In the course of planning the proposed drilling program, CNOOC and ADA has to date, undertaken consultation with relevant stakeholders in the region to identify regulatory processes, potential environmental issues and management requirements. Ongoing consultation with these groups will continue up to and during the drilling program.

Stakeholders associated with the program that have been consulted are listed in **Table 2**.

Table 2 Stakeholder consultation

Stakeholder	Contact	Date	Matters Discussed
DMP	Zoe Jones Zoe.jones@DMP.wa.gov.au Ph: (08) 9222 3658	Ongoing	EP requirements.
WA Department of Fisheries	Rob Tregonning Rob.tregonning@fish.wa.gov.au (08) 9482 7375	19/06/09	Advice on locations and fisher groups
WAFIC – Western Australia Fishing Council	Graeme Stewart ceo@wafic.org.au 08 9492 8888	19/06/09	Advice on locations and fisher groups
AFMA	Daniel Quinn (02) 6225 5555 Daniel.quinn@afma.gov.au	19/06/09	Advice on locations and fisher groups contact.
AMSA	Mark Roberts cme@amsa.gov.au (02) 6279 5000.	19/06/09	Shipping routes

1.5 Environmental Impact Assessment, Management and Mitigation

The main environmental hazards associated with the drilling program include:

- Presence of drill rig and support vessels;
- Well equipment remaining on seabed after drilling (rig to be removed from location at end of drilling);
- Drilling operations (i.e., lost equipment);
- Discharge of sewage and putrescible wastes, deck drainage oily wastes;
- Management of solid and hazardous materials and waste;
- Ballast water discharge and hull cleaning;
- Deck drainage discharge from drill rig and vessels;
- Exhaust and well testing emissions; and
- Accidental spills.

The Environment Plan provides a detailed assessment of potential impacts. The key points of the assessment, and management and mitigation measures are summarised in **Table 3** below. The summary risk ranking is also shown in **Table 3**; there are a total of 18 potential environmental risks, all of which have been assessed as having low risk.

Table 3 Summary of environmental impact assessment results

Impact Assessment	Management and Mitigation	Risk Ranking
<p>Presence of drilling rig and support vessels: rig positioning and anchoring.</p> <p>Disturbance to seabed habitat</p>	<ul style="list-style-type: none"> • Pre-mobilisation survey of drill locations • Adherence to anchoring procedures to minimise chain and anchor drag. 	Low
<p>Presence of drilling rig and support vessels: interference with other activities.</p> <p>Interference with commercial fishing and shipping, cumulative affects of offshore oil and gas activities and risk of collision with other vessels leading to oil spills.</p>	<ul style="list-style-type: none"> • Implementation of measures discussed in consultation with commercial fisheries. • Liaison and communication with commercial fishing operators regarding schedules and work plans during the drilling program. • Offshore distance will reduce the extent of inconvenience. • All support vessel operations will be conducted in compliance with the AMSA OSV Code (e.g., radar monitoring, vessel communications). • 500m safety zone to protect rig infrastructure. • Navigation light present on Songa Venus. • Continuous support vessel surveillance. • Commercial shipping lanes through the WA-406-P permit area managed by liaison with AMSA. 	Low
<p>Presence of drilling rig and support vessels: artificial lighting.</p> <p>Attraction of seabirds and other marine life and the safety need to other vessels visibility at night.</p>	<ul style="list-style-type: none"> • Standard maritime safety procedures will be adopted (AMSA). Lighting selected to meet safety requirements. • Minimise unnecessary lights directed downwards toward water. • Crew to record observations of whales and other megafauna. These will be provided to DEWHA. 	Low
<p>Presence of drilling infrastructure and support vessels: impact to visual amenity.</p> <p>Visual impact in nearshore areas</p>	<ul style="list-style-type: none"> • Distance from shoreline 350 km from shoreline. 	Low
<p>Presence of drilling rig and support vessels: Noise from VSP survey.</p> <p>Behavioural changes to marine mammals.</p>	<ul style="list-style-type: none"> • Application of DEWHA VSP guidelines (Appendix D): <ul style="list-style-type: none"> – Pre-start up visual observations. – Soft-start up procedures. – Operating procedures including: <ol style="list-style-type: none"> i. Visual observations of the <i>observation zone</i> must be maintained continuously to identify if there are any whales present. ii. If a whale is sighted within the <i>observation zone</i> the operator of the acoustic source must be placed on stand-by to power down the acoustic source. iii. If a whale is sighted within the <i>shut down zone</i> the acoustic source must be shut down completely. 	Low

	<ul style="list-style-type: none"> - Low visibility operating procedures. - Observation zone: A 3 kilometre horizontal radius from the VSP acoustic source <p>Shut down zone: A 500 metre horizontal radius from the VSP acoustic source</p>	
<p>Presence of drilling rig and support vessels: noise from drill rig, drilling vessels and support vessels, helicopters.</p> <p>Behavioural changes to marine mammals.</p>	<ul style="list-style-type: none"> • Application of DEWHA guidelines for cetacean observation and recording on rig and support vessels. • Program will be undertaken on the outskirts of the calving period and at the beginning of the migratory, periods for whale species that are likely to occur in the region. • Program of short duration (approximately 50 days at one well site and 30 days at the other two well locations). • Noise produced from the drilling rig (low-level, low-frequency tones), and accompanying support vessels in the order of magnitude of noise produced by commercial shipping. • Adoption of encroachment distances from whales by service vessels (300 m) and helicopters (500 m) (Australian National Guidelines for Whale and Dolphin Watching 2005). 	Low
		Low
<p>Drilling discharges: discharge of synthetic based drilling cuttings and muds to sea.</p> <p>Discharge of synthetic based drilling cuttings and mud to sea</p>	<ul style="list-style-type: none"> • Drill cuttings are treated on the shale shakers, cuttings dryer and by centrifuge prior to disposal to maximise recovery and reuse of drill muds. • No bulk SBM discharge at end of drilling. • Specialist SBM monitoring contractor will be present during the SBM drilling phase. The specialist role will include education of crew in aspects of SBM handling and monitoring compliance. • All handling and management will be undertaken by the specific Drilling Fluids contractor SBM Management Plan and Procedures. • Daily analysis of residual SBM on cuttings will be undertaken to verify quantities discharged and for reporting. • SBM rapidly biodegrades such that impacts from smothering and biodegradation • It is anticipated that only one section per well will be drilled using SBM. • The well locations have no particular environmental sensitivities and are distant from any marine reserves. 	Low
<p>Drilling operations: lost equipment and well completion</p> <p>Disruption to commercial fishing operations.</p>	<ul style="list-style-type: none"> • Equipment retrieval at end of drilling campaign. • ROV recovery if feasible. 	Low
<p>Discharge of sewage and putrescible wastes, deck drainage, oily wastes:</p>	<ul style="list-style-type: none"> • All vessels will comply with State and Commonwealth legislation for the control of pollution and dumping at sea. • Solids will be returned to shore for disposal. 	Low

<p>Waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • All hazardous materials will be stored in appropriately banded areas. • Wastes will be segregated as required and stored in storage areas and transferred to onshore licensed materials handlers for disposal to a licensed depot. • Waste register will be maintained to record waste management practices and audited to verify compliance. • Records kept of unplanned emissions and discharges. • Induction training will be provided for waste management. 	
<p>Discharge of solid and hazardous materials and waste: Waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • All vessels will comply with State and Commonwealth legislation for the control of pollution and dumping at sea. • Solids will be returned to shore for disposal. • All hazardous materials will be stored in appropriately banded areas. • Wastes will be segregated as required and stored in storage areas and transferred to onshore licensed materials handlers for disposal to a licensed depot. • Waste register will be maintained to record waste management practices and audited to verify compliance. • Records kept of unplanned emissions and discharges. • Induction training will be provided for waste management. • A maintenance program shall be in place for waste management equipment. 	Low
<p>Freight transfer: Introduction of pests such as vermin.</p>	<ul style="list-style-type: none"> • Freight transfers from the shore to the rig will be managed by inspection at the shore base. Equipment arriving packaged to the shore base will be unpacked and loaded onto the supply vessel prior to loading onto the rig. 	Low
<p>Ballast water discharge and hull cleaning: Introduction of marine pests. Introduction of marine species.</p>	<ul style="list-style-type: none"> • Ballast water will be exchanged as per vessel procedures, if required. • Rig to comply with Australian Ballast Water Management Requirements by AQIS and the Commonwealth National Biofouling Management Guidance for the Petroleum Production and Exploration Industry. • Vessel to comply with the Australian Ballast Water Management Requirements (AQIS). • Vessel masters will be made aware of the AQIS Maritime Awareness Kit. 	Low
<p>Deck drainage discharge from drill rig and vessels: waste discharge to sea. Disturbance to marine environment.</p>	<ul style="list-style-type: none"> • In the event of a chemical or oil spill, absorbent materials will be used to remove spill material prior to any washing activities. • The absorbent material will be containerised and sent to shore as hazardous waste to ensure that no contaminated waste streams are routinely discharged from the deck drainage system. • MSDS forms available for all hazardous chemicals • Use of oil detection monitoring equipment (OMD-2005 scattered light sensor) for treated oily water, which is maintained under the routine maintenance system in place. • Deck treatment systems (separators) for oily wastes and discharge of separated water. 	Low
<p>Exhaust and well testing emissions: Emission to atmosphere. Pollution of atmosphere.</p>		Low

	<ul style="list-style-type: none"> • Ensure that the vessel has an Oil Spill Contingency Plan (OSCP) in place and staff appropriately trained in its execution. • Ensure that all necessary fuel spill equipment is functional and accessible on the vessel. • Ensure that fuel will not be transferred during inappropriate weather conditions. • Ensure that equipment and procedures used for transferring fuel from vessel to rig (e.g., 'Dry-Break' hose couplings), conform to the AMSA Code for the safe working of support vessels. • Supply vessels will cease operating and seek safe harbour (or deep water) where conditions make it unsafe, in the view of the Vessel Master, to continue drilling operations. • Ensure that all vessel operations are conducted in compliance with the AMSA OSV Code (e.g., radar monitoring, vessel communications). • Spill modelling undertaken to enable oil spill contingency planning. • Ensure that all personnel are aware of the existence and location of the above-listed documents. 	Low
<p>Accidental spill: Chemical spill. Impacts to water quality and marine life. Impacts to water quality and marine life.</p>	<ul style="list-style-type: none"> • Minimisation of chemical usage and generation of waste. • Education in waste handling procedures during transfer and operational usage for relevant personnel. 	Low
<p>Accidental spills: Blow out, uncontrolled release of reservoir fluids. Impacts to marine fauna.</p>	<ul style="list-style-type: none"> • Shallow gas survey to understand risk of intersecting hydrocarbon bearing zone while drilling before BOPs are installed. • Offset well review to understand likelihood of intersecting over-pressured strata. • Maintenance of all well control equipment including routine maintenance of choke and kill line hoses and other fittings to the BOP, and other well control equipment. • Installation of blowout preventers. • Routine monitoring of pressure within the drilling fluid system. • Oils spill and emergency response plan. 	Low

In summary, the exploration wells are located in the Bonaparte Basin, in Commonwealth waters. The duration of the program is an estimated 100 days, the drilling is distant from marine protected areas and has low impact to the marine environment. Stakeholders have been consulted, and mitigation measures have been put in place to manage whale interaction.

Management and mitigation measures that will be followed during the project are provided in the Environment Plan. The implementation strategy for the Environment Plan specifically details the measures needed to ensure that the environmental performance objectives and standards are met, and identifies:

- Systems, practices and procedures;
- Specific roles and responsibilities;
- Employee training;
- Monitoring, auditing and recording requirements;
- Emergency response planning; and
- Consultation with government and stakeholders.

1.6 Contact Details

Please direct all queries, comments or request for a copy of the approved CNOOC WA-406-P Drilling Campaign Environment Plan to:

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