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TABLE OF CONTENTS

| | | |
|-----------|---|----------|
| 1. | INTRODUCTION | 2 |
| 2. | DESCRIPTION OF THE ACTION | 2 |
| 3. | DESCRIPTION OF THE RECEIVING ENVIRONMENT | 4 |
| 3.1 | Physical Environment | 4 |
| 3.2 | Biological Environment | 4 |
| 3.3 | Socio-Economic Environment | 5 |
| 4. | ENVIRONMENTAL HAZARDS | 5 |
| 5. | SUMMARY OF MANAGEMENT APPROACH..... | 5 |
| 6. | CONSULTATION | 9 |
| 7. | CONTACT DETAILS..... | 9 |
| 8. | REFERENCES | 9 |

LIST OF FIGURES

| | |
|---|---|
| Figure 2-1:Drilling location map for Cadwallon-1 Exploration Well | 3 |
|---|---|

LIST OF TABLES

| | |
|---|---|
| Table 2-1: Co-ordinates, Water Depth and Timing (GDA 94, MGA zone 50). | 2 |
| Table 5-1. Management Objectives and Commitments for NWS Program Related Activities. | 6 |

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1. INTRODUCTION

Woodside Energy Ltd (Woodside) proposes to undertake drilling activities on the North West Shelf (NWS) in the license area WA-434-P, using the Maersk Discoverer semi-submersible, dynamically positioned (DP) drill rig, operated by Maersk Drilling Australia. Drilling activities are planned to commence in October 2011 and to continue through until December 2011.

The well is part of the exploration drilling activities on the NWS. The environmental risks and management thereof are described in the NWS Drilling and Completion Environment Plan, Revision 5 (NWS EP), approved by the Department of Mines and Petroleum (DMP) in August 2009. The Cadwallon-1 Exploration Well Environment Plan Bridging Document (EPBD) - serves as a bridging Environment Plan to the NWS EP, and describes the well specific details such as well location, rig to be used, fluid systems, cuttings volumes and cuttings disposal methods. This document serves as a summary of the Cadwallon-1 Exploration Well and relevant parts of the EPBD and NWS EP.

2. DESCRIPTION OF THE ACTION

The Cadwallon-1 exploration well is situated in permit area WA-434-P (Figure 2-1) and is located approximately 540 km from Karratha, 475 km from Mardie, 310 km from Ningaloo Marine Park and 343 km from Murion Island Marine Management Area.

The well will be drilled with a water based drilling fluid system, as detailed in the Cadwallon-1 Exploration Well Environment Plan Bridging Document, approved by the DMP in September 2011. On completion of drilling and evaluation logs, the well will be permanently plugged and abandoned and the subsea wellheads removed.

Table 2-1 summarises the well details including surface coordinates, water depth, permit area and timing for the proposed well. This schedule is subject to change due to operational requirements and external influences such as cyclones.

Table 2-1: Co-ordinates, Water Depth and Timing (GDA 94, MGA zone 50).

| Water Depth (m LAT) | Longitude | Latitude | Permit Area | Timing |
|------------------------|--------------------|-------------------|-------------|---------|
| 2005 | 111° 36' 52.606" S | 19° 54' 54.788" E | WA-434-P | Q4 2011 |

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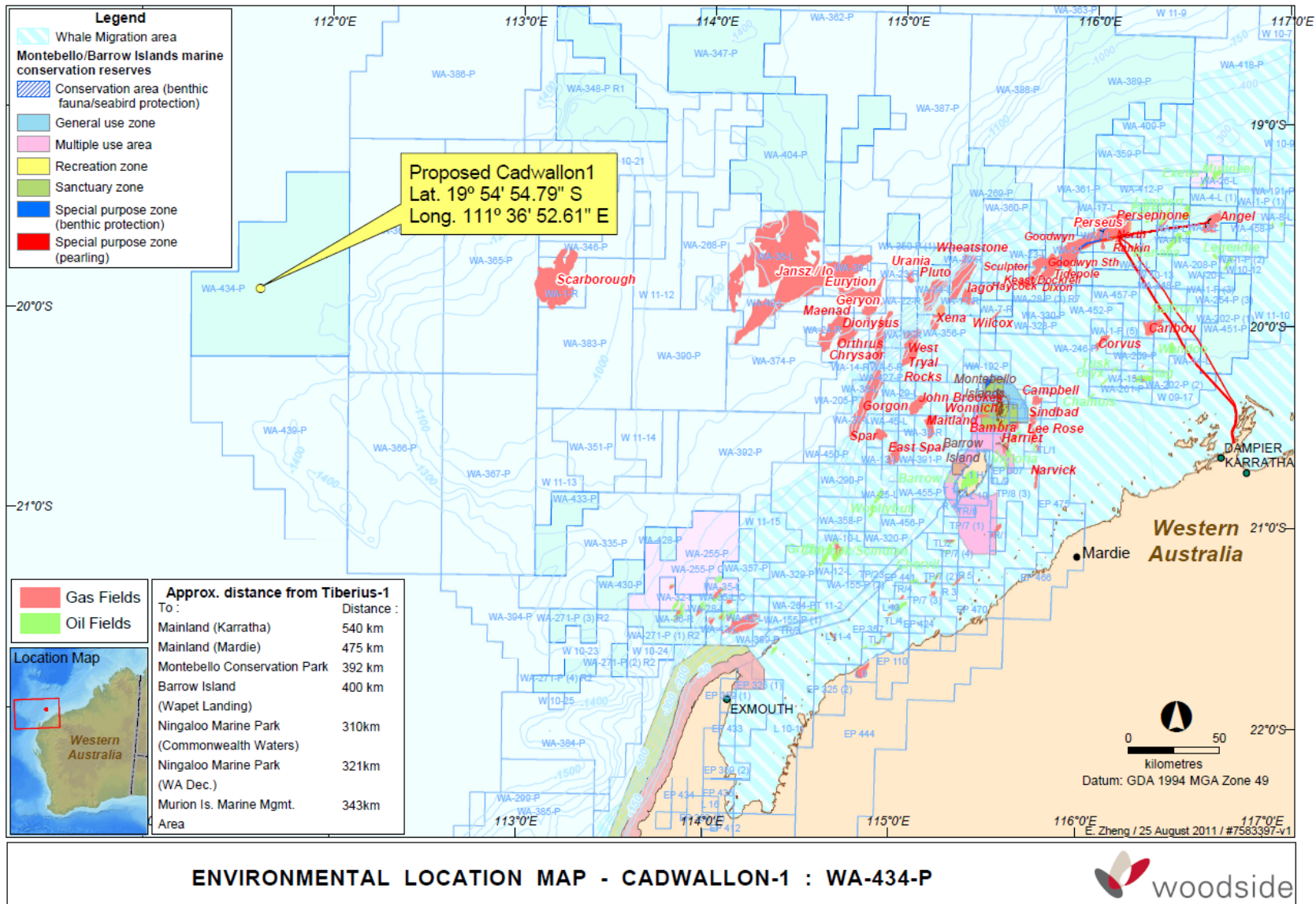


Figure 2-1: Drilling location map for Cadwallon-1 Exploration Well

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3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Physical Environment

The water depth on the continental shelf of the NWS area ranges between 50 and 1,500 m, although most of the area lies between 50 and 500 m water depth. Two significant banks are present on the gently inclined shelf, the Rankin Bank and the Glomar Shoal. The seabed is generally characterised by deep (>5 m) soft, silty sediments which become softer and finer with increasing depth.

General wind patterns in the region are monsoonal, with a marked seasonal pattern. Wind direction is predominantly from the south-east and north-east during April to September with an average wind speed of 5 – 6 knots. During October to March the prevailing wind direction is from the south-west, west and north-west and the average wind speeds are less than 10 knots. Tropical cyclones occur in the area, typically three to four times per year, most commonly between December and April (WEL, 2006). Swells of up to 2 m can be expected year round, with April being the calmest month, and January and June the roughest. Wave direction predominantly follows wind direction (east south-east in winter, west south-west in summer), except during cyclone or storm conditions.

3.2 Biological Environment

Sampling of the benthic zone has consistently shown that the soft sediments of the NWS support a low abundance, high diversity invertebrate fauna population, largely comprising burrowing polychaete worms (Phylum Annelida) and crustaceans (Phylum Crustacea). Echinoderms, bivalves and molluscs also contribute significantly to the faunal composition of the area.

Five species of turtle listed under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* are known to occur in the region; Flatback, Leathery, Green, Hawksbill and Loggerhead. Individuals of all five species may be expected to pass through the region on their way to and from nesting beaches on the mainland and adjacent islands, however, while at sea the density (concentration) of animals is low.

A number of whale species may be encountered in the region including pygmy blue, sperm and humpback whales. The humpback whale is listed as Vulnerable under the *EPBC Act* and the population migrates across the North West Marine Region (NWMR) during the annual migration. During June, July and early August the whales follow a northward route across the NWMR, that appears to follow the edge of the continental shelf to the calving grounds off the Kimberley Coast. Cow-calf pairings tend to occur in the area from September to October. Research undertaken by the Centre for Whale Research indicates that cow-calf pairings generally remain in close proximity to the shore during the southern migration following a relatively narrow route that passes close to the Dampier Archipelago and Montebello Islands.

Dwarf minke whales and pygmy blue whales have been recorded in open water sites in the Scott Reef region. This indicates that these whales would also be occurring within the broader NWMR. In addition it is likely that sperm, blue and beaked whales may occur in the region at certain times of the year.

Surveys off the NWS indicate that seabird distribution is generally very patchy except near islands where shelter and anomalies in surface water concentrate food seasonally. Most of the birds encountered offshore forage in flocks of 20 to more than 200 individuals, often of different species and are commonly associated with schools of pelagic fish, such as tuna. Foraging groups typically comprise Sooty Terns, Wedge-tailed Shearwaters and the occasional Frigatebird.

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3.3 Socio-Economic Environment

The WA-434-P permit area is beyond the range of nearshore fisheries (eg. prawn fisheries) that operate between the North West Cape and Port Hedland. There are no tourism activities within the vicinity of the licence area. There are also no known sites of Aboriginal or Non-Aboriginal cultural or heritage significance within the licence area.

Near the vicinity of the licence area, there are no known existing or proposed marine parks and reserves. There are however sensitive marine environments that occur further away from the licence area. An example of this is the area of coastline extending from Dampier Archipelago to North-West Cape, and associated coasts and islands, including the Montebello Islands and Barrow Island.

4. ENVIRONMENTAL HAZARDS

An overarching environmental risk assessment was conducted based on the Woodside corporate risk process for general drilling activities in the NWS EP. The risk assessment process indicated that the potential impacts arising from drilling activities can be categorised as either having a low or medium risk level. There were no impacts identified above a medium risk level.

The risk of a major hydrocarbon spill during routine drilling activities (e.g. refuelling and multiple well control barrier failure) was assessed as having a medium risk level (on the basis that environmental consequences of an impact from a major spill are moderate to major but the actual risk of occurrence is unlikely to highly unlikely). The NWS EP outlines a range of worst case spill scenarios relevant to the drilling activities that may be undertaken and details a range of mitigation measures in place during drilling activities to prevent spills.

The Cadwallon-1 Exploration Well program activities are adequately addressed by the NWS EP and the comprehensive environmental management controls detailed in the NWS EP will be maintained by Woodside and the relevant contractors. Considering the controls in place to prevent spills from occurring, the magnitude of the spill scenarios modelled, distance offshore from sensitive environments (e.g. coral reefs) and the probabilities of hydrocarbons contacting shorelines for expected offshore activities, it can be concluded that a significant hydrocarbon spill to the ocean during Cadwallon-1 program activities and impact to sensitive environmental receptors is unlikely.

Any spills will be managed according to the oil spill arrangements and procedures outlined in the approved Woodside Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (OSCP) (ERP-3210) as revised from time to time.

A number of whale species may be encountered in the region, including pygmy, blue, sperm and humpback whales. To ensure minimal impact on whales in the area, support vessels will maintain a 300 m separation distance, where safe to do so, from any whales sighted, as per Part 8 of the *EPBC Regulations 2000*.

5. SUMMARY OF MANAGEMENT APPROACH

Woodside's environmental management strategies and procedures to be used during drilling activities include responsibilities, training and inductions, reporting frameworks, mitigation and response activities and monitoring and auditing procedures. Commitments associated with these will be used to reduce environmental risk to As Low As Reasonably Practicable (ALARP).

The key management objectives and commitments to be applied to the Cadwallon-1 Exploration Well are summarised in Table 5-1 below.

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Table 5-1. Management Objectives and Commitments for NWS Program Related Activities.

| Objectives | Commitments |
|--|---|
| Seabed Disturbance | |
| Minimise disturbance to benthic habitat community | <ul style="list-style-type: none"> The Maersk Discoverer is a dynamically positioned rig and therefore will not be required to deploy anchors. |
| Drill Mud and Cuttings | |
| Minimise localised reduction in water quality, smothering of benthic fauna, and decreased light attenuation due to increased turbidity. | <ul style="list-style-type: none"> Non-toxic to slightly toxic water based fluids used. Procedures for vessel to rig bulk transfers, including visual observations and mud system transfers. |
| Marine Pollution from Routine Discharges | |
| Minimise potential acute and chronic toxicity effect on marine organisms, effects to water quality and indirect effects to marine fauna both in the water column and on the seabed. | <ul style="list-style-type: none"> Waste water discharges to meet legislative requirements. All fluids required to complete the activity and are proposed to be discharged to the ocean shall be assessed regarding potential for environmental impact. Non-toxic to slightly toxic cementing fluids and fluorescein dyes used. |
| Waste Management | |
| Minimise impact on the marine environment from waste disposal. | <ul style="list-style-type: none"> D&C Waste Management Plan in place, detailing wastes generated and disposal requirements. All sewage and putrescible wastes to be managed and disposed of in accordance with MARPOL 73/78. All solid, liquid and hazardous wastes (other than sewage, grey water and putrescible wastes) will be incinerated (where an approved incinerator is in place) or compacted (if possible) and stored in designated areas and sent ashore for recycling, disposal or treatment at a licensed waste treatment facility. Waste logs maintained to record waste management practices, including volumes of wastes incinerated. |
| Invasive Marine Species Management | |
| Minimise the risk of introduction and establishment of Invasive Marine Species (IMS) in sensitive and shallow water environments. | <ul style="list-style-type: none"> Adherence to the Australian Quarantine and Inspection Service's (AQIS) Australian Ballast Water Management Requirements. IMS Risk Assessments completed and documented, for vessels, rigs and immersible equipment planning to enter and operate within nearshore waters around Australia. |
| Disturbance to Marine Fauna | |
| <i>Noise:</i> Minimise potential physiological effects or disruption to behaviour patterns of marine fauna due to sound energy associated with the rig, support vessel and helicopter operations. | <ul style="list-style-type: none"> The interaction of the support vessels and helicopters with cetaceans will be consistent with Part 8 of the EPBC Regulations 2000 which requires vessels to maintain a 300 m stand off distance to cetaceans and |

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| Objectives | Commitments |
|---|--|
| | helicopters shall not operate lower than 1650 ft or within the horizontal radius of 500 m of a known cetacean. |
| <i>Recording of Marine Mammals:</i> Add to the data on marine mammals in the North West Shelf area | <ul style="list-style-type: none"> Sightings of marine mammals will be recorded and reports sent to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) periodically. |
| Atmospheric Emissions | |
| Minimise atmospheric emissions. | <ul style="list-style-type: none"> Use of low sulphur fuel, where it is available, to minimise emissions from combustible sources. Compliance with MARPOL 73/78 Annex VI requirements. |
| Marine Pollution from Non-Routine Discharges | |
| Minimise potential chronic / acute toxicity effect on marine organisms. | <ul style="list-style-type: none"> The rig and support vessels will comply with MARPOL 73/78 and have a Shipboard Oil Pollution Emergency Plan (SOPEP) in place for managing spills onboard the rig or vessel. For spills to the ocean, spill response will be undertaken as per the Woodside WA and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210). The Dampier Sub-Basin OSCP will be revised and updated periodically. Adherence to Woodside's well integrity standards and blow-out preventer in place. Adherence to bulk transfer procedures. Fuel transfer hoses to have dry-break couplings and floats Continuous visual monitoring of hoses, couplings, flow gauges and the sea surface as well as radio contact during transfers on both the support vessels and rigs/vessels. Transfers of fuel only undertaken during daylight hours, except with the Well Site Manager's approval, and when sea conditions are appropriate. Fuels, oil and chemicals will be stored with secondary containment. Spill kits will be well stocked and readily available with personnel trained in their use. |
| Cyclone Response | |
| Minimise the impact on benthic habitats and reduced potential occurrence of hydrocarbon spills. | <ul style="list-style-type: none"> Implement all measures in Woodside's Cyclone Response Procedures and the drilling contractor's Cyclone Emergency Response Plan. Secure the well by isolating any significant hydrocarbon zones and disconnecting from the well, preventing communication of any hydrocarbon fluids in the well to the surface. |
| Socio-Economic | |

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| Objectives | Commitments |
|--|---|
| Minimise potential impact on socio-economic values | <ul style="list-style-type: none"> • Adherence to standard maritime safety procedures (Auscoast Warnings via Australian Maritime Safety Authority (AMSA) where appropriate). • Compliance with AMSA administered marine safety regulations and marine notification requirements. • Pre-drilling notification/consultation with stakeholders, as required. • Notification of activity details as required to relevant stakeholders prior to commencement of each survey. • Adherence with Rig Quality and Safety Management procedures. |
| Environmental Management Plan | |
| Woodside and contractor personnel understand and comply with the environmental objectives, standards and commitments within the Cadwallon EPBD and NWS EP. | <ul style="list-style-type: none"> • All Woodside and contractor personnel undertake an environmental induction. • Copy of Cadwallon EPBD and NWS EP on board rigs. |
| Rig contractor's HSE Management system covers applicable requirements of the Cadwallon EPBD and NWS EP. | <ul style="list-style-type: none"> • Review of rig contractor's HSE management system to ensure it covers applicable requirements of the Program EP. |
| Environmental inspections to be carried out according to the requirements of the Cadwallon EPBD and NWS EP. | <ul style="list-style-type: none"> • Environmental Commitments Summary provided to the rig(s). • Audits to ensure compliance with commitments in the Cadwallon EPBD and NWS EP are to be undertaken as per the D&C Audit Schedule. |
| All environmental incidents are reported in accordance with the requirements of the Cadwallon EPBD and NWS EP, Woodside and legislative requirements. | <ul style="list-style-type: none"> • Environmental incidents recorded and reported according to the requirements of the Cadwallon EPBD and NWS EP, Woodside Standard Event Reporting and Investigation. |
| A review of the operation conducted at the end of the program. | <ul style="list-style-type: none"> • Review of the environmental performance of the operation conducted at the end of Program activities. |

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6. CONSULTATION

Woodside has an extensive history undertaking drilling and completions activities on the North West Shelf. Over this time, Woodside has developed a sound understanding of potential stakeholder concerns that may arise during drilling activities and has implemented appropriate management strategies in the NWS EP to address key environmental aspects.

To ensure Woodside's understanding of potential stakeholder concerns remains current, stakeholder consultation for drilling activities includes the following:

- Consultation, as appropriate, with key stakeholders during the preparation of the Cadwallon-1 Exploration Well Environment Plan Bridging Document to identify and manage specific environmental issues.
- Distribution of electronic notification to a broader stakeholder group prior to the commencement of the activity.

7. CONTACT DETAILS

For further information about the Cadwallon-1 exploration well, please contact:

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tim.grubba@woodside.com.au

8. REFERENCES

Woodside Energy Ltd (WEL) (2006), "Pluto LNG Development Draft Public Environment Report / Public Environmental Review, (EPBC Referral 2006/2968), Assessment No. 1632, December 2006. Woodside Energy Ltd, Perth

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