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Prepared by: T. Bonnici - WEL D&C Environmental Adviser	3/2/09		
Reviewed by: S. Glennie - WEL Superintendent	4/2/09		
Approved by: D. Robb - WEL D&C Operations Manager	5/2/09		

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Doug Robb

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## North West Shelf (NWS) Intervention Campaign Environment Plan Summary

This summary of the North West Shelf Intervention Campaign Environment Plan has been submitted to comply with Regulation 11(7)(8) of the *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*.

### Introduction

Woodside Energy Ltd (Woodside) proposes to undertake well intervention operations at the Cossack/Wanaea and Lambert/Hermes (CWLH) fields on the North West Shelf (NWS), using the Havila Harmony dynamically positioned vessel, operated by TSMarine.

The aim of the intervention programme is to carry out Production Logging Testing (PLT) operations to establish where the water bearing zones are located in the wells and undertake subsequent plugging of the water bearing zones. It may also be required to install plugs to provide a double mechanical barrier at the Lambert-4 location. The work is planned to be undertaken throughout 2009 depending on availability of the vessel and requirements of the CWLH stakeholders.

### Project Description

The four wells are located in licence areas WA-11-L and WA-16-L, with the closest well (Wanaea-7) 134 km north north-west of Karratha, 128 km northeast of the Montebello Conservation Park and 161 km northeast of Barrow Island. Water depths at the well locations range between 78 to 127 m.

### Coordinates of Activities

The surface location coordinates for the wells are: *UTM (GDA94 50S)*

Well	Longitude	Latitude
Lambert-4	116° 29' 10.70" E	19° 27' 02.67" S
Lambert-6	116° 29' 16.90" E	19° 26' 56.92" S
Wanaea-1	116° 26' 02.60" E	19° 35' 35.30" S
Wanaea-7	116° 26' 06.53" E	19° 35' 31.61" S

### Description of the Existing Environment

The four wells to be included in the intervention campaign covered by this Environment Plan (EP) are located on the North West Shelf (NWS). There are no known areas of environmental significance in the immediate vicinity of the well. No endangered or vulnerable species are known to reside permanently with the area, although some may pass through on migratory routes.

### 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 SE and NE during April to September with an average wind of speed 5 – 6 knots. During October to March the prevailing wind direction is from the

SW, W and NW 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. 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 (ESE in winter, WSW in summer), except during cyclone or storm conditions.

### **Biological Environment**

Sampling of the benthic zone has consistently shown that the soft sediments of NWS support a low abundance, high diversity invertebrate fauna population, largely comprising burrowing polychaete worms (Phylum *annelida*) and crustaceans (Phylum *crustacean*). 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, Leatherly, Green, Hawksbill and Loggerhead Turtles. 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. The Group IV Humpback Whale (*Megaptera novaeangliae*) population migrates across the NWS during the annual migration. During June, July and early August the whales follow a northward route across the NWS, which 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/October. Research undertaken by the Centre for Whale Research indicates that cow-calf pairings generally remain in the proximity of the close shore during the southern migration following a relatively narrow route that passes close to the Dampier Archipelago and Montebello Islands.

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 (*Sterna fuscata*), Wedge-tailed Shearwaters (*Puffinus pacificus*) and the occasional Frigatebird (*Frigata* spp).

### **Socio-Economic Environment**

The offshore NWS supports one open fishery and three offshore fisheries, extending northwards and eastwards from the North West Cape out to the limits of state jurisdiction at a depth of 200 m. The main fisheries in this area include the Pilbara Trawl Fishery, Pilbara Trap Fishery, Western Tuna and Billfish Fishery and the Northern Shark Fishery. There are no recreational fisheries in the vicinity of any permit areas on the NWS.

### **Major Environmental Hazards and Controls**

A risk assessment of the Havila Harmony intervention activities identified no *major* hazards for the activities. Activities identified as posing potential *moderate* risk to the environment were significant release of hydrocarbons due to the Havila Harmony losing position and foundering. The likelihood of a major hydrocarbon spill during intervention and commissioning activities is unlikely.

A number of whale species may be encountered in the region, including Pygmy Blue, Sperm and Humpback Whales. The intervention and commissioning activities are to be undertaken on wells located within the Humpback migratory path. As the intervention activities may be

completed throughout 2009, they may be undertaken during the known Humpback migration period. To ensure minimal impact on whales in the area, the vessel will maintain a 300 m separation distance, where safe to do so, from any whales sighted.

The risk of a significant hydrocarbon spill occurring during the intervention activities is very low. The results of spill modelling undertaken for the Cossack Pioneer FPSO production facility, which is located approximately 4 km to the east of the closest well - Wanaea-1 (located in permit area WA-16-L) – was used to consider the likely fate and trajectory of spilled hydrocarbons, if a loss of containment were to occur.

A conservatively large marine diesel spill scenario from the Cossack Pioneer was modelled, assessing a surface discharge of 5,500 m<sup>3</sup>. This scenario is considered to be an overestimation of the potential spill events that could occur from the NWS intervention activities, however provide a useful indication of the trajectories and fate of any spilled substances if a significant unplanned discharge were to occur.

Simulations indicated that surface slicks and entrained hydrocarbons are very unlikely (<1% probability) to make contact with any of the surrounding coastlines during any season. The overall trend was for slicks to migrate offshore or parallel to shorelines.

A series of comprehensive environmental management controls will be maintained by Woodside and TSMarine to ensure that no significant environmental effects are realised from the intervention and commissioning activities. Potential spills will be managed according to the oil spill arrangements and procedures outlined in the approved Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210).

## Summary of Management Approach

The following table identifies the key management objectives, standard and criteria to achieve these objectives.

	Standards	Criteria
No significant disturbance to seabed and benthic habitats	<ul style="list-style-type: none"> <li>Woodside Environmental Standards</li> <li>Vessel Operating Procedures</li> </ul>	<ul style="list-style-type: none"> <li>Use of dynamically positioned vessel ship.</li> <li>Use of ROV to position and remove transponders.</li> <li>Recording and reporting of all items lost overboard.</li> </ul>
No introduction of exotic marine species	<ul style="list-style-type: none"> <li>AQIS Australian Ballast Water Management Requirements</li> <li><i>Quarantine Act 1980</i></li> </ul>	<ul style="list-style-type: none"> <li>Havila Harmony adheres to AQIS Australian Ballast Water Management Requirements and quarantine requirements.</li> </ul>
No significant impact to transient marine fauna	<ul style="list-style-type: none"> <li>Woodside Environmental Standards</li> <li>EBPC Amendment Regulations 2006</li> <li>DEWHA Guidelines for Minimising Disturbances to Whales</li> </ul>	<ul style="list-style-type: none"> <li>Guidelines to minimise whale disturbance followed.</li> <li>Required safe distance of 300 m from cetaceans maintained by vessel.</li> </ul>
No significant impact on marine environment from fluids discharged	<ul style="list-style-type: none"> <li>Woodside Environmental Standards</li> <li>Vessel Preventative Maintenance System (PMS)</li> </ul>	<ul style="list-style-type: none"> <li>Use and discharge of approved fluids, as outlined in EP.</li> </ul>
No significant impact on marine environment from routine discharges	<ul style="list-style-type: none"> <li>Woodside Environmental Standards</li> <li>MARPOL 73/78 Annex IV</li> </ul>	<ul style="list-style-type: none"> <li>Sewage and putrescibles waste systems are fully operational prior to commencement of drilling operations and include maceration to less than 25 mm diameter.</li> <li>Deck drainage contaminated by hydrocarbons or chemicals is contained and disposed onshore unless monitored and oil in water content meets MARPOL requirements.</li> </ul>
No significant environmental impact from solid and hazardous wastes	<ul style="list-style-type: none"> <li>Woodside Environmental Standards</li> <li>Woodside D&amp;C Waste Management Plan</li> <li>MARPOL 73/78 Annex IV</li> </ul>	<ul style="list-style-type: none"> <li>Waste Management Plan in place and adhered to.</li> <li>Hazardous wastes documented and tracked according to requirements.</li> <li>MSDS sheets readily available.</li> <li>Waste log maintained and quantities of wastes transported ashore recorded.</li> </ul>

	Standards	Criteria
No hydrocarbon or chemical spills to the marine environment	<ul style="list-style-type: none"> <li>• Woodside Environmental Standards</li> <li>• Western Australia and Dampier Sub-Basin Oil Spill Contingency Plan (ERP-3210)</li> <li>• Havila Harmony SOPEP</li> <li>• Havila Harmony Fuel Transfer Procedure</li> <li>• Havila Harmony Emergency Response Plan</li> <li>• Havila Harmony HSE Management System</li> <li>• Havila Harmony Preventative Maintenance System (PMS)</li> <li>• MARPOL 73/78 Annex I</li> </ul>	<ul style="list-style-type: none"> <li>• Approved OSCP in place and complies with MARPOL.</li> <li>• Havila Harmony crew induction covers spill response procedures and spill response exercise conducted.</li> <li>• Re-fuelling in port only.</li> <li>• Re-fuelling procedures are in place and followed.</li> <li>• Dry break couplings used on transfer hoses.</li> <li>• All valves, couplings and transfer hoses checked for integrity prior to use.</li> <li>• JHA for bulk transfer of fluids reviewed before transfers.</li> <li>• DP operator in the control room at all times.</li> <li>• Records kept of inspections and preventative maintenance.</li> <li>• Approval is sought and provided prior to all dispersant applications.</li> </ul>
Minimise emissions to atmosphere from incineration of wastes	<ul style="list-style-type: none"> <li>• Woodside Environment Standards</li> <li>• MARPOL 73/78 Annex VI</li> </ul>	<ul style="list-style-type: none"> <li>• Incineration certified to meet MARPOL requirements.</li> <li>• Incinerator operated as per Incinerator Operating Manual.</li> <li>• Only combustible non-hazardous waste, with the exception of oil and oily material, to be incinerated.</li> <li>• Ash to be contained and transported onshore for disposal.</li> </ul>
No significant impact on recreational vessels, commercial fishing, and shipping	<ul style="list-style-type: none"> <li>• Woodside Environmental Standards</li> <li>• Havila Harmony Emergency Response Plan</li> <li>• Australian Maritime Safety Authority (AMSA) requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Functional navigational lighting in place and in use.</li> <li>• Consultation with local fishermen, fishing industry groups and management agencies as needed. Operations carried out in a manner that does not interfere with navigation and fishing to a greater extent than is necessary.</li> <li>• Marine notices broadcast according to Standard Maritime Safety Procedures (AMSA), via the Rescue Co-ordination Centre (RCC).</li> </ul>

## **Consultation**

Consultation with parties who may be directly impacted will be undertaken on an ongoing basis. Vessels in the Western Tuna and Billfish Fishery may be operating in the permit area, hence the Commonwealth Fisheries Association, West Australian Fishing Industry Council, TunaWest and Southern and Western Tuna and Billfish Fisheries will be contacted prior to intervention activities commencing to inform them of the vessel location. Consultation with broader stakeholders is not deemed necessary at this time due to the small area affected, short duration of planned activities and lack of sensitive environments close to the well locations. This will be reviewed on an ongoing basis.

## **Contact Details**

For Further information about the project, please contact:

Tanya Bonnici

Woodside Drilling and Completions Environmental Adviser

(08) 9348 6292

[tanya.bonnici@woodside.com.au](mailto:tanya.bonnici@woodside.com.au)