

1. COORDINATES OF THE ACTIVITY

The Cossack, Wanaea, Lambert and Hermes (CWLH) fields are operated by Woodside Energy Ltd (Woodside) and are located on the North West Shelf (NWS) of Western Australia. Production from the CWLH fields is to be processed on the Floating Production Storage and Offloading (FPSO) vessel the *Okha* moored to a Riser Turret Mooring (RTM).

The *Okha* is located in 80 m of water depth 125-145 km north west of Karratha, in location:
 Latitude: 19° 35' 13" South
 Longitude: 116° 26' 29" East

2. THE RECEIVING ENVIRONMENT

No significant environmental resources are located in the immediate vicinity of the proposed activities.

The benthic community is expected to be similar to other locations on the NWS which is characterised by low density infauna consisting of mobile burrowing species, including molluscs, crustaceans, and polychaete, sipunculid and platyhelminth worms.

A number of whale species may be encountered in the region, including Pygmy Blue, Sperm and Humpback Whales. The CWLH fields' location is within the known Humpback Whale Migratory path.

3. DESCRIPTION OF THE ACTION

The CWLH fields were produced through the *Cossack Pioneer* FPSO from 1995 to 2011 using a subsea system of wells tied back via flow-lines. The *Cossack Pioneer* will be replaced with the *Okha* FPSO for the extended field life. The subsea infrastructure has been upgraded to meet the extension of field life.

The function of the *Okha* is to extract, process, store and offload oil and export gas from reservoirs: oil is despatched to trading tankers whilst export gas is transported via the Gas Export Line (GEL) to North Rankin A (NRA), from where it is subsequently transported to the Karratha Gas Plant. The offshore development consists of subsea wells and installations (e.g. wellheads, production manifolds and flowlines), an FPSO and GEL.

4. MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

The table below contains the performance objectives, standards and criteria for major environmental hazards during the operations phase of the CWLH Fields and *Okha* FPSO.

Table 1 – Performance Objectives, Standards and Criteria

Objective	Standards	Criteria
Minimise the environmental impact of discharging Produced Formation Water	OPGGSER Regulation 29 <i>Okha</i> Produced Water System Operations Manual	Overboard Produced Water discharge is measured and monitored continuously (average and peak concentrations, and volume).
		PFW System is operated according to relevant procedures.

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Objective	Standards	Criteria
	<p><i>Okha Operations Performance Standard, Environmental Emissions Monitoring and Controls</i></p> <p><i>OKH Laboratory Procedures Process Sampling</i></p> <p><i>Risk-Based Inspection Report – Okha FPSO Pressure Vessel and Piping</i></p> <p><i>Okha Operations Performance Standard – P01 Pressure Vessels</i></p>	<p>Oil content of Produced Water is measured via an online Sigrist UV Fluorescence Photometer in the overboard discharge line.</p> <p>Calibration of laboratory Horiba analyser is conducted in accordance with Laboratory Procedure.</p> <p>Calibration of Sigrist analyser is conducted in accordance with Okha Operations Performance Standard P31.</p> <p>Magnetic flowmeter instrument and calibration is checked in accordance with Okha Operations Performance Standard P31.</p> <p>Degasser is inspected both internally and externally.</p> <p>Hydrocyclone units undergo internal inspections.</p> <p>In event of high OIW readings, produced water stream is diverted to slops tanks for further treatment prior to discharge (via ODME).</p> <p>Independent analysis of produced water results via independent lab.</p> <p>Reporting of the 24 hour average OIW content of Produced Water discharge overboard.</p> <p>A letter is sent to DMP notifying of any potential OIW exceedences associated with non-routine activity.</p> <p>Periodic review / assessment of actual discharged volumes and trends.</p>
<p>No significant (>80L) hydrocarbon spills to the marine environment</p>	<p><i>OPGGSER, Regulation 26</i></p> <p><i>Okha Bunkering Procedure</i></p> <p><i>Vessel bunkering procedure (specific to vessels supplying and receiving fuel)</i></p> <p><i>CWLH Wells Operating Envelopes 2010</i></p> <p><i>Dampier Sub-Basin Oil Spill Contingency Plan</i></p> <p><i>Okha Emergency Response Plan</i></p> <p><i>Inspection, Maintenance and Monitoring (IMM) Plan</i></p> <p><i>Pipeline Repair Strategy</i></p> <p><i>Vessel SOPEP (Vessel specific)</i></p> <p><i>Okha Combined Ship and Offshore Facility Security Plan</i></p>	<p>Fuel bunkering to the FPSO will be conducted in accordance with the facility Bunkering Procedure.</p> <p>Diesel bunkering hoses and fittings are compatible with supply vessel pump pressures. Bunkering hoses are certified as suitable for a safe operating pressure range at purchase – records of certification shall be kept.</p> <p>Dry break couplings will be provided on the FPSO diesel bunkering hoses. Dry break couplings and hoses will be formally inspected periodically. Inspection records will be retained.</p> <p>Vessel to vessel fuel bunkering procedures to be adhered to and bunkering records required by the procedures will be completed and retained.</p> <p>In the event of a spill to the marine environment the Dampier Sub-Basin Oil Spill Contingency Plan may be activated (depending on the volume spilt and likelihood of escalation).</p> <p>Woodside has determined, and integrated into the production system, a well integrity envelope for each production well. Operations will be conducted within this envelope.</p> <p>Subsea shut-in and ESD valves will be subject to routine testing, and records of tests will be kept.</p> <p>To protect against accidental damage from anchors, dropped objects, fishing gear and the like, the location of production wells has been marked on the relevant navigational charts by the Australian Hydrographic Office and will be maintained.</p> <p>The FPSO navigational equipment (radar, navigational aids (lighting and AIS)) will be maintained for the life of the</p>

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Objective	Standards	Criteria
		offshore facilities and repaired as a matter of priority if equipment failure occurs. ROV inspections of the pipeline and inspections of the risers, riser protection frames etc will be conducted regularly, in line with the Pipeline System IMM Plan and inspection findings retained.

5. SUMMARY OF THE MANAGEMENT APPROACH

The management approach follows Woodside’s Management System (in line with an ISO-14001 management system). A systematic approach is taken through the identification and assessment of hazards and risk, the establishment of objectives, performance standards, criteria and the development of appropriate documentation.

Environmental management when in the field and connected to the riser will be the responsibility of the FPSO Offshore Installation Manager (OIM).

6. CONSULTATION

Woodside consulted with DMP during 2008-2010 as the Designated Authority, with respect to the planned scope of work related to the CWLH Redevelopment Project. Meetings were also held with the National offshore Petroleum Safety Authority (NOPSA), Australian Maritime Safety Authority (AMSA), and American Bureau of Shipping (ABS) in relation to the overall project regulations, codes and standards.

Consultation has included internal liaison between the Project Team, *Cossack Pioneer* Team, and major Contractors.

Further notification and consultation with external stakeholders will occur as the project moves forward.

7. CONTACT DETAILS

For further information please contact Emilio Papiccio, Environment Manager Operations, on +618 9348 5180.