

Endurance 3D Marine Seismic Survey 2007 Environment Plan

Public Summary

1. Project Description

ConocoPhillips (Browse Basin) Pty Ltd (COP) will undertake the Endurance 3-Dimensional Marine Seismic Survey (3DMSS) within Exploration Permits WA-398-P and WA-396-P, within the Caswell Sub-Basin of the Browse Basin, 400 km north of Broome, Western Australia (WA) (Figure 1).

The 3DMSS is scheduled to commence in the fourth quarter of 2007, and extend over a period of approximately three months. The precise start date will be dependent upon survey vessel availability.

The survey area is restricted to Commonwealth waters and is expected to cover an area of approximately 190,000 hectares. The corner coordinates for this survey area are listed below.

COP has contracted Fugro-Geoteam AS (Fugro) to undertake the 3DMSS. Fugro will utilise the M/V Geo Atlantic to conduct the survey. This vessel is owned by Polar Queen AS and operated by Rieber Shipping AS. Rieber Shipping has the technical management of the Geo Atlantic. The chase vessel will be the M/V Tanux 1, which is owned by Tanux Shipping KS and operated by Tananger Offshore AS. For this survey, the Australian marine crew will be hired through Total Marine Services. Both vessels and all crew will adhere to Fugro protocols and procedures.

The survey will utilise 10 streamers separated by 100 metres, giving a spread width of 900 metres behind the vessel. The streamers will be 5,000 metres in length and will operate at a depth of approximately 7 metres. The configuration of the dual source array is expected to comprise airguns of 4,300 in³ and 2,500 psi (0-128 Hz). The survey will maintain source array width of 50 metres and the airgun source will run at a depth of approximately 6 metres.

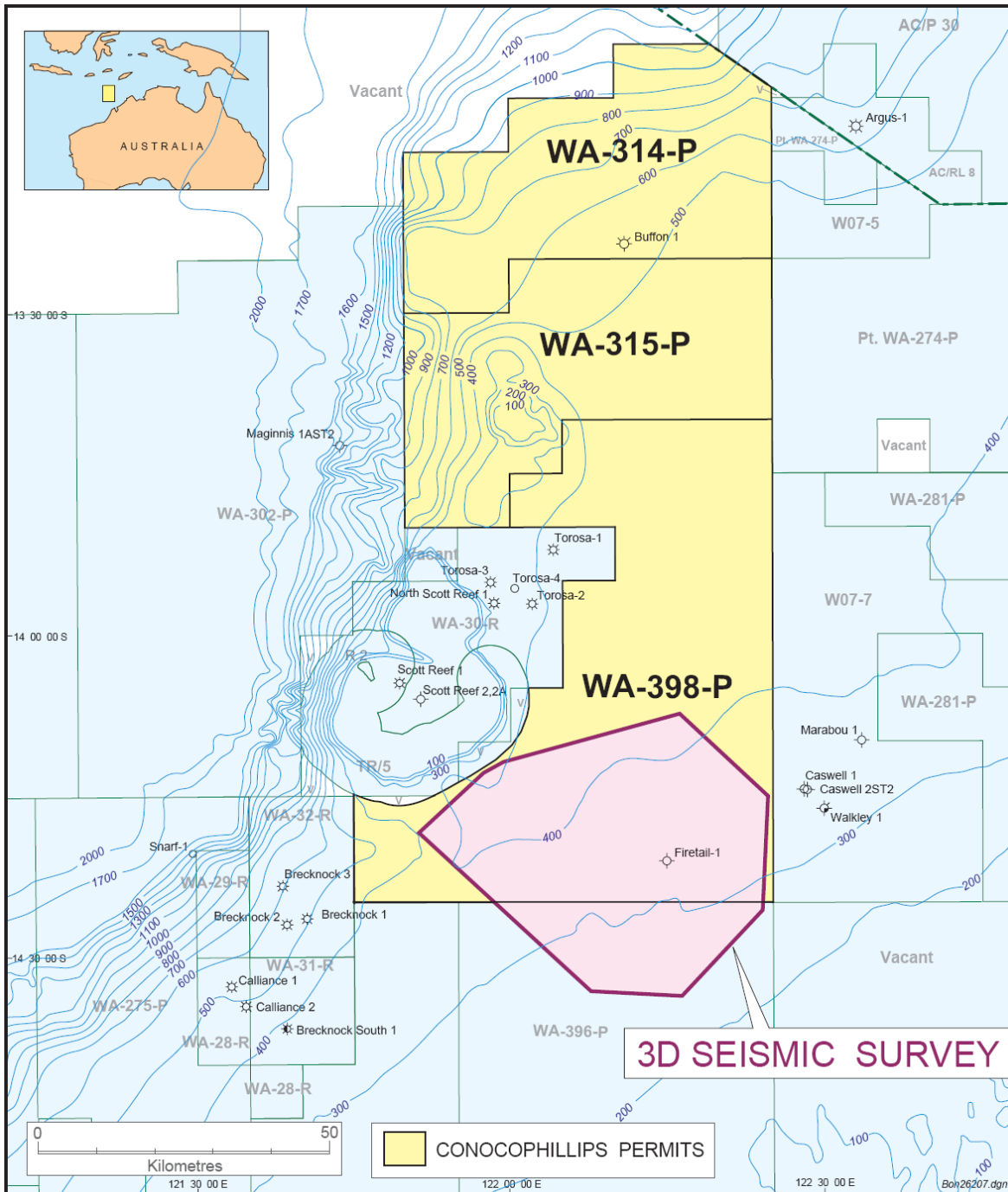
The majority of the survey will be conducted in water depths of 250 - 500 metres and, given the source and streamer depths given above (6 - 7 m), it is unlikely that any of the towed equipment will make contact with the seafloor or benthic communities.

The chase vessel will accompany the seismic vessel during the 3DMSS, except when making re-supply trips to port, to ensure adequate separation is maintained between the survey array and other watercraft. Sea-bunkering may be required for the duration of the survey, as the seismic vessel is not anticipated to return to berth until the completion of the programme. Crew transfers will be via helicopter at sea or via support vessel.

2. Coordinates of the Activity

Latitude: south			Longitude: east		
degrees	minutes	seconds	degrees	minutes	seconds
14	12	36.47	121	57	11.1
14	11	34.38	121	59	06.99
14	07	02.41	122	16	17.38
14	14	53.43	122	24	52.07
14	25	44.24	122	24	19.18
14	33	53.39	122	16	26.33
14	33	24.61	122	07	34.12
14	18	16.45	121	50	52.54

Figure 1. Location of Survey Area



3. Description of the Receiving Environment

3.1 Physical Environment

The water depth in the survey area ranges from approximately 250 to 500 metres. The closest prominent seabed features to the 3DMSS area are Scott Reef (north-west of the survey area) and Seringapatam Reef, some 50 kilometres to the north.

3.2 Biological Environment

Species that are rare or endangered are protected under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 and the Western Australian Wildlife Conservation Act 1950. The EPBC Act also provides protection for cetaceans. Six listed threatened species were identified from a search of the EPBC Act Protected Matters Database. These species may occur in the area but are likely to be transient through the area and it is highly unlikely that the area is a habitat critical to the survival of any listed threatened species.

The search of the EPBC Protected Matters database also returned 69 species covered by the marine provisions of the EPBC Act that may occur in the 3DMSS area. These comprise:

- The streaked shearwater (migratory bird);
- 31 species of fish (pipefish, seahorses and pipehorses);
- 14 species of seasnake;
- Three species of turtle; and
- 20 species of cetaceans.

The bird, seasnake, turtle and cetacean species may transit through the 3DMSS area, however there are no known roosting or breeding habitats for these species within, or adjacent to, the 3DMSS area. The fish species are likely to be listed in the search due to the proximity of the 3DMSS area to Scott Reef. However, the survey area does not encroach upon Scott Reef and it is highly unlikely that any of the listed fish species will be present in the water depths (250 metres) within which the survey will be conducted.

3.3 Cultural Environment

The survey area is about 300 kilometres from the Australian mainland, approximately 25 kilometres from Sandy Islet and about 400 kilometres from the town of Broome, Western Australia. While the survey area is partly within the Indonesian Traditional Fishing Zone (MOU74 Box), the survey will be conducted in water depths of 250 – 500 metres and is unlikely to impact these fishing activities. It is unlikely that the area is used by Australian Aboriginal people for hunting or fishing purposes. There are no islands or land within the survey area, therefore there are no Aboriginal heritage issues.

There are no ports or inhabited islands within the survey area, therefore there are not expected to be any impacts from the survey on European heritage.

3.4 Socio-Economic Environment

Commonwealth-managed fisheries permitted to operate in this area are the North West Slope Trawl Fishery, the Southern Blue Fin Tuna Fishery, the Western Skipjack Fishery and the Western Tuna and Billfish Fishery (Northern Sector). Details of these fisheries are available from the Australian Fisheries Management Authority (AFMA) website (http://www.afma.gov.au/fisheries/fisheries_index.htm). Correspondence from AFMA indicated that vessels in the North West Slope Trawl Fishery reported operating in the survey area during 2005 and 2006. There are currently seven permit holders in this fishery.

The State-managed West Coast Demersal Scalefish Fishery operates in the survey area. The fishery comprises 20 vessels but rarely operates in water depths greater than 100 metres, and never in water depths greater than 200 metres. Shark fishing is licensed in this area but activity is expected to be limited.

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Indonesian and Timorese fishermen, using traditional methods, are legally permitted to harvest marine products in the MOU74 Box. Sea cucumbers (holothurians), *Trochus* and sharks are targeted by the fishers. Fishing effort is difficult to estimate, though in 1998, 89 Indonesian fishing vessels were recorded anchored at Scott Reef. Between August to October, up to 60 boats may be visiting the reef, though they often depart the region at the onset of the North-west Monsoon season, when the 3DMSS is scheduled to commence. Although they mainly harvest on the reef or in the lagoon, some boats may infrequently operate outside the lagoon.

The survey area is remote from the main commercial shipping routes off the Australian coastline. Military training activities are unexpected as the survey area is not within a Defence maritime exercise area.

4. Major Environmental Hazards and Controls

An environmental hazard analysis process was applied to the survey, based on the ConocoPhillips internal environmental risk assessment methodology and in accordance with the principles of Australian Standard AS/NZS 4360:2004. Environmental hazardous events have been identified from a review of the proposed survey activities and the environmental setting for the activities.

Hazardous events have been assessed according to their potential environmental effects in the categories of atmospheric emissions, discharges to marine environment, physical presence, waste generation, and socio-economic effects.

High and significant residual risks are not deemed to be tolerable, and require further evaluation to determine practical risk management controls to treat and reduce the risk to as low as reasonably practicable (ALARP). Moderate residual risks are deemed to be tolerable, subject to on-going verification that risk management controls are effective. Low residual risks are deemed to be tolerable and do not warrant additional risk treatment. Nevertheless, they require regular review.

The hazard analysis process identified 13 moderate risks and 3 low risks. These are presented in Table 1, along with the associated management approach. There were no high or significant risks identified.

5. Management Approach

Environmental management of ConocoPhillips-operated activities is implemented through a hierarchy of policies and procedures that cascade from the corporate level through to the business units and their individual operations. These policies and procedures are framed and implemented within the Health, Safety and Environmental (HSE) Management System, which is the governing HSE system for the seismic survey activities.

Six environmental management strategies have been formulated to address the identified environmental hazards for the survey, categorised in the following groups: Exhaust Emissions, Spills, Waste, Physical Presence and Socio-economic Impacts.

The environmental objectives defined in the Environmental Management Strategies are based on the identified environmental hazardous events, associated environmental effects and the assessed risks, corporate policies and performance commitments, and applicable legal requirements.

Table 1. Summary of Environmental Hazards, Potential Effects and Management Approach.

Environmental Hazardous Event	Potential Effect	Management Approach	Residual Risk	Management Strategy
Exhaust gas emissions from power generation on survey vessels	Greenhouse and ecotoxic (NO _x , SO _x , HCs and CO) gas emissions. Release of particulate matter.	Equipment maintenance to sustain efficient fuel burning. Use of low sulphur diesel.	Moderate	Management of Exhaust Emissions
Spill of fuel during bunkering operations	Marine pollution if fuel is lost to sea. Impact on marine species (including oiling and ingestion).	Dry break hoses used for bunkering operations. Onboard spill kits.	Moderate	Management of Spills
Rupture of, or leakage from, survey vessel fuel tanks (e.g. from collision or grounding)	Marine pollution with hydrocarbons if spill reaches sea.	Watch (visual, radio and radar) maintained at all times that survey vessel is under way. Onboard spill kits. Maritime notification of seismic vessel and chase vessel locations to AMSA.	Moderate	Management of Spills
Discharge of engine oil from survey vessel	Marine pollution with hydrocarbons if spill reaches sea.	Onboard spill kits. Any machinery space bilge water to be discharged overboard is routed to the MARPOL approved oily water separator before disposal.	Moderate	Management of Spills
Loss of hydraulic fluid	Marine pollution with hydraulic fluid if spill reaches sea (small volumes).	Onboard spill kits.	Moderate	Management of Spills
Release of hydrophone streamer fluid into marine environment	Marine pollution from streamer fluid. Considered non-hazardous.	Solid streamers.	Low	Management of Spills

Onboard spillage of hydrocarbons and chemicals	Marine pollution if spill reaches sea (small volumes)	Onboard spill kits.	Moderate	Management of Spills
Inappropriate handling and disposal of sewage and grey water	Marine pollution from raw sewage waste, increased biological oxygen demand (BOD) as a result of organic material.	All sewage waste to be treated in the vessel's sewage treatment facility, according to applicable standards, prior to discharge. Waste logs shall be maintained.	Moderate	Management of Waste
Inappropriate handling and disposal of domestic waste	Changes to local habitats through addition of foreign food sources. Contamination of marine environment from packaging waste.	Food scraps to be macerated to a diameter of less than 25 mm prior to disposal. Waste logs shall be maintained.	Moderate	Management of Waste
Inappropriate handling and disposal of hazardous and non-hazardous solid waste.	Consequences may include contamination of the atmosphere, soil and/ or water resources, either on location or at the waste disposal facility.	Recyclable and non-hazardous wastes will be segregated from other wastes and returned to shore for reuse, recycling or disposal. Waste logs shall be maintained.	Moderate	Management of Waste
Potential effects on marine organisms such as physical disturbance to benthic communities residing on shoals. Possible interference to commercial fishing and shipping	Physical damage to benthic communities. Property damage to other vessels	Strict adherence to streamer handling procedures. Vessels supplied with detailed bathymetric charts. All reasonable measures will be taken to retrieve any lost equipment. All relevant stakeholders informed of vessels movements during the survey.	Moderate	Management of Seabed Impacts Management of Interactions with Wildlife

<p>Collision of survey vessel with marine fauna, or their disturbance by marine noise from vessel engines or survey equipment.</p>	<p>Potential disturbance to local marine fauna.</p> <p>Potential injury or mortality of wildlife due to physical impact.</p> <p>Behavioural changes, including approaching or avoidance of towed bolt airguns.</p>	<p>Management Measures for Organisations/Vessels Conducting Seismic Surveys in Australian Waters, pp7-12 of EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales, DEW, May 2007</p> <p>Watch maintained at all times that survey vessel is under way.</p> <p>Survey being conducted outside of known humpback whale peak migration periods.</p> <p>Survey corridors not believed to traverse significant feeding, breeding or resting areas for protected marine species (cetaceans, turtles, etc.).</p> <p>Protected species are able to move away from slow moving survey vessel.</p>	<p>Moderate</p>	<p>Management of Interactions with Wildlife</p>
<p>Survey vessel lighting during night-time survey</p>	<p>May result in a temporary local concentration of marine fauna that are attracted to the night lights on the vessel.</p>	<p>Any marine fauna attracted to the light are expected to disperse during daylight hours.</p> <p>Survey corridors are sufficiently distant (~30 km) from known turtle nesting sites for there to be negligible risk of impact upon nesting turtles or hatchlings.</p>	<p>Moderate</p>	<p>Management of Interactions with Wildlife</p>

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Environmental impact on the seabed from dropped objects	Physical damage to seabed benthic communities	Certified lifting/winch equipment	Low	Management of Seabed Impacts
Interference with commercial and recreational fishing vessels, commercial shipping, Navy and Customs vessels and other marine users.	Temporary navigation hazard and exclusion zone around the survey vessel and associated survey equipment (streamers).	Watch (visual, radio and radar) maintained at all times that survey vessel is under way. Navigation Aids (lights, flags, radar, etc.) on survey vessel. Notification of survey vessel's location to AMSA – AusCoast warnings. Notifications to commercial and recreational fishermen, AFMA, and any other relevant stakeholders.	Low	Management of Social and Economic Impacts on Marine Users
Transport of marine pest species into Australian waters.	Elimination of a commercially important native Australian marine species through competition with introduced pest species.	Vessels to conform to Australian Quarantine Inspection Service (AQIS) guidelines relating to ballast water exchange and hull fouling.	Moderate	Management of Social and Economic Impacts on Marine Users

6. Stakeholder Consultation

Prior to the Environment Plan being submitted, various agencies and stakeholders were contacted in an attempt to determine any concerns or conflicts that might arise from the survey activities (Table 2). In the event a concern or issue is raised by a stakeholder the Department of Industry and Resources (DoIR) will be notified accordingly.

Ongoing consultation will be undertaken with the following stakeholders prior to and during the survey, in accordance with the approval to conduct the survey issued by DoIR on 2 November 2007:

- Rescue Co-ordination Centre of AusSAR, Canberra, will be kept informed of survey vessel movements;
- Weekly reports will be submitted to the Director – Department of Industry and Resources from the commencement of operations;
- Liaison with North West Slope and Western Tuna and Billfish Fisheries and various fisheries agencies prior to work commencing, and details of communications provided to Australian Fisheries Management Authority; and
- Border Protection Command will be provided details of the survey 14 days prior to commencing operations.

Table 2. Stakeholder Consultation

Stakeholder	Form of Consultation
A Raptis and Sons	Letter
Australian Customs Service (Coastwatch)	Phone
Australian Fisheries Management Authority - Environmental Policy Section Ph: 1300 723 621 cate.coddington@afma.gov.au wade.whitelaw@afma.gov.au	Phone and email
Australian Hydrographic Office -Surveying Ships and Units, Surveying Operations hydro.operations@defence.gov.au	Email
Australian Maritime Safety Authority - Rescue Coordination Centre Ph: 1800 641 792, rccaus@amsa.gov.au	Phone
Broome Port Authority Jim Ahearn, CEO Ph: (08) 91921304	Letter
Commonwealth Fisheries Association Peter Franklin, CEO, ceo@comfish.com.au	Letter
Department of Environment and Conservation - EPA Service Unit Ph: (08) 6364 6500, tim.gentle@dec.wa.gov.au	Phone, email and letter
Department of Fisheries (WA) Rob Tregonning, Ph: (08) 9482 7375, Rob.Tregonning@fish.wa.gov.au	Phone, email and letter
Department for Planning and Infrastructure - Marine Operations Ph: (08) 9216 8237	Phone
Kimberley Professional Fishermen's Association Bob Masters, Secretary, kimoff@wn.com.au	Email

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Northern Fishing Companies Association Steven Valentine, svalentine@newfish.com.au	Letter
National Offshore Petroleum Safety Authority (NOPSA) Ian McGillivray, Ph: (08) 6461 7000	Phone
Port of Darwin Bruce Wilson, Harbourmaster, Ph: (08) 8922 0660	Letter
Western Australian Northern Trawl Owners Association Norm Peovitis, President, normp@waseafoods.com.au David Carter, dcarter@newfish.com.au	Letter
Western Australian Fishing Industry Council Rick De San Miguel, CEO, ceo@wafic.org.au Guy Leyland, Manager, gleyland@wafic.org.au , Ph: (08) 9492 8888	Phone, email and letter

7. Contact Details

Roald Brotherton
 Director of Operations
 ConocoPhillips (Browse Basin) Pty Ltd
 Ph: (08) 6363 2118
 Email: roald.brotherton@conocophillips.com