



TDOB08 – 2D Marine Seismic Survey (T/41P – Bass Basin)

Environment Plan Summary

Revision 0

Issue date: 25/04/2008

| | | | | | |
|------|----------|-------------------|----|------|------|
| 0 | 25/04/08 | Issued for Review | LC | JK | NN |
| Rev. | Date | Description | By | Chkd | App. |



Introduction

3D Oil is undertaking the TDOB08 2D seismic acquisition program within Exploration Permit T/41P. This permit area is situated in Commonwealth waters and is shown in Figure 1.

An Environment Plan (EP) for this survey has been prepared in accordance with the requirements of the *Petroleum (Submerged Land) (Management of Environment) Regulations 1999* (as amended). This summary document has been prepared to comply with the requirements of Regulation 11(7) and (8) of those regulations.

The EP has reviewed the seismic acquisition activity within the T/P41 environmental context and assessed the risk the activity poses to the environment. The EP further defines control and mitigation measures; and management strategies which will minimise environmental risk associated with the activity.

The EP, approved by Mineral Resources Tasmania (the Commonwealth's Designated Authority), details participant roles and responsibilities in implementing the identified control/mitigation measures which ensures the seismic acquisition program is undertaken in accordance with 3D Oils' Health, Safety & Environment (HSE) Policy. The EP is intended to serve as a practical environmental management tool which can be used throughout the seismic acquisition program to achieve the stated and agreed environmental outcomes.

Description of Activity

3D Oil Ltd is the designated operator and 100% titleholder of Exploration Permit T/41P, located in commonwealth waters within the Bass Basin in central Bass Strait. Permit Area T/41P is located approximately 90km* north of Georgetown (Tas), 50km* west of Flinders Island and 65km south of Wilsons Promontory (Vic).

3D Oil is undertaking the TDOB08 2D marine seismic survey to assess the subsurface geology of the area. Marine seismic surveys emit high energy, low frequency sound sources towed behind a vessel. The 2D seismic survey will be conducted using a purpose built seismic survey vessel, the CGG *Pacific Titan* (refer Figure 2).

The survey location and shot-lines are provided in Figure 1 with the coordinates of the permit boundary provided in Table 1. The area to be surveyed is approximately 2805 km². The survey will traverse approximately 2201km during April/May 2008 over a period of 20-34 days, dependent on the prevailing weather conditions and down-time due to cetacean interaction.

The *Pacific Titan* will tow one streamer measuring approximately 6000m in length with hydrophone intervals located at 12.5m intervals at a depth of 8m below sea level (bsl). The vessel will acquire seismic data at an average speed of between 4-8knots. The hydrophone streamer will be gel filled (solid). One single source tuned airgun array will be towed astern of the vessel at a depth of 6mbsl. The array will consist of 3040 in³ bolt guns operating at 2000psi which will release acoustic pulses into the water column on average every 10-12 seconds. The reflected acoustic signals are recorded by hydrophones towed behind the vessel located in the streamer. Data collected by the hydrophones is stored in onboard computers for processing and analysis allowing the underlying geological strata to be determined.

* From nearest permit boundary

The *Pacific Titan* will traverse the survey area along defined transects (or seismic lines) in water depths ranging from 50m to 70m (refer Figure 1). Seismic activities are planned to occur on a 24hr operational basis and in sea-states of <4.5m.

Figure 1: 2D Seismic Program (T/41P)

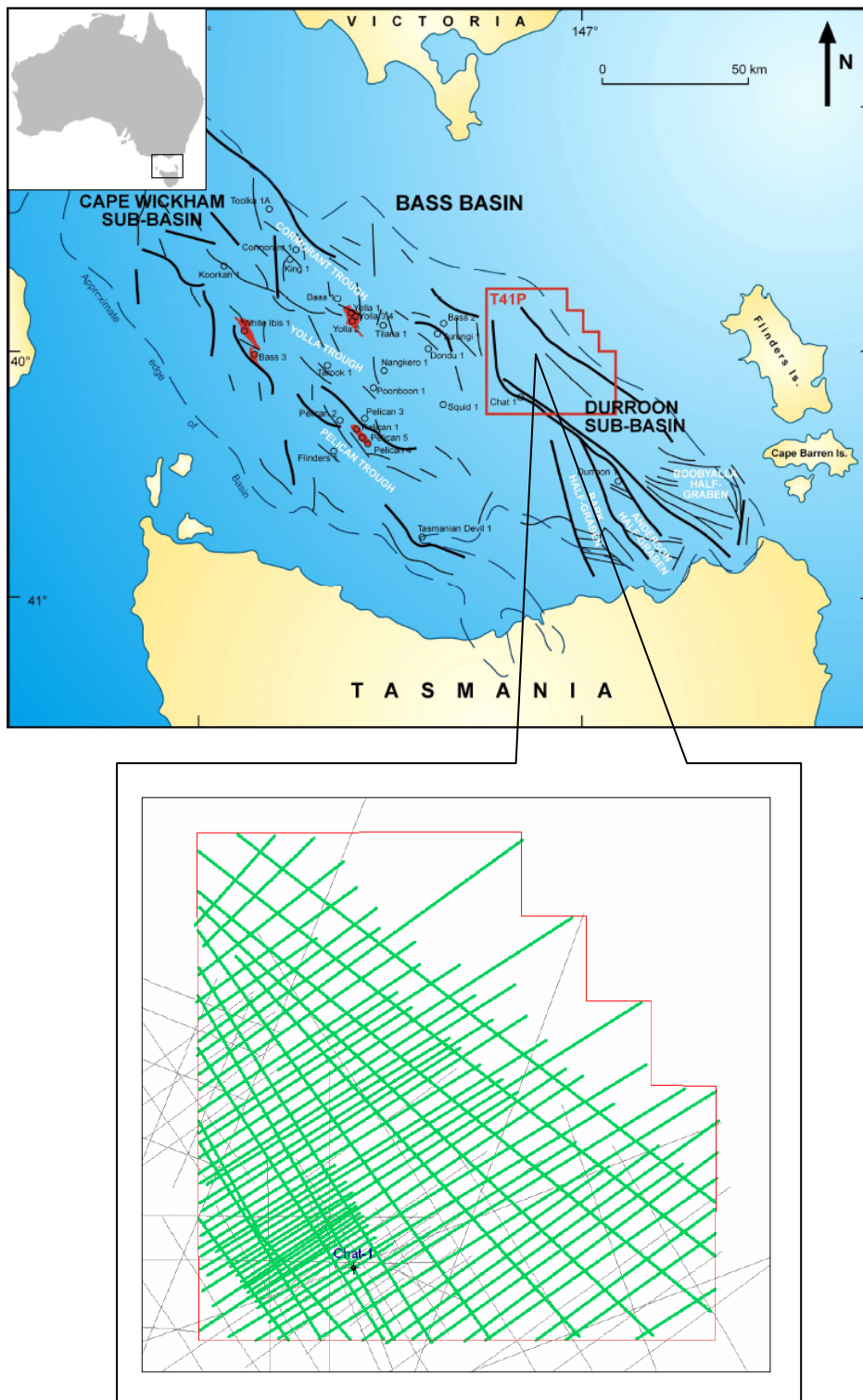


Table 1: T/P41 Permit Location (AGD66)

| Latitudes | Longitudes |
|----------------|-----------------|
| 39° 45' 00" S | 146 ° 30' 00" E |
| 39 ° 45' 00" S | 146 ° 56' 00" E |
| 39 ° 50' 00" S | 146 ° 56' 00" E |
| 39 ° 50' 00" S | 147 ° 00' 00" E |
| 39 ° 55' 00" S | 147 ° 00' 00" E |
| 39 ° 55' 00" S | 147 ° 06' 00" E |
| 40 ° 00' 00" S | 147 ° 06' 00" E |
| 40 ° 00' 00" S | 147 ° 10' 00" E |
| 40 ° 15' 00" S | 147 ° 10' 00" E |
| 40 ° 15' 00" S | 146 ° 30' 00" E |

Figure 2: CGG Pacific Titan





Description of the Receiving Environment (T/41P)

Physical Environment & Areas of Environmental Significance

The T/41P permit area lies in the Bass Basin, in Bass Strait midway between Victoria and Tasmania. The permit does not lie near any area having World Heritage significance or listed RAMSAR wetlands. The nearest areas of conservation significance to the permit area include the Kent Group National Park (Tas), located approximately 23km NE of the permit, the Boags Marine Protected Area (Com), located approximately 15km north of the permit and Wilsons Promontory Marine National Park (Vic) located approximately 60km north of the permit.

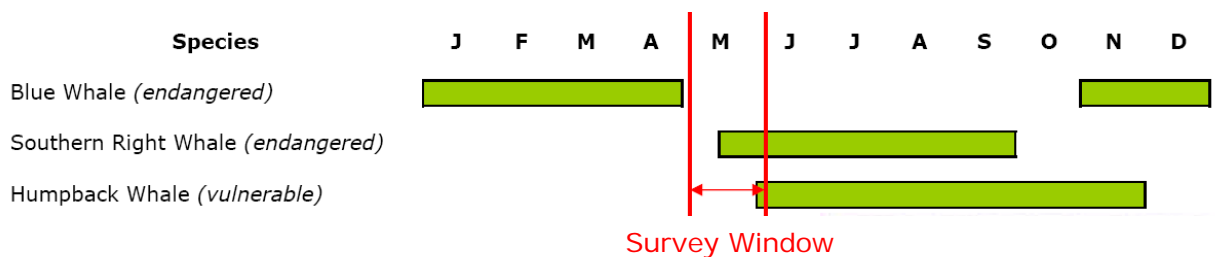
The climate of the region is cool temperate, with cool wet winters, and cool summers. Temperature ranges for May lie between 11.4-15.6°C with an associated mean monthly rainfall of 75mm and a predominant wind direction from the west/north-west. Tidal currents predominate in the area with velocities varying between 0.05m/s (central Bass Strait) to 0.5m/s at the margins (Flinders & King Islands). Wave conditions are dictated by local conditions and easterly swells propagating from the Tasman Sea. The region is protected from westerly and south-westerly swells by King Island and Tasmania. Extreme conditions in northern Bass Strait produced by easterly and south-easterly storms can produce significant wave heights ranging from 4.5-5.5m. Significant wave heights of 6.8-7.5m can be expected for the 5 and 100 year return period storms respectively, with lesser wave heights found further south into central Bass Strait.

Water depths in T/41P range from 80m (western permit area) to 50m (east/southern permit area). The seabed is flat to undulating expected to consist of a sandy/muddy carbonate in the west of the permit area to a more gravel-type carbonate in the east. Benthic organisms in Bass Strait are dominated by sponges and bryozoans, with micro-crustaceans and polychaete worms.

Biological Environment

Migratory and resident fauna are present in the vicinity of the T/41P permit area include cetaceans, fish and seals. Up to eight EPBC-listed migratory marine species, including 3 endangered species (Blue Whale, Southern Right Whale and White Shark) and one vulnerable species (Humpback Whale) may migrate or forage through the permit area during certain periods of the year (*refer Figure 3*). Humpback and Southern Right Whales may be encountered during the survey period as the survey timing coincides with their migration through Bass Strait. The permit area itself is not a recognised aggregation area for breeding, feeding or resting for these species. There are no threatened EPBC-listed ecological communities in the vicinity of the permit area.

Figure 3: Cetacean Migratory Timeframes (Bass Strait)





The Australian Fur-seal occurs throughout Bass Strait. There are numerous breeding colonies near Wilson's Promontory, Deal Island (Judgement Rock) and Tenth Island. There are no breeding grounds within the survey area or in the immediate vicinity of the permit area.

Great White Sharks have been recorded in Bass Strait and are known to frequent waters around seal colonies, particularly during seal pupping season (October to December). As above, the permit area does not contain known breeding areas for seals and the seismic activity will be undertaken outside the seal breeding season.

Seventeen species of EPBC-listed migratory birds may occur in proximity to the Permit Area. Bird species listed as threatened include 13 species of albatross and 3 species of petrel. These birds, protected by international agreements (BONN Convention, CAMBA, JAMBA) are mostly oceanic seabirds and seldom come to land unless breeding. Islands and rocky outcrops in Bass Strait supports breeding populations of Australian seabirds, and while these species may overfly and forage within the permit area, given the distance of islands and rocky outcrops from the permit area, the likelihood of interaction is low.

There are numerous species of fish in Bass Strait, including a number of important pelagic commercial species such as pilchards, anchovies, Australian salmon, Blue Sprat and southern calamari. Among the demersal species, school whiting and flathead are significant commercial species. Lesser commercial species such as Gummy shark, school shark, jackass morwong, jack mackerel and snapper are also present.

Other Marine Users

The permit area supports other marine use activities including commercial fishing, commercial shipping and oil and gas infrastructure. Two historic shipwrecks may be in proximity to the permit area however seismic activities will not impact on these heritage items.

Commercial vessels sailing to northern Australian ports (Sydney, etc) from Burnie and Devonport traverse the permit area, however the permit area lies east of the Melbourne-Devonport ferry service.

Commercial fisheries which may operate in the general vicinity of the permit area include the following Commonwealth Fisheries:

- Bass Strait Central Scallop Fishery;
- Southern Square Jig Fishery;
- Small Pelagics Fishery;
- Commonwealth Trawl Fishery (Southern and Eastern Scale-fish and Shark Fishery); and
- Gillnet hook and trap fishery.

Tasmanian fisheries which may operate in the area include the Rock Lobster Fishery however given the soft sediment across the permit area, this is considered unlikely.

All fishery total catch figures for the permit area indicate that commercial fishing is of low intensity.



Major Environmental Hazards & Controls

An environmental risk analysis has been undertaken for the TDOB08 2D Seismic Survey activities in accordance with the requirements of AS/NZ4360:2003 (Risk Management) and HB203: 2006 Environmental Risk Management Guidelines (2006). The qualitative risk assessment for the seismic activities indicates that with the proposed/management and mitigation measures implemented, no significant environmental impacts are expected and the activities carry a medium/low environmental risk.

Details of key environmental activities and associated impacts, together with their risk control measures and residual risk ranking is provided in Table 2.

Management Approach

3D Oil, the operator of the permit area T/41P, is responsible for assuring that the proposed seismic survey is managed in accordance with this Environment Plan. The seismic contractor (CGG Veritas and Swire Pacific) will undertake the operations on 3D Oils' behalf and under contractual arrangements with 3D Oil, will implement and comply with all environmental constraints and procedures nominated in the approved EP.

Specific responsibilities for the environmental commitments (controls, inspections, etc) made in the 3D Oil seismic acquisition survey EP are detailed within the Plan.

Consultation

3D Oil has consulted with regulatory agencies, fishery groups and fishing industry groups in preparation for the TDOB08 seismic operations. Regulatory agencies consulted include the Tasmanian Mineral Resources Tasmania (MRT) (Designated Authority), the Commonwealth Department of Environment, Water, Heritage & the Arts (DEWHA), the Tasmanian Department of Primary Industries & Water (Wild Fisheries Section), the Victorian Department of Primary Industries (Fisheries & Aquaculture) and the Australian Fisheries Management Authority (AFMA).

Fisheries consulted with details associated with the TDOB08 T/41P seismic survey include the following:

- Lakes Entrance Fishing Cooperative Ltd (LEFCOL);
- Twofold Bay Fishing Cooperative;
- San Remo Fishing Cooperative;
- South-east Trawl Fishing Industry Association (SETFIA);
- South East Fishing Association (SEFA);
- Seafood Industry Victoria (SIV);
- Tasmanian Fishing Industry Council (TFIC);
- Tasmanian Abalone Council;
- TASfish; and
- VR Fish.

3D Oil will continue to communicate with fisheries associated with changes to the seismic program which may affect commercial fishing operations.



Nominated Liaison Contact

Further information associated with the environmental aspects of the TDOB08 2D seismic survey may be obtained from 3D Oil by writing to:

Noel Newell
Managing Director – 3D Oil
Level 5, 164 Flinders Lane,
Melbourne, VIC, 3000



Table 2: Environmental Risk Assessment Summary

| Aspects | Possible Environmental Impacts | Control & Mitigation Measures | Residual Risk |
|-------------------------|---|---|---------------|
| Acoustic Noise – Survey | <p>Damage to marine mammals and marine life</p> <p>Behavioural changes to Cetaceans</p> <p>Behavioural changes to fish/planktonic species</p> | <p>No known feeding/breeding or aggregation grounds in proximity to T/41P</p> <p>Implement & comply with requirements of the DEWHA Industry Guidelines <i>Policy Statement 2.1 – Interaction between Offshore Seismic Exploration and Whales (2007)</i> (includes soft-start, power-down, shut-down procedures)</p> <p>Cetacean sightings during survey forwarded to DEWHA</p> <p>All sightings of dolphins will be treated as whale sightings until is it confirmed by the MMO. All relevant control measures (power-down, shutdown) will be observed.</p> <p>Marine Crew fully trained in cetacean observation, distance estimation and reporting</p> <p>Experienced MMO onboard to assist with cetacean observation</p> <p>MMO to record seal behaviour during daylight hours within proximity to the vessel and the behaviour noted.</p> <p>During night-time/low visibility conditions start-up will only occur if there have not been 3 or more whale instigated power/shut-downs in the preceding 24hr period or if operations were not underway in preceding 24hrs the vessel has been in the vicinity of the proposed start-up position for at least 2hrs (under good visibility conditions) and no whales have been sighted.</p> <p>MMO to record the presence of seals and note behaviour to seismic activities during daylight hours</p> <p>Behavioural responses to fish likely to be localised and short-term with soft-start procedures minimising impacts</p> | Low-Medium |



| Aspects | Possible Environmental Impacts | Control & Mitigation Measures | Residual Risk |
|-------------------------|--|--|---------------|
| Seismic Vessel Presence | Interference with shipping and fishing vessels increasing the risk of collision | Low density of fishing/commercial vessels in permit area Seismic activities short duration (20-34days) with no permanent infrastructure left on seabed Information on the location and timing of seismic program to be communicated to vessels via AMSA through a Notice to Mariners issued for activity duration Navigation lighting on Pacific Titan Vessel equipped with navigation aids (radio, radar & visual watches) & crew vigilant for fishing /commercial vessel during survey Crew competency with required maritime training standards Consultation with fishing industry groups undertaken and to continue In accordance to MARPOL, the vessels will operate under Shipboard Oil Pollution Emergency Plan (SOPEP). Crew is trained in preparedness and routine drills undertaken | Low-Medium |
| | Light-spill interfering with marine fauna and birds | Light emissions are in accordance with navigation safety and workplace safety requirements Extent of light-spill limited Permit area located at distance from nearest land | Low |
| | Anchoring activity creating disturbance to seabed benthos | Seabed substrate consists of mud/sands allowing for rapid recolonisation No anchoring on location except in emergency | Low |
| Ballast Water | Introduction of exotic species which colonise and create competition for local resources | Initial mobilisation from Singapore will observe AQIS Australian Ballast Water Management Requirements Local ballasting during seismic within permit area | Low |



| Aspects | Possible Environmental Impacts | Control & Mitigation Measures | Residual Risk |
|--|---|---|---------------|
| Mobilisation of Vessel from Western Victorian Waters | Transfer of the <i>Abalone Viral Ganglioneuritis</i> into Tasmanian waters affecting commercial abalone fisheries as a result of seismic equipment and vessel fouling | <p>Vessel to undertake deep water re-ballasting prior to mobilisation to Tasmanian waters (as required)</p> <p>Full cleaning and disinfecting process will have been conducted on the trailing equipment in accordance with recognized decontamination procedure</p> <p>Tasmanian Supply Base (Burnie) minimises potential for transfer</p> | Low |
| Grey water/sewage disposal | <p>Increased nutrients in surrounding marine waters on discharge</p> <p>Visual amenity impacts</p> | <p>Sewage is treated in accordance with MARPOL 73/78 requirements (i.e. approved biological treatment). Macerated to particle size less than 25mm and disinfected prior to discharge</p> <p>Grey & black water directed to system (low volume)</p> <p>High dispersal/dilution in Bass Strait environment</p> <p>Permit area not in proximity to landmass</p> | Low |
| Oily water discharges from equipment spaces | <p>Toxicity impacts to marine flora & fauna</p> <p>Reduction of water quality</p> | <p>Oily water passes through an oil/water separator and treated to an oil-in-water content <15ppm (MARPOL 73/78 Annex 1)</p> <p>Oily water discharged via an IMO approved Oil-in-water (OIW) meter as per MARPOL 73/78 Annex 1 with alarm on excursion</p> <p>Separated oil store in dedicated tank for onshore disposal (refer <i>Special wastes</i>)</p> <p>Activity recorded in the Oil Record Log (onboard)</p> <p>Low volumes discharged and rapid dilution/dispersion in marine waters</p> | Low |
| Putrescible waste (food-scrap) | <p>Increased nutrients in surrounding marine waters on discharge</p> <p>Visual amenity impacts</p> | <p>Waste macerated to less than 25mm particle size in accordance with MARPOL 73/78 and discharged below water line</p> <p>Low volumes discharged and rapid dilution/dispersion in marine waters</p> | Low |



| Aspects | Possible Environmental Impacts | Control & Mitigation Measures | Residual Risk |
|---|--|---|---------------|
| Special waste disposal (onshore) | Toxicity impacts to marine flora & fauna Reduced water quality Visual amenity impacts | Identification of waste reduction measures (at source) to prevent waste generation Clear waste identification, segregation, containment (in skips or sealed drums) and labelling; Waste storage areas are routinely inspected; Special waste disposed or recycles onshore Training and reinforcement to all crew (& other) personnel of waste management requirements; Documented Disposal Records. | Low |
| Incineration of solid Non-Biodegradable wastes (paper, plastic & wood) & Equipment Combustion | Reduction in air quality Aesthetic impacts of smoke | Segregation/disposal requirements detailed in Vessel Garbage Management Plan Low volumes generated and rapid dilution/dispersion in atmosphere Regular equipment monitoring and maintenance undertaken to ensure maximum efficiencies All emissions from marine utilities are in accordance with the guidelines in MARPOL Annex VI Prevention of Air Pollution from Ships | Low |
| Fuel transfer spill | Impacts on water quality and marine life | No 'at sea' refuelling planned for seismic campaign In unlikely event of requiring a fuel transfer at sea, activity will be undertaken in accordance with approved Bunkering Procedures with all associated equipment routinely maintained and inspected; Suitable absorbent material is held on the vessel to cleanup small diesel spills; Availability of implemented and tested SOPEP | Low |
| Diesel spill due to vessel collision/grounding | Impacts on water quality and marine life Shoreline Pollution (very low probability) Disruption to fishing activities | Navigational aids on the <i>Pacific Titan</i> including navigation lighting, radars, radio and visual surveillance to avoid collisions. Vessel operated by experienced and competent crew with access to bathymetric and marine charts Grounding risk low due to distance from nearest landmass (60km) and lack of emergent landforms in the permit area. Issue of a Notice to Mariners via AMSA Availability of implemented and tested SOPEP | Low-Medium |



| Aspects | Possible Environmental Impacts | Control & Mitigation Measures | Residual Risk |
|------------------|---|--|---------------|
| Chemicals spills | Impact on water quality and marine life | Small quantities of chemical are stored onboard Chemicals are packaged & labelled in accordance with legislation Crew members trained in the handling and PPE requirements of specific chemicals All chemical storage areas are appropriately signed and labelled with instructions and warnings; Chemical storage areas routinely inspected; MSDSs are to be made available for all chemicals; Spill kits to be provided in appropriate locations; Availability of implemented and tested SOPEP. | Low |

Note: C = Consequence
L = Likelihood