WEST SEAHORSE PROJECT

SEA LION DRILLING CAMPAIGN
ENVIRONMENT PLAN SUMMARY (VIC/P57)
(GIPPSLAND BASIN)

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ABBREVIATIONS

AHO	Australian Hydrographic Office
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
AMSA	Australian Maritime Safety Authority
CHPL	Carnarvon Hibiscus Pty Ltd
CMR	Commonwealth Marine Reserve
ENE	East-North-East
EPBC	Environment Protection Biodiversity Conservation
EP	Environment Plan
EPO	Environmental Performance Outcome
EPS	Environmental Performance Standard
HSE	Health Safety & Environment
HVAC	Heating Ventilation and Air Conditioning
IMO	International Maritime Organization
IMS	Invasive Marine Species
JVP's	Joint Venture Partners
MARPOL	Marine pollution protocol
MNP	Marine National Park
MODU	Mobile Offshore Drilling Unit
MR	Marine Reserve
MSDS	Material Safety Data Sheet
NE	North East
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NP	National Park
NSW	New South Wales
OCNS	Offshore Chemical Notification Scheme
ODME	Oil Detection Monitoring Equipment
OPEP	Oil Pollution Emergency Plan
PLONOR	Poses Little or No Risk
POB	Persons on Board
PSZ	Petroleum Safety Zone
RAMSAR	RAMSAR Convention on Wetlands
RCC	Rescue Coordination Centre
ROV	Remotely Operated Vehicle
SESSF	Southern and Eastern Scalefish and Shark Fishery
SOPEP	Shipboard Oil Pollution Emergency Plan
SSE	South-south east
STCW95	International Convention on Standards of Training, Certification and Watch-keeping
SW	South West
TAS	Tasmania
Tcf	Trillion cubic feet
VIC	Victoria

1.0 INTRODUCTION

Carnarvon Hibiscus Pty Ltd ('CHPL'), as nominated titleholder (on behalf of a Joint Venture comprising of 3D Oil Limited and HIREX), under the *Offshore Petroleum & Greenhouse Gas Storage (Environment) Regulations 2009* ('Environment Regulations') will undertake exploration drilling at the Sea Lion-1 well location to explore for hydrocarbons resources in the Exploration Permit VIC/P57.

This Environment Plan (EP) Summary has been prepared in accordance with the requirements of Section 11(3) and 11(4) of the Environment Regulations. This document summarizes the Sea Lion Drilling Campaign (VIC/P57) Environment Plan (SLN-CHP-10-RG-PR-0003) which was accepted by the National Offshore Petroleum Safety & Environmental Management Authority (NOPSEMA) on 8th July 2015.

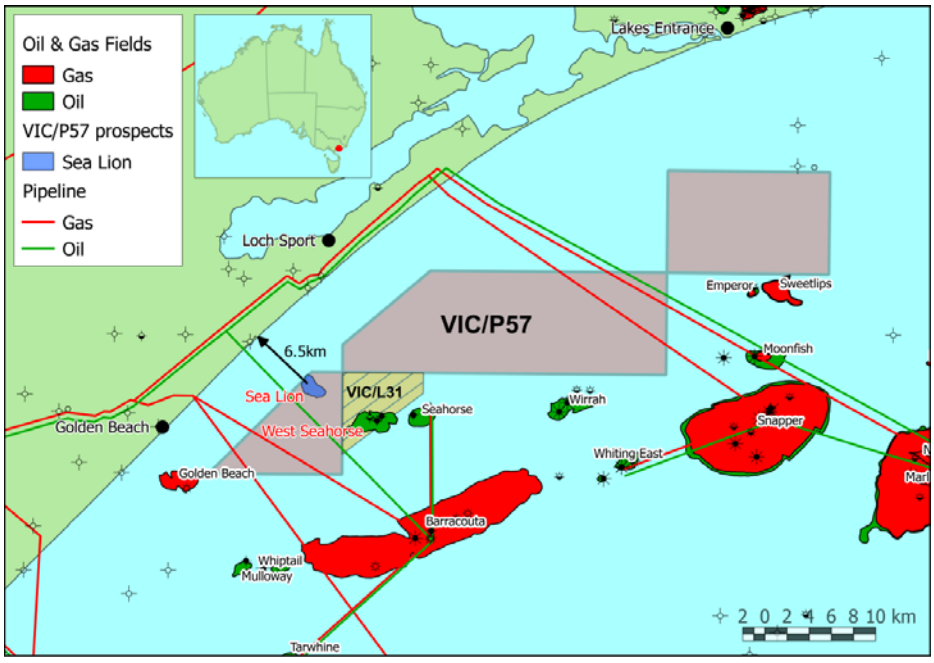
2.0 LOCATION OF ACTIVITY

The Sea Lion-1 location lies in a water depth of 24m in the Gippsland Basin approximately 6.5km from the Victorian coast (refer **Figure 2-1**). The coordinates of the well are:

Latitude:	38° 10' 28.34"S
Longitude:	147° 33' 8.26'E

A Petroleum Safety Zone (PSZ) of 500m will be gazetted around this location for the drilling activity (termed the 'operational area'). This operational area defines the spatial area of the petroleum activity which is managed under the accepted EP. Support vessel or Mobile Offshore Drilling Unit (MODU) transit to and from the operational area by support vessel and port activities associated with the support vessels, is not in the scope of the accepted EP.

Figure 2-1: Sea Lion Regional Location



3.0 DESCRIPTION OF THE ACTIVITY

The Sea Lion-1 exploration well will be drilled by the jack-up MODU, West Telesto (refer **Figure 3.1**). At least one support vessel will be in attendance at the rig site at all times. Supply vessels will transit between Geelong (marine supply base location) and Sea Lion-1 providing drilling equipment, casing and drill pipe to the MODU.

Helicopter support, for activities such as crew change or medical emergency, will be based from Essendon.

Key activities are as follows:

- Drilling of top-hole sections using seawater and high viscosity sweeps;
- Installation and cementing of steel casing in the hole;
- Installation of a surface-mounted blowout preventer;
- Drilling of production section using a closed loop system for recirculation of water-based muds (WBM) and separation of drill cuttings;
- Drilling bottom hole section to the planned depth;
- Formation evaluation and logging including Vertical Seismic Profiling (VSP); and
- On completion, the well will either be plugged and abandoned, or suspended.

Drill cuttings generated during the drilling of the top-hole sections will be discharged directly to the seabed. For the bottom-hole section, drill cuttings will be returned to the drill rig and discharged at sea surface.

Drilling of the Sea Lion exploration well is expected to commence in Q3 2015 with the well taking approximately 25-30 days to drill (weather dependent).

Figure 3-1: West Telesto MODU

4.0 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section describes the environment in the Sea Lion-1 *location*[1] and the *surrounding area* (i.e. area identified through oil spill trajectory modelling as potentially being impacted by a loss of well control/well blow-out event).

4.1 PHYSICAL ENVIRONMENT

The Sea Lion-1 location is approximately 6.5km from the Gippsland coast in Commonwealth waters of the Twofold Shelf Bioregion[2] in the South East Marine Region. The continental shelf is relatively narrow in the northern section of the bioregion, becoming much broader and shallower in the southern area of the Gippsland Basin. The Twofold Shelf area is strongly influenced by a number of different currents that run through and near the shelf, bringing both warm and cool currents to the region. The area includes marine parks and reserves and contains listed species which are classified as endangered or vulnerable. The area has a moist, cool temperate climate with warm summers and winter-spring rainfall.

The coastline consists of long sandy beaches broken by rocky headlands and numerous coastal lagoons. Estuary systems occur along the coastline within the region, with the larger estuaries located at Lakes Entrance (Gippsland Lakes); Sydenham Inlet and Mallacoota Inlet. Most of these estuary systems are intermittently closed to the marine environment (except Lakes Entrance and Corner Inlet).

Sea Lion-1 is located in Bass Strait which is a relatively shallow area of the continental shelf with high winds and strong tidal currents. The following metocean characteristics apply to the Sea Lion-1 location:

- Strong tidal currents (~2-2.5knots) run parallel to the coast (SW-NE) and follow a semi-diurnal pattern.
- Surface water temperatures vary from an average of 13^{o}C in winter to 18^{o}C in summer.
- Wind speeds lie predominantly in the 30-45 km/hr range with wind gusts up to approximately 80km/hr. The wind direction in the July to September period predominates from the west.
- The area is protected from south-westerly swells by Tasmania but is strongly influenced by south-easterly and easterly swells of 1-1.5m with maximum heights varying between 1.9-2.7m.

The Sea Lion-1 location is essentially flat with a gradient less than 1^{o}. North-west of the proposed drill site the area is smooth with minor relief. To the south-east of the site, minor seafloor channels and shallow depressions are the main feature. These are caused by storm surges redepositing finer sediments and leaving courser sediments on the seafloor. The seabed at the Sea Lion-1 site consists of fine to medium sands with isolated shell fragments (<3mm) which extends to the SE and medium to course grained sand with abundant shell fragments (<5mm) to the NW of the site. No debris or obstructions have been identified at Sea Lion-1.

4.2 BIOLOGICAL ENVIRONMENT

The near-shore fauna of Bass Strait is characterized by species of reef fish, echinoderms, gastropods and bivalves. Benthic surveys undertaken by the Museum of Victoria (1979-1984) identified 350 species of invertebrates in the area, half of which were crustaceans and the rest polychaetes and mollusks. The nearshore sediments along Ninety Mile Beach, due to the action of waves and currents, are considered too mobile to support fixed biota such as seagrass. For the Patricia Baleen Project, located approximately 100km to the northeast, the inshore area has been characterized as containing scallops and other large bivalves, crabs, ascidians, small aggregations of sponges (porifera) and bryozoans.

Benthic studies undertaken in proximity to the Sea Lion-1 location with a similar sandy substrate support seabed benthic in-fauna such as crustaceans, small bi-valves, sea-stars, sponges, squid and polychaete worms which are widespread in the Gippsland Basin.

[1] This is defined as the area affected by drilling discharges and includes the 'operational area' as defined in Section 2.
[2] Defined under the Integrated Marine and Coastal Regionalization of Australia (IMCRA)

The most recent Victorian Scallop Fishery Survey Report[3] identified the level of scallop abundance within the Sea Lion location to be approximately 0.619kg/1000m^2. The survey also identified that the level of recruitment to the Sea Lion area had been low[4] over the survey period. Scallop fishing intensity reports received from the Department of Environment and Primary Industry (DEPI)[5] identified the Sea Lion area has had a low intensity of scallop fishing over the past 10 years.

The location also supports a number of vertebrate species such as fish, seabirds, whales and seals including listed, threatened and migratory species under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999.

The broader surrounding area around Sea Lion-1 contains environmental assets/receptors of high value or sensitivity including biologically important habitats for threatened species (e.g. seabirds, southern right whales) or habitats which provide valuable ecological services (i.e. Key Ecological Features (KEFs) such as canyon systems and upwellings).

The Sea Lion-1 location and surrounding area also contains a number of commercial fishing species such as rock lobster, scallops, scale-fish, prawns, squid and abalone (refer **Section 4.4.2**).

4.2.1 Conservation Areas (Operational and Surrounding Area)

The Sea Lion-1 location is not located in an area of conservation significance.

Conservation areas present in the Sea Lion-1 *surrounding area* include the following:

- Internationally Significant Sites: Gippsland Lakes RAMSAR site (VIC), Corner Inlet RAMSAR site (VIC), Towra Point Nature Reserve (NSW) RAMSAR site, Myall Lakes RAMSAR site (NSW), Hunter Estuary Wetlands RAMSAR site (NSW), Elizabeth and Middleton Reef RAMSAR Site (NSW), Moulting Lagoon RAMSAR site (TAS), Lavina Nature Reserve RAMSAR site (TAS), Flood Plain Lower Ringarooma River RAMSAR site (TAS), Croajingalong National Park and Biosphere Reserve (including Nadgee Reserve) and Wilsons Promontory National Park & Biosphere Reserve;
- Nationally Significant Sites: East Gippsland Commonwealth Marine Reserve (CMR), Beagle CMR, Zeehan CMR, Apollo CMR, Flinders CMR, Freycinet CMR, Jervis CMR, Hunter CMR, Lord Howe CMR, Central Eastern CMR, Cod Grounds CMR, Boags CMR, Franklin CMR, Huon CMR, Solitary Islands CMR, Gifford CMR and Australian Whale Sanctuary;
- Victorian State Significant Sites: Ninety Mile Beach Marine National Park (MNP), Nooramunga Marine and Coastal Park, Beware Reef Marine Sanctuary, Wilsons Promontory MNP, Point Hicks MNP, Corner Inlet MNP, Cape Howe MNP, Gippsland Lakes Coastal Park, Cape Conran Coastal Park, Gabo Island Special Management Area.
- NSW State Significant Sites: Batemans Marine Park (MP), Jervis Bay MP, Port Stephens-Great Lakes MP, Solitary Islands MP, Cape Byron MP, Lord Howe Island MP, NSW Aquatic reserves (Central NSW coast), Bournda National Park (NP), Mimosa Rocks NP, Montague Island Nature Reserve, Eurobodalla NP, Murramarang NP, Meroo NP, Conjola NP, Jervis Bay NP, Seven Mile Beach NP, Royal NP, Botany Bay/Kamay NP, Sydney Harbour NP, Ku-ring-gai Chase NP, Bouddi NP, Wyrrabalong NP, Worimi NP, Tomaree NP, Myall Lakes NP, Booti Booti NP, Saltwater NP, Crowdy Bay NP, Limeburners Creek NP, Goolawah NP, Hat Head NP.
- Tasmanian State Significant Sites: Kent Group Marne Reserve (MR), Governor Island MR, Maria Island MR & National Park, Kent Group NP, Strezlecki NP, Mount William NP, Narawntapu NP, Albatross Island Nature Reserve (NR), Reid Rocks NR, Black Pyramid NR, Rodondo Island NR, West Moncoeur Island NR, Judgement Rocks NR, Cat island Conservation Area, Low Islets NR, Moriarty Rocks NR, Foster Island NR, Tenth Island NR and Penguin Islet NR.

[3] Semmens J.M. & Jones, N.A.R. (2012) – 2012 Victorian Scallop Fishery Survey Report, February 2012, Institute for marine and Antarctic Studies
[4] This is consistent with studies undertaken on Browns Bank, Scotian Shelf one of Canada's major scallop fisheries on the east coast, which found scallops in highest densities were found on gravel substrates. In contrast to this, the presence of finer-grained sediments is less suitable for scallop presence.
[5] Now the Department of Environment, Land, Water & Planning (DELWP)

4.2.2 Habitats

At the Sea Lion-1 location, the habitat is an open marine environment with a sandy seabed.

In the broader surrounding area, marine habitats consist of sub-tidal rocky reefs, submarine canyons and escarpments, shelf rocky reefs and seamounts.

Coastal habitats surrounding Sea Lion-1 include sandy beaches and dunes; inter-tidal rocky shorelines; cliffs and exposed rocky headlands; estuarine environments containing mangroves, saltmarsh and seagrass; and sheltered inter-tidal flats (sand and mudflats).

4.3 EPBC SPECIES

4.3.1 Marine Mammals

At the Sea Lion-1 location, three EPBC-listed threatened whale species may be seasonally present: Blue Whale (*Balaenoptera musculus*), Humpback Whale (*Megaptera novaeangliae*) and Southern Right Whale (*Eubalaena australis*). Four additional EPBC-listed migratory species are also listed as present: Brydes Whale (*Balaenoptera edeni*), Pygmy Right Whale (*Caperea marginata*), Killer Whale (*Orcinus orca*) and Dusky Dolphin (*Lagenorhynchus obscurus*) with five listed species also recorded as present.

The Sea Lion-1 location lies adjacent to a biologically important area for the Southern Right Whale (resting and migrating) in the coastal (state) waters of Victoria.

Within the broader surrounding area there are two additional EPBC-listed threatened cetacean species listed as present: Sei Whale (*Balaenoptera borealis*) and Fin Whale (*Balaenoptera physalus*); five additional EPBC-listed migratory species: Sperm Whale (*Physter macrocephalus*), Antarctic Minke Whale (*Balaenoptera bonaerensis*), Indo pacific Humpback Dolphin (*Sousa chinensis*) and Irrawaddy Dolphin (*Orcaella brevirostris*); and 24 additional listed cetacean species.

At the Sea Lion-1 location, two EPBC-listed fur seal species are present: the Australian Fur Seal (*Arctocephalus pusillus*) and the New Zealand Fur Seal (*Arctocephalus fosteri*). These species are commonly known to occur around platform structures in Bass Strait.

Within the broader surrounding area the migratory Dugong (*Dugong dugon*) is listed as being present.

4.3.2 Avifauna

At the Sea Lion-1 location eighteen EPBC-listed threatened bird species are listed as having a presence with seventeen species listed as migratory. These birds are predominantly seabird (albatross and petrel) species. The Sea Lion-1 location is located in a biologically important area (feeding and foraging) for five of these species.

Within the Sea Lion-1 broader surrounding areas, ninety-six EPBC-listed threatened or migratory bird species are identified as being present (may occur or are likely to occur). These species include migratory marine seabirds, migratory terrestrial and migratory wetland species. The adjacent Gippsland coastline contains significant feeding and nesting areas for coastal and wetland migratory EPBC-listed bird species, particularly at Lakes Entrance, Corner Inlet and the estuarine environments along the Gippsland coastline. Colonies of seabirds (penguins) are located on the Bass Strait Islands between Wilson's Promontory and Tasmania, at Wilson's Promontory, and to the east at the Skerries and Tullaberga and Gabo Islands.

4.3.3 Sharks & Rays

At the Sea Lion-1 location, two EPBC-listed species of shark having a threatened status may have a presence: Great White Shark (*Carcharodon carcharias),* and Whale Shark (*Rhincodon typus*). Two migratory species, the Porbeagle *(Lamna nasus)* and Shortfin Mako *(Isurus oxyrinchus)* are also listed as having a presence. There are no listed or threatened rays at the Sea Lion-1 location.

The Sea Lion-1 location is located in a biologically important area for the threatened Great White Shark.

Within the broader surrounding area one additional species of shark, the Grey Nurse Shark (*Carcharias Taurus*) is listed as critically endangered, and one species of ray, the Giant Manta Ray (*Manta birostris*) is listed as migratory.

4.3.4 Reptiles

At the Sea Lion-1 location there are three EPBC-listed reptile species having a threatened status which may have a presence: Loggerhead Turtle (*Caretta caretta*), Green Turtle (*Chelonia mydas*) and Leatherback Turtle (*Dermochelys coriacea*).

Within the broader surrounding area three additional EPBC-listed threatened turtle species, the Hawksbill Turtle (*Eretmochelys imbricata*), Flatback Turtle (*Natator depressus*) and Olive Ridley Turtle (*Lepidochelys olivacea*) may be present.

4.3.5 Fish

The Southeast Marine Region displays a large diversity of plant and animal species. In addition to high diversity, the region has large numbers of endemic species including 600 species of fish, of which 85% are thought to be endemic and 11% are common only to waters of neighboring New Zealand. Up to 95% of mollusks present, approximately 90% of echinoderms and up to 62% of macro-algae (seaweed) species are only found in these waters.

There are no EPBC-Listed threatened fish species identified at the Sea Lion-1 location. Twenty-seven (27) species of pipefish, seahorse, pipe-horse and sea-dragon are listed as having a possible presence however these species are generally found in shallow in-shore areas on shallow reefs and macro-algal beds and, given the sandy substrate, unlikely to be present at Sea Lion-1.

Four EPBC-listed threatened fish species which potentially occupy marine habitats in the Sea Lion-1 surrounding area include: the Australian Grayling (*Prototroctes maraena*); the Black Rock Cod (*Epinephelus daemelii*); Red Handfish (*Thymichthys politus*) and Zeibell's Handfish (*Brachiopsilus ziebelli*).

4.4 SOCIO ECONOMIC ACTIVITIES

4.4.1 Commercial Shipping

Commercial shipping includes passengers and freight between the Australian mainland and Tasmania and other through traffic operating between Australian Ports and to/from New Zealand. A vessel traffic separation scheme has been instituted between the Victorian/NSW border and Wilsons Promontory to enhance maritime safety in the area separating shipping into discrete, one direction lanes. Additionally, an "Area to be avoided" has been designated by the International Maritime Organisation (IMO) to protect the Esso-BHP Bass Strait Oil and Gas Facilities. As such, all ships over 200 gross tonnages are restricted to the shipping channels to the east and south of this area.

Sea Lion-1 is located within the Bass Strait 'Area to be avoided'. AMSA has advised that vessel encounter will be limited to commercial fishing and recreational vessels. Encounter with third party oil service vessels is also possible although unlikely given the location of the Esso-BHP Bass Strait facilities and their marine base (Barry Beach Marine Terminal located in Corner Inlet) relative to the Sea Lion location.

4.4.2 Fisheries

It is also estimated that there are over 500 species of fish found in the waters of Bass Strait many of them having commercial importance. Fish species include recreational species, such as Tuna, Marlin, and Australian Salmon, and commercial species such as orange roughy, flathead, flake, trevalla, lobster, abalone, crabs, sea stars, sea urchins and squid are present in the area.

The following summarizes commercial fishing activities within the Sea Lion-1 surrounding area.

Commercial Fishing: Commercial fisheries known to occur at the Sea Lion-1 location and within the surrounding areas include the following:

- Commonwealth Fisheries: Southern and Eastern Scalefish and Shark Fishery (SESSF) which includes the Commonwealth Trawl Sector and Gillnet Hook and Trap Fishery; Small Pelagic Fishery, Southern Squid-jig Fishery, Eastern Skipjack Tuna Fishery, and Eastern Tuna and Billfish Fishery;
- Victorian State Fisheries: Victorian Rock Lobster Fishery, Giant Crab Fishery, Victoria Scallop Fishery, Ocean General Fishery, Ocean Purse Seine Fishery, Inshore Trawl Fishery and Abalone Fishery;
- NSW State Fisheries: Abalone Fishery, Estuary General Fishery, Eastern Prawn Trawl Fishery, Rock Lobster Fishery, Ocean Hauling Fishery, Ocean Trap and Line Fishery, Sea Urchin and Turban Shell Restricted Fishery and Ocean Trawl Fishery; and
- Tasmanian State Fisheries: Abalone Fishery, Giant Crab Fishery, Rock Lobster Fishery, Scalefish Fishery, Scallop Fishery and Shellfish Fishery.

Aquaculture: Commercial aquaculture operations which are in the area surrounding Sea Lion include abalone farming at Tullaberga & Gabo Islands (VIC) and oyster leases within NSW estuarine areas and at Port Sorell in Tasmania.

4.4.3 Indigenous Cultural Heritage

The Gippsland and NSW coastlines are of significant aboriginal cultural heritage. This includes areas where there may be no physical evidence of past cultural activities but includes places of spiritual or ceremonial significance, places where traditional plant or mineral resources occur or trade and travel routes. These places are often found near major food sources such as rivers, lakes, swamps and the coast.

Along the Gippsland and NSW coastlines, encounter with areas containing coastal shell middens is possible. These areas may also contain charcoal and hearth stones from fires, and items such as bone and stone artefacts and are located within sheltered positions in the dunes, coastal scrub and woodlands, within rock shelters or on exposed cliff tops with good vantage points. Other culturally significant heritage items include aboriginal scarred trees where bark was removed for use in canoes; aboriginal mounds which often contain charcoal, burnt clay/stone, animal bones, shells, stone tools and sometimes aboriginal burials (found usually near rivers, lakes or swamps); freshwater middens, flake stone tools, grinding stones or ground-edge axes (most common near rivers and creeks).

4.4.4 European Heritage

There are no listed World Heritage areas, Commonwealth Heritage Places, National Heritage Places or places on the Register of National Estate within, or in the immediate vicinity of the Sea Lion-1 location. The closest Commonwealth Heritage Place is the Wilson's Promontory Lighthouse located 122km SW and Gabo Island Lighthouse located 215km ENE of the drilling location.

Within the surrounding area are the following heritage listed (coastal) locations:

- World Heritage: Lord Howe Island; and
- National Heritage Place: Royal National Park & Garawarra State Conservation Reserve.

Review of the National Shipwreck Database showed that no historic shipwrecks are located at the Sea Lion-1 location. The closest shipwreck is the *Julius* (1892) (approx. 14km NNE), *Norfolk* (1914) (approx. 17km NNE) and *Trinculo* (1879) wrecked on Ninety Mile Beach (approx. 20km WSW). Other wrecks include an unknown wreck approximately 45km south.

Within the surrounding area there are five (5) historic shipwreck protection zones where fishing, diving and boating are not allowed:

- Clonmel (1841) located at the entrance to Port Albert (-38.744000°S, 146.677800°E) has a protection zone of 50m;
- SS Glenelg (1900) located in Bass Strait near Lakes Entrance (-38.552400°S, 147.2074000°E) has a protection zone of 500m;
- Bega (1908) located 6.2nm northeast of Tathra Head in 76m of water (-36.6539166°S, 150.00144°E) has a protection zone of 797m;
- Lady Darling (1880) located 4 miles south of Montague Island in approximately 30m of water (-36.318333°S, 150.168333°E) (no details on size of protection zone); and
- M24 (Japanese Midget Submarine) (1942) located off Sydney's Northern Beaches (-33.6725°S, 151.3827°E) and has a protection zone of 500m.

4.4.5 Defence Activities

The Australian Defence Force (ADF) has advised that the Sea Lion-1 location is beneath Defence Restricted Airspace R258D. The ADF requires notification of any activities within the area.

4.4.6 Oil & Gas

The Gippsland Basin has been producing hydrocarbons since 1969 (a total of 4 billion barrels of liquids and 9.8TCF of gas to the end of June 1998). Currently the Gippsland Basin has:

- Seventeen developed offshore oil and gas fields;
- Twenty-four offshore production facilities (platforms, mono-towers & subsea completions); and
- Over 600km of pipeline network.

Onshore oil and gas processing facilities are located at both Longford and Orbost. Most of this infrastructure is operated by Esso Australia Resources Pty Ltd.

The Sea Lion-1 location is approximately 18km NW of Esso-BHP's Barracouta platform and 5km WNW of the Seahorse subsea wellhead. Sea Lion-1 is located approximately 35km east of the Longford Onshore Processing Facility.

The Sea Lion-1 Drilling Campaign activities are located entirely within Petroleum Exploration Permit VIC/P57.

5.0 ENVIRONMENTAL IMPACT & RISK ASSESSMENT

5.1 ENVIRONMENTAL IMPACT IDENTIFICATION METHODOLOGY

CHPL undertook an environmental risk assessment into drilling activities at the Sea Lion-1 location to identify the potential environmental hazards, their potential impacts, and the control measures to manage the impacts and risks to as low as reasonably practicable (ALARP) and acceptable levels. The risk assessment and evaluation was undertaken using CHPL's Risk Management Framework which involved:

- Defining the activity and its interaction with the environment;
- Establishing the environmental and social values within the area affected by the operation;
- Identification of environmental hazards undertaken via brainstorming workshops and peer reviews utilizing industry personnel with a sufficient breadth of knowledge and experience in drilling activities. This identified the hazards with the potential to harm or impact to the environment from planned (routine and non-routine) and unplanned (incident) activities;
- Evaluation of hazards with the potential to impact the environment to establish the level of consequence severity (selecting the highest level of environmental impact) and without any control measures applied, estimating the likelihood that that consequence would occur;
- Identification of control measures to prevent or mitigate the consequence and with these measures adopted, establishing the residual risk of each credible environmental hazard; and
- Establishing whether the established impact/residual risk lies at acceptable and ALARP levels. During the risk assessment, where residual risks were found to be intolerable (high) or within the ALARP region (medium), the hazard was reassessed for elimination potential and/or additional controls implemented until the residual impact and risk was demonstrated to be ALARP (i.e. *if a measure is practicable and it cannot be shown that the cost of the measure is grossly disproportionate to the benefit gained, the measure is considered reasonably practicable*).

The CHPL risk assessment framework is consistent with the approach outlined in ISO14001 (*Environmental Management Systems*), ISO31000:2009 (*Risk Management*) and HB203: 2012 (*Environmental Risk Management – Principles and Process*). This framework identifies and assesses environmental risk for each credible environmental hazard in accordance with the CHPL Qualitative Risk Matrix (refer **Table 5-3**) using the definitions for Consequence and Likelihood contained in **Tables 5-1** and **5-2. Table 5-4** defines management actions and responsibilities for each of the residual risk categories.

Residual risks defined as high are unacceptable and further action must be taken to reduce the risk further. Residual risk in the medium classification requires further risk reduction controls to be implemented (if possible) via a risk treatment plan. Residual risk assessed as low requires no risk treatment plan however continuous improvement is attained by implementation of best practice management.

Table 5-1: Definition of Consequence

Consequence	Description
5. Critical	**S:** Extensive Injuries (Multiple Fatalities). **E:** Large scale catastrophic impact; significant recovery work over years/decades; Level 3 oil spill (>1000tonnes); potential revocation of Licence or Permit. **A:** Extensive Damage (>$25M). **R:** Extreme adverse public, political or media outcry resulting in international media coverage; critical impact on business reputation.

Consequence	Description
4. Major	**S:** Major Injury (Single Fatality). **E:** Major environmental impact with recovery work over months/years; Level 2 oil spill (10-1000tonnes); material breach of licence, permit or act. **A:** Major Damage ($10M-$25M). **R:** Significant impact on business reputation and/or national media exposure; local community complaint.
3. Significant	**S:** Significant Injury (Lost Time Injury (LTI) or Restricted Work Day Case (RWDC)). **E:** Significant environmental impact with recovery work over a few days/weeks; Level 1 oil spill (<10tonnes); impact/damage to item of National Environmental Significance (NES); possible administrative fine level. **A:** Significant damage ($5M-$10M). **R:** Serious local adverse public media attention or complaints; local user concern; moderate to small impact on business reputation.
2. Minor	**S:** Minor Injury (Medical Treatment Injury) **E:** Local environmental impact, negligible remedial/recovery work; <1BBl oil spill; no significant impact to others; regulatory notification required. **A:** Minor Damage ($1M-$5M). **R:** Public awareness but no public concern beyond local users; Minor impact on business reputation.
1. Negligible	**S:** Slight Injury (First Aid Treatment). **E:** Negligible Impact, Effect contained locally; no statutory reporting. **A:** Slight Damage (0-$1M). **R:** Negligible Impact on Reputation; no public or regulator interest.

Legend: **S:** Safety, **E:** Environment, **A:** Asset Damage, **R:** Business Reputation

Table 5-2: Definition of Likelihood

Consequence	Description
5. Very likely	Expected to occur in most circumstances
4. Likely	Probably occur in most circumstances
3. Possible	Might occur at some time
2. Unlikely	Could occur at some time
1. Very Unlikely	Only occurs in exceptional circumstances

Table 5-3: CHPL Qualitative Risk Matrix

		Consequence				
		1. Negligible	2. Minor	3. Significant	4. Major	5. Critical
Likelihood	5. Very Likely					
	4. Likely					
	3. Possible					
	2. Unlikely					
	1. Very Unlikely					

Table 5-4: Definition of Risk and Management Response

Category	Description & Response
High	**High Risk:** Work cannot proceed as currently planned. Urgent remedy and resources required for immediate risk reduction. If risk is to be accepted temporarily then approval from the CEO must be obtained and the Board consulted.
Medium	**Medium Risk:** Risk reduction measures need to be implemented in keeping with other priorities. Generally acceptable level of risk where further risk reduction is shown not to be practicable.
Low	**Low Risk:** Risks are sufficiently low to be acceptable (i.e. at ALARP). Manage for continuous improvement by application of best practice.

In assessing for ALARP and acceptability, CHPL adopts the following criteria:

- Acceptability Demonstration:
  - The principles of Ecologically Sustainable Development (ESD) are fulfilled;
  - Hibiscus Health Safety & Environment (HSE) Policy Principles are achieved;
  - All relevant Commonwealth and State legislative criteria are achieved;
  - The activity does not contravene management plans or result in unacceptable impacts to protected matters under the EPBC Act 1999;
  - Stakeholders have been provided information sufficient to understand and respond to relevant interests which are then addressed;
  - Risk and impact have been demonstrated to be ALARP.

  It should be noted that the CHPL qualitative risk methodology also defines risk criteria whereby risk levels are considered to be acceptable.
- ALARP Demonstration:

  Under-pinning the risk assessment at all times are the key principles of environmentally-safe design (i.e. adoption of the hierarchy of controls); options analysis to ensure during program design that the most environmentally-sound practice is adopted; and the adoption of industry standards and codes. Demonstration of ALARP within the EP includes one or a combination of the following approaches:
  - *Hazard/Risk Criteria Approach:* The CHPL qualitative risk matrix defines risk criteria which it considers is at a level which is ALARP;
  - *Hierarchy of Controls*: Controls identification according to the hierarchy which ensures that reliable, effective controls are selected in preference to administrative controls;
  - *Comparative Options Assessments*: Evaluation of a range of control measure options describing the relative merits and drawbacks, with the selection of options which are practicable;
  - *Comparison with International/Industry Codes and Standards*: Adoption of relevant activity design standards, operational standards, management system frameworks and operational procedures against recognized national, international and industry standards or codes of practice; and
  - *Cost Benefit Analysis*: Numerical assessment of costs relating to the control measure, the expected risk reduction expected and the cost of the measure to be implemented.

5.3 SEA LION DRILLING CAMPAIGN ENVIRONMENTAL HAZARDS

The following sections identify the environmental hazards associated with the Sea Lion-1 Drilling Campaign.

5.3.1 Planned (Routine and Non-routine) Activities

The sources of impact/risk identified for planned activities include:

- Mobilization of facilities to VIC/P57:
  - Introduction of Invasive Marine Species (IMS) from biofouling and ballast water discharges;
- Physical presence of facilities in VIC/P57:
  - Disruption to commercial fishing activities;
  - Disruption to commercial shipping activities;
  - Seabed disturbance from West Telesto installation activities;
  - West Telesto/AHTS Vessel lighting impacts;
- Drilling-related discharges/emissions to the marine environment:
  - Drill mud and cuttings release (seabed impacts and water column turbidity impacts);
  - Brine Discharges;
  - Cementing operations;
  - Sound impacts – use of VSP in logging activities;
- General facility and vessel operations and discharges to the marine environment:
  - Treated deck/bilge water discharge;
  - Sewage discharge;
  - Cooling water discharges;
  - Reverse Osmosis Brine Discharge;
  - Combustion/equipment emissions;
  - Vessel/facility-related sound emissions; and
  - Helicopter-related sound emissions.

5.3.2 Unplanned (incident) Activities

During the risk assessment process, a number of potential impacts/risks occurring from unplanned activities were also identified. These hazards range from small scale chemical spills with a low environmental consequence to large scale oil spill events with high environmental consequences. The sources of risk include:

- Loss of hydrocarbons due to a loss of well control;
- Loss of hydrocarbons due to a vessel collision;
- Loss of hydrocarbons due to a refueling (bunkering) spill;
- Chemical/oil spills through deck drain system;
- Loss of solid non-biodegradable/hazardous waste overboard;
- Accidental release of food-scraps overboard;
- Dropped objects overboard;
- Hydraulic line liquid release from subsea equipment (ROV, etc.); and
- Vessel collision with a cetacean.

A summary of these hazards, details of potential environmental impact and risk, and a summary of the control measures for the activity are provided in **Appendix A**.

6.0 ONGOING MONITORING OF ENVIRONMENTAL PERFORMANCE

CHPL is responsible for ensuring the Sea Lion Drilling Campaign in VIC/P57 is managed in compliance with the Sea Lion Drilling Campaign EP accepted by NOPSEMA under the Environment Regulations.

For each environmental hazard identified and assessed within the EP, a specific environmental performance outcome (EPO) has been identified, supported by control measures which have measurable environmental performance standards (EPS) to achieve the EPO. Specified measurement criteria provide the evidence to demonstrate that the performance standards and outcomes are achieved.

CHPL will review the drilling contractor's HSE management system with respect to CHPL's HSE expectations to ensure appropriate EP coverage to establish and resolve any inconsistencies, conflicts and system gaps with the CHPL HSEMS. A campaign-specific bridging document will address CHPL's specific requirements to be managed within the campaign.

The implementation strategy detailed in the accepted Sea Lion Drilling Campaign EP identifies the following methodology to ensure compliance with this EP and deliver EPOs. This includes:

- Pre-contract award review of third party contractors to ensure equipment/procedural/material compliance against the requirements of the EP;
- Identifying personnel responsible for the implementation of control measures and provision of records. These personnel shall monitor the performance of the control measure for compliance and effectiveness and feedback to the on-board CHPL HSE Advisor;
- A CHPL environmental induction program to advise personnel of relevant sensitivities, environmental hazards, EPOs and relevant incident reporting requirements (including reportable incidents); and
- The CHPL HSE Advisor shall collate daily environmental monitoring parameters to monitor EPO attainment and obtain all relevant records to verify discharges, incidents, etc.

An EP compliance audit and EP implementation review against the campaign-specific bridging document will be undertaken during the drilling campaign.

7.0 SUMMARY OF RESPONSE ARRANGMENTS IN THE OIL POLLUTION EMERGENCY PLAN

The Sea Lion Drilling Campaign Oil Pollution Emergency Plan (OPEP) details the CHPL incident and crisis command structure and CHPL's response arrangements to respond to, and escalate, an oil spill event.

This OPEP interfaces externally with the spill contingency plans developed by the Australian Maritime Safety Authority (AMSA) (National Plan for Maritime Environmental Emergencies [National Plan]), Victorian Government (VICPLAN) (including Gippsland Ports), NSW Government (*State Waters Marine Oil and Chemical Spill Contingency Plan*), Tasmanian Government (TASPLAN) and the Australian Marine Oil Spill Centre (AMOSC) (AMOSPlan); and internally with Hibiscus Petroleum's Crisis Management Plan and the West Telesto/Vessel Shipboard Oil Pollution Emergency Plan (SOPEP).

7.1 SUPPORT ARRANGEMENTS

CHPL's emergency incident arrangements describes CHPL's role as a Control Agency supported by the following support arrangements:

- Master services agreement with AMOSC which provides access on a 24/7 basis to oil spill response equipment, dispersant and specialist personnel in Geelong, Fremantle, Broome and Exmouth; access to Oil Industry resources (Mutual Aid Stockpiles) and trained industry response (Core Group) personnel; Fixed Wing Aerial Dispersant Capability (FWADC); and to the Global Response Network which provides mutual aid assistance during a spill event;
- A Memorandum of Understanding (MOU) with the Australian Maritime Safety Authority (AMSA) to access NATPLAN response equipment and dispersant stockpiles; National Response Team (NRT) and National Response Support Team (NRST) resources to support a spill response;
- Membership with Oil Spill Resources Limited (OSRL). This allows 24/7 access to dispersant, response equipment and specialist resource capabilities;
- A 24/7 callout agreement with Upstream Production Solutions (UPS) to support CHPL in incident management capability;
- Support services such as 24/7 oil spill trajectory modelling, on-call aerial, marine, logistics, scientific monitoring, shore base logistics, first strike oil spill responders, international Transportation Contractor and waste management support;
- Salvage Recovery Contractor; and
- Well Control Specialists.

The Sea Lion OPEP provides a First Strike Plan detailing the tasks to mobilise a first strike response for the first 48hours of an oil spill event. This includes key response actions, notifications and provides immediate guidance to the oil spill Incident Management Team until a full Incident Action Plan specific to the oil spill event is developed.

These arrangements are tested prior to drilling commencement at the Sea Lion location in accordance with exercise objective contained in the OPEP.

7.2 RESPONSE STRATEGIES

CHPL has assessed available response strategies for application at the Sea Lion location and established an oil spill preparedness and response position to demonstrate that impacts and risks associated with the loss of hydrocarbons would be mitigated and managed to ALARP and acceptable levels.

The following oil spill response strategies were evaluated and selected for a significant oil spill event (Level 2 or Level 3 under the National Plan) from the Sea Lion Drilling Activity:

- Source Control (deployment of a capping stack or relief well drilling);

- Operational Monitoring and Evaluation (natural degradation);
- Dispersant Application at sea surface (aerial and vessel-based);
- Offshore contain and recover activities;
- Shoreline Protection and Deflection Activities;
- Shoreline Cleanup; and
- Oiled Wildlife Management.

The potential environmental impacts and risks arising from these strategies include:

- Air emissions causing a temporary reduction in air quality;
- Physical presence of low flying aircraft causing sound disturbance to fauna;
- Vessel presence causing disturbance to fauna from light and noise; damaging shallow shoreline habitats or introducing IMS;
- Vessel collision with marine fauna;
- Exposure of personnel and in-water fauna to oil and/or dispersant from dispersant application activities;
- Damage to shoreline habitats, cultural heritage sites and threatened flora and fauna from spill response equipment, personnel mobilization and clean-up operations;
- Exclusion of marine and shoreline users as a result of implementing exclusion zones;
- Pollution to the marine environment from waste generated during a spill response;
- Additional spills (e.g. in-field vessel collisions);
- Physical injury and stress to wildlife if captured for treatment or hazing adopted.

Response strategies adopted for a spill-specific response will vary according to the size and type of hydrocarbon, the environmental sensitivities threatened, prevailing weather conditions, access constraints and available resources. For all significant spills, a pre-operational Net Environmental Benefits Analysis (NEBA) is undertaken to consider the advantages and disadvantages of various oil spill response strategies. The NEBA considers the impacts and risks arising from the response strategy (above) and are considered as part of the ALARP and acceptability assessment. Appropriate response strategies are determined when the environmental benefit of implementing the response outweighs the potential risks and impacts of not undertaking the response. The NEBA is completed in consultation with relevant government departments and agencies.

Implementation of response strategies would be reassessed during a spill event and on an on-going basis considering the changing dynamics of the spill event (size, weather conditions, etc.).

7.3 OPERATIONAL & SCIENTIFIC MONITORING

The OPEP includes an Operational and Scientific Monitoring Plan (OSMP) which is initiated in the event of a Level 2 or 3 oil spill during the Sea Lion Drilling Campaign. The nature and scale of the spill will determine the implementation and operational timing of the scientific modules detailed in the OSMP. Seven targeted scientific monitoring modules may be implemented to address a range of biological receptors (species and habitats), physical-chemical (water, sediments) and socio-economic receptors such as fisheries.

CHPL has a third party contract in place for the provision of monitoring services.

8.0 CONSULTATION DETAILS

For the purposes of the Sea Lion Drilling Campaign (VIC/P57) Environment Plan and consistent with the Environment Regulations (Regulation 11(A)), CHPL has consulted stakeholders it considers relevant to the proposed activity as well as the additional stakeholders who were identified as part of the ongoing consultation activities for the drilling program.

All stakeholders were provided with an emailed activity summary, with further information provided based upon identified issues and concerns. Where-ever practicable, stakeholder meetings were held to discuss the proposed drilling activities.

A list of stakeholders engaged as part of the Sea Lion Drilling Campaign (VIC/P57) consultation activities is provided in **Table 8-1**.

Table 8-1: Stakeholders Consulted as part of Sea Lion Drilling Campaign (VIC/P57) Consultation Activities

Interest Area	Organization/Name
Commercial Fishing	Australian Fisheries Management Authority (AFMA)
	Department of Environment and Primary Industries (DELWP) (VIC)
	South-East Trawl Fishing Industry Association (SETFIA)
	Lakes Entrance Fisherman's Cooperative (LEFCOL)
	Sustainable Shark Fishing Inc. (SSF)
	Southern Shark Alliance (SSA)
	Victorian Scallop Fisherman's Association (VSFA)
	Commonwealth Fisheries Association (CFA)
	Eastern Zone Rock Lobster Fishing Industry Association
	Seafood Industry Victoria
	Eastern Zone Abalone Industry Association
	Individual Fishermen
Recreational Fishing	VRFish
Government Agencies	Australian Maritime Safety Authority (AMSA)
	Australian Hydrographic Office
Government Agencies	Department of Defence (Air Control Cell)
	Border Protection Command
	Department of Economic Development Jobs Transport and Resources (DEDJTR (Earth Resources Regulation))
	Department of Transport, Planning and Local Infrastructure (DEDJTR)
	Transport for NSW
	Tasmanian Environment Protection Authority
	Gippsland Ports
	Parks Victoria (VIC)
	Department of Environment and Primary Industries (DELWP) (VIC)
	Victoria Police (VIC)
	Gippsland Water Police (VIC)
	East Gippsland Shire Council
	Wellington Shire Council
	South Gippsland Shire Council
	Environment Protection Authority (VIC)
	Department of Environment (COM)

Interest Area	Organization/Name
Government Agencies	Department of Primary Industries, Parks Water and the Environment (DPIPWE) (Tas.)
	Officer of the Chief Fire Officer (VIC)
Oil Spill Response Organizations	Australian Marine Oil Spill Centre (AMOSC)
	Australian Maritime Safety Authority (AMSA)
	Upstream Production Solutions (UPS)
	GHD
	RPS-APASA
	Oil Spill Response Australia (ORCA)
	Oil Spill Response Limited (OSRL)
	Transpacific Waste (TPI)
	Massey University – Wildbase
	Wildlife Victoria
	Pendoley Environmental
	Asia Pacific Response
Community Groups	Loch Sport Community Emergency Planning Group
	Golden Beach Community Emergency Planning Group
Oil & Gas Operators	Esso
	Nexus Energy
	Cape Energy
	Geosciences Australia
Other Infrastructure	Basslink

CHPL received feedback on the proposed activity across a number of topic areas. CHPL has considered feedback from these stakeholders and for all issues, concerns or claims raised by relevant persons, CHPL has made an assessment of the merits and where CHPL considers merit exists, inclusion has been made within this EP. For all issues, whether merit exists or not, CHPL has provided their position on the concern to the stakeholder. This feedback is provided in **Appendix B.**

This appendix details the following:

- Details of the objections and claims about adverse impacts of the activity raised by relevant persons;
- An assessment of the merit of the objectives and claims raised; and
- Measures adopted to manage the environmental impacts and risks identified in those objections and claims.

8.1 ONGOING CONSULTATION

Stakeholders identified in **Table 8-2** will be notified prior to the commencement; for nominated activities or milestones during; and following completion of the drilling activities as part of CHPL's ongoing consultation program for the VIC/P57 Exploration Permit activities. Each of the stakeholders listed have identified the appropriate communication channels and timing for these consultation interactions.

CHPL will continue to accept and receive feedback from all stakeholders for the duration of the accepted EP. Any issues or concerns raised during the activity will be assessed and for those items where merit exists, identify with stakeholders practical measures (as practicable and appropriate) to minimize impacts and risks to acceptable and ALARP conditions. Confirmed measures will be advised to stakeholders and the measures incorporated into the activity.

Table 8-2: Ongoing Stakeholder Notifications for Sea Lion Drilling Program

Stakeholder	Notification Triggers	Timing
Australian Fisheries Management Authority (AFMA)	Notification of Rig Move	On Commencement of Rig Move
Australian Hydrographic Office (AHO)	Notification for issue of Notice to Mariners Additional Subsea Infrastructure (Sea Lion-1 successful)	Two weeks prior to Rig Move Marine Pollution Incident Within 2 months of well completion
Australian Maritime Safety Authority (AMSA)	Notification of Rig Move Desktop Response Exercise Marine Pollution Incident Annual AMSA Workshops	On Commencement of Rig Move Prior to Sea Lion-1 Spud On incident occurrence AMSA Invitation
Department of Defence	Notification of Rig Move Increased vessel/aircraft activity	On Commencement of Rig Move Marine Pollution Incident
Australian Petroleum Producer & Exploration Association (APPEA)	Industry-wide related issues	As required
Border Protection Command (BPC)	Notification of Rig Move Rig Evacuation	On Commencement of Rig Move Rig Arrival at Location Rig Departure from Location On Evacuation Event
Fishing Industry Groups CFA, SETFIA, SIV, SSF, VSFA, SSA, LEFCOL, EZAIA Individual Fishermen	Alterations to Drilling Program which may affect interest When drilling program details are confirmed Rig Mobilisation/Demobilisation Equipment Loss (not recoverable) Permanent Seabed infrastructure presence (Fishing Plotter Upgrade) Marine Pollution Incident	On confirmation of program alteration On confirmation of drilling program details On Commencement of Rig Move On rig demobilisation from area Within 3 months of rig demobilisation On incident occurrence
Additional SETFIA Notification	Pre-notification of Drilling	One month prior to mobilisation One week prior to mobilisation At rig mobilisation Start of Operations Updates as required End of Activity
Additional Reporting (SSF, SIV, SETFIA, VSFA)	Drilling Discharges Monitoring Data	Within one month of report finalisation
DEDJTR (Earth Resources Regulation)	Reportable Incident Confirmation of Planned Drilling Start Date Normal Notification of Drilling Commencement Cessation Notification	Within 2hrs of occurrence One month prior to commencement Five business days prior to drilling commencement Within one week of ceasing drilling operations

Stakeholder	Notification Triggers	Timing
DEDJTR (Emergency Risk & Resilience)	Desktop Response Exercise Changes in Drilling program affecting OPEP VICPLAN Operations Meetings Rig Mobilisation/Demobilisation Marine Pollution Incident (including monitoring)	Prior to Sea Lion-1 Spud On change event As determined by DEDJTR On Commencement of Rig Move On incident occurrence
Gippsland Ports	Rig Mobilisation/Demobilisation Marine Pollution Incident	On Commencement of Rig Move On incident occurrence
Victoria Police	Desktop Response Exercise Rig Mobilisation/Demobilisation Marine Pollution Incident	Prior to Sea Lion-1 Spud On Commencement of Rig Move On incident occurrence
Gippsland Water Police	Rig Mobilisation/Demobilisation	On Commencement of Rig Move
DEPI (now DELWP)	Rig Mobilisation/Demobilisation	On Commencement of Rig Move
Adjacent Oil & Gas Operators	Rig Mobilisation/Demobilisation Marine Pollution Incident	On Commencement of Rig Move On incident occurrence
Basslink	Rig Move over Bass Link	5 Days prior to Rig Move
Loch Sport Community Emergency Planning Group Golden Beach Community Emergency Planning Group	Key Project Milestones (Rig Move, mobilisation, demobilisation, further development activities) Marine Pollution Incident	At Key Milestones On incident occurrence
Transport for NSW Tasmanian EPA	Changes in Drilling program affecting OPEP Rig Mobilisation/Demobilisation Marine Pollution Incident (including monitoring)	On change event On Commencement of Rig Move On incident occurrence
Oil Spill Response Organisations AMOSC, AMSA, UPS, RPS-APASA, OSRL, ORCA, TPI	Desktop Response Exercise Changes in Drilling program affecting OPEP Rig Mobilisation/Demobilisation Marine Pollution Incident	Prior to Sea Lion-1 Spud On change event On Commencement of Rig Move On incident occurrence

9.0 CONTACT DETAILS

Further information associated with the environmental aspects of the Sea Lion Drilling Campaign in VIC/P57 may be obtained from CHPL by contacting:

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APPENDIX A – ENVIRONMENTAL IMPACTS AND RISKS

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Planned Activities (Routine & Non-Routine)			
Possible introduction of Invasive Marine Species into VIC/P57	Colonisation of introduced species competing with native species with the potential to create ecological disruption.	Medium	Vessels comply with *Australian Ballast Water Management Requirements*. Ballast water complies with *EPA Protocol for Environmental Management: Domestic Ballast Water Management in Victorian Waters* Biofouling risk assessment (rig/vessels) assessed as low prior to entry to Australia Rig and vessels carry current IFAS Certification
Presence of Vessels and Infrastructure in VIC/P57	Localised disruption, interference or displacement of commercial fishing activities in the area	Low	Affected fishing stakeholders are identified during consultation for continued liaison Stakeholders notified at commencement of rig move activities & on significant events. Marine Warnings issued (Notice to Mariners, AUSCOAST) Petroleum Safety Zone Gazettal (West Telesto) Rig Standby Vessel to warn third party vessels **If Sea Lion Successful:** Assess/minimise PSZ, update fishery plotters with Sea Lion PSZ
	Localised disruption to Third Party Commercial and Recreational Vessel Movements.	Low	Sea Lion location within the Area to be Avoided Rig/Vessels obtain approval to enter the 'Area to be Avoided' Affected stakeholders are identified during consultation for continued liaison Marine Warnings issued (Notice to Mariners, AUSCOAST) Compliance with Marine Order 30: Prevention of Collisions Compliance with Marine Order 27: Radio Equipment Radio Operators are competent to STCW95 requirements Rig Standby Vessel to warn third party vessels Sea Lion Successful: Well PSZ Gazettal & placement on navigation charts
	Temporary and localised disturbance of soft seabed sediments from rig installation activities	Low	Pre-mobilisation survey establishes suitability of drill site location Adherence to Marine Operations Manual with no use of anchors to position

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Presence of Vessels and Infrastructure in VIC/P57	Temporary, localised lighting creating disorientation to light sensitive species	Low	Navigation lighting on-board the rig/vessels certified and maintained in accordance with Manufacturer's Specifications Workplace lighting conforms with rig/vessel Safety Case/ILO Code of Practice Requirements
Routine discharge of brine to the marine environment at the end of drilling	Localised temporary elevated salinity concentrations with potential harm of deterrence of pelagic fauna which are salinity sensitive.	Low	Brine inventories discharged to the marine environment are within 10% of background seawater concentrations. Chemicals selected for brine on the Drilling Campaign are classified as OCNS CHARM silver or gold, non-CHARM E or PLONOR.
Routine cementing residues discharged to the marine environment from cementing operations	Localised and temporary affects to water quality, marine biota and altered seabed habitats.	Low	Cement program specifies the required cement quantities for each hole section. Chemicals selected for brine on the Drilling Campaign are classified as OCNS CHARM silver or gold, non-CHARM E or PLONOR ROV surveillance of conductor cementing operation to limit cement return to the seabed. Excess cement is returned to shore for disposal or provided to next titleholder at the end of drilling
Generation of noise from Vertical Seismic Profiling Activities	Temporary localised sound exposure to marine fauna with possible physiological and behavioural (i.e. avoidance) effects including protected marine species.	Low	Acoustic source size selected is smallest to achieve logging objectives VSP Crew provided with induction on environmental sensitivities at the Sea Lion location Compliance with EPBC Act Policy Statement 2.1 to manage potential interaction between VSP and cetaceans present. One Marine Mammal Observer (MMO) and one trained crew member to undertake cetacean observations.

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Routine discharge of drill cuttings and WBM to the seabed and the marine environment	CHPL has undertaken cuttings drilling cuttings/mud discharge modelling to assess possible impacts to the marine environment. Assessment of this data against species present within the sea Lion-1 location identified the following: • Burial of benthic species leading to possible localised mortalities. Studies undertaken on faunal counts/diversity have shown no significant effects of sedimentation with respect to settling colonies with rapid recolonization expected within months to a year; • Temporary displacement of demersal fish species. • Localised and temporary minor effects to water quality (e.g. turbidity increase) leading to localised fish avoidance and visual plume observation to socio-economic values in the area. Modelling undertaken has predicted: • Localised burial of benthic habitat (@1mm) within 2100m (maximum) from the wellsite in the prevailing NE-SW current direction; • Visible plume detected at maximum distance of 4.9km from the rig discharge point.	Low	Chemicals selected for brine on the Drilling Campaign are classified as OCNS CHARM silver or gold, non-CHARM E or PLONOR. For lower well section, use of solids control equipment (e.g. shale shakers, hydro cyclones) removes residual WBM from cuttings prior to discharge overboard with the performance of the system continuously monitored. Drilling fluid properties are tested at least twice daily to ensure the WBM system is optimised and working effectively. Sediment monitoring (sediment thickness, current data) will be undertaken during, and at the completion of drilling, to validate sedimentation modelling results. If the sediment profile shows deviation from that predicted, with greater thicknesses at distance from the wellhead, CHPL will assess the significance of this deviation and investigate possible causes (e.g. high currents, increased volumes of drill cuttings/muds, etc.). Measures which will be considered to reduce impacts of increased sedimentation include a reduction in the number of sweeps (intermediate section) and refinement of WBM surface treatment systems (production section). Visible WBM plume monitoring will be undertaken for the lower well sections (intermediate and production sections) and at the end of well mud release to verify predictive modelling results and limit the length of visible plume to acceptable levels. • If, during the drilling of the intermediate/production section, a significant deviation is measured between predicted and observed values measures to be considered to reduce visible plume impacts may include, where possible, reduced sweeps and optimisation of the WBM recovery system (as above). • The end-of well WBM discharge will be visually monitored hourly to assess the plume travel distance against that predicted. Should the plume exceed the predicted travel distance at 1hr the discharge will be curtailed and allowed to dilute and dissipate; otherwise the discharge will continue and monitored hourly for acceptability of plume distance. If the visible plume exceeds the predicted plume length at 1hr the rate will be reduced and additional control measures which may be implemented include WBM dilution prior to discharge and discharge on moving tide. Discharge monitoring results reviewed and assessed at the end of drilling activity to inform future drilling in the area. Monitoring results to be provided to interested fishing groups.

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Routine Vessel /Rig Discharges – treated bilge water	Localised and temporary reduction in water quality with possible adverse impacts to marine biota	Low	Vessels: Compliance with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Section 9) & Marine Order 91 (Marine Pollution Prevention-Oil) Rig: Compliant with MARPOL 73/78 Annex I Whole oils are collected and transported to shore for treatment and disposal in accordance with Victorian legislation. Treatment systems are maintained in accordance with vessel/rig Preventative Maintenance System (PMS) with Oil Detection Monitoring Equipment certified and calibrated.
Routine Vessel /Rig Discharges – treated sewage	Localised and temporary reduction in water quality (organics and bacteria) with possible adverse impacts to marine biota	Low	Vessels: Compliance with *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Section 26D) & Marine Order 96 (Marine Pollution Prevention-Sewage) Rig: Compliant with MARPOL 73/78 Annex IV Treatment systems are maintained in accordance with vessel/rig PMS Vessel sewage system capacity suitable for full crew on-board
Routine rig cooling water discharge to the marine environment	Localised and temporary residual biocide chemicals and elevated water temperatures around discharge point with possible behavioural impacts to local in-water species	Low	Rig utilises predominantly closed loop cooling systems (no system discharge). For open loop system no chemical biocides are added. Cooling system is maintained in accordance with rig PMS
Routine Reverse Osmosis (RO) brine discharge to the marine environment	Localised temporary elevated salinity concentrations with potential harm of deterrence of pelagic fauna which are salinity sensitive.	Low	RO system is maintained in accordance with rig PMS Reverse Osmosis unit is inspected daily to ensure that the equipment is operating within normal limits.

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Routine Vessel /Rig Discharges – atmospheric discharges	Localised and temporary reduction in air quality from atmospheric emissions. Localised increase in refrigerant emissions contributing to the global greenhouse gas effect.	Medium	Rig & vessels fuel use is compliant with MARPOL Annex VI requirements for sulphur emissions (3.5%m/m sulphur) Rig/vessel marine engines compliant with MARPOL 73/78 Annex VI for NOX emission (appropriate to class) All combustion equipment and HVAC systems are maintained in accordance with vessel/rig PMS and manufacturers specifications Proactive fuel monitoring on-board rig/vessels to identify (and correct) abnormal fuel usage Maintenance technicians are certified to undertake maintenance of HVAC systems.
Routine Vessel/Rig – sound emissions within the marine environment	Localised behavioural disturbance to marine fauna including localised avoidance/attraction including protected marine mammal species	Low	Rig equipment & vessel propulsion/DP systems operate in accordance with Manufacturers specifications. Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with Cetaceans Vessel crews inducted and familiar with EPBC Regulation 2000 (Part 8) requirements
Routine emissions – Aviation support	Temporary and localised behavioural disturbance to marine fauna including protected marine mammal species	Low	Helicopters maintained in accordance with Manufacturers specifications/CAA Standard. Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with Cetaceans Helicopter crews inducted and familiar with EPBC Regulation 2000 (Part 8) requirements
Unplanned (Incident) Activities			

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Loss of hydrocarbons to the marine environment due to loss of well control	Modelling shows the following potential impacts may occur as a result of a loss of well control event (worst case): • Surface oiling and dissolved/entrained hydrocarbons extending along the Victorian/ NSW coastline from Inverloch to Port Macquarie including NE coast of Tasmania and the Bass Strait Islands; • Altered water quality leading to possible oiling impacts to surface fauna (birds, mammals, reptiles), water column species such as fish, sub-tidal benthic invertebrates and corals; • Potential interference with activities of other oil and gas operators; • Potential interference with or displacement of other sea users in oil spill area (commercial fishing and shipping); • Coastal resource impacts to inter-tidal fauna, fauna colonies, estuarine environments, European and aboriginal heritage and tourism; • Tainting of seafood in areas affected by oil spill.	Medium	Site surveys completed before drilling to assess for subsurface hazards Activity undertaken in accordance with accepted WOMP, Well Design and Drilling Program, Well Control Procedures and subordinate/associated documents. Drilling contractor personnel are trained and competent in well control. During the drilling of the hydrocarbon bearing strata, two pressure tested barriers are maintained at all times. Primary well barrier (overbalance mud system) is continuously monitored to detect possible loss conditions. All pressure containing strings are tested at installation and/or prior to drill out. Blowout Preventers (BOPs) are installed prior to entering hydrocarbon–bearing zone. BOPs are tested prior to installation, when installed on the well and tested Cement testing (for strength, etc.) is undertaken to ensure proper isolation of the hydrocarbon formations in the well. Implementation of the Sea Lion Drilling Campaign Emergency Response Plan (ERP), Oil Emergency Pollution Plan (OPEP) and Well Recovery Response Plan (WRRP) for emergency/oil spill events. Oil Spill Preparedness measures (trained personnel, equipment, support agency agreements) maintained to support OPEP implementation (refer to **Section 7** for Oil Spill Response arrangements). Emergency response arrangements are routinely tested on board the rig and prior to drilling commencement.

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Loss of hydrocarbons to marine environment due to a vessel collision/tank leak (e.g. support Vessel)	Temporary impacts to the following: • Surface oiling/ entrained hydrocarbons extending along the Gippsland coastline from the Honeysuckles to Cape Howe; • Altered water quality leading to possible oiling impacts to surface and water column fauna; • Potential interference with activities of other oil and gas operators, commercial fishing and shipping; • Coastal resource impacts to inter-tidal fauna, fauna colonies, estuarine environments, European and aboriginal heritage and tourism; • Tainting of seafood in areas affected by oil spill.	Low	AHTS Vessels are certified and activity is undertaken in accordance with the requirements of the certified Vessel Safety Management System. Vessel activity within the PSZ is in accordance with the Rig's Marine Operations Manual and associated operations procedures. Affected stakeholders are identified during consultation for continued liaison Marine Warnings issued (Notice to Mariners, AUSCOAST) Compliance with Marine Order 30: Prevention of Collisions Compliance with Marine Order 27: Radio Equipment Radio Operators are competent to STCW95 requirements Rig Standby Vessel to warn third party vessels Implementation of Vessel SOPEP and Sea Lion Drilling Campaign OPEP for oil spill events. Oil Spill Preparedness measures (trained personnel, equipment, support agency agreements) maintained to support OPEP implementation (refer to **Section 7** for Oil Spill Response arrangements). Oil spill response arrangements are routinely tested on board the rig/vessel and prior to drilling commencement.
Loss of hydrocarbons to the marine environment during refuelling/ bunkering operations	Minor and temporary disruption to protected species such as oiling of marine mammals and seabirds. Localised minor and/or temporary contamination of water which may lead to effects on marine biota in offshore waters.	Low	AHTS Vessels are certified and activity is undertaken in accordance with the requirements of the certified Vessel Safety Management System. Vessel activity within the PSZ is in accordance with the Rig's Marine Operations Manual, Refuelling Procedures and Permit to Work for the activity. Dry break couplings are used and all transfer equipment is fit-for-purpose, routinely maintains and inspected prior to transfer. Implementation of Vessel SOPEP and Sea Lion Drilling Campaign OPEP for oil spill events. Oil Spill Preparedness measures (trained personnel, equipment, support agency agreements) maintained to support SOPEP/OPEP implementation (refer to **Section 7** for Oil Spill Response arrangements). Oil spill response arrangements are routinely tested on board the rig/vessel and campaign testing of the OPEP undertaken prior to drilling commencement.

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Accidental spills of chemicals from rig/ support vessel deck activities	Localised temporary contamination of water which may lead to effects on marine biota in offshore waters	Low	Compliance with Marine Order 91: Marine Pollution Prevention - Oil Chemicals are hazard assessed prior to purchase Chemicals handling and transport comply with the requirements of the IMDG Code and according to rig/vessel storage plans. Routine inspections are undertaken to ensure that minimum standards are implemented to control deck spill risk Crews are inducted into chemical/oil handling requirements on-board Material Safety Data Sheets are available for all chemicals on-board
Accidental loss of solid, non-biodegradable or hazardous waste overboard to the marine environment	Local damage to benthic habitats or marine fauna ingestion or entanglement. Localised temporary contamination of water which may lead to effects on marine biota in offshore waters.	Low	Compliance with Marine Order 95: Marine Pollution Prevention – Garbage Rig/Vessels operate in accordance with approved Garbage Management Plan Rig/vessels personnel are inducted into waste management requirements Rig/vessels implement routine house-keeping inspections of waste storage areas
Accidental loss of equipment into the marine environment	Localised seabed disturbance to benthic habitat in the immediate area of the dropped object and seabed obstruction interfering with marine user activity.	Low	Lifting appliances are designed and manufactured to accepted industry standards; maintained and inspected in accordance with Manufacturers Specifications; and carry the necessary certifications. Lifting Operations are undertaken in accordance with approved procedures Personnel involved in lifting operations are appropriately trained and certified. Post-well clearance survey is undertaken to verify presence of debris. Where possible equipment is retrieved, however if this is not possible, third party marine users will be notified of debris presence with fishing plotter upgrade for the object (as required).
Accidental release of hydraulic liquid (Work-class ROV activities)	Localised temporary contamination of water which may lead to effects on marine biota in offshore waters	Low	ROV activities are undertaken by trained and competent personnel ROV equipment undergoes a pre-dive inspection to verify the equipment is fit-for-purpose, and is maintained and inspected in accordance with the ROV Contractors PMS For work-class ROVs, pump/pressure sensor interlocks on hydraulic systems are maintained and tested in accordance with manufacturer's specifications. ROV Operations are undertaken in accordance with approved procedures

Environmental Hazard	Potential Environmental Impact	Residual Risk (Controls Implemented)	Activity Control Measures
Accidental Collision between a support Vessel and threatened/ migratory whale species.	Potential injury or fatality of an individual or number of fauna	Low	Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 – Interacting with Cetaceans Vessel crews inducted and familiar with EPBC Regulation 2000 (Part 8) requirements

APPENDIX B – STAKEHOLDER FEEDBACK

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Maritime Safety	Stakeholder requested that: • AHO is advised of the rig move at least two weeks prior to move to support a Notice to Mariners; • Rig move notice is provided to AMSA RCC prior to rig move.	CHPL acknowledges the requests which are consistent with the requirements for marine movement activities to be reported to AMSA RCC and AHO.	CHPL, via forward consultation strategy, to ensure that drilling contractor notifies AMSA RCC and AHO within designated timeframes to ensure that maritime safety is managed.
Defence Activity	Stakeholder advised that: • Sea Lion is in an area where there may be unexploded ordinances and CHPL should inform itself on the risk with conducting exploration activities. • Area is in Defence Restricted Air Space and the Joint Air Space Control Cell should be advised of any activity or increased activity in the area.	CHPL acknowledges potential risk item and notification requirements. Relevant surveys will be undertaken prior to activity commencement and notifications made to the Joint Air Space Control Cell in accordance with nominated timeframes.	CHPL is/has: • Undertaking a geophysical survey of the area to determine presence of unexploded ordinances in the Sea Lion drilling area. • Logged in forward consultation strategy the requirement to notify the Joint Air Space Control Cell as per notification request of CHPL activities in the area.
Basslink	Stakeholder advised that the transit of a rig over the Bass Link Cable route requires: • Notification prior to the transit including the estimated transit start and stop time and any significant changes to the schedule, with a final notification when the operation is clear of the cable; and • Any work that may result in objects being discharged overboard be suspended for the period of the transit.	CHPL acknowledges the request and will undertake these notifications.	CHPL, via forward consultation strategy, will ensure Bass link is notified of the West Telesto rig transit crossing activities within designated timeframes.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fishing	**Sound Impacts for Activities (VSP):** Stakeholder raised concern regarding sound impacts from vertical seismic profiling (VSP) associated with drilling activities in the Sea Lion area and impacts to scallop fishery. Stakeholder does not agree with CHPL's determination of a 'low risk and acceptable levels of risk to scallops' and believes that drilling should be delayed until IMAS Research (into scallop impacts from seismic surveys) can allow for relevant information to be included in the impact evaluation.	CHPL undertakes consequence assessment and risk evaluation in a structured process in accordance with the CHPL risk assessment methodology. CHPL in their determination of impacts to marine species utilises all available scientific literature to make an informed assessment on possible effects/impacts with proposed petroleum activities. In this context, CHPL does not rely on one piece of scientific literature, but considers all studies recognising the individual study boundary conditions. This then allows for a complete assessment of potential impacts recognising specific operating conditions. While not abundant, there have been a representative number of studies which have evaluated scallop impacts from intense low frequency sound. An interim IMAS study[6] utilised a close range seismic source to assess for scallop effects and mortality. Conditions associated with this study identify that scallops are present in the near-field of the acoustic source where a significant particle motion component of the sound field is present. While the final results are not issued, the interim results identify a possibility of increased mortality and behavioural impacts to scallops. This interim information has been used to inform on possible impacts to scallops present near the Sea Lion well during VSP activities. While the final IMAS report will be more statistically robust, sufficient evidence is present in the interim IMAS report to identify impacts. Utilising this information and applying it to the Sea Lion area, it is possible that localised mortalities, from the near field particle motion component (occurs close to the source) is possible. However, scallop fishery reports[7] identify that the scallop abundance in the Sea Lion locations is low with limited recruitment over preceding years. On this basis, the impacts to scallops associated with near-field impacts, at a fishery impact level, given their low abundance, is unlikely and the risk is assessed as low. CHPL has conservatively adopted the 'worst case' consequences associated with the IMAS study into the environmental context at Sea Lion to assess scallop impacts and does not consider the issue of the final IMAS report to be material to this assessment. *On the basis of these factors above, the delay to the drilling program to await final the IMAS Research study is not considered to hold merit.*	Impacts on fisheries/fauna reduced to an ALARP and acceptable level through: • Vertical Seismic Profiling (VSP): The acoustic source size selected for the survey is reduced to the minimum level which still achieves logging objectives. This has been achieved via consultation with acquisition experts with experience in similar geologies and in similar well depths which have achieved satisfactory logging outcomes. The VSP activity occurs from a stationary platform (not mobile hence localised impacts) with limited VSP firings over a small timeframe (~hrs). • VSP operational procedures reflect the requirements of EPBC Policy Statement 2.1 which monitor for whales during daylight hours during VSP activities ensuring shut-downs and soft-start procedures are implemented to protect sound sensitive fauna from exposure.

[6] Semmens, J, (2014) – Milestone Progress Report – Assessing the Impacts of Marine Seismic Surveys on South East Australian Scallop and Lobster Fisheries, FRDC Project number 2012/008.
[7] Semmens J.M. & Jones, N.A.R. (2012) – 2012 Victorian Scallop Fishery Survey Report, February 2012, Institute for Marine and Antarctic Studies.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Presence of Known Scallop Beds of Significance at Drilling Location:** Stakeholder has claimed that drilling works will occur over a known bed of scallops of significance to the scallop industry.	CHPL has requested through consultation with stakeholder spatial fishing data and densities, however this information has not been forthcoming. CHPL has adopted language used by the stakeholder in multiple records received during the drilling campaign that the drilling area overlaps "traditional fishing grounds" in the absence of any spatial data provided. To facilitate consultation with the group, CHPL has adopted stakeholder's reference to the area as "traditional fishing grounds". Stakeholder has claimed that CHPL has actively omitted information on a known bed of scallops of significance from CHPL's submissions to NOPSEMA instead referring to the sentiment that the area was 'traditional' fishing grounds for scallop fishermen. In the absence of any spatial data provided by the stakeholder, CHPL has obtained all available data (site survey data, DEPI fishing intensity records, fishing stock analysis reports) to determine possible densities of scallops in the vicinity of drilling activities. CHPL considers that this information has been obtained from reliable sources and reflects the legislative obligation to report catch data. Feedback from the observations made on the recent geotechnical survey undertaken at Sea Lion in preparation for the drilling activity identified the seabed to be flat covered in a coarse-grained carbonate sand with small numbers of tube-worms and limited numbers of epifauna. This is consistent with benthic fauna surveys in adjacent areas which identify similar types and abundances of benthic fauna (i.e. sea-stars, polychaete worms, crustaceans, sea-spider, squid and small bivalves) and previous data obtained in Sea Lion-1 geophysical studies identifying the site to be sandy-bottomed. CHPL considers that the information provided by regulators, scientific bodies undertaking stock assessments and visual observations undertaken during CHPL surveys does not support the claims which have been made by the stakeholder with respect to "works will occur over known beds of significance to the scallop fishing industry".	Impacts on fisheries reduced to an ALARP and acceptable level through: • Sediment monitoring will be undertaken to validate measured thicknesses against those predicted by modelling. Significant deviations from predicted thicknesses will be investigated and measures such as reduced sweeps (intermediate section) and refinement of WBM surface treatment systems (production section) considered to reduce impacts of sedimentation where possible; • Vertical Seismic Profiling (VSP): The acoustic source size selected for the survey is reduced to the minimum level which still achieves logging objectives. This has been achieved via consultation with acquisition experts with experience in similar geologies and in similar well depths which have achieved satisfactory logging outcomes. The VSP activity occurs from a stationary platform (not mobile hence localised impacts) with limited VSP firings over a small timeframe (~hrs).

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Sound Impacts for Activities (VSP):** Stakeholder raised concern over the VSP activity having the potential to impact spawning, settlement, growth, long-term productivity or access is a significant consequence to fisheries. Stakeholder claimed that CHPL has not detailed the seismic source to be utilised in VSP activities; no referencing to acoustic decay characteristics; did not address areas of convergence and reverberation through substrate and how this can lead to high sound levels far from the source; and cannot determine this accurately without taking measurements in the field to determine accurate exposure levels received by scallop stocks.	VSP activities proposed for the Sea Lion well will be undertaken from the rig (i.e. a stationary source) with limited firings over a short timeframe (~hrs). CHPL has provided both the VSP source Sound Energy Levels (SELs) and Sound Pressure Levels (SPLs) based upon the maximum source size to be used in VSP at Sea Lion to the stakeholder. CHPL also provided to the stakeholder, representative modelling predicting the VSP's acoustic footprint in a shallow water environment together with decay characteristics. The acoustic study for the Otway region (similar source size, very similar water depths and similar sandy bottom to the Sea Lion area) is considered an equivalent setting to Sea Lion. Given this type of sound modelling is produced for marine seismic surveys to establish sound footprints, CHPL considers that sufficient, relevant information has been provided to the stakeholder to allow for an informed assessment of VSP activities and to assess and determine impacts. Information presented by stakeholder with respect to behavioural impacts on scallops (larvae & adults) due to low frequency sound (IMAS Interim Report & Aguilar de Soto (2012)) relate to 'near field' impacts where the particle motion component of the sound field is high. Aguilar de Soto (2012) identified mortality and deformation of scallop larvae and attributed the impacts to the near-field particle motion of the sound wave. Similarly the interim IMAS study exposes adult scallops to an acoustic array at 4.2m which are in the near field of the low frequency sound source. VSP activities at Sea Lion, with the source located 20m from the seabed, at the lowest expected frequency of 6Hz is expected to have a near-field range of approximately 230m. Scallops, if present within this radius, might be expected to be affected by near-field particle motion, however the effect will be localised. It is noted that at 1000m the VSP SEL is predicted to be ~151dB re 1µPa^2.s equating to a SPL of 171dB re 1µPa (approx.). This is in the range of sound emitted by commercial fishing vessels which are routinely used in the fishery. *CHPL considers that all relevant information has been provided to the stakeholder to determine scallop exposures/impacts and a comparison has been made between VSP studies and activities undertaken by commercial fishing vessels, which CHPL expects to be acceptable to the fishery from a physiological and behavioural impact perspective (i.e. fishing vessel sound levels).*	Impacts on fisheries reduced to an ALARP and acceptable level through: • Vertical Seismic Profiling (VSP): The acoustic source size selected for the survey is reduced to the minimum level which still achieves logging objectives. This has been achieved via consultation with acquisition experts with experience in similar geologies and in similar well depths which have achieved satisfactory logging outcomes. The VSP activity occurs from a stationary platform (not mobile hence localised impacts) with limited VSP firings over a small timeframe (~hrs).

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Sound Impacts for Activities (VSP):** Stakeholder proposed a damage bond or licence buy-back should be implemented to compensate/protect against damage to scallops from drilling activity. Additional compensation was sought by stakeholder as a result of loss of access to scallop stocks; and compensation for damages and loss of income during the drilling period and on successful completion of the well.	CHPL operates within the framework of the *Offshore Petroleum and Greenhouse Storage Act 2006* (Section 280) which requires a person undertaking an activity not to interfere with fishing or navigation to a greater extent than is necessary for the reasonable exercise of the rights of that person. In undertaking the proposed drilling activities the impacts and risks associated with the activity must be demonstrated to be acceptable and ALARP and that 'interference' has been minimised to the extent practicable. Additionally, CHPL has established through its risk assessment process, that the impact to scallops, based upon available scientific literature and Scallop Fishery Surveys, will be localised and not significant at a population level. *On this basis CHPL does not consider that placement of a damages bond, fisheries licence by-back or compensation for damages/lost income has merit.*	• CHPL has selected the minimum acoustic source size to accomplish survey objectives. • In the event that the Sea Lion well is successful, CHPL has committed to review the Petroleum Safety Zone radius to minimise the area impact to fisheries. This radius will be assessed on the basis of guaranteeing infrastructure integrity.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Vibrational Impacts to Scallops:** One stakeholder raised concern over the VSP activity having the potential to impact spawning, settlement, growth, long-term productivity or access is a significant consequence to fisheries. The stakeholder identified sediment vibration as a possible cause of behavioural and physiological impact to scallops and CHPL had supplied insufficient information on the verified substrate vibration as a result of the VSP program (& hence potential impacts to scallops).	VSP activities proposed for the Sea Lion well will be undertaken from the rig (i.e. a stationary source) with limited firings over a short timeframe (~hrs). CHPL has undertaken an extensive literature review associated with types of drilling/sound impacts (behavioural & lethal) to scallops. While some literature exists with seismic sound impacts there is a paucity of data available on behavioural and vibrational impacts to scallops. CHPL has adopted scientific principles and determined a zone whereby impacts (behavioural/lethal) to scallops due to sediment displacement may be above 'normal' fishing vessel-based vibration experienced in the area. Sediment displacement is directly proportional to sound pressure levels (SPLs). It is noted that VSP activity does not continually vibrate the seabed but rather, over the period of the VSP activity, would serve to displace sediment to varying degrees 200 times based on the predicted 200 shots to be undertaken during the program. Continuous sound sources (i.e. vessels) will serve to 'vibrate'. Not–withstanding this, based upon the predicted acoustic footprint for the VSP activity, SPL levels at 1000m are expected to be in the same range as the sound emitted, and sediment vibrations caused by fishing vessels. No benchmarks of acceptable sound propagation or 'substrate vibration' is recognised through scientific studies or by the stakeholder to define scallop impacts (physiological or behavioural). CHPL acknowledges the available interim results of the IMAS study, referenced by the stakeholder with respect to vibration as a parameter for evaluating impacts to scallop species. It should be noted however, that the IMAS study has been conducted in the near-field to assess for possible impacts to scallop species. For seismic array frequencies (lowest frequency ~6Hz) the near field might be measured out to 230m (i.e. localised). With regard to possible scallop species impacts, from the Victorian Scallop Fishery Survey Report (2012)[8], low scallop abundance with limited recruitment is reported at the Sea Lion site. Any localised behavioural/lethal impacts in this low abundance location is not considered significant at a population level. CHPL considers it has provided sufficient information with respect to substrate vibration from VSP sources to the stakeholder. CHPL also considers it has undertaken a robust risk assessment of this issue based upon the limits of available literature and has acknowledged the potential for behavioural and physiological impacts.	Impacts on fisheries reduced to an ALARP and acceptable level through: • Vertical Seismic Profiling (VSP): The acoustic source size selected for the survey is reduced to the minimum level which still achieves logging objectives. This has been achieved via consultation with acquisition experts with experience in similar geologies and in similar well depths which have achieved satisfactory logging outcomes. The VSP activity occurs from a stationary platform (not mobile hence localised impacts) with limited VSP firings over a small timeframe (~hrs).

[8] Semmens J.M. & Jones, N.A.R. (2012) – 2012 Victorian Scallop Fishery Survey Report, February 2012, Institute for Marine and Antarctic Studies.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Sound Impacts from Drilling Activities:** Stakeholder raised concerns over the low frequency sound emitted by drilling and the impact to shark species. Stakeholder requested baseline studies to monitor for animal behaviours and how drilling noise will be monitored, the period that drilling noise monitoring will be undertaken to determine short and long-term impacts; and what modelling had been performed to determine the impact and cumulative noise of all activities such as standby vessels, supply vessels and drilling impacts on the ecology.	Drill Rig: CHPL assessed possible sound impacts from drilling to marine species. Specifically a review into low frequency infrasound on shark species was undertaken. This review identified shark species are responsive to impulsive low frequency sound which resembles struggling prey (otherwise there is no clear behaviour with differing sound levels). The Sea Lion location is located within a brownfield oil and gas area. It is also noted that shark fishing does not occur at the Sea Lion location. International studies undertaken on sound levels emitted from drilling jack-up rig activities identified sound generated is very low level (in frequency range 8.9-44.7Hz peaking ~127dB re 1µPa) and similar to operational production platforms. Ambient ocean noise in Bass Strait due to wind and wave activities are estimated at 90-120dB, also within the infrasound range. On this basis the sound levels (temporary & incremental) from the drill rig are not expected to have a measurable effect on the sound environment of Bass Strait. Rig/vessels (Cumulative): Studies undertaken within the Timor Sea provide an indication of the broadband sound levels within the marine environment during vessel/rig operation. While the study does not provide for multiple vessels in the field, the presence of multiple vessels attending the West Telesto at Sea Lion is estimated at less than 10% of the project duration given the supply base is located at Geelong. Interaction between third party vessels and support vessels are considered more frequent. The temporary incremental sound increases may lead to localised marine fauna avoidance during vessel operations. Monitoring: Noise data obtained during drilling would confirm the sound footprint of the rig/vessel interactions at differing times throughout the drilling campaign and this data may indicate a slightly modified sound footprint (more/less) on literature values which may increase/decrease the level of displacement of sound sensitive fish species. However unlike cetaceans there is not a recognised threshold for behavioural change in fish. For sharks, the information is even less certain with literature identifying that they are responsive to impulsive low frequency sound (otherwise are non-responsive). Hence the data would have limited value to fisheries. From CHPL's perspective the monitoring data, based upon this unique combination of rig/vessel type, may provide information/ confirmation on sound footprint however CHPL is unable to mitigate the noise based upon the monitoring feedback. On this basis, the data would have limited value to both fisheries and CHPL. *Monitoring is not considered to hold merit in this instance.*	The following controls have been adopted to reduce impacts from vessel and rig-based sound: • Equipment on-board the West Telesto and AHTS vessels are maintained and operate to manufacturer's specifications.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Toxicity of Drill Cuttings:** Stakeholder concern regarding the potential mineralogical toxicity and heavy metal content of cuttings which are extracted as cuttings as part of the drilling process.	CHPL has undertaken an assessment of the underlying formation depositional characteristics and sediment strata to provide an informed assessment on potential toxicity of cuttings. The majority of Gippsland Basin sub-surface sediments and rocks have been transported and deposited by water (i.e. "sedimentary"). This has resulted in chemically mature sediments (or rocks) with Quartz sands and felspathic shales the dominant rocks found throughout the Latrobe Group (primary target for the Sea Lion well). On the basis of this depositional history, any reactive toxic metals and compounds in the Gippsland Basin sediments have been exposed to water and air for a significant amount of time during erosion, transportation and their toxicity has reduced through oxidation which increases the chemical compound stability (i.e. any residual metals are tightly bound within the rock matrix and not bioavailable to the environment). On this basis, the drilled cuttings from the Sea Lion well are unlikely to be significantly different to the sediments encountered in onshore Gippsland coastline sediments. Subsurface "volcanic formations", can be associated with higher metal concentrations in cuttings however there is limited volcanic input into the depositional systems with at the Sea Lion well (i.e. geology is sedimentary and reservoir is in a shallow with a recent depositional history). It is to be noted that even in areas where volcanic activity is present (e.g. Indonesia), drill cuttings analysis have shown that metal concentrations are very low and using standard techniques for assessing metal bioavailability the results showed leachates significantly below regulated levels. On this basis, even in volcanic formations, bioavailability of metals in the marine environment is extremely low. CHPL considers that cuttings present a very low risk and impact potential with respect to heavy metals/ toxicity content.	• No additional measures have been adopted to manage this concern given the low level hazard this material presents from a heavy metal/toxicity perspective.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Toxicity of Drilling/Cement Chemicals:** Stakeholders expressed concern over the: • Level of toxicity of drilling/cementing chemicals used in drilling; • Possible synergistic effects of chemical combinations used; • Deoxygenation of waters around discharge locations; and • The applicability of international chemical assessment methods (based upon types of species tested i.e. inclusion of scallops).	CHPL has assessed these possible concerns and provided feedback to stakeholders as follows: • CHPL has selected drilling chemical constituents in accordance with the Offshore Chemical Notification System (OCNS) which is an internationally-recognised standard accepted by the oil industry for the classification of chemicals according to their level of environmental hazard. Classification under this system requires rigorous testing if the chemical with screening protocols which evaluate and eliminate chemical constituents which are hazardous (including possible synergistic effects). This system is regulated in the UK by the Department of Energy and Climate Change using scientific and environmental advice provided by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and Marine Scotland. Australia does not have a similar system in place and has adopted this standard as in the Sea Lion-1 campaign to protect the marine environment, given the international nature of drilling chemical supplies and the robust assessment process utilised. The assessment considers two environmental segments: water and sediment to acknowledge a chemical can partition between the two receptors. The OCNS requires bioaccumulation/bio-concentration and biodegradability data, aquatic toxicity data from three trophic levels (algae, crustacea and fish) and a sediment re-worker (if chemical components meet certain criteria) to predict the potential ecosystem risk[9]. Bio-concentration data is determined using either fish or a bi-valve mollusc [mussel, scallop [*Pecten spp.*] or oyster [Test Method OECD 305 & ASTM 1022]. • CHPL will only utilise chemicals which meet high environmental performance thresholds under the OCNS system (refer control measure adoption). • Oxygen scavengers proposed for the drilling program are chemicals which rapidly oxidise in the presence of air. The mud discharge route to the marine environment (base of mud pits) ensures residual concentrations of oxygen scavengers are oxidised on release before entering the water column.	Impacts on fisheries reduced to an ALARP and acceptable level through: • Utilising drilling/ cement chemical additives which are assessed as GOLD, SILVER, non-CHARM 'E' or PLONOR under the North Sea OCNS system; • During the lower well section ensure cuttings treatment systems is constantly monitored to maximise WBM recovery before cuttings discharge overboard and WBM testing is undertaken to ensure WBM system is optimised reducing overall WBM discharges; • Sediment monitoring will be undertaken during drilling to validate predictive modelling results. Significant deviations from predicted sediment thicknesses will be investigated and measures such as reduced sweeps (intermediate section) and refinement of WBM surface treatment systems (production section) considered to reduce impacts of sedimentation where possible.

[9] Centre for Environment, Fisheries and Aquaculture Science (CEFAS), 2014 – Offshore Chemical Notification Scheme at http://www.cefas.defra.gov.uk/industryinformation/ offshore-chemical-notification-scheme.aspx

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Alienation of Fishing Grounds:** Stakeholder raised query over why Sea Lion-1 could not be directionally drilled from the WSH location (~7.5km east of exploration well) to reduce seabed alienation from fisheries.	CHPL has assessed the feasibility of directionally drilling the Sea Lion well from the West Seahorse location. Due to the shallow nature of the Sea Lion well and the distance from West Seahorse, a directionally drilled well would increase the technical risk associated with the well; in addition to increasing the drilling period (3 weeks versus 3-6 months) and all associated discharges. A directionally drilled well to Sea Lion from West Seahorse is the stakeholder's preference to eliminate sea floor obstructions including flowlines, etc. *This option cannot be considered based upon the technical challenges and overall economics.*	• In the event that the Sea Lion well is successful, CHPL has committed to review the Petroleum Safety Zone radius to minimise the area impact to fisheries. This radius will be assessed on the basis of guaranteeing infrastructure integrity. • If successful, surveys will be undertaken to determine feasibility of trenching flowline and fishery studies will establish possible hazards.
	Seabed Disturbance (Sedimentation): Stakeholders raised concerns over the level of seabed sedimentation associated with drilling residues and possible entry of sediment into State waters which may affect demersal fisheries operating around Lakes Entrance.	CHPL has engaged with stakeholders who raised concerns associated with drilling discharges and provided information on the results of drilling discharge modelling with those stakeholders. Based upon modelling results, sedimentation effects are predicted to lie parallel to the coastline (i.e. NE-SW) given the prevailing tidal current regime and are unlikely to significantly intrude on State waters. Sedimentation effects (i.e. at 1mm sediment thickness) are predicted to range to 2.12km from the rig with a predicted maximum area covered of 49Ha. No sedimentation impacts are predicted at Lakes Entrance (~50km away). Sediment monitoring is proposed to verify sediment thickness during drilling, verify predictions from modelling and ensure sedimentation impacts remain within accepted levels.	Sediment monitoring will be undertaken during drilling to validate predictive modelling results. Significant deviations from predicted sediment thicknesses will be investigated and measures such as reduced sweeps (intermediate section) and refinement of WBM surface treatment systems (production section) considered to reduce impacts of sedimentation where possible. Monitoring results will be shared with stakeholders.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Seabed Disturbance (Sedimentation):** **S**takeholder did not accept that predictive computer modelling was a relevant tool to address its concerns in that it does not reflect actual conditions (currents, water column variations & other natural phenomena) at this location. Re-suspension of sediment and possible issues to down-current scallops including future ability to spawn or physiological impacts associated with quality and growth had not been considered in the modelling output.	CHPL considers the use of industry-standard models and its field-verified input parameters to be a relevant tool for predicting sediment and water turbidity impacts from drilling discharges. CHPL will monitor and verify the predictive modelling during the drilling activity. Modelling parameters (e.g. surface and seabed currents) have been used in internationally recognised models which are tested and verified through field measurements with government agencies such as AMSA utilising these models. The sediment dispersion model itself is an enhancement of the Offshore Operators Committee (OOC) model and has been extensively validated and applied to discharge operations in Australian waters. CHPL considers the selected MUDMAP model and natural system modelling parameters utilised to predict impacts meets industry standards and the selected conditions are suitable for the proposed drilling locations. *CHPL considers this a relevant tool to provide an indication of predicted impacts*. Re-suspension of seabed sediments is expected at the drilling location given anecdotal observations regarding the regional current flows. It should be noted that once particulate matter has settled to the seabed it requires additional shear stress to re-suspend, as does existing seabed sediments. Re-suspension volumes are a function of the surface area available to seabed currents/storm events with re-suspension common in areas of shallow water and strong seabed currents. Accordingly the surface layer of deposited sediment from drilling is expected to re-suspend during heavy seas/currents, however the magnitude of re-suspension is expected to be similar to the existing seabed sediment re-suspension characteristics in the area. Benthic habitats/fauna constantly experience sediment redistribution and drilling sediment impacts are expected to be no greater than that of the natural environment in Bass Strait. While the predictive modelling has not included re-suspension aspects, spawning and physiological impacts to scallops (if present in a down-current direction) are not expected to be substantially different from re-suspension in the natural environment. *CHPL does not consider that drilling particulate re-suspension is a material impact to the natural environment in Bass Strait.*	CHPL will monitor sedimentation during the drilling activity to verify modelling and initiate mitigation measures to ensure sedimentation impacts remain within accepted levels. Monitoring results will be shared with stakeholders.

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Water Column Turbidity Impacts:** Stakeholders raised concerns associated with 'low tidal current' regimes at the drilling location with the potential for plume stagnation or 'dead-spots' and requested monitoring to verify discharges accord with predictions from modelling.	CHPL discussed with and provided information on the results of drilling discharge modelling with stakeholders who raised concerns. Based upon modelling results, for the final mud discharge, a visual plume is predicted to be observed at a distance no greater than 4.9km (with a maximum areal extent of 3km^2), and during the drilling window (expected August-September) the visible plume is expected to be ~ 2.2-3km. Modelling predicts that the plume rapidly dissipates after discharge ceases. Plume monitoring is proposed to verify the dispersal characteristics associated with WBM plumes (i.e. concerns with low tidal regimes in the area), verify predictions from modelling and ensure turbidity impacts remain within accepted levels.	• CHPL will monitor visible plume length during the drilling activity to verify modelling and ensure turbidity impacts remain within accepted levels. • Monitoring results will be shared with stakeholders.
	Stakeholder Engagement (Methodology): Stakeholder stated they were unhappy with the consultation process adopted by CHPL and requested that CHPL explain how it would improve the process and the level of trust between the parties. The stakeholder reiterated that due to the nature of the ill treatment of the stakeholder by CHPL many within the fishing industry feel that CHPL are unauthentic in their consultation with the stakeholder and that it was merely a 'tick box' exercise. Stakeholder stated that they did not feel that CHPL were genuinely interested in knowing what they had to say.	CHPL considers that they have openly discussed the proposed activity, its potential impacts and provided requested information to the stakeholder. As with all fishing groups in the area, any concerns raised have been taken seriously. Where verified evidence is available workable solutions have been identified and implemented where-ever possible. *CHPL disagrees that consultation efforts have been disingenuous and considers that statements made do not hold merit.* CHPL considers that the working relationship with the stakeholder in question is poor and would like to rectify the situation. CHPL has offered suggestions to commence the dialogue between parties (i.e. share information) however these suggestions (i.e. confidentiality agreements) have not been considered suitable by the stakeholder.	• CHPL will explore with other groups their experience with successful methodologies to establish functional working arrangements and provide suggestions to stakeholder.
	Stakeholder Engagement (Monitoring Program): Stakeholder proposed that a mutual relationship could be established between the stakeholder and CHPL in developing and undertaking a monitoring program concerning the impacts to scallop populations during and following CHPL operations within the area. Stakeholder identified in meeting minutes that CHPL were reluctant to provide comment on this as an option.	CHPL does not recall reference to a proposed scallop monitoring program during the stakeholder meeting, but does recall a proposed "Monitoring In-situ" program proposed in 2014 correspondence. CHPL considers that expenditure on scientific studies for use by both the petroleum and fishing industry needs to have a robust scientific basis and must define clear objectives so that outcomes can be recognised by both industries. The scientific basis and clear attainment objectives of the proposed "Monitoring In-Situ" Program have not been clearly defined and a proposal has not been received by CHPL. This information should be discussed with CHPL to determine if a suitable program could be developed.	• CHPL remains open to further discussion with Stakeholder

Topic	Objection/Claim	Assessment of Feedback	Response/Measures Adopted
Commercial Fisheries	**Improved Methods for Engagement with Commercial Fisheries (Health & Safety Initiative):** Stakeholder suggested that a possible improved methodology to engage with fishermen may be assisting fishermen with safety–related matters.	CHPL sees merit in using health and safety as a means to improve consultation effectiveness between commercial fisheries and the oil and gas industry. CHPL will further consider this approach in conjunction with stakeholder representative to determine the best way to improve consultation activities.	CHPL continues to liaise with stakeholder representative and other commercial fisheries in the Gippsland Basin to improve consultation effectiveness.
	Activity Notifications: Stakeholders requested additional notifications are implemented to ensure fishing industry group is aware of petroleum activities in VIC/P57 or of altered conditions associated with the activity.	CHPL acknowledges the notification requirements of individual stakeholders. This requirement has been incorporated into the forward consultation strategy for the Sea Lion Drilling Program on a stakeholder-specific basis.	Information has been adopted into the Sea Lion Drilling Campaign forward consultation strategy.