




OPERATIONS ENVIRONMENT PLAN - SUMMARY

for

Production Licence Areas VIC/L24 and VIC/L30

(including Licensed Pipelines VIC/PL37, VIC/PL37(V) and VIC/PL42)

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Contents

| | | |
|----------|---|-----------|
| 1 | INTRODUCTION | 5 |
| 1.1 | COORDINATES OF THE ACTIVITY | 5 |
| 1.1.1 | <i>Casino Pipeline</i> | 5 |
| 1.1.2 | <i>Casino to Pecten East Pipeline</i> | 5 |
| 1.1.3 | <i>Schematics of the activity</i> | 5 |
| 2 | DESCRIPTION OF THE RECEIVING ENVIRONMENT | 9 |
| 2.1 | PHYSICAL ENVIRONMENT | 9 |
| 2.2 | MARINE ECOLOGY | 9 |
| 2.3 | SOCIO-ECONOMIC ENVIRONMENT | 9 |
| 3 | DESCRIPTION OF THE ACTIVITY | 11 |
| 4 | MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS | 13 |
| 5 | SUMMARY OF MANAGEMENT APPROACH..... | 17 |
| 6 | CONSULTATION..... | 19 |
| 6.1 | COMMUNITY CONSULTATION..... | 19 |
| 6.2 | GOVERNMENT CONSULTATION..... | 20 |
| 7 | CONTACT DETAILS | 21 |

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1 Introduction

1.1 Coordinates of the activity

1.1.1 Casino Pipeline

Coordinates for the Casino Pipeline are shown in Table 1-1.

Table 1-1 - Casino Pipeline Co-ordinates

| Feature | Easting (m) | Northing (m) |
|-----------------------|-------------|--------------|
| HDD Entry | 670 967 | 5 724 059 |
| HDD Exit | 670 851 | 5 722 499 |
| Tangent Point 1 T.P.1 | 670 548 | 5 718 412 |
| Tangent Point 2 T.P.2 | 669 795 | 5 716 992 |
| Tangent Point 3 T.P.3 | 654 147 | 5 704 615 |
| Tangent Point 4 T.P.4 | 652 421 | 5 704 243 |
| Pipeline End | 647 508 | 5 705 471 |

Table Notes:

Horizontal Datum: Geocentric Datum of Australia 1994
 Spheroid: GRS80
 Projection: Universal Transverse Mercator (UTM)
 Central Meridian: 147^o East (Zone 55)

1.1.2 Casino to Pecten East Pipeline

Coordinates for the Casino to Pecten East Pipeline are shown in Table 1-2.

Table 1-2 - Casino to Pecten East Pipeline Co-ordinates

| Feature | Easting (m) | Northing (m) |
|---------------------------------|-------------|--------------|
| Pecten East Lay down Flange | 646 721.33 | 5 722 229.72 |
| Tangent Point 1 TP1 | 641 639.41 | 5 716 205.00 |
| Tangent Point 2 TP2 | 641 498.48 | 5 715 996.16 |
| Tangent Point 3 TP3 | 640 536.76 | 5 714 186.45 |
| Tangent Point 4 TP4 | 640 712.52 | 5 712 811.72 |
| Casino Tie-in Initiation Flange | 647 471.53 | 5 705 450.61 |

Table Notes:

Horizontal Datum: Geocentric Datum of Australia 1994
 Spheroid: GRS80
 Projection: Universal Transverse Mercator (UTM)
 Central Meridian: 147^o East (Zone 55)

1.1.3 Schematics of the activity

See Figures 1-3 and 1-4.

Figure 1-3 Casino / Henry / Netherby Fields - Location Map

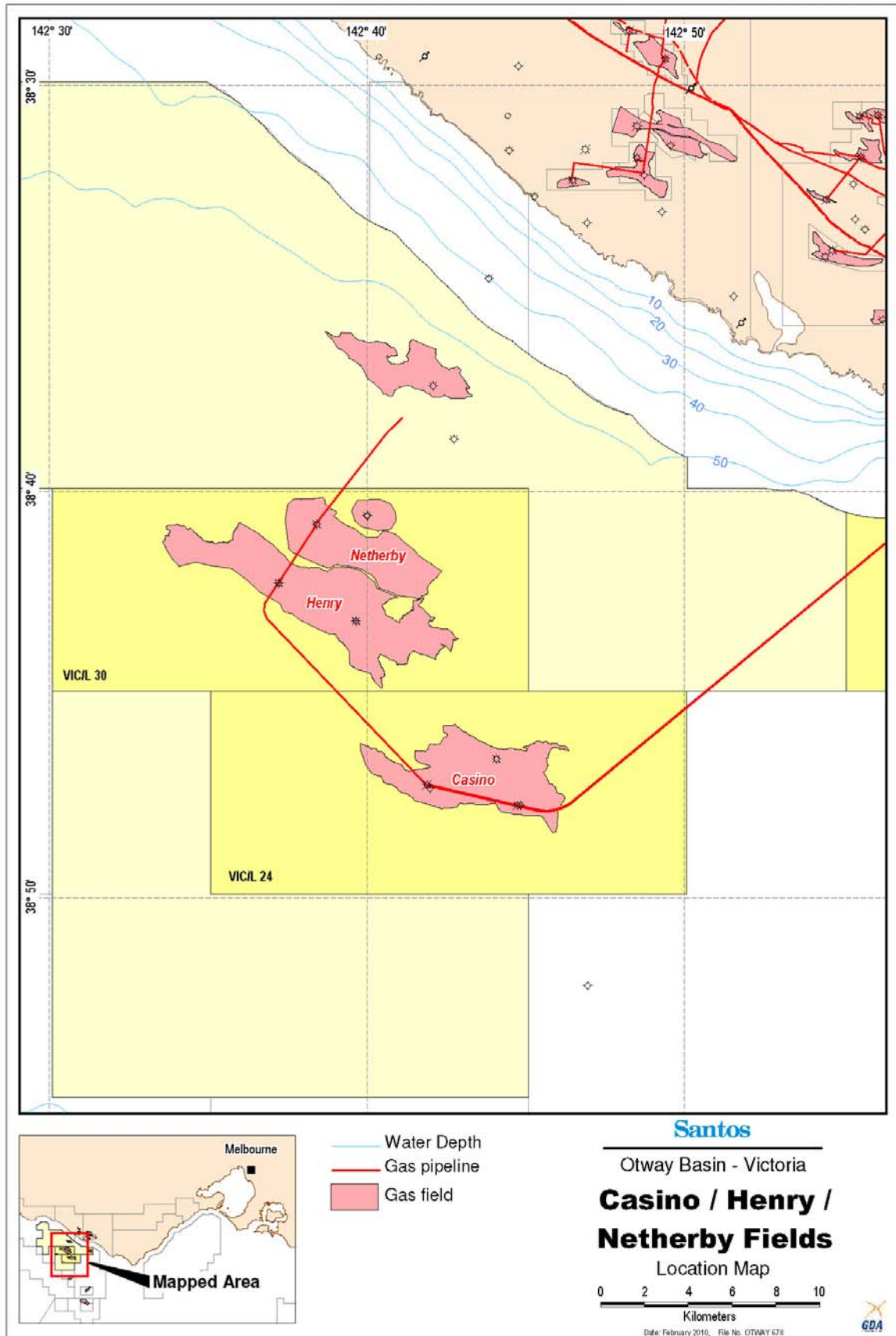
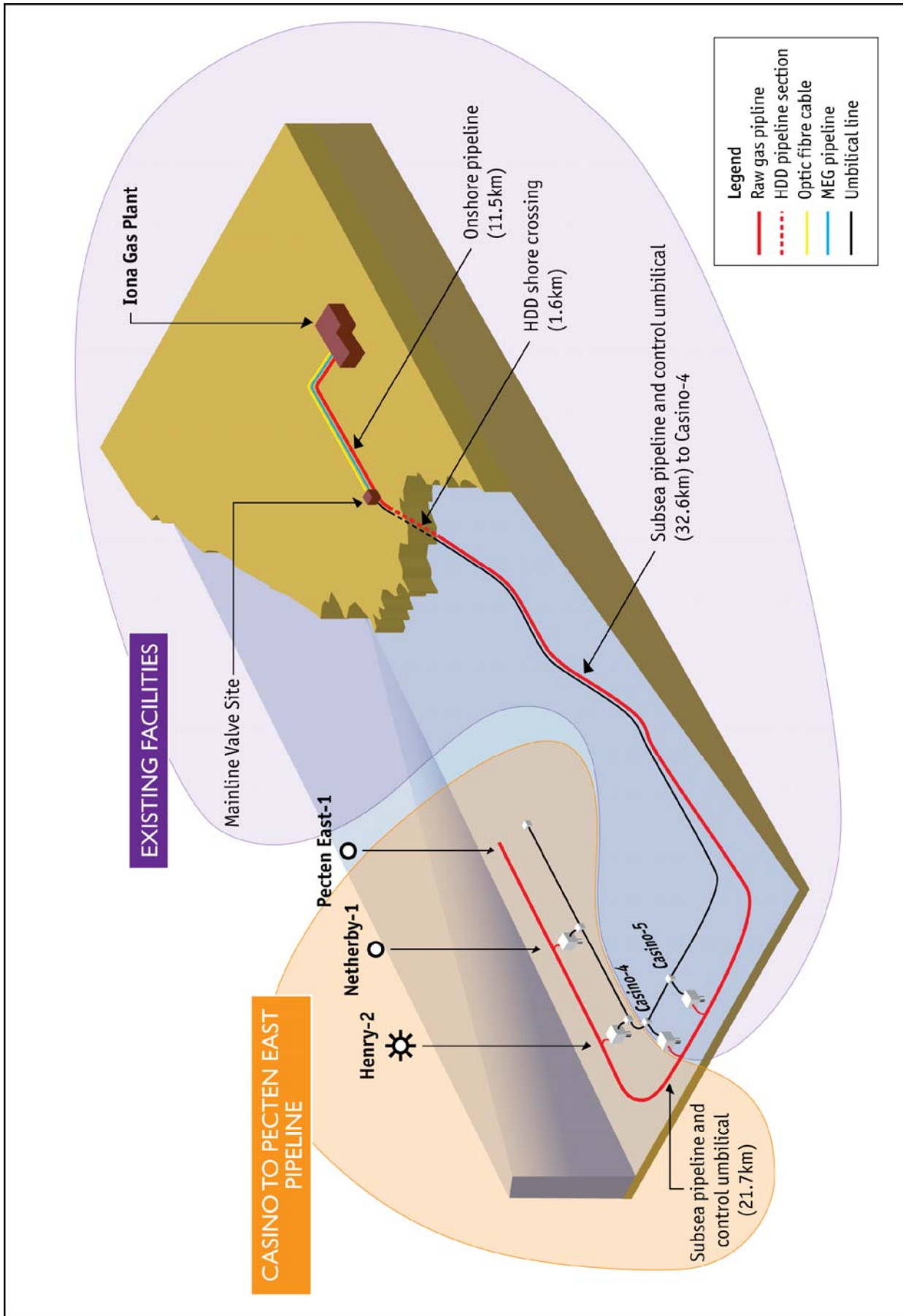


Figure 1-4: Casino Pipeline and Casino to Pecten East Pipeline



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2 Description of the receiving environment

2.1 Physical Environment

High energy wave conditions are characteristic of the survey areas, with more severe wave conditions occurring in winter.

The general seabed along the Casino Pipeline shelves overall to the south and southwest from a minimum water depth of 15 metres at the HDD exit location to a maximum of 70 metres near the Casino wells. Along the pipeline route, from the Casino gas field towards the shore, the seabed rises from about 70 metres to 50 metres water depth over a distance of some 20 km. Shoreward of the 50 m depth contour, the Casino Pipeline route traverses through a shallow valley feature on the seafloor, but avoids a 'spur' feature on the seabed between 50 and 70 m water depth by deviating east of the feature.

In the area of the Casino to Pecten East pipeline, the seabed is essentially flat with gently sloping bathymetry and with water depths varying between 65 and 70 metres. Along the pipeline route, from the Casino gas field to Pecten East location, the seabed rises from about 70 metres (near Casino-4) to about 55 metres at the Pecten East location.

2.2 Marine Ecology

Bass Strait, including the Otway Basin, is an area of high faunal diversity, including cetaceans, sharks, pipefish, seahorse, pipehorse, seadragons, dolphins and seals. A wide variety of marine species are commercially harvested in the Otway basin including southern rock lobster, giant crab, abalone, squid, and a large number of fish species including orange roughy, gemfish, flathead, blue grenadier, redfish, school whiting, warehou, jackass morwong, blue eye trevalla, gemfish, john dory, royal red prawn, silver trevally, yellowfin tuna and broadbill swordfish.

2.3 Socio-economic Environment

Main activities in the development area include:

- Petroleum exploration and production.
- Commercial fishing.
- Commercial shipping.
- Marine conservation (parks and sanctuaries).
- Recreation and tourism.

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3 Description of the activity

This action in the Environment Plan covers activities associated with offshore production licences VIC/L24 and VIC/L30, specifically for activities associated with the operation of the Casino-4, Casino-5, Henry-2 and Netherby-1 production wells and with the offshore licensed pipelines VIC/PL37, VIC/PL37(V) (**Casino Pipeline**) and VIC/PL42 (**Casino – Pecten East Pipeline**).

Production from Casino-4 and Casino-5 wells and operation of the VIC/PL37 and VIC/PL37(V) pipelines commenced in 2006. Production from Henry-2 and Netherby-1 wells and operation of the VIC/PL42 pipelines commenced in early 2010.

Operations activities within licence areas VIC/L24 and VIC/L30 and within the scope of the Environment Plan comprise the following:

- Flow of hydrocarbons from the wells and through the pipelines to shore - ongoing.
- Flow of chemicals from the Gas Plant to the wells and pipelines - ongoing
- Periodic visual survey by ROV to assess the condition of the pipeline, umbilical and wellheads
- Direct operation of a pipeline valve on an as-needs basis by ROV
- Replacement of depleted or damaged cathodic protection anodes on an as-needs basis by ROV
- Grout bag installation to correct pipeline free spans on an as-needs basis by ROV.

There are no routine maintenance activities within the licence areas themselves. Maintenance activities that mitigate environmental risks in the licence areas are undertaken at the onshore Gas Plant and MLV site (maintenance on the corrosion inhibitor system, testing of pipeline shut down systems).

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4 Major environmental hazards and controls

The main environmental hazards associated with the pipeline and associated subsea equipment operation for the operation of VIC/L24 and VIC/L30 activities include:

- Interaction with commercial fishing activities
- Noise from the operation of the well valves.
- Release of hydraulic fluid during operation of the well valves.
- Hazards from periodic underwater inspection surveys using a survey vessel
 - Interaction with commercial fishing vessels
 - Impact on marine fauna by the operation of the remotely operated underwater inspection vehicle (ROV).
 - Waste discharges from the survey vessel.
 - Air emissions from the survey vessel.
 - Introduction of invasive marine species.
- Accidental events

The Environment Plan provides a detailed assessment of potential impacts. The key points of the assessment, and management and mitigation measures and summary risk ranking are summarised in Table 4-1 below. There are two activities assessed as being of greater than 'low' risk (risk rating '1') for the pipeline installation. These are (i) the potential for invasive marine species from ROV survey vessel activities; and (ii) loss of pipeline or well integrity causing hydrocarbon loss into the environment.

The risk assessment reflects the low impact nature of the ongoing offshore pipeline and well operations, the temporary and infrequent nature of any survey vessel activities and the application of appropriate mitigation measures during pipeline and well operations.

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Table 4-1: Summary of major environmental risks

| Aspects | Source of risk | Impacts | Prevention / Mitigation measures | Like- lihood | Conse- quence | Risk Rating |
|--|--|---------------------|---|-----------------|------------------|----------------|
| ROV activities | Invasive marine species from vessel activities – local vessels | Effects on biota | <p>Comply with domestic ballast water arrangements in accordance with the Environment Protection (Ships' Ballast Water) Regulations 2006</p> <p>Vessel used in water depth of less than 20 metres to be required to comply with DPI's Code of Practice – Biosecurity Control Measures for Abalone Viral Ganglioneuriitis, February 2009</p> | Unlikely | Moderate | 2 |
| | Invasive marine species from vessel activities – non-local vessels | Effects on biota | <p>Use Code of Practice for Antifouling and In-water Hull Cleaning and Maintenance (ANZECC, 1997).</p> <p>Verify vessel's recent locations of activity, since last anti-fouling (with reference to known areas where exotic species have become established).</p> <p>Vessel masters will be made aware of the AQIS 'Maritime Awareness Kit'.</p> <p>Comply with domestic ballast water arrangements in accordance with the Environment Protection (Ships' Ballast Water) Regulations 2006</p> <p>Vessel used in water depth of less than 20 metres to be required to comply with DPI's Code of Practice – Biosecurity Control Measures for Abalone Viral Ganglioneuriitis, February 2009</p> | Unlikely | Moderate | 2 |
| Accidental events involving pipeline and wellheads | Loss of pipeline integrity through corrosion | Petroleum discharge | <p>Emergency Response Plan</p> <p>Oil Spill Contingency Plan</p> | Unlikely | Major | 2 |
| | Uncontrolled well flow | Petroleum discharge | <p>Gazetted safety zones around each wellhead.</p> <p>Regular testing of emergency shutdown systems</p> <p>Emergency Response Plan</p> <p>Oil Spill Contingency Plan</p> | Unlikely | Major | 2 |

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5 Summary of management approach

The Environment Plan describes the environmental objectives, performance standards and measurement criteria appropriate to the activities and an implementation strategy to achieve these objectives. The implementation strategy includes:

- Systems, practices and procedures.
- Organisation
- Employee and contractor awareness.
- Monitoring, auditing and management of non-conformances.
- Emergency response / spill contingency plan.
- Consultation.

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6 Consultation

6.1 Community consultation

The following organisations were consulted during the construction of the VIC/L24 and VIC/L30 facilities.

Australia:

- Commonwealth Fisheries Association.

Victoria:

- Seafood Industry Victoria (SIV).
- Warrnambool Professional Fishermen's Association.
- Portland Professional Fishermen's Association.
- Port Campbell Professional Fishermen's Association.
- Apollo Bay Professional Fishermen's Association.
- Victorian Scallop Industry Association.
- South East Trawl Fishing Industry Association.
- South East Non-Trawl Fishing Industry Association.
- Deakin University (Warrnambool) blue whale research group.
- Tuna Boat Owners of Australia
- TunaWest
- SEANET OceanWatch Australia
- Scallop Fishermen's Industry Association
- Great Australian Bight Fishing Industry Association
- Lakes Entrance Fishermen's Cooperative

In addition, thirty five individual fishermen were consulted.

For ongoing operations, the requirement for community consultation is assessed to be very small. This would, however, change in the remote event that major intervention work (e.g. well workover, pipeline repair) was required. TRUenergy are instructed to pass on any comments, concerns or complaints about VIC/L24 and VIC/L30 activities that they receive to Santos' Victorian Operations Superintendent, for his attention. Members of the community are also able to contact the Santos' Superintendent directly.

6.2 Government consultation

The following organisations were consulted during the construction of the VIC/L24 and VIC/L30 facilities.

Australia:

- Department of Environment and Heritage (DEH) / Department of Environment, Water, Heritage and Arts (DEWHA).
- Department of Industry Tourism and Resources (DITR) / Department of Resources Energy and Tourism (DRET)
- Australian Fisheries Management Authority (AFMA).
- Australian Maritime Safety Authority (AMSA).
- Border Protection Command.

Victoria:

- Department of Primary Industries (DPI) – Minerals and Petroleum, Fisheries
- Department of Sustainability and Environment (Warrnambool) (DSE).
- Department of Victorian Communities - Aboriginal Affairs Victoria

Government consultation for the operational phase of VIC/L24 and VIC/L30 activities (being operation of the Casino Pipeline, the Casino to Pecten East Pipeline and the Casino, Henry and Netherby wells) comprises

- routine and non-routine reporting in accordance with the regulations, and
- any proposed future changes to the activities within VIC/L24 and VIC/L30 that are sufficiently significant to require revision and re-submission of the Environment Plan to the Regulator.

7 Contact details

Please direct all queries and comments on this environment plan summary to:

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