

Bass Strait Operations

Decommissioning Report 2021

Esso Australia Resources Pty Ltd



Leading the transition to a
new future

ExxonMobil

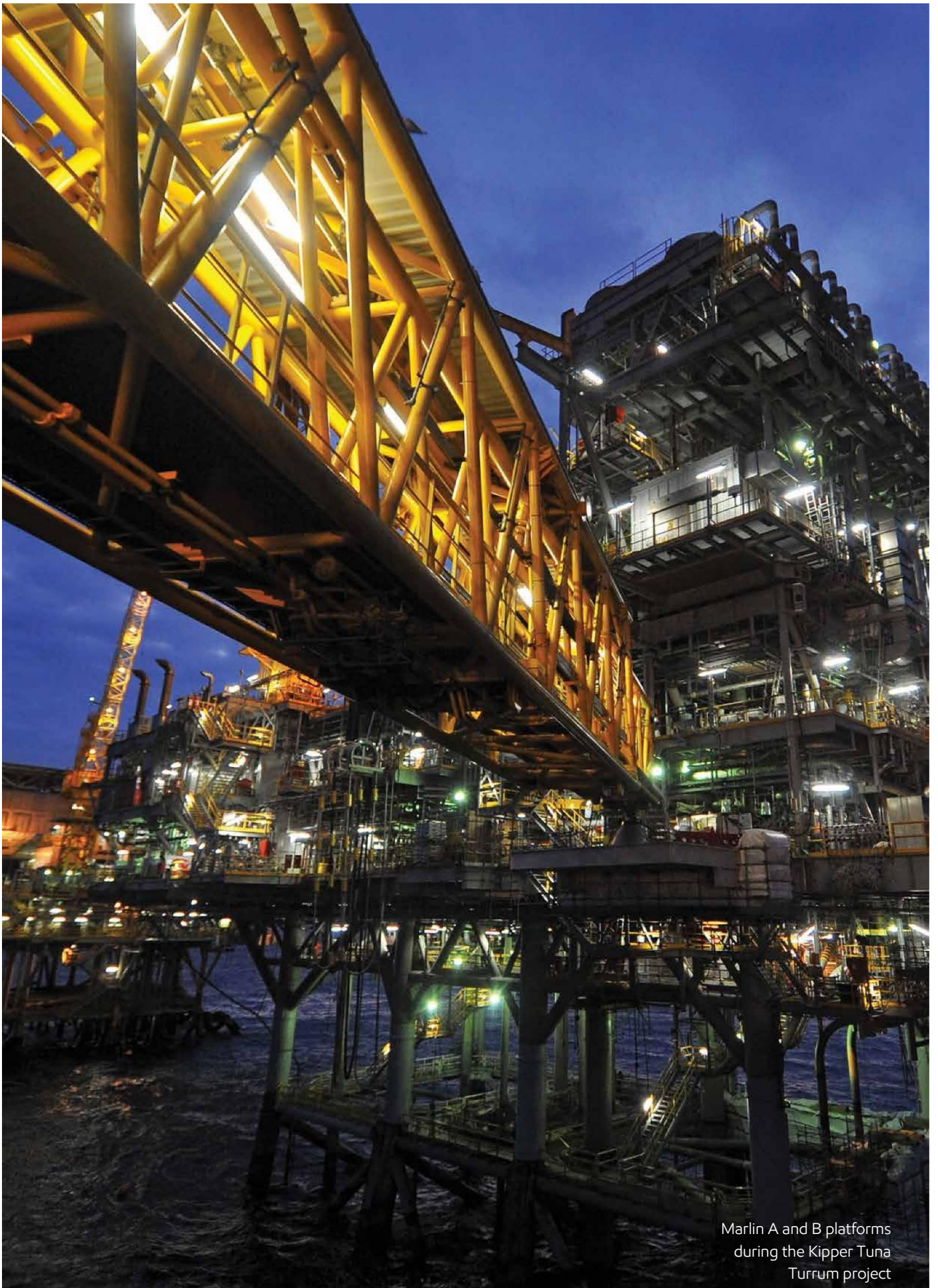
Esso Australia Resources Pty Ltd and BHP Petroleum (Bass Strait) Pty Ltd are 50:50 co-venturers in a joint venture for the exploration, development and production of oil and gas from Bass Strait and are the owners of the Longford Facility. Esso Australia Resources Pty Ltd is the designated Operator of the joint venture under the Gippsland Basin Joint Venture Operating Agreement. EARPL receives services, including personnel, from its wholly owned subsidiary, Esso Australia Pty Ltd. Esso Australia Pty Ltd is "operator" as defined in the *Occupational Health and Safety Regulations 2007*.



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Marlin A and B platforms
during the Kipper Tuna
Turrum project

Executive Summary

“After an extensive history of successful resource development and energy supply across Australia, some of our fields are starting to reach the end of their productive life leading to the dawn of a new industry, and with it, some fantastic opportunities for the nation.”



Production Manager, Geoff Humphreys

Esso Australia Resources Pty Ltd (Esso) is a wholly owned subsidiary of ExxonMobil Australia Pty Ltd. Esso operates oil and gas production assets in Bass Strait, off Victoria's Gippsland coast, on behalf of the Gippsland Basin Joint Venture (Esso and BHP Petroleum (Bass Strait) Pty Ltd (BHP)) and the Kipper Unit Joint Venture (Esso, BHP, and MEPAU A Pty Ltd). The assets consist of 421 wells, 19 platforms, five subsea facilities and more than 800 kilometres of subsea pipeline.

After delivering energy to Australia for over 50 years, many of the Gippsland Basin's fields are reaching the end of their productive life.

In 2021, 10 platforms, three subsea facilities, 16 pipelines and approximately half of all wells drilled were no longer producing oil and gas. This includes the Whiting, Mackerel, Fortescue, Kingfish A,

Kingfish B, Flounder, Bream A, Bream B, Dolphin and Perch platforms and the Blackback, Seahorse and Tarwhine subsea facilities. A further six platforms and seven pipelines are expected to progressively stop producing oil and gas during the next few years.

Esso is currently planning for the decommissioning of all these assets that are expected to no longer be producing oil and gas by 2025.

As planning for decommissioning progresses, Esso is focused on safely shutting-down facilities as they reach the end of their productive life, and ensuring they stay safe throughout the decommissioning process.

At the same time, the company is focused on safely continuing to operate other facilities and pipelines that will continue to provide essential energy to Australia for many years to come.

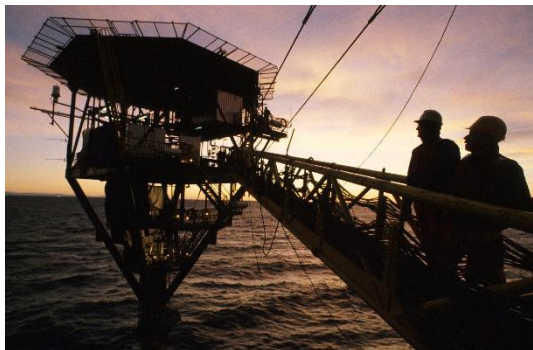
This Report forms part of Esso's commitment to keep government, interested non-government organisations and other stakeholders informed of the progress of decommissioning activities.

Decommissioning planning

The Decommissioning Program will follow a five-stage Decommissioning Project Management System based on the ExxonMobil Capital Project Management System principles.

During 2021, Esso progressed work to support Stage 2 (Select). This involves ongoing engagement with National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) regarding the assessment of decommissioning concepts and numerous technical, environmental, socioeconomic, safety and cost studies to help define requirements for the Decommissioning Program.

Integrity assessments conducted in 2021 determined there was sufficient structural integrity not to preclude full removal of the platforms and pipelines if required.



The structural integrity of the Perch platform was confirmed during integrity assessment in 2021

Esso also prepared the *Decommissioning 'Deviation' Environment Plans Scoping Document*, which was submitted to NOPSEMA in August. This document seeks NOPSEMA's input into the approach for the preparation of Deviation Environment Plans for any decommissioning concepts that deviate from full infrastructure removal.

In 2022, Esso plans to submit the first of three proposed Deviation Environment Plans to NOPSEMA.

In June, a specialist independent contractor was engaged to review Esso's engineering and project management approach to decommissioning activities. Based on this review, Esso will incorporate all reasonable and practicable measures to reduce the timeframe for completing decommissioning activities.

Preparatory Decommissioning Activities

Preparatory Decommissioning Activities such as plug and abandonment, maintenance, care and preservation have progressed for all non-producing facilities in accordance with the *Bass Strait Environment Plan*.

Esso conducted maintenance reviews of all non-producing platforms and associated pipelines in 2021.

Esso also undertakes regular detailed assessments of Bass Strait facilities as part of its ongoing maintenance program. In 2021, the scope of the program was expanded to include the use of high-tech drone and laser scanning tools to build 3D digital models of the Bass Strait platforms.



Kingfish A platform imagery captured by an Airscope Industries drone

During the year, Esso plugged and abandoned a total 36 wells from the Mackerel, Kingfish B and Fortescue platforms. Another 29 wells from the Bream A and Flounder platforms were plugged and secured. Of the total 183 wells across the 13 currently non-producing facilities, 76 wells have been permanently plugged and abandoned. Plug and abandonment works will continue throughout 2022 and in the following years, with all work expected to be completed prior to 30 September 2027.

For the first time in the history of Bass Strait operations, Esso has mobilised two hydraulic workover rigs to simultaneously conduct plug and abandonment programs. The HWT 600 hydraulic workover rig was moved to the Fortescue platform from the Mackerel platform in February, while Rig 22 was mobilised to start decommissioning preparation on the Kingfish B platform in June.

Further efficiencies are being gained through an innovative technique for performing reservoir abandonment without the use of a hydraulic workover rig. The technique involves through-tubing abandonment of the reservoir.

Esso also implemented a batch approach, which involves completing abandonment activities on the lower sections of all wells followed by the upper sections. This approach is proving effective and efficient and will be used in future plug and abandonment programs.

Environmental studies

Esso's environmental assessment program is providing an enhanced understanding of the marine environment around Bass Strait offshore platforms and pipelines. The program is also helping to determine optimal decommissioning outcomes for all infrastructure types.

As part of this program, Esso has provided approximately 1000 hours of subsea imagery to Deakin University and the Australian Institute of Marine Science to identify marine organisms that exist around subsea infrastructure.

In February and March, a field survey, using an underwater remotely operated vehicle, was conducted to collect sediment and environmental media samples as well as a visual assessment of marine flora and fauna around Esso facilities.



The MMA Leeuwin survey vessel alongside the Barracouta platform

In September, the South East Trawl Fishing Industry Association Pty Ltd (SETFIA) was engaged to conduct a comprehensive study about fishery operations in Bass Strait.

Regulator engagement

Esso is committed to keeping interested government agencies informed of actions and progress relating to decommissioning activities in Bass Strait.

In 2021, Esso engaged with several regulatory bodies including NOPSEMA and the National Offshore Petroleum Titles Administrator.

In August, an implementation plan was submitted to NOPSEMA outlining how Esso is responding to General Direction 817 issued under Section 574 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*. Esso progressed all Directions throughout the year, with Direction 1a, 1b, 1c, 3a and 3b being met to NOPSEMA's satisfaction and subsequently closed.

In accordance with Direction 5, updates on the progress of activities for each of the Directions can be found in this *Bass Strait Operations Decommissioning Report 2021*.

Stakeholder engagement

Through its stakeholder engagement framework, Esso aims to keep stakeholders informed about decommissioning activities. This includes ensuring stakeholders are consulted on an ongoing basis about matters that affect them.

During 2021, more than 430 engagements were conducted. Almost 60 of these related directly to decommissioning activities and primarily focused on communications with the fisheries industry including SETFIA, the *Panama II* octopus fishing vessel, and the Fishermen's Tribunal.

Face-to-face engagements were limited because of COVID-19 restrictions. We plan to increase these in 2022 as pandemic restrictions ease.

As part of Esso's commitment to working collaboratively, we were among the first oil and gas companies to join the Centre of Decommissioning Australia (CODA), which was established in March 2021 by National Energy Resources Australia.

CODA has announced a series of foundation projects designed to rapidly accelerate cross-industry understanding of Australia's decommissioning challenges. These projects, along with other work proposed by CODA, represent critical early-stage building blocks in delivering CODA's and Esso's, objective of maximising value for Australia from decommissioning activities.

As outlined in this Report, the process of decommissioning offshore facilities presents many complex challenges. As the operator of some of Australia's most mature oil and gas fields, Esso is committed to decommissioning our Bass Strait offshore facilities safely and responsibly.

A handwritten signature in black ink, appearing to read 'Geoff Humphreys', written in a cursive style.

Geoff Humphreys

Production Manager
Esso Australia Resources Pty Ltd



Kingfish A Platform

1 Introduction

This annual Decommissioning Report provides a progress update on Esso's decommissioning activities in Bass Strait from 1 January to 31 December 2021. It includes information about key safety, health, environment and social management progress associated with decommissioning activities.

The Report forms part of Esso's commitment to keep government, interested non-government organisations and other stakeholders informed of decommissioning activities.

1.1 Overview

Esso Australia Resources Pty Ltd (Esso) is a wholly owned subsidiary of ExxonMobil Australia Pty Ltd. Esso operates assets in Bass Strait, off Victoria's Gippsland coast, in partnership with the Gippsland Basin Joint Venture (Esso and BHP Petroleum (Bass Strait) Pty Ltd (BHP)) and the Kipper Unit Joint Venture (Esso, BHP, and MEPAU A Pty Ltd). The assets consist of 421 wells, 19 platforms, five subsea facilities and more than 800 kilometres of subsea pipeline. Esso receives services, including personnel, from Esso Australia Pty Ltd, which is also a wholly owned subsidiary of ExxonMobil Australia Pty Ltd.

The offshore facilities extract, process and store oil and gas, which is transported onshore for further processing and distribution to customers. A variety of products are produced from operations in Bass Strait, ranging from gas and condensate to oil. Different reservoirs produce hydrocarbon products with different properties. Pipelines contain a combination of reservoir fluids.

Ten platforms, three subsea facilities, 16 pipelines and approximately half of all wells drilled are no longer producing oil and gas.

A further six platforms and seven pipelines are expected to no longer support oil and gas production by 2025. Esso's decommissioning team is planning for the eventual decommissioning of all assets in Bass Strait.

The decommissioning team is leveraging lessons learned from ExxonMobil's experiences in other locations, and liaising with the ExxonMobil decommissioning centre of expertise, to ensure local decommissioning activities meet regulatory, community, government and ExxonMobil requirements.

As planning for decommissioning progresses, Esso is focused on safely shutting-down facilities as they reach the end of their productive life, and ensuring they stay safe throughout the entire decommissioning process.

1.2 Operations history

In 1965, the Gippsland Basin Joint Venture drilled Australia's first offshore well in Bass Strait, resulting in the discovery of the Barracouta gas field.

Two years later Kingfish was discovered, the first offshore oil field, which to this day remains the largest oil field ever discovered in Australia. Production from the first platform commenced in 1969.

Infrastructure costing billions of dollars was built to develop, produce and process crude oil and gas, which has powered industry, fuelled vehicles, heated homes and supported the manufacture of products in Australia and overseas for the past 50 years.

Through the continued exploration, development and production of oil and gas in Bass Strait, there are now 24 offshore platforms and installations in the area, including the newest Marlin B platform and Kipper subsea wells, which feed a network of more than 800 kilometres of underwater pipelines.

Esso's activities in Bass Strait are conducted by up to 300 workers who live and work offshore at any one time. They are supported by many more onshore workers, who process the oil and gas at Esso's Longford and Long Island Point plants before supplying gas to Australian customers, and liquids products to Australian and overseas customers.

Platform operations are supported by helicopters and supply vessels. A heliport based in Longford operates regular flights to transfer personnel to and from platforms. The supply vessels operate out of Barry Beach Marine Terminal, moving between platforms to load and unload cargo.

The Gippsland Basin Joint Venture has been responsible for more than 50% of Australia's crude oil and liquids production and currently supply over 40% of eastern Australia's natural gas requirements. This equates to more than four billion barrels of crude oil and around eight trillion cubic feet of gas produced since production began.

1.3 Location

Esso's operations are located in Bass Strait, off Victoria's Gippsland coast in Australia. The Operational Area lies entirely within the South-west Marine Region.

The facilities are located in water depths ranging from 38 metres (Dolphin platform) to 402 metres (Blackback subsea facility). Their distance from the coast ranges from 12 kilometres (Seahorse subsea facility) to 87 kilometres (Blackback subsea facility). The facilities are shown in Figure 1-2.

1.4 Facilities description

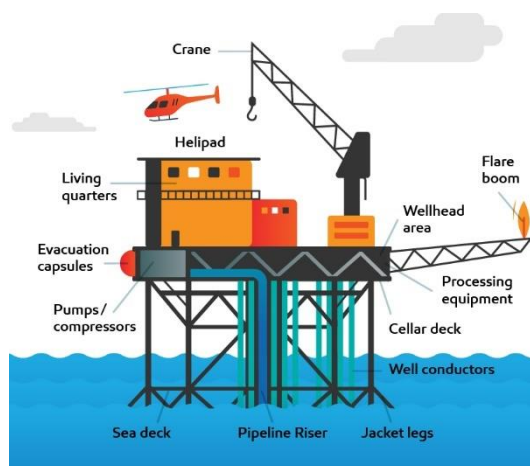
The Bass Strait infrastructure consists of staffed and unstaffed platforms and subsea facilities with interconnecting pipelines and umbilicals.

Esso operates 19 platforms, as summarised in Table 1-1, as well as five subsea facilities, 34 primary licensed pipelines, eight secondary licensed pipelines, and 107 kilometres of umbilicals.

Platforms: Steel pile jackets

There are fifteen steel pile jacket platforms and one steel pile jacket riser access tower. Steel pile jacket platforms have a tubular steel base structure (or jacket) that is fastened to the sea floor by piles, as shown in Figure 1-1. These jackets support the 'topsides', which include the production facilities, living quarters for personnel working on the platform, and a helicopter landing pad.

Figure 1-1: Diagram of a typical steel pile jacket platform



Platforms: Concrete gravity structures

A concrete gravity structure platform (as shown in Figure 1-2) is one that is placed on the seabed and, by its own weight, is capable of withstanding the environmental forces it may be exposed to during its lifetime.

Esso's West Tuna and Bream B Platforms were the first concrete-based platforms constructed in Australia and were the first concrete gravity structures designed, built and operated by Esso.

Platforms: Monotowers

The Bass Strait operations include two monotowers (as shown in Figure 1-2) – the Perch and Dolphin platforms. These platforms are fixed installations consisting of a steel gravity-based monotower with iron ore ballast supporting minimal topside production facilities, including two wells.

The iron ore ballast is predominately contained within the platform leg to ensure the structure remains upright and stable.

Figure 1-2: Location of facilities

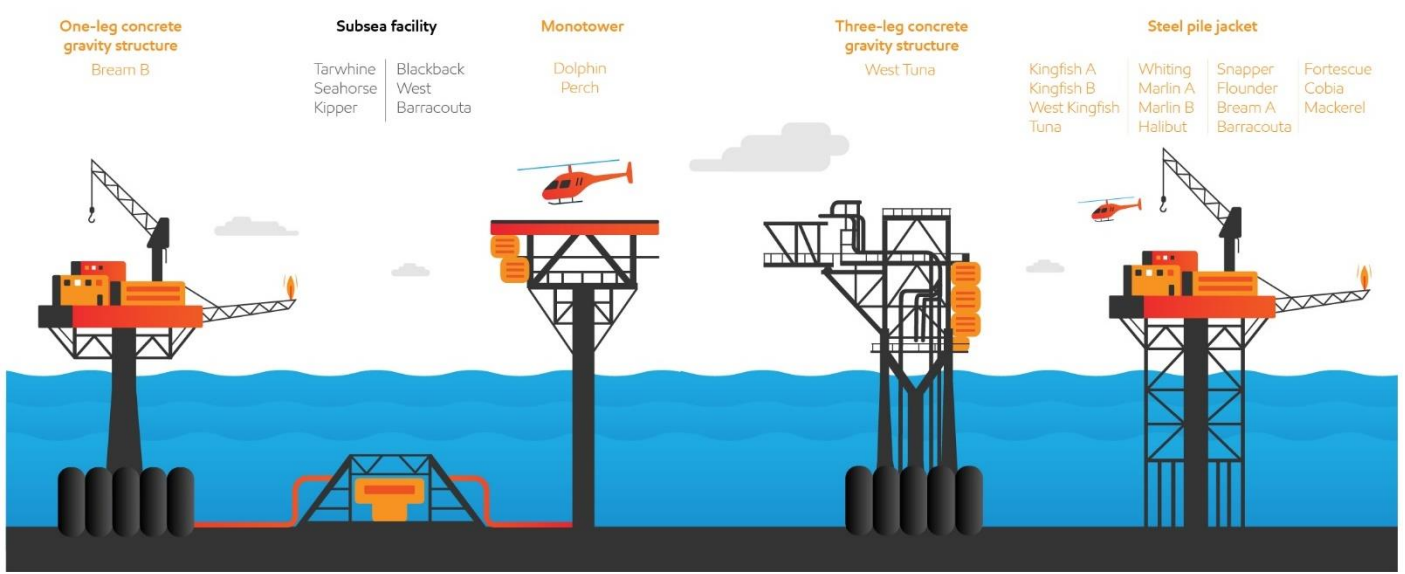
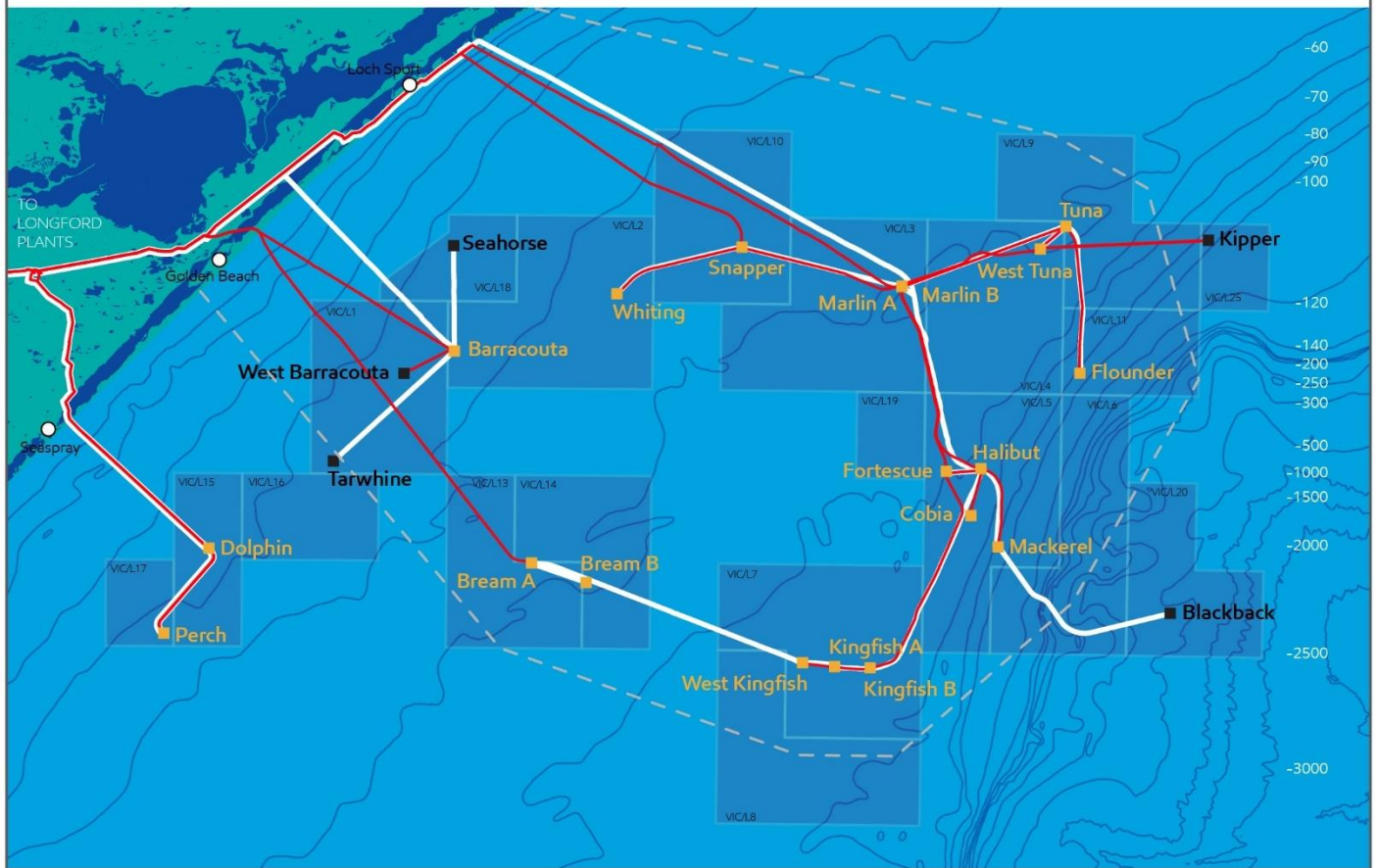
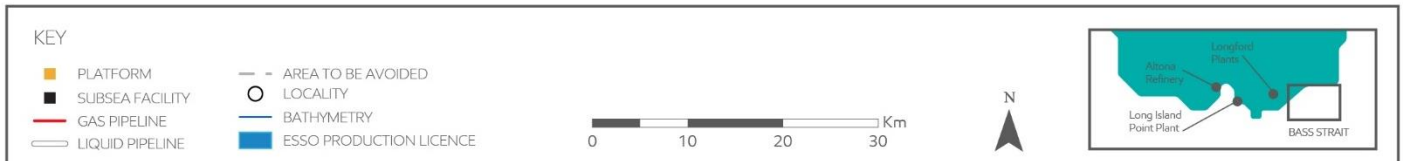


Table 1-1: Platform summary

Name	Type	Distance to coast (km)	Water depth (m)	Status
Barracouta	SPJ	23	46	P
Bream A	SPJ	48	59	NP
Bream B	CGS	51	61	NP
Cobia	SPJ	68	75	P
Dolphin	MT	21	38	NP
Flounder	SPJ	58	93	NP
Fortescue	SPJ	62	69	NP
Halibut	2xSPJ	63	73	P
Kingfish A	SPJ	77	77	NP
Kingfish B	SPJ	77	78	NP
Mackerel	SPJ	72	93	NP
Marlin A	SPJ	42	59	P
Marlin B	SPJ	42	59	P
Perch	MT	24	42	NP
Snapper	SPJ	32	55	P
Tuna	SPJ	43	59	P
West Kingfish	SPJ	72	76	P
West Tuna	CGS + SPJ riser access tower	45	61	P
Whiting	SPJ	34	54	NP

Subsea facilities

Esso operates five subsea facilities in Bass Strait as listed in Table 1-2. A diagram of a typical subsea facility is shown in Figure 1-2.

Table 1-2: Subsea facilities summary

Name	Distance to coast (km)	Water depth (m)	Status
Blackback	87	402	NP
Kipper	41	95	P
Seahorse	21	42	NP
Tarwhine	21	42	NP
West Barracouta	22	46	P

Pipelines

A network of pipelines transport crude oil and gas produced offshore for processing at Longford Plants.

Crude oil is collected offshore at three points (Halibut, Barracouta and Perch-Dolphin) and then sent to Longford Plants via dedicated pipelines.

Gas is transported from the four major gas-producing offshore platforms (Marlin, Barracouta, Bream A and Snapper) to Longford Plants through dedicated gas pipelines.

In total, there are 34 primary licensed pipelines and eight secondary licensed (gaslift and fuel gas) pipelines.

1.5 Stages of activity

Esso operates the Bass Strait facilities in accordance with defined stages of petroleum activity:

- Production
- Cessation of Production
- Stasis Mode
- Decommissioning
- Surrender of Titles.

These stages of activity are shown in Figure 1-3.

1.5.1 Preparatory Decommissioning Activities

For the purpose of this Report, 'Preparatory Decommissioning Activities' are decommissioning-related activities that fall within the Cessation of Production and Stasis Mode stages. Updates related to these stages of activity are covered in Chapter 3.

Preparatory Decommissioning Activities are primarily undertaken in accordance with the approved *Bass Strait Environment Plan*.

Offshore pipelines in State waters operate under the *Bass Strait State Waters Environment Plan*.

Once a facility ceases production of oil and/or gas it may be a number of years before all Preparatory Decommissioning Activities are able to be completed.

SPJ: Steel Pile Jacket

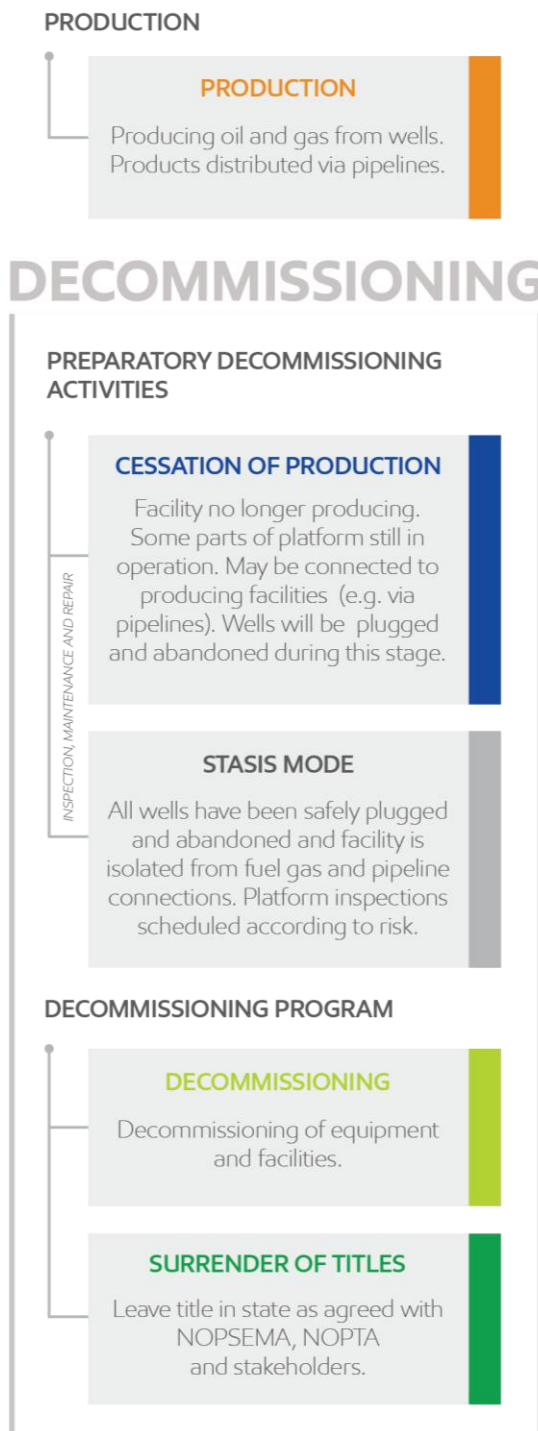
CGS: Concrete Gravity Structure

MT: Monotower

NP: Non-producing

P: Producing

Figure 1-3: Stages of activity in the lifecycle of a facility



- prepare facilities for decommissioning, such as enabling the flushing of pipelines or umbilicals and subsequent liquids disposal.

To allow for this, platforms may be maintained, wells may be temporarily brought online, and platform systems may remain in operation, for example power, air, safety systems, fuel systems, pig launcher/receivers, and cathodic protection.

Cessation of Production

The Cessation of Production stage of activity commences when a facility is no longer producing oil and/or gas, or pipelines are no longer used to transport oil and/or gas to shore or to supply other facilities with resources. There are a number of activities within Cessation of Production, such as:

- well plug and secure using a wireline rig to preserve wellbore integrity for the period prior to plug and abandonment
- care and preservation where wells are shut-in pre-plug and abandonment, except in certain circumstances such as for the supply of fuel gas for power generation. Platforms are de-staffed, with platform visits conducted as required to complete operations and maintenance tasks (e.g. restart equipment that has shut down, top up lube oils, launch/receive pigs, re-establish communications) to facilitate upstream platform operations and/or maintain equipment for future decommissioning preparation activities
- well plug and abandon, which involves the permanent closure of the well
- well conductor pull where well conductors are removed either post-plug and abandonment or as part of decommissioning
- facility preparation activities, which prepare the platform for decommissioning (e.g. preparing the topsides and jackets for lifting activities; removing hydrocarbons; cleaning import and export pipelines; air-gap risers on platforms etc.). This is undertaken in parallel with inspection, maintenance and repair to preserve the facility for a period of Stasis Mode. Facilities are progressively isolated from fuel gas and pipeline connections. Property that does not require the use of a heavy-lift vessel or specialist equipment is assessed for removal on an ongoing basis.

Due to the high level of interconnectedness of the Bass Strait facilities, some non-producing facilities may continue to be required to:

- support key activities, such as pipeline inspections
- facilitate operations on other connected producing platforms and subsea facilities
- support inspection, maintenance and repair activities, and/or

Pipelines will be filled with treated water. Sections of risers and pipelines may be removed in preparation for platform or pipeline decommissioning.

Stasis Mode

Facilities and pipelines are considered to be 'not in use, nor to be used' in connection with the operations (as per Section 572 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*) when the Stasis Mode stage of activity is reached. This indicates the facility or pipeline is ready for decommissioning.

Platform visits will be undertaken to complete inspection, maintenance and repair activities to maintain the platform prior to future decommissioning.

Inspection, maintenance and repair

Since a facility may continue to be 'in use' for some years during the Cessation of Production stage; inspection, maintenance and repair is likely to occur throughout both the Cessation of Production and Stasis Mode stages. This is required to:

- maintain the platform to an appropriate standard
- ensure safety and environmental risks are reduced to As Low as Reasonably Practicable (ALARP) and acceptable levels
- preserve all decommissioning outcomes up to and including full removal as required under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, unless deviations are justified and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

These activities include well integrity testing, structural and corrosion control maintenance/repair as required, and checks on operating systems such as fuel gas, air compressors, crane and lifting equipment, open and closed piles, and safety systems.

Once platforms are de-staffed, periodic platform visits are conducted for operations and maintenance to facilitate upstream platform operations and/or maintain equipment for future decommissioning preparation activities. Platform visits may be conducted as day trips, or by temporarily re-staffing the facility for days to weeks.

1.5.2 Decommissioning Program

The 'Decommissioning Program' consists of both the Decommissioning and Surrender of Titles stages of activity. Refer to Section 2.1 for further information.

Decommissioning

Decommissioning of facilities is expected to be undertaken by specialist third party contractors with the appropriate vessels, equipment and expertise to undertake this work during one or more decommissioning campaigns.

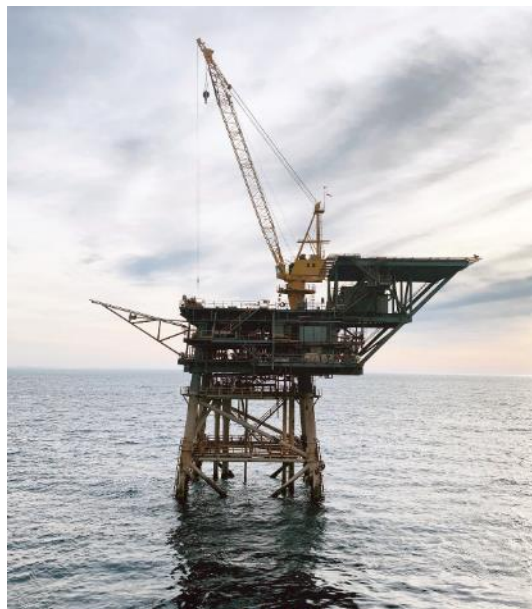
Surrender of Titles

Following the completion of decommissioning and post-decommissioning monitoring, as appropriate and agreed with NOPSEMA, the Titleholders will apply to the National Offshore Petroleum Titles Administrator to surrender the relevant petroleum titles.

1.6 Status

The stage of activity for each of the non-producing platforms and subsea facilities (excluding pipelines), as well as the decommissioning activities conducted during 2021 and the proposed forward schedule of ongoing Preparatory Decommissioning Activities, is shown in Figure 1-4 but is subject to change.

The status of all facilities and pipelines as at the end of 2021 is shown in Figure 1-5.



Whiting platform in the Cessation of Production stage of activity with wells plugged and abandoned and well conductors removed

Figure 1-4: Estimated timing of activities for currently non-producing platforms and subsea facilities

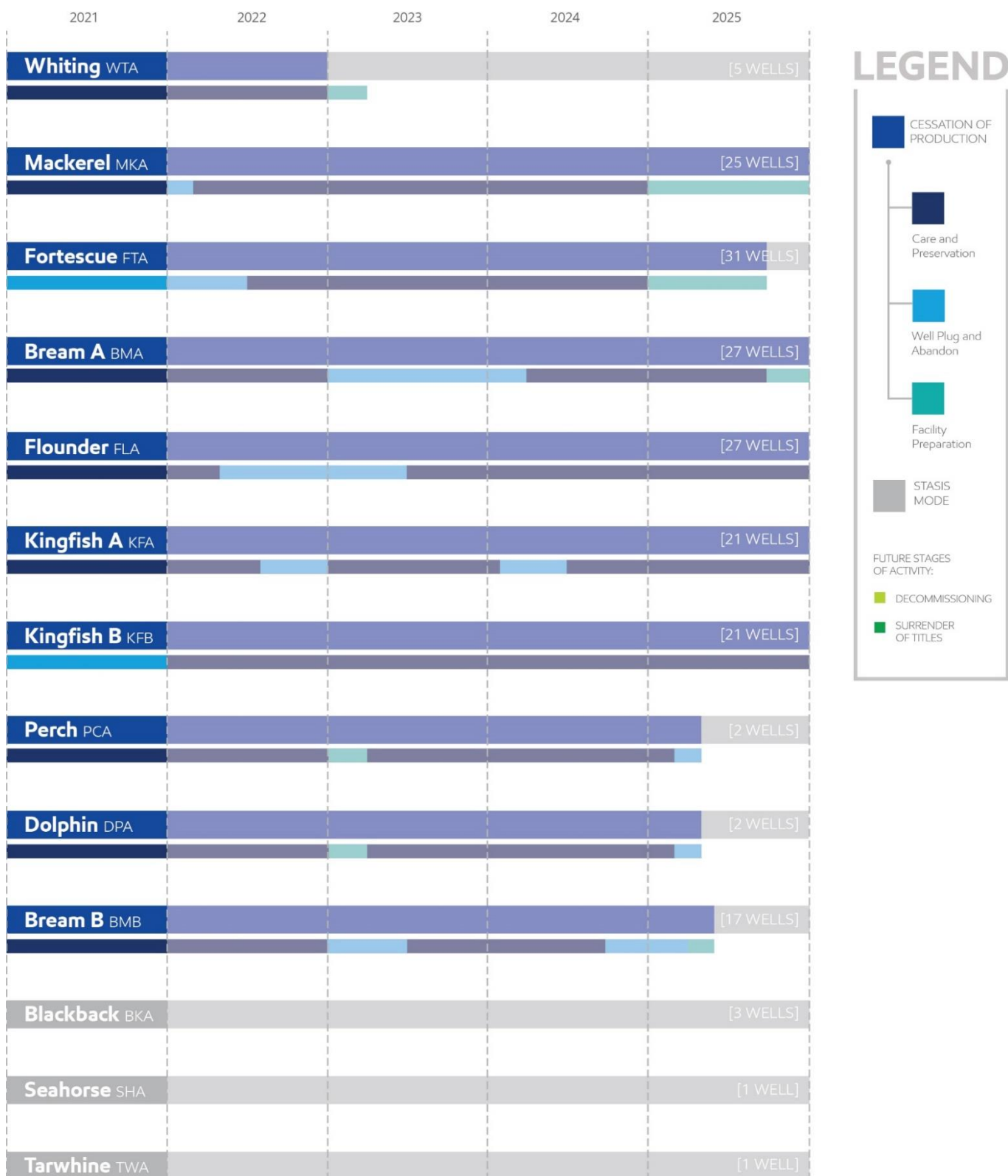
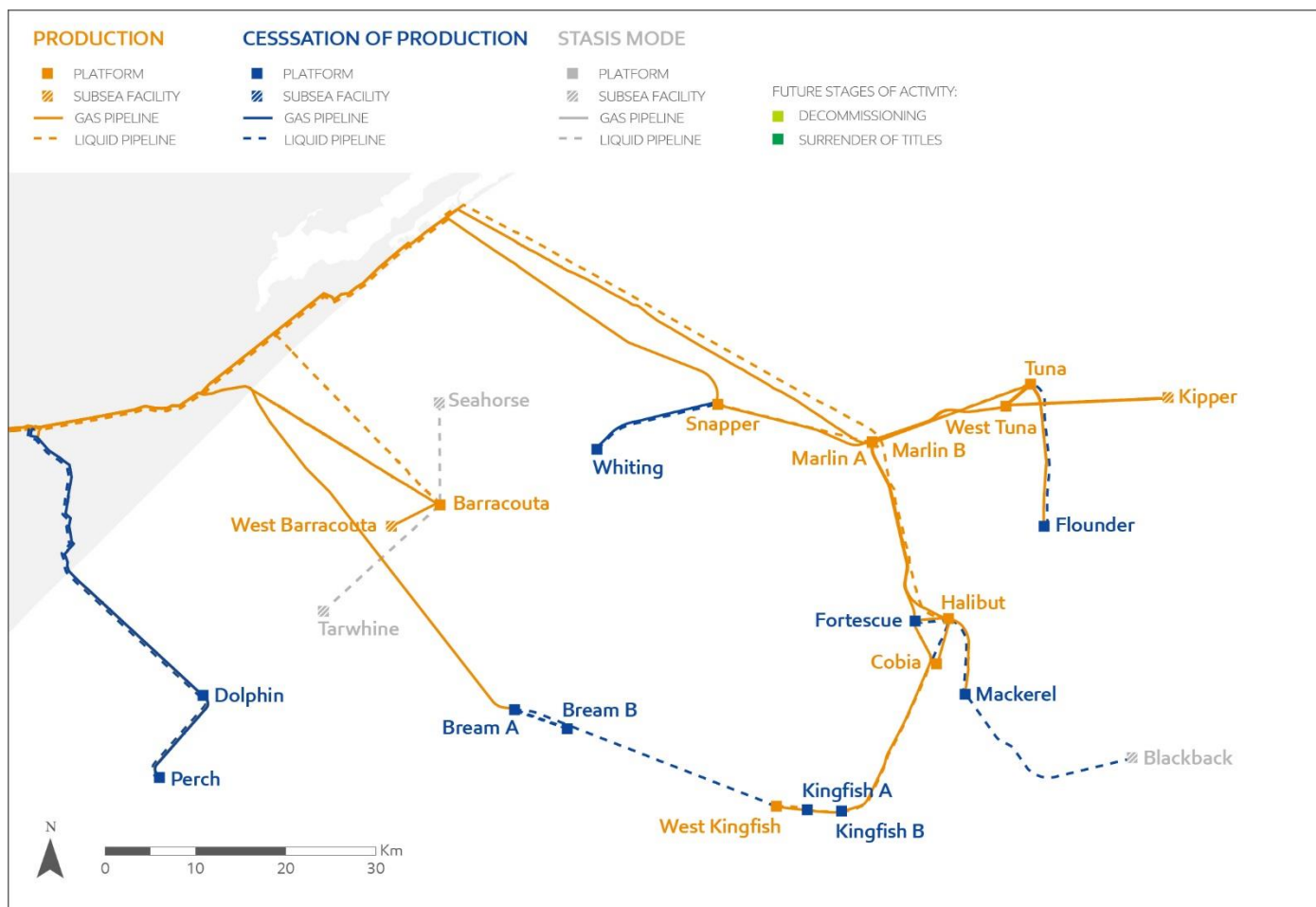


Figure 1-5: Status of facilities and pipelines as at December 2021



2 Decommissioning planning

Esso is committed to planning decommissioning activities so that they minimise impacts to the environment, while meeting the expectations of regulators, stakeholders and the community.

2.1 Approach

Safely conducting a decommissioning project of this nature and scale requires extensive detailed planning supported by a number of technical, execution and environmental studies.

Esso is undertaking decommissioning planning in accordance with the ExxonMobil Operations Integrity Management System (OIMS). This ensures that all aspects of risk are managed and encompass the use of specialist skillsets, training of personnel, specialist equipment and competent contractors. It also involves integration of decommissioning planning with operating facilities and provides the mechanism for obtaining input from key stakeholders.

2.1.1 Project management and verification

Esso applies the ExxonMobil Capital Project Management System (EMCAPS) when managing capital projects to ensure a disciplined and consistent approach to planning and execution. Bass Strait decommissioning will follow a tailored Decommissioning Project Management System (DPMS) based on EMCAPS principles.

The DPMS consists of five stages covering End of Field Life through to Surrender of Petroleum License or Titles. Figure 2-1 provides an overview of the DPMS stages and objectives associated with each stage.

A 'gate' system is used by Esso to ensure the project achieves the objectives and deliverables of the preceding stage before work can move through to the next stage. Senior management reviews are associated with the passage of each gate.

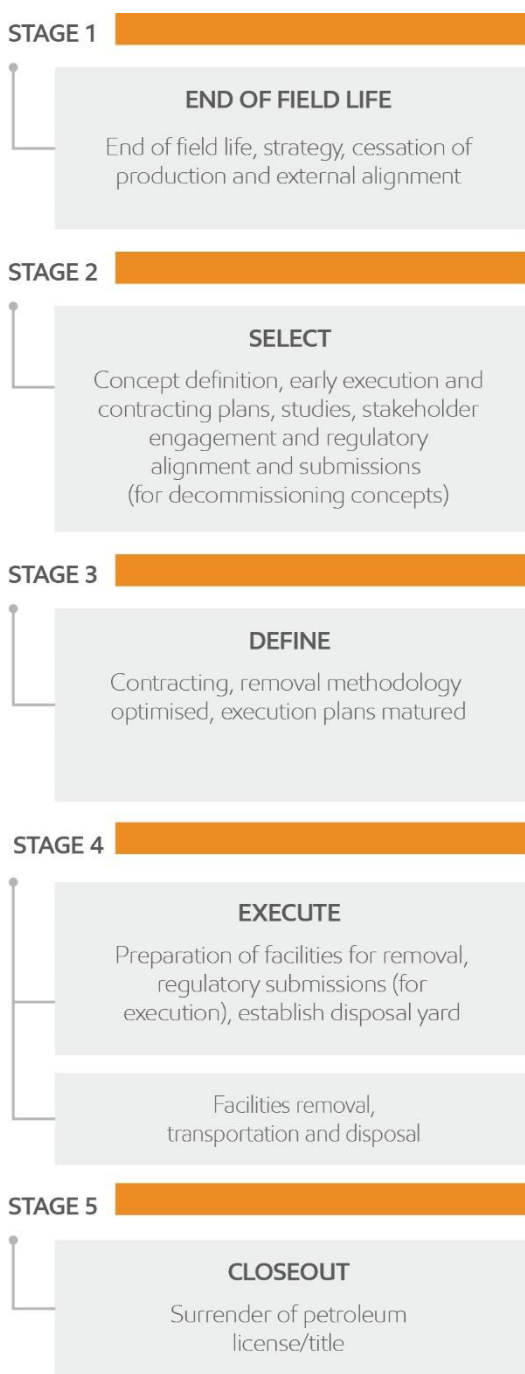
Esso is progressing work to support Stage 2 (Select) of the project. This involves ongoing engagement with NOPSEMA regarding decommissioning concepts assessment and environmental studies that will help define requirements for the Decommissioning Program.

Preparatory Decommissioning Activities such as plug and abandonment, maintenance and care and preservation will continue to be undertaken independent of, but in close alignment with, the DPMS.

2.1.2 Decommissioning concepts assessment

Section 572 (3) of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*, requires Esso to remove all structures, equipment and other property that is neither used nor to be used, in connection with the operations, from the title area. This is referred to as the 'base case end state'. However, under Section 572 (7) of the Act, the obligation to fully remove all property is subject to other provisions of the Act, regulations, directions and other applicable laws. As such, Esso has identified a range of decommissioning concepts including the base case end state as well as consideration of other feasible concepts.

Figure 2-1: DPMS five stages of project evolution



As part of Stage 2 (Select), Esso is undertaking an evaluation of the decommissioning concepts to assess environmental impacts and risks that may arise, as well as technical, safety, socio-economic and cost aspects.

The evaluation is based on global studies and literature, supplemented by further assessments using Bass Strait specific studies, including environmental sampling, undertaken by Esso (refer to Section 4.2). It will evaluate each provisional end state against applicable international, Commonwealth and State legislation, codes, standards, treaties, conventions and practices.

Esso is seeking stakeholder input and perspectives throughout the process through engagement with relevant stakeholders including commercial fishers and other users of Bass Strait.

Where a decommissioning concept does not propose the full removal of property, Esso will present proposed deviations to NOPSEMA for assessment and approval through the development of 'Deviation Environment Plans'. Deviation Environment Plans are required to demonstrate that the proposed deviation will:

- deliver equal or better environmental, safety and well integrity outcomes than the base case end state
- meet the ALARP and acceptability Environment Plan acceptance criteria required by the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulation 2009*.

If either of these assessments indicate that the proposed deviation does not meet the equal or better environmental outcome or the ALARP and acceptability Environment Plan acceptance criteria, the decommissioning option will not be pursued and a Removal Environment Plan will be developed for the base case end state.

2.1.3 Deviation Environment Plans

As the first decommissioning project of this scale and complexity in Australian waters, Esso continues to work closely with NOPSEMA as decommissioning planning evolves to ensure regulatory commitments are met and appropriately documented.

During 2021, Esso prepared a *Decommissioning 'Deviation' Environment Plans Scoping Document*, which was submitted to NOPSEMA in August. This document aims to seek NOPSEMA's input into the approach for the preparation of Deviation Environment Plans for decommissioning concepts that deviate from the base case end state.

Esso proposes three separate Deviation Environment Plan submissions, with each relating to a major property type (as described in Section 1.4):

- Deviation Environment Plan 1: Steel pile jackets and monopods
- Deviation Environment Plan 2: Pipelines, umbilicals and associated subsea infrastructure
- Deviation Environment Plan 3: Concrete gravity structures.

Esso plans to submit Deviation Environment Plan 1 to NOPSEMA in 2022.

Approval is also required under the *Environment Protection (Sea Dumping Act) 1981* for any in-situ decommissioning and Esso is evaluating requirements under the *Environment Protection and Biodiversity Conservation Act 1999*.

2.2 Organisation of the work

A structured approach to managing decommissioning activities and implementing systems of work will help achieve optimal outcomes for all interested parties. As such, Preparatory Decommissioning Activities, which include the significant progress Esso has already made on well plug and abandonment work, is primarily undertaken in accordance with relevant Safety Cases and managed as part of the existing *Bass Strait Environment Plan*. Activities involving the use of jack-up rigs require separate environment plans. The future Decommissioning Program will be managed in accordance with execution environment plans, which outline the process Esso will undertake to execute the decommissioning concept approved in the relevant Deviation Environment Plans and/or Removal Environment Plans.

2.2.1 Preparatory Decommissioning Activities

Esso will continue to conduct ongoing maintenance activities on all non-producing platforms in accordance with the *Bass Strait Environment Plan*. This ensures decommissioning preparation can be completed safely and efficiently and that the facilities are maintained in a safe state so as not to preclude full removal until final decommissioning is undertaken.

Preparation activities include:

- inspection, maintenance and repair of facilities until final decommissioning
- preparation activities for pipeline or subsea infrastructure decommissioning (i.e. flushing, cleaning, cutting)
- removal of smaller pieces of subsea infrastructure/sections of pipelines or ancillary items on an opportunistic basis
- topsides decommissioning preparation activities such as air-gapping/flushing/cleaning
- well plug and abandonment.

2.2.2 Decommissioning Program

The Decommissioning Program will be managed by aggregating facilities into decommissioning work scopes that will involve the use of a Heavy Lift Vessel (HLV).

This approach considers the interconnectedness of the facilities to limit the impact to producing facilities and maintain power and communications reliability. It will also allow for the most efficient use of the HLV, which will in turn result in better environmental outcomes achieved through a reduction in environmental disturbances.

2.2.3 Marine asset contracting

Esso requires additional specialist equipment to undertake decommissioning activities for the Bass Strait facilities. This includes the:

- Multi-Purpose Support Vessel (MPSV)
- Mobile Offshore Drilling Unit (MODU) – deep water
- MODU – shallow water
- HLV.

The MPSV will provide a ‘walk-to-work’ option to support activities required for: facility preparation of Whiting, Perch, Dolphin and Bream B platforms; inspection and maintenance operations and; environmental studies. It will also support activities on subsea facilities and exploration wells.

The two MODUs will complete abandonments of the subsea suspended exploration wells and other wells that are not able to be completed by the platform-based hydraulic workover rigs (HWT 600 and Rig 22).

HLVs will be used for steel pile jacket platform removal, which is expected to commence prior to 30 September 2027.

No major third-party contracts were awarded during 2021.

2.3 Bass Strait specific studies

Esso is conducting numerous technical, environmental, socioeconomic, safety and cost studies to support decommissioning planning.

Some of these are research-based and scientific in nature and as such, involve partnerships with academic institutions, specialist technical companies, other industry members and independent subject matter experts.

SPOTLIGHT

Experience and technology confirm platform integrity

Esso Senior Structural Engineering Advisor, Dan Hughes, is using a combination of his team's extensive experience and the latest technologies to confirm the integrity of non-producing facilities in Bass Strait.

With more than 20 years' experience as a structural engineer, Dan has spent a significant portion of the past 13 years leading the Esso integrity team and mentoring and supporting graduate engineers.

"The work I am doing with Esso in Bass Strait is drawing on my many years of experience working on projects and providing engineering support for operations in Australia and globally. More recently, I have held roles as a structural advisor focused on the integrity of the Bass Strait platforms and other ExxonMobil facilities in Papua New Guinea, Nigeria, and Russia. I have also developed and managed an engineering group in the Bangalore Technology Centre, which provides global engineering capabilities to ExxonMobil," Dan said.

Esso conducts regular Facility Integrity and Maintenance System (FIMS) activities on the Bass Strait platforms using physical inspections for topsides, and remotely operated vehicles to inspect underwater components. While FIMS programs help to ensure the integrity of all equipment, additional decommissioning integrity reviews focus on the components that are critical for final platform removal. These consist of the primary structures, and secondary structures that include supports for major equipment, as well as the landing area used to access each platform.

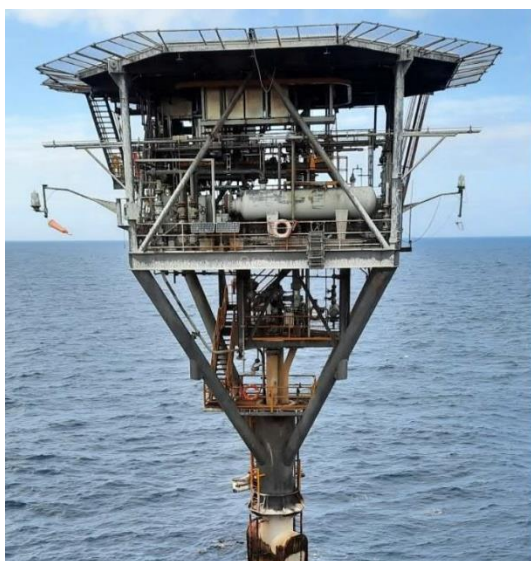
When physical access to a platform is restricted, Dan's team uses Airscope models of the platforms for their reviews. For example, models developed for the Perch and Dolphin platforms used high-tech drones and laser scanning tools to take over 2000 images of each platform that were spliced together to create a complete 3D model. This allowed engineers to comprehensively view and assess the platforms from any computer at any time.

"The high-resolution photos that make up the 3D models allow us to immediately visualise any anomalies on a platform and determine if there is a need for further assessment or action," Dan said.

"Our integrity assessments are leveraging both physical inspections and intelligent technologies in confirming the integrity of the Bass Strait platforms, and what will be required to maintain integrity through to platform removal."



Senior Structural Engineering Advisor, Dan Hughes



Perch platform (monotower)

2.3.1 Integrity assessments

In 2021, Esso conducted integrity assessments for the Perch Platform, Dolphin Platform and Perch-Dolphin-Shore Pipeline (License PL/15 and PL/17). The purpose of these assessments was to determine the structural integrity of the platforms, pipelines and associated equipment so they remain ready for decommissioning.

Assessments of the Perch and Dolphin platforms, both due to be decommissioned in 2027/2028, have determined they are currently structurally sound and can be fully removed.

The third assessment, which covers the offshore pipeline sections from the shoreline near Seaspray to the Perch and Dolphin platforms, also showed there is currently sufficient integrity not to preclude full removal of the pipeline if required.

A routine survey of the cathodic protection system will be completed in 2023.

Outcomes of the three integrity assessments were provided to NOPSEMA in August. NOPSEMA subsequently confirmed the integrity assessments appear to demonstrate that full removal of property will not be precluded.

Esso is planning to undertake platform above water surveys for both the Perch and Dolphin platforms as well as an assessment on the condition of the wells in 2022. Inspection and maintenance programs for both platforms will continue until they are decommissioned.

Integrity assessments were also conducted on the following non-producing assets in 2021:

- Flounder platform and oil pipeline
- Bream A platform and oil pipeline
- Bream B platform and oil pipeline
- Fortescue platform and oil pipeline
- Kingfish A platform
- Kingfish B platform
- Mackerel platform and oil pipeline
- Blackback oil and gas lift pipelines
- Whiting platform and oil and gas pipelines
- Cobia 2 pipeline.

A report presenting the outcomes of these integrity assessments will be provided to NOPSEMA in January 2022.

2.3.2 Independent review

In June 2021, Esso commissioned an independent third-party contractor to conduct a review of Esso's engineering and project management approach to decommissioning activities. This review aimed to identify opportunities and measures to reduce the timeframe for completing all necessary decommissioning activities.

Xodus Group was appointed in July and the review was completed in October. Esso assessed all recommendations resulting from the review and provided a report to NOPSEMA in November.

Based on the review's recommendations, Esso will incorporate reasonable and practicable measures that would likely reduce the timeframe for commencing and completing all necessary decommissioning activities.



Rig 22 on Kingfish B platform

3 Preparatory Decommissioning Activities

Esso is committed to maintaining non-producing facilities and their surrounding environments in a safe state until their eventual decommissioning.

Esso is progressing Preparatory Decommissioning Activities for all non-producing facilities. This includes the Whiting, Mackerel, Fortescue, Kingfish A, Kingfish B, Flounder, Bream A, Bream B, Dolphin and Perch platforms and the Blackback, Seahorse and Tarwhine subsea facilities. Preparatory Decommissioning Activities are decommissioning works required to be completed from the offshore platforms in advance of the final dismantling and removal campaign. This includes well plug and abandonment, cleaning, and flushing of production equipment. Esso expects work from these platforms will be completed no later than 30 September 2027.

3.1 Cessation of Production

Progress updates on facilities in the Cessation of Production stage of activity during 2021 are outlined in the following sections.

3.1.1 Care and preservation

In addition to regular ongoing maintenance, Esso's Care and Preservation teams periodically conduct maintenance reviews so that maintenance plans for non-producing platforms and pipelines remain effective in ensuring that:

- all environmental and safety risks remain ALARP and acceptable
- structural integrity is maintained so as not to preclude full removal as required under Section 572 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

In 2021, maintenance reviews were conducted for the following platforms and their relevant associated pipelines:

- Mackerel in May
- Dolphin and Perch in July
- Whiting, Bream A and Bream B in August
- Flounder in September
- Kingfish A and Kingfish B in October
- Fortescue in November.

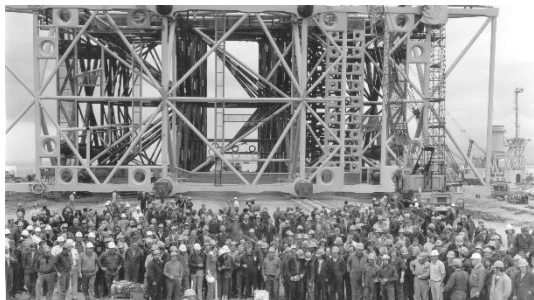
3.1.2 Wellwork

All three wells of the Blackback subsea facility were plugged and abandoned in 2019 during a two-month program using the semi-submersible MODU *Ocean Monarch*.



Ocean Monarch MODU

Also in 2019, Esso began a two-year plug and abandonment program for the Mackerel platform. The program involved using the HWT 600 hydraulic workover rig to abandon 22 of the 25 wells. The remaining three wells were previously plugged and abandoned.



Workers responsible for construction of the Mackerel platform in 1977



Some of the team members involved in the plug and abandonment of the Mackerel wells

As the first full plug and abandonment program with a platform-based rig, it provided learnings that have helped improve the efficiency of subsequent plug and abandonment works. For example, during the Mackerel plug and abandonment program, Esso implemented an innovative technique for performing reservoir abandonment without the use of the hydraulic workover rig.

The technique involved through-tubing abandonment of the reservoir by pumping cement into the Xmas tree, down the tubing and around the outside into the production casing to form a rock-to-rock barrier across the cap rock, which is the sealing rock that keeps hydrocarbons in place. The technique proved more efficient and as effective as the traditional method (see Figure 3-1) of pulling all tubing out of the well to set a cement plug.

Following the successful testing of this technique on five wells during the Mackerel program, the technique will continue to be used during future plug and abandonment programs.

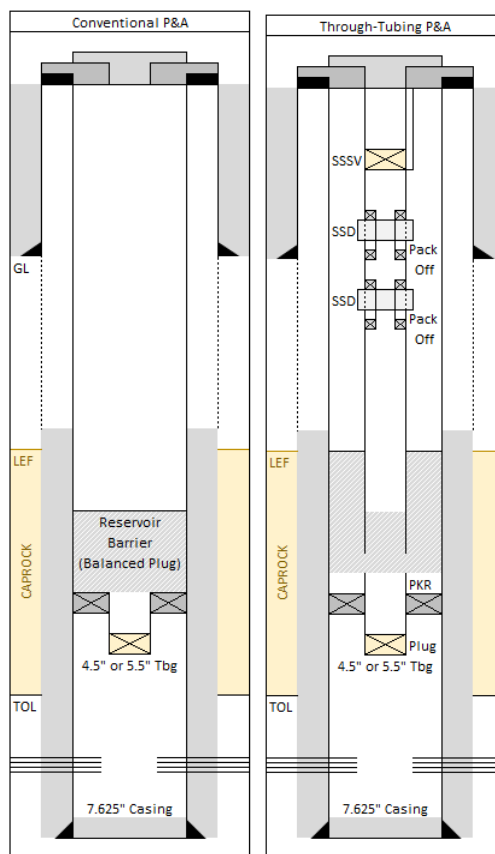


Figure 3-1: Well diagrams showing conventional plug and abandon methods (left) compared to through-tubing reservoir plug and abandon (right)

Efficiencies are also being gained through the use of a batch approach, which involves completing abandonment activities on the lower sections of all wells, followed by works on the upper sections of all wells as opposed to completing full abandonment of each well in sequence.

This batch approach, combined with the through-tubing technique for abandonment, achieved significant efficiencies and risk exposure reduction.

The Whiting platform entered the Cessation of Production stage of activity in 2019 after studies concluded that gas development, utilising the existing Whiting platform facilities, was not the preferred development concept. The five drilled wells were safely plugged and abandoned in September 2020 and well conductors were removed.

The Seahorse and Tarwhine subsea facilities, each consisting of a single well, were permanently plugged and abandoned in October 2020.

The Whiting, Seahorse and Tarwhine plug and abandonment program was completed by the jack-up drilling rig 'Tom Prosser'.

Following plug and abandonment work from the Mackerel platform in February 2021, the HWT 600 hydraulic workover rig was moved to the Fortescue platform.



Tom Prosser jack-up drilling rig (© Noble Corporation)

The crews on HWT 600 are working to safely plug and abandon 25 of the 31 wells at the Fortescue platform. The remaining six wells were previously plugged and abandoned.

A second hydraulic workover rig, Rig 22, was mobilised for well abandonment work on Kingfish B platform in June. This is the first time Esso has mobilised two hydraulic workover rigs to simultaneously conduct plug and abandonment programs in Bass Strait.



Rig 22 on Kingfish B

By the end of the year, the 21 wells at the Kingfish B platform were safely plugged and abandoned.

Esso also plugged and secured 15 wells at the Flounder platform in March 2021 and 14 wells at the Bream A platform in September.

The plug and secure process isolates the reservoir interval and prepares the platform wells for future well abandonment.

All plug and abandonment work for the 13 non-producing facilities is expected to be completed prior to 30 September 2027.

3.1.3 Facilities preparation

Facility-specific preparation engineering is required to define the scope of works needed to prepare each facility for removal. On award of the Removals contract (refer to Section 2.2.3) facility-specific preparation engineering will commence.

Meanwhile, Esso continues to assess opportunities to remove items of property that do not require the use of specialist equipment. This includes the removal of smaller items of subsea property as suitable vessels are available.

To facilitate planning, Esso has compiled a Subsea Material Register. The Register is intended to be used as the principal register for all subsea property, including its associated status.

When vessels are contracted, the Subsea Material Register is reviewed to identify whether an opportunity exists for the removal of subsea property. Considerations for recovering items during a vessel campaign include: vessel availability (weather etc.), vessel capability (lifting equipment type/capacity etc.), material location (depth, proximity to other infrastructure etc.) and recovery methodology.

During 2021, Seahorse electrical flying leads were successfully removed from the seabed.

3.2 Stasis Mode

The Blackback, Seahorse and Tarwhine subsea facilities are in Stasis Mode. The facilities entered Stasis Mode following completion of the plug and abandonment works for the combined five wells across these facilities.

Blackback's three subsea trees were removed as part of the plug and abandonment program.

The disconnected flowlines and electrical and chemical flying leads currently remain on the seabed. The umbilical termination assembly, umbilical, pipeline termination assembly, and 200-millimetre production pipeline and associated gas lift line connected to Mackerel platform also currently remain on the seabed.

During the plug and abandonment program, the subsea trees for each of the Seahorse and Tarwhine wells were removed. The Tarwhine parking frame and all the electrical, chemical and hydraulic flying leads have also been removed from the seabed. At Seahorse, the chemical and hydraulic flying leads were removed.

The pipelines and umbilicals for the Seahorse and Tarwhine facilities were cleaned and cut following the plug and abandonment and currently remain on the seabed. Scheduled inspections of these subsea facilities were undertaken in 2021.

The Blackback oil pipeline cleaning is scheduled to commence in late 2022.

3.3 Inspection, maintenance and repair

Esso regularly undertakes detailed assessments of Bass Strait facilities as part of the ongoing maintenance program.

During the year, the scope of the maintenance program was expanded to include the use of high-tech drone and laser scanning tools to build 3D digital models of Bass Strait platforms.

Airscope Industries was engaged to deliver the 3D models, which will be used to develop and plan work programs for:

- the care and preservation of platforms
- plug and abandonment of wells
- longer-term decommissioning works.

Over three months of high-definition drone and laser scan, imagery was captured of the Mackerel, Fortescue, Flounder, Kingfish A, Kingfish B, Bream A and Bream B platforms. This supplements imagery previously captured by Airscope Industries of the Whiting, Perch and Dolphin platforms.



Screenshot of the Kingfish A 3D model created using imagery captured by an Airscope Industries drone

This imagery supports the creation of interactive 3D detailed models, allowing workers to visualise and assess the platforms securely from any computer at any time.

SPOTLIGHT

Historic maintenance ensures pipeline integrity

Esso's commitment to its maintenance program over the past 50+ years has helped secure the integrity of the Bass Strait offshore pipelines, says Pipeline Engineer David Levy.

"We are seeing the benefits of maintaining long-term chemical corrosion inhibition programs, cathodic protection, and underwater pipeline inspections and rectifications that have resulted in very low levels of corrosion or degradation in the pipelines. This confirms that the maintenance program, based on ExxonMobil performance standards, has worked to ensure pipeline integrity," David said.

David is leading assurance and integrity assessments for more than 350 kilometres of offshore pipelines as they cease production. This includes assessing the condition and structural integrity of the pipe and flexible jumpers that connect the pipeline risers to the subsea horizontals near each platform, as well as the corrosion protection systems. Previously, David was responsible for leading integrity and subject matter expertise for more than 900 kilometres of Esso Bass Strait's onshore pipeline network. Prior to joining Esso, David was the Australian pipeline lead for BP and a Senior Pipeline and Integrity Engineer with ICD Asia Pacific, providing expert pipeline and asset integrity engineering support to various Australian operators.

"My role with Esso involves the development and delivery of programs, plans and budgets associated with pipeline integrity, which includes any required repairs. I am also the subject matter expert for onshore pipelines."

"When assessing a pipeline, I take an auditing approach that includes a gap analysis to identify any change in risks associated with the asset during decommissioning operations. This involves examining all of the components of the pipeline and associated infrastructure, and taking into account historical information about the pipeline such as any identified issues and how they may impact future decommissioning activities.

"Documenting the condition of the pipelines and predicting their future decommissioning state is an important part of this process so we can demonstrate that our assets are not precluded from full removal, and for the benefit of other decommissioning activities."

David said the offshore pipeline network also provided an environmentally sustainable way to assist with topsides flushing and completing plug and abandonment activities on wells.

"The pipeline network gives us the ability to easily transport and dispose of hydrocarbons and other production fluids from the platforms and wells. This helps manage the disposal of waste products with minimal risk to the environment. We can subsequently clean the pipelines to remove any internal contaminants before decommissioning the pipelines themselves.

"With Esso, we are in a fortunate position where all the legacy work in terms of compliance and periodic maintenance has been done to a high standard, which has given us confidence that we can remove these assets with low risk, if required."



Pipeline Engineer, David Levy (left) with Pipeline Maintenance Execution Lead, Lachlan Andrews and Pipelines Business Analyst, Chiara Centra



Example ROV imagery collected by Esso showing delicate soft-bodied invertebrates attached to structures

4 Environment

Esso is focused on continually improving our environmental management and aims to reduce the impact of decommissioning activities on the environment.

A summary of the physical, biological and socio-economic environments in the Bass Strait Operational Area is provided in Table 4-1.

Table 4-1: Operational Area environments summary (source: *Bass Strait Environment Plan*)

Aspect	Summary Data
Water temp.	Maximum: 20°C Minimum: 13°C
Benthos	<p><i>Base substrate:</i> The Operational Area is located on the flat outer shelf plain of the Twofold Shelf and overlaps an area of inshore soft sediment habitat. The benthic habitat within the Operational Area is expected to include predominantly lightly muddy, gravelly sand substrate. Benthic infauna such as crustaceans and polychaete worms also occur. Where hard substrate or points of attachment (facilities) are present, colonisation by epifauna occurs mostly in the form of sessile, invertebrate, filter feeders. The degree of colonisation varies between platforms, however, sponge beds have only been detected at the Bream B platform.</p> <p><i>Subtidal rocky reefs:</i> South-east Reef, an isolated offshore rocky reef, is mapped to exist in the VIC/L5 area, including beneath the Cobia platform. However, the reef has not been detected in any of the survey work conducted for the Gippsland activities. The Operational Area does not include intertidal waters.</p> <p><i>Coral:</i> The Operational Area includes deeper waters throughout the continental shelf, slope and off-slope regions where soft corals may occur. Soft corals (e.g. sea fans, sea whips) typically occur as part of mixed reef environments in waters along the coast, and are only expected to be near platforms closest to the shoreline.</p>
Fish (bony)	26 listed marine species of fish (or species habitat) may be found in the Operational Area.
Fish (cartilaginous)	Two listed threatened shark species (or species habitat) may occur within the Operational Area: the Great White shark; and Whale shark. Two additional listed migratory species (Mako shark and Porbeagle shark) may occur within the Operational Area. The Operational Area is within a distribution Biologically Important Area for the Great White shark.
Marine reptiles	Three listed threatened turtle species (Loggerhead, Green and Leatherback) may occur within the Operational Area.

Aspect	Summary Data
Marine mammals	27 cetacean (whale, dolphin, or porpoise) species (or species habitat), including five listed threatened whale species (Sei, Blue, Fin, Southern Right and Humpback), may occur within the Operational area. Sei whales and Fin whales have foraging, feeding or related behaviours likely to occur within the Operational Area. This area intersects Biologically Important Areas for the: Southern Right whale (distribution and migration); Pygmy blue whale (foraging and distribution); and Humpback whale (migration). New Zealand fur-seal and Australian fur-seal may occur within the Operational Area.
Plankton	Phytoplankton and zooplankton are widespread.
Seabirds	31 seabird and shorebird species (or species habitat), including 24 listed threatened species, may occur within the Operational Area. This area intersects foraging Biologically Important Areas for: Antipodean albatross, Black-browed albatross, Buller's albatross, Campbell albatross, Indian yellow-nosed albatross, Shy albatross, Wandering albatross, White-capped albatross, Common diving-petrel, White-faced storm-petrel, Flesh-footed shearwater and Short-tailed shearwaters.
Conservational interests	<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> species listed as V (Vulnerable), E (Endangered) or CE (Critically Endangered) include:</p> <ul style="list-style-type: none"> • Fish (bony): Australian grayling (V) (typically inhabits estuarine waters and coastal seas) • Fish (cartilaginous): Great White shark (V), Whale shark (V) • Marine mammals: Sei whale (V), Blue whale (E), Fin whale (V), Southern Right whale (E), Humpback whale (V) • Marine reptiles: Loggerhead turtle (E), Green turtle (V), Leatherback turtle (E) • Seabirds: Antipodean albatross(V), Southern royal albatross (V), Wandering albatross (V), Gibson's albatross (V), Northern royal albatross (E), Sooty albatross (V), Buller's albatross (V), Northern Buller's albatross (V), Shy albatross (V), Grey-headed albatross (E), Chatham albatross (E), Campbell albatross (V), Black-browed albatross (V), Salvin's albatross (V), White-capped albatross (V), White-bellied storm-petrel (V), Blue petrel (V), Southern giant petrel (E), Northern giant petrel (V), Gould's petrel (E), Curlew sandpiper (CE), Red knot (E), Eastern curlew (CE), Australian fairy tern (V), Fairy prion (southern) (V) <p>There are no World Heritage sites, natural listed places, indigenous listed places, Australian Marine Parks or National Parks and Reserves within the Operational Area.</p>
Commercial fishing	Commercial fishing occurs in Commonwealth waters along the continental shelf and the upper continental slope. Commercial fishing is not permitted within the platform petroleum safety zone, however, six Commonwealth-managed fisheries have management areas that intersect the Operational Area of the pipelines. These are: Bass Strait Central Zone Scallop; Eastern Tuna and Billfish Fishery; Small Pelagic Fishery; Southern and Eastern Scalefish and Shark Fishery; Southern Bluefin Tuna Fishery; and Southern Squid Jig Fishery. There are also three Victorian state-managed fisheries with management areas that extend into Commonwealth waters. Given the water depth in the Operational Area, the only commercial fisheries that may be present within the Operational Area of the pipelines are: Giant Crab Fishery; Rock Lobster Fishery; and Octopus Fishery. There are no state-managed aquaculture sites within the Operational Area.
Shipping	In accordance with Schedule 2 of the <i>Offshore Petroleum and Greenhouse Gas Storage Act 2006</i> administered by NOPSEMA, an Area to Be Avoided has been established to exclude unauthorised vessels greater than 200 tonnes or 24 metres length from entering the area around the Bass Strait platforms. A traffic separation scheme operates to the south of the Area to Be Avoided to control coastal shipping.
Nearest oil and gas activities	Esso facilities and activities are the only oil and gas activities undertaken within the Operational Area.
Recreational activity	Recreational fishing may occur within the Operational Area. Most recreational fishing typically occurs in nearshore coastal waters (shore or inshore vessels) and within bays and estuaries. Recreational fishing activity is expected to be minimal in the Operational Area. Marine-based recreation and tourism is unlikely to occur within the Operational Area due to the distance from the shore and lack of seabed features; however, presence is possible.
Wrecks	There are no historic heritage shipwrecks within the Operational Area. The closest are approximately 5 to 10 kilometres from Esso's facilities. These include: the Struan Sailing Vessel, Favourite Sailing Vessel, Talark and Leven Lass.

4.1 Environmental management

The management of environmental aspects relating to Preparatory Decommissioning Activities are governed by the *Bass Strait Environment Plan*.

Environmental management for Esso's Decommissioning Program will be governed by Environment Plan(s) that will:

- comply with the *Offshore Petroleum and Greenhouse Gas (Environment) Regulations 2009* and the *Environment Protection (Sea Dumping Act) 1981*, which includes requirements under the *Environment Protection and Biodiversity Conservation Act 1999*
- evaluate the environmental impacts and risks of the proposed decommissioning activities
- define Environmental Performance Outcomes and Standards, as well as the measurement criteria required to manage impacts and risks identified
- outline control measures to be used to reduce environmental impacts and risks to ALARP and acceptable levels
- provide details of the systems, practices and procedures in place to ensure environmental risks, impacts and control measures identified are implemented to achieve ALARP and acceptable levels so that Environmental Performance Outcomes and Environmental Performance Standards are achieved.

4.2 Environmental studies

Esso is gaining an enhanced understanding of the marine environment around Bass Strait offshore platforms and pipelines through an integrated environmental assessment program. The program is assisting in identifying optimal decommissioning outcomes for all infrastructure types.

In one study, Esso used its extensive library of underwater remotely operated vehicle (ROV) imagery of marine communities (e.g. fish, invertebrates, mammals) collected over many decades of routine inspections to identify marine organisms which exist around the subsea infrastructure. Esso worked in partnership with Deakin University and the Australian Institute of Marine Science (AIMS) to analyse approximately 1000 hours of this subsea imagery and identify species to the lowest possible taxa.

The study investigated the habitat value of Esso's facilities in Bass Strait, and potential consequences of decommissioning on marine life. This is one of the first studies to describe oil and gas structure-associated underwater communities in temperate Australian environments, and the first analysis of how underwater communities differ between platforms and pipelines.

The *MMA Leeuwin* vessel and AECOM/Marine Solutions personnel and marine scientists were contracted to collect data for several studies during February and early March 2021. This included collecting sediment and environmental media samples as well as a visual assessment of marine flora and fauna using an ROV operated by Total Marine Technology Pty Ltd. The *MMA Leeuwin* also completed studies of the pipelines and structures, as well as noise monitoring.

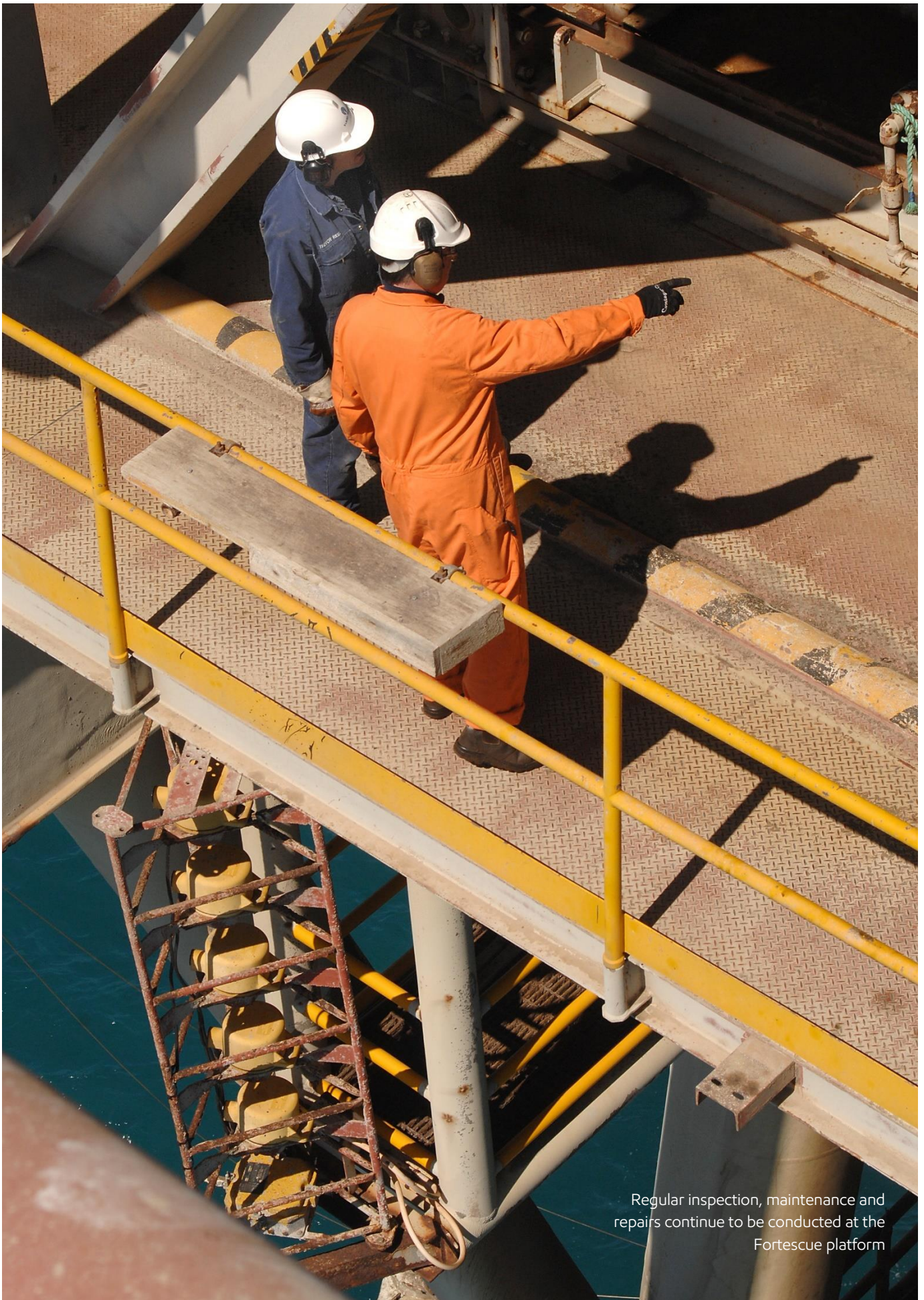
The data and samples collected by the *MMA Leeuwin* were provided to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for a sediment study; AIMS for analysis of ROV imagery; and AECOM for an environmental media study. Progress and results from these studies will be presented in the *Bass Strait Operations Decommissioning Report 2022*.

To better understand commercial fishing in Bass Strait, Esso engaged the South East Trawl Fishing Industry Association Pty Ltd (SETFIA) in September 2021 to conduct a study that will:

- identify all fisheries permitted to work inside the study area
- provide information about vessel size, gear types, catches etc. and fishing methods
- obtain, interpret, and collate seabed mapping data for Commonwealth trawl fishing grounds
- interview fishers about the location of their fishing grounds
- produce a comparative and tabulated risk ranking of fishing methods.

Esso is progressing additional studies to support decommissioning planning including a naturally occurring radioactive material study, a mercury study and material degradation studies (including plastics).

Study progress and results will be presented in the *Bass Strait Operations Decommissioning Report 2022*.



Regular inspection, maintenance and repairs continue to be conducted at the Fortescue platform

5 Regulatory framework and other requirements

Esso complies with all applicable laws and regulations, and maintains the high standards of Exxon Mobil Corporation. The metrics used to track and report performance demonstrate the effectiveness of Esso's management systems at guiding the company's activities.

5.1 Relevant legislation

Esso conducts decommissioning activities in accordance with all applicable Australian laws and regulations. The principal offshore legislation is the *Commonwealth Offshore Petroleum and Greenhouse Gas Storage Act 2006*. The Act is administered by NOPSEMA.

5.2 ExxonMobil standards

In accordance with its Standards of Business Conduct, above all else, Esso is committed to running safe and environmentally responsible operations. Accordingly, Esso manages its operations under a disciplined risk management framework known as the Operations Integrity Management System (OIMS). This System supports risk management through the identification, evaluation and control of risks during exploration, construction and production activities.

5.3 Environment plans

Esso's Bass Strait activities are undertaken in a manner consistent with the principles of ecologically sustainable development, and in accordance with approved environment plans.

The *Bass Strait Environment Plan* has been prepared in accordance with requirements of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* and *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* for

activities in Commonwealth waters. In developing the Environment Plan, Esso conducted a risk assessment to evaluate environmental risks associated with the activities being planned, and incorporated prevention and mitigation measures to reduce these risks to ALARP. Development of the Environment Plan was guided by *N04750-GN1344 Environment Plan Content Requirements* (NOPSEMA, 2016).

The Environment Plan, including the associated Oil Pollution Emergency Plan, was assessed and approved by NOPSEMA, and became the basis for how Esso manages its activities in Bass Strait. Additional supplementary environment plans are developed whenever a new activity is planned that is not covered by the current Environment Plan. This includes plug and abandonment environment plans and execution environment plans.

The Environment Plan is published on NOPSEMA's website (www.nopsema.gov.au) and Esso's website (www.exxonmobil.com.au). It is reviewed and updated every five years.

For activities in State waters, the *Bass Strait State Waters Environment Plan* was prepared in accordance with requirements of the *Victorian Offshore Petroleum and Greenhouse Gas Storage Act 2010*.

The Plan was assessed and approved by the Department of Economic Development, Jobs, Transport and Resources and is reviewed and resubmitted at least every five years.

5.4 Safety Cases

Safety Cases were prepared for each of the Esso Bass Strait facilities and for the pipeline network. These Safety Cases are reviewed at least every five years. Each Safety Case, and all subsequent revisions, are submitted to NOPSEMA in accordance with the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* and its regulations.

Each Safety Case contains detailed descriptions of:

- the facility/pipeline network
- the formal safety assessment conducted for the facility/pipeline network
- the Safety Management System that is used to manage the safety of the facility/network.

Activities conducted by the MPSV will be addressed in an addendum to the existing platform Safety Cases. New Safety Cases will be developed for: the MPSV itself; activities conducted by the MODU; and work outlined in Removal and/or Deviation Environment Plans.

5.5 Well Operations Management Plan

Esso operates in accordance with its Well Operations Management Plan. The Plan describes how Esso utilises OIMS to:

- control risks associated with all well operations
- satisfy the requirements of Part 5 of the *Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011*
- reduce well integrity risks to ALARP
- define performance outcomes, performance standards and measurement criteria.

5.6 Regulatory submissions and approvals

Esso will comply with any written notice of a General Direction issued by NOPSEMA. This includes General Direction 817 issued under Section 574 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* in May 2021.

In August, Esso submitted an implementation plan to NOPSEMA. This document outlines how Esso is responding to General Direction 817.

During the year, Esso progressed all Directions with Direction 1a, 1b, 1c, 3a and 3b being met to NOPSEMA's satisfaction and subsequently closed.

In accordance with Direction 5 of General Direction 817, updates on the progress of activities related to each of the Directions can be found in this *Bass Strait Operations Decommissioning Report 2021*, which was issued to NOPSEMA and published on the Esso website (www.exxonmobil.com.au) in December 2021.

6 People

To protect the health and safety of workers, decommissioning activities are conducted by a highly experienced team operating in accordance with Esso's industry leading plans and procedures.

6.1 Workforce

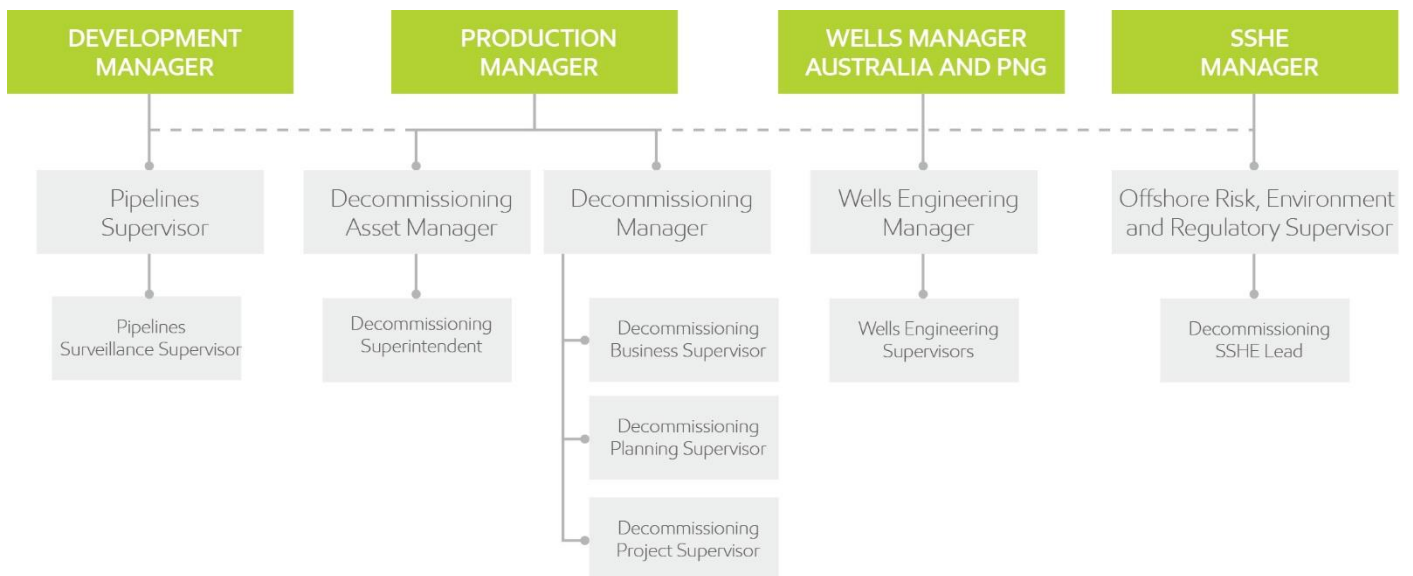
Esso's decommissioning workforce collectively has some 375 years of experience in large-scale oil and gas industry projects across all continents, except Antarctica. The decommissioning team structure is shown in Figure 6-1.

The team includes expertise across ExxonMobil construction, operational and decommissioning projects in regions that include Australia, the US, Canada, Russia, Africa, Asia and the Middle East.



Decommissioning team planning day held in March 2021 at the Esso Melbourne office

Figure 6-1: Decommissioning organisational chart



SPOTLIGHT

Emma brings global experience to Bass Strait

With more than 20 years of ExxonMobil experience, Decommissioning Project Supervisor, Emma Ogilvie is bringing her global knowledge and skills to the Bass Strait Decommissioning Program.

Emma has been involved in offshore projects covering the complete facility lifecycle; from the establishment of an offshore development in Australia to the Sable Decommissioning Project in Nova Scotia, Canada. As Project Manager, Emma was responsible for all aspects of decommissioning planning for Sable.

"The Sable Decommissioning Project gave me global decommissioning experience and, when I came back to Melbourne as the Technical Lead for the Bass Strait Decommissioning Program, I was able to apply the skills and knowledge I gained in Canada," Emma said.

"The best thing about my career has been the breadth of experiences I've encountered over the years. Having this experience is extremely valuable in my current role supporting the planning for the eventual decommissioning of our Bass Strait facilities."

Emma spent the first eight years of her ExxonMobil career in various engineering roles in Melbourne, before becoming the Business Manager on the \$4.5 billion Kipper Tuna Turrum project in Bass Strait. She spent five years working with her team to develop and commission the project's three oil and gas fields, which generated enough energy to power a city of one million people for about 35 years.

Following her success on Kipper Tuna Turrum, Emma was appointed to lead the Sable project in Canada.

"I've worked across engineering, project management, marketing, strategy, business and even human resources. It certainly hasn't been your typical engineering career," she said.

In addition to leading projects for ExxonMobil, Emma applies her extensive Australian and international experience to encouraging and mentoring young women in science, technology, engineering and mathematics careers.



Decommissioning Project Supervisor, Emma Ogilvie

As part of Esso's commitment to fostering an environment of inclusion and diversity, Esso has developed an Inclusion and Diversity Strategy, which is governed by the Inclusion and Diversity Council. To support the Strategy, Esso offers a range of Employee Resource Groups including the:

- Women in Energy Network which supports the professional and personal growth of all women in Esso
- PRIDE Australia Chapter, which stands for People for Respect, Inclusion and Diversity of Employees
- ABLE Network, which stands for 'A Better Life for Everybody' and is aimed at connecting people with disability, or who care for people with disability, as well as helping to raise awareness and understanding of disability within the workplace.

Workforce health and safety

To protect the health and safety of workers throughout decommissioning activities, Esso has industry leading health and safety plans, procedures, programs and initiatives in place.

During 2021, Esso workers completed more than 3 million work hours and implemented a:

- Leadership for Operations – Framework for Training (LOFT) Best Practice, which is a structured process to support the training and development of individuals occupying leadership positions. LOFT plays a key role in verifying competency of personnel in leadership positions in Process Safety
- Leadership Field Assessments initiative whereby first, second and third line supervisors oversee field teams conducting Permit to Work and Job Safety Analysis assessments to increase leadership visibility and allow leaders to enhance and impart their knowledge of work management systems
- Daily Leaders Guide that uses a five-step program covering pre-shift preparation, pre-start meetings, check-ins, work coordination and completion to guide leaders on how to best support their team

- Fit for Work, Healthy for Life program that included a seminar designed to motivate change and encourage new healthy habits through practical tips and strategies and the Biggest Improver 8-week challenge, which is a programmed initiative for individuals to meet their healthy life goals in a supported way
- Thriving Minds Challenge, delivered in partnership with ABLE to support Mental Health month.

Emergency preparedness

Esso has plans and processes in place to respond to emergency events such as natural disasters, pandemics and operational incidents. Regardless of the size, severity or cause of an event, each facility and business unit has access to trained responders and resources. Emergency response and incident management teams develop and practice procedures that enable Esso to provide a robust response in emergency situations to protect the safety of people and the environment.

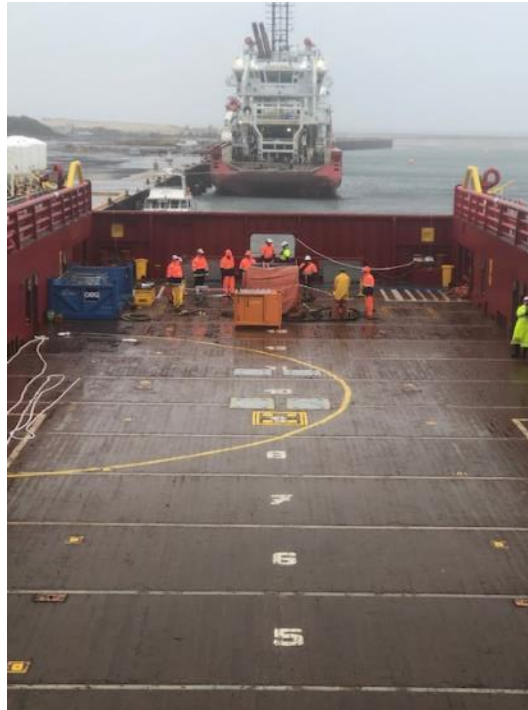
In addition to emergency response arrangements, numerous controls are in place across the Bass Strait facilities to prevent spills occurring and to limit their potential impact on the environment if they occur. These controls are documented in Esso’s Oil Pollution Emergency Plan submitted to NOPSEMA.

Esso regularly conducts emergency response scenario exercises to maintain response readiness. These exercises can include participation from government departments and agencies. The roles and responsibilities of Esso and other stakeholders involved in a spill response are outlined in the Oil Pollution Emergency Plan.

In March 2021, an offshore oil response exercise involving multiple stakeholders was held to test Esso’s spill response capabilities.

The exercise, held at Barry Beach, included mobilising oil spill response equipment and trained personnel from the Australian Marine Oil Spill Centre in Geelong, with key personnel from Esso operations, Gippsland Ports, management and crew of Esso’s platform support vessel the *Skandi Feisten*, and the Barry Beach Marine Terminal operator, Qube.

During the exercise, the team safely deployed an offshore containment and recovery boom, an oil spill response skimmer system and set up the vessel dispersant spray system from the *Skandi Feisten*.



Participants in the oil spill response exercise onboard the *Skandi Feisten*

ExxonMobil Australia is a founding member of the Australian Marine Oil Spill Centre, which is a co-operative enterprise established by the petroleum industry to provide response equipment and expertise in the event of a major oil spill. ExxonMobil Australia is also represented on the Marine Board of Victoria's Oil Spill Committee.

In the unlikely event of a major spill, Esso has access to additional Federal, Victorian and other State government support resources, as well as international resources based in Singapore and Southampton (UK).



Fishing nets typically used by local commercial fishers

7 Stakeholder engagement

Esso aims to maintain stakeholder confidence and trust in the company and its decommissioning activities through informative, inclusive and timely engagement and communications.

7.1 Stakeholder engagement framework

Through its stakeholder engagement framework, Esso aims to keep government, non-government organisation and community stakeholders informed about decommissioning activities. This includes ensuring that stakeholders are consulted on an ongoing basis about matters that affect them.

Key principles of Esso's stakeholder engagement framework include:

- providing meaningful information in a format and language that is readily understandable and tailored to the needs of stakeholders
- providing information that is timely and easily accessible to stakeholders
- establishing two-way dialogue and clear reporting mechanisms that allow stakeholders to have their issues heard and addressed
- inclusiveness in the representation of views, particularly for minority and special interest groups
- incorporating stakeholder feedback into Decommissioning Program design.

Throughout decommissioning, Esso will maintain ongoing consultation with relevant community,

government and non-government stakeholders to share information, receive feedback and respond to any concerns.

This includes identifying and addressing potential socioeconomic issues such as impacts on jobs and businesses, and commercial fishing grounds.

Stakeholder consultation is conducted in a way that suits the needs of stakeholders and includes meetings, individual discussions, emails, fact sheets, forums and round tables, website updates, social media posts, and media announcements.

All communication with stakeholders is documented, with any issues or grievances raised registered. Actions are tracked to resolve issues or grievances, and feedback is provided to stakeholders as required.

A Stakeholder Engagement Plan has been developed for the decommissioning of Bass Strait facilities. Specifically with regard to the Deviation Environment Plans, the Stakeholder Engagement Plan aims to ensure relevant people as described in subregulation 11A (1) of the *Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009* are consulted about proposed decommissioning concepts.

7.2 Collaboration

As operator of some of Australia's oldest oil and gas assets, and with a substantial plug and abandonment program already underway in Bass Strait, Esso is committed to working collaboratively with industry and the community to address the challenges and maximise the opportunities of decommissioning Australia's aging oil and gas infrastructure.

As part of this commitment, Esso was among the first oil and gas companies to join the Centre of Decommissioning Australia (CODA), which was established in March 2021 by National Energy Resources Australia – Australia's Industry Growth Centre for the energy resources sector.

CODA has appointed six industry leaders to form its inaugural Supervisory Committee, including Esso's Decommissioning Manager, Richard Perry. The Committee is the core of CODA's strategic focus and decision-making and serves to collectively answer strategic questions about decommissioning concepts based on technical, safety and environmental knowledge.

"Our expert team will be working closely with government and non-government stakeholders including the newly formed Centre of Decommissioning Australia. With the broad geographical expanse between major basins in Australia, CODA will be a crucial conduit to enable optimisation for all parties throughout the supply chain and it is very exciting to be part of this journey."



Richard Perry, Decommissioning Manager

CODA has announced a series of foundation projects designed to rapidly accelerate cross-industry understanding of Australia's decommissioning challenges including:

- understanding opportunities for local disposal and recycling
- a global review of decommissioning planning and execution learnings
- development of a decommissioning innovation and technology roadmap.

These projects, along with other work proposed by CODA, represent critical early-stage building blocks in delivering CODA's objective of maximising value for Australia from decommissioning activities.

7.3 Government engagement

Esso is committed to keeping interested government agencies informed of actions and progress relating to decommissioning activities in Bass Strait.

During the year, Esso engaged with several regulatory bodies, including NOPSEMA and the National Offshore Petroleum Titles Administrator (NOPTA), to share information about the Decommissioning Program.

In November, Esso and the Department of Agriculture, Water and the Environment began initial discussions on the potential applicability of the *Environment Protection (Sea Dumping Act) 1981* and *Environment Protection and Biodiversity Conservation Act 1999* to decommissioning activities.

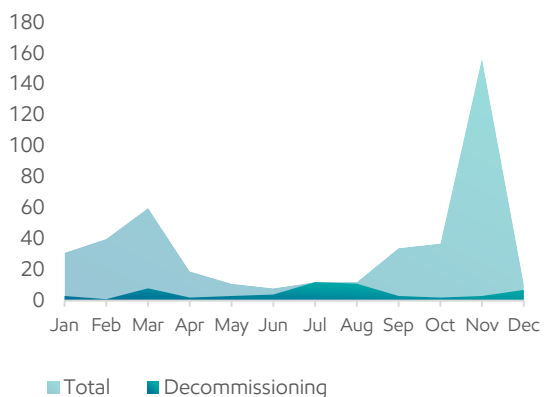
7.4 Community engagement

Esso has begun early-stage community engagement activities for the Decommissioning Program. In 2021, this predominantly involved email and phone communications as face-to-face engagements were limited by COVID-19 restrictions.

More than 430 engagements were conducted during the year, with almost 60 of these directly related to decommissioning activities (see Figure 7-1).

Decommissioning-related engagements primarily focused on communications with the fisheries industry including SETFIA, the *Panama II* octopus fishing vessel and the Fishermen's Tribunal.

Figure 7-1: Engagements conducted in 2021 (number)



With COVID-19 restrictions beginning to ease across Victoria in December, several face-to-face engagements were held in the Lakes Entrance area with representatives from commercial and recreational fishing groups. These engagements focused on providing information on decommissioning planning progress, seeking stakeholder input on future engagements and scheduling engagements for February 2022.

Other engagements conducted during the year included communications regarding the:

- oil spill offshore field exercise
- noise monitor placement around various platforms
- demobilisation of the Seven Eagle support vessel
- Long Island Point community and stakeholder session
- Longford community and stakeholder session
- regular engagement with local council
- Hastings Generation Project initial engagement.



Panama II octopus fishing vessel

Face-to-face engagements will continue to increase in 2022 in line with the lifting of pandemic restrictions.

Further information

For further information, please contact our stakeholder engagement team at:

consultation@exxonmobil.com

Alternatively, our Head Office for the ExxonMobil companies in Australia can be contacted by calling:

+61 3 9261 0000

or writing to:

GPO Box 400 Melbourne VIC 3001.

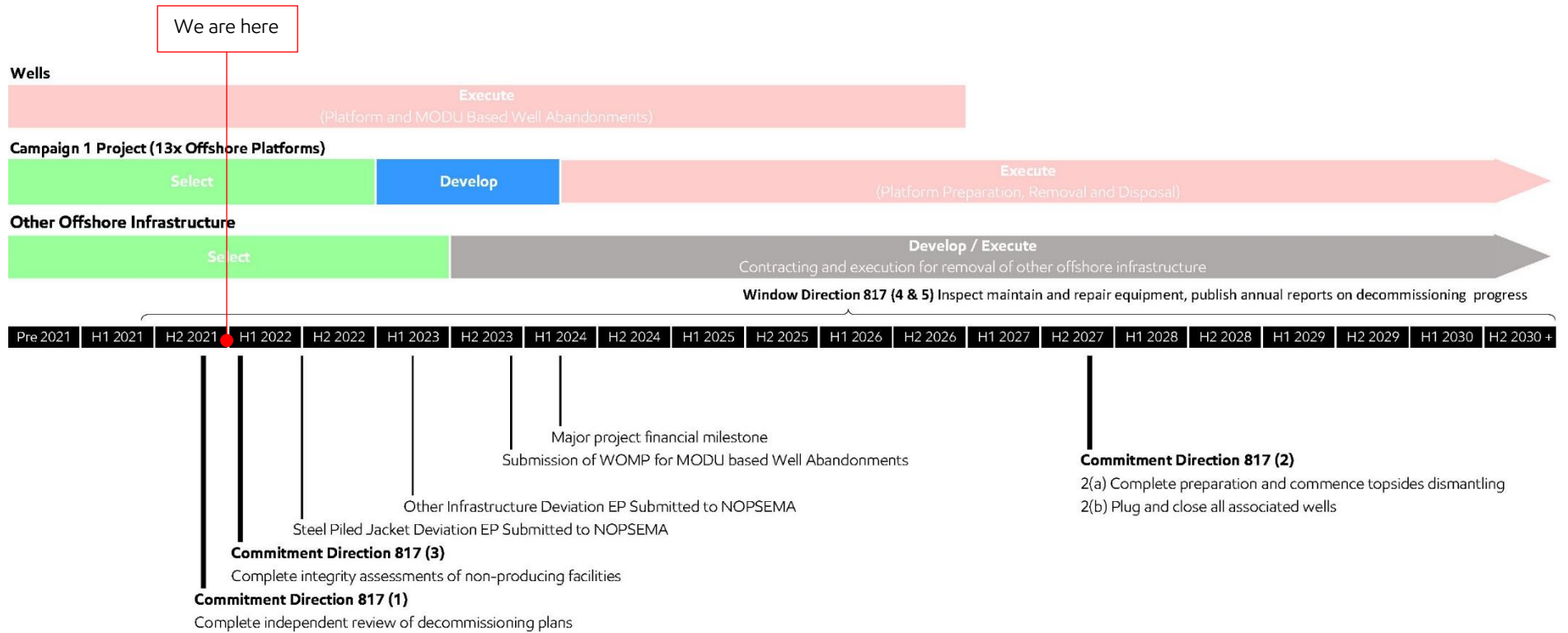
Acronyms

Acronym	Definition
AIMS	Australian Institute of Marine Science
ALARP	As Low As Reasonably Practicable
BHP	BHP Petroleum (Bass Strait) Pty Ltd
CODA	Centre of Decommissioning Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPMS	Decommissioning Project Management System
EMCAPS	ExxonMobil Capital Project Management System
Esso	Esso Australia Resources Pty Ltd
FIMS	Facility Integrity and Maintenance System
HLV	Heavy Lift Vessel
km	kilometre
LOFT	Leadership for Operations – Framework for Training
m	metre
MODU	Mobile Offshore Drilling Unit
MPSV	Multi-Purpose Support Vessel
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
OIMS	ExxonMobil Operations Integrity Management System
ROV	Underwater remotely operated vehicle
SETFIA	South East Trawl Fishing Industry Association Pty Ltd

Appendix A

General Direction 817 Status

Indicative schedule: Gippsland decommissioning milestones and direction



General Direction 817: Project progress and look ahead

General Direction 817 Direction		Key Work Plan Items	Progress to date	Look ahead next 12 months
1a	Commission an independent and suitably qualified body to complete a review of the engineering and project management approach to decommissioning activities to identify opportunities and propose measures to reduce the timeframe for commencing and subsequently completing all necessary decommissioning activities.	Commission independent report and implement reasonable and practicable measures	Report completed and submitted to NOPSEMA 16 November, 2021, included a summary of measures to be implemented. Direction 1 closed	Continue to implement remaining measures as the opportunity arises in the project schedule
1b	Submit a report to NOPSEMA within 180 days from the date this direction is signed, detailing the outcomes of this review and recommended measures.			
1c	Implement reasonable and practicable measures based on the review and recommendations that would likely reduce the timeframe for commencing and completing all necessary decommissioning activities.			
2a	Complete all preparatory decommissioning activities and commence the topside dismantling campaign as soon as reasonably practicable, and no later than 30 September 2027, for removal of all structures, property, and equipment no longer in use that are associated with facilities listed in Schedule 3.	Regulatory compliance for all activities Contract specialist Removals Contractor to complete removal and disposal of offshore assets	Developed and implementing Regulatory compliance plan for Campaign 1 activities Contracting plan developed and pre-qualification process complete	Submit relevant safety cases and environment plans Complete technical tendering for facility removal contracting
2b	To plug or close, to the satisfaction of NOPSEMA, all wells associated with the titles listed in Schedule 3, as soon as reasonably practicable and no later than 30 September 2027.	Plug and abandon all wells associated with Campaign 1 assets Well Operations Management Plan for Well Abandonment Stakeholder consultation on decommissioning plans	Multi-Purpose Support Vessel (MPSV) contracted to support specific decommissioning activities Continued to progress P&A program Continued stakeholder engagement	MPSV mobilisation Continue to progress P&A program Continue stakeholder engagement activities

General Direction 817 Direction		Key Work Plan Items	Progress to date	Look ahead next 12 months
3a	Conduct an integrity assessment of all equipment, structures and property associated with the Perch and Dolphin facilities located within titles VIC/L15 and VIC/L17, to demonstrate that full removal of structures, property and equipment will not be precluded.	Complete Perch and Dolphin integrity assessments	Perch and Dolphin integrity assessments completed; reports submitted to and accepted by NOPSEMA	Submit remaining facility integrity assessment reports to NOPSEMA
3b	Provide a preliminary report on the outcomes of the integrity assessment of Perch and Dolphin facilities to NOPSEMA within 90 days from the date of this direction is signed, and a detailed report no later than 31 January 2022.	Complete remaining facility integrity assessments	Remaining facility integrity assessments complete	
3c	Conduct a separate integrity assessment of all equipment, structures and property, other than those identified at Direction 3(a) that are in a non-producing state, within the titles listed in Schedule 3, to demonstrate that full removal of structures, property and equipment will not be precluded.			
3d	Provide a report on outcomes of the integrity assessment conducted as required under Direction 3(c) to NOPSEMA as soon as practicable and no later than 31 January 2022.			
4a	The registered holder must undertake inspection, maintenance and repair activities on all property and wells associated with facilities listed in Schedule 3 to ensure: <ul style="list-style-type: none"> i. property continues to perform its intended function, which in the case of non-producing facilities includes preparation for (or support of) decommissioning activities as well as supporting other facilities which may still be producing hydrocarbons; ii. approved decommissioning end states are not precluded; and iii. occupational health and safety, structural integrity, well integrity and environmental risks continue to be reduced to ALARP. 	Continue to implement the following established systems across all assets: <ul style="list-style-type: none"> • Facility Integrity Management System • Well Operations Management Plan • Offshore Asset Safety Cases Conduct platform maintenance review workshops throughout 2021	Work ongoing per all established asset management safety and integrity plans WOMP renewal proposal submitted to NOPSEMA Maintenance review workshops complete for all assets within the Campaign 1 scope	Continue to implement established assets management safety and integrity programs Continue management of wells in line with the WOMP
5a	Submit to NOPSEMA on an annual basis, a decommissioning progress report detailing progress with implementing the directions and associated decommissioning activities until all decommissioning works have been completed.	Annual Progress Report	Annual Report 2021 submitted to NOPSEMA	Prepare and submit 2022 Annual Report by 31 December 2022
5b	The report submitted under Direction 5(a) must be to the satisfaction of NOPSEMA and submitted to NOPSEMA no later than 31 December each year.			
5c	Publish the report on the registered holders' website within 14 days of obtaining NOPSEMA satisfaction under Direction 5(b).			



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