

# Otway Offshore Project

## 2021-2023 Program



Beach Energy is continuing development of the Otway offshore basin natural gas reserves within existing commonwealth offshore exploration permits and production licenses.

The Otway Offshore Project will ensure ongoing production at the Otway Gas Plant, which supplies natural gas to Victoria. Activities will occur in Commonwealth waters 32 to 80 km from Port Campbell, Victoria.

Activities will run over several phases, starting with assessing seabed locations and existing infrastructure, drilling wells, installing additional seabed infrastructure to tie-in wells to the existing platform and pipeline.

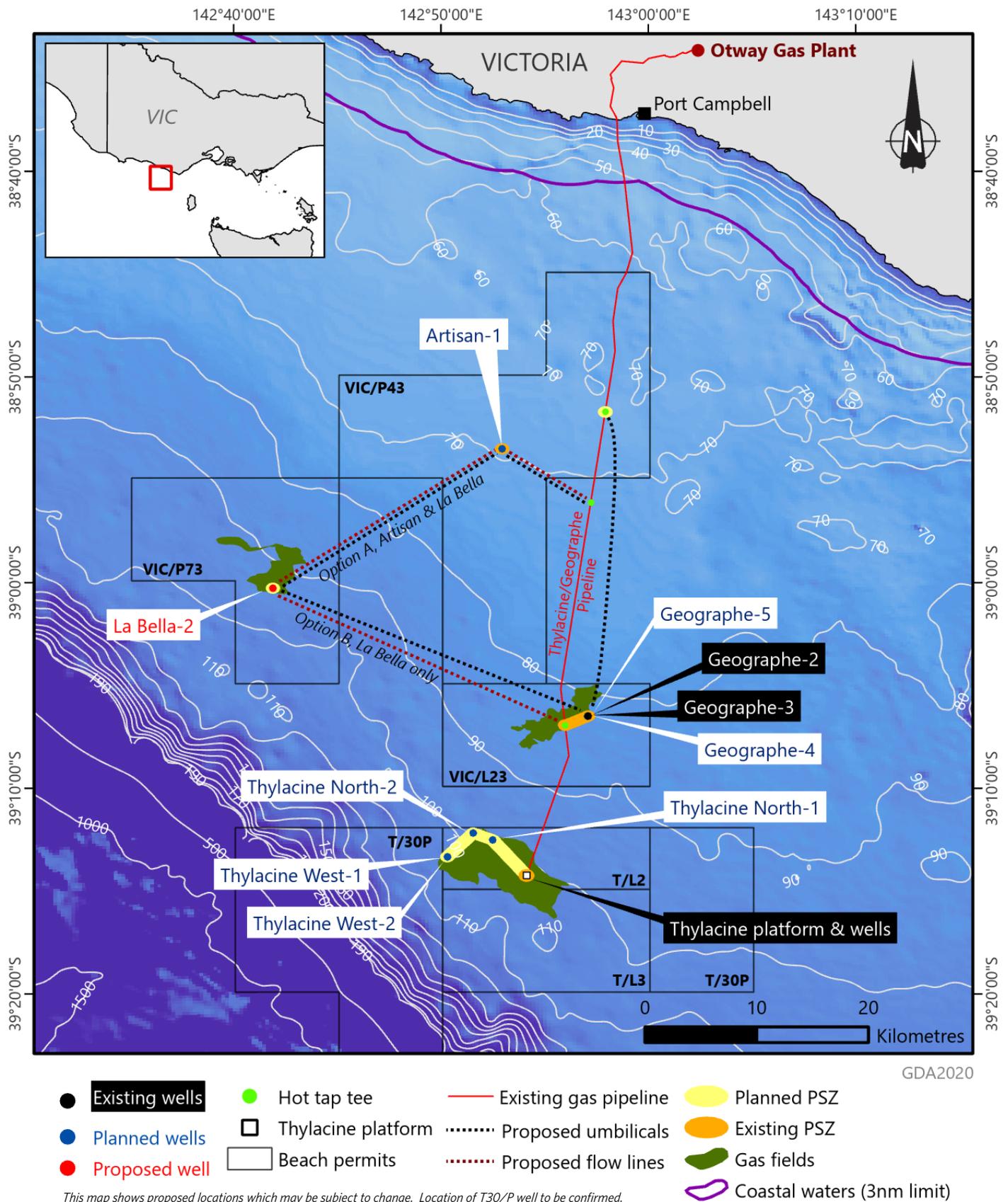


### Project timing

The timeline shows the order of activities over several phases, with indicative timeframes which are to be confirmed.



# Planned and Proposed Locations



# Otway Offshore Background

The unique geological characteristics of the Otway Basin mean it is an abundant source of natural gas which has been produced in the region for many years.

The Otway Offshore Project commenced in 2004 by Woodside Petroleum Ltd under a joint venture arrangement. First gas was produced by Woodside in mid-2007, then in March 2010, Origin Energy Resources Ltd commenced operatorship of the joint venture. In January 2018, Beach Energy (Beach) acquired the Otway Offshore Project assets and is now the operator.

Three development phases have been completed:

- Construction of the Otway Gas Plant
- Construction of the Thylacine offshore platform, subsea and seabed infrastructure
- Exploration and the development of current wells.

A seabed pipeline was constructed from the offshore wells, crossing the shore near Port Campbell, then buried in the onshore section to the Otway Gas Plant.

## Future development

To maintain natural gas production at the Otway Gas Plant, further phases to develop additional offshore wells are being planned.

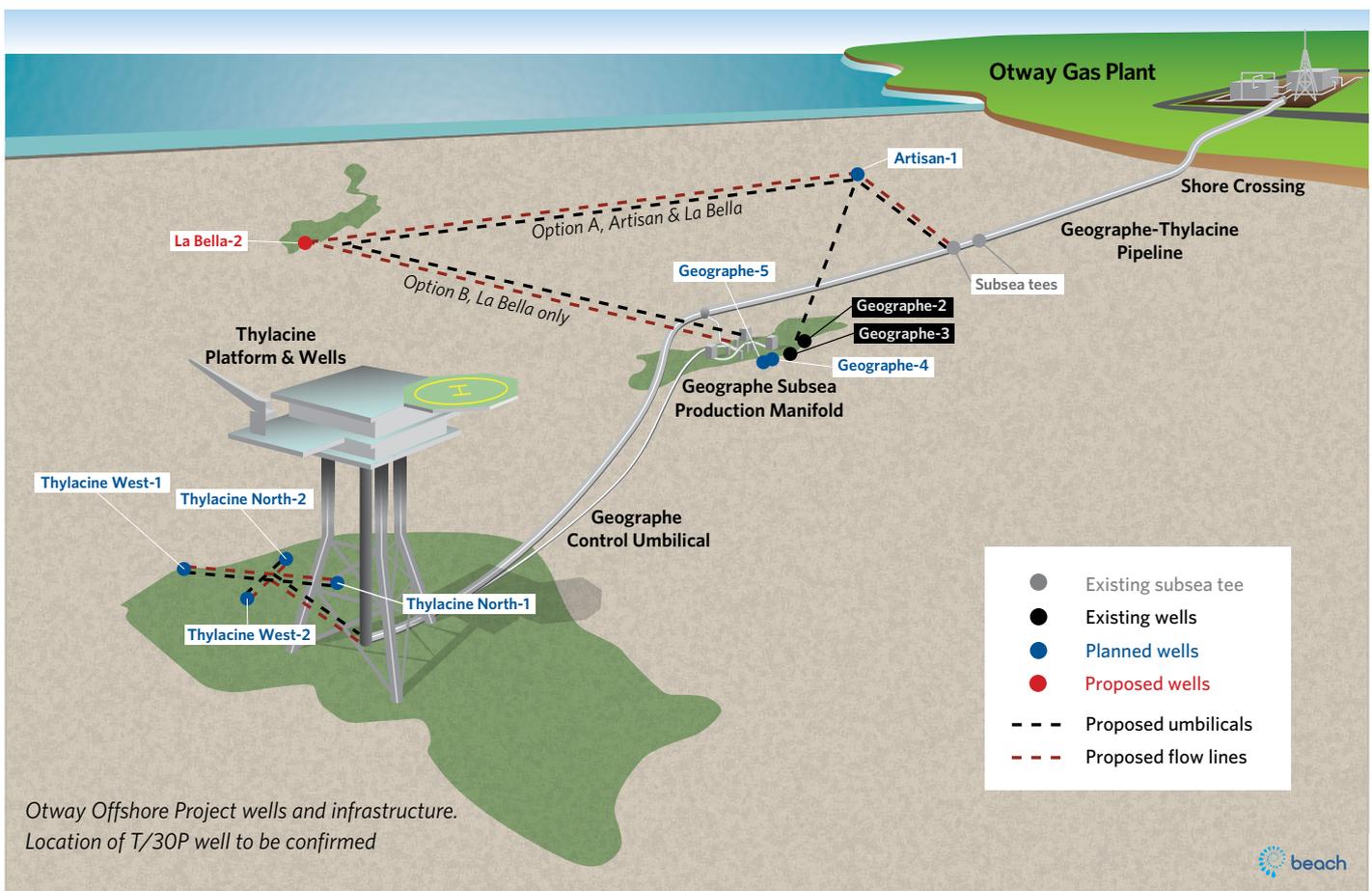
See also link to the Offshore Project Proposal (OPP) Information Sheet for further information on the plan for proposed wells, by visiting [www.beachenergy.com.au/vic-otway-basin/](http://www.beachenergy.com.au/vic-otway-basin/).

Beach holds offshore exploration permits and is required to complete exploration activities within timeframes set by the Commonwealth National Offshore Permit Titles Administrator (NOPTA).

Beach also has existing production permits and offshore gas facilities in the area already extracting natural gas which is processed at the Otway Gas Plant near Port Campbell. The proposed activities will enable ongoing production and supply to the Australian gas market.

## Consultation and feedback

This information sheet provides an overview of activities, the regulatory framework for safety and environment protection, potential impacts and risks in carrying out these activities, and measures to reduce and manage them, in accordance with Commonwealth regulations. It has been prepared to inform stakeholders, invite feedback and seek consultation with stakeholders who may be affected by the activities.



# Environment Protection

## Regulatory framework

Activities are regulated under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGs Act) which requires an Environment Plan (EP) for each activity type. Environment Plans are assessed by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) who regulates activities under the OPGGS Act.

Environment Plans must include a description of the existing environment and the proposed activity, an evaluation of the impacts and risks associated with the activities, environmental performance outcomes and standards, implementation strategy, and reporting requirements. Beach must demonstrate in the Environment Plan, how it will conduct the activities to ensure that potential impacts and any residual risks are reduced to "As Low As Reasonably Practicable" (ALARP) and of an acceptable level.

In developing the Environment Plans, relevant up-to-date technical and scientific studies will be taken into consideration, along with stakeholder feedback.

Environment Plans will be publicly available on the NOPSEMA website: [www.nopsema.gov.au](http://www.nopsema.gov.au)

## Oil pollution emergency plan

An Environment Plan must also include an Oil Pollution Emergency Plan (OPEP) for managing any hydrocarbon release.

When conducting offshore activities, there is an unlikely risk of release of hydrocarbons (which are primarily gas) or a spill from vessels in the event of an accident. Beach will review its existing Oil Pollution Emergency Plan (OPEP) to ensure it includes potential spill risks associated with the proposed activities. The OPEP forms part of the Environment Plans required to be accepted by NOPSEMA for each activity.

Preparing an OPEP involves using hydrocarbons spill modelling information for the local area using the most conservative credible case scenario. The modelling calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the volume and physical and chemical properties of possible spills event. The plans also assess the likelihood and consequences of any oil spill which must be reduced to ALARP through a range of control measures and include detailed response plans.

An Oil Pollution Emergency Plan describes the arrangements for responding to and monitoring any release of hydrocarbon and includes:

- The control measures necessary for rapid response
- Response arrangements and capability in place to ensure rapid implementation and provide for the ongoing maintenance of capability
- Response arrangements and capability in place for monitoring oil pollution to inform response activities as well as monitoring the effectiveness of these activities

These arrangements are based on the worse case spill event associated with the proposed activities to ensure that Beach has the appropriate level of response arrangement and capability.

## Marine environment

Beach recognises the environmental, heritage, social and economic values in the areas in which we operate.

The activities will be conducted in water depths ranging from 60 to 500 metres where there is a variety of marine fauna including the potential presence of:

- Blue, humpback and fin whales, particularly during the summer months
- Southern right and minke whales, particularly during the winter months
- Common dolphins and sharks species throughout the year
- New Zealand and Australian fur seals throughout the year
- Loggerhead, green turtle and leatherback turtles throughout the year
- Commonwealth managed fisheries, including: southern and eastern scalefish and shark; and southern squid jig fishery
- Victorian managed fisheries, including: rock lobster and giant crab
- Commercial shipping activity.

The Australian Marine Parks, Apollo and Zeehan, and State Marine Protected Areas, Twelve Apostles Marine National Park and The Arches Marine Sanctuary, are outside the proposed activity areas at a minimum distance of 20km.

# Operating Safely

## Maritime safety

At Beach, safety is our number one priority. The marine vessels and drill rig contracted by Beach will operate in accordance with Australian Maritime Standards, regulated by the Australian Maritime Safety Authority (AMSA) and will have their specific safety cases reviewed and accepted by NOPSEMA. This includes adherence to the following protocols at sea:

- Notifications to AMSA will be issued by the vessel contractor and drilling rig operator before they mobilise to the permit areas, and before demobilisation
- Communication with other vessels and marine users will occur using standard maritime protocols
- Safe operating distances will be maintained around all vessels and the drilling rig at all times

## Exclusion zones

During drilling, all vessels are required to observe a 2 km radius cautionary zone around the drilling rig. The cautionary zone is to allow for anchors, mooring chains and wire to be placed within the operational area during the drilling program. Exact locations of mooring chains and anchors will be made available at commencement of drilling each well.

There will also be a Petroleum Safety Zone (PSZ), which is a safety exclusion zone of 500 m around the drilling rig for each well. The PSZ is a formal safety exclusion zone and will be communicated via a 'Notice to Mariners' placed with Australian Hydrographic Office (AHO) outlining the exclusion zone and timeframe for the activities. PSZs for the well heads installed on the ocean floor will remain in place after drilling. New PSZs will be created for seabed infrastructure required to connect the well heads to the existing Thylacine pipeline and offshore platform. Existing and proposed PSZs are shown on the map above.

To avoid entanglement and safety risks, fishing nets, lines or pots should not be placed near seabed assessment areas or drilling exclusion zones. The safety exclusion zones will be monitored by supporting vessels once the drilling rig is anchored into position.

## Commercial fishing

The project activities will occur among commercial shipping routes and designated Commonwealth and State fisheries which cover vast areas. The seabed assessments and drilling activities require access to relatively small areas for short periods of time.

We are committed to minimising the impact of our activities and will consult with commercial fishers on arrangements to ensure each other's operational plans are understood, helping to minimise any impacts to fishing activities and to the Otway Offshore Project.

## Locations

All activities will take place in Commonwealth waters approximately 32 to 80 km from Port Campbell. The map on page two shows the locations of planned and proposed drilling activities. Further seabed assessment locations and drilling locations are to be confirmed.

Coordinates of all locations will be made available to relevant stakeholders after completion of planning, and if there are any changes.

## Project timings

The timeline on page one shows indicative time frames of the different activities. Drilling will commence mid-February 2021 with the Artisan exploration well. Start dates and durations of further wells to be drilled will be provided to relevant stakeholders after final plans and regulatory approvals are confirmed.

Approximate durations of key activities are:

- Seabed assessments: 3 to 12 days each
- Exploration wells: 35 to 55 days each
- Production wells: 70 to 90 days each

After activities commence, exact timings will also depend on fair sea state conditions.

## Regular updates

Any potentially impacted stakeholders will be provided with specific locations and timings prior to the commencement of the activity and can opt-in to a SMS message service for updates, simply by phoning or emailing Beach to provide their contact details.

# Seabed Assessments

## Purpose

Seabed assessments involves mapping the topography of the seabed and any features immediately below the seabed, along with measuring water depth and temperature.

This important pre-drilling activity is carried out to:

- Identify any identify possible hazards from man-made, natural and geological features which may compromise the positioning of a drilling rig
- Determine suitable locations for anchoring and rig placement for drilling operations, and for installing infrastructure to tie-in new wells to the existing platform or pipeline
- Inspect existing seabed infrastructure for future tie-ins.

## Approach and equipment

A range of commonly used techniques and equipment is used depending on different marine environments. The survey vessel may use a range of equipment, such as:

- Single-beam dual-frequency echo sounders, to measure water depths
- Motion-corrected multi-beam echo sounders, to conduct bathymetry mapping of water depths
- High-resolution side scan sonars for delineating seabed features

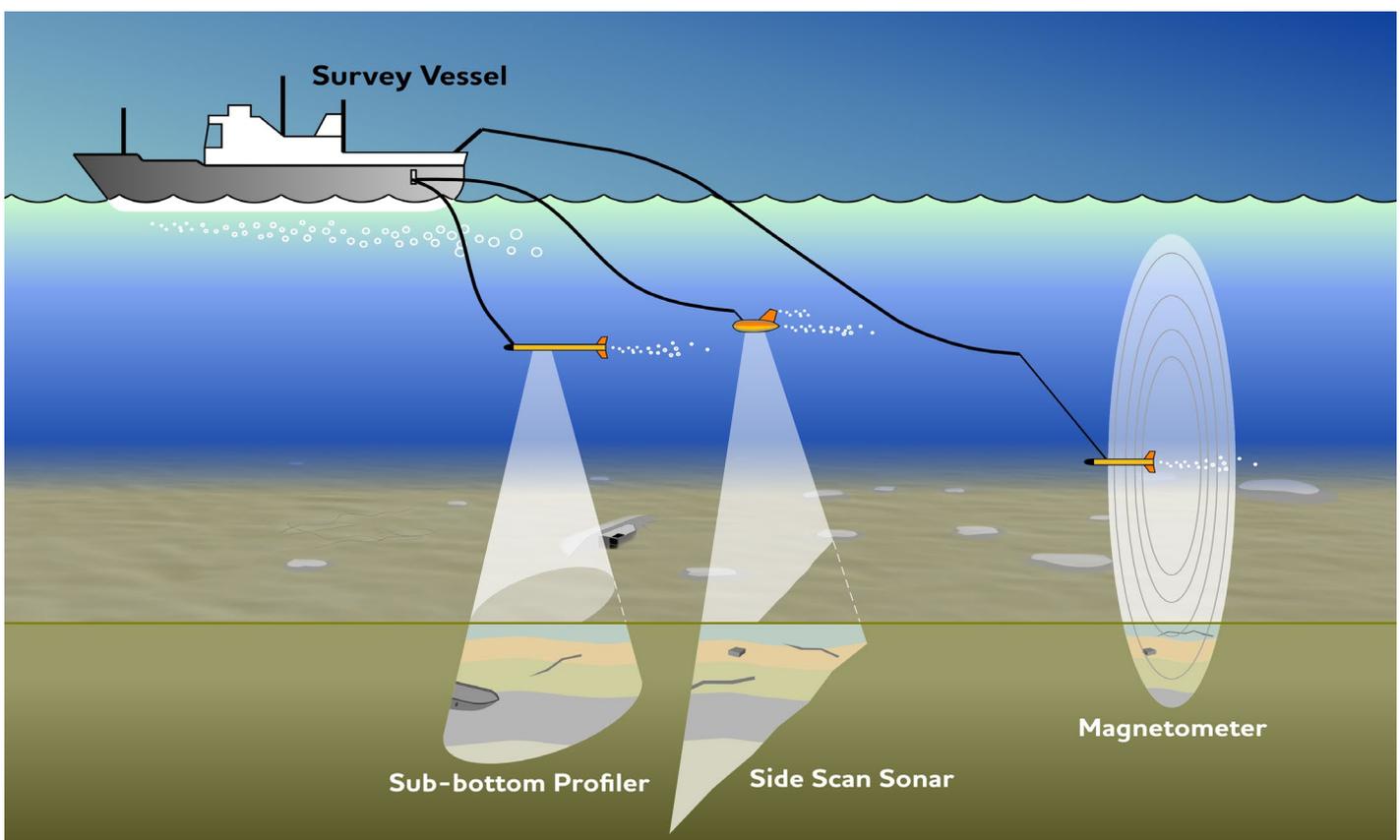
- Sub-bottom acoustic profilers used to acquire and assess features immediately below the seabed
- Marine magnetometer, to detect and map ferrous objects such as sunken ships, anchors and pipelines
- Seabed grab samples may be taken at the seabed
- Core samples may be taken as far as 6m below the seabed to confirm if the seabed will be suitable for the drilling rig to anchor and the subsea infrastructure to be installed.

Sound from the seabed site assessment equipment is significantly lower intensity than that produced from seismic surveys. An assessment of sound impacts on marine fauna is undertaken and included in Environment Plans for each project.

The diagram below shows a common setup for seabed site assessments.

## Completed Seabed Assessments

In February 2020, Beach successfully completed the first phase of seabed assessment activities. To view Beach's completed seabed assessment locations and further proposed seabed assessments for the T30P permit area, see the information sheets at: [www.beachenergy.com.au/vic-otway-basin/](http://www.beachenergy.com.au/vic-otway-basin/)



# Offshore Drilling

The program currently includes up to 8 wells to be drilled over approximately 18 to 24 months. The start date will be sometime after 1 October 2020 and stakeholders will be advised once the date is confirmed.

Two different types of wells are proposed as part of the drilling program:

- **Exploration well**

The first well drilled into a prospective gas reservoir to prove if hydrocarbons exist.

- **Production well**

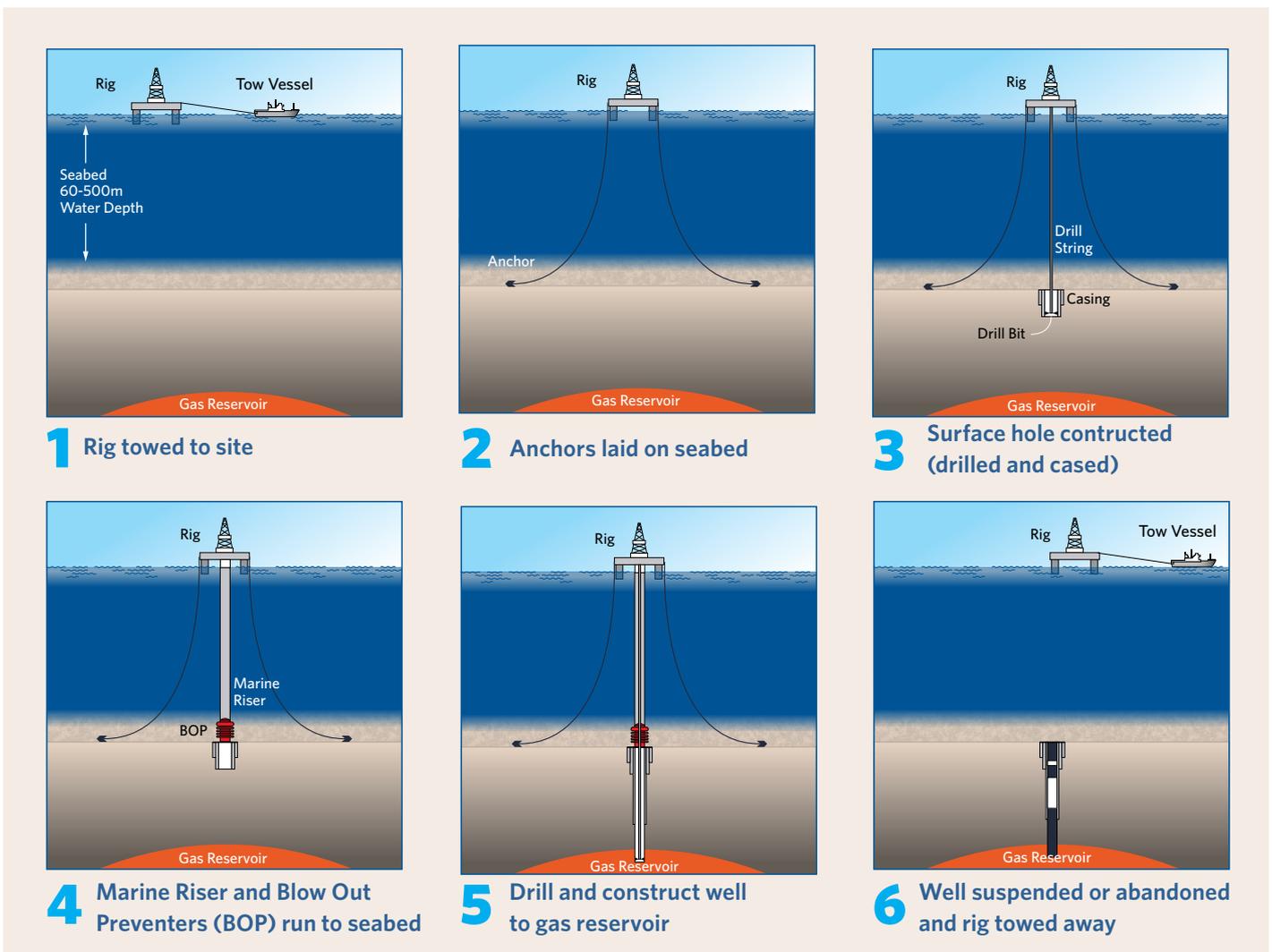
A well that has successfully reached a proven reserve and will be tied into seabed infrastructure to supply raw gas for processing.

## Approach and equipment

Beach has contracted the Diamond Ocean Onyx semi-submersible drill rig for the Otway Offshore project.

The approach to drilling is summarised in the following steps and shown in the diagram below:

- Using an approved shipping route, up to two tugs will tow the rig into place
- Anchors will be pre-laid by specialist anchor handling vessels and the rig will be anchored at sites determined as suitable by the seabed assessments
- A surface hole will be drilled and cased, then a Marine Riser and Blow Out Preventer installed
- The well will be drilled to the reach the gas reservoir beneath the seabed
- The well will then suspended for future production or, if unsuccessful it will be discontinued
- The rig will be moved from one well to the next, repeating the anchoring and drilling process
- After all wells are completed, the rig is towed to an agreed demobilisation point.



An outline of the drilling process that will be used in the offshore Otway Basin drilling program

## Drilling methodology

Beach will use a typical semisubmersible drilling rig commonly used in Australian waters. It can operate in waters up to 3,000m deep, drill for gas at up to 10,000m deep and accommodate around 150 crew.

Once the drilling rig is in position and anchored at the well site, a surface hole will be drilled and cased, followed by installation of a Marine Riser and Blow Out Preventer (BOP). Weighing approximately 244 tonnes and measuring 14m high, the BOP is a highly specialised valve unit used in all offshore drilling. The BOP is used to shut-in and seal off a well for planned operations such as pressure testing and in the event of a pressure build up or 'kick'. It ensures well integrity throughout the drilling process, ongoing safety of personnel and prevention of any environmental incidents.

The drilling process will use four or five stages of drilling, starting with a 36- inch drill head. Drilling will then reduce in diameter to consecutively smaller sizes until it reaches the end target depth. For each section, a casing will be placed in the hole and cemented, then a smaller drill will be run through the casing to drill a smaller hole to the next target depth and the process repeated to reach the target.

## Drilling muds

Offshore drilling operations typically use both water based and synthetic based fluids called 'muds' to lubricate and stabilise the wellbores in each section and remove drilling cuttings. Drill cuttings are the extracts of sedimentary layers that emerge from the drilling process and will range from very fine to coarse sizes.

Water based mud will be used in the upper drilling sections to remove extracts of sedimentary layers called cuttings. These cuttings will not require any treatment and will be deposited onto the seabed.

Synthetic based fluid will be used in the lower drilling section and produces cuttings that will require treatment to recover the fluid from the cuttings. The cuttings will be processed on the drilling rig before they are discharged overboard where they will settle rapidly on the seafloor around the well site. The cuttings will contain small levels of base fluid, which will quickly biodegrade. This is standard industry practice in Australia.

Marine mammals and fish may transit through these areas but will usually avoid the disturbance. Any exposure to suspended sediment before it settles on the seabed would be highly localised and temporary due to high dilution and fast dispersal in the water column.

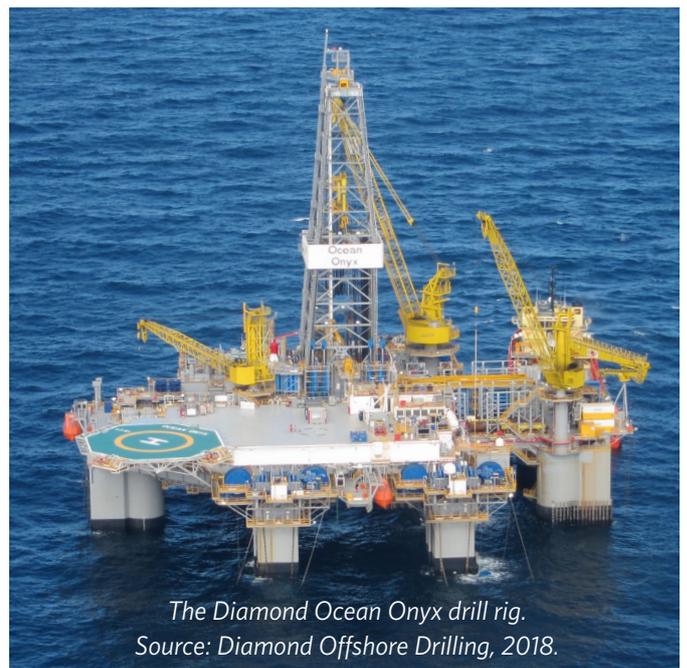
## Well evaluation

After an exploration well is drilled, a process called Vertical Seismic Profiling (VSP) may be required to evaluate the well. VSP produces a high-resolution seismic profile along the well which enables the well drilling data to be correlated with the existing seismic survey data. The technology works by using a small seismic energy source at surface near the well and receivers in the wellbore that record the signal. If VSP is required, sound levels will be determined to enable an impact assessment and any required mitigations.

## Well completions

Some seabed infrastructure for tying in wells is already in place and connected to the existing pipeline that flows raw gas to the Otway Gas Plant for processing. Additional infrastructure will also be installed for wells further away from the current infrastructure.

After a production well has been determined as commercially viable, it will be completed, commissioned and tied-in to the pipeline to flow the raw gas. A successful exploration well will be suspended for future access. Wells that are not commercially viable wells will be discontinued through a formal process called 'plug and abandon'.



The Diamond Ocean Onyx drill rig.  
Source: Diamond Offshore Drilling, 2018.

# Questions and Answers

## How long will drilling take and when will you start?

Each exploration well will take between 35 to 55 days and each production well, between 70 to 90 days. The entire drilling program will take around 18 to 24 months. Drilling will start mid-February 2021 and will continue to approximately the end of 30 December 2023. All timings will depend on final project planning, regulatory approvals, and fair sea states.

## How is the drilling rig secured?

Once the drilling rig has been towed to the well site, supported by an 'anchor handling vessel', the tug boats will run out eight anchoring lines which may extend to a kilometre. Specifically designed marine anchors, around 15 – 20 tonnes each, will be used to moor the drill rig. Positioning of the anchors will be determined by a rigorous mooring analysis, based on the results of the seabed site assessment and year-round weather data for the area.

## Will the drilling rig be visible from land?

Given the distance from the shore, the drilling rig and support vessels, will have low visibility from the land and may appear similar to other shipping activity. Gas flaring will be required for the proposed production wells as part of the final testing and completions.

## How many people will work on the drilling rig?

There will be up to 150 crew on the drilling rig at any one time. The crew will be transported to and from the rig via helicopter.

## How is safety managed on the drilling rig?

At Beach, safety is our first priority. Offshore drilling activities are highly regulated to stringent safety standards. All drilling rig operations will be managed in accordance with the dedicated Safety Case for the drilling rig, to be accepted by the regulator NOPSEMA. For more information see: [www.nopsema.gov.au/safety/safety-case/](http://www.nopsema.gov.au/safety/safety-case/)

## How will you reduce collision risks?

The marine vessels involved in the activities will operate in accordance with Australian Maritime Standards and ensure safe operations by:

- Having operational and navigation lighting on all vessels
- Maintaining a 24-hour shipping radar watch
- Monitoring and managing safety and exclusion zones.

## What happens after the wells are drilled?

After production wells are drilled and commissioned, they will be tied-in to the existing seabed pipeline which flows the raw gas to the Otway Gas Plant for processing. These reserves are expected to produce for several years. Other wells in this drilling program will be suspended for future use, by placing a standard wellhead of around one to two metres high from the seabed. Positions of wellheads will be notified to Australian Hydrographic Service and recorded on sea charts.

If a well is commercially unviable due to limited gas prospectivity, multiple cement plugs will be installed within the well to permanently seal the well. A cement plug will be installed at the seabed and all casings will be cut at least 2m below mudline, to ensure that the seabed is returned to the same condition prior to drilling. This process is called 'plug and abandon'.

## Will an exclusion zone exist?

The work will occur among commercial shipping routes and designated Commonwealth and State fisheries. Each fishery covers a vast area, whereas the seabed assessments will only require access to relatively small areas. To avoid entanglement and safety risks, fishing nets, lines or pots should not be placed near a seabed site assessment.

There will be a 2 km radius cautionary zone around the drilling rig for avoidance of mooring chains and anchors. There will also be a Petroleum Safety Zone (PSZ), which is a safety exclusion zone of 500 m around the drilling rig for each well. Formal safety exclusion zones will be communicated via a 'Notice to Mariners' placed with Australian Hydrographic Office (AHO). The safety exclusion zones will be monitored by supporting vessels once the drilling rig is anchored into position.

PSZs for the well heads installed on the ocean floor will remain in place after drilling. New PSZs will be created for seabed infrastructure required to connect the well heads to the existing Thylacine pipeline and offshore platform. Existing and proposed PSZs are shown on the map above.

## What about impacts on commercial fishing?

The Project is located within existing designated Commonwealth and State fisheries. Each fishery covers a vast area, whereas the seabed assessments require access to relatively small areas. In February 2020 Beach completed the first phase of seabed assessments. A small number of commercial fishers advised they may operate in the area and Beach provided regular updates on its operations via SMS for the 3-month duration of that activity. No issues arose and Beach will continue this approach for further seabed assessments.

During drilling, to avoid entanglement and safety risks, nets, lines or pots should not be placed near seabed assessment areas or drilling exclusion zones.

Beach is committed to minimising the impact of our activities and will consult with commercial fishers on arrangements to ensure each other's operational plans are understood, helping to minimise any impacts to fishing activities and to Beach's activities

## What about rock lobsters?

Sound from the seabed site assessment equipment will be a significantly lower intensity than seismic surveys. Sound modelling for the project has identified that sound levels will not reach the impact level referred to in the Day et al Report<sup>1</sup> at the seafloor and therefore impacts on rock lobster are not predicted.

There will be minimal impact from drilling activities given the wells are usually on flat seabed and avoid typical rock lobster habitat.

## Will the activities affect whales and dolphins?

Vessels within the permit area will move slowly. Each vessel will have a trained marine mammal observer whose specific task is to notify the vessel master of any whale or dolphin and advise them of suitable protocols to avoid potential impact. Avoidance of whales and dolphins

will be undertaken in accordance with the Environment Protection and Biodiversity Conservation (EPBC) Regulations (2000), including adherence to required speed and distances. All whale sightings will be recorded along with the actions taken to avoid potential impacts.

The seabed assessment equipment operates at high frequencies generally outside the hearing range of whales. Dolphins may hear the higher frequency sounds. However, given the low intensity downward direction of the equipment's beam, any impact to dolphins is expected to be low during the assessment activity.

## Are seabed assessments or VSP the same as a seismic survey?

No, these activities are not the same as a seismic survey which uses different technology to map the geology several kilometres below the seabed. The seabed site assessments only map the surface and immediately below the surface, using echo sounders, sonars and a sub-bottom profiler which operate at a much lower energy (intensity) and medium to higher frequency compared to those used in seismic surveys.

## Will the drilling impact shipwrecks?

The drilling program will not impact any known shipwrecks. Prior to any drilling commencing the completed seabed assessments will ensure a detailed understanding of the marine environment of each well site. Any new information confirmed will be provided to relevant authorities.

## What is ALARP?

ALARP stands for "As Low As Reasonably Practicable". It is an assessment principle commonly used in the oil and gas industry to assess and reduce potential risks and impacts that cannot be completely eliminated. For information on how NOPSEMA assesses ALARP see: [www.nopsema.gov.au/about/our-regulatory-activities/](http://www.nopsema.gov.au/about/our-regulatory-activities/)

<sup>1</sup> Day, R.D., McCauley, R.M. Fitzgibbon, Q.P., Hartmann, K., Semmens, J.M., Institute for Marine and Antarctic Studies, 2016, Assessing the impact of marine seismic surveys on southeast Australian scallop and lobster fisheries, University of Tasmania, Hobart, October. CC BY 3.0.

## Consultation and Feedback

Beach values stakeholder consultation and feedback, which is an important part of the process of preparing Environment Plans.

Beach invites consultation with stakeholders potentially affected by the survey or the drilling, including those stakeholders with specific local knowledge or an interest in the environmental performance of this project. Feedback and consultation will inform the development of the Environment Plans.

If you are seeking further information about this project specific to your functions, interests or activities, or wish to

provide feedback, please contact us. Beach will consider all feedback, including any concerns or objections. Measures will be explored to reduce any impacts and risks, and responses will be provided to stakeholders.

Please be advised that all stakeholder feedback, records of consultation, copies of correspondence, including emails, will be communicated to NOPSEMA in the preparation of the Environment Plans as required by legislation.

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☎ 1800 797 011

🌐 [beachenergy.com.au/vic-otway-basin/](http://beachenergy.com.au/vic-otway-basin/)