Cooper Energy is preparing to drill two gas exploration wells offshore Peterborough from July 2019.

We aim to find new gas resources which can be integrated with existing offshore production operations to bring new energy supply to Victoria.

Overview of activities
Cooper Energy is conducting gas exploration around its existing production operations offshore Peterborough.

Exploration activities include:
- seabed assessments conducted in April to confirm the suitability of the seabed for safely anchoring the drilling rig
- drilling of two offshore gas exploration wells: Annie-1 and Elanora-1
- plugging and abandonment of the wells on completion

Drilling rig Ocean Monarch, shown here doing operations for Cooper Energy in 2018 will return to the Otway Basin in 2019 to drill two exploration wells.

Program objectives
The offshore Otway Basin is already an important source of gas for south-east Australia. This program will target new prospects that can be developed and connected to existing pipeline and processing infrastructure in the region, to support its ongoing operation.

Locations
All activities will take place in waters regulated by the Commonwealth government. Annie-1 is located approximately 16 km from Port Campbell and 9 km from Peterborough. Elanora-1 is located approximately 38 km from Port Campbell and 31 km from Peterborough. The locations of the two wells are illustrated in a map on the following page.

Timing and milestone announcements
The Ocean Monarch drilling rig is expected to arrive on location to drill the first well, Annie-1, in mid-July.

The date of arrival will depend on the completion of the rig’s current work program in the Bass Strait. Cooper Energy will announce the expected arrival of the rig as dates become certain.

Each well is expected to take approximately 30 days to drill.

Cooper Energy will announce the commencement of drilling and results of each well.
2019 Offshore Otway Drilling Locations

Drilling operations

Offshore drilling operations typically use either water-based or synthetic based fluids to lubricate and stabilise the wellbore in each section, as well as to remove rock cuttings via circulation.

Only water-based fluid will be used in the drilling of these exploration wells. The drill cuttings recovered will not require any treatment and will be deposited on location.

Offshore drilling also requires the installation of specialised equipment to ensure integrity of the well and safety of all personnel post drilling of the surface hole.

Equipment such as a marine riser and blow out preventer (BOP) will be installed to prepare for drilling the reservoir.

Once drilling of a well is complete, the well will be evaluated using special tools run on a wireline. Regardless of whether the wells discover gas or not, both wells will be fully plugged and abandoned.
Cooper Energy gas operations in Otway Basin

Drilling operations

The unique geological characteristics of the Otway Basin means it is a source of natural gas which has been produced in the region for many years. The Otway Basin has become an important part of South East Australia’s energy supply together with gas production from Bass Strait.

Production from the Otway and Bass Strait is declining and Cooper Energy, together with other operators, are investing to find and develop new gas resources to meet South East Australia’s energy needs.

Cooper Energy, as operator of the Casino Henry Joint Venture has existing offshore operations in the Otway Basin including:

- the producing Casino, Henry and Netherby gas fields
- associated subsea infrastructure including wells, gas gathering and transportation pipelines, and control umbilical cables
- a 9 km raw gas buried pipeline connecting the fields to Lochard Energy’s Iona Gas plant.

The company’s operations in the region are set to expand through:

- exploration drilling operations planned for 2019 to find new gas resources in the offshore Otway Basin
- the acquisition from BHP of the onshore Minerva Gas Plant located 6 km from Port Campbell and connection of the plant to the Casino Henry gas pipeline system. The purchase of the Minerva Gas Plant has been agreed to occur on the cessation of production from the Minerva gas field.

Cooper Energy values stakeholder consultation and feedback. We’re keen to understand the community’s interests, especially areas of overlap with our operations so we can integrate this into our decision making.

If you’d like to know more about our activities, we would like to hear from you.

You can email us at: stakeholder@cooperenergy.com.au or phone: (08) 8100 4900. You can also find more information on the Community page of our website www.cooperenergy.com.au

The Otway Basin and offshore gas, did you know:

- In recognition of the region’s heritage as “the shipwreck coast”, offshore Otway Basin exploration wells and discovered fields are named after local shipwrecks
- Drilling commenced in the Victorian Otway Basin in the 1920’s and to date over 170 wells have been drilled
- Gas in Victoria was first discovered onshore at Port Campbell-1 by BHP in 1959
- Beach Energy discovered the first commercial onshore gas field at North Paratte-1 in 1979
- Onshore gas production commenced in 1986
- Shell drilled the first offshore exploration well at Pecten-1A in 1967 and made the first offshore gas discovery
- Offshore gas fields have been supplying energy to Victoria for 50 years. April 2019 marked the golden anniversary of first production from the Barracouta gas field in the Gippsland Basin.
- The first offshore commercial gas discovery in the Otway Basin was made at Minerva-1 in 1993 by BHP
- Minerva commenced production in 2005 and is still producing
- 11 offshore gas fields have been discovered and eight are currently in production
- Collectively these fields produced 19% of Victoria’s gas production in 2018
- More than 850 PJ of gas (that’s 850 million gigajoules) has been produced to Victorian customers from Otway Basin gas fields
Environment protection

Cooper Energy recognises the environmental, heritage, social and economic values in the areas in which we operate, and we work with care and respect for the environment and other marine users.

- Our 2019 Offshore Otway drilling is planned within the continental shelf seas in water depths of 60-75 metres.
- From research and experience working in the region we know many marine mammals, turtles, fish, seabirds and shorebirds will be present at particular times of the year. During our 2018 activities we observed Australian fur seals, common dolphin, little penguins, petrels and southern right whales. This year we’ve seen minke whales passing by our survey vessel and through the rest of winter we expect to see other cetaceans that migrate through the region.
- We factor in the presence of these (and other) species during planning and manage activities to minimise impacts and risks to marine life.
- We use our presence in the area to record cetacean observations and provide data to the Australian Marine Mammal Centre to support marine mammal conservation and policy initiatives.
- We also share the area with other offshore industries such as Commonwealth and Victorian fisheries. We engage other marine users during the planning phase and implementation of our activities, so we can understand and address concerns and keep them informed of our schedules.
- We will be working outside of Australian Marine Parks and State Marine Protected Areas.

Cooper Energy has developed an Environment Plan for the proposed activities. The Environment Plan has been assessed and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

The Environment Plan is a comprehensive document that details the environment we operate in and how we will manage our activities to ensure potential impacts and risks are reduced to “As Low As Reasonably Practicable” (ALARP) and an acceptable level.

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

Emergency Preparedness

At Cooper Energy we consider any incident that causes harm to people or the environment to be unacceptable. When planning and conducting our activities we are 100% focused on safety and environmental performance.

Nevertheless, we prepare to be ready to respond to emergency situations should they occur.

We have developed a range of contingency plans including a campaign specific Emergency Response Plan and an Oil Pollution Emergency Plan (OPEP) in consultation and collaboration with State and National response organisations. The OPEP forms part of the Environment Plan accepted by NOPSEMA and contains robust response strategies to protect the environment in the unlikely case of a release.

Further information on the environmental requirements for offshore petroleum activities can be found on NOPSEMA’s website: www.nopsema.gov.au

Maritime safety

Safety is paramount. The marine vessels and drill rig contracted by Cooper Energy will operate in accordance with Australian Maritime Standards, regulated by the Australian Maritime Safety Authority (AMSA) and have specific safety cases 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 drilling rig at all times

Exclusion zones

Some activities will occur in commercial shipping routes and designated Commonwealth and State fisheries areas.

During drilling, all vessels are required to avoid a declared exclusion zone of 500 metres around the drilling rig. This formal exclusion zone will be communicated via a ‘Notice to Mariners’ placed with Australian Hydrographic Office (AHO) outlining the exclusion zone and timeframe for the activities. The exclusion zone will be monitored by support vessels once the drilling rig is anchored. To avoid entanglement and safety risks, fishing nets, lines or pots should not be placed near drilling exclusion zones.

We’re committed to minimising the impact of our activities and have engaged extensively with relevant fishing industry associations. Nevertheless, we encourage commercial fishers to contact us if they regularly fish in the project location and would like more detailed information.
Drilling phase

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

How it all works

The offshore Otway Basin gas exploration program will drill two wells, both of which will fully be plugged and abandoned on conclusion – whether we make a discovery or not.

No infrastructure will be left on the sea floor once the wells are abandoned.

Approach and equipment

A semi-submersible drilling rig will be used to drill each well. Broadly, the steps involved in mobilising the drilling rig and drilling a well include:

- Using up to two tugs to tow the rig into place using designated shipping channels where possible
- Anchoring the rig to the seabed at sites that are environmentally and physically suitable, determined from the seabed site assessment
- Drilling the well to evaluate if a gas reservoir exists beneath the seabed
- Isolating formations with steel casing and cement
- Placing cement plugs in the well to seal off and isolate any possible hydrocarbon or water zones
- Cutting the wellhead from the well and recovering it to the rig
- Perform a seabed survey to ensure the seabed is clear
- Moving the rig from one well to the next and repeating the anchoring and drilling process
Questions and Answers

Why was this area chosen for gas exploration and development?

The Otway Basin is an important and longstanding source of gas supply for Victoria. The region has eight offshore fields currently producing gas and a number of prospects which are considered to hold the potential for development should economic resources be proven.

What is an Environment Plan and who assesses it?

An Environment Plan is required under the Commonwealth legislation, the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Regulations), to conduct petroleum activities in Commonwealth waters.

The content requirements for an Environment Plan are set out in the Regulations and 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.

In Commonwealth waters Environment Plans are assessed by the Commonwealth National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Are seabed assessments the same as a seismic survey? What is the difference?

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. Cooper Energy has conducted a seabed site assessment process to ensure the area is free from shallow hazards or other obstructions. No shipwrecks were identified during this process.

How does the drilling rig work?

Cooper Energy will use a typical semi-submersible drilling rig used in Australian waters. The rig can operate in waters up to 3,000 meters deep, drill for gas at up to 10,000 meters deep (both significantly greater than we require in the Otway) and can accommodate around 150 crew.

Once the drilling rig is in position and anchored at the well site, the drilling process is expected to use four or five stages of drilling, starting with a 42-inch diameter drill bit.

Drilling will then reduce in diameter to consecutively smaller sizes until it reaches the end target depth.

For each section, a steel 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. The process is repeated until the wellbore is completed.

How is the drilling rig secured?

The drilling rig will be towed to the well site, supported by an anchor handling supply vessel (AHSV). The AHSV’s will run out eight anchoring lines which may extend to over a kilometre. Specifically designed marine anchors, around 27 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.

How long will drilling take and when will you start?

It’s expected each exploration well will take approximately 30 days. Drilling is expected to start around mid-2019. The entire drilling program will take around 60 days.

What happens after the wells are drilled?

Both exploration wells will be plugged and abandoned using multiple cement plugs within the well to isolate both water and gas zones and permanently seal the well. A cement plug will be installed at the seabed and all casings will be cut at least 2 metres below mudline, to ensure that the seabed is returned to the same condition as prior to drilling.

Will the drilling rig be visible from land?

The drilling rig and support vessels will be visible from land, particularly when at the Annie-1 location. At Elanora-1 the rig and vessels will be adjacent to a shipping lane. As such the vessels will look similar to other vessels in the region. No gas flaring will be conducted.

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. The helicopter will take a direct path to the drilling rig and will fly at an altitude unlikely to cause disturbance to activities on the ground or sea surface.

What are drill cuttings? How are they dealt with?

Drill cuttings are the extracts of sedimentary layers (rock) that emerge from the drilling process and will range from very fine to coarse sizes. Due to the use of a water-based drilling fluid (mud) the cuttings will not require any treatment and can be deposited onto the seabed.

What will Cooper Energy do to ensure safety is maintained on the drilling rig?

Cooper Energy is committed to best practice safety standards. All drilling rig operations will be managed in accordance with the dedicated Safety Case for the drilling rig, accepted by the regulator NOPSEMA, per the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009 (OPPGGS).
Questions and Answers

For more information on Safety Cases see: https://www.nopsema.gov.au/ safety/safety-case/

What is ALARP?

ALARP stands for “As Low As Reasonably Practicable”. It is an assessment principle commonly used in industry to assess and reduce potential risks and impacts that cannot be completely eliminated.

For information on how NOPSEMA assesses ALARP in line with Commonwealth legislation see: https://www.nopsema.gov.au/about/our-regulatory-activities/

What does an Oil Pollution Emergency Plan cover?

An Oil Pollution Emergency Plan is also relevant for gas wells as it describes the arrangements for responding to and monitoring any release of hydrocarbon (including from vessels) and includes:

- The control measures necessary for rapid response
- Arrangements and capability in place to ensure a rapid response is implemented
- Arrangements and capability in place to monitor environmental sensitivities and the effectiveness of response efforts.

We base these arrangements on ‘worst-case’ spill events to ensure Cooper Energy is well prepared to implement a rapid and effective response in the unlikely event of a release.

Will an exclusion zone exist?

Yes, a temporary 500 meter exclusion zone will be in place around the rig while on location at each of the two drill sites. This formal exclusion zone will be communicated via a ‘Notice to Mariner’ placed with Australian Hydrographic Office (AHO) outlining the exclusion zone and timeframe for the activities.

The exclusion zone will be monitored by supporting vessels that will remain in the area once the rig is anchored in position.

There will be no exclusion zones at the well sites once the rig has departed.

How will you reduce the risk of collision with other vessels?

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

- Maintaining a 24-hour shipping radar watch
- Ensuring vessels have a crew to maintain 24-hour visual, radio and radar watch for other vessels
- Equipping vessels with navigation lighting and movements that comply with maritime standards
- Monitoring and managing safety and exclusion zones

Will drilling activities affect whales and dolphins?

There will be minimal impact from drilling activities on whales and dolphins.

We regularly observe passing whales and dolphins while operating in the Otway Basin. We take the opportunity to record data on cetacean observations and provide it to the Australian Marine Mammal Centre to support marine mammal conservation and policy initiatives.

To avoid vessel interactions, we ensure our vessels operate in accordance with the Environment Protection and Biodiversity Conservation (EPBC) Regulations (2000), including adherence to speed and distance requirements.

What about rock lobsters?

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

Will the drilling impact upon commercial fishing?

The well locations are within designated Commonwealth and State fisheries that may be used by commercial fishers.

A temporary 500 meter exclusion zone will be in place around the rig while on location at each of the two drill sites, meaning fishing vessels will need to avoid these areas while the rig is on location.

To avoid entanglement and safety risks, nets, lines or pots should not be placed near the drilling exclusion zones.

The formal exclusion zone will be communicated via a ‘Notice to Mariner’ placed with Australian Hydrographic Office (AHO) outlining the exclusion zone and timeframe for the activities.

Each well is expected to take approximately 30 days to drill. There will be no exclusion zones at the well sites once the rig has departed.

We are committed to minimising the impact of our activities and have engaged extensively with relevant fishing industry associations. Nevertheless, we encourage any commercial fishers to contact us if they regularly fish in the project location and would like more detailed information.
Consultation

Cooper Energy values stakeholder consultation and feedback. We are keen to understand the community’s interests, especially areas of overlap with our operations so we can integrate this into our decision making.

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