# Tight gas and oil: what to expect during exploration

Oil and gas resource development passes through distinct phases: Exploration & Appraisal → Development Planning & Production → End of Well Life & Rehabilitation. This factsheet explains the early phases of exploration and appraisal.

## What is exploration and appraisal?

Geological mapping identifies the possible presence of subsurface oil and gas resources. Exploration then confirms if those resources exist, while appraisal gathers information about the resource to determine whether it could be produced commercially. Many exploration activities do not produce sufficient results for projects to move to the development phases.

Tight gas and oil development in Queensland is at a very early stage. While the Taroom Trough, a geological formation that forms part of Queensland's Bowen Basin, has seen various levels of exploration activity since the 1960s, there has recently been heightened interest and investment from multiple operators in the area.

## Approvals and land access

Before exploring for gas or oil an operating company must hold an Authority to Prospect (ATP), which is granted by the Queensland Government. The company must secure an Environmental Authority before tenure is granted.

For preliminary activities (described below), the company must give written notice to the landholder at least 10 business days before entry and comply with the Land Access Code 2023. No land access agreement with a landholder is required for preliminary activities, but the Code's mandatory conditions apply. The Code includes mandatory conditions relating to matters of coexistence, biosecurity and general conduct that resource companies must comply with when undertaking authorised activities on private land. It also provides detail on issues such as Restricted Land, where resources activities cannot occur.

For advanced activities (anything beyond preliminary activities), the company must first negotiate land access and execute a Conduct and Compensation Agreement (CCA) with the landholder. Work could also proceed if no CCA is reached following a Court process.

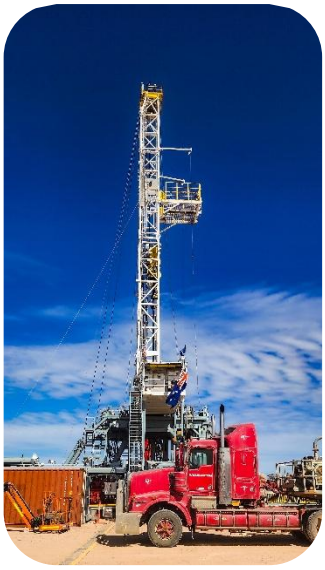
A CCA is a legally binding document that outlines the activities to be carried out, the obligations of the respective parties and compensation entitlements. Biosecurity considerations apply across the entire resource project lifecycle and are a critical component of the land access process.

## What exploration and appraisal involve

Preliminary exploration activities, including scouting or surveying, are the first steps taken by companies. The primary activity at this stage is seismic surveying. These surveys use specialised vehicles and devices on roads and tracks to map underground rock formations and geological structures using sound waves. In addition to seismic surveying, preliminary activities may also include:

- Walking in the designated resource authority area
- Driving existing roads or tracks in the area
- Taking soil and water samples
- Remote sensing
- Aerial, digital or environmental surveying

The main advanced activity is the drilling of exploration wells, but could also include activities such as surveying if new roads/tracks are required. This can be a significant operation in the context of tight gas and oil. It requires a cleared area of up to four hectares for a well pad, large drilling equipment capable of reaching 3000 metres or more, crews working 24/7 for several weeks to a few months, water storage infrastructure, and regular vehicle movements. Roads and tracks often need to be upgraded or constructed to accommodate the larger vehicles.



*Exploration in Taroom Trough, Queensland (source: Omega Oil and Gas).*

After an exploration well is drilled, several outcomes are possible, depending on what is discovered and the company's plans. If the well does not find adequate resources, it is typically cemented and sealed at multiple depths, cut off below ground level, and the site is rehabilitated. Alternatively, a well may be temporarily sealed, or suspended, while further tests are done. A suspended well can remain so for years but is monitored and maintained by the company. The well may also become a monitoring well for ongoing research and surveillance.

If the exploration well encounters gas or oil, the company may then move to the appraisal stage and conduct flow testing. This will likely require hydraulic fracturing to assess whether commercial production rates and durations are achievable from the deep and low-permeability target reservoirs. The gas produced during these tests may be flared, which involves burning off flammable substances that are unusable or which may present a safety hazard if not removed, or vented if capture and use is not practicable. Oil produced during these tests are stored in onsite oil tanks before being trucked away for refining.

## How long does exploration last?

Exploration programs are often episodic and the duration is dependent on the size of the area. Seismic surveys can take anywhere from a couple of weeks to more than a year, while a single drilling campaign may last from several weeks to several months. These activities can also alternate with quieter periods of data analysis. If results are encouraging, follow-up work may continue over subsequent years. A Potential Commercial Area (PCA) declaration allows a company to hold tenure while assessing commerciality before commercial production via an approved Petroleum Lease (PL).

## Landholder rights

Landholders have the right to negotiate the terms of any CCA and to take independent legal and financial advice before signing. Coexistence Queensland provides free, independent information and guidance on where to seek further advice. Further information on landholder rights is also available in The Gas Guide.

Landholders are entitled to compensation for adverse impacts to their property and business, including loss of possession, value or use of land; severance of land; costs, damage or loss arising from authorised activities; and consequential losses or damages.

Under the *Water Act 2000* (Qld), companies are required to carry out baseline assessments of water bores if they are present in areas where production testing or production has started that affect a relevant aquifer. This record is to help identify any future changes in groundwater levels or quality.

A bore assessment is required for bores that are identified in an area where the water level decline from the tenure holder's exercise of underground water rights has caused or is likely to cause the bore to have an impaired capacity. This a key element of a resource tenure holder's make good obligations. Make good agreements ensure that the bore owner is not disadvantaged if their bore is, or is likely to be, impaired as a result of resource activities.

If agreement on a CCA, compensation or Make Good Agreement cannot be reached, formal dispute resolution is available through conference by the Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development; Alternative Dispute Resolution (ADR) from an independent third party; investigation of disputed breeches by the Queensland Land Access Ombudsman; and, if unresolved, a hearing at the Land Court of Queensland.

## Where can I find out more?

Contact Coexistence Queensland on 1300 548 021 or visit www.cqld.org.au.

### Useful resources

- Coexistence Queensland tight gas and oil factsheet series
- Taroom Trough petroleum exploration
- Resources for landholders, Coexistence Queensland
- Queensland Government Taroom Trough Development Plan
- Understanding compensation, Coexistence Queensland
- The Gas Guide, Coexistence Queensland
- A Guide to Land Access in Queensland
- Landholder guide to negotiating gas activity