

Oil and Gas Commission Fact Sheet

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Hydraulic Fracturing and Disposal of Fluids

Many unconventional gas reservoirs require stimulation, which may require a physical technique called hydraulic fracturing (or fracking) to enhance permeability (opening of the gas reservoir, allowing natural gas to flow to the wellbore). There is a range of hydraulic fracturing techniques and several different approaches may be applied within a specific area.

What is Hydraulic Fracturing?

Hydraulic Fracturing is the process where a fluid (water, nitrogen, polymer, or oil-based) is injected at high enough pressures to fracture or crack the rock in the target zone (most commonly coal, shale or tight rock). A hard substance (the proppant), which can include silica sand, ceramics or resin-coated material, is mixed with the fluid to hold the cracks open once the pressure is lowered. In the hydraulic fracturing process, the fluid/proppant mixture is injected into the specific horizon targeted deep below the surface. These fractures/cracks are held open by the proppant, allowing natural gas to migrate to the wellbore.



Hydraulic fracturing requires a lot of heavy equipment at the wellsite. The equipment includes compressors, fluid tankers, proppant trucks, mixing tanks and an operations trailer.

What is Fracturing Fluid and How is it Disposed?

Fracturing fluids vary in composition, based on engineering requirements specific to the formation that holds the natural gas. After the fluid/proppant mixture is forced into the target rock unit, the well bore is flushed out and all fluids are flowed back to the surface and collected at the wellsite. Commonly between 50 to 90 per cent of the fluid is recovered.

Most fracturing fluid is recovered at the wellhead during flowback testing and production operations. In some cases this fluid may be stored, treated and re-used. When the fluid is to be disposed, it is generally trucked to an approved disposal well or facility. At this point it must be pumped into a deep underground formation using a wellbore reviewed and approved by the BC Oil and Gas Commission (Commission).

The Role of the Commission

Companies must make an application to the Commission for deep well disposal. The Commission reviews these applications to ensure:

- Oil and gas resources are not impacted.
- The proposed disposal or injection zone is compatible with the produced water.
- The produced water will remain within the underground formation.
- The applicant has obtained the necessary rights to the formation.

A thorough application review is used to minimize the potential for fluid migration between the injection zone and other zones. As a condition of approval, the Commission requires a Monthly Injection/Disposal Statement (BC-S18) form be submitted, reporting volume of fluid and average wellhead pressure. The Commission limits the pressure at which fluid can be injected into the formation to ensure the integrity of the injection zone. The composition of the disposed fluid may require a Waste Discharge Permit, issued by the Commission under the *Environmental Management Act*. There are commercial waste disposal sites operated by a third party that may be used to dispose of fracturing fluids. At these sites, the disposal wells must be approved by the Commission and the Waste Discharge Permits are issued by the Ministry of Environment.

Protection of Groundwater

The Commission regulations ensure that potable groundwater is protected. This is achieved by drilling practices that include surface casing, cementing surface casing, production casing and cementing production casing (see Figure 1). The drilling and production regulations outline in detail how industry must ensure our water resources are protected.

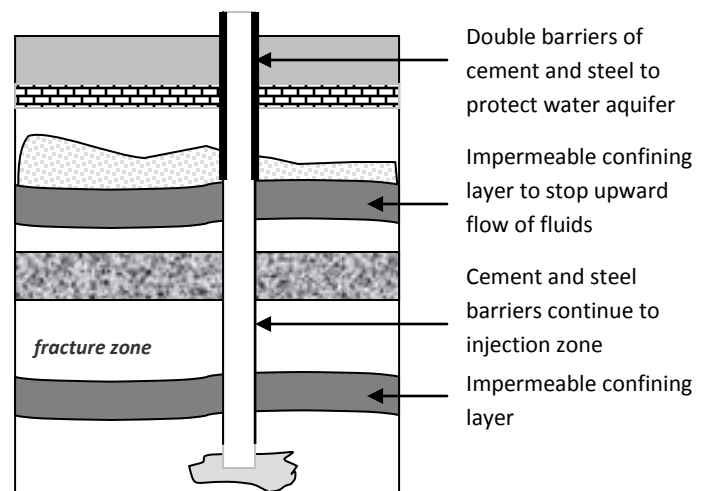


Figure 1 Protecting groundwater with proper drilling practices

Report a Concern/Learn More:

24 Hour Main Switchboard:

To report concerns regarding noise, smell or spill, or for general information

24 Hour Emergency Response for Industry Clients:

Tel: 1-250-794-5200 (24 hours a day)

Fax: 1-250-794-5390

Web: www.bcogc.ca

Mail: PO Box 9331 Stn. Prov. Gov't, Victoria, BC V8W 9N3

Toll free: 1-800-663-3456 (24 hours a day)

