Enviro dep FACTS

HYDRAULIC FRACTURING of SHALE

Releasing natural gas from shale formations dating back to before the dinosaurs

Hydraulic fracturing is a well completion process that releases natural gas from shale rock formations that are found thousands of feet below the surface of the Earth. This fossil fuel is formed from the remains of prehistoric plant and animal life that has been subjected to high temperatures and pressure for millions of years. A large portion of this ***thermogenic*** natural gas, which is trapped in shale formations, had been inaccessible until hydraulic fracturing was developed in the late 1940's. Technological advances, including the use of horizontal drilling, allow the modern driller to more economically develop this resource.

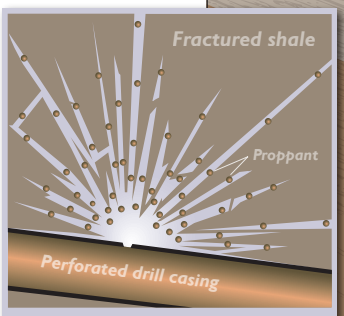
Natural gas is trapped in the Marcellus Shale rock formation, dating back 400 million years.

To release natural gas trapped in a formation, a hole is drilled into the ground vertically to the needed depth and then as much as two miles horizontally. This "bore hole" is lined with steel casing and cemented in to a depth adequate to protect freshwater aquifers, coal seams, etc. A mixture of water, sand, and chemicals (to improve flow) is then injected under high pressure to break apart the shale. The fracturing fluid flows away and the sand (called proppant) stays behind – holding the fractures apart so gas can escape. The released natural gas then flows up the casing to the surface.

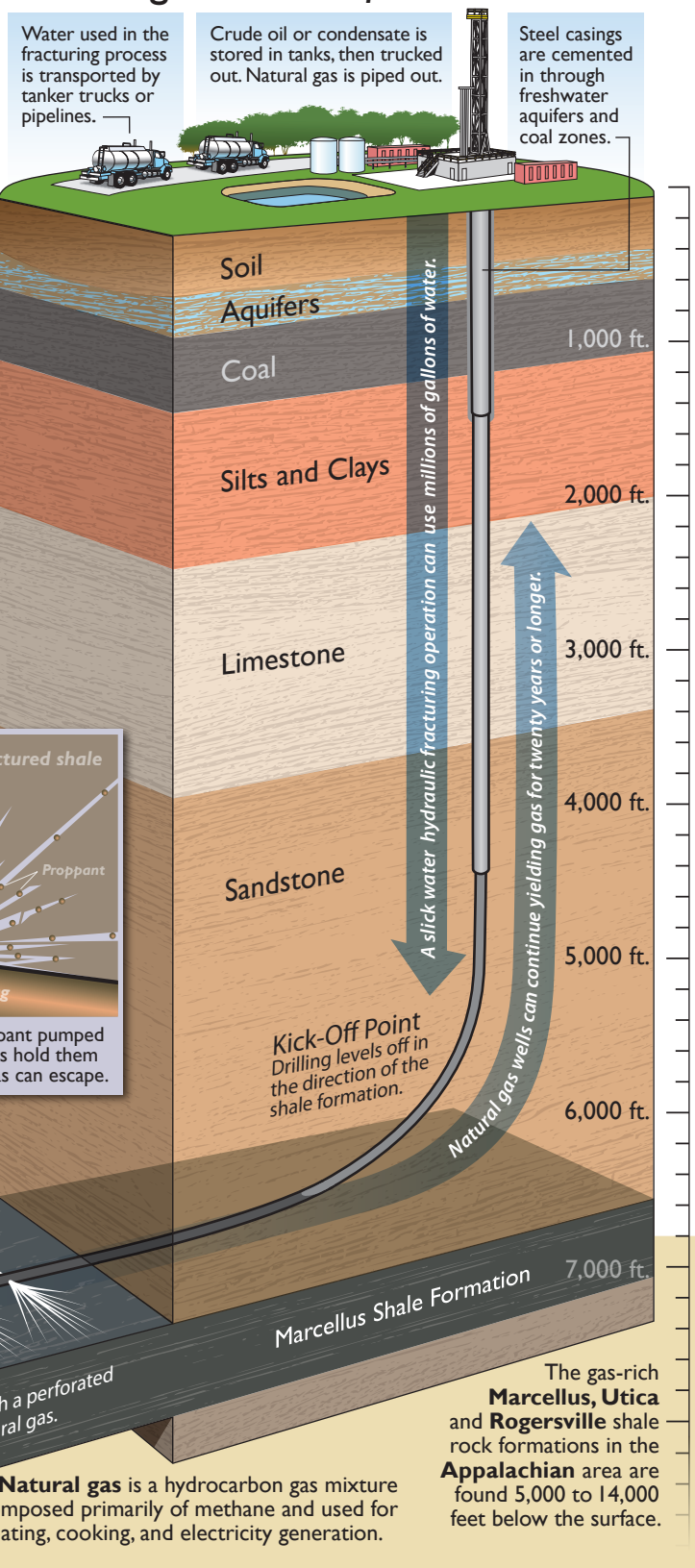
Fracturing fluid that is not left underground, having returned to the surface with the gas, is called ***flowback.*** Flowback is treated and reused in other wells. Its ultimate disposal is currently through a Class II disposal well.

Water is used for fracking because it will not compress.

The West Virginia Department of Environmental Protection (DEP) is committed to ensuring drillers engaging in hydraulic fracturing are compliant with current safety and environmental requirements.



Sand or ceramic proppant pumped into the shale fractures hold them open so the natural gas can escape.



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Shale is a fine-grained sedimentary rock formed in thin layers. Shale is composed of more abundant organic material than most other rock types, making it a rich ***hydrocarbon*** source in many areas.

Natural gas is a hydrocarbon gas mixture composed primarily of methane and used for heating, cooking, and electricity generation.

The gas-rich **Marcellus, Utica** and **Rogersville** shale rock formations in the **Appalachian** area are found 5,000 to 14,000 feet below the surface.