Marcellus Shale

Exploring Opportunities Together

TALISMAN ENERGY | Talisman Energy USA

A geological formation known as Marcellus Shale lies 3,000 to 6,000 feet underground, and covers 95,000 square miles, running from the Southern Tier of New York, across Pennsylvania into Ohio and West Virginia. Researchers at Penn State and the State University of New York at Fredonia estimate that the Marcellus Shale formation may contain up to 50 trillion cubic feet of recoverable natural gas with the potential to fuel the entire country for two full years.

While the natural gas held deep underground in the Marcellus Shale has existed for millions of years, the technology to get it out of the ground economically was only developed within the past decade. This huge untapped reservoir of natural gas represents tremendous opportunity for landowners and communities within the Twin Tiers area.

Since 2002, Talisman Energy USA has invested in the Twin Tiers and grown through acquisitions and success with new horizontal natural gas drilling techniques. Using state-of-the-art technology, Talisman Energy USA explores to find and develop natural gas.

Our commitment to the communities in which we operate includes:

- Developing long-term relationships with landowners
- Conducting fair and honest leasing practices
- Maintaining safe and environmentally responsible job sites
- Having a positive impact on local economies
- Promoting local engagement of resources and people

Frequently Asked Questions

What is shale?

Shale is a fine-grained sedimentary rock formed when quartz and clay minerals or mud are compacted by pressure over an extended period of time. Shale has a very compressed layer structure and such low permeability that it releases gas very slowly.

Shale is rich in organic material and sufficiently brittle but rigid enough to maintain open fractures. Natural gas found in shale is held in natural fractures, pore spaces, and on the surface of the organic material. The gas in the fractures is produced immediately while the gas attached to organic material is released over time as the pressure in the shale decreases. Shale gas reservoirs in the United States may be hundreds of feet thick.

How are wells drilled?

Unlike traditional vertical drilling techniques, horizontal drilling is more economical, as multiple wells may originate from the same pad, and has the ability to extract more production from the well. The ability to locate multiple wells on a well pad sharing surface equipment greatly reduces the foot print that would otherwise be required for multiple well sites. By using less surface area, horizontal wells also have the flexibility for location away from environmentally sensitive areas. Drilling begins with a central vertical wellbore descending to just above Marcellus Shale. At that point, the drill makes a gradual 90 degree turn and drills horizontally for up to 4,500 feet.

The first phase of the drilling is designed to protect groundwater aquifers. An initial wellbore is drilled well below potable aquifer levels. Thick steel pipe is then placed in the hole and sealed with cement on the outside of the pipe. With the potable water zones now protected from invasion, drilling recommences to the deeper zones of interest and when this depth is reached a second string of steel pipe is run inside the first and additional cement is used to provide a permanent seal. This procedure will now allow for a double wall of steel plus cement protecting the fresh water zones from any chance of contamination. The design for this pipe and integrity of the well exceeds all specifications by regulatory authorities in the state or federally.

How is natural gas extracted from the shale?

After penetrating the shale, the rock must be hydraulically fractured, or “fraced”, to maximize the production of natural gas from Marcellus Shale. A fracture stimulation fluid comprised of fresh water, sand, and additives is injected into the well under high pressure to enhance fractures in the rock and free more gas.

These fractures start at the wellbore and extend as much as several hundred feet into the reservoir rock.

Sand, a “propping agent”, is pumped into the fractures to keep the rock from closing when the pumping pressure is released, allowing the natural gas to migrate from the rock pores to the surface wellbore. Along with fresh water and sand, the fracture fluid contains two main types of additives: a friction reducer, which aids pumping, and a bactericide, which kills bacteria. These two additives respectively make up .5% and .025% of the total fluid composition.

What equipment is required for each drilling site?

The fracturing (frac) operation requires a smaller version of a drilling rig called a service rig, frac equipment, and water tanks. Once a well is deemed productive, it will be tied-in to an existing gas pipeline gathering system and all frac equipment is removed from the producing site. The majority of the water recovered is recycled on subsequent fracs.

How is environmental impact minimized?

Beyond complying with state and federal environmental protection requirements, we conduct our own extensive supervision and inspections during all phases of our operations from surveying, drilling, and pipeline construction through production and final reclamation. Talisman Energy USA has an exemplary safety and environmental record and we ensure that all property and roads are ultimately restored to equivalent or better condition than when our operations began. Mitigating traffic concerns has been accomplished by sourcing water from larger ponds and using pipelines to transfer water to the frac operation.

How is safety assured?

Talisman Energy USA is very concerned about the health and safety of our employees and the public. Areas to be cleared or otherwise disturbed are kept as small as safely possible. During a shale operation, an on-site representative ensures that all state and federal safety requirements plus Talisman Energy USA’s health, safety and environmental guidelines are met at all times. Traffic related to the operation is closely monitored to ensure traffic By-Laws and Talisman Energy USA’s safety guidelines and policies are adhered to. Talisman Energy USA focuses on planning for containment of all fluids that are used in our operations.

Will there be an increase in noise and traffic?

During the drilling and fracing period for a new well, you may experience increased traffic, dust, and general noise associated with the use and movement of heavy equipment in the area. Talisman Energy USA manages our activities to mitigate adverse impact to your community. As required, we spray dirt roads with water and calcium to keep dust down. We are sensitive to scheduling our activities around school bussing hours and community events whenever possible. To further mitigate traffic disruptions, we also provide our movement schedules to local fire districts, emergency service centers, and traffic departments.

Should I be concerned with flaring?

Flaring is sometimes necessary to test a well before the well is connected to a gathering line. The flare is ignited under controlled procedures to reduce gas emissions while maintaining the integrity of the test. The flare test is important for royalty owners and Talisman Energy USA because it helps estimate the size, characteristics, and potential productivity of the reservoir. Controlled burn flaring is as short as possible and the test typically runs for no more than 72 hours. Any flaring that may occur will be in compliance with all flaring regulations. The natural gas from the Marcellus Shale has high methane content and is of comparable quality to what is consumed in home heating. Talisman Energy USA pre-builds pipelines and compression facilities to help accomplish the goal of minimum flaring.

How does Talisman Energy USA lease properties from landowners?

Many local landowners are leasing their oil and gas rights to Talisman Energy USA. We believe that leasing your land is your choice. We also believe that based on our experience, success, and proven record, leasing your land with Talisman Energy USA is your best choice. In order to explore for gas, Talisman Energy USA must first lease mineral rights.

To date, we have active oil and gas leases in nearly 30 counties covering 1 million acres. When a well is successful, royalties are paid to the leaseholders who have land within the well spacing unit. More than 2,300 people are currently receiving monthly royalty payments on our wells.

Talisman Energy USA has a team of expert land agents to work with property owners and answer your questions. If you are interested in pursuing a lease with Talisman Energy USA, please call our Good Neighbor Hotline at 866-566-4747.

Where and how is news made available?

Our web site, www.talismanusa.com, is a good place to find information about all of our activities. Information sheets with more technical details are available there. We will send notices by mail to all unit owners and hold open houses in our core operating areas to give us an opportunity to talk with you personally.

How can I contact Talisman Energy USA with questions?

Should you require further information or have any concerns regarding the construction or operation of a project, please contact the following:

Good Neighbor Hotline	**607-562-4063 or 866-566-4747 (toll free)**
Emergency Contact	**800-530-5392**

Additional public information documents may be obtained from the DEC website at www.dec.ny.gov or the DEP website at www.depweb.state.pa.us

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