

## ***What happens after drilling?***

The drilling operation is considered complete when the wellbore has reached the target zone and our geologists are satisfied that the most likely gas-bearing rock has been penetrated. The wellbore is cased with steel pipe, and cement fills the space between the casing and the drilled earth and rock. The drill rig and all of the associated support infrastructure is then moved to the next drilling site.

If sufficient evidence is found that the well has tapped more than a little gas, the next stages of well completions are planned. A smaller completions rig moves in and narrow (2-7/8") production tubing is fed into the wellbore. The well is then cleaned and tested for economic viability - a process that involves "flaring" of the well.

## ***Flaring for cleanup and testing***

Flaring is the controlled burning of natural gas at a flare stack. It is a safer method than venting gas into the atmosphere. A flare is used during two different operations that prepare a well for production.

The first step is to clean and "swab" the well. We use the well's gas pressure to lift the drilling mud, well debris and completion fluids out of the well. The fluids are collected into containers to be used at a future well or sent for disposal. Some gas flows up the well during this process where it is burned as a flare rather than being released into the atmosphere.

Once the well has been cleaned of drilling and completion fluids, we normally allow for the gas pressure to build back up to the original pressure before we begin testing. Pressure measurement gauges are strung into the well and testing is done by flowing gas out of the well at controlled rates for timed periods, typically over 24 to 72 hours. This information is a vital part of the data that determines the potential of the well. Again, the gas flow is flared at the well site.

Since each phase of well completions and development depends on the results of the previous step, it is difficult to predict the exact flaring schedule.



***TUBING AND FLARE AT REED, NEAR GIBSON***



## ***Safety Measures***

As with all the operations of Fortuna Energy, safety is a primary concern. A staff of five highly trained well-completions experts monitors and controls every aspect of these clean-up and testing phases. The team works in shifts, round the clock. The flare stack is positioned to be clear of any nearby trees. Tests are only run for the minimum amount of time necessary to collect the data that will help define the potential reservoir size, and strength of the well.

## ***Will the flare be loud?***

Occasionally, the flare may produce some noise. This sound is expected and is completely normal for some wells. It is produced by high-velocity gas moving through the flare stack and passing rapidly through the nozzle tip at the base of the flame. Although a noisy well may still not prove economically viable for production, the early presence of a powerful gas stream can be a good sign of more to come.

## ***Does the flare waste gas?***

Testing time is kept as short as possible, typically less than four days, and only uses the same quantity of gas as the well would normally produce for that same time period. The data from these tests is vital to determining the economic viability of the well before we commit to the next expenditures, including equipping the well site and building a pipeline gathering system. The flared gas is a small price to pay for making an informed decision about building facilities that will cost an additional million dollars or more.

## ***What about emissions?***

Because Trenton-Black River natural gas is mostly pure methane (CH<sub>4</sub>), no dangerous emissions are produced. In fact, in our area, the methane content of Black River gas has always been around 98% of the total gas output. The end products of an efficient methane flame are non-toxic carbon dioxide (CO<sub>2</sub>) and water vapor (H<sub>2</sub>O). Consequently, there is very little visible smoke produced by the flare flame. If some smoke does appear, this would indicate incomplete combustion. Wind, water, or poor mixing of air with the gas may produce some smoke.



***FLARE AT SODERBLOM, IN BIG FLATS***



***FLARE AT ANDREWS, NEAR GIBSON***

## ***What are the next steps?***

If the test results confirm an economically viable gas deposit, preparations will be made for production. The next steps will include building the required production equipment at the well site and constructing the pipeline to transport the gas to market.

*For further information, please access our website at [www.fortunaenergy.com](http://www.fortunaenergy.com) or contact our information desk at (607) 795-2780.*