

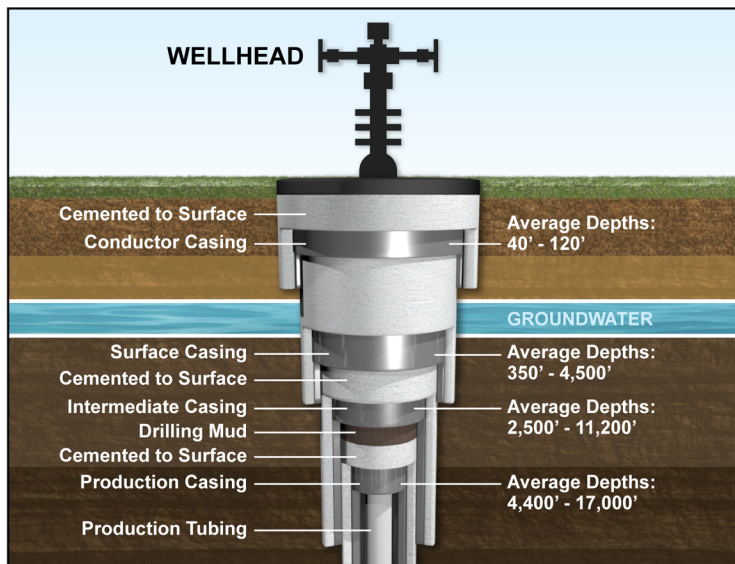


## Well Casing Failure Rates: Myth vs. Fact


**Anti-fracking activists frequently claim that shale wells have excessively high failure rates. In reality, well failure rates are exceedingly low.**

 **Fact:** A typical well is comprised of about seven layers of thick steel and cement, each of which has a specific role in protecting groundwater.

 **Fact:** For a well to leak every one of those layers would have to break and fail. Such instances are extremely rare.



## Did You Know...

 Based on Pennsylvania Department of Environmental Protection data compiled by the Associated Press, the well failure rate for all the oil and natural gas wells drilled in Pennsylvania since 2005 is about one third of one-percent (**0.33 percent**).



 A 2011 Ground Water Protection Council study found a well failure rate of less **0.03 percent** in Ohio and **0.01 percent** in Texas.



## What They Are Saying:



*"Hydraulic fracturing ... has proven to be a safe and effective stimulation technique. Ground water is protected during the shale gas fracturing process by a combination of the casing and cement that is installed when the well is drilled and the thousands of feet of rock between the fracture zone and any fresh or treatable aquifers."*  
**Department of Energy, 2009**



*"[A]ctual well integrity failures are very rare. Well integrity failure is where all barriers fail and a leak is possible. True well integrity failure rates are two to three orders of magnitude lower than single barrier failure rates."*  
**George E. King, Petroleum Engineer, 2013; prepared for the SPE Technical Conference and Exhibition**



*"It is a small risk that a well leaks and this has been proven in the United States."*  
**Professor Richard Davies, Durham University, 2014**