

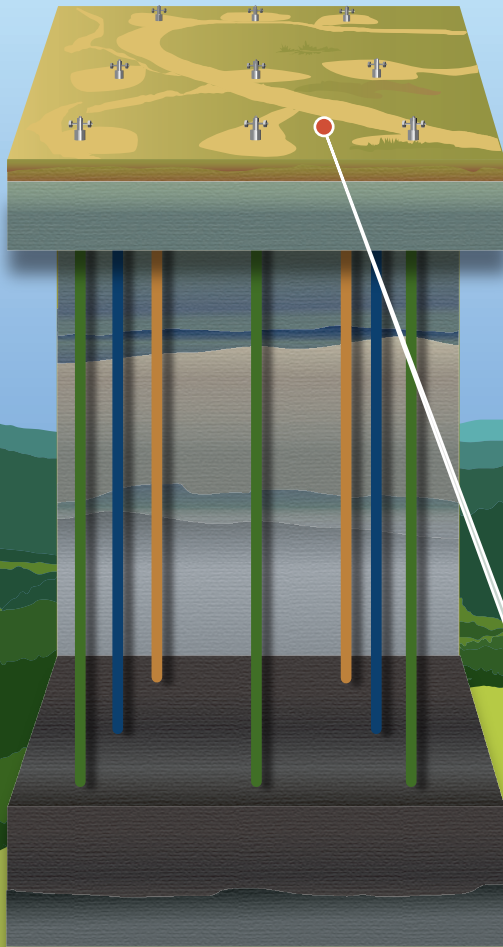


REDUCING Surface Footprint with Horizontal Drilling:

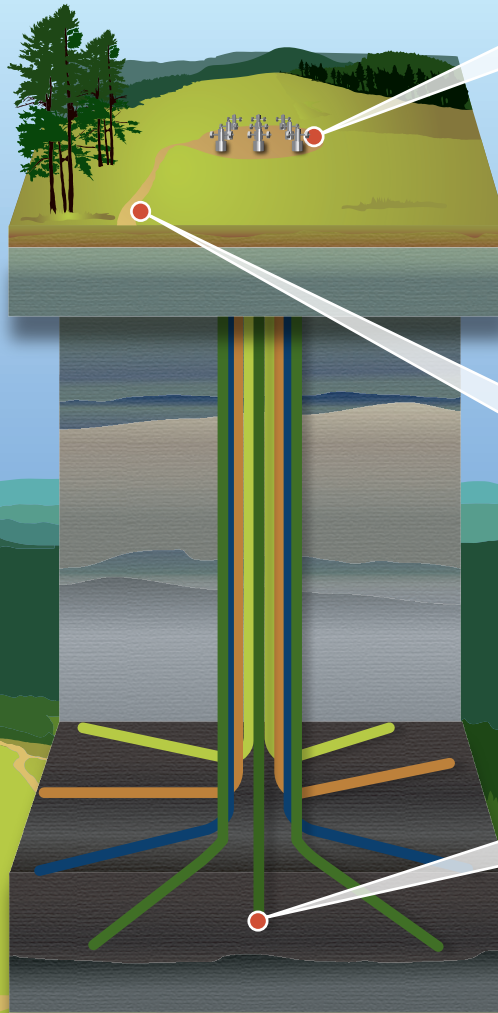
American oil and gas producers have deployed new technologies to provide access to trapped oil and gas once thought inaccessible. The combination of horizontal drilling with hydraulic fracturing has provided the country with a vast new supply of natural gas and increased domestic oil

production. These innovative techniques have also allowed drilling companies to drastically reduce the footprint they leave on the surface in places like Wyoming, Louisiana and Pennsylvania.

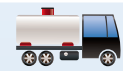
Previous Well Spacing



Consolidated Well Spacing



90% Horizontal drilling and directional drilling allow drillers to consolidate gas wells onto one small pad site – resulting in as much as a **90% reduction in overall surface presence.**¹



By confining production to one pad site, companies are able to reduce the number of access roads and pipelines needed to service dozens of wells.



Wells are initially drilled vertically from the surface but then **branch out underground** to tap the gas-bearing rock deep below.



Conventional vertical drilling requires **many wells spaced out over a wide area** to effectively produce oil or gas.

¹ North Dakota Department of Mineral Resources
http://www.legis.nd.gov/files/committees/65-2017/19_5052_03000appendixb.pdf