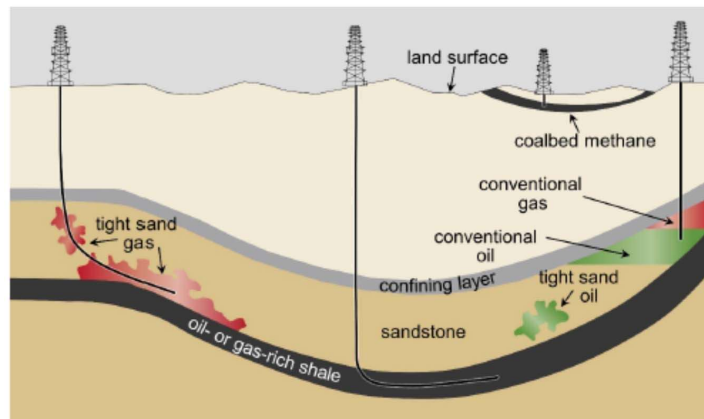


Hydraulic Fracking Impacts and Public and Environmental Protection

What is hydraulic fracturing (or fracking)?

- Fracking is a process in which water, sand, and certain types of chemicals are injected into the reservoir rock formation at high pressure to create fractures. The fractures allow oil and gas to more easily flow to the wellbore.
- Fracking has been used for over 50 years in New Mexico in unconventional drilling, but with horizontal drilling fracking has increased significantly in support of unconventional oil and gas production in tight gas and oil formations and in oil and gas shales.

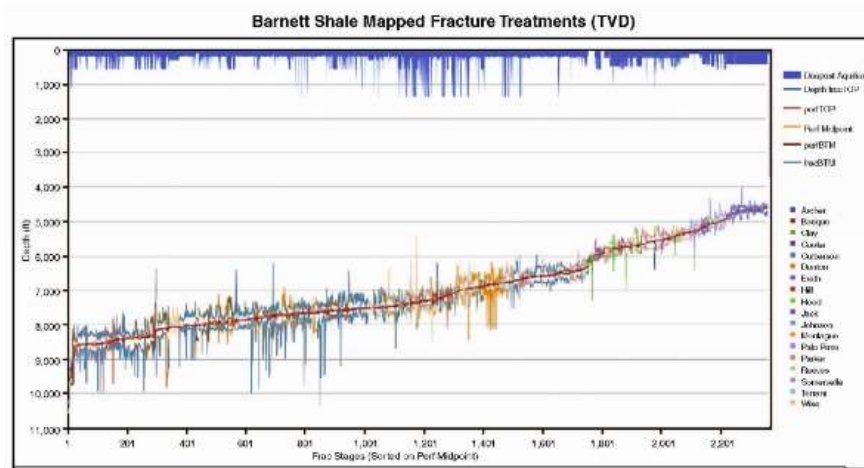


What types of chemicals are used in hydraulic fracturing?

- Fracking chemicals are generally grouped within approximately 10 types of compounds. These chemicals improve the effectiveness of the sand and water as they open the fractures.
- Though fracking chemicals are found in low concentrations (they are only about 0.8-1.0% of the entire volume of the fracking fluid), some of the chemical types may potentially impact human health. Fracking chemicals include:
 - Water –98% to 99% on volume basis
 - Proppant –1% to 1.9%: fine sand or ceramic to hold fractures open
 - Friction reducer –0.025%: Polyacrylamide (flocculent in water treatment)
 - Disinfectant (biocide) –0.005% to 0.05%: Glutaraldehyde or quaternary amine
 - Surfactants - .5 to 2 ppm: Modify surface/interfacial tension, prevent emulsions,
 - Gelation chemicals (thickeners): Guar gum & cellulose polymers to keep proppant in suspension
 - Scale inhibitors: Phosphates or phosphonates
 - Hydrochloric acid: sometimes to create the first small crack in the rock
 - Corrosion inhibitor 0.2% to 0.5%: only if acid is used.

Does hydraulic fracturing pose a major threat to ground water contamination?

- As shown in the figure below, fracked wells are generally thousands of feet deep, while ground water aquifers are relatively shallow, generally only hundreds of feet deep.
- Therefore, fractures are unlikely paths for contamination of ground water.
- “... all scientifically documented cases of ground water contamination associated with fracking are related to poor well casings and their cements, or from leakages of fluid at the surface.” (EPA, 2012)



NM stance on hydraulic fracturing chemicals and their use?

- Fresh water use for hydraulic fracturing should be significantly reduced or eliminated, and currently fresh water only makes up about 8% of frack water.
- All fracking chemical use, including proprietary chemicals, should be provided to the Consortium through a Non-Disclosure Agreement to enable evaluation of human and environmental health and safety.
- High toxicity or high-risk chemicals that impact the cost of treatment and the reuse of produced water should be banned from use.
- The Consortium chemical characterization and analysis program should include evaluation of human and environmental risk and fate and transport of all produced water constituents including drilling, fracking, and production chemicals.

References and More Information

- NM Produced Water Research Consortium website: <https://nmpwrc.nmsu.edu/>
- Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States – EPA: https://www.epa.gov/sites/default/files/201612/documents/hfdwa_executive_summary.pdf

Questions

- Contact the Consortium at: nmpwrc@nmsu.edu