

IADC Briefing Book

Hydraulic Fracturing: Water Contamination



One of the most frequently discussed concerns with hydraulic fracturing is whether or not it contaminates groundwater with methane gas or oil. Fracturing is routinely used for wells that are thousands of feet deeper than any local water basin. Well design requirements for hydraulically fractured wells include stronger pipe and additional cement to seal the well off and prevent contamination. The reality is the potential to leak fracture materials into water sands or basins from deep hydrocarbon zones is exceptionally low as shown by microseismic monitoring data. [6]

Key Messages

- A 2015 EPA study, which reflected 5 years of research, found that hydraulic fracturing activities have not led to widespread, systemic impacts to drinking water resources. The EPA noted that it was “the most complete compilation of scientific data to date, including over 950 sources of information, published papers, numerous technical reports, information from stakeholders and peer-reviewed EPA scientific reports. [1]
- A 2014 US Department of Energy study also concluded that hydraulic fracturing does not cause water contamination. The EPA injected tracers into hydraulic fracturing fluid and found no contamination after 12 months of tracking. [2]
- A 2016 study from the University of Cincinnati concluded that hydraulic fracturing had no effect on water quality in five eastern Ohio counties at the center of the Utica shale boom. Researchers sampled water from 23 different wells 3 or 4 times per year, from 2012 to February 2015, for a total of 191 samples. [3]
- A 2015 Yale University study concluded that there is no evidence of association with deeper brines or long-range migration of these compounds to shallow aquifers. Water from 64 private water wells near hydraulic fracturing sites was sampled. Researchers found no contamination in the well water, and the amounts they did detect were hundreds or thousands of times smaller than what can be detected by commercial labs. [4]

Resources

1. EPA’s Study of Hydraulic Fracturing for Oil and Gas and Its Potential Impact on Drinking Water Resources (US EPA): <http://www.epa.gov/hfstudy>
2. An Evaluation of Fracture Growth and Gas/Fluid Migration as Horizontal Marcellus Shale Gas Wells are Hydraulically Fractured in Greene County, Pennsylvania (US Department of Energy): http://www.netl.doe.gov/File%20Library/Research/onsite%20research/publications/NETL-TRS-3-2014_Greene-County-Site_20140915_1_1.pdf
3. University of Cincinnati study: <https://energyindepth.org/ohio/new-university-of-cincinnati-study-finds-no-water-contamination-from-fracking/>
4. Proceedings of the National Academies of Sciences: <http://www.pnas.org/content/112/43/13184.abstract>
5. Elevated levels of diesel range organic compounds in groundwater near Marcellus gas

operations are derived from surface activities (Proceedings of National Academy of Sciences): <http://www.pnas.org/content/112/43/13184.abstract>

6. Environmental Impacts of Hydraulic Fracturing: What are the Facts?
<http://pubs.acs.org/doi/pdfplus/10.1021/bk-2015-1216.ch001?src=recsys>