

SUMMARY: MAY, 2011 DUKE UNIVERSITY STUDY OF GAS FOUND IN DRINKING WATER WELLS NEAR NY AND PA FRACKING OPERATIONS, Published in Proceedings of Natl. Acad. Sciences

The most common complaint of residents using private drinking water wells near hydraulic fracturing (“fracking”) operations in other states has been finding natural gas in their drinking water, often at concentrations high enough to be ignitable. The gas industry has said that this can’t be gas from their operations, because the shale being “fracked” is thousands of feet below the shallow drinking water aquifers. Other concerns include withdrawal of millions of gallons of water in areas of limited ground and surface water resources to use for high pressure injection to fracture shale and release gas.

An important new study of natural gas in drinking water wells near hydraulic fracturing operations was published by Duke scientists (S. Osborne *et al*) in the May issue of the Proceedings of the National Academy of Scientists. Key findings of the study:

- When 60 drinking water wells in three regions of Pennsylvania and New York were tested for the presence of natural gas, **those close to active gas wells (within about 3,000 ft) showed a much higher level of dissolved gas in the water. The average fell within the Dept. of Interior’s Hazard Mitigation Action Level; wells were even higher.** By contrast, drinking water wells located over the same formation, but more than 3,000 feet away from active gas wells, showed zero to very low levels of natural gas.
- To determine whether the gas came from shallower, biologically produced (“biogenic”) gas pockets or from the shale formation, the authors used two state-of-the-art methods: 1) measuring the ratio of particular types of carbon and hydrogen atoms (isotopes) in the methane obtained from the water wells and 2) measuring the fraction of the gas obtained that was higher carbon gases (ethane, propane or butane). **The natural gas from wells close to fracking sites was characteristic of shale-formed gas, rather than shallower biogenic gas.**
- The study did not determine whether the shale gas was reaching the drinking water aquifer through failed gas well casings, or by upward movement through new or previously formed fissures and cracks in the thousands of feet between the shale and shallow drinking water aquifers. **The gas industry has claimed that bad well casings are the exception. If that is the case, the strong relationship between natural gas found in wells and closeness to active gas operations strongly suggests that the gas is migrating upward from the shale layer.**
- **The fact that NC’s shale formations are shallower (ie, closer to drinking water) than those in NY and PA may indicate that we are at even greater risk of well contamination. Fracking must be viewed as potentially dangerous to drinking water aquifers until we can be sure that well casings won’t leak, and until technological solutions can be found to prevent upward gas migration following fracking.** Thousands of NC residents in these areas depend on wells every day for safe water and are not within reach of city water.
- The study also looked for evidence of fracking fluids or natural deep brines or radioactivity in the well water samples and did not find it. Up to 60% of fracking fluid stays underground.

This study raises serious questions about the potential impacts of hydraulic fracturing on drinking water in NC, indicating the need for extensive further study before changing current regulations.