Environmental Sustainability

Extractive industry practices and technologies (e.g. hydraulic frac'ing*)
**a variety of spellings and uses: fracing, frac'ing, fracking, fracturing*

Hydraulic fracturing has been commercially producing since 1949, according to the oil and gas industry. Since 1949, hydraulic fracturing has helped produce more than 7 billion barrels of oil and 600 trillion cubic feet of natural gas. It is estimated that up to 90% of the wells operating today have been hydraulically fractured. According to the National Petroleum Council, 60% to 80% of all wells drilled in the U.S. during the next decade will require fracturing to remain viable. The process, which forces highly pressurized water, sand and chemicals into rock to release the gas and oil locked inside, gives drillers access to deeply buried gas deposits.

In 2004, the Environmental Protection Agency (EPA) examined hydraulic fracturing and determined it can be safe if diesel fuel isn't added to the drilling fluids. The agency based its decision in part on a non-binding agreement with the three largest drilling service companies—Halliburton, Schlumberger and B.J. Services—to stop using diesel. But the agreement applied only to gas drilling in shallow coal deposits, and all three acknowledged using other potentially harmful chemicals, such as benzene, ethylbenzene, toluene and xylene.

In 2005, Congress addressed hydraulic fracturing in the Energy Policy Act (EPAct). Under EPAct, Congress passed a provision for oil drillers that explicitly prohibits regulation of hydraulic fracturing under the provisions of the Safe Drinking Water Act, the way the EPA regulates almost all other types of underground fluid injection. The industry does not have to comply with the section of the Clean Water Act that regulates pollutants at construction sites. And, it doesn't have to abide by the Clean Air Act, which regulates industrial emissions. Drilling companies are not required to report discharge of toxic chemicals for the Toxics Release Inventory under the Superfund law. In some fracturing jobs—like those in the Marcellus Shale in Pennsylvania and New York—more than 40,000 gallons of fracturing chemicals, with no company disclosure of the chemical constituents, can be used at a single well.

Because the process is exempt from most federal oversight, it is overseen by state agencies that are spread thin and have widely varying regulations. A recent report by the Ground Water Protection Council revealed that only four of the 31 drilling states it surveyed have regulations that directly address hydraulic fracking and that no state requires companies to track the volume of chemicals left underground. One in five states doesn't require the concrete casing used to contain wells to be tested before hydraulic fracking. Approximately one-third of the millions of gallons of water used in fracking returns to the surface, where it is either reused or trucked to treatment plants. More than half the states allow the open, dirt-brimmed waste pits that collect toxic fluids to intersect with the water table, even though waste pits are connected to hundreds of cases of water contamination.

A New York City analysis of fracking found that whereas a single fractured natural gas well may do no harm, the hundreds required to exploit shale gas "brings an increased level of risk to the water supply." Plus, although fracking occurs deep below freshwater aquifers, natural cracks "serve as conduits that facilitate migration of contaminants, methane or pressurized fluids."

Frac'ing requires water. Western Resource Advocates found that oil companies have secured the right to divert more that 6.5 billion gallons of water a day during peak river flows. They also hold rights to stores in dozens of reservoirs, 1.7 million acre feet of water, which is enough to supply metro Denver for six years. Researchers have discovered that Chesapeake Energy taps fresh water from Dallas Fort Worth Airport pipes to their operations; the airport sits on the Barnett Shale gas play. Other companies in the area tap into local fire hydrants and golf course reservoirs.

Hydraulic fracturing operations have quality of life impacts—from creation of a spider web of new roads, to increased traffic and noise pollution, to increased potential for spills—on the communities where they operate and the communities where the wastewater is stored or dumped. As well, there are documented cases of environmental and public health impacts.

Investors are addressing service providers, but the primary focus is on acreage holders because they can switch to service providers using less harmful alternatives. They have an incentive to do so because they share financial and legal liability if problems emerge from fracturing operations. Acreage holders are oil and gas companies, most of which are in many portfolios.

The House Committee on Energy and Commerce has written to companies asking for detailed information, including documentation of all wells hydraulically fractured from 2007 to 2009, the proximity of those wells to underground drinking water sources, volumes and types of chemicals used in the process and any health and environmental effects of the drilling. Public outcry for drinking water protection has moved Congress to consider amending the Safe Drinking Water Act and giving the EPA authority over the process.

MAJOR SHALE PLAYS

- **Barnett Shale**, located in Texas, is currently the largest and most prolific unconventional gas resource play in the U.S. and was the first location where natural gas was extracted from shale.
- **Haynesville Shale**, located in Northwest Louisiana, East Texas and extending into Arkansas, could be as large as the Barnett Shale and some industry experts are calling it "the Big One."
- **The Marcellus Shale** extends through Pennsylvania, New York, Ohio and West Virginia. According to a Penn State geoscientist, the Marcellus Shale play could supply the natural gas needs of the U.S. for 14 years.

- **The Fayetteville Shale**, located on the Arkansas side of Arkomo basin, currently is the second most productive shale play and one of the nation's 10 largest fields of any type.
- The **Green River Basin** is located in Wyoming, Utah and Colorado; 80% of it is under federally owned land.
- The **Woodford Shale** formation is in Southeastern Oklahoma.

Addressing the impact of companies on this issue is aligned with the Critical Concerns of the Sisters of Mercy to reverence Earth and work more effectively toward the sustainability of life. Efforts are also acting in interdependence with all creation.

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