ENVIRONMENTAL REGULATION OF HYDRAULIC FRACTURING IN SHALE FORMATIONS

Deola Ali – University of Houston Law Center
What is Hydraulic Fracturing?
History of Hydraulic Fracturing

- 1903: first tested in Mt. Airy Quarry, NC to mine granite
- 1948: first used commercially
- 1981: Texas Oilman George Mitchell starts gas fracing of shale (Barnett Shale)
- 1990s: Better know-how and high gas prices pushe Shale fracing to other regions
History of Hydraulic Fracturing

■ 1997: Legal Environmental Assistance Foundation (LEAF) v EPA (118 F.3d 1467 (11th Cir. 1997)) (hydraulic fracturing should be regulated under SDWA)

■ 2004: EPA report on the use of hydraulic fracturing in coal bed methane operations finds no effect on groundwater (raised concerns on diesel).

History of Hydraulic Fracturing

- 2007: Gas well in Bainbridge, Ohio causes explosion; incident blamed on hydraulic fracturing. Similar events reported in other gas producing states – Penn, Colorado.

- 2008: Outside interest groups expand efforts to attack hydraulic fracturing in mid-Atlantic region (Marcellus Shale).

- 2010: Movie (Gasland) released to rave reviews (Oscar nominated)

- 2010: Congress commissions EPA study (prelim. result expected in 2012)
If Hydraulic Fracturing Has Been Around For 100 Years, Why The New Concerns?
Conventional Reservoirs
- High quality rock properties (porosity and permeability),
- No need for artificial stimulation (fracturing)
- Wells typically drain hundreds/thousands of acres, typically geologically driven plays with higher risk.

Unconventional Reservoirs
- Poor Rock Properties (low porosity and permeability)
- Need fracturing
- Drain poorly (10-40 acres typical)
- Horizontal wells generally improve drainage (but high production decline 70% – 80% in year 1)
CONVENTIONAL" VS. "UNCONVENTIONAL"
Porosity and Permeability
Shale is Everywhere -- Almost
Environmental Concerns

- Fracing Fluid Composition
- Surface Concerns
- Underground Water Safety
- Nuisance Issues
- Water Withdrawal
Fracing Fluid Composition

**Issues**
- Nondisclosure
- Hazardous content *(Acids, Biocides, Surfactants)*

**Regulation**
- State Mandatory Disclosure Laws *(Penn lists online)*
- Reflexive Disclosure by Industry *(FracFocus website)*
- Federal *(MSDS—limited)*
Surface Concerns

- Noise
  - About a month (drill + frack)
- Road Use
  - Wear and tear
  - Dust and auto damage
- Pad size
  - Trucks need space
  - Erosion/landslides
  - Scarring (aesthetic damage)
- Transient Workers
- Multiple Time, Place, Manner Regulations at the Municipal Level
Surface Concerns

- Run Off Water
- Frac Fluid Spills
  - Blowouts
- Regulations
  - Multiple local level regulation
  - Private action civil suits
  - Organized citizen groups providing visibility
Underground Water Safety

- **Issues**
  - Gas migration into aquifers (Gasland)
  - U.S. v. Range Resources (N.D. Tex 2011)
  - Diesel?

- **Regulations**
  - State Level Controls on well casing integrity (zonal isolation)
  - SDWA (UIC—not applicable, attempted legislative amendments failed)
  - DOI considering regulation on national parks
Underground Water Safety
Water Withdrawal

**Issues: Fracing is very water intensive**

<table>
<thead>
<tr>
<th>Shale Gas Play</th>
<th>Volume of Drilling Water per Well (gal)</th>
<th>Volume of Fracturing Water per Well (gal)</th>
<th>Total Volumes of Water per Well (gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barnett</td>
<td>400,000</td>
<td>2,300,000</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Fayetteville</td>
<td>60,000*</td>
<td>2,900,000</td>
<td>3,060,000</td>
</tr>
<tr>
<td>Haynesville</td>
<td>1,000,000</td>
<td>2,700,000</td>
<td>3,700,000</td>
</tr>
<tr>
<td>Marcellus</td>
<td>80,000*</td>
<td>3,800,000</td>
<td>3,880,000</td>
</tr>
</tbody>
</table>

**Regulations**
- Water withdrawal permits (e.g. Penn)
- Reflexive solution through increased recycling
Conclusions

- Increasing pressure to regulate at Federal level (initial result of EPA study in 2012 will be instructive)
- Push back by some States (Texas)
- Industry becoming more accountable and self-regulating
- Active citizen groups won’t leave fracking alone and will be forcing a lot of change