Tribal Lands and Environment:
A National Forum on
Solid Waste, Emergency Response,
Contaminated Sites
and
Underground Storage Tanks

August 19-22, 2013
Hyatt Regency Tamaya ~ Pueblo of Santa Ana
Hydraulic Fracturing in Indian Country - Applicable Legal Tools for Managing Gas Exploration/Extraction Near Tribal Lands

Gregory T. Hixson
Short Cressman & Burgess PLLC
206-682-3333
ghixson@scblaw.com
Presentation Overview

- A lawyer's explanation of Hydraulic Fracturing
- What are the impacts to the reservation environment and natural resources?
- How is Hydraulic Fracturing regulated? What Law applies?
- Gas exploration and extraction on Tribal lands, where it's going and what can be done.
Hydraulic Fracturing 101: How does it Work?
Shale Gas Plays, Lower 48 States

Source: Energy Information Administration based on data from various published studies.
Updated: March 10, 2010
Drilling the Well
Drilling the Well
Well Casing

- **24” conductor casing** (30-60 feet)
- **20” casing** (200-500 feet) cemented to surface
- **13 3/8” casing** (up to 1,000 feet) cemented to surface
- **9 5/8” casing**
  - If necessary to seal off shallow oil, gas or brine bearing zones
- Casing for vertical and horizontal wells identical to this point
- **5 1/2” casing**
  - 500 feet above Marcellus

www.marcelluscoalition.org

Courtesy of Range Resources
Fracturing Process

Hydraulic fracturing often involves the injection of more than a million gallons of water, chemicals, and sand at high pressure down the well. The depth and length of the well varies depending on the characteristics of the hydrocarbon-bearing formation. The pressurized fluid mixture causes the formation to crack, allowing natural gas or oil to flow up the well.

Water Use in Hydraulic Fracturing Operations
- **Water Acquisition** - Large volumes of water are transported for the fracturing process.
- **Chemical Mixing** - Equipment mixes water, chemicals, and sand at the well site.
- **Well Injection** - The hydraulic fracturing fluid is pumped into the well at high injection rates.
- **Flowback and Produced Water** - Recovered water (called flowback and produced water) is stored on-site in open pits or storage tanks.
- **Wastewater Treatment and Waste Disposal** - The wastewater is then transported for treatment and/or disposal.
Water Acquisition
Chemical Additives

Average Hydraulic Fracturing Fluid Composition for US Shale Plays

- Water: 99.2%
- Other: 0.79%
- Acid: 0.07%
- Crosslinker: 0.032%
- Scale Inhibitor: 0.023%
- Breaker: 0.02%
- Iron Control: 0.004%
- Biocide: 0.001%
- Corrosion Inhibitor: 0.05%
- Friction Reducer: 0.05%
- Clay Control: 0.034%

Source: FracFocus data August 2012
## Chemical Additives

<table>
<thead>
<tr>
<th>Constituent Name</th>
<th>Generic Name</th>
<th>CAS Number</th>
<th>Common Use</th>
<th>Hazardous as Appears on MSDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,4 Trimethylbenzene</td>
<td>Aromatic Hydrocarbon</td>
<td>95-63-6</td>
<td>Paint, Mold Making Kit (Arts and Crafts), Unleaded Gasoline</td>
<td>Yes</td>
</tr>
<tr>
<td>2-Bromo-2-nitro-1,3-propanediol</td>
<td>Bronopol</td>
<td>52-51-7</td>
<td>Anti-Bacterial Soap, Skin Cleansing (Wipes), Hand Wash and Body Shampoo</td>
<td>Yes</td>
</tr>
<tr>
<td>Acrylate Polymer</td>
<td>Acrylate Polymer</td>
<td>*</td>
<td>No Common Product Uses Identified</td>
<td>No</td>
</tr>
<tr>
<td>Aluminum Silicate</td>
<td>Silicate</td>
<td>1302-76-7</td>
<td>Powdered Milk Anti-Caking Food Additive, Home and Commercial Fire Resistant Cement</td>
<td>No</td>
</tr>
<tr>
<td>Borate Salts</td>
<td>Borate Salts</td>
<td>*</td>
<td>No Common Product Uses Identified</td>
<td>No</td>
</tr>
<tr>
<td>Chlorous Acid, Sodium Salt</td>
<td>Inorganic Salt</td>
<td>7758-19-2</td>
<td>Food Additive (Non-Specific)</td>
<td>Yes</td>
</tr>
<tr>
<td>Crystalline Silica, Cristobalite</td>
<td>Silica</td>
<td>14464-46-1</td>
<td>Textured Foundation for Painting, Interior Paint</td>
<td>Yes</td>
</tr>
<tr>
<td>Crystalline Silica, Quartz</td>
<td>Silica</td>
<td>14808-60-7</td>
<td>Cat Litter, Tile Motar, Arts &amp; Crafts Ceramic Glaze</td>
<td>Yes</td>
</tr>
<tr>
<td>Crystalline Silica, Quartz</td>
<td>Silica</td>
<td>14808-60-7</td>
<td>Hand Cleaner, Laundry Cleaner, Concrete Filler, Concrete Sealant</td>
<td>No</td>
</tr>
<tr>
<td>Diethylenetriamine</td>
<td>Organic Amine</td>
<td>111-40-0</td>
<td>Industrial Epoxy Coating</td>
<td>Yes</td>
</tr>
<tr>
<td>EDTA/Copper chelate</td>
<td>EDTA/Copper Chelate</td>
<td>*</td>
<td>Fertilizer for Agricultural Use and Farm Animal Hoof Infection Treatment</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Flowback

**Storage**
- Flowback is stored in pits or steel tanks pending disposal.

**Disposal**
- Common disposal method is through Underground Injection Wells.
  - Regulated by EPA through Underground Injection Control (UIC) program or state or tribe with delegated regulatory authority.
- Discharged to surface water pursuant to NPDES. Requires pre-treatment.
- Efforts to recycle flowback waters, or treat so it can be used in managed irrigation and land applications.
Flowback

marcellus-shale.us
Gas Extraction
Potential Impacts to the Reservation Environment and Natural Resources
Ground Water

- Fracking fluid chemical additives may contaminate drinking water supply
- Methane may contaminate groundwater resources which may impact the drinking water supply
- Coal bed aquifer contamination – Potential long term source of drinking water
Ground Water
Acquisition of Surface Water – Impacts to Reserved Water Rights

- A 2011 EPA report estimates that 70 to 140 billion gallons of water are used to fracture 35,000 wells in the United States each year.

- Potential to significantly impact localized communities with limited water supply

<table>
<thead>
<tr>
<th>Shale Play</th>
<th>Formation Depth (ft)</th>
<th>Porosity (%)</th>
<th>Organic Content (%)</th>
<th>Freshwater Depth (ft)</th>
<th>Fracturing Water (gallons/well)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barnett</td>
<td>6,500-8,500</td>
<td>4-5</td>
<td>4.5</td>
<td>1,200</td>
<td>2,300,000</td>
</tr>
<tr>
<td>Fayetteville</td>
<td>1,000-7,000</td>
<td>2-8</td>
<td>4-10</td>
<td>500</td>
<td>2,900,000</td>
</tr>
<tr>
<td>Haynesville</td>
<td>10,500-13,500</td>
<td>8-9</td>
<td>0.5-4</td>
<td>400</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Marcellus</td>
<td>4,000-8,500</td>
<td>10</td>
<td>3-12</td>
<td>850</td>
<td>3,800,000</td>
</tr>
</tbody>
</table>

Data are from GWPC and ALL Consulting, 2009.
Spills: Surface Water, Land, Fish & Wildlife
Stormwater/Surface Water
Potential Impacts to Reservation Air Resources

- Natural gas is a cleaner energy source than coal,

\[\textit{but}..\]

- Estimated as much as 3.6-7.9 percent of the methane from shale production escapes into the atmosphere over the lifetime of a well.

- One tonne of methane has the same global warming potential as 25-72 tonnes of carbon dioxide.
Potential Impacts to Reservation Air Resources

Venting, Flaring and Capturing

• In 2011, methane and carbon dioxide emissions from production, processing, transmission and storage amounted to the equivalent of 177 million tonnes of carbon dioxide, about 2.6 percent of all U.S. emissions.
Air Pollution / Green House Gases
Increased Seismic Activity

Earthquakes with magnitude \( M \geq 3 \) in the U.S. midcontinent, 1967–2012. After decades of a steady earthquake rate (average of 21 events/year), activity increased starting in 2001 and peaked at 188 earthquakes in 2011. Human-induced earthquakes are suspected to be partially responsible for the increase.

William L. Ellsworth, USGS Science, 12 July 2013
Vol. 341 no. 6142
How is Hydraulic Fracturing Regulated?
What Laws Apply?
## Significant Regulations

<table>
<thead>
<tr>
<th>Category</th>
<th>Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Well Construction:</strong></td>
<td>State and Tribe Oil &amp; Gas Regulations</td>
</tr>
<tr>
<td><strong>Water Acquisition:</strong></td>
<td>State or Tribal Water Law/Reserved Rights</td>
</tr>
<tr>
<td><strong>Fracking Fluid Chemicals:</strong></td>
<td>EPCRA, TSCA, Tribal and State Law</td>
</tr>
<tr>
<td>(Storage &amp; Handling)</td>
<td></td>
</tr>
<tr>
<td><strong>Flowback Disposal:</strong></td>
<td>CWA; SDWA, Tribal Law</td>
</tr>
<tr>
<td><strong>Spill/Contamination Response:</strong></td>
<td>CERCLA; HSCA, State Law; RCRA; SDWA</td>
</tr>
</tbody>
</table>
Safe Drinking Water Act (SDWA)

- Safe Drinking Water Act (SDWA) regulates Underground Injection Control (UIC) programs.
- UIC programs are jointly administered by EPA and states or tribes subject to the “primacy” rules.
Safe Drinking Water Act (SDWA)

- Signed into law in 1974
- EPA interpreted the SDWA as not applicable to fracking because the primary purpose of fracking is not underground injection.

- *Legal Envtl. Assistance Found. v. United States EPA*, 118 F.3d 1467 (11th Cir. 1997): The Court held that the SDWA gave a “straightforward statutory command” and “dictated that all underground injection be regulated…”
Safe Drinking Water Act (SDWA)
Safe Drinking Water Act (SDWA)

Energy Policy Act of 2005 exempts fracking from the SDWA:

The term “underground injection” –
(A) means the subsurface emplacement of fluids by well injection; and
(B) excludes –
(i) the underground injection of natural gas for storage; and
(ii) the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas or geothermal production activities.
Clean Air Act (CAA)

- *WildEarth Guardians v. EPA*: Alleged that EPA failed to review new source performance standards (NSPS) for the oil and gas industry.

- February 2010, US Dist. Court for the Dist. Of Columbia issued a Consent Decree, which required EPA to take action related to review of these standards.

- EPA issued the Final Amendments to Air Regulations for the Oil and Natural Gas Industry on April 17, 2012

- Expected to result in a 95% reducing in VOCs generated from hydraulic fracturing through implementing Reduced Emissions Completions (REC) or “Green Completions” Rule becomes fully implemented in 2015.
Chemical Disclosure Requirement

Emergency Planning and Community Right to Know Act (EPCRA)

- MSDS must be available
- Report inventory of MSDS chemicals to state, local officials, and fire departments if > 10,000 lbs.
- EPA has not included oil and gas extraction as an industry that must report under Toxic Release Inventory (Database of toxic chemical releases and waste management activities).

Hydraulic Fracturing in Indian County
Brief History of Mineral Resources on Indian Lands

- Before 1938, mineral rights were in a state of confusion due to the US Government's shifting and inconsistent policies toward Indian people.

- Mineral Leasing Act of 1938 (IMLA):
  - Created single set of rules
  - Leasing required tribal consent and Secretary of Interior approval
  - The IMLA requires the Secretary of Interior to manage and regulate the mineral leasing.
Existing Bureau of Land Management Rule Concerning Natural Gas Production

• Existing BLM rules regulating natural gas production on public and Indian lands were established in 1982 and last revised in 1988.

• Existing rules do not specifically address issues with hydraulic fracturing.

• BLM issued proposed rule regulating hydraulic fracturing on May 11, 2012.
BLM’s First Proposed Rule:
*Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands*

- BLM issued proposed rule regulating hydraulic fracturing on May 11, 2012.
- Three primary objectives: (1) Public disclosure of chemicals used in fracturing operations; (2) Construction standards for fracturing operations; and (3) Management of flowback water.
- Received 177,000 comments.
- Industry complained as duplicative of state regulations.
- Rule withdrawn January 2013.
BLM’s Second Proposed Rule:
Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands

- On May 16, 2013, the BLM issued a revised draft proposal for regulation of hydraulic fracturing on federal and Indian lands.

- BLM declined to adopt the “opt-out” provision (requested by many tribal commenters), which would have permitted tribes to decide not to apply the rule to their lands.
BLM Rule “Useable Water” Definition

The definition of “usable water” includes all underground sources of drinking water, zones actually used as water supply for industrial or agricultural purposes and zones designated by a state or by a tribe as needing isolation or protection from oil and gas operations, in addition to any zones containing water that does not exceed certain levels of total dissolved solids. 78 Fed. Reg. at 31,674 (to be codified at 43 C.F.R. § 3160.0-5).
Tribal Variances to BLM Rule

- Tribes may seek a variance from final BLM Regulation. An approved variance permits an Operator to comply with the Tribal regulation.

- Requires application to BLM for variance approval; Tribe must demonstrate necessity of the variance.

- Variance must meet or exceed BLM standards.

- Variance limited to operational activities (monitoring, testing). BLM notice and approval procedures continue to apply.
BLM’s Second Proposed Rule:  
*Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands*

**Chemical Disclosure and Reporting**

- Requires disclosure of chemical composition of fracking fluids within 30 days of completing fracking operations.
- Requires disclosure of whether the well is on federal or tribal land and a certification that the information is correct and complies with applicable laws governing notice and permits.

**Cementing and Construction Requirements**

- Requires operator to submit a Cement Evaluation Log (CEL) within 30 days of completing fracking operations.
BLM’s Second Proposed Rule:  
_Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands_

**Flowback Fluid Storage**

- Operators must submit to the BLM a plan for managing and containing fluids recovered during the hydraulic fracturing process
- Flowback fluids may be stored either in tanks or lined pits
- BLM has requested comments on the costs and benefits of storing flowback fluids in closed tanks.
- Currently, operators on federal or tribal land may use unlined pits if state law permits.
BLM’s Second Proposed Rule:  
*Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands*

- Comments due August 23, 2013
- Final Rule expected in 2014
  - Currently in U.S. House of Representatives Natural Resources committee.
Lease Requirements

• Require that lessee comply with all Tribal laws and regulations
• Site Assessment to determine baseline
• Ongoing monitoring
• Response/Remedial plan
Tribal Laws potentially Applicable to Hydraulic Fracturing

Hazardous Substances Control Act (HSCA)

- Remedial statute/code provides for cleanup of hazardous substances (Not regulatory)
- Imposes tribal cleanup standards
- Spill notice requirements;
- Authority to perform inspections
- Cost recovery
Tribal Laws potentially Applicable to Hydraulic Fracturing

Groundwater Management Ordinance

• Regulate activities that may impact groundwater, potentially including site specific assessment, period monitoring/inspection, and groundwater standards.
• Define areas of “usable water”
• Establish a Natural Resource Inventory
Tribal Laws potentially Applicable to Hydraulic Fracturing

**Tribal Public Disclosure Laws**

- Tribal Emergency Planning and Community Right to Know (EPCRA) or similar Act or Ordinance requiring public disclosure of hazardous substance inventories and management
What does the Future Hold?

Natural gas trade summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
<th>Net Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>4,000</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>2005</td>
<td>3,500</td>
<td>900</td>
<td>2,600</td>
</tr>
<tr>
<td>2006</td>
<td>3,200</td>
<td>800</td>
<td>2,400</td>
</tr>
<tr>
<td>2007</td>
<td>3,000</td>
<td>700</td>
<td>2,300</td>
</tr>
<tr>
<td>2008</td>
<td>2,800</td>
<td>600</td>
<td>2,200</td>
</tr>
<tr>
<td>2009</td>
<td>2,500</td>
<td>500</td>
<td>2,000</td>
</tr>
<tr>
<td>2010</td>
<td>2,200</td>
<td>400</td>
<td>1,800</td>
</tr>
<tr>
<td>2011</td>
<td>2,000</td>
<td>300</td>
<td>1,700</td>
</tr>
<tr>
<td>2012</td>
<td>1,800</td>
<td>200</td>
<td>1,600</td>
</tr>
</tbody>
</table>


Note: LNG exports to Mexico were delivered by truck. Re-exports are shipments of LNG to foreign countries that were previously imported, offloaded into above-ground LNG storage tanks, and then subsequently reloaded onto tankers for delivery to other countries.

Net imports

Strong natural gas exports and lower imports reduced net imports to around 1,510 Bcf in 2012, the lowest level since 1990.

- Total imports decreased by 10 percent to 3,135 Bcf in 2012. Pipeline and LNG imports decreased by 5 percent to 2,901 Bcf and by 50 percent to 175 Bcf, respectively.
- Total exports increased by 8 percent to 1,019 Bcf in 2012. Pipeline exports increased by 11 percent to 1,551 Bcf and offset decreases in LNG exports and re-exports.
Questions / Discussion

Thank you

Greg Hixson
Short Cressman & Burgess PLLC
ghixson@scblaw.com
(206) 682-3333