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DATE: August 15, 2017

TOPIC: Oil and Gas and the Texas Railroad Commission: Lessons for Regulating a Free Society

LOCATION: San Antonio Petroleum Club
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TIME: 7:30 AM Breakfast - 8:00 AM Presenters - 8:50 AM Questions & Answers

INTRODUCTIONS: E.O. (Trey) Scott, III, Trinity Mineral Management, Ltd.

PRESENTERS: Dr. Mark A. Miller, Petroleum Engineering Consulting and Advisory Services

Oil and Gas and the Texas Railroad Commission: Lessons for Regulating a Free Society

- History of the Railroad Commission – How We Got There
- The Railroad Commission in Texas Politics
- Regulatory Challenges Facing the Commission
- Ways Texas Can Do Better

UPCOMING: SEP 19 Trey Scott: Oilfield Cleanup & House Bill 2259
OCT 17 Sean Caporaletti: Fair Market Value

Dr. Mark A. Miller
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After graduating with a BS in Engineering from Harvey Mudd College, Dr. Mark Miller began a career in the oil and gas industry as a Petroleum Engineer. Later receiving a PhD from Stanford University, he went on to teach petroleum engineering at The University of Texas at Austin for 18 years.

After leaving UT, Mark established a worldwide petroleum engineering consulting practice and was a founder and CEO/CTO of a small company that provided software to the oil and gas industry. He is currently semi-retired and does occasional consulting.

Dr. Miller was the Libertarian Party nominee for Texas Railroad Commissioner in 2014 and 2016. In 2016 he was the only candidate for Railroad Commissioner to receive endorsements from the Texas' major newspapers.

Professional Experience

Consulting Petroleum Reservoir Engineer Jan 2015 to Present

Providing reservoir engineering consulting and advisory services in technology development, general reservoir engineering, reservoir simulation, and the reservoir engineering aspects of natural gas, naturally-fractured reservoirs, and shale plays.

Promethean Technologies Group, LLC Jun 2012 to Dec 2014

Founder and CEO/CTO – providing technical management for company that produces shale analysis software products.

Object Reservoir, Inc. Jan 2012 to May 2012

Chief Technology Officer – developed and managed shale gas analysis software products.

Consulting Petroleum Reservoir Engineer Feb 2006 to Dec 2011

Provided reservoir engineering consulting and training, with expertise in the characterization, analysis, design, and optimization of petroleum recovery projects. Specialties include general reservoir engineering, reservoir simulation, reservoir engineering aspects of natural gas and naturally fractured reservoirs, thermal oil recovery, petrophysical property analysis, well test analysis, and fluid property characterization.

Object Reservoir, Inc. Dec 2002 to Feb 2006

Senior Reservoir Engineer - provided reservoir engineering supervision, expertise, and support for consulting services, sales, and development activities of a reservoir modeling technology company.

Consulting Petroleum Reservoir Engineer Sep 2001 to Dec 2002

Reservoir engineering consulting and training for worldwide oil and gas producing companies.

University of Texas at Austin Jun 1983 to Aug 2001

Associate Professor (after 1989), Department of Petroleum and Geosystems Engineering. Taught courses and conducted research in reservoir engineering, naturally fractured reservoirs, natural gas engineering, thermal oil recovery, and petrophysics. Deputy Director, Center for Petroleum and Geosystems Engineering, 1988-97.

Stanford University Apr 1983 to Jun 1983

Acting Instructor of petroleum engineering. Taught graduate level course in *Advanced Natural Gas Engineering*.

Reservoir Engineer - reservoir simulation and general reservoir engineering for waterflood and thermal recovery projects. **Corporate Staff Engineer** - reports and recommendations to Group Vice-President and various corporate departments. **Natural Resources Engineer** - minerals project planning. **Operations Engineer** - development drilling, well completions, workovers, and artificial lift installations.

Education

PhD	Petroleum Engineering	Stanford University	(1983)
BS	Engineering	Harvey Mudd College	(1972)

Professional Registration

Professional Petroleum Engineer: Texas 54523 (1983)

Recent Publications

Miller, M.A.: "Oil & Gas and the Texas Railroad Commission: Lessons for Regulating a Free Society" (Nov 2015).

Miller, M.A.: "A Stochastic Approach to Shale Well Completion Design," paper URTEC 1920616 presented at the 2014 Unconventional Resources Technology Conference, Denver, CO, 25-27 Aug.

Nair, N., and M.A. Miller: "Cross-Play Shale Gas Well Performance Analysis," paper SPE 166468 presented at the 2013 Society of Petroleum Engineers Technical Conference and Exhibition, New Orleans, LA, 30 Sep – 02 Oct.

Okouma, V., S. Vitthal, N. Nair, and M.A. Miller: "Playwide Well Performance Analysis in Montney Siltstone." paper 162843 presented at the 2012 Society of Petroleum Engineers Canadian Unconventional Resources Conference, Calgary, Canada. 30 Oct – 01 Nov.

Miller, M.A., C. Jenkins, and R. Rai: "Applying Innovative Production Modeling Techniques to Quantify Fracture Characteristics, Reservoir Properties, and Well Performance in Shale Gas Reservoirs." paper 139097 presented at the 2010 Society of Petroleum Engineers Eastern Regional Meeting, Morgantown, USA, 12-14 Oct.

Naimi-Tajdar, R., C. Han, K. Sepehrnoori, T.J. Arbogast, and M.A. Miller: "A Fully Implicit, Compositional, Parallel Simulator for IOR Processes in Fractured Reservoirs," *Soc. Pet. Eng. J.* (Sep. 2007).

Miller, M.A. and E.D. Holstein: "Gas Reservoirs," Reservoir Engineering Ch. 10, Petroleum Engineering Handbook, Society of Petroleum Engineers, to be published 2006.

Oil & Gas and the Texas Railroad Commission Lessons for Regulating a Free Society

Mark Miller, PhD, PE

Today's Talk

- History of the Railroad Commission
- The Railroad Commission in Texas politics
- Regulatory challenges facing the Commission
- Ways Texas can do better

Reading List

- Childs, W.R.: *The Texas Railroad Commission: Understanding Regulation in American to the Mid-Twentieth Century* (2005).
- Prindle, D.F.: *Petroleum Politics and the Texas Railroad Commission* (1981).
- Miller, M.A.: *Oil & Gas and the Texas Railroad Commission – Lessons for Regulating a Free Society* (2015).

A Brief History of the TRRC (cont.)

- Established in 1891 to regulate railroads
 - Governor Hogg wanted Commissioners to be appointed
 - ✓ Texas Legislature had a different idea.
- One of the first consumer protection agencies in the US
 - Ranchers and farmers believed they were being overcharged for freightage.
 - But Texas badly needed a rail system to connect the vast reaches of the state and to support economic growth, wanting to industrialize after the Civil War.
- Early Commissioners experienced some of the difficulties in regulating monopolies
 - Finding “optimal rates” that will keep charges low but high enough for companies to upgrade equipment
 - How to deal with competing technologies
 - ✓ In this, pipelines and trucking, for example.
- Two phrases of note from the Childs book:
 - Pragmatic federalism
 - Dual management

A Brief History of the TRRC (cont.)

- Following the Splindletop discovery in 1901, Texas, by 1930, had become the #1 oil producing province in the world.
 - During this time the TRRC's responsibilities were expanded to oil pipelines (1917), oil and gas production (1919), natural gas delivery systems (1920), bus lines (1927), trucking (1929).
- A series of regulatory “crises” ensued after the East Texas field was discovered in 1930.

East Texas Field ...

The First Texas Oil Boom (1930)

- Huge!
 - 45 miles long by 12 miles wide, extending across five counties
 - ✓ 7 billion barrels originally in-place, 5.4 billion barrels produced to date
 - Less than a year after discovery:
 - ✓ Producing > 1 million barrels of oil per day
 - ✓ A new well was being completed every hour!
 - Kilgore at one time had 1000 producing oil wells in its downtown.
- Poorly understood (at the time) geologic trap (interestingly, source rocks are Eagle Ford shale)
 - Major companies failed to acquire leases
- Regulatory issues were complicated by the (controversial and poorly understood at the time) strong waterdrive
- Oil prices fell from \$1.10 per barrel to less than \$0.10 per barrel
- So much chaos (caused by large diversity of ownership) that in 1931, Texas Gov. Sterling sent in the National Guard and Rangers to enforce martial law

A Brief History of the TRRC (cont.)

- Subsequent legislation established the Commission's right to prorate oil, eventually for both physical and economic reasons
 - Consistently sought to protect independent oil companies and mineral rights owners from unrestrained competition
 - ✓ Rationale – unregulated production brings chaos – *i.e.*, normal economic considerations are precluded because oil is discovered, a problem exacerbated by the legal principal of rule of capture
- From 1930-70 the TRRC managed the world's oil surplus
 - “Prorating” production to match market demand

TRRC Politics

- Part of Texas' plural executive, which includes:
 - Secretary of State (appointed by Governor)
 - Lieutenant Governor
 - Attorney General
 - Comptroller of Public Accounts
 - Commissioner of the General Land Office
 - ✓ Largest mineral rights owner in Texas
 - Commissioner of Agriculture
 - Railroad Commissioners (3)
 - State Board of Education (15, elected from districts)
- **Railroad Commissioners are elected to rotating 6-yr terms, one every 2 years.**

Current Commissioners

- Wayne Christian (2022)
 - Financial planner and former Texas House Representative, Center
 - Stephen F. Austin University Bachelor of Business Administration
- Ryan Sitton (2020)
 - Asset Integrity (mechanical) engineer from Houston
 - Texas A&M BS Mechanical Engineering
- Christi Craddick, Chair (2018)
 - Attorney, Midland native, daughter of Tom Craddick (former Speaker of Texas House of Representatives)
 - UT Plan II, Law School graduate
- The only petroleum engineer to serve as Railroad Commissioner (1947-63) was Bill Murray, UT MSPE 1937

Political Idiosyncrasies

- Having three heads, the Railroad Commission is the only statewide executive position on the ballot every two years.
- The Commission has an avowed dual role as industry champion as well as its regulator.
 - Institutionalized regulatory capture
- Most important regulatory agency in Texas government
 - Directly responsible to voters, but it continues to operate with a misleading name.
 - Fewer than 5% of voters are aware of its duties

How the TRRC Views Itself



How the Oil & Gas Industry Views the TRRC



How the Public Views the TRRC



Railroad Commission is broken

EXPRESS-NEWS EDITORIAL BOARD : MAY 9, 2014 : Updated: May 9, 2014 1:35pm

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Regulatory Challenges

- Fracking fears
 - Groundwater contamination
 - Air quality from natural gas leaks
 - Earthquakes from wastewater disposal
- Conflicting property rights
 - Urban drilling
 - Eminent domain
- Rapidly advancing shale technology
- Transparency and reform

Fracking Has Entered the Public Discourse



How the Oil & Gas Industry Views Fracking



How the Public Views Fracking



Damage Award in Texas Fracking Case Raises Stakes in Air Quality Debate

By David Hasemyer | May 28, 2014



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Regulators Close Case on Flaming Texas Water, Researcher Says Not So Fast

MAY 30, 2014 | 11:19 AM

BY MOSE BUCHELE

Near Weatherford, TX



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↑ WALL STREET AIRLINES TECHNOLOGY

Near Azle/Reno, TX

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After quakes, Texas Railroad Commission considers stricter rules on drilling

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By JAMES OSBORNE

Staff Writer

josborne@dallasnews.com

Published: 12 May 2014 09:12 PM

Updated: 12 May 2014 09:48 PM

State oil and gas regulators are considering stricter rules for drillers after a series of earthquakes in North Texas less than six months ago.

Critics say new Railroad Commission rules on common-carrier pipelines don't adequately protect landowners



Marissa Barnett [Twitter](#) [Email](#)

Published: December 5, 2014 10:59 am



AUSTIN — Oil and gas regulators will soon require pipeline operators to provide sworn testimony and supporting documents in

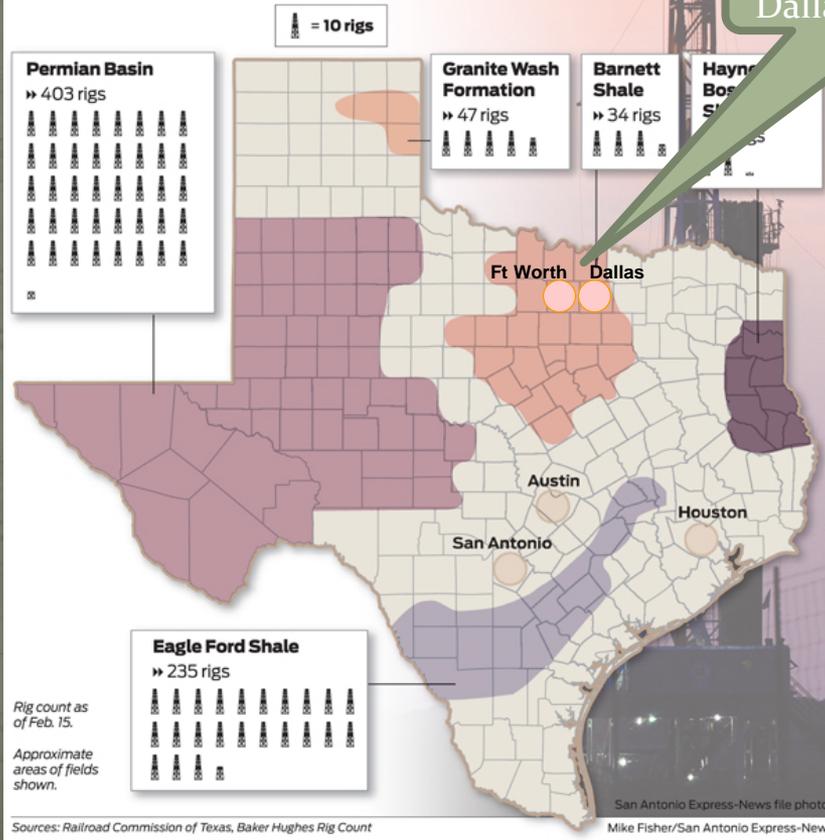


Shale Activity in Texas

Texas oil and gas fields

Texas has more than one-fifth of the world's drilling rigs operating and five major areas of oil and gas production. The Barnett Shale in North Texas was the first field where horizontal drilling and hydraulic fracturing were used to produce oil and gas from dense shale rock. Since then, drilling and production has ramped up in the Eagle Ford in South Texas, the Haynesville/Bossier Shale in East Texas and the Panhandle's Granite Wash, a tight sandstone. The Permian Basin, a historically prolific area for oil and gas production, has re-emerged as a complex field with drilling in multiple geologic horizons.

What happened to Dallas and Ft Worth?



Conflicting Property Rights

- Expanding geographic footprint of shale production means increasing encroachment into residential and commercial areas.
 - Even though per-well footprint is greatly diminished
- Surface rights are increasingly severed from mineral rights
 - Mineral rights are legally dominant in Texas
- Common carrier pipelines have almost unlimited authority to seize land.
 - Few incentives to minimize landowner impact

Conflicts Resolved or Not?



Dissecting Denton: How a Texas City Banned Fracking

by [Jim Malewitz](#) | Dec. 15, 2014 | [12 Comments](#)

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photo by: Brandi Korte / Frack Free Denton

State lawmakers, the oil and gas industry and national environmental groups are asking deep questions about Denton, home to two universities, 277 gas wells and now, thanks to a rag-tag group of local activists, Texas' first ban on hydraulic fracturing.

**This story was also published in [Politico Magazine](#).*

DENTON — Cathy McMullen taps the brakes of her Toyota Prius after driving through a neighborhood of mostly one-story homes in Denton, about an hour northwest of Dallas. “There,” she says, nodding toward a limestone wall shielding from view a pad of gas wells. McMullen, a 56-year-old home health nurse, cruised past a stretch of yellowed grass and weeds. “They could have put that pad site on that far corner right there,” she says, pointing ahead. “The land’s all vacant.”

Instead, the wells sit on the corner of Bonnie Brae and Scripture Street. Across the way: Texas Health Presbyterian Hospital. Across another street: the basketball court, picnic tables and purple playground of McKenna Park. That was where Range Resources, a company based in

House Bill 40 (84th Legislature)

- Response to 2014 Denton fracking ban passed Nov.2014
- HB 40 expressly preempts local regulation of oil and gas:
 - “... a municipality or other political subdivision may not enact or enforce an ordinance or other measure ... that bans, limits, or otherwise regulates an oil and gas operation ...”
 - Exceptions, any ordinance that:
 - ✓ “regulates only aboveground activity related to an oil and gas operation ... including a regulation governing fire and emergency response, traffic, lights, or noise, or imposing notice or reasonable setback requirements” and
 - ✓ “is commercially reasonable” and
 - ✓ “does not effectively prohibit an oil and gas operation conducted by a reasonably prudent operator” and
 - ✓ “is not otherwise preempted by state or federal law.”
- Went into effect 18.May.2015
 - Vantage Energy resumed fracking operations 01.Jun.2015

A Few Sunset Commission Transparency Recommendations for the TRRC

- Change the name to the **Texas Energy Resources Commission**
- Limit campaign contributions to 1.5 yrs before an election rather than throughout full six-year terms
- Prohibit Commissioners from accepting contributions from parties with contested cases
- Require resignation when a Commissioner becomes a candidate for another elected office
- Require the Commission to adopt a more robust recusal policy
- Transform the TRRC into an agency governed by a part-time appointed board
- Transfer the Commission's enforcement hearings to the State Office of Administrative Hearings
- Transfer gas utility regulation to the Public Utility Commission

A Few Recommendations to Consider for the Texas Railroad Commission

- Transparency
 - Change the name
 - Abandon Commission's role as oil & gas industry champion
- Regulatory reform
 - Shed some current responsibilities, *e.g.*, natural gas rate setting, pipeline safety and permitting
 - Sunset review all regulations
- Address urban drilling problems, *e.g.*, recommend
 - Block grant fraction of severance taxes to local jurisdictions
 - ✓ So that risks and rewards are appropriately reconciled
- Address property rights
 - Increased attention to surface property rights
 - ✓ Including recommendations for statutory changes
- More aggressive focus on earthquakes
- Recommend changes in Texas statutes to better balance the rights of surface and mineral owners

Shale Technology Challenges

- Traditional view of allowables and well spacing are outdated.
- Technology is continuing to advance rapidly.
 - TRRC technical staff will be challenged.
- It is unclear how the TRRC will make the transition to shale development as analogous to manufacturing.

Questions?

