

# Texas: The Proven Model for Successful Regulation of Unconventional Reservoirs

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# This is Bad Regulation



# But we don't have to hide from the issues

- Briefly on my background:
- I worked in private industry as an environmental and petroleum geologist and have cleaned up more oilfield pollution than anyone you will ever meet.
- I have run the largest oil and gas regulatory agency in the United States, the Railroad Commission of Texas.
- During my tenure, we developed the regulations that permitted the development of shale gas for over 10 years.

# The 3 Goals of Successful Oil and Gas Regulation

1. Public Safety

2. Environmental Protection

3. Economic Development

- Regulation must cover the entire life cycle of the well, from birth to death, drilling to plugging

# Old

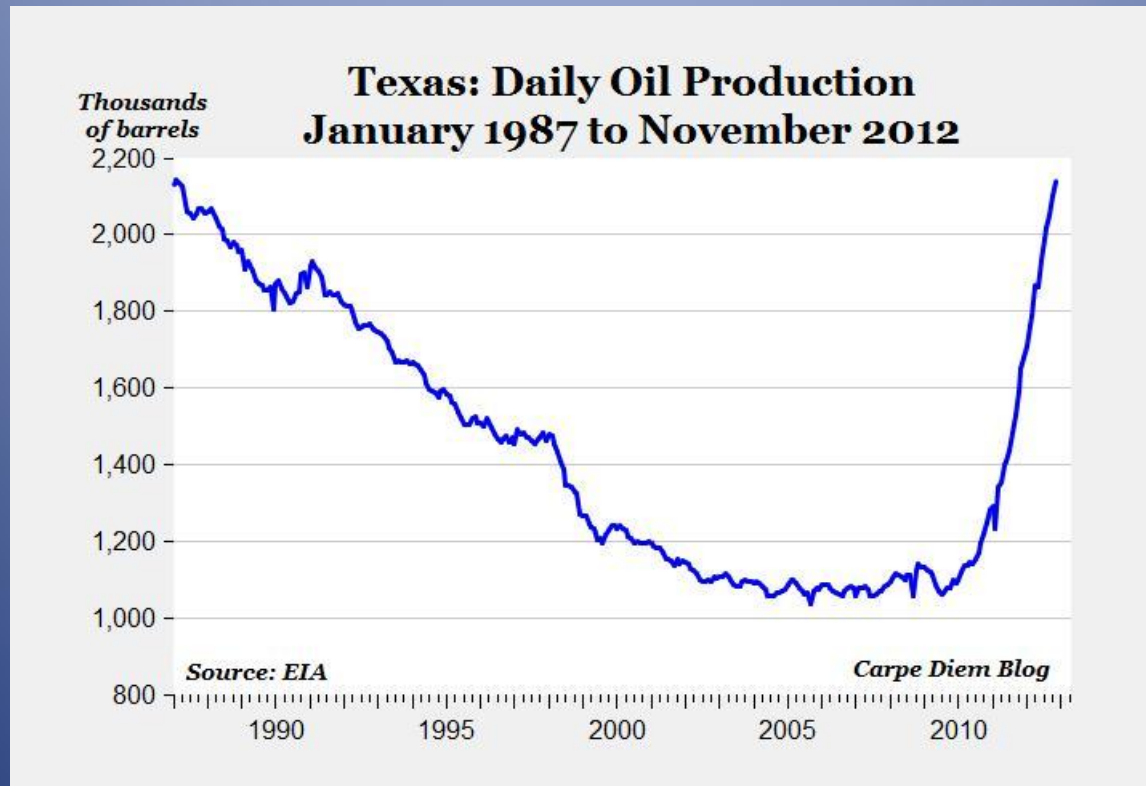


New





# Texas Oil Production



How is it done in Texas?  
Could it be done in Europe?





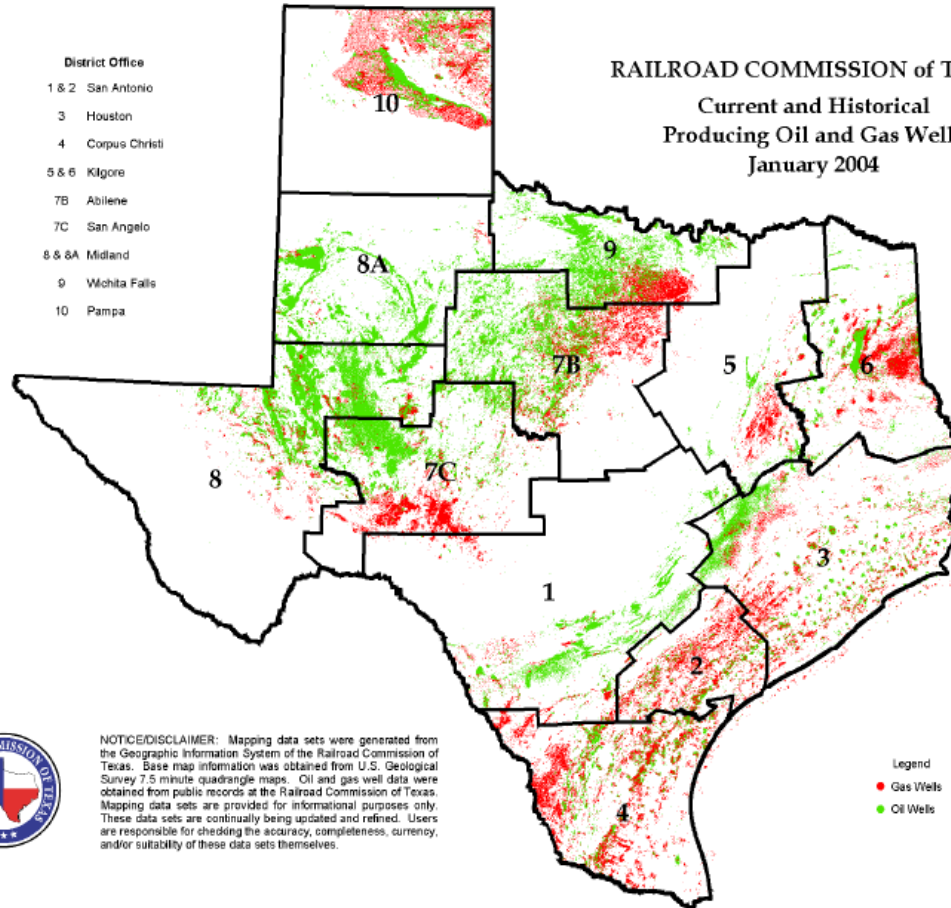
# Romania + Texas = ?

- *Texas* (US) (696200 km<sup>2</sup>)
- *Romania* (238391 km<sup>2</sup>).
- Texas is almost three times (2.92) the size of *Romania*.

# RAILROAD COMMISSION of TEXAS

## Current and Historical Producing Oil and Gas Wells January 2004

- District Office
- 1 & 2 San Antonio
  - 3 Houston
  - 4 Corpus Christi
  - 5 & 6 Kilgore
  - 7B Abilene
  - 7C San Angelo
  - 8 & 8A Midland
  - 9 Wichita Falls
  - 10 Pampa



NOTICE/DISCLAIMER: Mapping data sets were generated from the Geographic Information System of the Railroad Commission of Texas. Base map information was obtained from U.S. Geological Survey 7.5 minute quadrangle maps. Oil and gas well data were obtained from public records at the Railroad Commission of Texas. Mapping data sets are provided for informational purposes only. These data sets are continually being updated and refined. Users are responsible for checking the accuracy, completeness, currency, and/or suitability of these data sets themselves.

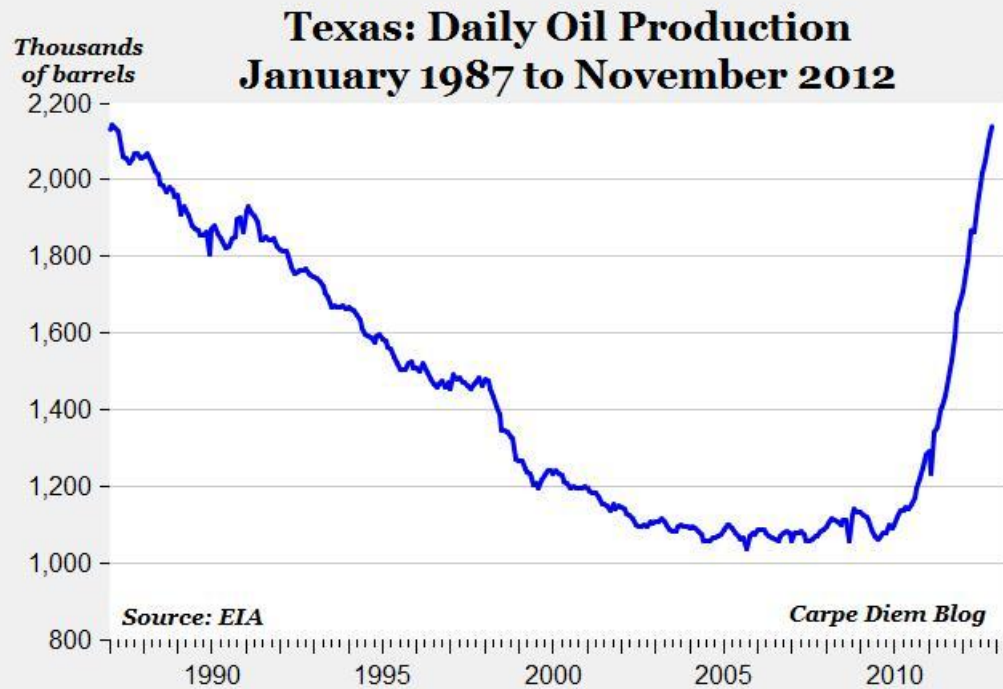
Legend

- Gas Wells
- Oil Wells

# Snapshot of Texas Energy

- Approximately 450,000 existing well bores, over 1,000,000 wells drilled in past 100 years.
- Production heading toward 500,000,000 bbls of oil / yr.
- Produces 8 TCF gas/yr.
- 1/3 of all Natural Gas in US comes from Texas.
- Impact can be seen from outer space!

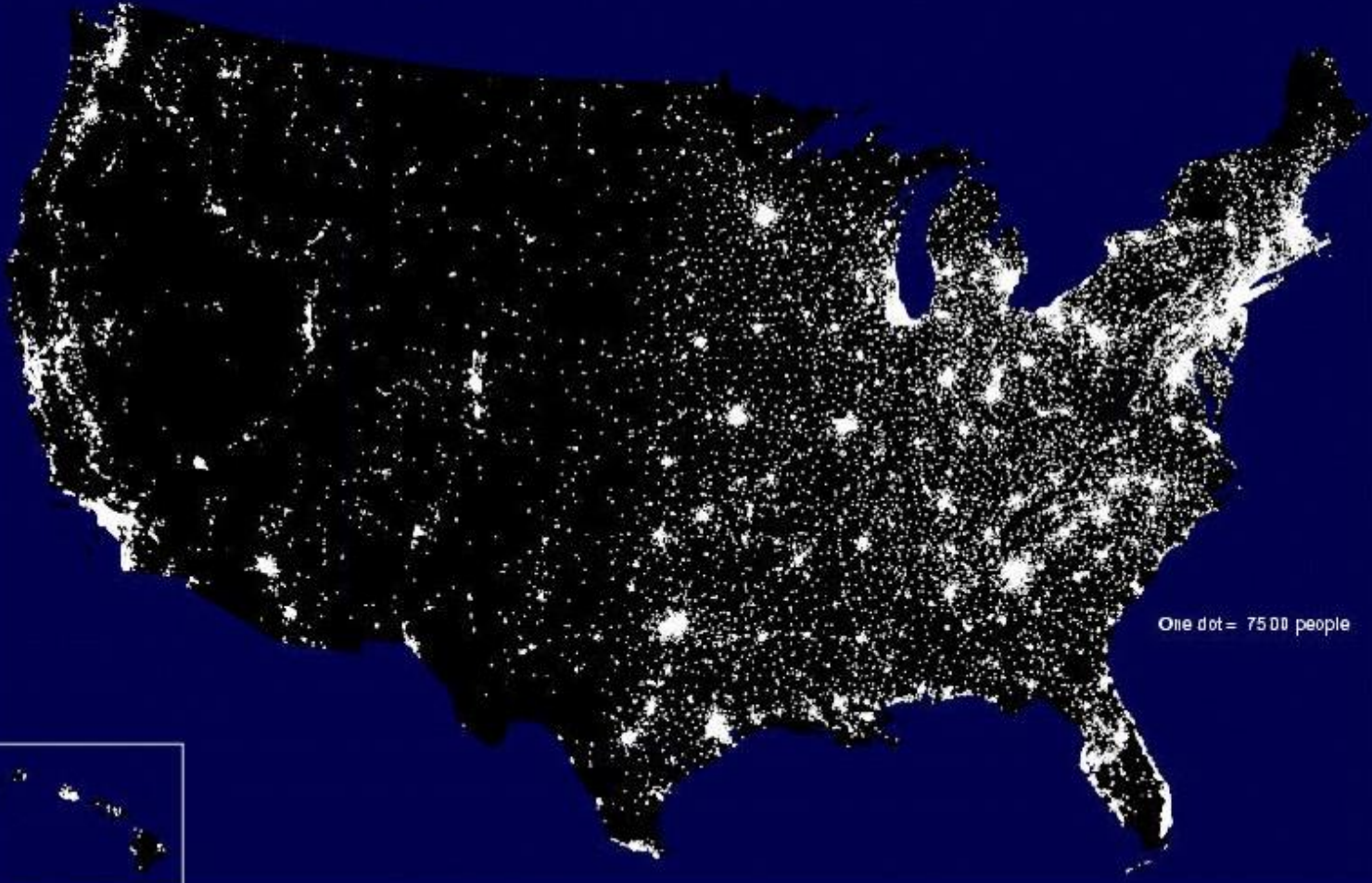
# Texas



# 2000



## 2000 POPULATION DISTRIBUTION IN THE UNITED STATES



One dot = 75 000 people





2012





# What does Hydrofracture technology mean to Texas?

- Jobs
- Taxes
- Technology
- Energy Independence

# Hydrofracturing in Texas

- Over 20,000 gas and oil wells have been safely hydrofractured in Texas over the past decade.
- There has not been a single instance of groundwater contamination in Texas from fracturing.

# Why?

One reason and one reason only...

# Comprehensive Regulation

**...that is enforced**

Drill Bit to Burner Tip  
Spud to plug

# Why Regulate? Common Public Concerns

- Groundwater and Water Well Protection.
- Waste Management.
- Water Use.
- Air Impact.

Concerns continued

# Infrastructure Footprint

- Roads.
- Traffic.
- Noise.
- Odors.
- Pads, tanks, and wellheads on leases.
- Pipeline easements.
- Royalty payments.

....Each has a solution!

# Common Perceived Benefits

- Clean Energy.
- Enhanced energy independence from foreign sources of oil and gas.
- Jobs.
- Taxes, Royalties, and other State Income.

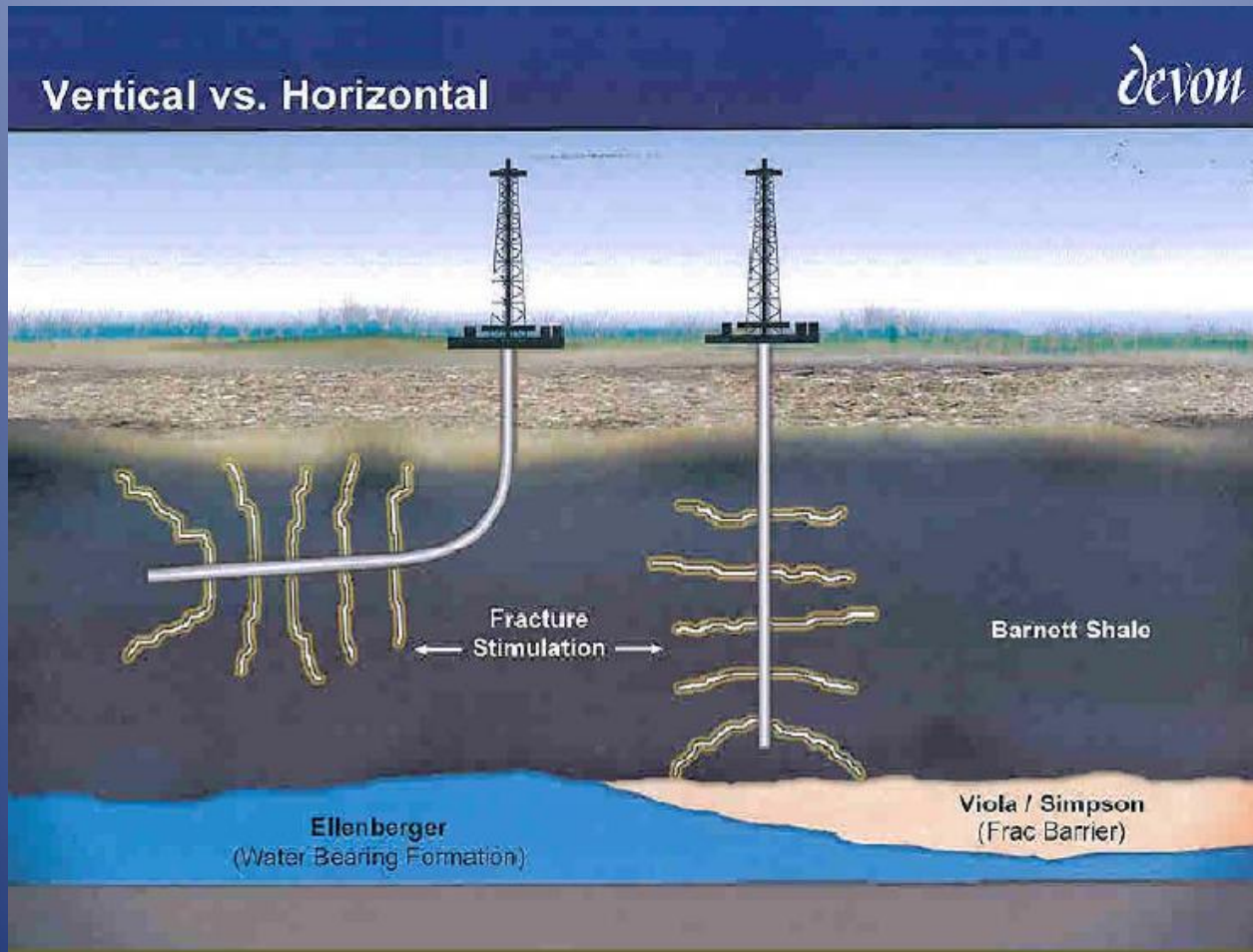


# Texas Impact in US \$ (2011 data)

- Jobs\* = 223,000 direct jobs > \$100,000/job
- Taxes: \$9.25 billion per year
- Energy Technology & Education: world leader
- Energy Independence: priceless

\*does not include refining, equipment, pipelines

# What is a Hydrofracture Job?



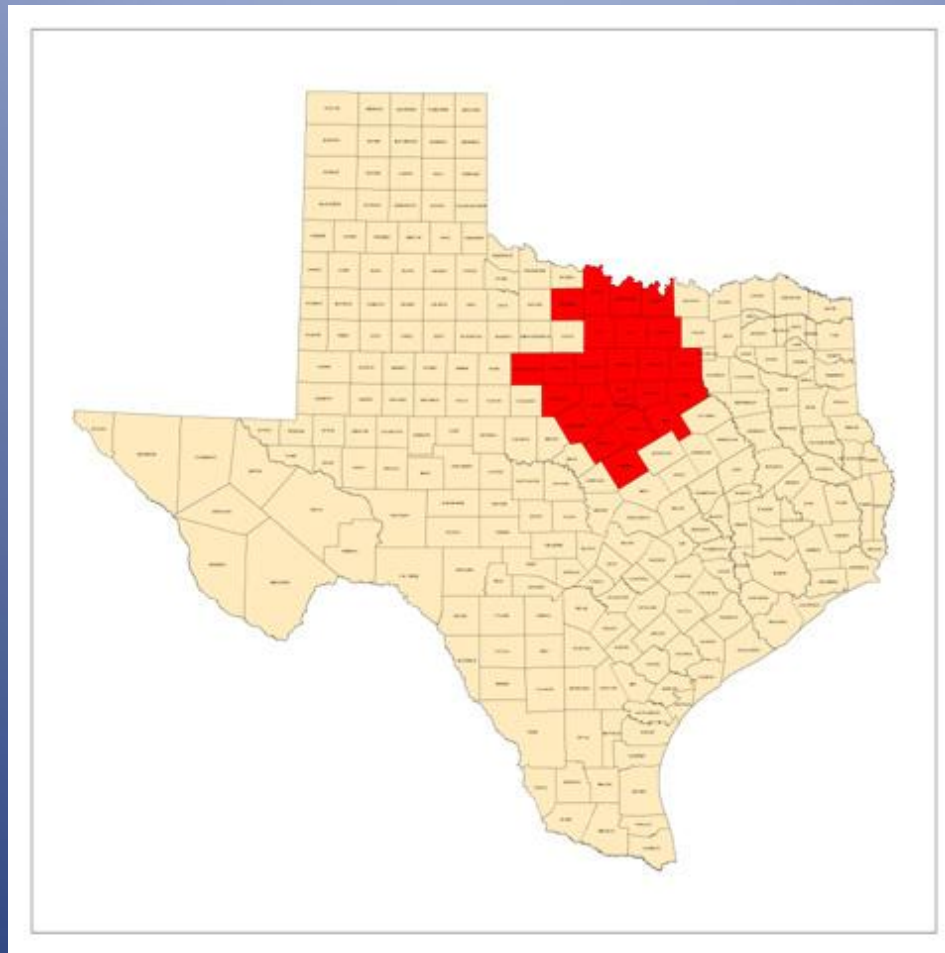
# #1 Misconception about Hydrofracturing and Shale Gas

- Safety and Environmental risk is not about the actual fracturing procedure.
- There must be an overall, comprehensive regulatory framework over oil and gas production to ensure safe and clean development.
- Must begin at the drill bit and continue to the customer's burner tip.

# The Rock...Shale



Barnett Shale in Texas = 20,000 km sq.  
Romania Country = 240,000 km sq.



# Barnett Shale Gas Production

- Barnett Shale January 2012 through November 2012 = 1,770 Bcf.
- Accounts for 31% of Texas Gas Production.



# Barnett Shale Statistics

- As of January 23, 2013 there are 16,530 total gas wells entered on RRC records.
- In addition, there are 2,457 permitted locations.
- Possibly more than 30 TCFG.

....Enough for the entire US for 1 year.

# New Eagleford Play

- Oil rich.
- Deeper.
- Rural.



# The 3 Goals of Successful Oil and Gas Regulation

1. Public Safety
2. Environmental Protection
3. Economic Development

# Public Safety

- Includes workers and average citizens.
- Industry must be transparent and communicate.
- Identify risks: explosions, toxic atmosphere, handling hazardous substances like acid, mechanical injury.
- Install regulations and inspect and enforce.

Example: require drilling equipment to have regular safety checks

# Environmental Protection

- Water
- Soil
- Air

# Environmental Protection

- Identify sensitive environmental issues like water protection, waste disposal, water use, species and habitats.
- Understand how industry activity may interact with these concerns.
- Develop regulations, inspect and enforce, and require cleanup after accidents.



# Accidents *WILL* Happen

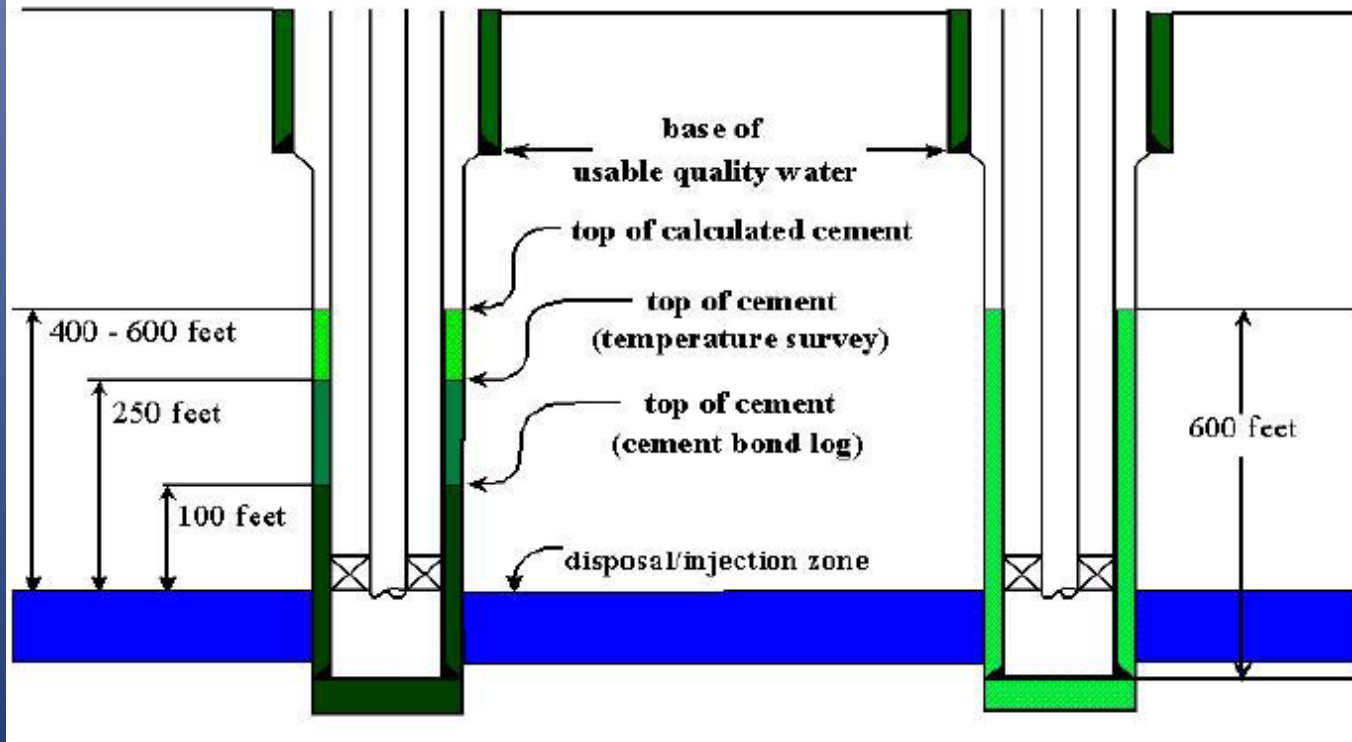
- People make mistakes.
- Equipment can fail.
- Know how and when to respond with **expertise** and **funding**.

# How Do Regulations Protect Groundwater?

- Any time a well is drilled in Texas rules require that surface casing in the well be set below the depth of usable quality.
- The Commission's rules include strict well construction requirements that require several layers of steel casings and cement to protect groundwater.
- In addition, Commission rules require gauges that monitor casings at the surface, so if there is a downhole problem, it is easily and quickly identified.
- For fracturing fluid to affect the usable quality water, a leak in the well would have to go through several layers of protection and several layers of casing to leak outside of the wellbore.

# Cement

## Criteria for Determining the Adequacy of Cement



# Economic Development

- A “Happy Path” to routine permits.
- Industry deserves to know the rules in advance.
- Consistent and stable government oversight.
- **Transparency** with public and information.
- **Accountability** of Regulators.

# The 4 steps to Successful Regulation

1. Compose thorough regulatory framework and have government pass regulations with the weight of law.
2. Frequently inspect industry activities for compliance.
3. Use enforcement (fines, shut in wells, damage compensation) to penalize lawbreakers.
4. Regulators and Industry must be ***transparent and accountable.***

# Do Not Over - Regulate



# Avoid Over-Regulation

- Regulations should have clear goals.
- Regulation can be updated at any time as technology evolves.
- Some regulations need to be based on a case by case basis... Example: surface casing

# Regulations

- Over 100 technical and complex oilfield regulations in Texas.
- Specific Hydrofracture Regulations: Few are needed because of the comprehensive regulatory framework:
  - 1. Frac Focus: transparency with disclosure
  - 2. Recycling of waste/frac flowback water: make it industry friendly to encourage



# Spud to Plug and **Beyond**

- Beyond is an Oil Field Cleanup fund, paid by fees on oil and gas production. In Texas it is  $\frac{1}{2}$  of  $\frac{1}{100}$  of a US Dollar per barrel of oil or mcf gas produced.

# Use of Oilfield Cleanup Fund

- The fund authorizes and provides money to the State for the cleanup of abandoned or orphaned pollution sites or wells.
- Texas has plugged more than 30,000 orphaned wells and cleaned up 4000 pollution historical sites.

# Establish Bonding Process

- Bonding: operators must provide financial assurance for a license to operate in Texas, minimum is \$25,000, maximum can be in millions of dollars.

# Life Cycle of Regulatory Oversight

- Pre Spud.
- Drill and complete.
- Produce, Sell, and Dispose.
- Recomplete.
- Plug.
- Protect .

# Waste

- 99% of waste is salt water. Injection preferred disposal method.
- Disposal or Recycling? Not mutually exclusive!
- Exotic Waste: NORM, Asbestos, Condensate Spills.

# Air Protection

- GHG.
- New Source.
- NSHAPS.
- MSS.

# Final Step of Successful Regulation

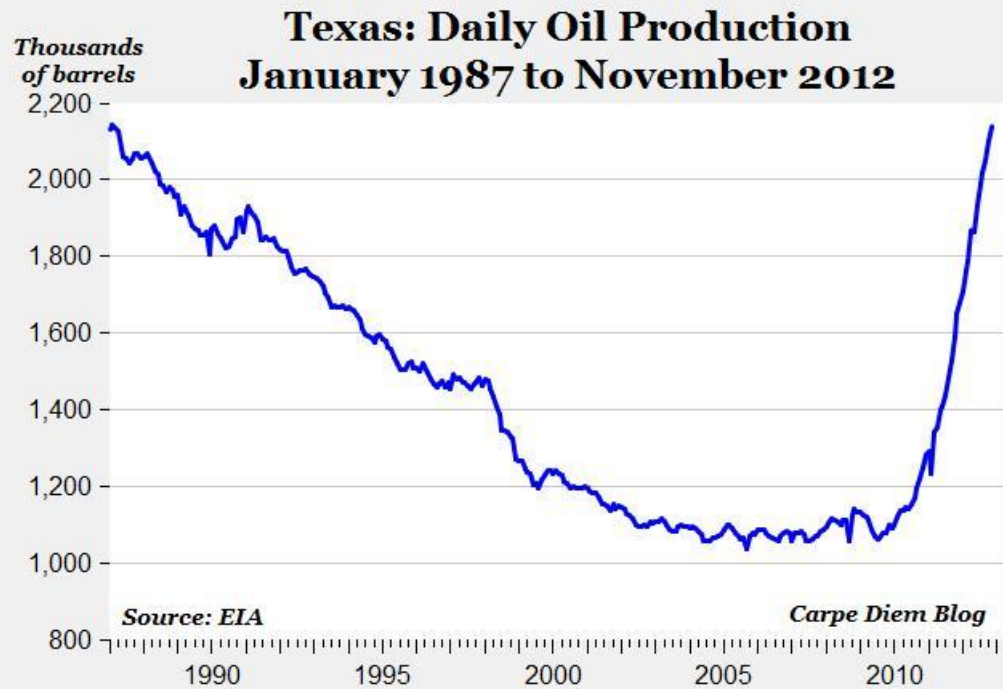
- Build a Regulatory Safety Net for abandonment and accidents.
  1. Proper regulations to plug and abandon wells.
  2. Funding and authority for government to step in if industry fails to meet requirements.
  3. Encourage recycling and other environmental objectives.
- Example: Texas has used \$200 million of industry fees to plug 30,000 abandoned historic wells and clean up 4,000 old abandoned oil field sites.

# A Good Regulating Agency Must Have at Least 5 Parts

- Well trained Inspectors in the field 24-7.
- Specialists issuing permits and collecting data.
- Attorneys to enforce.
- Management to administer and budget.
- The ability to respond to accidents and emergencies.



# Texas



What Should a Regulator Look Like?

# A Good Regulator



- John Tintera is a Partner at *Sebree & Tintera, LLC*, an international energy consulting firm in Austin, Texas, USA. He recently (2012) retired as the Executive Director of the *Railroad Commission of Texas (RRC)*, America's largest state regulatory agency over all oil and gas operations. Jack is a licensed professional geoscientist with over 30 years of combined technical and managerial experience as an industry petroleum geologist and environmental regulator. He has conducted thousands of oil field related assessments and cleanup activities while in state government and is an expert in emergency response.
- As Executive Director of the RRC, he was responsible for policy implementation, legislative and budget coordination, hiring and other personnel actions, as well as supervising ten divisions ranging from pipeline safety, surface mining, and oil and gas. Jack also worked at RRC for twenty years in various environmental permitting positions. Prior to his work at RRC, he served as a geologist and consultant for major international oil companies, such as *ExxonMobil* and *Tenneco*. His insight into oil and gas regulations in all aspects of oil and gas development including protecting the environment is sought throughout the world including countries such as Spain, and Romania.
- John holds degrees in geology from Michigan State University and Bowling Green State University.

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