



Penn State  
Cooperative Extension

**Marcellus Shale Educational  
Webinar Series**

April 2010 - September 2010

# **Penn State Cooperative Extension Marcellus Shale Educational Webinars April 2010 – September 2010**

- Six-part series of one-hour on-line educational seminars
- Our goal is to help address the opportunities and challenges related to exploring for gas in the Marcellus shale in Pennsylvania
- Audiences
  - Public officials at all levels
  - Cooperative Extension and other educational organizations
  - Planning and economic development agencies or groups
  - Environmental organizations
  - People who might influence public policy or individual decisions regarding exploration for gas
  - Citizens

For more information:

<http://naturalgas.extension.psu.edu/Events.htm>

# Marcellus Shale Webinar Series Planning Committee

- Members
  - Mark Douglass,  
Jefferson County
  - Neal Fogle, Montour  
County
  - Joann Kowalski,  
Susquehanna County
  - John Turack,  
Westmoreland County
  - Charles Abdalla,  
Agricultural Economics  
& Rural Sociology Dept.  
University Park
- With help from:
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  - Nancy Ellen Kiernan,  
Program Evaluator
  - Peg Shuffstall, Jacki  
Weikert & Sherry Crum,  
Information Technology  
Specialists

**Penn State College of Agricultural Sciences**



# A Decade of Lessons Learned from Urban Drilling in Fort Worth

Marcellus Shale Educational Webinar

May 20, 2010

Presented

by

Sarah Fullenwider

Senior Assistant City Attorney

City of Fort Worth, Texas

# Shale Gas Plays, Lower 48 States



Source: Energy Information Administration based on data from various published studies  
 Updated: May 28, 2009

# Barnett vs. Marcellus Shale

## *Fort Worth Basin*

~ 34 Million Acres

~ 2 Million Acres CORE

## *Appalachian Basin*

~118 Million Acres

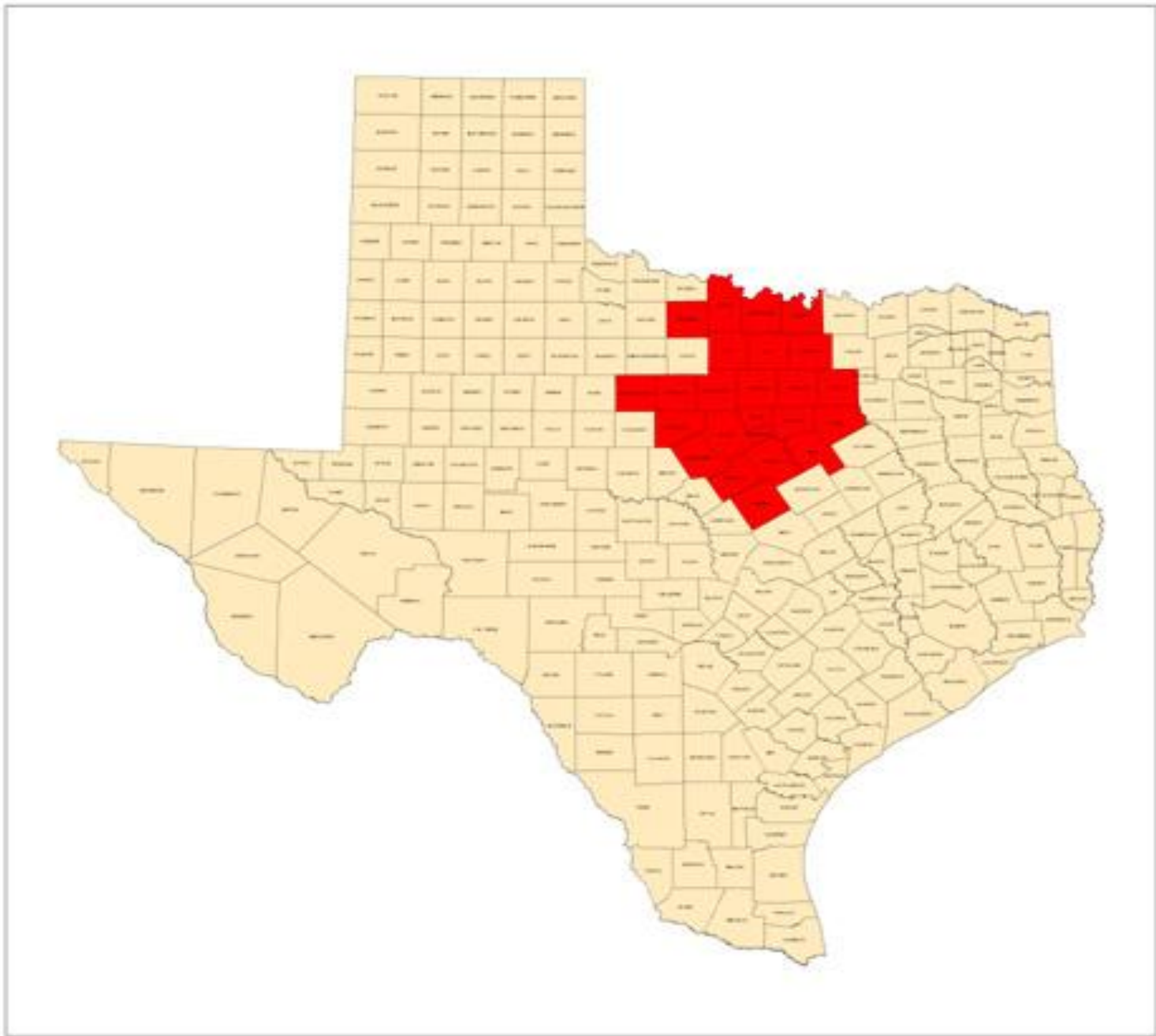
~ 16 - 32 Million Acres CORE

# Barnett Shale Statistics

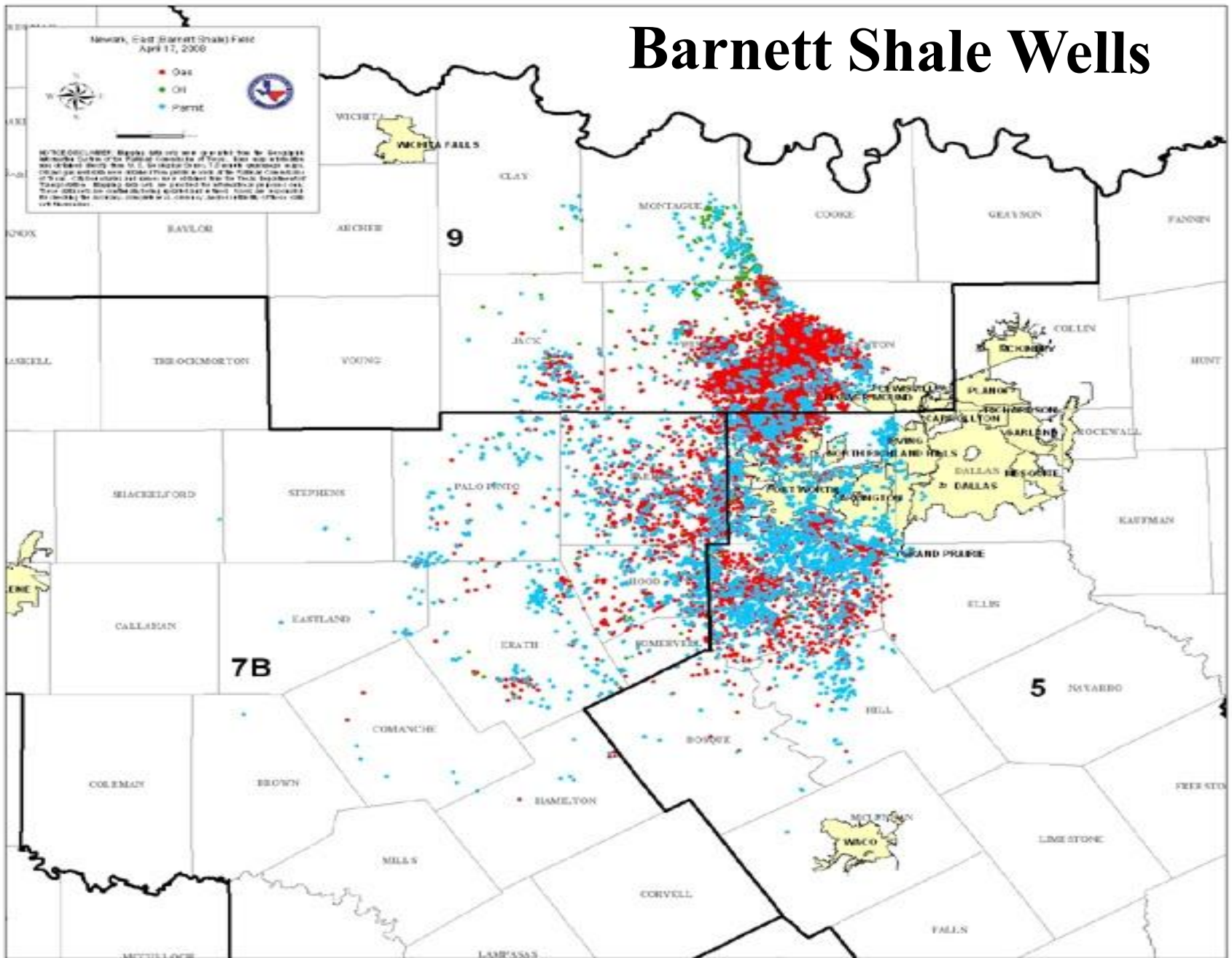
As of **May 10, 2010**, there were a total of **13,902** gas wells with 3,333 permitted locations

**By 2009** there were a total of **136 injection wells** and commercial saltwater disposal wells, and 24 disposal permits were issued

This field produces in **23 counties** with a total of **234 operators**



# Barnett Shale Wells



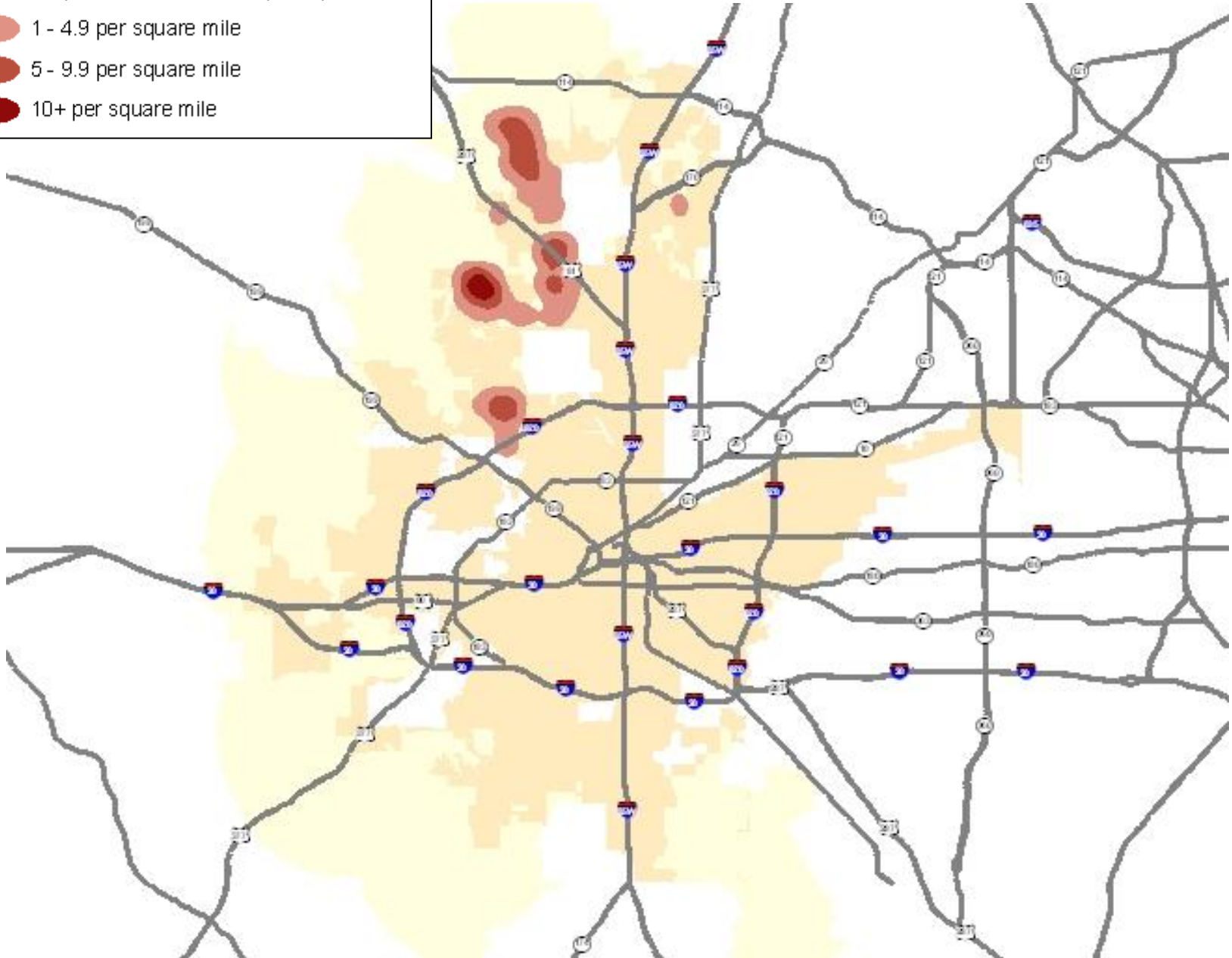
# 2003

No color represents Less than 1 per square mile

1 - 4.9 per square mile

5 - 9.9 per square mile

10+ per square mile



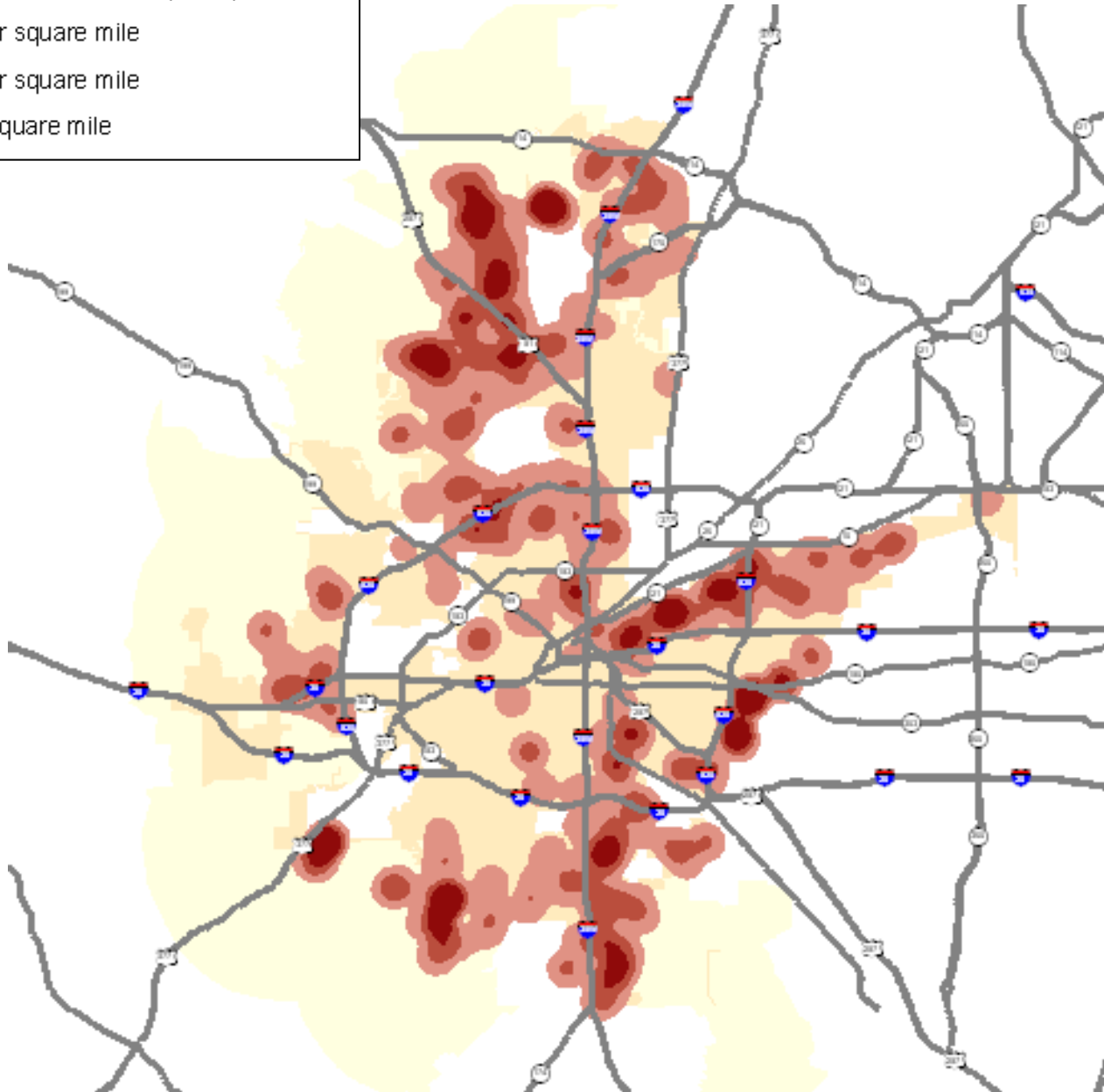
# 2008

No color represents Less than 1 per square mile

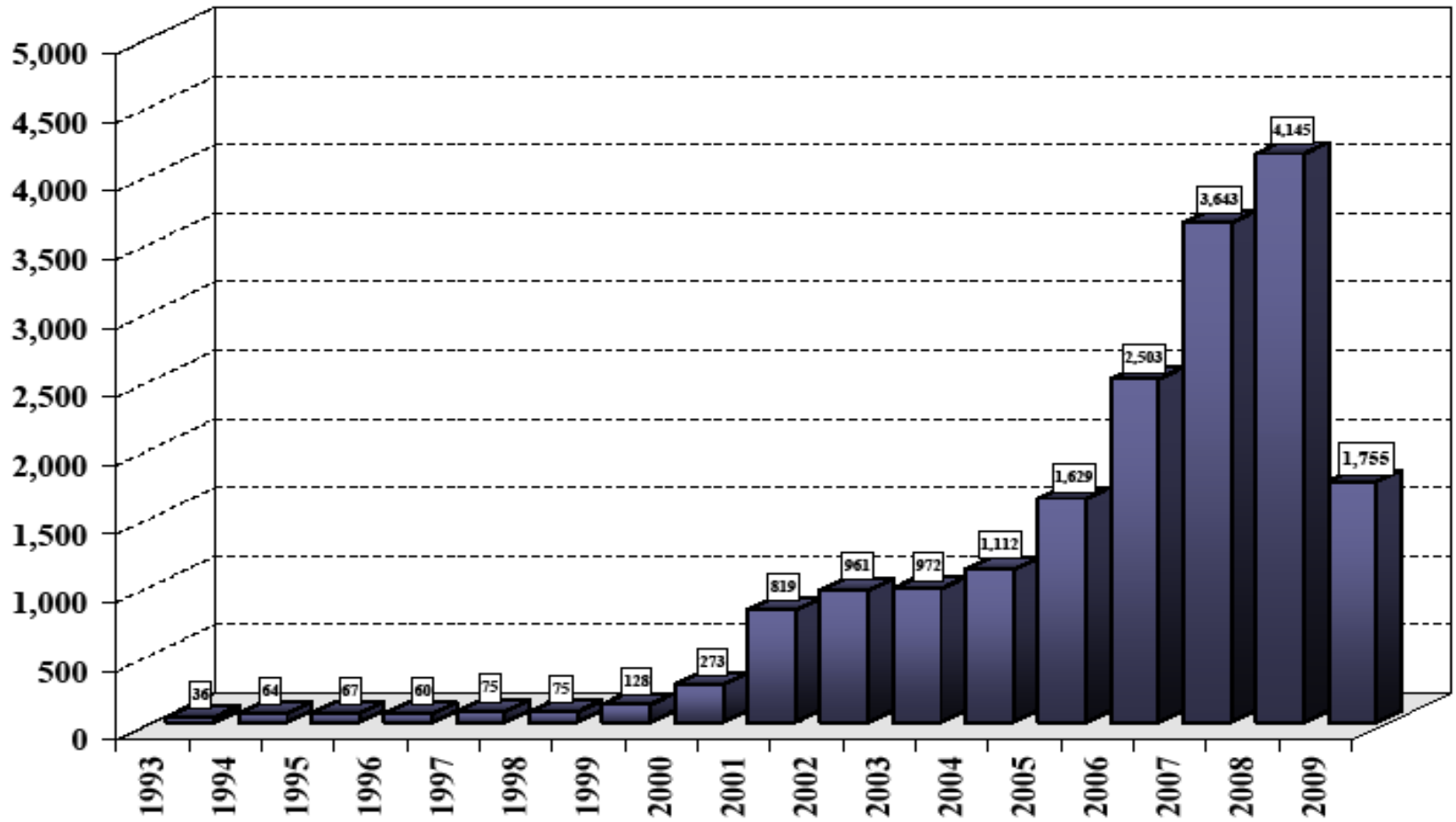
1 - 4.9 per square mile

5 - 9.9 per square mile

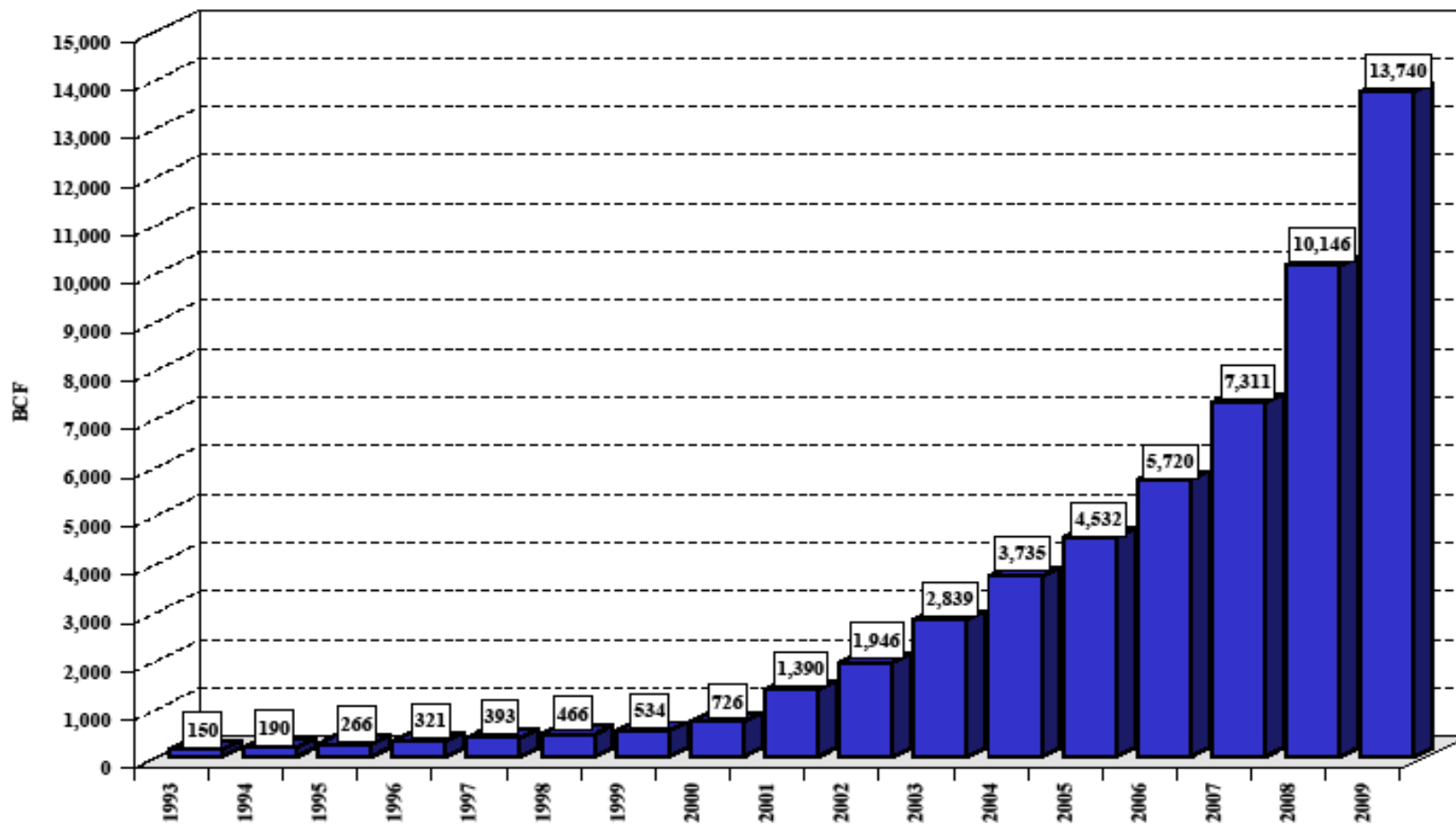
10+ per square mile



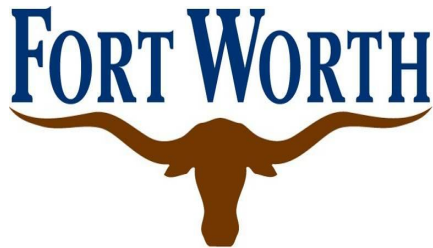
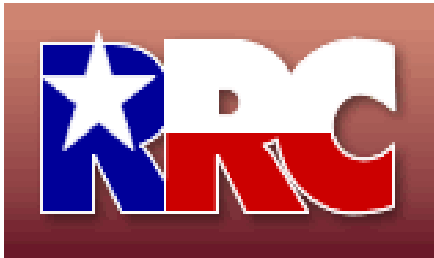
**Newark, East (Barnett Shale)  
Drilling Permits Issued  
(1993-2009)**



**Newark, East (Barnett Shale) Well Count  
1993 through 2009**



# Jurisdiction to Regulate in Texas



- **Railroad Commission of Texas** regulates the safety of gas wells, pipelines and salt water disposal facilities and all associated operations such as casing, depth, disposal
- Local municipalities can govern “**quality of life issues**” such as setbacks, landscaping, fencing, public notice, noise, etc., but municipal regulations could be **challenged** as a constitutional **taking** if they prevent a property owner from producing minerals
- **Counties have no regulatory authority**



# Could Have / Should Have

Hindsight is truly 20/20 and changing the process would have depended on:

- Early Citizen Awareness of Issues
- Local Politics
- County, State and Federal Involvement
- A Perfect World versus the Real One

# Categories of Lessons Learned

- Citizen Complaints
- Regulation of Drilling
- Truck Traffic and Impacts to Roads
- Regulation of Pipelines and Compressor Stations
- Current and Future Land Use Issues
- Environmental Concerns
- The Need for State and Federal Regulatory Oversight
- Dealing with the City's Revenue Windfall

# Citizen Complaints

- Impacts on residences / quality of life
- Property values & lending impediments
- Inability to control location of gas wells
- Lack of knowledge regarding mineral laws
- Inequities in leasing bonuses and royalty payments and lease terms
- Unscrupulous landmen
- Lack of municipal controls and involvement in the individual leasing process

# In Hindsight We Could Have....

- Created a mechanism earlier to provide current information on the status of permits and locations of drilling sites
- Created a proactive city website Q&A page earlier in the process
- Saturated the public with information
- Held more city organized educational public meetings with citizens, the industry and the Railroad Commission
- Engaged the local bar association earlier to educate citizens on the legal impacts of signing leases and mineral ownership
- Required bilingual information to be distributed from gas companies
- Required landmen to register with the city and provide contact information
- Educated gas companies about differences of drilling in urban areas
- Involved local real estate companies and HUD

# Regulation of Drilling

- Noise
- Lights
- Water Use
- Truck Traffic
- Setbacks
- Mud Pits
- Fresh Water Pits



- Delivery Times
- Landscaping
- Protected Uses
- Fire Code Issues
- Public Notice
- Compliance Issues

# Earlier We Could Have ....

- **Required a greater setback from Protected Uses**
- **Required same standards** for all wells regardless of location
- **Hired a noise consultant**
- **Required Noise management** plans and standards for enforcing **low-frequency and pure tone noise**
- **Limited work hours** for site development and restricted **delivery** to daytime hours for wells located near Protected Uses
- **Required watering/wetting** of all drill site access roads adjacent to residential property
- **Required closed loop mud system** for all wells
- **Regulated the location of fresh water fracture ponds**
- **Created a Gas Drilling Review Committee** to provide problem-solving venue for high-impact wells, pipelines through residential areas, and non-commercial truck routes
- **Established deadlines** for **landscaping** drill sites
- **Regulated** location and use of **fracture ponds**

# Truck Traffic and Impacts to Roads

- Heavy trucks on roads designed for less use is creating early deterioration of city streets at the burden of taxpayers
- City ordinance requires use of commercial truck routes where possible
- City also requires a road maintenance agreement and a bond

# A Better Solution Might Be...

## To implement a Road Repair Fee To Recoup Cost of Repairs:

- **Collect fee at time of permitting** to off-set the assumed loss of useful life of facility at current reconstruction costs
- Consider the **ability of the road to withstand truck traffic** based on construction type (asphalt, concrete, etc.)
- **Estimate the volume of truck traffic** based on well operations including method of water/saltwater delivery and/or removal
- **Hire an Engineering consultant** to prepare a report to apply these principles to gas drilling in your area

# Pipelines and Compressor Stations

- Pipelines are required to get the gas to market but:
  - Companies have power of eminent domain creating issues for private property owners; and
  - Pipelines are being placed in front yards of neighborhoods close to homes
- Large compressor stations located in urbanized areas create:
  - Noise issues
  - Aesthetic/incompatibility issues



# Keep Informed About Pipelines

- Require **pipeline permits** for all routes that will utilize city or county **rights-of-way** or in **private residential areas**
- Require **pipeline routes to be filed with the city, county and state** for all commercial and industrial routes
- Require **written notice** to all adjacent property owners prior to pipeline construction
- Require immediate reporting to city and counties of all **pipeline incidents**
- Require submission of **digital as-built drawings to city and counties** within 60 days of construction completion

# Controlling Compressor Locations

- Establish **setbacks** for line and lift compressors
- Establish **maximum noise levels**
- Create enhanced standards for units **adjacent to residential** uses
- Establish **fencing, secondary containment and landscaping** regulations
- **Require screening of all compressor tanks and equipment** close to residential uses and rights-of-way

# Salt Water Disposal

- Water must be hauled or piped to a disposal well
- Creates road wear, traffic and safety concerns
- Issue of where to locate disposal wells and who operates the well
- Concerns about contamination of water and soil



# To Address Salt Water Issues

- Establish city or county **construction standards** for saltwater pipelines
- Require saltwater pipeline **permits** to cover route and street crossings
- Allow piping to **saltwater disposal/injection wells** to **industrially-zoned well sites** with approved commercial truck routes



# A Better Solution for Pipelines, Compressor Stations and Saltwater Disposal

- Require a **centralized production location** for:
  - Tank batteries
  - Compressors
  - Salt water lines from well site
  - Gas pipelines from well site
  - Salt water injection wells
- Saltwater and gas would be piped to centralized industrial location to minimize impacts to neighborhoods and roads and reduce number of acres needed for pad sites

# Also Consider....

- Working with state transportation department to install natural gas pipelines in controlled access highway rights-of-way away from neighborhoods
- Creating limited eminent domain power for salt water pipelines
- Control and use of commercial salt water disposal wells – should government operate?

# Current and Future Land Use Issues

- Pad sites will affect land uses and growth now and for many years into the future
  - Need acknowledgement and cooperation between operators and cities, counties and the state regarding intended **future land use** per comprehensive land plans
  - Create master plan for drilling and location of pipelines
  - Create plans for drainage, backfilling, vegetation, road reclamation, etc. for sites that are **plugged and abandoned**
  - **Require landscaping, screening, fencing and long term maintenance around all sites**
  - Require **surface use agreements** for long term maintenance and reclamation of **fracture ponds**



# Environmental Concerns - Air

- **Air Emission Issues**

- Short and long term exposure concerns
- **Establish base line** data early in process
- Require **routine inspection** of sites for faulty equipment for compliance with state regulations
- Require **long term monitoring stations**
- Require “**green completion**” – techniques or methods that **minimize the amount of natural gas and vapors released** to the environment when a well is being flowed during completion or re-completion
  - Use of appropriate equipment and processes to **minimize vapor release**
  - Direct **all salable gas to sales lines** as soon as practicable or shut in the well
  - Allow **variances** if the techniques or methods are infeasible or would endanger the personnel or the public



# Environmental Concerns-

## Water and Soil

- Require a pre- and post-drilling analysis of water from any fresh water wells located within a certain distance of the well bore along with the geographic coordinates of every water well within a certain number of feet of the well bore
- Require perimeter controls and secondary containment to be employed
- Require a site map and a description of the controls that will be utilized to minimize the waste and manage the post-construction storm water run off to prevent runoff into any channel that drains into lakes or streams
- Require measures that prohibit the storage of chemicals on the ground or where exposed to the weather
- Require written plans to protect the watershed in case of a discharge
- Establish drill site or lease equipment setbacks from shorelines of lakes and streams
- Prohibit use of water from lakes and streams without governmental consent
- Encourage recycling of flow back water and the use of less water
- Encourage the use of less toxic products

# Environmental Concerns-

## Water and Soil

- Require an environmental impact study
- Require compliance with all state and federal regulatory guidelines and authorities related to the existence of threatened or endangered plants or animals that may exist and be impacted by the Lessee's activities.
- Require operators to identify and assess potential environmental impacts to the property due to operation and subsequent mitigation measures
- Prohibit any explosives, toxic materials, or substances regulated as hazardous wastes, hazardous materials, hazardous substances, or toxic substances under any federal, state, or local law or regulation except products commonly used in connection with oil and gas exploration and development operations and stored in the usual manner and quantities
- Require immediate clean up, mitigation, removal and repair of any soil or ground water contamination and damage caused by the presence or release of any hazardous materials

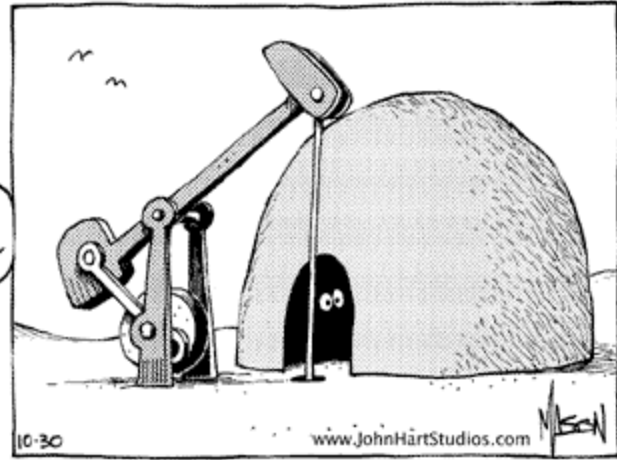
# State and Federal Oversight and Involvement

- Give counties and cities enforcement authority
- Work closely with school districts and other governmental agencies to create a united position
- Require setbacks from residential uses for gas wells, compressor stations, tank batteries and gas pipelines
- Consider adopting state model rules for drilling and the location and use of salt water disposal wells
- Regulate the transportation of drilling mud
- Require property valuation information to be provided for property acquired by eminent domain
- Require permits from the state regulatory agency before condemning property for gas pipelines
- Required notice to adjoining surface property owners, county commissioners and applicable ground water districts of an application for a permit to dispose of oil and gas waste in a commercial disposal well

# Revenue from Gas Drilling

- Cities and counties can benefit from leasing property
- The overall economy benefitted from the Barnett Shale
  - \$8.2 billion in annual **economic activity**
  - 83,823 permanent **jobs**
- City of Fort Worth anticipates **\$1 billion** in bonus and royalty revenue over the next 25 – 30 years plus ad valorem proceeds of an additional **\$400 Million** over 20 years
- Need to decide whether to use it now or later - who benefits?

# Questions?





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# Previously Recorded Educational Webinars

*Water Use & Water Quality Issues*

*Above the Marcellus Shale - Minimizing Impacts to Forests & Wildlife*

*Planning for Community Impacts*

*Marcellus Shale Workforce Needs Assessment*

*Community Response Options to Marcellus Shale & Energy Development*

*Treatment/Disposal Options for Wastewaters from Shale Gas Drilling*

*Leasing & Drilling on State-Owned Lands*

*Marcellus Shale Legislation & Litigation: A Year (2009) in Review*

*Post Leasing-Considerations of What Happens Next, Lessons Learned to Date*

*Underground Injection Wells as an Option for Disposal of Shale Gas Wastewaters: Policies and Practicality*

*Impact of Marcellus Shale: What Do the Economic Impact Studies Imply?*

*Perspectives on Marcellus Shale Gas Development in Southwest PA*

**The above webinars can be viewed at:**

**<http://naturalgas.extension.psu.edu/webinars.htm>**