

NY Marcellus: We're Still Waiting

Gregory H. Sovas - XRM, LLC

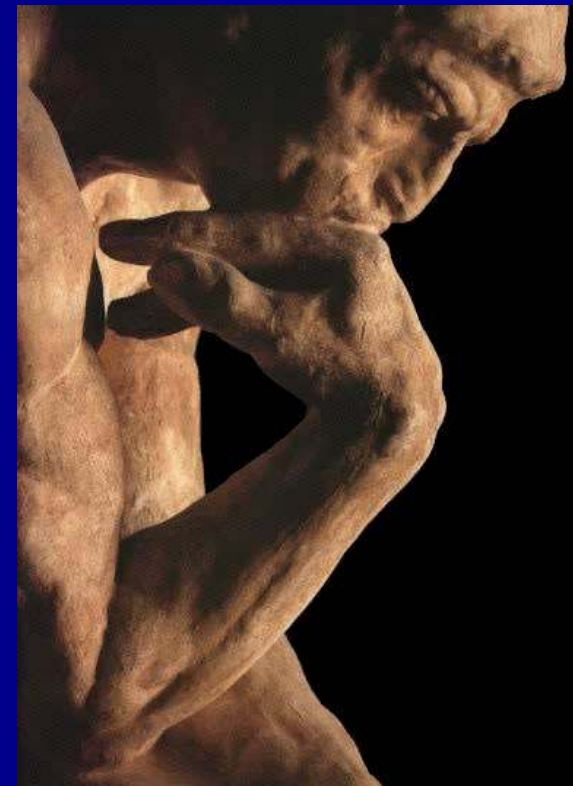
NY Society of American Foresters Annual Meeting
Syracuse, NY
January 28, 2011

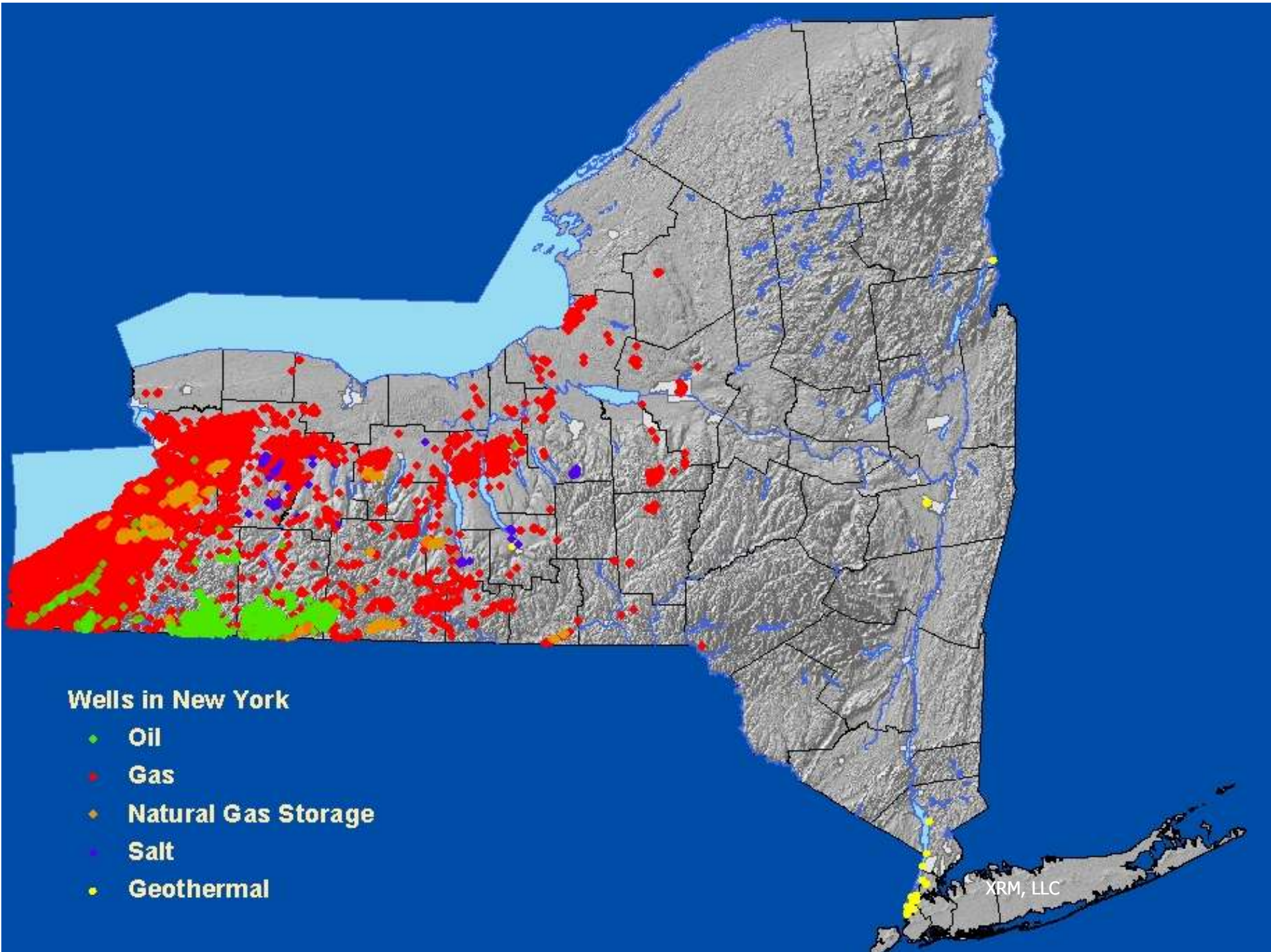
Background

- 33 years at NYSDEC, last 22 as Division Director, Mineral Resources
- Vice President, Governmental Affairs, Spectra Environmental Group
- Principal, Director – Lake Country FracWater Specialists, LLC
- Twin Tiers Landowners Coalition

Topics of the Day

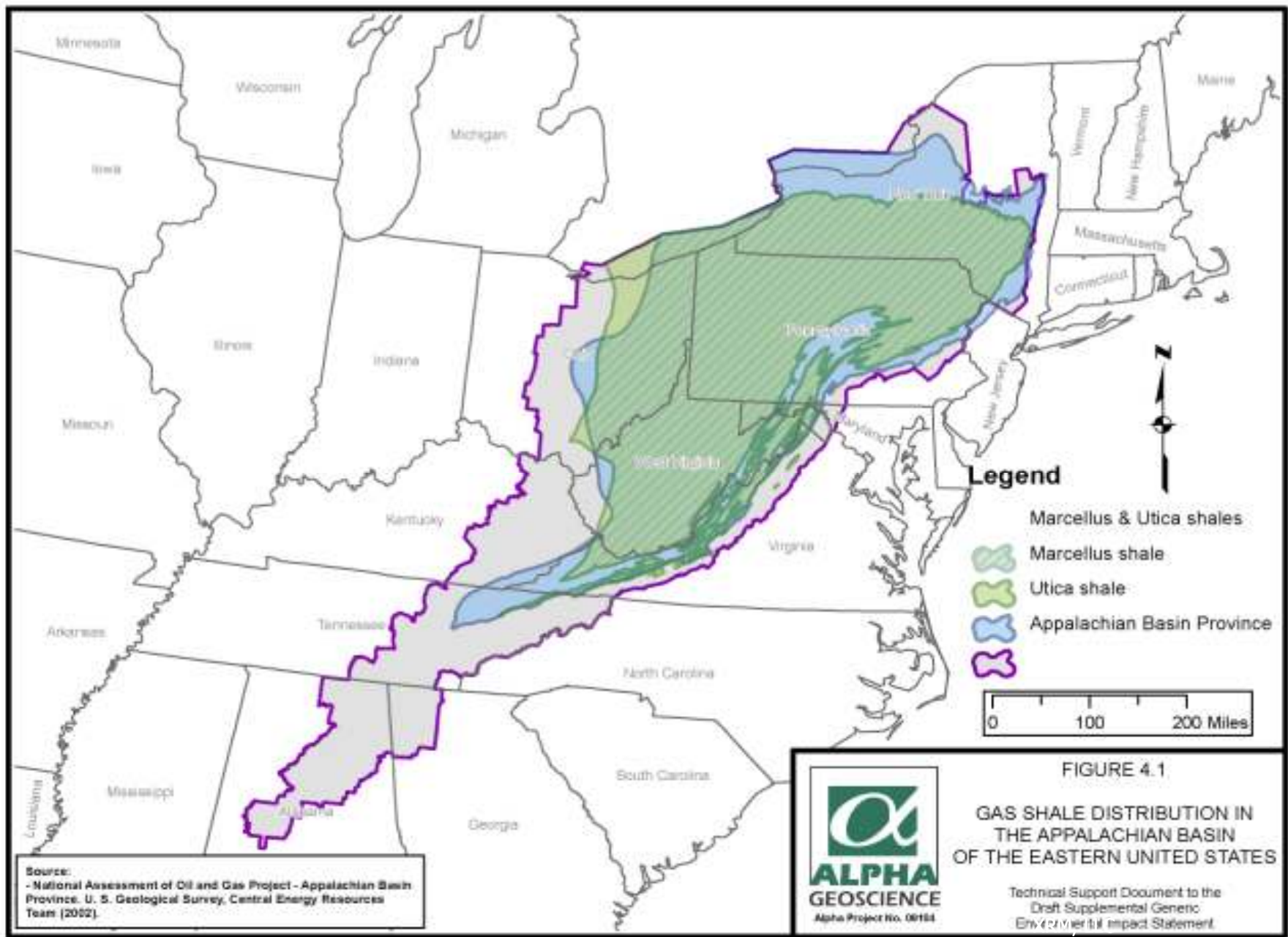
- Marcellus – what is it?
- Environmental concerns
- State's regulatory process
- Economic development & jobs
- Next steps, timelines

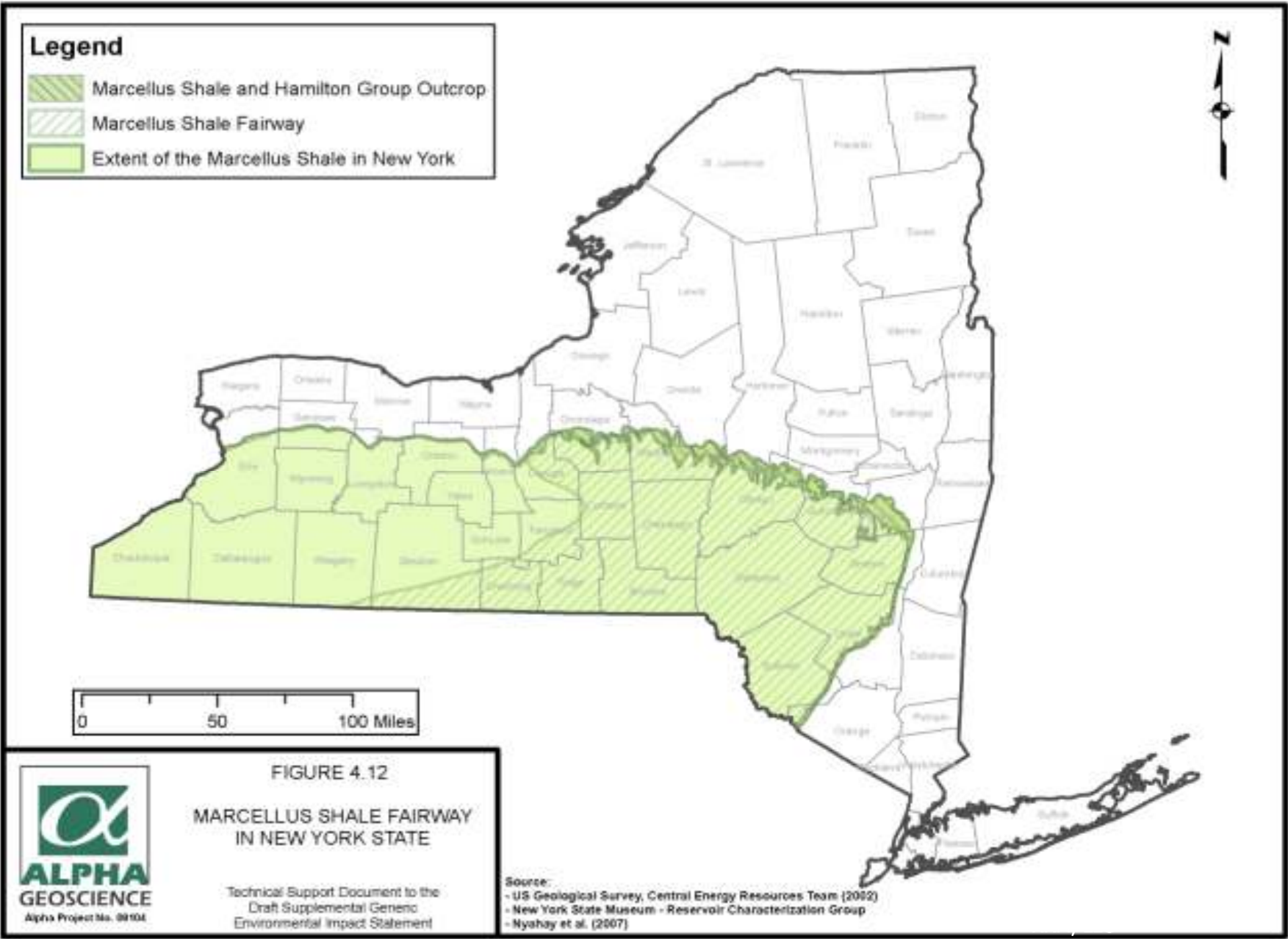




Natural Gas - Marcellus Shale

- 500 trillion cubic feet of natural gas
- Environmentally-preferable fuel
- Technological advances to produce gas from shales now economic
- Near population centers, markets
- In depressed areas of NY, PA
- International game changer





Legend




-  Marcellus Shale and Hamilton Group Outcrop
-  Marcellus Shale Fairway
-  Extent of the Marcellus Shale in New York

FIGURE 4.12

**MARCELLUS SHALE FAIRWAY
IN NEW YORK STATE**



Technical Support Document to the
Draft Supplemental Generic
Environmental Impact Statement

Source:
- US Geological Survey, Central Energy Resources Team (2002)
- New York State Museum - Reservoir Characterization Group
- Nyahay et al. (2007)

Marcellus Development



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1992 Findings on Gas Well Drilling



- No Significant Impact:
 - Consistent with Final GEIS
 - No other DEC permits needed
 - Includes wells drilled in primary and principal aquifers
- May be Significant:
 - In a State Parkland
 - More than 2.5 acres in Agricultural District disturbed
 - Less than 2,000 feet from a municipal water supply well

What Has Changed?

- Scope of operations has changed:
 - Water supply for frac operations
 - Frac water recycling and disposal
 - Logistics of storing and moving water and spent fluids
 - Overall development of the resource
 - Impacts to municipalities
- Issues that are being addressed

SGEIS Process

- Excellent scoping document with public hearings
- SGEIS draft released September 2009
- Public hearings and comment period closed December 2009
- Final SGEIS Findings Statement

NY's Oil and Gas Regulatory Program

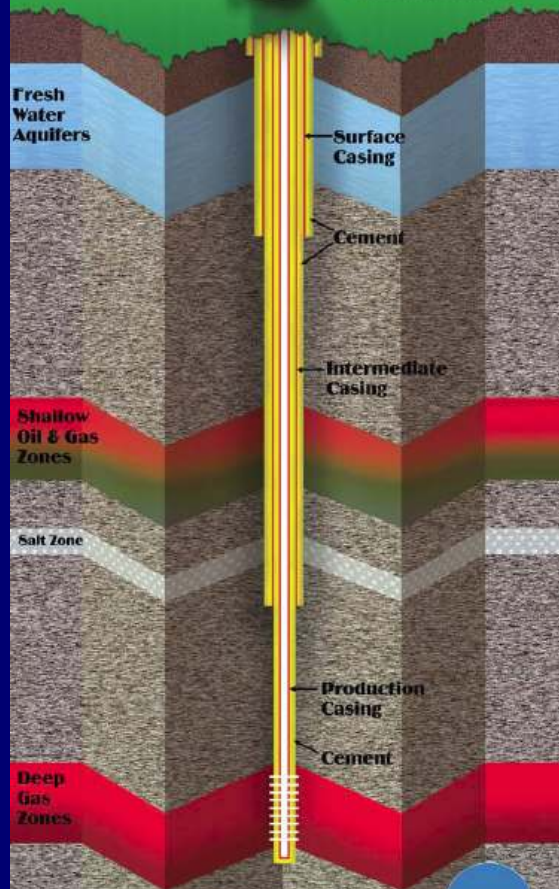
- Modernized by 1981 Amendments
- Developed as a groundwater protection program
- All wells are cased and cemented through freshwater zones since early 80's
- Cementing of any well drilled in primary aquifer is witnessed by DEC

Groundwater Protection

Well Casing and Cementing Program

The Division of Mineral Resources' well casing and cementing regulations provide for the protection of the State's fresh water aquifers

Regulations require that wells be constructed and operated to prevent the movement of oil, gas or water from one zone to another

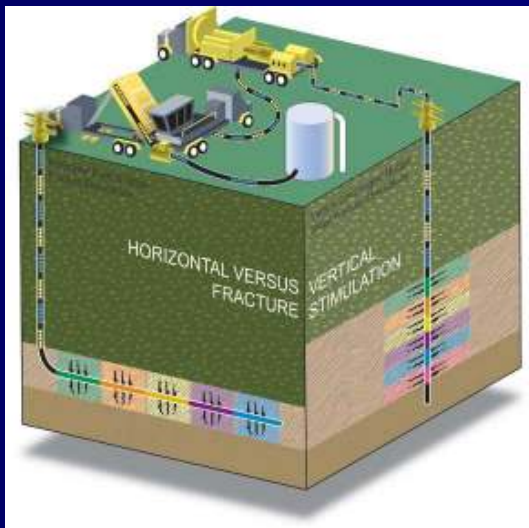


New York State Department
of Environmental Conservation

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Hydrofracing Experience



- More than 1 million wells hydrofraced since 1940
- Governmental organizations never raised any issues
- Nothing new in Marcellus hydrofrac except more water and chemicals

Therefore, the injected fluid does not come into contact with groundwater; it is, in fact, injected into and recovered through a wellbore that has been specifically constructed to safely convey hydrocarbons under pressure to the surface without negatively impacting fresh water aquifers. The Department has ***no record of any documented instance of groundwater contamination caused by hydraulic fracturing for gas well development in New York, despite the use of this technology in thousands of wells across the state during the past 50 or more years.***

New York State Department of Environmental Conservation
Division of Mineral Resources
Bureau of Oil and Gas Regulation

EPA Jumps In

EPA Starts Hydrofracking Study

By: Clean Skies News, Published: 03/18/10 4:08pm



The EPA says it will redirect nearly \$2 million to get a study on hydraulic fracturing under way this year.

The study comes amid increasing fears that hydrofracking could contaminate drinking water aquifers. The practice is now regulated state by state.

EPA says the study will be transparent and peer-reviewed, and is asking its independent

Science Advisory Board to help frame it. Administrator Lisa Jackson said last month the agency would need another \$30 million to complete the study.

EPA Study Conclusions?

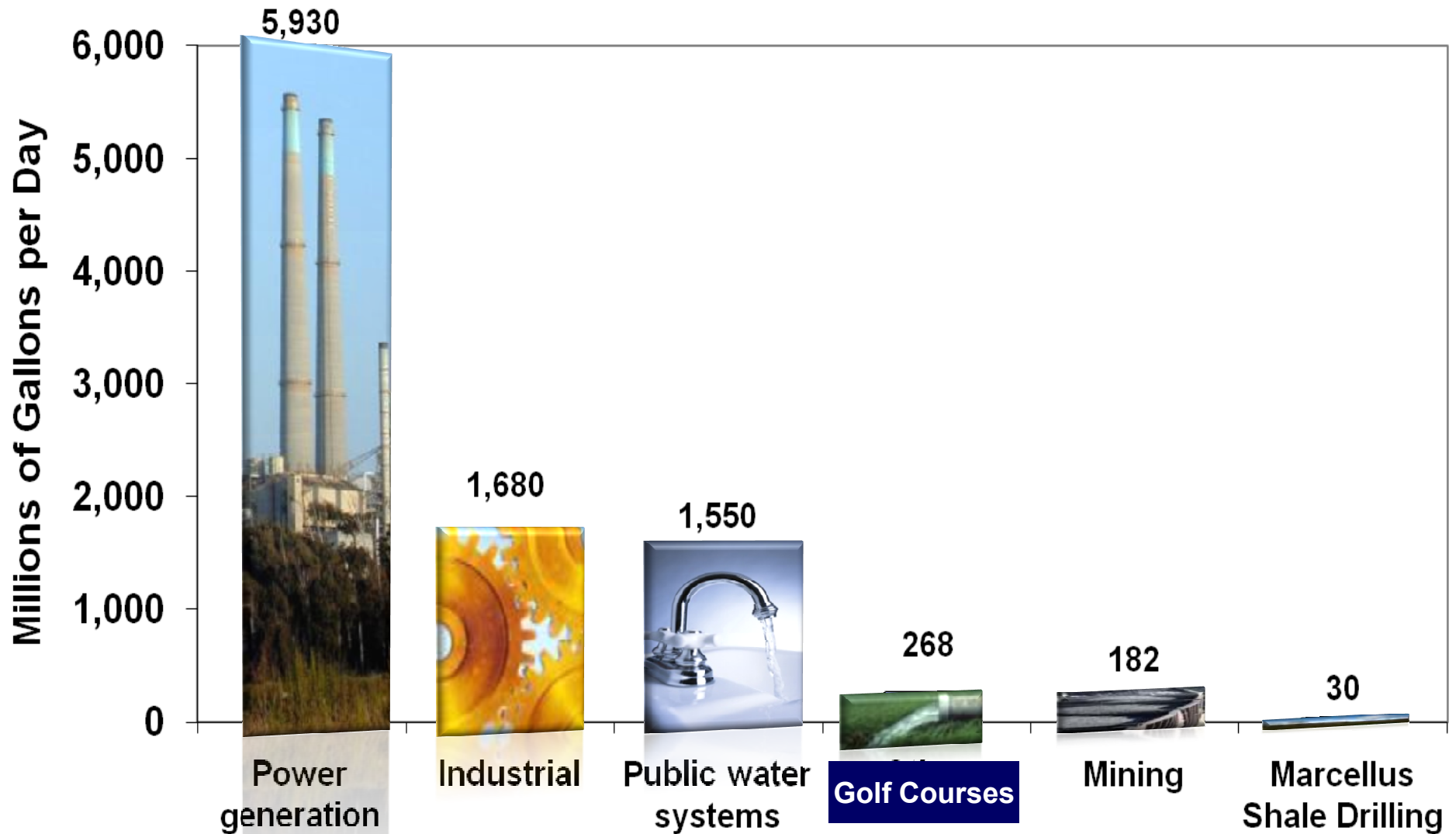
- Circus-like hearings held around country
- EPA looking for more money, time
- Will not find any widespread impacts
- Disclosure of chemicals will save face
- Major waste of money, time: political football, NYS moratoria?

Water and Groundwater



- Supply – new demand
- Gas migration
- Impact of hydrofracing on groundwater
- Surface spills, containment
- Hydrofracing, recycling, reuse, disposal
- Transport issues, roads

Comparable Water Usage in PA



Susquehanna River Basin total water demand
According to the Gas Technology Institute

Produced Water Treatment Options

- Economically viable options primarily distillation/evaporation or reverse osmosis systems
- Both processes have limitations, could be expensive
- Both produce a high concentration solid that requires disposal

Disposal Options

- Sewage treatment plant
- Landfill for solids
- Distillation and reverse osmosis plants
- Deep well disposal
- Any new technology



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Reuse & Recycling

- Movement toward recycling of produced water, onsite
- Reduces transport costs
- Driven by current and future regulatory limits
- Lessens pressure on treatment plants
- Research needed on beneficial uses

Lake Country FracWater Specialists, LLC

- Remove barium and strontium chlorides, other metals
- More efficient reuse, prevents scaling
- Mobile unit on site
- Local firm from Livonia and Tioga, PA



Summary of Marcellus Water Impacts

- Casing and cementing through fresh water not a problem
- Horizontal drilling no different than vertical
- Hydrofracing not a problem
- Water supply manageable
- Need options for recycling/reuse and wastewater disposal

Defending a Near Perfect Record

- No impact to groundwater from drilling
- No impact on aquifers from drilling
- No impact to groundwater from hydrofracing
- No lawsuit on any well drilled since 1984
- Yet Marcellus development stalled!

NY Marcellus Spacing

2005 & 2008 Legislation

Shale Gas (Vertical Well)	any depth	36 to 44	Wellbore within the target formation no less than 460 feet from any unit boundary
Shale Gas (Horizontal Well - written commitment to drill infill wells with all horizontal infill wells to be drilled from a common pad within three years of the first well drilled)	any depth	Up to 640	Initial horizontal wellbore or wellbores within the target formation approximately centered in the unit and no wellbore in target formation less than 330 feet from any unit boundary
Shale Gas (Horizontal Well - no written commitment to drill infill wells)	any depth	36 to 44 (plus, if applicable, the number of additional acres necessary and sufficient to ensure the horizontal wellbore within the target formation is no less than 330 feet from any unit boundary)	Wellbore within the target formation no less than 330 feet from any unit boundary

Marcellus Land Considerations

- Four to five acre drilling pad, consolidated area
- Multiple wells from one location
- Horizontal wells for greater resource recovery
- Smaller footprint
- Environmentally preferable

Leasing Considerations

- Develop a management plan
- Use existing farm roads
- Consider multiple use of property, where you want roads in the future
- Understand that drilling longer term
- Save timber for landowner
- Review state land leasing stipulations

Pennsylvania Marcellus Economic Impact - 2010



- \$3.9 billion in total value added 2009, \$8 billion 2010
- \$389 million in state and local taxes in 2009, \$785 million 2010
- 48,000 jobs – 88,000 in 2010
- Over 5,000 wells drilled; over 2,000 Marcellus!
- Over 200,000 jobs in 2020

New York's Marcellus Activity

- Drilling and hydrofracing continuing
- But no Marcellus activity re horizontal drilling, high-volume hydrofracing
- Work continues on draft SGEIS
- Started almost three years ago
- Caught in workload, political influence purgatory

Potential Economic Development in NY

- IOGA of NY annual estimates (July 2009):
 - 300 wells drilled
 - 1,500 disturbed acres
 - 1,000 MCF daily (very conservative)
 - Total well capital \$600 million (likely low)
- Only Marcellus development
- 58 well applications pending

Total Annual Economic Impact from NY Marcellus

- \$108 million annual landowner royalties at 12.5% (conservative)
- \$20 million real property taxes
- \$33 million state tax revenue (corporate & income tax on royalties)
- \$1.4 billion annually
- Likely very conservative

New Employment from Marcellus Development

- Engineering, surveying, construction
- Aggregates and earthmoving
- Equipment manufacturing & service
- Environmental permitting
- Water transport/wastewater recycling
- Legal, accounting, other professional services

Marcellus Shale Coalition

<http://www.marcelluscoalition.org/site/jobportal.html>

The screenshot displays the Marcellus Shale Coalition's job portal. At the top left is the logo, which consists of a blue water drop icon containing a green leaf, followed by the text "MARCELLUS SHALE COALITION". A horizontal navigation bar below the logo contains five buttons: "Home", "About", "Opportunity", "MSC Jobs", and "Find a Job". The main content area features a large banner with a green field under a cloudy sky. The banner text reads "RENEWAL. PROSPERITY. MARCELLUS JOBS" in white and yellow, with "Powered by America's Can-Do Spirit" at the bottom. To the right of the banner is a green box with white text: "The Marcellus creates jobs for our region, giving people the ability to support their families during good economic times and bad. Explore this site and find jobs in your area today." Below this text is a "Get Started" button. Below the banner is a blue bar with "Profiles" on the left and "Official Site" on the right. The "Profiles" section contains four job listings, each with a small image and a description: "Compressor Operator" (Maintains natural gas compressors and equipment), "Floor Hand" (Operates well drilling and service rigs. Assists with general maintenance), "Roustabout" (Performs pipe fittings and all-around mechanical tasks), and "Driller" (Supervises well drilling crew. Operates rig controls and monitors drilling operations). To the right of these listings is the Marcellus Shale Coalition logo and the text "OFFICIAL SITE".

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PIOGA – Oil & Gas Assn.

www.pioga.org



Pennsylvania: The Keystone to America's Energy Future

PIOGA
Pennsylvania Independent
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PIOGA Career Center

Looking for a job in the local oil&gas industry? Jobs seekers can post resumes for free to be viewed by companies seeking candidates.

Email your resume to jobs@pioga.org and include your name and job description you are seeking.

Job Openings - Member Companies are welcome to submit a job posting for free.

Click here to email the job opening to jobs@pioga.org

All files submitted will be reviewed/approved and posted within 3-5 days. PIOGA is not a placement agency - this serves as a voluntary service for our member companies and job seekers. By submitting your resume or job opening you are authorizing PIOGA to place the file on the website that is available for public viewing.

Jobs openings and resumes will only be posted for two months and will be removed after two months, unless contacted to request removal prior.

Only PDFs and Word Documents and files smaller than 2 MBs will be accepted!

Industry Open Positions

Position: Director, Safety-Gas (posted 1/24/2011)

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Land Related Jobs

Land & Legal

The job titles listed below are typical of those for companies and individuals who work in conjunction with oil and gas companies to acquire property, mark boundaries, etc. for drilling projects. These careers offer a mix of office and field work.

Job Title	Description	Education/Experience
Abstractor / Title Examiner	Searches public records and examines titles to determine a property title's legal condition.	High school diploma or two-year degree. Requires courthouse knowledge and the ability to work through legal documents and titles to create an ownership chain. Background in real estate law helpful.
Lease Agent / Land Agent / Landman	Works on behalf of the oil and gas company to acquire land for operations through leases, purchases, and access/usage agreements. Coordinates with the survey company, the oil and gas company, and the land owners.	High school diploma or two-year degree. Requires good people skills and the ability to negotiate. Requires a legal understanding of mineral ownership, a basic familiarity with exploration and production operations, and a general understanding of geology.
Surveyor	Determines property boundaries. Lays out oil and gas projects. Creates maps.	Surveyors are not required to have a college education, but state licensing requirements make it preferable to earn one. Vocational training in civil engineering, mathematics, physics, statistics, geometry, drafting, blueprint reading, and computer science are helpful.
Surveyor's Assistant	Assists surveyor in determining property boundaries and laying out projects.	High school education or better with a strong background in physics, science, and math.

Environmental Jobs

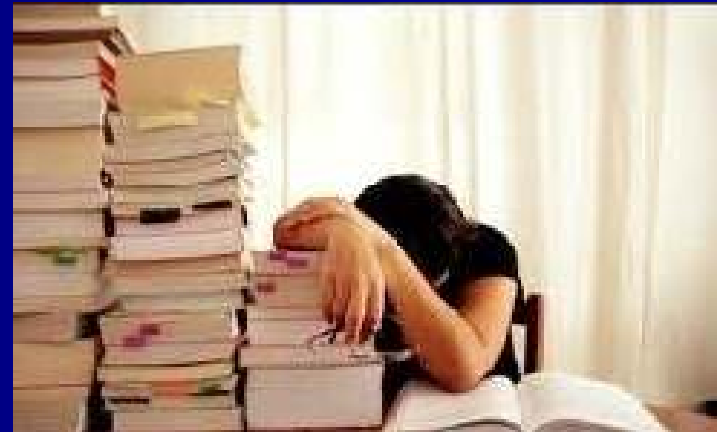
Environmental

The job titles listed below are typical of those for professionals involved in supporting oil and gas production companies as they make preparations to drill for oil and gas in an environmentally responsible manner. Many of these positions offer a mix of indoor and outdoor tasks.

Job Title	Description	Education/Experience
Environmental Technician	Develops and implements Environmental and Erosion Sedimentation Plans. Has a complete understanding of environmental law and regulations and their application to the oil and gas industry. Develops and implements Spill Prevention Contingency Control Plans (SPCC). Completes water testing analysis.	Minimum two-year degree in environmental technology or related field.
Chemical Technician	Performs laboratory tests and tasks on soil and water samples.	At least a two-year diploma in chemical technology or a related program.
Soil Scientist	Conducts soil surveys. Recommends soil management programs. Helps design hydrologic plans. Manages soils for landscape design, mine reclamation, and site restoration. Has a strong background in the physical and biological sciences and mathematics.	Four-year degree in environmental soil science.

Next SGEIS Steps

- Comment period closed December 2009
- 14,000 comments to consider
- Additional information requested
- Governor's veto message sets stage



Governor's Hydrofracing Moratorium Veto

- Vetoes bill, issues Executive Order
- Complete draft SGEIS on or around June 2011
- Public comment (again!) for at least 30 days
- If hearings needed, have to hold in NYC and Marcellus shale region



Executive Order & SEQR Translation

- Public notice means final SGEIS in September at earliest
- Why mention NYC and public hearings if not going to happen?
- Public hearings mean 2012 for drilling at earliest
- Governor Cuomo blessed Executive Order

The Debate Clash

Technical, scientific

- Oil and gas industry has answers
- Done safely everywhere
- Significant economic development, jobs
- Production of clean-burning natural gas

Social, philosophical

- No drilling is good
- Know don't like it, but can't find substantive technical reason
- Hate oil and gas industry
- Exploitation of Mother Earth, natural resources
- Hydrofracing lightning rod

NY's Circle of Pressure



SGEIS Process

- Process should not overwhelm decision-making
- Needs to progress to conclusion
- Investment in NY must be allowed to proceed
- NY needs to capture benefits immediately
- Hope that gas companies come back

Final SGEIS

- An environmental textbook
- A technical, regulatory guidance document for industry
- A public information document
- A legal regulatory framework for development to proceed
- Industry insulation from lawsuits

What is at Stake?

- Energy
 - Clean-burning fuel of choice
 - Domestic supplies near markets
 - Balance of payments, national security
- Economic development
 - New jobs, new industries
 - Significant impact to states, localities
 - Landowners share wealth

Environment

- No compromises
 - Protection of fresh waters
 - Stringent state regulatory controls
 - Water/wastewater management plans
- Advances in drilling technology
 - Smaller footprint
 - Greater resource recovery
 - Multiple wells from same pad

Marcellus Natural Gas Development in NY

----- May be the greatest economic
development opportunity in depressed
areas of the state that we will see in
our generation -----

Business Council of NY, October 2009

Contact Information

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Twin Tiers Landowners Coalition

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