NY SGEIS: Lessons learned, a process for Interagency and Inter-department collaboration

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Outline

• New York’s oil and gas history and activity
• New York’s regulatory program
• HVHF – why move forward?
• Brief Intro to Horizontal Drilling and HVHF
• What are the big environmental issues?
• DEC’s Approach to HVHF
Outline

• Recent Events in DEC’s Approach to HVHF
• Key Provisions of the revised dSGEIS/Regulations
• State versus Federal regulation
• Public debate
• Notable Developments
Oil and Gas Wells in New York

- Gas seeps: Lake Erie - 1626
- Oil seeps: Cuba, NY - 1627
- First natural gas well: Fredonia, NY - 1821
  - Dug well near gas bubbles in creek
- First oil well: Allegany County - 1863
- Est. 75,000 wells drilled since the 1820s
- 14,500 wells reported in 2010
2009 Oil and Gas Activity in NY

• 44.9 bcf gas produced
  – 5% of NYS gas consumption
• 323,536 bbl oil produced
• $206 million wellhead market value
• $26 million landowner royalties
• $6.2 million in local taxes
• 552 well permits issued
• $24.7 million in financial security held by DEC
• 93 state leases, 63,676 acres, $1.4 million
Regulatory Program

- Oil, Gas and Solution Mining Law (ECL 23)
- Regulations 6NYCRR Parts 550-559
- Site-specific permits: environmental and technical reviews
  - Site considerations
  - Well drilling and construction methods
  - Fluid handling and disposal
  - Well spacing and correlative rights
  - Plugging permits and reclamation
Why Move Forward?

• History of successful regulation
  – Resource development
  – Environmental protection

• The Shale opportunity - Big E’s
  – Energy
  – Economy
  – Environment
Energy

- Marcellus recoverable reserves est. at 490 tcf (basin-wide)
  - Annual U.S. consumption: ≈ 23 tcf
  - Annual NY consumption: ≈ 1.2 tcf

- New York State Energy Plan:
  - “Production and use of in-state energy resources – renewable resources and natural gas – can increase the reliability and security of our energy systems, reduce energy costs, and contribute to meeting climate change, public health and environmental objectives. . . . New York can reduce the amount of dollars ‘exported’ out of the State to pay for energy resources.”
  - “Encourage development of the Marcellus Shale natural gas formation with environmental safeguards that are protective of water supplies and natural resources.”
Economy

• Early mineral leases/offers
  – $3,500 to $5,500 per acre, 20% royalty

• Marcellus Shale Coalition – Penn State Economic Impact Study
  – Pennsylvania 2010: 1,405 Marcellus wells producing 2 bcf/d
  – Economic activity increased by $11.2 billion in 2010
    • 140,000 additional jobs
    • $1.1 billion state and local taxes
  – Landowner lease payments of $1.6 billion

• New York State Commission on State Asset Maximization:
  – “Taking into account the significant environmental considerations, the State should study the potential for new private investment in extracting natural gas in the Marcellus Shale on State-owned lands, in addition to development on private lands.”
FIGURE 5-12
MARCELLUS SHALE FAIRWAY
IN NEW YORK STATE

Source:
- New York State Museum - Reservoir Characterization Group
- Nyahay et al. (2007)
Marcellus Shale

The Marcellus Shale is a large geologic formation stretching from New York to Ohio and West Virginia. Development has generally occurred in a “fairway” stretching from Scranton, PA to Charleston, WV. Operators generally employ high-volume hydraulic fracturing North of Clarksburg, WV.

HVHF not limited to Marcellus Shale.
Horizontal Drilling

Conventional vertical drilling involves penetration down to the formation. Horizontal drilling involves penetration down to and thru the formation. The horizontal method allows for maximum exposure to the target formation. This graphic shows the curved “L” shape of a horizontal wellbore.

Photo credit: John Perez
Hydraulic Fracturing

Highly organic shale formations, including Marcellus, have high porosity (voids containing natural gas), but low permeability, meaning that the gas cannot flow freely through the rock to the wellbore. To artificially create pathways for gas to flow, operators employ a process known as hydraulic fracturing.
Hydraulic Fracturing

Service companies pump large quantities of water, sand, and chemicals down the wellbore and into the targeted formation to create the artificial fractures. The pressure of the gas trapped within the pore spaces returns the inputted fluid to the surface and natural gas follows.
State Environmental Quality Review Act

- Government agency must review the environmental impact of its actions.
  - Issuance of a permit to drill (and frac) a natural gas well is an action which requires review.

- Disclose and address the impacts that can be reasonably anticipated.

- Avoid or minimize adverse environmental impacts to the maximum extent practicable.

- The purpose of a SEQRA review is to identify potential adverse impacts and ways to mitigate them.
Generic Environmental Impact Statement

- Evaluates separate actions having common impacts
  - Individual EIS not needed if GEIS adequately addresses all potential impacts
  - Still an individual permit after site and technical review
  - Supplemental EIS needed for if potentially significant impacts not addressed

- Gas well drilling in NYS was reviewed in a 1992 GEIS
  - 12-year effort; four-volume, 937-page document

- Potential shale-related impacts not addressed by GEIS
  - High-volume fluid management
  - Multi-well pad drilling

- 800+ page draft Supplemental GEIS (dSGEIS)
  - 9 chapters, glossary, 26 appendices, 587 references
Recent Events

- Draft SGEIS released Sept. 30, 2009
- Executive Order 41, issued Dec. 13, 2010, directed DEC to prepare revised draft
- Revised draft released Sept. 7, 2011
- *Original comment period closing on Dec. 12, 2011*
- Comment Period extended till Jan. 11, 2012
- Public hearings held Nov. 16, 17, 29 and 30 at four locations across the state
- 13,000 comments on the draft SGEIS
- 40,000 comments to date on the revised draft
Other Key Events

• Draft regulations – released Sept. 28, 2011.
  – Draft regulations include revisions and additions to Parts 52, 190, 550-556, 560 and 750

• Stormwater General Permit – released Sept. 28, 2011.

• All comments periods closed on Jan. 11, 2012
Key Environmental Concerns Related to HVHF

- Water contamination
- Gas Migration
- Ecosystems and Wildlife
- Air Quality
- Greenhouse Gas Emissions
- Naturally Occurring Radioactive Material
Key Environmental Concerns Related to HVHF

• Socioeconomic Impacts
  – Community Character
  – Noise
  – Visual Impacts
  – Road Use
Mitigation

SGEIS uses mix of substantive and procedural tools to address HVHF

– Well pad siting setbacks
– More detailed application requirements
– Supplementary permit conditions
– Thresholds for site-specific SEQRA determinations of significance
Well Pad Setbacks

• Water Resources Protection

Drilling is prohibited*:

– in the Syracuse or New York City watersheds or 4,000 ft buffer
– within 2000’ of public drinking water intakes and reservoirs
– within 500’ of primary aquifers
– within 500’ of principal aquifer without site-specific review and permits
– within 100 year floodplains
– within 500 feet of private water well unless waived by owner

* New to 2011 revised SGEIS
Application Process (App. 6)

• Well operator of proposed HVHF well must, among other things:
  – Identify source of fresh water
  – Test private water wells prior to drilling
  – Disclose chemical additives by type and volume
  – Identify measures to reduce air quality impacts (particulates and NOx)
  – Develop and submit a fluid disposal plan
  – Develop and submit an invasive species management plan
Supplementary Permit Conditions (App. 10)

Permit will require/include:

- Secondary Containment
- Reserve pit specs
- Need for ERP
- Approved blowout use preventer and testing plan
- Casing and cementing standards
- Flowback handling and disposal conditions
Notable Mitigation Measures

• Ecosystems and Wildlife
  – Site-specific studies for impacts in forest and grassland focus areas

• Air Quality
  – Encourage low-emission flowback and completion of wells

• Community Character
  – Review of location for consistency w/local laws and plans
Mitigation Measures Cont’d

- Permit conditions cover every aspect of drilling an HVHF well, including:
  - Requirement for closed loop drilling in certain instances;
  - Well design and construction requirements such as cement holding times and API specs; and
  - Requirement for operator to complete Pre-frac checklist
What’s not covered by dSGEIS?

- Site-specific SEQRA determinations required for:
  - Any application when the top of the target fracture zone is shallower than 2,000 feet
  - Any application when the top of the target fracture zone is less than 1,000 feet from base of known fresh water supply
  - Any well pad within 500 feet of principal aquifer*
  - Any proposed water withdrawal from a pond, lake, or a groundwater withdrawal within 500 feet of a private well*
  - Any proposed centralized flowback water surface impoundment*

(Chapter 3, Section 3.2.5) *new in 2011 draft
Draft Regulations

- Part 52 and 190 will promulgate prohibition on surface activities assoc. with HVHF on state managed land.

- Part 550 to 560 will promulgate most of the application requirements and supplementary permit conditions found in App. 6 and 10 of the revised dSGEIS.

- Part 750 will promulgate new stormwater requirements for HVHF wells, incl. provisions for general permits.
Highlights of Oil and Gas Regulations

• Part 551 will be revised to eliminate cap on FS for deep wells.
• Part 552 will be revised to extend permit term and to clarify life of permit.
• Part 553 will be revised to reflect legislative changes made in 2005 and 2008 to statewide spacing.
• Parts 554-556 will be amended to update statewide reporting and plugging requirements for all wells.
• A new Part 560 will be added to address HVHF.
Highlights of Proposed Oil and Gas Regulations

• New Part 560 will promulgate:
  • Definitions specific to HVHF
  • Application requirements
  • Setbacks for well pads
  • Testing, recordkeeping & reporting requirements
  • Well construction and operation requirements
  • Reclamation requirements
Marcellus Shale - Public Policy Debate

- Driven by stakeholders:
  - Environmental Absolutists – no drilling ever
  - Environmental Pragmatists – recognize energy and economic benefits, but want assurance technology is safe
  - “Responsible Drilling” Advocates – landowners and local officials in favor of drilling provided environmental safeguards are in place
  - Economic Development Activists – we’ve already missed the boat and should start drilling immediately
  - Industry – need to make business decisions involving billions of dollars based upon regulatory climate
Marcellus Shale - Public Policy Debate

• Facts vs Emotion
  – Education vs persuasion
  – Science vs storytelling

• Many different agendas at work
  – Fossil fuels vs renewables
  – Not in my backyard
  – Downstate vs upstate
  – Pastoral poverty vs farm preservation
  – Politics
Next Steps

- Process and review the mountain of comments
- Preparation of Responsiveness Summary (SEQRA) and Assessment of Public Comments (SAPA)
- Complete revisions to draft documents
- Adoption of Final SGEIS, Issuance of Findings Statement

Comments received on morning of 1/12/2012
Notable Developments

- Legal Challenges to Local Oil and Gas Laws
  - Anschutz Exploration Corp v. Town of Dryden
  - Cooperstown Holstein Corp. v. Town of Middlefield

- NYSAG Suit Against Federal Members of DRBC/Issuance of Final DRBC Regulations?

- Signing of Water Withdrawal Bill
Questions