

Marcellus Shale Gas Well Development in New York State

6/6/2008



New York State Department of Environmental Conservation
Division of Mineral Resources

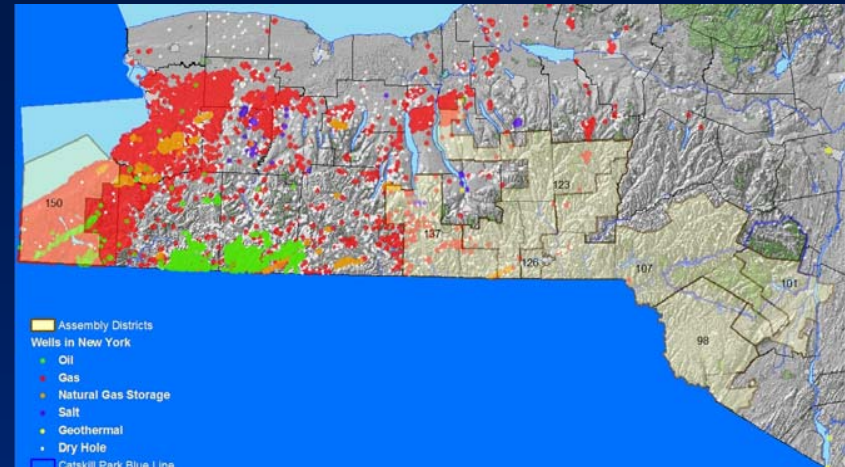
Today's Key Points

- Gas and oil wells are not new to NY
- All aspects of the activity are regulated to protect the environment and landowners
- Horizontal drilling and hydraulic fracturing are already legal and common in NY
- Marcellus development is not dependent on proposed legislation A10526, S8169

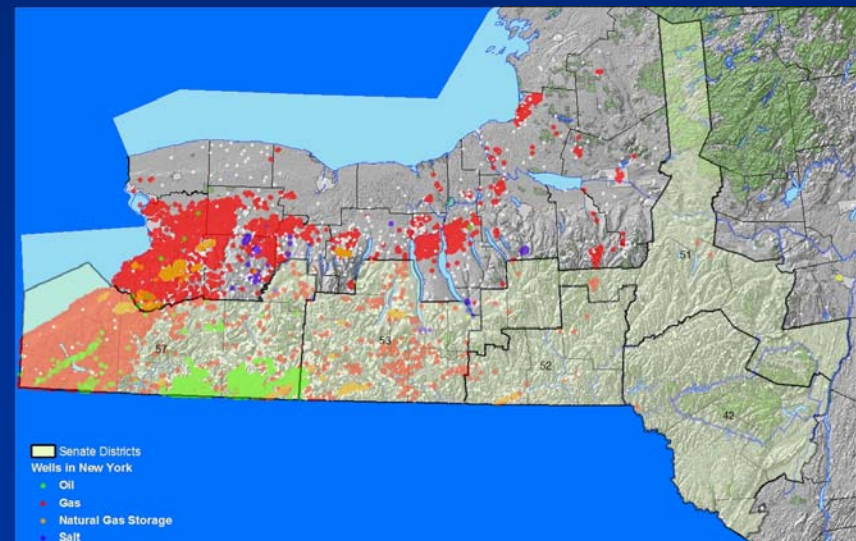


Not New To New York

- First gas well – Fredonia, 1821
- First oil well – Allegany County, 1863
- Estimated 75,000 wells drilled in NY



Assembly Districts and Wells



Senate Districts and Wells

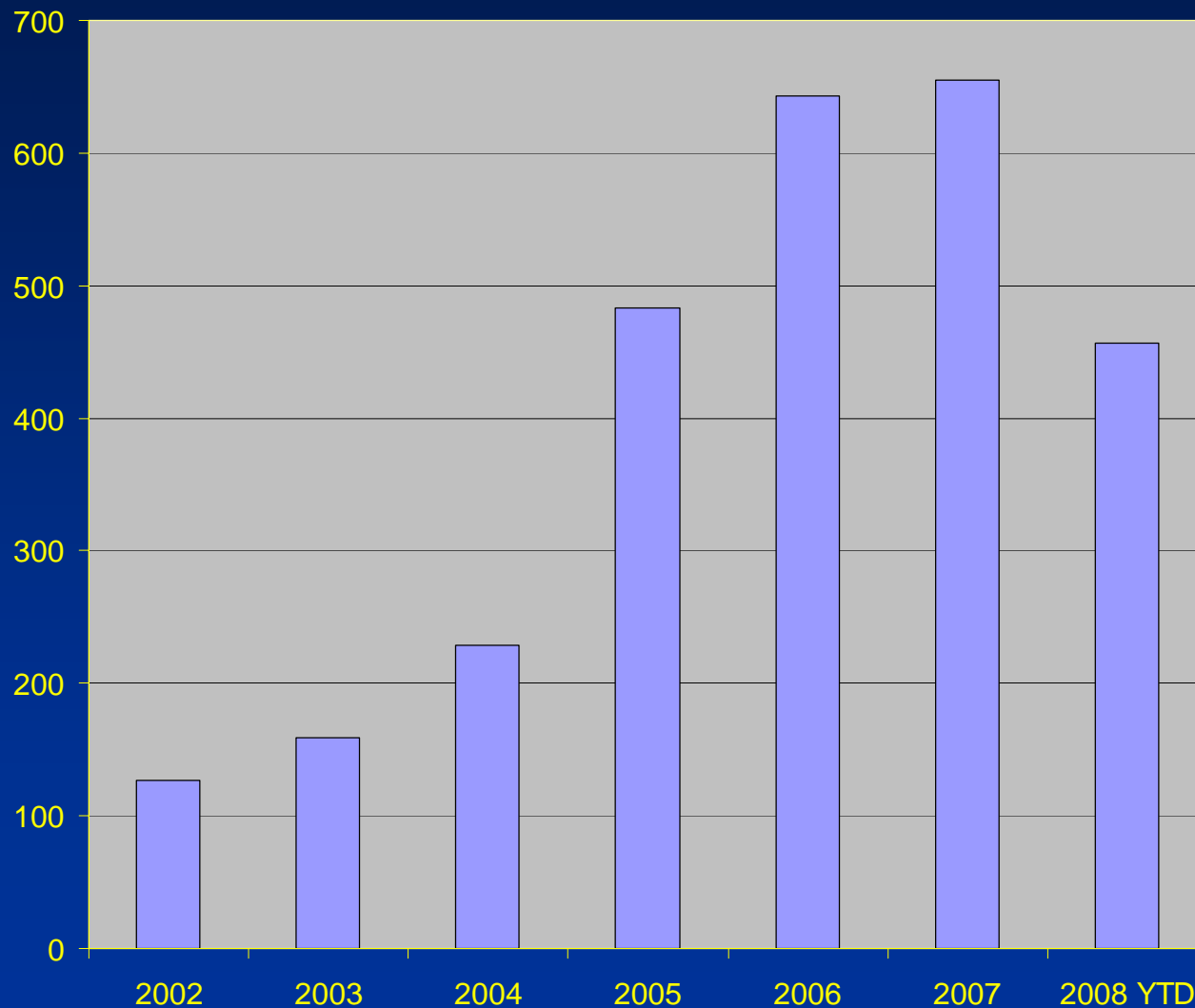
Recent Oil & Gas Activity in NYS

- Large increases in permitting since 2005
- Deeper wells (record: 13,500 TVD)
- Horizontal/directional wells
- 2005 well spacing & compulsory integration law
- High profile Marcellus shale interest and leasing activity



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NYS Drilling Permit Applications



New York's Oil and Gas Industry

2007 preliminary data

- 55 bcf gas
 - 5% of NYS gas consumption
 - 796,000 homes heated
- 345,000 bbl oil
- \$513 million wellhead market value (95% gas)
- \$64 million landowner royalties
- \$15 million in local taxes
- ~ 13,700 wells reported by owners
- Economic benefits to upstate NYS/Southern Tier



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Oil & Gas Regulatory Program

- Oil, Gas & Solution Mining Law passed in 1963; major amendments 1981, 2005
- Regulate oil and gas activity to:
 - Prevent waste
 - Protect public health, safety and the environment
 - Provide for greater ultimate recovery of oil and gas
 - Protect correlative rights of all persons
- 1992 FGEIS - site review under SEQR



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Protecting the Environment

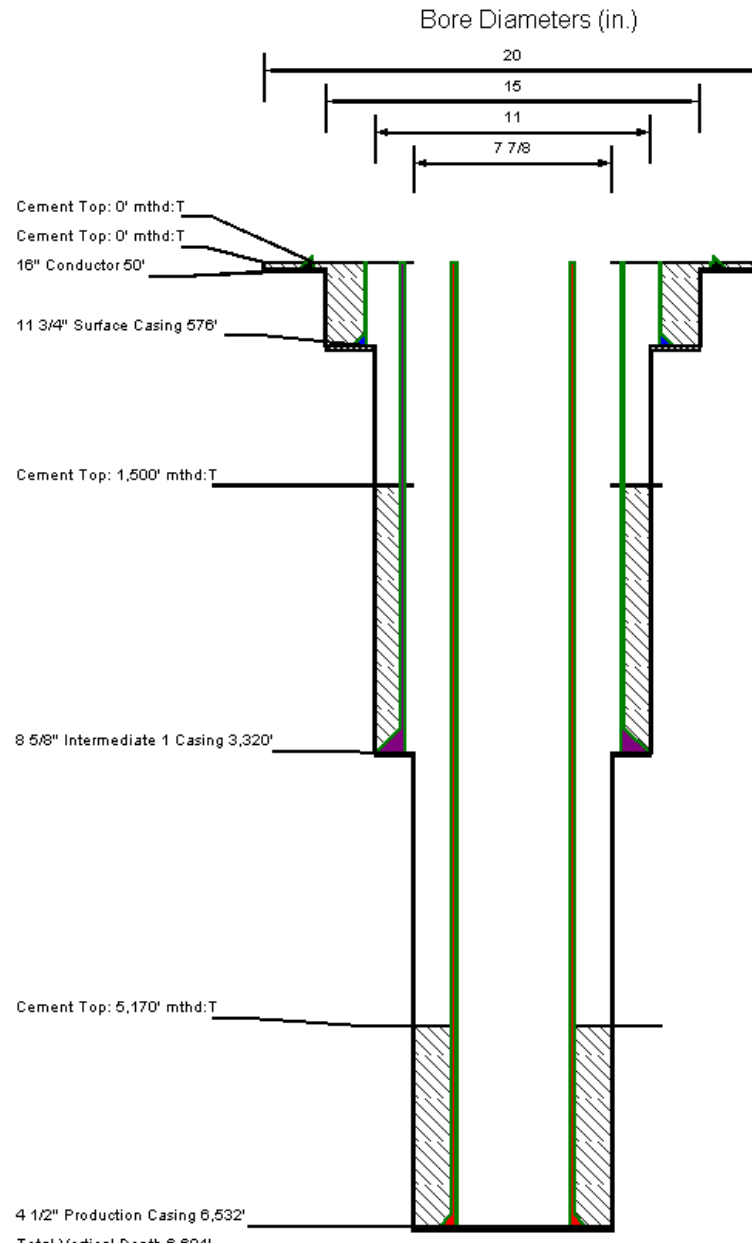
- Before a well permit is issued
 - Site inspection, location screening, setbacks, drilling and construction plan, financial security
- When a well permit is issued
 - Casing, cement, well control, site-specific permit conditions, notification requirements
- After a well permit is issued
 - Drilling inspections, site reclamation and restoration, annual reporting, requirement to plug w/ permit

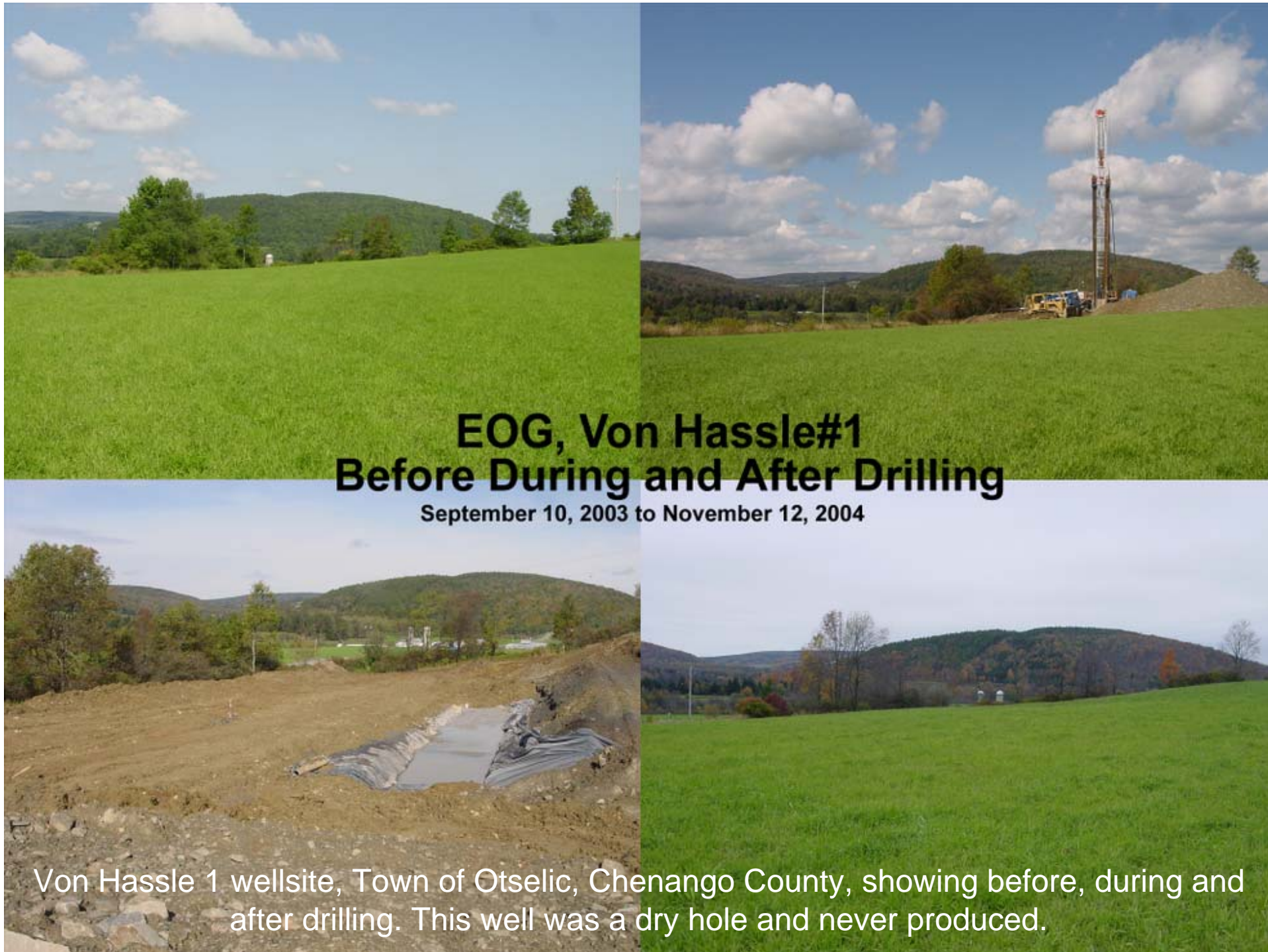


Well Completion Diagram

API Well No: 31-101-21710-00-00				
Owner:	Well Name: BERGSTRESSER 1			
County: STEUBEN	Field: GLODES CORNERS R	Pool:		
Coordinates: X	Y	Sec:	Twp:	Rng:

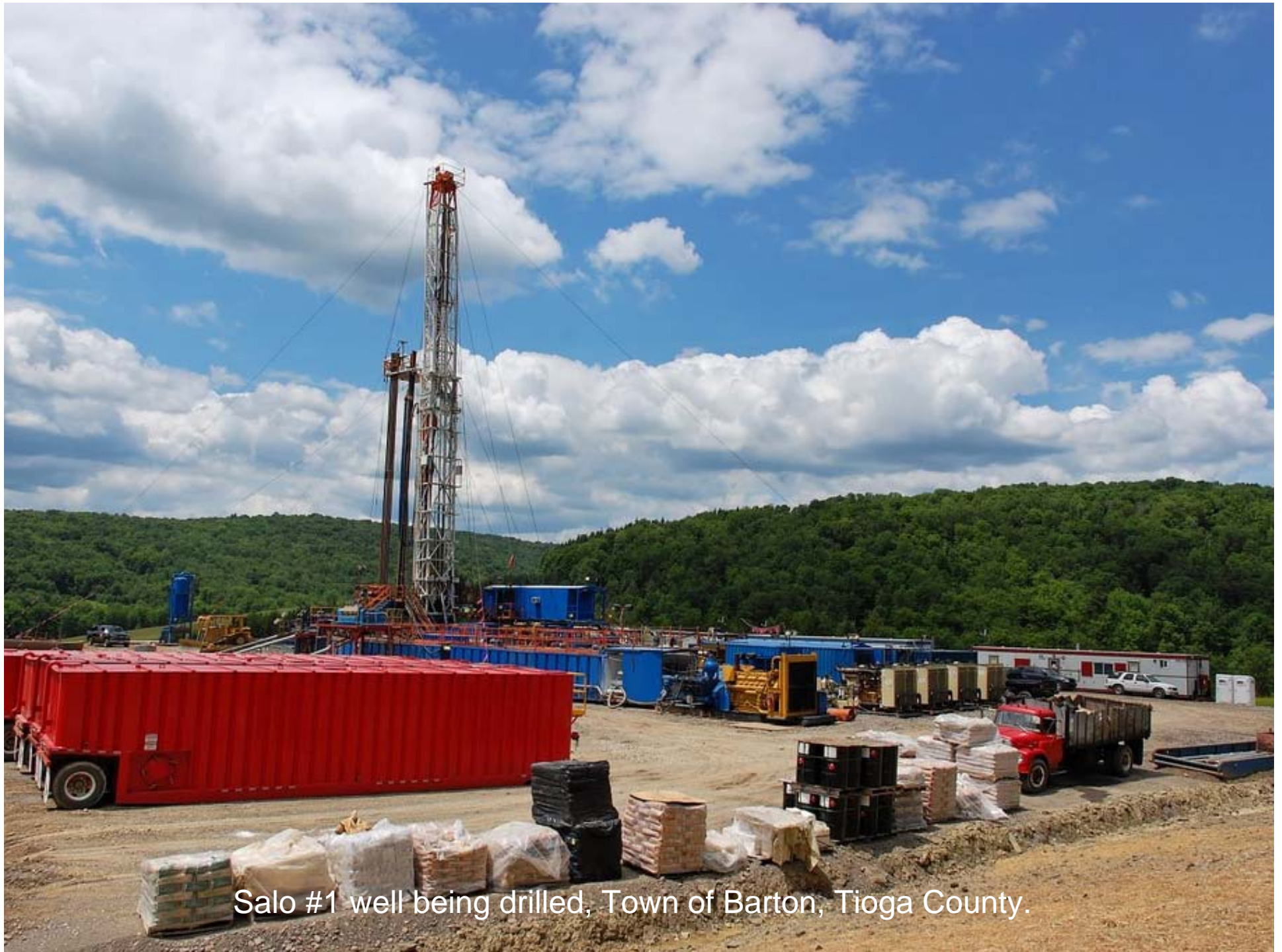
Note: Changes to the drawing do not effect the database





EOG, Von Hassle#1
Before During and After Drilling
September 10, 2003 to November 12, 2004

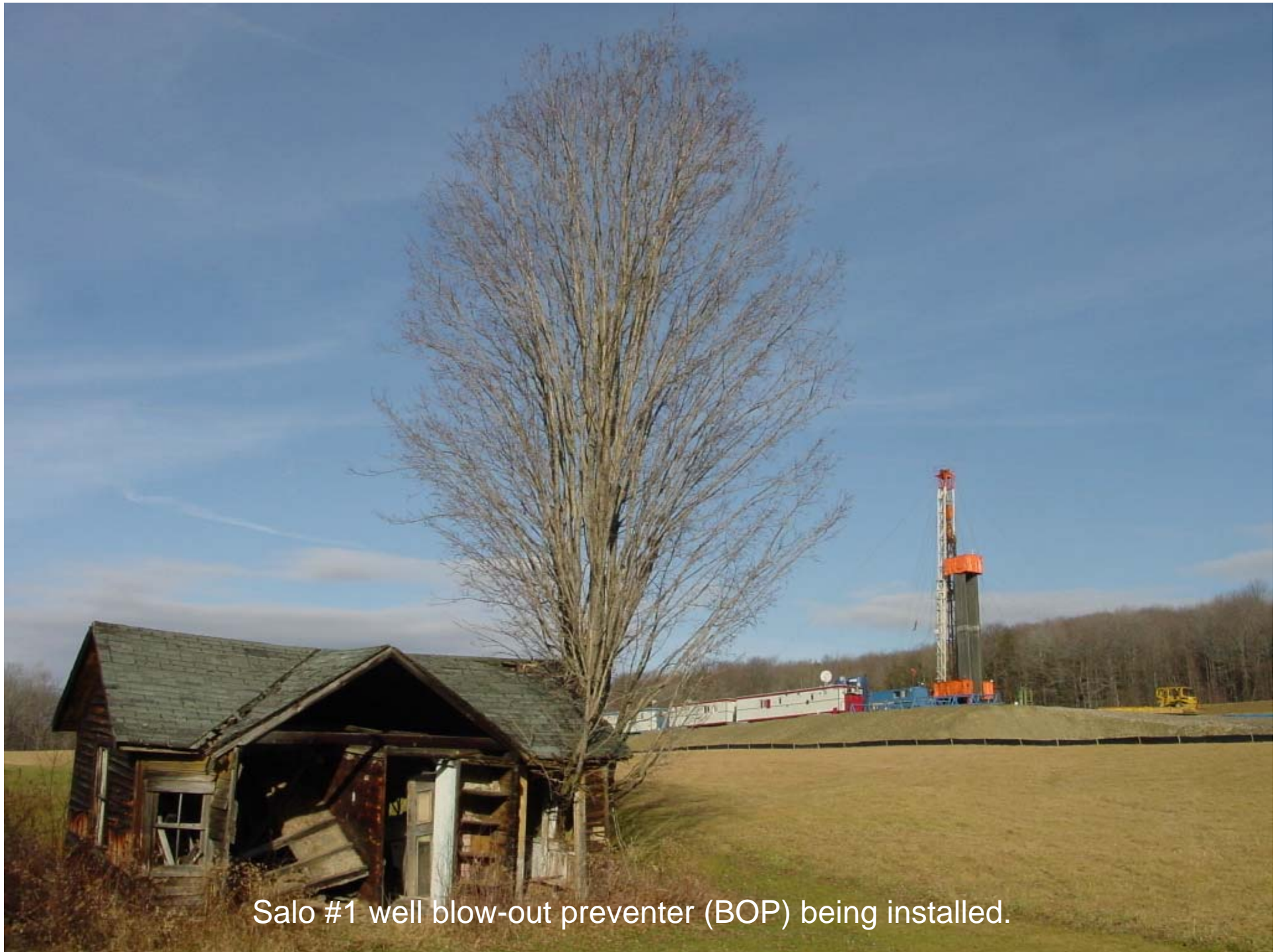
Von Hassle 1 wellsite, Town of Otselic, Chenango County, showing before, during and after drilling. This well was a dry hole and never produced.



Salo #1 well being drilled, Town of Barton, Tioga County.



Salo #1 well blow-out preventer (BOP) being installed.



Salo #1 well blow-out preventer (BOP) being installed.



Shipman 1A well being drilled, Town of Barton, Tioga County, 2006.



NYS Erwin Game Management Area 2, Steuben County, during drilling in 2000.
This well was drilled on NY State land.



NYS Erwin Game Management Area 2 wellhead after completion of drilling operations.
Well was drilled in an existing clearing along an existing road.



NYS Erwin Game Management Area 2 wellsite after plugging and reclamation.
Well was an unsuccessful dry hole.



Chemung SRA #1 during drilling, Town of Catlin, Chemung County.



Chemung SRA #1 after rig removed, Town of Catlin, Chemung County.



Chemung SRA #1 production site, Town of Catlin, Chemung County.



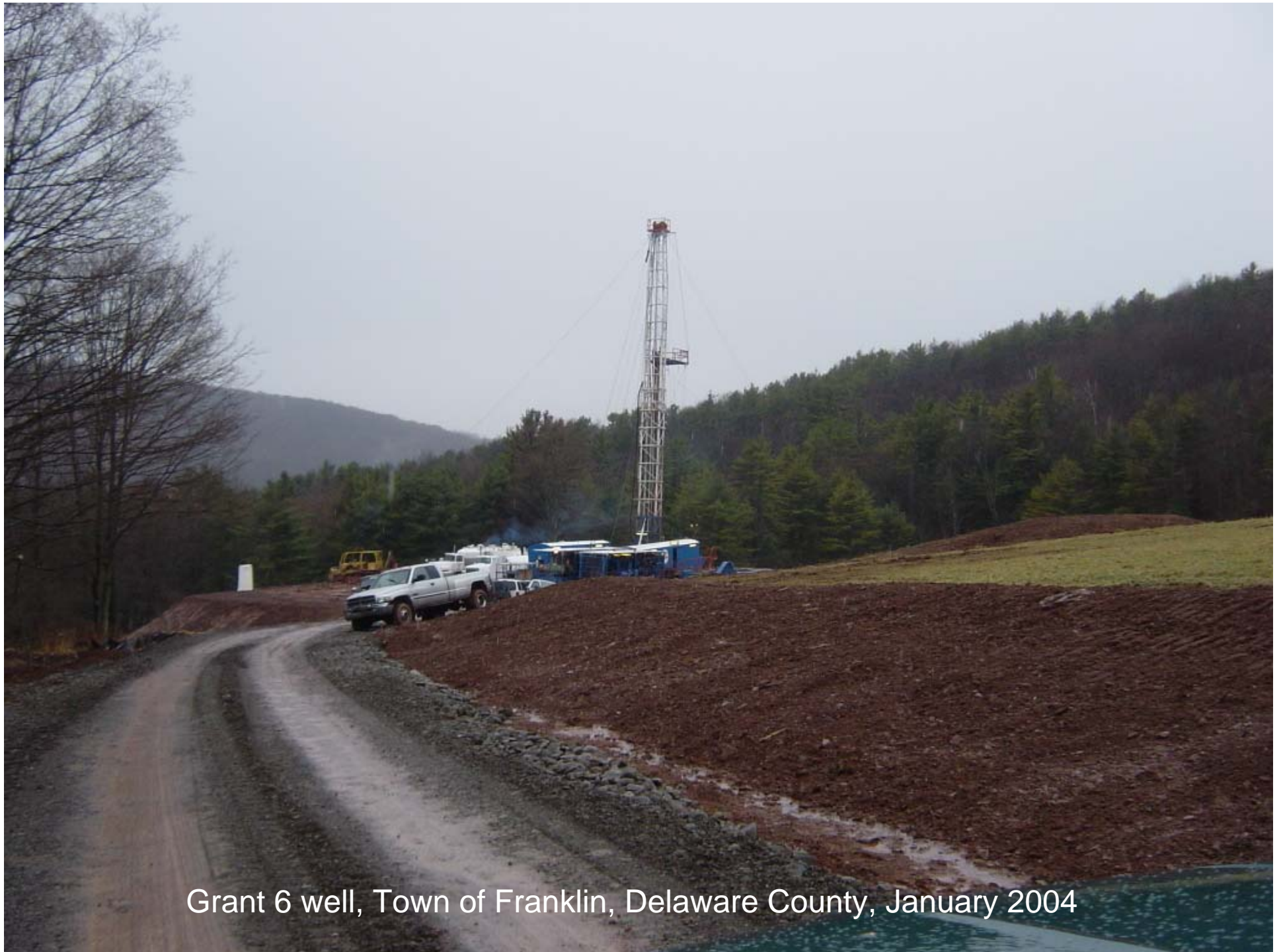
Jimerson 1240 Well, Trenton-Black River well, Town of Hornby, Steuben County. This well, drilled in 1999, has produced approximately \$3.5 million in royalties for approximately 18 landowners in the 629 acre well unit.



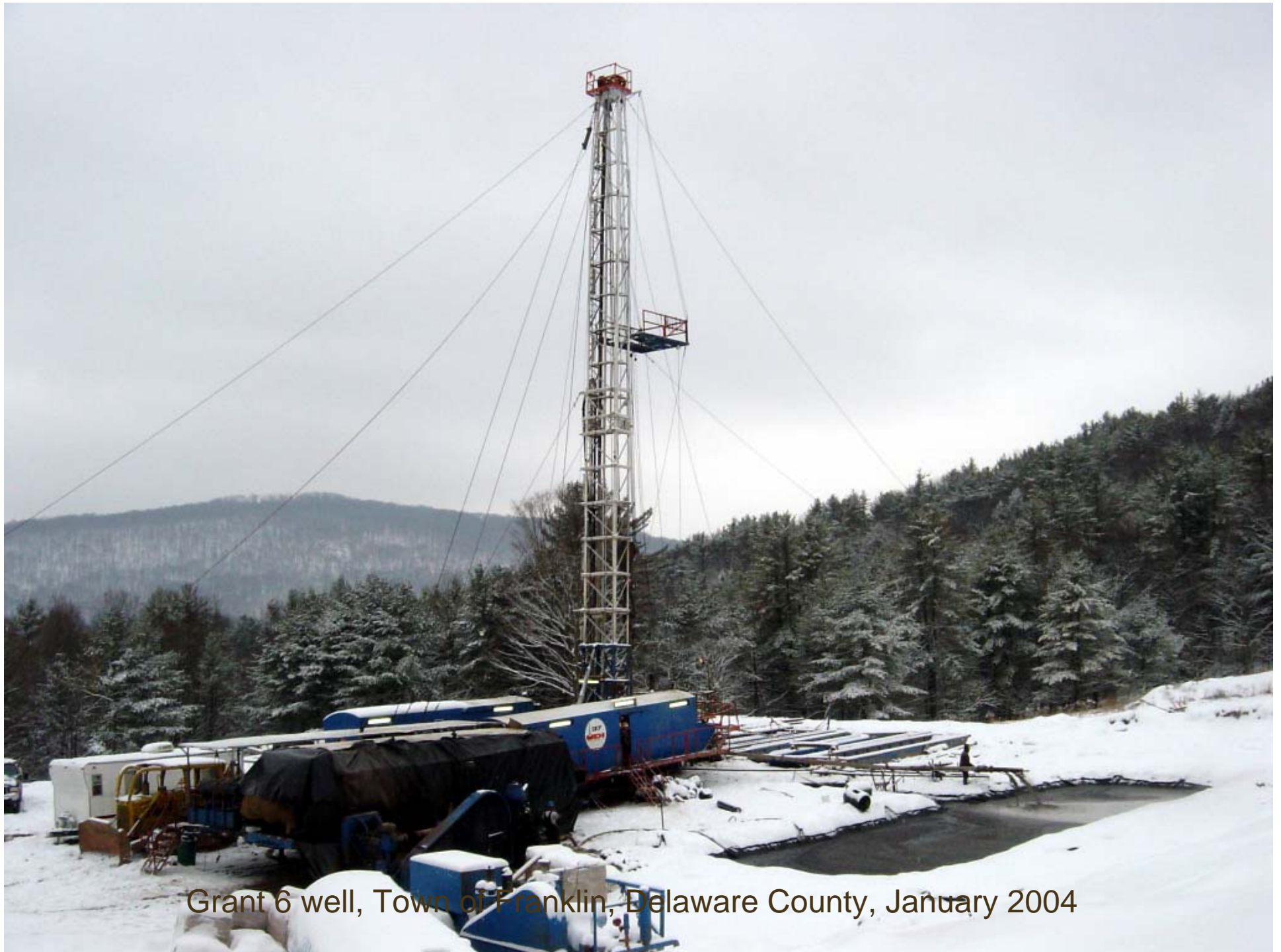
Root 1514 well, Town of Catlin, Chemung County. Successful Trenton-Black River well with 640 acre unit. New York State land, at top of hill, is included in the drilling unit. Dead trees in background were caused by flooding from beaver dam.



Two wells on one well pad: Drumm 1 Black River production well & Drumm G-2 shale test, Town of Bradford, Steuben County
Note additional derrick (Fortuna, Elliot #1 on horizon).



Grant 6 well, Town of Franklin, Delaware County, January 2004



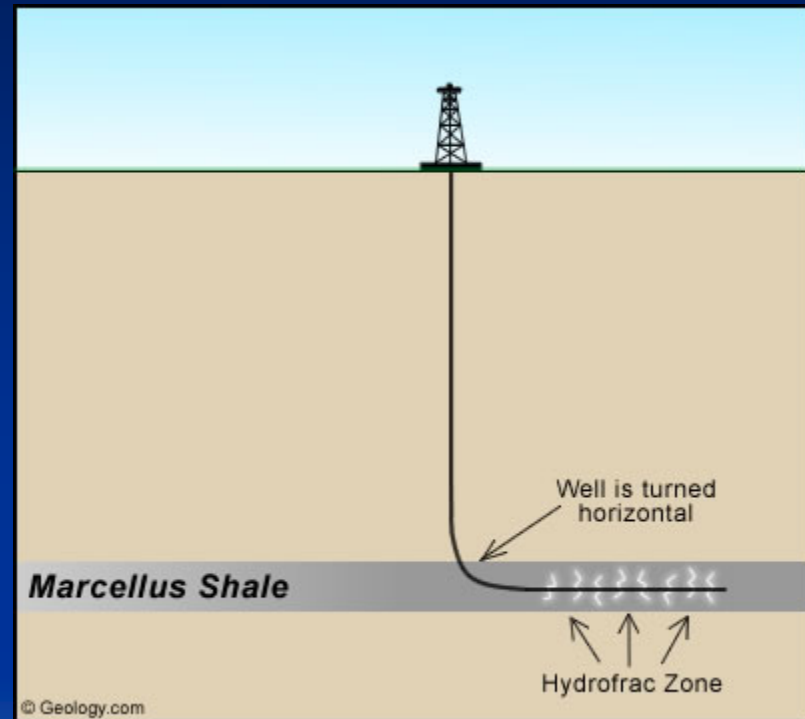
Grant 6 well, Town of Franklin, Delaware County, January 2004



Grant 6 well, Town of Franklin, Delaware County, January 2004 (Plugged Dry Wildcat)

Horizontal Drilling

- First horizontal well in New York – 1989
- 69 of 665 applications in 2007 were for horizontal or directional drilling



Hydraulic Fracturing (“Fracking”)

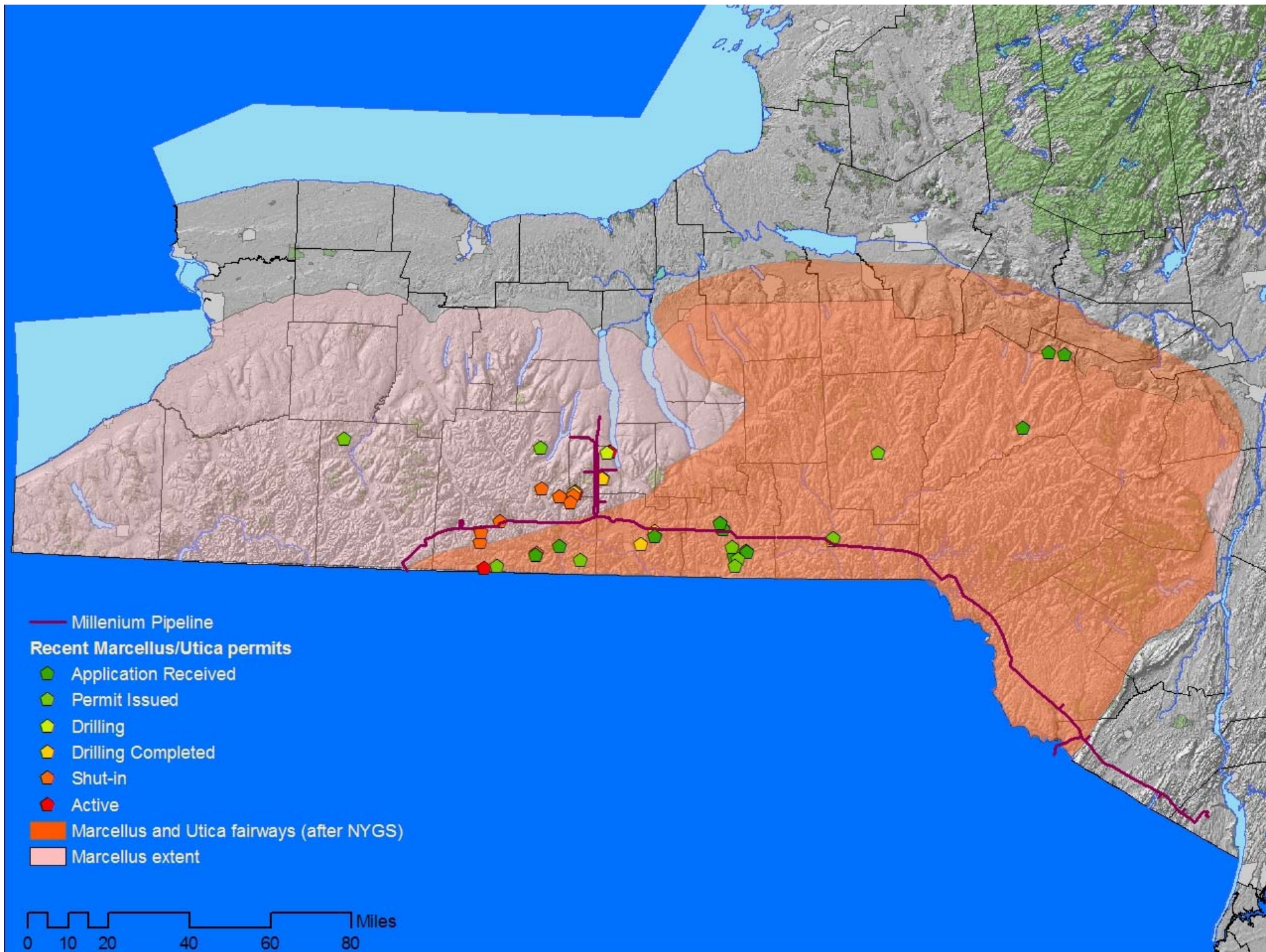
- Used for decades in NYS
- Formations are thousands of feet below surface and groundwater
- Does not occur until after the ground water zones are sealed and drilling completed
- All oil and gas states surveyed – not one instance of drinking water contamination in over one million frac jobs



Marcellus Shale Development

- Vertical wells already developed
- Three horizontal proposals currently before DEC
- DEC's existing environmental review and permitting process is protective
- Proposed A10526/S8169 only changes the administrative process to make it more efficient





Marcellus Facts – What's the Same

- Current permitting process provides environmental protection for siting, well drilling and production
 - Casing and cement requirements protect groundwater
- 1992 GEIS provides framework for SEQRA compliance
 - Site-specific environmental assessment, supplemental EIS's when necessary
- Tall tales always associated with oil and gas leasing and exploration



Marcellus Facts – What's Different

- New areas
- High-dollar paid-up leases
- Multiple wells from common pad
- Hydraulic fracturing and frac water volumes
 - Standard for all shale wells
 - Large scale for horizontal wells (1 million gallons or more per well)
 - Water source, handling, disposal
 - Frac fluid composition
 - Adequate state regulatory programs already in place





Frac pit for Beagel #2, Town of Kirkwood, Broome County, 5/16/2008
Temporary pit size approximately 100'x150'x10' (~ 1,000,000 gallons)

Current Issues

- Public education
 - Landowner information
 - DEC website
 - Public meetings
- Water withdrawals (SRBC, DRBC)
- Flow-back water disposal
- ECL amendment for well spacing,
A10526/S8169



Marcellus Economic Development

- Resource estimates of 168-516 tcf
- Drilling costs up to \$3 million per well
- Broome and Delaware county leasing coalition
 - 300 owners, \$90 million bonus, 15% royalty
- Coalition in Kirkwood, Binghamton, Conklin and Windsor
- Other active leasing
- Total NY market value could reach \$1 billion



Well Spacing 2005 Amendments

- Permit issuance establishes a spacing unit
 - Statewide unit sizes based on depth, formation; streamlined administrative process
 - Non-conforming units
- Horizontal shale proposals now require the non-conforming unit process
 - Statewide spacing allows horizontal drilling in other formations without the non-conforming process
 - Fluke for shale because of statewide unit size and setbacks, not scientific or technical reasons



Compulsory Integration 2005 Amendments

- All spacing unit owners guaranteed the opportunity to participate in the well or receive a royalty
- Monthly hearing process in Albany
 - Hearing policy issued February 22, 2006.
 - 95 hearings held since May 16, 2006.
 - 75 orders signed since May 16, 2006.
 - 15 referrals to OHMS
 - 3 orders pending (record is open)
 - 2 units extinguished before orders issued
- No changes needed for Marcellus Shale Development



Proposed 2008 Amendments

- Statewide units for horizontal shale drilling
- No changes to environmental review and permitting process
- No changes to compulsory integration



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NYS Oil & Gas Web Links

- Overview:
<http://www.dec.ny.gov/energy/205.html>
- Landowner info:
<http://www.dec.ny.gov/energy/1532.html>
- On-line database:
<http://www.dec.ny.gov/energy/1603.html>

