

Marcellus Shale Exploration

Energy Development and the Environment

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Presentation Topics

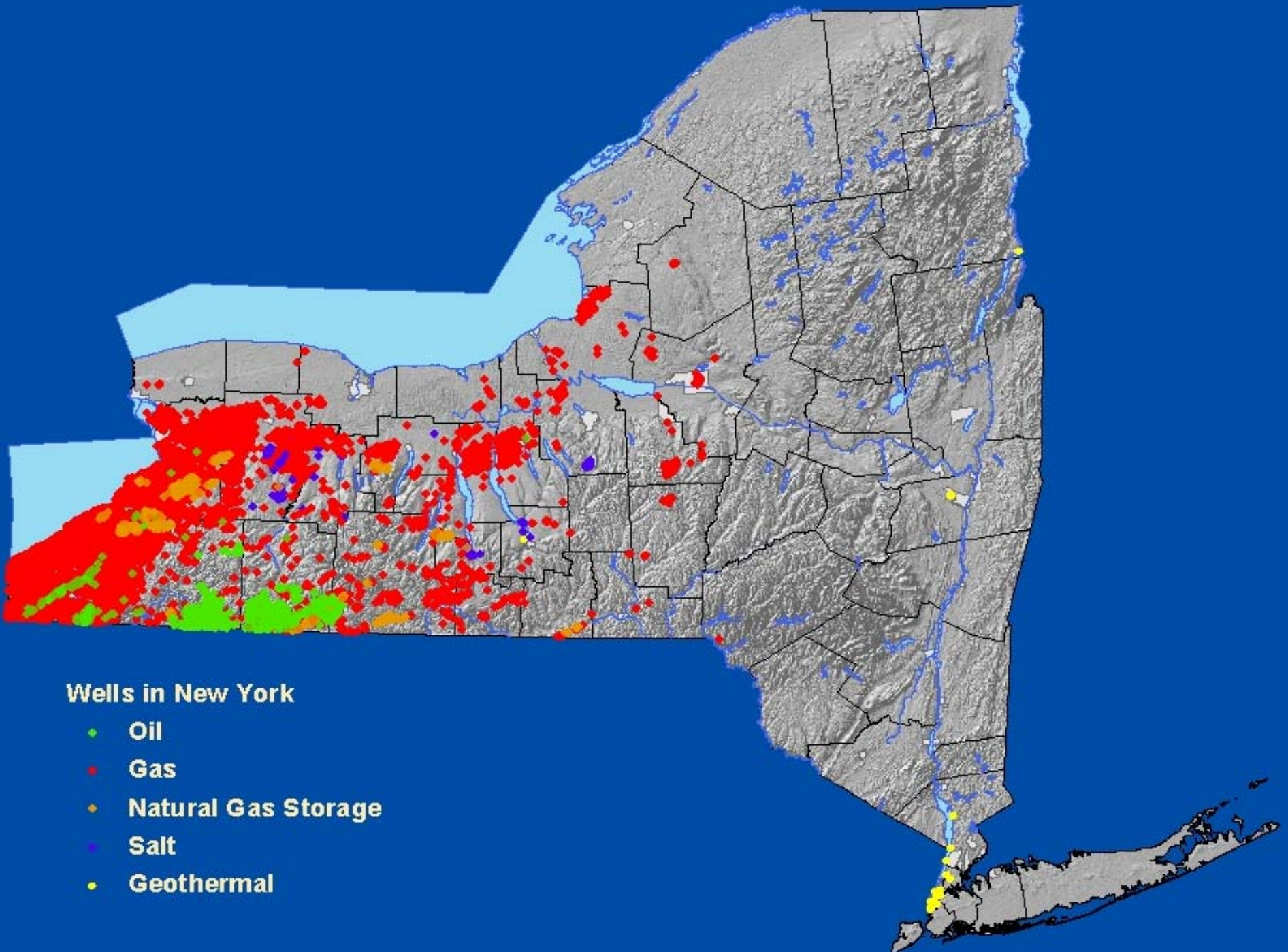
- How does DEC regulate the oil & gas industry
- Primary regulatory issue unique to Marcellus Development
- How will this issue be addressed



Historical Oil & Gas Development in New York

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





New York's Oil and Gas Industry

(2007 preliminary data)

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



Oil & Gas Regulatory Program

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



ECL Article 23

- Issue permits to drill and plug wells
 - Oil, gas, solution salt mining and underground gas storage wells
 - Stratigraphic, brine disposal and geothermal wells > 500 ft. deep
- Collect and disseminate oil and gas well geological, technical and production data



ECL Article 23 – cont.

- Require financial security to ensure well plugging and reclamation
- Set well spacing and order compulsory integration
- Lease state lands for oil and gas
- Issue permits for underground gas storage fields



DEC and Local Government Authority for Oil and Gas Regulation

- Article 23, Title 3 of the Environmental Conservation Law (ECL)
 - Delegates all authority to regulate oil and gas activity to DEC.
 - Specifies that local governments retain jurisdiction over local roads and their rights under the Real Property Tax Law.



Protecting the Environment

- Before a well permit is issued
 - Site inspection, location screening, environmental assessment, setbacks, drilling and construction plan, financial security
- When a well permit is issued
 - Casing, cement, well control, site-specific permit conditions, notification requirements (including local government prior to spud)
- After a well permit is issued
 - Drilling inspections, annual reporting, requirement to plug and reclaim site under a permit

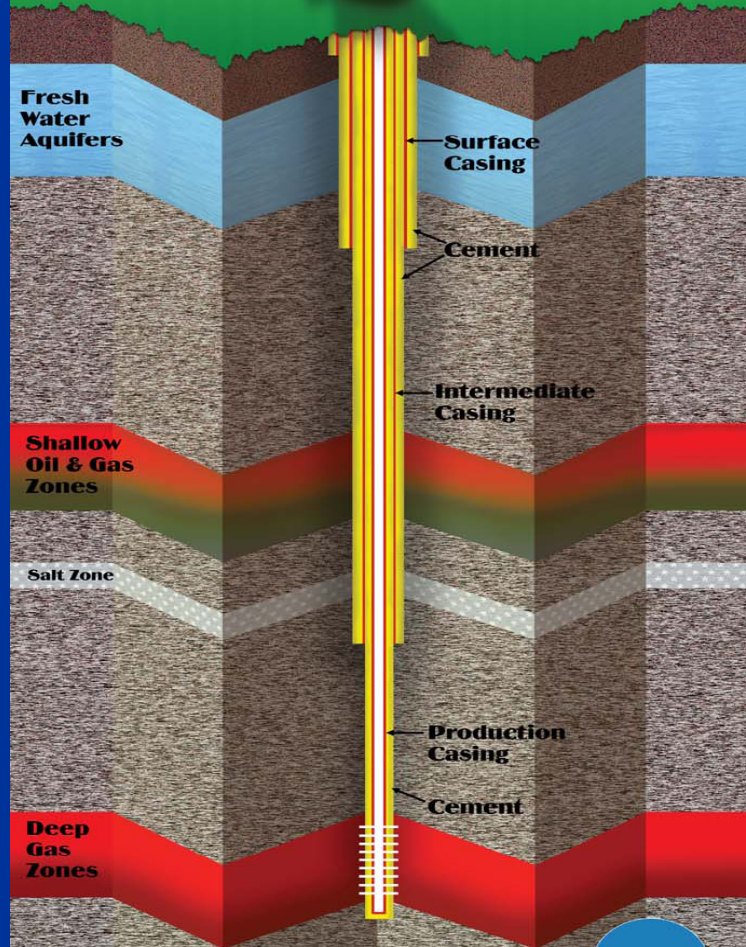


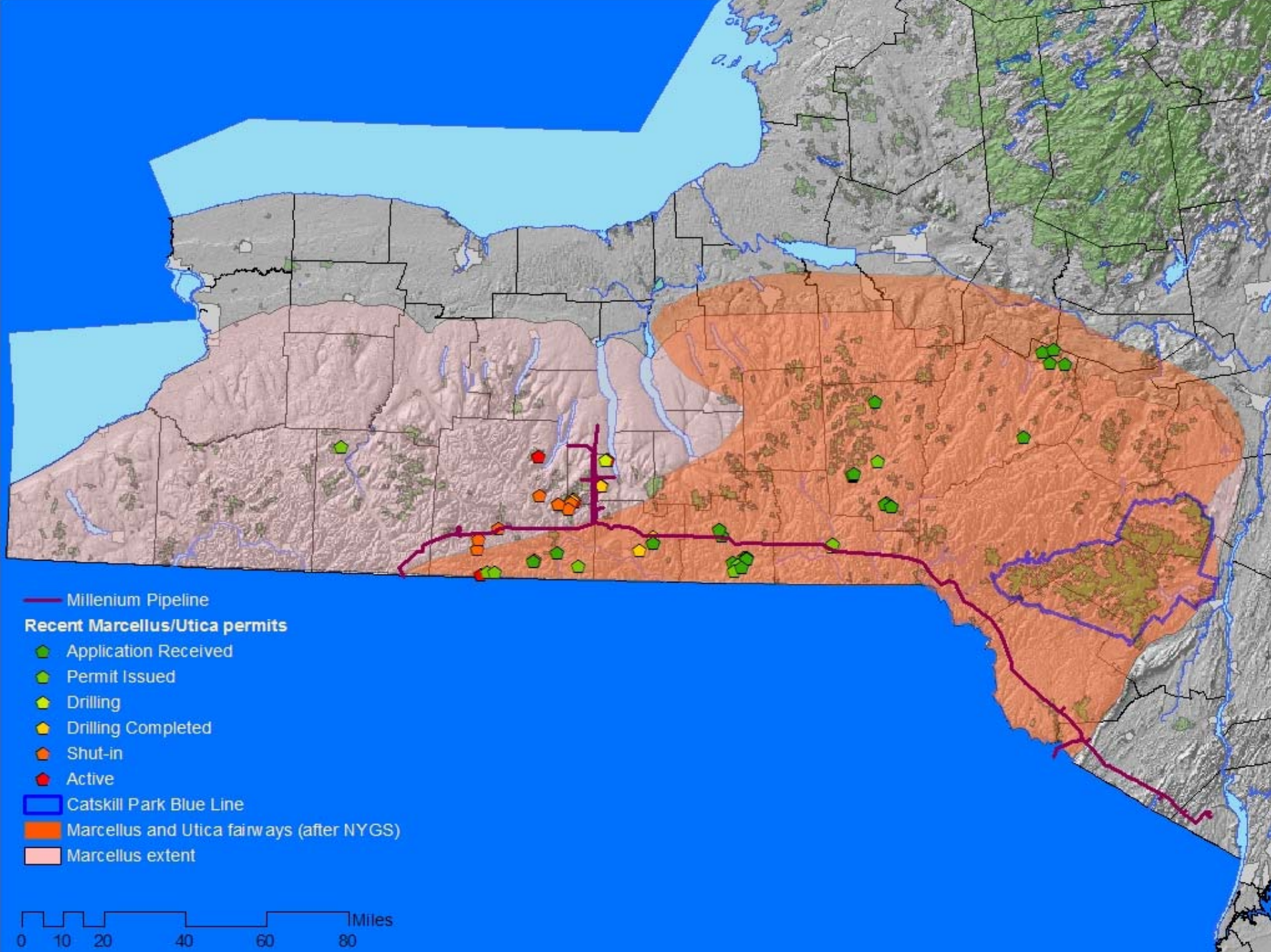
Groundwater Protection

Well Casing and Cementing Program

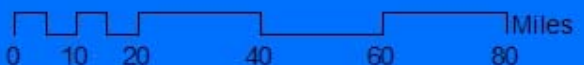
The Division of Mineral Resources' well casing and cementing regulations provide for the protection of the State's fresh water aquifers

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



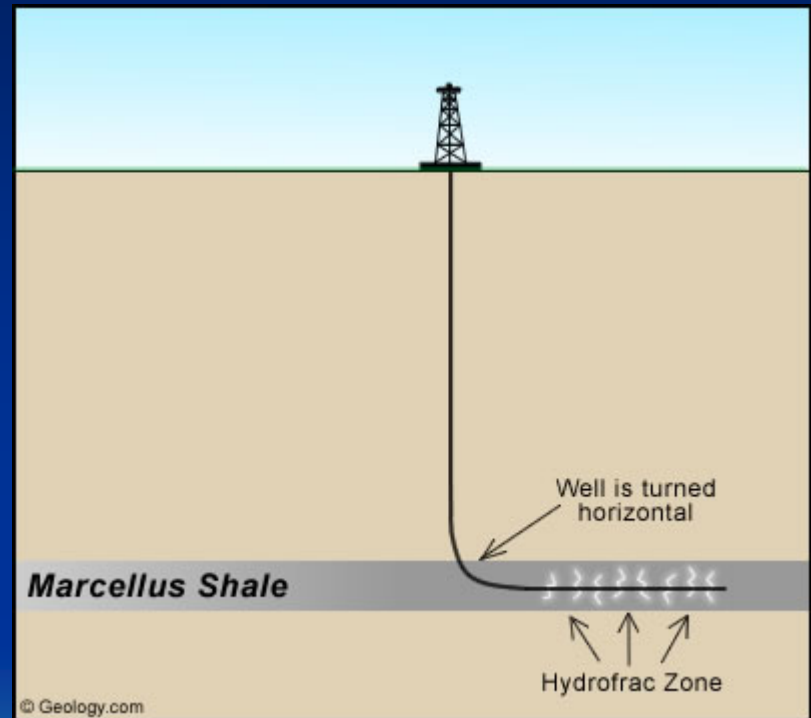


- Millenium Pipeline
- Recent Marcellus/Utica permits**
- Application Received
- Permit Issued
- Drilling
- Drilling Completed
- Shut-in
- Active
- Catskill Park Blue Line
- Marcellus and Utica fairways (after NYGS)
- Marcellus extent



Horizontal Drilling in New York

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



Primary Regulatory Issue Unique to Marcellus Development

- “Size” of hydro-fracturing operation
 - Water source
 - Frac fluid handling and storage
 - Flowback fluid storage and disposal



Hydraulic Fracturing (“Fracking”)

- Used for decades in New York State
- Target formations are thousands of feet below surface and ground water
- Does not occur until after the ground water zones are sealed and drilling is completed
- Fracturing is limited to completion interval



Water Use, Storage and Disposal

- Water withdrawals require Basin approvals (SRBC, DRBC)
- Hydraulic fracturing and frac water volumes
 - 1 million gallons or more per well
 - Fluid handling and disposal
 - Frac fluid composition requested as part of DEC's drilling application
 - Fluid stored in lined pits or tanks
 - Pits and tanks inspected by DEC
 - Fluid removed from site by Part 364 waste hauler









NYSDEC 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>



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New York State Department of Environmental Conservation
Division of Mineral Resources