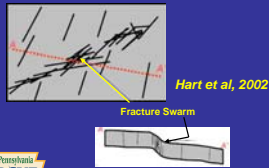


WHAT ARE DEVONIAN BLACK SHALES?

- Fredonia, NY – 1821 (Lake Erie Area, Chautauqua County)
- Big Sandy, KY – 1921 (Eastern KY, Southern OH, Western WV)
- Cottageville, WV – 1930 (Jackson & Mason Counties)
- Midway-Extra, WV – 1948 (Putnam & Jackson Counties)
- Lakeshore, OH, PA & NY – 1970s (S of Lake Erie Shoreline)



Schlumberger, 2007

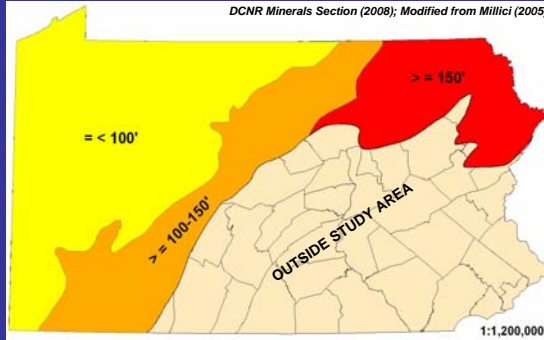
THE MARCELLUS SHALE

- Black, Organic Rich Shale
- Middle Devonian aged, Moderate Depth
(Btw Shallow UD Sands and LD Oriskany Ss)
- Present Throughout PA, Thickest in East,
Fractured, Nano Darcy Permeability
- Continuous Resource / Resource Play / Source
Rocks as Reservoirs



THE MARCELLUS SHALE

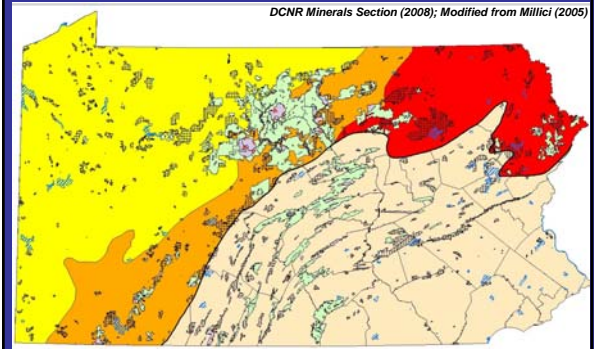
DCNR Minerals Section (2008); Modified from Millici (2005)



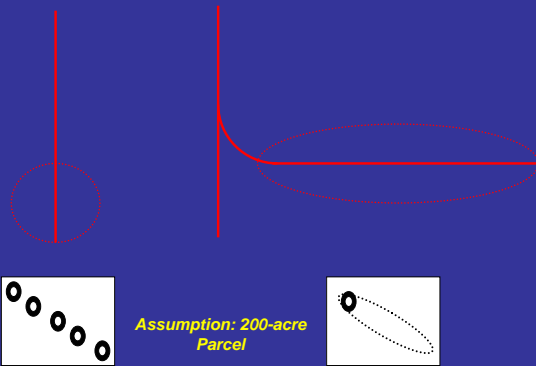
GROSSLY GENERALIZED THICKNESS CARTOON

MARCELLUS OCCURRENCE & STATE LANDS

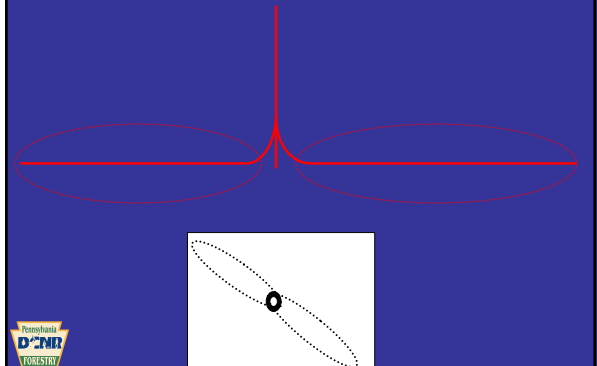
DCNR Minerals Section (2008); Modified from Millici (2005)



VERTICAL vs. HORIZONTAL DRILLING

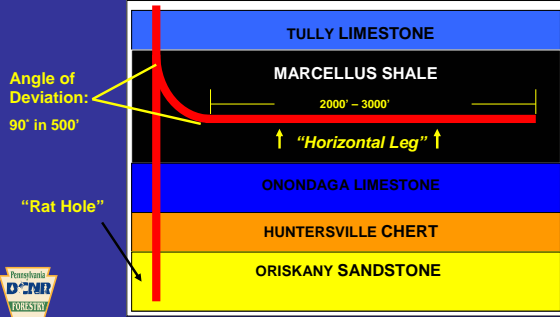


RECENT HORIZONTAL TECHNIQUES

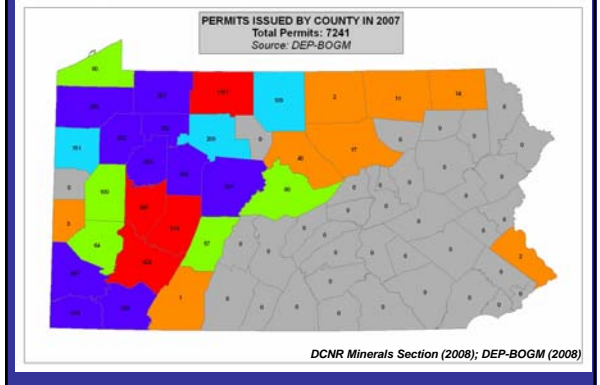


THEORETICAL EXPLORATION CARTOON

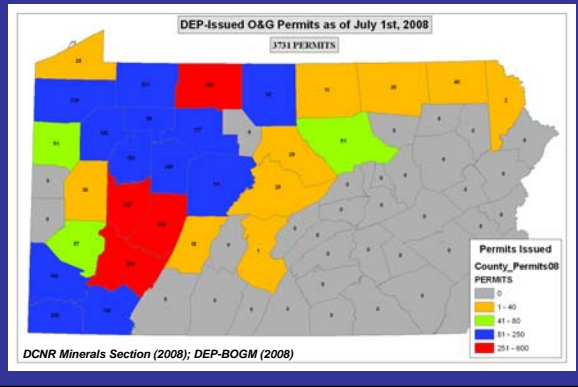
~ 5,000'- 9,000' DEEP, REGIONALLY UNIFORM



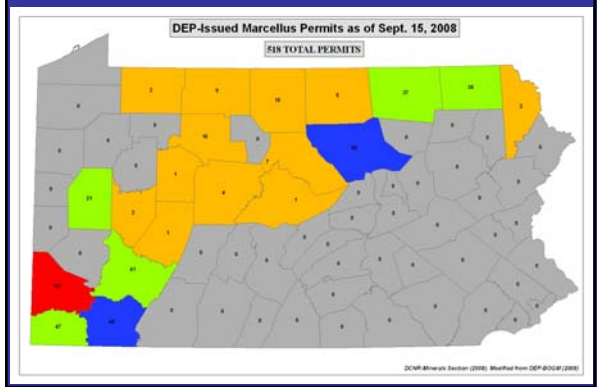
DEP-Issued WELL Permits: 2007



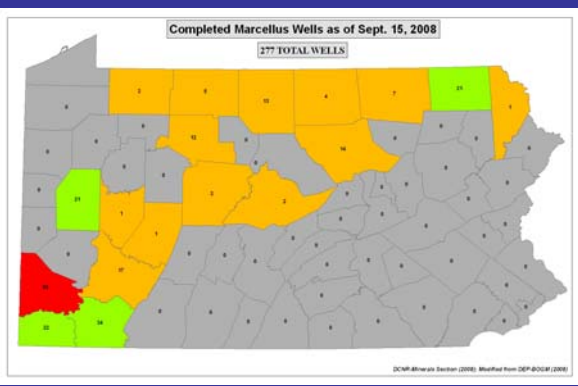
DEP-Issued WELL Permits: as of July 1, 2008



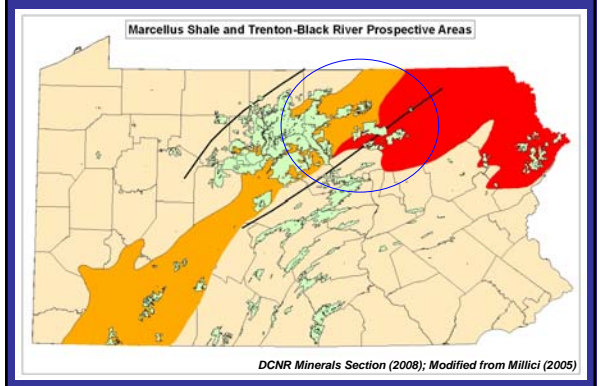
DEP Issued MARCELLUS Permits: as of Sept. 15, 2008



Completed MARCELLUS Wells: as of Sept. 15, 2008



2008 LEASE SALE: SPATIAL EXTENT



2008 LEASE SALE: Decision Making Process

- Detailed Design
- Minimize Impact to State Forest Land
- O&G Industry Interest & Demand
- Lease Sale Review Team
- State Forest Environmental Review (SFER)
- Public Transparency



Typical Marcellus GR Curve
(Steuben County, NY)

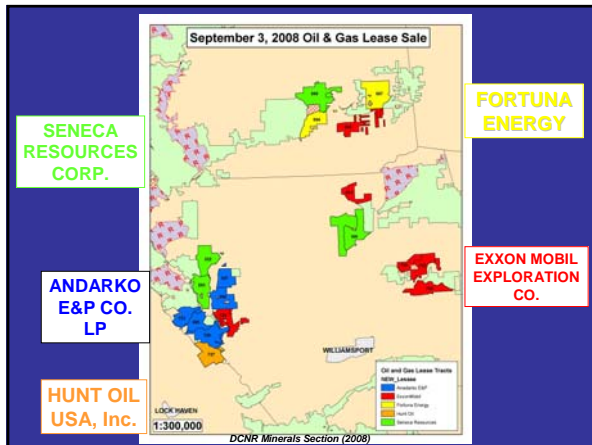


2008 LEASE SALE: Tract Analysis

- Proposed Tracts Submitted to Forest District(s) For Analysis
- On The Ground Analysis
- GIS based Analysis
- Areas of Special Consideration
- Non Development Areas



(AAPG 2008)

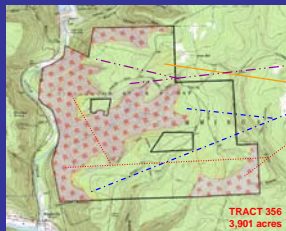


September 3, 2008 LEASE SALE: Lease Pts.

- **SETBACKS/BUFFERS:**
Streams: 200 Ft (300 Ft Exceptional Value)
Roads, Trails, ROW: 300 Ft
Buildings: 200 Ft
Lease Boundary: 300 Ft
State Parks/Wild and Nat Areas: 600 Ft
- **WELL PAD SITES:**
Approval of District Forester (location & size)
Pre Allocated # of Maximum Pad Sites
- **PIPELINES, ROADS, RIGHTS OF WAY:**
Approval of District Forester
Standard Department Agreements (Off-Lease)

September 3, 2008 LEASE SALE: Lease Pts.

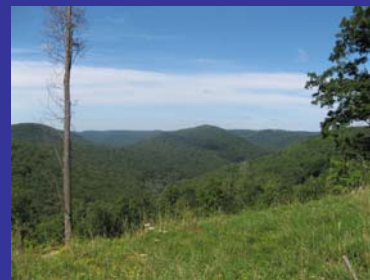
- **AREAS OF SPECIAL CONSIDERATION:**
New to 2008 Lease Agreement
"Special" Areas Delineated Before Sale
Areas Includes – Recreation, Slope, Viewshed, Ecological, Timber



ECO – 1,522 acres
TIMBER – 728 acres
VIEWSHED – 1,404 acres
REC & SLOPE – 1,628 acres
Total AoSC – 5,282 acres

TRACT 356
3,901 acres

QUESTIONS?



THANK YOU FOR THE
OPPORTUNITY TO PRESENT

