

Utica Shale Update

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Ohio Department of Natural Resources



Ohio Department of
NATURAL RESOURCES

Horizontal Well Activity

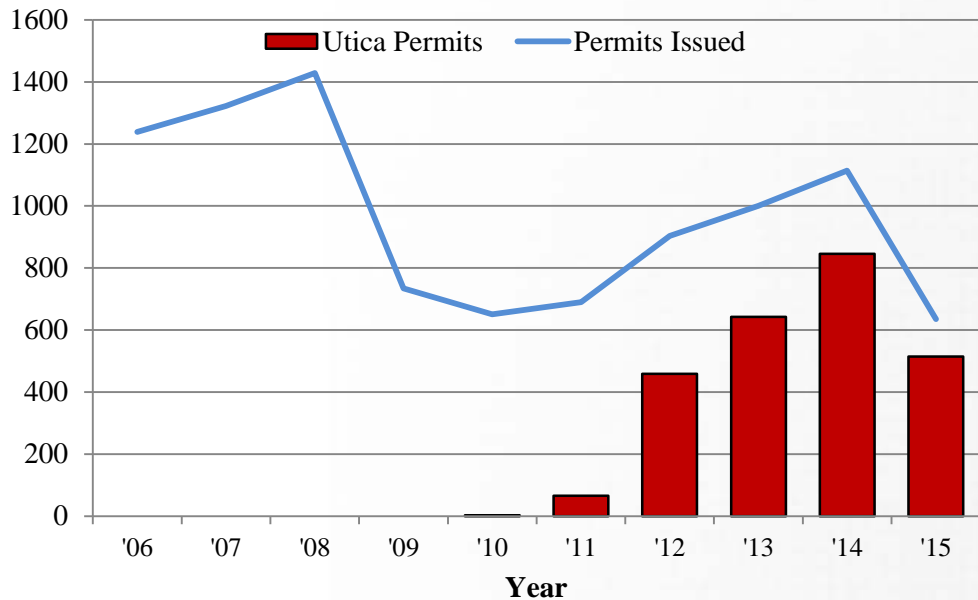


Activity Trends

Agency Progress

Emerging Issues

Horizontal Well Permitting



OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS RESOURCES MANAGEMENT
2045 MORSE RD., BLDG. F-0, COLUMBUS, OH 43229-6693
Phone: (614) 265-6922 • Fax: (614) 265-6910

APPLICATION FOR A PERMIT (Form 1)
(REVISED 09/15)

SEE INSTRUCTIONS ON BACK

1. We (applicant) _____ Address: _____ hereby apply this date _____, 20____, for a permit to: <input type="checkbox"/> Drill Vertical Well <input type="checkbox"/> Revised Location <input type="checkbox"/> Convert <input type="checkbox"/> Drill Horizontally <input type="checkbox"/> Plug Back <input type="checkbox"/> Deepen <input type="checkbox"/> Drill Directionally <input type="checkbox"/> Plug and Abandon <input type="checkbox"/> Reopen <input type="checkbox"/> Reissue <input type="checkbox"/> Temporary Inactive: <input type="radio"/> 1 st year <input type="radio"/> 2 nd year <input type="radio"/> 3 rd year _____ year		2. OWNER NUMBER: _____ Phone Number: () - _____
3. TYPE OF WELL: <input type="checkbox"/> Oil & Gas <input type="checkbox"/> Annular Disposal <input type="checkbox"/> Saltwater Injection <input type="checkbox"/> Stratigraphic Test <input type="checkbox"/> Gas Storage <input type="checkbox"/> Other (explain): <input type="checkbox"/> Solution Mining* <input type="checkbox"/> Enhanced Recovery* (if checked, select appropriate box below) <input type="checkbox"/> Input/Injection <input type="checkbox"/> Water Supply <input type="checkbox"/> Observation <input type="checkbox"/> Production/Extraction		
4. Is the well location or production facility(s) within an urbanized area as defined by ORC 1509.01 (Y)? <input type="checkbox"/> Yes <input type="checkbox"/> No		20. TYPE OF TOOLS: <input type="checkbox"/> Cable <input type="checkbox"/> Rotary (<input type="checkbox"/> Air <input type="checkbox"/> Fluid) <input type="checkbox"/> Cable/Rotary <input type="checkbox"/> Service Rig
5. MAIL PERMIT TO: _____		21. SOURCE(S) OF GROUND AND/OR SURFACE WATER USED IN PRODUCTION OPERATION: Watershed: <input type="checkbox"/> Lake Erie <input type="checkbox"/> Ohio River Estimated Withdrawal Rate (gal/day): _____ Estimated Total Volume (gal): _____ If Recycled Water - Estimated Total Volume (gal): _____
6. COUNTY: (Select County) _____		22. EMERGENCY TELEPHONE NUMBERS (closest to well site): Fire: _____ Medical: _____
7. CIVIL TOWNSHIP: _____	8. SECTION: _____	9. LOT: _____
10. FRACTION: _____	11. QTR TWP: _____	
12. TRACT/ALLOT: _____		
13. WELL NUMBER: _____		
14. LEASE NAME: _____		
15. PROPOSED TOTAL DEPTH: _____		
16. PROPOSED GEOLOGICAL FORMATIONS: _____ _____		
17. DRILLING UNIT ACRES: _____		23. MEANS OF INGRESS AND EGRESS: Road: _____
18. ATTACH LANDOWNER ROYALTY LISTING: _____		24. ROAD USE FOR HORIZONTAL WELL: <input type="checkbox"/> Maintenance Agreement Attached <input type="checkbox"/> Non-agreement Affidavit Attached <input type="checkbox"/> State Route (Not Required)
19. IF PERMITTED PREVIOUSLY: API Number: _____		25. ARE THE SURFACE RIGHTS OWNED BY THE STATE OF OHIO? Agency Name: _____
26. FOR PLUGGING APPLICATIONS: Date of Last Production: _____ Amount of Oil: _____ (bbl) Gas: _____ (mcf)		

Well Drilling



Horizontal Well Drilling by Year:

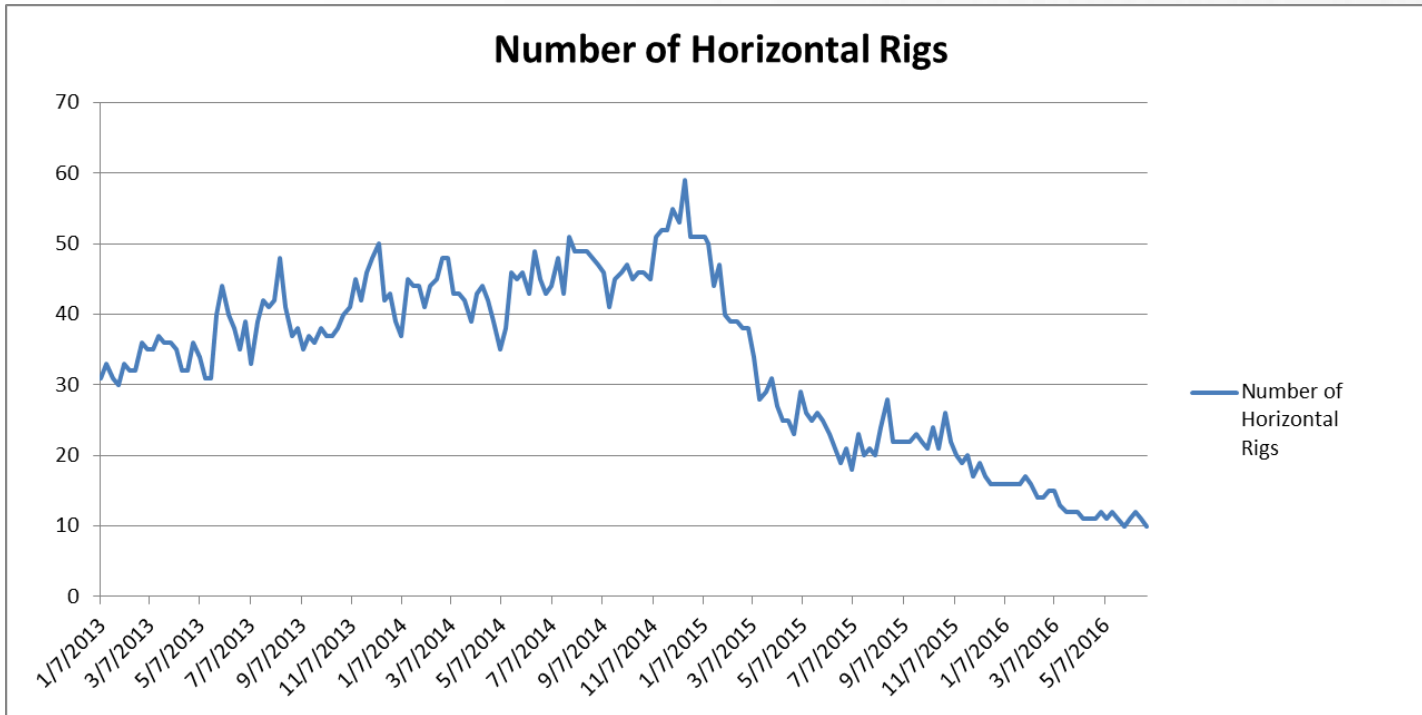
2011 – 64

2012 – 135

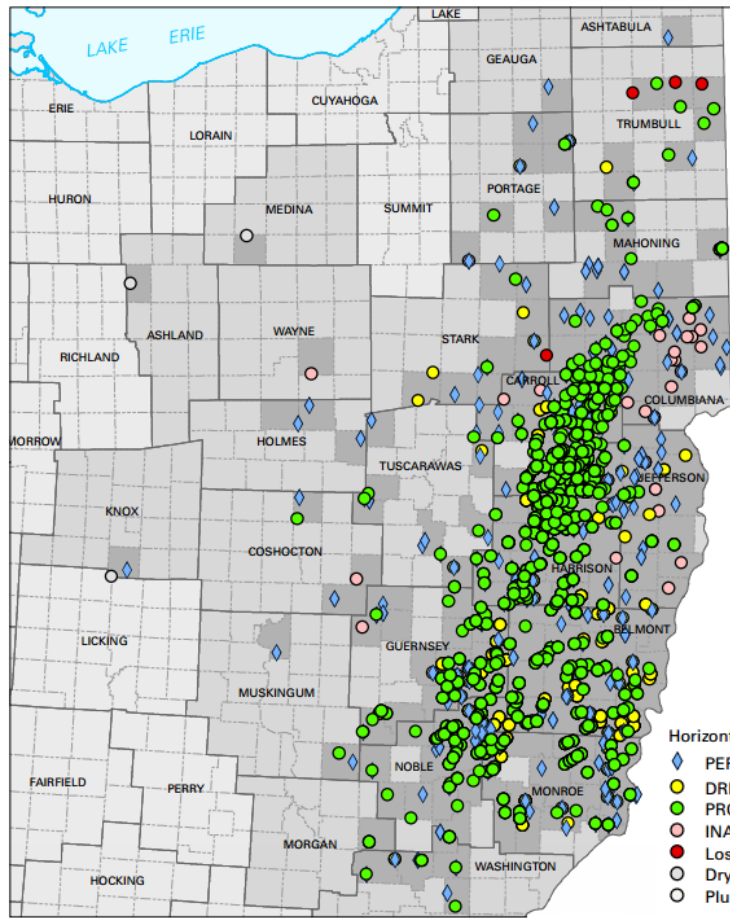
2013 – 526

2014 – 764

Horizontal Rig Count



Horizontal Utica – Point Pleasant Well Activity in Ohio



As of 7.2.2016	Utica / P. Pleasant	Marcellus	Total
Total Permits	2187	44	2231
Wells Drilled	1755	29	1784
Wells Producing	1334	21	1355

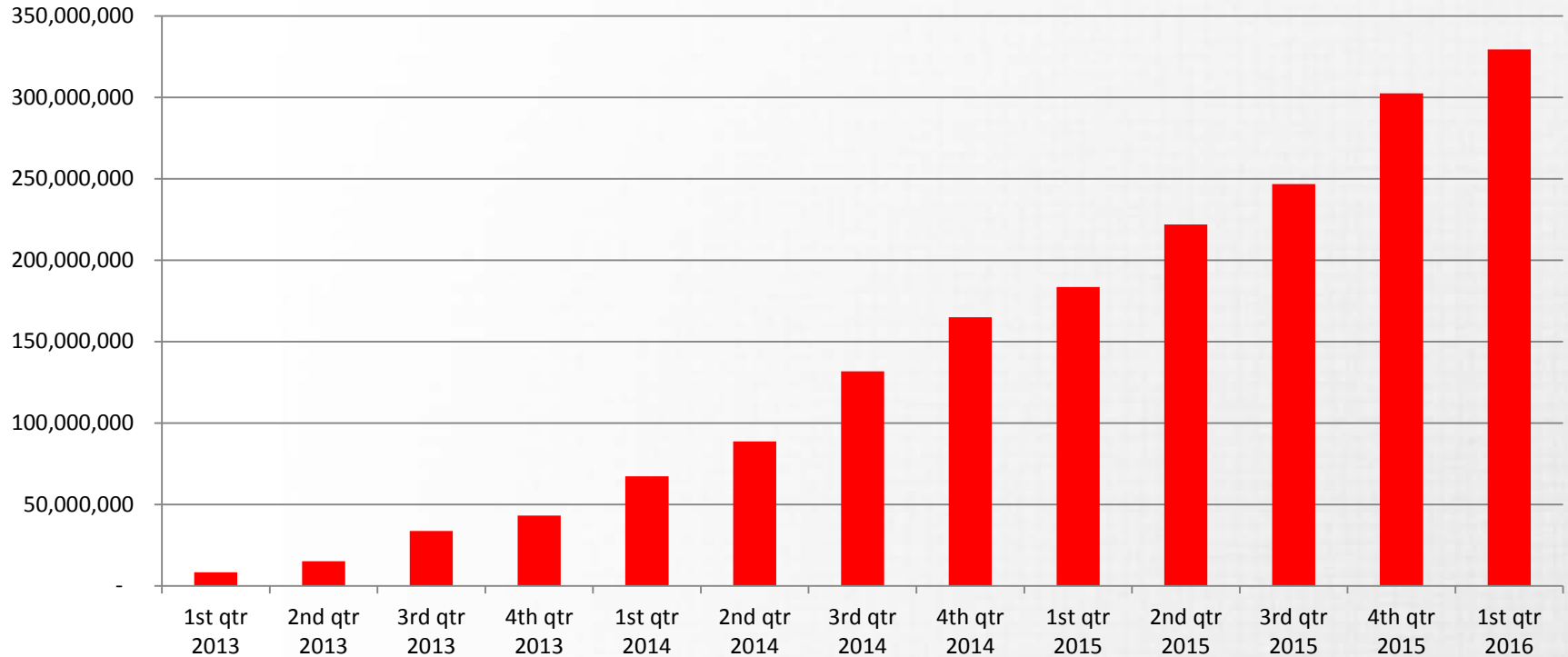
- Horizontal well status as of 7/2/2016
- ◆ PERMITTED-(Permitted; Not Drilled; Canceled) (431)
 - DRILLED-(Drilling; Well Drilled) (332)
 - PRODUCING-(Producing; Plugged Back) (1,336)
 - INACTIVE-(Drilled Inactive; Shut in) (47)
 - Lost Hole or Final Restoration (33)
 - Dry and Abandoned (3)
 - Plugged and Abandoned (3)

Production

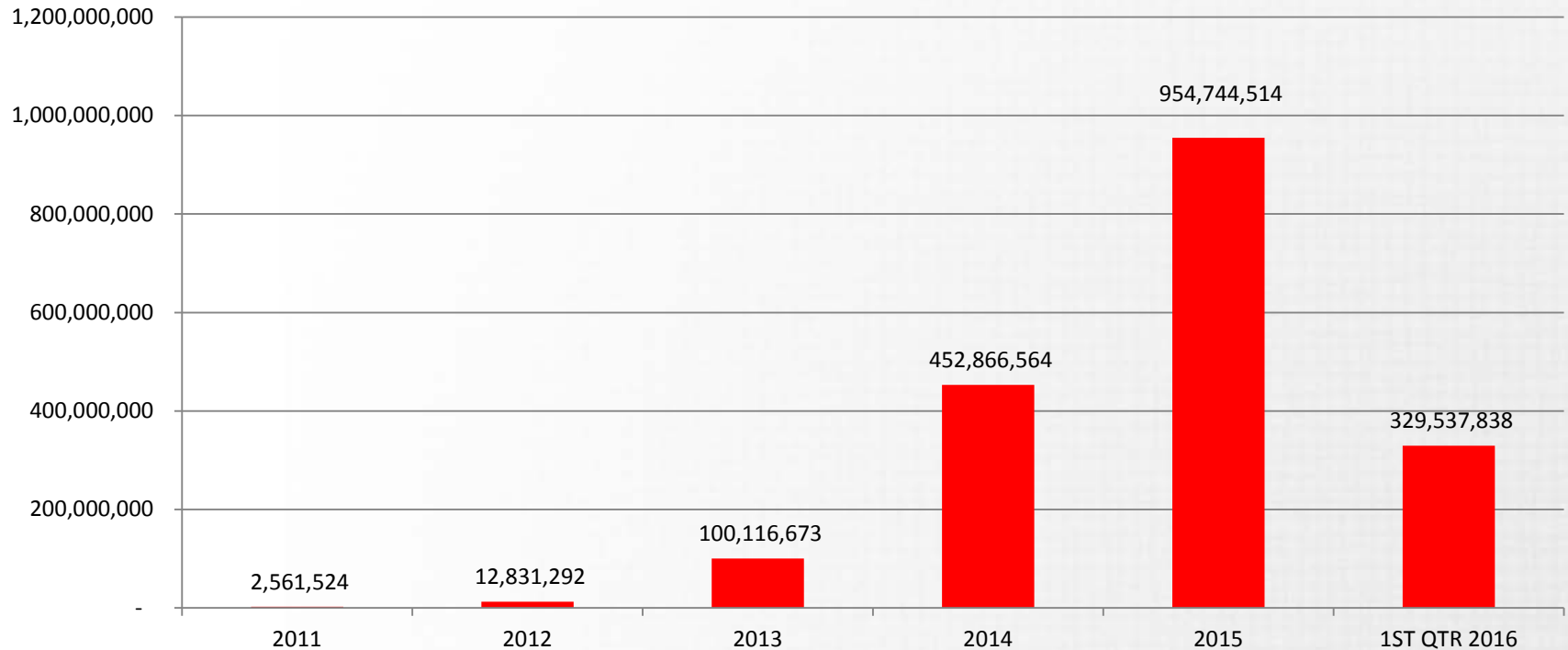


<u>Producing Wells:</u>	
Utica/Point Pleasant:	1334
Marcellus:	21
TOTAL:	1355

Shale Natural Gas Production by Quarter

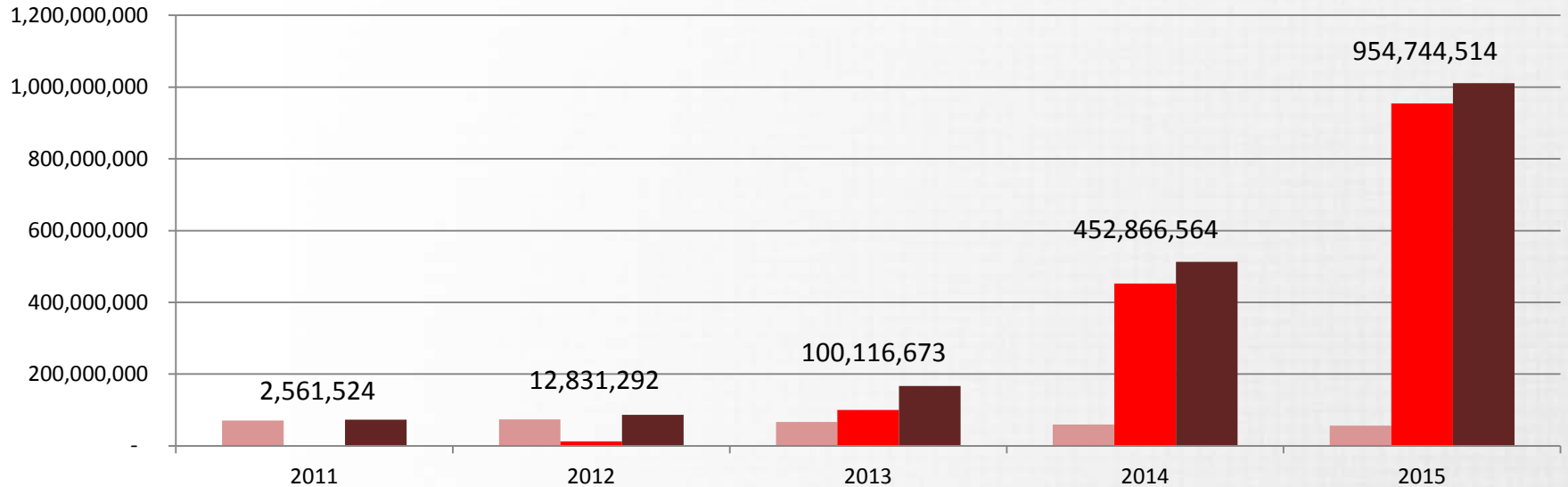


Shale Natural Gas Production by Year

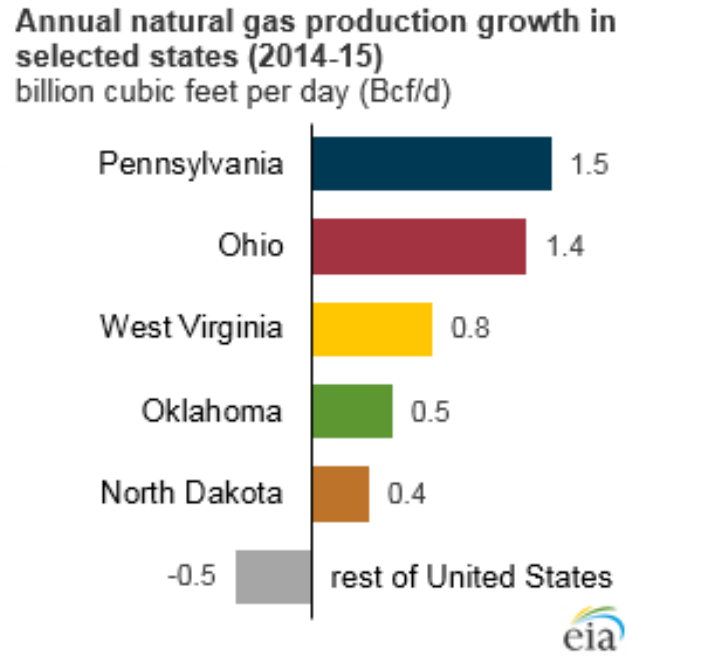


Total Natural Gas Production by Year

■ Conventional Gas ■ Shale Gas ■ Total Gas
Labels = Shale Natural Gas Production Amounts



Annual Growth in Natural Gas Production

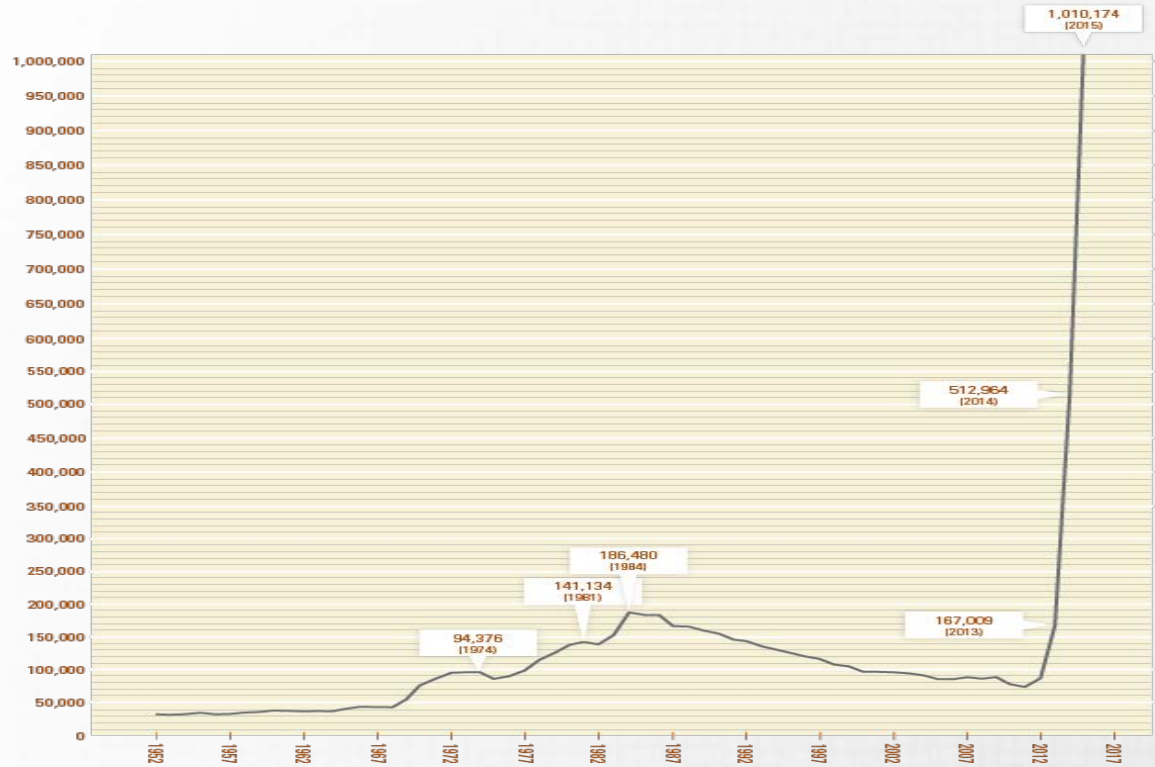


Historical Natural Gas Production

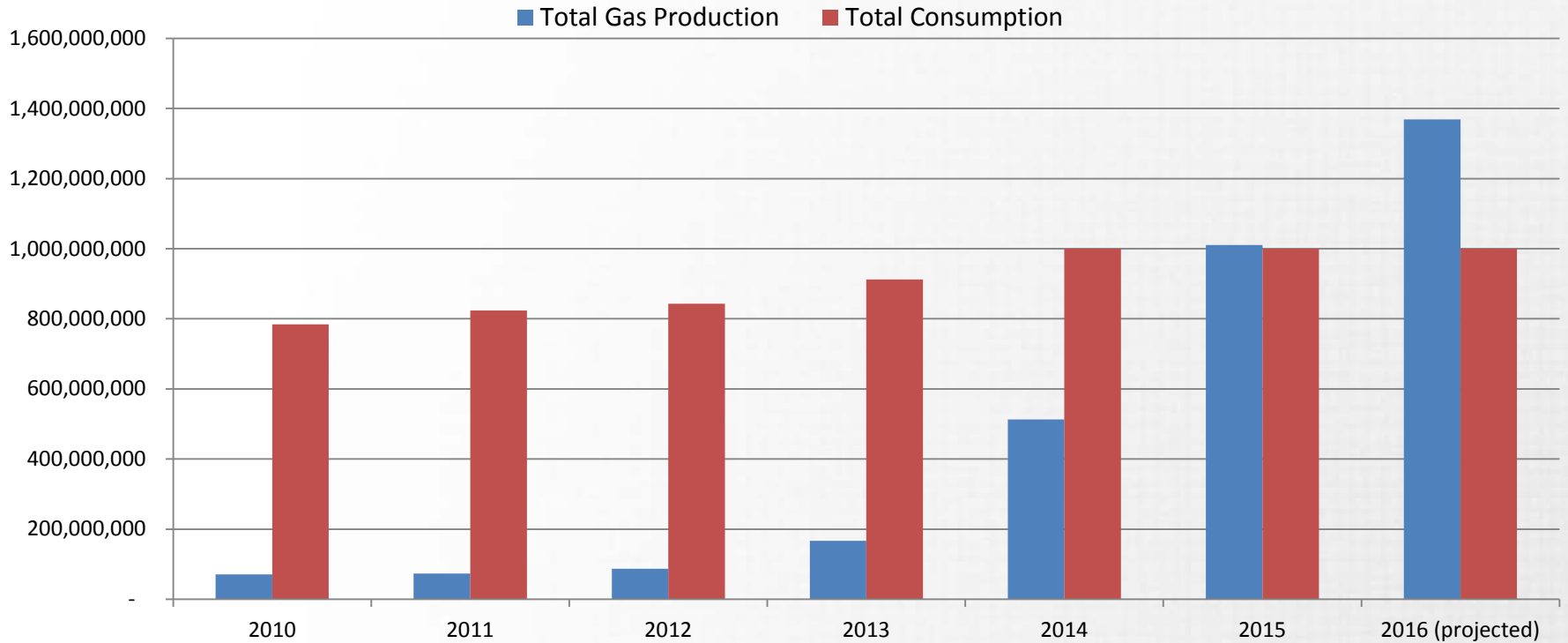
Exponential growth in natural gas production

Exciting opportunities for end-product development

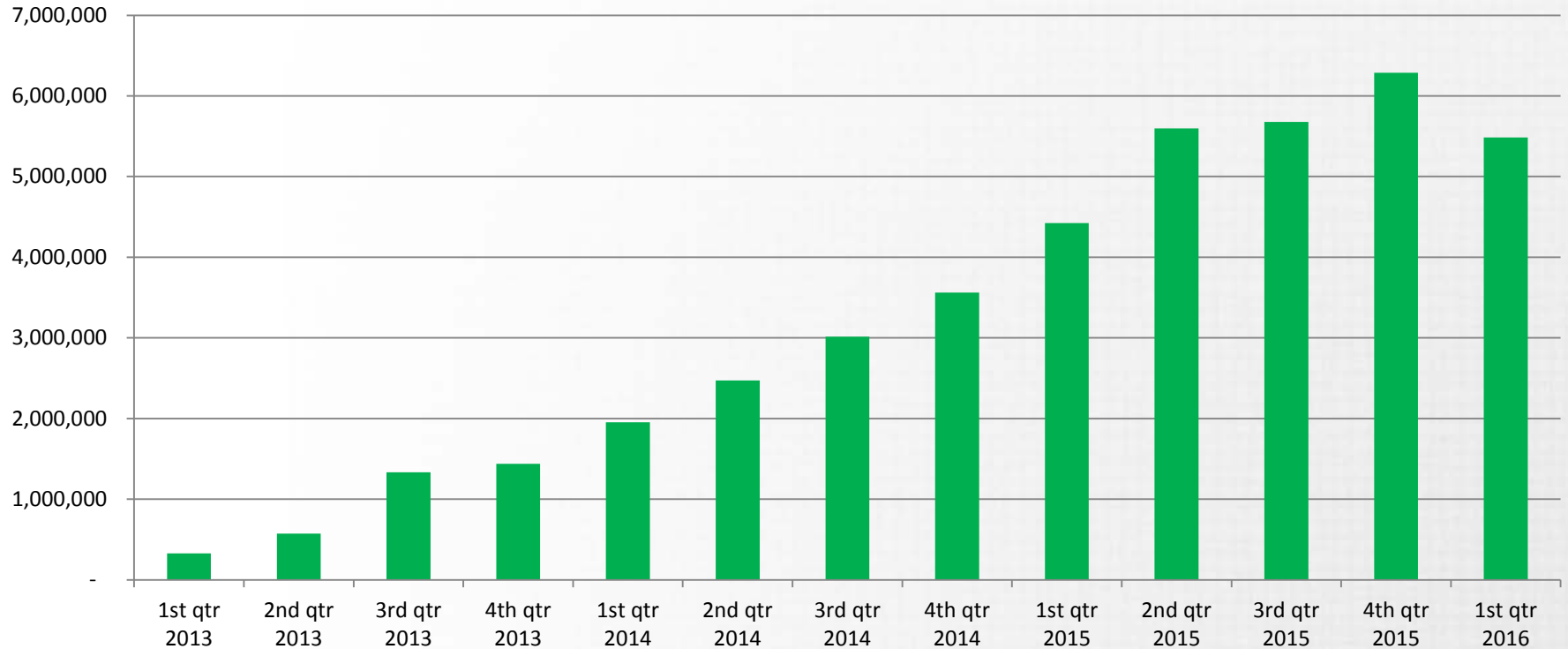
Encouraging increases due to longer laterals, fine tuned completion stages and choke programs



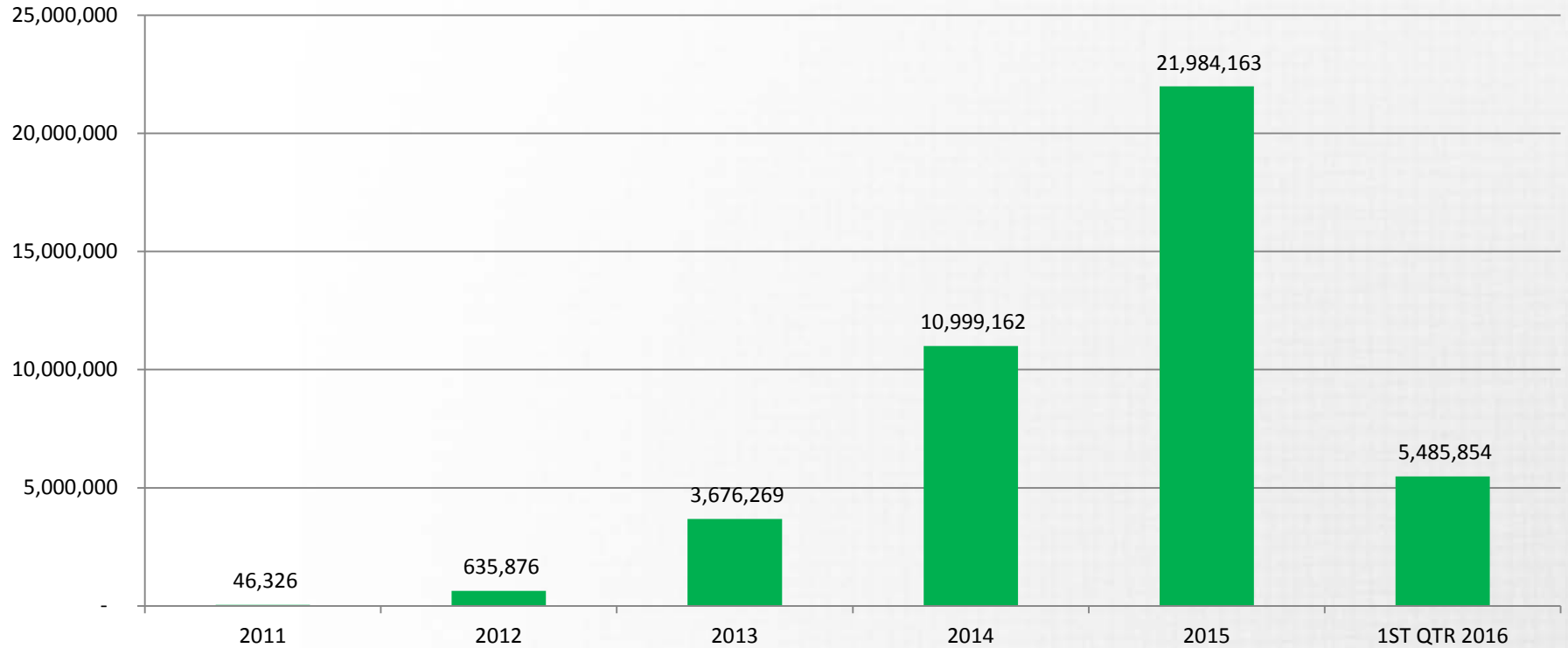
Natural Gas Consumption and Production



Shale Oil Production by Quarter

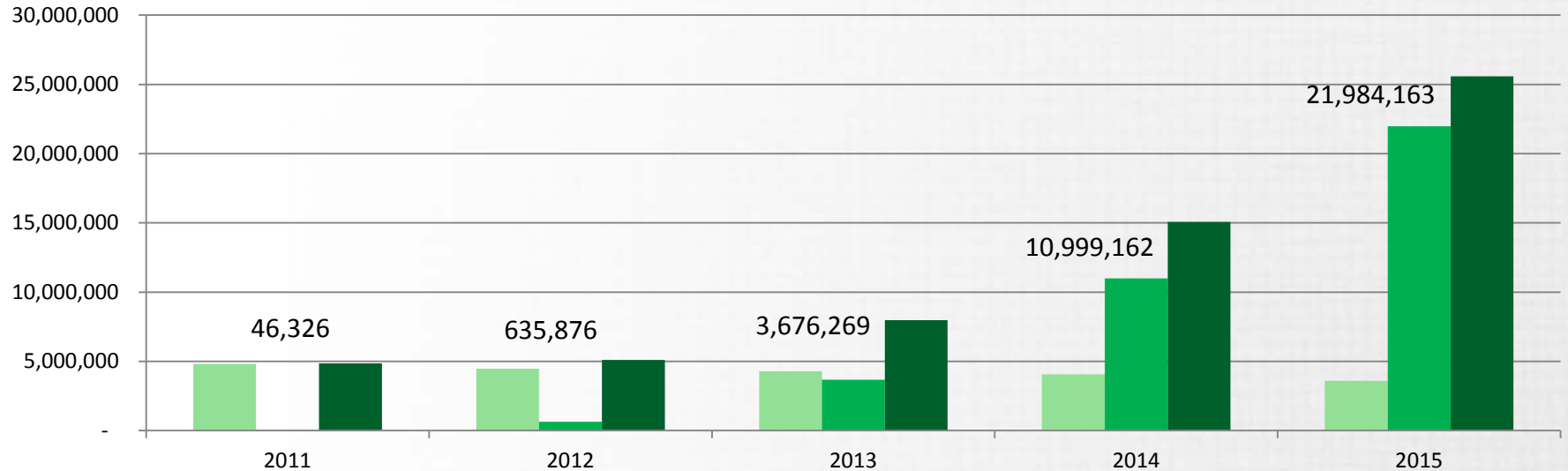


Shale Oil Production by Year



Total Oil Production by Year: Shale vs. Vertical Wells

■ Conventional Oil ■ Shale Oil ■ Total Oil
Labels = Shale Oil Production Amounts



Historical Oil Production

Surpassing JD Rockefeller



Underground Injection Control



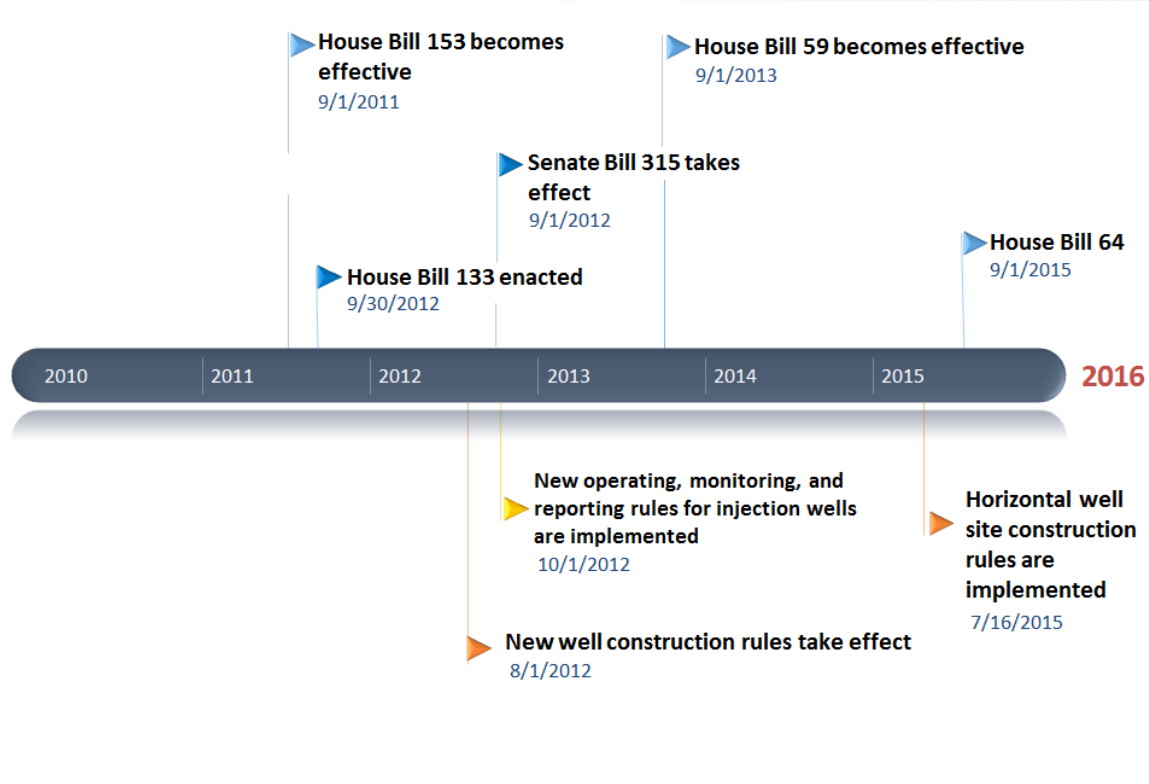
Underground Injection Control



Making Progress

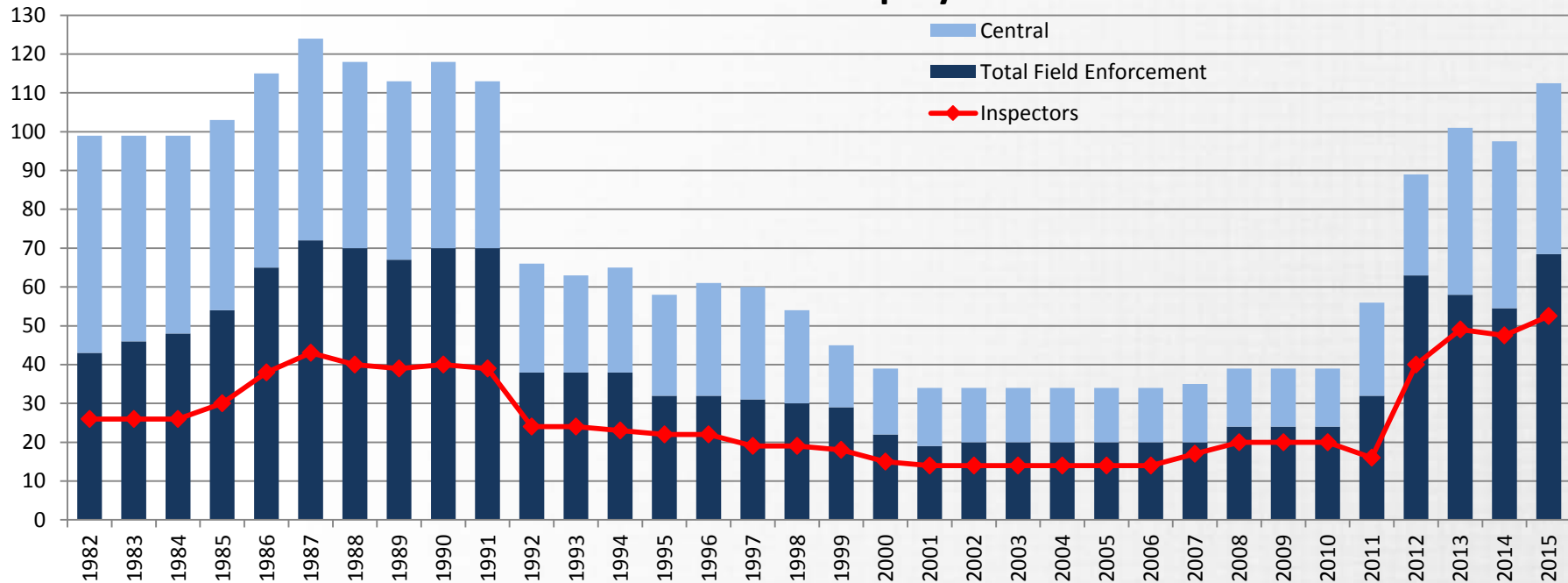
- Statute and rule updates
- Staffing increases
- Emergency response capability improvements
- Seismic activity monitoring capability
- Waste management adaptations

Regulatory Framework



Staffing Changes in Response to Shale Development

Illustration of Historic DOGRM Employment Levels -- 1982 to 2015



Horizontal Pad Construction

Horizontal well site construction rule:7/16/2015
696 pads constructed to date
510 support drilling and/or production operations



Emergency Response Team

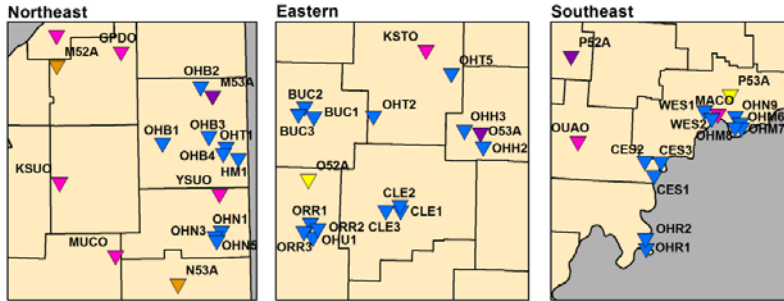


OhioNET Seismic Network

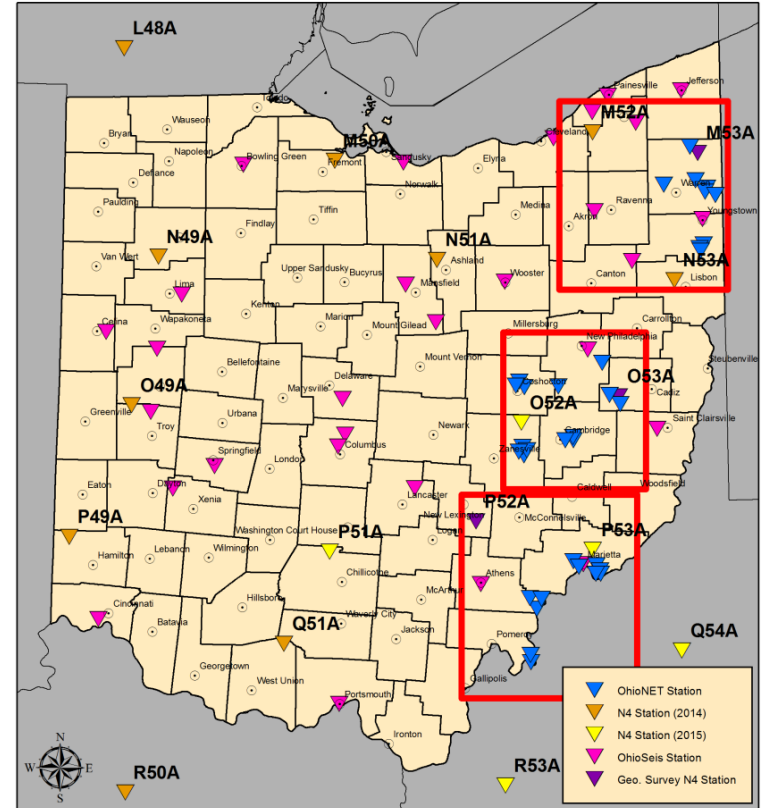
- 21 ODNR owned stations
- 12 Operator leased stations
- 13 Operator stations (ODNR receives alerts and data as needed)

Total: 61 3-component stations

Adding staff and stations in summer of 2016, including surface accelerometers to measure particle velocity



Ohio Department of Natural Resources: Division of Oil & Gas Resources Management OhioNET Seismic Network



Seismic Program



Anticipated Rebound

- Midstream and downstream opportunities
- Record production levels
 - 63 wells > 20,000 bbl production in 2016Q1
 - 50 wells > 1,000,000 mcf production in 2016Q1
- Proven leaseholds and investment from E&P

[Shell's \\$6 billion ethane cracker in western Pennsylvania will also impact Ohio, West Virginia](#)

Akron Beacon Journal - Jun 7, 2016

A \$6 billion ethane cracker plant coming to western Pennsylvania could bring thousands of new jobs to Ohio, including the Akron area's plastics industry. A subsidiary of Royal Dutch Shell announced plans Tuesday to build the plant on the Ohio River at ...

[Belmont, Monroe Counties Continue to Drive Ohio's Utica NatGas Production](#)

Natural Gas Intelligence - Jun 21, 2016

Belmont and Monroe counties continued to dominate Ohio's Utica Shale production in the first quarter, with wells in the play's sweet spot there accounting for much of the increase in the state's natural gas production, according to data from the Ohio ...

[Belmont County Leads the Way as Ohio Gas Production Reaches Record Level](#)

Wheeling Intelligencer - Jun 20, 2016

BETHESDA — With hundreds of productive wells in Eastern Ohio, the Rice Energy "Mohawk Warrior" well in central Belmont County continues leading the way as the Buckeye State reached record Marcellus and Utica shale natural gas yields from January ...

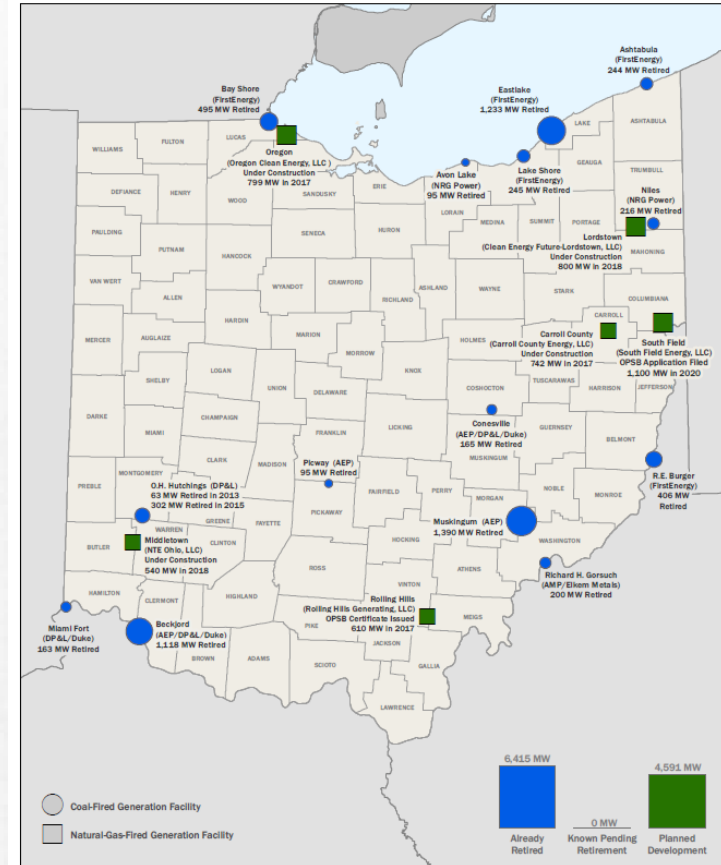
[Here are the top Utica shale wells from natural gas drillers](#)

Columbus Business First - Jun 20, 2016

Drillers keep pumping natural gas from eastern Ohio's Utica shale, and Rice Energy Inc. continues to lead the way with big wells. The Pennsylvania company continued its quarterly trend of owning the top well in the state. In the first quarter of 2016 ...

Anticipated Rebound

With 6,415 MW of electric generation recently retired, Ohio has 4,591 MW of planned generation development – all natural gas fired power plants.



Contact Information

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<http://oilandgas.ohiodnr.gov>

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Ohio Department of
NATURAL RESOURCES

ODNR Division of
OIL & GAS RESOURCES

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Emergency Response

Shale Activity

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Ohio's Oil and Natural Gas Production Totals Released for First Quarter of 2016

During the first quarter of 2016, Ohio's horizontal shale wells produced 5,485,854 barrels of oil and 329,537,838 Mcf (329 billion cubic feet) of natural gas, according to figures released today by the Ohio Department of Natural Resources (ODNR).

[Read more here...](#)

Drilling Activity

	7/2/16	Rigs Drilled	Permits
Marcellus	0	29	44
Utica	11	1,766	2,187
Conventional	9	1,366	2,006

Permit totals since 9/2/2010

Public Records Request

Email or call (614) 265-6922 for Public Records Requests. (not for general inquiries)

[Make a Request >](#)

Chemical Information

Find chemical information through **FracFocus**, by **Well Search**, and by **MSDS >**

Employment

View State of Ohio employment opportunities ([see Natural Resources](#))

[More >](#)