

Marcellus Shale Workforce

**ECONOMIC & WORKFORCE DEVELOPMENT
WORK GROUP**

**GOVERNOR'S MARCELLUS SHALE
ADVISORY COMMISSION**

April 14, 2011

***Marcellus Shale Education
and Training Center***

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**Marcellus Shale
Education &
Training Center**

**Workforce Development
& Continuing Education**

**Pennsylvania College
of Technology**



PENNSTATE



College of
Agricultural
Sciences

natural gas

exploration & drilling
<http://naturalgas.psu.edu>



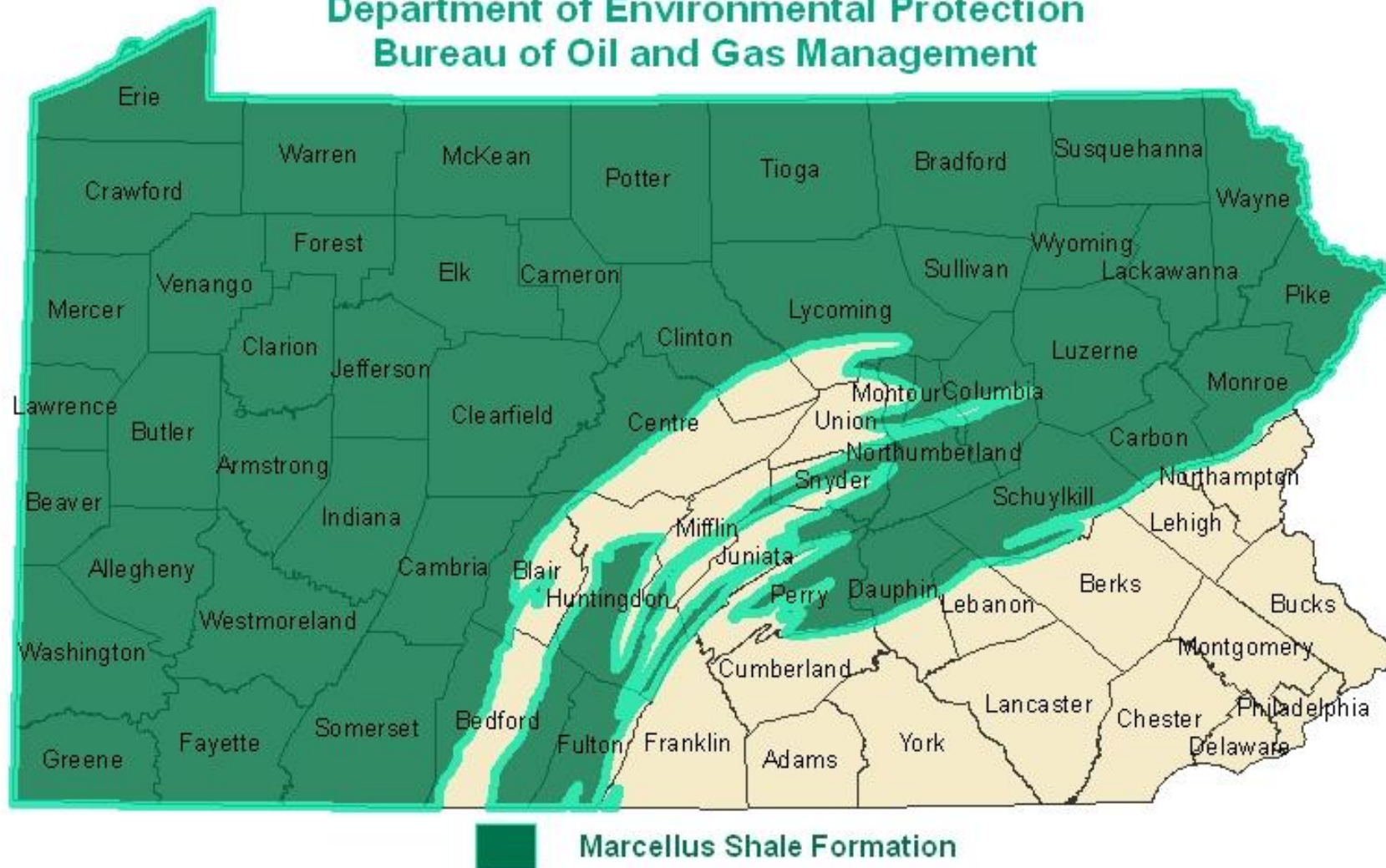
**Marcellus Shale
Education &
Training Center**

www.msetc.org

Workforce Development



Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Oil and Gas Management



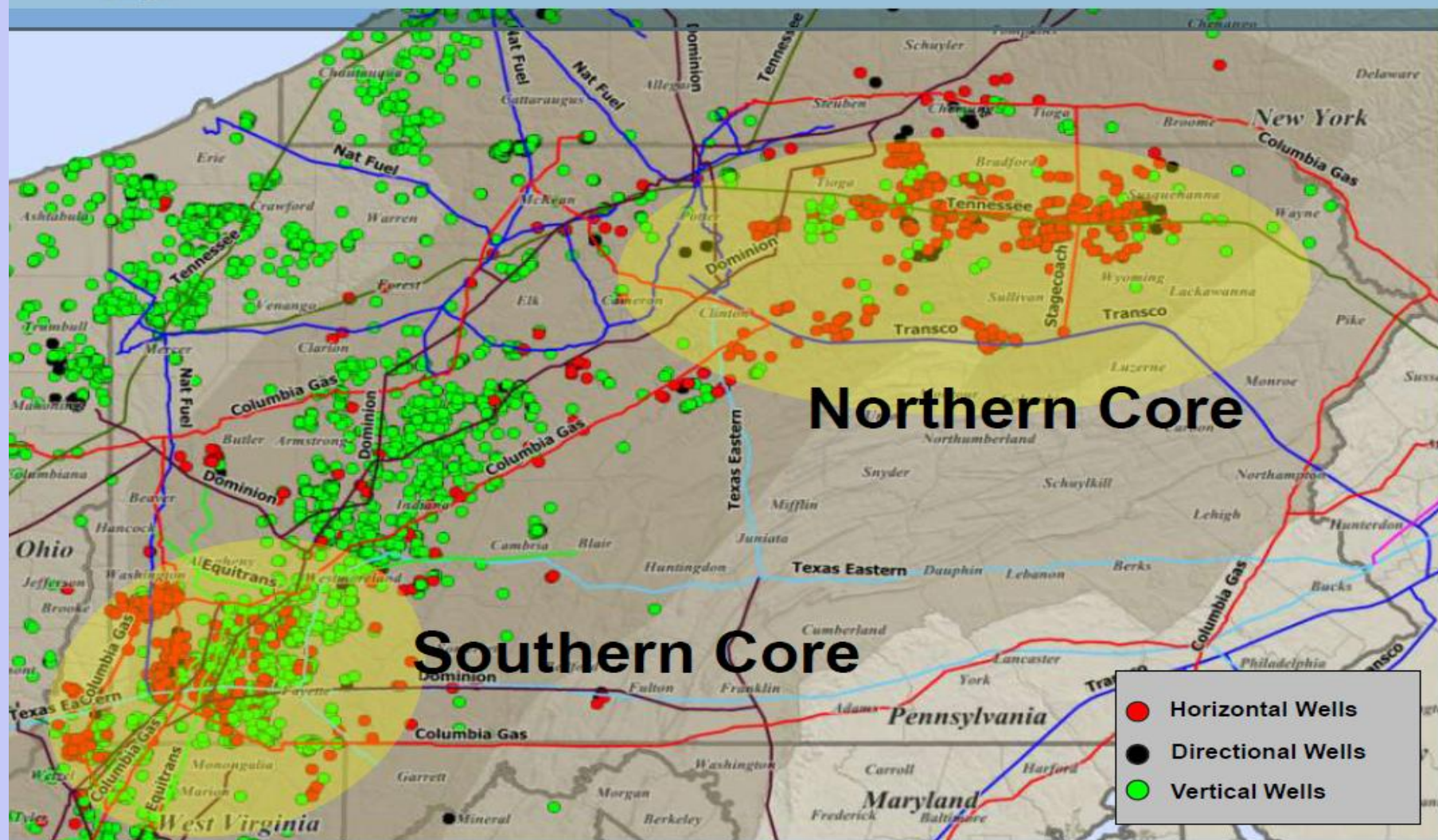
World's 10 Largest Natural Gas Fields ⁽¹⁾

	Field Name	Country	Recoverable Reserves, Tcf
1	South Pars/North Dome	Iran and Qatar	1,235
	MARCELLUS	UNITED STATES OF AMERICA	489 ⁽²⁾
2	Urengoy	Russia	222
3	Yamburg	Russia	138
4	Hassi R'Mel	Algeria	123
5	Shtokman	Russia	110
6	South Iolotan-Osman	Turkmenistan	98
7	Zapolyarnoye	Russia	95
8	Hugoton	Unites States of America	81
9	Groningen	Netherlands	73
10	Bovanenko	Russia	70

(1) Rafael Sandres, Global Natural Gas Reserves – A Heuristic Viewpoint, March 2006

(2) Dr. Terry Engelder, Penn State University – from August 2009 issue of Fort Worth Basin Oil & Gas Magazine

Marcellus Shale Region Wells Drilled 2008 – 2010YTD

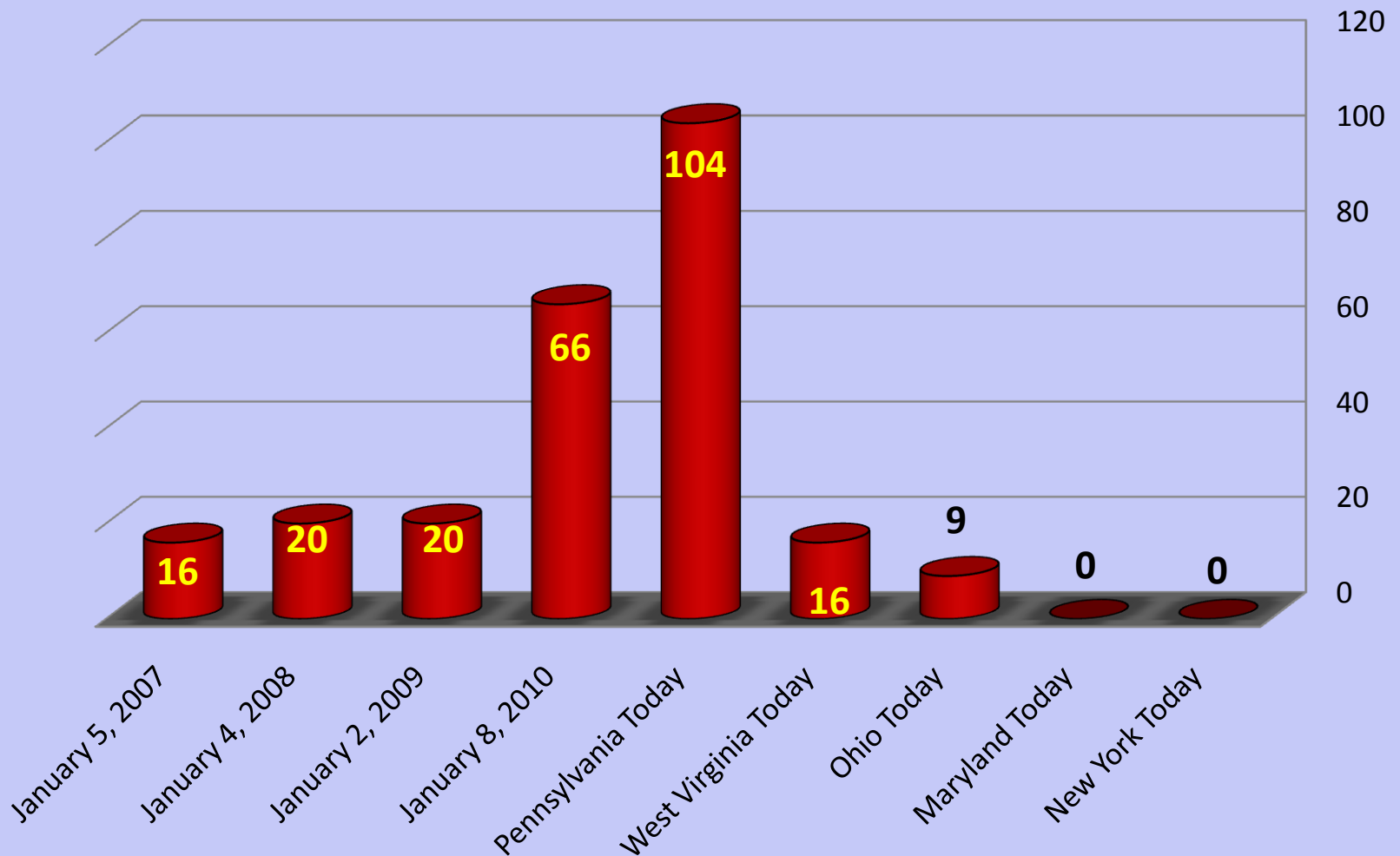


BENTEKENERGY.COM

Source RigData and BENTEK, October 2010

8

Rig Count



- Texas – 335 Land-based Natural Gas Rigs
- United States – 870 Land-based Natural Gas Rigs

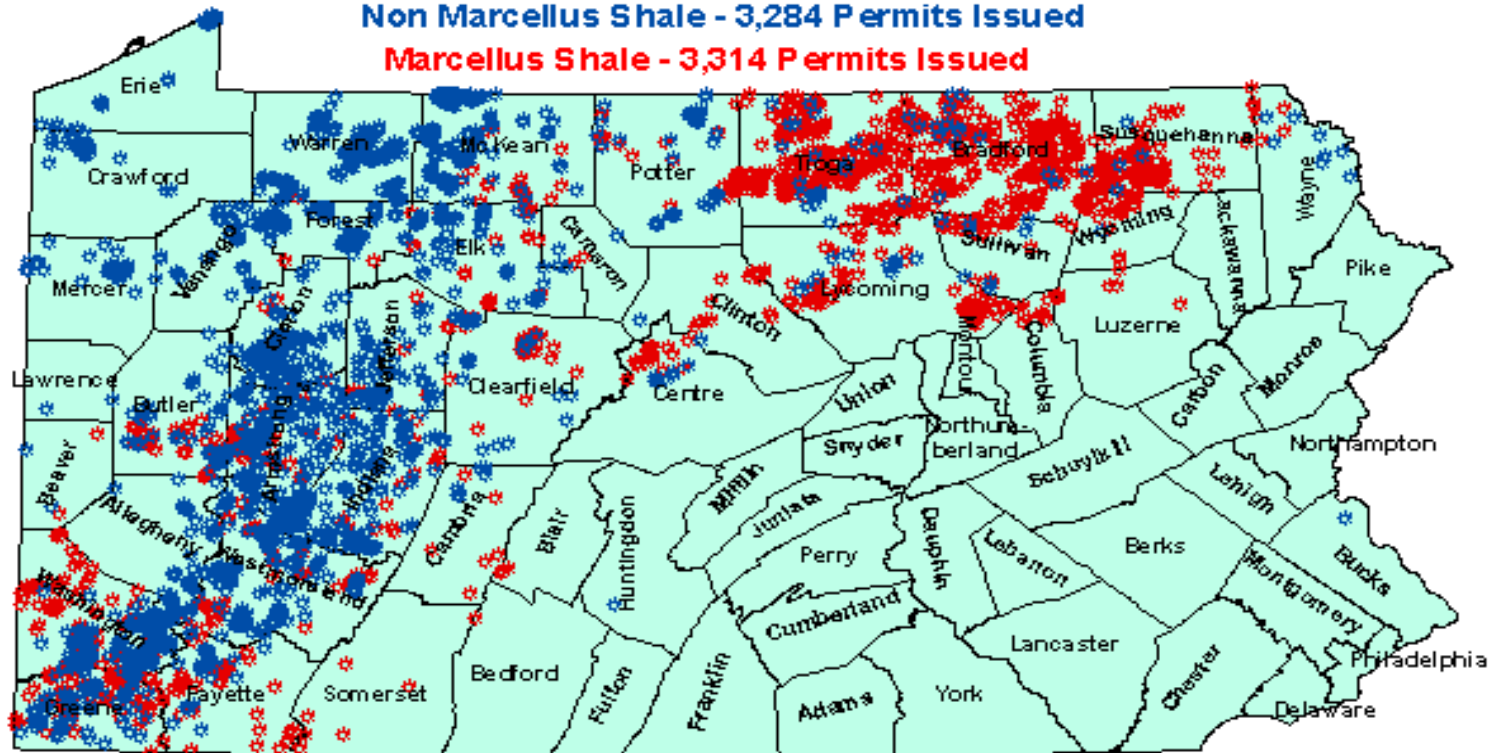
Sources: [Baker-Hughes Investor Relations](#) (April 1, 2011)

Department of Environmental Protection Bureau of Oil and Gas Management Well Permits Issued

Total Permits Issued January thru December 2010 - 6,598

Non Marcellus Shale - 3,284 Permits Issued

Marcellus Shale - 3,314 Permits Issued



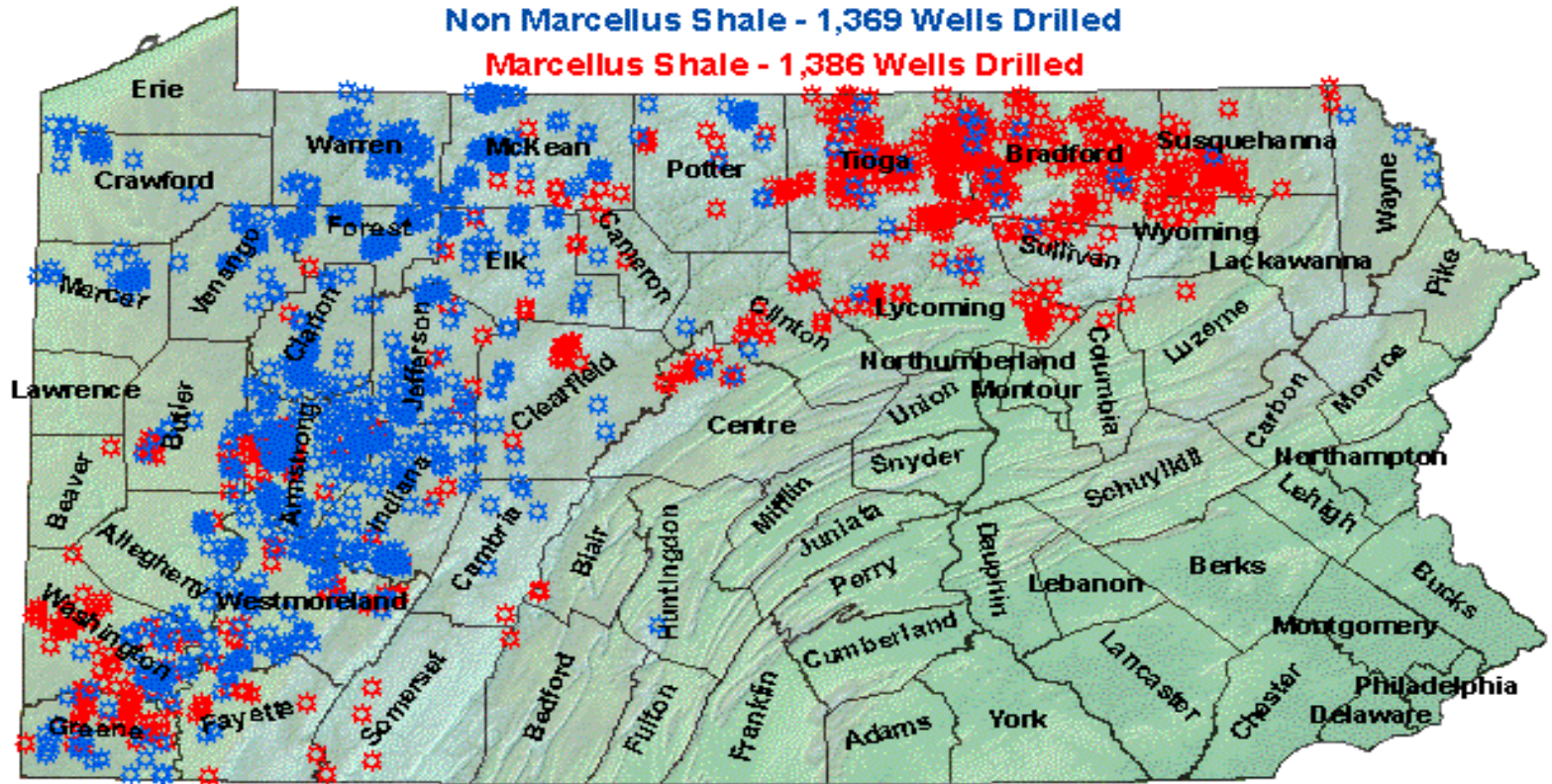
Updated 1/05/2011

Department of Environmental Protection Bureau of Oil and Gas Management Wells Drilled

2010 January-December Wells Drilled - 2,755

Non Marcellus Shale - 1,369 Wells Drilled

Marcellus Shale - 1,386 Wells Drilled

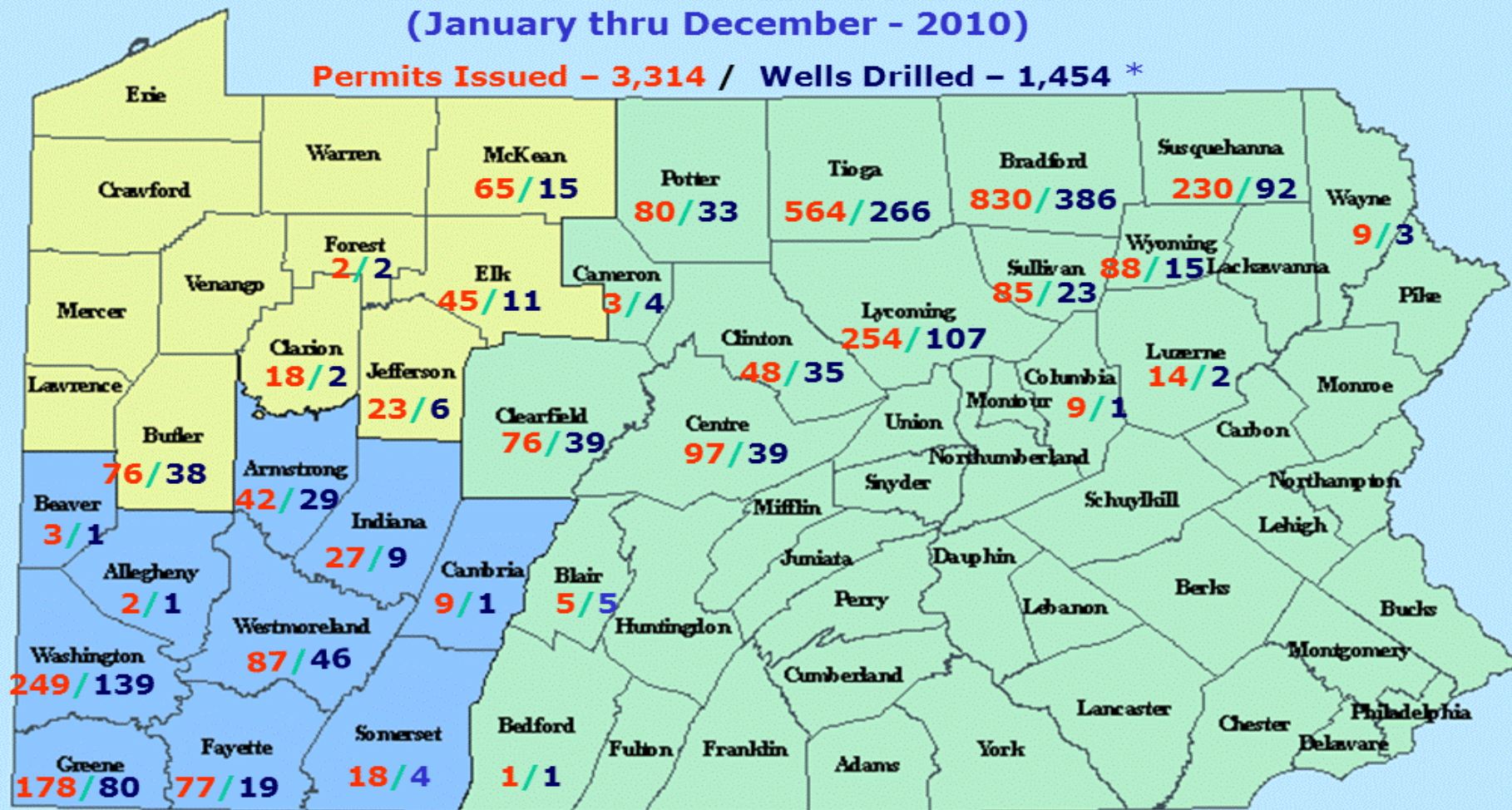


As Reported by Operators

Updated 01/05/2011

Department of Environmental Protection
Bureau of Oil and Gas Management
Marcellus Shale Permits Issued & Wells Drilled
(January thru December - 2010)

Permits Issued - 3,314 / Wells Drilled - 1,454 *



Updated 01/25/2011

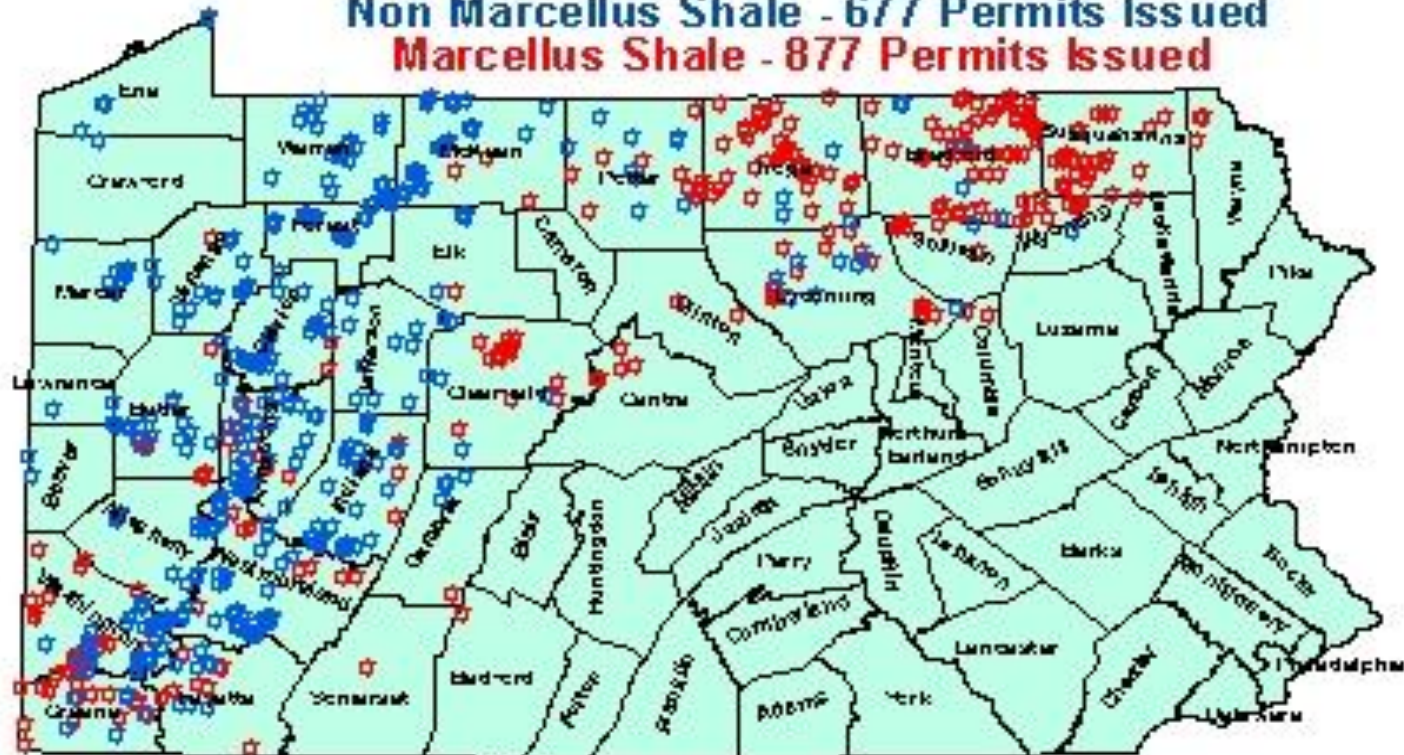
* As reported by Operators

Bureau of Oil and Gas Management Well Permits Issued

Total Permits Issued January-March - 2011 - 1,554

Non Marcellus Shale - 677 Permits Issued

Marcellus Shale - 877 Permits Issued



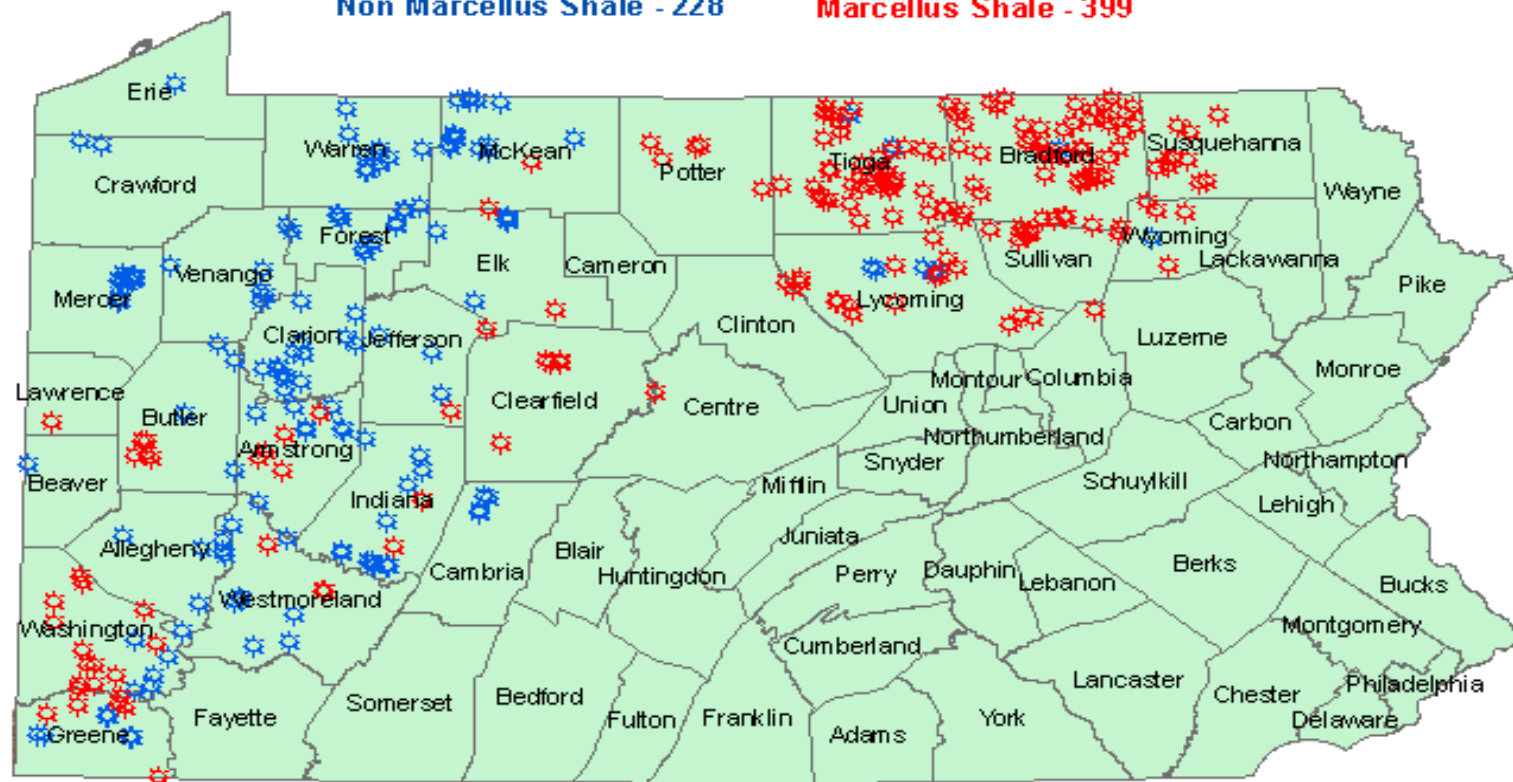
Updated 04/07/2011

Department of Environmental Protection
Bureau of Oil and Gas Management
Wells Drilled

2011 January-March Wells Drilled - 627

Non Marcellus Shale - 228

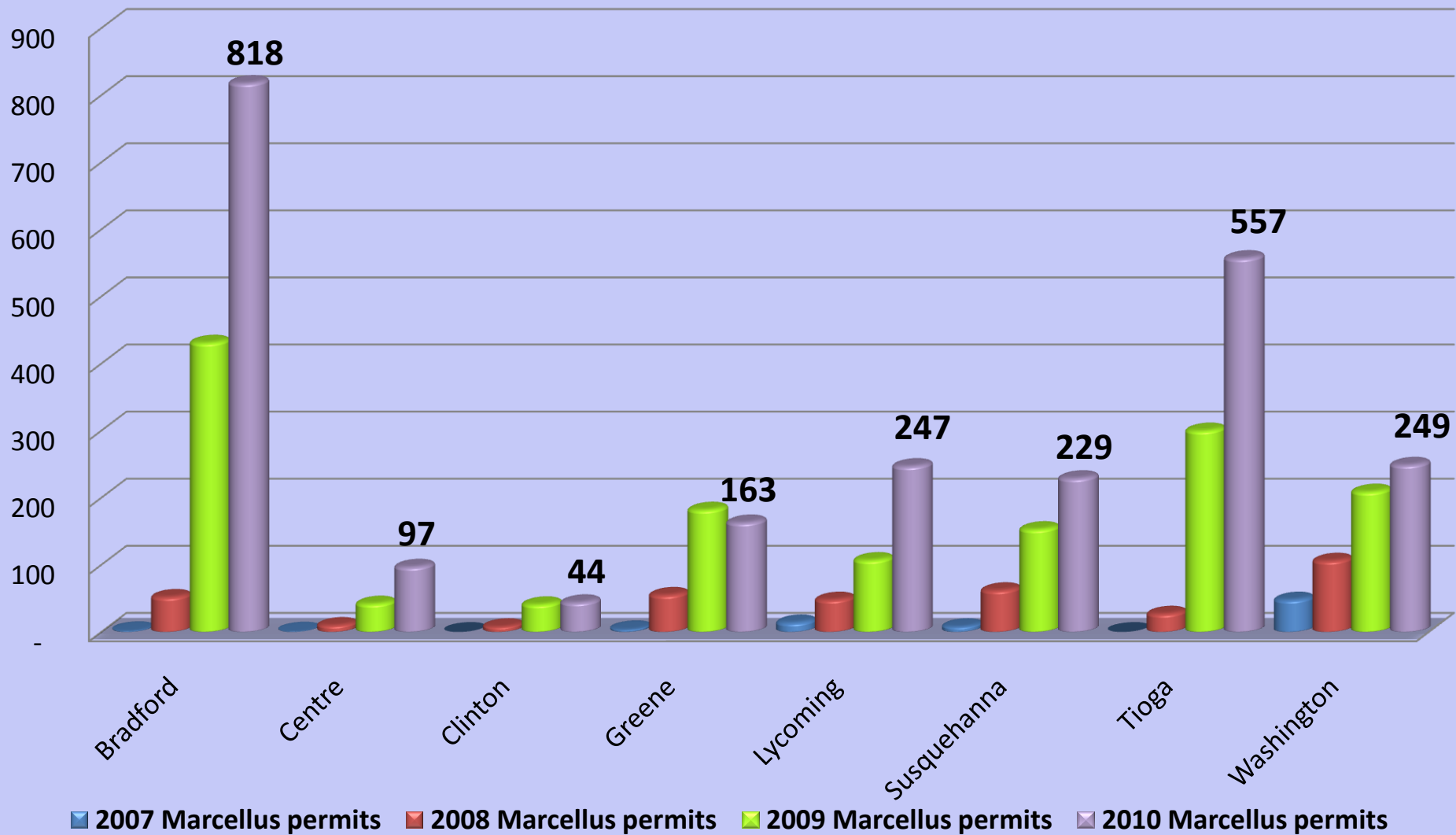
Marcellus Shale - 399



As Reported by Operators

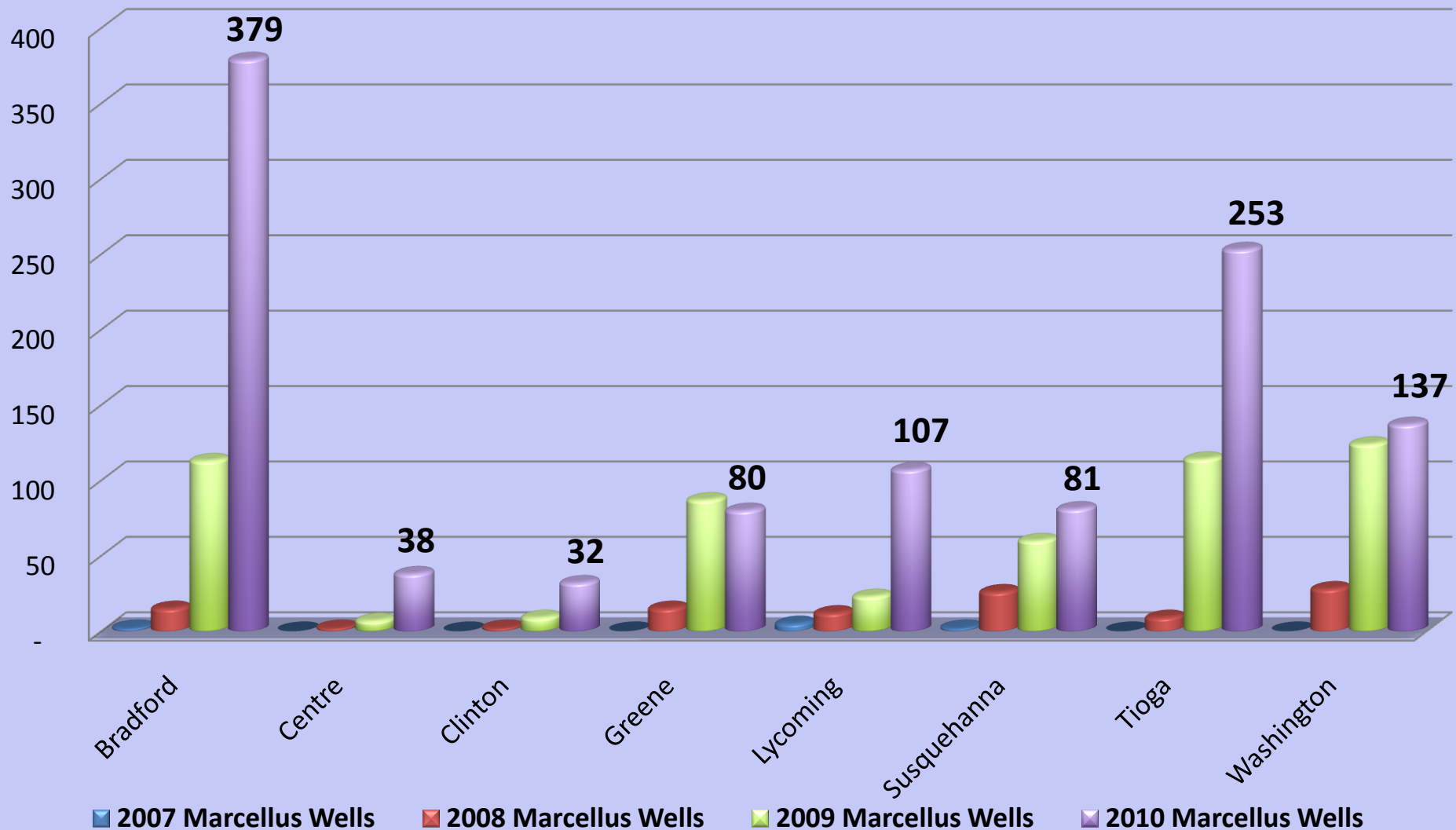
Updated 04/06/2011

Marcellus Permits 2007-2010



Source : [Pennsylvania
DEP](http://www.pennsylvania.gov/dep)

Marcellus Wells 2007-2010

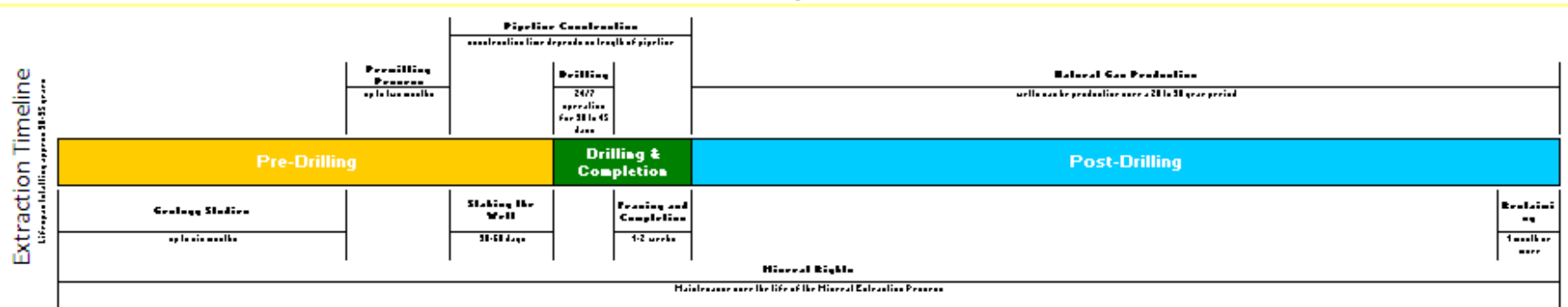
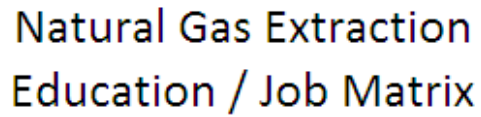


Source : [Pennsylvania
DEP](http://www.pennsylvania.gov/dep)

Where it all started for PCT

- Marcellus Shale Education and Training Center (MSETC) formed in November 2008
- Collaboration between:
 - Pennsylvania College of Technology - WDCE
 - Penn State Cooperative Extension

Education/Job Matrix

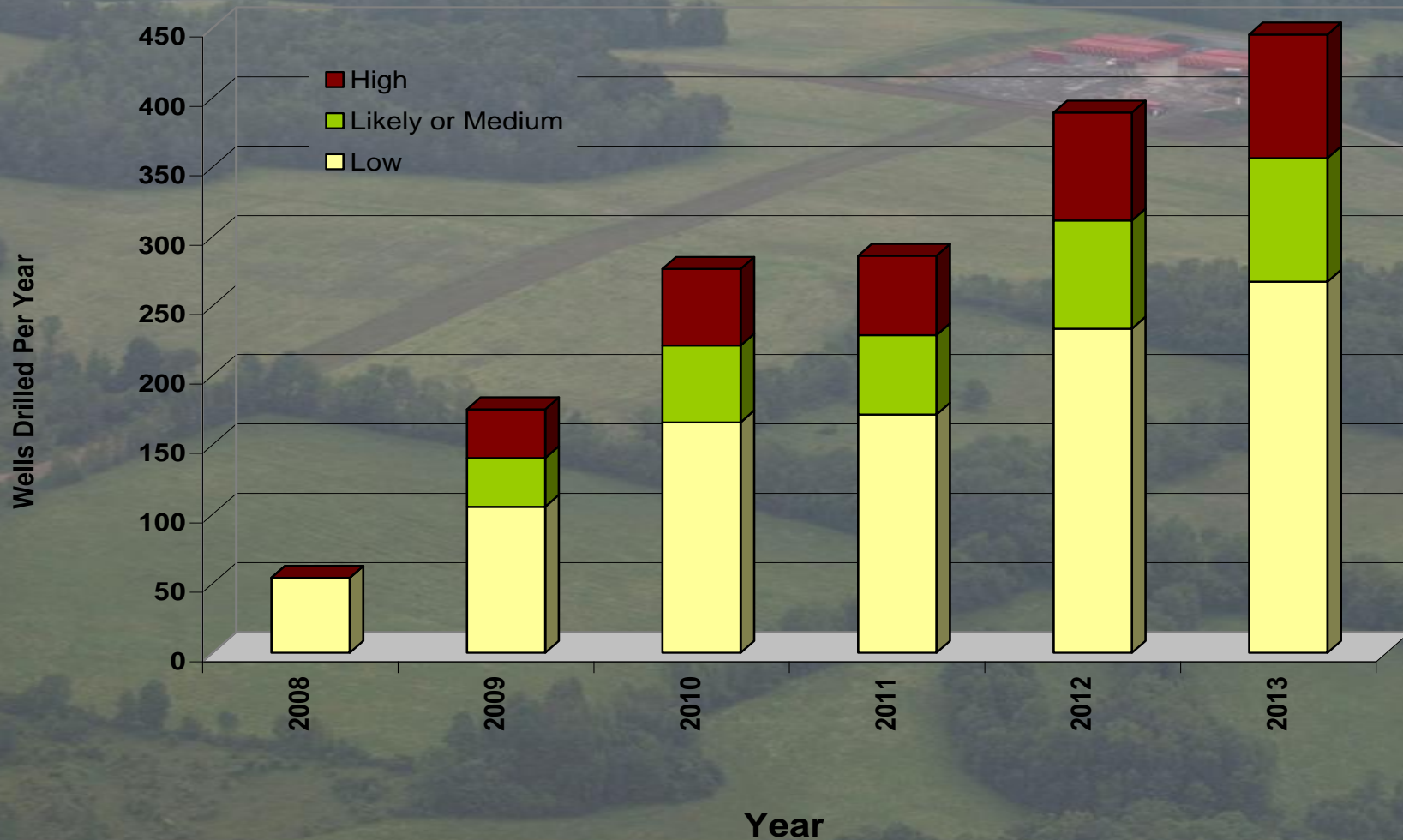


Drilling Down (The Matrix)

Pre-Drilling	Associated Jobs		Secondary/ Career and Technical Centers	Work Experiences/ Certification	Post Secondary/ Higher Education
	Geological Studies				
	Geologists				x
	Petroleum Engineers				x
	Computer tech				x
	Project Management			x	x
	CDL Drivers			x	
	Seismic			x	x
	Hydro Geologist				x
	Helicopter Pilot/Crew	x	x		
	Cartographer				x
	GIS Technicians			x	x
	Archeology				x
	Petroleum Chemists				x
	Water Management				x
	Biologist				x
	Geophysicists				x
	Mineral Rights				
	Landmen-for drilling/leasing			x	
	Lawyers				x
	Legal Professionals				x
	Para-legal	x	x	x	x
	Title-Abstract	x	x	x	x
	Operational Landmen for pipelines			x	
	Title Attorney				x
	Permitting Process				
	Environmental Engineers				x
	Environmental Technicians			x	x
	Office operation	x			x
	Water Sampling	x			
	Civil Engineers				x
	Local Government			x	
	Instrument Chief				x
	Roadman			x	
	Surveyors			x	x

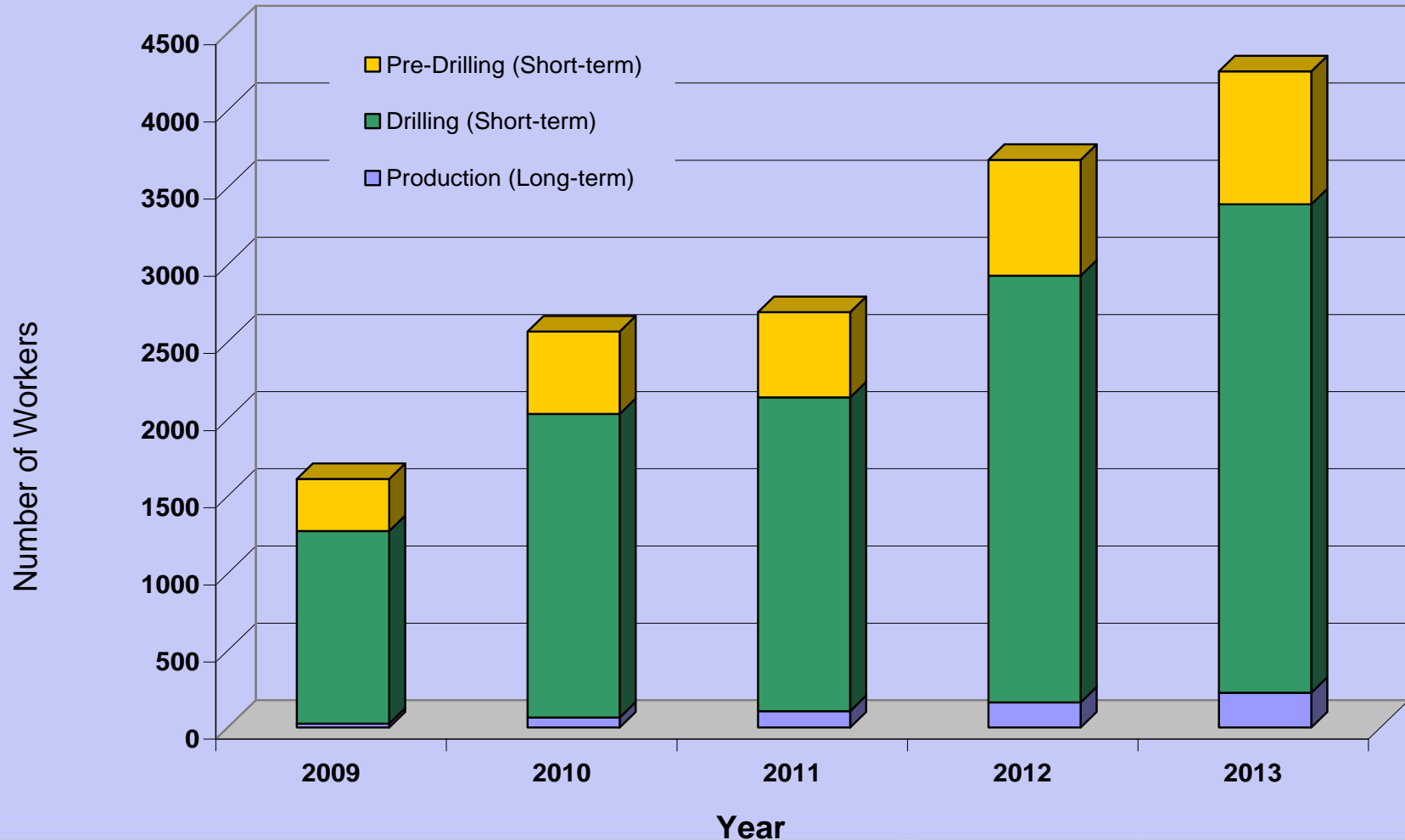
What Does This Mean in Terms of Wells?

Projected Northern Tier WIB Scenarios - Wells Drilled Per Year

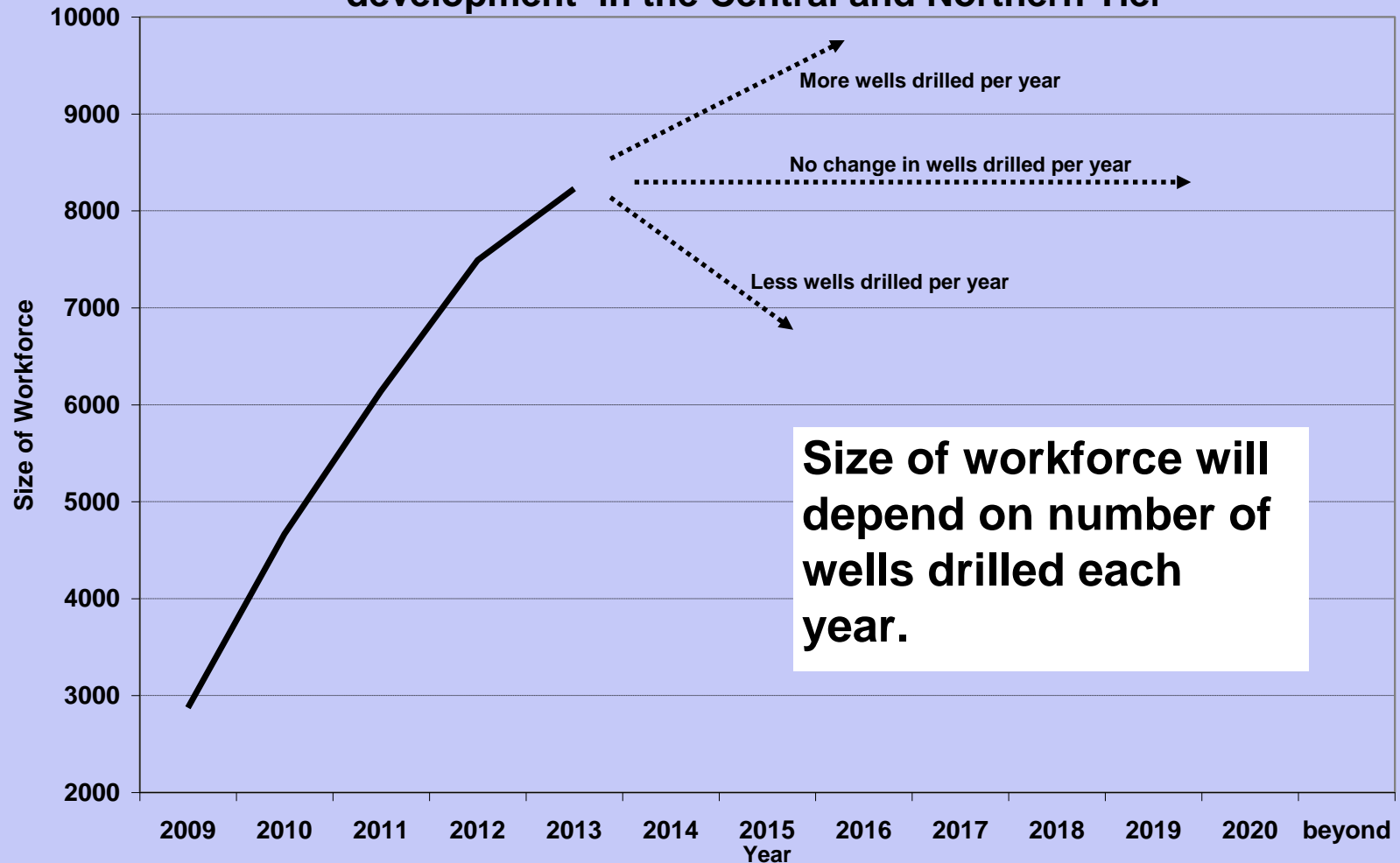


What Does This Mean in Terms of Jobs?

"Likely" Scenario Northern Tier WIB Region Marcellus Shale Workforce Requirements By Phase



Direct Workforce Requirements of Marcellus Shale development in the Central and Northern Tier



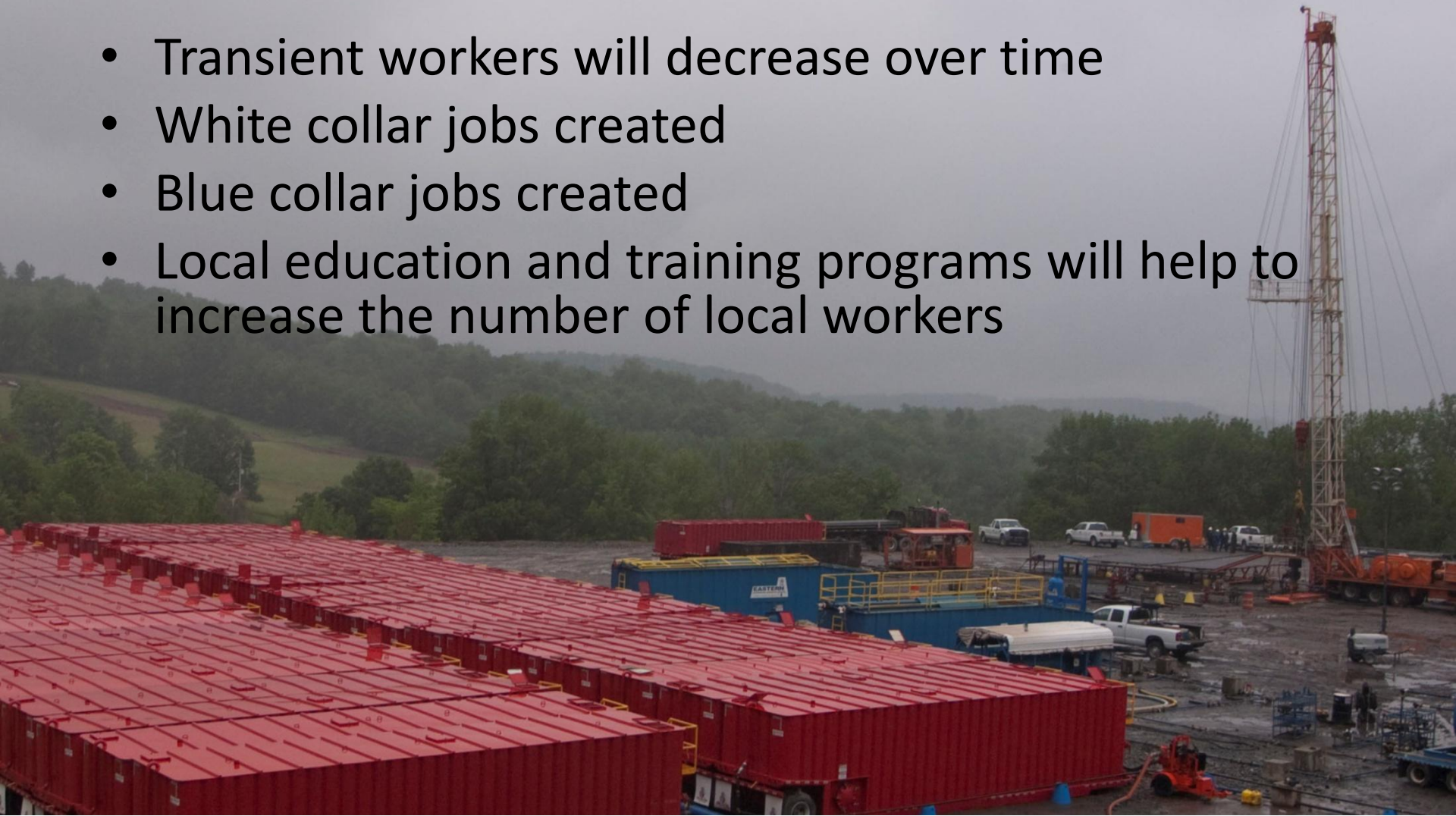
Size of workforce will depend on number of wells drilled each year.

What We Discovered

- The direct job opportunities in northcentral Pennsylvania will likely increase dramatically
- Most job opportunities will be “blue collar”
- The direct workforce to drill a single well requires approximately 410 individuals working in 150 different occupations
- An average of 20-30 contract companies are utilized to drill a single well
- Each well requires 11.53 full-time equivalent workers and .17 full-time production jobs

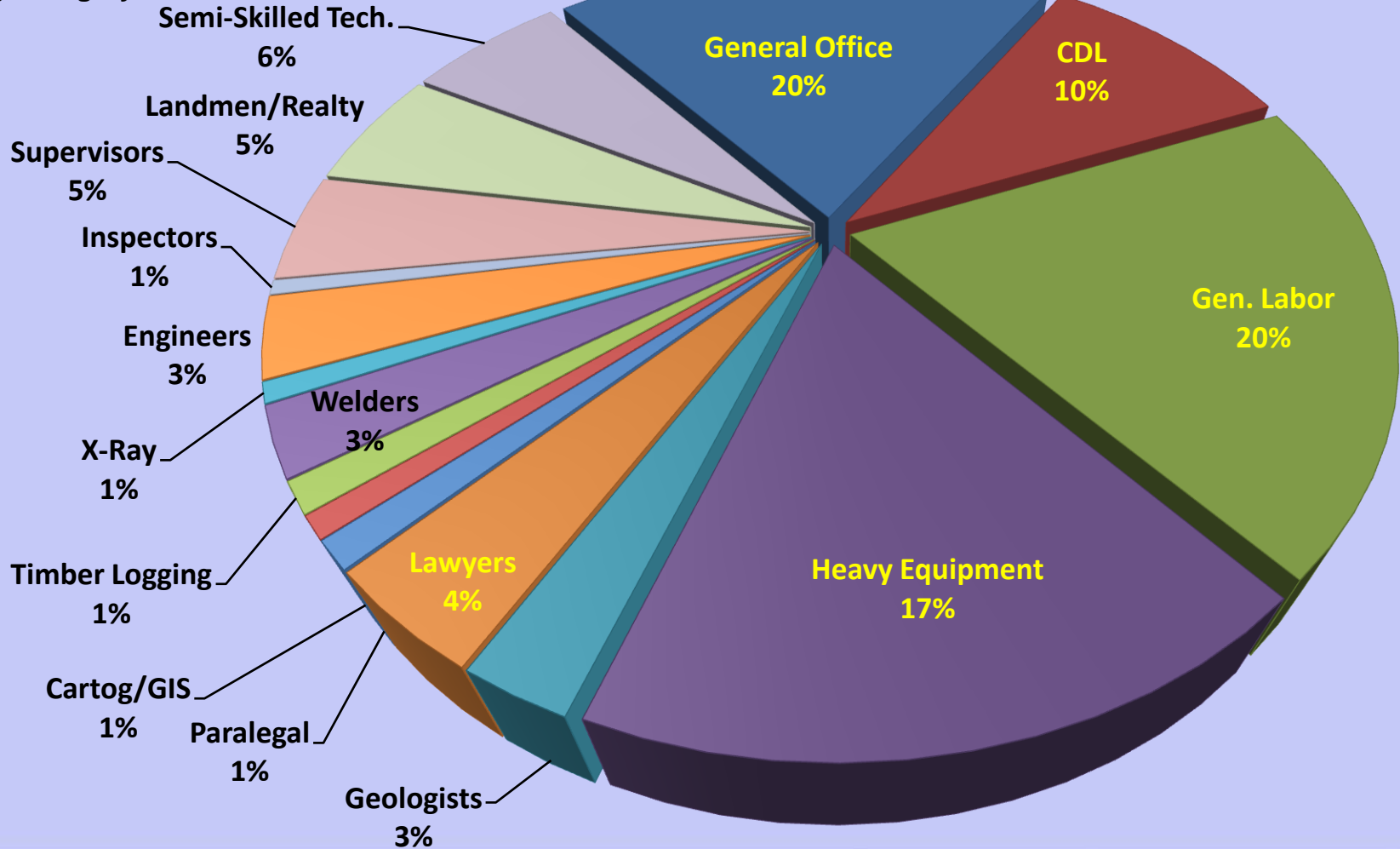
Jobs

- Transient workers will decrease over time
- White collar jobs created
- Blue collar jobs created
- Local education and training programs will help to increase the number of local workers

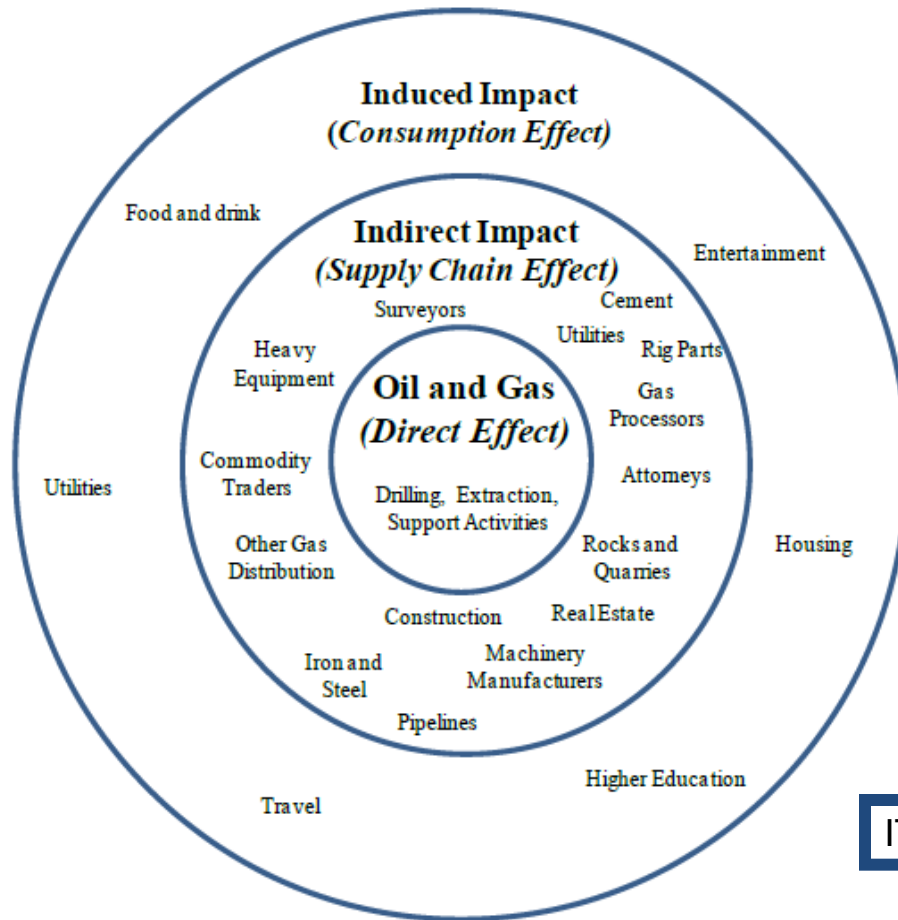


What specific jobs are required?

**Natural Gas Workforce Requirements
By Category**



Each Direct Job Is Estimated to Create 1.53 Indirect And Induced Jobs



Heavy Equipment



Construction



IT support



Pipe Inspection

INDIRECT JOBS

Related to the Natural Gas Industry

- Surveyors
- Business Managers
- Retail Sales
- Bankers/Accountants
- Hotel Management
- Realtors
- Restaurant Owners
- Chefs & Food Service Workers
- Forestry
- Mechanics
- Many more.....

How Long will Unconventional Shale Last?

“Potential” Marcellus Shale County-based Timeline Example

70% Drillable	6-Wells	10-wells
Square Miles	700	700
Drillable Area/Well Pads	490	490
Total Wells	2,940	4,900
Years @ 15 Rig Average	16.3	27.2

Provided as an illustration for
discussion, not a forecast of future
activity

Don't forget Utica, Huron, Upper Devonian,
others?

Academic Programs

- Degree Programs & Certifications



PCT Degrees - Directly Related

Automated Manufacturing Technology - A.A.S.

Civil Engineering Technology – A.A.S. and B.S.

Computer Aided Drafting Technology – A.A.S.

Computer Aided Product Design – B.S.

Construction Management – B.S.

Diesel Technology- A.A.S.

Electric Power Generation – A.A.S.

Electrical Technology – A.A.S.

Electronics & Computer Engineering Technology – A.A.S.

Heavy Construction Equipment Technology – A.A.S.

Machine Tool Technology - A.A.S.

Welding - A.A.S. Welding & Fabrication Engineering Technology – B.S.

PCT Degrees – Indirectly Related

Accounting – A.A.S. and B.S.

Business Administration – B.S.

Business Management – A.A.S.

Information Technology – A.A.S. and B.S.

Legal Assistant – Paralegal – A.A.S.

Culinary Arts – A.A.S. and B.S.

Hospitality Management – A.A.S.

Health Sciences, esp. Radiography – A.A.S.

MSETC Noncredit Training



MSETC Noncredit Programs

- “Fit 4 Natural Gas”
 - Roustabout Pre-emp. Training
- API 1104 welding training
 - Level 1
 - Level 2
- API 1104 certification and testing
- OSHA Rough Terrain Forklift Certification
- Commercial Driver Training (CDL Class A)
- PEC/ Premier SafeLand USA
- Certified Operations Technician
- OSHA 30 hour certifications (Online)
- OSHA 10 Hour Construction
- First Aid/ CPR

MSETC Offerings – Future

- Emergency Responders
- Roughneck Training (Hands-on)
- OSHA Regulatory Training
- Well operator / tender
- Oilfield Heavy Equipment Safety
- Well Control
- Trenching/ Soils
- Instrumentation and Calibration
- DOT compliance training
- SCADA/ HMI
- Title Abstracting / Landman
- Welder's Helper/ Pipe fitting
- Fall Protection
- Erosion and Sediment Control

Natural Gas Training Site



First class
October 2011

High School Preparation

- Math is important!
- Low absenteeism
- On time
- Physically fit
- Able to work as a team
- Safety first
- No DUI
- No criminal offenses
- No drugs
- Clean driving record

Current MSETC Workforce Assessment Projects

- PA Statewide Workforce Assessment
- West Virginia Statewide Workforce Assessment

Current MSETC Economic Impact Analysis Projects

- Five-county Northern Tier PA
- Statewide Economic Impact Analysis

Grants

- National Science Foundation
 - \$900,000, 3-year, 20-county project with approx. 20 school districts
- PA Dept. of Labor & Industry
 - \$250,000 training grant (pre-employment and incumbent)
 - Industry Partnership grants for two regions in PA (SW & NC)
- U.S. Dept. of Labor
 - \$4.9 million for Marcellus wide pre-employment training



- What is ShaleNET?
 - Collaboration among key stakeholders to address Workforce issues related to Oil and Gas
 - Industry
 - Education
 - Public Workforce System



- What is ShaleNET?
 - Standardizes curriculum for six natural gas industry high priority occupations in five programs:
 - Roustabouts
 - Floorhands
 - Production Technician
 - CDL
 - Welder Helpers



- Provides:
 - Central communication structure for all workforce development initiatives:
 - Quarterly regional hub meetings at:
 - Pennsylvania College of Technology
 - Westmoreland Co. Community College
 - Annual Workforce Forum
 - 2011 Conference – Altoona, Sept. 20-21



- What's Next for ShaleNET?
 - Application for ShaleNET US
 - US DOL grant application for approx. \$13 million
 - Adds credit certificates and two-year AAS degree
 - Expands training network across U. S. shale areas

Where can the Commonwealth help?

- Workforce training funding assistance:
 1. Low-skilled/unskilled workforce to reduce unemployment
 - Roustabouts
 - Floorhands
 - Production Technicians (Hydraulic Fracturing)
 2. First responder/Emergency responder training
 3. Community awareness programming

Questions???

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