

# MARCELLUS SHALE FAST FACTS FEBRUARY 2012 EDITION\*

*Each of the following sections is a quick snapshot of labor market information for Pennsylvania's Marcellus Shale (MS) related industries and related economic activity.*

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\*Note: Data sets from the Quarterly Census of Employment and Wages (QCEW) and the New Hires Program have been updated in this edition to 2011Q2 and 2011Q3, respectively. For both data sets, this is the most current data available. Because neither data set is seasonally adjusted, the same quarter must be used when analyzing growth over time, in order to ensure seasonal factors are not influencing employment change. Therefore, 2011Q2 QCEW data are compared to 2008Q2, and 2011Q3 New Hire data are compared to 3<sup>rd</sup> quarter data for 2008, 2009, and 2010.

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CENTER FOR WORKFORCE INFORMATION & ANALYSIS

**Release Date: 2-7-2012**

CWIA-MS

## BACKGROUND INFORMATION

The purpose of this Fast Facts publication is to provide the most current available data on Marcellus Shale related economic activity. While several data sources are utilized in this document, the primary source is the Quarterly Census of Employment and Wages (QCEW).

The QCEW program derives its data from quarterly tax reports submitted to the Pennsylvania Unemployment Compensation system by employers subject to the state's unemployment insurance laws. This includes 95 percent or more of all wage and salary civilian employment in Pennsylvania.

In 2009, CWIA used the North American Industry Classification System (NAICS) to define the Marcellus Shale related industries. Much of the information included in this document reflects data on a group of six industries identified as "core," and a group of 30 industries identified as "ancillary" for Marcellus Shale related activity (see notes section below).

As Marcellus Shale related activity develops further in Pennsylvania, additional industries may be added to the ancillary group, based on factors such as significant employment gains in an industry in a Marcellus Shale geographic region or identification of a group of companies in the same industry involved in Marcellus Shale related activity. Of the current 30 ancillary industries, nine have been added since the April 2011 edition of this publication (\* denotes one of the new nine).

Also included in this publication are several additional data sources that capture employer demand and hiring activity. For an explanation of all data sources, please refer to the "Definitions" section on page 17.

The data in this edition include government (federal, state, and local) employment in all Marcellus Shale related industries because significant non-private employment is present in a number of these industries, most notably Highway, Street, & Bridge Construction; Engineering Services; Water Supply & Irrigation Systems; and Sewage Treatment Facilities.

### Notes:

Marcellus Shale Core Industries (NAICS): Crude Petroleum & Natural Gas Extraction (21111); Natural Gas Liquid Extraction (21112); Drilling Oil & Gas Wells (21311); Support Activities for Oil & Gas Operations (21312); Oil & Gas Pipeline & Related Structures Construction (237120); and Pipeline Transportation of Natural Gas (486210).

Marcellus Shale Ancillary Industries (NAICS): Fossil Fuel Electric Power Generation (22112); Natural Gas Distribution (22120); Water Supply & Irrigation Systems (22130); Sewage Treatment Facilities (221320); Water & Sewer Line & Related Structures Construction (237110); Highway, Street, and Bridge Construction (237310)\*; Nonresidential Site Preparation Contractors (238912); Petrochemical Manufacturing (325110)\*; Industrial Gas Manufacturing (325120); Iron & Steel Mills & Ferroalloy Manufacturing (331110<sup>1</sup>); Iron & Steel Pipe & Tube Manufacturing from Purchased Steel (331210); Mining Machinery & Equipment Manufacturing (333131); Oil & Gas Field Machinery & Equipment Manufacturing (333132); Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers (423810)\*; Industrial Machinery and Equipment Merchant Wholesalers (423830)\*; Industrial Supplies Merchant Wholesalers (423840)\*; General Freight Trucking, Local (484110)\*; Specialized Freight Trucking, Local (484220); Specialized Freight Trucking, Long-Distance (484230); Lessors of Other Real Property (531190); Construction, Mining & Forestry Machinery & Equipment Rental & Leasing (532412); Engineering Services (541330); Geophysical Surveying & Mapping Services (541360); Testing Laboratories (541380); Environmental Consulting Services (541620); Remediation Services (562910); Commercial & Industrial Machinery & Equipment Repair & Maintenance (811310); Administration of Air and Water Resource and Solid Waste Management Programs (924110)\*; Administration of Conservation Programs (924120)\*; Regulation and Administration of Communications, Electric, Gas, and Other Utilities (926130)\*.

*While the vast majority of Marcellus Shale related employment can be found in these industries, not all establishments in these industries are involved in Marcellus Shale. Asterisks indicate industries that have been added to the group of ancillary industries since the April 2011 edition of this publication.*

<sup>1</sup>NAICS 331110 replaced NAICS 331111 due to a change made by the Bureau of Labor Statistics – for an explanation of the implications of this change, please refer to page 19 in the Definitions Section.

# PENNSYLVANIA

## ECONOMIC BACKGROUND

- **Pennsylvania's seasonally adjusted unemployment rate for December 2011 was 7.6%.**
  - This was 0.9 percentage points below the U.S. rate of 8.5%.
  - O-T-M change was -0.3 percentage points.
  - O-T-Y change was -0.9 percentage points.
- **Pennsylvania's seasonally adjusted total nonfarm jobs for December 2011 was 5,699,100.**
  - O-T-M change was +6,500.
  - O-T-Y change was +59,200.
  - PA was still down 110,500 jobs since the start of the recession (December 2007).
- **Pennsylvania's new hire activity increased.**
  - There were 669,300 new hires across all industries in the 3<sup>rd</sup> quarter of 2011.
  - This was an increase of 89,800 over 3<sup>rd</sup> quarter 2010 (+15%).
- **Employer demand increased in Pennsylvania.**
  - 152,700 job ads were posted online in December 2011.
  - This was an increase of 19,200 from December 2010.
- **In Pennsylvania there were 2.9 unemployed persons for every online job posting (December 2011).**
  - The Pennsylvania rate was lower than the U.S. rate, which stood at 3.3.
  - The Pennsylvania rate was down from a peak of 4.8 unemployed per online job posting in late 2009.

O-T-M: Over the Month  
O-T-Y: Over the Year

# MARCELLUS SHALE RELATED

## INDUSTRIES EMPLOYMENT:

### SUMMARY STATISTICS

#### Employment (2008 Q2 to 2011 Q2):

- Core industries were up 13,500 (+131%).
- Ancillary industries were down 200 (<-1%).
- All industries declined 140,000 (-2%).
- 2011 Q2 Marcellus Shale related industries total employment was 229,000.

#### Establishments (2008 Q2 to 2011 Q2):

- More than 830 establishments were added (370 core, 460 ancillary).
- This represented 64.3% growth in the core industries and 3.7% growth in the ancillary industries; over the same time period, PA experienced 2.1% growth for all industries.
- Marcellus Shale related industries totaled 13,719 establishments in 2011 Q2

#### Wages (2010 Q3 through 2011 Q2):

- The average wage across all industries was \$46,559.
- The average wage in the core industries was \$76,918, which was approximately \$30,400 greater than the average for all industries.
- The average wage in the ancillary industries was \$63,155, which was approximately \$16,600 greater than the average for all industries.

#### New Hires (2008 Q3 to 2011 Q3):

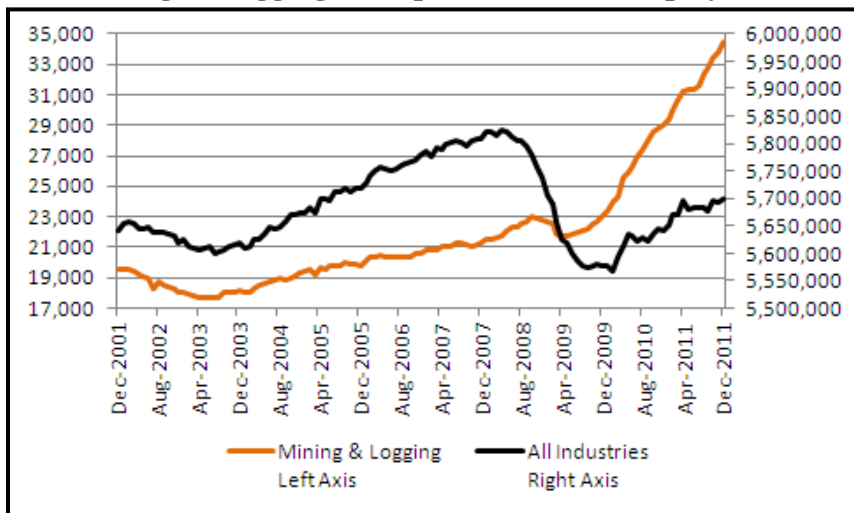
- Statewide new hires in the core industries were 171.5% higher in 2011Q3 than in 2008Q3.
- Statewide new hires in the ancillary industries were 28.0% higher in 2011Q3 than in 2008Q3.
- Statewide new hires across all industries were 1.6% lower in 2011Q3 than 2008Q3.

#### Online Job Postings (December 2011):

- There were 2,900 online job postings statewide in core and ancillary industries.

# MINING JOBS VS. TOTAL JOBS IN PENNSYLVANIA

Mining & Logging<sup>1</sup> Compared to Total Employment



## Current Employment Statistics (All data are seasonally adjusted)

- Total Pennsylvania Employment was 5,699,100 (December 2011).  
 O-T-M change was +6,500 (+0.1%).  
 O-T-Y change was +59,200 (+1.0%).  
 Change from 10 years ago was +57,900 (+1.0%).
- Mining & Logging Industries Employment in Pennsylvania was 34,400.  
 O-T-M change was +600 (+1.8%).  
 O-T-Y change was +5,400 (+18.6%).  
 Change from 10 years ago was +14,800 (+75.5%).

O-T-M: Over the Month  
 O-T-Y: Over the Year

## Points to Note

- 36.5% of the increase in mining & logging employment over the last decade occurred in the past 12 months; 77.0% occurred in the past two years.
- While employment totals across all industries have yet to reach pre-recession totals, employment in mining & logging industries in Pennsylvania reached its highest level in December 2011 (current data series began in 1990).

<sup>1</sup> Mining & Logging data are seasonally adjusted. Mining data, which are included in Mining & Logging, are not seasonally adjusted.

# PENNSYLVANIA MARCELLUS SHALE RELATED INDUSTRIES DATA

Establishments & Employment in CWIA's Identified Core & Ancillary Marcellus Shale Related Industries

Core Industries		2008Q2		2011Q2 <sup>1</sup>		Vol. Change	
NAICS	Title	Est.	Emp.	Est.	Emp.	Est.	Emp.
211111	Crude Petroleum & Natural Gas Extraction	184	2,530	225	3,875	41	1,346
211112	Natural Gas Liquid Extraction	14	99	24	481	10	382
213111	Drilling Oil & Gas Wells	69	1,560	124	4,601	55	3,041
213112	Support Activities for Oil & Gas Operations	115	2,394	328	8,069	213	5,675
237120	Oil & Gas Pipeline & Related Structures	66	2,411	116	5,480	50	3,070
486210	Pipeline Transportation of Natural Gas	127	1,331	128	1,365	1	35
<b>Totals</b>		<b>575</b>	<b>10,324</b>	<b>945</b>	<b>23,872</b>	<b>370</b>	<b>13,548</b>
Ancillary Industries		2008Q2		2011Q2 <sup>1</sup>		Vol. Change	
NAICS	Title	Est.	Emp.	Est.	Emp.	Est.	Emp.
221112	Fossil Fuel Electric Power Generation	64	4,320	64	4,107	0	-212
221210	Natural Gas Distribution	148	4,798	168	4,916	20	118
221310	Water Supply & Irrigation Systems	368	6,829	382	6,782	14	-47
221320	Sewage Treatment Facilities	474	4,350	483	4,430	9	80
237110	Water, Sewer, & Related Structure Const.	381	7,248	380	6,444	-1	-804
237310	Highway, Street, & Bridge Construction	535	21,762	543	21,845	8	83
238912	Nonresidential Site Preparation Contractors	619	10,914	637	9,720	18	-1,194
325110	Petrochemical Manufacturing	4	926	5	575	1	-351
325120	Industrial Gas Manufacturing	31	1,758	35	1,476	4	-283
331110*	Iron & Steel Mills & Ferroalloy Mfg.	73	13,666	62	13,246	-11	-420
331210	Iron, Pipe, & Tube Mfg. from Prchsd. Steel	45	4,529	38	3,771	-7	-757
333131	Mining Machinery & Equipment Mfg.	23	3,287	23	3,215	0	-72
333132	Oil & Gas Field Machinery & Equip. Mfg.	8	380	9	348	1	-32
423810	Const. & Mining Mach. Equip. Wholesalers	226	4,113	205	3,617	-21	-497
423830	Industrial Machinery & Equip. Wholesalers	1,017	12,444	958	11,844	-59	-599
423840	Industrial Supplies Merchant Wholesalers	308	3,310	343	3,582	35	272
484110	General Freight Trucking, Local	1,202	8,685	1,339	10,081	137	1,396
484220	Specialized Freight Trucking, Local	1,060	10,199	1,178	12,344	118	2,145
484230	Specialized Freight Trucking, Long-Distance	282	3,648	268	3,178	-14	-470
531190	Lessors of Other Real Estate Property	245	863	243	846	-2	-17
532412	Const., Mining, & Forestry Equip. Rental	100	2,137	147	2,932	47	795
541330	Engineering Services	2,470	42,697	2,554	43,131	84	434
541360	Geophysical Surveying & Mapping Services	59	289	52	226	-7	-62
541380	Testing Laboratories	394	7,316	404	7,800	10	484
541620	Environmental Consulting Services	465	3,064	490	3,339	25	275
562910	Remediation Services	224	2,812	251	2,853	27	42
811310	Comm. & Industrial Mach. & Equip. Repair	1,018	8,253	1,042	8,322	24	69
924110	Admin. of Air & Water Res. & Waste Mgmt.	107	4,996	109	4,735	2	-261
924120	Admin. of Conservation Programs	316	4,720	314	4,396	-2	-324
926130	Reg. & Admin. of Comm., Elec., Gas, & Util.	48	1,458	48	1,473	0	16
<b>Totals</b>		<b>12,314</b>	<b>205,770</b>	<b>12,774</b>	<b>205,575</b>	<b>460</b>	<b>-194</b>

Source: Industry Data is from Pennsylvania's Quarterly Census of Employment and Wages

- From 2008 Q2 to 2011 Q2, employment in core industries increased by 131.2%.
- Over the same period, employment in the ancillary industries was virtually unchanged.
- Employment across all industries decreased 2.4% (appx. 140,000) over the same time period.

<sup>1</sup>2011 Q2 QCEW data are initial. These data may be revised upon release of QCEW 2011Q3 data.

Notes: These data are not seasonally adjusted. While most change was due to actual growth or decline, some movement may be due to seasonal patterns or administrative changes to data.

\*NAICS definition implemented with 2011Q1 data. Please see NAICS Changes in "Definitions" section on page 19.

# WORKFORCE INVESTMENT AREA MARCELLUS SHALE RELATED INDUSTRIES DATA<sup>1</sup>

The tables below depict employment growth in the core and ancillary industries for Workforce Investment Areas (WIA) with substantial Marcellus Shale drilling activity (number of Marcellus Shale wells drilled in 2010 in parentheses).

<b>Northern Tier (762)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	93	2,021	1,928	2073.1%
Ancillary	1,762	3,433	1,671	94.8%

<b>Southwest Corner (220)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	691	2,361	1,670	241.7%
Ancillary	10,516	11,212	696	6.6%

<b>Central (162)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	112	1,864	1,752	1564.3%
Ancillary	9,723	11,131	1,408	14.5%

<b>North Central (108)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	2,074	2,588	514	24.8%
Ancillary	4,162	4,586	424	10.2%

<b>Tri-County (76)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	2,333	2,841	508	21.8%
Ancillary	9,408	9,176	-232	-2.5%

<b>Westmoreland &amp; Fayette (65)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	465	1,190	725	155.9%
Ancillary	10,698	10,917	219	2.0%

<b>6 WIA Total (1,393)</b>	<b>2008Q2</b>	<b>2011Q2<sup>1</sup></b>	<b>Vol. Change</b>	<b>Pct. Change</b>
Core	5,768	12,865	7,097	123.0%
Ancillary	46,269	50,455	4,186	9.0%

Source: Industry Data is from Pennsylvania's Quarterly Census of Employment and Wages

- The Northern Tier WIA experienced the most rapid growth in Marcellus Shale core industries of all WIAs in terms of both volume and percentage; Northern Tier saw an increase of 1,928 employees from 2008Q2 to 2011Q2, for an increase of over 2,000%.
- The Central WIA was second in terms of employment growth by volume and by percentage with an employment increase of almost 1,600%.
- Across the six WIAs employment in the core industries increased by 123.0%; ancillary employment increased by 9.0%.
- Employment gains in Marcellus Shale related industries were seen in each WIA that had substantial Marcellus Shale drilling activity.

<sup>1</sup>2011 Q2 QCEW data are initial. These data may be revised upon release of QCEW 2011Q3 data.

Notes: These data are not seasonally adjusted. While most change was due to actual growth or decline, some movement may be due to seasonal patterns or administrative changes to data.

# WAGES FOR MARCELLUS SHALE CORE & ANCILLARY INDUSTRIES<sup>1</sup>

<b>Core Industries Title</b>	<b>Average Wage<sup>2</sup></b>
Crude Petroleum & Natural Gas Extraction	\$98,721
Natural Gas Liquid Extraction	\$93,002
Drilling Oil & Gas Wells	\$79,865
Support Activities for Oil & Gas Operations	\$65,278
Oil & Gas Pipeline & Related Structures Construction	\$69,867
Pipeline Transportation of Natural Gas	\$81,938
<b>Average</b>	<b>\$76,918</b>
<b>Ancillary Industries Title</b>	<b>Average Wage<sup>2</sup></b>
Fossil Fuel Electric Power Generation	\$109,281
Natural Gas Distribution	\$78,090
Water Supply & Irrigation Systems	\$54,557
Sewage Treatment Facilities	\$53,850
Water & Sewer Line & Related Structures Construction	\$65,444
Highway, Street, & Bridge Construction	\$54,861
Nonresidential Site Preparation Contractors	\$51,975
Petrochemical Manufacturing	\$74,442
Industrial Gas Manufacturing	\$83,739
Iron & Steel Mills & Ferroalloy Manufacturing*	\$73,068
Iron & Steel Pipe & Tube Manufacturing from Purchased Steel	\$80,121
Mining Machinery & Equipment Manufacturing	\$71,955
Oil & Gas Field Machinery & Equipment Manufacturing	\$61,900
Construction & Mining Machinery Equipment Wholesalers	\$59,496
Industrial Machinery & Equipment Merchant Wholesalers	\$66,142
Industrial Supplies Merchant Wholesalers	\$62,759
General Freight Trucking, Local	\$40,575
Specialized Freight Trucking, Local	\$45,097
Specialized Freight Trucking, Long-Distance	\$48,663
Lessors of Other Real Estate Property	\$38,477
Construction, Mining, & Forestry Machinery & Equip. Rental	\$75,046
Engineering Services	\$76,338
Geophysical Surveying & Mapping Services	\$51,151
Testing Laboratories	\$64,355
Environmental Consulting Services	\$66,427
Remediation Services	\$54,503
Commercial & Industrial Mach. & Equip. Repair & Maintenance	\$51,658
Admin. of Air & Water Res. & Solid Waste Mgmt. Programs	\$61,398
Admin. of Conservation Programs	\$48,807
Reg. & Admin. Of Communications, Electric, Gas, & Other Utils.	\$81,626
<b>Average</b>	<b>\$63,155</b>

Source: Industry Data is from Pennsylvania's Quarterly Census of Employment and Wages

- The average wage across all industries for 2010Q3 through 2011Q2 was \$46,559.
- The average wage in the core industries was approximately \$30,400 greater than the average for all industries; the average wage in the ancillary industries was approximately \$16,600 higher.

<sup>1</sup> Average Wages for these industries were calculated by combining the most recent four quarters of available wage data; in this case 2010Q3 through 2011Q2.

<sup>2</sup>2011 Q2 QCEW data are initial. These data may be revised upon release of QCEW 2011Q3 data.

\*NAICS definition implemented with 2011Q1 data. Please see NAICS Changes in "Definitions" section on page 19.

# PENNSYLVANIA & WORKFORCE INVESTMENT AREA MARCELLUS SHALE RELATED INDUSTRIES ONLINE JOB POSTING ACTIVITY<sup>1</sup>

## Pennsylvania Statewide Online Job Postings

	Dec-2010	Dec-2011	Pct. Increase
Core Industries	144	225	56.3%
Ancillary Industries	2,041	2,672	30.9%
<b>Total All Industries<sup>2</sup></b>	<b>133,541</b>	<b>152,699</b>	<b>14.3%</b>

## Select WIA Online Job Postings (core & ancillary combined)

WIA	Dec-2010	Dec-2011	Pct. Increase
Northern Tier	64	71	10.9%
Southwest Corner	71	91	28.2%
Central	96	171	78.1%
North Central	40	50	25.0%
Tri-County	31	68	119.4%
Westmoreland & Fayette	59	81	37.3%
<b>Total</b>	<b>361</b>	<b>532</b>	<b>47.4%</b>

- **Pennsylvania Online Job Postings**
  - Total job postings across all industries for Pennsylvania were 14.3% higher in December 2011 than in December 2010.
  - The increase seen in Marcellus Shale related industries (32.6%) outpaced the overall trend in PA.
- **WIA Online Job Postings**
  - The largest percentage increase for job postings in the core and ancillary industries occurred in the Tri-County WIA with a rise of 119.4% from December 2010 to December 2011.
  - The Central WIA experienced the second highest level of job posting growth in December 2011, rising 78.1% over the year.
  - The six WIAs with a substantial amount of Marcellus Shale drilling activity saw online job postings for these industries increase by a combined 47.4% in December 2011 compared to December 2010.

<sup>1</sup> Job Postings are counted using Wanted Analytics' Help Wanted Online job posting spidering tool. Job posting increases should be viewed as an indication of **trend only**. For a complete explanation of this data set, please refer to the Definitions section of this document.

<sup>2</sup> Total Job postings in this table will not be comparable to total postings for December 2011 published in the January 2012 edition of the Pennsylvania Fast Facts, due annual benchmarking revisions to the data.

# STATEWIDE HIGH-PRIORITY OCCUPATIONS RELATED TO MARCELLUS SHALE

The occupations listed in the table below are found within the staffing patterns of Marcellus Shale related core and ancillary industries and have been identified as High Priority for Pennsylvania. High-Priority Occupations (HPOs) are identified as in demand by employers, have higher skills needs, and are most likely to provide family sustaining wages.

A Standard Occupational Code (SOC) is provided for each occupation. For a complete list of terms, please refer to the Staffing Pattern definition on page 18.

SOC Code	SOC Title	Average Annual Wage	Education Level
13-1051	Cost Estimators	\$60,120	Bachelor's degree
17-2112	Industrial Engineers	\$77,310	Bachelor's degree
41-4011	Sales Representatives, Scientific & Technical	\$87,120	Related work exper
43-3021	Billing & Posting Clerks & Machine Operators	\$32,200	Short-term OJT
43-3031	Bookkeeping, Accounting & Auditing Clerks	\$35,540	Moderate-term OJT
43-4051	Customer Service Representatives	\$36,620	Moderate-term OJT
43-5061	Production, Planning & Expediting Clerks	\$38,800	Moderate-term OJT
43-6014	Secretaries	\$30,650	Moderate-term OJT
43-9061	Office Clerks	\$28,760	Short-term OJT
47-1011	Supervisors - Construction Trades & Extraction Workers	\$64,630	Related work exper
47-2061	Construction Laborers	\$33,290	Moderate-term OJT
47-2073	Operating Engineers	\$43,740	Moderate-term OJT
47-2152	Plumbers, Pipefitters & Steamfitters	\$52,450	Long-term OJT
49-1011	Supervisors - Mechanics, Installers & Repairers	\$63,800	Related work exper
49-9041	Industrial Machinery Mechanics	\$44,940	Long-term OJT
49-9042	Maintenance & Repair Workers	\$36,390	Moderate-term OJT
49-9051	Electrical Power-Line Installers & Repairers	\$58,220	Long-term OJT
49-9052	Telecommunications Line Installers & Repairers	\$54,240	Long-term OJT
51-1011	Supervisors - Production & Operating Workers	\$55,800	Related work exper
51-4121	Welders, Cutters, Solderers & Brazers	\$36,250	Postsec award
51-9061	Inspectors, Testers, Sorters, Samplers & Weighers	\$36,540	Moderate-term OJT
53-1031	Supervisors - Transportation & Vehicle Operators	\$58,600	Related work exper
53-3032	Truck Drivers, Heavy & Tractor-Trailer	\$41,360	Short-term OJT
53-7062	Laborers & Freight, Stock & Material Movers	\$27,650	Short-term OJT

Source: The Center for Workforce Information & Analysis

**Workforce development funding in the commonwealth may be available for training programs required to enter these occupations.**

# REGIONAL HIGH-PRIORITY OCCUPATIONS RELATED TO MARCELLUS SHALE

The occupations listed in the table below are found within the staffing patterns of Marcellus Shale related core industries and have been identified as High-Priority for certain Workforce Investment Areas (WIAs).<sup>1</sup> High Priority Occupations (HPOs) are identified as in demand by employers, have higher skills needs, and are most likely to provide family sustaining wages.

A Standard Occupational Code (SOC) is provided for each occupation. For a complete list of terms, please refer to the Staffing Pattern definition on page 18.

SOC Code	SOC Title	Average Annual Wage	Education Level
17-2151	Mining & Geological Engineers	\$64,010	Bachelor's degree
17-3023	Electrical & Electronic Engineering Technicians	\$54,040	Associate degree
17-3025	Environmental Engineering Technicians	\$46,790	Associate degree
19-2042	Geoscientists	\$67,860	Master's degree
19-4041	Geological & Petroleum Technicians	\$49,700	Associate degree
45-4022	Logging Equipment Operators	\$24,480	Moderate-term OJT
<b>47-5011</b>	<b>Derrick Operators, Oil &amp; Gas</b>	<b>\$41,920</b>	<b>Moderate-term OJT</b>
<b>47-5012</b>	<b>Rotary Drill Operators, Oil &amp; Gas</b>	<b>\$41,550</b>	<b>Moderate-term OJT</b>
<b>47-5013</b>	<b>Service Unit Operators, Oil, Gas &amp; Mining</b>	<b>\$38,530</b>	<b>Moderate-term OJT</b>
<b>47-5071</b>	<b>Roustabouts, Oil &amp; Gas</b>	<b>\$30,490</b>	<b>Moderate-term OJT</b>
49-3042	Mobile Heavy Equipment Mechanics	\$44,850	Long-term OJT
51-4122	Welding, Soldering & Brazing Machine Setters	\$37,250	Postsec award
53-7071	Gas Compressor & Gas Pumping Station Operators	\$51,620	Moderate-term OJT
53-7072	Pump Operators	\$42,200	Moderate-term OJT
53-7073	Wellhead Pumpers	\$37,010	Moderate-term OJT

Source: The Center for Workforce Information & Analysis

Each of the occupations in this table has been identified as an HPO in one or more of the following WIAs: Central, North Central, Northern Tier, Northwest, Southwest Corner, Three Rivers, Tri-County, West Central, and Westmoreland-Fayette.

Bolded occupations are HPOs in each WIA listed above. For a complete list of HPOs by Local Workforce Investment Area, please refer to:

<http://www.paworkstats.state.pa.us/gsipub/index.asp?docid=504>

**Workforce development funding in the commonwealth may be available for training programs required to enter these occupations.**

<sup>1</sup> These occupations were added to Local Workforce Investment Areas HPO lists through the HPO petition process.

# PENNSYLVANIA MARCELLUS SHALE RELATED INDUSTRIES NEW HIRES

Core Industries	Volume of New Hires by Quarter				Change 2008Q3 - 2011Q3	
	2008Q3	2009Q3	2010Q3	2011Q3	Vol.	Pct.
<b>Title</b>						
Crude Petroleum & Natural Gas Extraction	247	116	239	418	171	69.2%
Natural Gas Liquid Extraction	19	37	18	77	58	305.3%
Drilling Oil & Gas Wells	304	230	396	485	181	59.5%
Support Activities for Oil & Gas Operations	246	148	932	1,350	1,104	448.8%
Oil & Gas Pipeline & Related Structures	114	89	131	235	121	106.1%
Pipeline Transportation of Natural Gas	19	15	7	12	-7	-36.8%
<b>Total</b>	<b>949</b>	<b>635</b>	<b>1,723</b>	<b>2,577</b>	<b>1628</b>	<b>171.5%</b>
<b>Ancillary Industries</b>	<b>Volume of New Hires by Quarter</b>				<b>Change 2008Q3 - 2011Q3</b>	
<b>Title</b>	<b>2008Q3</b>	<b>2009Q3</b>	<b>2010Q3</b>	<b>2011Q3</b>	<b>Vol.</b>	<b>Pct.</b>
Fossil Fuel Electric Power Generation	43	21	18	36	-7	-16.3%
Natural Gas Distribution	113	89	101	127	14	12.4%
Water Supply & Irrigation Systems	42	39	35	71	29	69.0%
Sewage Treatment Facilities	73	60	33	59	-14	-19.2%
Water, Sewer Line & Related Structures	459	433	435	469	10	2.2%
Highway, Street, & Bridge Construction	2,140	2,032	2,090	2,609	469	21.9%
Nonresidential Site Preparation Contractors	754	516	627	708	-46	-6.1%
Petrochemical Manufacturing	19	4	27	13	-6	-31.6%
Industrial Gas Manufacturing	47	14	21	49	2	4.3%
Iron & Steel Mills & Ferroalloy Mfg.*	285	307	326	543	258	90.5%
Iron, Steel Pipe, Tube Mfg. from Prchsd. Steel	203	131	137	183	-20	-9.9%
Mining Machinery & Equipment Mfg.	270	55	200	376	106	39.3%
Oil & Gas Field Machinery & Equipment	10	3	16	8	-2	-20.0%
Const. & Mining Mach. Equip. Wholesalers	191	119	128	205	14	7.3%
Industrial Mach. & Equip. Wholesalers	543	345	443	626	83	15.3%
Industrial Supplies Merchant Wholesalers	218	100	277	313	95	43.6%
General Freight Trucking, Local	544	409	631	743	199	36.6%
Specialized Freight Trucking, Local	552	324	661	1161	609	110.3%
Specialized Freight Trucking, Long-Distance	171	138	162	180	9	5.3%
Lessors of Other Real Estate Property	19	19	27	42	23	121.1%
Const., Mining, & Forestry Mach. & Equip.	183	201	164	261	78	42.6%
Engineering Services	3,682	2,876	3,377	4,631	949	25.8%
Geophysical Surveying & Mapping Services	6	7	6	11	5	83.3%
Testing Laboratories	466	275	561	652	186	39.9%
Environmental Consulting Services	217	133	240	300	83	38.2%
Remediation Services	437	347	378	633	196	44.9%
Commercial & Industrial Mach. & Equip.	387	250	337	436	49	12.7%
Admin. Of Air & Water Res. & Waste	3	2	3	5	2	66.7%
Admin. of Conservation Programs	8	5	4	13	5	62.5%
Reg. & Admin. of Comm., Elec., Gas &	0	0	0	0	0	N/A
<b>Totals</b>	<b>12,085</b>	<b>9,254</b>	<b>11,465</b>	<b>15,463</b>	<b>3,378</b>	<b>28.0%</b>

- In 2011 Q3 there were 2,577 New Hires in the Marcellus Shale related core industries. This was 171.5% higher than 2008 Q3
- In 2011 Q3 there were 15,463 New Hires in the Marcellus Shale related ancillary industries. This was 28.0% higher than 2008 Q3.
- Across all industries in Pennsylvania, total New Hires in 2011 Q3 were 1.6% lower than in 2008 Q3

Note: In every economy there is job creation and job destruction every month and the result is employment change. New hires are linked to job creation; however, an increase in new hires does not directly equate to an increase in the total employment count. The new hires count is simply an indication of hiring activity in an industry. Separations, in the form of layoffs or quits, are linked to job destruction and account for the other half of the employment change equation. The balance of hires and separations result in the employment change.

\*NAICS definition implemented with 2011Q1 data. Please see NAICS Changes in "Definitions" section on page 19.

# WORKFORCE INVESTMENT AREA

## MARCELLUS SHALE RELATED

### INDUSTRIES NEW HIRES

The tables below depict the number of new hires in the core and ancillary industries for WIAs with substantial Marcellus Shale drilling activity during the third quarter of each year from 2008 to 2011. Volume change and percent change are both based on 2008Q3 to 2011Q3 calculations.

Northern Tier	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	0	0	125	175	175	N/A
Ancillary	18	42	94	249	231	1283.3%

Southwest Corner	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	36	18	177	378	342	950.0%
Ancillary	360	209	332	471	111	30.8%

Central	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	0	4	251	261	261	N/A
Ancillary	184	179	287	520	336	182.6%

North Central	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	107	157	404	419	312	291.6%
Ancillary	162	68	135	201	39	24.1%

Tri-County	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	195	78	148	270	75	38.5%
Ancillary	452	419	371	679	227	50.2%

Westmoreland & Fayette	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	5	9	36	49	44	880.0%
Ancillary	446	402	534	761	315	70.6%

6 WIA Total	2008Q3	2009Q3	2010Q3	2011Q3	Vol. Change	Pct. Change
Core	343	266	1,141	1,552	1,209	352.5%
Ancillary	1,622	1,319	1,753	2,881	1,259	77.6%

- Across these six WIAs, there were more than three and a half times as many new hires in the Marcellus Shale related core industries in 2011Q3 than in 2008Q3; there were 78% more new hires in the ancillary industries in 2011Q3 than in 2008Q3.
- All six WIAs had more new hires in the core industries in 2011Q3 than in 2008Q3; all six WIAs saw more new hire activity in the ancillary industries as well over that time period.
- Northern Tier WIA and Central WIA had no new hires in the core industries in 2008Q3, but combined for 436 core new hires in 2011Q3.

# QUARTERLY WORKFORCE INDICATORS

(based on the U.S. Census Bureau, Local Employment Dynamics (LED))

## Percentage of Industry<sup>1</sup> Employment by Age Group (2011Q1)

Northern Tier	14-24	25-34	35-44	45-54	55+
All industry groups	13.6%	18.4%	21.1%	25.6%	22.4%
2111 Oil and Gas Extraction	***	24.6%	23.1%	32.3%	***
2131 Support Activities for Mining	24.1%	34.6%	19.6%	15.6%	6.0%
2371 Utility System Construction	12.4%	25.4%	17.5%	27.7%	16.4%
4862 Pipeline Transportation of Natural Gas	***	***	33.3%	41.7%	***

Southwest Corner	14-24	25-34	35-44	45-54	55+
All industry groups	12.0%	19.4%	20.3%	24.9%	23.5%
2111 Oil and Gas Extraction	***	30.4%	23.5%	25.6%	12.7%
2131 Support Activities for Mining	19.5%	36.0%	22.5%	14.3%	7.8%
2371 Utility System Construction	9.7%	22.7%	25.0%	25.2%	17.5%
4862 Pipeline Transportation of Natural Gas	***	14.7%	22.7%	38.0%	***

Central	14-24	25-34	35-44	45-54	55+
All industry groups	12.6%	18.9%	21.0%	25.2%	22.2%
2111 Oil and Gas Extraction	***	27.7%	26.8%	24.1%	5.4%
2131 Support Activities for Mining	16.2%	36.5%	25.1%	15.7%	6.4%
2371 Utility System Construction	***	19.5%	21.7%	27.4%	22.4%
4862 Pipeline Transportation of Natural Gas	***	15.6%	18.8%	34.4%	21.9%

North Central	14-24	25-34	35-44	45-54	55+
All industry groups	12.1%	18.2%	21.5%	26.1%	22.0%
2111 Oil and Gas Extraction	7.8%	18.5%	20.2%	30.8%	22.8%
2131 Support Activities for Mining	14.8%	34.3%	22.8%	19.7%	8.3%
2371 Utility System Construction	24.3%	26.1%	20.7%	19.5%	9.7%
4862 Pipeline Transportation of Natural Gas	***	12.2%	18.9%	39.0%	26.2%

Tri-County	14-24	25-34	35-44	45-54	55+
All industry groups	13.2%	19.5%	20.4%	25.0%	21.8%
2111 Oil and Gas Extraction	***	27.0%	19.5%	30.7%	18.5%
2131 Support Activities for Mining	11.0%	29.2%	23.1%	23.4%	13.2%
2371 Utility System Construction	8.0%	26.4%	20.3%	27.1%	17.8%
4862 Pipeline Transportation of Natural Gas	***	52.6%	15.8%	26.3%	***

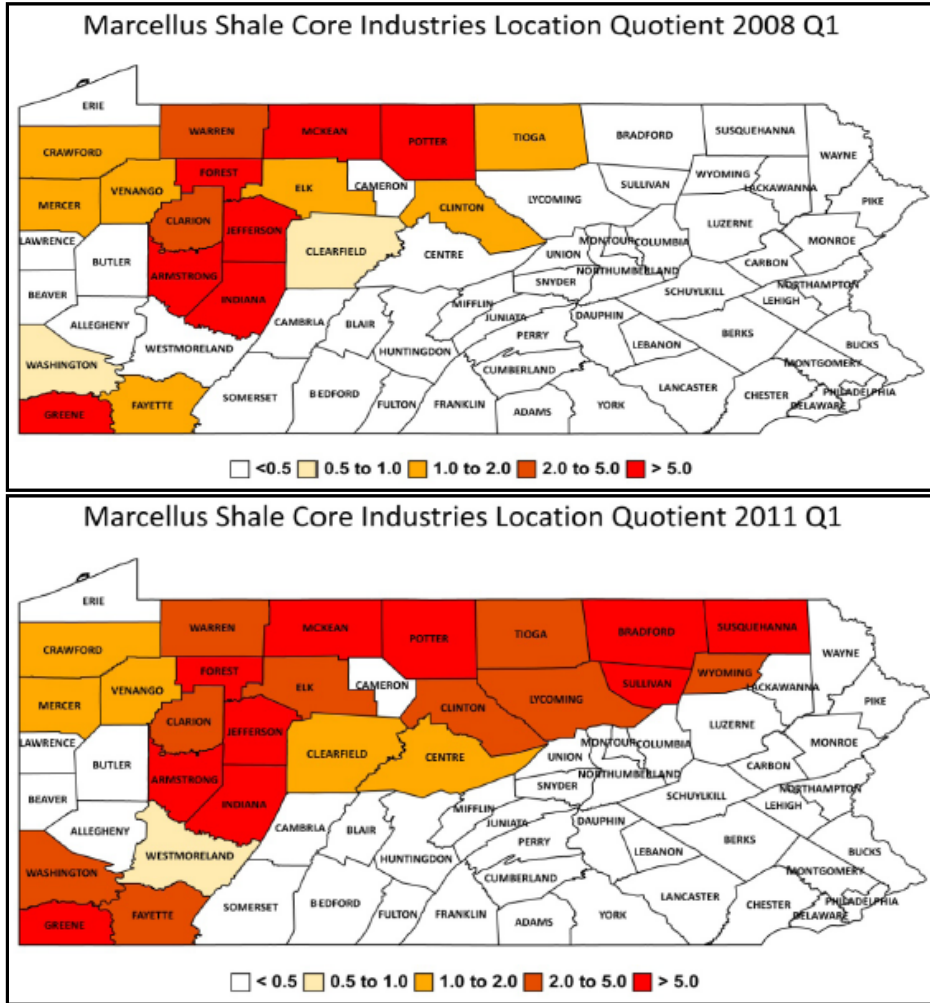
Westmoreland & Fayette	14-24	25-34	35-44	45-54	55+
All industry groups	12.6%	18.3%	20.5%	25.5%	23.1%
2111 Oil and Gas Extraction	***	30.4%	20.1%	28.4%	12.5%
2131 Support Activities for Mining	***	34.2%	25.4%	18.7%	9.0%
2371 Utility System Construction	***	25.0%	23.2%	27.6%	15.1%
4862 Pipeline Transportation of Natural Gas	***	18.4%	17.1%	42.1%	21.1%

\*\*\* Indicates that data cannot be disclosed due to confidentiality restrictions or data quality standards

- Workers in the Marcellus Shale related industry groups tended, on average, to be younger than the total across all industries.
- The percentage of workers in core related industry groups aged 55 and over was smaller than found across all industries.

<sup>1</sup> Local Employment Dynamics data are only available at the 4-digit NAICS level. While these industry groups contain some employment from non-Marcellus Shale related core industries, they help to provide an understanding of the industries' employment composition by age.

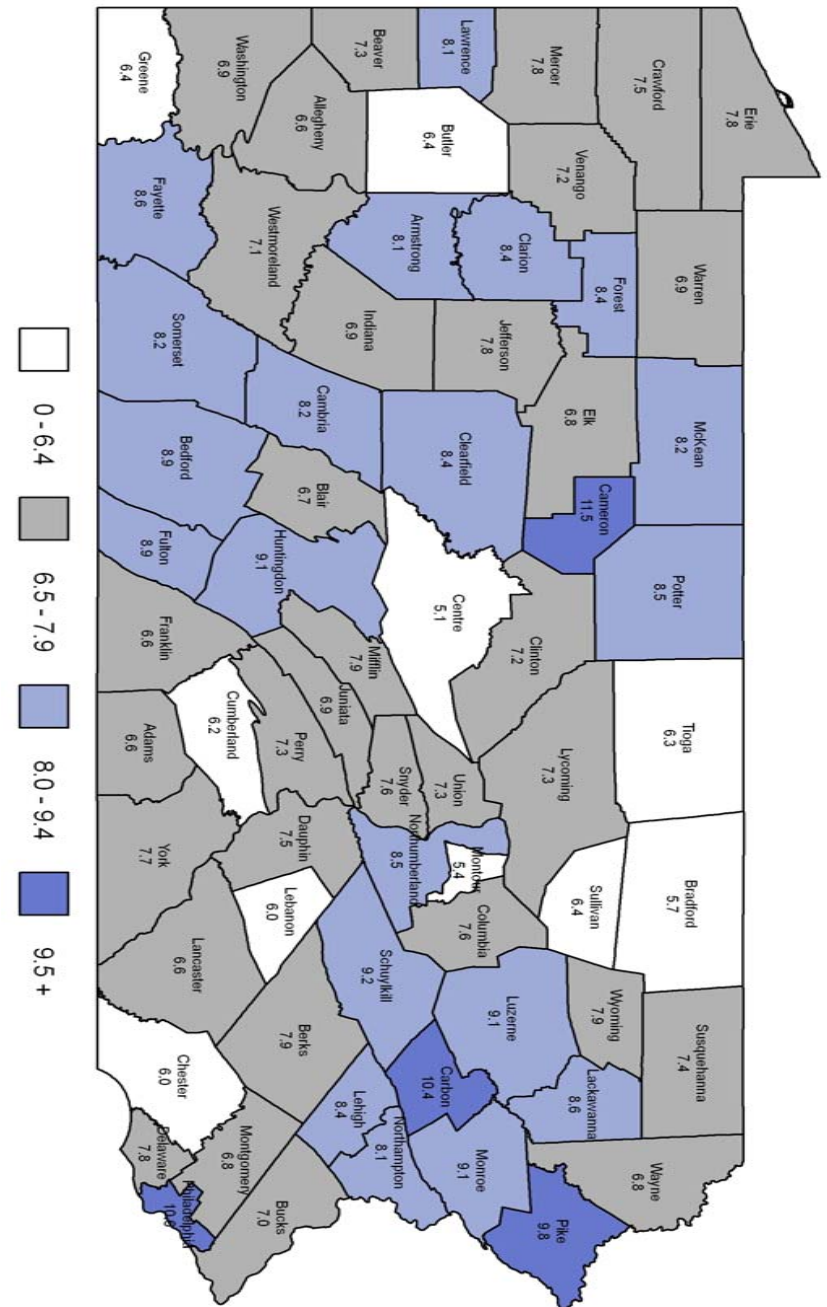
# MARCELLUS SHALE CORE INDUSTRIES LOCATION QUOTIENTS BY COUNTY



- Location Quotients are a way of comparing the concentration of industry employment in a particular area to state or national averages, and are often used to measure and areas competitiveness. In this case, the percentage of each Pennsylvania county's employment working in the Marcellus Shale Core Industries is compared to the national average.
- In the maps above, if the Location Quotient is:
  - **Less than 1:** the percentage of the county's employment in the core industries is smaller than the national average;
  - **Equal to 1:** the percentage of the county's employment in the core industries is the same as the national average;
  - **Greater than 1:** the percentage of the county's employment in the core industries is higher than the national average

**Example:** a location quotient of 5 in a particular county would indicate that there are 5 times as many people working in these industries in that county than the national percentage of people working in these industries.

# PENNSYLVANIA UNEMPLOYMENT RATES BY COUNTY DECEMBER 2011





# **DEFINITIONS:**

## **LABOR FORCE STATISTICS\*** - Source: Pennsylvania Local Area Unemployment Statistics (LAUS).

The labor force and unemployment data are based on the same concepts and definitions as those used for the official national estimates obtained from the Current Population Survey (CPS). The Local Area Unemployment Statistics (LAUS) program measures employment and unemployment on a place-of-residence basis and produces estimates using equations based on regression techniques. This method utilizes data from several sources, including the CPS, the Current Employment Statistics (CES) program, and state unemployment insurance (UI) programs. The LAUS program does not produce estimates for any demographic groups.

**Unemployment Rate:** The number of unemployed as a percent of the labor force.

**Unemployment:** All persons aged 16 years and older who had no employment during the reference week (contains the 12th day of the month), were available for work (except for temporary illness), and had made specific efforts to find employment sometime during the four-week period ending with the reference week. Persons who were waiting to be recalled to jobs from which they had been laid off need not to have been looking for work to be classified as unemployed.

**Employment:** All persons who, during the week which includes the 12th day of the month, (a) did any work as paid employees, worked in their own businesses or professions or on their own farm, or worked 15 hours or more as unpaid workers in enterprises operated by members of their families, or (b) were not working but who had jobs from which they were temporarily absent. Each employed person is counted only once, even if the person holds more than one job. Included are the self-employed, unpaid family workers, agricultural workers, and private household workers, who are excluded by the CES survey.

**Labor Force:** All persons either working or looking for work or classified as employed or unemployed.

## **JOBS\*** - Source: Pennsylvania Department of Labor & Industry, Current Employment Statistics (CES).

Each month the CES program surveys about 140,000 national businesses and government agencies in order to provide detailed industry data on employment, hours, and earnings of workers on non-farm payrolls. This is a collaborative effort between BLS and the states. CES produces a count of jobs, not of people.

**Nonfarm Jobs:** The total number of persons on establishment payrolls employed full or part time who received pay for any part of the pay period that includes the 12th day of the month.

Temporary and intermittent employees are included, as are any employees who are on paid sick leave, on paid holiday, or who work during only part of the specified pay period. A striking employee who only works a small portion of the survey period, and is paid, would be included as employed under the CES definitions. Persons on the payroll of more than one establishment are counted in each establishment. Data exclude proprietors, self-employed, unpaid family or volunteer workers, farm workers, and domestic workers. Persons on layoff, strike, or leave without pay for the entire pay period, or who have not yet reported for work are not counted as employed. Government employment covers only civilian employees.

**\* THESE DATA ARE SEASONALLY ADJUSTED:** Seasonal adjustment removes the change in employment that is due to normal seasonal hiring or layoffs (holidays, weather, etc.), thus leaving an over-the-month change that reflects only employment changes due to trend and irregular movements.

# **DEFINITIONS:**

## **QUARTERLY WORKFORCE INDICATORS** – Source: U.S. Census Bureau, Local Employment Dynamics

The Quarterly Workforce Indicators (QWI) are a set of economic indicators that can be queried by different levels of geography as well as by industry, gender, and age of workers. The QWI are built upon wage records in the Unemployment Insurance (UI) system and information from state Quarterly Census of Employment and Wages (QCEW) data.

## **QUARTERLY CENSUS OF EMPLOYMENT AND WAGES** - Source: The Pennsylvania Department of Labor & Industry, Quarterly Census of Employment and Wages

**Employment:** Employment data include all employment covered under the Pennsylvania Unemployment Compensation program for each of the three months in the quarter. The employment count represents the number of full-time and part-time employees who worked during or received pay for the payroll period including the 12<sup>th</sup> of the month. The employment totals for each month are averaged for the quarter employment count. Included are persons on paid vacations or on paid sick leave. Workers temporarily earning no wages due to labor-management disputes, layoffs or other reasons are not reported as employed. Persons on the payroll of more than one employer during the same reference week are reported more than once.

**Establishment:** The location of a certain economic activity, such as a factory, store, office, or mine, that produces goods or services. It is typically at a single physical location and engaged in one, or predominantly one, type of economic activity. An employer may have one or more establishments.

**Wages:** Total wages include total compensation paid during a calendar quarter (including bonuses). Average wages are calculated by dividing total wages for a quarter by average employment in that quarter.

## **STAFFING PATTERNS** – Source: Pennsylvania Department of Labor & Industry

**Staffing Pattern:** A listing of the occupations most commonly found within a particular industry. This information comes from the biennial *Long-Term Occupational Employment Projections* data.

**Average Annual Wage:** The mean annual wage earned by workers in the occupation, assuming 40 hours per week, 52 weeks a year. Wage data is derived from the annual *Occupational Employment Statistics (OES)* survey.

**Educational Attainment:** The Bureau of Labor Statistics (BLS) identifies 11 categories that have been used in career planning. These categories describe the most significant postsecondary education or training pathway to employment for workers in that occupation.

**Educational Attainment Level Abbreviations:**

- **Short-term or Moderate-term OJT** – basic tasks and skills are learned through a period of on-the-job training lasting up to one year.
- **Long-term training** – knowledge and skills are developed through years of on-the-job training or formal classroom instruction.
- **Related work exper** – training is gained through hands-on work in a similar occupation
- **Postsecondary award** – training is gained through a vocational training program.
- **Associate degree** – degree completed after two years of full-time schooling beyond high school
- **Bachelor's degree** – degree completed after four years of full-time schooling beyond high school
- **Degree plus exper** – a four-year bachelor's degree plus experience gained through hands-on experience
- **Masters, Doctoral, or Professional degree** – training at the college or university level beyond a four-year bachelor's degree.

# DEFINITIONS:

## **NEW HIRES** - Source: *The Pennsylvania Department of Labor & Industry*

New Hire Reporting is a process by which employers report information on all employees hired on or after January 1, 1998 to locate non-custodial parents, establish child support orders, or enforce existing orders. Company and individual data are confidential and cannot be reported on. However, the data can be aggregated to show where and in what industries hiring is taking place as an indication of what sectors of the economy are experiencing growth or decline. Approximately sixty percent of all new hires are captured. New hire counts by industry are an indication of trend only.

## **HELP WANTED ONLINE ADS** - Source: *The Conference Board Help Wanted OnLine™ data set*

The Conference Board Help Wanted OnLine data set provides real-time insight into the employment marketplace through the world's largest database of online job ads. Jobs ads can be classified by industry, occupation, employer, and geographic area. Data are analyzed for employment trends and to forecast economic conditions. The underlying data for The Conference Board HWOL are provided by Wanted Technologies Corporation.

## **MAP OF MARCELLUS SHALE FORMATION** - Source: *Department of Environmental Protection.*

## **WORKFORCE INVESTMENT AREA (WIA)**

A WIA is labor market area that is usually a group of contiguous counties, where employment, training and educational services are provided. Established through the Workforce Investment Act to provide services for dislocated workers and other eligible individuals, Pennsylvania's 22 WIAs are based on common geographic and economic factors.

## **NAICS CHANGES**

The North American Industry Classification System (NAICS), established in 1997, is reviewed for potential revisions every five years. The latest revision (2012) was implemented by BLS in the QCEW program with the release of 1<sup>st</sup> quarter 2011 data. As part of this revision, the NAICS code of only one Marcellus Shale related industry was impacted: NAICS 331111 (Iron & Steel Mills). The NAICS 2012 structure eliminated NAICS 331111, combining it with NAICS 331112 (Electrometallurgical ferroalloy product manufacturing) to form NAICS 331110 (Iron & Steel Mills and Ferroalloy Manufacturing). To account for this change, the Marcellus Shale ancillary industry list was modified to change NAICS 331111 to NAICS 331110, and all ancillary industry data will now include NAICS 331110. **To retain comparability, for time periods prior to 2011, data for NAICS 331111 & 331112 will be combined and shown under NAICS 331110.**

# MARCELLUS SHALE FORMATION

