Ohio | Department of Job and Family Services

John R. Kasich, Governor
Cynthia C. Dungey, Director

Ohio Shale

Quarterly Economic Trends for Ohio Oil and Gas Industries

January 2018

Ohio | Department of Job and Family Services

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A Message from Director Dungey

Ohio is fortunate to have a natural resource that can provide good jobs for families and reinvigorate many of our communities, especially those in the eastern part of the state. As you'll see in the pages that follow, core shale-related employment, which includes such things as oil and gas pipeline construction and well drilling, increased 171.4 percent from the second quarter of 2011 to the second quarter of 2017. Ancillary employment – for example, freight trucking and environmental consulting – also increased. We expect non-shale industries, such as food and retail businesses near drilling sites and the surrounding communities, to benefit from shale activity, as well.

The average wages of shale-related jobs are excellent: $88,682 in core industries and $67,045 in ancillary industries. In both cases, this is higher than the average wage in all Ohio industries: $48,847.

At the Ohio Department of Job and Family Services (ODJFS), we have been working hard to help more Ohioans take advantage of these opportunities. We've been working closely with local workforce investment areas, community colleges, other post-secondary educational institutions, and employers to identify the occupations most in need of workers and to make sure that appropriate training programs are in place. In any given month, thousands of shale-related job openings are posted online, at **OhioMeansJobs.com**. The Ohio Department of Higher Education also provides an overview of shale-related employment opportunities and information about education and training at **OhioEnergyPathways.org**.

Individuals can sign up for on-the-job training opportunities at any of the state's local OhioMeansJobs centers, which provide job training and other services to Ohioans looking for work and employers looking for workers. Individuals can post their resumes, and employers can post job openings at **OhioMeansJobs.com**.

We encourage any Ohioans in need of work or who may be considering new careers to explore these opportunities. We're committed to improving the well-being of Ohio's workforce and families, and are excited about the potential shale holds to make a difference in so many families' lives.

Cynthia C. Dungey

Cynthia C. Dungey, Director
Ohio Department of Job and Family Services

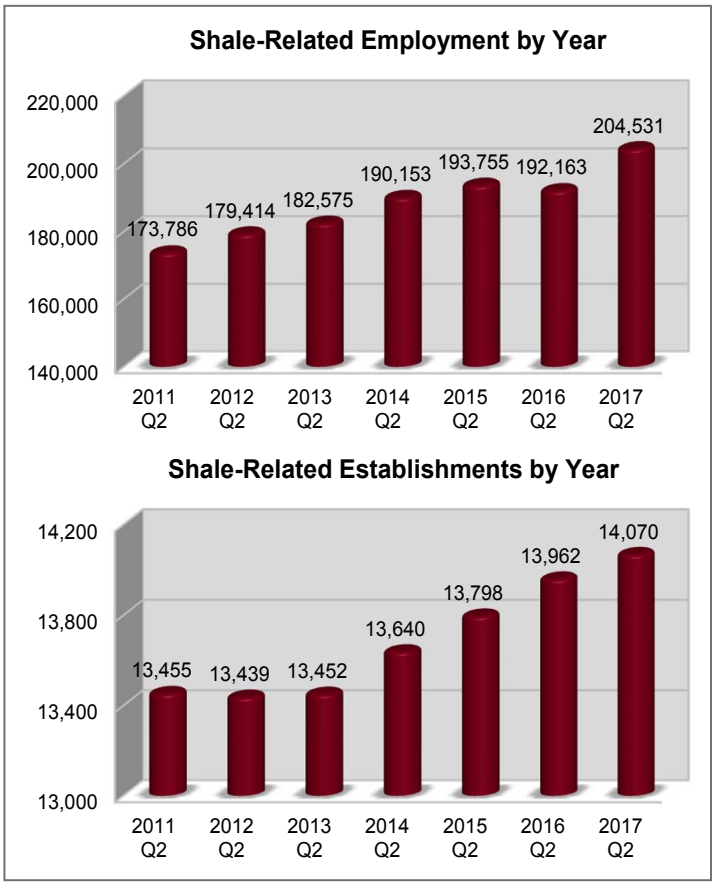
EXECUTIVE SUMMARY

Employment (2011 Q2 to 2017 Q2) See page 6.

- Core shale-related industry employment (such as pipeline construction and well drilling) was up by 11,780 (171.4 percent).
- Ancillary shale-related industry employment (such as freight trucking and environmental consulting) increased by 18,965 (11.4 percent).
- All industry employment was up by 403,056 (8.1 percent).

Business Establishments (2011 Q2 to 2017 Q2) See page 6.

- Core shale-related business establishments increased by 215 (36.4 percent).
- Ancillary shale-related establishments increased by 400 (3.1 percent).
- Over the same time period, Ohio experienced an increase of 6,893 (2.4 percent) business establishments in all industries.
- Shale-related business establishments totaled 14,070 during the second quarter of 2017.



Wages (2016 Q3 through 2017 Q2) See page 9.

- The four-quarter average wage across all industries was $48,847.
- The four-quarter average wage in core shale-related industries was $88,682, which was $39,835 greater than the average for all industries.
- The four-quarter average wage in ancillary shale-related industries was $67,045, which was $18,198 higher than the average for all industries.

Online Job Postings (2017 Q4) See page 10.

- Ohio had 3,289 online job postings in core and ancillary shale-related industries in 2017 Q4.

Stable Employment, All Hires and Separations (2011 Q4 to 2016 Q4) See page 14.

- Stable jobs, those present at the beginning and end of a quarter, increased in three core shale-related industries: support activities for mining, utility system construction, and pipeline transportation of natural gas.

These data are meant to provide a barometer of shale-related economic activity and employment trends. While the vast majority of shale-related employment can be found in certain industries, not all business establishments in those industries are involved in shale activity. For those that are, not all of their products and services and, therefore, their employment, are necessarily linked to shale-related economic activity.

BACKGROUND INFORMATION

Data Sources

The purpose of this quarterly publication is to provide the most current available data on shale-related economic activity in Ohio as compared to the base year of 2011. Although several data sources are cited in this publication, the primary source is the Quarterly Census of Employment and Wages (QCEW).

The QCEW program derives its data from quarterly tax reports of employers subject to state and federal unemployment insurance laws. This includes 95 percent or more of all wage and salary employment in Ohio. Under the QCEW program, employment data represent the number of covered workers who worked during, or received pay for, the pay period including the 12th of the month. Excluded are members of the armed forces, the self-employed, unpaid family workers and railroad workers covered by the railroad unemployment insurance system. Data is published approximately six months after the quarter ends.

Also included in this publication are several additional data sources that capture Ohio's most current overall economic situation (Local Area Unemployment Statistics and Current Employment Statistics), employer demand (The Conference Board Help Wanted OnLine™ Data Set) and hiring activity (Quarterly Workforce Indicators). For an explanation of all data sources, please refer to the "Definitions" section on page 18.

In this edition, most current data from the QCEW program are for the second quarter of 2017. Because the data are not seasonally adjusted, the same quarter of a given year must be used when analyzing growth over time. This will ensure that seasonal factors are not influencing employment change. Therefore, second quarter 2017 QCEW data are compared to second quarter 2011 QCEW data.

Data Limitations

The North American Industry Classification System (NAICS), which are reviewed and revised every five years, was used to define shale-related industries. Much of the information included in this publication reflects data on a group of six industries identified as "core" and a group of 30 industries identified as "ancillary." See page 20 for the impact the NAICS 2017 revision had on the shale-related industries.

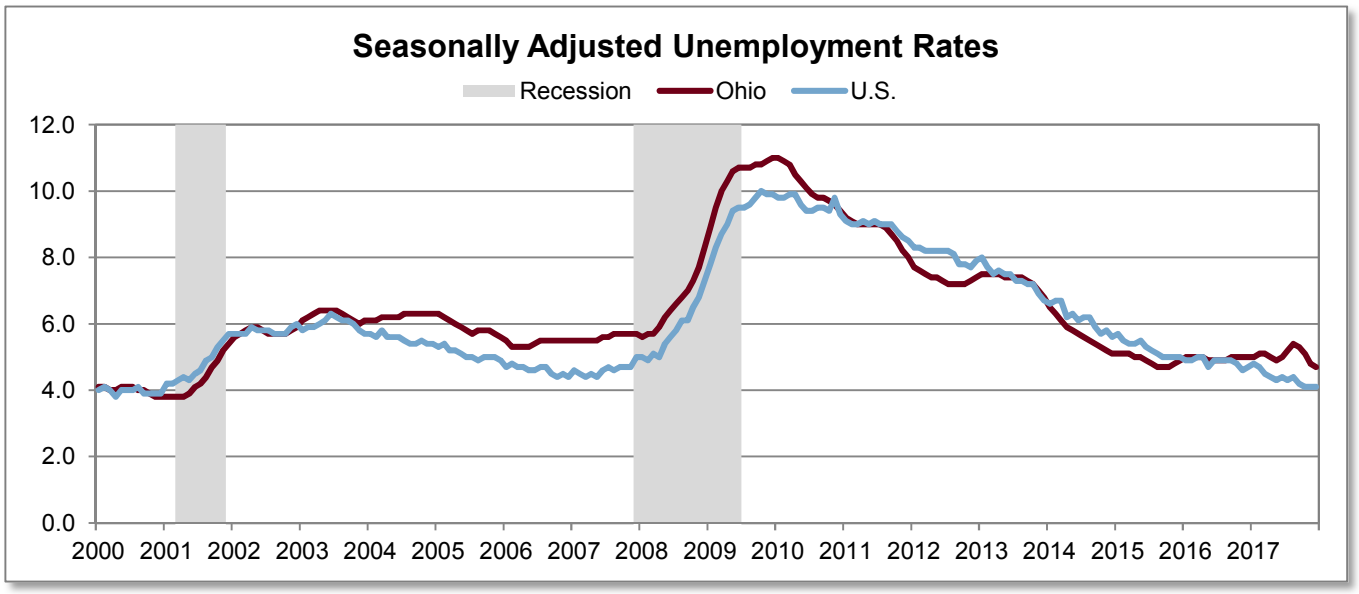
These data are meant to provide a barometer of shale-related economic activity and employment trends. While the vast majority of shale-related employment can be found in these industries, not all business establishments in these industries are involved in shale activity. For those that are, not all of their products and services and, therefore, their employment are necessarily linked to shale-related economic activity. This is particularly true for the ancillary industries.

The data in this publication include government employment (federal, state and local) in all shale-related industries because significant non-private employment is present in a number of these industries, most notably: highway, street and bridge construction; engineering services; water supply and irrigation systems; and sewage treatment facilities.

As shale-related activity develops further in Ohio, additional industries may be added to the ancillary group, based on such factors as significant employment gains in an industry in a geographic region or the identification of a group of companies in the same industry involved in shale-related activity.

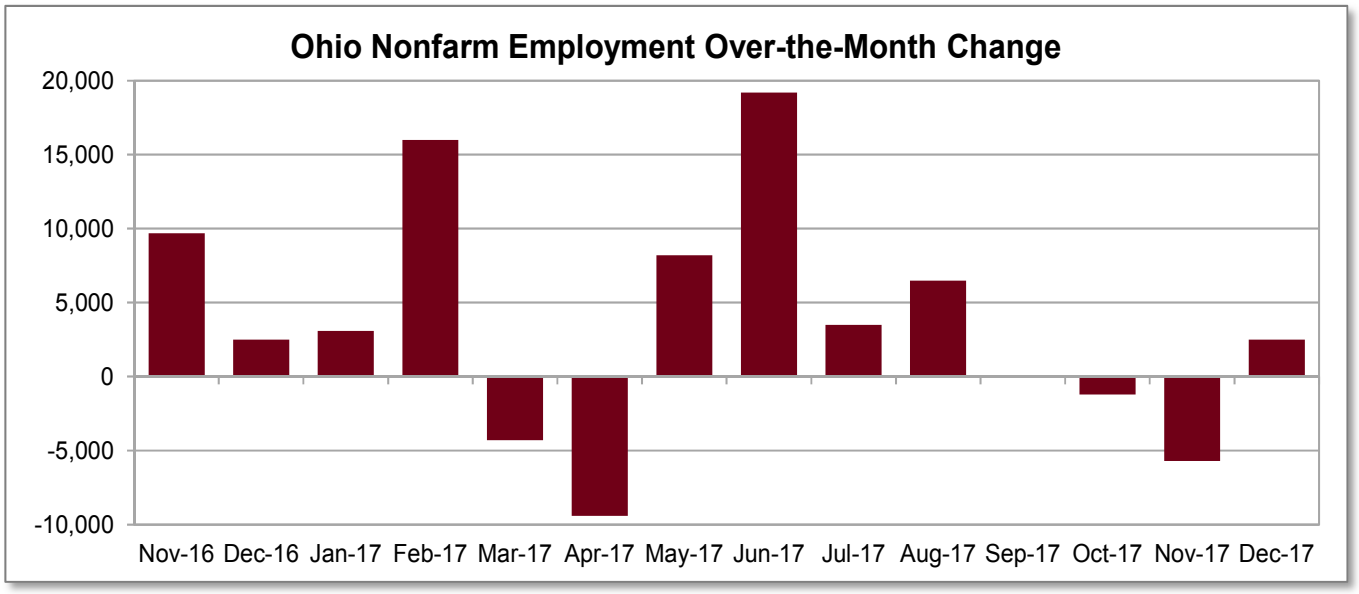
Snapshot of Employment in Ohio

- **Ohio's seasonally adjusted unemployment rate for December 2017 was 4.7 percent.**
  - The rate was down from 4.8 percent in November.



Note: Recessionary periods as defined by the National Bureau of Economic Research (NBER).

- **Ohio had 5,542,000 seasonally adjusted nonfarm jobs in December 2017.**
  - Compared to December 2016, employment has increased by 38,500 jobs.



- **In December 2017, 10,400 workers were employed in the mining and logging industry.**

STATEWIDE SHALE-RELATED INDUSTRIES

- From 2011 Q2 to 2017 Q2, employment in core industries increased by 11,780 (171.4 percent). Over the same period, employment in ancillary industries increased by 18,965 (11.4 percent).

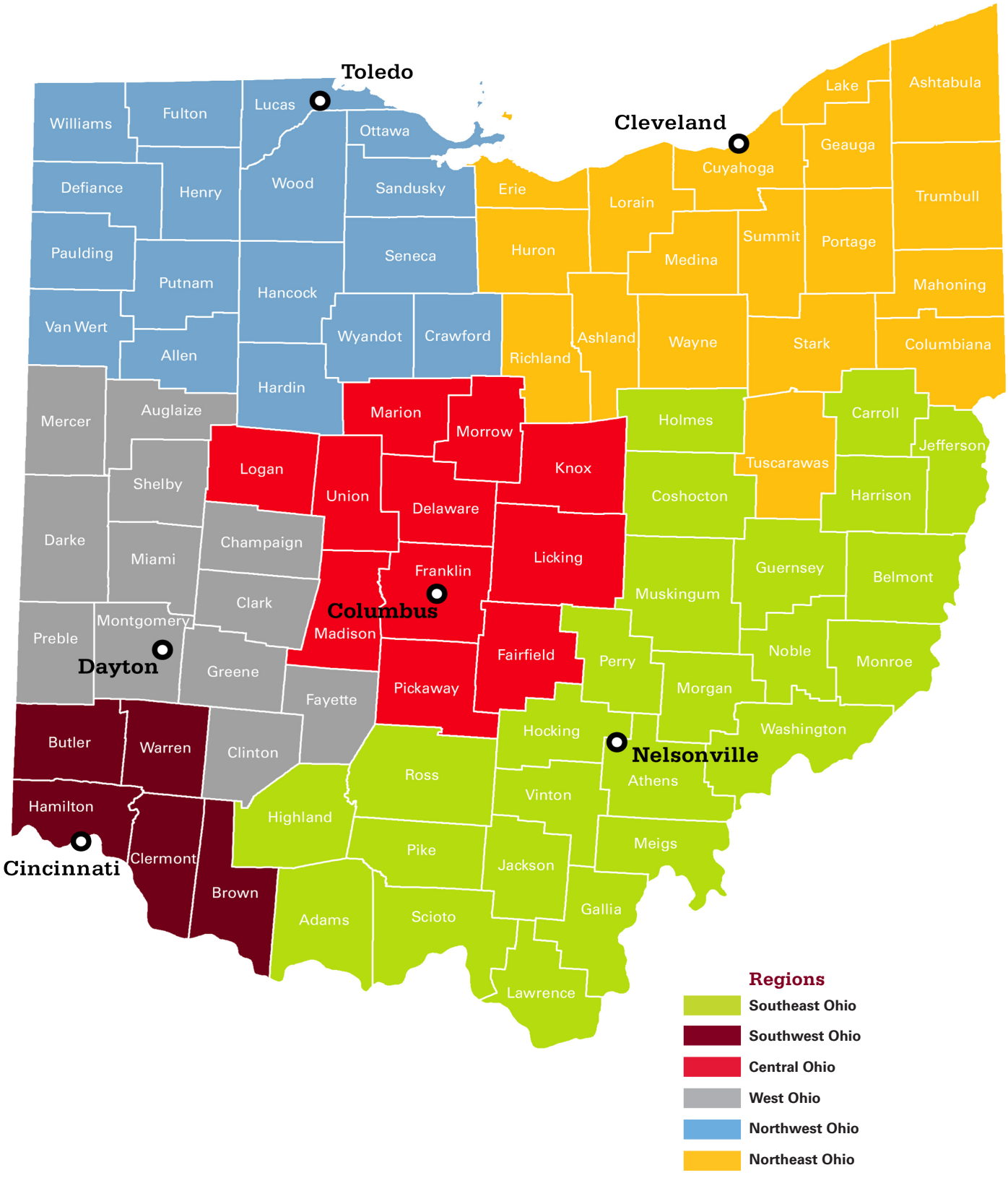
- From 2011 Q2 to 2017 Q2, the number of business establishments in the core industries grew by 215 (36.4 percent), while establishments in ancillary industries increased by 400 (3.1 percent).

Number of Business Establishments and Employment in Shale-Related Industries (2011 Q2 - 2017 Q2)

Core Industries		2011 Q2		2017 Q2		Change	
NAICS	Title	Estab.	Empl.	Estab.	Empl.	Estab.	Empl.
2111**	Oil and gas extraction	197	2,887	132	1,078	-65	-1,809
213111	Drilling oil and gas wells	79	525	114	1,215	35	690
213112	Support activities for oil and gas operations	181	1,292	319	3,669	138	2,377
237120	Oil and gas pipeline construction	98	1,862	194	12,176	96	10,314
486210	Pipeline transportation of natural gas	36	307	47	515	11	208
Core Industry Totals		**591**	**6,873**	**806**	**18,653**	**215**	**11,780**
Ancillary Industries		**2011 Q2**		**2017 Q2**		**Change**	
NAICS	Title	Estab.	Empl.	Estab.	Empl.	Estab.	Empl.
221112	Fossil fuel electric power generation	83	5,292	76	3,595	-7	-1,697
221210	Natural gas distribution	142	3,723	156	5,572	14	1,849
221310	Water supply and irrigation systems	248	6,049	259	5,836	11	-213
221320	Sewage treatment facilities	212	3,846	212	3,819	0	-27
237110	Water and sewer system construction	390	5,029	359	6,470	-31	1,441
237310	Highway, street, and bridge construction	724	15,156	740	18,047	16	2,891
238912	Nonresidential site preparation contractors	628	5,117	644	7,248	16	2,131
325110	Petrochemical manufacturing	5	357	4	ND	-1	ND
325120	Industrial gas manufacturing	47	748	42	ND	-5	ND
331110	Iron and steel mills and ferroalloy manufacturing	58	9,982	63	7,655	5	-2,327
331210	Iron, steel pipe and tube from purchase steel	53	3,122	40	3,501	-13	379
333131	Mining machinery and equipment manufacturing	12	453	10	267	-2	-186
333132	Oil and gas field machinery and equipment	6	137	10	246	4	109
423810	Construction equipment merchant wholesalers	200	2,575	184	2,806	-16	231
423830	Industrial machinery merchant wholesalers	1,693	15,287	1,640	17,261	-53	1,974
423840	Industrial supplies merchant wholesalers	503	4,803	494	5,557	-9	754
484110	General freight trucking, local	1,361	12,206	1,389	13,148	28	942
484220	Other specialized trucking, local	1,008	7,094	1,122	8,759	114	1,665
484230	Other specialized trucking, long-distance	284	4,540	334	6,444	50	1,904
531190	Lessors of other real estate property	291	949	285	1,029	-6	80
532412	Other heavy machinery rental and leasing	167	1,318	210	2,149	43	831
541330	Engineering services	2,285	27,611	2,448	29,895	163	2,284
541360	Geophysical surveying and mapping services	51	257	59	183	8	-74
541380	Testing laboratories	359	6,535	419	7,046	60	511
541620	Environmental consulting services	299	1,676	323	1,896	24	220
562910	Remediation services	178	2,394	213	3,731	35	1,337
811310	Commercial machinery repair and maintenance	1,102	7,328	1,070	9,498	-32	2,170
924110	Air, water, and waste program administration	165	6,259	157	6,283	-8	24
924120	Administration of conservation programs	281	6,586	271	6,365	-10	-221
926130	Utility regulation and administration	29	484	31	510	2	26
Ancillary Industry Totals		**12,864**	**166,913**	**13,264**	**185,878**	**400**	**18,965**
Core Industries and Ancillary Industries Totals		**13,455**	**173,786**	**14,070**	**204,531**	**615**	**30,745**
All Industries Totals		**288,288**	**4,987,972**	**295,181**	**5,391,028**	**6,893**	**403,056**

Source: Quarterly Census of Employment and Wages.
ND - Not Disclosable.
**See page 20 for explanation of 2111.

JOBSOHIO NETWORK REGIONS

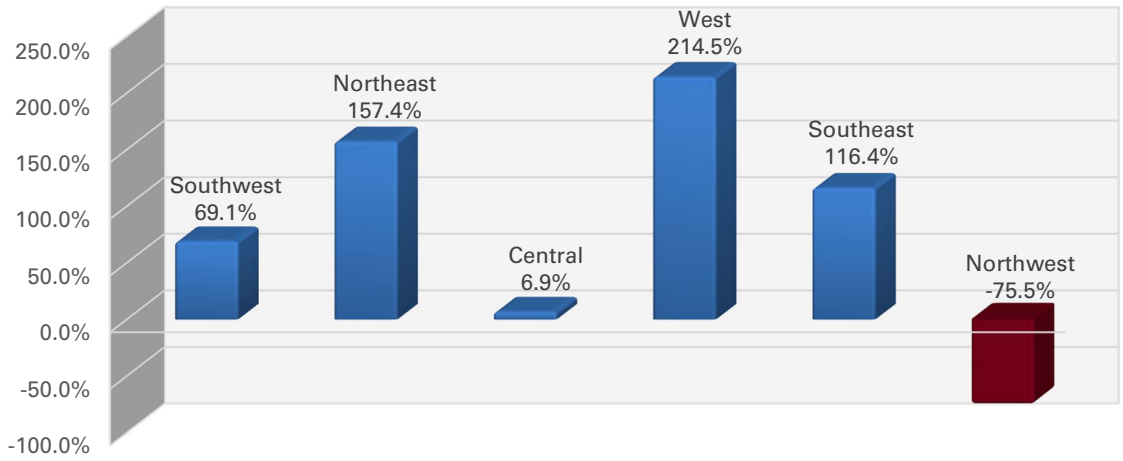


REGIONAL SHALE-RELATED INDUSTRIES

The JobsOhio Network is a partnership of statewide economic development organizations with deep ties to their business communities. The following charts show trends in shale-related employment for each of the six JobsOhio regions.

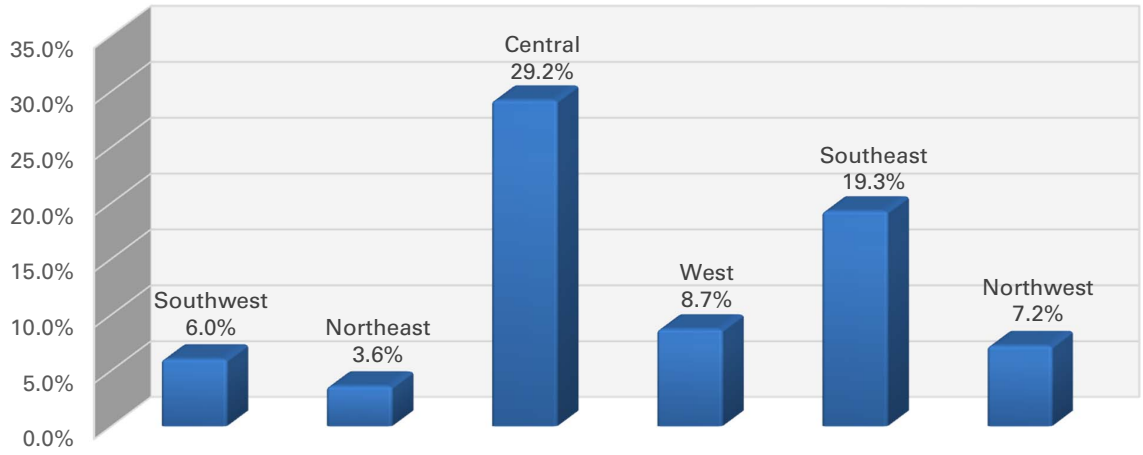
Large percentage increases and decreases in employment may be the result of a change in industry classification following a routine NAICS assignment review. Changes in NAICS assignments are typically done with the publication of the first-quarter data.

Core Shale-Related Industries
Percent Employment Change (2011 Q2 - 2017 Q2)



- The largest percent growth in employment for core shale-related industries was in the West region (214.5 percent), followed by the Northeast region (157.4 percent).

Ancillary Shale-Related Industries
Percent Employment Change (2011 Q2 - 2017 Q2)



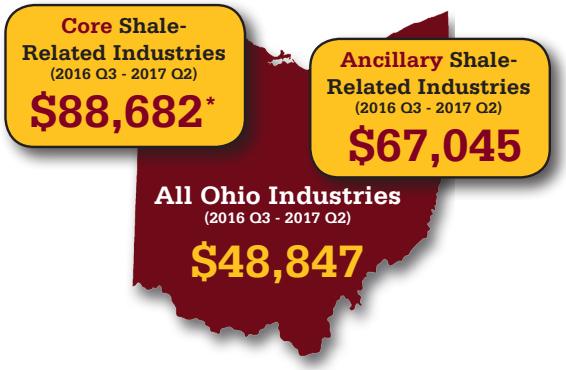
- For ancillary shale-related industries, the largest percent growth in employment was in the Central region (29.2 percent), followed by the Southeast region (19.3 percent).

Source: Quarterly Census of Employment and Wages program, Enhanced Quarterly Unemployment Insurance file.

WAGES FOR OHIO SHALE-RELATED CORE AND ANCILLARY INDUSTRIES

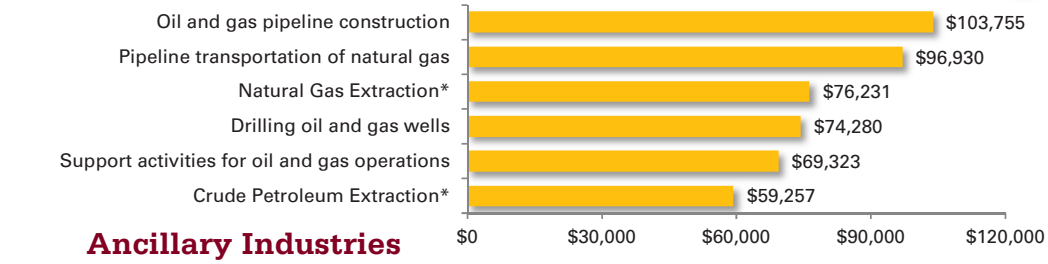
- The four-quarter average wage across all industries for 2016 Q3 through 2017 Q2 was $48,847.
- The four-quarter average wage in the core industries was $39,835 greater than the average wage for all industries.
- The four-quarter average wage in the ancillary industries was $18,198 higher than the average wage for all industries.

Large changes in average wages may be the result of a change in industry classification following a routine NAICS assignment review.

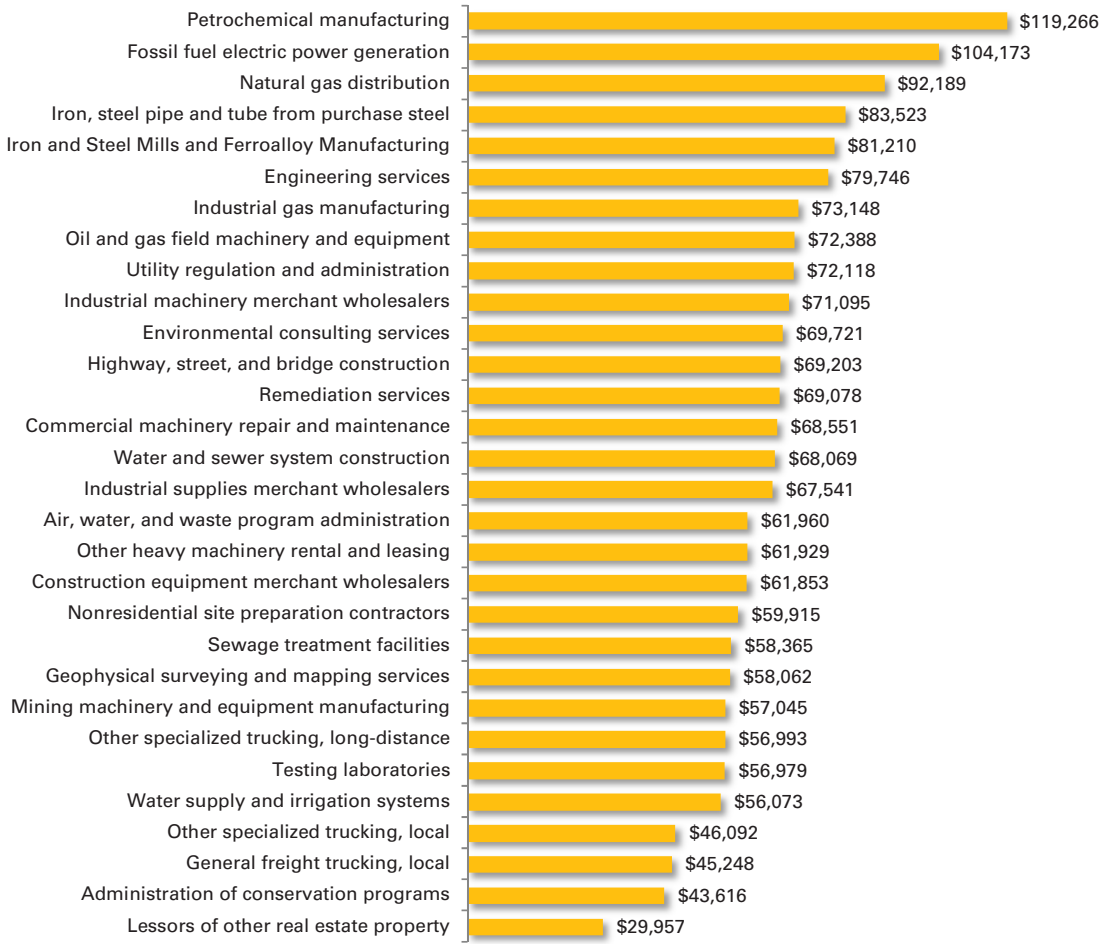


Four-Quarter Average Wage by Industry

Core Industries



Ancillary Industries



Source: Quarterly Census of Employment and Wages.
* Wages displayed are based on 2017 Q1 and Q2 only. The combined average wage for the core industries is based on a weighted average. See page 20 for more information.

OHIO SHALE-RELATED ONLINE JOB POSTINGS

Statewide Online Job Postings

	2016 Q4	2017 Q4	% Change
Core Industries	78	69	-11.5%
Ancillary Industries	3,402	3,220	-5.3%
Total: ALL Industries	**194,380**	**178,832**	**-8.0%**

Regional Online Job Postings

Core and Ancillary Combined	2016 Q4	2017 Q4	% Change
Southwest Ohio	851	718	-15.6%
Northeast Ohio	1,155	968	-16.2%
Central Ohio	545	641	17.6%
West Ohio	385	462	20.0%
Southeast Ohio	178	212	19.1%
Northwest Ohio	306	225	-26.5%
Total*	**3,480**	**3,289**	**-5.5%**

Source: The Conference Board Help Wanted Online® (HWOL). New ads only. Data are subject to revision. Not seasonally adjusted. Excludes miscellaneous ads.

Data are not comparable to previous *Ohio Shale Quarterly Economic Trends for Ohio Oil and Gas Industries* reports due to HWOL 2016 methodological revisions.

**The total includes job ads that may have listed Ohio as the only geographical area. As a result, the sum of the job ads for the regions may be lower, since it does not include ads without a city or metropolitan statistical area specification.*

Statewide Online Job Postings

- Total job postings across all Ohio industries decreased in 2017 Q4 compared to 2016 Q4.
- Overall, job postings decreased in core (-11.5 percent) and ancillary (-5.3 percent) shale-related industries.

Regional Online Job Postings

- Job postings increased in the Central Ohio (17.6 percent), West Ohio (20.0 percent), and Southeast Ohio (19.1 percent) regions in 2017 Q4 compared to 2016 Q4.

Ohio | Department of Job and Family Services

WELL ACTIVITY STATUS
AS OF JANUARY 6, 2018

STATE OF OHIO
JOHN R. KASICH, Governor
DEPARTMENT OF NATURAL RESOURCES
James Zehringer, Director
OFFICE OF INFORMATION TECHNOLOGY
Shannon Pierson, Chief

HORIZONTAL OIL AND GAS WELLS IN THE UTICA/POINT PLEASANT AND MARCELLUS FORMATIONS

OHIO DEPARTMENT OF NATURAL RESOURCES
2018

ODNR OFFICE OF INFORMATION TECHNOLOGY
January 2018

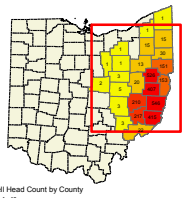
Horizontal Wells Activity Status at end of Saturday 01/06/2018:

Wells Permitted To Date:
Utica: 2736
Marcellus: 51
(2 Utica-Permitted wells are not mapped due to bad locational coordinates.)
(24 Utica-Permitted wells are not mapped due to well length >= 15000 feet.)

Wells Drilled To Date:
Utica: 2239
Marcellus: 35
(1 Utica-Drilled well is not mapped due to bad locational coordinates.)
(21 Utica-Drilled wells are not mapped due to well length >= 15000 feet.)

Wells Producing To Date:
Utica: 1787
Marcellus: 20
(1 Utica-Producing well is not mapped due to bad locational coordinates.)
(4 Utica-Producing wells are not mapped due to well length >= 15000 feet.)

Utica/Point Pleasant and Marcellus Horizontal Well Head Counts by County



Well Head Count by County
1 - 10
11 - 50
51 - 100
101 - 200
201 - 400
401 - 600

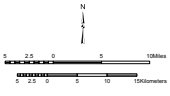
Projection is Ohio state plane coordinate system, south zone North American Datum 1983.

- Utica/Point Pleasant Well Heads
- Marcellus Well Heads
- Horizontal Wellbores

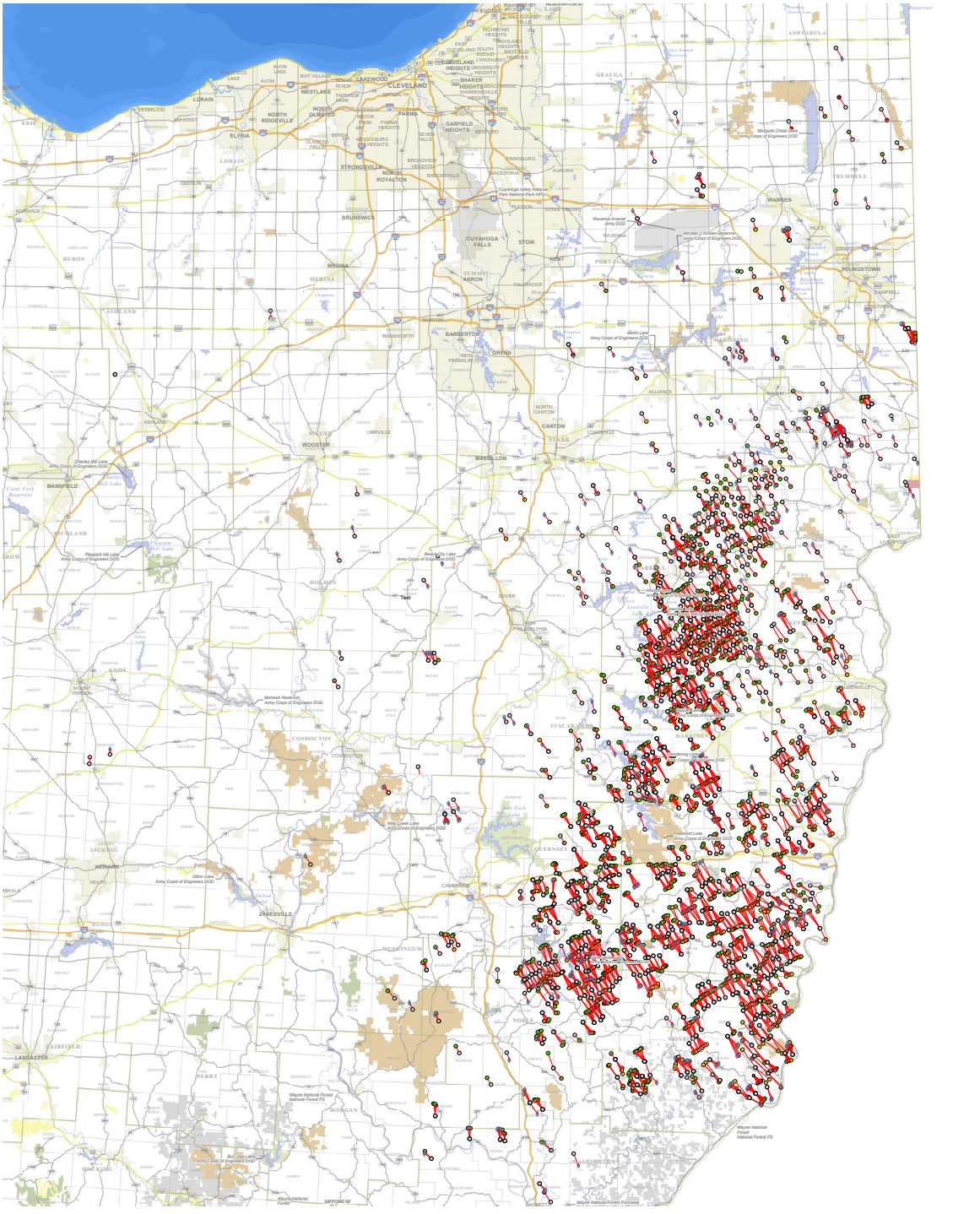
Utica/Point Pleasant Bottom Hole
- PERMITTED-(Permitted; Not Drilled; Canceled)
- DRILLED-(Drilling; Well Drilled)
- PRODUCING-(Producing; Plugged Back)
- INACTIVE-(Drilled Inactive; Shut in)
- Lost Hole or Final Restoration
- Dry and Abandoned
- Plugged and Abandoned

Marcellus Bottom Hole
- PERMITTED-(Permitted; Not Drilled; Canceled)
- DRILLED-(Drilling; Well Drilled)
- PRODUCING-(Producing; Plugged Back)
- Inactive

ODNR Lands
- Division of Forestry
- Department
- Division of Parks
- Division of Watercraft
- Division of Wildlife
- Natural Areas and Preserves



SCALE 1:300,000



Data source: The ODNR Division of Oil and Gas Resources provided the Well data from RBDMS; The ODNR Division of Geological Survey provided the S<SUB1</SUB> data; The ODNR Office of Information Technology provided the ODNR lands data; The NationalAtlas.gov provided the federal lands; Ohio Department of Transportation provided the city boundaries, roads, and lakes data.

KEY OCCUPATIONS IN CORE SHALE-RELATED INDUSTRIES

The occupations listed in the table below are found within the national staffing patterns of core shale-related industries. While these occupations are not exclusive to the core shale-related industries, the 2015 base employment count within these industries was above 50.

A standard occupation classification (SOC) code is provided for each occupation. For a complete list of terms and definitions, please refer to the Staffing Patterns definition on page 19.

SOC Code	SOC Title	Median Annual Wage[1]	Typical Education, Work Experience, On-the-Job Training (OJT)
17-2171	Petroleum Engineers	$109,574	Bachelor's degree
19-2042	Geoscientists, Except Hydrologists and Geographers	$65,645	Bachelor's degree
19-4041	Geological and Petroleum Technicians	$50,253	Associate's degree, Moderate-term OJT
47-2151	Pipelayers	$43,888	HS/GED, Short-term OJT
47-5011	Derrick Operators, Oil and Gas	$39,998	Less than HS, Short-term OJT
47-5012	Rotary Drill Operators, Oil and Gas	$40,976	Less than HS, Moderate-term OJT
47-5013	Service Unit Operators, Oil, Gas and Mining	$34,278	Less than HS, Moderate-term OJT
47-5021	Earth Drillers, Except Oil and Gas	$44,117	HS/GED, Moderate-term OJT
47-5071	Roustabouts, Oil and Gas	$30,514	Less than HS, Moderate-term OJT
47-5081	Helpers--Extraction Workers	$40,601	HS/GED, Moderate-term OJT
51-8092	Gas Plant Operators	$67,870	HS/GED, Long-term OJT
51-8093	Petroleum Pump System Oper./Refinery Oper./Gaugers	$61,589	HS/GED, Long-term OJT
53-7071	Gas Compressor and Gas Pumping Station Operators	$67,371	HS/GED, Moderate-term OJT
53-7073	Wellhead Pumpers	$33,841	HS/GED, Moderate-term OJT, Less than 5 years

[1]Annual wages have been calculated by multiplying hourly median wage by 2,080 hours.
Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics, May 2015.

Ohio | Department of Job and Family Services

IN-DEMAND SHALE-RELATED OCCUPATIONS

The occupations listed below have been identified as in-demand occupations through the Ohio Workforce Information Exchange — Job Forecast initiative as of July 2017. This initiative works directly with employers with at least one Ohio location to identify employers' most in-demand occupations over the next one, three, and five years. While the occupations below are not exclusive to the core shale-related industries, the 2015 base employment count within these industries was above 20.

For more information on the Workforce Information Exchange, please refer to page 20.

SOC Code	SOC Title	Median Annual Wage[1]	Typical Education, Work Experience, On-the-Job Training (OJT)
11-3031	Financial Managers	$106,330	Bachelor's degree, 5+ Years
11-9021	Construction Managers	$84,989	Bachelor's degree, Moderate-term OJT
11-9041	Architectural and Engineering Managers	$120,515	Bachelor's degree, 5+ Years Experience
11-1021	General and Operations Managers	$89,960	Bachelor's degree, 5+ Years Experience
13-1051	Cost Estimators	$56,597	Bachelor's degree
13-1199	Business Operations Specialists, All Other	$62,421	Bachelor's degree
13-2011	Accountants and Auditors	$63,357	Bachelor's degree
13-2051	Financial Analysts	$69,576	Bachelor's degree
15-1121	Computer Systems Analysts	$82,514	Bachelor's degree
17-2112	Industrial Engineers	$76,660	Bachelor's degree
43-3031	Bookkeeping, Accounting and Auditing Clerks	$35,600	HS/GED, Moderate-term OJT
43-4051	Customer Service Representatives	$30,514	HS/GED, Short-term OJT
43-6011	Executive Secretaries and Executive Administrative Assistant	$49,026	HS/GED, 1-5 Years Experience
43-6014	Secretaries and Administrative Assistants, Ex. Legal, Medical and Executive	$32,635	HS/GED, Short-term OJT
43-9061	Office Clerks, General	$28,600	HS/GED, Short-term OJT
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	$59,717	HS/GED, 5+ Years Experience
47-2031	Carpenters	$43,784	HS/GED, Apprenticeship
47-2061	Construction Laborers	$36,733	Less than HS, Short-term OJT
47-2073	Operating Engineers and Other Construction Equipment Operators	$48,859	HS/GED, Moderate-term OJT
47-2152	Plumbers, Pipefitters and Steamfitters	$51,792	HS/GED, Apprenticeship
49-1011	First-Line Supervisors of Mechanics, Installers and Repairers	$60,237	HS/GED, 1-5 Years Experience
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	$47,486	HS/GED, Long-term OJT
49-9041	Industrial Machinery Mechanics	$47,029	HS/GED, Long-term OJT
51-1011	First-Line Supervisors of Production and Operating Workers	$55,494	HS/GED, 1-5 Years Experience
51-4121	Welders, Cutters, Solderers and Brazers	$36,338	HS/GED, Moderate-term OJT
51-9061	Inspectors, Testers, Sorters, Samplers and Weighers	$36,171	HS/GED, Moderate-term OJT
53-3032	Heavy and Tractor-Trailer Truck Drivers	$40,872	Post-sec non-degree, Short-term OJT

[1]Annual wages have been calculated by multiplying hourly median wage by 2,080 hours.
Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics, May 2015.

STATEWIDE SHALE-RELATED EMPLOYMENT DATA

The Quarterly Workforce Indicators (QWI) are a set of economic indicators derived from state administrative records and basic demographic information from the Census Bureau. They can be examined based on geography, industry, gender and age of workers. Data presented are the most recent available. Because QWI data are not seasonally adjusted, the same quarter must be used when analyzing changes over time. This will ensure that seasonal factors are not influencing employment change. Therefore, in the table below and on the following page, 2011 Q4 data is presented with 2016 Q4 data.

The tables below and on the following page show Ohio shale-related employment. "Stable Employment" is an estimate of the number of jobs that were present at the beginning and end of a quarter. "All Hires" is the estimated number of workers who started a job during the quarter; it includes new and recalled employees. "Separations" is the estimated number of workers whose jobs with a given employer ended during a quarter.

Ohio	2011 Q4			2016 Q4		
	Stable Employment	All Hires	Separations	Stable Employment	All Hires	Separations
All industry groups	4,921,486	849,966	785,821	5,254,714	898,389	949,600
2111 Oil and Gas Extraction	3,032	190	181	1,614	305	178
2131 Support Activities for Mining	3,219	746	839	4,906	1,269	1,237
2371 Utility System Construction	11,921	2,209	3,439	15,407	3,975	4,788
4862 Pipeline Transportation of Natural Gas	339	14	3	538	18	13

Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics, Quarterly Workforce Indicators.

QWI are available only at the four-digit NAICS level. Consequently, although these industry groups contain some employment from non-shale-related core industries, they provide an indication of labor activity for these shale-related industries.

- Stable jobs, those present at the beginning and end of a quarter, increased in three core shale-related industries from 2011 Q4 to 2016 Q4: support activities for mining, utility system construction, and pipeline transportation of natural gas.
- The job market has significant turnover as demonstrated by the number of hires and separations.

JOBSOHIO NETWORK SHALE-RELATED EMPLOYMENT

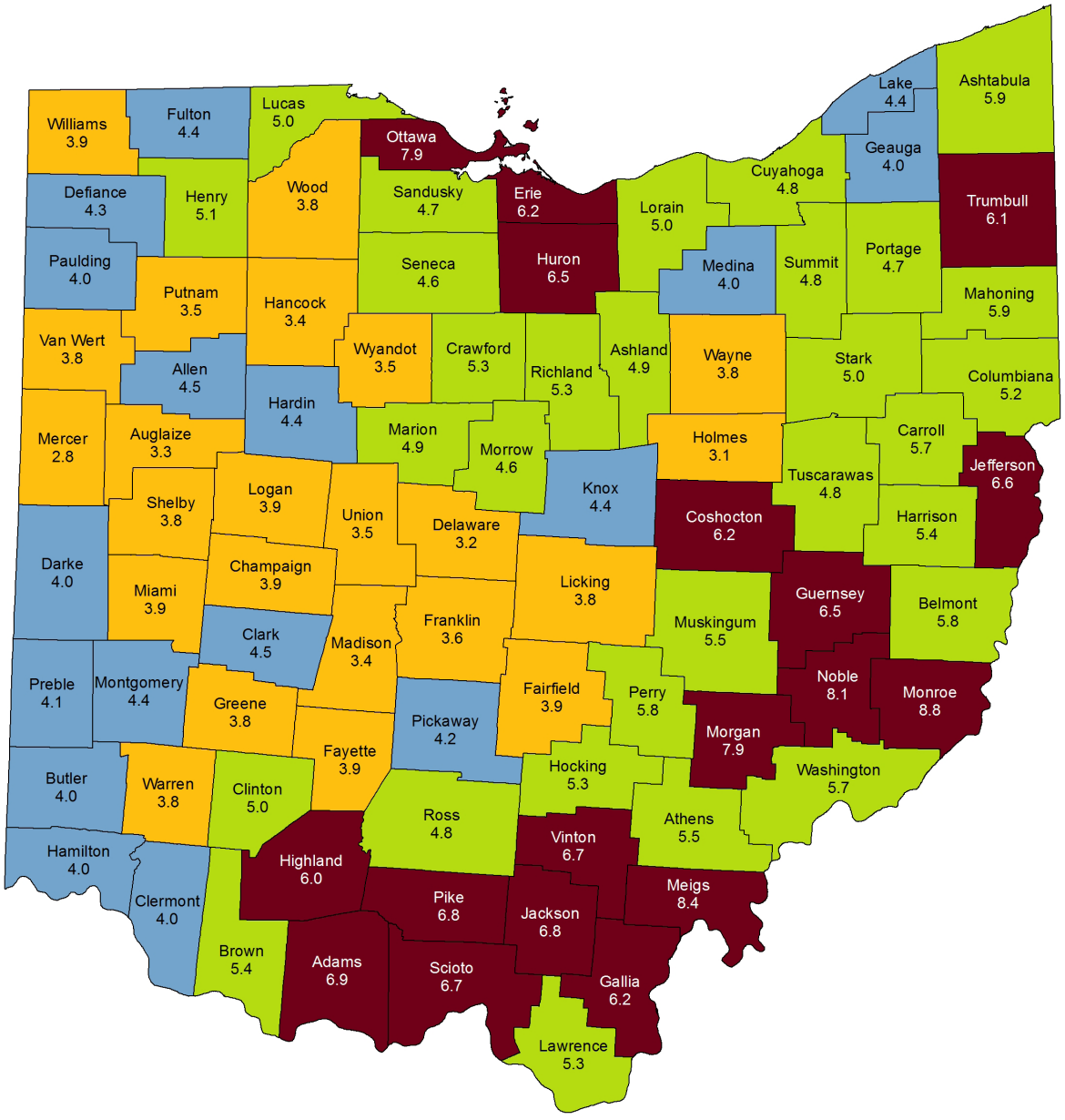
Central Ohio	2011 Q4			2016 Q4		
	Stable Employment	All Hires	Separations	Stable Employment	All Hires	Separations
All industry groups	980,450	181,537	160,699	1,079,777	212,474	218,770
2111 Oil and Gas Extraction	190	6	11	158	8	10
2131 Support Activities for Mining	330	56	144	257	22	69
2371 Utility System Construction	2,278	310	449	3,816	651	763
4862 Pipeline Transportation of Natural Gas	125	5	***	133	3	0
Northeast Ohio						
All industry groups	1,848,454	324,169	291,791	1,942,863	304,859	330,632
2111 Oil and Gas Extraction	709	80	72	723	73	71
2131 Support Activities for Mining	795	125	211	1,911	479	431
2371 Utility System Construction	4,420	905	1,485	4,796	1,266	1,902
4862 Pipeline Transportation of Natural Gas	98	4	***	204	6	3
Northwest Ohio						
All industry groups	513,450	97,373	85,998	548,781	92,752	97,996
2111 Oil and Gas Extraction	1,668	41	46	***	0	0
2131 Support Activities for Mining	12	13	***	46	24	31
2371 Utility System Construction	1,778	311	747	1,979	1,023	989
4862 Pipeline Transportation of Natural Gas	30	***	0	37	0	0
Southeast Ohio						
All industry groups	300,282	44,307	46,577	306,629	50,867	55,336
2111 Oil and Gas Extraction	428	58	47	725	221	97
2131 Support Activities for Mining	2,059	545	467	2,547	665	655
2371 Utility System Construction	845	327	258	1,310	425	480
4862 Pipeline Transportation of Natural Gas	76	***	0	89	***	3
Southwest Ohio						
All industry groups	763,316	126,563	127,969	839,273	145,885	154,125
2111 Oil and Gas Extraction	***	***	***	***	***	0
2131 Support Activities for Mining	5	0	0	57	67	42
2371 Utility System Construction	1,776	257	355	2,591	411	534
4862 Pipeline Transportation of Natural Gas	***	***	0	74	6	7
West Ohio						
All industry groups	515,534	76,017	72,786	537,393	91,551	92,741
2111 Oil and Gas Extraction	***	0	0	***	***	***
2131 Support Activities for Mining	19	7	15	89	13	8
2371 Utility System Construction	823	99	146	915	199	120
4862 Pipeline Transportation of Natural Gas	***	0	0	***	0	0

Source: U.S. Census Bureau, Longitudinal Employer-Household Dynamics, Quarterly Workforce Indicators.
****Indicates data cannot be disclosed due to confidentiality restrictions or data quality standards.*

Quarterly Workforce Indicators are available only at the four-digit NAICS level. Consequently, although these industry groups contain some employment from non-shale-related core industries, they help provide an indication of labor activity for these shale-related industries.

Ohio | Department of Job and Family Services

COUNTY UNEMPLOYMENT RATES IN DECEMBER 2017
(Not Seasonally Adjusted)



Unemployment Rates

	Not Seasonally Adjusted	Seasonally Adjusted
United States	3.9%	4.1%
Ohio	4.5%	4.7%

3.9% or Lower

4.0% to 4.5%

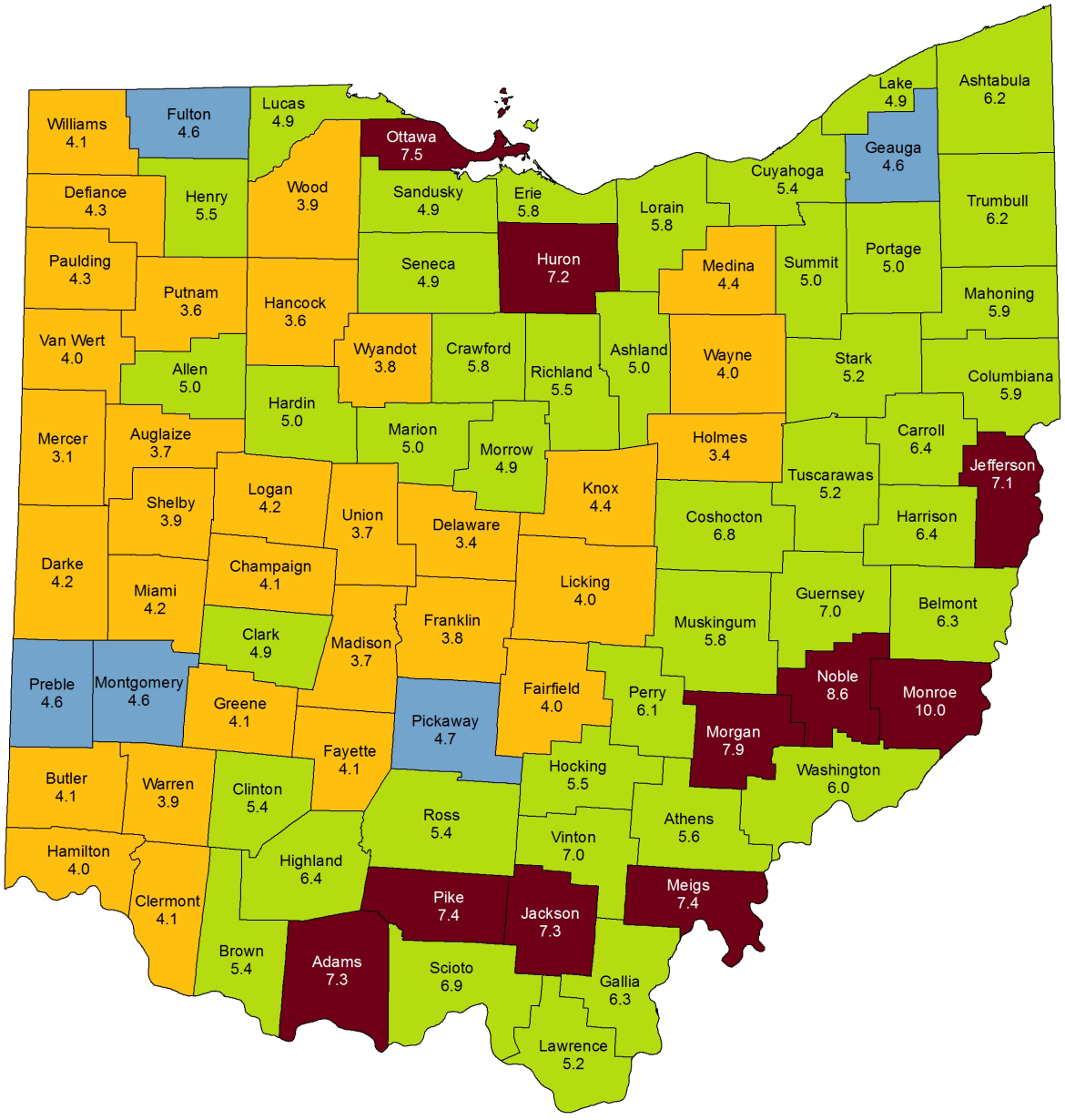
4.6% to 5.9%

6.0% or Higher

Source: Ohio Department of Job and Family Services
Office of Workforce Development
Bureau of Labor Market Information
*Data are preliminary and subject to revision.

Ohio | Department of Job and Family Services

COUNTY UNEMPLOYMENT RATES IN DECEMBER 2016
(Not Seasonally Adjusted)



Unemployment Rates

	Not Seasonally Adjusted	Seasonally Adjusted
United States	4.5%	4.7%
Ohio	4.8%	5.0%

4.5% or Lower
4.6% to 4.8%
4.9% to 7.0%
7.1% or Higher

Source: Ohio Department of Job and Family Services
Office of Workforce Development
Bureau of Labor Market Information
*Data based on 2016 benchmark.

DEFINITIONS

OHIO LABOR FORCE STATISTICS*

Source: Ohio Department of Job and Family Services' Bureau of Labor Market Information, 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 LAUS program measures employment and unemployment on a place-of-residence basis and produces estimates using equations based on regression techniques. This method uses data from several sources, including the CPS, the Current Employment Statistics (CES) program and state unemployment insurance programs. The LAUS program does not produce estimates for any demographic groups.

Employment – A count of all persons who, during the week that 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 – The population of people either working or looking for work, or classified as employed or unemployed.

Unemployment – A count of all persons age 16 and older who had no employment during the reference week (the week containing the 12th day of the month), who were available for work (except for temporary illness), and who had made specific efforts to find employment sometime during the four-week period ending with the reference week. This includes those waiting to be recalled to jobs from which they had been laid off.

Unemployment Rate – The number of unemployed workers as a percent of the labor force.

JOB DATA*

Source: Ohio Department of Job and Family Services' Bureau of Labor Market Information, Current Employment Statistics

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

Nonfarm Jobs – The total number of persons on established 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 worked during only part of the specified pay period. A striking employee who works only a small portion of the survey period, and is paid, is included as employed. Those on payrolls of more than one establishment are counted in each establishment. Data exclude proprietors, self-employed workers, unpaid family or volunteer workers, farm workers, and domestic workers. Those 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.

QUARTERLY WORKFORCE INDICATORS

Source: U.S. Census Bureau

The Quarterly Workforce Indicators are data that can be examined by region, industry, gender and age of workers. These indicators are built on wage records in the unemployment insurance system and information from state Quarterly Census of Employment and Wages (QCEW) data.

*THESE DATA ARE SEASONALLY ADJUSTED. Seasonal adjustment removes changes in employment due to normal seasonal hiring or layoffs (such as holidays, weather, etc.).

DEFINITIONS

QUARTERLY CENSUS OF EMPLOYMENT AND WAGES

Source: Ohio Department of Job and Family Services' Bureau of Labor Market Information, Quarterly Census of Employment and Wages

Business Establishment – An establishment is the location of a certain economic activity, such as a factory, store, office or mine, which 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.

Employment – Employment data include all employment covered under federal and Ohio unemployment insurance laws for each of the three months in a quarter. The employment count represents the number of full- and part-time employees who worked during or received pay for the payroll period including the 12th day of the month. The employment totals for each month are averaged for the quarter employment count. Those on paid vacations or paid sick leave are included. Workers temporarily earning no wages due to labor-management disputes, layoffs or other reasons are not reported as employed. Those on the payroll of more than one employer during the same reference week are reported more than once.

Wages – 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: Ohio Department of Job and Family Services' Bureau of Labor Market Information

A staffing pattern is a list of the occupations most commonly found within a particular industry. This information comes from the biennial Long-Term Occupational Employment Projections data.

Annual Median Wage – The annual median wage earned by workers in an occupation, assuming 40 hours of work per week, 52 weeks a year. Wage data is derived from the annual Occupational Employment Statistics survey.

Typical Education, Training and Experience – To assist with career planning, the BLS has determined the typical education needed for entry into an occupation, years of commonly needed work experience in a related occupation, and typical on-the-job training needed to attain competency in the occupation. For definitions of available categories, see **bls.gov/emp/ep_education_tech.htm**.

Typical Education Levels

- Less than high school
- High school diploma or equivalent (HS/GED)
- Postsecondary non-degree award (Post-HS Cert.)
- Associate's degree
- Bachelor's degree
- Master's degree
- Doctoral or professional degree

Work Experience in a Related Occupation

- Five years or more
- One to five years
- Less than one year

Typical On-The-Job (OJT) Training

- Long-term OJT – More than 12 months OJT or combined work experience and formal classroom instruction
- Moderate-term OJT – One to 12 months OJT and informal training
- Short-term OJT – Less than one month OJT

ONLINE JOB POSTINGS

Source: The Conference Board Help Wanted OnLine™ Data Set

The Conference Board HWOL data set provides real-time insight into the employment marketplace through the world's largest database of online job ads. Job 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.

DEFINITIONS

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CHANGES

NAICS, established in 1997, is reviewed for potential revisions every five years. The latest revision, in 2017, was implemented by BLS in the QCEW program with the release of first quarter 2017 data. As part of this revision, the NAICS code of two core shale-related industries were impacted: NAICS 211111 (Crude Petroleum and Natural Gas Extraction) and NAICS 211112 (Natural Gas Liquid Extraction). The NAICS 2017 structure regrouped those NAICS into 211120 (Crude Petroleum Extraction) and 211130 (Natural Gas Extraction). A portion of the former 211111 was moved to 211120; while 211130 contains all of 211112 and a portion of 211111. These data are comparable at the 4-digit level, as all are contained within 2111 (Oil and Gas Extraction), but they are not comparable at 5- or 6-digit level. Because the employment from year 2011 is not defined in NAICS 2017 codes and year 2017 employment is not defined under old codes, we provide only the 4-digit level data for NAICS 2111 on page 6.

Core Shale-Related Industries (NAICS):

Crude Petroleum Extraction (211120); Natural Gas Extraction (211130); Drilling Oil & Gas Wells (213111); Support Activities for Oil & Gas Operations (213112); Oil & Gas Pipeline & Related Structures Construction (237120); and Pipeline Transportation of Natural Gas (486210).

Ancillary Shale-Related Industries (NAICS):

Fossil Fuel Electric Power Generation (221112); Natural Gas Distribution (221210); Water Supply & Irrigation Systems (221310); 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 (3311101); 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); and Regulation and Administration of Communications, Electric, Gas, and Other Utilities (926130).

WORKFORCE INFORMATION EXCHANGE

Source: Governor's Office of Workforce Transformation

(workforce.ohio.gov)

The Governor's Office of Workforce Transformation deployed a statewide jobs forecasting tool to the top companies of predefined industry clusters. These companies represent small, medium and large businesses with at least 10 employees and at least one Ohio location. Through the forecasting tool, businesses identify the top five critical, difficult-to-fill job needs over the next one, three and five years. The information from the forecast tool is aggregated with current job postings and occupation projections from ODJFS to better align the in-demand jobs with education and training providers and Ohio's workforce development system.

John R. Kasich, Governor
State of Ohio

Cynthia C. Dungey, Director
Ohio Department of Job and Family Services

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