

Mike DeWine, Governor John Husted, Lt. Governor Matt Damschroder, Interim Director

2020 ANNUAL Ohio Shale Report

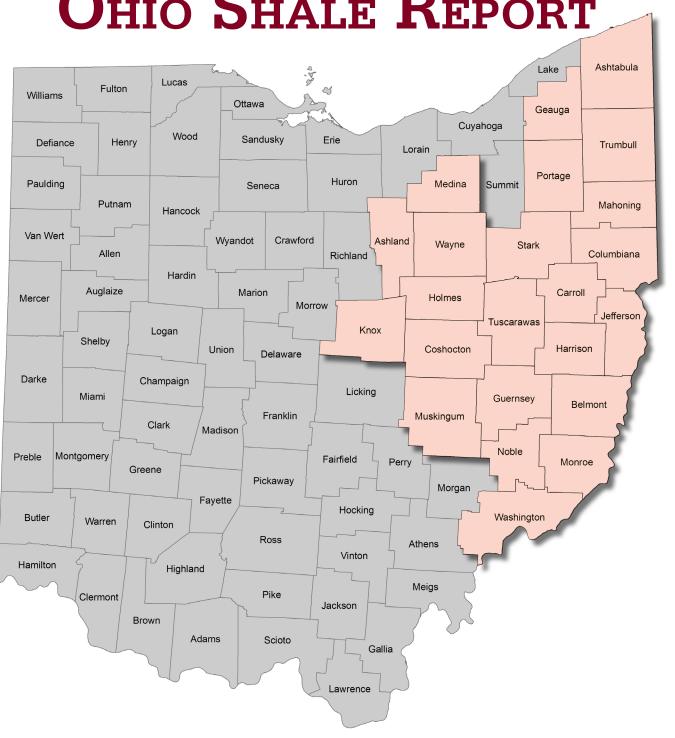


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Introduction

Ohio Revised Code Section 6301.12 calls for the publication of an annual report assessing the direct and indirect economic impact of businesses engaged in the production of horizontal wells. This report fulfills that requirement by presenting available economic data on businesses engaged in the production of oil and gas wells in Ohio. The focus is on employment in core and ancillary shale industries; it does not encompass all economic activity related to Ohio's shale industry. For example, increased business and employment at restaurants and retail stores located near shale development are not reflected in this report. Much of the information in this report reflects data for a group of five¹ industries defined as "core" shale-related industries and a group of 30 industries defined as "ancillary" shale-related industries. While most shale-related employment is in these industries, not all establishments in these industries are involved in shale-related activity. For those that are, not all their products and services and, therefore, their employment is necessarily linked to shale-related economic activity. This is particularly true for the ancillary industries.

This report shows annual employment and business establishment changes in core and ancillary shale-related industries from 2019 to 2020. It includes data for government employment (federal, state, and local) in shale-related industries that have significant non-private employment, most notably engineering services, water supply and irrigation systems, sewage treatment facilities, and highway, street, and bridge construction. The report also shows worker demand, key occupations in shale-related industries, residency status of new hires in core and ancillary industries, and average wages. It also offers a summary of regional workforce development plans.

In partnership with the U.S. Department of Labor's Bureau of Labor Statistics, the Ohio Department of Job and Family Services' Bureau of Labor Market Information collects and analyzes shale-related employment data for Ohio. The pages that follow provide a synopsis of this information for 2020. Previous annual reports can be found at **ohiolmi.com**.

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¹ In previous years, data were reported for six industries at the NAICS six-digit level. Starting in 2017, BLS stopped publishing annual data for two industries, NAICS 211111 (crude petroleum and natural gas extraction) and NAICS 211112 (natural gas liquid extraction), because the data did not meet disclosure standards. However, combined data for these industries are reported as NAICS 2111 (oil and gas extraction).

Executive Summary

Permits issued for shale wells peaked in 2014 and have slowed since. In 2014, permits were issued for 655 wells; in 2020, only 178 permits were issued. Although the number of shale wells continues to grow, employment in the core shale-related industries has declined.

From 2019 to 2020, core shale-related industries lost 3,000 jobs (-24.1%). The largest loss, 1,625 jobs, was in support activities for oil and gas operations. Employment in ancillary shale-related industries also declined, losing 3,954 jobs (-2.2%). In response to the coronavirus pandemic, many businesses temporarily closed or employees began working from home starting in March 2020. Virtually all industries suffered job losses following pandemic-related business closings.

The key occupations in core and ancillary shale-related industries provide family-sustaining wages and tend to require specialized skill sets. The median annual wages for key shale-related jobs ranged from \$31,350 to \$125,660. Among the key shale-related occupations, 26 of the top 38 jobs had median annual wages above the state median wage of \$40,300.

Employer demand for key shale-related occupations, as measured by online job ads, was higher in 2020 than in 2019. The estimated number of construction trade jobs in the core shale-related industries decreased by 23.0%, driven by an employment drop in oil and gas pipeline construction. The number of extraction trade jobs decreased 31.7% over the year.

Although data are not available on the state of residence for all workers, limited information is available from the State Directory of New Hires. Among the core shale-related industries, 84.8% of new hires were Ohio residents in 2020. Among the ancillary industries, 71.8% of new hires were Ohio residents.

Core Shale-Related Industry Employment

Employment in core shale-related industries decreased from 2019 to 2020. Overall employment in the core industries shrank 24.1%, a loss of 3,000 jobs. Support activities for oil and gas operations led the losses, shedding 1,625 jobs; drilling oil and gas wells lost 293 jobs over the year. See Figure 1 for details about employment in the core shale-related industries.

Figure 1. Core Shale-Related Industry Annual Employment Averages and Year-to-Year Change

NAICS	Title	Average Employment, 2019	Average Employment, 2020	Numeric Change	Percent Change
2111	Oil and Gas Extraction	1,124	1,039	-85	-7.6%
213111	Drilling Oil and Gas Wells	798	505	-293	-36.7%
213112	Support Activities for Oil and Gas Operations	4,609	2,984	-1,625	-35.3%
237120	Oil and Gas Pipeline Construction	5,317	4,339	-978	-18.4%
486210	Pipeline Transportation of Natural Gas	577	558	-19	-3.3%
	Core Industries Totals	12,425	9,425	-3,000	-24.1%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Business Establishments in Core Industries

The total number of Ohio business establishments in the core shale-related industries declined by 32 from 2019 to 2020, a -4.1% decrease. See Figure 2 for details about establishment growth in the core shale-related industries.

Figure 2. Core Shale-Related Industry Annual Establishment Averages and Year-to-Year Change

NAICS	Title	Average Number of Establishments, 2019	Average Number of Establishments, 2020	Numeric Change	Percent Change
2111	Oil and Gas Extraction	122	119	-3	-2.5%
213111	Drilling Oil and Gas Wells	100	96	-4	-4.0%
213112	Support Activities for Oil and Gas Operations	325	310	-15	-4.6%
237120	Oil and Gas Pipeline Construction	185	175	-10	-5.4%
486210	Pipeline Transportation of Natural Gas	46	46	0	0.0%
	Core Industries Totals	778	746	-32	-4.1%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Ancillary Shale-Related Industry Employment

Ancillary shale-related industries are indirectly involved with shale oil and gas well drilling and development. These industries provide products or support services to the core shale-related industries and to many other industries, as well. Employment in ancillary shale-related industries shrank by 3,954 jobs, a -2.2% decrease from 2019 to 2020. Industries with starred employment include some employment not disclosed for confidentiality. The large increase in utility and regulation administration employment is because of a change in disclosure status between 2019 and 2020. See Figure 3 for details about employment in the ancillary shale-related industries.

Figure 3. Ancillary Shale-Related Industry Annual Employment Averages and Year-to-Year Change

Change		Average	Average		
		Employment,	Employment,	Numeric	Percent
NAICS		2019	2020	Change	Change
221112	Fossil fuel electric power generation	2646*	2378*	-268	-10.1%
221210	Natural gas distribution	5,516	5,517	1	0.0%
221310	Water supply and irrigation systems	5,889	5,924	35	0.6%
221320	Sewage treatment facilities	3,860	3,790	-70	-1.8%
237110	Water and sewer line system construction	6227*	6044*	-183	-2.9%
237310	Highway, street, and bridge construction	17,414	16,972	-442	-2.5%
238912	Nonresidential site preparation contractors	7,061	6,784	-277	-3.9%
32511	Petrochemical manufacturing	ND	ND	NA	NA
32512	Industrial gas manufacturing	ND	ND	NA	NA
331110	Iron, steel mills and ferroalloy manufacturing	8,082	9,335	1,253	15.5%
331210	Iron, steel pipe and tube from purchased steel	3,409	3,078	-331	-9.7%
333131	Mining machinery and equipment manufacturing	381	274	-107	-28.1%
333132	Oil and gas field machinery and equipment	228	187	-41	-18.0%
423810	Construction equipment merchant wholesalers	3,027	2,877	-150	-5.0%
423830	Industrial machinery merchant wholesalers	19,274	18,399	-875	-4.5%
423840	Industrial supplies merchant wholesalers	5,912	5,816	-96	-1.6%
484110	General freight trucking, local	12,416	12,566	150	1.2%
484220	Other specialized trucking, local	9,293	9,263	-30	-0.3%
484230	Other specialized trucking, long-distance	6,233	5,972	-261	-4.2%
531190	Lessors of other real estate property	1,000	920	-80	-8.0%
532412	Other heavy machinery rental and leasing	2,403	2,245	-158	-6.6%
541330	Engineering services	30,783	29,757	-1,026	-3.3%
541360	Geophysical surveying and mapping services	236	251	15	6.4%
541380	Testing laboratories	6,811	6,473	-338	-5.0%
541620	Environmental consulting services	2,091	2,077	-14	-0.7%
	Remediation services	4,405	4,061	-344	-7.8%
811310	Commercial machinery repair and maintenance	9,746	9,277	-469	-4.8%
924110	Air, water, and waste program administration	6,170	6,086	-84	-1.4%
924120	Administration of conservation programs	5,930	5,221	-709	-12.0%
926130	Utility regulation and administration	210*	494	284	135.2%
	Ancillary Industry Totals	177,570	173,616	-3,954	-2.2%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Business Establishments in Ancillary Industries

The reported number of business establishments in ancillary shale-related industries increased by 207 from 2019 to 2020, a 1.5% increase. However, the large increase in establishments in utility regulation and administration was caused by differences between nondisclosed data in 2019 and published data in 2020. See Figure 4 for details.

Figure 4. Ancillary Shale-Related Industry Annual Establishment Averages and Year-to-Year

Change

Change		Average	Average		
		Establishments,	Establishments,	Numeric	Percent
_	Title	2018	2019	Change	Change
	Fossil fuel electric power generation	88	91	3	3.4%
221210	Natural gas distribution	161	167	6	3.7%
221310	Water supply and irrigation systems	260	265	5	1.9%
221320	Sewage treatment facilities	210	210	0	0.0%
237110	Water and sewer line system construction	375	378	3	0.8%
237310	Highway, street, and bridge construction	748	745	-3	-0.4%
238912	Nonresidential site preparation contractors	639	625	-14	-2.2%
325110	Petrochemical manufacturing	4	3	-1	-25.0%
	Industrial gas manufacturing	42	41	-1	-2.4%
331110	Iron, steel mills and ferroalloy manufacturing	61	61	0	0.0%
331210	Iron, steel pipe and tube from purchased steel	39	37	-2	-5.1%
333131	Mining machinery and equipment manufacturing	12	11	-1	-8.3%
333132	Oil and gas field machinery and equipment	13	12	-1	-7.7%
423810	Construction equipment merchant wholesalers	206	205	-1	-0.5%
423830	Industrial machinery merchant wholesalers	2,075	2,103	28	1.3%
	Industrial supplies merchant wholesalers	571	606	35	6.1%
	General freight trucking, local	1,467	1,495	28	1.9%
484220	Other specialized trucking, local	1,175	1,219	44	3.7%
484230	Other specialized trucking, long-distance	362	359	-3	-0.8%
531190	Lessors of other real estate property	290	282	-8	-2.8%
532412	Other heavy machinery rental and leasing	226	224	-2	-0.9%
541330	Engineering services	2,443	2,465	22	0.9%
541360	Geophysical surveying and mapping services	62	63	1	1.6%
541380	Testing laboratories	436	452	16	3.7%
541620	Environmental consulting services	327	337	10	3.1%
562910	Remediation services	221	234	13	5.9%
811310	Commercial machinery repair and maintenance	1,116	1,112	-4	-0.4%
924110	Air, water, and waste program administration	153	151	-2	-1.3%
924120	Administration of conservation programs	173	172	-1	-0.6%
926130	Utility regulation and administration	6	43	37	616.7%
	Ancillary Industry Totals	13,961	14,168	207	1.5%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Key Shale-Related Occupations

The occupations listed in this report are not exclusive to any industry, but they have a high presence in shale-related industries. Figure 7 shows key occupations in core and ancillary shale-related industries. These occupations are likely to provide family-sustaining wages and tend to require higher skill sets. Twenty-six of the 38 occupations had median annual wages above the state median occupational wage of \$40,300 for 2020.

Figure 5. Key Occupations in Shale-Related Industries

Sancers and Freight, Stock, and Material Movers, Hand Sala,350 No formal ed. credential, No exper., Short-term OJT As-9051 Office Clerks, General Sala,350 No formal ed. credential, No exper., Short-term OJT As-9051 Office Clerks, General Sala,350 No formal ed. credential, No exper., Short-term OJT As-9051 No formal ed. credential, No exper., Moderate-term OJT Sala, Sala Sala, Sala, Sala Sala, Sala, Sala Sala,			Median	Typical Education, Work Experince, On-the-Job Training
43-905 Office Clerks, General 43-805 Office Clerks, General 43-805 Customer Service Representatives 535,830 HS dipl/GED, No exper., Short-term OIT 43-8014 Secretaries and Administrative Assistants, Except Legal Ms dipl/GED, No exper., Moderate-term OIT 43-8014 Hs dipl/GED, No exper., Moderate-term OIT 43-8014 Hs dipl/GED, No exper., Moderate-term OIT 43-8013 Bookkeeping, Accounting, and Auditing Clerks 538,800 Hs dipl/GED, No exper., Moderate-term OIT 43-8031 Bookkeeping, Accounting, and Auditing Clerks 540,970 Hs dipl/GED, No exper., Moderate-term OIT 51-9061 Inspectors, Testers, Sorters, Samplers, and Weighers 540,970 Hs dipl/GED, No exper., Moderate-term OIT 51-9061 Inspectors, Testers, Sorters, Samplers, and Weighers 540,970 Hs dipl/GED, No exper., Moderate-term OIT 51-9061 Construction Laborers 542,990 No formal ed. credential, No exper., Moderate-term OIT 547-5012 Rotary Drill Operators, Oil and Gas 543,040 No formal ed. credential, No exper., Moderate-term OIT 547-5012 Derrick Operators, Oil and Gas 543,040 No formal ed. credential, No exper., Moderate-term OIT 547-5097 Earth Drillers, Except Iol and Gas 543,040 No formal ed. credential, No exper., Short-term OIT 547-5097 Earth Drillers, Except Iol and Gas 543,040 No formal ed. credential, No exper., Short-term OIT 547-5097 Earth Drillers, Except Iol and Gas 543,050 Hs dipl/GED, No exper., Moderate-term OIT 547-5013 Generators, Operators 548,850 Hs dipl/GED, No exper., Moderate-term OIT 547-5013 Generators, Operators 548,850 Hs dipl/GED, No exper., Moderate-term OIT 547-5013 Service Unit Operators, Oli, Gas, and Mining 554,900 Hs dipl/GED, No exper., Moderate-term OIT 547-5013 Service Unit Operators 547-5013 Service Unit Operators 547-5013 Service Unit Operators 547-5014 Hs dipl/GED, No exper., Moderate-term OIT 547-5013 Service Unit Operators 547-5014 Hs dipl/GED, No exper., Moderate-term OIT 547-50	SOC Code	SOC Title	Annual Wage	Needed
43-4051 Customer Service Representatives \$35,830 HS dipl./GED, No exper., Short-term OIT				
Association		•		
Secretaries and Administrative Assistants, Except Legal Medical		•		
Medical Helpers—Extraction Workers \$38,260 HS dipl./GED, No exper., Moderate-term OJT				
Sa.7073 Wellhead Pumpers Sa.8,900 HS dipl./GED, Less than 5 years exp., Moderate-term OIT	43-6014		\$37,110	HS dipl./GED, No exper., Short-term OJT
Bookkeeping, Accounting, and Auditing Clerks \$40,430 Some college-no degree, No exper., Moderate-term OJT	47-5081	HelpersExtraction Workers	\$38,260	HS dipl./GED, No exper., Moderate-term OJT
Signature Sign	53-7073	Wellhead Pumpers	\$38,900	HS dipl./GED, Less than 5 years exp., Moderate-term OJT
Second Construction Laborers	43-3031	Bookkeeping, Accounting, and Auditing Clerks	\$40,430	Some college-no degree, No exper., Moderate-term OJT
47-2051 Construction Laborers \$42,990 No formal ed. credential, No exper., Short-term OJT 47-5012 Rotary Drill Operators, Oil and Gas \$43,040 No formal ed. credential, No exper., Moderate-term OJT 53-3032 Heavy and Tractor-Trailer Truck Drivers \$46,420 Postecondary nondegree award, No exper., Short-term OJT 47-5011 Derrick Operators, Oil and Gas \$46,820 No formal ed. credential, No exper., Short-term OJT 47-5012 Pump Operators, Except Oil and Gas \$47,170 Hs dipl./GED, No exper., Moderate-term OJT 53-7072 Pump Operators, Except Wellhead Pumpers \$48,200 No formal ed. credential, No exper., Moderate-term OJT 547-2151 Pipelayers \$48,200 Hs dipl./GED, No exper., Moderate-term OJT 547-2151 Pipelayers \$48,200 No formal ed. credential, No exper., Short-term OJT 547-2151 Operating Engineers and Other Construction Equipment \$49,520 Hs dipl./GED, No exper., Moderate-term OJT 547-2073 Operating Engineers and Other Construction Equipment Operators Operato	51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	\$40,970	HS dipl./GED, No exper., Moderate-term OJT
A7-5012 Rotary Drill Operators, Oil and Gas \$43,040 No formal ed. credential, No exper., Moderate-term OJT \$3-3032 Heavy and Tractor-Trailer Truck Drivers \$46,420 Postsecondary nondegree award, No exper., Short-term OJT \$47-5011 Derrick Operators, Oil and Gas \$46,820 No formal ed. credential, No exper., Short-term OJT \$47-5017 Earth Drillers, Except Oil and Gas \$47,170 Hs dipl./GED, No exper., Moderate-term OJT \$47-2051 Pipelayers \$48,050 Hs dipl./GED, No exper., Moderate-term OJT \$47-2051 Pipelayers \$48,050 Hs dipl./GED, No exper., Moderate-term OJT \$47-2031 Carpenters \$49,520 Ms formal ed. credential, No exper., Short-term OJT \$47-2031 Operators Operators S48,200 Mobile Heavy Equipment Mechanics, Except Engines \$54,900 Hs dipl./GED, No exper., Moderate-term OJT Operators Operators Mobile Heavy Equipment Mechanics, Except Engines \$54,900 Hs dipl./GED, No exper., Moderate-term OJT \$47-5013 Service Unit Operators, Oil, Gas, and Mining \$54,940 No formal ed. credential, No exper., Moderate-term OJT \$47-2052 Plumbers, Pipefitters, and Steamfitters \$58,640 Hs dipl./GED, No exper., Long-term OJT \$47-2052 Plumbers, Pipefitters, and Steamfitters \$58,640 Hs dipl./GED, No exper., Apprenticeship Hs dipl./GED, No exper., Apprenticeship \$64,001 Executive Secretaries and Executive Administrative \$59,140 Hs dipl./GED, No exper., No OJT \$47-1011 First-Line Supervisors of Production and Operating \$64,400 Associate deg., No exper., No OJT \$47-1011 First-Line Supervisors of Construction Trades and \$64,200 Associate deg., No exper., No OJT \$47-1011 First-Line Supervisors of Mechanics, Installers, and \$68,200 Hs dipl./GED, No exper., No OJT \$47-1011 First-Line Supervisors of Mechanics, Installers, and \$68,200 Hs dipl./GED, No exper., No OJT \$47-2012 Industrial Engineers \$73,730 Hs dipl./GED, No exper., No OJT \$47-2012 Industrial Engineers \$89,200 Bachelor's Deg., No exper.	51-4121	Welders, Cutters, Solderers, and Brazers	\$41,410	HS dipl./GED, No exper., Moderate-term OJT
Heavy and Tractor-Trailer Truck Drivers \$46,420 Postsecondary nondegree award, No exper., Short-term OJT	47-2061	Construction Laborers	\$42,990	No formal ed. credential, No exper., Short-term OJT
Heavy and Tractor-Trailer Truck Drivers \$46,420 Postsecondary nondegree award, No exper., Short-term OJT	47-5012	Rotary Drill Operators, Oil and Gas	\$43,040	No formal ed. credential, No exper., Moderate-term OJT
47-5097 Earth Drillers, Except Oil and Gas \$47,170 HS dipl./GED, No exper., Moderate-term OJT 53-7072 Pump Operators, Except Wellhead Pumpers \$48,050 HS dipl./GED, No exper., Moderate-term OJT 47-2051 Pipelayers \$48,200 No formal ed. credential, No exper., Short-term OJT 47-2073 Operating Engineers and Other Construction Equipment Operators \$53,220 HS dipl./GED, No exper., Moderate-term OJT 49-3042 Mobile Heavy Equipment Mechanics, Except Engines \$54,900 HS dipl./GED, No exper., Long-term OJT 47-5013 Service Unit Operators, Oil, Gas, and Mining \$54,940 No formal ed. credential, No exper., Moderate-term OJT 49-9041 Industrial Machinery Mechanics \$55,770 HS dipl./GED, No exper., Long-term OJT 49-9041 Pumbers, Pipefitters, and Steamfitters \$58,640 HS dipl./GED, No exper., Apprenticeship 48-6011 Executive Secretaries and Executive Administrative Assistants \$59,140 HS dipl./GED, No exper., Apprenticeship 51-1011 First-Line Supervisors of Production and Operating Workers \$62,170 HS dipl./GED, Less than 5 years exp., No OJT 19-4045 Geological and Hydrological Technicians \$64,320 Bachelor's Deg., No exper., Moderate-term OJT 49-1011 <td>53-3032</td> <td>Heavy and Tractor-Trailer Truck Drivers</td> <td>\$46,420</td> <td>Postsecondary nondegree award, No exper., Short-term OJT</td>	53-3032	Heavy and Tractor-Trailer Truck Drivers	\$46,420	Postsecondary nondegree award, No exper., Short-term OJT
47-5097 Earth Drillers, Except Oil and Gas \$47,170 HS dipl./GED, No exper., Moderate-term OJT 53-7072 Pump Operators, Except Wellhead Pumpers \$48,050 HS dipl./GED, No exper., Moderate-term OJT 47-2031 Pipelayers \$48,200 No formal ed. credential, No exper., Short-term OJT 47-2073 Operators \$49,520 HS dipl./GED, No exper., Apprenticeship 49-3042 Mobile Heavy Equipment Mechanics, Except Engines \$54,900 HS dipl./GED, No exper., Long-term OJT 47-2013 Service Unit Operators, Oil, Gas, and Mining \$54,940 No formal ed. credential, No exper., Long-term OJT 47-2012 Plumbers, Pipefitters, and Steamfitters \$55,770 HS dipl./GED, No exper., Long-term OJT 49-9041 Industrial Machinery Mechanics \$55,5770 HS dipl./GED, No exper., Apprenticeship 49-6011 Executive Secretaries and Executive Administrative \$59,140 HS dipl./GED, No exper., Apprenticeship 43-6011 First-Line Supervisors of Production and Operating \$62,170 HS dipl./GED, Less than 5 years exp., No OJT 47-1011 First-Line Supervisors of Construction Trades and Extraction Work \$64,320 Bachelor's Deg., No exper., Moderate-term OJT 49-1011 First-Line Supervisors of Mechanics, In	47-5011	Derrick Operators, Oil and Gas	\$46,820	No formal ed. credential, No exper., Short-term OJT
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	17-2171	Petroleum Engineers	\$125,660	Bachelor's Deg., No exper., No OJT

Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics, May 2020

Demand for Workers in Key Shale-Related Occupations

Overall, job demand for key shale-related occupations, as measured by online job ads, increased from 2019 to 2020. However, many of the key shale-related occupations are common in other industries as well. Demand for some of those occupations increased tremendously from 2019 to 2020. This may have been because pandemic shutdowns of many businesses led to a surge of online products ordering and delivery. At the same time, specialty shale-related occupations saw a decline in demand. See Figure 6 for details.

Figure 6. Demand for Workers in Key Shale-Related Occupations

soc		Job Ad	d Count
Code	SOC Title	2019	2020
53-3032	Heavy and Tractor-Trailer Truck Drivers	25,176	86,041
43-4051	Customer Service Representatives	25,879	34,113
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	4,302	24,794
51-1011	First-Line Supervisors of Production and Operating Workers	8,727	10,329
17-2112	Industrial Engineers	10,735	9,677
15-1211	Computer Systems Analysts	10,295	9,609
11-1021	General and Operations Managers	7,432	8,848
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	4,991	5,825
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	5,013	4,145
43-3031	Bookkeeping, Accounting, and Auditing Clerks	3,650	4,108
43-9061	Office Clerks, General	3,768	3,152
43-6011	Executive Secretaries and Executive Administrative Assistants	2,368	2,619
49-9041	Industrial Machinery Mechanics	2,123	2,482
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	1,934	2,221
	Inspectors, Testers, Sorters, Samplers, and Weighers	1,579	2,165
11-9021	Construction Managers	1,616	1,744
47-2061	Construction Laborers	1,276	1,327
51-4121	Welders, Cutters, Solderers, and Brazers	877	873
47-2031	Carpenters	560	799
47-2152	Plumbers, Pipefitters, and Steamfitters	513	754
13-1051	Cost Estimators	598	671
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	317	494
47-2073	Operating Engineers and Other Construction Equipment Operators	335	392
47-5012	Rotary Drill Operators, Oil and Gas	29	79
47-5013	Service Unit Operators, Oil, Gas, and Mining	136	78
47-5097	Earth Drillers, Except Oil and Gas	45	69
19-2042	Geoscientists, Except Hydrologists and Geographers	53	57
17-2171	Petroleum Engineers	96	53
19-4045	Geological and Hydrological Technicians	35	47
47-2151	Pipelayers	11	27
47-5081	HelpersExtraction Workers	28	20
51-8092	Gas Plant Operators	21	15
47-5071	Roustabouts, Oil and Gas	19	14
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	33	10
53-7071	Gas Compressor and Gas Pumping Station Operators	2	1
47-5011	Derrick Operators, Oil and Gas	1	0
53-7072	Pump Operators Except Wellhead Pumpers	0	0
53-7073	Wellhead Pumpers	0	0
	Total	124,573	217,652

Source: TalentNeuron

From 2019 to 2020, the estimated number of construction trade jobs in core shale-related industries in Ohio shrank 23.0%, from 4,344 to 3,343. Oil and gas pipeline construction had the largest loss. The number of extraction trade jobs shrank 31.7%, from 2,015 to 1,377. Most of the decrease in extraction jobs was in support activities for oil and gas operations. See Figure 7 for details.

Figure 7. Estimated Number of Construction and Extraction Jobs in the Core Shale-Related Industries

		2019 2020		2019-2 Numeric			
NAICS	Title	Construction Trades	Extraction Trades	Construction Trades	Extraction Trades	Construction Trades	Extraction Trades
2111	Oil and Gas Extraction	69	154	64	143	-5	-12
213111	Drilling Oil and Gas Wells	184	247	116	157	-68	-91
213112	Support Activities for Oil and Gas Operations	1,062	1,429	688	925	-374	-504
237120	Oil and Gas Pipeline Construction	3,010	171	2,456	140	-554	-31
486210	Pipeline Transportation of Natural Gas	19	14	18	13	-1	-1
	Core Industries Totals	4,344	2,015	3,343	1,377	-1,001	-638

Source: Ohio Bureau of Labor Market Information

Shale-Related Industries' Worker State of Residence

Although data are not available on the state of residence for all workers, limited information is available from the State Directory of New Hires. This database was developed to help collect child support. State law requires all Ohio employers to report all independent contractors and newly hired and rehired employees to the directory within 20 days of the hire or rehire date.² Hiring activities that generate W-4 tax forms are included in the data.

On average in 2020, core-industry Ohio employers reported an average of 548 new hires from Ohio and 98 new hires from other states each quarter. This was a -8.1% decrease from 2019 for in-state new hires and a -89.9% decrease for out-of-state new hires. The percentage of core-industry new hires from Ohio increased from 37.9% in 2019 to 84.8% in 2020. See Figure 8 for details.

Ancillary shale-related industry employers reported an average of 9,312 Ohio new hires and 3,663 out-of-state new hires each quarter during 2020. This was a -16.5% decrease over 2019 for Ohio new hires and a 21.3% increase for out-of-state new hires. Among the ancillary industry, the percentage of new hires from Ohio decreased from 78.7% in 2019 to 71.8% in 2020. See Figure 9 for details.

² Ohio Revised Code Section 3121.89-3121.8911 and the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, 42 U.S.C. 653a.

Figure 8. 2019 and 2020 Average Quarterly New Hires in the Core Shale-Related Industries

			Numeric	Percent
State of Residence	2019	2020	Change	Change
Ohio	596	548	-48	-8.1%
Total Out-of-State	977	98	-879	-89.9%
Indiana	26	7	-20	-75.0%
Kentucky	38	8	-30	-78.3%
Michigan	21	5	-17	-77.6%
Pennsylvania	154	6	-148	-95.9%
West Virginia	77	10	-67	-86.7%
All Other States	661	62	-598	-90.6%

Source: Ohio Directory of New Hires

Figure 9. 2019 and 2020 Average Quarterly New Hires in the Ancillary Shale-Related Industries

			Numeric	Percent
State of Residence	2019	2020	Change	Change
Ohio	11,150	9,312	-1,838	-16.5%
Total Out-of-State	3,019	3,663	644	21.3%
Indiana	310	328	18	5.8%
Kentucky	299	322	23	7.8%
Michigan	177	167	-9	-5.2%
Pennslyvania	250	315	65	26.2%
West Virginia	296	250	-46	-15.6%
All Other States	1,688	2,281	593	35.1%

Source: Ohio Directory of New Hires

Total Wage Growth in the Core Shale-Related Industries

Total wages in the core shale-related industries decreased 23.0% from 2019 to 2020. In comparison, total wages across all industries in Ohio increased 1.0% over the same period. The decrease in wages among core shale-related industries was driven by an employment decline in support activities for oil and gas operations. See Figure 10 for detailed industry wage data.

Figure 10. Core Shale-Related Industry Total Wages and Year-to-Year Change

		Total Wages (thousands),	Total Wages (thousands),	Numeric Change	Percent
NAICS	Title	2019	2020	(thousands)	Change
2111	Oil and Gas Extraction	\$86,747	\$83,511	-\$3,236	-3.7%
213111	Drilling Oil and Gas Wells	\$58,595	\$34,729	-\$23,866	-40.7%
213112	Support Activities for Oil and Gas Operations	\$341,067	\$222,315	-\$118,752	-34.8%
237120	Oil and Gas Pipeline Construction	\$466,006	\$380,889	-\$85,117	-18.3%
486210	Pipeline Transportation of Natural Gas	\$59,433	\$58,110	-\$1,323	-2.2%
	Core Industries Totals	\$1,011,848	\$779,554	-\$232,294	-23.0%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Local and Regional Workforce Development Plans

Ohio's workforce development boards establish local policies for workforce services funded by the federal Workforce Innovation and Opportunity Act. They also develop four-year plans to identify target populations, in-demand occupations and employment trends to guide service delivery to support growing industries and successful job placement. The four-year local plans may also include regional plans developed by multiple local areas assigned by the state. The workforce development boards are required to submit these plans to the Ohio Department of Job and Family Services, which reviews them for viability, especially as they relate to compliance and performance. The most recent plans became effective July 1, 2021.

Local workforce development boards are required to review their local and regional plans and submit biannual modifications to their plans, if needed. The modifications reflect planned changes in service delivery to respond to evolving economic and occupational needs. Local areas that identify occupations in shale-related core and ancillary industries as in-demand occupations include that information in their local plans and policies. Modifications to plans will be due to the Ohio Department of Job and Family Services in January 2023.

Mike DeWine, Governor Jon Husted, Lt. Governor State of Ohio http://Ohio.gov

Matt Damschroder, Director

Ohio Department of Job and Family Services http://jfs.ohio.gov

> Office of Workforce Development http://jfs.ohio.gov/owd/

Bureau of Labor Market Information http://OhioLMI.com

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