

# 2014 OHIO OIL & GAS SUMMARY



# ANNUAL REPORT

Ohio Department of  
**NATURAL RESOURCES**

DIVISION OF OIL & GAS RESOURCES MANAGEMENT

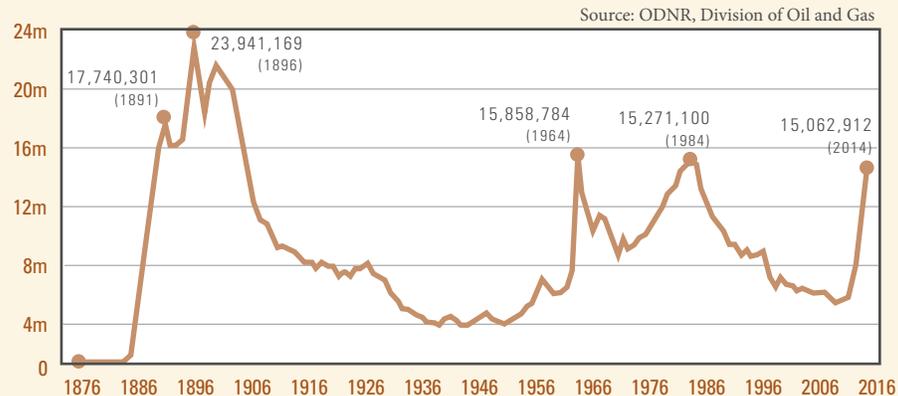
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## THE DIVISION OF OIL AND GAS RESOURCES MANAGEMENT IS RESPONSIBLE FOR REGULATING THE PERMITTING, DRILLING AND PRODUCTION OF OHIO'S OIL AND NATURAL GAS RESOURCES.

The Division of Oil and Gas Resources Management (division) is responsible for regulating the permitting, drilling and production of Ohio's oil and natural gas resources. The division also ensures protection of freshwater resources, plugs abandoned oil and gas wells and maintains a comprehensive database of Ohio's production wells. Expertise is provided by a professional staff of engineers, geologists, inspectors, and hydrogeologists. Program support services include permitting, hydrology, bonding, field inspection and enforcement, orphan well, underground injection control, legal, and administration support.

There are parallels in our history between today and when the division was created fifty years ago on October 15, 1965. At both times, oil and gas exploration was experiencing a "boom". Fifty years ago it was the Morrow County Trempealeau Dolomite play and today it is the Utica/Point Pleasant shale play. Oil production in 1964 was 15,858,784 barrels which was the highest amount since 1905. Oil production in 2014 was 15,062,912 barrels breaking the 15 million barrel mark for only the second time since 1964 (See inset 1). While Morrow County was primarily an oil play, the Utica/Point Pleasant play is both oil and gas. In addition to oil, natural gas production in 2014 surpassed the previous record of 186 billion cubic feet in 1984 with over 512 billion cubic feet being produced! (See inset 2) Both eras required significant law changes: in 1965 it was the creation of Ohio Revised Code Chapter 1509; today the shale play has spurred the passage of 5 significant bills adding 24 new sections and amending 36 other sections of Chapter 1509.

**INSET 1:**  
**Historic Ohio Oil Production**  
Total amount of oil production (Bbbls) from 1876 to 2014.  
(m: million)



**INSET 2:**  
**Historic Ohio Gas Production**  
Total amount of gas production (Mmcf) from 1952 to 2014.  
(k: thousand)



With this backdrop, we thought it would be interesting to look at some of the other highlights of the last 50 years.

### **Significant Law Changes**

- 1965 - Amended Substitute House Bill 234 - Creation of the Division of Oil and Gas
- 1967 - Current spacing rules enacted
- 1980 - Natural Gas Policy Act created an incentive for gas pricing leading to the drilling of 6,085 wells in 1981 which was the highest number drilled since 1903.
- 2004 - Urbanized Drilling law – gave the division sole and exclusive authority over all aspects of oil and gas industry leading to statewide consistent regulation.
- 2010 - Substitute Senate Bill 165 – the most comprehensive oil and gas law update in history. Regulations increased protection of public health, safety and the environment, addressed urban drilling and dedicated funding to the Orphan Well Program.
- 2012 - Amended Substitute Senate Bill 315 - addressed horizontal drilling.

### **Industry Highlights Since 1965**

- Most wells drilled in a year: 6,085 in 1981; Least wells drilled in a year: 427 in 2010
- Most actively drilled formation: Clinton sandstone – 55,940 wells
- Most Active county: Muskingum with 5,506 wells
- Number of wells drilled: 80,323
- Total Active wells: 20,085 in 1965 to 65,168 in 2014
- Deepest Vertical Well Drilled: 13,727' in 2010 in Belmont County
- Deepest Horizontal Well Drilled: 22,240' in 2014 in Belmont County
- Price range: Oil: \$2.96 (1965) to \$95.71 (2013); Natural Gas: \$0.25 (1965) to \$9.77 (2008)
- Market Value: Oil - \$1,203,827,927; Natural Gas – \$1,939,005,678; Combined - \$3,142,833,605. All records set in 2014.

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## INTRODUCTION

This fiftieth edition of the Ohio Oil & Gas Summary (The McCormac Report) remains dedicated to accurately presenting statistics that may reflect trends important to Ohio's oil and natural gas industry, citizens and governmental agencies. This report includes data submitted through July 2, 2015.

You may also note that some 2013 statistics have been adjusted to include well completion reports received after last year's cut-off date. The 2013 report estimated 643 wells were drilled; the total number has been revised to 642.

Horizontal shale activity increased significantly in 2014 and its impact on permitting, drilling and production is reflected throughout the report.

### **Highlights include:**

- 5,903 registered well owners, including 4,541 domestic owners operating 65,168 wells.
- Issued 2,206 permits, including 1,114 drilling permits.
- Issued 67 urbanized area permits in 12 counties.
- Drilled an estimated 715 oil and gas wells in 38 of Ohio's 88 counties.
- 521 wells were drilled to the Utica/Point Pleasant Shale formations accounting for 73% of all wells drilled.
- Harrison County replaced Carroll County as the most active county with 136 wells drilled which is the second consecutive year that more than 100 wells were drilled in a county.
- Horizontal well drilled to a record-setting length of 22,240 feet in Belmont County.
- 496 wells were plugged, including 19 contracted by the Orphan Well Program.
- Produced 15,062,912 barrels of crude oil, at an average price of \$79.92 per barrel.
- Produced more than 512 billion cubic feet of natural gas, at an average price of \$3.78 per mcf.
- The combined market value of crude oil and natural gas production was \$3,142,833,605 which is the highest amount on record.

### **To make oil and gas well data more accessible, the division:**

- Distributes copies of Risk Based Data Management System (RBDMS), its oil and gas well database.
- Posts updated shale development activity weekly and cumulatively on our website.
- Operators of horizontal oil and gas wells in Ohio are required to submit production data quarterly. It is published quarterly on our website.
- It is hard to believe but this is my 30th annual report. Thank you for your interest in it.

Mike McCormac

## PERMITTING

The division issued 2,206 permits, an increase of 12 (0.5%) from 2013 (Figure 1). This total includes permits issued to convert, deepen, drill, plug back, plug and abandon, reissue and reopen. Permits were issued in 15 days on average, compared to 14 days in 2013.

Permits issued to drill for oil and gas totaled 1,114, which reflects an 11.4% increase (114 permits) from last year. These permits included 722 new permits and 392 reissued permits. Utica/Point Pleasant shale permits increased by 203 for a total of 846, accounting for 76% of all drilling permits. Clinton sandstone permits decreased by 18 for a total of 117 (11%). Deep well permits increased by seven for a total of 79 (7%). Deep well permits are those issued to drill to formations below the Cambro-Ordovician Knox unconformity such as the Beekmantown dolomite, Rose Run sandstone, Trempealeau dolomite, Mt. Simon Sandstone and to the Precambrian granite. Devonian shale permits decreased by fifty two for a total of 36, including twenty-two issued for the Marcellus shale, and accounted for 3% of all drill permits. Berea Sandstone permits decreased by nine for a total of 30 (3%).

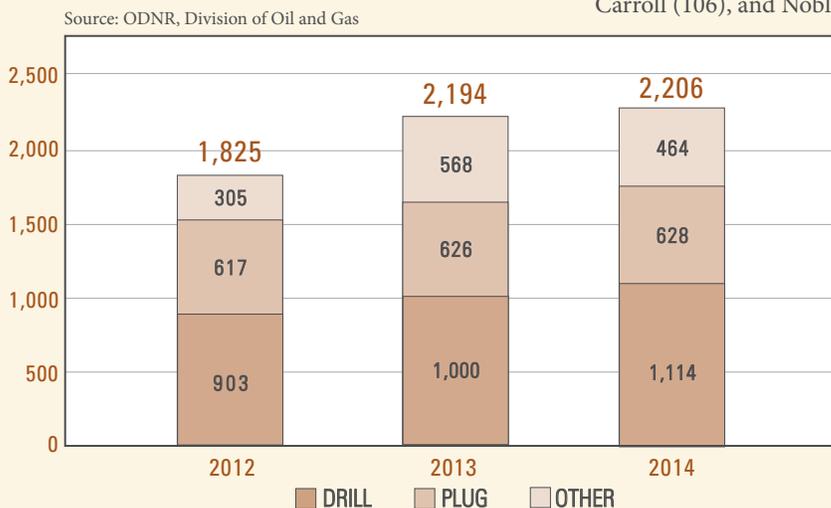
Six hundred and twenty-eight plugging permits were issued, an increase of 2 (0.3%) from 2013.

Notable permitting highlights for 2014 include:

- Issued 67 urbanized area permits (a decrease of 9) in 12 counties. The top five counties were Stark (18), Belmont (16), Cuyahoga and Trumbull (6 each) and Portage (5);
- Received & reviewed 21 unitization applications;
- Reviewed 4 mandatory pooling applications;
- Processed 51,687 production reports for 2014; and
- Issued 352 stratigraphic test well permits.

## DIRECTIONAL AND HORIZONTAL DRILLING PERMITS

This technology is used to access oil and gas beneath environmentally sensitive or densely populated areas, and to drill horizontally to enhance production. There were eleven directional drilling and eight hundred and thirty-four horizontal permits issued to drill oil and gas wells in 15 counties, an increase of 188 permits from 2013. Horizontal permits were issued to these formations: Utica/Point Pleasant Shale (821), Marcellus Shale (8) and Clinton sandstone (5). Directional permits were issued to the Clinton sandstone (1) Trenton Limestone (1), Utica/Point Pleasant Shale (5), Beekmantown dolomite (1), Rose Run sandstone (2) and Trempealeau dolomite (1). The most active counties were Harrison (194), Belmont (151), Monroe (122), Guernsey (116), Carroll (106), and Noble (102).



**FIGURE 1:**  
Oil and Gas  
Permits Issued  
2012 – 2014

The division issued 2,206 permits, an increase of 12 (0.5%) from 2013. This total includes permits issued to convert, deepen, drill, plug back, plug and abandon, reissue and reopen.

## BONDING/OWNERSHIP

Section staff manage all information and records concerning current well ownership and well transfers. During 2014, records were managed for 5,903 registered well owners, including 4,451 domestic owners and 1,452 commercial owners. Staff also recorded 3,143 changes in well ownership. There are 65,168 active wells in Ohio.

Oil and gas well bond release does not occur until an owner has successfully plugged and restored or transferred ownership and liability of all oil and gas wells under the operator's permits in Ohio.

During 2014, 152 bonds were released and 196 new owners were registered.

## DRILLING

The number of wells drilled increased for the fifth consecutive year. Drilling to the Utica/Point Pleasant Shales increased by 138 wells from 2013 which accounted for the rise in the number of wells drilled in 2014. An estimated 715 oil and gas wells were drilled, which was an increase of 73 wells (11%) from 2013 (Figure 2) (Appendix I). Wells were drilled in 38 of Ohio's 88 counties, a decrease of three (Figure 3).

## COMPLETIONS

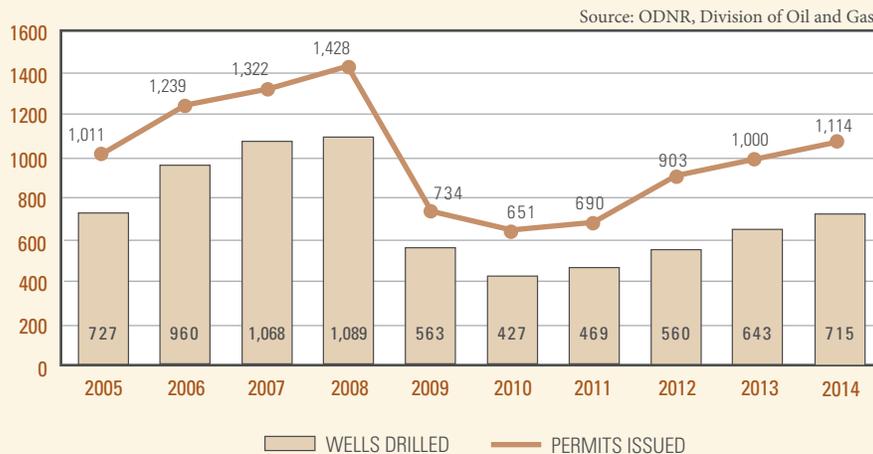
The majority of well completion reports had been submitted to the division by July 2, 2015 and an estimate was made for the missing reports in order to completely account for every well drilled. Of these, 699 were productive and 16 were dry holes, for a 98% productive rate (Table I).

- Total drilled footage is estimated at 9,168,327 feet compared to 6,659,128 for 2013.
- Average well depth was 12,823 feet, an increase of 2,451 feet per well.
- The median well depth was 14,945 feet compared to 13,038 feet in 2013.
- Total depths ranged from 566 feet in the Berea Sandstone (Licking County) to 22,240 feet in the Utica/Point Pleasant Shale for a horizontal well (Belmont County).

A summary of oil and gas completion statistics by county appears in Table II.

Completion zones ranged from the Pennsylvanian Cow Run to the Cambrian Trempealeau dolomite. Washington County had wells drilled to four different geologic zones. The Clinton sandstone and Utica/Point Pleasant shales accounted for 87% of all wells drilled. A summary of oil and gas completion statistics by producing zones appears in Table III.

**FIGURE 2:**  
Wells drilled vs. permits issued 2005 – 2014  
An estimated 715 oil and gas wells were drilled, which was an increase of 73 wells (15%) from 2013.



## FORMATION HIGHLIGHTS

The Utica/Point Pleasant Shales were the most actively explored formations accounting for 73% of all wells drilled. Preceding this exploration, 56 stratigraphic test wells were drilled through these formations to obtain geological data. Of these, 11 were plugged back and horizontally drilled in the Utica/Point Pleasant formations. Overall, 521 wells were drilled, an increase of 131 wells from 2013. These wells were drilled in 14 counties compared to 13 in 2013. Harrison County (134) was the most active followed by Carroll (99), Belmont (75), Guernsey (71) and Monroe (61).

The average depth per Utica/Point Pleasant well was 16,074 feet, an increase of 1,651 feet per well. Production reports were submitted for 838 wells in 2014. Of these, 793 were commercial producing wells and 45 were waiting to be put into production (Appendix II). Additionally, 216 Point Pleasant wells were started in 2014 but completed in 2015.

The Clinton sandstone was the next most actively drilled zone accounting for 13% percent of all wells drilled. Ninety-two wells were drilled, 19 less than the 113 wells drilled in 2013.



**FIGURE 3:**  
Wells drilled  
by county – 2014  
Wells were  
drilled in 38 of 88  
counties, a decrease  
of three.

Source: ODNR, Division of Oil and Gas

	DRILLED	CONVERTED	TOTAL FOOTAGE
Productive Wells	699	—	9,108,931
Dry Holes	16	—	59,396
Reopened Wells	0	—	0
Lost Holes	9	—	54,387
Stratigraphic Test Wells	56	—	429,769
Gas Storage Wells	0	0	0
Class II Brine Injection Wells	10	5	70,886
Solution Mining Wells	5	0	13,434
Water Supply Well	1	0	1,000
<b>TOTAL</b>	<b>796</b>	<b>5</b>	<b>9,737,803</b>

**TABLE I:**  
Drilling operations  
by type of well  
– 2014

Of the wells drilled for oil and gas, 699 were productive and 16 were dry holes, for a 98% productive rate.

TABLE II - OIL AND GAS COMPLETION STATISTICS BY COUNTY – 2014												
COUNTY	DEPTH RANGE OF RESERVOIRS		MAJOR TARGETED RESERVOIRS	DEVELOPMENT		EXPLORATORY		TOTAL WELLS	PERCENT PRODUCTIVE	DRILLED FOOTAGE		TOTAL
	SHALLOW	DEEP		PRODUCTIVE	DRY	PRODUCTIVE	DRY			PRODUCTIVE	DRY	
Ashland	539	5,132	Berea/Trempealeau	4	1	5	0	10	90.00	27,422	745	28,167
Ashtabula	3,204	5,807	Clinton/Rose Run	2	0	0	0	2	100.00	9,185	0	9,185
Athens	1,768	1,780	Berea	1	0	0	0	1	100.00	1,830	0	1,830
Belmont	8,525	22,240	Point Pleasant	55	0	20	0	75	100.00	1,286,947	0	1,286,947
Carroll	7,770	20,730	Point Pleasant	97	0	2	0	99	100.00	1,531,736	0	1,531,736
Columbiana	5,776	20,540	Point Pleasant	8	0	3	0	11	100.00	163,979	0	163,979
Coshocton	925	3,829	Clinton	14	1	0	0	15	93.33	42,908	3,175	46,083
Cuyahoga	3,067	3,140	Clinton	1	1	0	0	2	50.00	3,302	3,357	6,659
Fairfield	1,794	3,772	Trempealeau	1	2	0	0	3	33.33	1,936	7,521	9,457
Geauga	4,030	4,128	Clinton	3	0	0	0	3	100.00	12,794	0	12,794
Guernsey	6,582	17,443	Point Pleasant	59	0	12	0	71	100.00	1,061,966	0	1,061,966
Hancock	1,430	1,480	Trenton	0	0	1	0	1	100.00	1,480	0	1,480
Harrison	6,009	20,206	Point Pleasant	121	0	15	0	136	100.00	2,185,504	0	2,185,504
Holmes	610	5,780	Berea	2	0	1	0	3	100.00	7,332	0	7,332
Huron	3,314	3,475	Trempealeau	3	0	0	0	3	100.00	10,410	0	10,410
Jefferson	8,580	18,344	Point Pleasant	2	0	2	0	4	100.00	68,872	0	68,872
Knox	702	4,900	Clinton	21	1	1	2	25	88.00	65,228	13,853	79,081
Licking	526	4,518	Clinton	15	2	0	0	17	88.24	37,363	5,158	42,521
Mahoning	4,934	14,590	Clinton	6	0	1	0	7	100.00	63,308	0	63,308
Meigs	1,782	1,796	Berea	3	0	0	0	3	100.00	5,702	0	5,702
Monroe	1,300	21,175	Point Pleasant	56	0	15	0	71	100.00	1,104,007	0	1,104,007
Morgan	6,173	14,987	Beekmantown	4	1	2	0	7	85.71	55,350	6,340	61,690
Morrow	3,348	3,420	Trempealeau	0	1	0	0	1	0.00	0	3,420	3,420
Muskingum	3,022	6,854	Clinton	7	0	0	1	8	87.50	34,946	5,972	40,918
Noble	1,620	20,423	Point Pleasant	54	0	6	0	60	100.00	930,774	0	930,774
Perry	3,300	5,795	Beekmantown	1	0	2	0	3	100.00	14,970	0	14,970
Pickaway	2,412	2,626	Trempealeau	8	0	0	0	8	100.00	20,712	0	20,712
Portage	3,989	12,479	Clinton	4	0	1	0	5	100.00	32,872	0	32,872
Preble	1,502	1,700	Trempealeau	0	0	0	1	1	0.00	0	1,700	1,700
Richland	4,474	4,710	Trempealeau	3	0	0	0	3	100.00	14,005	0	14,005
Sandusky	1,428	1,470	Trenton	1	0	0	0	1	100.00	1,657	0	1,657
Stark	4,360	7,412	Clinton	27	0	0	1	28	96.43	161,983	6,950	168,933
Summit	3,668	3,762	Clinton	2	0	0	0	2	100.00	7,903	0	7,903
Trumbull	3,855	12,845	Clinton	4	0	1	0	5	100.00	33,043	0	33,043
Tuscarawas	4,380	14,649	Point Pleasant	1	0	2	0	3	100.00	32,024	0	32,024
Washington	808	15,865	Berea	14	0	1	0	15	100.00	70,751	0	70,751
Wayne	3,266	3,314	Clinton	1	0	0	0	1	100.00	3,422	0	3,422
Wood	1,178	1,205	Trenton	0	0	1	1	2	50.00	1,308	1,205	2,513
<b>TOTAL</b>				<b>605</b>	<b>10</b>	<b>94</b>	<b>6</b>	<b>715</b>	<b>97.76</b>	<b>9,108,931</b>	<b>59,396</b>	<b>9,168,327</b>

Source: ODNR, Division of Oil and Gas

**TABLE II: Oil and gas completion statistics by county – 2014**

A summary of oil and gas completion statistics by county. Average well depth was 16,074 feet, an increase of 1,651 feet per well.

Clinton sandstone wells averaged 4,196 feet in depth, an increase of 196 feet per well. Clinton sandstone wells were drilled in 18 counties, the same as last year. The most active counties were Stark (23), Knox (17) and Coshocton (12).

Drilling to the Knox formations stayed the same with 51 wells drilled. Drilling occurred in these formations: Beekmantown (9), Rose Run (10) and Trempealeau (32). Drilling occurred in 16 counties including Pickaway (8), Knox (4) and Ashland, Morgan and Stark (3 each) as the most active.

There were 27 Berea Sandstone wells drilled, twelve less than last year. Drilling occurred in 8 counties.

Washington led with 7 wells. The average depth was 1,252 feet.

Twelve wells were drilled to the Ohio Shale, a decrease of 23 wells. Drilling occurred in three counties. Noble County led with 5 wells. The average depth per well, for the Ohio Shale, was 3,152 feet, a decrease of 760 feet per well. An additional 6 wells drilled to the Marcellus shale. All 6 Marcellus wells were in Monroe County. The average depth per well, for the Marcellus Shale, was 13,479 feet, an increase of 1,288 feet per well.

**TABLE III: OIL & GAS COMPLETION STATISTICS BY PRODUCING ZONE – 2014**

PRODUCING ZONES	DEPTH RANGE OF RESERVOIRS		DEVELOPMENT		EXPLORATORY		TOTAL WELLS	PERCENT PRODUCTIVE	DRILLED FOOTAGE		
	SHALLOW	DEEP	PRODUCTIVE	DRY	PRODUCTIVE	DRY			PRODUCTIVE	DRY	TOTAL
Pennsylvanian (Cow Run)	808	826	1	0	0	0	1	100.00	869	0	869
Upper Mississippian (Keener)	1,300	1,340	1	0	0	0	1	0.00	1,340	0	1,340
Mississippian (1st and 2nd Berea)	526	2,100	25	2	0	0	27	92.59	32,431	1,385	33,816
Devonian (Ohio Shale - Marcellus)	1,620	13,932	15	0	3	0	18	100.00	118,699	0	118,699
Devonian (Oriskany)	----	----	0	0	0	0	0	0	0	0	0
Silurian (Clinton - Medina)	1,794	6,549	90	2	0	0	92	97.83	379,532	6,532	386,064
Ordovician (Utica/Point Pleasant)	6,582	22,240	442	0	79	0	521	100.00	8,374,675	0	8,374,675
Ordovician (Trenton)	1,178	1,480	1	0	2	1	4	75.00	4,445	1,205	5,650
Ordovician (Beekmantown)	5,607	6,854	5	1	3	0	9	88.89	49,895	6,340	56,235
Cambro-Ordovician (Rose Run)	5,651	7,412	7	0	1	2	10	80.00	55,031	12,922	67,935
Cambrian (Trempealeau)	1,502	5,132	18	5	6	3	32	75.00	92,014	31,012	123,026
Precambrian	----	----	0	0	0	0	0	0.00	0	0	0
<b>TOTAL</b>			<b>605</b>	<b>10</b>	<b>94</b>	<b>6</b>	<b>715</b>	<b>97.76</b>	<b>9,108,931</b>	<b>59,396</b>	<b>9,168,327</b>

Source: ODNR, Division of Oil and Gas

**TABLE III: Oil and gas completion statistics by producing zone – 2014**

A summary of oil and gas completion statistics by producing zone.

## WELLS COMPLETED BY MONTH AND OWNER

Drilling activity averaged 60 wells per month compared to 54 per month in 2013. August was the most active month with 79 wells (Figure 4).

Ninety-four owners drilled wells in 2014, 2 less than in 2013. Eighty-seven percent of these owners drilled less than 10 wells. The highest number of wells drilled by a single owner was 171 and the 10 most active operators drilled 70% (500) of all wells. Thirty-seven owners only drilled one well.

Knox County (16) had the highest number of cable tool operations followed by Licking (7) and Coshocton (6). Cable tool depths ranged from 566 feet (Licking County) to 3,400 feet (Perry County). All of these wells were drilled to the Berea (15) or Clinton (21) sandstones. The average depth per well drilled by cable tool was 2,109 feet, an increase of 75 feet; rotary-drilled wells averaged 13,391 feet, an increase of 2,615 feet per well.

The horizontal rig count for unconventional or shale wells averaged 44 rigs per week compared to 34 rigs per week in 2013. The vertical rig count for conventional wells averaged 18 rigs per week compared to 23 rigs per week in 2013 (Figure 5).

## WELLS COMPLETED BY TYPE OF TOOL

Rotary tools drilled the majority of wells. Cable-tool rigs drilled 36 wells and operated in seven counties.

**FIGURE 4:**  
Wells completed by month 2013 vs. 2014  
Drilling activity averaged 60 wells per month compared to 54 per month in 2013.



**FIGURE 5:**  
Horizontal (unconventional) Vs. Vertical (conventional) Rig Count by Week 2014



## PLUG BACK AND DEEPEN OPERATIONS

One well was dry in its permitted formation but plugged back to produce a shallower zone. There were no existing wells plugged back to a different producing zone or drilled to a deeper formation.

## TEN MOST ACTIVE COUNTIES

Harrison County replaced Carroll County as the most active county with 136 wells drilled (Table IV) which is the second consecutive year that more than 100 wells were drilled in a county. Carroll was second with 99 wells. Belmont County advanced from eighth to third place (75 wells). The focus of drilling to the Utica/Point Pleasant shales was clearly seen in these top-ten counties.

The top six counties had 512 wells drilled in them and all but eleven wells had these shales as the target. Additionally, many of these counties had stratigraphic test wells drilled in them which are not included in these totals.

Nine of these counties were in the top-ten last year. Overall, the largest increases occurred in Harrison (76 wells), Belmont (54) and Monroe (43). Belmont and Meigs were last in the in the top-ten in 2011. The biggest well decreases took place in Carroll (87), Columbiana (15) and Meigs (15) counties. Washington County was in the top-ten for the first time since 2001.

2014 RANK	COUNTY	WELLS DRILLED	2013 RANK	AVERAGE DEPTH PER WELL	ESTIMATED FOOTAGE DRILLED
1	Harrison	136	(2)	16,070	2,185,504
2	Carroll	99	(1)	15,472	1,531,736
3	Belmont	75	(8)	17,159	1,286,947
4	Guernsey	71	(3)	14,957	1,061,966
4	Monroe	71	(5)	15,549	1,104,007
6	Noble	60	(4)	15,513	930,774
7	Stark	28	(6)	6,033	168,933
8	Knox	25	(10)	3,163	79,081
9	Licking	17	(12)	2,501	42,521
10	Coshocton	15	(10)	3,072	46,083
10	Washington	15	(22)	4,717	70,751

Source: ODNR, Division of Oil and Gas

TABLE IV:  
Ten most active counties – 2014

Harrison County was the most active county with 136 wells drilled. Carroll County was second with 99 wells.

## EXPLORATORY WELLS

Exploratory drilling remained active in 2014. One hundred wells (14%) were classified as exploratory which was 53 less than in 2013 (Figure 6). Of these, 94 were productive and 6 were dry, representing a 94% success rate.

Continued exploration in the Utica/Point Pleasant Shales resulted in 79 exploratory wells being drilled compared to 113 in 2013. Drilling below the Knox unconformity decreased to 15 wells. Wells drilled to formations below the Knox unconformity such as the Beekmantown dolomite (3), Rose Run sandstone (3) and Trempealeau dolomite (9), are almost always seismic prospects. Five of these wells were dry holes. The Trenton Limestone was also active with three wells.

Wells were drilled in 23 counties. Belmont (20) was the most active county, followed by Harrison and Monroe (15 each), Guernsey (12) and Noble (6).

The majority of exploratory wells were classified as either 'deeper pool wildcats' (53) or 'outposts' (41). Additionally, 6 wells were drilled as 'wildcats'. Productive rates were as follows: 'deeper pool wildcats' – 96%, 'outposts' – 98% and 'wildcats' – 50%.

## COUNTY DRILLING DEPTH RECORDS

There were no new drilling depth records in 2014 (Appendix III). There were thirteen horizontal wells drilled greater than 20,000 feet, all which surpassed the previous longest well drilled in 2013 of 19,946 feet. In Belmont County, a horizontal well was drilled 22,240 feet into the Point Pleasant Shale, making it the longest well ever drilled in the state.

**FIGURE 6:**  
Development vs.  
exploratory  
wells – 2014

One hundred wells (14%) were classified as exploratory wells – 53 less than in 2013.



Source: ODNR, Division of Oil and Gas

## PRODUCTION

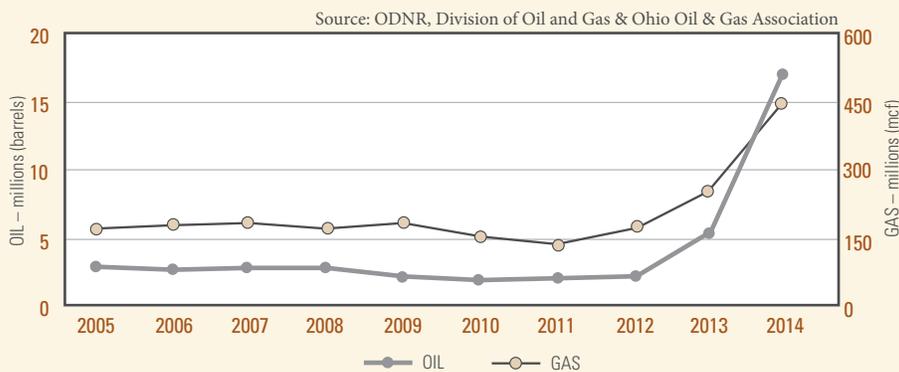
Ohio's total reported crude oil production was 15,062,912 barrels, an increase of 7,098,355 barrels (89.1%) from 2013 (Figure 7, Table V). This is most oil produced since 1984; the record for oil production was 23,941,169 barrels in 1896. In 2014, daily production averaged 41,268 barrels compared to 21,821 barrels in 2013. Through 2014, Ohio wells have produced 1,169,509,953 barrels. (Note: the 2013 oil production number was revised to 7,964,557 barrels).

Ohio wells produced 512,964,465 mcf of natural gas, an increase of 345,955,750 mcf (207.1%) from 2013 (Figure 7, Table V). Gas production figures include an estimated 593,173 mcf of natural gas used on the lease. This is the record for natural gas produced; the previous record for natural gas production was 186,479,632 mcf in 1984. In 2014, daily production averaged 1,405,382 mcf compared to 457,558 mcf in 2013.

Through 2014, Ohio wells have cumulatively produced 9,360,061,164 mcf of natural gas. (Note: the 2013 gas production number was revised to 167,008,715 mcf).

This year's production was influenced by the producing horizontal wells from the Marcellus and Utica/Point Pleasant shale formations. Wells producing from the Marcellus and Utica/Point Pleasant shale formations reported 10,999,162 barrels of oil (73% of total production) and 452,866,564 mcf of natural gas (88.3% of total production) (Appendix II).

The 2014 production numbers are an estimate based on available data reported to the Division of Oil & Gas Resources Management; oil reserve, gas reserve and gas consumption totals are based on data from the Department of Energy, Energy Information Administration.



**FIGURE 7:**  
Oil and gas  
production  
2005 – 2014

Ohio's total reported production of crude oil in 2014 was 15,062,912 barrels, and production of natural gas was 512,964,465 mcf.

Source: ODNR, Division of Oil and Gas, Department of Energy /Energy Information Administration

YEAR	OIL (Thousands of Barrels)		GAS (Mmcf)		
	PRODUCTION	RESERVES	PRODUCTION	RESERVES	CONSUMPTION
2005	5,652	46,000	84,135	898,000	825,961
2006	5,422	49,000	86,315	975,000	742,359
2007	5,455	48,000	88,095	1,027,000	806,350
2008	5,554	38,000	84,858	985,000	792,247
2009	5,009	38,000	88,824	896,000	740,925
2010	4,785	42,000	78,122	832,000	784,293
2011	4,853	41,000	73,290	758,000	823,548
2012	4,974	39,000	86,770	1,235,000	842,959
2013	8,006	42,000	167,923	3,201,000	912,403
2014	15,063	N/A	512,371	N/A	1,000,231

**TABLE V:**  
Crude oil and natural  
gas production,  
reserves and  
consumption  
2005 – 2014

In 2014, daily production of crude oil averaged 41,268 barrels compared to 21,821 barrels in 2013. In 2014, daily production of natural gas averaged 1,405,382 mcf compared to 457,558 mcf in 2013.

## MARKET VALUE

Estimated crude oil production valued at \$1,203,827,927<sup>(1)</sup> increased 57.1% (\$437,631,100) from its 2013 value. The average price per barrel was \$79.92, a decrease of \$15.79 from 2013's average price of \$95.71 per barrel (Table VI). Posted oil prices ranged from a high of \$105.76 (June 20 - 22) to a low of \$52.27 (December 31) per barrel.

The market value of natural gas increased 229% (\$1,349,595,035) to \$1,939,005,678<sup>(1)</sup>. The average price paid per mcf was \$3.78 in 2014, an increase

of \$0.27 per mcf from 2013 (Table VI). The Appalachian price index ranged from a low of \$3.63 in November to a high of \$5.61 in February.

Ohio's combined oil and gas market value increased by 131.8% (\$1,787,208,135). The total dollar value of \$3,142,833,605 is the highest on record (Figure 8). It exceeded the 1 billion dollar mark for the seventh time, with 1984 being the first time.

(1) Market value was estimated by multiplying the reported production volume by the average annual wellhead price.

Source: ODNR, Division of Oil and Gas, Appalachian Index - TCO & Ergon

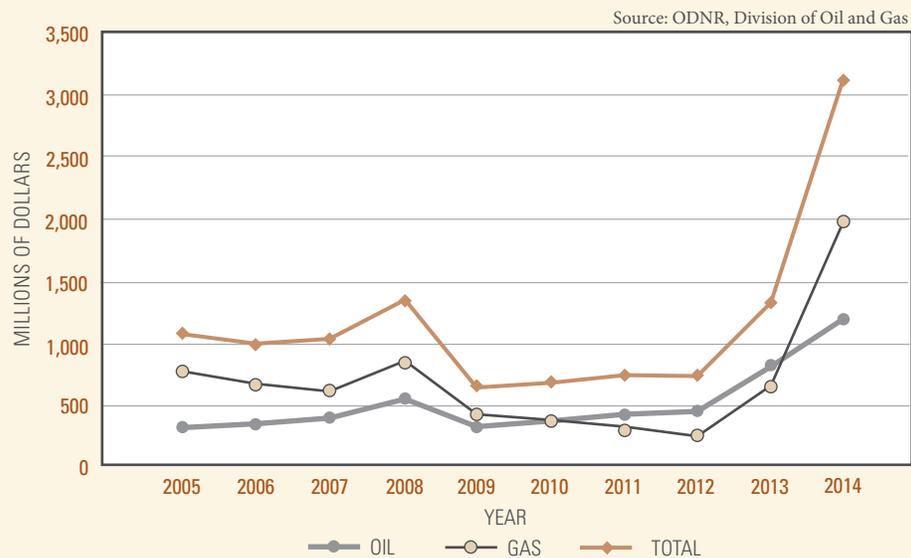
**TABLE VI:**  
Average  
wellhead price  
of oil and gas  
2005 – 2014

The average price per barrel of oil was \$79.92 in 2014, an increase of \$15.79 in 2013. The average price paid per mcf was \$3.78 in 2014, a increase of \$0.27 per mcf in 2013.

YEAR	OIL \$/Bbl	GAS \$/mcf
2005	\$53.03	\$9.03
2006	\$62.43	\$7.75
2007	\$67.69	\$7.40
2008	\$93.79	\$9.77
2009	\$55.56	\$4.36
2010	\$74.42	\$4.68
2011	\$90.06	\$4.28
2012	\$92.05	\$2.86
2013	\$95.71	\$3.51
2014	\$79.92	\$3.78

**FIGURE 8:**  
Dollar value  
of oil and gas  
2005 – 2014

Ohio's combined oil and gas total dollar value in 2014 was \$3,142,833,605.



## PLUGGING ACTIVITY

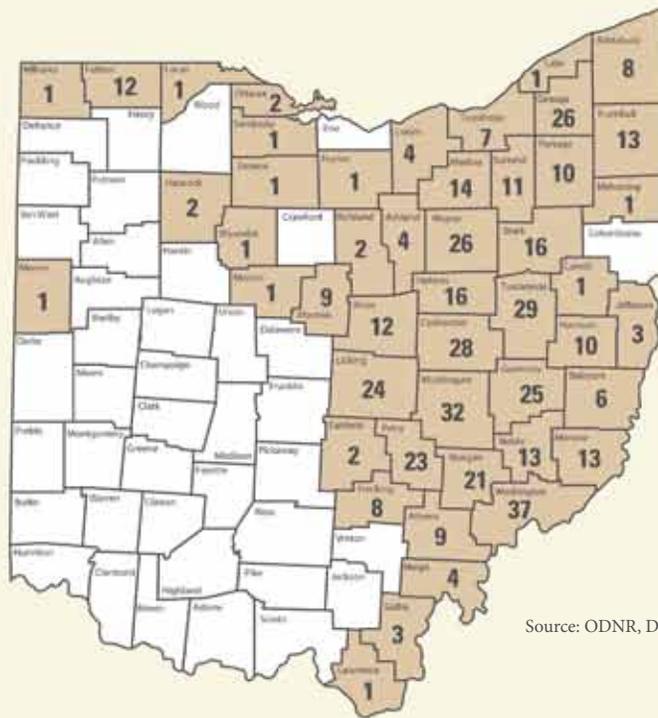
Plugging activity increased by 61 wells. Figure 9 compares plugging and drilling activity. In 2014, 496 wells were plugged compared to 435 in 2013. This total does not include dry or lost holes that were plugged in 2014. Nineteen of these wells were plugged through the Orphan Well Program. Additionally, three previously plugged wells were reopened for the purpose of re-plugging them.

Wells were plugged in 48 counties (Figure 10). Washington County (37) was the most active plugging county followed by Muskingum (32), Tuscarawas (29), Coshocton (28), Geauga (26) and Wayne (26).



**FIGURE 9:**  
Wells plugged vs. wells drilled 2005–2014

In 2014, 496 wells were plugged compared to 435 in 2013, a decrease of 61.



**FIGURE 10:**  
Wells plugged by county – 2014

Wells were plugged in 48 counties with Washington County having the most with 37.

Source: ODNR, Division of Oil and Gas

**APPENDIX I – WELLS DRILLED IN OHIO 1888 – 2014 (page 1)**

YEAR	PRODUCTIVE	DRY	TOTAL	BEREA	OHIO SHALE	CLINTON	UTICA/ POINT PLEASANT	TRENTON	ROSE RUN	CAMBRIAN
Prior (a) 1888 (b)	6,022	---	6,022	---	---	---	---	2,234	---	---
1888 (1)	617	---	617	---	---	---	---	542	---	---
1889	1,590	132	1,722	---	---	---	---	702	---	---
1890	2,497	96	2,593	---	---	---	---	2,151	---	---
1891	1,709	56	1,765	---	---	---	---	1,572	---	---
1892	1,551	38	1,589	---	---	---	---	1,465	---	---
1893	2,067	46	2,113	---	---	---	---	1,877	---	---
1894 (c)	3,216	85	3,301	---	---	---	---	3,001	---	---
1895	6,020	127	6,147	---	---	---	---	5,559	---	---
1896 (d)	5,600	856	6,456	---	---	---	---	4,339	---	---
1897	3,442	300	3,742	---	---	987	---	2,755	---	---
1898	3,338	172	3,510	---	---	132	---	2,852	---	---
1899	6,399	408	6,807	---	---	151	---	4,469	---	---
1900	6,098	457	6,555	---	---	116	---	5,013	---	---
1901	4,559	573	5,132	---	---	148	---	3,524	---	---
1902	5,651	649	6,300	---	---	306	---	4,213	---	---
1903	5,880	777	6,657	---	---	352	---	4,072	---	---
1904	4,974	858	5,832	---	---	382	---	3,141	---	---
1905	3,027	680	3,707	---	---	400	---	1,578	---	---
1906	2,903	681	3,584	---	---	388	---	1,535	---	---
1907	2,146	611	2,757	---	---	521	---	890	---	---
1908	2,083	695	2,778	---	---	522	---	848	---	---
1909	2,881	966	3,847	---	---	694	---	873	---	---
1910	2,059	670	2,729	---	---	668	---	572	---	---
1911	2,270	507	2,777	---	---	641	---	527	---	---
1912	3,527	956	4,483	---	---	926	---	551	---	---
1913	2,560	603	3,163	---	---	643	---	972	---	---
1914	2,371	534	2,905	---	---	943	---	861	---	---
1915	1,672	498	2,170	---	---	952	---	260	---	---
1916	2,028	525	2,553	---	---	469	---	699	---	---
1917	1,864	504	2,368	---	---	587	---	535	---	---
1918	1,708	446	2,154	---	---	605	---	466	---	---
1919	2,486	585	3,071	---	---	940	---	385	---	---
1920	2,421	722	3,143	---	---	1,240	---	565	---	---
1921	1,675	620	2,295	---	---	853	---	461	---	---
1922	1,989	607	2,596	---	---	906	---	522	---	---
1923	1,779	537	2,316	---	---	642	---	697	---	---
1924	1,704	439	2,143	---	---	605	---	592	---	---
1925	1,680	414	2,094	---	---	434	---	627	---	---

TABLE CONTINUED ON NEXT PAGE ►

APPENDIX I – WELLS DRILLED IN OHIO 1888 – 2014 (page 2)

YEAR	PRODUCTIVE	DRY	TOTAL	BEREA	OHIO SHALE	CLINTON	UTICA/ POINT PLEASANT	TRENTON	ROSE RUN	CAMBRIAN
1926	1,722	382	2,104	---	---	522	---	460	---	---
1927	1,286	337	1,623	---	---	---	---	262	---	---
1928	1,305	395	1,700	---	---	---	---	204	---	---
1929	1,936	634	2,570	---	---	---	---	191	---	---
1930	1,562	572	2,134	---	---	---	---	205	---	---
1931	789	287	1,076	---	---	---	---	148	---	---
1932	546	224	770	---	---	---	---	124	---	---
1933	496	183	679	---	---	---	---	123	---	---
1934	883	276	1,159	---	---	---	---	103	---	---
1935	544	192	736	---	---	---	---	94	---	---
1936	754	246	1,000	---	---	---	---	81	---	---
1937	813	432	1,245	---	---	---	---	---	---	---
1938	622	288	910	---	---	---	---	---	---	---
1939	713	319	1,032	---	---	---	---	---	---	---
1940	818	410	1,228	---	---	---	---	---	---	---
1941	1,034	527	1,561	---	---	---	---	---	---	---
1942	652	356	1,008	---	---	---	---	---	---	---
1943	625	391	1,016	---	---	---	---	---	---	---
1944	647	393	1,040	---	---	---	---	---	---	---
1945	649	385	1,034	---	---	---	---	---	---	---
1946	885	408	1,293	---	---	---	---	---	---	---
1947	899	484	1,383	---	---	---	---	---	---	---
1948	921	534	1,455	---	---	---	---	---	---	---
1949	626	426	1,052	---	---	---	---	---	---	---
1950 (2)	666	476	1,142	436	8	418	---	25	---	3
1951	626	435	1,061	394	10	406	---	18	---	6
1952	670	470	1,140	368	15	459	---	47	---	2
1953 (e)	711	386	1,097	359	21	402	---	30	---	6
1954	788	407	1,195	441	13	395	---	25	---	2
1955	898	336	1,234	---	---	---	---	---	---	---
1956	878	367	1,245	364	13	663	---	32	---	5
1957	773	268	1,041	260	12	579	---	21	---	2
1958	852	316	1,168	303	13	650	---	19	---	5
1959	843	315	1,158	300	11	672	---	20	---	13
1960	707	309	1,016	218	5	597	---	7	---	20
1961	809	295	1,104	257	10	619	---	4	---	42
1962	820	326	1,146	358	2	542	---	10	---	72
1963 (f)	748	407	1,155	266	2	443	---	14	4	302
1964	1,075	1,579	2,654	197	2	499	---	34	9	1,800
1965 (g)	904	801	1,705	195	2	635	---	53	16	729

TABLE CONTINUED ON NEXT PAGE ►

APPENDIX I – WELLS DRILLED IN OHIO 1888 – 2014 (page 3)

YEAR	PRODUCTIVE	DRY	TOTAL	BEREA	OHIO SHALE	CLINTON	UTICA/POINT PLEASANT	TRENTON	ROSE RUN	CAMBRIAN
1966	872	399	1,271	227	4	692	---	18	8	261
1967	953	258	1,211	170	17	853	---	18	4	132
1968	988	229	1,217	136	66	832	---	21	6	81
1969	926	183	1,109	104	17	863	---	13	10	56
1970	1,165	190	1,355	84	15	1,146	---	5	6	42
1971	1,065	173	1,238	98	11	1,038	---	5	5	37
1972	1,125	168	1,293	112	21	1,082	---	3	10	32
1973	1,337	166	1,503	76	31	1,345	---	5	5	26
1974	1,601	167	1,768	91	13	1,587	---	3	8	31
1975	1,105	115	1,220	62	6	1,103	---	5	17	22
1976	1,774	164	1,938	165	30	1,631	---	38	18	16
1977	2,455	171	2,626	390	34	2,083	---	33	11	15
1978 (h)	3,132	283	3,415	430	22	2,834	---	22	27	12
1979	3,480	179	3,659	542	131	2,848	---	22	29	23
1980	4,935	165	5,100	867	78	3,734	---	1	24	31
1981	5,685	400	6,085	733	543	4,366	---	---	16	50
1982	4,488	342	4,830	756	458	3,426	---	---	11	4
1983	4,000	299	4,299	557	533	3,203	---	1	7	51
1984	4,593	370	4,963	612	329	3,827	---	---	9	65
1985	3,546	214	3,760	345	315	3,042	---	---	19	94
1986	1,725	125	1,850	185	76	1,482	---	---	28	62
1987	1,721	161	1,882	153	40	1,454	---	---	70	55
1988	1,267	156	1,423	112	43	1,037	---	---	94	62
1989	1,153	159	1,312	69	145	890	---	---	92	77
1990	1,147	180	1,327	61	97	863	---	---	143	102
1991	1,001	170	1,171	89	89	794	---	---	116	108
1992	710	165	875	100	51	465	---	---	139	87
1993	643	180	823	60	35	330	---	2	260	89
1994	601	182	783	26	13	301	---	9	269	75
1995	507	163	670	25	11	253	---	2	202	94
1996	559	166	725	35	42	253	---	1	219	90
1997	620	178	798	33	20	277	---	0	223	110
1998	383	135	518	66	16	154	---	0	161	61
1999	407	95	502	32	65	177	---	5	106	55
2000	455	112	567	18	14	281	---	3	124	77
2001	599	100	699	36	29	396	---	1	113	58
2002	432	72	504	8	48	265	---	0	88	47
2003	455	65	520	30	60	258	---	2	82	40
2004 (i)	534	55	589	32	97	319	---	1	66	24
2005	658	69	727	48	116	409	---	7	45	50

TABLE CONTINUED ON NEXT PAGE ►

**APPENDIX I – WELLS DRILLED IN OHIO 1888 – 2014 (page 4)**

YEAR	PRODUCTIVE	DRY	TOTAL	BEREA	OHIO SHALE	CLINTON	UTICA/POINT PLEASANT	TRENTON	ROSE RUN	CAMBRIAN
2006	915	45	960	90	134	636	---	8	18	23
2007	1,022	46	1,068	90	157	672	---	7	35	32
2008	1,028	61	1,089	124	155	662	---	1	21	38
2009	517	46	563	43	97	320	---	2	30	25
2010 (j)	382	45	427	47	40	228	---	5	18	42
2011	443	26	469	52	51	222	25	2	26	47
2012 (k)	522	38	560	40	76	169	198	8	14	40
2013	622	20	642	39	35	111	390	4	12	26
2014	699	16	715	27	18	92	521	4	10	32
<b>TOTAL (l)</b>	<b>223,490</b>	<b>42,670</b>	<b>266,160</b>	<b>13,045</b>	<b>4,683</b>	<b>80,959</b>	<b>1,134</b>	<b>71,138</b>	<b>3,103</b>	<b>5,858</b>

Source: ODNR, Division of Oil and Gas

**REFERENCES**

1. Years 1888-1950: Alkire, Robert L., 1951, Oil and Gas Production, History, Regulation, Secondary Recovery and Bibliography, 8, part 2 of Ohio Division of Geological Survey Report of Investigations: 45-46 pp.
2. Years 1950-2014: Statistics from Annual Oil & Gas Statistical Reports published by Ohio Divisions of Oil & Gas Resources Management and Geological Survey. Numbers were not available for blank formation fields.

**HISTORICAL FOOTNOTES**

- a. Ohio lays claim to the first discovery of oil from a drilled well. In 1814, saltwater well drillers struck oil in Olive Township of Noble County at 475 feet.
- b. Ohio's first commercial oil and gas well was put into production in 1860 at Macksburg in Washington County.
- c. Alkire notes that the statistics for years 1894-1904 were incomplete and estimated that the total number of wells not accounted for during those years is approximately 12,000.
- d. Ohio was the nation's leading oil producer in 1896.
- e. Widespread acceptance of the hydraulic fracture method for increasing production in 1953.
- f. Morrow County Oil Boom in 1963.
- g. Creation of Ohio Division of Oil and Gas in 1965.
- h. Natural Gas Policy Act tax credit in 1978.
- i. Urbanized Drilling Law (HB 278) went into effect September 16, 2004.
- j. Senate Bill 165 went into effect June 30, 2010.
- k. Senate Bill 315 went into effect September 10, 2012.
- l. Total number of wells may actually be 278,160 (see footnote c).

## 2014 HORIZONTAL SHALE PRODUCTION BY COUNTY

Quarterly production reports for all horizontal wells drilled and completed in the Marcellus and Utica/Point Pleasant formation(s) have been combined into an annual report. The combined report and quarterly shale reports and can be found at: <http://oilandgas.ohiodnr.gov/production>.

The number of wells in production increased from 418 in the first quarter to 779 in the 4th quarter. Each quarter had production reports submitted on wells that were shut in and had not produced. Oil production increased from 1,951,641 barrels for the first quarter to 3,560,787 barrels for the fourth quarter. Natural gas production increased from 67,329,316 mcf for the first quarter to 165,020,459 mcf for the fourth quarter. Gas reporting totals include Natural Gas Liquids (NGL) as Ohio law does not require the separate reporting of these commodities. Total horizontal shale production for 2014 was 11,001,117 barrels of oil and 453,053,944 mcf of natural gas.

Eighteen counties submitted production reports for 2014. The totals by county are listed in Appendix II. The top 3 counties for oil production were: Carroll, Harrison and Noble. The top 3 counties for gas production were: Carroll, Belmont and Monroe.

It is very unlikely that the wells are being produced at anything near full capacity. Wells produced at high initial rates have the potential of being permanently damaged. Additionally, some wells that were previously reported as productive have been shut-in temporarily as a safety precaution due to simultaneous operations occurring on the well pad. Other wells may be waiting on infrastructure.

APPENDIX II – 2014 HORIZONTAL SHALE PRODUCTION BY COUNTY				
COUNTY	NUMBER OF WELLS	OIL TOTAL	GAS TOTAL	BRINE TOTAL
Belmont	73	154,013	95,246,696	879,081
Carroll	329	3,962,654	161,137,566	2,254,462
Columbiana	53	172,387	21,272,751	312,653
Coshocton	1	0	0	1,267
Guernsey	60	1,280,229	12,547,332	416,734
Harrison	142	2,913,700	49,975,816	1,276,428
Jefferson	17	24	7,775,426	50,833
Mahoning	13	26,927	4,034,561	159,567
Monroe	56	145,186	59,403,849	1,117,149
Morgan	2	46,619	164,519	36,622
Muskingum	1	4,902	74,873	1,273
Noble	61	2,165,721	38,341,044	770,440
Portage	4	1,030	98,666	1,345
Stark	2	8,101	160,647	1,897
Trumbull	10	40,688	1,078,096	67,600
Tuscarawas	5	41,897	263,400	22,599
Washington	8	37,039	1,478,702	93,358
Wayne	1	0	0	0
<b>TOTALS</b>	<b>838</b>	<b>11,001,117</b>	<b>453,053,944</b>	<b>7,463,308</b>

Source: ODNR, Division of Oil and Gas

**APPENDIX III - COUNTY DRILLING DEPTH RECORDS - 2014 (page 1)**

COUNTY	TOWNSHIP	PERMIT NO.	OPERATOR	WELL NO.	LEASE NAME	COMPLETION DATE	TOTAL DEPTH	FORMATION AT TOTAL DEPTH	WELL CLASS
ADAMS	FRANKLIN	11	OXFORD OIL CO.	1	J. RUSSELL & M. TENER	07/07/79	3,886	GRANITE WASH	FWC
ALLEN	SPENCER	64	ALCO OIL CO.	2	POHLMAN, FRUEND, ETZ HORN	12/31/65	3,266	GRANITE	FWC
ASHLAND	LAKE	1762	ROY STEWART	1	KENNETH & REX MASHER	02/04/60	5,485	TREMPEALEAU	DPWC
ASHTABULA	NEW LYME	2272	POI ENERGY	1	LAUTANEN	09/01/85	7,124	GRANITE	DPWC
ATHENS	DOVER	3062	QUAKER STATE	2	MILLFIELD COAL & MINING	07/17/84	6,525	ROSE RUN	FWC
AUGLAIZE	ST. MARYS	71	WEST OHIO OIL & GAS	1	D. & B. HOELSCHER	12/05/70	3,067	GRANITE	DPWC
BELMONT	PEASE	611	DAVID R. HILL INC.	1	GEORGETOWN MARINE	12/06/10	13,727	GRANITE	DPWC
BROWN	STERLING	6	SPENCER PETROLEUM CORP.	1	GRIFFITH	03/13/93	3,350	GRANITE	FWC
BUTLER	LEMON	4	ARMCO STEEL CORP.	1	ARMCO STEEL CORP.	03/12/67	3,296	"MIDDLE RUN"	IWDW
CARROLL	LEE	2059	ANSCHUTZ EXPLOR. CORP.	1	WHITE	09/15/10	9,503	ROSE RUN	DPWC
CHAMPAIGN	WAYNE	20	INDUSTRIAL GAS ASSOC.	1	P. & C. HOFFMAN	06/26/78	3,325	MT. SIMON	FWC
CLARK	MADISON	D 2	T. D. FRIEND	1	MATTISON	06/14/26	4,647	PRE MT. SIMON	FWC
CLERMONT	STONELICK	3	CONTINENTAL OIL CO.	1	C. WIKOFF	07/03/60	3,435	MT. SIMON	FWC
CLINTON	WILSON	10	STOCKER & SITLER INC.	1	COY	01/18/83	3,603	GRANITE	FWC
COLUMBIANA	HANOVER	648	MANAGEMENT CONTROL	3	F. MURRAY	07/28/70	10,242	GRANITE	DPWC
COSHOCTON	CRAWFORD	6397	LAKE REGION OIL INC.	2	LEVI M. TROYER	07/23/92	7,950	MT. SIMON	DPWC
CRAWFORD	VERNON	6	HAYNES O&G ENTERPRISES	1	DON D. CRUM	01/09/63	3,879	EAU CLAIRE	FWC
CUYAHOGA	MAYFIELD	1625	BASS ENERGY CO. INC.	1	MARCONI MEDICAL SYSTEMS	03/07/01	6,550	GRANITE	DPWC
DARKE	GREENVILLE	13 A	UNKNOWN	1	EDWARD BARNES	05/26/06	2,950	CAMBRIAN	FWC
DEFIANCE	MARK	28	S. E. BROWN	1	P. HAVER	10/22/62	3,606	MT. SIMON	FWC
DELAWARE	TRENTON	354	R.C. POLING CO. INC.	1	COCKRELL-GODSHALL UNIT	01/22/91	4,873	GRANITE	DPWC
ERIE	FLORENCE	19	SUN OIL CO.	1	A. HERMAN ETAL.	05/01/67	4,466	GRANITE	SWIW
FAIRFIELD	RUSH CREEK	1136	HOPEWELL O. & G. DEV. CO.	1	R. BIGHAM	06/16/94	5,924	GRANITE	DPWC
FAYETTE	UNION	1	KEWANEE OIL CO.	1	E. HOPKINS	07/12/57	4,708	GRANITE	FWC
FRANKLIN	PLEASANT	7	BARNWELL PRODUCING CO.	1	OAKHURST COUNTRY CLUB	08/08/64	3,753	MT. SIMON	FWC
FULTON	CHESTERFIELD	47	LIBERTY PETR. CORP.	1	CLYDE JOHNSTON	03/21/69	3,793	MT. SIMON	FWC
GALLIA	HARRISON	985	BAKERWELL INC.	1	JARRELL UNIT	03/24/04	7,146	TREMPEALEAU	FWC
GAUGA	TROY	1534	LOMAK PETROLEUM	1	J. VOYTKO	07/01/88	6,888	TREMPEALEAU	DPWC
GREENE	ROSS	4	TATUM PETR. CO. LLC.	1	KELLY GREENE	08/17/10	3,347	GRANITE	FWC
GUERNSEY	WESTLAND	4067	DAVID R. HILL, INC.	1	DEVCO UNIT	03/16/08	8,897	GRANITE	DPWC
HAMILTON	CROSBY	1	CONTINENTAL OIL CO.	1	WALTER C. BRISBIN	11/01/59	2,730	EAU CLAIRE	FWC
HANCOCK	UNION	139	FRANK M. DEVER	1	C. & M. FRAZIER	06/02/64	3,017	GRANITE	FWC
HARDIN	DUDLEY	79	MCMAHON BULLINGTON	1	WOLF	01/07/64	3,002	KNOX	FWC
HARRISON	GREEN	355	STOCKER & SITLER INC.	1	CHARLENE SCHANEY ETAL.	07/30/79	10,288	TREMPEALEAU	DPWC
HENRY	HARRISON	36	CALLANDER & KIMBREL	1	K. HALL	10/10/73	3,480	GRANITE	DPWC
HIGHLAND	FAIRFIELD	7	OHIO VALLEY OIL & GAS	1	COURTNEY	01/20/72	3,610	GRANITE	FWC
HOCKING	STARR	1222	E. J. DUNIGAN	1	M. & H. HOCKMAN	06/30/66	6,495	MT. SIMON	FWC
HOLMES	SALT CREEK	1283	G.C. & J.A. PARKER	1	DAN D. TROYER	11/12/63	7,369	TREMPEALEAU	FWC
HURON	WAKEMAN	103	APPALACHIAN EXPLOR. INC.	1	WOLF	10/05/81	4,574	GRANITE WASH	FWC
JACKSON	FRANKLIN	76	WORTHINGTON OIL CO.	1	G. & I. WOOD	07/08/64	6,320	GRANITE	FWC
JEFFERSON	WARREN	536	CHESAPEAKE EXPL., LLC	25-5-2	CREAMER	10/10/12	10,320	TRENTON	ST
KNOX	PIKE	1413	DAVID L. CANTWAY	1	E. CUNNINGHAM	08/07/61	5,745	GRANITE	FWC
LAKE	LEROY	1094	GREAT PLAINS EXPL. LTD	1	VROOMAN	01/24/04	6,355	GRANITE	DPWC
LAWRENCE	SYMMES	174	J. STANLEY GOLDBERG	1	A. PAYNE	04/01/66	7,002	GRANITE	FWC

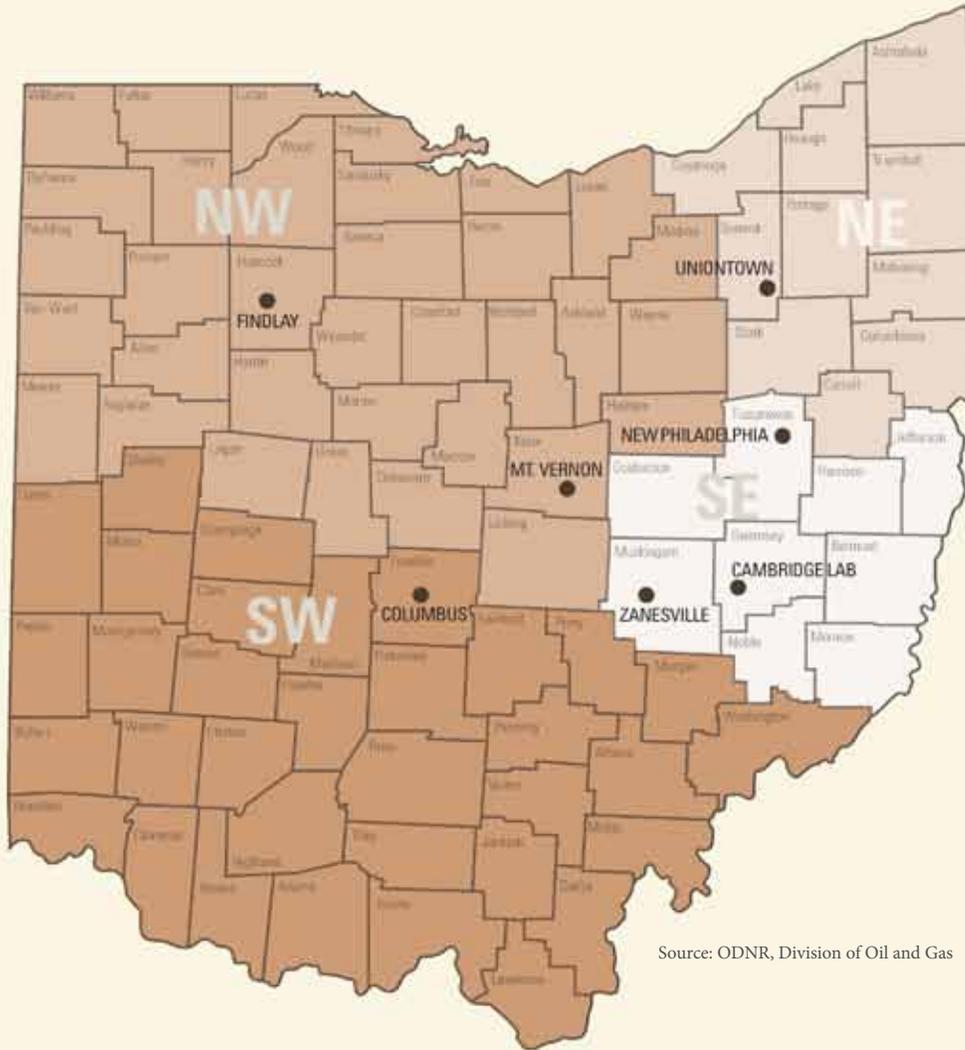
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APPENDIX III - COUNTY DRILLING DEPTH RECORDS - 2014 (page 2)

COUNTY	TOWNSHIP	PERMIT NO.	OPERATOR	WELL NO.	LEASE NAME	COMPLETION DATE	TOTAL DEPTH	FORMATION AT T.D.	WELL CLASS
LICKING	PERRY	4792	RONALD F. MORAN	1	RON MORAN	03/08/84	6,237	GRANITE	SWIW
LOGAN	JEFFERSON	86	WORTHINGTON OIL CO.	1	LENA COMER	05/11/76	3,402	MT. SIMON	FWC
LORAIN	GRAFTON	1370	KENOIL/KEN R. MILLER	1	LAWRENCE PALL	08/24/91	5,018	TREMPEALEAU	DPWC
LUCAS	HARDING	60	LIBERTY PETR. CORP.	1	KETRING UNIT	08/24/72	3,915	GRANITE	FWC
MADISON	FAIRFIELD	3	AMERADA PETR. CORP.	1	J. HUME	11/01/65	3,631	GRANITE	FWC
MAHONING	BEAVER	3158	D & L ENERGY, INC.	4	NORTHSTAR LUCKY	10/21/11	10,088	GRANITE	SWIW
MARION	CLARIDON	8	UNITED PRODUCING	1	H. & M. MITCHELL	03/14/62	3,672	GRANITE	FWC
MEDINA	HINCKLEY	1143	WISER OIL CO.	1 A	F. L. SMITH	01/03/59	7,040	GRANITE	FWC
MEIGS	LEBANON	3651	MURPHY OIL CO.	3	M. MCKELVEY	02/10/09	9,082	TREMPEALEAU	DPWC
MERCER	CENTER	141	HARNER UNION OIL CO.	2	M. & M. YEWWEY	02/09/71	3,215	GRANITE	DPWC
MIAMI	LOST CREEK	3	NATIONAL ASSOC. PETR.	1	E. WALKER	10/30/58	3,513	GRANITE	FWC
MONROE	OHIO	4305	PROTÉGÉ ENERGY II, LLC	1	DANGEL	01/18/12	10,980	TRENTON	ST
MONTGOMERY	MAD RIVER	D-2	DAYTON	M	DAYTON	01/1887	2,440	UNKNOWN	UNKN.
MORGAN	CENTER	4533	ARTEX OIL COMPANY	1	BICKFORD UNIT	08/20/05	8,222	ROSE RUN	DPWC
MORROW	PERRY	3737	STAR EXPL. CORP.	1	R. & W. BREWER	12/19/86	5,000	GRANITE	DPWC
MUSKINGUM	UNION	8776	1960 WELL SERVICES, LLC.	1	GOFF SWD	05/14/13	8,014	MT. SIMON	SWIW
NOBLE	ELK	1278	AMERADA PETR. CORP.	1	R. ULLMAN	02/01/67	11,442	GRANITE	DPWC
OTTAWA	CARROLL	50	FRED E. FITZGERALD	1	RAYMOND ARNDT	08/07/68	2,287	ST. PETER	FWC
PAULDING	JACKSON	13	MT. PLEASANT MINES LTD.	1	H. & E. AREND	10/30/76	3,440	GRANITE	FWC
PERRY	JACKSON	6595	R.C. POLING CO. INC.	1	RUSH CREEK PARTNERS, ETAL.	04/20/85	6,395	GRANITE	SWIW
PICKAWAY	PICKAWAY	24	RAMCO OIL & GAS CORP.	1	M. KERNS	01/17/85	4,500	GRANITE	FWC
PIKE	BEAVER	1	FRANK D. STAHLER	1	R. BAPST	06/14/50	4,227	ST. PETER	FWC
PORTAGE	DEERFIELD	2860	VIKING RESOURCES CORP.	1	VIKING RESOURCES CORP.	05/24/82	8,800	GRANITE WASH	DPWC
PREBLE	WASHINGTON	D-3	DOC TOLLIVER	3	A. H. CHRISTMAN	06/01/29	1,750	ST. PETER	FWC
PUTNAM	LIBERTY	31	OHIO OIL CO.	1	L. BARLAGE	03/21/44	3,377	GRANITE	FWC
RICHLAND	WASHINGTON	431	TRI STATE PRODUCING CO.	2	C. & K. SCOTT	09/05/66	5,503	GRANITE	DPWC
ROSS	GREEN	8	WELL SUPERVISION INC.	1	M. IMMELL	08/24/64	4,168	MT. SIMON	FWC
SANDUSKY	TOWNSEND	77	EAST OHIO GAS CO.	2	V. & I. HAFF	11/17/60	3,128	GRANITE	FWC
SCIOTO	GREEN	212	USS CHEMICALS/US STEEL	1	USS CHEMICALS/US STEEL	07/05/68	5,617	GRANITE	IWDW
SENECA	ADAMS	128	ASHLAND OIL	1	W. STIGAMIRE	01/24/65	3,175	MT. SIMON	FWC
SHELBY	SALEM	13	GUMP OIL CO.	1	J. & B. FOGY	11/10/56	3,360	GRANITE	FWC
STARK	PARIS	5052	VIKING RESOURCES CORP.	1	HANNA UNIT	09/02/97	8,292	ROSE RUN	POOL
SUMMIT	TWINSBURG	1591	K.S.T. OIL & GAS CO.	5	K.S.T. OIL & GAS CO.	07/18/84	7,225	GRANITE WASH	SWIW
TRUMBULL	LIBERTY	4043	D & L ENERGY, INC.	2	NORTHSTAR UNITED	08/21/11	9,038	GRANITE	SWIW
TUSCARAWAS	OXFORD	5465	RED HILL DEVELOPMENT	1	GENERAL CLAY	01/23/11	8,720	GRANITE	DPWC
UNION	DOVER	69	FUNK EXPLORATION	1	YODER	08/15/84	3,500	GRANITE	FWC
VAN WERT	JENNINGS	44	WEST OHIO GAS CO.	5	A. & M. MILLER	01/05/73	3,242	GRANITE	DPWC
VINTON	VINTON	924	COLUMBIA NAT. RES. INC.	723984	MORRIS	03/25/00	5,700	TREMPEALEAU	FWC
WARREN	WAYNE	C 2627	OHIO GEOLOGICAL SURVEY	DS-2	AMERICAN AGGREGATES CORP.	04/26/89	5,380	"MIDDLE RUN"	CORE
WASHINGTON	GRANDVIEW	9717	FLAT ROCK DEV. LLC	19	COLLINS	10/17/12	10,220	TRENTON	ST
WAYNE	CHIPPEWA	71	EAST OHIO GAS CO.	2	N. STEINER	08/12/61	6,919	GRANITE	DPWC
WILLIAMS	BRIDGEWATER	46	COLUMBIA GAS TRANS.	11061	COOK	12/31/71	4,497	GRANITE WASH	FWC
WOOD	LIBERTY	D-6	J. S. BRAILEY	1	S. KILLIAN	08/25/37	2,927	GRANITE	DPWC
WYANDOT	JACKSON	D-8	DIBBLE & MILLER	1	P. PARSELL	03/07/47	5,632	GRANIT	FWC

Source: ODNR, Division of Oil and Gas

## ODNR DIVISION OF OIL AND GAS RESOURCES MANAGEMENT REGIONAL OFFICES AND CONTACTS



Source: ODNR, Division of Oil and Gas

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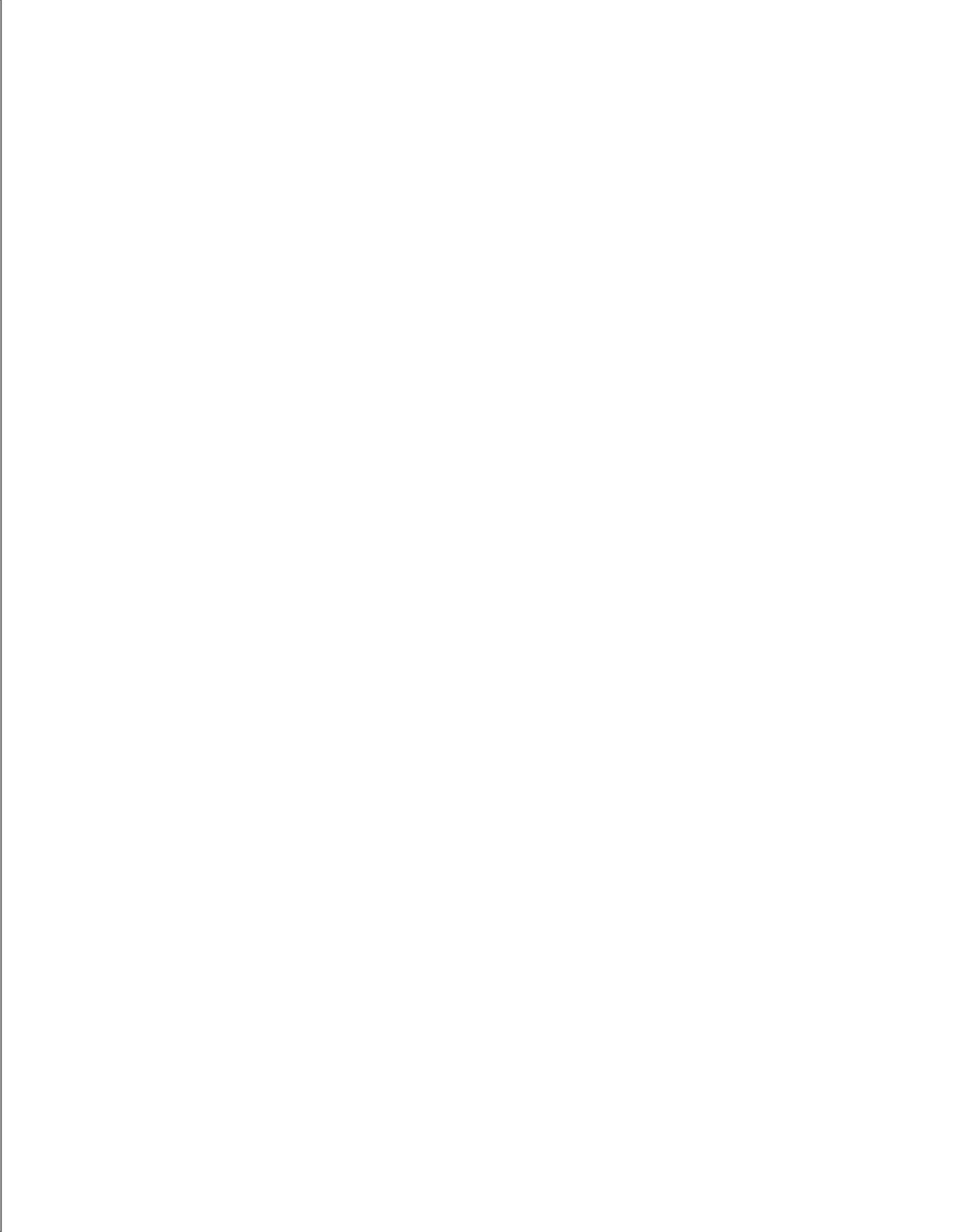
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Ohio Department of  
**NATURAL RESOURCES**

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**DIVISION OF OIL & GAS RESOURCES MANAGEMENT**

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John R. Kasich, Governor • James J. Zehringer, Director • Richard J. Simmers, Chief