

2016 Marcellus Shale and Utica-Point Pleasant Production Summary

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This summary was prepared by the West Virginia Geological and Economic Survey (WVGES). The data summarized herein were reported by operators to the West Virginia Department of Environmental Protection (WVDEP) Office of Oil and Gas for calendar year 2016. This report documents the increase in gas production and a decrease in natural gas “liquids” production.



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These production volumes represent data acquired by WVGES as of November 27, 2017. This dataset uses the data posted by WVDEP as of 11/13/2017. 2016 production data from several operators reporting Marcellus and Utica-Point Pleasant production in 2016 may not have been available at the time of this report; therefore, the values listed above may change as more data become available. Additionally, these volumes represent the total production from a given well and may be commingled in vertical wells from multiple formations, including the Marcellus Shale.

Glossary

bbl-barrel

Bcf-billion cubic feet

Mcf-thousand cubic feet

MMcf-million cubic feet

NGL-natural gas liquids

2016 Marcellus Shale Production Summary

Wells included in this overview all report production from the Marcellus Shale, but volumes may also include gas or liquids produced from commingled formations. "Liquids" refer to all heavier-chain hydrocarbons produced and may include oil as well as the natural gas liquids ethane, pentane, butane, hexane, etc. Beginning in 2013, WVDEP Office of Oil and Gas reporting requirements stated that natural gas liquids (NGLs) were to be reported separately from oil production. An examination of the numbers shows that many operators still included NGLs in oil production; therefore, reported oil and NGL numbers were combined and are referred to as "Liquids" in this report. Also, a noted overall decrease in reported liquids from 2015 to 2016 may be due to how liquids are being reported by operators. A 2016 legislative rule changed the reporting requirements for NGL production volumes so that condensate collected at the wellhead is reported and downstream NGLs extracted at processing plants is not reported. Selected 2015 data are shown in blue for comparison.

Number of horizontal Marcellus wells reporting production: 1862 (2015: 1668 wells)

Average measured depth reported: 13,214 ft.

Longest/Deepest measured depth reported: 20,294 ft.

Number of vertical Marcellus wells reporting production: 1425 (2015: 1298 wells, 2014: 1458 wells)

Average vertical depth reported: 5,553 ft.

Deepest vertical depth reported: 10,814 ft

Total Marcellus Gas Production 2016: 1,203.5 Bcf (2015: 1,133.1 Bcf)

The 2016 volume of Marcellus gas reported represents 86.9% of the total gas volume reported for all wells in West Virginia.

Top Gas Producing Counties 2016

1. Doddridge (322.6 Bcf)	2015: Doddridge (351.3 Bcf)
2. Wetzel (193.3 Bcf)	2015: Wetzel (195.0 Bcf)
3. Marshall (131.4 Bcf)	2015: Harrison (133.5 Bcf)
4. Ritchie (125.2 Bcf)	2015: Marshall (126.6 Bcf)
5. Harrison (119.7 Bcf)	2015: Ritchie (78.9 Bcf)
6. Tyler (115.5 Bcf)	2015: Tyler (75.5 Bcf)
7. Ohio (48.3 Bcf)	2015: Ohio (37.9 Bcf)
8. Taylor (34.6 Bcf)	2015: Taylor (27.1 Bcf)
9. Marion (30.0 Bcf)	2015: Barbour (25.2 Bcf)
10. Monongalia (26.6 Bcf)	2015: Marion (24.1 Bcf)

Top Operators for Gas Production 2016

1. Antero Resources Corp (472.7 Bcf)	2015: Antero Resources Corp (442.3 Bcf)
2. EQT Production Co (271.4 Bcf)	2015: EQT Production (175.4 Bcf)
3. Southwestern Prod Co (111.8 Bcf)	2015: Southwestern Prod Co (111.3 Bcf)
4. HG Energy (93.7 Bcf)	2015: Noble Energy Inc (99.1 Bcf)
5. Ascent Resources (41.7 Bcf)	2015: Ascent Resources (42.1 Bcf)
6. Jay-Bee Oil & Gas (36.1 Bcf)	2015: Stone Energy (39.7 Bcf)
7. Arsenal Resources (35.7 Bcf)	2015: Jay-Bee Oil & Gas (34.0 Bcf)

- | | |
|--|--------------------------------------|
| 8. CNX Gas (25.6 Bcf) | <i>2015: CNX Gas (32.5 Bcf)</i> |
| 9. Northeast Natural Energy (22.8 Bcf) | <i>2015: Trans Energy (23.6 Bcf)</i> |
| 10. Triad Hunter (21.3 Bcf) | <i>2015: Triad Hunter (22.5 Bcf)</i> |
| 11. Tug Hill Operating (21.2 Bcf) | |

Top Gas Wells In 2016

1. **4710303036**, WV 514419 (3.22 Bcf; EQT Prod Corp; Wetzel County, Completed October, 2015)
2. **4710302984**, WV 511407 (3.15 Bcf; EQT Prod Corp; Wetzel County, Completed January, 2016)
3. **4701706533**, Yoho Unit 2H (3.14 Bcf; Antero Resources Corp; Doddridge County, Completed February, 2016)
4. **4708510143**, Ericson Unit 2H (3.08 Bcf; Antero Resources Corp; Ritchie County, Completed September, 2015)
5. **4710303037**, WV 514416 (2.99 Bcf; EQT Prod Corp; Wetzel County, Completed October, 2015)

Total 2016 Marcellus Liquids Production*: 6,501,038 bbl *(2015: 10,210,805 bbl)*

The 2016 volume of Marcellus liquids reported represents 85.1% of the total liquids volume reported for all wells in West Virginia.

**Decrease in the volume of Liquids Production from 2015 to 2016 is likely due to a change in the way NGL data are reported the WVDEP. A 2016 legislative rule change in West Virginia required that condensate (lease condensate) data rather than NGL data are to be reported to WVDEP. The volumes reported are to be liquid condensate at the wellhead, not NGL volumes extracted downstream at processing plants.*

Top Liquids Producing Counties 2016*

- | | |
|-----------------------------|---------------------------------------|
| 1. Ohio (1,727,892 bbl) | <i>2015: Tyler (2,689,253 bbl)</i> |
| 2. Marshall (1,544,250 bbl) | <i>2015: Marshall (2,413,282 bbl)</i> |
| 3. Ritchie (952,760 bbl) | <i>2015: Ohio (1,571,894 bbl)</i> |
| 4. Brooke (703,033 bbl) | <i>2015: Wetzel (1,416,341 bbl)</i> |
| 5. Doddridge (608,913 bbl) | <i>2015: Brooke (715,943 bbl)</i> |
| 6. Tyler (544,899 bbl) | <i>2015: Doddridge (712,948 bbl)</i> |
| 7. Wetzel (406,831 bbl) | <i>2015: Ritchie (676,459 bbl)</i> |

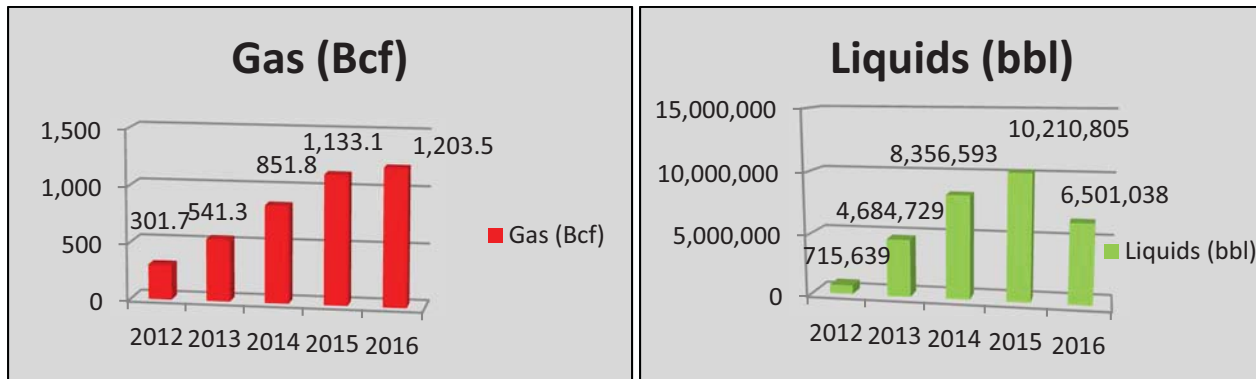
Top Operators for Liquids Production 2016*

- | | |
|---|---|
| 1. Southwestern Production Co (2,771,827 bbl) | <i>2015: Southwestern Production Co (2,533,373 bbl)</i> |
| 2. Antero Resources Corp (1,399,813 bbl) | <i>2015: Jay-Bee Oil & Gas (1,867,236 bbl)</i> |
| 3. EQT Production Co (659,664 bbl) | <i>2015: Noble Energy (1,418,769 bbl)</i> |
| 4. HG Energy (536,403 bbl) | <i>2015: Triad Hunter LLC (1,070,060 bbl)</i> |
| 5. Chevron Appalachia (446,846 bbl) | <i>2015: Antero Resources Corp (844,678 bbl)</i> |
| 6. Tug Hill Operating (277,513 bbl) | <i>2015: Trans Energy (655,323 bbl)</i> |
| 7. Jay-Bee Oil & Gas (161,921 bbl) | <i>2015: Stone Energy Corp (596,604 bbl)</i> |
| 8. CNX Gas (135,651 bbl) | <i>2015: Gastar Exploration Inc (594,622 bbl)</i> |
| 9. Triad Hunter (51,314 bbl) | <i>2015: EQT Production Co (281,477 bbl)</i> |
| 10. Ascent Resources (45,634 bbl) | <i>2015: Chevron Appalachia (192,734 bbl)</i> |

Top Liquids Wells In 2016

1. **4706900184**, Alice Edge OHI 6H (80,709 bbl; Southwestern Production Co; Ohio County)
2. **4705101776**, Betty Schafer MSH 201H (80,357 bbl; Southwestern Production Co; Marshall County)
3. **4706900181**, Alice Edge OHI 201H (79,147 bbl Southwestern Production Co; Ohio County)
4. **4706900187**, Alice Edge OHI 210H (77,077 bbl Southwestern Production Co; Ohio County)
5. **4706900179**, Alice Edge OHI 205H (70,177 bbl Southwestern Production Co; Ohio County)

Yearly Comparison of Marcellus Production



**Decrease in the volume of Liquids Production from 2015 to 2016 is likely due to a change in the way NGL data are reported the WVDEP. A 2016 legislative rule change in West Virginia required that condensate (lease condensate) data rather than NGL data are to be reported to WVDEP. The volumes reported are to be liquid condensate at the wellhead, not NGL volumes extracted downstream at processing plants.*

2016 Activity in Utica-Point Pleasant Play

Development of the Utica-Point Pleasant play in West Virginia is continuing. Using records currently on file with WVDEP and/or WVGES, eleven wells have reported 2016 production. Sixty-one wells have been permitted, remain in the permitting process or are in various stages of completion. Other wells targeting the Utica-Point Pleasant interval may be in the permitting process but may include other geologic intervals. Several other wells that may have been completed will likely show production for 2017.

Total 2016 Utica-Point Pleasant Gas Production*: 16.3 Bcf (2015: 14.2 Bcf)

Total 2016 Utica-Point Pleasant Liquids Production*: 5,581 bbl (2015: 38,010 bbl)

**Decrease in the volume of Liquids Production from 2015 to 2016 is likely due to a change in the way NGL data are reported the WVDEP. A 2016 legislative rule change in West Virginia required that condensate (lease condensate) data rather than NGL data are to be reported to WVDEP. The volumes reported are to be liquid condensate at the wellhead, not NGL volumes extracted downstream at processing plants.*

Individual Utica-Point Pleasant Well Production In 2016

1. **4705101732**, MND6HHS, Noble Energy; 5,204 MMcf Gas
2. **4709502273**, Rymer Unit 4HD, Antero Resources Corp; 3,480 MMcf Gas
3. **4710303109**, Big190, 513926, EQT Production; 2,199 MMcf Gas, 103 bbl Liquids
4. **4705101766**, Blake U-7H, Tug Hill Operating; 2,003 MMcf Gas
5. **4709502128**, Stewart Winland Unit 1300, Triad Hunter; 998 MMcf Gas
6. **4705101599**, Conner 6H, Chevron Appalachia; 879 MMcf Gas
7. **4710302973**, Messenger WTZ 3H U, Southwestern Production Co; 689 MMcf Gas
8. **4705101731**, Simms U-5H, Tug Hill Operating; 298 MMcf Gas
9. **4710302976**, Pribble 6HU, EQT Production; 248 MMcf Gas, 5,458 bbl Liquids
10. **4700900106**, Samuel Hubbard BRK 3H, Southwestern Production Co; 163 MMcf Gas, 20 bbl Liquids
11. **4705101853**, O E Burge U MSH 501H, Southwestern Production Co; 98 MMcf Gas, 1 month of production in 2016

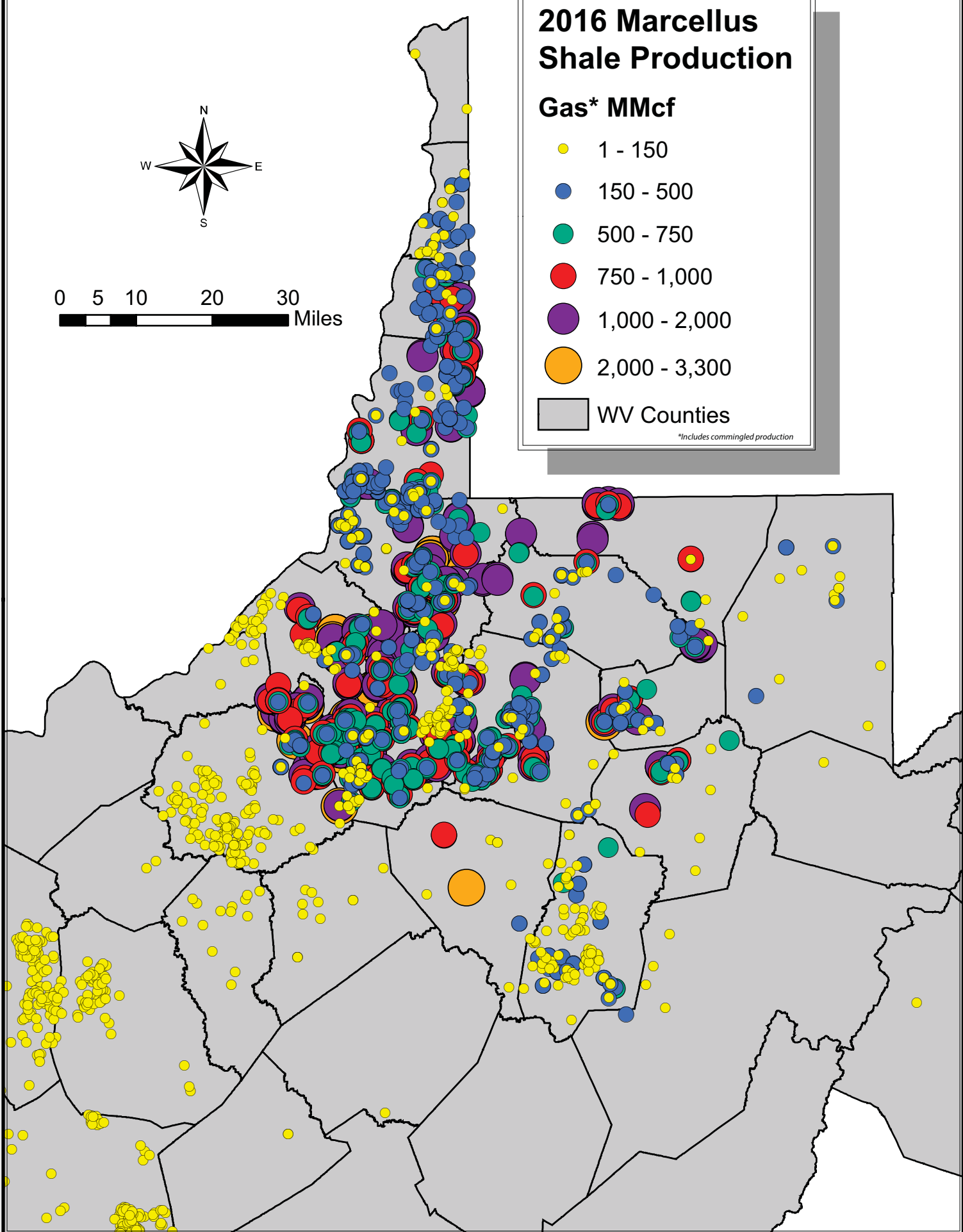
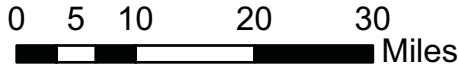
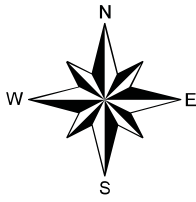
2016 Marcellus Shale Production

Gas* MMcf

- 1 - 150
- 150 - 500
- 500 - 750
- 750 - 1,000
- 1,000 - 2,000
- 2,000 - 3,300

■ WV Counties

*Includes commingled production



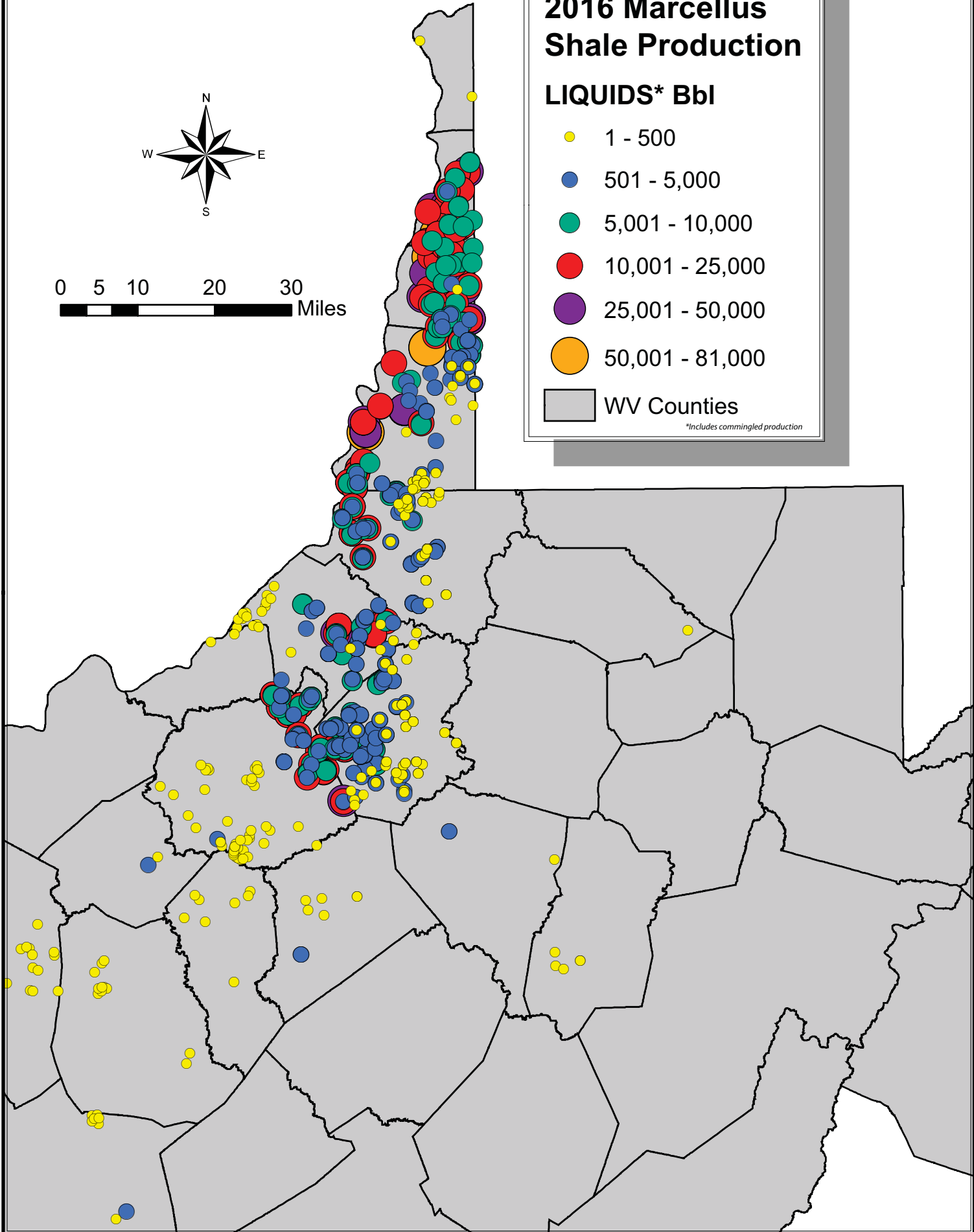
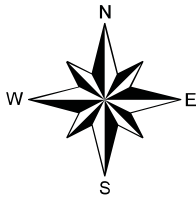
2016 Marcellus Shale Production

LIQUIDS* Bbl

- 1 - 500
- 501 - 5,000
- 5,001 - 10,000
- 10,001 - 25,000
- 25,001 - 50,000
- 50,001 - 81,000

■ WV Counties

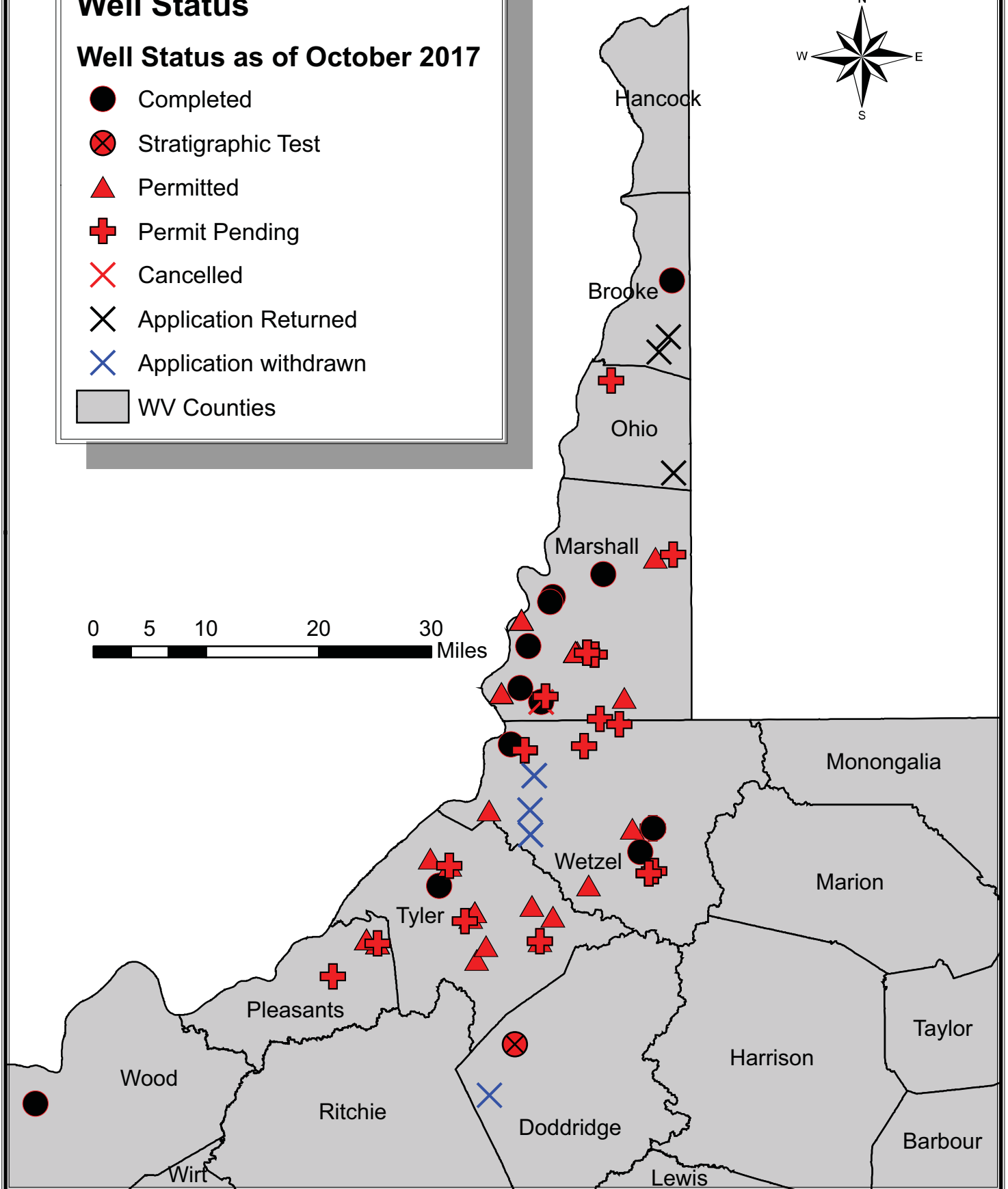
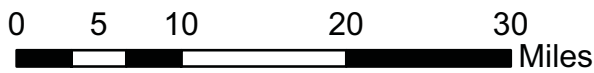
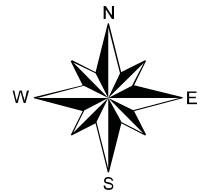
*Includes commingled production



2016 Utica-Point Pleasant Well Status

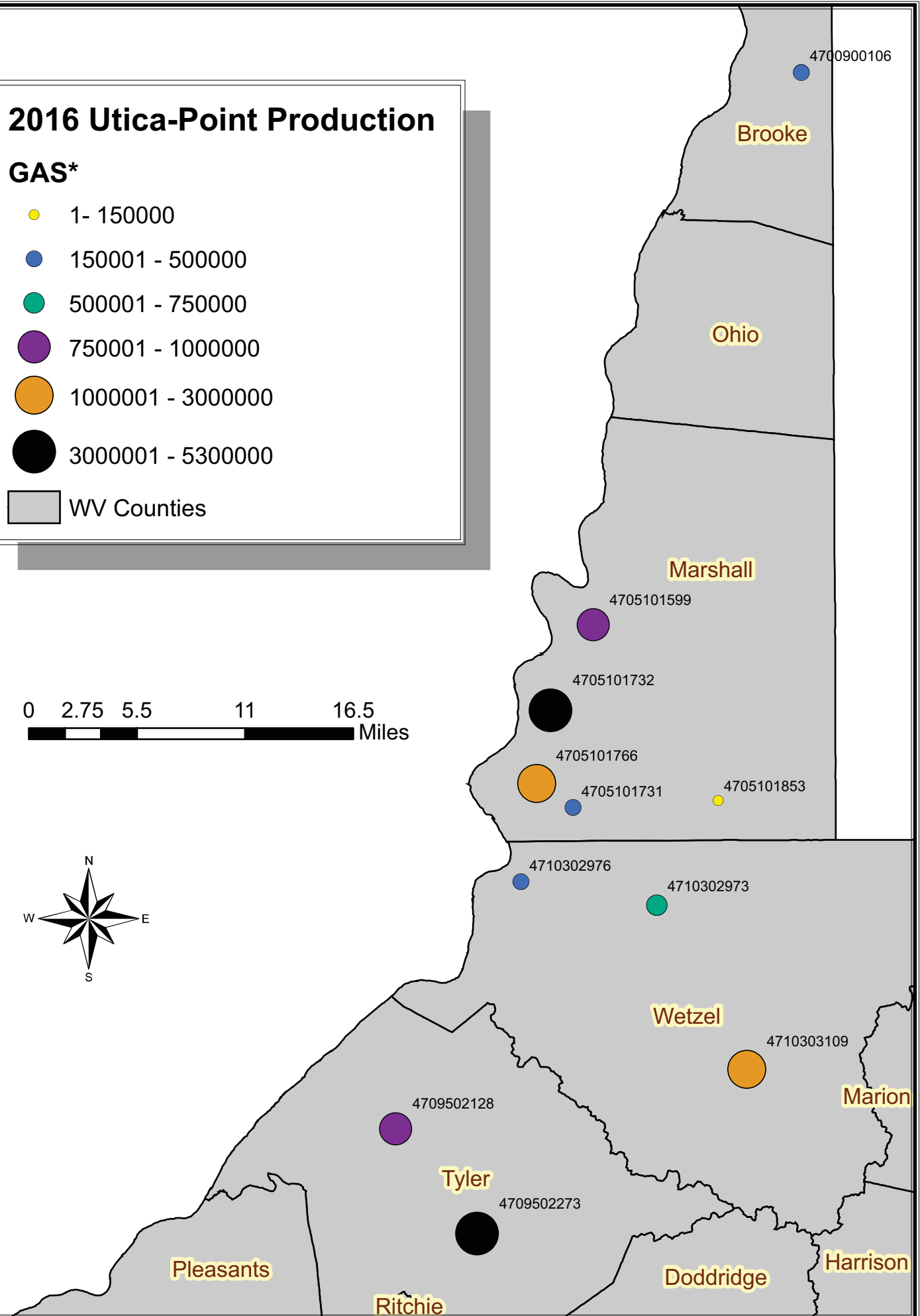
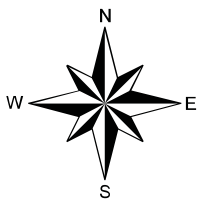
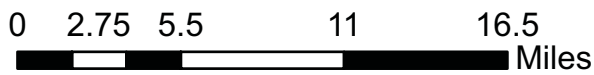
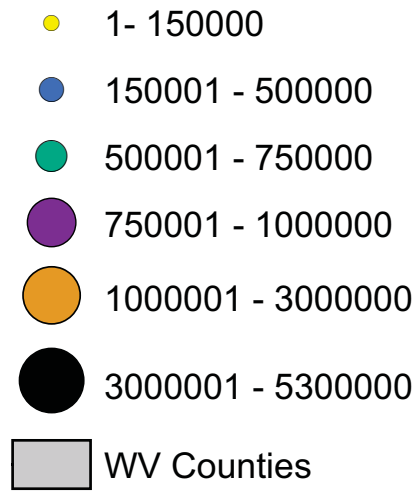
Well Status as of October 2017

- Completed
- ⊗ Stratigraphic Test
- ▲ Permitted
- ⊕ Permit Pending
- ⊗ Cancelled
- ⊗ Application Returned
- ⊗ Application withdrawn
- WV Counties




2016 Utica-Point Production


GAS*



2016 Utica-Point Pleasant Production

Liquids*

 20 - 103

 5458

 WV Counties

