

2019 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 2019.



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Disclaimer:

These production volumes represent data posted by WV Department of Environmental Protection Office of Oil & Gas as of 7/31/2020. Data from several operators reporting Marcellus and Utica-Point Pleasant production in 2019 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 Formation.

Glossary

bbl-barrel

Bcf-billion cubic feet

Mcf-thousand cubic feet

MMcf-million cubic feet

NGL-natural gas liquids

2019 Marcellus Production Summary

Wells included in this overview all report production from the Marcellus, but volumes may also include gas or liquids produced from commingled formations in vertical wells. 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. However, the reporting requirements and definition of the NGLs to be reported has changed several times. The current reporting for NGLs as stated in HB4270 (effective beginning for 2018 production reporting) requires that downstream natural gas liquids accounted to a well will be reported as NGL to that well API while wellhead oil and lease condensate will be reported together as crude oil.

Selected data from previous years are shown in blue for comparison.

Number of horizontal Marcellus wells reporting production: 2,758 (2018: 2,456 wells, 2017: 2,145 wells)

Average measured depth reported: 14,131 ft.

Longest/Deepest measured depth reported: 24,726 ft.

Number of vertical Marcellus wells reporting production: 1,424 (2018: 1,410 wells 2017: 1,421 wells)

Average vertical depth reported: 5,458 ft.

Deepest vertical depth reported: 8,790 ft.

Marcellus Gas

Total Marcellus Gas Production 2019: 1,895.1 Bcf (2018: 1,605.5 Bcf, 2017: 1,329.3 Bcf)

The 2019 volume of Marcellus gas reported represents 87.9% of the total gas volume reported for all wells in West Virginia. The total in 2018 was 90.6%.

Horizontal Well Marcellus Gas Production 2019: 1,891.2 Bcf

Vertical Well Marcellus Gas Production 2019: 3.8 Bcf

Top Gas Producing Counties 2019

1. Tyler (421.1 Bcf)	2018: Doddridge (424.7 Bcf)
2. Doddridge (395.1 Bcf)	2018: Tyler (262.4 Bcf)
3. Ritchie (242.2 Bcf)	2018: Ritchie (194.3 Bcf)
4. Marshall (200.0 Bcf)	2018: Wetzel (182.7 Bcf)
5. Wetzel (181.0 Bcf)	2018: Marshall (150.0 Bcf)
6. Harrison (115.2 Bcf)	2018: Harrison (117.6 Bcf)
7. Ohio (94.8 Bcf)	2018: Ohio (71.4 Bcf)
8. Monongalia (93.3 Bcf)	2018: Monongalia (65.0 Bcf)
9. Brooke (57.9 Bcf)	2018: Taylor (34.9 Bcf)
10. Marion (35.9 Bcf)	2018: Brooke (34.1 Bcf)

2019 Marcellus Reported Production

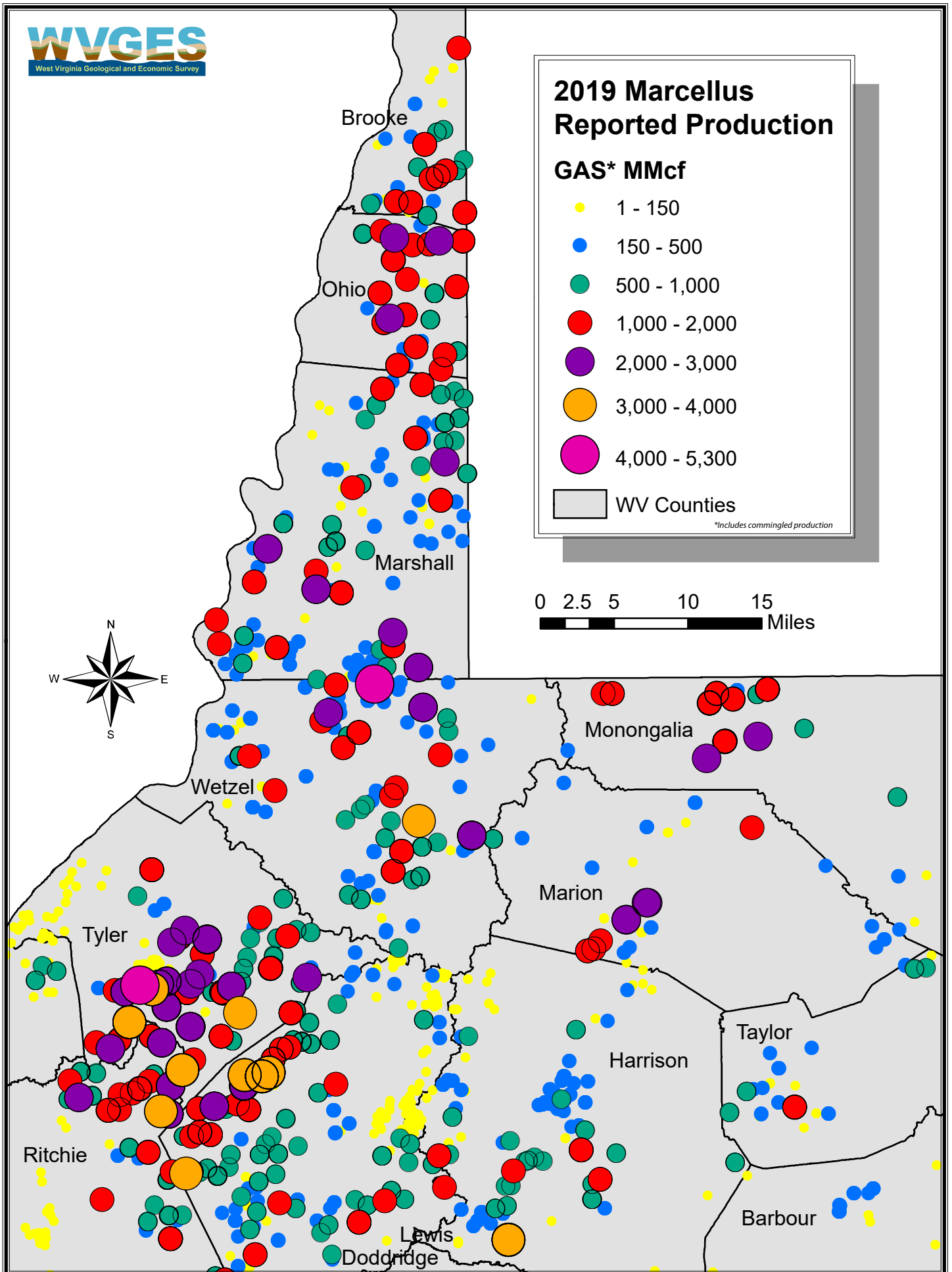
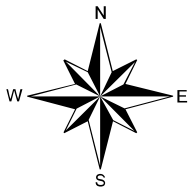
GAS* MMcf



WV Counties

*Includes commingled production

0 2.5 5 10 15
Miles



Top Operators for Gas Production 2019

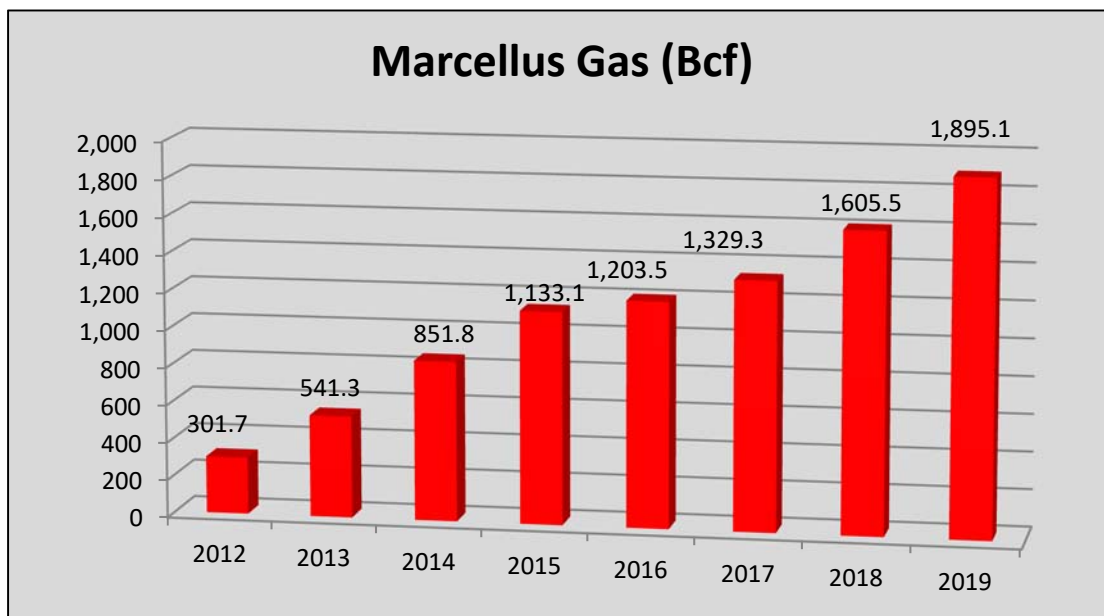
1. Antero Resources Corp. (897.9 Bcf)	<i>2018: Antero Resources Corp. (728.2 Bcf)</i>
2. Southwestern Prod Co. (252.3 Bcf)	<i>2018: EQT Production Co. (277.1 Bcf)</i>
3. EQT Production Co. (239.2 Bcf)	<i>2018: Southwestern Prod Co. (201.1 Bcf)</i>
4. Northeast Natural Energy (86.2 Bcf)	<i>2018: HG Energy LLC (77.2 Bcf)</i>
5. HG Energy LLC (83.1 Bcf)	<i>2018: Northeast Natural Energy (63.5 Bcf)</i>
6. Tug Hill Operating (60.5 Bcf)	<i>2018: Arsenal Resources (55.7 Bcf)</i>
7. Jay-Bee Oil & Gas (57.9 Bcf)	<i>2018: CNX Gas (50.2 Bcf)</i>
8. CNX Gas (56.9 Bcf)	<i>2018: Jay-Bee Oil & Gas (45.3 Bcf)</i>
9. Arsenal Resources (44.0 Bcf)	<i>2018: Tug Hill Operating (21.8 Bcf)</i>
10. Chevron Appalachia (29.9 Bcf)	<i>2018: XTO Energy (18.7 Bcf)</i>

Top Gas Wells In 2019*

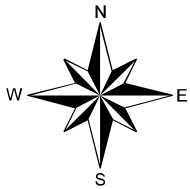
*Some of these wells are located in the Marcellus region from which natural gas liquids are produced. Due to differences in operator reporting, some of these wells may include NGLs.

1. **4710303205**, WTZ210H (4.52 Bcf; SWN Production Co.; Wetzel County, Completed August, 2018)
2. **4709502469**, Jameson Unit 1H (4.04 Bcf; Antero Resources Corp.; Tyler County, Completed March, 2019)
3. **4703305816**, KST5CHS (4.0 Bcf; HG Energy; Harrison County, Completed November, 2018)
4. **4701706845**, Smithers Unit 1H (3.91 Bcf; Antero Resources Corp.; Doddridge County, Completed October, 2018)
5. **4703305814**, KST5AHS (3.88 Bcf; HG Energy; Harrison County, Completed December, 2018)

Annual Comparison of Marcellus Gas Production



0 2.5 5 10 15 Miles

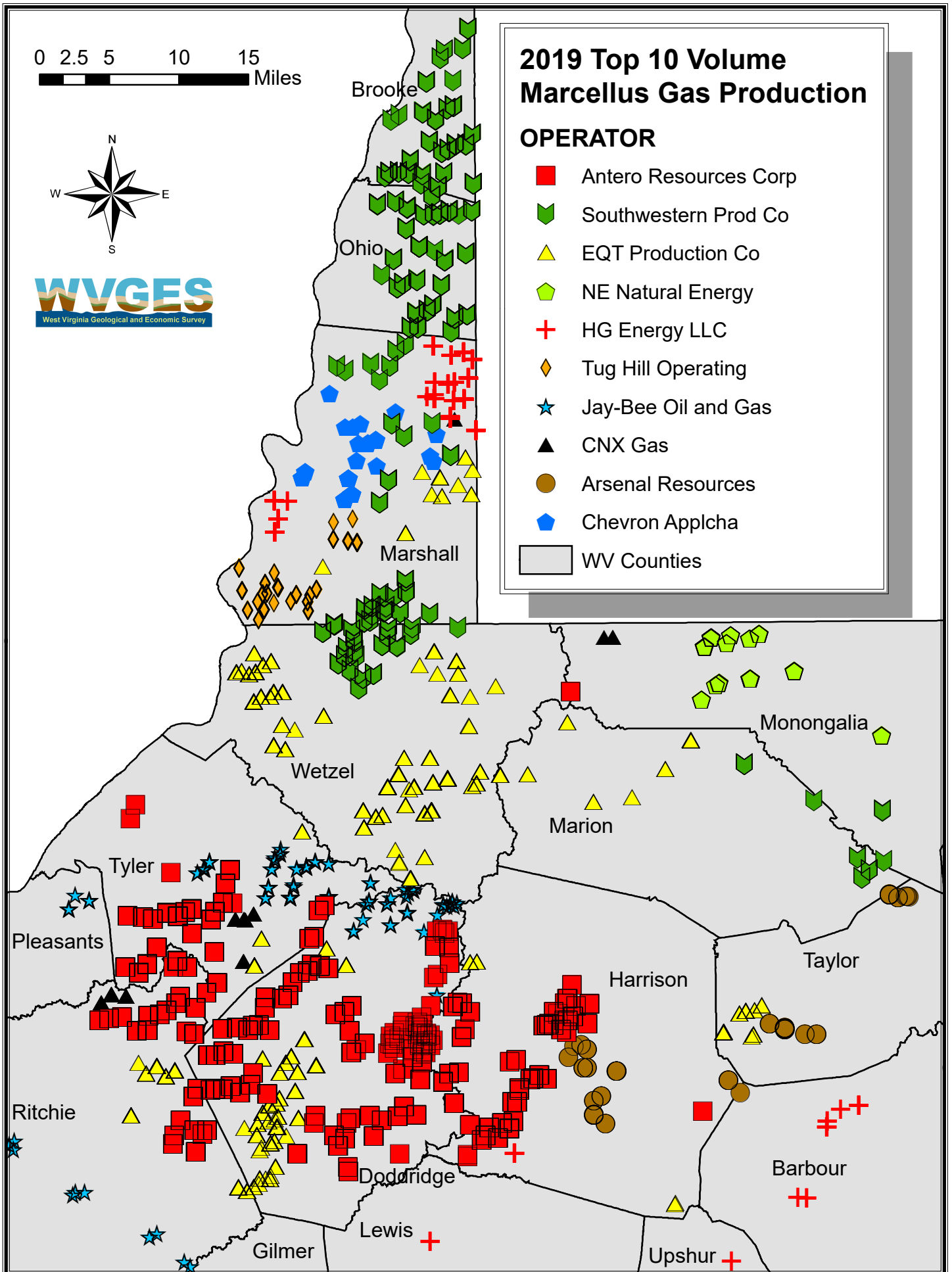


WVGES
West Virginia Geological and Economic Survey

2019 Top 10 Volume Marcellus Gas Production

OPERATOR

- Antero Resources Corp
- ▼ Southwestern Prod Co
- ▲ EQT Production Co
- ◆ NE Natural Energy
- + HG Energy LLC
- ◇ Tug Hill Operating
- ★ Jay-Bee Oil and Gas
- ▲ CNX Gas
- Arsenal Resources
- ◆ Chevron Applcha
- WV Counties



Marcellus Natural Gas Liquids (NGLs)

Total 2019 Marcellus Natural Gas Liquids Production*: 61,175,252 bbl *(2018: 64,233,908 bbl)*

HB4270 (effective beginning for 2018 production reporting) requires that downstream natural gas liquids accounted to a well will be reported as NGL to that well API while wellhead oil and lease condensate will be reported together as crude oil. Previously, 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. Therefore, 2018 & 2019 NGL values are not readily comparable to NGL values reported before 2018 (2012-2017). Due to inconsistencies in operator reporting, these numbers are subject to modification.

Top Natural Gas Liquids Producing Counties 2019

- | | |
|------------------------------|---|
| 1. Tyler (16,003,786 bbl) | <i>2018: Tyler (14,529,560 Bbl)</i> |
| 2. Marshall (12,930,393 bbl) | <i>2018: Doddridge (14,064,008 Bbl)</i> |
| 3. Ohio (11,407,816 bbl) | <i>2018: Ohio (9,581,629 Bbl)</i> |
| 4. Brooke (7,505,215 bbl) | <i>2018: Marshall (9,088,547 Bbl)</i> |
| 5. Ritchie (5,358,418 bbl) | <i>2018: Ritchie (8,744,746 Bbl)</i> |
| 6. Doddridge (5,000,143 bbl) | <i>2018: Brooke (5,043,295 Bbl)</i> |
| 7. Wetzel (2,674,095 bbl) | <i>2018: Wetzel (2,896,124 Bbl)</i> |

Top Operators for Natural Gas Liquids Production 2019*

- | | |
|---|---|
| 1. Southwestern Production Co. (22,844,466 bbl) | <i>2018: Antero Resources Corp. (31,580,262 bbl)</i> |
| 2. Antero Resources Corp. (19,639,566 bbl) | <i>2018: Southwestern Production Co. (19,087,381 bbl)</i> |
| 3. Tug Hill Operating (5,184,587 bbl) | <i>2018: HG Energy LLC (3,564,359 bbl)</i> |
| 4. Jay-Bee Oil & Gas (3,826,461 bbl) | <i>2018: CNX Gas (2,969,568 bbl)</i> |
| 5. HG Energy LLC (3,135,601 bbl) | <i>2018: Jay-Bee Oil & Gas (2,954,904 bbl)</i> |
| 6. CNX Gas (2,569,357 bbl) | <i>2018: Tug Hill Operating (1,744,506 bbl)</i> |
| 7. Chevron Appalachia (2,446,137 bbl) | <i>2018: Chevron Appalachia (1,020,464 bbl)</i> |
| 8. Tribune Resources (812,737 bbl) | <i>2018: Ascent Resources (528,101bbl)</i> |
| 9. Triad Hunter (716,340 bbl) | <i>2018: Tribune Resources (518,510 bbl)</i> |
| 10. None | <i>2018: Triad Hunter (265,583 bbl)</i> |

Top Natural Gas Liquids Wells In 2019

1. **4706900248**, Mason Cottrell OHI 210H (288,055 bbl; SWN Production Co.; Ohio County, 12 months of production)
2. **4706900236**, Thelma Hays OHI 1H (286,873 bbl; SWN Production Co.; Ohio County, 12 months of production)
3. **4706900235**, Thelma Hays OHI 10H (269,983 bbl; SWN Production Co.; Ohio County, 12 months of production)
4. **4705101836**, MND1DHS (268,100 bbl; HG Energy; Marshall County, 12 months of production)
5. **4706900244**, Benjamin Honecker OHI 10H (262,320 bbl; SWN Production Co.; Ohio County, 10 months of production)

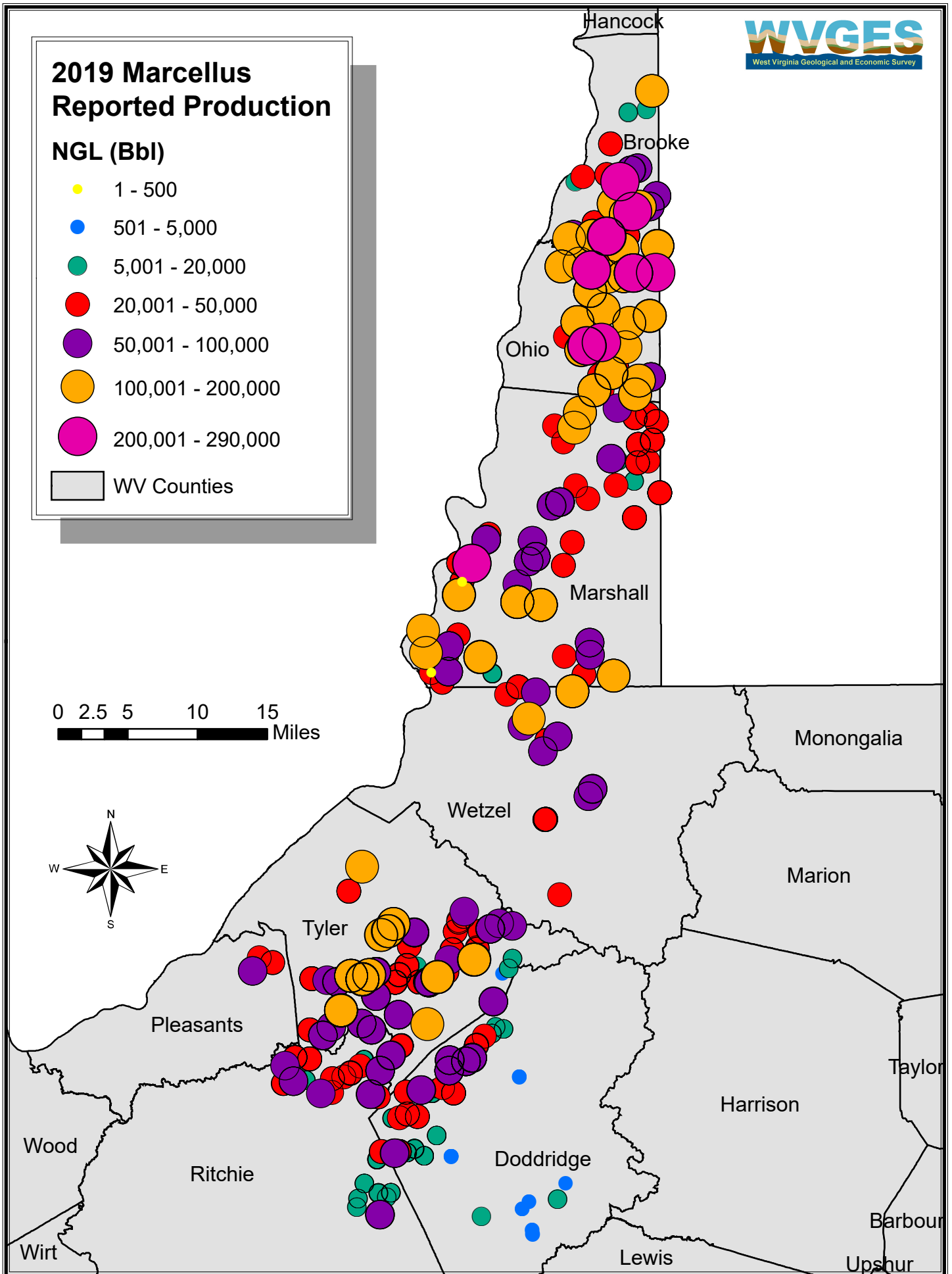
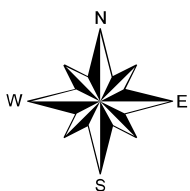
2019 Marcellus Reported Production

NGL (Bbl)

- 1 - 500
- 501 - 5,000
- 5,001 - 20,000
- 20,001 - 50,000
- 50,001 - 100,000
- 100,001 - 200,000
- 200,001 - 290,000










WV Counties

0 2.5 5 10 15 Miles

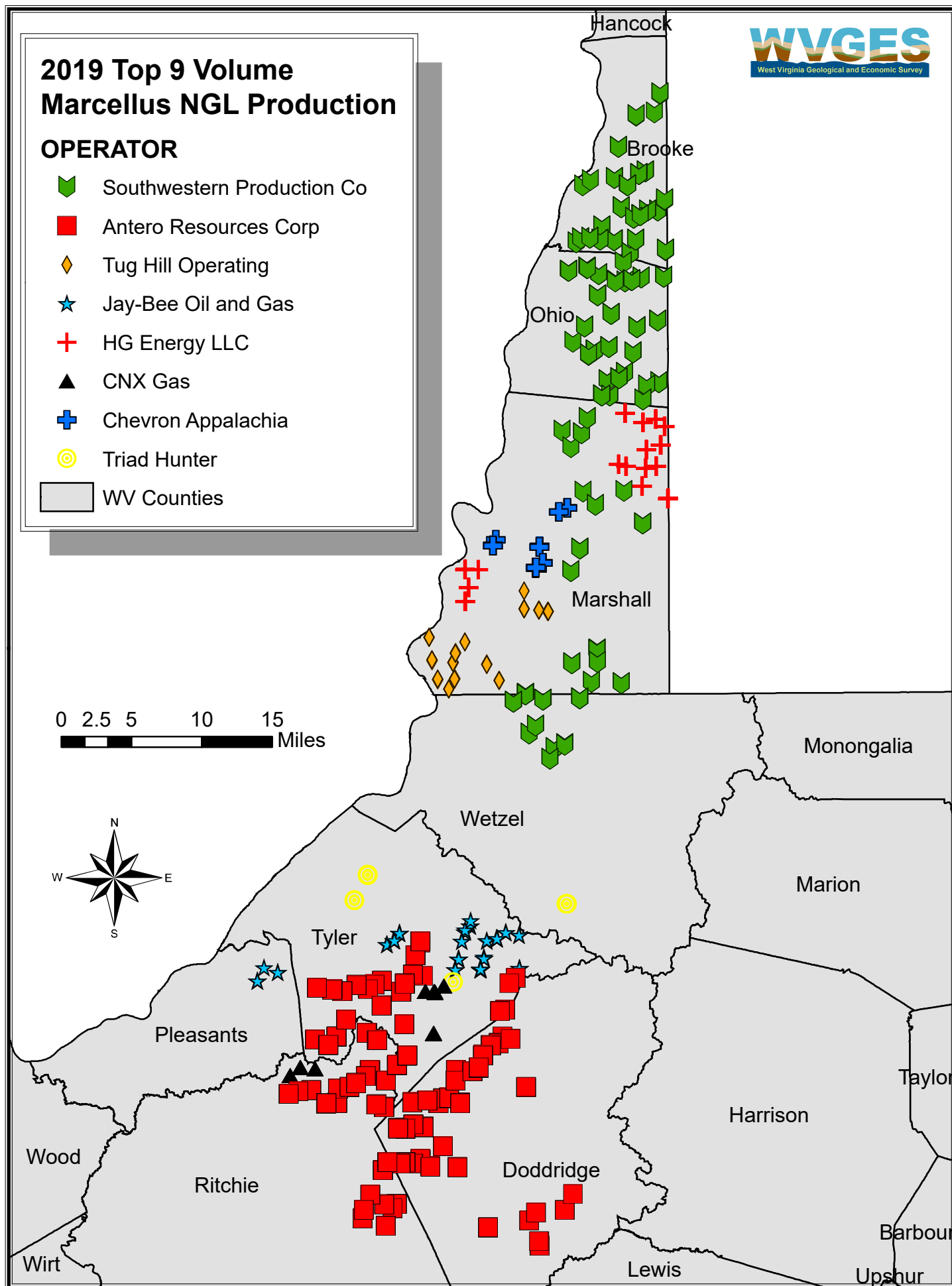
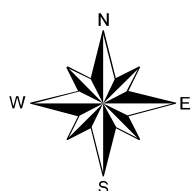


2019 Top 9 Volume Marcellus NGL Production

OPERATOR

-  Southwestern Production Co
-  Antero Resources Corp
-  Tug Hill Operating
-  Jay-Bee Oil and Gas
-  HG Energy LLC
-  CNX Gas
-  Chevron Appalachia
-  Triad Hunter
-  WV Counties

0 2.5 5 10 15 Miles



2019 Activity in Utica-Point Pleasant Play

Development of the Utica-Point Pleasant natural gas play in West Virginia is continuing. Records currently on file with WVDEP and/or WVGES indicate that 48 wells have reported 2019 production. One hundred thirty-two wells have been permitted, remain in the permitting process or are in various stages of completion. Other wells targeting/testing the Utica-Point Pleasant interval may be in the permitting process but may be completed and produced from the Marcellus. Several other wells that may have been completed will likely show production for 2020.

Total 2019 Utica-Point Pleasant Gas Production: 77.4 Bcf (2018: 22.5 Bcf)

Average measured depth reported: 19,564 ft.

Longest/Deepest measured depth reported: 28,221 ft.

Individual Utica-Point Pleasant Well Production In 2019

API	COUNTY	OPERATOR	GAS (MCF)	OIL (Bbl)	NGL (Bbl)
4705102013	Marshall	HG Enrgy II App	5,597,623		
4705102045	Marshall	HG Enrgy II App	5,558,082		
4705102014	Marshall	HG Enrgy II App	5,543,428		
4705102012	Marshall	HG Enrgy II App	4,863,094		
4705101983	Marshall	Tug Hill Oprtng	4,436,867		
4705101998	Marshall	Tug Hill Oprtng	4,339,013		
4709502495	Tyler	Triad Hunter	4,025,074		
4705101952	Marshall	Tug Hill Oprtng	3,364,811		
4705101784	Marshall	Chevron Applcha	3,154,723		
4705101957	Marshall	Tug Hill Oprtng	3,132,019		
4705101893	Marshall	Tug Hill Oprtng	2,696,654		
4705101912	Marshall	Tug Hill Oprtng	2,380,883	10,457	47,000
4705102009	Marshall	CNX Gas	2,115,367		
4705101938	Marshall	CNX Gas	2,073,543		
4705101911	Marshall	Tug Hill Oprtng	2,024,540	19,486	57,552
4705102008	Marshall	CNX Gas	2,002,747		
4705101910	Marshall	Tug Hill Oprtng	1,322,928	15,463	57,881
4705102018	Marshall	Am Ptrlm Prtnrs	1,273,828		
4705102046	Marshall	Am Ptrlm Prtnrs	1,190,928		
4705102071	Marshall	Am Ptrlm Prtnrs	1,162,047		

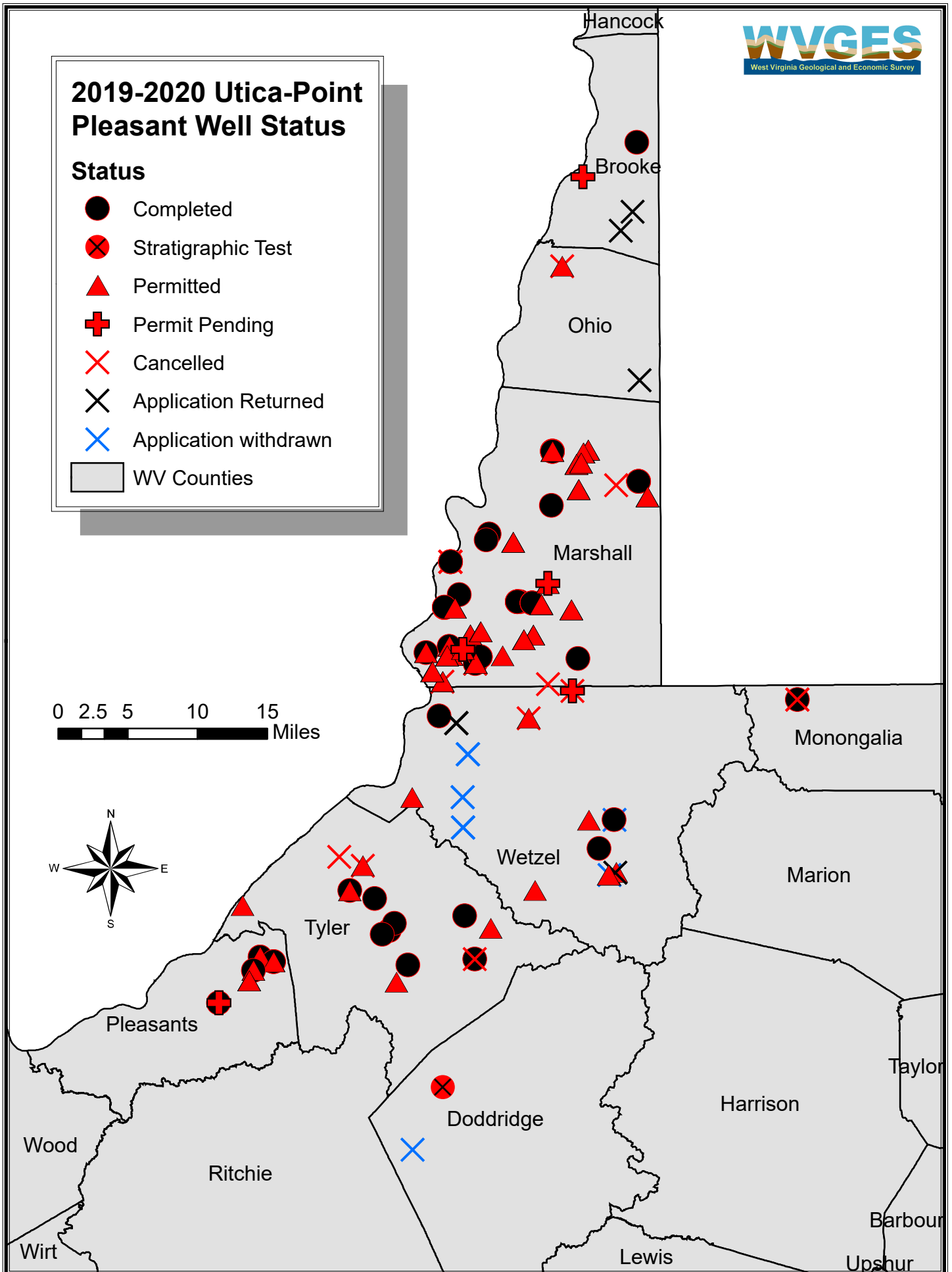
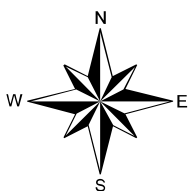
API	COUNTY	OPERATOR	GAS (MCF)	OIL (Bbl)	NGL (Bbl)
4705102047	Marshall	Am Ptrlm Prtnrs	1,105,174		
4707302560	Pleasants	Jay-Bee O&G	1,053,621		
4705101967	Marshall	Tug Hill Oprtng	1,043,859		
4707302563	Pleasants	Jay-Bee O&G	1,030,618		
4705101969	Marshall	Tug Hill Oprtng	1,028,727		
4705101968	Marshall	Tug Hill Oprtng	1,028,627		
4705101853	Marshall	SWN Prdctn Co	971,629		
4705101732	Marshall	HG Enrgy II App	963,106		
4706101806	Monongalia	CNX Gas	942,959		
4705102016	Marshall	Tug Hill Oprtng	913,548		
4709502330	Tyler	Jay-Bee O&G	724,118		
4707302561	Pleasants	Jay-Bee O&G	591,719		
4709502273	Tyler	AnteroRsrcsCorp	571,909	665	
4709502128	Tyler	Triad Hunter	438,942	119	
4705101766	Marshall	Tug Hill Oprtng	420,185		
4705101731	Marshall	Tug Hill Oprtng	418,563		
4705101599	Marshall	Chevron Applcha	413,510		
4710303151	Wetzel	EQT Prod Co	327,937		
4710303109	Wetzel	EQT Prod Co	291,494		
4710302973	Wetzel	SWN Prdctn Co	243,481		
4707302578	Pleasants	Jay-Bee O&G	208,821		
4709502311	Tyler	Jay-Bee O&G	155,096		
4709502321	Tyler	Jay-Bee O&G	112,307		
4710302976	Wetzel	EQT Prod Co	86,051		
4709502334	Tyler	Jay-Bee O&G	83,595		
4709502446	Tyler	Jay-Bee O&G	35,397		
4707302565	Pleasants	Jay-Bee O&G	28,828		

2019-2020 Utica-Point Pleasant Well Status

Status

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

0 2.5 5 10 15 Miles



2019 Utica-Point Pleasant Gas Production

GAS (MMcf)

- 1 - 1,000
- 1,001 - 2,000
- 2,001 - 3,000
- 3,001 - 4,000
- 4,001 - 5,000
- 5,001 - 5,600

WV Counties

