



Dave Hardy  
Secretary of Revenue

Dale W. Steager  
State Tax Commissioner

STATE TAX DEPARTMENT

June 28, 2019

FILED  
2019 JUN 28 P 12:12  
SECRETARY OF STATE

The Honorable Mac Warner  
Secretary of State  
Building 1, Suite 157-K  
State Capitol  
Charleston, West Virginia 25305

Dear Secretary Warner:

Attached for filing in the State Register are tentative natural resource property valuation variables for the 2020 Tax Year that have been developed by the State Tax Department for use in determining the appraised value of coal, oil, natural gas, managed timberland and other natural resource properties for ad valorem tax purposes.

The State Tax Department will accept written public comments on all variables until August 1, 2019. Final valuation variables will be filed on or before September 1, 2019.

Public comments concerning the attached variables should be forwarded to the following address:

West Virginia State Tax Department  
Property Tax Division  
Attention: Jeff Amburgey  
P.O. Box 2389  
Charleston, West Virginia 25328-2389

Sincerely,

Dale W. Steager  
State Tax Commissioner

DWS/ja/j

Attachment

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2019 JUN 28 P 12:13

OFFICE OF THE  
SECRETARY OF STATE

**OIL AND GAS PROPERTIES ANALYSIS**

**Tax Year 2020**

June 28, 2019  
Dale W. Steager  
State Tax Commissioner  
Department of Revenue

**OIL AND GAS**

TY 2020

**Capitalization Rate Analysis and Results:**

In developing a capitalization rate for use in valuing specific income-producing properties consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for producing oil and gas properties. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 1J

<b><u>Safe Rate</u></b>	( 3-Month Constant Maturity Interest Rates )			
	January	December	2018	<b>1.973%</b>

<b><u>Risk Rate</u></b>	(Interest differential between Loan Rate and 3-Month Constant Maturity Interest Rates)		
	<u>Loan Rate*</u>		<u>Risk Rate</u>
	2018	6.904%	4.931%
		*Prime plus 2%	

<b><u>Equity</u></b>	(Differential between Equity Rates and 3-Month Constant Maturity Interest Rates)		
	<u>Equity Rate**</u>		<u>Risk Rate</u>
	2018	[13.00%/(1-.26)]-1.973%	15.595%
		** Value Line Investment Survey Analysis	

<b><u>Composite Risk Rate</u></b>	Loan and Equity Rates weighted by industry estimated capital structure					
	<u>Equity Rate</u>	<u>Debt Rate</u>		<u>Composite Risk</u>		
	2018	10.1368%	1.726%	<b>12.487%</b>	***	
	Note.	Debt equity Ratio	Debt	35%	Equity	65%
	***	Effective severance tax adjustment		0.95		

<b><u>Non Liquidity Rate</u></b>	Interest differential between 3-month Constant Maturity Interest Rates and a 1 year Constant Maturity Interest Rates which reflects a reasonable time necessary to sell active property					
				<u>1yr T Bill</u>	<u>90 day T Bill</u>	<u>Non Liquidity Rate</u>
	January	December	2018	2.332%	1.973%	<b>0.359%</b>

<b><u>Management Rate</u></b>	Charges for the management of investment portfolios	
	Fixed Rate (by Rule)	<b>0.500%</b>

<b><u>Property Tax Rate</u></b>	Sixty percent (60%) of State average Class III property tax rate.		
	2018	60% of 2.17	<b>1.302%</b>

<b><u>Inflation Rate</u></b>				
	January	December	2018	<b>1.910%</b>

**Capitalization Rate**

Since the valuation of oil and gas property is predicated on a three year production, the capitalization rate will be considered in a similar manner.

	<u>2018</u>	<u>2017</u>	<u>2016</u>
<b>Inflation Rate</b>	-1.910%	-2.110%	-2.070%
<b>Safe Rate</b>	1.973%	0.947%	0.319%
<b>Composite Risk Rate</b>	12.487%	13.282%	14.998%
<b>Non Liquidity Rate</b>	0.359%	0.254%	0.295%
<b>Management Rate</b>	0.500%	0.500%	0.500%
<b>Property Tax Rate</b>	1.302%	1.308%	1.308%
<b>Total</b>	14.711%	14.181%	15.350%
	50.000%	33.333%	16.667%
	7.355%	4.727%	2.558%
			<b>14.641%</b>

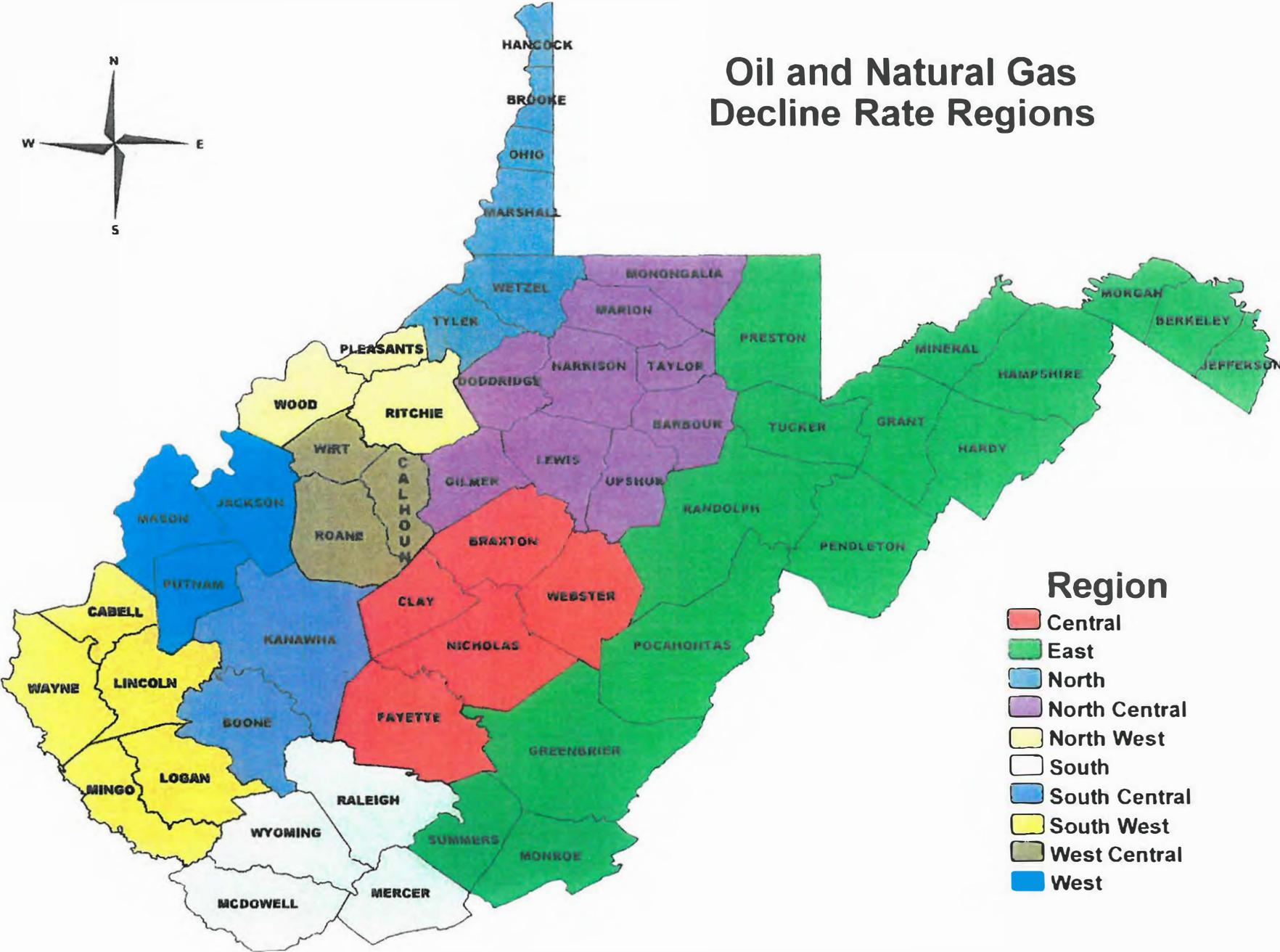
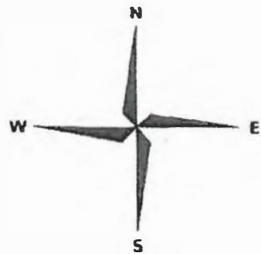
Capitalization Rate Rounded to:

**14.60%**

**MULTIPLIERS FOR 14.6% MID-YEAR LIFE (ANNUALLY)**

<u>YEAR</u>		<u>YEAR</u>	
1	0.934131	21	0.061195
2	0.815123	22	0.053399
3	0.711276	23	0.046596
4	0.620660	24	0.040659
5	0.541588	25	0.035479
6	0.472590	26	0.030959
7	0.412382	27	0.027015
8	0.359845	28	0.023573
9	0.314001	29	0.020570
10	0.273997	30	0.017950
11	0.239090	31	0.015863
12	0.208630	32	0.013667
13	0.182051	33	0.011926
14	0.158857	34	0.010407
15	0.138619	35	0.009081
16	0.120959	36	0.007924
17	0.105549	37	0.006915
18	0.092102	38	0.006034
19	0.080368	39	0.005265
20	0.070129	40	0.004594

# Oil and Natural Gas Decline Rate Regions



- Region**
- Central
  - East
  - North
  - North Central
  - North West
  - South
  - South Central
  - South West
  - West Central
  - West

## Decline Rates for Natural Gas and Oil Formations: Central

Central: Braxton, Clay, Fayette, Nicholas, Webster

Code	Formation	Year 1	Year 2	Year 3 +
12	Alexander, Benson	-0.31	-0.20	-0.10
14	Benson	-0.48	-0.08	-0.08
16	Benson, Balltown+	-0.45	-0.16	-0.12
17	Gordon +	-0.30	-0.07	-0.07
18	Big Injun	-0.34	-0.13	-0.13
19	Big Injun, Big Lime	-0.36	-0.13	-0.13
22	Big Lime	-0.34	-0.34	-0.13
26	Ravenclyff	-0.40	-0.40	-0.25
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.41	-0.22	-0.09
110	Marcellus *	-0.41	-0.22	-0.09
111	Utica*	-0.41	-0.22	-0.09
9	Exception (Median)	-0.41	-0.22	-0.09
10	Non-Filer	-0.30	-0.07	-0.07

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

### Decline Rates for Natural Gas and Oil Formations: East

**East: Berkeley, Grant, Greenbrier, Hampshire, Hardy, Jefferson, Mineral, Monroe, Morgan, Pendleton, Pocahontas, Preston, Randolph, Summers, Tucker**

Code	Formation	Year 1	Year 2	Year 3 +
1	Oriskany	-0.30	-0.30	-0.19
14	Benson	-0.31	-0.17	-0.12
20	Benson +	-0.44	-0.20	-0.08
21	Benson, Fifth	-0.29	-0.28	-0.09
32	Brallier +	-0.48	-0.20	-0.05
33	Elk, Benson	-0.39	-0.21	-0.08
34	Elk, Benson, Riley	-0.53	-0.19	-0.05
35	Elk, Benson, Riley +	-0.36	-0.19	-0.11
36	Elk, Benson, Balltown	-0.34	-0.18	-0.11
37	Elk, Alexander, Benson	-0.50	-0.07	-0.07
38	Elk, Alexander, Benson +	-0.40	-0.16	-0.16
39	Huntermville	-0.31	-0.31	-0.14
40	Fox, Haverty	-0.36	-0.21	-0.15
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
110	Marcellus	-0.59	-0.22	-0.17
111	Utica*	-0.59	-0.22	-0.17
9	Exception (Median)	-0.41	-0.22	-0.10
10	Non-Filer	-0.29	-0.07	-0.05

\*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

## Decline Rates for Natural Gas and Oil Formations: North

North: Brooke, Hancock, Marshall, Ohio, Tyler, Wetzel

Code	Formation	Year 1	Year 2	Year 3 +
11	Gordon	-0.47	-0.31	-0.09
13	Alexander, Benson, Riley	-0.26	-0.16	-0.15
15	Benson, Riley	-0.18	-0.16	-0.06
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
110	Marcellus	-0.52	-0.23	-0.18
111	Utica*	-0.52	-0.23	-0.18
9	Exception (Median)	-0.39	-0.23	-0.08
10	Non-Filer	-0.18	-0.16	-0.06

\*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

**Decline Rates for Natural Gas and Oil Formations: North Central**

**North Central: Barbour, Doddridge, Gilmer, Harrison, Lewis, Marion, Monongalia, Taylor, Upshur**

Code	Formation	Year 1	Year 2	Year 3 +
11	Gordon	-0.41	-0.14	-0.12
12	Alexander, Benson	-0.37	-0.19	-0.11
13	Alexander, Benson Riley	-0.40	-0.28	-0.05
14	Benson	-0.31	-0.17	-0.12
15	Benson, Riley	-0.34	-0.17	-0.14
18	Big Injun	-0.36	-0.16	-0.13
21	Benson, Fifth	-0.31	-0.20	-0.14
28	Weir	-0.34	-0.34	-0.07
29	Weir +	-0.28	-0.28	-0.23
33	Elk, Benson	-0.34	-0.16	-0.11
34	Elk, Benson, Riley	-0.42	-0.27	-0.08
37	Elk, Alexander, Benson	-0.49	-0.23	-0.08
38	Elk, Alexander, Benson +	-0.38	-0.20	-0.12
40	Fox, Haverly	-0.46	-0.16	-0.08
50	Rhinestreet	-0.28	-0.03	-0.03
57	Alexander, Benson, Balltown	-0.39	-0.26	-0.08
58	Alexander	-0.35	-0.20	-0.10
59	Alexander +	-0.39	-0.22	-0.10
60	Alexander, Benson, Riley +	-0.39	-0.35	-0.12
61	Balltown	-0.35	-0.20	-0.10
62	Balltown, Speechley	-0.28	-0.22	-0.10
63	Balltown, Speechley +	-0.30	-0.13	-0.10
64	Benson, Balltown, Speechley	-0.28	-0.22	-0.09
65	Benson, Bradford	-0.37	-0.20	-0.10
66	Benson, Balltown	-0.29	-0.23	-0.11
67	Benson, Riley +	-0.38	-0.14	-0.10
68	Benson, Speechley	-0.30	-0.22	-0.14
69	Brallier, Elk	-0.42	-0.20	-0.13
70	Brallier	-0.40	-0.22	-0.15
71	Deeper/Onondaga or Oriskany/Helderberg	-0.24	-0.24	-0.03
72	Elk, Alexander	-0.42	-0.22	-0.09
73	Elk, Benson +	-0.38	-0.20	-0.12
74	Elk	-0.43	-0.12	-0.10
75	Elk, Riley	-0.60	-0.35	-0.17
76	Fox +	-0.46	-0.18	-0.09
77	Haverly, Elk, Benson (No Alexander)	-0.35	-0.16	-0.16
78	Haverly	-0.45	-0.15	-0.15
79	Riley	-0.44	-0.22	-0.10
80	Speechley	-0.30	-0.18	-0.09
81	Alexander, Benson, Speechley	-0.39	-0.24	-0.10
82	Haverly, Elk, Alexander	-0.47	-0.14	-0.14
85	Fifth, Oil	-0.45	-0.25	-0.22
87	Bayard All	-0.30	-0.20	-0.05
88	Fifth	-0.29	-0.18	-0.12
89	Fifth +	-0.25	-0.15	-0.13
90	Gordon, Injun All	-0.41	-0.23	-0.23
91	Squaw	-0.37	-0.31	-0.06
92	Injun +	-0.34	-0.22	-0.22
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
109	Trenton/Deeper *	-0.38	-0.21	-0.11
110	Marcellus	-0.59	-0.29	-0.23
111	Utica**	-0.59	-0.29	-0.23
9	Exception (Median)	-0.38	-0.21	-0.11
10	Non-Filer	-0.23	-0.03	-0.03

\*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

\*\*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

## Decline Rates for Natural Gas and Oil Formations: North West

### North West: Pleasants, Ritchie, Wood

Code	Formation	Year 1	Year 2	Year 3 +
2	Huron, Rhinestreet	-0.41	-0.26	-0.07
4	Huron	-0.42	-0.24	-0.14
5	Huron, Shales above Huron	-0.39	-0.25	-0.14
8	Berea	-0.31	-0.15	-0.15
11	Gordon	-0.38	-0.10	-0.10
12	Alexander, Benson (No Riley)	-0.34	-0.23	-0.10
13	Alexander, Benson, Riley	-0.32	-0.20	-0.10
14	Benson	-0.19	-0.19	-0.10
44	Rhinestreet, Huron, Shallow Shale	-0.43	-0.28	-0.11
47	Alexander, Riley, (No Benson)	-0.41	-0.05	-0.05
48	Rhinestreet, Alexander, Benson, Riley	-0.31	-0.24	-0.10
49	Weir, Squaw, Big Injun	-0.27	-0.17	-0.07
50	Rhinestreet	-0.40	-0.27	-0.27
51	Rhinestreet +	-0.36	-0.21	-0.10
52	All Upper Devonian (Undiv)	-0.48	-0.33	-0.19
53	Huron, Chemung	-0.35	-0.11	-0.09
54	Huron, Hampshire, Pocono	-0.12	-0.12	-0.11
55	Upper Devonian (Above Huron)	-0.46	-0.33	-0.23
56	Chemung Sands= Riley, Bradford, Balltown, Speechley, Warren (No Benson or Alexander)	-0.28	-0.18	-0.10
83	Huron Oil	-0.74	-0.44	-0.40
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.39	-0.23	-0.13
110	Marcellus	-0.46	-0.29	-0.23
111	Utica**	-0.46	-0.29	-0.23
9	Exception (Median)	-0.39	-0.23	-0.13
10	Non-Filer	-0.12	-0.05	-0.05

\*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

\*\*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

## Decline Rates for Natural Gas and Oil Formations: South

### South: McDowell, Mercer, Raleigh, Wyoming

Code	Formation	Year 1	Year 2	Year 3 +
8	Berea	-0.34	-0.15	-0.15
22	Big Lime	-0.31	-0.19	-0.07
23	Big Lime, Maxton	-0.31	-0.19	-0.07
24	Big Lime, Ravenciff	-0.29	-0.29	-0.17
25	Berea +	-0.37	-0.12	-0.08
26	Ravenciff	-0.40	-0.08	-0.07
28	Weir	-0.44	-0.20	-0.10
29	Weir +	-0.28	-0.21	-0.08
30	Weir, Big Lime	-0.37	-0.19	-0.13
42	Maxton, Ravenciff	-0.40	-0.08	-0.07
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.27	-0.13	-0.09
97	Coalbed Methane (Vertical)	0.03	0.10	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
110	Marcellus *	-0.36	-0.19	-0.09
111	Utica*	-0.36	-0.19	-0.09
9	Exception (Median)	-0.36	-0.19	-0.09
10	Non-Filer	-0.23	-0.08	-0.05

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

## Decline Rates for Natural Gas and Oil Formations: South Central

### South Central: Boone, Kanawha

Code	Formation	Year 1	Year 2	Year 3 +
3	Devonian Shale	-0.23	-0.08	-0.05
4	Huron	-0.31	-0.15	-0.04
8	Berea	-0.23	-0.14	-0.09
18	Big Injun	-0.29	-0.25	-0.12
27	Huron, Shales above Huron	-0.21	-0.08	-0.05
28	Weir	-0.30	-0.21	-0.14
29	Weir +	-0.31	-0.25	-0.09
31	Devonian Shales +	-0.27	-0.07	-0.05
86	Big Injun-Oil	-0.19	-0.18	-0.10
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.33	-0.19	-0.08
110	Marcellus *	-0.33	-0.19	-0.08
111	Utica*	-0.33	-0.19	-0.08
9	Exception (Median)	-0.33	-0.19	-0.08
10	Non-Filer	-0.19	-0.07	-0.04

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

<b>Decline Rates for Natural Gas and Oil Formations: South West</b>				
<b>South West: Cabell, Lincoln, Logan, Mingo, Wayne</b>				
<b>Code</b>	<b>Formation</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3 +</b>
3	Devonian Shale	-0.31	-0.15	-0.04
8	Berea	-0.36	-0.11	-0.11
18	Big Injun	-0.38	-0.22	-0.04
22	Big Lime	-0.19	-0.19	-0.19
43	Berea, Big Lime	-0.18	-0.18	-0.18
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.38	-0.22	-0.10
110	Marcellus *	-0.38	-0.22	-0.10
111	Utica*	-0.38	-0.22	-0.10
9	Exception (Median)	-0.38	-0.22	-0.10
10	Non-Filer	-0.18	-0.11	-0.04

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

<b>Decline Rates for Natural Gas and Oil Formations: West Central</b>				
<b>West Central: Calhoun, Roane, Wirt</b>				
<b>Code</b>	<b>Formation</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3 +</b>
2	Huron, Rhinestreet	-0.49	-0.11	-0.06
4	Huron	-0.33	-0.22	-0.14
27	Huron, Shales above Huron	-0.42	-0.23	-0.12
44	Rhinestreet, Huron, Shallow Shale	-0.51	-0.14	-0.11
45	Devonian Shale, Pocono	-0.25	-0.17	-0.12
46	Pocono	-0.29	-0.25	-0.12
84	Big Injun, Oil	-0.41	-0.41	-0.11
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.42	-0.24	-0.10
110	Marcellus *	-0.42	-0.24	-0.10
111	Utica*	-0.42	-0.24	-0.10
9	Exception (Median)	-0.42	-0.24	-0.10
10	Non-Filer	-0.25	-0.11	-0.06

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

## Decline Rates for Natural Gas and Oil Formations: West

### West: Jackson, Mason, Putnam

Code	Formation	Year 1	Year 2	Year 3 +
1	Oriskany	-0.40	-0.40	-0.29
2	Huron, Rhinestreet	-0.13	-0.12	-0.03
3	Devonian Shale	-0.31	-0.15	-0.04
4	Huron	-0.29	-0.14	-0.05
5	Huron, Shales above Huron	-0.38	-0.15	-0.06
6	Huron, Berea	-0.29	-0.08	-0.08
7	Berea, Devonian Shale	-0.08	-0.08	-0.08
8	Berea	-0.36	-0.16	-0.16
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.35	-0.20	-0.09
110	Marcellus *	-0.35	-0.20	-0.09
111	Utica*	-0.35	-0.20	-0.09
9	Exception (Median)	-0.35	-0.20	-0.09
10	Non-Filer	-0.08	-0.08	-0.03

\* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

## Average Industry Operating Expense Results

### **CONVENTIONAL GAS**

- Average Operating Expenses	=	\$5,000
- Coal Bed Methane, Vertical Wells Expenses	=	\$9,000

### **OIL**

- Average Operating Expenses	=	\$5,750
- Average Enhanced Operating Expenses	=	\$9,000

### **MARCELLUS/UTICA**

- Vertical Producing Well		
- Average Operating Expenses	=	\$15,000
- Horizontal Producing Well		
- Average Operating Expenses	=	\$100,000

### **HORIZONTAL WELLS (OTHER THAN MARCELLUS/UTICA AND COAL BED METHANE)**

- Horizontal Producing Well		
- Average Operating Expenses	=	\$20,000

Minimum Working Interest Appraisal = \$500 per well

Flat Rate Royalty Multiplier = 5.75

Home Use Only Wells: Appraised at \$500 per well

Industrial Use Only Wells:\* MCF usage X \$ 3.15/MCF  
BBL usage X \$65.23/BBL

\*(Also includes Department of Environmental Protection reported wells.)

### Non-Filer Valuations

Working Interest	=	150% of previous year's appraisal
Royalty Interest	=	90% of previous year's appraisal

### Valuation

The previously discussed variables are used to establish a future income stream converted to present worth through application of a capitalization rate. The sum of the discounted future net income per year represents a reasonable estimate of market value.

### Lease Rate/Term Survey and Results

The non-producing property value for each county is determined by multiplying the average delay rental by a factor, which represents the average lease term under present economic conditions.

As a result of higher lease terms being inversely proportional to the value of oil and gas (thus counties with little leasing or production activities reflect inflated values) and with the volatile nature of county activity, necessary adjustments in the review have been made.

A compilation of lease terms produced a statewide average of 5 years. This term (5 years) was applied to all county lease rates and compared to the appraisal rates derived from calculations using individual county data as well as regional data. The resulting calculations were reviewed and considered in the assignment of an appraisal rate per acre.

The appraisal rate/acre amounts shown on the next page are preliminary figures, which may change if additional lease data is received. These rates have been applied to all county magisterial districts with either producing wells, lease activity within the past 5 years or both. Tax districts void of activity within the past 5 years have been assigned the minimum value per acre.

OIL & GAS RESERVE RATES FOR TY 2020			
COUNTY	CO #	DISTRICT #	TY2020 \$/AC
BARBOUR	1	1	\$55.00
		2	\$1.00
		3	\$55.00
		4	\$55.00
		5	\$55.00
		6	\$1.00
		7	\$55.00
		8	\$55.00
		9	\$55.00
		10	\$55.00
		11	\$55.00
BERKELEY	2	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
BOONE	3	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$1.00
		8	\$20.00
		9	\$1.00
BRAXTON	4	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
BROOKE	5	1	\$1.00
		2	\$1.00
		3	\$105.00
		4	\$105.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
CABELL	6	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
CALHOUN	7	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
CLAY	8	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
DODDRIDGE	9	1	\$100.00
		2	\$100.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$100.00
		7	\$100.00
		8	\$100.00
		9	\$1.00
FAYETTE	10	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
GILMER	11	1	\$25.00
		2	\$25.00
		3	\$25.00
		4	\$1.00
		5	\$1.00
		6	\$25.00
GRANT	12	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
GREENBRIER	13	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
HAMPSHIRE	14	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
HANCOCK	15	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00

<b>OIL &amp; GAS RESERVE RATES FOR TY 2020</b>			
<b>COUNTY</b>	<b>CO #</b>	<b>DISTRICT #</b>	<b>TY2020 \$/AC</b>
<b>HARDY</b>	<b>16</b>	<b>1</b>	<b>\$1.00</b>
		<b>2</b>	<b>\$1.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$1.00</b>
		<b>5</b>	<b>\$1.00</b>
		<b>6</b>	<b>\$1.00</b>
<b>HARRISON</b>	<b>17</b>	<b>1</b>	<b>\$90.00</b>
		<b>2</b>	<b>\$1.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$1.00</b>
		<b>5</b>	<b>\$90.00</b>
		<b>6</b>	<b>\$1.00</b>
		<b>7</b>	<b>\$90.00</b>
		<b>8</b>	<b>\$1.00</b>
		<b>9</b>	<b>\$90.00</b>
		<b>10</b>	<b>\$1.00</b>
		<b>11</b>	<b>\$90.00</b>
		<b>12</b>	<b>\$90.00</b>
		<b>13</b>	<b>\$1.00</b>
		<b>14</b>	<b>\$90.00</b>
		<b>15</b>	<b>\$90.00</b>
		<b>16</b>	<b>\$1.00</b>
		<b>17</b>	<b>\$1.00</b>
		<b>18</b>	<b>\$90.00</b>
		<b>19</b>	<b>\$1.00</b>
		<b>20</b>	<b>\$90.00</b>
		<b>21</b>	<b>\$1.00</b>
<b>JACKSON</b>	<b>18</b>	<b>1</b>	<b>\$40.00</b>
		<b>2</b>	<b>\$40.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$40.00</b>
		<b>5</b>	<b>\$1.00</b>
		<b>6</b>	<b>\$40.00</b>
		<b>7</b>	<b>\$40.00</b>
<b>JEFFERSON</b>	<b>19</b>	<b>1</b>	<b>\$1.00</b>
		<b>2</b>	<b>\$1.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$1.00</b>
		<b>5</b>	<b>\$1.00</b>
		<b>6</b>	<b>\$1.00</b>
		<b>7</b>	<b>\$1.00</b>
		<b>8</b>	<b>\$1.00</b>
		<b>9</b>	<b>\$1.00</b>
		<b>10</b>	<b>\$1.00</b>

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC		
KANAWHA	20	1	\$30.00		
		2	\$1.00		
		3	\$30.00		
				4	\$1.00
				5	\$1.00
				6	\$1.00
				7	\$1.00
				8	\$1.00
				9	\$1.00
				10	\$1.00
				11	\$1.00
				12	\$1.00
				13	\$1.00
				14	\$1.00
				15	\$30.00
				16	\$30.00
				17	\$1.00
				18	\$1.00
				19	\$30.00
				20	\$1.00
				21	\$1.00
				22	\$1.00
				23	\$30.00
				24	\$30.00
				25	\$30.00
				26	\$1.00
				27	\$1.00
				28	\$30.00
				29	\$1.00
				30	\$1.00
				31	\$1.00
LEWIS	21	1	\$35.00		
		2	\$35.00		
		3	\$35.00		
		4	\$35.00		
		5	\$1.00		
		6	\$35.00		
		7	\$1.00		
		8	\$1.00		
		9	\$1.00		
LINCOLN	22	1	\$25.00		
		2	\$25.00		
		3	\$1.00		
		4	\$25.00		
		5	\$25.00		
		6	\$25.00		
		7	\$25.00		
		8	\$25.00		
		9	\$25.00		
		10	\$1.00		

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
LOGAN	23	1	\$15.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$15.00
		9	\$1.00
MARION	24	1	\$1.00
		2	\$90.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$90.00
		12	\$90.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$90.00
		17	\$1.00
		18	\$90.00
		19	\$90.00
		20	\$1.00
		21	\$1.00
		22	\$1.00
MARSHALL	25	1	\$1.00
		2	\$1.00
		3	\$105.00
		4	\$105.00
		5	\$105.00
		6	\$1.00
		7	\$105.00
		8	\$1.00
		9	\$105.00
		10	\$1.00
		11	\$1.00
		12	\$105.00
		13	\$105.00
		14	\$105.00
		15	\$105.00
		16	\$1.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
MASON	26	1	\$1.00
		2	\$25.00
		3	\$25.00
		4	\$25.00
		5	\$25.00
		6	\$25.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$25.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$25.00
		15	\$25.00
		16	\$25.00
MC DOWELL	27	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$1.00
		6	\$20.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$20.00
		12	\$1.00
		13	\$20.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
MERCER	28	1	\$1.00
		2	\$15.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$15.00
		7	\$1.00
		8	\$1.00
		9	\$15.00
		10	\$1.00
		11	\$15.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
MINERAL	29	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
MINGO	30	1	\$1.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
		9	\$20.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
MONONGALIA	31	1	\$35.00
		2	\$1.00
		3	\$35.00
		4	\$35.00
		5	\$35.00
		6	\$1.00
		7	\$35.00
		8	\$35.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$35.00
		19	\$1.00

<b>OIL &amp; GAS RESERVE RATES FOR TY 2020</b>			
<b>COUNTY</b>	<b>CO #</b>	<b>DISTRICT #</b>	<b>TY2020 \$/AC</b>
<b>MONROE</b>	<b>32</b>	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
<b>MORGAN</b>	<b>33</b>	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
<b>NICHOLAS</b>	<b>34</b>	1	\$1.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$15.00
		8	\$1.00
		9	\$1.00
<b>OHIO</b>	<b>35</b>	1	\$1.00
		2	\$1.00
		3	\$105.00
		4	\$105.00
		5	\$1.00
		6	\$105.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
<b>PENDLETON</b>	<b>36</b>	1	\$1.00
		2	\$10.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$10.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
PLEASANTS	37	1	\$40.00
		2	\$40.00
		3	\$40.00
		4	\$40.00
		5	\$40.00
		6	\$1.00
		7	\$40.00
		8	\$40.00
POCAHONTAS	38	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
PRESTON	39	1	\$30.00
		2	\$30.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
		7	\$1.00
		8	\$30.00
		9	\$1.00
		10	\$30.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
		19	\$1.00
		20	\$1.00
PUTNAM	40	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
		11	\$25.00
		12	\$25.00
		13	\$1.00

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
RALEIGH	41	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$20.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$20.00
RANDOLPH	42	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$20.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$20.00
		17	\$1.00
		18	\$1.00
RITCHIE	43	1	\$80.00
		2	\$1.00
		3	\$80.00
		4	\$1.00
		5	\$80.00
		6	\$1.00
		7	\$80.00
		8	\$1.00
		9	\$1.00
		10	\$80.00

<b>OIL &amp; GAS RESERVE RATES FOR TY 2020</b>			
<b>COUNTY</b>	<b>CO #</b>	<b>DISTRICT #</b>	<b>TY2020 \$/AC</b>
<b>ROANE</b>	<b>44</b>	<b>1</b>	<b>\$35.00</b>
		<b>2</b>	<b>\$35.00</b>
		<b>3</b>	<b>\$35.00</b>
		<b>4</b>	<b>\$35.00</b>
		<b>5</b>	<b>\$1.00</b>
		<b>6</b>	<b>\$35.00</b>
		<b>7</b>	<b>\$35.00</b>
		<b>8</b>	<b>\$1.00</b>
		<b>9</b>	<b>\$35.00</b>
<b>SUMMERS</b>	<b>45</b>	<b>1</b>	<b>\$1.00</b>
		<b>2</b>	<b>\$1.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$1.00</b>
		<b>5</b>	<b>\$5.00</b>
		<b>6</b>	<b>\$1.00</b>
		<b>7</b>	<b>\$1.00</b>
<b>TAYLOR</b>	<b>46</b>	<b>1</b>	<b>\$1.00</b>
		<b>2</b>	<b>\$1.00</b>
		<b>3</b>	<b>\$90.00</b>
		<b>4</b>	<b>\$90.00</b>
		<b>5</b>	<b>\$90.00</b>
		<b>6</b>	<b>\$90.00</b>
		<b>7</b>	<b>\$90.00</b>
<b>TUCKER</b>	<b>47</b>	<b>1</b>	<b>\$15.00</b>
		<b>2</b>	<b>\$15.00</b>
		<b>3</b>	<b>\$1.00</b>
		<b>4</b>	<b>\$1.00</b>
		<b>5</b>	<b>\$15.00</b>
		<b>6</b>	<b>\$1.00</b>
		<b>7</b>	<b>\$1.00</b>
		<b>8</b>	<b>\$1.00</b>
		<b>9</b>	<b>\$15.00</b>
		<b>10</b>	<b>\$1.00</b>
		<b>11</b>	<b>\$15.00</b>
		<b>12</b>	<b>\$1.00</b>

**OIL & GAS RESERVE RATES FOR TY 2020**

COUNTY	CO #	DISTRICT #	TY2020 \$/AC
TYLER	48	1	\$100.00
		2	\$100.00
		3	\$1.00
		4	\$100.00
		5	\$100.00
		6	\$100.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$100.00
UPSHUR	49	1	\$70.00
		2	\$70.00
		3	\$1.00
		4	\$70.00
		5	\$70.00
		6	\$70.00
		7	\$70.00
WAYNE	50	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$20.00
		9	\$20.00
		10	\$20.00
		11	\$1.00
		12	\$20.00
WEBSTER	51	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$15.00
		5	\$15.00
		6	\$15.00
		7	\$1.00

OIL & GAS RESERVE RATES FOR TY 2020			
COUNTY	CO #	DISTRICT #	TY2020 \$/AC
WETZEL	52	1	\$100.00
		2	\$100.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$1.00
		7	\$1.00
		8	\$100.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$100.00
		13	\$1.00
WIRT	53	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$1.00
		5	\$35.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
WOOD	54	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
		9	\$35.00
		10	\$1.00
		11	\$35.00
		12	\$35.00
		13	\$1.00
		14	\$1.00
WYOMING	55	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$1.00
		9	\$1.00
		10	\$20.00

**MANAGED TIMBER  
PROPERTY ANALYSIS**

**Tax Year 2020**

June 28, 2019  
Dale W. Steager  
State Tax Commissioner  
Department of Revenue

## MANAGED TIMBERLAND APPRAISAL RATES TAX YEAR 2020

(based on market 2014-2018)

### Rates Per Acre

#### Class II Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$250	\$155	\$50
Region 2	\$250	\$150	\$50
Region 3	\$280	\$175	\$50
Region 4	\$295	\$190	\$50
Region 5	\$205	\$140	\$50

#### Class III/IV Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$225	\$150	\$75
Region 2	\$225	\$150	\$75
Region 3	\$245	\$155	\$75
Region 4	\$260	\$170	\$75
Region 5	\$225	\$150	\$75

- Region 1 = Brooke, Cabell, Hancock, Jackson, Marshall, Mason, Ohio, Pleasants, Putnam, Tyler, Wetzel, and Wood Counties
- Region 2 = Braxton, Calhoun, Clay, Doddridge, Gilmer, Harrison, Lewis, Marion, Monongalia, Ritchie, Roane, Taylor, and Wirt Counties
- Region 3 = Barbour, Greenbrier, Monroe, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, Upshur, and Webster Counties
- Region 4 = Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral and Morgan Counties
- Region 5 = Boone, Fayette, Kanawha, Lincoln, Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wayne, and Wyoming Counties

### Harvest Volumes per Acre

#### Harvest Interval Grades

	<u>35 yrs.</u>	<u>45 yrs.</u>	<u>55 yrs.</u>	<u>80 yrs.</u>	<u>Total</u>
1 - Site Index 75 or more	4.6 cords 1.5 Mbf	-- --	2.6 cords 4.4 Mbf	3.3 cords 8.6 Mbf	10.5 cords 14.5 Mbf
2 - Site Index 65 - 75	3.3 cords 1.0 Mbf	-- --	7.0 cords 3.2 Mbf	4.6 cords 5.5 Mbf	14.9 cords 9.7 Mbf
3 - Site Index less than 65	-- --	3.1 cords 0.8 Mbf	-- --	15.4 cords 3.7 Mbf	18.5 cords 4.5 Mbf

## Managed Timberland Statistics

### Estimation of Required Rate of Return: Class II Rates

**A. Safe Rate of Return (5 Year T-Bill Rate)**

Year	Rate	W/A %	W/A Rate
2018	2.7480	33.33%	0.9159
2017	1.9100	26.67%	0.5094
2016	1.3383	20.00%	0.2677
2015	1.5292	13.33%	0.2038
2014	1.6410	6.67%	0.1095

2.006 %

**B. Nonliquidity Rate**

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate
2018	0.3583	33.33%	0.1194
2017	0.2542	26.67%	0.0678
2016	0.2950	20.00%	0.0590
2015	0.2683	13.33%	0.0358
2014	0.0883	6.67%	0.0059

0.288 %

**C. Risk Rate (30 yr T-bills vs 5 yr T-bills)**

Year	Rate	W/A %	W/A Rate
2018	0.3642	6.67%	0.0243
2017	0.9850	13.33%	0.1313
2016	1.2592	20.00%	0.2518
2015	1.3117	26.67%	0.3498
2014	1.6992	33.33%	0.5663

1.324 %

**D. Management Factor of 0.5%**

0.500 %

**E. Property Tax Component**

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2018	0.708	33.33%	0.2360
2017	0.714	26.67%	0.1904
2016	0.708	20.00%	0.1416
2015	0.714	13.33%	0.0952
2014	0.714	6.67%	0.0476

0.711 %

**F. Inflation Rate:**

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2018	1.910	20.00%	0.3820
2017	2.110	6.67%	0.1407
2016	2.070	13.33%	0.2759
2015	0.730	33.33%	0.2433
2014	0.760	26.67%	0.2027

(1.245) %

**TOTAL REQUIRED RATE OF RETURN (REAL)**

3.584 %

**LESS: PROPERTY TAX COMPONENT**

(0.711)

**TOTAL DISCOUNT COMPONENT**

2.873 %

**Stumpage Prices:**

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor	0.00%	0.55%

		1.0000	1.0000	1.0000	1.0000	
<b>SAWTIMBER</b>	Current	\$/MBF at age	\$/MBF at age	\$/MBF at age	\$/MBF at age	
	<b>Region</b>	<b>\$/MBF</b>	<b>35</b>	<b>45</b>	<b>55</b>	<b>80</b>
	Region 1	198.33	198.33	198.33	198.33	198.33
	Region 2	198.66	198.66	198.66	198.66	198.66
	Region 3	219.12	219.12	219.12	219.12	219.12
	Region 4	220.51	220.51	220.51	220.51	220.51
	Region 5	170.43	170.43	170.43	170.43	170.43

		1.2116	1.2800	1.3521	1.5508	
<b>PULPWOOD:</b>		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age	
	<b>Region</b>	<b>\$/Cord</b>	<b>35</b>	<b>45</b>	<b>55</b>	<b>80</b>
	Region 1	6.39	7.74	8.18	8.64	9.91
	Region 2	5.20	6.30	6.66	7.03	8.06
	Region 3	5.24	6.35	6.71	7.09	8.13
	Region 4	10.90	13.20	13.95	14.73	16.90
	Region 5	6.01	7.29	7.70	8.13	9.32

**Management Costs:**

<b>Region</b>	<b>\$/acre (1)</b>
1	3.25
2	3.25
3	3.25
4	3.25
5	3.25
<b>State</b>	

**Tax Rates:**

Effective Federal Income Tax Rate	21.00%
Effective WV State Income Tax Rate (6.5% * (1-.21))	5.14%
Effective WV Severance Tax Rate (1.5% * (1-.21))	1.19%

**Yield (Volumes) (80 year rotation)**

Timberland			
Productivity Grades	Site Index	Yield - MBF	Yield - Cords
Grade I	75 or more	14.5	10.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

## Managed Timberland Statistics

### Estimation of Required Rate of Return: Class III & IV Blended Rates

**A. Safe Rate of Return (5 Year T-Bill Rate)**

Year	Rate	W/A %	W/A Rate		
2018	2.7480	33.33%	0.9159		
2017	1.9100	26.67%	0.5094		
2016	1.3383	20.00%	0.2677		
2015	1.5292	13.33%	0.2038		
2014	1.6410	6.67%	0.1095	2.006	%

**B. Nonliquidity Rate**

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate		
2018	0.3583	33.33%	0.1194		
2017	0.2542	26.67%	0.0678		
2016	0.2950	20.00%	0.0590		
2015	0.2683	13.33%	0.0358		
2014	0.0883	6.67%	0.0059	0.288	%

**C. Risk Rate (30 yr T-bills vs 5 yr T-bills)**

Year	Rate	W/A %	W/A Rate		
2018	0.3642	6.67%	0.0243		
2017	0.9850	13.33%	0.1313		
2016	1.2592	20.00%	0.2518		
2015	1.3117	26.67%	0.3498		
2014	1.6992	33.33%	0.5663	1.324	%

**D. Management Factor of 0.5%**

0.500 %

**E. Property Tax Component**

(60% of Blended III&IV Rates)

Year	Rate	W/A %	W/A Rate		
2018	1.302	33.33%	0.4340		
2017	1.308	26.67%	0.3488		
2016	1.308	20.00%	0.2616		
2015	1.314	13.33%	0.1752		
2014	1.314	6.67%	0.0876	1.307	%

**F. Inflation Rate:**

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate		
2018	1.910	20.00%	0.3820		
2017	2.110	6.67%	0.1407		
2016	2.070	13.33%	0.2759		
2015	0.730	33.33%	0.2433		
2014	0.760	26.67%	0.2027	(1.245)	%

**TOTAL REQUIRED RATE OF RETURN (REAL)**

4.180 %

**LESS: PROPERTY TAX COMPONENT**

(1.307)

**TOTAL DISCOUNT COMPONENT**

2.873 %

**Stumpage Prices:**

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor	0.00%	0.55%

		1.0000	1.0000	1.0000	1.0000
<b>SAWTIMBER</b>	Current	\$/MBF at age	\$/MBF at age	\$/MBF at age	\$/MBF at age
<b>Region</b>	<b>\$/MBF</b>	35	45	55	80
Region 1	198.33	198.33	198.33	198.33	198.33
Region 2	198.66	198.66	198.66	198.66	198.66
Region 3	219.12	219.12	219.12	219.12	219.12
Region 4	220.51	220.51	220.51	220.51	220.51
Region 5	170.43	170.43	170.43	170.43	170.43

		1.2116	1.2800	1.3521	1.5508
<b>PULPWOOD:</b>		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age
<b>Region</b>	<b>\$/Cord</b>	35	45	55	80
Region 1	6.39	7.74	8.18	8.64	9.91
Region 2	5.20	6.30	6.66	7.03	8.06
Region 3	5.24	6.35	6.71	7.09	8.13
Region 4	10.90	13.20	13.95	14.73	16.90
Region 5	6.01	7.29	7.70	8.13	9.32

**Management Costs:**

<b>Region</b>	<u>\$/acre (1)</u>
1	3.25
2	3.25
3	3.25
4	3.25
5	3.25
<b>State</b>	

**Tax Rates:**

Effective Federal Income Tax Rate	21.00%
Effective WV State Income Tax Rate (6.5% * (1-.21))	5.14%
Effective WV Severance Tax Rate (1.5% * (1-.21))	1.19%

**Yield (Volumes) (80 year rotation)**

Timberland			
Productivity Grades	Site Index	Yield - MBF	Yield - Cords
Grade I	75 or more	14.5	10.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

**West Virginia Wgt/Avg Managed Timberland Stumpage Prices**

**REGION 1 - Sawtimber**

Year	Volume	\$/MBF	W/A%	\$/MBF
2018	9,307.85	208.95	33.33%	69.65
2017	21,212.89	213.81	26.67%	57.02
2016	11,080.07	170.93	20.00%	34.19
2015	12,561.80	192.85	13.33%	25.71
2014	12,162.06	176.34	6.67%	11.76
	<b>66,324.67</b>			<b>198.33</b>

**REGION 1 - Pulpwood \***

Year	Volume	\$/CORD	W/A%	\$/CORD
2018			0.00%	
2017	3,802.40	5.81	60.00%	3.49
2016	240.00	2.70	20.00%	0.54
2015	7,218.90	15.03	13.33%	2.00
2014	464.40	5.40	6.67%	0.36
	<b>11,725.70</b>			<b>6.39</b>

**REGION 2 - Sawtimber**

Year	Volume	\$/MBF	W/A%	\$/MBF
2018	37,951.25	214.78	33.33%	71.59
2017	57,210.90	203.96	26.67%	54.39
2016	41,475.00	185.68	20.00%	37.14
2015	26,487.65	175.25	13.33%	23.37
2014	22,001.80	182.47	6.67%	12.17
	<b>185,126.60</b>			<b>198.66</b>

**REGION 2 - Pulpwood**

Year	Volume	\$/CORD	W/A%	\$/CORD
2018	5,952.60	4.23	33.33%	1.41
2017	5,606.50	6.84	26.67%	1.82
2016	25,517.30	4.17	20.00%	0.83
2015	42,863.30	5.97	13.33%	0.80
2014	2,168.10	5.04	6.67%	0.34
	<b>82,107.80</b>			<b>5.20</b>

**REGION 3 - Sawtimber**

Year	Volume	\$/MBF	W/A%	\$/MBF
2018	107,266.20	233.19	33.33%	77.73
2017	112,269.80	212.95	26.67%	56.79
2016	136,304.30	191.34	20.00%	38.27
2015	135,967.80	207.12	13.33%	27.62
2014	91,467.44	280.52	6.67%	18.71
	<b>583,275.54</b>			<b>219.12</b>

**REGION 3 - Pulpwood**

Year	Volume	\$/CORD	W/A%	\$/CORD
2018	25,448.30	6.04	33.33%	2.01
2017	143,565.20	7.86	26.67%	2.10
2016	169,606.30	1.92	20.00%	0.38
2015	184,907.30	3.85	13.33%	0.51
2014	170,736.30	3.57	6.67%	0.24
	<b>694,263.40</b>			<b>5.24</b>

**REGION 4 - Sawtimber**

<u>Year</u>	<u>Volume</u>	<u>\$/MBF</u>	<u>W/A%</u>	<u>\$/MBF</u>
2018	25,582.56	218.49	33.33%	72.83
2017	15,073.14	238.37	26.67%	63.57
2016	9,925.16	170.26	20.00%	34.05
2015	6,644.42	223.42	13.33%	29.79
2014	5,020.90	303.89	6.67%	20.27
	<u>62,246.18</u>			<u>220.51</u>

**REGION 4 - Pulpwood**

<u>Year</u>	<u>Volume</u>	<u>\$/CORD</u>	<u>W/A%</u>	<u>\$/CORD</u>
2018	4,428.90	12.56	33.33%	4.19
2017	3,813.30	11.16	26.67%	2.98
2016	4,538.50	11.14	20.00%	2.23
2015	6,137.40	7.22	13.33%	0.96
2014	7,765.20	8.16	6.67%	0.54
	<u>26,683.30</u>			<u>10.90</u>

**REGION 5 - Sawtimber**

<u>Year</u>	<u>Volume</u>	<u>\$/MBF</u>	<u>W/A%</u>	<u>\$/MBF</u>
2018	10,243.05	173.82	33.33%	57.94
2017	45,373.14	162.33	26.67%	43.29
2016	23,026.02	150.53	20.00%	30.11
2015	37,714.40	160.15	13.33%	21.35
2014	21,661.40	265.95	6.67%	17.74
	<u>138,018.01</u>			<u>170.43</u>

**REGION 5 - Pulpwood**

<u>Year</u>	<u>Volume</u>	<u>\$/CORD</u>	<u>W/A%</u>	<u>\$/CORD</u>
2018	1,568.50	5.73	33.33%	1.91
2017	9,644.70	7.32	26.67%	1.95
2016	2,794.40	5.99	20.00%	1.20
2015	2,889.50	4.05	13.33%	0.54
2014	10,191.40	6.19	6.67%	0.41
	<u>27,088.50</u>			<u>6.01</u>

# **COAL PROPERTIES ANALYSIS**

**Tax Year 2020**

June 28, 2019  
Dale W. Steager  
State Tax Commissioner  
Department of Revenue

# COAL CAPITALIZATION RATE

## Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 11.

<b>Safe Rate</b>	90 day Treasury Bills	<b>Safe Rate</b>
January	December 2018	1.973%
January	December 2017	0.947%
January	December 2016	0.319%

<b>Risk Rate</b>	Interest differential between Loan Rate and 90 day Treasury Bills		
	<u>Loan Rate*</u>		<u>Debt Risk Rate</u>
	2018	6.90%	4.927%
	2017	6.10%	5.153%
	2016	5.51%	5.191%
	*Prime plus 2%		

<b>Equity</b>	Differential between Equity Rates and 90 day Treasury Bills		
	<u>Equity Rate**</u>		<u>Equity Risk Rate</u>
	2018	[15.0%/(1- .26)]-1.973	18.297%
	2017	[15.25%/(1- .275)]-0.947	20.087%
	2016	[14.75%/(1- .30)]-0.319	20.752%
	** Value Line Investment Survey Analysis		

<b>Composite Risk Rate</b>	Loan and Equity Rates weighted by industry estimated capital structure		
	<u>Equity Rate</u>	<u>Debt Rate</u>	<u>Composite Risk</u>
2018	11.893%	1.724%	13.617%
2017	13.057%	1.804%	14.861%
2016	13.489%	1.817%	15.306%
Note:	Debt Equity Ratio	Debt 35%	Equity 65%

<b>Non Liquidity Rate</b>	Interest differential between a 90 day Treasury Bill and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property			
		<u>1yr T Bill</u>	<u>90 d T Bill</u>	<u>Non Liquidity Rate</u>
January	December 2018	2.332%	1.973%	0.359%
January	December 2017	1.201%	0.947%	0.254%
January	December 2016	0.614%	0.319%	0.295%

<b>Management Rate</b>	Charges for the management of investment portfolios	
Fixed Rate (by Rule)	0.500%	

<b>Inflation Rate</b>			
January	December 2018	1.910%	
January	December 2017	2.110%	
January	December 2016	2.070%	

**Capitalization Rate** Since the valuation of active coal property is predicated on a three year production average, the capitalization rate is considered in a similar manner.

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Inflation Rate	-1.910%	-2.110%	-2.070%
Safe Rate	1.973%	0.947%	0.319%
Composite Risk Rate	13.617%	14.861%	15.306%
Non Liquidity Rate	0.359%	0.254%	0.295%
Management Rate	0.500%	0.500%	0.500%
Total	14.539%	14.452%	14.350%
Three Yr Average:	14.447	Rounded to	<b>14.40%</b>

CAPITALIZATION RATE - 14.4%			
MULTIPLIERS:		%	
1YR	0.935	9YR	5.214
2YR	1.752	10YR	5.493
3YR	2.467	11YR	5.737
4YR	3.091	12YR	5.949
5YR	3.637	13YR	6.135
6YR	4.114	14YR	6.298
7YR	4.531	15YR	6.440
8YR	4.896		

**COAL**

**Price and Royalty Rate Analysis**

The development of royalty rates for the various categories of mines and markets involves information collection and review from a variety of sources. Coal lease rates have been derived from transaction information provided by county producers, assessors, tax auditors, and by individual lessors/lessees involved in the specific transaction. The prices for mined coal, as per 110-CSR-11, have been calculated from information provided by the WV Public Service Commission and U.S. Energy Information Administration concerning power plant fuel purchases. Prices provided by producers as part of tax filing and from data obtained from market summaries are included for comparison. Because a large portion of the data used in this analysis is, by law, considered confidential, only a summary of the results are published.

**COAL SALE PRICES FOR TY20 APPLICATION**

<b>GRAND SUMMARY ALL SOURCES</b>	<b>STEAM SPOT</b>	<b>STEAM TERM</b>	<b>MET</b>
PSC (2018)	\$54.58	\$47.48	
FERC (2018)	\$50.40	\$52.37	
Active Return Summary (2018)	in progress	in progress	in progress
Coal Market Publication (3 year average - Platts)	\$48.11 PGH (13/3) Rail \$53.59 CAPP (12/1.67) Barge		\$146.81 Low Vol HCC \$151.90 High Vol A \$124.04 High Vol B

**STATE STEAM PRICE**  
**STATE MET PRICE**

\$49.66 FERC & PSC 3 Yr Ave SPOT  
\$124.04 Platts High Vol B estimated while 2018 Active Returns are processed

	Spot Sales	Term Sales	Total
2018 WVSC Reported Tons	4,050,229	12,793,409	16,843,638

<b>COAL TY20 ROYALTY RATES</b>	2018 - Active Return 1YR		2017 2YR		2016 3YR		2015 4YR		2014 5YR	
	%S	%D	%S	%D	%S	%D	%S	%D	%S	%D
TOTAL RECORDS	in progress	in progress	1,644	1,061	691	776	447	452	1,447	599
SUM of PERCENT			9,633.84	5,379.27	4,445.82	4,020.76	2,904.85	2,327.95	8,869.07	3,313.93
STRAIGHT AVERAGE			5.86	5.07	6.43	5.18	6.50	5.15	6.13	5.53
MEDIAN			8.00	5.00	6.00	5.50	6.00	5.00	6.00	5.00
WEIGHTED AVERAGE (by Active Acres)			6.74	5.76	6.62	5.45	6.80	5.10	6.94	5.84

ROYALTY RATE DEEP (%)	5.54
ROYALTY RATE SURFACE (%)	6.78

**ROYALTY RATE CALCULATIONS**

Steam Coal/ Deep Mine	\$49.66	per ton X	5.54%	=	\$2.75	per ton
Metallurgical Coal/ Deep Mine	\$124.04	per ton X	5.54%	=	\$6.87	per ton
Steam Coal/ Surface Mine	\$49.66	per ton X	6.78%	=	\$3.36	per ton
Metallurgical Coal/ Surface Mine	\$124.04	per ton X	6.78%	=	\$8.40	per ton

### **Explanation of Reserve Coal Valuation**

The RCVM consists of a computer model, which utilizes a database consisting of coal beds and characteristics, property locations, mine locations, sales, transportation, etc., for the entire state. An extensive algorithm calculates in-place tonnage, expected time of mining and present value for all the mineable coal on every property.

There are, therefore, no set "rates" available on reserve coal under the Rule. The RCVM values on each property will not be available until all data has been entered, after October 15 of each year. Please refer to the State Register, Legislative Rules, Title 110, Series 11 for details of the process.

**Title 110, Series 11**  
**Valuation of Active and Reserve Coal Property for Ad Valorem Property Tax Purposes**

The above Legislative Rule was modified during the 2005 Legislative Session requiring biennial (every other year) updating of the geostatistical basis for several valuation factors used in the Reserve Coal Valuation Model. To satisfy that requirement, maps and data files concerning the Market Interest Factor, the Market Mineability Factor, the Use Conflict Factor and the Environmental Factor were revised for Tax Year 2019 (next update in TY2021). Preliminary research has been conducted to determine the effects of the factors on coal valuation. The results are as follows:

**Market Interest Factor**

This is the relationship between transactions (sales, leases, prospects, permit applications, etc.) and mining as it relates to properties and locations. Trans\_Ct is the number of transactions counted within the radius.

Radius = 5 miles

If Trans\_Ct <= 30 Then TransFactor = 20

If Trans\_Ct > 30 And Trans\_Ct <= 20 Then TransFactor = 40

Else TransFactor = 80

**Market Mineability Factor**

This is the relationship between property location and mining, through time. Determining feature is count of mines within the radius.

Radius = 2.5 miles

Surface Mines Smine

Deep Mines Dmine

Boom Mines Bmine

Historic Mines Omine

Current Mines Cmine

To assign MineFactor

If Cmine > 0 Then MineFactor = 20

If Cmine = 0 And (Omine > 0 Or Bmine > 0) Then MineFactor = 40

Else MineFactor = 80

**Use Conflict Factor**

This is the relationship between oil & gas well drilling and mining as it relates to property location. Well density is in wells per square mile.

WellDensity <= 5 Then WellFactor = 0

WellDensity > 5 And WellDensity < 10 Then WellFactor = 20

WellDensity > 10 And WellDensity < 15 Then WellFactor = 40

WellDensity > 15 Then WellFactor = 80

**Environmental Factor**

This is the relationship of known environmental hazards and impediments to the likelihood of mining occurring at this location. The rates are compiled from maps and represent densities of problems mapped.

Envrate <= 10 or Null Then EnvFactor = 0

Envrate > 10 and Envrate <= 20 Then EnvFactor = 20

Envrate > 20 and Envrate <= 60 Then EnvFactor = 40

Envrate > 60 Then EnvFactor = 80

**OTHER MINED MINERAL  
PROPERTY ANALYSIS**

**Tax Year 2020**

June 28, 2019  
Dale W. Steager  
State Tax Commissioner  
Department of Revenue

## OTHER MINED MINERALS CAPITALIZATION RATE

### Capitalization Rate Analysis and Results:

In developing a capitalization rate for use in valuing specific income-producing properties consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 1k.

<u>Safe Rate</u>			<u>Safe Rate</u>	
90 day Treasury Bills				
January	December	2018		1.973%
January	December	2017		0.947%
January	December	2016		0.319%

<u>Risk Rate</u> Interest differential between Loan Rate and 90 day Treasury Bills				
	<u>Loan Rate*</u>		<u>Debt Risk Rate</u>	
2018	6.90%			4.927%
2017	6.10%			5.153%
2016	5.51%			5.191%
	*Prime plus 2%			

<u>Equity</u> Differential between Equity Rates and 90 day Treasury Bills				
	<u>Equity Rate**</u>		<u>Equity Risk Rate</u>	
2018	[12.00%/(1-.26)]-1.973			14.243%
2017	[12.00%/(1-.275)]-0.947			15.605%
2016	[11.75%/(1-.30)]-0.319			16.467%
	** Value Line Investment Survey Analysis			

<u>Composite Risk Rate</u> Loan and Equity Rates weighted by industry estimated capital structure				
	<u>Equity Rate</u>	<u>Debt Rate</u>	<u>Composite Risk</u>	
2018	9.258%	1.724%	10.982%	
2017	10.143%	1.804%	11.947%	
2016	9.880%	2.076%	11.956%	
Note:	Debt Equity Ratio	Debt	35%	Equity 65%

Non Liquidity Rate Interest differential between 90 day Treasury Bills and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property

			<u>1yr T Bill</u>	<u>90 d T Bill</u>	<u>Non Liquidity Rate</u>
January	December	2018	2.332%	1.973%	0.359%
January	December	2017	1.201%	0.947%	0.254%
January	December	2016	0.614%	0.319%	0.295%

Management Rate Charges for the management of investment portfolios  
Fixed Rate (by Rule) 0.500%

<u>Inflation Rate</u>				
January	December	2018	1.910%	
January	December	2017	2.110%	
January	December	2016	2.070%	

<u>Property Tax Rate</u> Sixty percent (60%) of State average Class III property tax rate				
January	December	2018	60% of 2.170 =	1.302%
January	December	2017	60% of 2.180 =	1.308%
January	December	2016	60% of 2.180 =	1.308%

Capitalization Rate Since the valuation of other mined mineral property is predicated on a three year production average, the capitalization rate is considered in a similar manner.

	<u>2018</u>	<u>2017</u>	<u>2016</u>
Inflation Rate	-1.910%	-2.110%	-2.070%
Safe Rate	1.973%	0.947%	0.319%
Composite Risk Rate	10.982%	11.947%	11.956%
Non Liquidity Rate	0.359%	0.254%	0.295%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.302%	1.308%	1.308%
<b>Total</b>	<b>13.206%</b>	<b>12.846%</b>	<b>12.308%</b>

Three Yr Average: 12.787% Rounded to: **12.80%**

### CAPITALIZATION RATE - 12.80%

MULTIPLIERS:	%	%	%
1YR	0.942	9YR	5.491
2YR	1.776	10YR	5.809
3YR	2.516	11YR	6.092
4YR	3.172	12YR	6.342
5YR	3.754	13YR	6.564
6YR	4.269	14YR	6.761
7YR	4.727	15YR	6.935
8YR	5.132		

## OTHER MINED MINERALS

### ROYALTY RATE SURVEY

The determination of royalty rates for other mined minerals within the state of West Virginia is dependent upon the availability of leasehold information. Since this information is limited, the Department has chosen to review data for the most recent thirty year period. A summary only of this review is shown below in order to protect the confidentiality of parties involved.

RESOURCE	DATA SOURCES	AVERAGE ROYALTY	MEDIAN ROYALTY	TY2020 RATE
LIMESTONE	15	\$0.22	\$0.20	<b>\$0.22</b>
SANDSTONE	8	\$0.31	\$0.25	<b>\$0.30</b>
CLAY/SHALE	34	\$0.12	\$0.10	<b>\$0.11</b>
SAND/GRAVEL	10	\$0.35	\$0.40	<b>\$0.40</b>
SALT BRINE	1	N/A	N/A	<b>\$0.10</b>

## RESERVE VALUES

	number of sales	\$/AC
LIMESTONE	5	\$3,000.00
SANDSTONE	8	\$2,300.00
CLAY/SHALE	16	\$850.00
SAND/GRAVEL	6	\$4,000.00
SALT	2	\$1,140.00