



Dave Hardy
Secretary of Revenue

Matthew Irby
State Tax Commissioner

STATE TAX DEPARTMENT

September 1, 2022

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 final natural resource property valuation variables for the 2023 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.

In accordance with the requirements of §§110CSR1-I, 1-J and 1-K, tentative variables were made available for public comments on July 1, 2022. The department received comments on the tentative valuation variables and provides the following response.

First, the agency received many comments regarding the new capitalization methodology for oil and gas variables. One particular comment noted the size premium utilized. While the agency selected this size premium as reflective of the size of companies producing the vast majority of oil and gas in West Virginia, after additional analysis, it was determined that the size premium would be derived from a risk pool closer to the median. The Unsystematic Risk Premium was likewise increased to account for additional risk to an individual well. A comment also noted an incorrect decline rate in the Northwest Region. This has been corrected.

Second, the agency received a comment on Managed Timberland regarding the calculation methodology. After additional analysis, it was determined that a calculation error had occurred and has been corrected. We received an additional comment regarding the substantively low capitalization rate compared to the prior year and with other states. This was our statement last year on that rate:

These rates are the result of fiscal policy related to the Covid-19 pandemic, and do not necessarily fully encapsulate the risk associated with the long-term investment in the timber industry. As a result, the historic management rate has been adjusted from 0.5% to 1.0%. This is consistent with industry specific valuation procedures throughout the course of the pandemic.

Finding that financial instability in the marketplace remains high due to the fiscal policy related to the Covid-19 pandemic, the agency has determined to accept the comment and again adjust the management rate.

Third, the agency received a number of comments regarding errors in the calculation of the rate on coal and other mined minerals including a request that the equity rate be investigated and sourced. Those errors have been corrected and should be reflected in the final rate and the source should be included.

Sincerely,



Matthew R. Irby
State Tax Commissioner

Attachment

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2023

September 1, 2022
Matthew R. Irby
State Tax Commissioner
Department of Revenue

OIL AND GAS CAPITALIZATION RATE

The 07/01/2022 cost of capital analysis for WV Oil and Gas TY 2023 was completed on 06/30/2022 using the Q4 2021 Cost of Capital Professional study. Returns were selected and calculated for the time period ranging from 1928 to 2021 using a geometric mean.

5.4.2.a: Equity Portion: An equity percentage of **65.00%** was selected. Given the components selected the formula used is as follows:
$$\text{CoE} = \text{RFR} + \text{ERP} + \text{SP} + \text{IRP} + \text{CSRP}$$
$$16.71\% = 3.55\% + 4.91\% + 2.31\% + 1.65\% + 2.80\%$$

5.4.2.a.1 A **3.55%** Risk Free Rate (RFR) was selected, representing the 20-Year Treasury Constant Maturity Rate available on 06/28/2022 at the Federal Reserve Bank.

5.4.2.a.2 A **4.91%** Equity Risk Premium (ERP) was selected, representing the Historical ERP calculated using the S&P 500 average annual return of 10.21% derived from CRSP data for the 1928 - 2021 period and a 5.30% 20-year T-Bond average annual return (Reconstructed) for the same timeframe.

5.4.2.a.3 An implied **2.31%** Industry Risk Premium (IRP) was calculated using an industry beta of 1.47. The 5-Year industry beta for 2021 US - Oil & Gas Exploration & Production was sourced from **Salvidio & Partners and included 9 firms**. Implied Industry Risk Premium = (Industry Beta * ERP) - ERP = (1.47 * 4.91%) - 4.91%.

5.4.2.a.4 A **3.14%** Size Premium (SP) was selected. The Size Premium was based on CRSP decile 6_8 which included 1,064 firms with an equity market capitalization size ranging from \$629,118,000 to \$3,276,553,000 in Q4 2021. The CRSP decile 6_8 mean annual return reached 11.86% between 1928 and 2021. The mean annual return for the S&P 500 for the same period was 10.21%.

5.4.2.a.5 A **2.8%** Unsystematic Risk Premium (URP) based upon the property tax rate and the cost of managing the investment.

Cost of Capital was calculated as **12.37%** cost of equity capital for WV Oil and Gas TY 2023 as of 07/01/2022 based on the Build-Up Model.

5.4.2.b Debt Portion A Debt Percentage of **35%** was selected

5.4.2.b.1 A borrowing rate (pre-tax cost of debt) of **5.26%** was selected. Damodaran 2021 (Oil and Gas Exploration and Production Book Interest Rate).

5.4.2.b.2 A tax rate of **18.21%** was selected from Damodaran 2021 Oil and Gas Exploration and Production Money Making Firms

The Weighted Average Cost of Capital (WACC) was also computed for WV Oil and Gas TY 2023. Given the components selected the formula used is as follows:

$$WACC = (CoE * We) + (KdPreTax * (1 - t) * Wd)$$

$$12.37\% = (16.71\% * 65.00\%) + (5.26\% * (1 - 18.21\%) * 35.00\%)$$

Weighted Average Sate Wide Cost of Capital is calculated as 12.37% WACC for WV Oil and Gas TY 2023 as of 07/01/2022.

Cost of Capital = 12.37% WACC for West Virginia Oil and Gas as of 07/01/2022.

CAPITALIZATION RATE -12.37%			
Year	Multiplier	Year	Multiplier
1	0.9434	16	0.1641
2	0.8395	17	0.1460
3	0.7471	18	0.1300
4	0.6649	19	0.1157
5	0.5917	20	0.1029
6	0.5266	21	0.0916
7	0.4686	22	0.0815
8	0.4171	23	0.0725
9	0.3712	24	0.0646
10	0.3303	25	0.0575
11	0.2940	26	0.0511
12	0.2616	27	0.0455
13	0.2328	28	0.0405
14	0.2072	29	0.0360
15	0.1844	30	0.0321

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	Braxton
14	Benson	-0.48	-0.08	-0.08	Clay
16	Benson, Balltown+	-0.45	-0.16	-0.12	Fayette
17	Gordon +	-0.30	-0.07	-0.07	Nicholas
18	Big Injun	-0.34	-0.13	-0.13	Webster
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	
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	Berkeley
14	Benson	-0.31	-0.17	-0.12	Grant
20	Benson +	-0.44	-0.20	-0.08	Greenbrier
21	Benson, Fifth	-0.29	-0.28	-0.09	Hampshire
32	Brallier +	-0.48	-0.20	-0.05	Hardy
33	Elk, Benson	-0.39	-0.21	-0.08	Jefferson
34	Elk, Benson, Riley	-0.53	-0.19	-0.05	Mineral
35	Elk, Benson, Riley +	-0.36	-0.19	-0.11	Monroe
36	Elk, Benson, Balltown	-0.34	-0.18	-0.11	Morgan
37	Elk, Alexander, Benson	-0.50	-0.07	-0.07	Pendleton
38	Elk, Alexander, Benson +	-0.40	-0.16	-0.16	Pocahontas
39	Huntermville	-0.31	-0.31	-0.14	Preston
40	Fox, Haverty	-0.36	-0.21	-0.15	Randolph
93	4th Sand	-0.42	-0.32	-0.08	Summers
94	50 Foot	-0.34	-0.26	-0.07	Tucker
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	
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 Exception 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	McDowell
22	Big Lime	-0.31	-0.19	-0.07	Mercer
23	Big Lime, Maxton	-0.31	-0.19	-0.07	Raleigh
24	Big Lime, Ravencloff	-0.29	-0.29	-0.17	Wyoming
25	Berea +	-0.37	-0.12	-0.08	
26	Ravencloff	-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, Ravencloff	-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	
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 West**South West: Cabell, Lincoln, Logan, Mingo, Wayne**

Code	Formation	Year 1	Year 2	Year 3 +	
3	Devonian Shale	-0.31	-0.15	-0.04	Cabell
8	Berea	-0.36	-0.11	-0.11	Lincoln
18	Big Injun	-0.38	-0.22	-0.04	Logan
22	Big Lime	-0.19	-0.19	-0.19	Mingo
43	Berea, Big Lime	-0.18	-0.18	-0.18	Wayne
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	
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.

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	Boone
4	Huron	-0.31	-0.15	-0.04	Kanawha
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	
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.

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	Brooke
13	Alexander, Benson, Riley	-0.26	-0.16	-0.15	Hancock
15	Benson, Riley	-0.18	-0.16	-0.06	Marshall
93	4th Sand	-0.42	-0.32	-0.08	Ohio
94	50 Foot	-0.34	-0.26	-0.07	Tyler
95	Injun/Weir	-0.51	-0.26	-0.09	Wetzel
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	
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 Exception 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	Pleasants
4	Huron	-0.42	-0.24	-0.14	Ritchie
5	Huron, Shales above Huron	-0.39	-0.25	-0.14	Wood
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.

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	Barbour
12	Alexander, Benson	-0.37	-0.19	-0.11	Doddridge
13	Alexander, Benson, Riley	-0.40	-0.28	-0.05	Gilmer
14	Benson	-0.31	-0.17	-0.12	Harrison
15	Benson, Riley	-0.34	-0.17	-0.14	Lewis
18	Big Injun	-0.36	-0.16	-0.13	Marion
21	Benson, Fifth	-0.31	-0.20	-0.14	Monongalia
28	Weir	-0.34	-0.34	-0.07	Taylor
29	Weir +	-0.28	-0.28	-0.23	Upshur
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, Haverty	-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	

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

North Central: continued				
Code	Formation	Year 1	Year 2	Year 3 +
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	Haverty, Elk, Benson (No Alexander)	-0.35	-0.16	-0.16
78	Haverty	-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	Haverty, 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
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.

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	Jackson
2	Huron, Rhinestreet	-0.13	-0.12	-0.03	Mason
3	Devonian Shale	-0.31	-0.15	-0.04	Putnam
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	
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.

Decline Rates for Natural Gas and Oil Formations: West Central

West Central: Calhoun, Roane, Wirt

Code	Formation	Year 1	Year 2	Year 3 +	
2	Huron, Rhinestreet	-0.49	-0.11	-0.06	Calhoun
4	Huron	-0.33	-0.22	-0.14	Roane
27	Huron, Shales above Huron	-0.42	-0.23	-0.12	Wirt
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	
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.

Average Industry Operating Expense Results – Safe Harbor

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

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 \$2.56/MCF
BBL usage X \$56.99/BBL

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

Non-Filer Pricing

Under W.Va. CSR sec. 110-1J-8 the Tax Commissioner shall now use the average industry price of the producing area and strata multiplied by the production of the well as reported to the WV Department of Environmental Protection in determining the working interest income. The following prices will be used across the state:

Natural Gas	=	\$4.00 per mcf
Oil	=	\$60 per barrel
Natural Gas Liquids	=	\$25 per barrel

Minimum Pricing

As provided under W.Va. Code sec. 11-1C-10, the following minimum net value (after expenses) are set:

Natural Gas	=	\$0.30 per mcf
Oil	=	\$10.00 per barrel
Natural Gas Liquids	=	\$0.30 per MMBtu

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.

COUNTY	CO #	TY 2023 \$/AC BY COUNTY AND DISTRICT									
BARBOUR	1	DIS 1 \$55.00	DIS 2 \$1.00	DIS 3 \$55.00	DIS 4 \$55.00	DIS 5 \$55.00	DIS 6 \$1.00	DIS 7 \$55.00	DIS 8 \$55.00	DIS 9 \$55.00	DIS 10 \$55.00
BARBOUR	1	DIS 11 \$55.00									
BERKELEY	2	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00		
BOONE	3	DIS 1 \$20.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$20.00	DIS 5 \$20.00	DIS 6 \$20.00	DIS 7 \$1.00	DIS 8 \$20.00	DIS 9 \$1.00	
BRAXTON	4	DIS 1 \$20.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$20.00	DIS 6 \$20.00	DIS 7 \$20.00	DIS 8 \$1.00		
BROOKE	5	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$105.00	DIS 4 \$105.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00		
CABELL	6	DIS 1 \$25.00	DIS 2 \$1.00	DIS 3 \$25.00	DIS 4 \$25.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$25.00	DIS 9 \$1.00	DIS 10 \$25.00
CALHOUN	7	DIS 1 \$30.00	DIS 2 \$1.00	DIS 3 \$30.00	DIS 4 \$30.00	DIS 5 \$30.00	DIS 6 \$30.00				
CLAY	8	DIS 1 \$20.00	DIS 2 \$1.00	DIS 3 \$20.00	DIS 4 \$20.00	DIS 5 \$20.00	DIS 6 \$20.00				
DODDRIDGE	9	DIS 1 \$100.00	DIS 2 \$100.00	DIS 3 \$100.00	DIS 4 \$100.00	DIS 5 \$100.00	DIS 6 \$100.00	DIS 7 \$100.00	DIS 8 \$100.00	DIS 9 \$1.00	
FAYETTE	10	DIS 1 \$20.00	DIS 2 \$20.00	DIS 3 \$20.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
FAYETTE	10	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00							
GILMER	11	DIS 1 \$25.00	DIS 2 \$25.00	DIS 3 \$25.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$25.00				
GRANT	12	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00					
GREENBRIER	13	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
GREENBRIER	13	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$1.00	DIS 17 \$1.00	DIS 18 \$1.00		
HAMPSHIRE	14	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
HANCOCK	15	DIS 1 \$25.00	DIS 2 \$1.00	DIS 3 \$25.00	DIS 4 \$25.00	DIS 5 \$1.00	DIS 6 \$1.00				
HARDY	16	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00				
HARRISON	17	DIS 1 \$90.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$90.00	DIS 6 \$1.00	DIS 7 \$90.00	DIS 8 \$1.00	DIS 9 \$90.00	DIS 10 \$1.00
HARRISON	17	DIS 11 \$90.00	DIS 12 \$90.00	DIS 13 \$1.00	DIS 14 \$90.00	DIS 15 \$90.00	DIS 16 \$1.00	DIS 17 \$1.00	DIS 18 \$90.00	DIS 19 \$1.00	DIS 20 \$90.00
HARRISON	17	DIS 21 \$1.00									
JACKSON	18	DIS 1 \$40.00	DIS 2 \$40.00	DIS 3 \$1.00	DIS 4 \$40.00	DIS 5 \$1.00	DIS 6 \$40.00	DIS 7 \$40.00			
JEFFERSON	19	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00

COUNTY	CO #	TY 2023 \$/AC BY COUNTY AND DISTRICT									
KANAWHA	20	DIS 1 \$30.00	DIS 2 \$1.00	DIS 3 \$30.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
KANAWHA	20	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$30.00	DIS 16 \$30.00	DIS 17 \$1.00	DIS 18 \$1.00	DIS 19 \$30.00	DIS 20 \$1.00
KANAWHA	20	DIS 21 \$1.00	DIS 22 \$1.00	DIS 23 \$30.00	DIS 24 \$30.00	DIS 25 \$30.00	DIS 26 \$1.00	DIS 27 \$1.00	DIS 28 \$30.00	DIS 29 \$1.00	DIS 30 \$1.00
KANAWHA	20	DIS 31 \$1.00									
LEWIS	21	DIS 1 \$35.00	DIS 2 \$35.00	DIS 3 \$35.00	DIS 4 \$35.00	DIS 5 \$1.00	DIS 6 \$35.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	
LINCOLN	22	DIS 1 \$25.00	DIS 2 \$25.00	DIS 3 \$1.00	DIS 4 \$25.00	DIS 5 \$25.00	DIS 6 \$25.00	DIS 7 \$25.00	DIS 8 \$25.00	DIS 9 \$25.00	DIS 10 \$1.00
LOGAN	23	DIS 1 \$15.00	DIS 2 \$15.00	DIS 3 \$15.00	DIS 4 \$15.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$15.00	DIS 9 \$1.00	
MARION	24	DIS 1 \$1.00	DIS 2 \$90.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$90.00	DIS 10 \$1.00
MARION	24	DIS 11 \$90.00	DIS 12 \$90.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$90.00	DIS 17 \$1.00	DIS 18 \$90.00	DIS 19 \$90.00	DIS 20 \$1.00
MARION	24	DIS 21 \$1.00	DIS 22 \$1.00								
MARSHALL	25	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$105.00	DIS 4 \$105.00	DIS 5 \$105.00	DIS 6 \$1.00	DIS 7 \$105.00	DIS 8 \$1.00	DIS 9 \$105.00	DIS 10 \$1.00
MARSHALL	25	DIS 11 \$1.00	DIS 12 \$105.00	DIS 13 \$105.00	DIS 14 \$105.00	DIS 15 \$105.00	DIS 16 \$1.00				
MASON	26	DIS 1 \$1.00	DIS 2 \$25.00	DIS 3 \$25.00	DIS 4 \$25.00	DIS 5 \$25.00	DIS 6 \$25.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$25.00
MASON	26	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$25.00	DIS 15 \$25.00	DIS 16 \$25.00				
MCDOWELL	27	DIS 1 \$20.00	DIS 2 \$1.00	DIS 3 \$20.00	DIS 4 \$20.00	DIS 5 \$1.00	DIS 6 \$20.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
MCDOWELL	27	DIS 11 \$20.00	DIS 12 \$1.00	DIS 13 \$20.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$1.00				
MERCER	28	DIS 1 \$1.00	DIS 2 \$15.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$15.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$15.00	DIS 10 \$1.00
MERCER	28	DIS 11 \$15.00									
MINERAL	29	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
MINERAL	29	DIS 11 \$1.00									
MINGO	30	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$20.00	DIS 4 \$20.00	DIS 5 \$20.00	DIS 6 \$20.00	DIS 7 \$20.00	DIS 8 \$1.00	DIS 9 \$20.00	DIS 10 \$20.00
MINGO	30	DIS 11 \$20.00	DIS 12 \$1.00								
MONONGALIA	31	DIS 1 \$35.00	DIS 2 \$1.00	DIS 3 \$35.00	DIS 4 \$35.00	DIS 5 \$35.00	DIS 6 \$1.00	DIS 7 \$35.00	DIS 8 \$35.00	DIS 9 \$1.00	DIS 10 \$1.00
MONONGALIA	31	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$1.00	DIS 17 \$1.00	DIS 18 \$1.00	DIS 19 \$35.00	
MONROE	32	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	
MORGAN	33	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00		

COUNTY	CO #	TY 2023 \$/AC BY COUNTY AND DISTRICT									
NICHOLAS	34	DIS 1 \$1.00	DIS 2 \$15.00	DIS 3 \$15.00	DIS 4 \$15.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$15.00	DIS 8 \$1.00	DIS 9 \$1.00	
OHIO	35	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$105.00	DIS 4 \$105.00	DIS 5 \$1.00	DIS 6 \$105.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$1.00
PENDLETON	36	DIS 1 \$1.00	DIS 2 \$10.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$10.00			
PLEASANTS	37	DIS 1 \$40.00	DIS 2 \$40.00	DIS 3 \$40.00	DIS 4 \$40.00	DIS 5 \$40.00	DIS 6 \$1.00	DIS 7 \$40.00	DIS 8 \$40.00		
POCAHONTAS	38	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00		
PRESTON	39	DIS 1 \$30.00	DIS 2 \$30.00	DIS 3 \$30.00	DIS 4 \$30.00	DIS 5 \$30.00	DIS 6 \$30.00	DIS 7 \$1.00	DIS 8 \$30.00	DIS 9 \$1.00	DIS 10 \$30.00
PRESTON	39	DIS 11 \$1.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$1.00	DIS 17 \$1.00	DIS 18 \$1.00	DIS 19 \$1.00	DIS 20 \$1.00
PUTNAM	40	DIS 1 \$25.00	DIS 2 \$25.00	DIS 3 \$1.00	DIS 4 \$25.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$25.00	DIS 9 \$1.00	DIS 10 \$25.00
PUTNAM	40	DIS 11 \$25.00	DIS 12 \$25.00	DIS 13 \$1.00							
RALEIGH	41	DIS 1 \$20.00	DIS 2 \$20.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$20.00	DIS 6 \$1.00	DIS 7 \$20.00	DIS 8 \$20.00	DIS 9 \$20.00	DIS 10 \$1.00
RALEIGH	41	DIS 11 \$20.00	DIS 12 \$20.00								
RANDOLPH	42	DIS 1 \$20.00	DIS 2 \$20.00	DIS 3 \$1.00	DIS 4 \$20.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$20.00
RANDOLPH	42	DIS 11 \$20.00	DIS 12 \$1.00	DIS 13 \$1.00	DIS 14 \$1.00	DIS 15 \$1.00	DIS 16 \$20.00	DIS 17 \$1.00	DIS 18 \$1.00		
RITCHIE	43	DIS 1 \$80.00	DIS 2 \$1.00	DIS 3 \$80.00	DIS 4 \$1.00	DIS 5 \$80.00	DIS 6 \$1.00	DIS 7 \$80.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$80.00
ROANE	44	DIS 1 \$35.00	DIS 2 \$35.00	DIS 3 \$35.00	DIS 4 \$35.00	DIS 5 \$1.00	DIS 6 \$35.00	DIS 7 \$35.00	DIS 8 \$1.00	DIS 9 \$35.00	
SUMMERS	45	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$5.00	DIS 6 \$1.00	DIS 7 \$1.00			
TAYLOR	46	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$90.00	DIS 4 \$90.00	DIS 5 \$90.00	DIS 6 \$90.00	DIS 7 \$90.00			
TUCKER	47	DIS 1 \$15.00	DIS 2 \$15.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$15.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$15.00	DIS 10 \$1.00
TUCKER	47	DIS 11 \$15.00	DIS 12 \$1.00								
TYLER	48	DIS 1 \$100.00	DIS 2 \$100.00	DIS 3 \$1.00	DIS 4 \$100.00	DIS 5 \$100.00	DIS 6 \$100.00	DIS 7 \$1.00	DIS 8 \$1.00	DIS 9 \$1.00	DIS 10 \$100.00
UPSHUR	49	DIS 1 \$70.00	DIS 2 \$70.00	DIS 3 \$1.00	DIS 4 \$70.00	DIS 5 \$70.00	DIS 6 \$70.00	DIS 7 \$70.00			
WAYNE	50	DIS 1 \$20.00	DIS 2 \$20.00	DIS 3 \$1.00	DIS 4 \$1.00	DIS 5 \$1.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$20.00	DIS 9 \$20.00	DIS 10 \$20.00
WAYNE	50	DIS 11 \$1.00	DIS 12 \$20.00								
WEBSTER	51	DIS 1 \$1.00	DIS 2 \$1.00	DIS 3 \$1.00	DIS 4 \$15.00	DIS 5 \$15.00	DIS 6 \$15.00	DIS 7 \$1.00			
WETZEL	52	DIS 1 \$100.00	DIS 2 \$100.00	DIS 3 \$100.00	DIS 4 \$100.00	DIS 5 \$100.00	DIS 6 \$1.00	DIS 7 \$1.00	DIS 8 \$100.00	DIS 9 \$1.00	DIS 10 \$1.00
WETZEL	52	DIS 11 \$1.00	DIS 12 \$100.00	DIS 13 \$1.00							

COUNTY	CO #	TY 2023 \$/AC BY COUNTY AND DISTRICT									
WIRT	53	DIS 1	DIS 2	DIS 3	DIS 4	DIS 5	DIS 6	DIS 7	DIS 8		
		\$35.00	\$35.00	\$35.00	\$1.00	\$35.00	\$35.00	\$35.00	\$35.00	\$35.00	
WOOD	54	DIS 1	DIS 2	DIS 3	DIS 4	DIS 5	DIS 6	DIS 7	DIS 8	DIS 9	DIS 10
		\$35.00	\$35.00	\$35.00	\$35.00	\$1.00	\$35.00	\$35.00	\$35.00	\$35.00	\$35.00
WOOD	54	DIS 11	DIS 12	DIS 13	DIS 14						
		\$35.00	\$35.00	\$1.00	\$1.00						
WYOMING	55	DIS 1	DIS 2	DIS 3	DIS 4	DIS 5	DIS 6	DIS 7	DIS 8	DIS 9	DIS 10
		\$20.00	\$20.00	\$20.00	\$20.00	\$20.00	\$1.00	\$20.00	\$1.00	\$1.00	\$20.00

**MANAGED TIMBER
PROPERTY ANALYSIS**

Tax Year 2023

September 1, 2022
Matthew R. Irby
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES

TAX YEAR 2023

(based on market 2017-2021)

Tentative Rates Per Acre

Class II Parcels					
	<u>Grade 1</u>		<u>Grade 2</u>		<u>Grade 3</u>
Region 1	\$200		\$140		\$50
Region 2	\$200		\$140		\$50
Region 3	\$200		\$140		\$50
Region 4	\$200		\$140		\$50
Region 5	\$200		\$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	\$225		\$150		\$75
Region 4	\$225		\$150		\$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 <u>Grades</u>	<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	
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

Estimation of Required Rate of Return

A. Safe Rate of Return (5 Year T-Bill or 5 Year Corp Bond Rate)				
Year	Rate	W/A %	W/A Rate	
2021	1.2600	6.67%	0.0840	
2020	2.0700	26.67%	0.5521	
2019	1.9575	20.00%	0.3915	
2018	2.7480	33.33%	0.9159	
2017	1.9100	13.33%	0.2546	2.198 %
<hr/>				
B. Nonliquidity Rate (20 yr T-Bill vs. 3 Month T-Bills)				
Year	Rate	W/A %	W/A Rate	
2021	1.8200	33.33%	0.6066	
2020	1.0100	26.67%	0.2694	
2019	0.5000	20.00%	0.1000	
2018	0.3583	13.33%	0.0478	
2017	0.2542	6.67%	0.0170	1.041 %
<hr/>				
C. Risk Rate (30 yr T-bills or 5 year Corp Bond vs 30 day T-bills)				
Year	Rate	W/A %	W/A Rate	
2021	1.2000	33.33%	0.4000	
2020	1.7000	26.67%	0.4534	
2019	0.6250	20.00%	0.1250	
2018	0.3642	13.33%	0.0485	
2017	0.9850	6.67%	0.0657	1.093 %
<hr/>				
D. Management Factor of 1.0%				
E. Property Tax Component (60% of Blended III&IV Rates)				
Year	Rate	W/A %	W/A Rate	
2021	0.720	33.33%	0.2400	
2020	0.720	26.67%	0.1920	
2019	0.720	20.00%	0.1440	
2018	0.708	13.33%	0.0944	
2017	0.714	6.67%	0.0476	0.718 %
<hr/>				
F. Inflation Rate: (BLS -- 20 yr average)				
Year	Rate	W/A %	W/A Rate	
2021	2.560	26.67%	0.6828	
2020	1.360	33.33%	0.4533	
2019	1.810	20.00%	0.3620	
2018	1.910	13.33%	0.2546	
2017	2.110	6.67%	0.1407	(1.893) %
<hr/>				
TOTAL REQUIRED RATE OF RETURN (REAL)				4.156 %
LESS: PROPERTY TAX COMPONENT				(0.718)
TOTAL DISCOUNT COMPONENT				3.438 %

West Virginia Wgt/Avg Managed Timberland Stumpage Prices

REGION 1 - Sawtimber

	Year	Volume	\$/MBF	W/A%	\$/MBF
See Note 1	2021	17,506.45	\$273.95	40.00%	\$109.58
	2020				N/A
	2019	29,481.29	\$209.92	30.00%	\$62.98
	2018	9,307.85	\$208.95	20.00%	\$41.79
	2017	21,212.89	\$170.93	10.00%	\$17.09
			<u>77,508.48</u>		

REGION 1 - Pulpwood *

	Year	Volume	\$/CORD	W/A%	\$/CORD
See Note 1	2021	374.80	\$2.70	90.00%	\$2.43
See Note 2	2020				N/A
See Note 2	2019				N/A
	2018				N/A
	2017	3,802.40	\$2.70	10.00%	\$0.27
		<u>4,177.20</u>			<u>\$2.70</u>

REGION 2 - Sawtimber

	Year	Volume	\$/MBF	W/A%	\$/MBF
See Note 1	2021	30,718.90	\$252.08	40.00%	\$100.83
	2020				N/A
	2019	38,964.42	\$197.22	30.00%	\$59.17
	2018	37,951.25	\$214.78	20.00%	\$42.96
	2017	57,210.90	\$203.96	10.00%	\$20.40
			<u>164,845.47</u>		

REGION 2 - Pulpwood

	Year	Volume	\$/CORD	W/A%	\$/CORD
See Note 1	2021	1,799.90	\$5.15	40.00%	\$2.06
	2020				N/A
	2019	8,026.30	\$6.93	30.00%	\$2.08
	2018	5,952.60	\$4.23	20.00%	\$0.85
	2017	5,606.50	\$6.84	10.00%	\$0.68
			<u>21,385.30</u>		

REGION 3 - Sawtimber

	Year	Volume	\$/MBF	W/A%	\$/MBF
See Note 1	2021	80,518.40	\$234.10	40.00%	\$93.64
	2020				N/A
	2019	86,183.30	\$197.17	30.00%	\$59.15
	2018	107,266.20	\$233.19	20.00%	\$46.64
	2017	112,269.80	\$212.95	10.00%	\$21.30
			<u>386,237.70</u>		

REGION 3 - Pulpwood

	Year	Volume	\$/CORD	W/A%	\$/CORD
See Note 1	2021	9,538.40	\$5.29	40.00%	\$2.12
	2020				N/A
	2019	126,600.70	\$1.29	30.00%	\$0.39
	2018	25,448.30	\$6.04	20.00%	\$1.21
	2017	143,565.20	\$7.86	10.00%	\$0.79
			305,152.60		

REGION 4 - Sawtimber

	Year	Volume	\$/MBF	W/A%	\$/MBF
See Note 1	2021	20,245.15	\$272.95	40.00%	\$109.18
	2020				N/A
	2019	29,355.02	\$204.95	30.00%	\$61.49
	2018	25,582.56	\$218.49	20.00%	\$43.70
	2017	15,073.14	\$238.37	10.00%	\$23.84
			90,255.87		

REGION 4 - Pulpwood

	Year	Volume	\$/CORD	W/A%	\$/CORD
See Note 1	2021	1,453.70	\$9.98	40.00%	\$3.99
	2020				N/A
	2019	2,349.30	\$10.05	30.00%	\$3.02
	2018	4,428.90	\$12.56	20.00%	\$2.51
	2017	3,813.30	\$11.16	10.00%	\$1.12
			12,045.20		

REGION 5 - Sawtimber

	Year	Volume	\$/MBF	W/A%	\$/MBF
See Note 1	2021	21,846.55	\$242.16	40.00%	\$96.86
	2020				N/A
	2019	35,343.64	\$180.50	30.00%	\$54.15
	2018	10,243.05	\$173.82	20.00%	\$34.76
	2017	45,373.14	\$162.33	10.00%	\$16.23
			112,806.38		

REGION 5 - Pulpwood

	Year	Volume	\$/CORD	W/A%	\$/CORD
See Note 1	2021	5,423.30	\$6.86	40.00%	\$2.74
	2020				N/A
	2019	1,659.60	\$4.99	30.00%	\$1.50
	2018	1,568.50	\$5.73	20.00%	\$1.15
	2017	9,644.70	\$7.32	10.00%	\$0.73
			18,296.10		

Note 2: No reported production

Management Costs:

Region	\$/acre (1)
1	3.25
2	3.25
3	3.25
4	3.25
5	3.25

State**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	

COAL PROPERTIES ANALYSIS

Tax Year 2023

September 1, 2022
Matthew R. Irby
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.

<u>Safe Rate</u>	90 day Treasury Bills	<u>Safe Rate</u>
	January December	0.060%
	January December	0.370%
	January December	2.104%

<u>Risk Rate</u>	Interest differential between Loan Rate and 90 day Treasury Bills	
	<u>Loan Rate*</u>	<u>Debt Risk Rate</u>
2021	5.54%	5.480%
2020	5.54%	5.170%
2019	7.28%	5.176%
	*Prime plus 2%	

<u>Equity</u>	Differential between Equity Rates and 90 day Treasury Bills	
	<u>Equity Rate**</u>	<u>Equity Risk Rate</u>
2021	11.04%	16.264%
2020	11.44%	14.761%
2019	15.13%	18.166%

**COE - BVR Cost of Capital Professional (CRSP, Center for Research in Security Prices, Salvador Partners, Damodaran, Stern School)

<u>Composite Risk Rate</u>	Loan and Equity Rates weighted by industry estimated capital structure.			
	<u>Equity Rate</u>	<u>Debt/(Debt+Equity)</u>	<u>Debt Rate</u>	<u>Composite Risk</u>
2021	12.198%	25.0%	1.370%	13.568%
2020	11.071%	25.0%	1.293%	12.364%
2019	11.232%	25.0%	2.076%	13.308%

Non Liquidity Rate

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	2021	0.320%	0.060%	0.260%
January	December	2020	0.380%	0.370%	0.010%
January	December	2019	2.050%	1.550%	0.500%

Management Rate

Charges for the management of investment portfolios.

Fixed Rate (by Rule)	0.500%
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Inflation Rate

January	December	2021	2.560%
January	December	2020	1.360%
January	December	2019	1.810%

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>2021</u>	<u>2020</u>	<u>2019</u>
Inflation Rate	-2.560%	-1.360%	-1.810%
Safe Rate	0.060%	0.370%	2.104%
Composite Risk Rate	13.568%	12.364%	13.308%
Non Liquidity Rate	0.260%	0.010%	0.500%
Management Rate	0.500%	0.500%	0.500%
Total	11.828%	11.884%	14.602%

Three Yr Average: 12.80%

Rounded to:

12.80%

<u>CAPITALIZATION RATE</u>	<u>12.80%</u>		
Yr	<u>MULTIPLIERS:</u>		
1	0.887	9	5.170
2	1.672	10	6.057
3	2.369	11	6.943
4	2.987	12	7.830
5	3.534	13	8.716
6	4.020	14	9.603
7	4.450	15	10.489
8	4.832		

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 active operations, 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 TY23 APPLICATION

GRAND SUMMARY ALL SOURCES	STEAM SPOT	STEAM TERM	MET
PSC (2021)	\$60.65	\$47.44	
FERC (2021)	\$64.59	\$54.81	
Active Return (AR) Summary (2021)	in progress	in progress	in progress
Coal Market Publication (3 year average - Platts)	\$47.74 PGH (13/3) Rail \$55.13 CAPP (12/1.67) Barge		\$159.05 Low Vol HCC \$160.20 High Vol A \$139.13 High Vol B

STATE STEAM PRICE	\$56.50 FERC & PSC, 3Yr Ave SPOT
STATE MET PRICE	\$139.13 Platts High Vol B 3Yr Ave (Estimate)

	Spot Sales	Term Sales	Total
2021 WV-PSC Reported Tons	1,245,309	11,925,403	13,170,712

COAL TY23 ROYALTY RATES

	2021 - Active Return		2020		2019		2018		2017	
	1YR		2YR		3YR		4YR		5YR	
	%S	%D	%S	%D	S	%D	%S	%D	%S	%D
TOTAL RECORDS	In Progress		27	25	77	25	76	47	640	672
SUM of PERCENT			156.90	126.05	528.27	133.33	517.21	268.47	3,968.00	3,702.72
STRAIGHT AVERAGE			5.81	5.04	6.86	5.33	6.81	5.71	6.20	5.51
MEDIAN			6.50	6.00	7.00	6.00	6.00	5.00	6.00	5.00
WEIGHTED AVERAGE			6.68	5.39	6.70	3.68	6.36	5.83	6.45	5.83

ROYALTY RATE DEEP (%)	5.18
ROYALTY RATE SURFACE (%)	6.55

ROYALTY RATE CALCULATIONS

Steam Coal/ Deep Mine	\$56.50	per ton X	5.18%	=	\$2.93	per ton
Metallurgical Coal/ Deep Mine	\$139.13	per ton X	5.18%	=	\$7.21	per ton
Steam Coal/ Surface Mine	\$56.50	per ton X	6.55%	=	\$3.70	per ton
Metallurgical Coal/ Surface Mine	\$139.13	per ton X	6.55%	=	\$9.11	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 1I for details.

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 2023 (next update in TY25). 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 >= 28 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 < 12 Then WellFactor = 40

WellDensity > 12 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 <= 30 Then EnvFactor = 40

Envrate > 30 Then EnvFactor = 80

**OTHER MINED MINERAL
PROPERTY ANALYSIS**

Tax Year 2023

September 1, 2022
Matthew R. Irby
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 11.

<u>Safe Rate</u>	90 day Treasury Bills		<u>Safe Rate</u>
January	December	2021	0.060%
January	December	2020	0.370%
January	December	2019	2.104%

<u>Risk Rate</u>	Interest differential between Loan Rate and 90 day Treasury Bills	
	<u>Loan Rate*</u>	<u>Debt Risk Rate</u>
2021	5.54%	5.480%
2020	5.54%	5.170%
2019	7.28%	5.176%
	*Prime plus 2%	

<u>Equity</u>	Differential between Equity Rates and 90 day Treasury Bills	
	<u>Equity Rate**</u>	<u>Equity Risk Rate</u>
2021	11.97%	17.634%
2020	12.00%	16.298%
2019	12.00%	14.112%

**COE - BVR Cost of Capital Professional (CRSP, Center for Research in Security Prices, Salvador Partners, Damodaran, Stern School)

<u>Composite Risk Rate</u>		Loan and Equity Rates weighted by industry estimated capital structure.		
	<u>Equity Rate</u>	<u>Debt/(Debt+Equity)</u>	<u>Debt Rate</u>	<u>Composite Risk</u>
2021	13.23%	25.0%	1.370%	14.595%
2020	11.00%	25.0%	1.680%	12.681%
2019	9.53%	25.0%	1.817%	11.350%

Non Liquidity Rate

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	2021	0.320%	0.060%	0.260%
January	December	2020	0.380%	0.370%	0.010%
January	December	2019	2.050%	1.550%	0.500%

Management Rate

Charges for the management of investment portfolios.

Fixed Rate (by Rule)	0.500%
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Inflation Rate

January	December	2021	2.560%
January	December	2020	1.360%
January	December	2019	1.810%

Property Tax

2021	1.380%
2020	1.320%
2019	1.320%

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>2021</u>	<u>2020</u>	<u>2019</u>
Inflation Rate	-2.560%	-1.360%	-1.810%
Safe Rate	0.060%	0.370%	2.104%
Composite Risk Rate	14.595%	12.364%	13.308%
Non Liquidity Rate	0.260%	0.010%	0.500%
Management Rate	0.500%	0.500%	0.500%
Property Tax	1.380%	1.320%	1.320%
Total	9.904%	13.521%	13.964%

Three Yr Average: 13.90%

Rounded to:

13.90%

CAPITALIZATION RATE -		13.90%	
Yr	<u>Multipliers</u>	Yr	
1	0.878	9	4.964
2	1.649	10	5.842
3	2.326	11	6.720
4	2.920	12	7.598
5	3.441	13	8.476
6	3.899	14	9.354
7	4.301	15	10.232
8	4.654		

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 to protect the confidentiality of parties involved.

Resource	# of Data Sources	Ave Royalty	Median Royalty	TY2023 Rate
LIMESTONE	15	\$0.22	\$0.20	\$0.22
SANDSTONE	8	\$0.31	\$0.25	\$0.30
CLAY/SHALE	34	\$0.12	\$0.10	\$0.11
SAND/GRAVEL	10	\$0.35	\$0.40	\$0.40
SALT BRINE	1	n/a	n/a	n/a

Reserve Values

	# of Sales	\$/AC
LIMESTONE	5	\$3,000
SANDSTONE	8	\$2,300
CLAY/SHALE	16	\$850
SAND/GRAVEL	6	\$4,000
SALT	2	\$1,140