



STATE OF WEST VIRGINIA
Department of Revenue
State Tax Department

Jim Justice
Governor

Dale W. Steager
State Tax Commissioner

August 31, 2017

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

Dear Secretary Warner:

Attached are final natural resource property valuation variables for the 2018 Tax Year that have been developed by the State Tax Department for use in appraising oil and gas, managed timberland, coal and other natural resource properties for ad valorem tax purposes.

In accordance with requirements of §§ 110 CSR 1-I, 1-J, and 1-K, tentative variables were made available for public comments on June 30, 2017. The Department received six comments on the tentative valuation variables, which all related to the valuation of oil and gas properties. No adjustments were made for these issues. However, the price for Metallurgical coal was revised based upon information that was unavailable on June 30.

The final valuation variables are being filed for inclusion in the State Register.

Sincerely,

Dale W. Steager
State Tax Commissioner

DWS/ja/j

Attachment

cc: All County Assessors

FILED
2017 AUG 31 P 12:00
OFFICE OF THE SECRETARY OF STATE

FILED

2017 AUG 31 P 12:07

GENE WOODRUFF
SECRETARY OF STATE

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2018

September 1, 2017
Dale W. Steager
State Tax Commissioner
Department of Revenue

OIL AND GAS

TY 2018

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.

Safe Rate	(3-Month Constant Maturity Interest Rates)			
	January	December	2016	0.319%

Risk Rate	(Interest differential between Loan Rate and 3-Month Constant Maturity Interest Rates)			
	<u>Loan Rate*</u>		<u>Risk Rate</u>	
	2016	5.510%	5.191%	
		*Prime plus 2%		

Equity	(Differential between Equity Rates and 3-Month Constant Maturity Interest Rates)			
	<u>Equity Rate**</u>		<u>Risk Rate</u>	
	2016	[12.25%/(1-.37)]-0.319%	19.125%	
	** Value Line Investment Survey Analysis			

Composite Risk Rate	Loan and Equity Rates weighted by industry estimated capital structure.					
	Equity Rate	Debt Rate		Composite Risk		
	2016	12.4313%	1.817%	14.998%	***	
	Note: Debt equity Ratio	Debt	35%	Equity	65%	
	*** Effective severance tax adjustment		0.95			

Non Liquidity Rate	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	2016	0.614%	0.319%	0.295%

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

Property Tax Rate	Sixty percent (60%) of State average Class III property tax rate.			
	2016	60% of 2.18		1.308%

Inflation Rate				
	January	December	2016	2.070%

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>2016</u>	<u>2015</u>	<u>2014</u>
Inflation Rate	-2.070%	-0.730%	-0.760%
Safe Rate	0.319%	0.053%	0.033%
Composite Risk Rate	14.998%	15.186%	14.389%
Non Liquidity Rate	0.295%	0.269%	0.088%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.308%	1.314%	1.314%
Total	15.350%	16.592%	15.564%
	50.000%	33.333%	16.667%
	7.675%	5.531%	2.594%
			15.800%

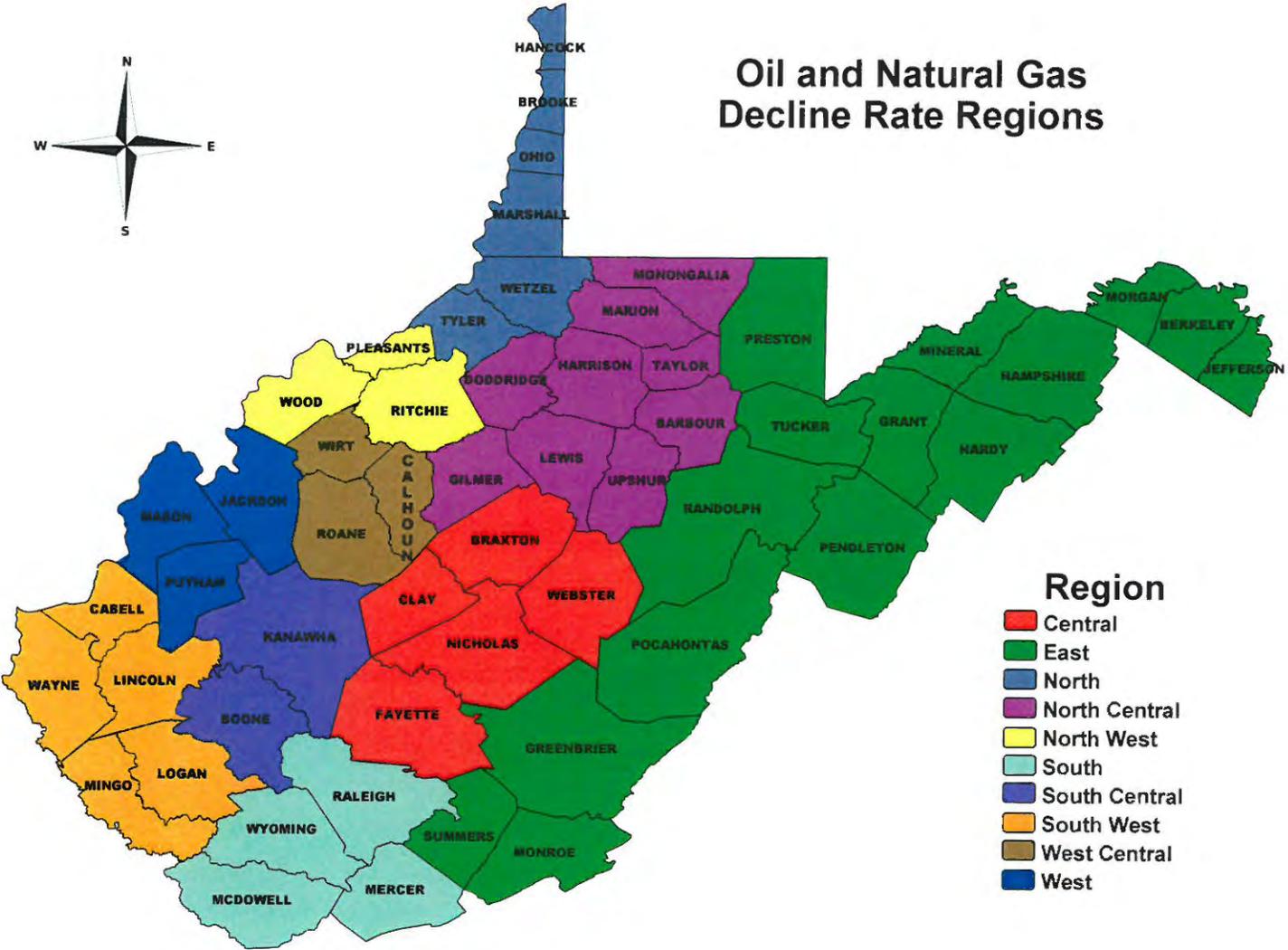
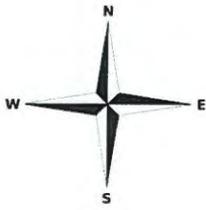
Capitalization Rate Rounded to:

15.80%

MULTIPLIERS FOR 15.8% MID-YEAR LIFE (ANNUALLY)

<u>YEAR</u>		<u>YEAR</u>	
1	0.929278	21	0.049428
2	0.802485	22	0.042684
3	0.692993	23	0.036860
4	0.598439	24	0.031831
5	0.516787	25	0.027488
6	0.446275	26	0.023737
7	0.385385	27	0.020499
8	0.332802	28	0.017702
9	0.287394	29	0.015286
10	0.248181	30	0.013201
11	0.214319	31	0.011400
12	0.185077	32	0.009844
13	0.159824	33	0.008501
14	0.138018	34	0.007341
15	0.119186	35	0.006339
16	0.102924	36	0.005475
17	0.088881	37	0.004728
18	0.076754	38	0.004083
19	0.066281	39	0.003525
20	0.057238	40	0.003044

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	Ravencliff	-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, 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
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
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, Ravencloff	-0.29	-0.29	-0.17
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
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.

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
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.

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
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.

Industry Operating Expense Survey and Results

This component was determined through a review of responses to a survey distributed by the State Tax Department to producers of all oil and natural gas wells producing in West Virginia and through use of other market data.

GAS

- % Working Interest Expenses for Typical Producing Well	=	45%
- Maximum Operating Expenses	=	\$5,000
- Coal Bed Methane, Vertical Wells Expenses	=	\$9,000

OIL

- % Working Interest Expenses for Typical Producing Well	=	35%
- Maximum Operating Expenses	=	\$5,750
- Maximum Enhanced Operating Expenses	=	\$9,000

MARCELLUS/UTICA

- % Working Interest Expenses for Vertical Producing Well	=	30%
- Maximum Operating Expenses	=	\$30,000
- % Working Interest Expenses for Horizontal Producing Well	=	20%
- Maximum Operating Expenses	=	\$175,000

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

- % Working Interest Expenses for Horizontal Producing Well	=	30%
- Maximum 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 \$ 2.52/MCF
BBL usage X \$43.14/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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
BARBOUR	1	1	\$60.00
		2	\$1.00
		3	\$60.00
		4	\$60.00
		5	\$60.00
		6	\$1.00
		7	\$60.00
		8	\$60.00
		9	\$60.00
		10	\$60.00
		11	\$60.00
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	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
		8	\$90.00
		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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
HARDY	16	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
HARRISON	17	1	\$90.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$90.00
		6	\$1.00
		7	\$90.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$90.00
		12	\$90.00
		13	\$1.00
		14	\$90.00
		15	\$90.00
		16	\$1.00
		17	\$1.00
		18	\$90.00
		19	\$1.00
		20	\$90.00
		21	\$1.00
JACKSON	18	1	\$40.00
		2	\$40.00
		3	\$1.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
JEFFERSON	19	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

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$1.00
		7	\$100.00
		8	\$1.00
		9	\$100.00
		10	\$1.00
		11	\$1.00
		12	\$100.00
		13	\$100.00
		14	\$100.00
		15	\$100.00
		16	\$1.00

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$1.00
		7	\$30.00
		8	\$30.00
		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	\$30.00
		19	\$1.00

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
MONROE	32	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
MORGAN	33	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
NICHOLAS	34	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
OHIO	35	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$100.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
PENDLETON	36	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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
PLEASANTS	37	1	\$45.00
		2	\$45.00
		3	\$45.00
		4	\$45.00
		5	\$45.00
		6	\$1.00
		7	\$45.00
		8	\$45.00
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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/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	\$70.00
		2	\$1.00
		3	\$70.00
		4	\$1.00
		5	\$70.00
		6	\$1.00
		7	\$70.00
		8	\$1.00
		9	\$1.00
		10	\$70.00

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
ROANE	44	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$35.00
		8	\$1.00
		9	\$35.00
SUMMERS	45	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$5.00
		6	\$1.00
		7	\$1.00
TAYLOR	46	1	\$1.00
		2	\$1.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
TUCKER	47	1	\$15.00
		2	\$15.00
		3	\$1.00
		4	\$1.00
		5	\$15.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$15.00
		10	\$1.00
		11	\$15.00
		12	\$1.00

OIL & GAS RESERVE RATES FOR TY 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
TYLER	48	1	\$90.00
		2	\$90.00
		3	\$1.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$90.00
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 2018			
COUNTY	CO #	DISTRICT #	TY2018 \$/AC
WETZEL	52	1	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$1.00
		7	\$1.00
		8	\$90.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$90.00
		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	\$40.00
		2	\$40.00
		3	\$40.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
		8	\$40.00
		9	\$40.00
		10	\$1.00
		11	\$40.00
		12	\$40.00
		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 2018

September 1, 2017
Dale W. Steager
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES TAX YEAR 2018

(based on market 2012-2016)

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	\$245	\$160	\$50
Region 4	\$255	\$180	\$55
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	\$225	\$150	\$75
Region 4	\$230	\$160	\$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	--	2.6 cords	3.3 cords	10.5 cords
	1.5 Mbf	--	4.4 Mbf	8.6 Mbf	14.5 Mbf
2 - Site Index 65 - 75	3.3 cords	--	7.0 cords	4.6 cords	14.9 cords
	1.0 Mbf	--	3.2 Mbf	5.5 Mbf	9.7 Mbf
3 - Site Index less than 65	--	3.1 cords	--	15.4 cords	18.5 cords
	--	0.8 Mbf	--	3.7 Mbf	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
2016	1.3383	33.33%	0.4461
2015	1.5292	26.67%	0.4078
2014	1.6410	20.00%	0.3282
2013	1.1725	13.33%	0.1563
2012	0.7608	6.67%	0.0507

1.389 %

B. Nonliquidity Rate

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

Year	Rate	W/A %	W/A Rate
2016	0.2950	33.33%	0.0983
2015	0.2683	26.67%	0.0716
2014	0.0883	20.00%	0.0177
2013	0.0733	13.33%	0.0098
2012	0.1292	6.67%	0.0086

0.206 %

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

Year	Rate	W/A %	W/A Rate
2016	1.2592	6.67%	0.0840
2015	1.3117	13.33%	0.1748
2014	1.6992	20.00%	0.3398
2013	2.2758	33.33%	0.7585
2012	2.1600	26.67%	0.5761

1.933 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2016	0.708	33.33%	0.2360
2015	0.714	26.67%	0.1904
2014	0.714	20.00%	0.1428
2013	0.708	13.33%	0.0944
2012	0.714	6.67%	0.0476

0.711 %

F. Inflation Rate:

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2016	2.070	6.67%	0.1381
2015	0.730	33.30%	0.2431
2014	0.760	26.67%	0.2027
2013	1.500	20.00%	0.3000
2012	1.700	13.33%	0.2266

(1.110) %

TOTAL REQUIRED RATE OF RETURN (REAL)

3.629 %

LESS: PROPERTY TAX COMPONENT

(0.711)

TOTAL DISCOUNT COMPONENT

2.918 %

Stumpage Prices:

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor	0.00%	2.17%

		1.0000	1.0000	1.0000	1.0000	
SAWTIMBER	Current	\$/MBF at age	\$/MBF at age	\$/MBF at age	\$/MBF at age	
	Region	\$/MBF	35	45	55	80
	Region 1	179.77	179.77	179.77	179.77	179.77
	Region 2	178.76	178.76	178.76	178.76	178.76
	Region 3	225.30	225.30	225.30	225.30	225.30
	Region 4	218.21	218.21	218.21	218.21	218.21
	Region 5	181.75	181.75	181.75	181.75	181.75

		2.1199	2.6276	3.2568	5.5702	
PULPWOOD:		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age	
	Region	\$/Cord	35	45	55	80
	Region 1	6.81	14.44	17.90	22.18	37.94
	Region 2	5.89	12.49	15.48	19.19	32.82
	Region 3	3.84	8.15	10.10	12.52	21.41
	Region 4	9.02	19.12	23.70	29.38	50.25
	Region 5	5.73	12.14	15.05	18.65	31.90

Management Costs:

Region	\$/acre (1)
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17
State	

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate (6.5% * (1-.35))	4.23%
Effective WV Severance Tax Rate (1.5% * (1-.35))	0.98%

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
2016	1.3383	33.33%	0.4461
2015	1.5292	26.67%	0.4078
2014	1.6410	20.00%	0.3282
2013	1.1725	13.33%	0.1563
2012	0.7608	6.67%	0.0507

1.389 %

B. Nonliquidity Rate

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

Year	Rate	W/A %	W/A Rate
2016	0.2950	33.33%	0.0983
2015	0.2683	26.67%	0.0716
2014	0.0883	20.00%	0.0177
2013	0.0733	13.33%	0.0098
2012	0.1292	6.67%	0.0086

0.206 %

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

Year	Rate	W/A %	W/A Rate
2016	1.2592	6.67%	0.0840
2015	1.3117	13.33%	0.1748
2014	1.6992	20.00%	0.3398
2013	2.2758	33.33%	0.7585
2012	2.1600	26.67%	0.5761

1.933 %

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
2016	1.308	33.33%	0.4360
2015	1.314	26.67%	0.3504
2014	1.314	20.00%	0.2628
2013	1.314	13.33%	0.1752
2012	1.326	6.67%	0.0884

1.313 %

F. Inflation Rate:

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2016	2.070	6.67%	0.1381
2015	0.730	33.33%	0.2433
2014	0.760	26.67%	0.2027
2013	1.500	20.00%	0.3000
2012	1.700	13.33%	0.2266

(1.111) %

TOTAL REQUIRED RATE OF RETURN (REAL)

4.230 %

LESS: PROPERTY TAX COMPONENT

(1.313)

TOTAL DISCOUNT COMPONENT

2.918 %

Stumpage Prices:

		<u>Sawtimber</u>	<u>Pulpwood</u>		
Stumpage Price Adjustment Factor		0.00%	2.17%		
		1.0000	1.0000	1.0000	1.0000
SAWTIMBER	Current	\$/MBF at age	\$/MBF at age	\$/MBF at age	\$/MBF at age
Region	\$/MBF	35	45	55	80
Region 1	179.77	179.77	179.77	179.77	179.77
Region 2	178.76	178.76	178.76	178.76	178.76
Region 3	225.30	225.30	225.30	225.30	225.30
Region 4	218.21	218.21	218.21	218.21	218.21
Region 5	181.74	181.74	181.74	181.74	181.74
		2.1199	2.6276	3.2568	5.5702
PULPWOOD:		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age
Region	\$/Cord	35	45	55	80
Region 1	6.81	14.44	17.90	22.18	37.94
Region 2	5.89	12.49	15.48	19.19	32.82
Region 3	3.84	8.15	10.10	12.52	21.41
Region 4	9.02	19.12	23.70	29.38	50.25
Region 5	5.73	12.14	15.05	18.65	31.90

Management Costs:

Region	<u>\$/acre (1)</u>
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17
State	

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate (6.5% * (1-.35))	4.23%
Effective WV Severance Tax Rate (1.5% * (1-.35))	0.98%

Yield (Volumes) (80 year rotation)

Timberland		Yield - MBF	Yield - Cords
Productivity Grades	Site Index		
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
2016	11,080.07	170.93	33.33%	56.98
2015	12,561.80	192.85	26.67%	51.43
2014	12,162.06	176.34	20.00%	35.27
2013	19,017.77	177.45	13.33%	23.66
2012	12,628.15	186.56	6.67%	12.44
	67,449.85			179.77

REGION 1 - Pulpwood *

Year	Volume	\$/CORD	W/A%	\$/CORD
2016	240.00	2.70	33.33%	0.90
2015	7,218.90	15.03	26.67%	4.01
2014	464.40	5.40	20.00%	1.08
2013	6,102.20	2.96	13.33%	0.39
2012	45,387.00	6.42	6.67%	0.43
	59,412.50			6.81

REGION 2 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2016	41,475.00	185.68	33.33%	61.89
2015	26,487.65	175.25	26.67%	46.73
2014	22,001.80	182.47	20.00%	36.49
2013	25,896.85	177.79	13.33%	23.71
2012	25,640.98	149.01	6.67%	9.93
	141,502.28			178.76

REGION 2 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2016	25,517.30	4.17	33.33%	1.39
2015	42,863.30	5.97	26.67%	1.59
2014	2,168.10	5.04	20.00%	1.01
2013	119,279.40	12.83	13.33%	1.71
2012	22,647.40	2.86	6.67%	0.19
	212,475.50			5.89

REGION 3 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2016	136,304.30	191.34	33.33%	63.78
2015	135,967.80	207.12	26.67%	55.23
2014	91,467.44	280.52	20.00%	56.10
2013	161,397.70	275.63	13.33%	36.75
2012	111,920.60	201.57	6.67%	13.44
	637,057.84			225.30

REGION 3 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2016	169,606.30	1.92	33.33%	0.64
2015	184,907.30	3.85	26.67%	1.03
2014	170,736.30	3.57	20.00%	0.71
2013	153,197.40	7.78	13.33%	1.04
2012	183,132.60	6.39	6.67%	0.43
	861,579.90			3.84

REGION 4 - Sawtimber

<u>Year</u>	<u>Volume</u>	<u>\$/MBF</u>	<u>W/A%</u>	<u>\$/MBF</u>
2016	9,925.16	170.26	33.33%	56.75
2015	6,644.42	223.42	26.67%	59.58
2014	5,020.90	303.89	20.00%	60.78
2013	12,820.20	211.47	13.33%	28.20
2012	4,808.73	193.47	6.67%	12.90
	<u>39,219.41</u>			<u>218.21</u>

REGION 4 - Pulpwood

<u>Year</u>	<u>Volume</u>	<u>\$/CORD</u>	<u>W/A%</u>	<u>\$/CORD</u>
2016	4,538.50	11.14	33.33%	3.71
2015	6,137.40	7.22	26.67%	1.93
2014	7,765.20	8.16	20.00%	1.63
2013	15,488.60	8.32	13.33%	1.11
2012	7,382.20	9.61	6.67%	0.64
	<u>41,311.90</u>			<u>9.02</u>

REGION 5 - Sawtimber

<u>Year</u>	<u>Volume</u>	<u>\$/MBF</u>	<u>W/A%</u>	<u>\$/MBF</u>
2016	23,026.02	150.53	33.33%	50.18
2015	37,714.40	160.15	26.67%	42.71
2014	21,661.40	265.95	20.00%	53.19
2013	31,859.00	198.20	13.33%	26.43
2012	10,887.05	138.63	6.67%	9.24
	<u>125,147.87</u>			<u>181.74</u>

REGION 5 - Pulpwood

<u>Year</u>	<u>Volume</u>	<u>\$/CORD</u>	<u>W/A%</u>	<u>\$/CORD</u>
2016	2,794.40	5.99	33.33%	2.00
2015	2,889.50	4.05	26.67%	1.08
2014	10,191.40	6.19	20.00%	1.24
2013	18,292.60	7.13	13.33%	0.95
2012	8,296.30	6.93	6.67%	0.46
	<u>42,464.20</u>			<u>5.73</u>

COAL PROPERTIES ANALYSIS

Tax Year 2018

September 1, 2017
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.

Safe Rate	90 day Treasury Bills	Safe Rate
January	December 2016	0.319%
January	December 2015	0.053%
January	December 2014	0.033%

Risk Rate	Interest differential between Loan Rate and 90 day Treasury Bills		
<u>Loan Rate*</u>		<u>Debt Risk Rate</u>	
2016	5.51%	5.191%	
2015	5.26%	5.207%	
2014	5.25%	5.217%	
	*Prime plus 2%		

Equity	Differential between Equity Rates and 90 day Treasury Bills		
<u>Equity Rate**</u>		<u>Equity Risk Rate</u>	
2016	[14.75%/(1-.30)]-0.319	20.752%	
2015	[14.75%/(1-.30)]-0.053	21.038%	
2014	[15.50%/(1-.30)]-0.033	22.110%	
	** Value Line Investment Survey Analysis		

Composite Risk Rate	Loan and Equity Rates weighted by industry estimated capital structure		
	<u>Equity Rate</u>	<u>Debt Rate</u>	<u>Composite Risk</u>
2016	13.489%	1.817%	15.306%
2015	13.675%	1.822%	15.497%
2014	15.477%	1.565%	17.042%
Note:	Debt Equity Ratio	Debt 35%	Equity 65%

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	2016	0.614%	0.319%	0.295%
January	December	2015	0.322%	0.053%	0.269%
January	December	2014	0.121%	0.033%	0.088%

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

Inflation Rate			
January	December	2016	2.070%
January	December	2015	0.730%
January	December	2014	0.760%

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>2016</u>	<u>2015</u>	<u>2014</u>
Inflation Rate	-2.070%	-0.730%	-0.760%
Safe Rate	0.319%	0.053%	0.033%
Composite Risk Rate	15.306%	15.497%	17.042%
Non Liquidity Rate	0.295%	0.269%	0.088%
Management Rate	0.500%	0.500%	0.500%
Total	14.350%	15.589%	16.903%
Three Yr Average:	15.614	Rounded to:	15.60%

CAPITALIZATION RATE - 15.8%				
MULTIPLIERS:		%		%
	1YR	0.930	9YR	5.023
	2YR	1.735	10YR	5.275
	3YR	2.431	11YR	5.493
	4YR	3.033	12YR	5.682
	5YR	3.554	13YR	5.845
	6YR	4.004	14YR	5.987
	7YR	4.394	15YR	6.109
	8YR	4.731		

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 TY18 APPLICATION

GRAND SUMMARY ALL SOURCES	STEAM SPOT	STEAM TERM	MET
PSC (2016)	\$48.85	\$53.12	
FERC (2016)	\$43.97	\$54.06	
Active Return Summary (CY16)		\$51.14 34.2 MM Tons	\$69.12 14.6 MM Tons
Coal Market Publication (3 yr average - Platts)	\$49.65 PGH (13/3) Rail \$49.86 CAPP (12/1.67) Barge		\$101.08 Low Vol HCC \$103.02 High Vol A \$94.13 High Vol B
STATE STEAM PRICE	\$53.42 FERC & PSC, 3 Yr Ave Spot		
STATE MET PRICE	\$77.12 Active Return 3 Yr Ave		

2016 WVPSC Reported Tons	Spot Sales	Term Sales	Total
	6,087,797	8,102,564	14,190,361

COAL TY18 ROYALTY RATES	2015 - Active Return 1YR		2014 2YR		2013 3YR		2012 5YR		2011 5YR	
	%S	%D	%S	%D	%S	%D	%S	%D	%S	%D
TOTAL RECORDS	691	776	447	452	1,447	905	1,354	599	1,908	2,756
SUM of PERCENT	4,445.82	4,020.76	2,904.85	2,327.95	8,869.07	4,695.25	8,087.34	3,313.93	11,881.66	14,663.03
STRAIGHT AVERAGE	6.43	5.18	6.50	5.15	6.13	5.19	5.97	5.53	6.23	5.32
MEDIAN	6.00	5.50	6.00	5.00	6.00	5.00	5.00	5.00	6.00	5.13
WEIGHTED AVERAGE (by Active Acres)	6.62	5.45	6.80	5.10	6.94	5.49	6.58	5.84	6.45	6.28
ROYALTY RATE DEEP (%)	5.63									
ROYALTY RATE SURFACE (%)	6.68									
ROYALTY RATE CALCULATIONS										
Steam Coal/ Deep Mine	\$53.42	per ton X	5.63%	=	\$3.01	per ton				
Metallurgical Coal/ Deep Mine	\$77.12	per ton X	5.63%	=	\$4.34	per ton				
Steam Coal/ Surface Mine	\$53.42	per ton X	6.68%	=	\$3.57	per ton				
Metallurgical Coal/ Surface Mine	\$77.12	per ton X	6.68%	=	\$5.15	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 2017. 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 >= 20 Then TransFactor = 20

If Trans_Ct < 20 And Trans_Ct >= 10 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 < 20 Then WellFactor = 40

WellDensity > 20 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 <= 20 or Null Then EnvFactor = 0

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

Envrate > 40 and Envrate < 80 Then EnvFactor = 40

Envrate >= 80 Then EnvFactor = 80

**OTHER MINED MINERAL
PROPERTY ANALYSIS**

Tax Year 2018

September 1, 2017
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>	90 day Treasury Bills			<u>Safe Rate</u>
January	December	2016		0.319%
January	December	2015		0.053%
January	December	2014		0.033%

<u>Risk Rate</u>	Interest differential between Loan Rate and 90 day Treasury Bills		
<u>Loan Rate*</u>			<u>Debt Risk Rate</u>
2016	5.51%		5.191%
2015	5.26%		5.207%
2014	5.25%		5.217%

*Prime plus 2%

<u>Equity</u>	Differential between Equity Rates and 90 day Treasury Bills		
<u>Equity Rate**</u>			<u>Equity Risk Rate</u>
2016	[11.75%/(1-.30)]-0.319		16.467%
2015	[11.75%/(1-.30)]-0.053		16.733%
2014	[11.75%/(1-.30)]-0.033		16.753%

** 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>
2016	9.880%	2.076%	11.956%
2015	10.040%	2.083%	12.123%
2014	10.052%	2.087%	12.139%

Note: Debt Equity Ratio Debt 40% Equity 60%

<u>Non Liquidity Rate</u>	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	2016	0.614%	0.319%	0.295%
January	December	2015	0.322%	0.053%	0.269%
January	December	2014	0.121%	0.033%	0.088%

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

<u>Inflation Rate</u>			
January	December	2016	2.070%
January	December	2015	0.730%
January	December	2014	0.760%

<u>Property Tax Rate</u>	Sixty percent (60%) of State average Class III property tax rate.		
January	December	2016	60% of 2.180 = 1.308%
January	December	2015	60% of 2.190 = 1.314%
January	December	2014	60% of 2.190 = 1.314%

<u>Capitalization Rate</u>	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>2016</u>	<u>2015</u>	<u>2014</u>
Inflation Rate	-2.070%	-0.730%	-0.760%
Safe Rate	0.319%	0.053%	0.033%
Composite Risk Rate	11.956%	12.123%	12.139%
Non Liquidity Rate	0.295%	0.269%	0.088%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.308%	1.314%	1.314%
Total	12.308%	13.529%	13.314%

Three Yr Average: 13.050% Rounded to: **13.10%**

CAPITALIZATION RATE - 13.10%

MULTIPLIERS:	%	%
1YR	0.940	9YR 5.437
2YR	1.772	10YR 5.748
3YR	2.507	11YR 6.022
4YR	3.157	12YR 6.265
5YR	3.731	13YR 6.480
6YR	4.240	14YR 6.669
7YR	4.689	15YR 6.837
8YR	5.086	

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	TY2018 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	\$0.10

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