Dave Hardy
Secretary of Revenue

STATE TAX DEPARTMENT

Dale W. Steager
State Tax Commissioner

August 29, 2018

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 2019 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 28, 2018. The Department received seven comments on the tentative valuation variables, which all related to the expense allowance in the valuation of oil and gas properties. No adjustments were made for these issues. Two of the comments related to an incorrect decline rate in the North West Region. This has been corrected. Additionally, a minor change was made for the coal royalty rates and for the price of Metallurgical coal based upon information that was unavailable on June 28, 2018.

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

Property Tax Division, 1124 Smith Street, P.O. Box 2389, Charleston, WV 25328-2389
Telephone 304-558-3940
Fax 304-558-1843

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2019

August 29, 2018
Dale W. Steager
State Tax Commissioner
Department of Revenue

OIL AND GAS TY 2019

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 1U

Safe Rate (3-Month Constant Maturity Interest Rates)

January December 2017 **0.947%**

Risk Rate (Interest differential between Loan Rate and 3 Month Constant Maturity Interest Rates)

Loan Rate*		Risk Rate
2017	6.097%	5.150%

*Prime plus 2%

Equity (Differential between Equity Rates and 3-Month Constant Maturity Interest Rates)

Equity Rate**		Risk Rate
2017	[12.75%/(1-.275)]-0.947%	16.639%

** *Value Line Investment Survey Analysis*

Composite Risk Rate Loan and Equity Rates weighted by industry estimated capital structure

	Equity Rate	Debt Rate		Composite Risk	
2017	10.8154%	1.803%		**13.282%**	***
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

			1yr T Bill	90 day T Bill	Non Liquidity Rate
January	December	2017	1.201%	0.947%	**0.254%**

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

2017 60% of 2.18 **1.308%**

Inflation Rate

January December 2017 **2.110%**

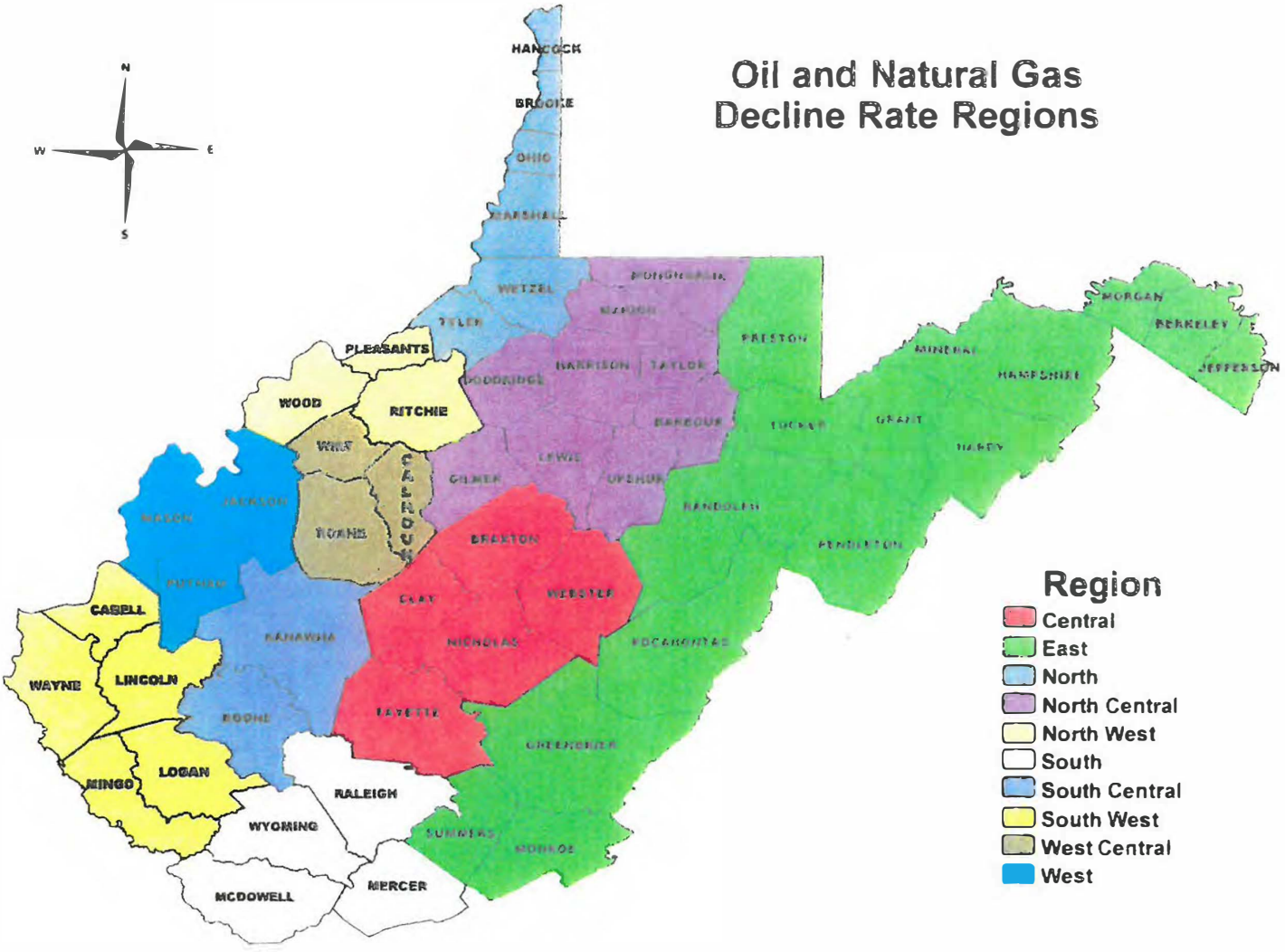
Capitalization Rate Since the valuation of oil and gas property is predicated on a three year production, the capitalization rate will be considered in a similar manner

	2017	2016	2015	
Inflation Rate	-2 110%	-2 070%	-0 730%	
Safe Rate	0 947%	0 319%	0 053%	
Composite Risk Rate	13 282%	14 998%	15 186%	
Non Liquidity Rate	0 254%	0 295%	0 269%	
Management Rate	0 500%	0 500%	0.500%	
Property Tax Rate	1 308%	1 308%	1 314%	
Total	14 181%	15 350%	16 592%	
	50 000%	33.333%	16 667%	
	7.090%	5.117%	2.765%	**14.972%**

Capitalization Rate Rounded to **15.00%**

MULTIPLIERS FOR 15.0% MID-YEAR LIFE (ANNUALLY)

YEAR		YEAR	
1	0 932505	21	0 056976
2	0 810874	22	0 049545
3	0 705108	23	0 043082
4	0 613137	24	0 037463
5	0 533163	25	0 032576
6	0 463620	26	0 028327
7	0 403148	27	0 024632
8	0 350563	28	0 021420
9	0 304837	29	0 018626
10	0 265076	30	0 016196
11	0 230501	31	0 014084
12	0 200436	32	0 012247
13	0 174292	33	0 010649
14	0 151558	34	0 009260
15	0 131790	35	0 008052
16	0 114600	36	0 007002
17	0 099652	37	0 006089
18	0 086654	38	0 005295
19	0 075351	39	0.004604
20	0 065523	40	0 004003


Oil and Natural Gas
Decline Rate Regions
N
W
E
S
HANCOCK
BROOKE
OHIO
MARSHALL
WETZEL
TYLER
PLEASANTS
WOOD
RITCHIE
DODDRIDGE
HARRISON
TAYLOR
BARBOUR
WIRT
CALHOUN
GILMER
LEWIS
UPSHUR
RANDOLPH
JACKSON
MASON
ROANE
BRAXTON
CLAY
WEBSTER
NICHOLAS
FAYETTE
PUTNAM
CABELL
KANAWHA
WAYNE
LINCOLN
BOONE
MINGO
LOGAN
RALEIGH
WYOMING
MCDOWELL
MERCER
SUMMERS
MONROE
GREENBRIER
POCAHONTAS
PRESTON
TUCKER
PENDLETON
GRANT
HARDY
MINERAL
HAMPSHIRE
MORGAN
BERKELEY
JEFFERSON
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	Hunterville	-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, Ravencliff	-0.29	-0.29	-0.17
25	Berea +	-0.37	-0.12	-0.08
26	Ravencliff	-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, Ravencliff	-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	=	40%
- 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 $ 2.99/MCF BBL usage X $50.80/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 2019

COUNTY	CO #	DISTRICT #	TY2018 $/AC
BARBOUR		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 2019

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	$95.00
		2	$95.00
		3	$95.00
		4	$95.00
		5	$95.00
		6	$95.00
		7	$95.00
		8	$95.00
		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 2019

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 2019

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 2019

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 2019

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 2019

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 2019

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 2019

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 2019

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 2019

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	$75.00
		2	$1.00
		3	$75.00
		4	$1.00
		5	$75.00
		6	$1.00
		7	$75.00
		8	$1.00
		9	$1.00
		10	$75.00

OIL & GAS RESERVE RATES FOR TY 2019

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 2019

COUNTY	CO #	DISTRICT #	TY2018 $/AC
TYLER	48	1	$95.00
		2	$95.00
		3	$1.00
		4	$95.00
		5	$95.00
		6	$95.00
		7	$1.00
		8	$1.00
		9	$1.00
		10	$95.00
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 2019

COUNTY	CO #	DISTRICT #	TY2018 $/AC
WETZEL	52	1	$95.00
		2	$95.00
		3	$95.00
		4	$95.00
		5	$95.00
		6	$1.00
		7	$1.00
		8	$95.00
		9	$1.00
		10	$1.00
		11	$1.00
		12	$95.00
		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 2019

August 29, 2018
Dale W. Steager
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES
TAX YEAR 2019

(based on market 2013-2017)

Rates Per Acre

Class II Parcels

	Grade 1	Grade 2	Grade 3
Region 1	$240	$150	$50
Region 2	$235	$145	$50
Region 3	$280	$175	$50
Region 4	$300	$195	$50
Region 5	$215	$140	$50

Class III/IV Parcels

	Grade 1	Grade 2	Grade 3
Region 1	$225	$150	$75
Region 2	$225	$150	$75
Region 3	$245	$155	$75
Region 4	$265	$170	$75
Region 5	$225	$150	$75

Region 1 = Brooke, Cabell, Hancock, Jackson, Marshall, Mason, Ohio, Pleasants, Putnam, Tyler, Wetzel, and Wood Counties

Region 2 = Braxton, Calhoun, Clay, Doddridge, Gilmer, Harrison, Lewis, Marion, Monongalia, Ritchie, Roane, Taylor, and Wirt Counties

Region 3 = Barbour, Greenbrier, Monroe, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, Upshur, and Webster Counties

Region 4 = Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral and Morgan Counties

Region 5 = Boone, Fayette, Kanawha, Lincoln, Logan, McDowell, Mercer, Mingo Raleigh, Summers, Wayne, and Wyoming Counties

Harvest Volumes per Acre

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

Managed Timberland Statistics

Estimation of Required Rate of Return: Class II Rates

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

Year	Rate	W/A %	W/A Rate
2017	1.9100	33.33%	0.6366
2016	1.3383	26.67%	0.3569
2015	1.5292	20.00%	0.3058
2014	1.6410	13.33%	0.2187
2013	1.1725	6.67%	0.0782

1.596 %

B. **Nonliquidity Rate**

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

Year	Rate	W/A %	W/A Rate
2017	0.2542	33.33%	0.0847
2016	0.2950	26.67%	0.0787
2015	0.2683	20.00%	0.0537
2014	0.0883	13.33%	0.0118
2013	0.0733	6.67%	0.0049

0.234 %

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

Year	Rate	W/A %	W/A Rate
2017	0.9850	6.67%	0.0657
2016	1.2592	13.33%	0.1679
2015	1.3117	20.00%	0.2623
2014	1.6992	26.67%	0.4532
2013	2.2758	33.33%	0.7585

1.708 %

D. **Management Factor of 0.5%**

0.500 %

E. **Property Tax Component**

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2017	0.714	33.33%	0.2380
2016	0.708	26.67%	0.1888
2015	0.714	20.00%	0.1428
2014	0.714	13.33%	0.0952
2013	0.708	6.67%	0.0472

0.712 %

F. **Inflation Rate:**

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2017	2.110	6.67%	0.1407
2016	2.070	13.33%	0.2759
2015	0.730	33.33%	0.2433
2014	0.760	26.67%	0.2027
2013	1.500	20.00%	0.3000

(1.163) %

TOTAL REQUIRED RATE OF RETURN (REAL)	3.587 %
LESS: PROPERTY TAX COMPONENT	(0.712)
TOTAL DISCOUNT COMPONENT	2.875 %

Stumpage Prices:

	Sawtimber	Pulpwood
Stumpage Price Adjustment Factor	1.00%	0.87%

SAWTIMBER	Current	1.0000 $/MBF at age	1.0000 $/MBF at age	1.0000 $/MBF at age	1.0000 $/MBF at age
Region	**$/MBF**	35	45	55	80
Region 1	190.77	190.77	190.77	190.77	190.77
Region 2	188.74	188.74	188.74	188.74	188.74
Region 3	219.20	219.20	219.20	219.20	219.20
Region 4	224.17	224.17	224.17	224.17	224.17
Region 5	174.96	174.96	174.96	174.96	174.96

PULPWOOD:		1.3542 $/cd at age	1.4767 $/cd at age	1.6103 $/cd at age	1.9997 $/cd at age
Region	**$/Cord**	35	45	55	80
Region 1	6.58	8.91	9.72	10.60	13.16
Region 2	6.11	8.28	9.03	9.85	12.23
Region 3	4.90	6.63	7.23	7.89	9.79
Region 4	9.78	13.24	14.44	15.75	19.55
Region 5	6.15	8.33	9.08	9.90	12.29

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**

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
2017	1 9100	33.33%	0.6366
2016	1.3383	26.67%	0.3569
2015	1.5292	20.00%	0.3058
2014	1 6410	13.33%	0 2187
2013	1 1725	6.67%	0 0782

1.596 %

B. Nonliquidity Rate

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

Year	Rate	W/A %	W/A Rate
2017	0 2542	33 33%	0 0847
2016	0.2950	26.67%	0 0787
2015	0 2683	20 00%	0 0537
2014	0 0883	13 33%	0 0118
2013	0 0733	6 67%	0 0049

0.234 %

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

Year	Rate	W/A %	W/A Rate
2017	0 9850	6 67%	0 0657
2016	1 2592	13 33%	0 1679
2015	1 3117	20 00%	0 2623
2014	1 6992	26 67%	0 4532
2013	2 2758	33 33%	0.7585

1.708 %

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
2017	1 308	33.33%	0 4360
2016	1 308	26.67%	0.3488
2015	1 314	20.00%	0 2628
2014	1 314	13 33%	0 1752
2013	1 314	6 67%	0 0876

1.310 %

F. Inflation Rate:

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2017	2 110	6 67%	0 1407
2016	2 070	13 33%	0.2759
2015	0.730	33 33%	0.2433
2014	0 760	26 67%	0 2027
2013	1.500	20.00%	0 3000

(1.163) %

TOTAL REQUIRED RATE OF RETURN (REAL)	4.185 %
LESS: PROPERTY TAX COMPONENT	(1.310)
TOTAL DISCOUNT COMPONENT	2.875 %

Stumpage Prices:

	Sawtimber	Pulpwood
Stumpage Price Adjustment Factor	0.00%	0.87%

SAWTIMBER	Current	1.0000 $/MBF at age	1.0000 $/MBF at age	1.0000 $/MBF at age	1.0000 $/MBF at age
Region	**$/MBF**	35	45	55	80
Region 1	190.77	190.77	190.77	190.77	190.77
Region 2	188.74	188.74	188.74	188.74	188.74
Region 3	219.21	219.21	219.21	219.21	219.21
Region 4	224.16	224.16	224.16	224.16	224.16
Region 5	174.95	174.95	174.95	174.95	174.95

PULPWOOD:		1.3542 $/cd at age	1.4767 $/cd at age	1.6103 $/cd at age	1.9997 $/cd at age
Region	**$/Cord**	35	45	55	80
Region 1	6.58	8.91	9.72	10.60	13.16
Region 2	6.11	8.28	9.03	9.84	12.22
Region 3	4.90	6.63	7.23	7.89	9.79
Region 4	9.78	13.24	14.44	15.74	19.55
Region 5	6.15	8.33	9.08	9.90	12.29

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-.35)	1.19%

Yield (Volumes) (80 year rotation)

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

West Virginia Wgt/Avg Managed Timberland Stumpage Prices

REGION 1 - Sawtimber

Year	Volume	$/MBF	W/A%	$/MBF
2017	21,212.89	213.81	33.33%	71.27
2016	11,080.07	170.93	26.67%	45.58
2015	12,561.80	192.85	20.00%	38.57
2014	12,162.06	176.34	13.33%	23.51
2013	19,017.77	177.45	6.67%	11.84
	76,034.59			190.77

REGION 1 - Pulpwood

Year	Volume	$/CORD	W/A%	$/CORD
2017	3,802.40	5.81	33.33%	1.94
2016	240.00	2.70	26.67%	0.72
2015	7,218.90	15.03	20.00%	3.01
2014	464.40	5.40	13.33%	0.72
2013	6,102.20	2.96	6.67%	0.20
	17,827.90			6.58

REGION 2 - Sawtimber

Year	Volume	$/MBF	W/A%	$/MBF
2017	57,210.90	203.96	33.33%	67.99
2016	41,475.00	185.68	26.67%	49.51
2015	26,487.65	175.25	20.00%	35.05
2014	22,001.80	182.47	13.33%	24.33
2013	25,896.85	177.79	6.67%	11.86
	173,072.20			188.74

REGION 2 - Pulpwood

Year	Volume	$/CORD	W/A%	$/CORD
2017	5,606.50	6.84	33.33%	2.28
2016	25,517.30	4.17	26.67%	1.11
2015	42,863.30	5.97	20.00%	1.19
2014	2,168.10	5.04	13.33%	0.67
2013	119,279.40	12.83	6.67%	0.86
	195,434.60			6.11

REGION 3 - Sawtimber

Year	Volume	$/MBF	W/A%	$/MBF
2017	112,269.80	212.95	33.33%	70.98
2016	136,304.30	191.34	26.67%	51.02
2015	135,967.80	207.12	20.00%	41.42
2014	91,467.44	280.52	13.33%	37.40
2013	161,397.70	275.63	6.67%	18.38
	637,407.04			219.21

REGION 3 - Pulpwood

Year	Volume	$/CORD	W/A%	$/CORD
2017	143,565.20	7.86	33.33%	2.62
2016	169,606.30	1.92	26.67%	0.51
2015	184,907.30	3.85	20.00%	0.77
2014	170,736.30	3.57	13.33%	0.48
2013	153,197.40	7.78	6.67%	0.52
	822,012.50			4.90

REGION 4 - Sawtimber

Year	Volume	$/MBF	W/A%	$/MBF
2017	15,073 14	238 37	33 33%	79 46
2016	9,925 16	170 26	26 67%	45.40
2015	6,644 42	223 42	20.00%	44 68
2014	5,020.90	303 89	13.33%	40.52
2013	12,820.20	211 47	6 67%	14.10
	49,483.82			224.16

REGION 4 - Pulpwood

Year	Volume	$/CORD	W/A%	$/CORD
2017	3,813.30	11 16	33.33%	3.72
2016	4 538.50	11 14	26.67%	2.97
2015	6,137.40	7.22	20 00%	1 44
2014	7,765.20	8.16	13.33%	1 09
2013	15,488.60	8.32	6.67%	0.55
	37,743.00			9.78

REGION 5 - Sawtimber

Year	Volume	$/MBF	W/A%	$/MBF
2017	45,373 14	162 33	33 33%	54 11
2016	23,026 02	150.53	26 67%	40 14
2015	37,714 40	160 15	20.00%	32 03
2014	21,661 40	265.95	13.33%	35 46
2013	31,859 00	198.20	6.67%	13.21
	159,633.96			174.95

REGION 5 - Pulpwood

Year	Volume	$/CORD	W/A%	$/CORD
2017	9,644 70	7 32	33 33%	2.44
2016	2,794 40	5 99	26.67%	1.60
2015	2,889.50	4 05	20 00%	0 81
2014	10,191.40	6 19	13 33%	0 83
2013	18,292 60	7 13	6 67%	0.48
	43,812 60			6.15

COAL PROPERTIES ANALYSIS

Tax Year 2019

August 29, 2018
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 1

Safe Rate 90 day Treasury Bills

			Safe Rate
January	December	2017	0 947%
January	December	2016	0 319%
January	December	2015	0 053%

Risk Rate Interest differential between Loan Rate and 90 day Treasury Bills

Loan Rate*		Debt Risk Rate
2017	5 10%	5 153%
2016	5.51%	5 191%
2015	5 26%	5 207%

*Prime plus 2%

Equity Differential between Equity Rates and 90 day Treasury Bills

Equity Rate**		Equity Risk Rate
2017	[15 25%/(1- 275)]-0 947	20 087%
2016	[14 75%/(1 30)]-0 319	20 752%
2015	[14 75%/(1- 30)] 0 053	21 018%

** *Value Line Investment Survey Analysis*

Composite Risk Rate Loan and Equity Rates weighted by industry estimated capital struct

	Equity Rate	Debt Rate	Composite Risk
2017	13 057%	1 804%	14 861%
2016	13 489%	1 817%	15 306%
2015	13.662%	1 822%	15 484%

Note Debt Equity Ratio Debt 35% Equity 65%

Non Liquidity Rate .nterest differentia between a 90 day Treasury Bill and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property

			1yr T Bil	90 d T Bil	Non Liquidity Rate
January	December	2017	1 201%	0 947%	0 254%
January	December	2016	0 614%	0 319%	0 295%
January	December	2015	0 322%	0 053%	0 269%

Management Rate Charges for the management of investment portfolios

Fixed Rate (by Rule) 0 500%

Inflation Rate

January	December	2017	2 110%
January	December	2016	2 070%
January	December	2015	0 730%

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

	2017	2016	2015
Inflation Rate	-2 110%	-2 070%	-0 730%
Safe Rate	0 947%	0 319%	0 053%
Composite Risk Rate	14 861%	15 306%	15 484%
Non Liquidity Rate	0.254%	0 295%	0 269%
Management Rate	0 500%	0 500%	0 500%
Tota	14.452%	14 350%	15.576%

Three Yr Average: 14 793 Rounded to **14.80%**

CAPITALIZATION RATE - 14.8%			
MULTIPLIERS	%		%
1YR	0 933	9YR	5 149
2YR	1 746	10YR	5 419
3YR	2.454	11YR	5 653
4YR	3 071	12YR	5 858
5YR	3 609	13YR	6 036
6YR	4 077	14YR	6 191
7YR	4 485	15YR	6 326
8YR	4 840		

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-1I 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 TY19 APPLICATION

GRAND SUMMARY ALL SOURCES	STEAM SPOT	STEAM TERM	MET
PSC (2017)	$51.60	$50.22	
FERC (2017)	$48.88	$51.70	
Active Return Summary (2017)	$48.66	$53.49	$110.25
	86.3 MM Tons	3.9 MM Tons	28.5 MM Tons
Coal Market Publication	$45.75	PGH (13/3) Rail	$119.19 Low Vol HCC
(3 yer average - Platts)	$49.24	CAPP (12/1.67) Barge	$121.42 High Vol A
			$105.57 High Vol B
STATE STEAM PRICE	$49.78	FERC & PSC 3 Yr Ave SPOT	
STATE MET PRICE	$84.66	Active Return 3 Yr Ave	

	Spot Sales	Term Sales	Total
2017 WVPSC Reported Tons	5,386,369	12,827,197	18,213,566

COAL TY19 ROYALTY RATES	2016 - Active Return 1YR		2015 2YR		2014 3YR		2013 4YR		2012 5YR	
	%S	%D	%S	%D	%S	%D	%S	%D	%S	%D
TOTAL RECORDS	1,644	1,061	691	776	447	452	1,447	905	1,354	599
SUM of PERCENT	9,633.84	5,379.27	4,445.82	4,020.76	2,904.85	2,327.95	8,869.07	4,695.25	8,087.34	3,313.93
STRAIGHT AVERAGE	5.86	5.07	6.43	5.18	6.50	5.15	6.13	5.19	5.97	5.53
MEDIAN	6.00	5.00	6.00	5.50	6.00	5.00	6.00	5.00	5.00	5.00
WEIGHTED AVERAGE(by Active Acres)	6.74	5.76	6.62	5.45	6.80	5.10	6.94	5.49	6.58	5.84
ROYALTY RATE DEEP (%)	5.53									
ROYALTY RATE SURFACE (%)	6.74									

ROYALTY RATE CALCULATIONS						
Steam Coal/ Deep Mine	$49.78	**per ton X**	5.53%	=	$2.75	per ton
Metallurgical Coal/ Deep Mine	$84.66	**per ton X**	5.53%	=	$4.68	per ton
Steam Coal/ Surface Mine	$49.78	**per ton X**	6.74%	=	$3.35	per ton
Metallurgical Coal/ Surface Mine	$84.66	**per ton X**	6.74%	=	$5.70	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 of the process.

Title 110, Series 1I
Valuation of Active and Reserve Coal Property for Ad Valorem Property Tax Purposes

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

Market Interest Factor
This is the relationship between transactions (sales, leases, prospects, permit applications, etc.) and mining as it relates to properties and locations. Trans_Ct is the number of transactions counted within the radius.
Radius = 5 miles

If Trans_Ct >= 30 Then TransFactor = 20

If Trans_Ct < 30 And Trans_Ct > 20 Then TransFactor = 40

Else TransFactor = 80

Market Mineability Factor
This is the relationship between property location and mining, through time. Determining feature is count of mines within the radius.
Radius = 2.5 miles

Surface Mines: Smine

Deep Mines: Dmine

Boom Mines: Bmine

Historic Mines: Omine

Current Mines: Cmine

To assign MineFactor

If Cmine > 0 Then MineFactor = 20

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

Else MineFactor = 80

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

WellDensity < 5 Then WellFactor = 0

WellDensity >= 5 And WellDensity < 10 Then WellFactor = 20

WellDensity >= 10 And WellDensity < 15 Then WellFactor = 40

WellDensity >= 15 Then WellFactor = 80

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

Envrate <= 10 or Null Then EnvFactor = 0

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

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

Envrate > 60 Then EnvFactor = 80

OTHER MINED MINERAL PROPERTY ANALYSIS

Tax Year 2019

August 29, 2018
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

Safe Rate 90 day Treasury Bills

			Safe Rate
January	December	2017	0.947%
January	December	2016	0 319%
January	December	2015	0 053%

Risk Rate Interest differential between Loan Rate and 90 day Treasury Bills

	Loan Rate*	Debt Risk Rate
2017	6 10%	5 153%
2016	5 51%	5.191%
2015	5 26%	5.207%

*Prime plus 2%

Equity Differential between Equity Rates and 90 day Treasury Bills

Equity Rate**		Equity Risk Rate
2017	[12 00%/(1- 275)]-0 947	15 605%
2016	[11.75%/(1-.30)]-0.319	16 467%
2015	[11 75%/(1- 30)]-0 053	16 733%

** *Value Line Investment Survey Analysis*

Composite Risk Rate Loan and Equity Rates weighted by industry estimated capital structure

	Equity Rate	Debt Rate	Composite Risk
2017	10 143%	1 804%	11 947%
2016	9 880%	2 076%	11 956%
2015	10 040%	2 083%	12 123%

Note: Debt Equity Ratio Debt 35% Equity 65%

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

			1yr T Bill	90 d T Bil	Non Liquidity Rate
January	December	2017	1 201%	0 947%	0 254%
January	December	2016	0 614%	0 319%	0 295%
January	December	2015	0 322%	0 053%	0 269%

Management Rate Charges for the management of investment portfolios

Fixed Rate (by Rule) 0 500%

Inflation Rate

January	December	2017	2 110%
January	December	2016	2 070%
January	December	2015	0 730%

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

January	December	2017	60% of 2 180 =	1 308%
January	December	2016	60% of 2 180 =	1 308%
January	December	2015	60% of 2 190 =	1 314%

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

	2017	2016	2015
Inflation Rate	2 110%	2 070%	0.730%
Safe Rate	0 947%	0 319%	0 053%
Composite Risk Rate	11 947%	11 956%	12 123%
Non Liquidity Rate	0 254%	0.295%	0.269%
Management Rate	0 500%	0 500%	0 500%
Property Tax Rate	1 308%	1 308%	1 314%
Total	12 846%	12 308%	13 529%

Three Yr Average: 12 894% Rounded to **12.90%**

CAPITALIZATION RATE - 12.90%

MULTIPLIERS	%		%
1YR	0 941	9YR	5 473
2YR	1 775	10YR	5 769
3YR	2 513	11YR	6 068
4YR	3 167	12YR	6 316
5YR	3 746	13YR	6 536
6YR	4.259	14YR	6 730
7YR	4 714	15YR	6 902
8YR	5 116		

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	TY2019 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**