



Dave Hardy
Secretary of Revenue

STATE TAX DEPARTMENT

Dale W. Steager
State Tax Commissioner

August 31, 2020

OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

2020 AUG 31 P 2:06

FILED

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

Dear Secretary Warner:

Attached for filing in the State Register are final natural resource property valuation variables for the 2021 Tax Year that have been developed by the State Tax Department for use in determining the appraised value of coal, oil, natural gas, managed timberland and other natural resource properties for ad valorem tax purposes.

In accordance with the requirements of §110CSR1-I, 1-J and 1-K, tentative variables were made available for public comments on June 29, 2020. The department received zero comments on the tentative valuation variables. Additionally, changes were made for the coal, oil and gas, other mined mineral, and managed timberland royalty rates and prices based upon information that was unavailable on June 29, 2020

Sincerely,

Dale W. Steager
State Tax Commissioner

DWS/lb/t

Attachment

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2020 AUG 31 P 2:06

OFFICE OF THE VIRGINIA
SECRETARY OF STATE

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2021

Dale W. Steager
State Tax Commissioner
Department of Revenue

OIL AND GAS

TY 2021

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	2019	2.104%
January	December	2018	1.973%
January	December	2017	0.947%

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

Loan Rate*	Risk Rate
2019 7.280%	5.176%
2018 6.900%	4.927%
2017 6.100%	5.153%

*Prime plus 2%

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

Equity Rate**	Risk Rate
2019 13.0%/(1-0.26)-1.55	16.018%
2018 13.0%/(1-0.26)-1.55	15.595%
2017 13.0%/(1-0.275)-1.55	16.621%

** DQYDJ.COM

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

	Equity Rate	Debt Rate	Composite Risk	
2019	10.4114%	1.817%	12.871%	***
2018	10.1365%	1.724%	12.485%	
2017	10.8034%	1.804%	13.270%	

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	2019	2.050%	1.550%	0.500%
January	December	2018	2.332%	1.973%	0.359%
January	December	2017	1.201%	0.947%	0.254%

Management Rate Charges for the management of investment portfolios.

Fixed Rate (by Rule)	0.500%
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Property Tax Rate Sixty percent (60%) of State average Class III property tax rate.

2019	60% of 2.17	1.320%
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Inflation Rate

January	December	2019	1.810%
January	December	2018	1.910%
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.

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Inflation Rate	-1.810%	-1.910%	-2.110%
Safe Rate	2.104%	1.973%	0.947%
Composite Risk Rate	12.871%	12.485%	13.270%
Non Liquidity Rate	0.500%	0.359%	0.254%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.320%	1.302%	1.308%
Total	15.485%	14.709%	14.169%
	50.000%	33.333%	16.667%
	7.743%	4.903%	2.362%
			15.007%

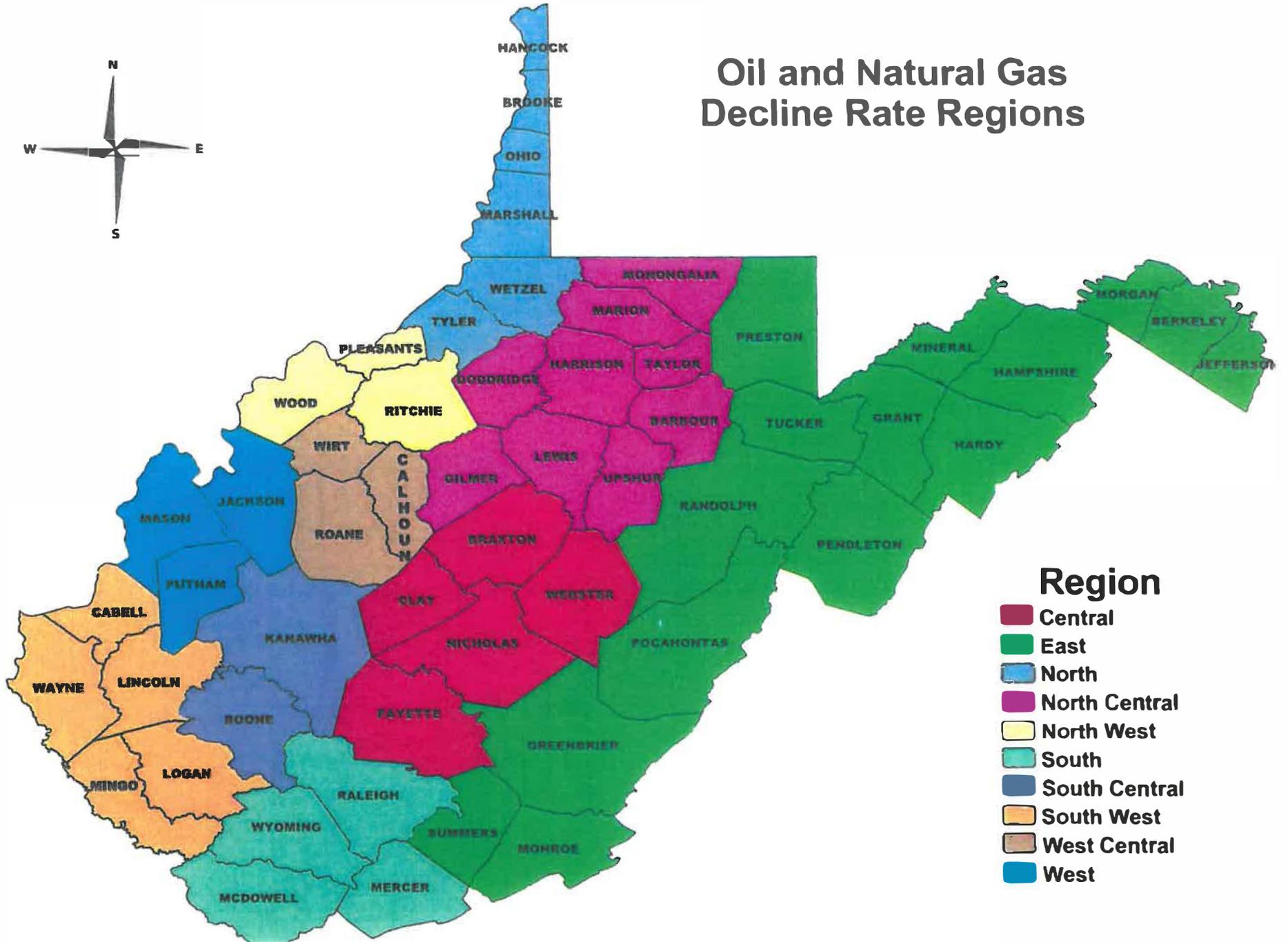
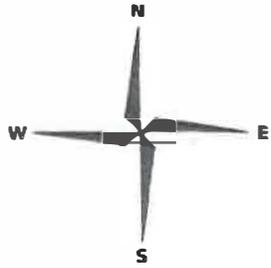
Capitalization Rate Rounded to:

15.01%

MULTIPLIERS FOR 14.6% MID-YEAR LIFE (ANNUALLY)

<u>YEAR</u>		<u>YEAR</u>	
1	0.932475	21	0.056901
2	0.810796	22	0.049476
3	0.704995	23	0.043020
4	0.612999	24	0.037406
5	0.533009	25	0.032525
6	0.463456	26	0.028281
7	0.402979	27	0.024591
8	0.350394	28	0.021382
9	0.304671	29	0.018592
10	0.264915	30	0.016166
11	0.230346	31	0.014056
12	0.200288	32	0.012222
13	0.174152	33	0.010627
14	0.151427	34	0.009240
15	0.131667	35	0.008035
16	0.114486	36	0.006986
17	0.099546	37	0.006075
18	0.086557	38	0.005282
19	0.075262	39	0.004593
20	0.065441	40	0.003993

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
9	Exception (Median)	-0.41	-0.22	-0.09
10	Non-Filer	-0.30	-0.07	-0.07

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
9	Exception (Median)	-0.41	-0.22	-0.10
10	Non-Filer	-0.29	-0.07	-0.05

Decline Rates for Natural Gas and Oil Formations: South

South: McDowell, Mercer, Raleigh, Wyoming

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

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* 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
9	Exception (Median)	-0.38	-0.22	-0.10
10	Non-Filer	-0.18	-0.11	-0.04

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

Decline Rates for Natural Gas and Oil Formations: South Central

South Central: Boone, Kanawha

Code	Formation	Year 1	Year 2	Year 3 +
3	Devonian Shale	-0.23	-0.08	-0.05
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
9	Exception (Median)	-0.33	-0.19	-0.08
10	Non-Filer	-0.19	-0.07	-0.04

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
9	Exception (Median)	-0.39	-0.23	-0.08
10	Non-Filer	-0.18	-0.16	-0.06

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	-0.23
110	Marcellus	-0.46	-0.29	-0.23
111	Utica *	-0.46	-0.29	-0.23
9	Exception (Median)	-0.39	-0.23	-0.13
10	Non-Filer	-0.12	-0.05	-0.05

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

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

Code	Formation	Year 1	Year 2	Year 3 +
11	Gordon	-0.41	-0.14	-0.12
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
9	Exception (Median)	-0.38	-0.21	-0.11
10	Non-Filer	-0.23	-0.03	-0.03

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

Decline Rates for Natural Gas and Oil Formations: West				
West: Jackson, Mason, Putnam				
Code	Formation	Year 1	Year 2	Year 3 +
1	Oriskany	-0.40	-0.40	-0.29
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
9	Exception (Median)	-0.35	-0.20	-0.09
10	Non-Filer	-0.08	-0.08	-0.03

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

Decline Rates for Natural Gas and Oil Formations: West Central				
West Central: Calhoun, Roane, Wirt				
Code	Formation	Year 1	Year 2	Year 3 +
2	Huron, Rhinestreet	-0.49	-0.11	-0.06
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
9	Exception (Median)	-0.42	-0.24	-0.10
10	Non-Filer	-0.25	-0.11	-0.06

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

Average Industry Operating Expense Results

CONVENTIONAL GAS

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

OIL

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

MARCELLUS/UTICA

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

- Horizontal Producing Well
- Average Operating Expenses = \$125,000

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

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

Minimum Working Interest Appraisal = \$500 per well

Flat Rate Royalty Multiplier = 5.75

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

Industrial Use Only Wells:* MCF usage X \$2.56/MCF
BBL usage X \$56.99/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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
BARBOUR	1	1	\$55.00
		2	\$1.00
		3	\$55.00
		4	\$55.00
		5	\$55.00
		6	\$1.00
		7	\$55.00
		8	\$55.00
		9	\$55.00
		10	\$55.00
		11	\$55.00
BERKELEY	2	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
BOONE	3	1	\$ 20.00
		2	\$1.00
		3	\$1.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$1.00
		8	\$20.00
		9	\$1.00
BRAXTON	4	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
BROOKE	5	1	\$1.00
		2	\$1.00
		3	\$105.00
		4	\$105.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
CABELL	6	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
CALHOUN	7	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
CLAY	8	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
DODDRIDGE	9	1	\$100.00
		2	\$100.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$100.00
		7	\$100.00
		8	\$100.00
		9	\$1.00
FAYETTE	10	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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 2021					
COUNTY	CO #	DISTRICT #	TY2021 \$/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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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
MARSHALL	25	1	\$1.00
		2	\$1.00
		3	\$105.00
		4	\$105.00
		5	\$105.00
		6	\$1.00
		7	\$105.00
		8	\$1.00
		9	\$105.00
		10	\$1.00
		11	\$1.00
		12	\$105.00
		13	\$105.00
		14	\$105.00
		15	\$105.00
		16	\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
MINERAL	29	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
MINGO	30	1	\$1.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
		9	\$20.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
MONONGALIA	31	1	\$35.00
		2	\$1.00
		3	\$35.00
		4	\$35.00
		5	\$35.00
		6	\$1.00
		7	\$35.00
		8	\$35.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
		19	\$35.00
			\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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	\$105.00
		4	\$105.00
		5	\$1.00
		6	\$105.00
		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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
PLEASANTS	37	1	\$40.00
		2	\$40.00
		3	\$40.00
		4	\$40.00
		5	\$40.00
		6	\$1.00
		7	\$40.00
		8	\$40.00
POCAHONTAS	38	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
PRESTON	39	1	\$30.00
		2	\$30.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
		7	\$1.00
		8	\$30.00
		9	\$1.00
		10	\$30.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
		19	\$1.00
		20	\$1.00
PUTNAM	40	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
		11	\$25.00
		12	\$25.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
RALEIGH	41	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$20.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$20.00
RANDOLPH	42	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$20.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$20.00
		17	\$1.00
		18	\$1.00
RITCHIE	43	1	\$80.00
		2	\$1.00
		3	\$80.00
		4	\$1.00
		5	\$80.00
		6	\$1.00
		7	\$80.00
		8	\$1.00
		9	\$1.00
		10	\$80.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/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 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
TYLER	48	1	\$100.00
		2	\$100.00
		3	\$1.00
		4	\$100.00
		5	\$100.00
		6	\$100.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$100.00
UPSHUR	49	1	\$70.00
		2	\$70.00
		3	\$1.00
		4	\$70.00
		5	\$70.00
		6	\$70.00
		7	\$70.00
WAYNE	50	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$20.00
		9	\$20.00
		10	\$20.00
		11	\$1.00
		12	\$20.00
WEBSTER	51	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$15.00
		5	\$15.00
		6	\$15.00
		7	\$1.00

OIL & GAS RESERVE RATES FOR TY 2021			
COUNTY	CO #	DISTRICT #	TY2021 \$/AC
WETZEL	52	1	\$100.00
		2	\$100.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$1.00
		7	\$1.00
		8	\$100.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$100.00
		13	\$1.00
WIRT	53	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$1.00
		5	\$35.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
WOOD	54	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
		9	\$35.00
		10	\$1.00
		11	\$35.00
		12	\$35.00
		13	\$1.00
		14	\$1.00
WYOMING	55	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$1.00
		9	\$1.00
		10	\$20.00

**MANAGED TIMBER
PROPERTY ANALYSIS**

Tax Year 2021

Dale W. Steager
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES TAX YEAR 2021

(based on market 2015-2019)

Tentative Rates Per Acre

Class II Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$228	\$140	\$50
Region 2	\$235	\$148	\$50
Region 3	\$258	\$164	\$50
Region 4	\$282	\$200	\$81
Region 5	\$200	\$140	\$50

Class III/IV Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$275	\$175	\$75
Region 2	\$275	\$175	\$75
Region 3	\$275	\$180	\$75
Region 4	\$310	\$195	\$75
Region 5	\$275	\$175	\$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

<u>Harvest Interval</u> <u>Grades</u>	<u>35 yrs.</u>	<u>45 yrs.</u>	<u>55 yrs.</u>	<u>80 yrs.</u>	<u>Total</u>
1 - Site Index 75 or more	4.6 cords	--	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
2019	1.9575	33.33%	0.6524
2018	2.7480	26.67%	0.7329
2017	1.9100	20.00%	0.3820
2016	1.3383	13.33%	0.1784
2015	1.5292	6.67%	0.1020

2.048 %

B. Nonliquidity Rate

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

Year	Rate	W/A %	W/A Rate
2019	0.5000	33.33%	0.1667
2018	0.3583	26.67%	0.0956
2017	0.2542	20.00%	0.0508
2016	0.2950	13.33%	0.0393
2015	0.2683	6.67%	0.0179

0.370 %

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

Year	Rate	W/A %	W/A Rate
2019	0.6250	6.67%	0.0417
2018	0.3642	13.33%	0.0485
2017	0.9850	20.00%	0.1970
2016	1.2592	26.67%	0.3358
2015	1.3117	33.33%	0.4372

1.060 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2019	0.720	33.33%	0.2400
2018	0.708	26.67%	0.1888
2017	0.714	20.00%	0.1428
2016	0.708	13.33%	0.0944
2015	0.714	6.67%	0.0476

0.714 %

F. Inflation Rate:

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2019	1.810	20.00%	0.3620
2018	1.910	6.67%	0.1274
2017	2.110	13.33%	0.2813
2016	2.070	33.33%	0.6899
2015	0.730	26.67%	0.1947

(1.655) %

TOTAL REQUIRED RATE OF RETURN (REAL)

3.037 %

LESS: PROPERTY TAX COMPONENT

(0.714)

TOTAL DISCOUNT COMPONENT

2.323 %

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	134.14	134.14	134.14	134.14	134.14
Region 2	134.51	134.51	134.51	134.51	134.51
Region 3	144.09	144.09	144.09	144.09	144.09
Region 4	143.53	143.53	143.53	143.53	143.53
Region 5	109.57	109.57	109.57	109.57	109.57

		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	2.52	5.35	6.63	8.22	14.06
Region 2	3.45	7.31	9.07	11.24	19.22
Region 3	3.70	7.83	9.71	12.04	20.58
Region 4	7.55	16.00	19.83	24.58	42.04
Region 5	6.10	12.93	16.03	19.87	33.98

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		
2019	1.9575	33.33%	0.6524		
2018	2.7480	26.67%	0.7329		
2017	1.9100	20.00%	0.3820		
2016	1.3383	13.33%	0.1784		
2015	1.5292	6.67%	0.1020		
				2.048	%

B. Nonliquidity Rate

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

Year	Rate	W/A %	W/A Rate		
2019	0.5000	33.33%	0.1667		
2018	0.3583	26.67%	0.0956		
2017	0.2542	20.00%	0.0508		
2016	0.2950	13.33%	0.0393		
2015	0.2683	6.67%	0.0179		
				0.370	%

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

Year	Rate	W/A %	W/A Rate		
2019	0.6250	6.67%	0.0417		
2018	0.3642	13.33%	0.0485		
2017	0.9850	20.00%	0.1970		
2016	1.2592	26.67%	0.3358		
2015	1.3117	33.33%	0.4372		
				1.060	%

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		
2019	1.320	33.33%	0.4400		
2018	1.302	26.67%	0.3472		
2017	1.308	20.00%	0.2616		
2016	1.308	13.33%	0.1744		
2015	1.314	6.67%	0.0876		
				1.311	%

F. Inflation Rate:

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate		
2019	1.810	20.00%	0.3620		
2018	1.910	6.67%	0.1274		
2017	2.110	13.33%	0.2813		
2016	2.070	33.33%	0.6899		
2015	0.730	26.67%	0.1947		
				(1.655)	%

TOTAL REQUIRED RATE OF RETURN (REAL)

3.634 %

LESS: PROPERTY TAX COMPONENT

(1.311)

TOTAL DISCOUNT COMPONENT

2.323 %

Stumpage Prices:

		<u>Sawtimber</u>	<u>Pulpwood</u>		
Stumpage Price Adjustment Factor		0.00%	0.55%		
		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	204.11	204.11	204.11	204.11	204.11
Region 2	200.25	200.25	200.25	200.25	200.25
Region 3	209.81	209.81	209.81	209.81	209.81
Region 4	211.85	211.85	211.85	211.85	211.85
Region 5	169.74	169.74	169.74	169.74	169.74
		1.2116	1.2800	1.3521	1.5508
PULPWOOD:		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age
Region	\$/Cord	35	45	55	80
Region 1	2.52	3.06	3.23	3.41	3.92
Region 2	5.76	6.98	7.37	7.79	8.93
Region 3	4.13	5.00	5.28	5.58	6.40
Region 4	10.90	13.20	13.95	14.74	16.90
Region 5	5.72	6.94	7.33	7.74	8.88

Management Costs:

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

Tax Rates:

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

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
2019	29,481.29	209.92	33.33%	69.97
2018	9,307.85	208.95	26.67%	55.72
2017	21,212.89	213.81	20.00%	42.76
2016	11,080.07	170.93	13.33%	22.79
2015	12,561.80	192.85	6.67%	12.86
	83,643.90			204.11

REGION 1 - Pulpwood *

Year	Volume	\$/CORD	W/A%	\$/CORD
2019			0.00%	
2018			60.00%	0.00
2017	3,802.40	5.81	20.00%	1.16
2016	240.00	2.70	13.33%	0.36
2015	7,218.90	15.03	6.67%	1.00
	11,261.30			2.52

REGION 2 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2019	38,964.42	197.22	33.33%	65.74
2018	37,951.25	214.78	26.67%	57.27
2017	57,210.90	203.96	20.00%	40.79
2016	41,475.00	185.68	13.33%	24.76
2015	26,487.65	175.25	6.67%	11.69
	202,089.22			200.25

REGION 2 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2019	8,026.30	6.93	33.33%	2.31
2018	5,952.60	4.23	26.67%	1.13
2017	5,606.50	6.84	20.00%	1.37
2016	25,517.30	4.17	13.33%	0.56
2015	42,863.30	5.97	6.67%	0.40
	87,966.00			5.76

REGION 3 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2019	86,183.30	197.17	33.33%	65.72
2018	107,266.20	233.19	26.67%	62.18
2017	112,269.80	212.95	20.00%	42.59
2016	136,304.30	191.34	13.33%	25.51
2015	135,967.80	207.12	6.67%	13.81
	577,991.40			209.81

REGION 3 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2019	126,600.70	1.29	33.33%	0.43
2018	25,448.30	6.04	26.67%	1.61
2017	143,565.20	7.86	20.00%	1.57
2016	169,606.30	1.92	13.33%	0.26
2015	184,907.30	3.85	6.67%	0.26
	650,127.80			4.13

REGION 4 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2019	29,355.02	204.95	33.33%	68.32
2018	25,582.56	218.49	26.67%	58.26
2017	15,073.14	238.37	20.00%	47.67
2016	9,925.16	170.26	13.33%	22.70
2015	6,644.42	223.42	6.67%	14.90
	86,580.30			211.85

REGION 4 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2019	2,349.30	10.05	33.33%	3.35
2018	4,428.90	12.56	26.67%	3.35
2017	3,813.30	11.16	20.00%	2.23
2016	4,538.50	11.14	13.33%	1.49
2015	6,137.40	7.22	6.67%	0.48
	21,267.40			10.90

REGION 5 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2019	35,343.64	180.50	33.33%	60.17
2018	10,243.05	173.82	26.67%	46.35
2017	45,373.14	162.33	20.00%	32.47
2016	23,026.02	150.53	13.33%	20.07
2015	37,714.40	160.15	6.67%	10.68
	151,700.25			169.74

REGION 5 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2019	1,659.60	4.99	33.33%	1.66
2018	1,568.50	5.73	26.67%	1.53
2017	9,644.70	7.32	20.00%	1.46
2016	2,794.40	5.99	13.33%	0.80
2015	2,889.50	4.05	6.67%	0.27
	18,556.70			5.72

COAL PROPERTIES ANALYSIS

Tax Year 2021

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	2019
	January	December	2018
	January	December	2017
			2.104%
			1.973%
			0.947%

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

Loan Rate*		Debt Risk Rate
2019	7.28%	5.176%
2018	6.90%	4.927%
2017	6.10%	5.153%

*Prime plus 2%

Equity Differential between Equity Rates and 90 day Treasury Bills

Equity Rate**		Equity Risk Rate
2019	[15.134%/(1-.26)]-2.104%	18.166%
2018	[15.00%/(1-.26)]-1.973%	18.297%
2017	[15.25%/(1-.275)]-0.947%	20.087%

** DQYDJ.COM

Composite Risk Rate

	Equity Rate	Debt Rate	Composite Risk
2019	11.232%	2.076%	13.308%
2018	11.893%	1.724%	13.617%
2017	13.057%	1.804%	14.861%
Note: Debt Equity Ratio		Debt 40%	Equity 60%

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.

			1yr T Bill	90 d T Bill	Non Liquidity Rate
January	December	2019	2.050%	1.550%	0.500%
January	December	2018	2.332%	1.973%	0.359%
January	December	2017	1.201%	0.947%	0.254%

Management Rate

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

Inflation Rate

January	December	2019	1.810%
January	December	2018	1.910%
January	December	2017	2.110%

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.

	2019	2018	2017
Inflation Rate	-1.810%	-1.910%	-2.110%
Safe Rate	2.104%	1.973%	0.947%
Composite Risk Rate	13.308%	13.617%	14.861%
Non Liquidity Rate	0.500%	0.359%	0.254%
Management Rate	0.500%	0.500%	0.500%
Total	14.602%	14.539%	14.452%

Three Yr Average: 14.531 Rounded to: **14.50%**

CAPITALIZATION RATE -		14.50%	
MULTIPLIERS:	Yr	Yr	
	1	9	4.715
	2	10	4.991
	3	11	5.232
	4	12	5.443
	5	13	5.627
	6	14	5.788
	7	15	5.928
	8		

COAL

Price and Royalty Rate Analysis

The development of royalty rates for the various categories of mines and markets involves information collection and review from a variety of sources. Coal lease rates have been derived from transaction information provided by active operations, assessors, tax auditors, and by individual lessors/lessees involved in the specific transaction. The prices for mined coal, as per 110-CSR-1, 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 TY21 APPLICATION

GRAND SUMMARY ALL SOURCES	STEAM SPOT	STEAM TERM	MET
PSC (2019)	\$52.62	\$46.53	
FERC (2019)	\$54.53	\$48.01	
Active Return Summary (2019)	\$48.47	In Progress	\$114.18
Coal Market Publication (3 year average - Platts)	\$50.18 PGH (13/3) Rail \$56.79 CAPP (12/1.67) Barge		\$160.94 Low Vol HCC \$167.59 High Vol A \$136.86 High Vol B

STATE STEAM PRICE	\$52.10 FERC & PSC, 3Yr Ave SPOT
STATE MET PRICE	\$112.88 Active Return 3Yr Ave

	Spot Sales	Term Sales	Total
2018 WWPSC Reported Tons	6,436,788	13,049,081	19,485,869

COAL TY20 ROYALTY RATES	2019 - Active Return 1YR		2018 - Active Return 2YR		2017		2016		2015	
	%S	%D	%S	%D	3YR S	%D	4YR %S	%D	5YR %S	%D
TOTAL RECORDS	In Progress		78	47	640	672	1,644	1,061	891	776
SUM of PERCENT			517.21	268.47	3,968.00	3,702.72	9,833.84	5,379.27	4,445.62	4,020.78
STRAIGHT AVERAGE			8.81	5.71	8.20	5.51	8.86	5.07	6.43	5.18
MEDIAN			6.00	5.00	6.00	5.00	6.00	5.00	8.00	5.50
WEIGHTED AVERAGE			6.36	5.83	6.45	5.83	8.74	5.78	6.62	5.45
ROYALTY RATE DEEP (%)	5.72									
ROYALTY RATE SURFACE (%)	6.54									

ROYALTY RATE CALCULATIONS						
Steam Coal/ Deep Mine	\$52.10	per ton X	5.72%	=	\$2.98	per ton
Metallurgical Coal/ Deep Mine	\$112.88	per ton X	5.72%	=	\$6.45	per ton
Steam Coal/ Surface Mine	\$52.10	per ton X	8.54%	=	\$3.41	per ton
Metallurgical Coal/ Surface Mine	\$112.88	per ton X	6.54%	=	\$7.39	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 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 2021 (next update in TY2023). 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 >= 25 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 <= 50 Then EnvFactor = 40

Envrate > 50 Then EnvFactor = 80

**OTHER MINED MINERAL
PROPERTY ANALYSIS**

Tax Year 2021

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	2019	2.104%
	January	December	2018	1.973%
	January	December	2017	0.947%

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

<u>Loan Rate*</u>		<u>Debt Risk Rate</u>
2019	7.28%	5.176%
2018	6.90%	4.927%
2017	6.10%	5.153%

*Prime plus 2%

Equity Differential between Equity Rates and 90 day Treasury Bills

<u>Equity Rate**</u>		<u>Equity Risk Rate</u>
2019	[12.00%/(1-.26)]-1.550%	14.112%
2018	[12.00%/(1-.26)]-1.973	14.243%
2017	[12.00%/(1-.275)]-0.947	15.605%

** 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>
2019	9.533%	1.817%	11.350%
2018	9.258%	1.724%	10.982%
2017	10.143%	1.804%	11.947%

Non Liquidity Rate

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

			<u>1yr T Bill</u>	<u>90 d T Bill</u>	<u>Non Liquidity Rate</u>
January	December	2019	2.050%	1.550%	0.500%
January	December	2018	2.332%	1.973%	0.359%
January	December	2017	1.201%	0.947%	0.254%

Management Rate

Charges for the management of investment portfolios.

Fixed Rate (by Rule)	0.500%
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Inflation Rate

January	December	2019	1.810%
January	December	2018	1.910%
January	December	2017	2.110%

Property Tax Rate

Sixty percent (60%) of State average Class III property tax rate.

January	December	2019	60% of 2.200 =	1.320%
January	December	2018	60% of 2.170 =	1.302%
January	December	2017	60% of 2.180 =	1.308%

Capitalization Rate

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

	<u>2019</u>	<u>2018</u>	<u>2017</u>
Inflation Rate	-1.810%	-1.910%	-2.110%
Safe Rate	2.104%	1.973%	0.947%
Composite Risk Rate	11.350%	10.982%	11.947%
Non Liquidity Rate	0.500%	0.359%	0.254%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.320%	1.302%	1.308%
<u>Total</u>	13.964%	13.206%	12.846%

Three Yr Average: 13.339% Rounded to: **13.30%**

CAPITALIZATION RATE 13.10%

MULTIPLIERS:	<u>Yr</u>	<u>Yr</u>	<u>Yr</u>	<u>Yr</u>
	1	0.455	9	4.917
	2	1.284	10	5.223
	3	2.016	11	5.492
	4	2.662	12	5.730
	5	3.232	13	5.940
	6	3.735	14	6.125
	7	4.180	15	6.289
	8	4.571		

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 of this review is shown below in order to protect the confidentiality of parties involved.

RESOURCE	DATA SOURCES	AVERAGE ROYALTY	MEDIAN ROYALTY	TY2020 RATE
LIMESTONE	15	\$0.22	\$0.20	\$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