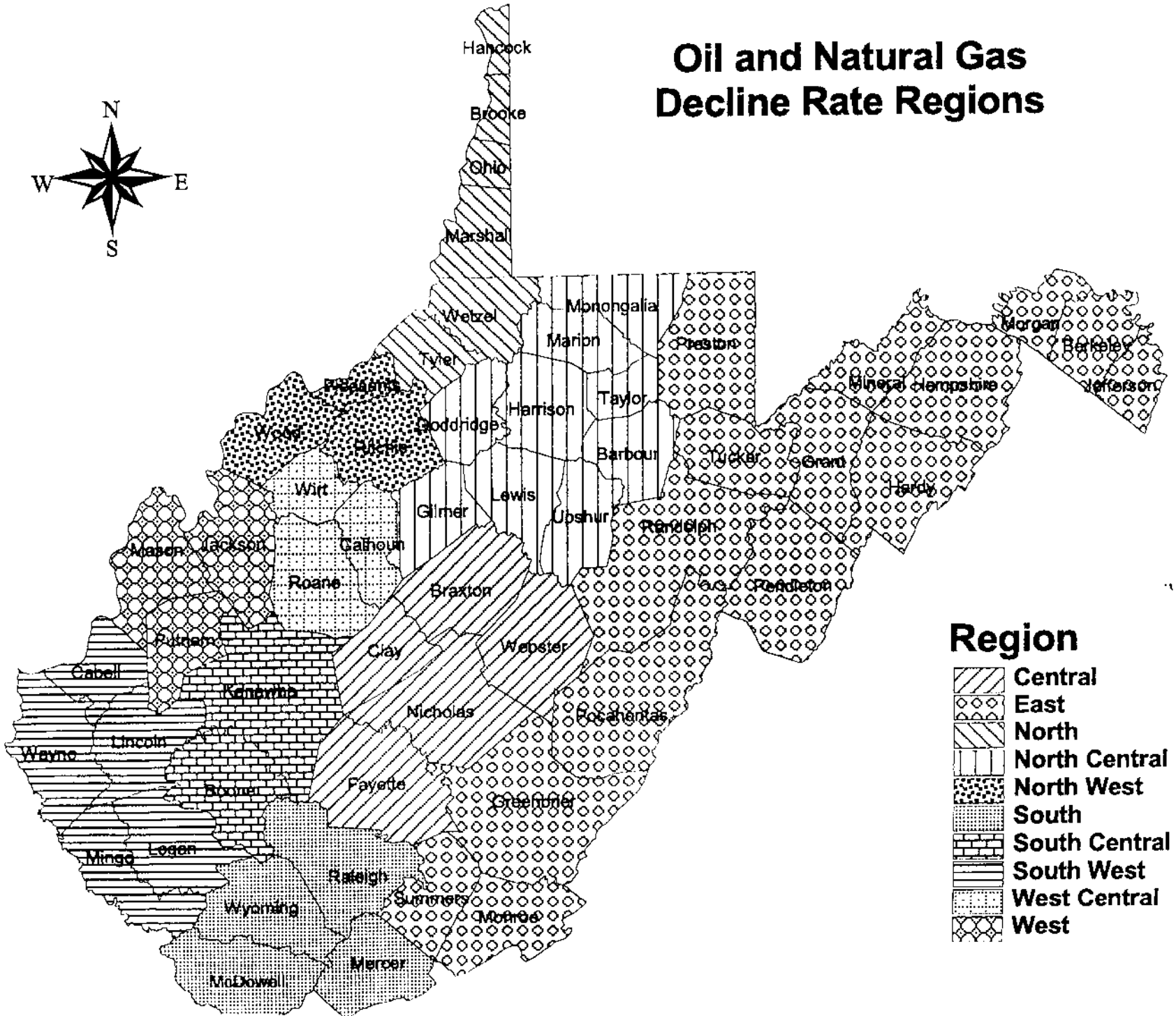
Oil and Natural Gas Decline Rate Regions



WEST VIRGINIA GEOLOGICAL AND ECONOMIC SURVEY

State of West Virginia
Gaston Caperton
Governor

Department of Commerce, Labor,
& Environmental Resources
Leonard A. Harvey, Secretary

Geological and Economic Surv
Larry D. Woodson, Director
Carl J. Smith, Deputy Director

Central Region:

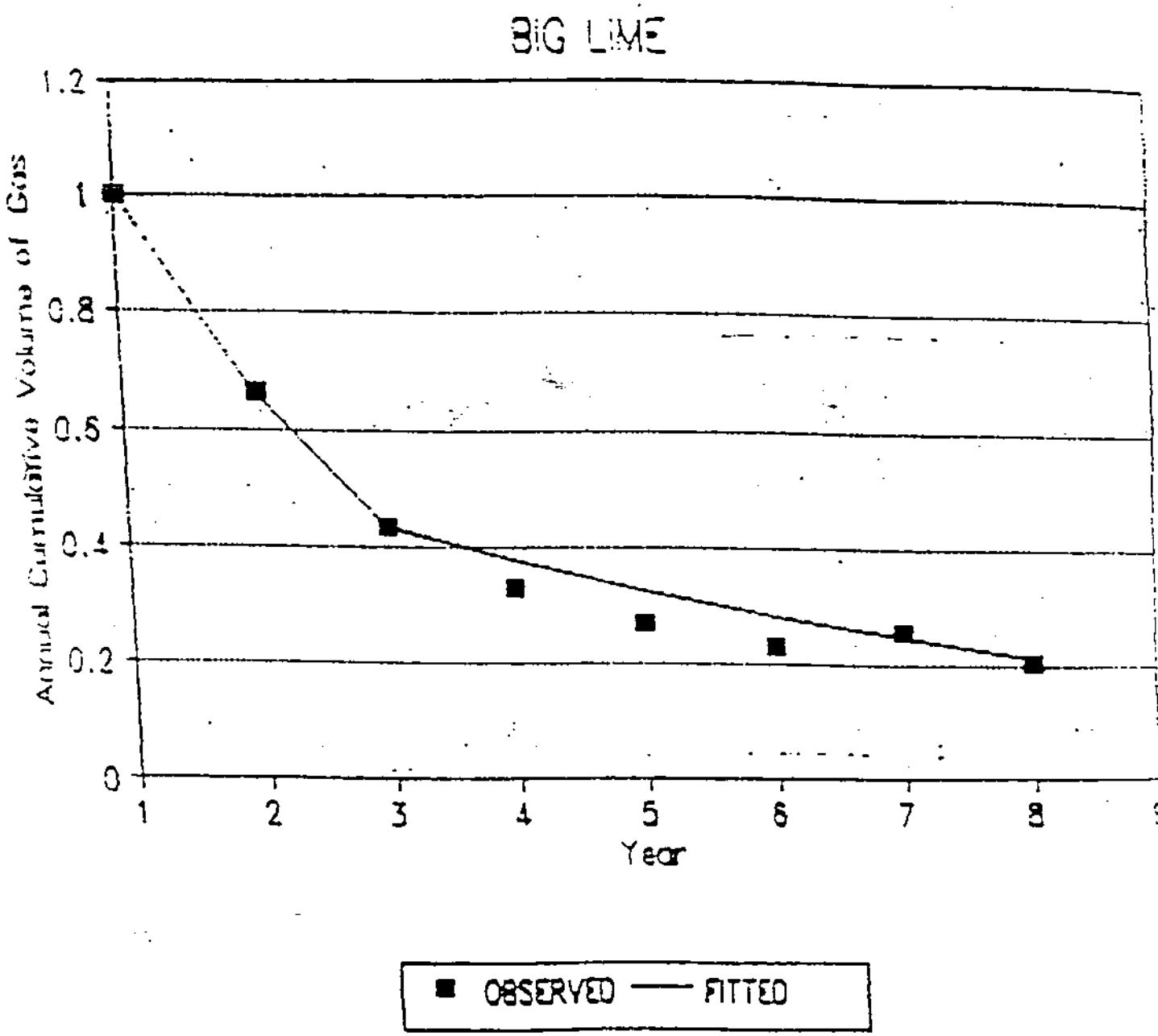
Formation = Big Lime

Model

Decline from 1st to 2nd year = .34 (# observations used = 78)
Decline from 2nd to 3rd year = .34 (# observations used = 63)
Decline after 3rd year = .13 (# observations used ranged from 37 to 5

Normalized Decline

Year	Observed	Model
1	1.00	1.00
2	.66	.66
3	.43	.43
4	.33	.38
5	.27	.33
6	.23	.28
7	.26	.24
8	.20	.21


BIG LIME
Annual Cumulative Volume of Gas
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
Year
OBSERVED
FITTED

Decline Rates for Natural Gas and Oil Formations

Code		Central Year 1	Central Year 2	Central Year 3	Braxton
12	Alexander, Benson	0.31	0.20	0.10	Clay
14	Benson	0.48	0.08	0.08	Fayette
16	Benson, Balltown	0.45	0.16	0.12	Nicholas
17	Gordon +	0.30	0.07	0.07	Webster
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*	0.38	0.23	0.10	
9	Exception (median)	0.38	0.23	0.10	
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

Code			East	East	East	
			Year 1	Year 2	Year 3	Berkeley
1	Oriskany		0.30	0.30	0.19	Grant
14	Benson		0.31	0.17	0.12	Greenbrier
20	Benson +		0.44	0.20	0.08	Hampshire
21	Benson, Fifth		0.29	0.28	0.09	Hardy
32	Brallier +		0.48	0.20	0.05	Jefferson
33	Elk, Benson		0.39	0.21	0.08	Mineral
34	Elk, Benson, Riley		0.53	0.19	0.05	Monroe
35	Elk, Benson, Riley +		0.36	0.19	0.11	Morgan
36	Elk, Benson, Balltown		0.34	0.18	0.11	Pendelton
37	Elk, Alexander, Benson		0.50	0.07	0.07	Pocahontas
38	Elk, Alexander, Benson +		0.40	0.16	0.16	Preston
39	Hunterville		0.31	0.31	0.14	Randolph
40	Fox, Haverty		0.36	0.21	0.15	Summers
93	4th Sand		0.42	0.32	0.08	Tucker
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	
9	Exception (median)		0.39	0.21	0.09	
10	Non-Filer		0.29	0.07	0.05	

Decline Rates for Natural Gas and Oil Formations

Code			North	North	North	
			Year 1	Year 2	Year 3	Brooke
11	Gordon		0.47	0.31	0.09	Hancock
13	Alexander, Benson, Riley		0.26	0.16	0.15	Marshall
15	Benson, Riley		0.18	0.16	0.06	Ohio
93	4th Sand		0.42	0.32	0.08	Tyler
94	50 Foot		0.34	0.26	0.07	Wetzel
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.42	0.26	0.08	
10	Non-Filer		0.18	0.16	0.06	

Decline Rates for Natural Gas and Oil Formations

Code		North Central Year 1	North Central Year 2	North Central 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/Onondago or Oriskany Heiderberg	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	Methane	0.23	0.08	0.05
109	Trenton/Deeper*	0.37	0.20	0.10
9	Exception (median)	0.37	0.20	0.10
10	Non-Filer	0.23	0.03	0.03

*
Barbour
Doddridge
Gilmer
Harrison
Lewis
Marion
Monongalia
Taylor
Upshur

* 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

Code		North West Year 1	North West Year 2	North West Year 3	Pleasants
2	Huron, Rhinestreet	0.41	0.26	0.07	Ritchie
4	Huron	0.42	0.24	0.14	Wood
5	Huron, Shale, 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	0.15	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	0.24	0.10	
9	Exception (median)	0.39	0.24	0.10	
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

Decline Rates for Natural Gas and Oil Formations

Code		South	South	South	
		Year 1	Year 2	Year 3	McDowell
8	Berea	0.34	0.15	0.15	Mercer
22	Big Lime	0.31	0.19	0.07	Raleigh
23	Big Lime, Maxton	0.31	0.19	0.07	Wyoming
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	Methane	0.23	0.08	0.05	
9	Exception (median)	0.34	0.19	0.08	
10	Non-Filer	0.23	0.08	0.05	
98	Methane (Spec)*	0.60	0.60	0.60	

* Involves a special drilling procedure for coalbed methane removal

Decline Rates for Natural Gas and Oil Formations

Code		South Central Year 1	South Central Year 2	South Central Year 3	Boone
3	Devonian Shale	0.23	0.08	0.05	Kanawha
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*	0.30	0.21	0.08	
9	Exception (median)	0.30	0.21	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

Code		South West Year 1	South West Year 2	South West Year 3	Cabell
3	Devonian Shale	0.31	0.15	0.04	Lincoln
8	Berea	0.36	0.11	0.11	Logan
18	Big Injun	0.38	0.22	0.04	Mingo
22	Big Lime	0.19	0.19	0.19	Wayne
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*	0.36	0.22	0.08	
9	Exception (median)	0.36	0.22	0.08	
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

Code		West Central	West Central	West Central	
					Calhoun
2	Huron, Rhinestreet	0.49	0.11	0.06	Roane
4	Huron	0.33	0.22	0.14	Wirt
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	0.25	0.11	
9	Exception (median)	0.42	0.25	0.11	
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 informatiom is available.

Decline Rates for Natural Gas and Oil Formations

Code		West	West	West	
		Year 1	Year 2	Year 3	Jackson
1	Oriskany	0.40	0.40	0.29	Mason
2	Huron, Rhinestreet	0.13	0.12	0.03	Putnam
3	Devonian Shale	0.31	0.15	0.04	
4	Huron	0.29	0.14	0.05	
5	Huron, Shale, Above Huron	0.38	0.15	0.06	
6	Huron, Berea	0.29	0.08	0.08	
7	Berea, Devonian Shales	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	0.16	0.08	
9	Exception (median)	0.35	0.16	0.08	
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 informatiom is available.