

Quality Characteristics of the Lower Elkhorn Coal Bed in Eastern Kentucky

Cortland F. Eble

Thickness and quality data from the Kentucky Coal Resources Information System (KCRIS) are summarized in this chart for the Lower Elkhorn coal bed (and equivalents). Parameter averages and ranges of values are presented in the two tables, and average values are displayed graphically by county.

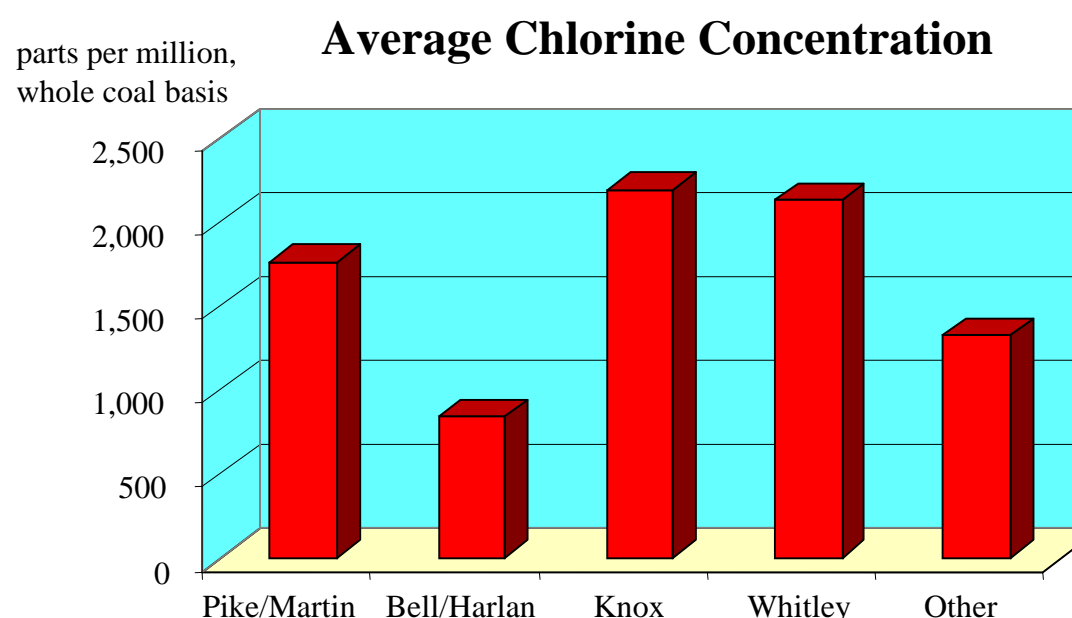
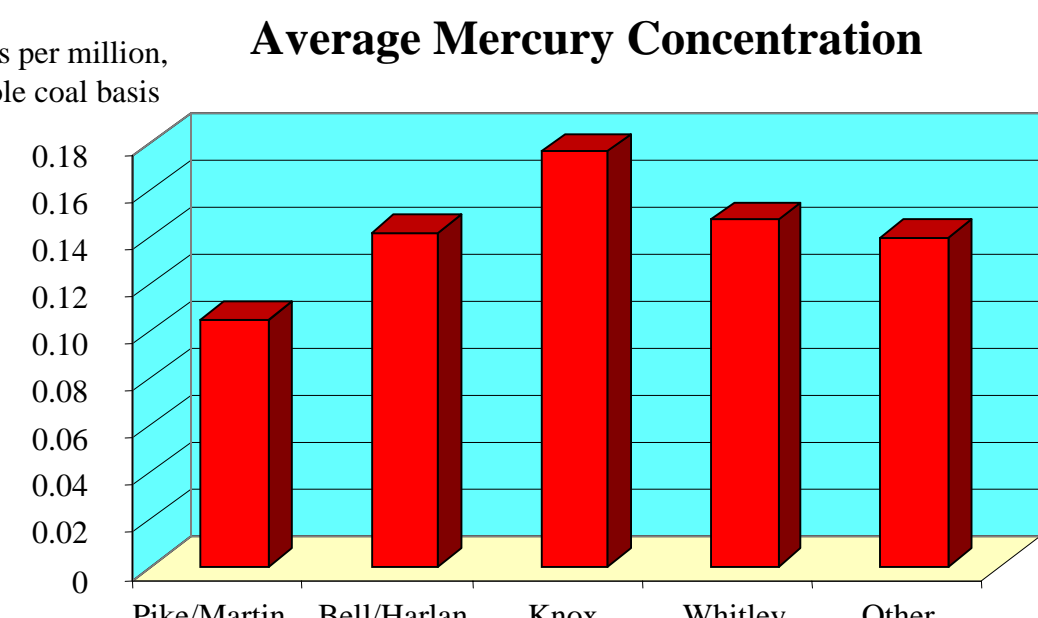
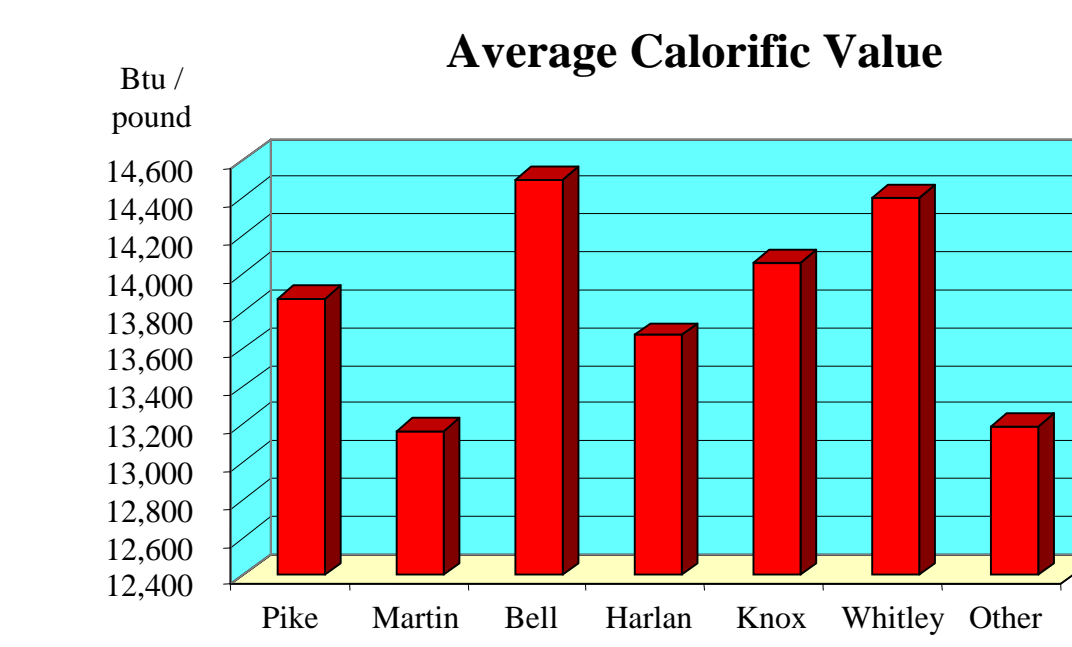
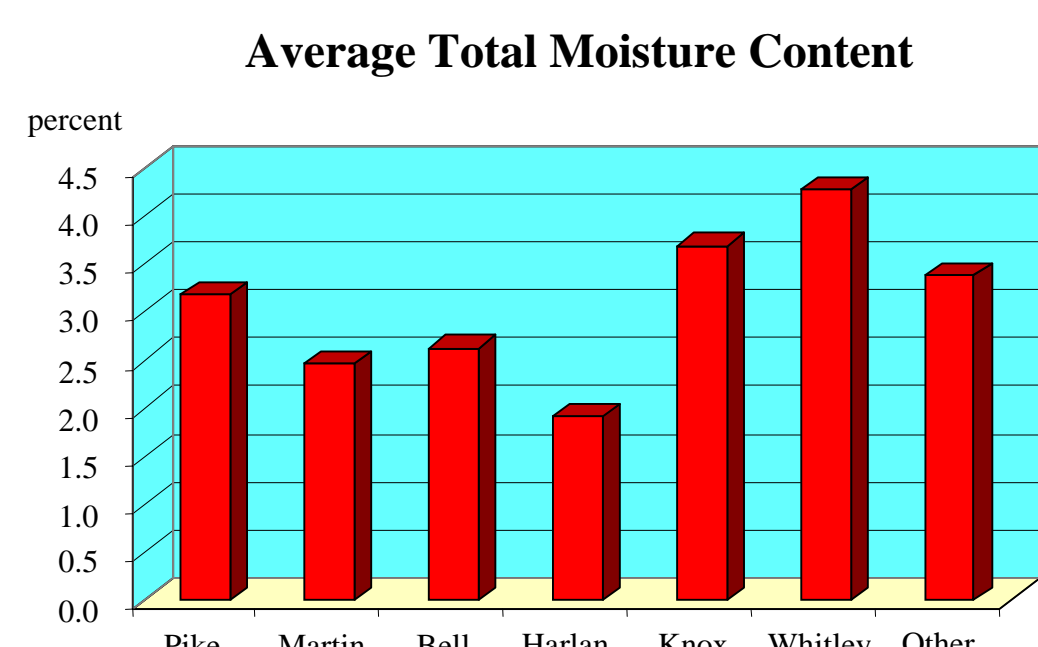
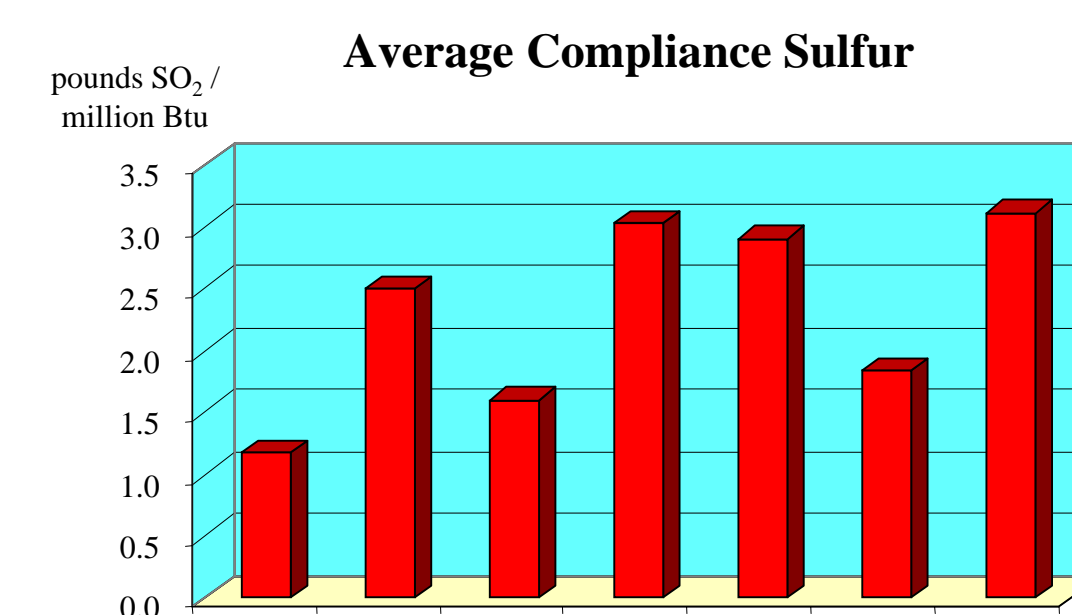
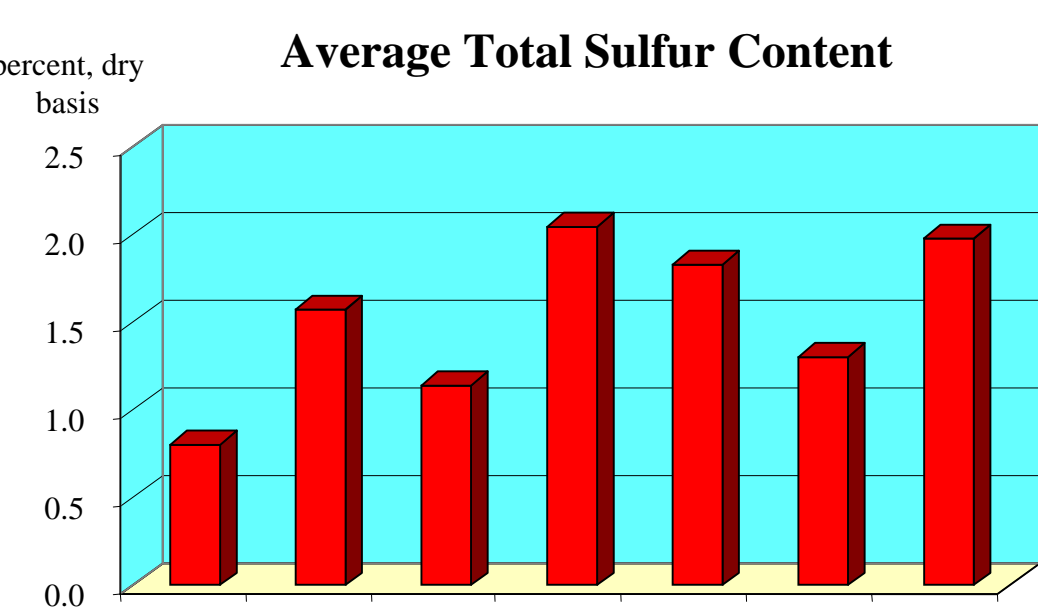
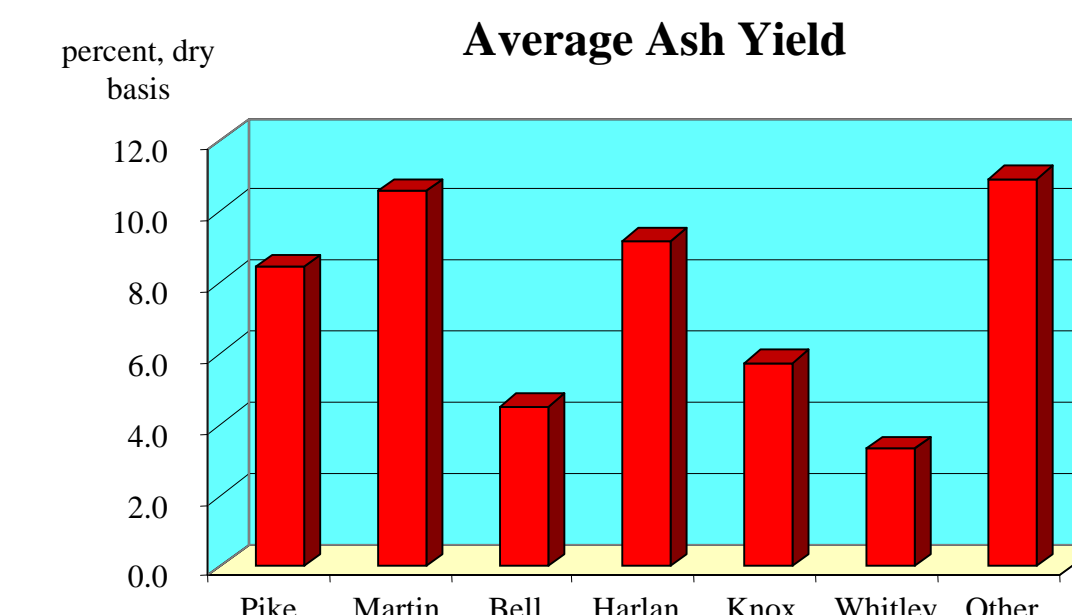
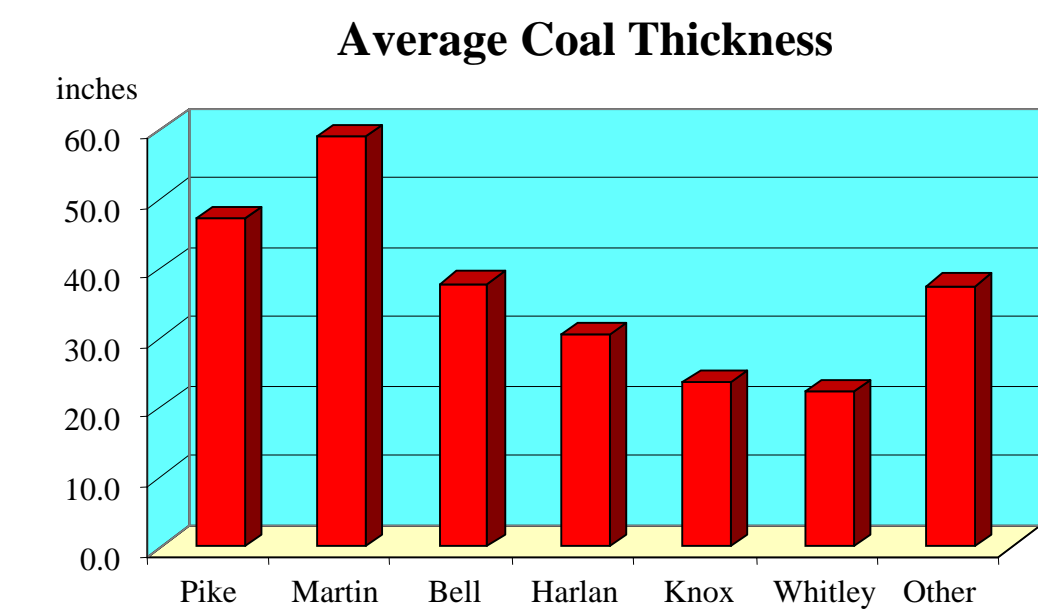
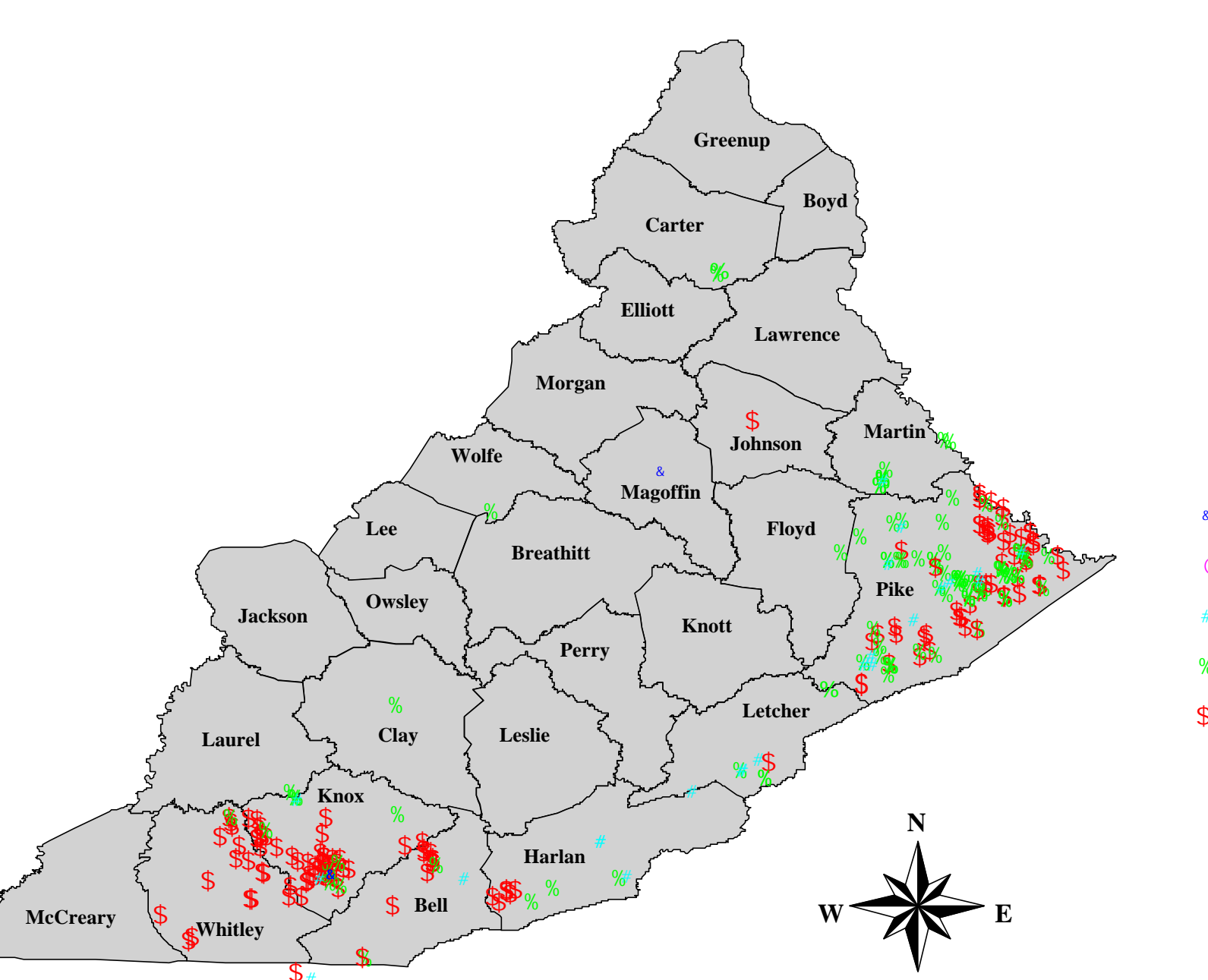
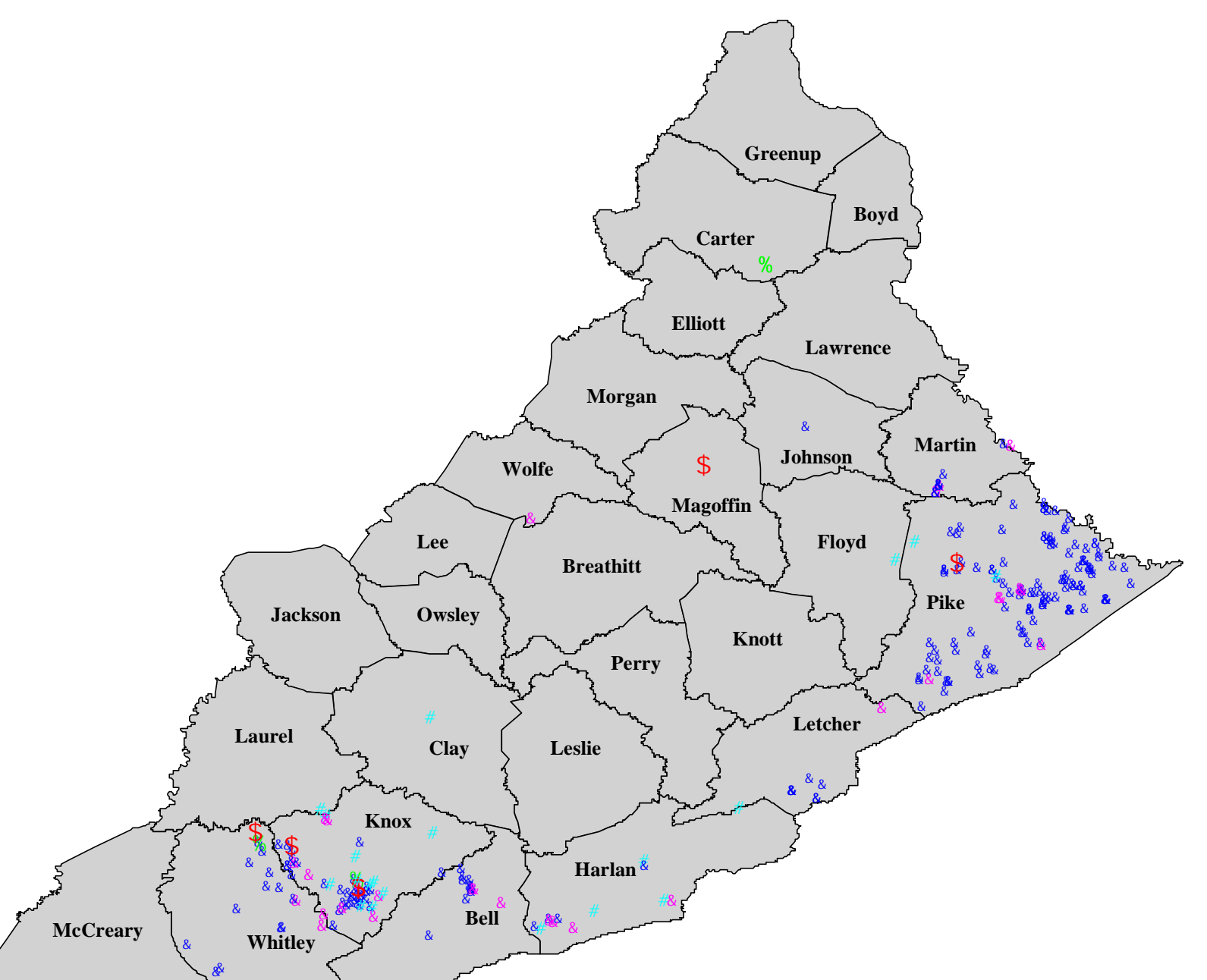
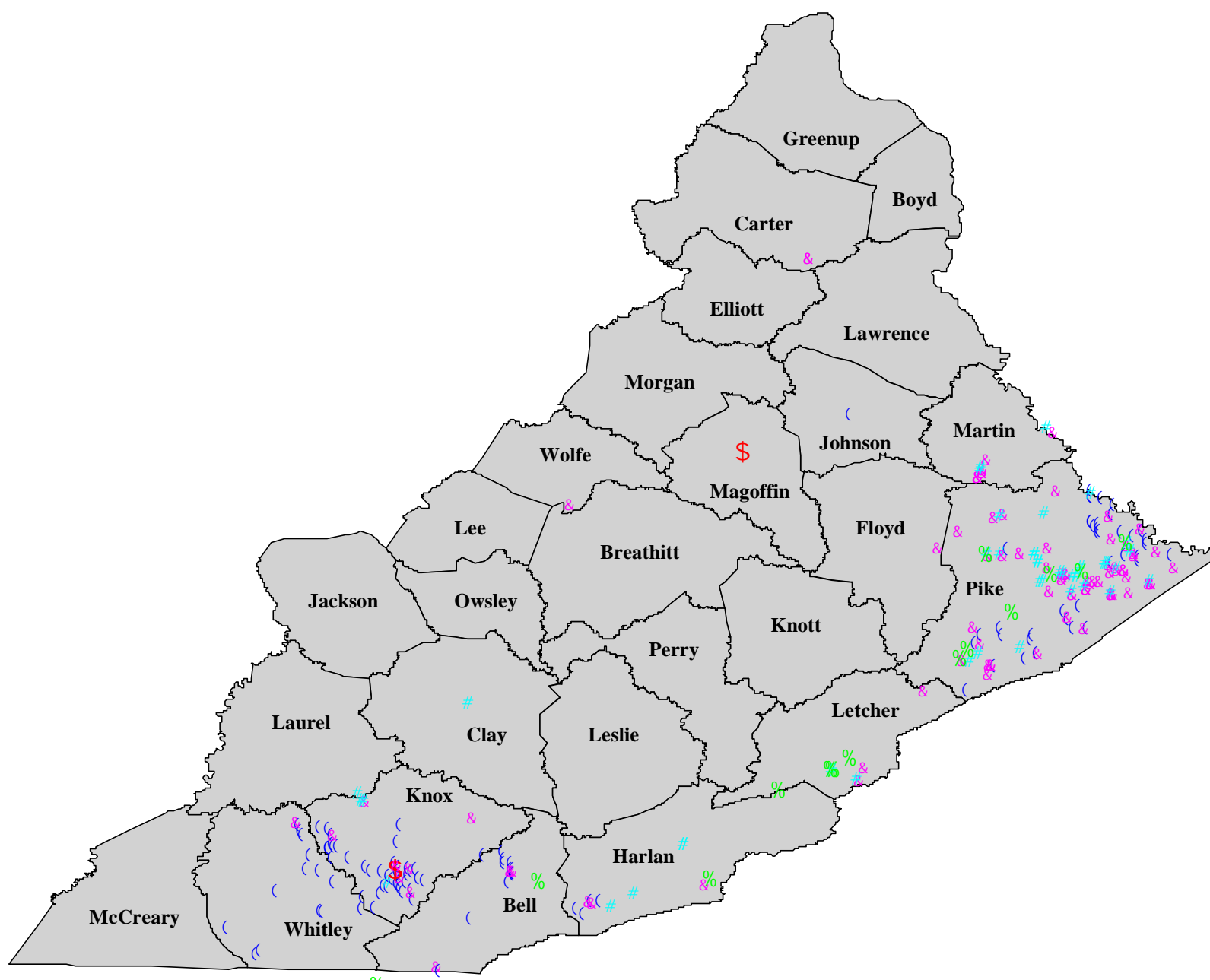
The Lower Elkhorn is one of the most heavily mined coal beds in the Eastern Kentucky Coal Field; more than 17,000 tons were mined in 1997, according to the Energy Information Administration. The Lower Elkhorn, which occurs within the Pikeville Formation of the Breathitt Group, is also one of the thickest and most laterally extensive coal beds in eastern Kentucky, averaging 55 inches in thickness where sampled in Pike and Martin Counties (mainly in and adjacent to active mines). In other counties where the Lower Elkhorn is mined, it averages 39 inches in total bed thickness. The Lower Elkhorn coal bed is characteristically low in ash and sulfur (avg. 7.5 percent and 1.2 percent, respectively), which historically has made it an attractive target for both steam and metallurgical applications. The low sulfur content renders it a "compliance coal" in many instances, meaning that when burned, it emits less than 1.2 pounds of sulfur dioxide (SO₂) for every million Btu generated.

The Environmental Protection Agency is currently interested in the amount of mercury and chlorine in coal that is burned by electric utilities. KCRIS data indicate the mercury content of the Lower Elkhorn coal varies between 0.01 and 0.57 parts per million (ppm, whole coal basis). Chlorine contents vary between 100 and 3,700 ppm.

References Cited
Thacker, E.E., Weisenfluh, G.A., and Andrews, W.M., Jr., 1998, Total coal thickness of the Lower Elkhorn coal in eastern Kentucky: Kentucky Geological Survey, series 11, Map and Chart Series 20, 1 sheet.

Acknowledgments
The author wishes to acknowledge the assistance of Drew Andrews, Jerry Weisenfluh, and Steve Greb in the preparation of this report.

Western Europe Stage	Mid-continent USA Series	North American Series	Eastern Kentucky Group	Eastern Kentucky Formation	Major Coal Beds and Coal Zones
Westphalian D	Desmoinesian	Middle Pennsylvanian	Breathitt	Princess	Princess No. 9 Princess No. 8 Princess No. 7 Princess No. 6 Princess No. 5a, 5b Princess No. 5, Richardson, Skyline <i>Stoney Fork Member</i>
				Four Corners	Broas Peach Orchard <i>Arnett Member</i> Hazard Haddix <i>Magoffin Member</i>
Bolsovian	Atokan	Middle Pennsylvanian	Breathitt	Hyden	Taylor Hamlin Fire Clay rider Fire Clay Whitesburg <i>Kendrick Shale Member</i>
				Pikeville	Amburgy Elkins Fork Shale Upper Elkhorn No. 3 Alma <i>Crummies Member</i> Lower Elkhorn ← Little Eagle <i>Betsie Shale Member</i>
Langsettian	Morrowan	Lower	Grundy	Clintwood Millard <i>Unnamed marine zone</i> Hagy Splash Dam / Barren Fork Elswick / Stearns	



County	Coal Thickness	Total Moisture	Ash Yield	Total Sulfur	Calorific Value	Compliance Sulfur
Pike	47.3	3.2	8.4	0.8	13,869	1.2
Average	131.6	7.7	18.1	5.2	15,051	7.7
Maximum	14.4	1.2	1.6	0.4	12,215	0.6
Minimum	134	78	134	134	134	134
Count						
Martin	62.1	2.1	9.3	1.3	13,367	1.9
Average	73.8	2.2	12.6	1.8	13,696	2.7
Maximum	46.9	1.9	7.4	0.6	12,866	0.8
Minimum	12	3	12	12	12	12
Count						
Bell	37.9	2.6	4.5	1.1	14,499	1.6
Average	45.7	4.6	15.8	2.5	15,082	3.6
Maximum	30.7	1.5	1.2	0.7	12,593	0.9
Minimum	15	14	15	15	15	15
Count						
Harlan	30.5	1.9	9.2	2.0	13,672	3.0
Average	43.0	2.5	18.3	3.2	14,840	5.1
Maximum	20.5	1.3	2.9	0.6	12,141	0.9
Minimum	14	6	14	14	14	14
Count						
Knox	23.7	3.7	5.7	1.8	14,057	2.9
Average	33.0	6.4	41.8	9.2	14,916	22.0
Maximum	14.0	1.7	1.1	0.5	7,970	0.7
Minimum	58	18	58	58	58	58
Count						
Whitley	22.3	4.3	3.3	1.3	14,404	1.8
Average	26.5	7.3	6.5	4.8	14,955	6.9
Maximum	14.2	2.2	1.0	0.6	13,878	0.8
Minimum	18	11	18	18	18	18
Count						
Other	37.5	3.4	10.9	2.0	13,194	3.1
Average	74.0	7.6	25.0	5.4	14,602	10.0
Maximum	15.6	1.1	1.8	0.7	10,779	1.0
Minimum	16	12	16	16	16	16
Count						

	As	Be	Cd	Cl	Co	Cr	Hg	Mn	Ni	Pb	P	Sb	Se	Th	U
Pike/Martin	12.5	2.7	0.0	1,764.7	4.1	17.5	0.1	39.7	12.1	6.5	48.5	1.0	4.3	2.5	1.2
Average	110.0	6.9	0.1	3,700.0	16.0	33.8	0.3	249.1	42.9	12.0	120.0	2.1	6.6	4.0	2.2
Maximum	0.7	0.7	0.0	500.0	1.0	4.1	0.0	3.0	4.0	1.9	44.0	0.2	2.3	0.4	0.3
Minimum	17	18	17	17	82	83	17	82	83	18	17	17	17	17	18
Count															
Bell/Harlan	11.4	1.4	0.1	840.0	3.6	13.4	0.1	22.5	7.4	5.6	265.8	0.6	3.6	2.5	1.1
Average	34.0	2.0	0.2	2,780.0	8.6	31.7	0.4	59.0	14.0	9.9	830.0	1.1	5.6	4.2	1.9
Maximum	2.0	0.5	0.0	100.0	1.2	3.1	0.0	3.8	3.1	1.4	44.0	0.3	1.6	0.6	0.2
Minimum	6	6	6	6	13	13	6	13	13	6	6	6	6	6	6
Count															
Knox	39.8	2.0	0.0	2,191.7	4.5	9.0	0.2	23.5	11.8	2.5	91.0	0.9	2.6	1.0	0.8
Average	110.0	3.7	0.1	3,100.0	11.0	24.1	0.6	100.0	23.8	10.0	420.0	2.0	3.4	4.9	3.0
Maximum	1.3	0.7	0.0	1,000.0	1.3	2.5	0.0	3.5	3.5	0.5	22.0	0.2	1.4	0.2	0.2
Minimum	12	12	12	12	28	30	12	30	30	12	12	12	12	12	12
Count															
Whitley	16.9	1.6	0.0	2,128.6	5.8	5.0	0.1	29.2	11.0	1.5	61.1	0.8	2.1	0.4	0.5
Average	40.0	2.2	0.1	2,600.0	11.0	8.1	0.5	210.0	19.9	2.0	87.0	1.1	3.6	0.5	1.0
Maximum	1.8	0.9	0.0	1,600.0	0.2	1.8	0.0	4.4	4.6	0.9	44.0	0.4	1.2	0.3	0.3
Minimum	7	7	7	7	12	14	7	14	14	7	7	7	7	7	7
Count															
Other	41.8	2.2	0.1	1,325.0	5.9	17.4	0.1	75.3	27.5	8.8	51.5	1.6	4.5	2.7	2.2
Average	63.0	3.7	0.4	2,100.0	13.9	47.7	0.2	673.6	105.5	11.0	70.0	2.4	6.7	4.0	3.6
Maximum	14.0	1.5	0.0	200.0	1.5	2.9	0.1	4.8	9.6	5.1	44.0	0.7	2.2	0.5	0.4
Minimum	4	6	4	4	13	13	4	13	13	6	4	4	4	4	6
Count															