COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
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Coal Bed Methane Resources of Colorado

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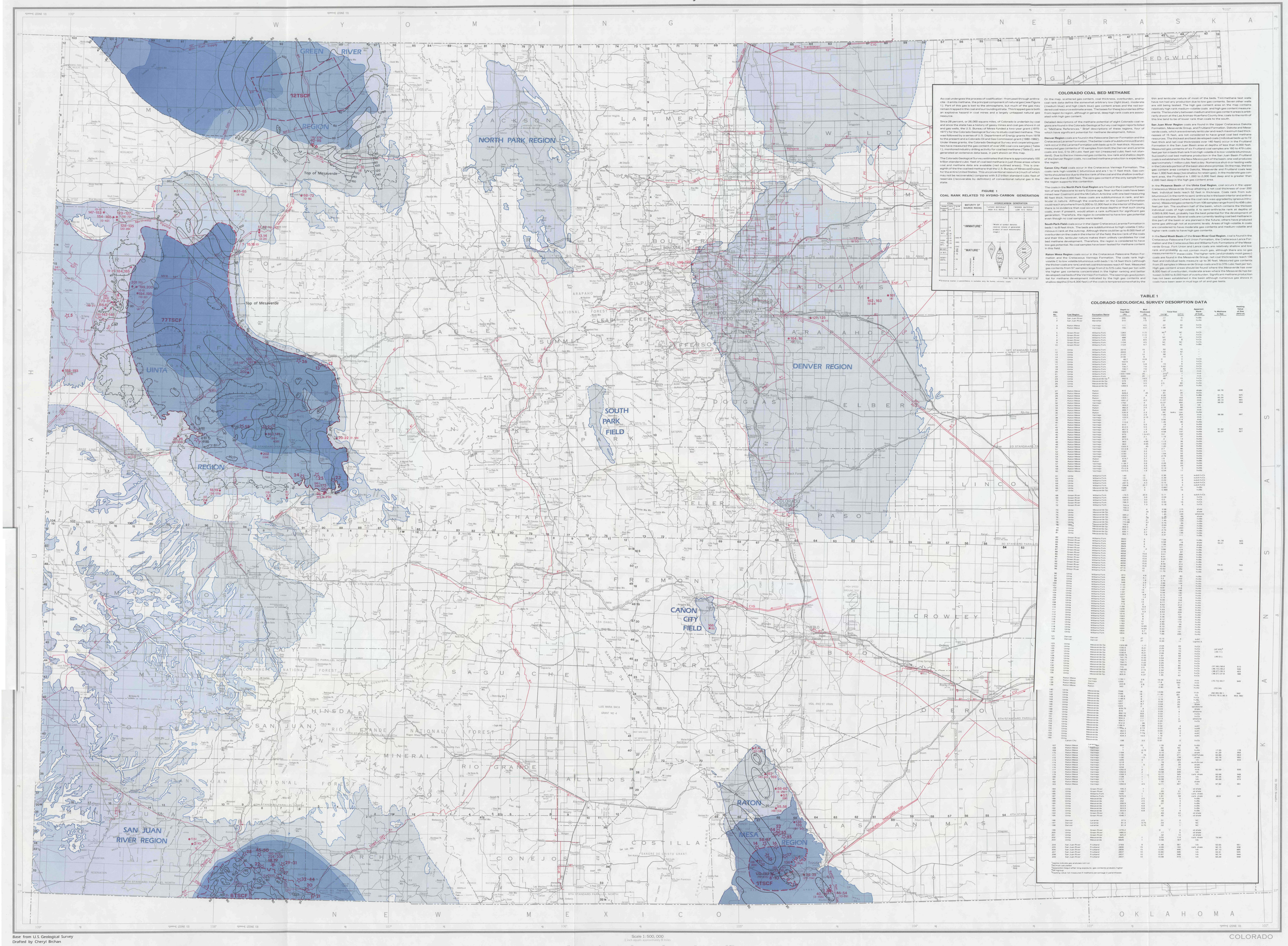

COLORADO COAL BED METHANE

As coal undergoes the process of coalification - from peat through anthracite - it emits methane, the principal component of natural gas (see Figure 1). Part of the gas is lost to the atmosphere, but much of the gas may remain trapped in the coal and surrounding strata. This trapped gas is both an explosive hazard in coal mines and a largely untapped natural gas resource.

Since 28 percent, or 26,000 square miles, of Colorado is underlain by coal and since the state has a history of gassy mines and coal gas shows in oil and gas wells, the U.S. Bureau of Mines funded a two-year grant (1975-1976) to the Colorado Geological Survey to study coal bed methane. This was followed by a series of U.S. Department of Energy grants (1978 to the present and a Colorado Oil and Gas Commission grant (1980-1982). Under these grants, the Colorado Geological Survey and cooperating parties have measured the gas content of over 200 coal core samples (Table 1), monitored industry drilling activity for coal bed methane (Table 2), and generated an extensive data base, in part shown on this map.

The Colorado Geological Survey estimates that there is approximately 100 trillion standard cubic feet of coal bed methane in just those areas where coal and methane data are available (red outlined areas). This is one-eighth of the coal bed methane that the U.S. Bureau of Mines estimates for the entire United States. This unconventional resource (much of which may not be recoverable) compares with 3.2 trillion standard cubic feet of reserves (recoverable by definition) of conventional natural gas in the state.

FIGURE 1
COAL RANK RELATED TO HYDRO-CARBON GENERATION

COAL RANK	ASTM CLASS	% R	MATURITY OF SOURCE ROCKS	HYDROCARBON GENERATION: "LIQUID MATERIAL" (900 to 12 MGS)	HYDROCARBON GENERATION: "GASEOUS MATERIAL" (200 to 12 MGS)
Anthracite	Meta-anthracite	8.0	"OVERMATURE"		
	Anthracite	6.0			
	Semi-anthracite	4.0			
Semi-anthracite	Low volatile bituminous	2.0	"MATURE"	Oil Window	Wet Gas Window
Coking coal	Medium volatile bituminous	1.4			
Coking coal	High volatile bituminous A	1.1			
Coking coal	High volatile bituminous B	0.9			
Coking coal	High volatile bituminous C	0.7			
Subbituminous	Subbituminous A	0.6	"IMMATURE"	Oil Window	Dry Gas Zone
Subbituminous	Subbituminous B	0.5			
Subbituminous	Subbituminous C	0.4			
Lignite	Lignite A	0.3			
Lignite	Lignite B	0.2			

"R" is Vitrinite reflectance (a measure of coal maturation). Depth of burial, temperature, and time are factors in determining coal maturation. Modified from Bostick and Alpern, 1977, p. 30.

Depth Burial and Maturation (%R) of Selected Tertiary Coals from Piceance Basin, Colorado

Detailed descriptions of the methane potential of eight Colorado coal regions are found in the Colorado Geological Survey coal region reports listed in "Methane References." Brief descriptions of these regions, four of which have significant potential for methane development, follow:

Denver Region coals are found in the Paleocene Denver Formation and the Cretaceous Laramie Formation. The better coals of subbituminous B and C rank occur in the Laramie Formation with beds up to 31 feet thick. However, measured gas contents of 13 samples from both the Denver and Laramie coals are low, 0 to 24 cubic feet per ton (measured cubic feet not standard). Due to the low measured gas contents, low rank and shallow depth of the Denver Region coals, no coal bed methane production is expected in the region.

Canon City Field coals occur in the Cretaceous Vermejo Formation. The coals rank high volatile C bituminous and are 1 to 11 feet thick. Gas contents should be low due to the low rank of the coal and the shallow overburden. Only one gas test, 24 cubic feet per ton content of the only sample from the region supports this contention.

The coals in the **North Park Coal Region** are found in the Coalmont Formation of late Paleocene to early Eocene age. Near surface coals have been locally mined for decades. The coals are high volatile C bituminous and are 30 feet thick; however, these coals are subbituminous in rank, and textacular in nature. Although the overburden on the Coalmont Formation could reach overburden from 5,000 to 12,000 feet in the interior of the basin, there is no evidence that coal occurs at these depths or that such young coals, even if present, would attain a rank sufficient for significant gas generation. Therefore, the region is considered to have low gas potential even though no coal samples were tested.

South Park Field coals occur in the Upper Cretaceous Laramie Formation in beds 1 to 8 feet thick. The beds are subbituminous to high volatile C bituminous in rank at the outcrop. Although there could be up to 8,000 feet of overburden on the coals in the interior of the field, the low rank of the coals and their thin, lenticular nature makes them unlikely candidates for coal bed methane development. Therefore, the region is considered to have low gas potential. No coal samples have been tested for methane content in this field.

Raton Mesa Region coals occur in the Cretaceous-Paleocene Raton Formation and the Cretaceous Vermejo Formation. The coals rank high volatile C to low volatile bituminous with beds 1 to 14 feet thick (although the thicker coals are very shale and coal interbedded beyond 7 feet. Measured gas contents from 57 samples range from 0 to 515 cubic feet per ton with an average content of 172 cubic feet per ton. This gas content is well developed coal beds of the Vermejo Formation. The seemingly good potential for methane development indicated by the high gas contents and shallow depths (75 to 4,000 feet) of the coals is tempered somewhat by the thin and lenticular nature of most of the beds. Two methane test wells have not had any production due to low gas contents. Seven other wells are still being tested. The high gas content area on the map contains the thicker coals and is surrounded by a zone where the coals are thinner and less reliable. The boundary between medium and low gas content areas is arbitrarily drawn at the Las Animas-Huerfano County line, coals to the north of this line tend to be of lower rank than coals to the south.

San Juan River Region coals are found in the Upper Cretaceous Dakota Formation, Mesaverde Group, and Fruitland Formation. Dakota and Mesaverde coals are thin, lenticular and reach maximum bed thicknesses of 15 feet, are not considered to have great coal bed methane resources. The thickest and best developed coals (individual beds up to 72 feet thick and net coal thicknesses over 140 feet) occur in the Fruitland Formation in the San Juan Basin area at depths of less than 4,000 feet. Measured gas contents of six Fruitland coal samples are 160 to 479 cubic feet per ton (beds that rank from high-volatile A to low-volatile bituminous. Successful coal bed methane production in the Fruitland Formation in this area is established in the New Mexico part of the basin; one well produces from Colorado. Production tests are being conducted in or testing wells in the Colorado portion of the basin also show promise. On the map, the low gas content area contains Dakota, Mesaverde and Fruitland coals less than 1,000 feet deep (shallow methane gas). In the moderate gas content area, the Fruitland is 1,000 to 2,000 feet deep and is greater than 2,000 feet deep in the high gas content area.

In the **Piceance Basin** of the **Uinta Coal Region**, coal occurs in the upper Cretaceous Mesaverde Group attaining a net coal thickness of over 200 feet. Individual beds reach 52 feet in thickness. Coals rank from subbituminous C in the north to semi-anthracite in the basin interior and anthracite in the southeast (where the coal rank was upgraded by igneous intrusions). Measured gas contents from 108 samples range from 0 to 488 cubic feet per ton. The southern half of the basin, which contains the thickest coal beds and highest gas contents, has been estimated to have over 4,000-9,000 feet, probably has the best potential for the development of coal bed methane. Several wells are currently testing coal bed methane in this part of the basin or are planned in the future; others have produced some gas although not at economic levels. Areas of high-volatile A coals are considered to have moderate gas contents and medium-volatile and higher rank coals to have high gas contents.

In the **Sand Wash Basin** of the **Green River Coal Region**, coal is found in the Cretaceous-Paleocene Fort Union Formation, the Cretaceous Lance Formation and the Cretaceous Iles and Williams Fork Formations of the Mesaverde Group. Fort Union and Lance coals are relatively shallow and low rank and probably do not contain much gas, although there are no gas measurements in these coals. The higher rank (and probably most gassy) coals are found in the Mesaverde Group; net coal thicknesses reach 136 feet and individual beds measure up to 36 feet. Measured gas contents from 28 samples range from 0 to 488 cubic feet per ton. The best coal bed methane potential areas should be found where the Mesaverde has over 2,000 feet of overburden; moderate areas where the Mesaverde has between 1,000 to 2,000 feet of overburden. Significant methane production has not been established in the basin although numerous gas shows in coals have been seen in mud logs of oil and gas tests.

TABLE 1
COLORADO GEOLOGICAL SURVEY DESORPTION DATA

COS No.	Coal Region	Formation Name	Depth to Top of Bed (feet)	Bed Thickness (feet)	Total Gas (cc/g)	Total Gas (cu ft/ton)	Apparent Gas Content (cu ft/ton)	% Methane in Gas	Heating Value (Btu/cu ft)
1	San Juan River	Menefee	210	7.5	.37	.12	Dulls		
2	San Juan River	Menefee	210	7.5	.32	.10	Dulls		
3	Raton Mesa	Vermejo	111	6.0	.07	.30	PulCk		
4	Raton Mesa	Vermejo	135	1.08	.05	.25	PulCk		
5	Green River	Williams Fork	1283	11.5	NC*	NC	PulCk		
6	Green River	Williams Fork	1283	11.5	NC	NC	PulCk		
7	Green River	Williams Fork	488	8.5	.24	.9	PulCk		
8	Green River	Williams Fork	326	8.5	.24	.9	PulCk		
9	Green River	Williams Fork	1123	NC	NC	NC	PulCk		
10	Green River	Williams Fork	1123	NC	NC	NC	PulCk		
11	Uinta	Williams Fork	2216	.75	.50	.13	-		
12	Uinta	Williams Fork	2243	1.92	.47	.12	-		
13	Uinta	Williams Fork	2122	.13	.38	.10	-		
14	Uinta	Williams Fork	2122	.13	.32	.8	-		
15	Uinta	Williams Fork	46.7	1.0	.9	.3	PulCk		
16	Uinta	Williams Fork	502.8	.5	.10	.3	PulCk		
17	Uinta	Williams Fork	1502.8	.5	.19	.6	PulCk		
18	Uinta	Williams Fork	1502.8	.5	.19	.6	PulCk		
19	Uinta	Williams Fork	1502	.5	.17	.5	PulCk		
20	Uinta	Williams Fork	1502	.5	.17	.5	PulCk		
21	Uinta	Mesaverde Gp.	2000	.5	.15	.5	PulCk		
22	Uinta	Mesaverde Gp.*	992.5	14.5	.40	.15	PulCk		
23	Uinta	Mesaverde Gp.*	992.5	14.5	.7	.2	PulCk		
24	Uinta	Mesaverde Gp.	995	2.5	.5	.2	PulCk		
25	Uinta	Mesaverde Gp.	1384.5	3.5		.203	PulCk		
27	Raton Mesa	Raton	810	1.50	5.1	.490	shale	66.78	698
28	Raton Mesa	Raton	826.2	.45	2.8	.12	PulBk		
29	Raton Mesa	Raton	1026.5	2	6.03	.194	PulBk	81.70	925
30	Raton Mesa	Raton	1026.5	2	6.03	.194	PulBk	81.70	925
31	Raton Mesa	Vermejo	1740	2	10.37	.492	shale	86.52	984
32	Raton Mesa	Raton	1740	2	10.37	.492	shale	86.52	984
33	Raton Mesa	Raton	482.2	2.5	4.94	.160	shale		
34	Raton Mesa	Raton	494.2	2	4.94	.160	shale		
35	Raton Mesa	Vermejo	1128.4	1.5	1.25	.71	PulBk	96.58	987
36	Raton Mesa	Vermejo	1128.4	1.5	1.25	.71	PulBk		
37	Raton Mesa	Vermejo	1215.5	.75	.71	.23	shale		
38	Raton Mesa	Vermejo	1215.5	.75	.71	.23	shale		
39	Raton Mesa	Vermejo	1116.8	1.25	.65	.21	PulBk		
40	Raton Mesa	Vermejo	1116.8	1.25	.65	.21	PulBk		
41	Raton Mesa	Vermejo	813	5.5	.19	.6	PulBk		
42	Raton Mesa	Vermejo	813	5.5	.19	.6	PulBk		
43	Raton Mesa	Vermejo	861.5	4.64	.122	.39	PulBk	81.82	822
44	Raton Mesa	Vermejo	869.5	4.64	.122	.39	PulBk	82.07	827
45	Raton Mesa	Vermejo	1384.5	1.5	1.47	.47	PulBk		
46	Raton Mesa	Vermejo	897	1.5	.5	.2	PulBk		
47	Raton Mesa	Vermejo	897	1.5	.5	.2	PulBk		
48	Raton Mesa	Vermejo	963	4.83	1.13	.36	PulBk		
49	Raton Mesa	Vermejo	1005.5	4.83	1.13	.36	PulBk		
50	Raton Mesa	Vermejo	1005.5	.5	.2	.1	PulBk		
51	Raton Mesa	Vermejo	1012.8	.5	.2	.1	PulBk		
52	Raton Mesa	Vermejo	1030	1.2	.44	.14	PulBk		
53	Raton Mesa	Vermejo	1030	1.2	.44	.14	PulBk		
54	Raton Mesa	Vermejo	1030	3.2	2.79	.88	PulBk		
55	Raton Mesa	Vermejo	1030	3.2	2.79	.88	PulBk		
56	Raton Mesa	Raton	896	1.5	.5	.2	PulBk		
57	Raton Mesa	Vermejo	1138.7	5.8	2.05	.65	PulBk		
58	Raton Mesa	Vermejo	1138.7	5.8	2.05	.65	PulBk		
59	Raton Mesa	Vermejo	1013.8	1.5	.5	.2	PulBk		
60	Raton Mesa	Vermejo	1013.8	1.5	.5	.2	PulBk		
61	Uinta	Williams Fork	1	13	0.96	.12	subA-hvCb		
62	Uinta	Williams Fork	148	2.25	1.5	.45	subA-hvCb		
63	Uinta	Williams Fork	143.5	18.5	0.24	.9	subA-hvCb		
64	Uinta	Williams Fork	143.5	18.5	0.24	.9	subA-hvCb		
65	Uinta	Williams Fork	258.8	1.5	0.178	.06	subA-hvCb		
66	Uinta	Mesaverde Gp.	1588	3	0.867	.21	PulBk		
67	Uinta	Mesaverde Gp.	1607	3	0.489	.15	PulBk		
68	Green River	Williams Fork	178.5	20.5	0.11	.4	subA-hvCb		
69	Green River	Williams Fork	178.5	20.5	0.11	.4	subA-hvCb		
70	Green River	Williams Fork	644.0	8.0	0.09	.3	hvCb		
71	Green River	Williams Fork	644.0	8.0	0.09	.3	hvCb		
72	Green River	Williams Fork	196.7	1.0	0.18	.6	hvCb		
73	Uinta	Mesaverde Gp.	799.8	.4	3.58	.115	shale		
74	Uinta	Mesaverde Gp.	799.8	.4	3.58	.115	shale		
75	Uinta	Mesaverde Gp.	995.2	.4	1.46	.129	siltstone		
76	Uinta	Mesaverde Gp.	995.2	.4	1.46	.129	siltstone		
77	Uinta	Mesaverde Gp.	1172.95	3.0	1.46	.44	PulBk		
78	Uinta	Mesaverde Gp.	1172.95	3.0	1.46	.44	PulBk		
79	Uinta	Mesaverde Gp.	836.5	4.7	2.51	.243	PulBk		
80	Uinta	Mesaverde Gp.	836.5	4.7	2.51	.243	PulBk		
81	Uinta	Mesaverde Gp.	1007	3	0.489	.15	PulBk		
82	Green River	Williams Fork	860	5	7.64	.211	-		
83	Green River	Williams Fork	860	5	7.64	.211	-	81.78	805
84	Green River	Williams Fork	3684	3	0.92	.19	shale	53.21	538
85	Green River	Williams Fork	3684	3	1.99	.256	shale		
86	Green River	Williams Fork	3687	3.5	2.65	.124	shale		
87	Green River	Williams Fork	3687	3.5	2.65	.124	shale		
88	Green River	Williams Fork	3898	3	2.72	.87	PulBk		
89	Green River	Williams Fork	4608	15.5	8.41	.268	PulBk		
90	Green River	Williams Fork	4608	15.5	8.41	.268	PulBk		
91	Green River	Williams Fork	4608	15.5	9.26	.296	PulBk		
92	Green River	Williams Fork	4608	15.5	9.26	.296	PulBk		
93	Green River	Williams Fork	4714	10	8.56	.272	PulBk	74.41	769
94	Green River	Williams Fork	4714	10	10.56	.337	PulBk		
95	Uinta	Williams Fork	873	4.8	2.49	.80	PulBk	69.45	741
96	Uinta	Williams Fork	873	4.8	2.49	.80	PulBk		
97	Uinta	Williams Fork	1164	2.5	3.14	.100	PulBk		
98	Uinta	Williams Fork	1164	2.5	3.14	.100	PulBk		
99	Uinta	Williams Fork	349	2.5	3.66	.116	PulBk		
100	Uinta	Williams Fork	349	2.5	3.66	.116	PulBk		
101	Uinta	Williams Fork	1167	14	6.81	.218	PulBk	73.09	739
102	Uinta	Williams Fork	1167	14	5.82	.186	PulBk		
103	Uinta	Williams Fork	1167	7.9	6.79	.217	PulBk		
104	Uinta	Williams Fork	1167	7.9	6.79	.217	PulBk		
105	Uinta	Williams Fork	1182	13	6.77	.215	PulBk		
106	Uinta	Williams Fork	1182	13	6.77	.215	PulBk		
107	Uinta	Williams Fork	1182	6.9	5.70	.182	PulBk		
108	Uinta	Williams Fork	1182	6.9	5.70	.182	PulBk		
109	Uinta	Williams Fork	1516	12	8.56	.272	PulBk		
110	Uinta	Williams Fork	1516	12	8.56	.272	PulBk		
111	Uinta	Williams Fork	1516	12	3.16	.101	PulBk		
112	Uinta	Williams Fork	1516	12	3.16	.101	PulBk		
113	Uinta	Williams Fork	1783	12	5.42	.173	PulBk		
114	Uinta	Williams Fork	1783	12	5.42	.173	PulBk		
115	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
116	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
117	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
118	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
119	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
120	Uinta	Williams Fork	1854	16.85	5.53	.177	PulBk		
121	Denver	Denver	119	27	0.13	.4	subC		
122	Denver	Denver	119	27	0.33	.11	subC		
123	Uinta	Mesaverde Gp.	1304.68	1.17	2.04	.65	hvCb		
124	Uinta	Mesaverde Gp.	1304.68	1.17	2.04	.65	hvCb		
125	Uinta	Mesaverde Gp.	1330.6	8.21	2.06	.56	hvCb	(47.83)*	
126	Uinta	Mesaverde Gp.	1330.6	8.21	2.06	.56	hvCb	(39.11)	
127	Uinta	Mesaverde Gp.	1330.6	8.21	2.06	.56	hvCb		
128	Uinta	Mesaverde Gp.	1330.6	8.21	2.06	.56	hvCb	(49.51)	
129	Uinta	Mesaverde Gp.	741.75	4.43	2.05	.64	hvCb		
130	Uinta	Mesaverde Gp.	741.75	4.43	2.05	.64	hvCb		
131	Uinta	Mesaverde Gp.	798.73	6.92	2.05	.60	hvCb		
132	Uinta	Mesaverde Gp.	798.73	6.92	2.05	.60	hvCb		
133	Uinta	Mesaverde Gp.	1149.65	2.75	2.79	.89	hvCb	(57.66) 58.6	910
134	Uinta	Mesaverde Gp.	1149.65	2.75	2.79	.89	hvCb	(46.15) 46.2	926
135	Uinta	Mesaverde Gp.	1149.65	2.75	2.79	.89	hvCb	(48.27) 48.3	928
136	Uinta	Mesaverde Gp.	804.6	4.5	2.79	.89	hvCb	(48.27) 48.3	928
137	Raton Mesa	Vermejo	1192.1	2.6	19.06	.64	-		
138	Raton Mesa	Raton	1250	.51	1.8	.6	hvAb	(70.73) 65.7	940
139	Raton Mesa	Raton	223.8	2.8	1.58	.51	hvAb		
140	Uinta	Raton	847	2.5	2.89	.90	hvAb	(53.34)	
141	Uinta	Mesaverde	1598	18	13.93	.436	hvAb		
142	Uinta	Mesaverde	1148.9	2.67	3.16	.95	hvCb	(80.99) 80.1	942
143	Uinta	Mesaverde	1148.9	2.67	3.16	.95	hvCb	(79.83) 79.3 85.5	952, 960
144	Uinta	Mesaverde	1207	9	0.76	.24	hvBb		
145	Uinta	Mesaverde	1207	9	0.76	.24	hvBb		
146	Uinta	Mesaverde	1207	9	0.94	.30	hvBb		
147	Uinta	Mesaverde	1207	9	0.94	.30	hvBb		
148	Uinta	Mesaverde	876.75	2	2.05	.61	sandstone		
149	Uinta	Mesaverde	876.75	2	1.27	.54	shale		
150	Uinta	Mesaverde	892.2	4.5	0.07	.3	siltstone		
151	Uinta	Mesaverde	892.2	4.5	0.07	.3	siltstone		
152	Uinta	Mesaverde	898.45	8.5	0.52	.1	hvCb		
153	Uinta	Mesaverde	898.45	8.5	0.52	.1	hvCb		
154	Uinta	Mesaverde	912.8	.96	0.51	.2	subC		
155	Uinta	Mesaverde	912.8	.96	0.51	.2	subC		
156	Uinta	Mesaverde	1179.5	2.5	0.03	.2	subC		
157	Uinta	Mesaverde	1179.5	2.5	0.03	.2	subC		
158	Uinta	Mesaverde	362.1	3.75	0.59	.3	subC		
159	Uinta	Mesaverde	362.1	3.75	0.59	.3	subC		
160	Uinta	Mesaverde	434.5	2.5	0.07	.2	subC		
161	Uinta	Mesaverde	434.5	2.5	0.07	.2	subC		
162	Garden City	Trout Creek	196	3.5	0.51	.2	hvCb		
163	Raton Mesa	Vermejo	960	12	1.8	.47	hvCb		
164	Raton Mesa	Vermejo	1	2	1.27	.40	NC		
165	Raton Mesa	Vermejo	1	2.75	1.27	.40	NC		
166	Raton Mesa	Vermejo	1148	4	11.48	.367	hvAb	17.55	118
167	Raton Mesa	Vermejo	1190	.75	8.46	.271	roof+shale	51.20	563
168	Raton Mesa	Vermejo	1190	2	8.46	.271	roof+shale	93.98	953
169	Raton Mesa	Vermejo	1205	2.5	1.18	.38	shale	92.04	934
170	Raton Mesa	Vermejo	1205	2.5	1.18	.38	shale	92.04	934
171	Raton Mesa	Vermejo	1218	1	.19	.25	sd,sh,coal		
172	Raton Mesa	Vermejo	1218	1	.19	.25	sd,sh,coal		
173	Raton Mesa	Vermejo	1234	.5	0.02	.2	sd shale		
174	Raton Mesa	Vermejo	1234	.5	0.02	.2	sd shale		
175	Raton Mesa	Vermejo	1092.8	2	3.89	.318	shale	92.82	935
176	Raton Mesa	Vermejo	1092.8	2	3.89	.318	shale		
177	Raton Mesa	Vermejo	1198	1.5	12.17	.345	carb. shale	93.68	948
178	Raton Mesa	Vermejo	1198	1	16.93	.414	sh	95.06	962
179	Raton Mesa	Vermejo	1198	1	16.93	.414	sh	95.06	962
180	Raton Mesa	Vermejo	1198	1	12.87	.351	shale		
181	Raton Mesa	Vermejo	1198	1	12.87	.351	shale	97.82	991
182	Uinta	Green River	795.7	1	.17	.5	oil shale		
183	Uinta	Green River	1189.7	1	.21	.6	oil shale		
184	Uinta	Williams Fork	1945	1	4.26	.137	carb. shale		
185	Uinta	Williams Fork	1945	1	4.26	.137	carb. shale	26.8	347
186	Uinta	Mesaverde	250	2.5	.08	.3	hvBb		
187	Uinta	Mesaverde	250	2.5	.08	.3	hvBb		
188	Uinta	Mesaverde	250	4.5	.08	.3	hvBb		
189	Uinta	Mesaverde	250	4.5	.08	.3	hvBb		
190	Uinta	Mesaverde	303.9	4.8	.02	.1	hvBb		
191	Uinta	Mesaverde	303.9	4.8	.02	.1	hvBb		
192	Uinta	Mesaverde	1346.7	1	.41	.12	sh shale		
193	Uinta	Mesaverde	1346.7	1	.41	.12	sh shale		
194	Denver	Laramie	81.4	2.5	.01	NC			
195	Denver	Laramie	81.4	2.5	.01	NC			
196	Denver	Laramie	81.4	9.75	.02	NC			
197	Denver	Laramie	81.4	9.75	.02	NC			
198	Green River	Green River	1278.2	5	.1	.4	oil shale		
200	Uinta	Green River	1485.5	7	.17	.5	oil shale		
201	Uinta	Green River	1485.5	7	.17	.5	oil shale		
202	Uinta	Mesaverde	6525	3.75	1.14	.31	carb. shale	79.94	
203	Uinta	Mesaverde	6525	3.75	0.58	.18.1	sub		
204	San Juan River	Fruitland	2789	1	11.48	.367	sub	93.85	961
205	San Juan River	Fruitland	2868	.75	4.39	.180	carb. shale	92.15	938
206	San Juan River	Fruitland	2868	.75	4.39	.180	sh	92.15	938
207	San Juan River	Fruitland	2837	10	10.80	.346	sub	93.81	961
208	San Juan River	Fruitland	2837	10	9.87	.316	sub	92.74	944
209	San Juan River	Fruitland	2837	10	10.80	.346	sub	94.24	968

*Parts indicate gas analyses not run.
NC=not calculated.
Desorption begun after long exposure; gas contents probably higher.
High-ash.
*Heating value not measured if methane percentage in parentheses.

TABLE 2
METHANE TEST WELLS

Well Number	Well Name	Location	Total Depth (feet)	Coal Completion Date (mo. yr.)	Objective	Coal Bed Methane Status
1	Colorado Interstate Gas Co. CTM-29-1	Sec. 29, T.9S, R.91W	1613	July 1979	Mesaverde	Water well
2	Colorado Interstate Gas Co. CTM-29-2	Sec. 29, T.9S, R.91W	1661	July 1979	Mesaverde	Water well
3	Exxon Corp. Vega Unit 2	Sec. 24, T.9S, R.93W	9894	9-15-78	Mesaverde	Producing
4	Tech Across Inc. CBR 1-3	Sec. 13, T.4S, R.101W	2855	12-7-78	Mesaverde	Dry
5	Cowles Energy Inc. Federal 1-15	Sec. 15, T.4S, R.103W	5354	June 1979	Mesaverde	Suspended
6	Energy Reserves Vardaman #1	Sec. 29, T.7N, R90W	5010	12-31-79	Mesaverde	Plugged
7	Amdahl-Cavin Nichols 1-24	Sec. 24, T.11S, R67W	3198	June 1980	Mesaverde	No production
8	City of Trinidad Trinidad #3	Sec. 32, T.33S, R60W	1444	11-6-80	Vermejo	Testing
9	City of Trinidad Trinidad #2	Sec. 32, T.33S, R60W	1465	11-6-80	Vermejo	Testing
10	City of Trinidad Trinidad #1	Sec. 32, T.33S, R60W	1455	11-7-80	Vermejo	Testing
11	Exxon Corp. Vega Unit 6	Sec. 19, T.9S, R.92W	8999	8-21-81	Mesaverde	Shut-in
12	Rio Colorado Oil Sw Inc. Carlisle Valley #1	Sec. 19, T.9S, R.92W	4851	1979	Mesaverde	Shut-in
13	Snyder Oil Co. Snyder Burton Parker 1-16	Sec. 16, T.6S, R90W	7800	9-27-82	Mesaverde	Shut-in
14	Wood, McShane & Thams State 16-32-K1	Sec. 16, T.32S, R67W	2172	8-4-82	Vermejo	Testing
15	Wood, McShane & Thams State 36-32-F1	Sec. 36, T.32S, R67W	2139	9-16-82	Vermejo	Testing
16	Wood, McShane & Thams State 16-32-M1	Sec. 16, T.32S, R66W	2025	9-23-82	Vermejo	Testing
17	Wood, McShane & Thams State 36-32-M1	Sec. 36, T.32S, R66W	1720	9-30-82	Vermejo	Testing
18	Southern Ute Indian Tribe Oxford #1	Sec. 25, T.6S, R90W	2853	1982	Fruitland	Shut-in
19	Southern Ute Indian Tribe Oxford #2	Sec. 25, T.6S, R90W	2888	1982	Fruitland	Shut-in
20	Tiffany Gas Co. Stoco #1	Sec. 3, T.32N, R5W	2138	1982	Fruitland	Shut-in
21	Tiffany Gas Co. Ross #1	Sec. 15, T.32N, R5W	2175	1983	Fruitland	Testing
22	Perlman Mabie Pauline 1-15	Sec. 15, T.34N, R6W	1800	9-3-82	Fruitland	Producing
23	Amoco Hodcities Ranch #2	Sec. 20, T.12S, R93W	2205	1	Mesaverde	Tight hole
24	Amoco Boone Unit #1	Sec. 13, T.12S, R91W	3361	?	Mesaverde	Tight hole
25	Amoco Somerset Unit #1	Sec. 3, T.12S, R90W	4425	?	Mesaverde	Tight hole
26	Amoco W.Co. Jolley 1-8	Sec. 8, T.7S, R97W	8112	?	Mesaverde	Shut-in
27	Perlman Clara Olivarous 1-4	Sec. 4, T.10N, R71W	8610	?	Mesaverde	Shut-in
28	Perlman Quatro 5-1	Sec. 5, T.34N, R6W	2016	8-8-83	Fruitland	Shut-in
29	Perlman Southern Ute 1-27	Sec. 27, T.34N, R7W	7924	1-24-83	Fruitland	Shut-in
30	Perlman Southern Ute 1-32	Sec. 32, T.34N, R7W	7930	11-8-82	Fruitland	Shut-in
31	Perlman Southern Ute 1-33	Sec. 33, T.34N, R7W	7970