THE GEOLOGICAL SURVEY OF WYOMING

Gary B. Glass, State Geologist

REPORT OF INVESTIGATIONS NO. 24

GEOPHYSICAL LOGS, LITHOLOGIC DESCRIPTIONS, AND COAL ANALYSES FROM COAL TEST HOLES DRILLED IN 1982 IN THE SALT WELLS AND KEMMERER AREAS, SWEETWATER AND UINTA COUNTIES, WYOMING

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INTRODUCTION

Forty-one coal test holes were drilled in the Salt Wells area, Sweetwater County, Wyoming from May 10 to June 6, 1982, and ten coal test holes were drilled in the Kemmerer area, Uinta County, Wyoming from August 4 to August 16, 1982. Both areas are located in southwestern Wyoming; the Salt Wells area is located in the Rock Springs Coal Field about 20 miles southeast of the town of Rock Springs on the southeastern flank of the Rock Springs uplift, and the Kemmerer area is located about 13 miles northeast of the town of Evanston in the southern part of the Kemmerer coal field (Figure 1). The drilling was done by Gordon Drilling, Inc. of Roundup, Montana under contract with the University of Wyoming. Funding for the project was provided by the Laramie Energy Technology Center, U.S. Department of Energy, through a transfer of funds from the Geological Survey, U.S. Department of Interior. This project supports the Department of Interior's federal coal leasing program by providing information on coal quality and thickness, and supports the Department of Energy's (Laramie Energy Technology Center) search for commercially suitable underground coal gasification sites.

Preliminary results of the drilling, coring, geophysical logging, and the analytical laboratory work on coal samples from the cores are presented. The drill hole and core hole locations for the project were chosen by the University of Wyoming's Department of Geology and Geophysics and Department of Civil Engineering, in consultation with the Conservation Division, U.S. Geological Survey. The approximate locations of the drill holes and core holes in the Salt Wells and Kemmerer areas are shown in Figures 2 and 3. The specific location of each drill hole and core hole is given in the log heading on the geophysical and lithologic logs. All drill hole locations are described by legal locations (section, township, range) and by distances, in feet, from section lines. Many of the drill holes in the Salt Wells area have also been described by the State Plane Coordinate System as determined by detailed surveys courteously supplied by Rocky Mountain Energy Company. Ground elevations of the holes drilled in the Salt Wells area were surveyed by Rocky Mountain Energy Company and are accurate to within ±0.1 feet. Elevations of the other drill holes were approximated in the field using U.S. Geological Survey topographic quadrangle maps and are accurate to within ±5 feet of elevation.

DRILLING, LOGGING, AND CORING PROCEDURES

Conventional rotary drilling equipment was used for all drilling and coring operations. For the first 200 to 300 feet of each hole, air was the primary drilling medium. Below this depth, circulating water, augmented with detergent (foam) where necessary, was used. Depending on the hardness of the rocks encountered, either a blade drilling bit (5-1/8 inch Kenclaw) or a tricone rock bit (4-3/4 inch Walker-McDonald or Varrell) was selected. A total of 32 drill holes were drilled in this manner. Immediately after drilling was completed, the drill hole was logged by Reich Geo-Physical, Inc. of Billings, Montana, using a Comprobe #2 geophysical probe. Natural gamma-ray, resistivity, high-resolution gamma-gamma density, and caliper logs were simultaneously recorded in a single run per hole. Dry hole resistivity logs were recorded in the upper parts of drill holes above the fluid level. The original copies of the geophysical logs were photographically reduced to a scale of 1 inch equals 50 feet for convenience in reproducing this report.

Lithologies of drill cuttings from the 32 drill holes that were not cored were

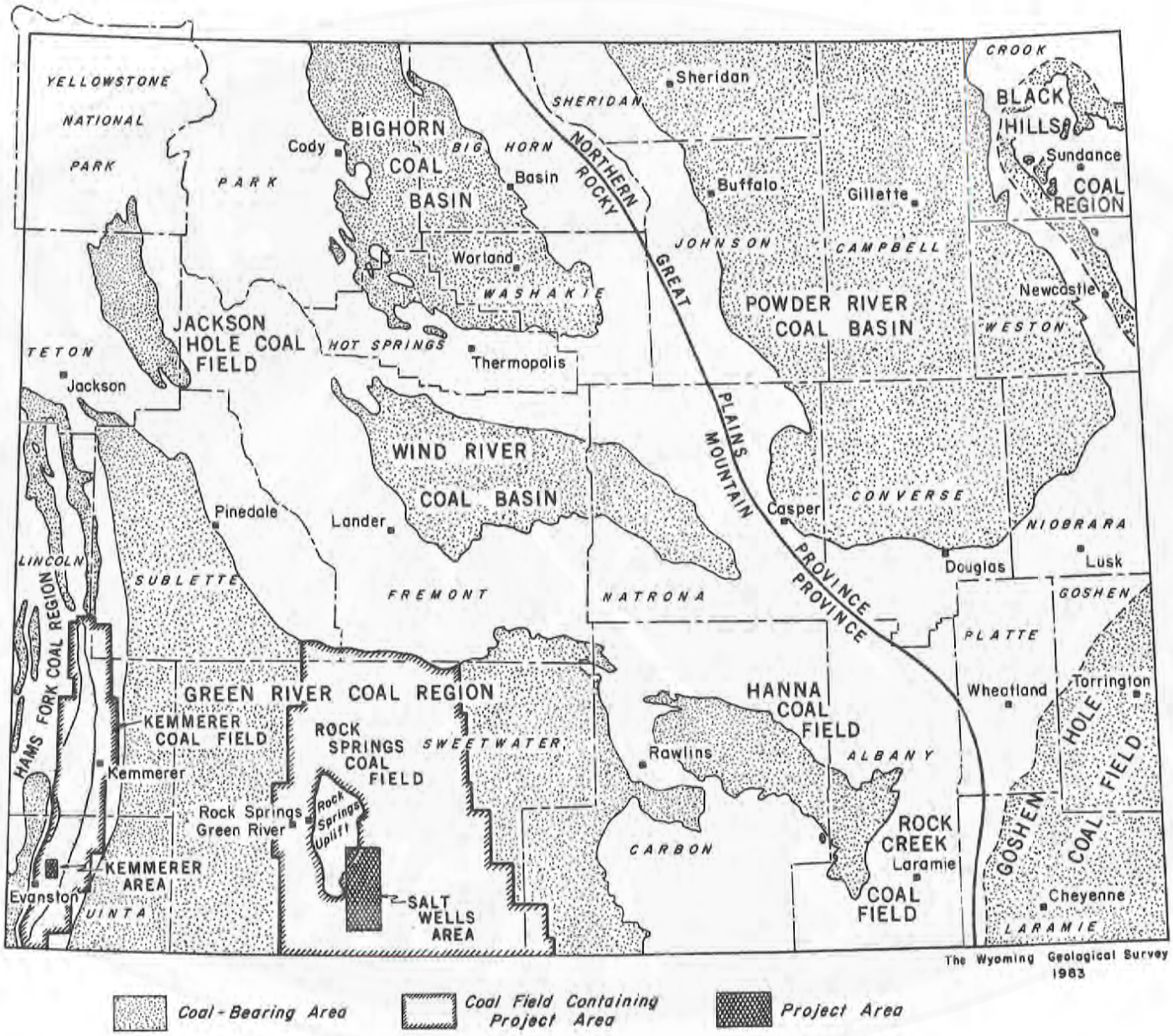


Figure 1. Index map of Wyoming coal-bearing areas showing location of the Salt Wells and Kemmerer project areas.

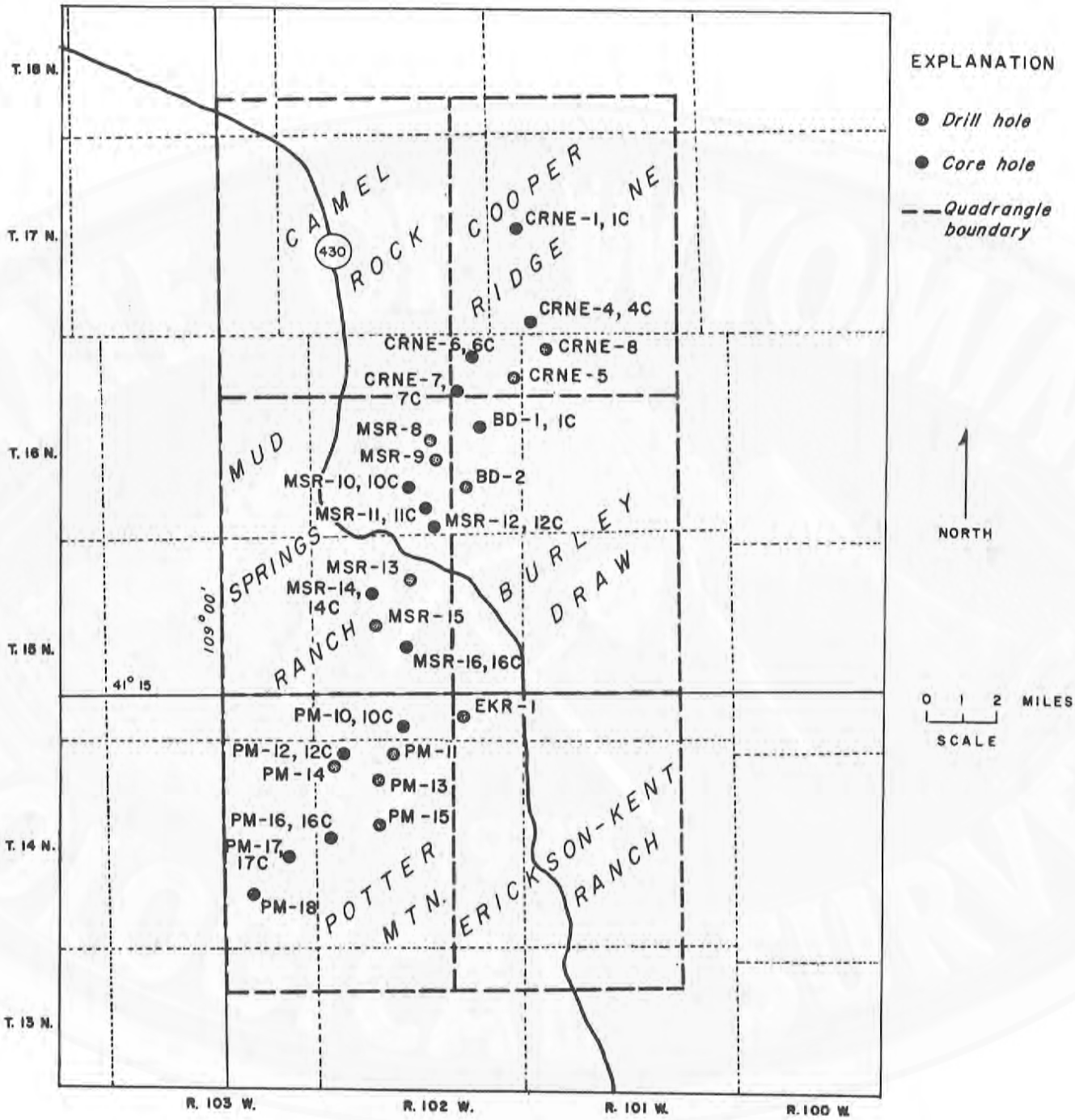


Figure 2. Location map of the Salt Wells area drill holes and core holes, and of U.S.G.S. 7.5 minute quadrangles.

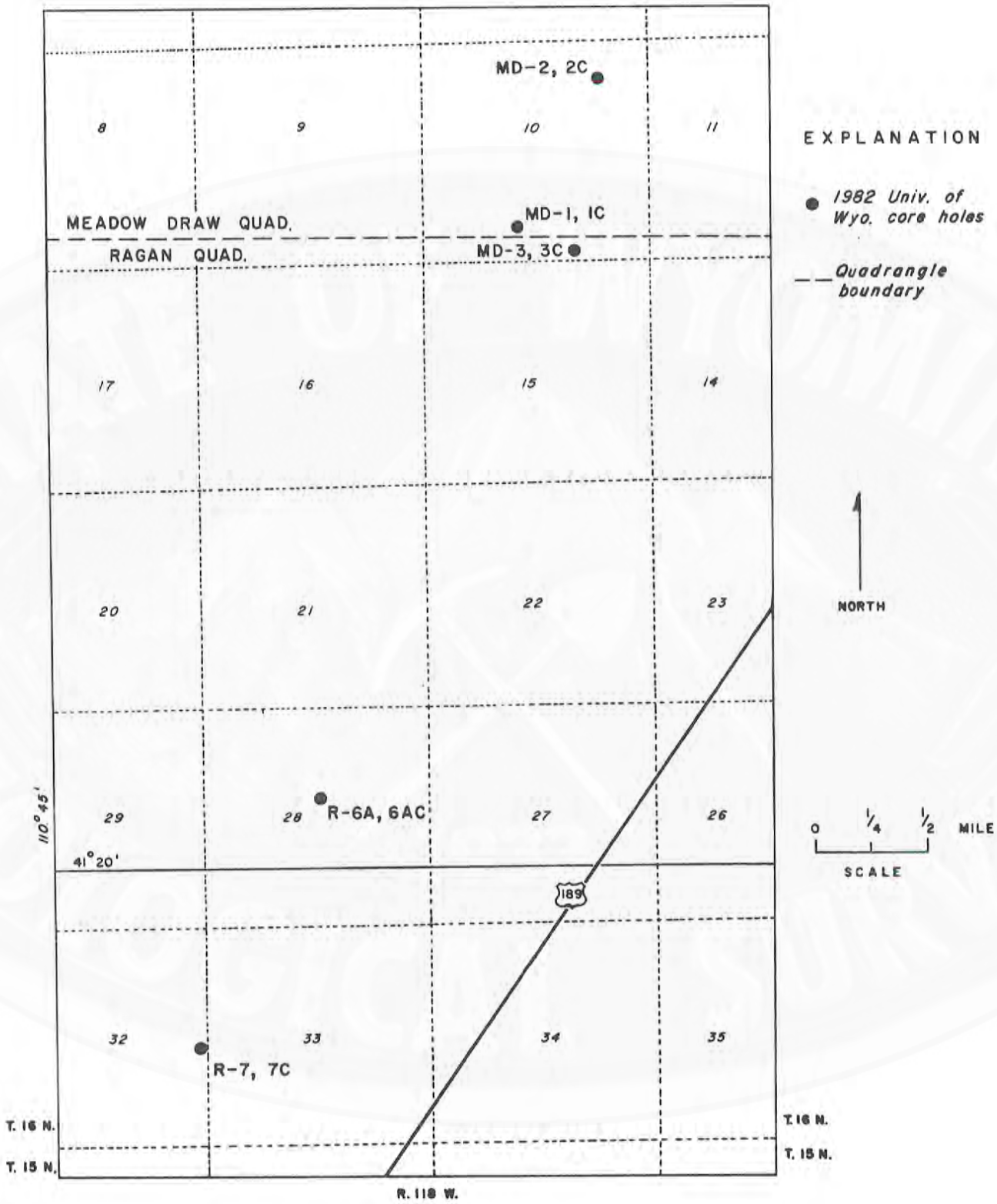


Figure 3. Location map of Kemmerer area core holes.

sampled on 5-foot intervals and described by a geologist in the field. Later, the lithologic descriptions were adjusted to match the general rock types as interpreted from the geophysical logs. Because this report is preliminary and will be followed by detailed descriptions of cuttings and core samples, the lithologic descriptions presented in this report have been generalized.

A total of 19 core holes were drilled on this project. Each core hole was located adjacent to a previously drilled and logged rotary drill hole. Using the geophysical log of this adjacent rotary drill hole, coring intervals were selected to include, where possible, the five feet of rock above and below the coal bed. After a 4-3/4-inch hole was drilled with a blade-type drill bit to the top of the first core interval in a drill hole, a core was drilled using a 2-7/8-inch diamond or carbide core bit with a 3-½-inch outside diameter outer barrel either 10 to 15 feet in length, depending on the thickness of the core interval. Once this uppermost interval was cored, the hole was reamed with the 4-3/4-inch blade bit and drilling proceeded to the next core interval. As core was removed from the core barrel at the surface, the total thickness of the recovered core was measured, broken into 2-foot sections, wrapped in cylindrical plastic bags (tubing), and placed into core boxes. After coring of a drill hole was completed, geophysical logs were run in the core hole in the same manner as described above. No lithologic descriptions of the drill cuttings or recovered core from the core holes were made in the field. As a result, only the location of the core intervals within the drill holes and the geophysical logs of the core holes are presented in this report.

CORE SAMPLING AND CHEMICAL ANALYSIS

The coal recovered from the cores was sampled for analysis in two different ways: in increments of one or two feet and as a composite made by physical combination of more than one incremental sample. The composited samples had the following analyses performed on them: proximate and ultimate analyses, heat value, and forms of sulfur (Table 1); fusibility of ash, free-swelling index (FSI), moist, mineral-matter-free heat value and apparent rank were calculated (Table 2); and major and minor oxides and selected trace elements in ash (Table 3). One hundred forty-three of the incremental samples were analyzed for their proximate and ultimate composition and their heat value (Appendix A). Several incremental samples were also selected for determination of equilibrium moisture, Hardgrove Grindability Index, and percent Na_2O in ash (Appendix A). Table 4 summarizes the Hardgrove Grindability Indices determined for these increments. Because these Grindability Indices were determined for selected increments rather than entire coal beds, they should be used cautiously.

The footages for each increment submitted for analysis were adjusted in this report to correspond with the coal intervals determined from the geophysical logs. Similarly, it was necessary to adjust the thickness of each increment to account for coring losses and the inclusion of noncoaly rock. In most cases, the presence of noncoaly rock in a sampled interval was evidenced by its high ash content, its low heating value, and its character on the geophysical logs. Analyzed increments that contained noncoaly rock have been noted by footnotes in Appendix A.

It should be noted that all the sampled increments were not analyzed at the same time (noted by asterisks in Appendix A). One group of increments was analyzed in July; another group of increments was analyzed in September; and the remaining increments and composited samples were analyzed in November and December. Although all coal was continuously sealed in plastic tubing, there may have been some moisture loss in the increments not analyzed until November and December. As a check on moisture loss, the average as-received moisture contents for increments analyzed in July and September were compared to moisture contents of increments analyzed at the end of the year. Preliminary evaluation of the average moisture contents suggests that moisture loss in the samples between July and November was relatively minor, the difference being only 0.4 percent for coal samples from the Almond Formation. Not enough data were available to compare moisture contents in the Fort Union Formation coals. Average moisture content of the Adaville Formation coals differed by 1.6 percent from September to November.

Users of the analytical data in this report should note that the composited coal bed analyses presented in Tables 1, 2, 3 are more indicative of the coals in these two test areas than the analyses of individaul increments. The analyses of individaul increments, however, provide insight into vertical variations in coal quality that might be expected in coals of the two areas. These vertical variations will prove useful in an economic evalution of the coals since this type of data indicates the feasibility of selective mining to remove high ash or high sulfur portions of individual coal beds.

In conclusion, it is stressed that there are not enough analyses in this report to fully characterize any individual coal beds, let alone the coal-bearing formations in the two areas. Although such characterization must await additional drilling and analyses, the data in this report do provide insight into the general thickness and quality of the coals in the two areas.

TABLE 1. PROXIMATE AND ULTIMATE ANALYSES, HEAT VALUES, AND FORMS OF SULFUR OF COAL BEDS FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFUR FORMS (PERCENT) SULFATE	PYRITIC	ORGANIC	HEATING VALUE (BTU/POUND)	BASIS[3]
SALT WELLS AREA														
Core Hole BD-1C (Paleocene Fort Union Formation)														
225.0-233.5(C)[4]	13.3	31.1	45.8	9.8	5.35	59.29	0.81	23.93	0.78	0.02	0.22	0.54	10,130	A
8.5	----	35.8	52.9	11.3	4.46	68.38	0.94	13.98	0.89	0.02	0.25	0.62	11,690	B
8.5	----	40.4	59.6	----	5.03	77.14	1.06	15.76	1.01	0.02	0.28	0.71	13,180	C
Core Hole CRNE-1C (Upper Cretaceous Almond Formation)														
157.6-161.6(C)	12.9	20.8	33.5	32.8	4.11	41.72	0.60	20.27	0.51	0.02	0.12	0.37	7,000	A
4.0[5]	----	23.9	38.5	37.6	3.07	47.88	0.69	10.14	0.59	0.02	0.14	0.43	8,030	B
3.5	----	38.2	61.8	----	4.92	76.76	1.11	16.27	0.94	0.04	0.23	0.67	12,880	C
Core Hole CRNE-4C (Paleocene Fort Union Formation)														
232.0-242.0(C)	15.9	31.2	44.7	8.2	5.97	58.93	0.83	25.36	0.73	0.02	0.18	0.53	10,120	A
10.0	----	37.2	53.1	9.7	4.98	70.10	0.98	13.33	0.88	0.02	0.21	0.65	12,040	B
10.0	----	41.2	58.8	----	5.51	77.66	1.09	14.77	0.97	0.02	0.23	0.72	13,330	C
Core Hole CRNE-7C (Upper Cretaceous Almond Formation)														
311.5-321.0(C)	15.1	31.0	48.4	5.5	5.44	61.28	0.75	26.42	0.56	0.02	0.11	0.43	10,520	A
9.5	----	36.5	57.0	6.5	4.41	72.21	0.89	15.29	0.66	0.02	0.13	0.51	12,390	B
9.5	----	39.1	60.9	----	4.72	77.26	0.95	16.36	0.71	0.02	0.14	0.55	13,260	C
Core Hole MSR-10C (Upper Cretaceous Almond Formation)														
168.5-172.0(C)	13.0	31.9	50.2	4.9	5.64	64.00	0.88	23.63	0.91	0.03	0.20	0.68	11,140	A
3.5	----	36.7	57.6	5.7	4.81	73.58	1.01	13.88	1.04	0.03	0.23	0.78	12,810	B
3.5	----	38.9	61.1	----	5.10	78.01	1.07	14.71	1.11	0.03	0.24	0.84	13,580	C
Core Hole MSR-11C (Upper Cretaceous Almond Formation)														
62.0- 66.5(C)	14.1	32.5	43.6	9.8	5.57	59.47	0.69	21.64	2.82	0.12	1.01	1.69	10,270	A
4.5	----	37.8	50.8	11.4	4.65	69.22	0.80	10.62	3.29	0.14	1.18	1.97	11,950	B
4.5	----	42.6	57.4	----	5.25	78.15	0.91	11.98	3.71	0.16	1.33	2.22	13,490	C
Core Hole MSR-12C (Paleocene Fort Union Formation)														
226.0-232.0(C)	14.6	30.5	46.9	8.0	5.82	60.97	0.78	23.73	0.75	0.01	0.22	0.52	10,430	A
6.0	----	35.8	54.9	9.3	4.91	71.37	0.92	12.62	0.87	0.01	0.26	0.60	12,210	B
6.0	----	39.4	60.6	----	5.41	78.69	1.01	13.93	0.96	0.01	0.29	0.66	13,460	C
Core Hole MSR-14C (Upper Cretaceous Almond Formation)														
213.0-217.8(C)	10.5	28.5	42.0	19.0	5.30	55.77	0.69	18.16	1.10	0.02	0.34	0.74	9,610	A
4.8[6]	----	31.8	47.0	21.2	4.61	62.31	0.78	9.87	1.23	0.02	0.38	0.83	10,730	B
3.5	----	40.4	59.6	----	5.85	79.08	0.99	12.51	1.57	0.03	0.49	1.05	13,620	C
362.0-367.0(C)	10.9	31.4	51.3	6.4	5.66	64.67	0.90	21.60	0.75	0.02	0.16	0.57	11,380	A
5.0	----	35.3	57.5	7.2	4.98	72.62	1.01	13.34	0.84	0.02	0.18	0.64	12,770	B
5.0	----	38.0	62.0	----	5.37	78.27	1.09	14.36	0.91	0.02	0.20	0.69	13,770	C
422.2-424.0	11.7	33.1	45.2	10.0	5.37	62.36	1.15	19.11	2.06	----	----	----	10,880	A
1.8	----	37.5	51.2	11.3	4.59	70.64	1.30	9.86	2.33	----	----	----	12,320	B
1.8	----	42.2	57.8	----	5.18	79.62	1.47	11.11	2.62	----	----	----	13,890	C
428.7-432.5(WA)[7]	11.9	30.5	46.4	11.2	5.74	60.78	1.20	20.41	0.69	----	----	----	10,570	A
3.8	----	34.7	52.8	12.5	5.02	69.17	1.36	11.16	0.78	----	----	----	12,030	B
4.0	----	39.8	60.2	----	5.75	78.94	1.56	12.85	0.90	----	----	----	13,750	C
Core Hole MSR-16C (Paleocene Fort Union Formation)														
209.0-214.0(C)	10.9	30.8	47.7	10.6	5.42	62.17	1.01	19.76	1.07	0.02	0.25	0.80	10,860	A
5.0	----	34.6	53.5	11.9	4.71	69.79	1.13	11.31	1.20	0.02	0.28	0.90	12,190	B
5.0	----	39.3	60.7	----	5.34	79.18	1.28	12.84	1.36	0.02	0.32	1.02	13,830	C

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFUR FORMS (PERCENT) SULFATE	PYRITIC	ORGANIC	HEATING VALUE (BTU/POUND)	BASIS[3]
Table 1 continued														
SALT WELLS AREA continued														
					Core Hole MSR-16C continued									
248.6-251.0(WA)	12.1	28.0	47.8	12.1	5.28	60.33	0.96	20.60	0.70	----	----	----	10,340	A
2.4	----	31.8	54.4	13.8	4.47	68.67	1.09	11.22	0.79	----	----	----	11,760	B
2.5	----	37.0	63.0	----	5.20	79.53	1.27	13.08	0.92	----	----	----	13,630	C
284.5-286.8	11.2	33.2	46.1	9.5	6.47	63.58	1.15	18.46	0.82	----	----	----	11,020	A
2.3	----	37.3	52.0	10.7	5.88	71.58	1.30	9.61	0.92	----	----	----	12,410	B
2.5	----	41.8	58.2	----	6.58	80.17	1.45	10.77	1.03	----	----	----	13,900	C
					Core Hole PM-10C (Upper Cretaceous Almond Formation)									
219.5-229.0(C)	10.2	31.7	53.2	4.9	5.41	68.17	0.74	20.18	0.63	0.01	0.15	0.47	11,870	A
9.5	----	35.3	59.3	5.4	4.75	75.88	0.82	12.43	0.70	0.01	0.17	0.52	13,220	B
9.5	----	37.3	62.7	----	5.03	80.22	0.87	13.14	0.74	0.01	0.18	0.55	13,970	C
266.1-275.0(WA)	10.2	30.7	48.0	11.1	5.85	63.57	1.13	17.85	0.53	----	----	----	11,060	A
9.5	----	34.2	53.6	12.3	5.24	70.89	1.26	9.74	0.59	----	----	----	12,330	B
9.5	----	39.1	61.0	----	6.00	80.78	1.44	11.10	0.65	----	----	----	14,050	C
265.5-275.0(C)	9.6	30.5	48.8	11.1	5.71	63.57	0.88	18.19	0.51	0.01	0.06	0.44	11,120	A
9.5	----	33.7	54.0	12.3	5.13	70.32	0.97	10.70	0.56	0.01	0.06	0.49	12,300	B
9.5	----	38.4	61.6	----	5.85	80.20	1.11	12.20	0.64	0.01	0.07	0.56	14,030	C
					Core Hole PM-12C (Upper Cretaceous Almond Formation)									
311.0-319.0(C)	11.8	30.7	53.2	4.3	5.66	67.68	1.07	20.75	0.52	0.01	0.08	0.43	11,760	A
8.0	----	34.8	60.3	4.9	4.91	76.77	1.22	11.61	0.59	0.01	0.09	0.49	13,340	B
8.0	----	36.6	63.4	----	5.17	80.72	1.28	12.21	0.62	0.01	0.09	0.52	14,030	C
358.0-364.0(C)	10.0	31.0	53.6	5.4	5.42	68.22	0.95	19.60	0.44	<0.01	0.04	0.40	11,940	A
6.0	----	34.5	59.5	6.0	4.78	75.84	1.05	11.87	0.49	<0.01	0.04	0.45	13,270	B
6.0	----	36.7	63.3	----	5.08	80.65	1.12	12.62	0.53	<0.01	0.05	0.48	14,110	C
					Core Hole PM-16C (Upper Cretaceous Almond Formation)									
141.0-145.5(C)	10.7	30.7	47.6	11.0	5.60	62.63	0.89	19.16	0.73	0.02	0.11	0.60	11,010	A
4.5	----	34.4	53.3	12.3	4.93	70.12	0.99	10.84	0.82	0.02	0.12	0.68	12,330	B
4.5	----	39.2	60.8	----	5.62	79.95	1.13	12.37	0.93	0.02	0.13	0.78	14,060	C
190.0-195.0(C)	12.1	31.0	52.1	4.8	5.51	67.06	0.78	20.44	1.37	0.03	0.27	1.07	11,620	A
5.0	----	35.3	59.2	5.5	4.73	76.28	0.89	11.04	1.56	0.03	0.31	1.22	13,210	B
5.0	----	37.3	62.7	----	5.01	80.72	0.94	11.68	1.65	0.03	0.33	1.29	13,980	C
265.5-267.5	13.3	33.2	51.2	2.3	6.48	67.55	1.30	21.46	0.89	----	----	----	11,830	A
2.0	----	38.3	59.0	2.7	5.76	77.93	1.50	11.11	1.03	----	----	----	13,650	B
2.0	----	39.4	60.0	----	5.92	80.07	1.54	11.41	1.06	----	----	----	14,020	C
316.0-321.5(C)	12.0	31.2	52.7	4.1	5.74	67.74	1.04	20.89	0.48	0.01	0.04	0.43	11,860	A
5.5	----	35.5	59.8	4.7	5.00	76.96	1.18	11.66	0.54	0.01	0.04	0.49	13,470	B
5.5	----	37.2	62.8	----	5.24	80.72	1.23	12.24	0.57	0.01	0.04	0.52	14,130	C
441.0-449.0(C)	11.4	31.0	49.6	8.0	5.77	64.75	0.96	19.97	0.51	<0.01	0.06	0.45	11,380	A
8.0	----	35.0	55.9	9.1	5.07	73.07	1.08	11.12	0.58	<0.01	0.07	0.51	12,840	B
8.0	----	38.5	61.5	----	5.58	80.37	1.19	12.22	0.64	<0.01	0.08	0.56	14,130	C
					Core Hole PM-17C (Upper Cretaceous Almond Formation)									
212.0-218.0(C)	12.1	31.0	52.0	4.9	5.64	67.04	1.03	20.85	0.56	0.01	0.08	0.47	11,630	A
6.0	----	35.2	59.3	5.5	4.88	76.23	1.17	11.54	0.63	0.01	0.09	0.53	13,220	B
6.0	----	37.3	62.7	----	5.17	80.71	1.24	12.21	0.67	0.01	0.09	0.57	14,000	C

Table 1 continued

SALT WELLS AREA continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	SULFUR FORMS (PERCENT) SULFATE	PYRITIC	ORGANIC	HEATING VALUE (BTU/POUND)	BASIS[3]
Core Hole PM-17C continued														
343.0-348.0(C)	12.4	30.8	52.3	4.5	5.66	67.17	1.10	21.05	0.51	0.03	0.09	0.39	11,670	A
5.0	----	35.2	59.6	5.2	4.87	76.72	1.26	11.42	0.58	0.03	0.11	0.44	13,330	B
5.0	----	37.1	62.9	----	5.13	80.88	1.32	12.06	0.61	0.03	0.11	0.47	14,060	C
452.2-457.0(WA)	10.9	27.0	39.7	22.5	5.18	53.12	1.06	17.61	0.59	----	----	----	9,250	A
4.8[8]	----	30.5	44.9	24.7	4.47	60.04	1.20	8.93	0.67	----	----	----	10,450	B
5.0	----	41.1	59.0	----	6.03	79.27	1.57	12.29	0.85	----	----	----	13,750	C
KEMMERER AREA														
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
96.0-121.0(C)	22.4	32.2	40.4	5.0	6.24	54.61	0.74	33.23	0.19	<0.01	0.02	0.17	9,410	A
25.0[9]	----	41.5	52.1	6.4	4.82	70.38	0.96	17.17	0.24	<0.01	0.02	0.22	12,120	B
25.0	----	44.4	55.6	----	5.15	75.22	1.02	18.35	0.26	<0.01	0.02	0.24	12,960	C
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-198.0(C)	21.7	32.8	38.5	7.0	6.10	54.01	0.49	31.81	0.54	<0.01	0.09	0.45	9,380	A
23.0[10]	----	41.9	49.1	9.0	4.69	68.99	0.63	15.99	0.70	<0.01	0.12	0.58	11,980	B
39.0	----	46.1	53.9	----	5.15	75.82	0.69	17.58	0.76	<0.01	0.13	0.63	13,160	C
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-473.0(C)	21.3	33.8	40.3	4.6	6.44	56.51	0.70	31.10	0.66	<0.01	0.16	0.50	9,870	A
24.0	----	43.0	51.2	5.8	5.15	71.80	0.88	15.49	0.84	<0.01	0.20	0.64	12,540	B
23.5	----	45.6	54.4	----	5.47	76.25	0.94	16.45	0.89	<0.01	0.21	0.68	13,310	C
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
275.0-281.0(C)	22.9	32.3	40.8	4.0	6.07	55.08	0.86	33.75	0.22	<0.01	0.03	0.19	9,470	A
6.0[11]	----	41.9	52.9	5.2	4.56	71.43	1.11	17.40	0.28	<0.01	0.04	0.24	12,270	B
9.0	----	44.2	55.8	----	4.81	75.36	1.17	18.36	0.30	<0.01	0.04	0.26	12,950	C

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Analyses reported as A, sample as received; B, sample dry; C, sample dry ash-free.

[4] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[5] Upper and lower parts of the sampled interval were probably not coal.

[6] Includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[7] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[8] Lower part of the sampled interval was probably not coal.

[9] Interval sampled includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[10] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet was lost in coring and was not recovered.

[11] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet was lost in coring and was not recovered.

TABLE 2. FUSIBILITY OF ASH, FREE-SWELLING INDEX, MOIST, MINERAL-MATTER-FREE HEAT VALUE, AND APPARENT RANK OF COAL SAMPLES FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[2]	FUSIBILITY OF ASH (TEMPERATURE °F) REDUCING ATMOSPHERE: INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	OXIDIZING ATMOSPHERE: INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	FREE-SWELLING INDEX[3]	MOIST, MINERAL-MATTER-FREE HEAT VALUE (BTU/LB)[4]	APPARENT RANK OF COAL[5]
SALT WELLS AREA											
Core Hole BD-1C (Paleocene Fort Union Formation)											
225.0-233.5(C)[6] 8.5/8.5	2220	2250	2340	2440	2200	2250	2310	2420	0	11,340	Subbituminous A
Core Hole CRNE-1C (Upper Cretaceous Almond Formation)											
157.6-161.6 (C) 4.0[7]/3.5	2410	2440	2470	2590	2440	2510	2550	2800	0	10,850	Subbituminous A
Core Hole CRNE-4C (Paleocene Fort Union Formation)											
232.0-242.0 (C) 10.0/10.0	2200	2250	2330	2470	2230	2250	2310	2470	0	11,110	Subbituminous A
Core Hole CRNE-7C (Upper Cretaceous Almond Formation)											
311.5-321.0 (C) 9.5/9.5	2370	2400	2410	2450	2420	2440	2460	2510	0	11,190	Subbituminous A
Core Hole MSR-10C (Upper Cretaceous Almond Formation)											
168.5-172.0 (C) 3.5/3.5	2240	2280	2330	2420	2250	2280	2320	2430	0	11,780	High Volatile C Bituminous
Core Hole MSR-11C (Upper Cretaceous Almond Formation)											
62.0- 66.5(C) 4.5/4.5	2450	2500	2540	2610	2430	2500	2530	2570	0	11,530	High Volatile C Bituminous
Core Hole MSR-12C (Paleocene Fort Union Formation)											
226.0-232.0 (C) 6.0/6.0	2310	2390	2450	2550	2320	2430	2460	2540	0	11,430	Subbituminous A
Core Hole MSR-14C (Upper Cretaceous Almond Formation)											
213.0-217.8 (C) 4.8[8]/3.5	2450	2550	2590	2760	2490	2530	2610	2730	0	12,110	High Volatile C Bituminous
362.0-367.0 (C) 5.0/5.0	2290	2340	2410	2480	2290	2360	2440	2560	0	12,240	High Volatile C Bituminous
442.2-424.0 1.8/1.8	----	----	----	----	----	----	----	----	-	12,240	High Volatile C Bituminous
428.7-432.5 (WA)[9] 3.8/4.0	----	----	----	----	----	----	----	----	-	12,040	High Volatile C Bituminous
Core Hole MSR-16C (Paleocene Fort Union Formation)											
209.0-214.0 (C) 5.0/5.0	2530	2530	2540	2560	2560	2600	2650	2750	0	12,290	High Volatile C Bituminous
248.6-251.0 (WA) 2.4/2.5	----	----	----	----	----	----	----	----	-	11,900	High Volatile C Bituminous
284.5-286.8 2.3/2.5	----	----	----	----	----	----	----	----	-	12,300	High Volatile C Bituminous
Core Hole PM-10C (Upper Cretaceous Almond Formation)											
219.5-229.0 (C) 9.5/9.5	2240	2270	2290	2370	2260	2300	2320	2340	0	12,550	High Volatile C Bituminous
265.5-275.0 (C) 9.5/9.5	2690	2800	2820	2870	2690	2820	2840	2870	1/2	12,650	High Volatile C Bituminous

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[2]	FUSIBILITY OF ASH (TEMPERATURE °F) REDUCING ATMOSPHERE INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	OXIDIZING ATMOSPHERE INITIAL DEFORMATION	SOFTENING	HEMISPHERICAL	FLUID	FREE SWELLING INDEX[3]	MOIST, MINERAL MATTER-FREE HEAT VALUE (BTU/LB)[4]	APPARENT RANK OF COAL[5]
TABLE 2 continued											
SALT WELLS AREA continued											
Core Hole PM-12 C (Upper Cretaceous Almond Formation)											
311.0-319.0 (C) 8.0/8.0	2400	2430	2480	2550	2370	2410	2470	2490	1/2	12,340	High Volatile C Bituminous
358.0-364.0 (C) 6.0/6.0	2960	>3000	>3000	>3000	2910	>3000	>3000	>3000	1/2	12,690	High Volatile C Bituminous
Core Hole PM-16C (Upper Cretaceous Almond Formation)											
141.0-145.5 (C) 4.5/4.5	2530	2720	2740	2800	2530	2670	2740	2800	1/2	12,510	High Volatile C Bituminous
190.0-195.0 (C) 5.0/5.0	2400	2500	2550	2620	2420	2460	2520	2580	1/2	12,280	High Volatile C Bituminous
265.5-267.5 2.0/2.0	----	----	----	----	----	----	----	----	-	12,150	High Volatile C Bituminous
316.0-321.5 (C) 5.5/5.5	2360	2380	2400	2440	2390	2440	2520	2600	1/2	12,420	High Volatile C Bituminous
441.0-449.0 (C) 8.0/8.0	2550	2830	2840	2860	2710	2830	2850	2890	1/2	12,470	High Volatile C Bituminous
Core Hole PM-17C (Upper Cretaceous Almond Formation)											
212.0-218.0 (C) 6.0/6.0	2370	2390	2420	2450	2380	2410	2440	2490	1/2	12,290	High Volatile C Bituminous
343.0-348.0 (C) 5.0/5.0	2460	2520	2540	2630	2430	2490	2500	2620	1/2	12,330	High Volatile C Bituminous
452.2-457.0 (WA) 4.8/5.0	----	----	----	----	----	----	----	----	-	12,230	High Volatile C Bituminous
KEMMERER AREA											
Core Hole MD-2C (Upper Cretaceous Adaville Formation)											
96.0-106.2 (C) 10.2/25.0	2230	2250	2280	2530	2200	2230	2250	2500	0	9,960	Subbituminous B
96.0-108.3 (WA) 12.3/25.0	----	----	----	----	----	----	----	----	-	9,910	Subbituminous B
106.2-121.0 (C) 14.8[10]/25.0	2210	2240	2280	2530	2190	2230	2250	2500	0	9,980	Subbituminous B
109.8-121.0 (WA) 13.6/25.0	----	----	----	----	----	----	----	----	-	10,000	Subbituminous B
96.0-121.0 (C) 25.0[10]/25.0	2230	2270	2290	2530	2230	2260	2280	2340	0	9,950	Subbituminous B
Core Hole MD-3C (Upper Cretaceous Adaville Formation)											
175.0-198.0 (C) 23.0[11]/39.0	2360	2400	2450	2640	2360	2410	2540	2530	0	10,150	Subbituminous B
Core Hole R-6AC (Upper Cretaceous Adaville Formation)											
449.0-473.0 (C) 24.0/23.5	2220	2250	2270	2310	2220	2260	2290	2340	0	10,390	Subbituminous B
Core Hole R-7C (Upper Cretaceous Adaville Formation)											
275.0-281.0 (C) 6.0[12]/9.0	2260	2270	2290	2320	2260	2280	2290	2310	0	10,000	Subbituminous B

Table 2 continued

[1] All analytical work by Wyoming Analytical Laboratires, Inc., Laramie, Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Free-Swelling Index determined and reported in accordance with ASTM Standard D-720-67.

[4] Determined by the Parr Formula for moist, mineral-matter-free Btu (ASTM Standard D-338-77).

[5] Rank determination from ASTM Standard D-388-77, Table 1.

[6] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[7] Upper and lower parts of the sampled interval probably not coal.

[8] Includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[9] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[10] Interval includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[11] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet was lost in coring and was not recovered.

[12] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet was lost in coring and was not recovered.

TABLE 3. MAJOR AND MINOR OXIDES AND SELECTED TRACE ELEMENTS IN ASH OF COMPOSITE COAL SAMPLES FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[3]	MAJOR AND MINOR OXIDES AS PERCENT OF THE ASH[2]											SELECTED TRACE ELEMENT CONCENTRATIONS OF THE ASH (PARTS PER MILLION)		
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	Mn_3O_4[4]	P_2O_5	SO_3	Barium	Strontium	Zirconium
SALT WELLS AREA														
Core Hole BD-1C (Paleocene Fort Union Formation)														
225.0-233.5 8.5/8.5	52.68	16.54	6.52	9.47	2.35	2.35	0.66	0.77	0.05	0.13	8.14	1,430	1,410	510
Core Hole CRNE-1C (Upper Cretaceous Almond Formation)														
157.6-161.6 4.0[5]/3.5	56.68	17.56	7.06	10.12	4.25	0.46	0.60	0.92	0.04	0.13	1.39	4,490	2,810	587
Core Hole CRNE-4C (Paleocene Fort Union Formation)														
232.0-242.0 10.0/10.0	68.33	14.20	2.24	1.08	1.07	0.53	2.23	0.58	0.03	0.04	9.42	1,820	319	261
Core Hole CRNE-7C (Upper Cretaceous Almond Formation)														
311.5-321.0 9.5/9.5	39.06	23.29	7.50	12.64	3.68	0.51	0.74	0.91	0.05	0.21	10.21	5,820	4,550	557
Core Hole MSR-10C (Upper Cretaceous Almond Formation)														
168.5-172.0 3.5/3.5	46.29	19.58	13.31	8.46	2.61	0.29	0.93	0.79	0.05	0.36	5.62	5,180	1,540	362
Core Hole MSR-11C (Upper Cretaceous Almond Formation)														
62.0-66.5 4.5/4.5	34.73	16.54	38.60	3.10	0.90	0.23	0.54	0.46	0.08	0.95	3.77	349	315	371
Core Hole MSR-12C (Paleocene Fort Union Formation)														
266.0-232.0 6.0/6.0	59.48	15.78	9.69	4.70	1.43	2.66	0.44	0.84	0.04	0.20	4.54	5,740	924	505
Core Hole MSR-14C (Upper Cretaceous Almond Formation)														
213.0-217.8 4.8[6]/3.5	68.58	17.11	5.34	2.44	0.79	0.15	1.78	0.57	0.03	0.11	1.15	9,230	804	242
362.0-367.0 5.0/5.0	55.59	17.83	8.83	7.94	0.91	0.18	1.11	0.73	0.10	0.26	5.19	8,000	5,100	259
Core Hole MSR-16C (Paleocene Fort Union Formation)														
209.0-214.0 5.0/5.0	70.01	16.88	7.58	2.09	0.66	0.10	0.42	0.81	0.03	0.16	1.12	891	225	289
Core Hole PM-10C (Upper Cretaceous Almond Formation)														
219.5-229.0 9.5/9.5	37.06	18.90	9.61	21.56	5.44	0.52	0.52	0.56	0.06	0.25	4.77	5,400	1,820	202
265.5-275.0 9.5/9.5	64.46	23.89	2.58	2.53	1.58	0.50	1.57	0.74	0.03	0.03	1.87	1,140	847	162
Core Hole PM-12C (Upper Cretaceous Almond Formation)														
311.0-319.0 8.0/8.0	53.53	23.21	6.16	10.73	0.55	0.21	0.80	0.64	0.05	0.19	3.76	763	863	143
358.0-364.0 6.0/6.0	62.27	29.04	3.40	2.13	0.38	0.79	0.72	0.88	0.03	0.07	0.01	1,290	1,280	254

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET)/ BED THICKNESS (FEET)[3]	MAJOR AND MINOR OXIDES AS PERCENT OF THE ASH[2]											SELECTED TRACE ELEMENT CONCENTRATIONS OF THE ASH (PARTS PER MILLION)		
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	Na_2O	K_2O	TiO_2	Mn_3O_4[4]	P_2O_5	SO_3	Barium	Strontium	Zirconium
Table 3 continued														
SALT WELLS AREA continued														
Core Hole PM-16C (Upper Cretaceous Almond Formation)														
141.0-145.5 4.5/4.5	66.66	22.69	4.06	2.34	0.86	0.10	1.69	0.59	0.03	0.08	0.75	556	908	78
190.0-195.0 5.0/5.0	52.81	19.53	18.59	3.21	0.67	0.12	1.42	0.45	0.03	0.34	2.70	661	562	51
316.0-321.5 5.5/5.5	55.41	28.09	4.35	7.66	0.25	1.91	0.35	0.75	0.03	0.22	0.29	4,890	1,910	139
441.0-449.0 8.0/8.0	56.44	28.85	3.39	5.92	0.41	0.96	0.71	0.92	0.03	0.11	1.94	1,160	1,530	532
Core Hole PM-17C (Upper Cretaceous Almond Formation)														
212.0-218.0 6.0/6.0	46.37	26.43	7.18	12.24	1.65	0.12	0.35	0.64	0.07	0.31	3.60	4,250	5,770	470
343.0-348.0 5.0/5.0	59.62	24.72	6.43	5.65	0.45	0.31	0.49	0.93	0.04	0.23	0.50	4,990	825	480
KEMMERER AREA														
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
96.0-106.2 10.2/25.0	49.49	11.46	6.23	17.23	4.55	1.38	0.54	0.55	0.07	0.14	8.12	939	1,150	725
106.2-121.0 14.8[7]/25.0	52.99	8.78	6.00	16.58	4.27	1.36	0.37	0.48	0.06	0.14	8.74	1,140	1,180	257
96.0-121.0 25.0[7]/25.0	51.29	9.96	6.20	17.29	4.52	1.40	0.47	0.51	0.07	0.14	7.89	1,090	1,200	256
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-198.0 23.0[8]/39.0	55.00	16.90	5.66	9.78	1.93	0.18	0.35	0.50	0.06	0.12	9.44	242	238	282
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-473.0 24.0/23.5	39.73	7.24	10.70	18.05	4.03	0.37	0.28	0.39	0.13	0.25	18.69	584	459	225
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
275.0-281.0 6.0[9]/9.0	34.23	11.73	12.03	20.23	8.00	2.23	0.52	0.45	0.04	0.28	9.91	1,350	1,930	196

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming. Metals were determined by inductively coupled argon plasma spectrometry on an Instrumentation Laboratory Plasma 100A spectrometer; sulfur was determined by ASTM Standard Method D-1757.

[2] The major and minor oxides and selected trace elements were normalized to equal 100%. Additional trace elements were not looked for and could be present in the coal sample.

[3] Total coal bed thickness as determined by geophysical logs.

[4] To convert to percent MnO_2, multiply MN_3O_4 by 1.1398.

[5] Upper and lower parts of the sampled interval were probably not coal.

[6] Sample includes 1.3 feet of interbedded thin coals and noncoaly rock in the lower part of the sampled interval.

[7] Interval sampled includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[8] This analysis only refers to a composite sample of the upper 23 feet of the coal bed; the lower 16 feet of the coal bed was lost in coring and was not recovered.

[9] This analysis only refers to a composite sample of the upper 6 feet of the coal bed; the lower 3 feet of the coal bed was lost in coring and was not recovered.

TABLE 4. SUMMARY OF HARDGROVE GRINDABILITY INDICES, BY FORMATION, FOR INCREMENTAL SAMPLES OF COAL FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

Age and Formation	Number of Coal Beds Sampled[2]	Number of Samples	Hardgrove Grindability Index[3] Range	Average
Salt Wells Area				
Paleocene Fort Union Formation	4	7	44-57	49
Upper Cretaceous Almond Formation	11	19	10-56	41
Kemmerer Area				
Upper Cretaceous Adaville Formation	3	10	9-60	44

[1] All tests by Wyoming Analytical Laboratories, Inc., Laramie, Wyoming.

[2] Only selected portions (increments) of a particular coal bed were tested.

[3] Determined in accordance with ASTM Standard D 409-71 (Reapproved 1978).

LITHOLOGIC DESCRIPTIONS AND GEOPHYSICAL LOGS

The following abbreviations are used on the headings of the lithologic descriptions and geophysical logs:

Comp. — completed

FSL — from south line

FNL — from north line

FEL — from east line

FWL — from west line

Size, Bit Type: bit diameter in inches; bit types include K-Kenclaw, V-Varrell, WM-Walker McDonald, and C-Christensen 3 7/8" core bit.

CPS/IN — counts per second per inch

T.C. — time constant

H.R. Density — high resolution density

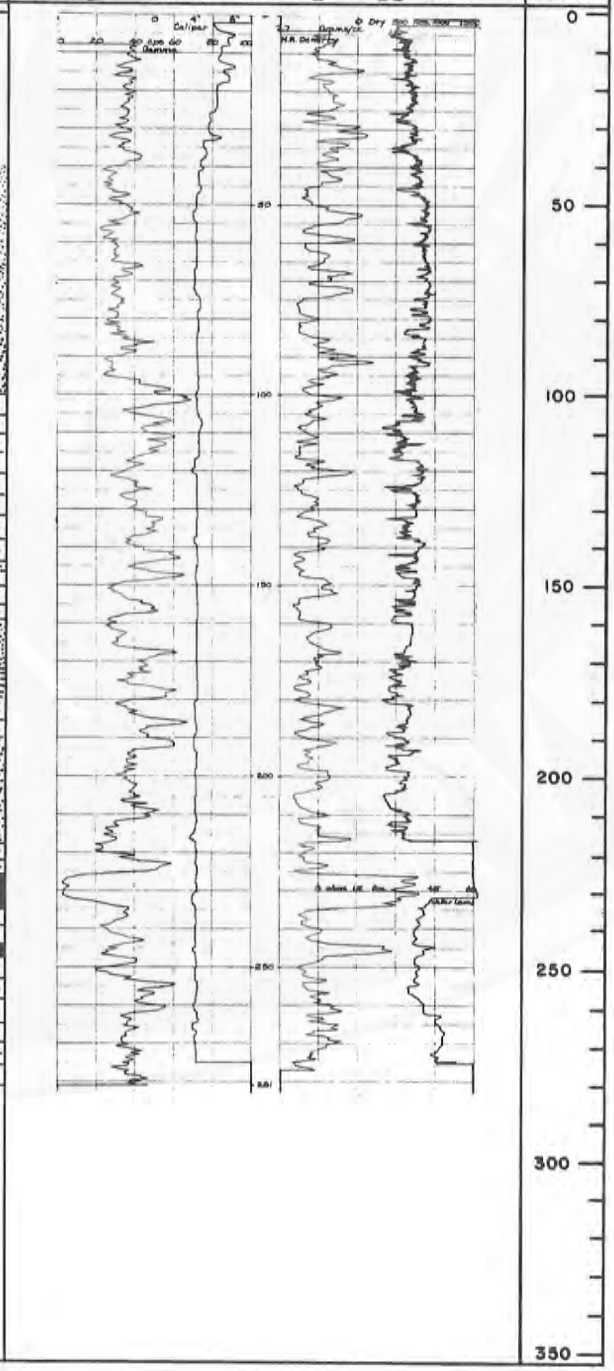
TD — total depth

THE UNIVERSITY OF WYOMING		HOLE NO. BD-1	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Burley Draw	
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 14 T.16N. R. 102W		FOOTAGE LOCATION: 400' FSL, 300'FEL	
GROUND ELEVATION: 6934.8'	TOTAL DEPTH: 281'	DEPTH TO WATER: 232'	
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 281'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G.Huskey		GEOPHYSICAL PROBE TYPE: Comprobe No. 2	
REMARKS: State Coord. System Loc: 252,754.17 N, 471,446.35 E			

LOGGED DEPTH: 275 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

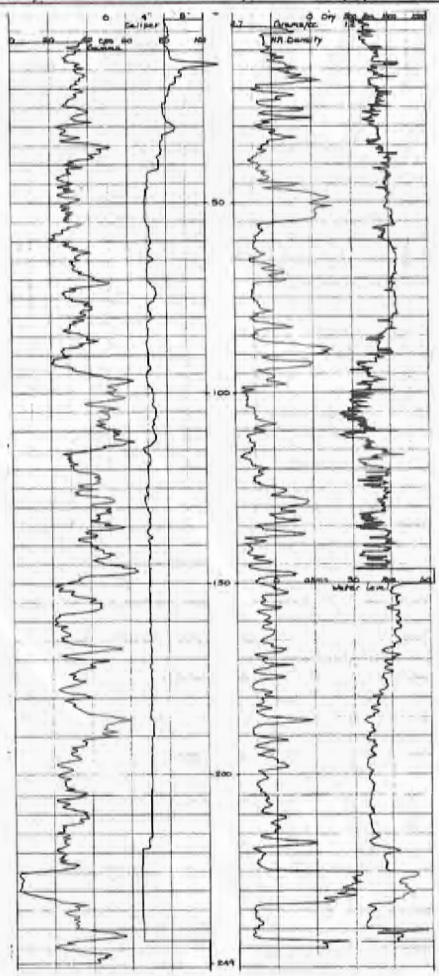
INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
40	
	Sandstone, brownish-gray
85	Sandstone, light gray
100	
	Shale, medium gray
145	Shale, black, carbonaceous
147	Shale, medium gray
160	Sandstone, light gray
172	Shale, black, carbonaceous
181	Shale, medium gray
190	Sandstone, light gray
205	Sandstone, grayish-brown
217	Shale, dark gray, carbonaceous
226	Coal
235	Shale, dark gray
244	Coal?
247	
	Shale
281TD	



THE UNIVERSITY OF WYOMING			HOLE NO. BD-1C	SHEET 1 OF1
AREA: Salt Wells		QUAD. NAME: Burley Draw		
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SE¼SE¼ SEC. 14 T.16N., R.102W.		FOOTAGE LOCATION: 388' FSL, 291'FEL		
GROUND ELEVATION: 6934.9'	TOTAL DEPTH: 251'		DEPTH TO WATER: 150'	
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 221'	CORE FOOTAGE: 30'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: State Coord. System Loc: 242,742.53 N, 471,455.81E				

LOGGED DEPTH: ____ FT. LOGGING SPEED: ____ FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 200 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	REFER TO BD-1						0
							50
							100
							150
							200
221							
251	TD						250
							300
							350



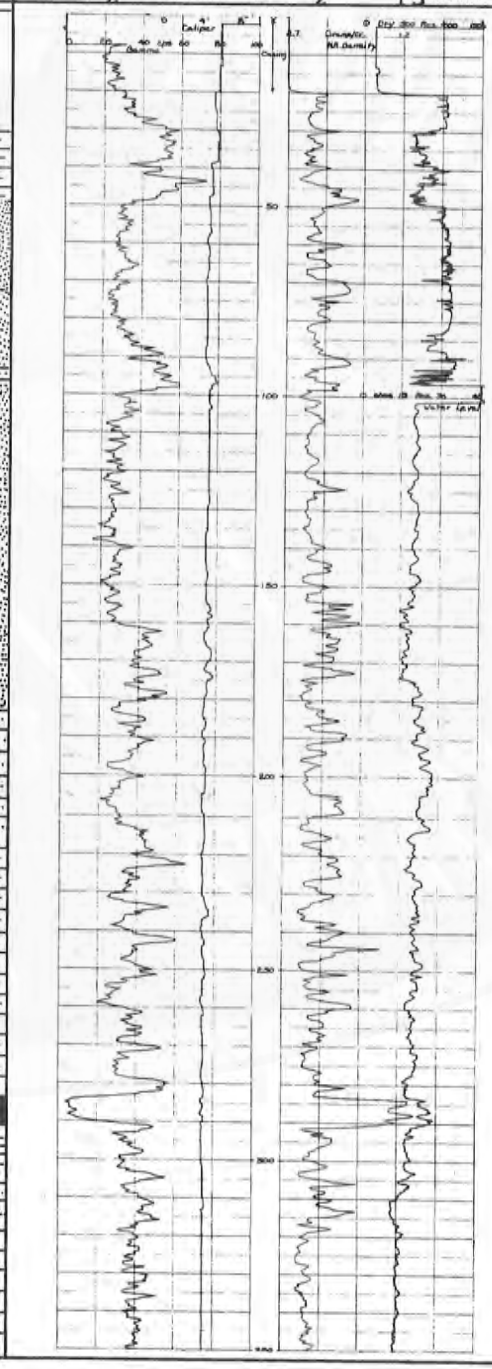
THE UNIVERSITY OF WYOMING		HOLE NO. BD-2	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Burley Draw	
DATE STARTED: 5/13/82	DATE COMP.: 5/14/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SW¼ SEC. 26 T.16N., R. 102W.		FOOTAGE LOCATION: 2300'FSL, 1800'FWL	
GROUND ELEVATION: 6876.4'	TOTAL DEPTH: 780'	DEPTH TO WATER: 101'	
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 780'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe No. 2	
REMARKS: State Coord. System Loc: 244,510.99'N, 468,688.01'E			

LOGGED DEPTH: 780 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
31	Shale, light and dark gray
49	
	Sandstone, medium gray
93	Siltstone, light gray
99	
	Sandstone, medium gray
161	
	Sandstone, medium gray
183	
	Siltstone, light gray
214	
	Shale, medium gray
284	Coal
291.5	
	Shale, medium gray, silty
315	
	Shale

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

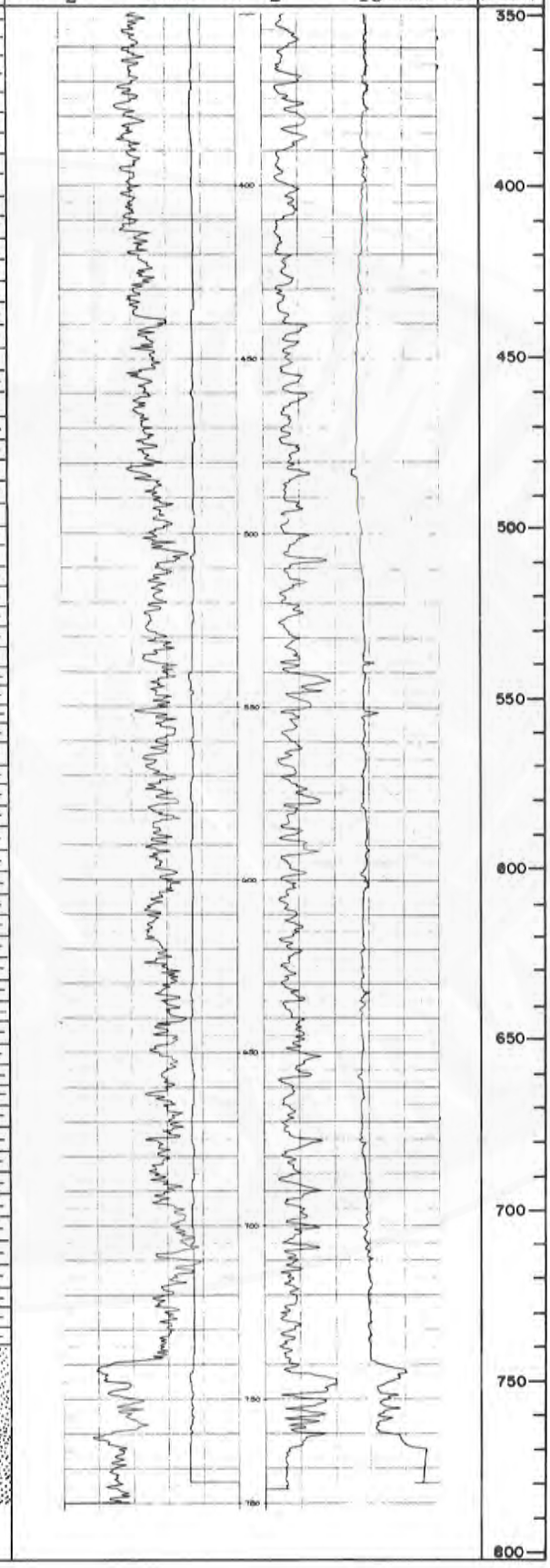
THE UNIVERSITY OF WYOMING

HOLE NO. BD-2

SHEET 2 OF 2

LOGGED DEPTH: 780 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
	Shale	
739	Sandstone, light gray	
780TD		



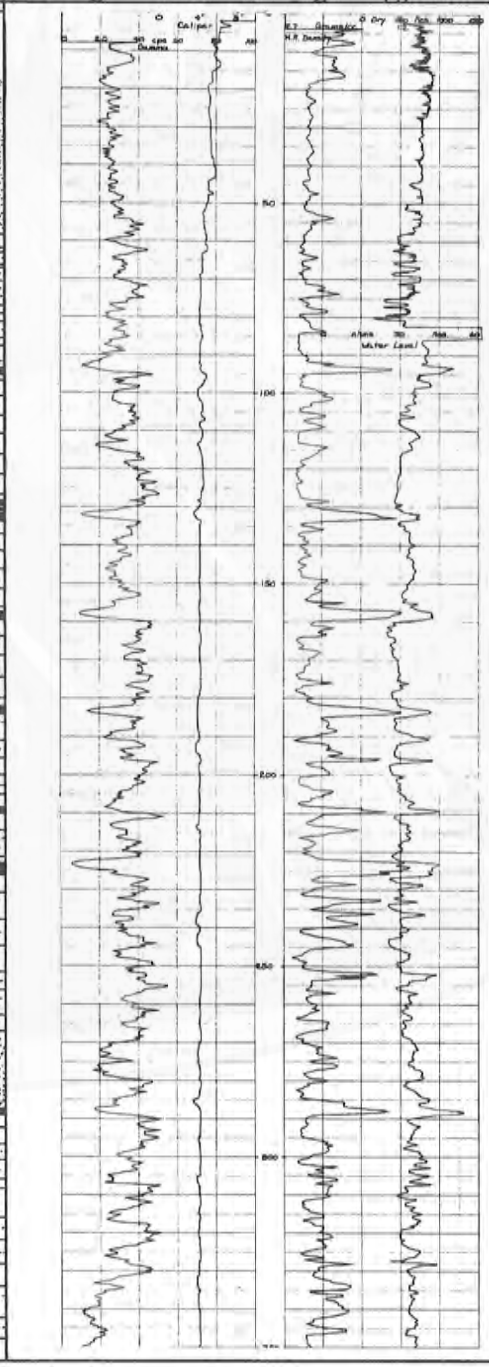
THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-1	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 18 T. 17N., R. 101W		FOOTAGE LOCATION: 200' FSL 200' FEL	
GROUND ELEVATION: 7032.7'	TOTAL DEPTH: 370'	DEPTH TO WATER: 86'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 370'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 283,270.84N, 477,872.91E			

LOGGED DEPTH: 365 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
17	
	Sandstone, light brownish-gray
58	Shale, dark brownish-gray
65	Siltstone, light gray
67	
	Siltstone, light gray, and shale, medium gray
93	Coal
95	
	Shale, medium to dark gray
128	Shale, carbonaceous, and coal
131	Coal
134	
	Shale, medium gray
157	Coal
159.5	
	Shale, medium gray
182.5	Coal
184.5	
	Siltstone and shale, medium gray
208	Coal
210	
	Siltstone and shale, medium gray
222	Coal
226	
	Shale, dark gray; thin coals
253.5	
	Shale, dark gray
270	Sandstone, light gray
287	Coal
289	
	Shale, black, carbonaceous, and siltstone, light gray

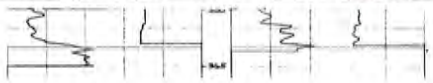
STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-1	SHEET 2 OF 2
INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 365 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 20 TC 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 260 TC 2 — RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)

360TD

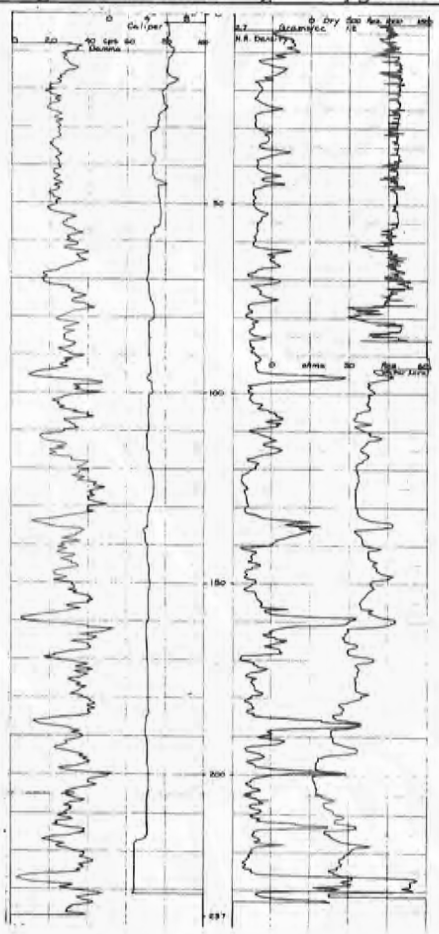


350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-10	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 18 T. 17N. R. 101W		FOOTAGE LOCATION: 179'FSL, 203'FEL	
GROUND ELEVATION: 7032.8'	TOTAL DEPTH: 238'	DEPTH TO WATER: 93'	
SIZE, BIT TYPE: 4 ¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 203'	CORE FOOTAGE: 35'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 283,250.30N 477,870.37E			

LOGGED DEPTH: 237 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to CRNE-1						0, 50, 100, 150, 200, 250, 300, 350
153–168							
218–238	TD						

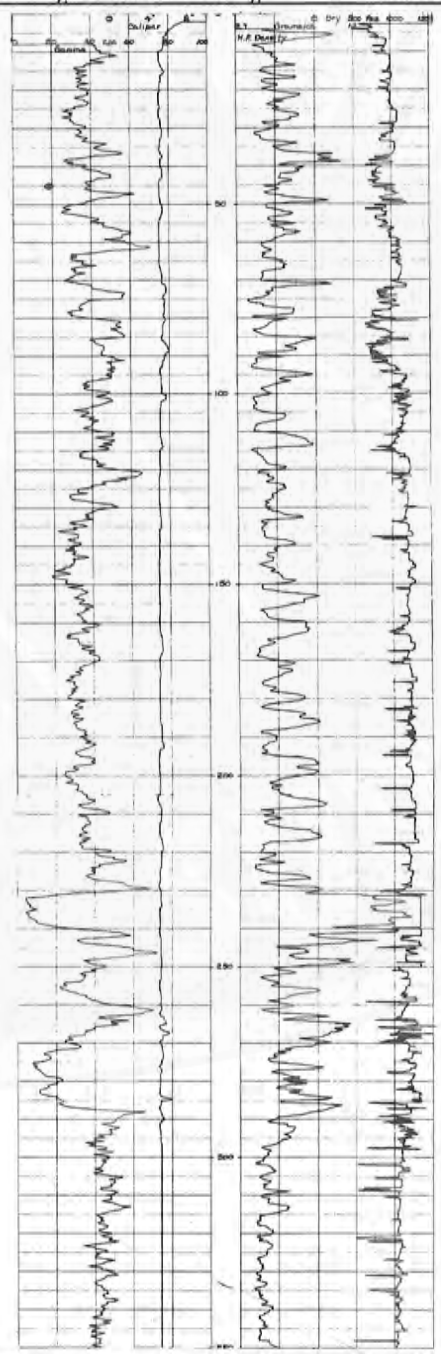


THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-4	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/16/82	DATE COMP.: 5/16/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼SW¼ SEC. 32 T.17N., R.101W		FOOTAGE LOCATION: 1700'FSL, 850'FWL	
GROUND ELEVATION: 7115.1'	TOTAL DEPTH: 800'	DEPTH TO WATER: 800+'	
SIZE, BIT TYPE: 5-1/8 K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 800'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 269,081.36N, 478,848.63E			

LOGGED DEPTH: 761 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
36.5	Coal?
39	
	Shale, brownish-gray
59	
	Sandstone, light gray
70	
	Shale, medium gray
92	
	Sandstone, light gray
220	
	Shale, light gray
231	
	Coal, with shale partings
244	
	Sandstone, light gray
260	
	Shale, dark gray, carbonaceous
271	
	Sandstone, brownish-gray
288	
	Shale

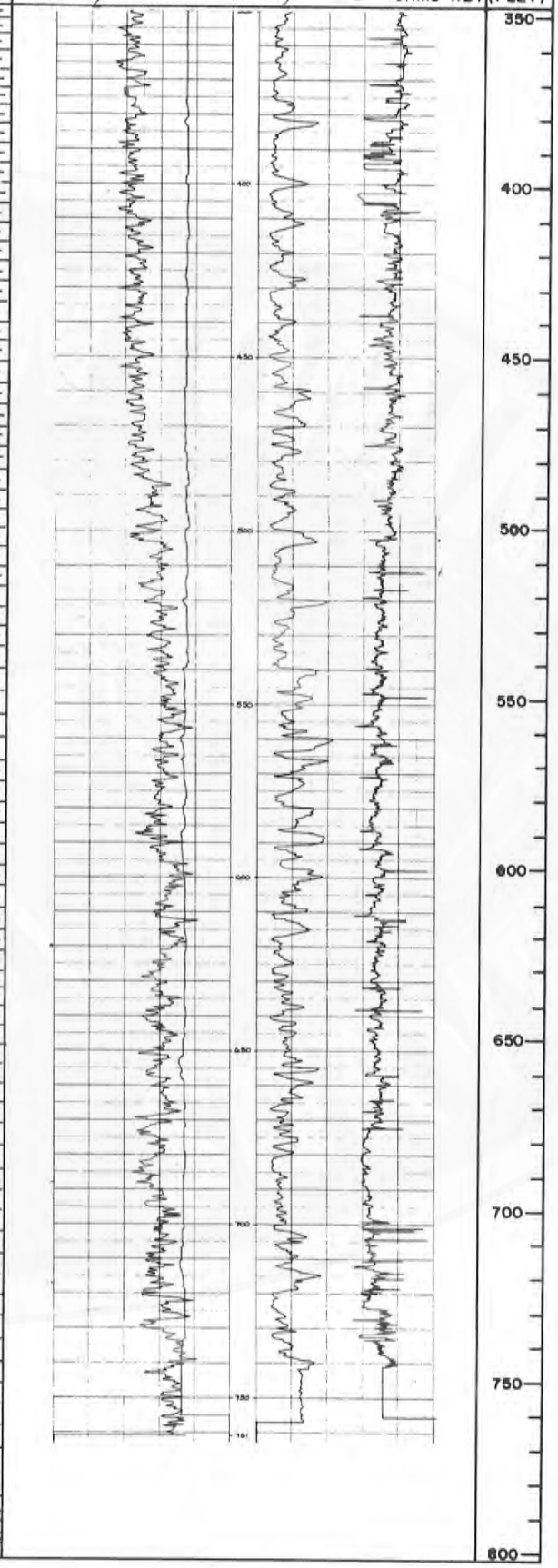
STRIP LOG



THE UNIVERSITY OF WYOMING | HOLE NO. CRNE-4 | SHEET 2 OF 2

LOGGED DEPTH: 761 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
	Shale	
785	Sandstone, light gray	
800 TD		



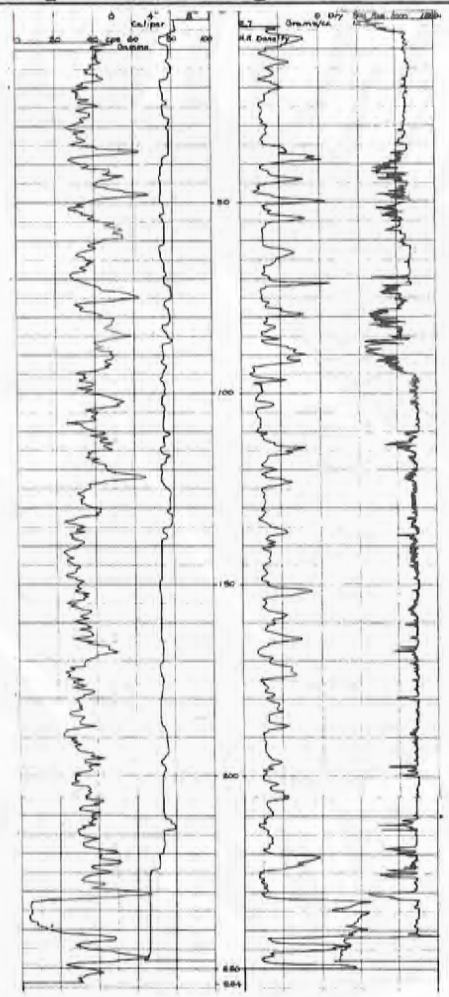
THE UNIVERSITY OF WYOMING	HOLE NO. CRNE-4C	SHEET 1 OF 1

AREA: Salt Wells	QUAD. NAME: Cooper Ridge NE
DATE STARTED: 5/17/82 / DATE COMP.: 5/17/82	COUNTY: Sweetwater / STATE: Wyoming
LOCATION: NW¼SW¼ SEC. 32 T.17N., R. 101W.	FOOTAGE LOCATION: 1,681' FSL, 859' FWL
GROUND ELEVATION: 7,115.1' / TOTAL DEPTH: 255'	DEPTH TO WATER: 255+
SIZE, BIT TYPE: 4¾ K.C / DRILL TYPE: Portadrill	ROTARY FOOTAGE: 225' / CORE FOOTAGE: 30'
DRILLED BY: Gordon Drilling	GEOPHYSICAL LOGGING BY: Reich Geophysical
LITHOLOGY RECORDED BY: G. Huskey	GEOPHYSICAL PROBE TYPE: Comprobe #2

REMARKS: State Coord. System Loc: 269,062.53N, 478,857.33E

LOGGED DEPTH: 254 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY OHMS WET	DEPTH (FEET)
	Refer to CRNE-4						0, 50, 100, 150, 200, 250, 300, 350
225–255	TD						



THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-5	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 12 T. 16N., R. 102W.		FOOTAGE LOCATION: 2,000'FNL, 1,800'FEL	
GROUND ELEVATION: 7,291.6'	TOTAL DEPTH: 700'	DEPTH TO WATER: 584'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 700'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	

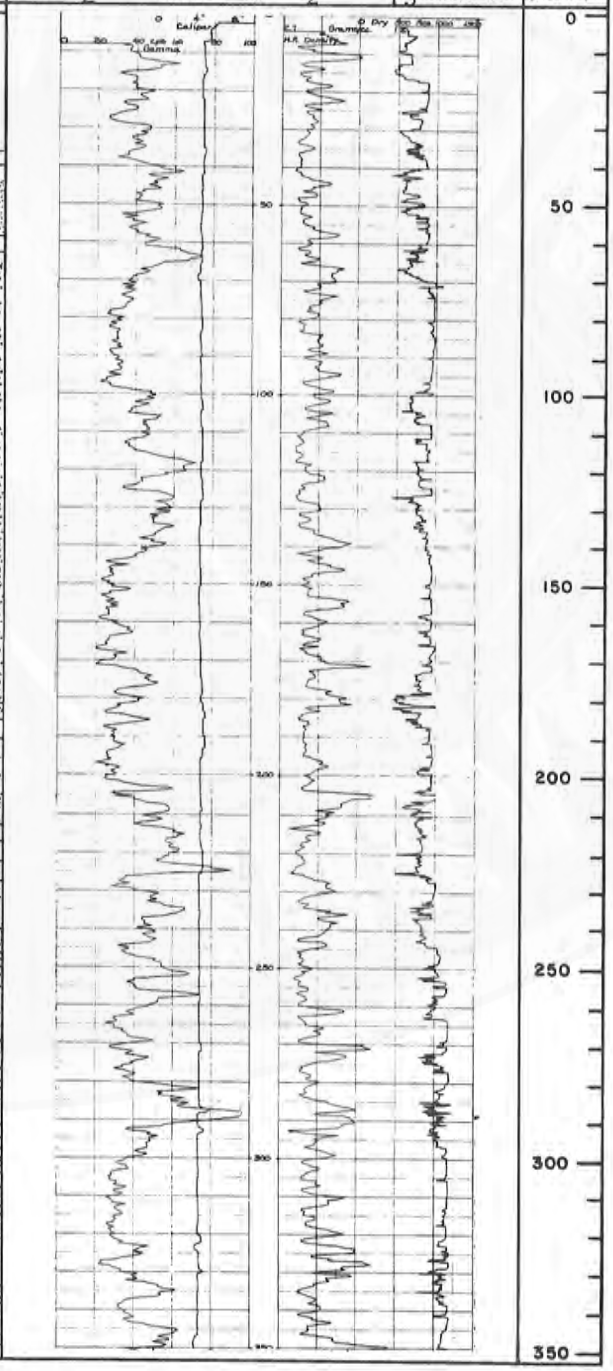
REMARKS: State Coord. System Loc: 261,299.77N, 475,425.14E

LOGGED DEPTH: 699 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
36	Shale, medium gray
43	Sandstone, medium gray
59	Shale, medium gray
66	
	Sandstone, medium gray, fine grained
109	
	Sandstone, medium gray, very fine grained
182	
	Shale, medium gray
204	Sandstone, medium gray
213	Shale, medium gray
226	Sandstone, medium gray
231	
	Sandstone, medium gray, and shale, medium gray, interbedded
280	Shale, medium gray
292	Sandstone and shale, medium gray
300	Siltstone, medium gray
317	
	Sandstone, as 109-82
334	
	Sandstone and shale, medium gray, interbedded

STRIP LOG



DEPTH (FEET)

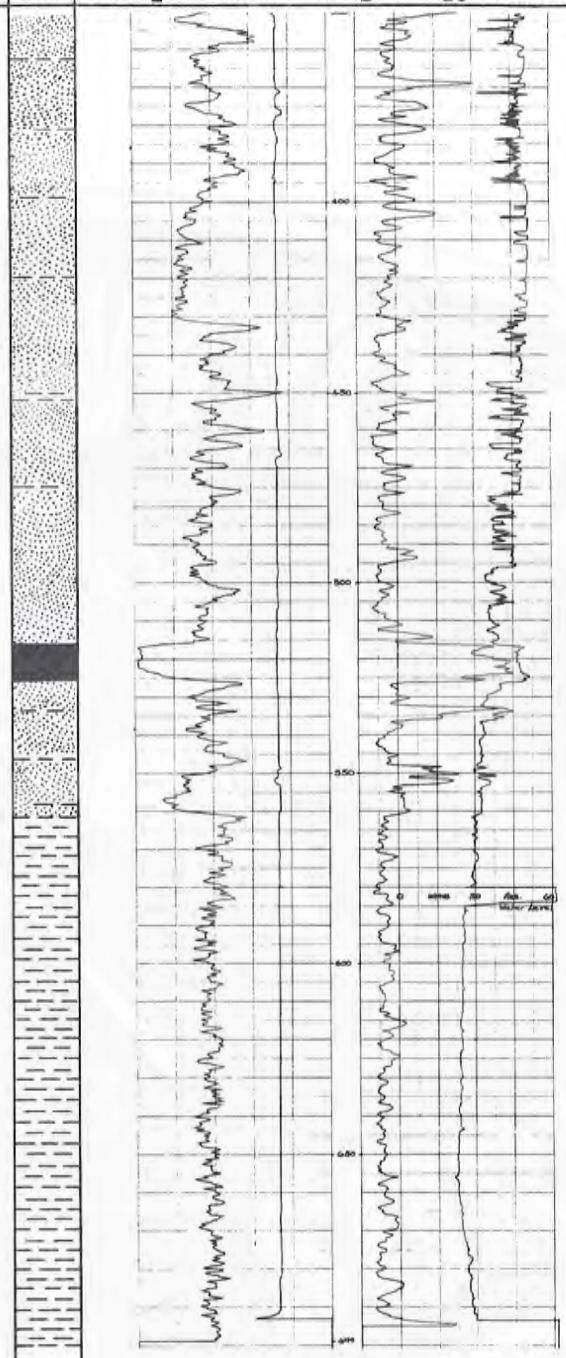
THE UNIVERSITY OF WYOMING

HOLE NO. CRNE-5 | SHEET 2 OF 2

LOGGED DEPTH: 699 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
	Sandstone and shale, medium gray, interbedded
516	
526	Coal
	Sandstone and shale, interbedded
561	
	Shale
700TD	

STRIP LOG

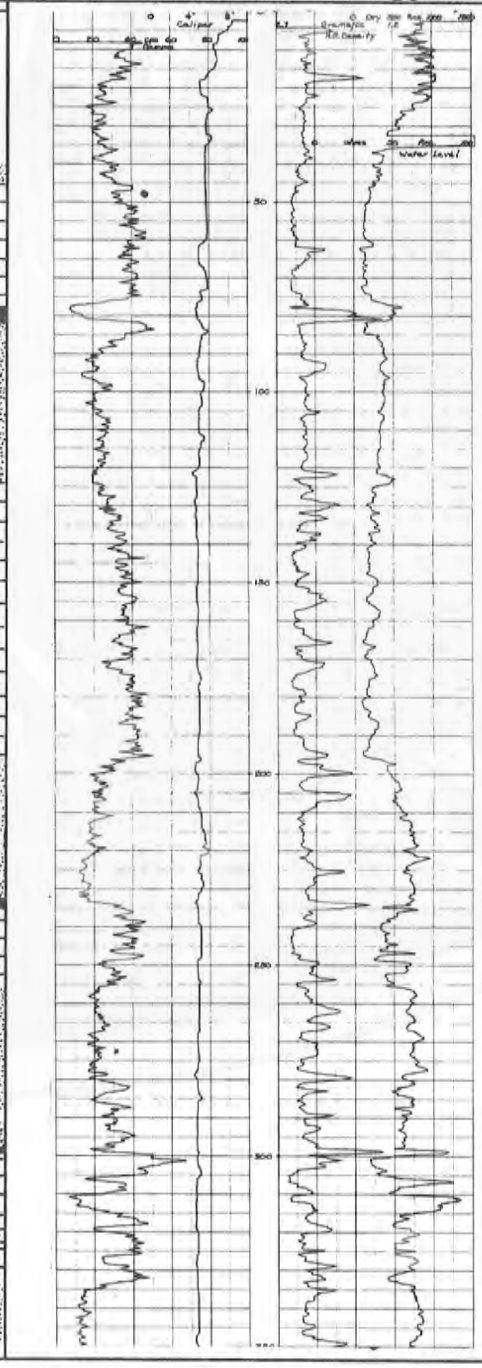


THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-6	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/14/82	DATE COMP.: 5/14/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 2 T. 16N., R. 102W		FOOTAGE LOCATION: 800'FSL, 2200'FWL	
GROUND ELEVATION: 7,060.4'	TOTAL DEPTH: 390'	DEPTH TO WATER: 35'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 390'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 263,876.88N, 468,980.98E			

LOGGED DEPTH: 389 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
	Soil, light brown, sandy
40	
45	Sandstone, medium gray
	Shale, medium gray
78	
82	Coal
	Sandstone, light gray
124	
	Shale, medium gray
196	
	Sandstone, light gray
233	Coal
235	Shale, dark gray, carbonaceous
256	
	Sandstone, light gray, as 82-124
298	Coal
299.5	
	Shale, dark gray
333	

STRIP LOG



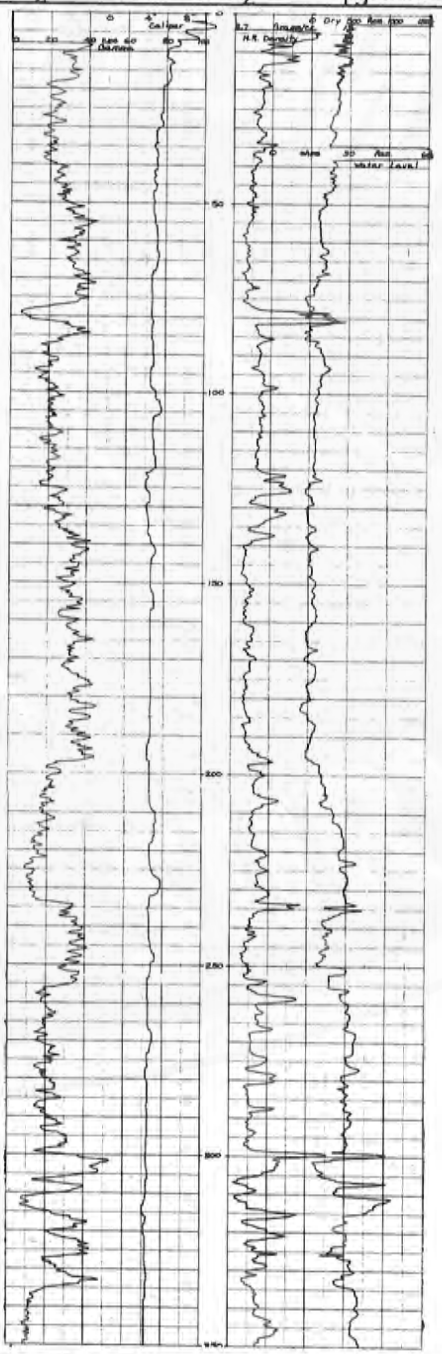
DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-6	SHEET 2 OF 2
			LOGGED DEPTH: 389 FT. LOGGING SPEED: 20 FT./MIN.	
INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2 / CALIPER 0 4 8 SCALE / H.R. DENSITY CPS/IN 260 TC 2 / RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Sandstone, medium gray			350
368	Coal			
371	Shale, dark gray			
390TD				400
				450
				500
				550
				600
				650
				700
				750
				800

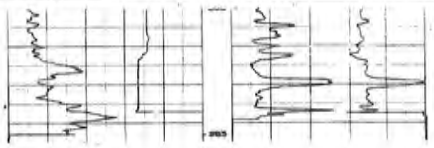
THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-6C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 5/15/82	DATE COMP.: 5/15/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 2 T. 16N., R. 102W.		FOOTAGE LOCATION: 782'FSL, 2,192'FWL	
GROUND ELEVATION: 7,061.0'	TOTAL DEPTH: 385'	DEPTH TO WATER: 35'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 329'	CORE FOOTAGE: 56'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 263,858.56N, 468,972.48E			

LOGGED DEPTH: 383 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to CRNE-6						
72–88							
234–244							
297–307							



THE UNIVERSITY OF WYOMING			HOLE NO. CRNE-6C	SHEET 2 OF 2
CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 383 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 20 TC 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 TC 2 RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)



367

387 TD

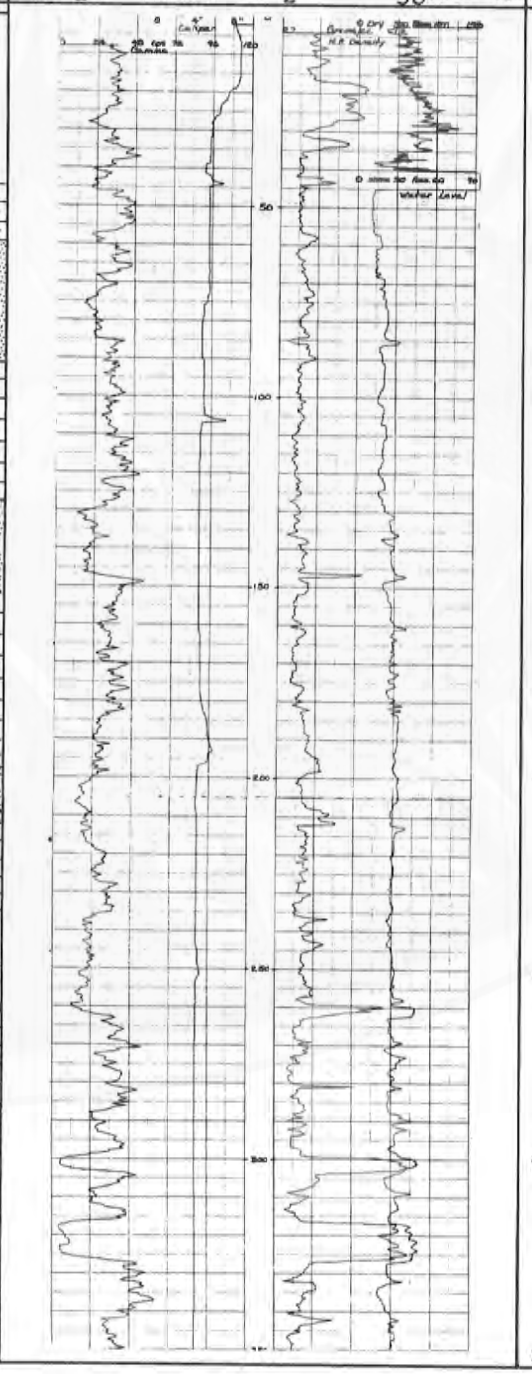
350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-7	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 6/5/82	DATE COMP.: 6/5/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 10 T. 16N. R. 102W		FOOTAGE LOCATION: 900'FSL, 500'FEL	
GROUND ELEVATION: 7015.2'	TOTAL DEPTH: 400'	DEPTH TO WATER: 45'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 400'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 258,409.70N, 466,272.93E			

LOGGED DEPTH: 396 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Soil, light brown, with abundant orange-brown sandstone
45	Shale, light gray
60	Sandstone, medium gray
91	Shale, dark gray
128	Sandstone, medium gray
152	Shale, dark gray, carbonaceous
194	Sandstone, medium gray
212	Shale, dark gray, carbonaceous
236	Sandstone, light gray
259.5	Coal
262	Shale, dark gray and black, carbonaceous
299.5	Coal
304	Sandstone, medium gray
317	Coal
327	

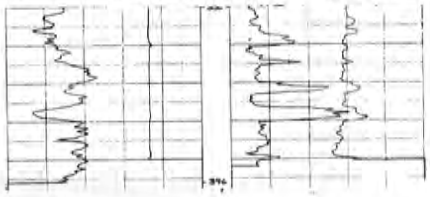
STRIP LOG



THE UNIVERSITY OF WYOMING	HOLE NO. CRNE-7	SHEET 2 OF 2

LOGGED DEPTH 396 FT. LOGGING SPEED 20 FT./MIN.

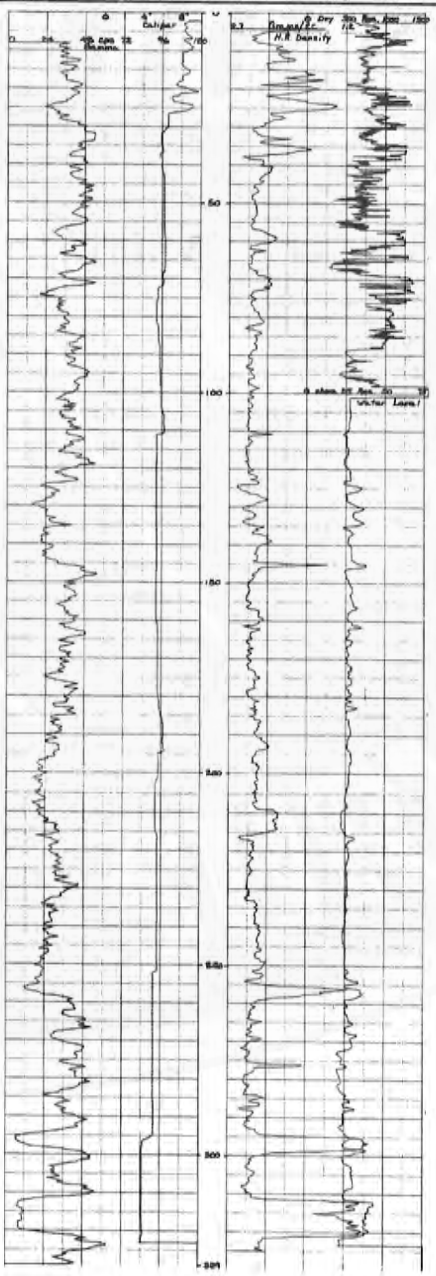
INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
	Sandstone, medium gray						350
370	Coal, shaley						
372.5	Shale, dark gray, carbonaceous						
376.5	Coal, shaley						
380	Shale, dark gray, silty						400
400TD							
							450
							500
							550
							600
							650
							700
							750
							800



THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-7C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 6/6/82	DATE COMP.: 6/6/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 10 T. 16N R. 102W		FOOTAGE LOCATION: 909'FSL, 512'FEL	
GROUND ELEVATION: 7016.1'	TOTAL DEPTH: 330'	DEPTH TO WATER: 101'	
SIZE, BIT TYPE 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 299'	CORE FOOTAGE: 31'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 258,419.12N, 466,260.88E			

LOGGED DEPTH: 329 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	See CRNE-7						
299							
330	TD						



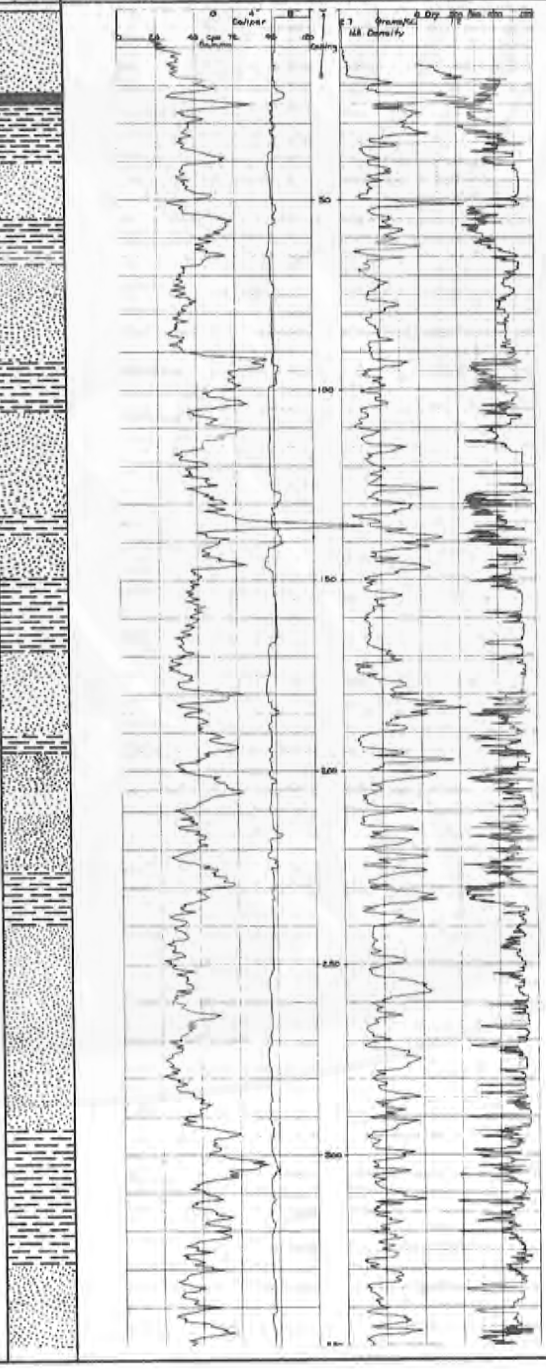
THE UNIVERSITY OF WYOMING		HOLE NO. CRNE-8	SHEET 1 OF 3
AREA: Salt Wells		QUAD. NAME: Cooper Ridge NE	
DATE STARTED: 6/5/82	DATE COMP.: 6/6/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 6 T. 16N R. 101W		FOOTAGE LOCATION: 1100'FNL, 300'FEL	
GROUND ELEVATION: 7190.9'	TOTAL DEPTH: 935'	DEPTH TO WATER: 482'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 935'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 266,159.74N, 477,732.61E			

LOGGED DEPTH: 931 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 30 OHMS WET

INTERVALS	LITHOLOGY
0	Sandstone, orange-brown
22	Coal
24.5	Shale, dark gray and black
40	Sandstone, orange-brown
55	Shale, light gray
67	Sandstone, orange-brown
92	Shale, light gray
105	Sandstone, light gray
133	Shale, medium gray
138	Sandstone, light gray
149	Shale, medium gray-green
168	Sandstone, light gray
190	Shale, light grey
194	Sandstone, light gray
205	Sandstone, dark gray
210	Sandstone, light gray
225	Shale, light gray
240	Sandstone, light gray
293	Shale, medium gray
327	Sandstone, medium gray

STRIP LOG



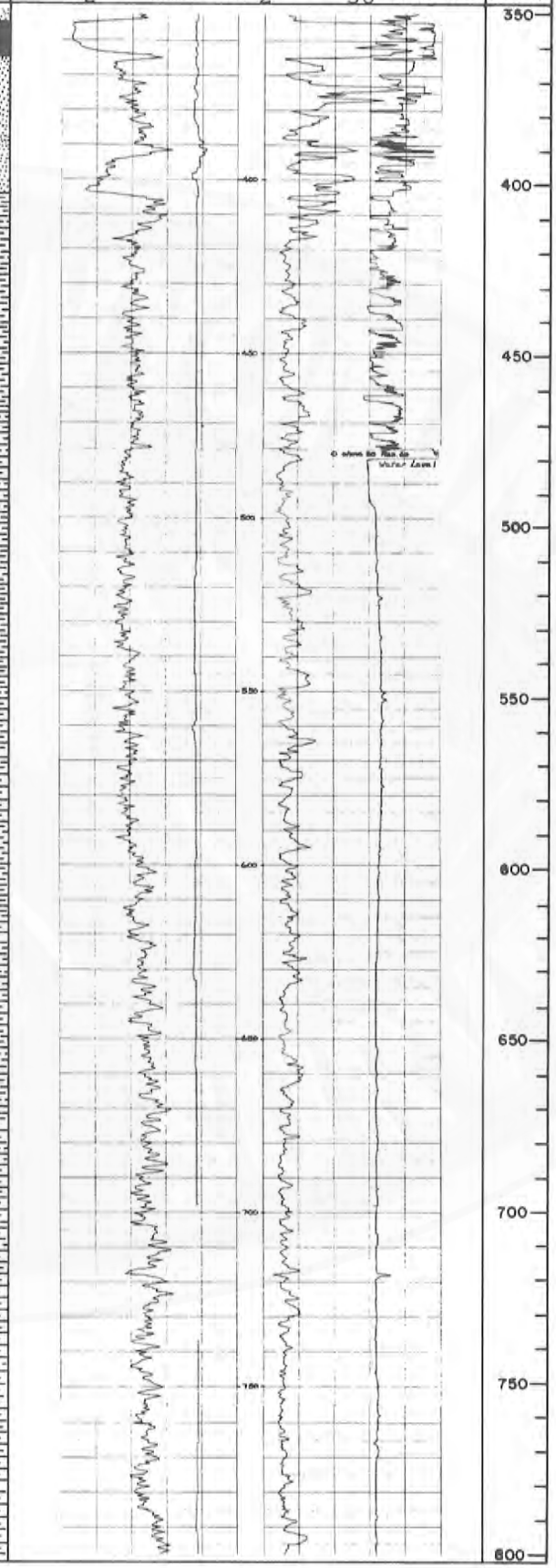
DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING

HOLE NO. CRNE-8 SHEET 2 OF 3

LOGGED DEPTH 931 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
354.5	Coal	
365	Sandstone, medium gray	
405		
	Shale	



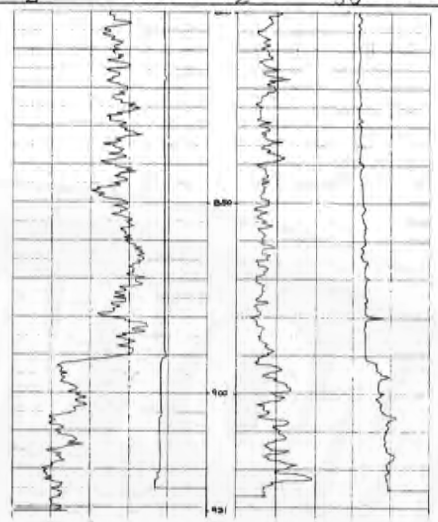
THE UNIVERSITY OF WYOMING

HOLE NO. CRNE-8

SHEET 3 OF 3

LOGGED DEPTH: 931 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
	Shale						800
							850
892							900
	Sandstone						
931TD							950
							1000
							1050
							1100
							1150
							1200
							1250

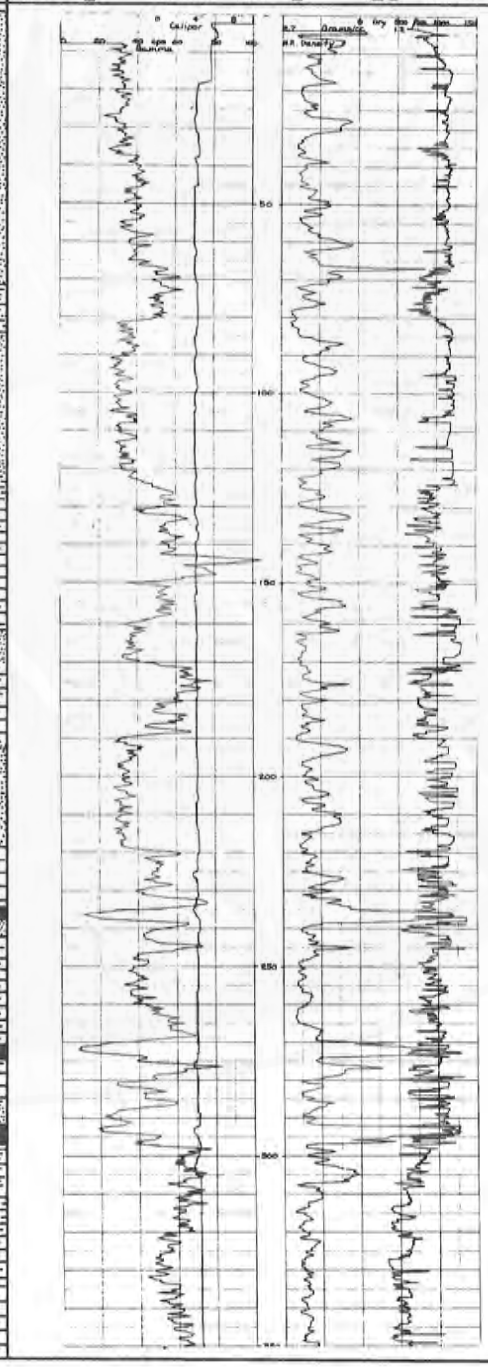


THE UNIVERSITY OF WYOMING		HOLE NO. EKR-1	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Erickson-Kent Ranch	
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼ SEC. 35 T. 15N., R. 102W.		FOOTAGE LOCATION: 1500' FNL, 1100' FWL	
GROUND ELEVATION: 7210'	TOTAL DEPTH: 405'	DEPTH TO WATER: 376'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 405'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

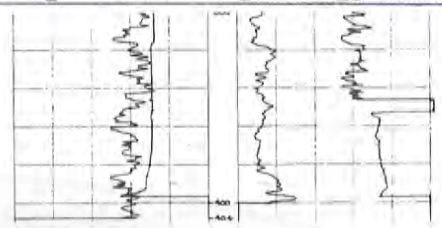
LOGGED DEPTH: 404 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	
	Sandstone, orange-red
71	Shale, light gray, silty
85	
	Sandstone, light gray
122	
	Shale, light gray
162	
	Sandstone, light gray
171	
	Shale, light and dark gray
191	
	Sandstone, light gray
219	
	Shale, light gray
235	Coal
238.5	
	Sandstone, grayish-brown
243	
	Shale, light gray
270	Coal
274	
	Shale, light gray
285	
292	Sandstone, light gray
297	Coal
	Shale, light gray
307	
	Shale

STRIP LOG



THE UNIVERSITY OF WYOMING			HOLE NO. EKR-1	SHEET 2 OF 2
INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 404 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 20 TC 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN 260 TC 2 — RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)



Shale

404TD

350 400 450 500 550 600 650 700 750 800

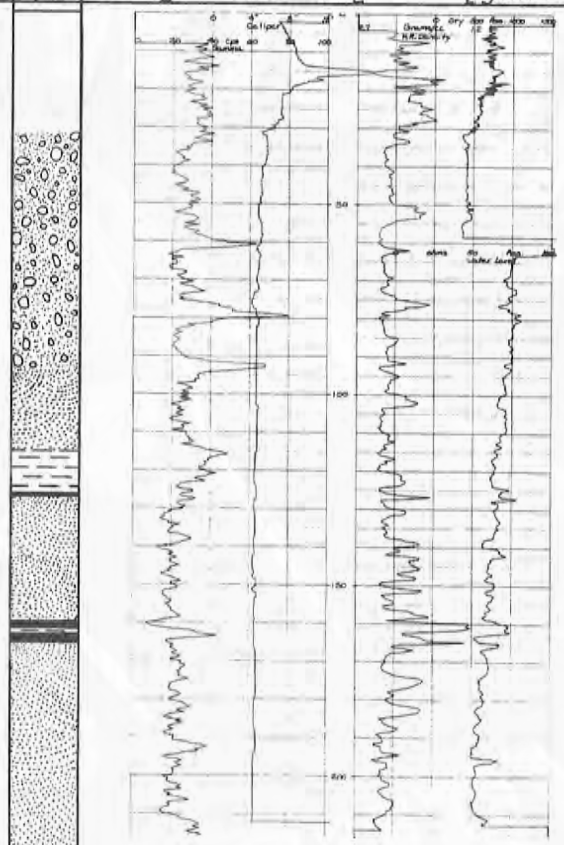
THE UNIVERSITY OF WYOMING		HOLE NO. MSR-8	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼ SEC. 22 T. 16N., R. 102W		FOOTAGE LOCATION: 700' FNL, 1,600' FWL	
GROUND ELEVATION: 6,959.9'	TOTAL DEPTH: 220'	DEPTH TO WATER: 63'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 220'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc. 251,734.42N, 463,478.41E			

LOGGED DEPTH: 218 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	
	Soil, brownish-gray, sandy
31	
	Conglomerate, orange-brown
93	
	Sandstone, medium gray
115	
	Shale, dark gray, carbonaceous
126	
127	Coal?
	Sandstone, medium gray
159.5	Coal with shale partings
165.5	
	Sandstone, medium gray
220TD	

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-9	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼SE¼	SEC. 22 T. 16N. R. 102W	FOOTAGE LOCATION: 600'FSL, 2,600'FWL	
GROUND ELEVATION: 6,884.5'	TOTAL DEPTH: 540'	DEPTH TO WATER: 53'	
SIZE, BIT TYPE: 4-3/4W	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 540'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	

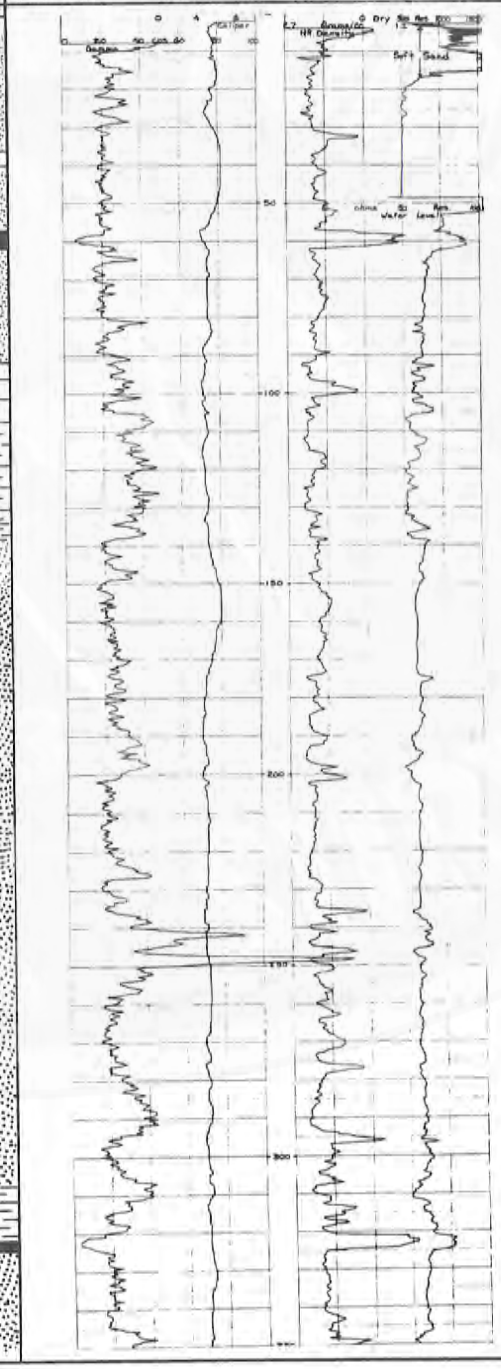
REMARKS: State Coord. System Loc: 247,592.49N, 463,881.96E

LOGGED DEPTH: 536 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0–5	Soil, brown, sandy
5–36	Sandstone, light brown
36–41	Shale, light brown
41–57	Sandstone, light brown,
57–61.5	Coal
61.5–91	Sandstone, light gray
91–133	Shale, dark gray, carbonaceous
133–138	Shale, black, carbonaceous
138–307	Sandstone, brownish-gray Sandstone, medium gray, fine grained, subrounded, well sorted, quartzose
307–321	Shale, medium gray
321–324.5	Coal

STRIP LOG

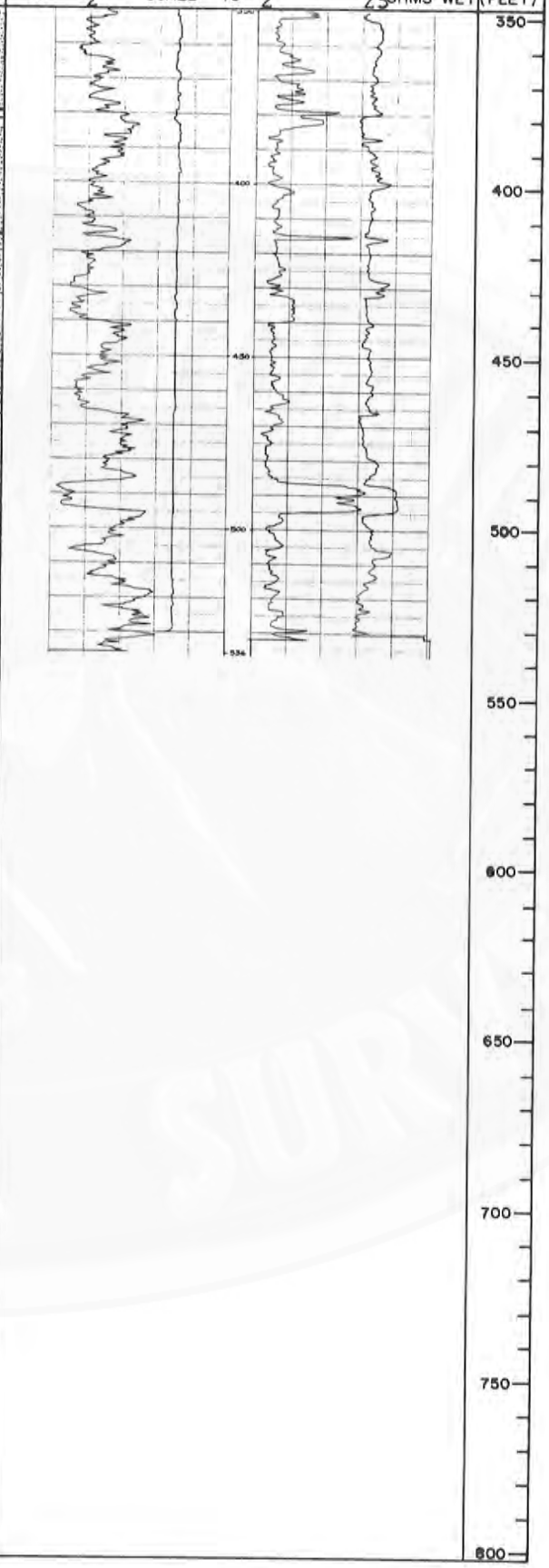


DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-9	SHEET 2 OF 2

LOGGED DEPTH: 536 FT LOGGING SPEED: 20 FT/MIN.

INTERVALS	LITHOLOGY	STRIP LOG
	Sandstone, medium gray	
379	Coal?	
380	Shale, medium gray	
384	Sandstone, medium gray	
415	Coal	
416	Sandstone, medium gray	
487	Coal	
495	Sandstone, medium gray	
540TD		



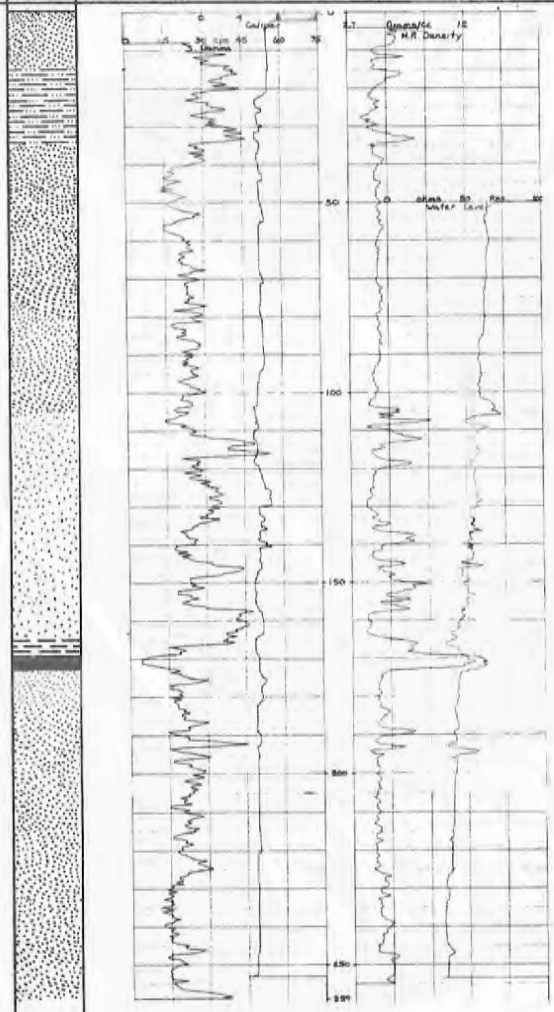
THE UNIVERSITY OF WYOMING		HOLE NO. MSR-10	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/10/82	DATE COMP.: 5/12/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 28 T. 16N. R. 102W.		FOOTAGE LOCATION: 1900' FSL, 600' FEL	
GROUND ELEVATION: 6,890.4'	TOTAL DEPTH: 260'	DEPTH TO WATER: 50'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 260'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 244,075.51N, 460,932.78E			

LOGGED DEPTH: 259 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 15 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	Sandstone, pale orange-gray
15	
	Siltstone, pale orange-brown
34	
	Sandstone, pale orange-white
106	
	Sandstone, light gray
165	Shale, gray
169	Coal
173	
	Sandstone, medium gray
259TD	

STRIP LOG

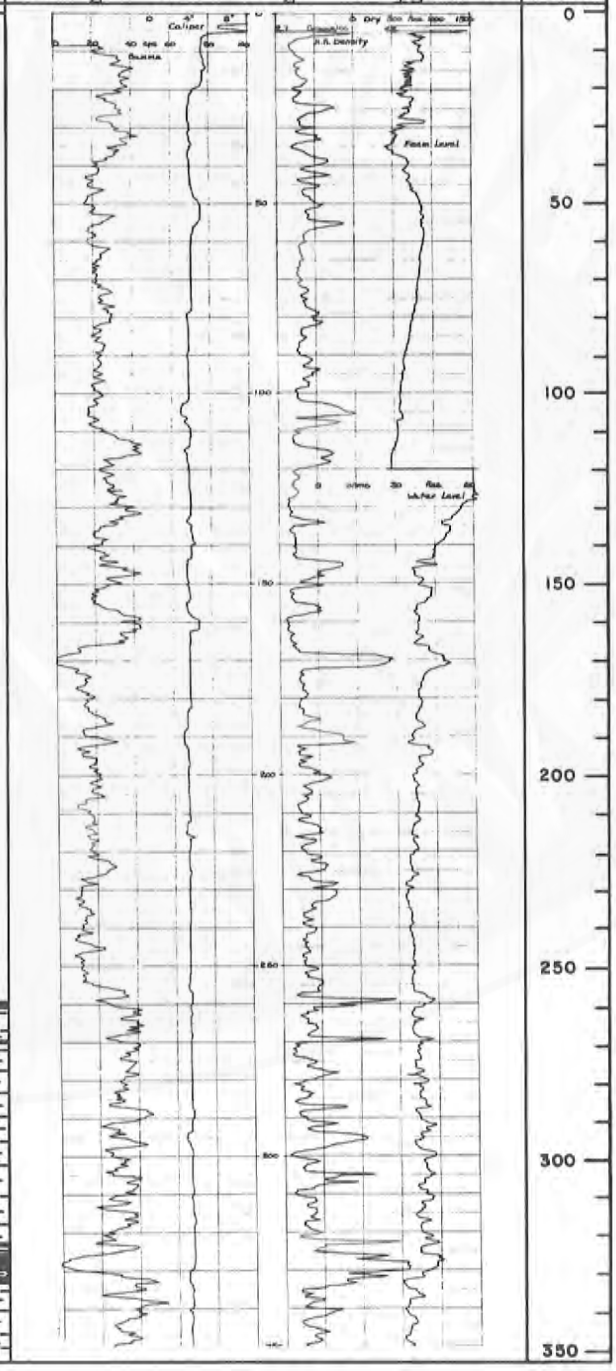


DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-10C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/18/82	DATE COMP.: 5/18/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 28 T. 16N. R. 102W.		FOOTAGE LOCATION: 1,892'FSL, 612'FEL	
GROUND ELEVATION: 6,891.9'	TOTAL DEPTH: 360'	DEPTH TO WATER: 50'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 344'	CORE FOOTAGE: 16'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 244,067.05N, 460,920.40E			

LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG
	Refer to MSR-10 for lithologic description to 259. Description of lithology from cuttings for 259-358.	
163–179	Cored Interval	
259	Coal	
261	Shale	
269	Coal	
270	Shale, dark gray	
322	Coal	
323	Shale, dark gray	
326	Coal with shale partings	
334	Shale, dark gray, carbonaceous	



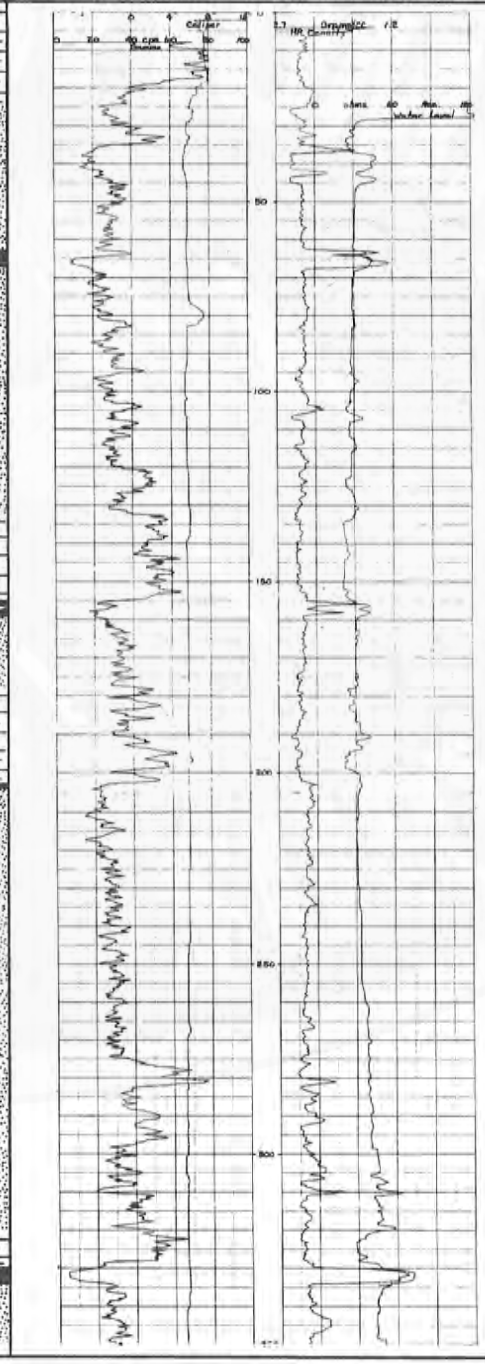
THE UNIVERSITY OF WYOMING			HOLE NO. MSR-10C	SHEET 2 OF 2
CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 200 TC 2 CALIPER 4 8 SCALE H.R. DENSITY CPS/IN 260 TC 2 RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
358TD				350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-11	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/10/82	DATE COMP.: 5/10/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼ SEC. 34 T. 16N., R. 102W.		FOOTAGE LOCATION: 600' FNL, 800' FWL	
GROUND ELEVATION: 6,807.6'	TOTAL DEPTH: 360'	DEPTH TO WATER: 38'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 360'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 241,307.89N, 461,956.36E			

LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
5	Shale, dark gray, carbonaceous
25	Sandstone, light gray
63	Coal
67.5	Sandstone, light gray
134	Shale, medium grayish-brown
155	Coal, 1' shale parting in middle
159	Sandstone, light gray
178	Shale, light gray
203	Coal
204	Sandstone, light gray
320	Shale, medium grayish-brown
330	Coal
334	Sandstone, light gray

STRIP LOG

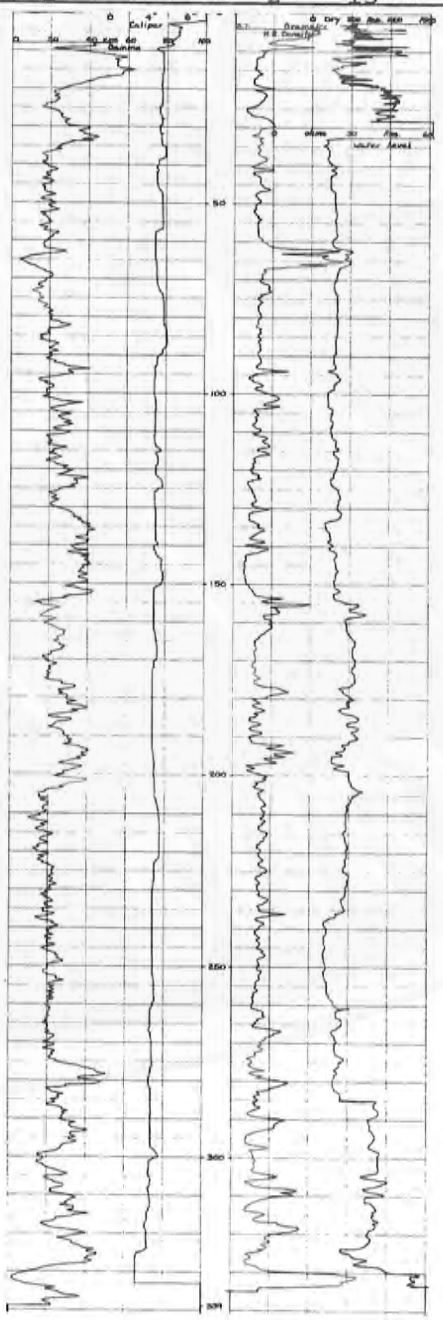


THE UNIVERSITY OF WYOMING			HOLE NO. MSR-11	SHEET 2 OF 2
INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 358 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 200 TC 2 CALIPER 4 8 SCALE H.R. DENSITY CPS/IN 260 TC 2 RESISTIVITY 500 OHMS DRY 30 OHMS WET	DEPTH (FEET)
352 360TD	Shale, medium grayish-brown			350 400 450 500 550 600 650 700 750 800

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-11C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/17/82	DATE COMP.: 5/17/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼NW¼ SEC. 34 T. 16N. R. 102W.		FOOTAGE LOCATION: 616'FNL, 810'FWL	
GROUND ELEVATION: 6,807.6'	TOTAL DEPTH: 340'	DEPTH TO WATER: 33'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 301'	CORE FOOTAGE: 39'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 241,291.92N, 461,946.07E			

LOGGED DEPTH: 359 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to MSR-11						0
58							50
72							
							100
152							150
162							
							200
							250
							300
325							
340	TD						350

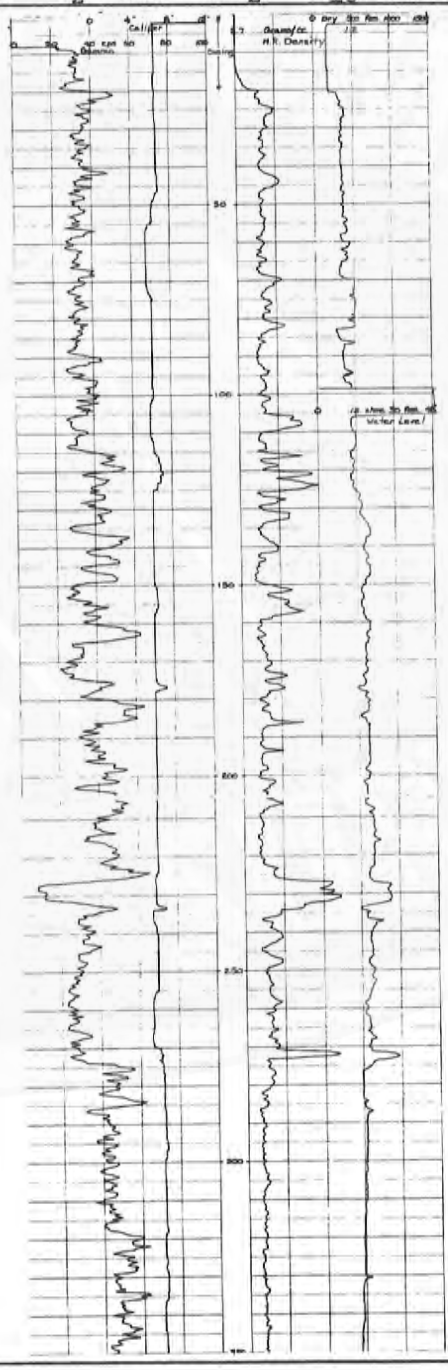


THE UNIVERSITY OF WYOMING		HOLE NO. MSR-12	SHEET 1 OF 3
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/12/82	DATE COMP.: 5/12/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼SE¼ SEC. 34 T. 16N., R. 102W.		FOOTAGE LOCATION: 250' FSL, 1200'FWL	
GROUND ELEVATION: 6,868.4'	TOTAL DEPTH: 980'	DEPTH TO WATER: 105'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 980'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	

REMARKS: State Coord. System Loc: 236,638.79N, 464,622.90E

LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	No Lithology Log available, samples raked out by reclamation crew.						0
							50
							100
							150
							200
227–234	Coal						
							250
271–273	Coal						
							300
							350



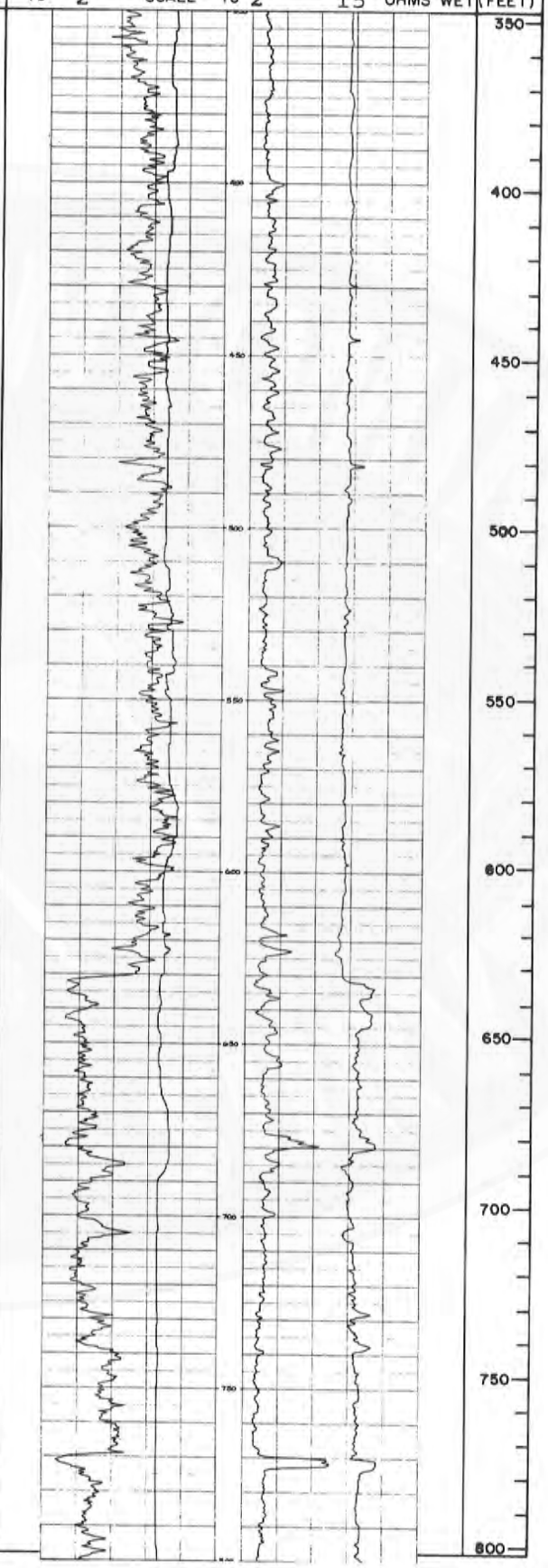
THE UNIVERSITY OF WYOMING

HOLE NO. MSR-12

SHEET 2 OF 3

LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.

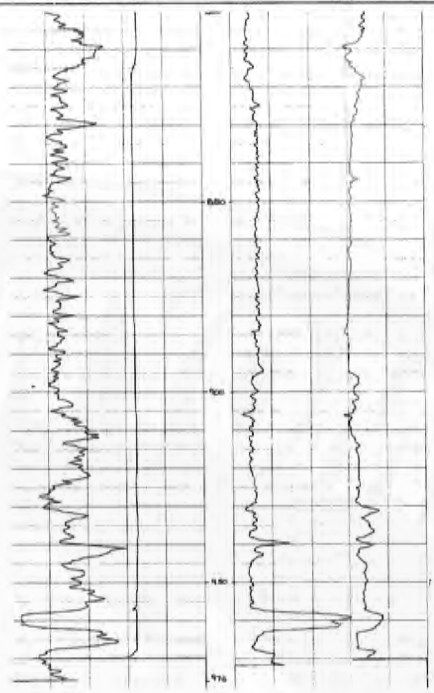
CORED INTERVALS	LITHOLOGY	STRIP LOG
677–680	Coal?	
770–773	Coal	



THE UNIVERSITY OF WYOMING			HOLE NO. MSR-12	SHEET 3 OF 3

LOGGED DEPTH: 976 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 200 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
958 962.5	Coal						
980TD							

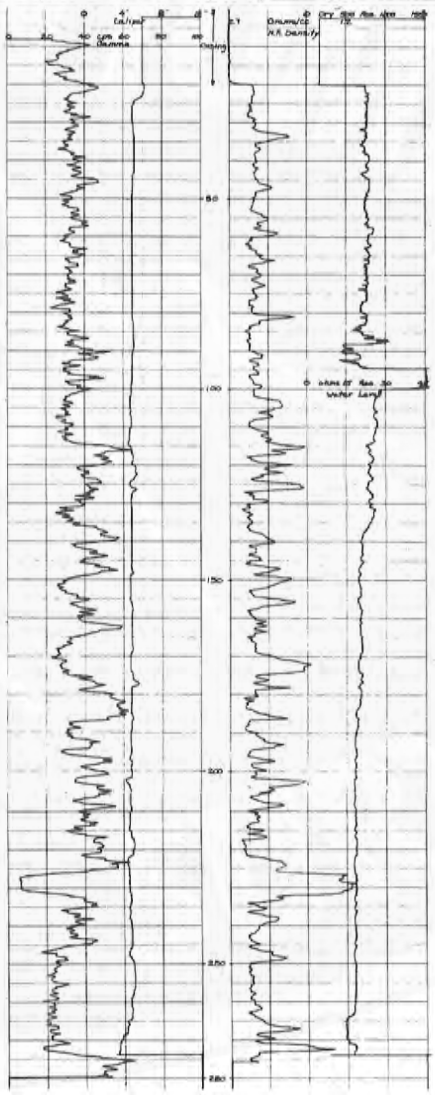


800
850
900
950
1000
1050
1100
1150
1200
1250

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-12C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/13/82	DATE COMP.: 5/13/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼SE¼ SEC. 34 T. 16N. R. 102W		FOOTAGE LOCATION: 262'FSL, 1,189FWL	
GROUND ELEVATION: 6,868.9'	TOTAL DEPTH: 280'	DEPTH TO WATER: 100'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 256'	CORE FOOTAGE: 24'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS: State Coord. System Loc: 236,651.16N, 464,611.98E			

LOGGED DEPTH: 280 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to MSR-12						0, 50, 100, 150, 200, 250, 300, 350
222–236							
270–280	TD						

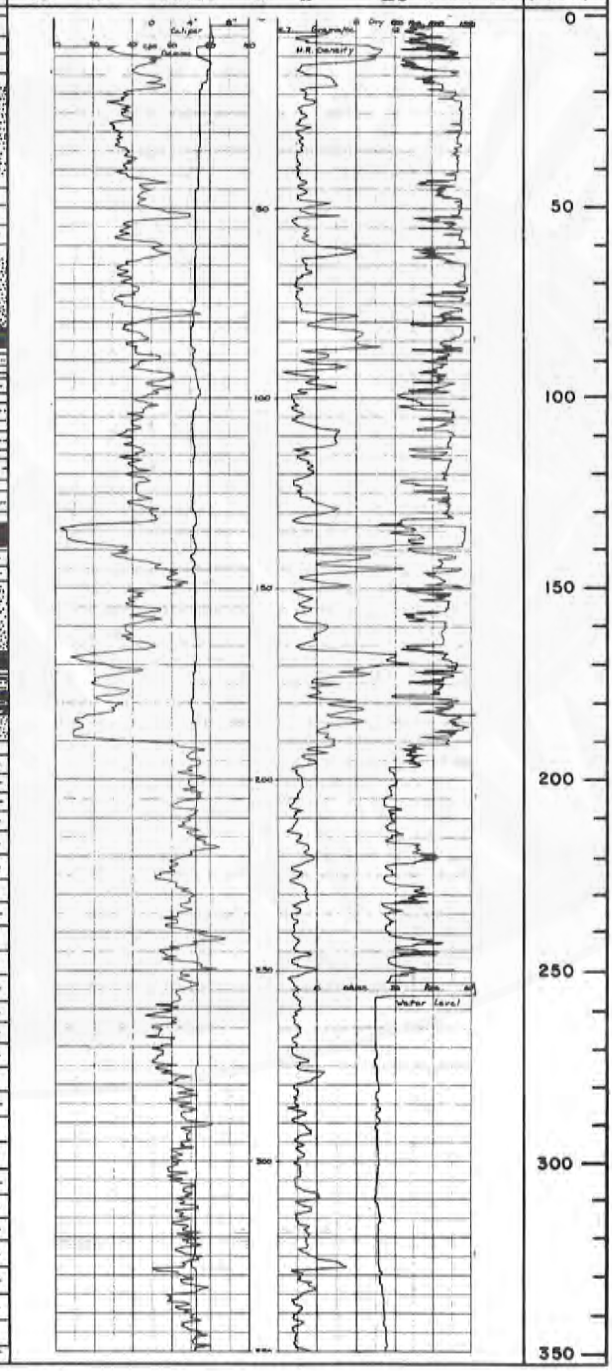


THE UNIVERSITY OF WYOMING		HOLE NO. MSR-13	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 9 T. 15N., R. 102W		FOOTAGE LOCATION: 900' FNL, 1200'FEL	
GROUND ELEVATION: 6910'	TOTAL DEPTH: 460'	DEPTH TO WATER: 256'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 460'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

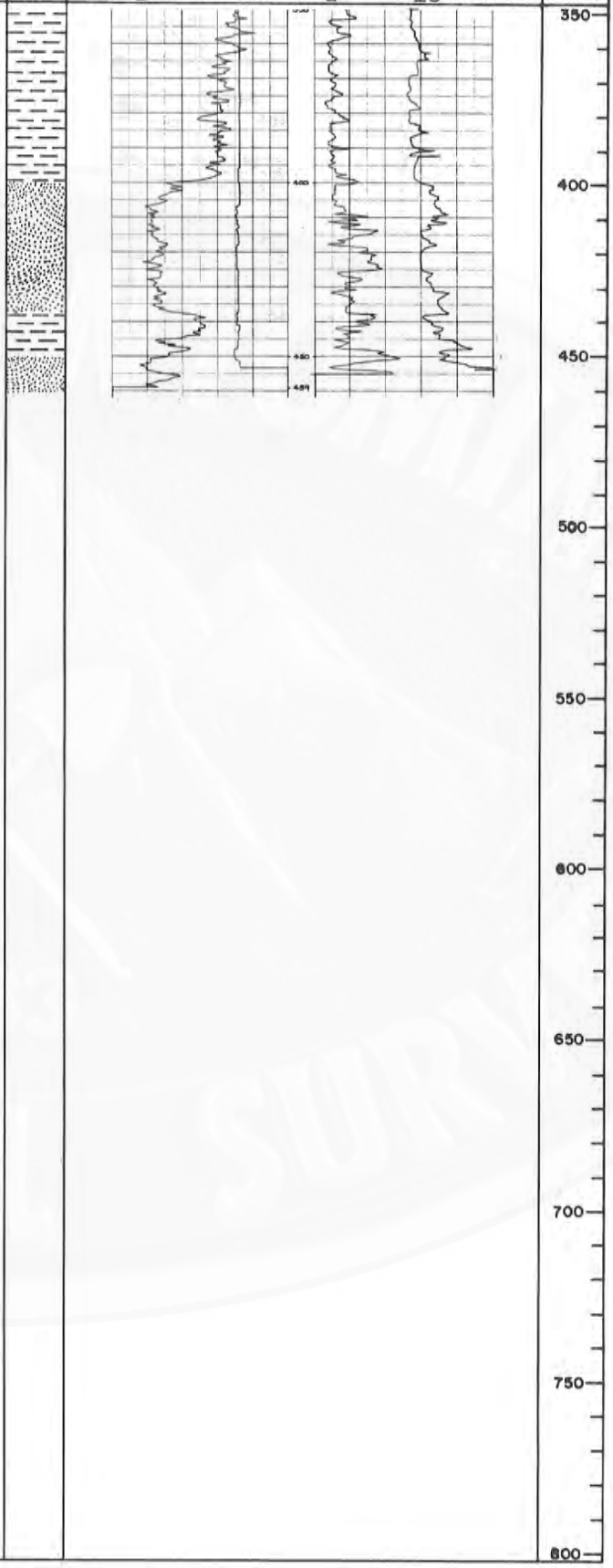
LOGGED DEPTH: 459 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, brown, sandy
5	Shale, pale greenish-brown
18	
	Sandstone, orange-brown
42	
	Shale, pale grayish-green
63	Sandstone, whitish-brown
78	Sandstone, light gray
81	
87	Coal
	Shale, light gray, silty
133	Coal
139.5	Shale, light gray
150	Sandstone, light gray
166	Coal
171	Shale with coal stringers
183	
	Shale



THE UNIVERSITY OF WYOMING			HOLE NO. MSR-13	SHEET 2 OF 2
			LOGGED DEPTH: 459 FT. LOGGING SPEED: 20 FT./MIN.	
INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2 / CALIPER 0 4 8 SCALE / H.R. DENSITY CPS/IN 260 TC 2 / RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)



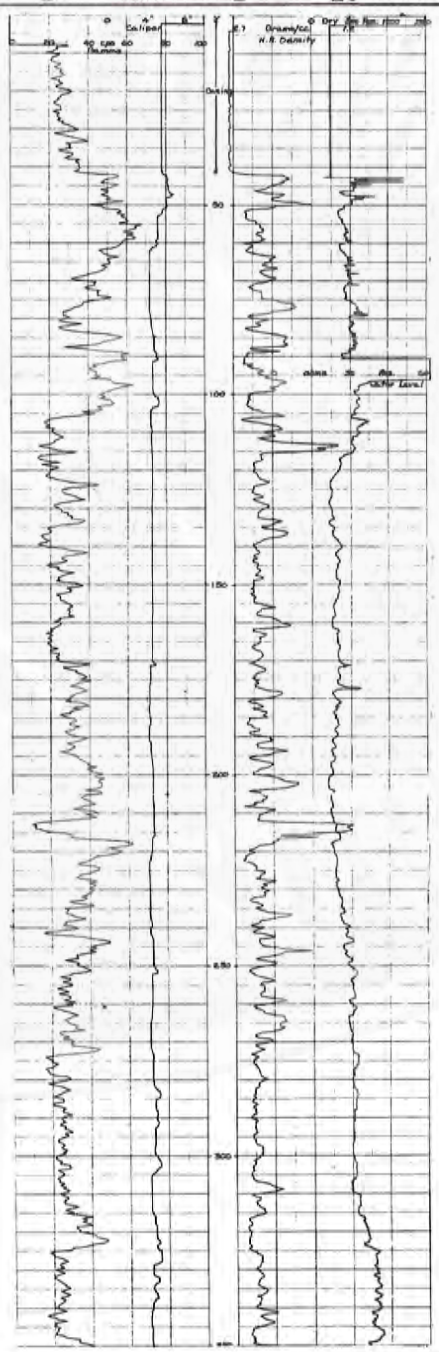
THE UNIVERSITY OF WYOMING		HOLE NO. MSR-14	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/19/82	DATE COMP.: 5/19/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 8 T. 15N R. 102W		FOOTAGE LOCATION: 400'FSL, 750'FEL	
GROUND ELEVATION: 6900'	TOTAL DEPTH: 680'	DEPTH TO WATER: 96'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 680'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 679 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	
	Shale, dark gray-brown
20	
25	Shale, light gray-brown
	Shale
106	
	Sandstone, light gray
113	
115	Coal
	Sandstone, light gray
170	
	Shale, medium gray, silty
212	Coal
216.5	
	Shale, medium gray, silty
238	Shale, black
242	
	Sandstone, light gray
307	Conglomerate
310	
	Sandstone, light gray
349	

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

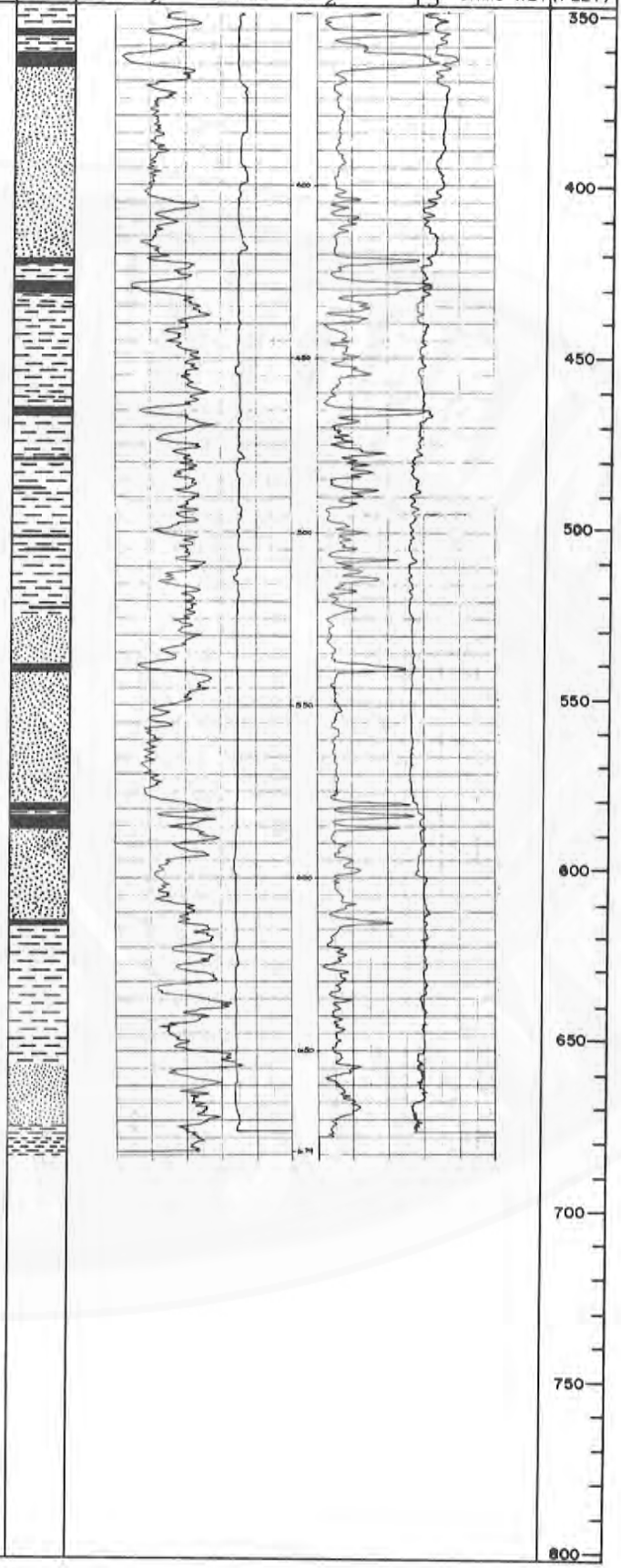
THE UNIVERSITY OF WYOMING

HOLE NO. MSR-14 | SHEET 2 OF 2

LOGGED DEPTH: 679 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 200 TC 2 | CALIPER 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

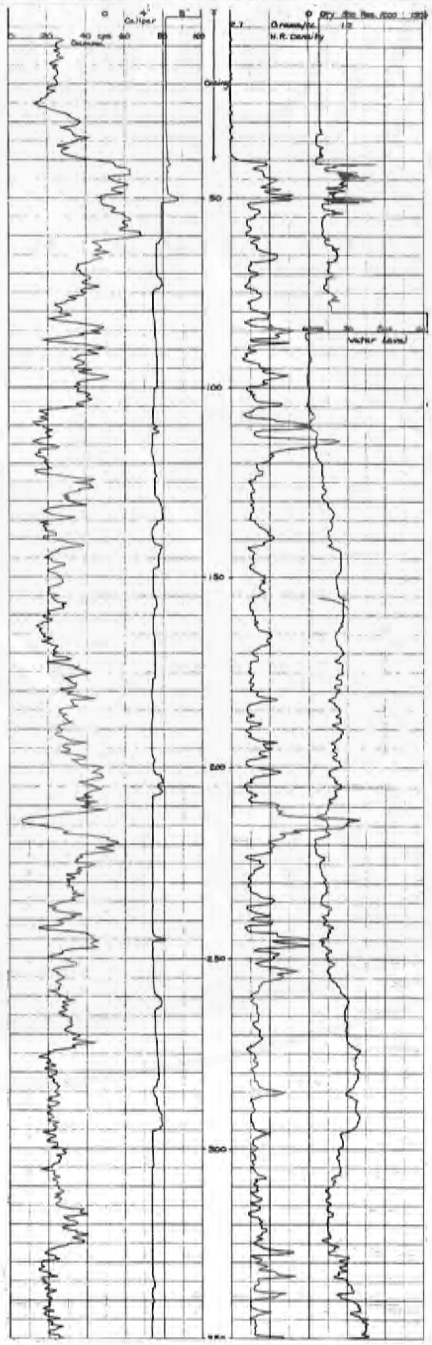
INTERVALS	LITHOLOGY
	Shale, black carbonaceous
355	Coal
357	Shale, black, carbonaceous
362	Coal
366	
	Sandstone, light gray
421	Coal
423	Shale, dark gray to black
428	Coal
432	Shale, dark gray; shale, black, carbonaceous
464.5	Coal
466.5	Shale, dark gray; shale, black, carbonaceous; and thin coals, interbedded
524	Sandstone, light gray
538	Coal
540.5	Sandstone, light gray
578	Coal with dark gray shale partings
586	Sandstone, light gray
612	Coal
613.5	Shale, medium gray
654	Sandstone, light gray
671	Shale, black, carbonaceous
674	Shale, dark gray
680TD	



THE UNIVERSITY OF WYOMING		HOLE NO. MSR-14C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/20/82	DATE COMP.: 5/20/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 8 T. 15N R. 102W.		FOOTAGE LOCATION: 400' FSL, 750' FEL	
GROUND ELEVATION: 6900'	TOTAL DEPTH: 435'	DEPTH TO WATER: 85'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 385'	CORE FOOTAGE: 50'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 434 FT. LOGGING SPEED: 20 FT./MIN.

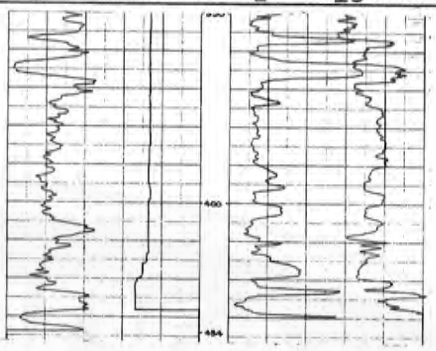
CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
208–222	Refer to MSR-14						0, 50, 100, 150, 200, 250, 300, 350



THE UNIVERSITY OF WYOMING			HOLE NO. MSR-14C	SHEET 2 OF 2

LOGGED DEPTH: 434 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 20 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
351–372							350
							400
420–435	TD						
							450
							500
							550
							600
							650
							700
							750
							800



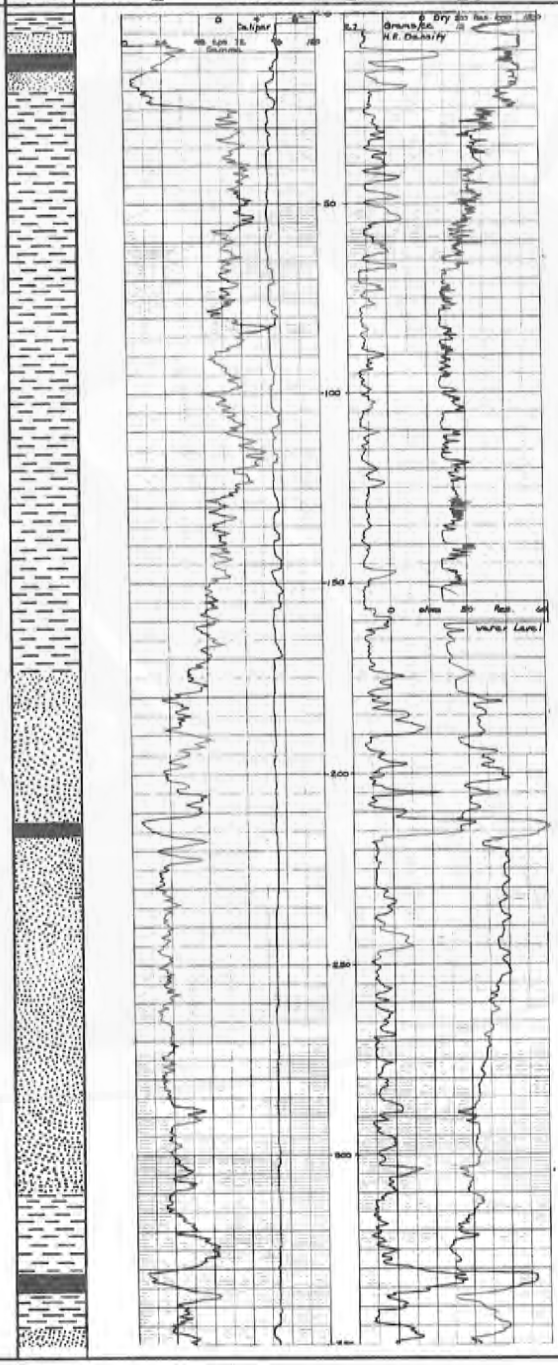
THE UNIVERSITY OF WYOMING		HOLE NO. MSR-15	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/25/82	DATE COMP.: 5/25/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 17 T. 15N. R. 102W		FOOTAGE LOCATION: 2200'FSL, 800'FEL	
GROUND ELEVATION: 6970'	TOTAL DEPTH: 440'	DEPTH TO WATER: 161'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 440'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 440 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
0	Shale, light gray, silty
5	Sandstone, brownish-orange
10	Coal?
15	Sandstone, grayish-brown
20	
	Shale
173	
	Sandstone
212	Coal
216	
	Sandstone, medium gray
310	
	Shale, dark gray
331	Coal
336	Shale, dark gray
345	
	Sandstone, medium gray

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. MSR-15	SHEET 2 OF 2
			LOGGED DEPTH: 440 FT. LOGGING SPEED: 20 FT./MIN.	

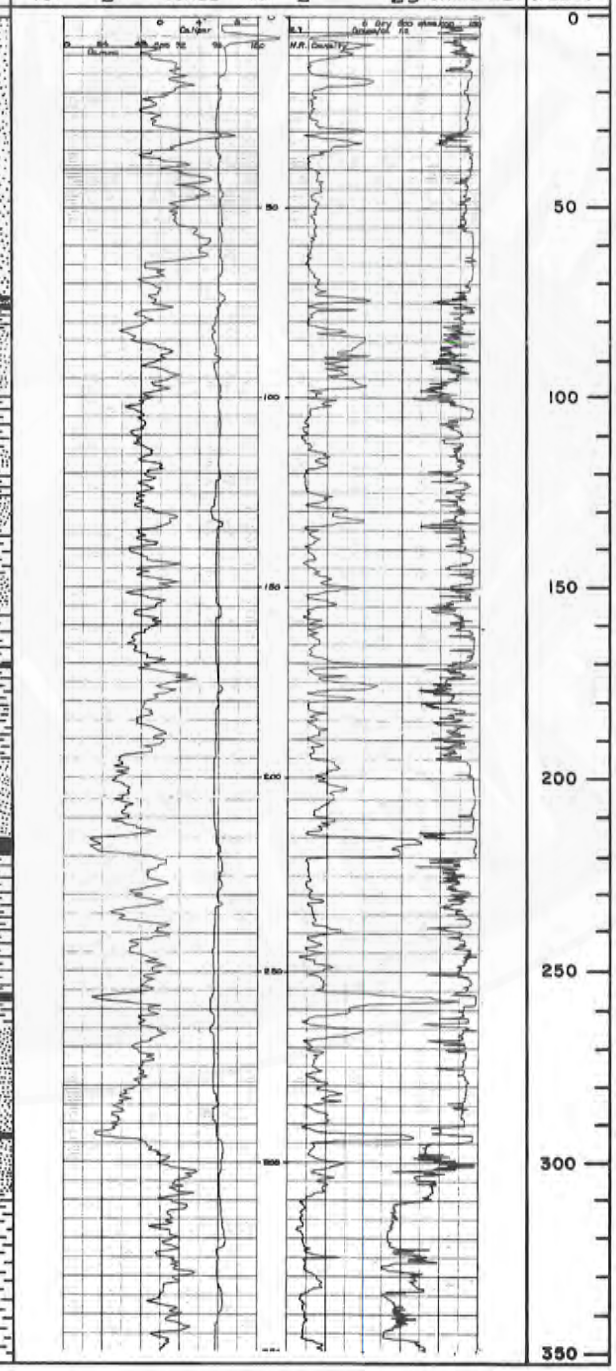
INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
352	Shale, dark gray						350
366	Coal						
368							
	Sandstone, medium gray						400
440TD							
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING		HOLE NO. MSR-16	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 5/31/82	DATE COMP.: 5/31/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 21 T. 15N. R. 102W.		FOOTAGE LOCATION: 150'FSL, 300'FEL	
GROUND ELEVATION: 7300'	TOTAL DEPTH: 740'	DEPTH TO WATER: 423'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 735 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	
	Sandstone, orange-brown
73	
77	Coal, with 2' sandstone parting
82	Shale, medium gray
98	Sandstone, medium gray
	Shale, medium gray to black
114	Sandstone, medium gray
119	Shale, medium gray to black
126	
134	Sandstone, medium gray
147	Shale, medium gray to black
155	Sandstone, medium gray
	Shale, medium gray to black
170	Coal
171	
180	Shale, dark gray
195	Shale, medium gray-green
	Sandstone, medium gray
215	
220	Coal
	Shale, medium gray-green
256	
258	Coal
265	Shale, medium gray-green
	Sandstone, medium gray
292.5	Coal
294	
308	Sandstone, brownish-gray
	Shale

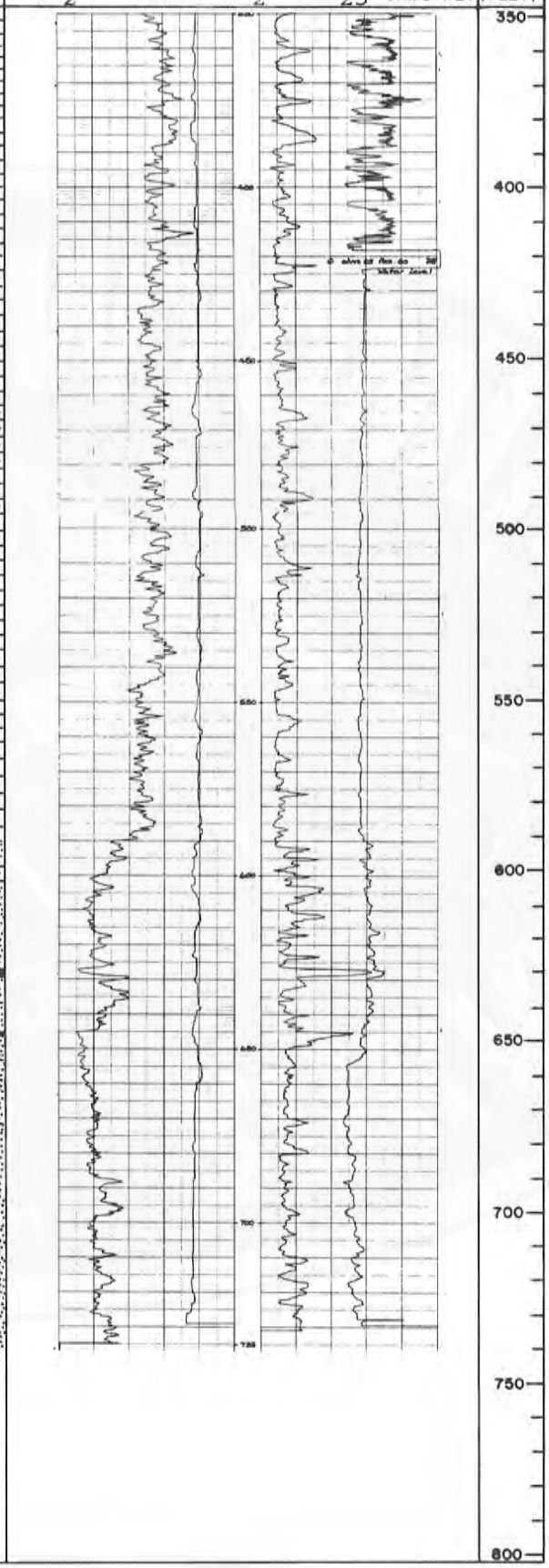


THE UNIVERSITY OF WYOMING

HOLE NO. MSR-16 | SHEET 2 OF 2

LOGGED DEPTH: 735 FT. LOGGING SPEED: 20 FT./MIN.

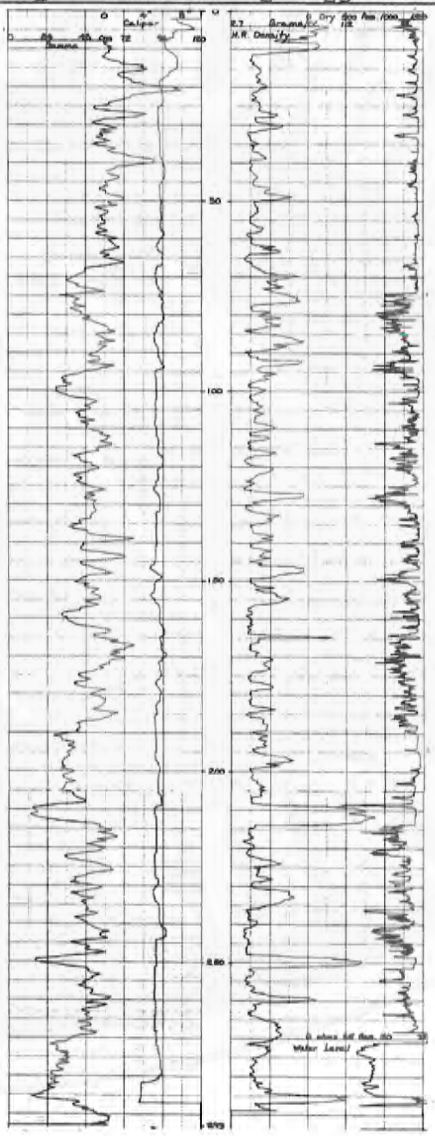
INTERVALS	LITHOLOGY	STRIP LOG
	Shale	
590		
	Sandstone and shale, dark gray to black, interbedded	
627	Coal	
629	Sandstone and shale, dark gray to black, interbedded	
645	Coal	
647		
	Sandstone, medium gray	
740 TD		



THE UNIVERSITY OF WYOMING		HOLE NO. MSR-16C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Mud Springs Ranch	
DATE STARTED: 6/1/82	DATE COMP.: 6/1/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 21 T. 15N R. 102W		FOOTAGE LOCATION: 125' FSL, 310' FWL	
GROUND ELEVATION: 7300'	TOTAL DEPTH: 295'	DEPTH TO WATER: 271'	
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 252'	CORE FOOTAGE: 43'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 293 FT. LOGGING SPEED: 20 FT./MIN.

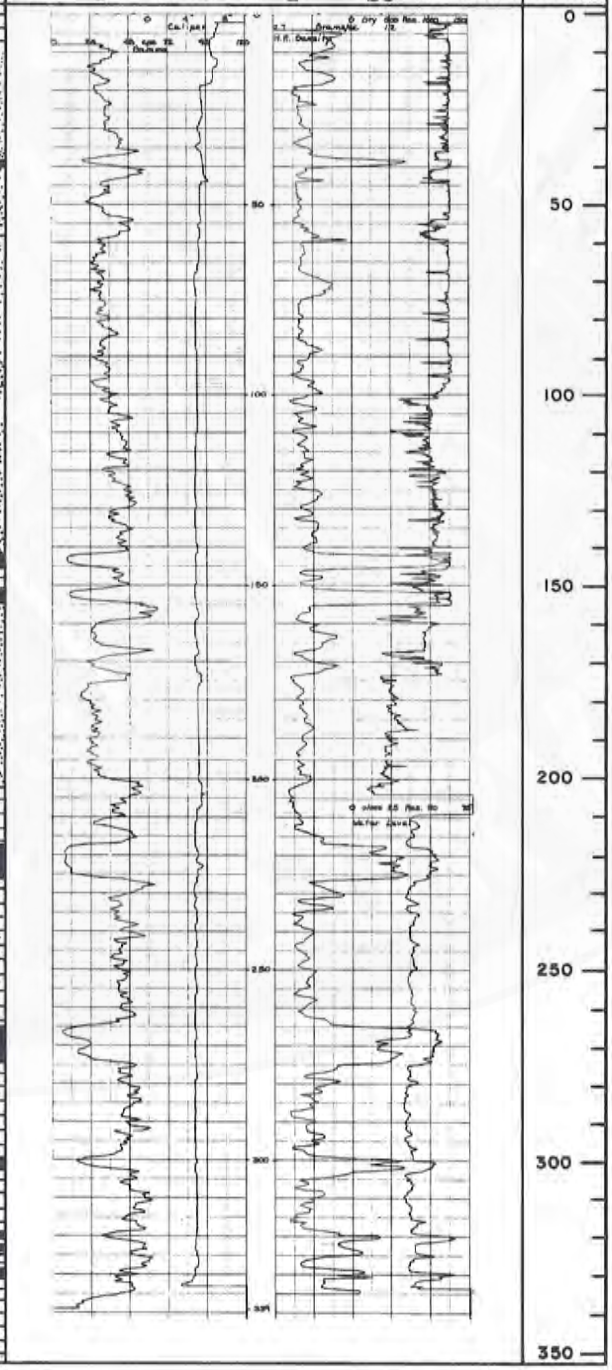
CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Refer to MSR-16						0
							50
							100
							150
							200
210.3 – 225.3							
245 – 261							250
283 – 295	TD						300
							350



THE UNIVERSITY OF WYOMING		HOLE NO. PM-10	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/26/82	DATE COMP.: 5/27/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SW¼ SEC. 33 T. 15N R. 102W		FOOTAGE LOCATION: 1400'FSL, 2640'FEL	
GROUND ELEVATION: 7145'	TOTAL DEPTH: 340'	DEPTH TO WATER: 209'	
SIZE, BIT TYPE: 5-1/8L	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 340'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 339 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Shale, gray-brown, sandy
10	Sandstone, medium gray
15	Sandstone, orange-brown
35	Sandstone, dark gray
38	Coal
40	Sandstone, medium gray
55	Shale, gray-black, carbonaceous
60	Sandstone, orange-brown
90	Sandstone, medium gray
142	Coal
146	Shale, dark gray
151.5	Coal
155	Sandstone, medium gray
202	Shale, black, carbonaceous
217	Coal
226.5	Shale, dark gray
265	Coal
275	Shale, dark gray
299	Coal
303	Shale, dark gray
319.5	Coal, with shale parting
325	Shale, dark gray
328.5	Coal
331	Shale, dark gray

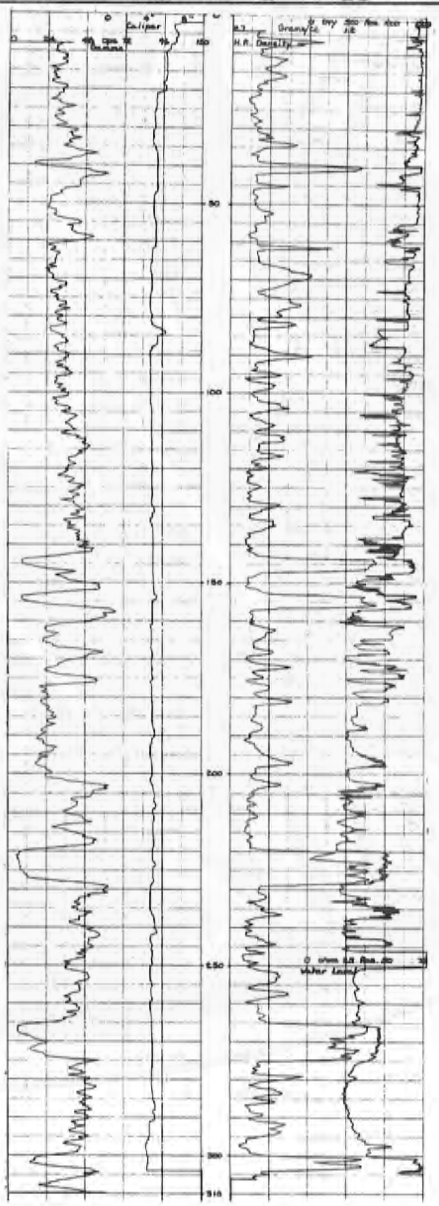


THE UNIVERSITY OF WYOMING			HOLE NO. PM-10	SHEET 2 OF 2
			LOGGED DEPTH: 339 FT. LOGGING SPEED: 20 FT./MIN.	
INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 TC 2 / CALIPER 0 4 8 SCALE / H.R. DENSITY CPS/IN 260 TC 2 / RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Shale, dark gray			350
400TD				400
				450
				500
				550
				600
				650
				700
				750
				800

THE UNIVERSITY OF WYOMING		HOLE NO. PM-10C	SHEET 1 OF 1
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/28/82	DATE COMP.: 5/28/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼SW¼ SEC. 33 T. 15N R. 102W		FOOTAGE LOCATION: 1400'FSL, 2640'FEL	
GROUND ELEVATION: 7145'	TOTAL DEPTH: 312'	DEPTH TO WATER: 246'	
SIZE, BIT TYPE: 4 ¾" K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 233.7	CORE FOOTAGE: 78.3'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 310 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Refer to PM-10						0, 50, 100, 150, 200, 250, 300, 350
140–160							
215–236.5							
262–282.8							
297–312	TD						



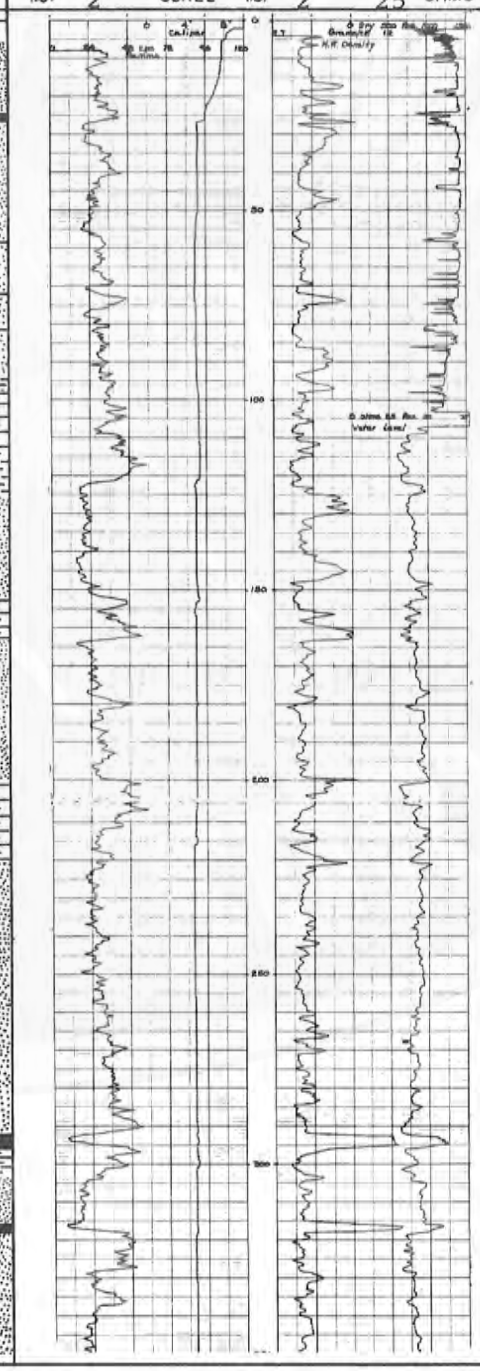
THE UNIVERSITY OF WYOMING		HOLE NO. PM-11	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/28/82	DATE COMP.: 5/29/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼NW¼ SEC. 4 T. 14N R. 102W		FOOTAGE LOCATION: 1800'FNL, 700'FWL	
GROUND ELEVATION: 7210'	TOTAL DEPTH: 520'	DEPTH TO WATER: 107'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 520'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	

REMARKS:

LOGGED DEPTH: 516 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
5	Sandstone, orange-gray
24.5	Coal?
27	Sandstone, medium gray
45	
50	Sandstone, orange-brown
	Sandstone, medium gray and shale, dark gray, interbedded
98	
	Shale, dark gray
125	
	Sandstone, medium gray
152	
163	Shale, dark gray-black
	Sandstone, medium gray
200	
	Shale, gray to black
220	
	Sandstone
292	
296	Coal
303	Shale, dark gray, carbonaceous
315.5	Sandstone, light gray
318	Coal
	Sandstone, light gray and shale, dark gray, interbedded

STRIP LOG



THE UNIVERSITY OF WYOMING			HOLE NO. PM-11	SHEET 2 OF 2
			LOGGED DEPTH 516 FT. LOGGING SPEED 20 FT./MIN.	

INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
372	Coal						350
378.5	Shale and siltstone						
387.5	Coal						
388.5	Shale, dark gray and siltstone, light gray						
400							400
	Sandstone, light gray						
439	Shale, dark gray, carbonaceous						
457							450
468	Coal						
	Shale, dark gray, carbonaceous						
488							
492	Coal						
504	Sandstone and shale, interbedded coal, with shale parting near base.						500
507							
520TD	Sandstone, light gray and shale, dark gray, carbonaceous, interbedded.						
							550
							600
							650
							700
							750
							800

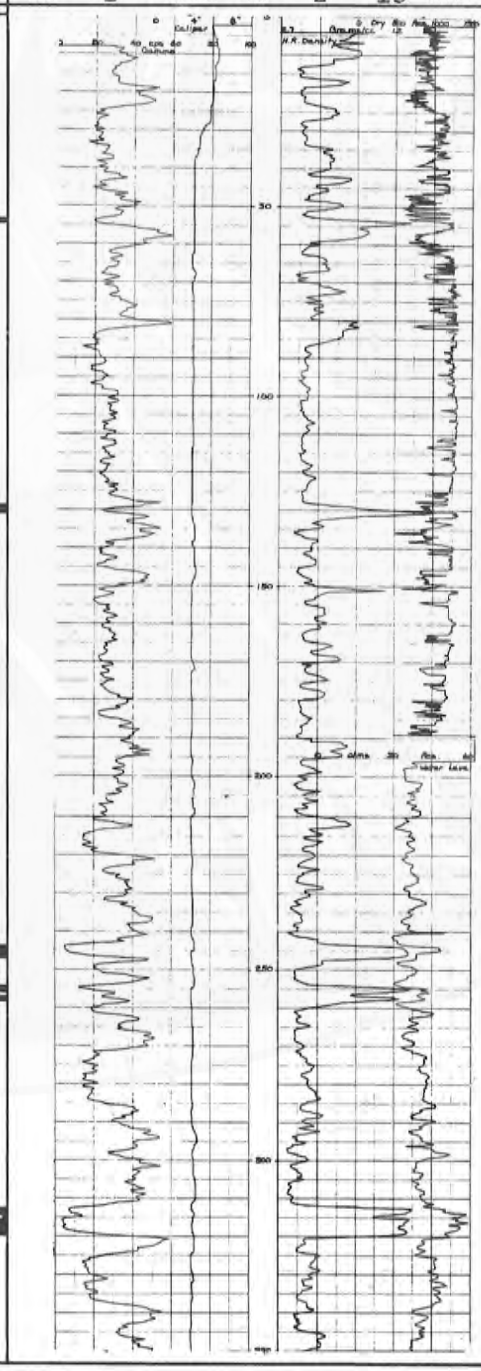
THE UNIVERSITY OF WYOMING		HOLE NO. PM-12	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/20/82	DATE COMP.: 5/20/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 6 T. 14N R. 102W		FOOTAGE LOCATION: 1800'FNL, 2300'FEL	
GROUND ELEVATION: 7390'	TOTAL DEPTH: 520'	DEPTH TO WATER: 196'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 520'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 518 FT. LOGGING SPEED: ____ FT./MIN.

GAMMA CPS/IN 20 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 15 OHMS WET

INTERVALS	LITHOLOGY
	No lithology log available, samples washed out by core hole drilling
53.5 55	Coal
129 132	Coal
243.5 247.5	Coal
254 258	Coal, with parting in middle
312 320	Coal, with parting between 314 and 315

STRIP LOG

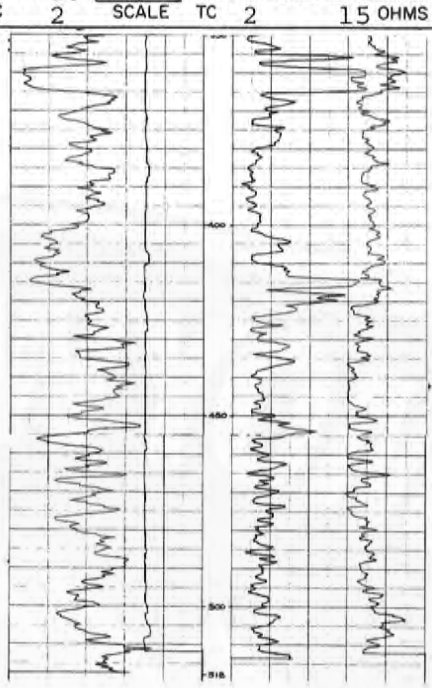


DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING		HOLE NO. PM-12	SHEET 2 OF 2

LOGGED DEPTH: 518 FT. LOGGING SPEED: ____ FT./MIN.

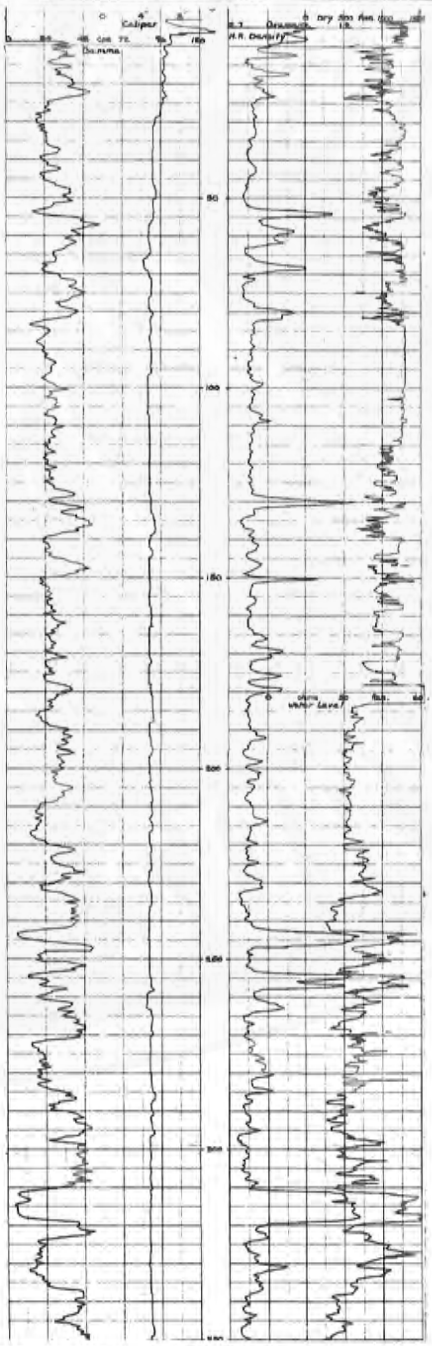
INTERVALS	LITHOLOGY	STRIP LOG
355	Coal	
357		
358.5	Coal	
365		
414	Coal	
416.5		
417.5	Coal	
421		
520TD		



THE UNIVERSITY OF WYOMING		HOLE NO. PM-12C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/26/82	DATE COMP.: 5/26/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼NE¼ SEC. 6 T. 14N. R. 102W		FOOTAGE LOCATION: 1800'FNL, 2300'FEL	
GROUND ELEVATION: 7390'	TOTAL DEPTH: 425.6'	DEPTH TO WATER: 183'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 341.7'	CORE FOOTAGE: 83.9'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

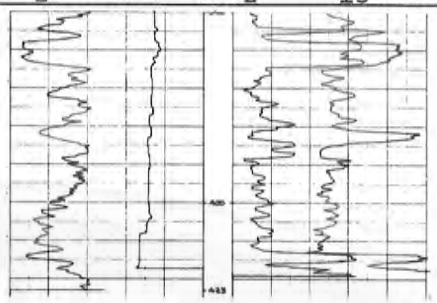
LOGGED DEPTH: 423 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 15 OHMS WET	DEPTH (FEET)
	Refer to PM-12						0, 50, 100, 150, 200, 250, 300, 350
238 – 263.4							
305 – 324							



THE UNIVERSITY OF WYOMING			HOLE NO. PM-12C	SHEET 2 OF 2
			LOGGED DEPTH: 423 FT. LOGGING SPEED: 20 FT./MIN.	

CORED INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 / TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 / TC 2	RESISTIVITY 500 OHMS DRY / 15 OHMS WET	DEPTH (FEET)
350							350
374							
							400
410							
425	TD						
							450
							500
							550
							600
							650
							700
							750
							800

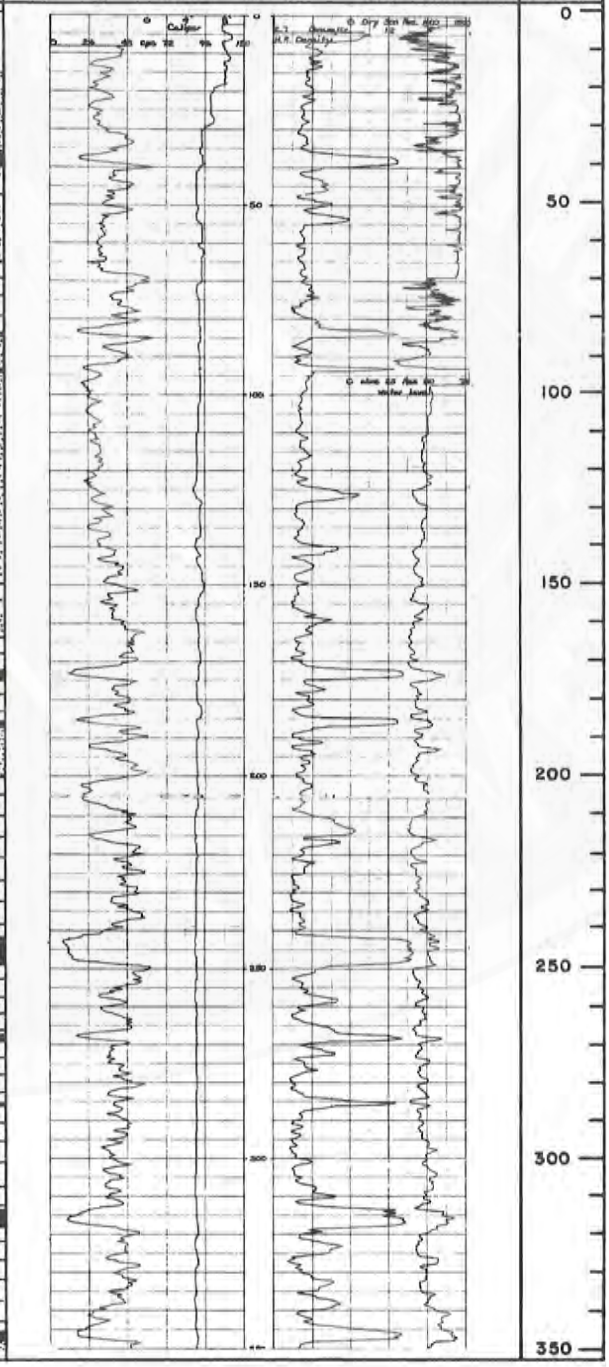


THE UNIVERSITY OF WYOMING		HOLE NO. PM-13	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/29/82	DATE COMP.: 5/29/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NE¼NE¼ SEC. 8 T. 14N. R. 102W.		FOOTAGE LOCATION: 200'FNL, 800'FEL	
GROUND ELEVATION: 7270'	TOTAL DEPTH: 400'	DEPTH TO WATER: 97'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 400'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 385 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
14	Sandstone, orange-brown
37	Coal
40	Sandstone and shale, interbedded
52	Sandstone, medium gray
68	Shale, light gray
83	Coal
85	Sandstone, medium gray
92.5	Coal
94	Sandstone, medium gray
149	Shale, medium gray
157	Sandstone, medium gray-brown
163	Shale, black, carbonaceous
172	Coal
175	Shale, dark gray
185	Coal
187	Sandstone, medium gray
200	Shale, black, carbonaceous
241.5	Coal
249	Shale, light gray to black
267	Coal
269	Shale, light gray to black
285	Coal
286	Shale, light gray to black
313	Coal
318	Shale, light gray to black
345	Coal
348	



THE UNIVERSITY OF WYOMING			HOLE NO. PM-13	SHEET 2 OF 2
			LOGGED DEPTH: 385 FT. LOGGING SPEED: 20 FT./MIN.	

INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 TC 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
354 358	Sandstone, medium gray Coal with shale parting						350
	Shale, black, carbonaceous						
400TD							400
							450
							500
							550
							600
							650
							700
							750
							800

THE UNIVERSITY OF WYOMING	HOLE NO. PM-14	SHEET 1 OF 3

AREA: Salt Wells	QUAD. NAME: Potter Mountain
DATE STARTED: 5/25/82 DATE COMP.: 5/30/82	COUNTY: Sweetwater STATE: Wyoming
LOCATION: NW¼SE¼ SEC. 6 T. 14N. R. 102W.	FOOTAGE LOCATION: 1800'FSL, 2300'FEL
GROUND ELEVATION: 7470' TOTAL DEPTH: 1000'	DEPTH TO WATER: 495'
SIZE, BIT TYPE: 5-1/8K,V DRILL TYPE: Portadrill	ROTARY FOOTAGE: 1,000' CORE FOOTAGE: 0'
DRILLED BY: Gordon Drillings	GEOPHYSICAL LOGGING BY: Reich Geophysical
LITHOLOGY RECORDED BY: G. Huskey	GEOPHYSICAL PROBE TYPE: Comprobe #2

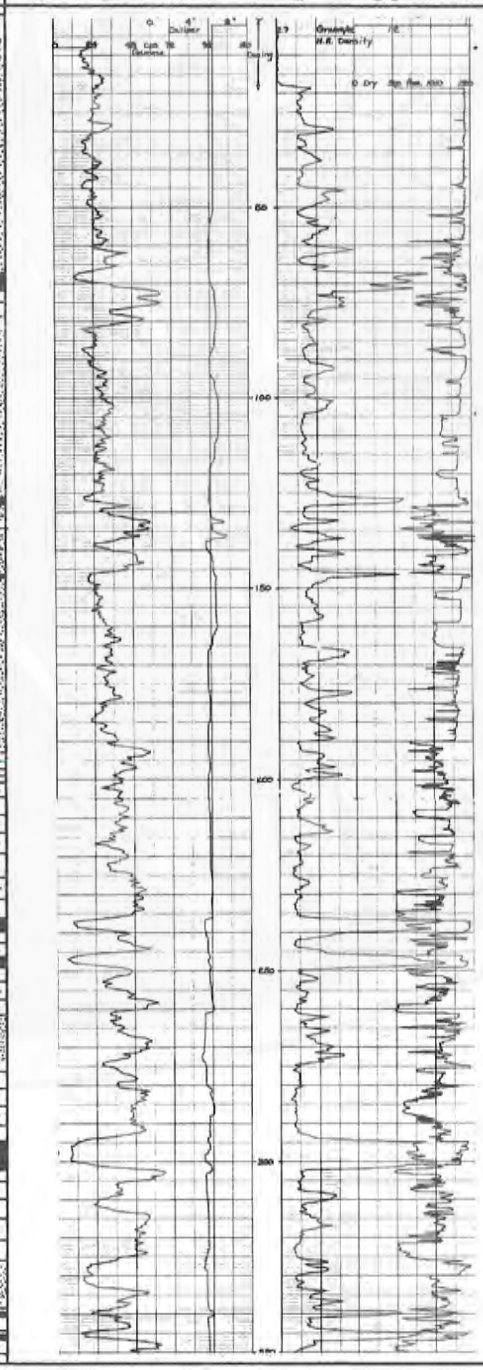
REMARKS:

LOGGED DEPTH: 999 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 30 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, light brown, sandy
5	
	Sandstone, light orange-brown
67	Coal, with shaley parting
72	Shale, dark gray-brown
81	
	Sandstone, light gray
126	Coal
128	Sandstone, dark gray
132	Sandstone and shale, dark gray
146	Coal?
147	
	Sandstone, light gray
191	Shale, light gray, and silty
201	
	Shale, dark gray
236.5	Coal
240	Shale, medium gray
246	Coal
249	Shale, medium gray
262	Sandstone, light gray
274	Shale, dark gray
294.5	Coal
302	Shale, light to dark gray
327	Sandstone, light gray
336	Shale, dark gray
339	Coal
341	Shale, dark gray
345	Coal
347	

STRIP LOG



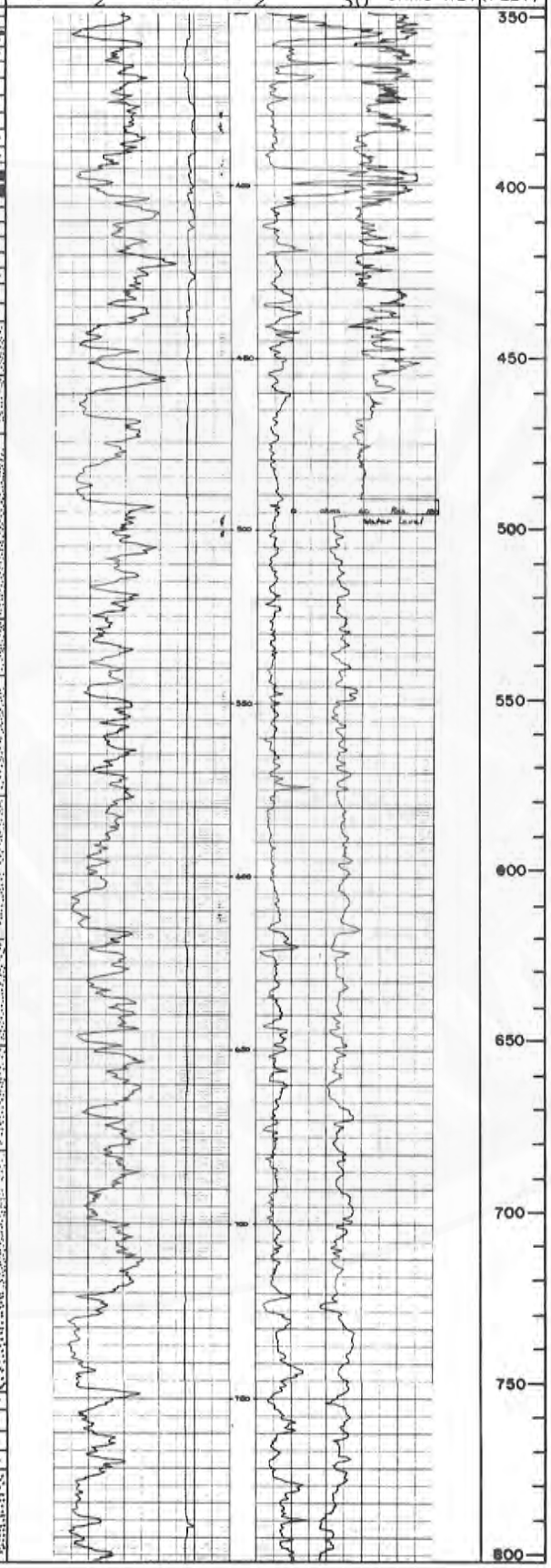
DEPTH (FEET)

THE UNIVERSITY OF WYOMING

HOLE NO. PM-14 | SHEET 2 OF 3

LOGGED DEPTH: 999 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
355	Shale, dark gray
356	Coal
	Shale, dark gray
395	
403	Coal with shale parting
	Shale, light and dark gray
440	
	Sandstone, light gray and shale, light gray, interbedded
493	
	Sandstone, medium gray and shale, light gray, interbedded
720	
	Sandstone, medium gray
748	
	Shale, light gray
772	
	Sandstone, medium gray
798	



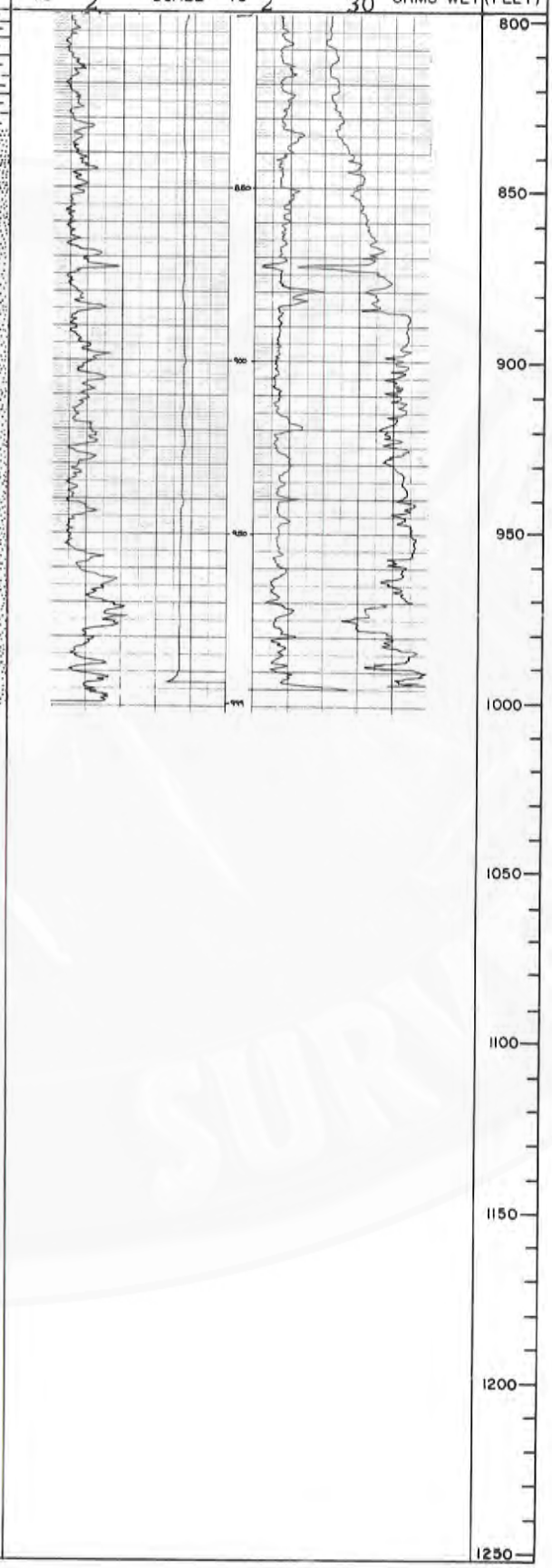
THE UNIVERSITY OF WYOMING

HOLE NO. PM-14

SHEET 3 OF 3

LOGGED DEPTH: 999 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
	Shale, light gray	
833		
	Sandstone, medium gray	
1000 TD		

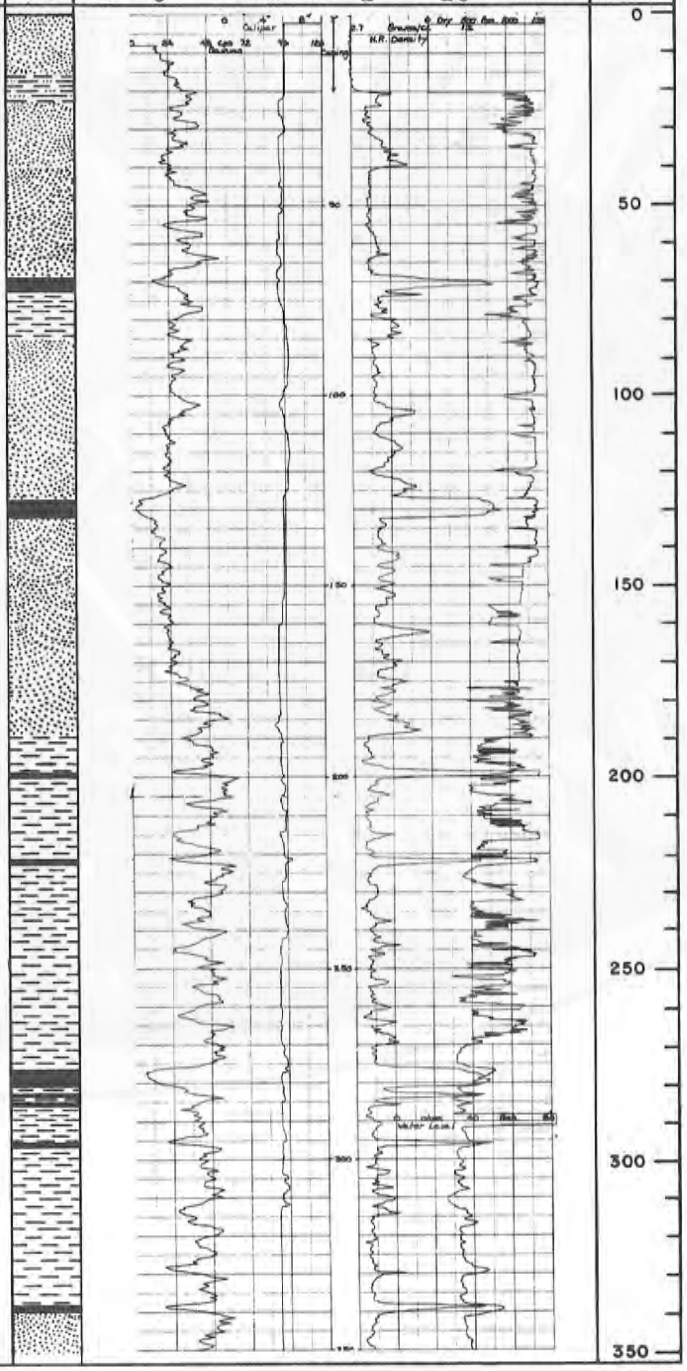


THE UNIVERSITY OF WYOMING		HOLE NO. PM-15	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 6/2/82	DATE COMP.: 6/3/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 17 T. 14N. R. 102W		FOOTAGE LOCATION: 2500'FNL, 900'FEL	
GROUND ELEVATION: 7510'	TOTAL DEPTH: 740'	DEPTH TO WATER: 291'	
SIZE, BIT TYPE: 5-1/8K ,V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 0 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY
0	Sandstone, orange-brown
16	Shale, dark gray, silty
23	Sandstone, orange-brown
40	Sandstone, medium gray
69	Coal?
71.5	Shale, dark gray-brown
85	Sandstone, medium gray
127	Coal
132	Sandstone, light gray
189	Shale, dark gray
198.5	Coal
200	Shale, dark gray
221	Coal
223	Shale, medium to dark gray, banded
276	Coal
281	Coal and shale, dark gray
286	Shale, dark gray
295	Coal
296.5	Shale, dark gray
338	Coal
340	

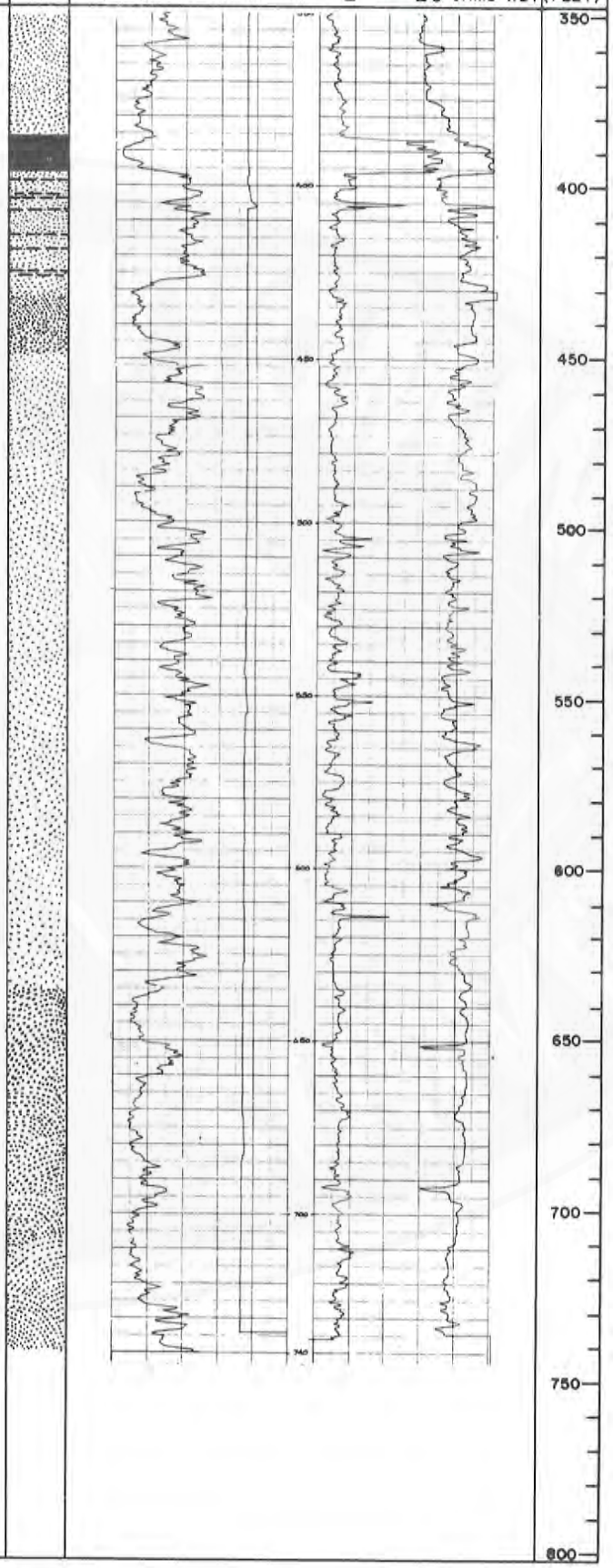


THE UNIVERSITY OF WYOMING

HOLE NO. PM-15 | SHEET 2 OF 2

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
	Sandstone, light brownish-gray
386.5	Coal
396	
	Sandstone, light gray and shale, interbedded
427	
	Sandstone, light gray
448	
	Sandstone, medium gray
635	
	Sandstone, light gray
740TD	



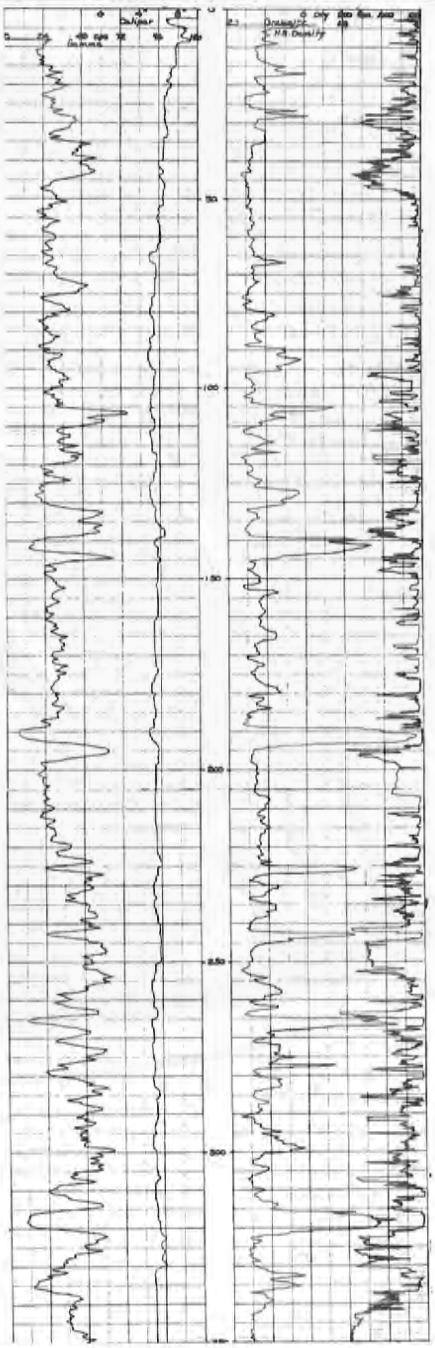
THE UNIVERSITY OF WYOMING		HOLE NO. PM-16	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 5/30/82	DATE COMP.: 5/31/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SE¼ SEC. 18 T. 14N. R. 102W.		FOOTAGE LOCATION: 300' FSL, 2300' FWL	
GROUND ELEVATION: 7750'	TOTAL DEPTH: 580'	DEPTH TO WATER: 500'	
SIZE, BIT TYPE: 5-1/8K, WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 580'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 556 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0–5	Soil, orange-brown, sandy
5–18	Sandstone, orange-brown
18–27	Shale, dark gray
27–42	Sandstone, brownish-gray
42–80	Sandstone, pale orange-brown
80–95	Sandstone, medium gray
95–105	Shale, dark gray
105–117	Sandstone, medium gray
117–127	Shale, black, carbonaceous
127–131	Sandstone, medium gray
131–139	Shale, black, carbonaceous
139–144	Coal
144–189	Sandstone, medium gray
189–193	Coal
193–208	Sandstone, medium gray
208–225	Shale, dark gray, carbonaceous
225–227	Coal
227–242	Sandstone, medium gray, and shale, dark gray, carbonaceous
242–244	Coal
244–265	Shale, dark gray, carbonaceous
265–267.5	Coal
267.5–316	Shale, dark gray, carbonaceous
316–321	Coal
321–342	Sandstone, dark gray

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

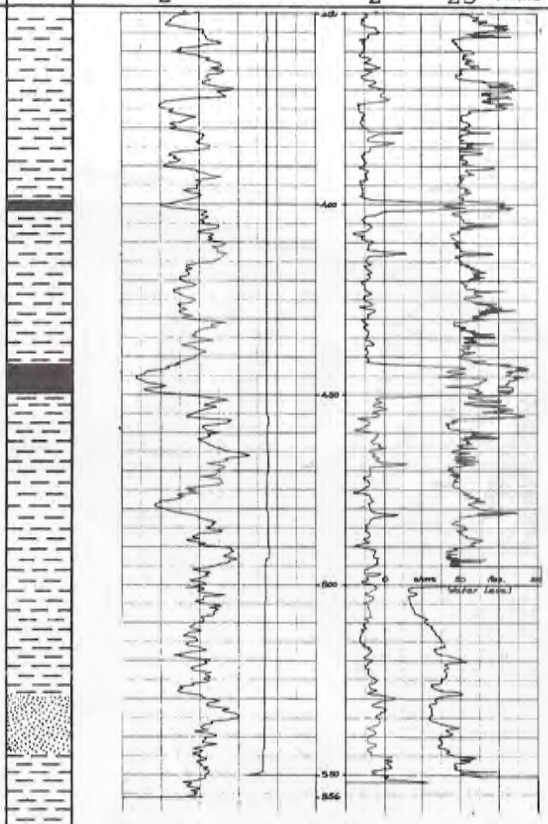
THE UNIVERSITY OF WYOMING

HOLE NO. PM-16 | SHEET 2 OF 2

LOGGED DEPTH: 556 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
	Shale, dark gray, carbonaceous
399	
402	Coal
	Shale, dark gray, carbonaceous
442	
450	Coal
	Shale, dark gray, carbonaceous
529	
	Sandstone
545	
	Shale, medium to dark gray, carbonaceous
580 TD	

STRIP LOG

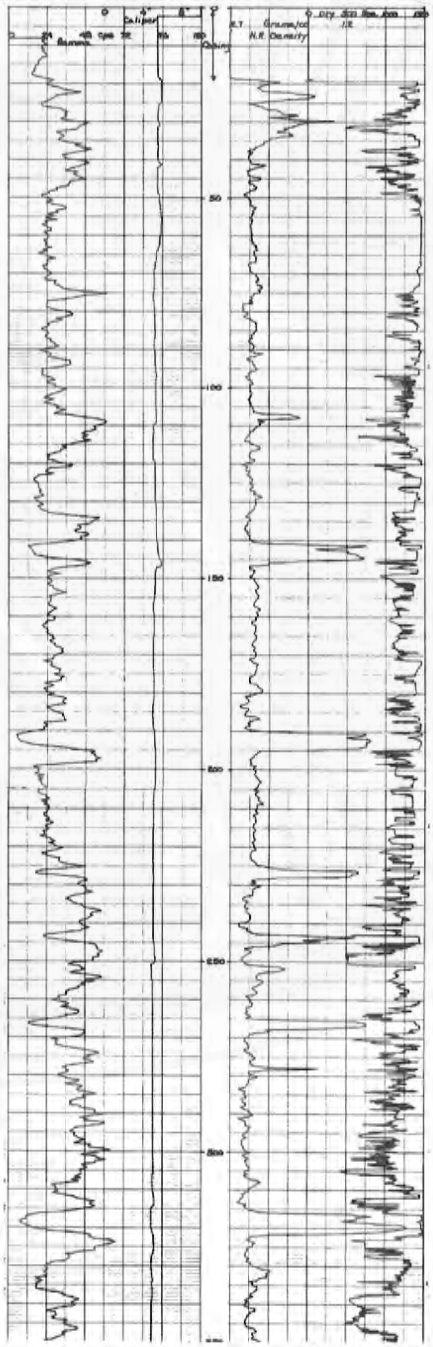


DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

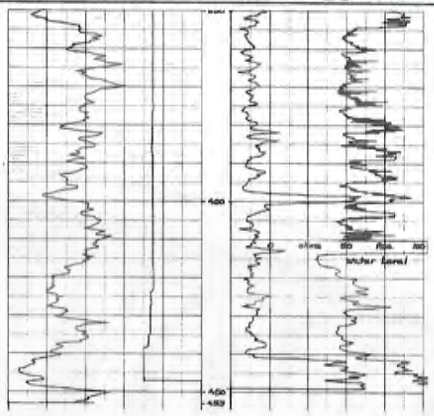
THE UNIVERSITY OF WYOMING		HOLE NO. PM-16C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 6/2/82	DATE COMP.: 6/2/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 18 T.14N R. 102W		FOOTAGE LOCATION: 300'FSL, 2300'FWL	
GROUND ELEVATION: 7750'	TOTAL DEPTH: 455'	DEPTH TO WATER: 413'	
SIZE, BIT TYPE: 4 ¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 399.7'	CORE FOOTAGE: 55.3'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 453 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 24 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 T.C. 2	RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
	Refer to PM-16						0, 50, 100, 150, 200, 250, 300, 350
137–147							
187–197							
263–273							
316–326							



THE UNIVERSITY OF WYOMING			HOLE NO. PM-16C	SHEET 2 OF 2
CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 453 FT. LOGGING SPEED: 20 FT/MIN. GAMMA CPS/IN 24 TC 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 TC 2 RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)



440

455.3 TD

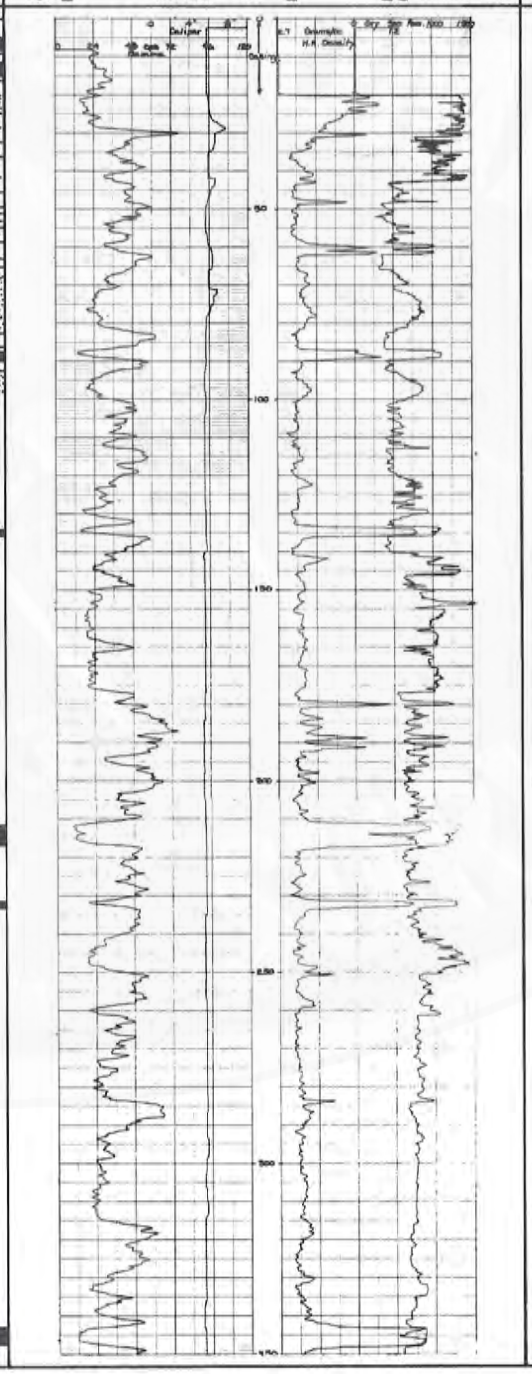
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING			HOLE NO. PM-17	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain		
DATE STARTED: 6/2/82	DATE COMP.: 6/3/82	COUNTY: Sweetwater	STATE: Wyoming	
LOCATION: SW¼NW¼ SEC.24 T. 14N R.103W.		FOOTAGE LOCATION: 2200'FNL, 100'FWL		
GROUND ELEVATION: 7870'	TOTAL DEPTH: 500'	DEPTH TO WATER: 382'		
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 500'	CORE FOOTAGE: 0'	
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical		
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2		
REMARKS: Lost circulation at 100' and drilled blind to TD				

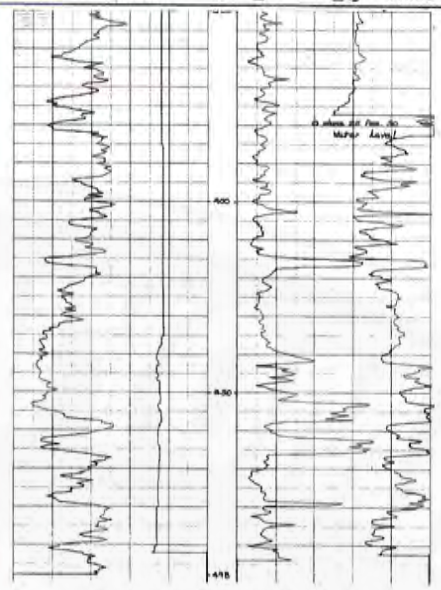
LOGGED DEPTH: 498 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, gray-brown, shaley
5	Coal
8	Shale, medium gray
11	
15	Coal?
19	Shale, light gray
24	Sandstone, pale gray
	Shale, dark gray, carbonaceous
40	
	Shale, medium gray
67	
	Sandstone, pale orange
82	Shale, black, carbonaceous
87	Coal
90	
93	Shale, black, carbonaceous
100	Sandstone, medium gray
133.5	Coal
136	
	— N O S A M P L E S —
211	Coal
217.5	
231	Coal
233	
343	Coal
348	



THE UNIVERSITY OF WYOMING			HOLE NO. PM-17	SHEET 2 OF 2
CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 498 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 24 TC 2 CALIPER 0 4 8 SCALE H.R. DENSITY CPS/IN 260 TC 2 RESISTIVITY 500 OHMS DRY 25 OHMS WET	DEPTH (FEET)
415 417	Coal			
452.5 457.5	Coal			
462 466	Coal			
478.5 479.5	Coal			
500TD				



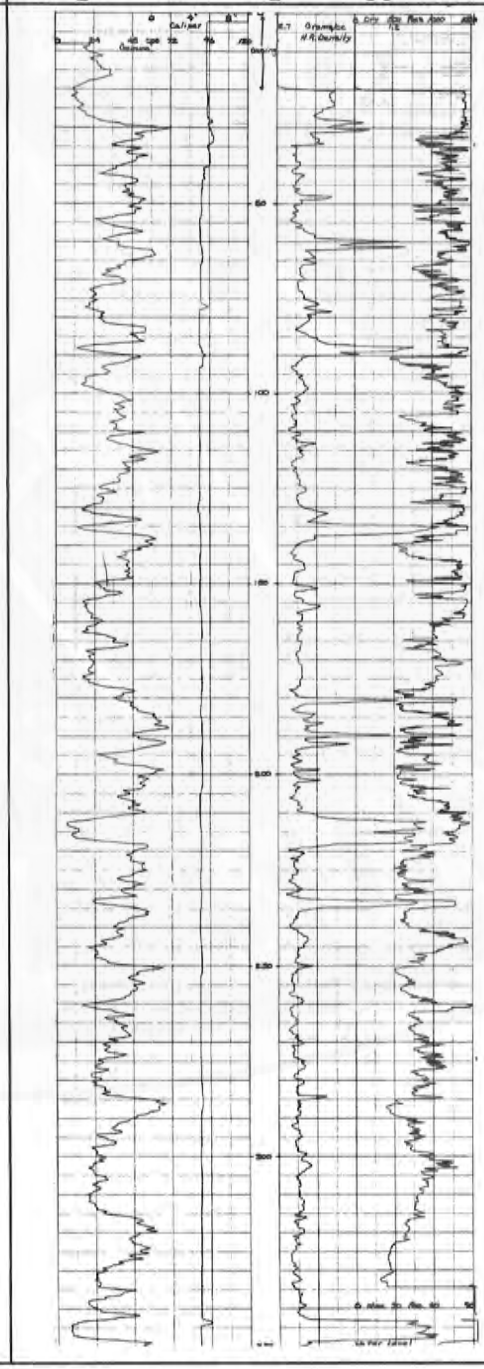
350
400
450
500
550
600
650
700
750
800

THE UNIVERSITY OF WYOMING		HOLE NO. PM-17C	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 6/4/82	DATE COMP.: 6/4/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: SW¼NW¼ SEC. 24 T. 14N R. 103W		FOOTAGE LOCATION: 2200'FNL, 100'FWL	
GROUND ELEVATION: 7870'	TOTAL DEPTH: 473'	DEPTH TO WATER: 359'	
SIZE, BIT TYPE: 4 ¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 410'	CORE FOOTAGE: 63'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 472 FT. LOGGING SPEED 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 30 OHMS WET

CORED INTERVALS	LITHOLOGY	STRIP LOG	DEPTH (FEET)
	Refer to PM-17		0
			50
			100
130–141			150
			200
207–221			250
			300
338			350



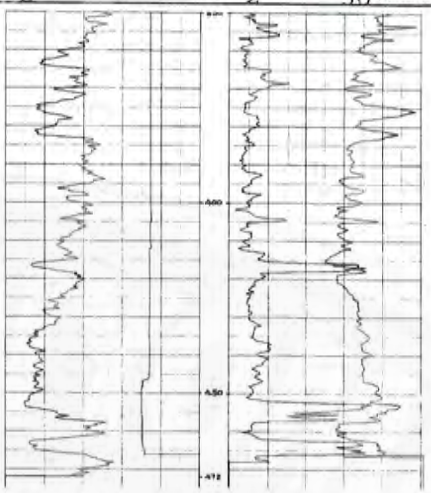
THE UNIVERSITY OF WYOMING

HOLE NO. PM-17C

SHEET 2 OF 2

LOGGED DEPTH: 472 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 240 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 260 500 TC 2	RESISTIVITY OHMS DRY 30 OHMS WET	DEPTH (FEET)
351							350
							400
448							450
473	TD						
							500
							550
							600
							650
							700
							750
							800

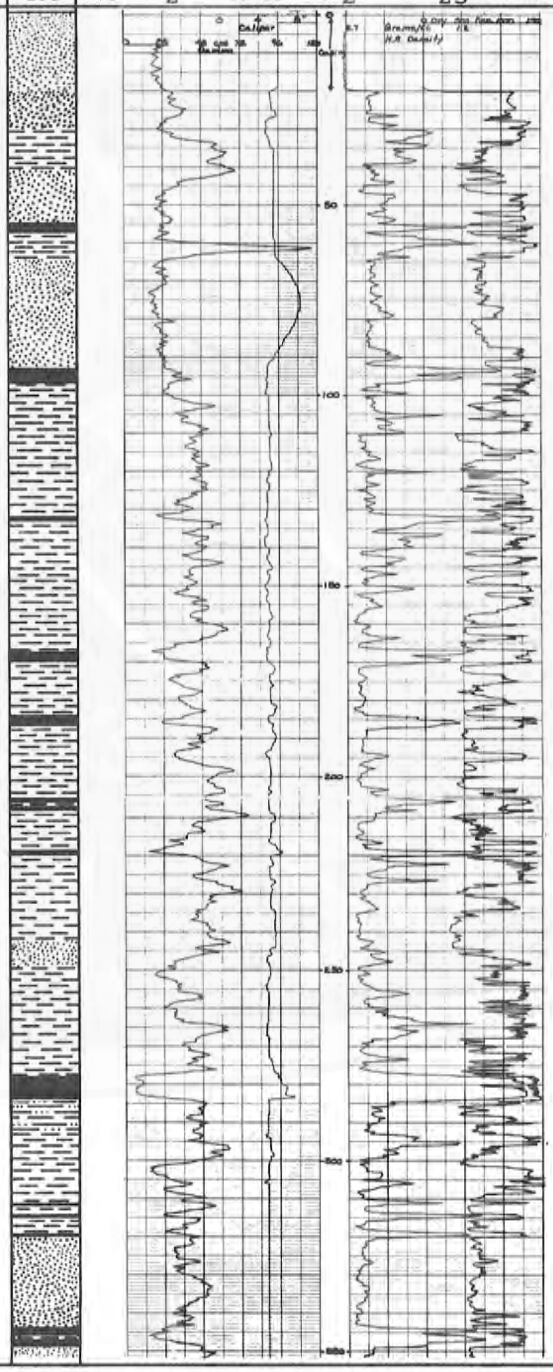


THE UNIVERSITY OF WYOMING		HOLE NO. PM-18	SHEET 1 OF 2
AREA: Salt Wells		QUAD. NAME: Potter Mountain	
DATE STARTED: 6/4/82	DATE COMP.: 6/5/82	COUNTY: Sweetwater	STATE: Wyoming
LOCATION: NW¼SW¼ SEC. 26 T. 14N R. 103W		FOOTAGE LOCATION: 2600' FSL, 100' FWL	
GROUND ELEVATION: 7630'	TOTAL DEPTH: 740'	DEPTH TO WATER: 615'	
SIZE, BIT TYPE: 5-1/8K,V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #2	
REMARKS:			

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 T.C. 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

INTERVALS	LITHOLOGY
0	
	Sandstone, light orange-brown
20	
	Sandstone, orange-white
30	
	Shale, dark gray
40	
	Sandstone, orange-white
55	
57	Coal
64	Shale, black, carbonaceous
	Sandstone, orange-brown
93	
97	Coal
	Shale, dark gray, carbonaceous
132	
133	Coal
	Shale, dark gray
167	
170	Coal
	Shale, dark gray and black
184	
187	Coal
	Shale, dark gray and black
205	
208	Coal with shale parting
218.5	Shale, dark gray and black
220	Coal
	Shale, dark gray and black
242	
249	Sandstone, medium gray
	Shale, dark gray and black
278	
284	Coal
293	Shale, medium gray, silty
	Shale, black, carbonaceous, and coal, interbedded
320	
	Sandstone, medium-dark gray
344	
349	Coal with shale partings



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING

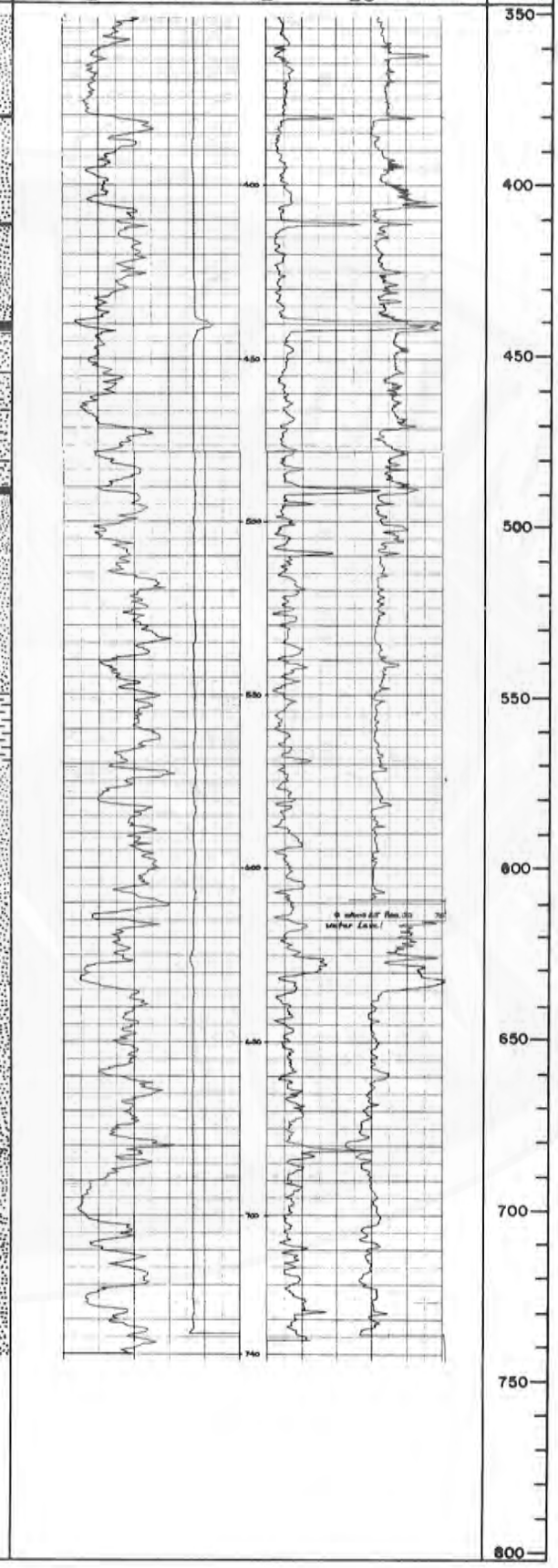
HOLE NO. PM-18

SHEET 2 OF 2

LOGGED DEPTH: 740 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 24 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 260 TC 2 | RESISTIVITY 500 OHMS DRY 25 OHMS WET

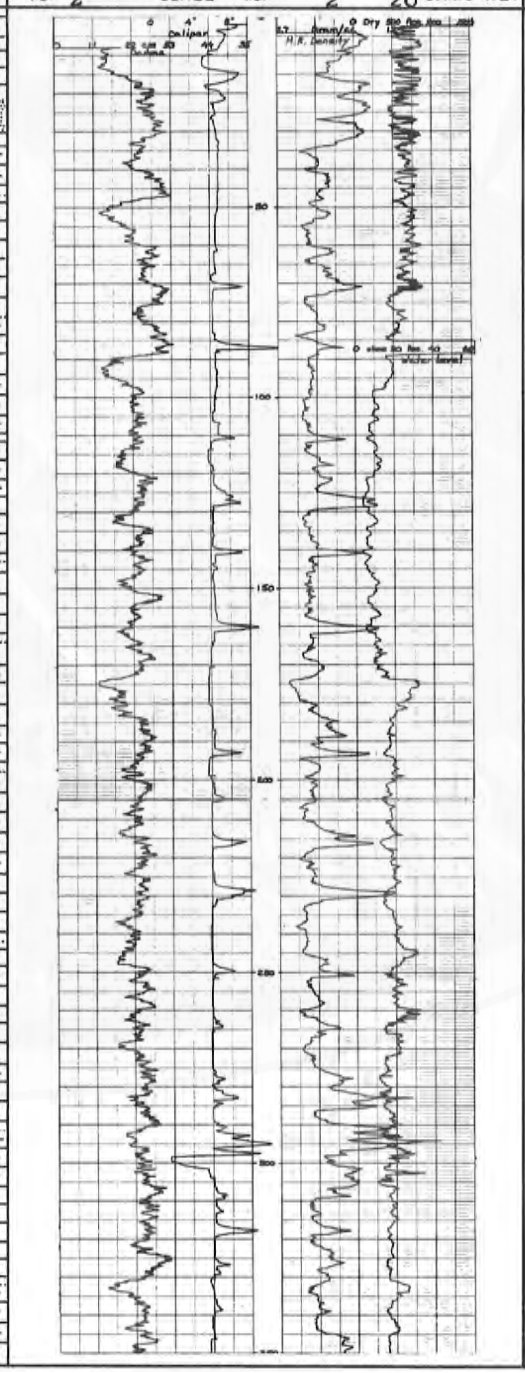
INTERVALS	LITHOLOGY
	Sandstone, dark brownish-gray
380	Coal?
381	Sandstone, brownish-gray
393	Sandstone, medium gray
411	Coal?
412	Sandstone, medium gray
439	
442	Sandstone and shale, interbedded
490	Coal
492	Sandstone, dark brownish-gray
510	Sandstone, medium gray
550	Shale, black
570	Sandstone, medium gray with abundant shale stringers
681	Sandstone, medium gray
740 TD	



THE UNIVERSITY OF WYOMING		HOLE NO. MD-1	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/3/82	DATE COMP.: 8/4/82	COUNTY: Unita	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 10 T. 16N., R. 118W.		FOOTAGE LOCATION: 880'FSL, 2150'FWL	
GROUND ELEVATION: 6885'	TOTAL DEPTH: 740'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 740'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 619 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY	STRIP LOG
0–5	Soil, light brown, sandy	
5–21	Shale, dark brown	
21–30	Sandstone, light brown	
30–740	Shale, medium gray-green, interbedded with 1' to 4' stringers of siltstone, medium gray	

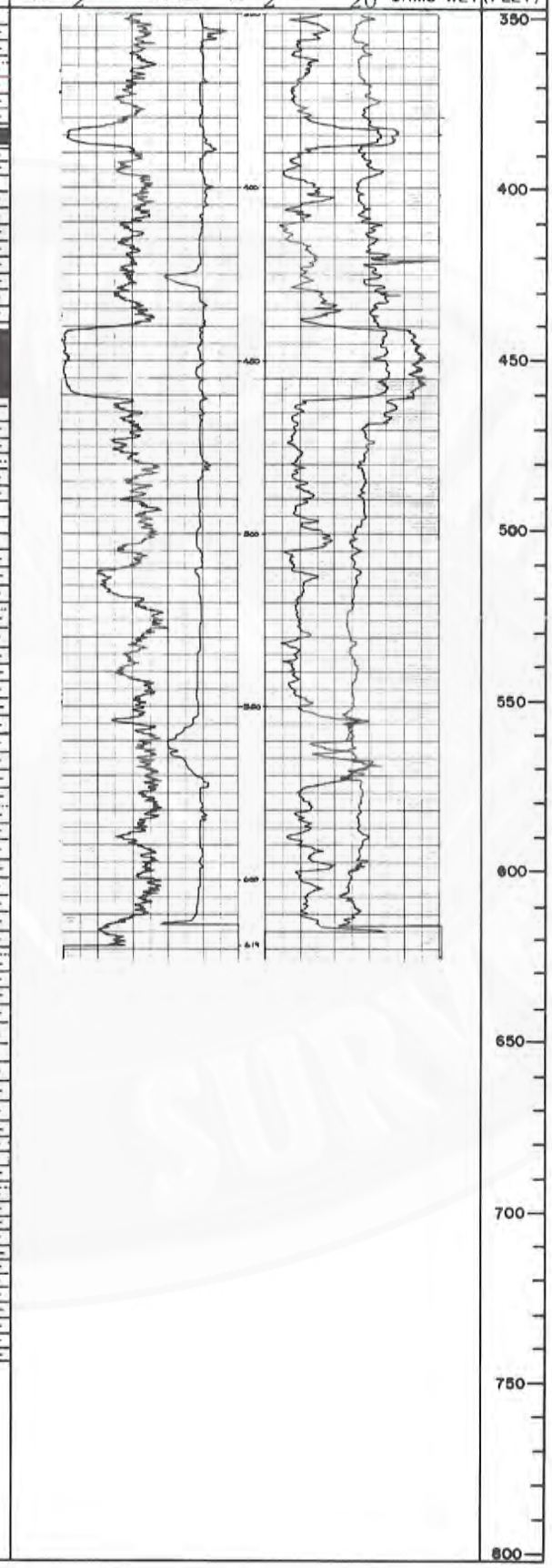


THE UNIVERSITY OF WYOMING

HOLE NO. MD-1 | SHEET 2 OF 2

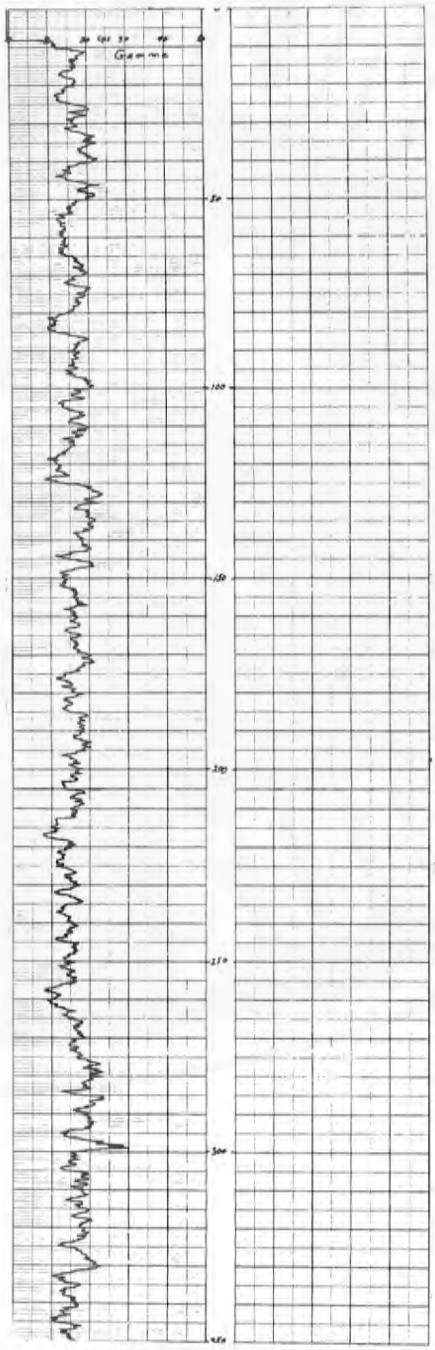
LOGGED DEPTH: 619 FT. LOGGING SPEED 20 FT./MIN.

INTERVALS	LITHOLOGY
383 388	Coal
	Shale, dark gray
441 461	Coal
	Shale, dark gray, interbedded with stringers of siltstone, medium gray
745TD	



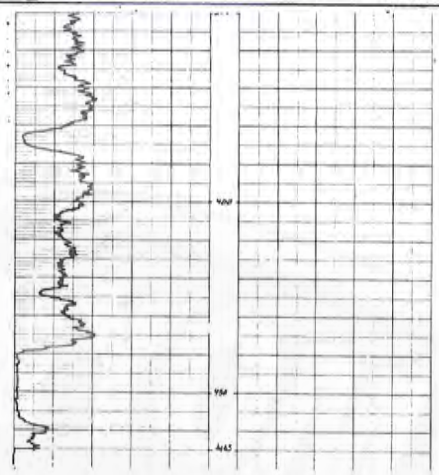
THE UNIVERSITY OF WYOMING		HOLE NO. MD-1C	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/5/82	DATE COMP.: 8/5/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SE¼SW¼ SEC. 10 T. 16N R. 118W		FOOTAGE LOCATION: 880'FSL, 2150'FWL	
GROUND ELEVATION: 6885'	TOTAL DEPTH: 475'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 444.5'	CORE FOOTAGE: 30.5'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 465 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 100 T.C. 2	CALIPER 4 8 SCALE	H.R. DENSITY CPS/IN ---- T.C. ----	RESISTIVITY ----OHMS DRY ----OHMS WET	DEPTH (FEET)
	Refer to MD-1						0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING			HOLE NO. MD-1C	SHEET 2 OF 2
CORED INTER-VALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 465 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 10 TC 2 — CALIPER 0 4 8 SCALE — H.R. DENSITY CPS/IN ---------- TC ---------- — RESISTIVITY OHMS DRY OHMS WET	DEPTH (FEET)

378
393
435
465.5 TD



350
400
450
500
550
600
650
700
750
800

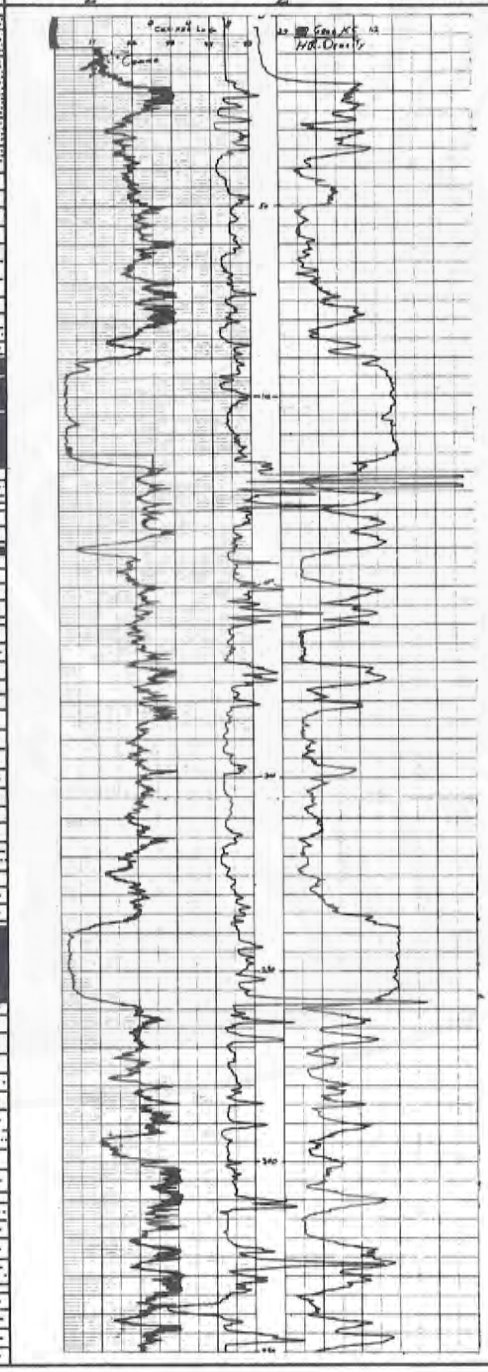
THE UNIVERSITY OF WYOMING		HOLE NO. MD-2	SHEET 1 OF 2
AREA Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/6/82	DATE COMP.: 8/7/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼NE¼ SEC 10 T. 16N R. 118W		FOOTAGE LOCATION: 900' FNL, 1200 FEL	
GROUND ELEVATION: 6870'	TOTAL DEPTH: 800'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 800'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 780 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 110 T.C. 2 — CALIPER 4 8 SCALE — H.R. DENSITY CPS/IN 140 T.C. 2 — RESISTIVITY -- OHMS DRY, -- OHMS WET

INTERVALS	LITHOLOGY
0	
	Sandstone, pale yellow, silty
38	
	Shale, medium gray
81	
89.5	Siltstone, dark gray
	Coal, with 1' to 1½' partings in upper and middle part
117.5	
	Shale, dark gray, with siltstone stringers
139	
	Coal
141.5	
	Shale, dark gray, with siltstone stringers
238	
	Coal
258.5	
	Shale, dark gray, with siltstone stringers

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

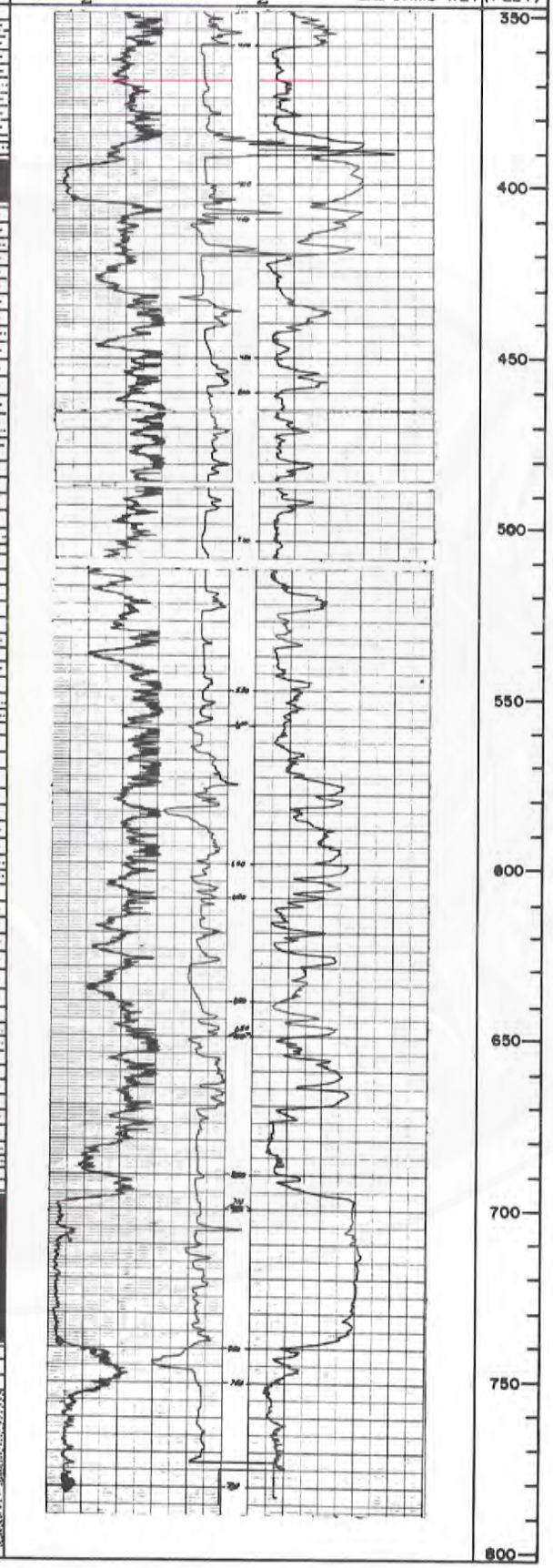
THE UNIVERSITY OF WYOMING

HOLE NO. MD-2 | SHEET 2 OF 2

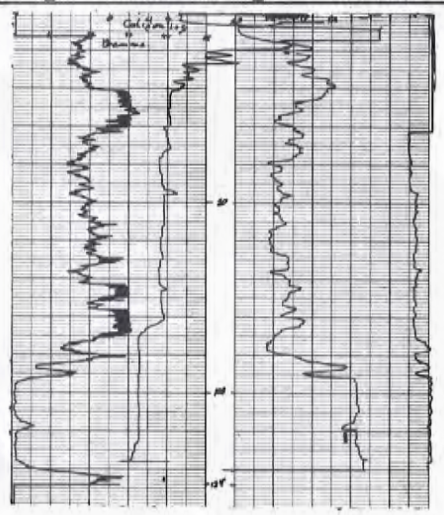
LOGGED DEPTH: 780 FT. LOGGING SPEED: 20 FT./MIN.

INTERVALS	LITHOLOGY
393	
405	Coal
	Shale, dark gray, with thin siltstone stringers
696	
	Coal
739	
	Shale, dark gray
753	
	Sandstone, light gray
800TD	

STRIP LOG



THE UNIVERSITY OF WYOMING		HOLE NO. MD-2C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/11/82	DATE COMP.: 8/11/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼NE¼ SEC. 10 T. 16N R. 118W		FOOTAGE LOCATION: 900'FNL, 1200'FEL	
GROUND ELEVATION: 6870'	TOTAL DEPTH: 127'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 83'	CORE FOOTAGE: 44'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 124 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 11 T.C. 2 / CALIPER 0 4 8 SCALE / H.R. DENSITY CPS/IN 140 T.C. 2 / RESISTIVITY ----OHMS DRY ---OHMS WET	DEPTH (FEET)
	Refer to MD-2			0
				50
83				100
127	TD			
				150
				200
				250
				300
				350

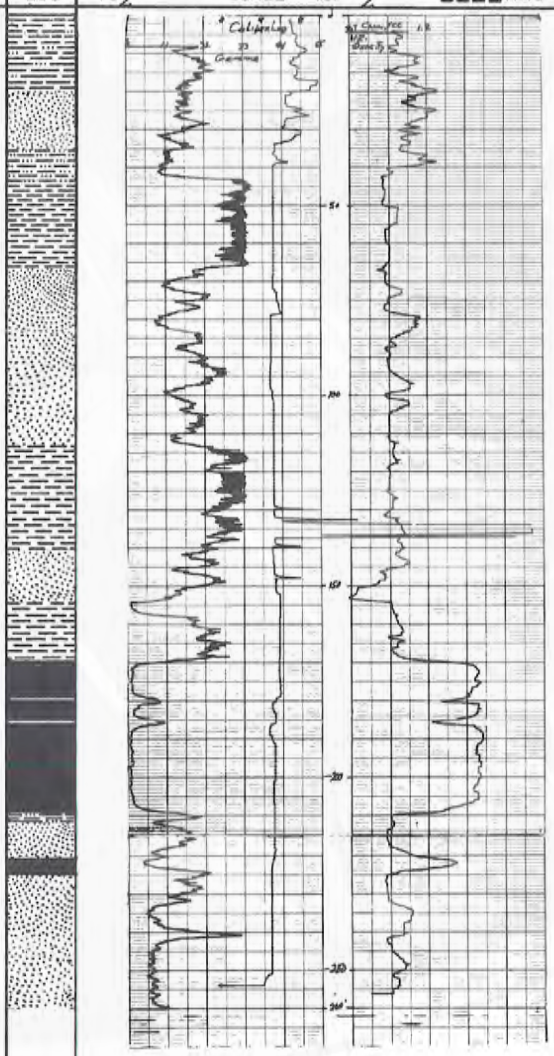
THE UNIVERSITY OF WYOMING		HOLE NO. MD-3	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/11/82	DATE COMP.: 8/11/82	COUNTY Uinta	STATE: Wyoming
LOCATION: SW¼SW¼ SEC. 10 T. 16N R. 118W		FOOTAGE OCATION: 200'FSL, 1800'FEL	
GROUND ELEVATION: 6815'	TOTAL DEPTH: 260'		DEPTH TO WATER: 90'
SIZE, BIT TYPE: 5-1/8WM	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 260'	CORE FOOTAGE 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 260 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 11 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY --- OHMS DRY --- OHMS WET

INTERVALS	LITHOLOGY
0	
	Shale, orange, silty
20	
	Sandstone, yellow-orange
35	
	Siltstone, pale yellow
43	
	Shale, dark gray
66	
	Sandstone, light gray
113	
	Shale, dark gray
140	
	Sandstone, medium gray
154	
169.5	Shale, dark gray
	Coal, with 1' parting at 179.5' and 1.5' parting at 185'
209.5	
	Shale, dark gray, silty
211	
220.5	Sandstone, light gray
224	Coal
	Sandstone, light gray
260TD	

STRIP LOG

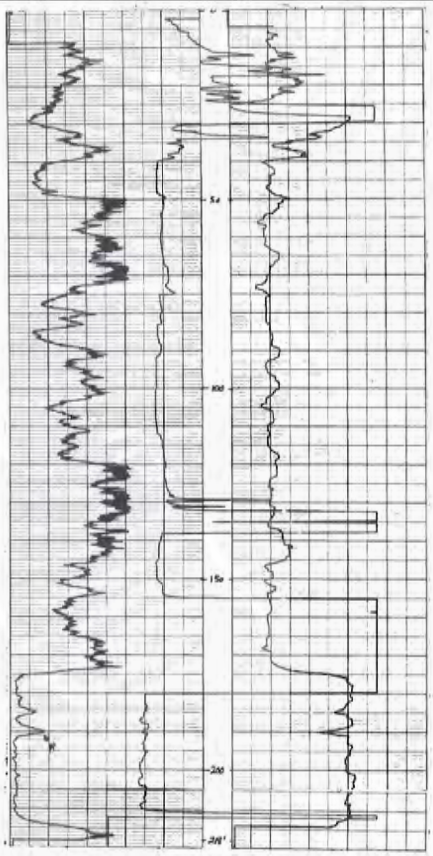


DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING		HOLE NO. MD-3C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Meadow Draw	
DATE STARTED: 8/12/82	DATE COMP.: 8/12/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼SE¼ SEC. 10 T. 16N. R. 118W.		FOOTAGE LOCATION: 214'FSL, 1,814'FEL	
GROUND ELEVATION: 6815'	TOTAL DEPTH: 225'	DEPTH TO WATER: 90'	
SIZE, BIT TYPE 4¾ K.C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 162'	CORE FOOTAGE: 63'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 218 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 11 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 140 T.C. 2	RESISTIVITY --- OHMS DRY -- OHMS WET	DEPTH (FEET)
	Refer to MD-3						0, 50, 100, 150, 200, 250, 300, 350
162							
225	TD						

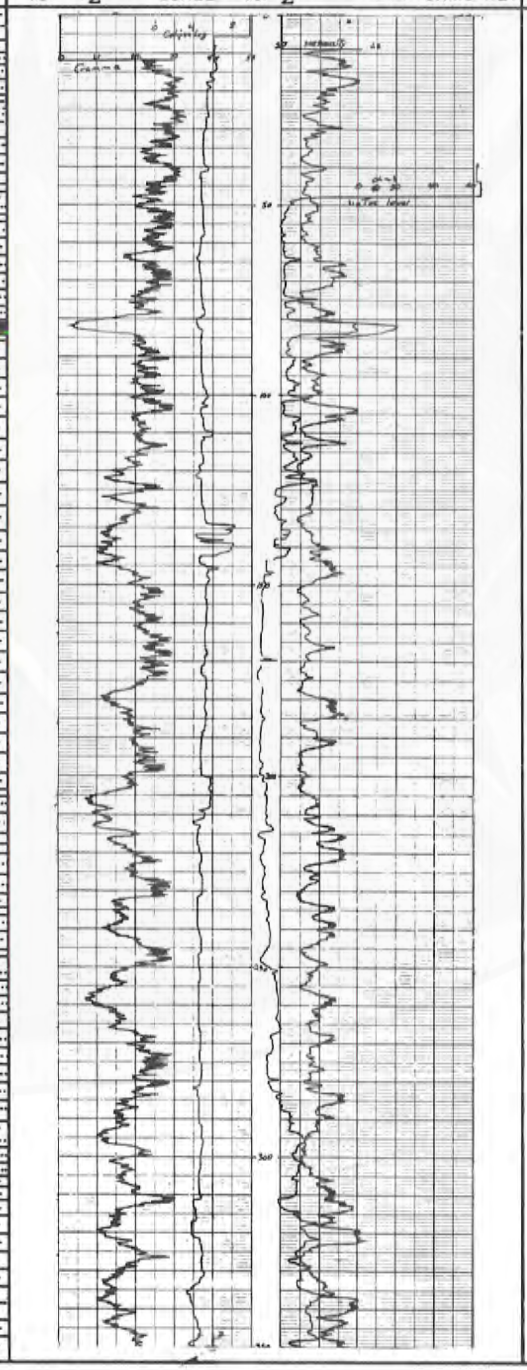


THE UNIVERSITY OF WYOMING		HOLE NO. R-6A	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/13/82	DATE COMP.: 8/13/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 28 T. 16N R. 118W		FOOTAGE LOCATION: 1950' FNL, 2250' FEL	
GROUND ELEVATION: 6865'	TOTAL DEPTH: 560'	DEPTH TO WATER: 48'	
SIZE, BIT TYPE: 5-1/8K	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 560'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 550 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 110 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY -- OHMS DRY -- OHMS WET

INTERVALS	LITHOLOGY
0–10	Shale, red-brown
10–20	Siltstone, orange-brown
20–60	Shale, gray-brown, silty
60–81	Siltstone, light gray-green
81–84.5	Coal
84.5–205	Shale, dark gray
205–304	Siltstone, medium gray and shale, dark gray, interbedded
304–350	Shale, dark gray

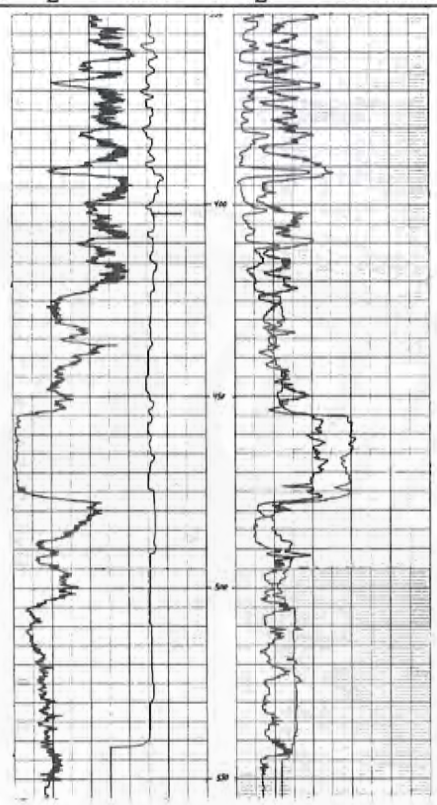


THE UNIVERSITY OF WYOMING	HOLE NO. R-6A	SHEET 2 OF 2

LOGGED DEPTH: 550 FT. LOGGING SPEED: 20 FT./MIN.

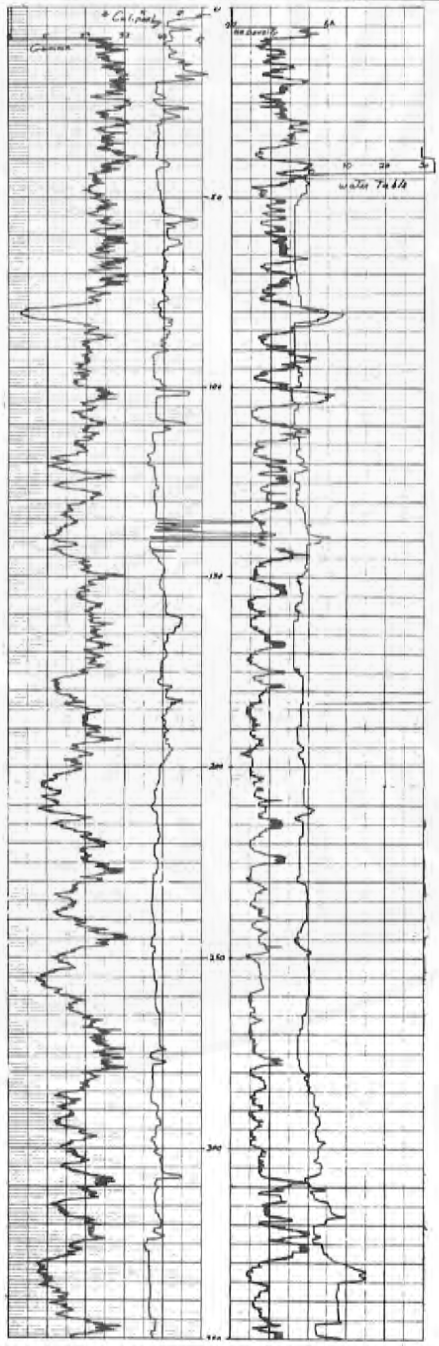
INTERVALS	LITHOLOGY
390	
393	Coal
	Shale, dark gray, silty
420	
	Sandstone, light gray
455	
	Coal
477.5	
	Shale, dark gray
482	
	Siltstone, dark gray
503	
	Sandstone, light gray
560TD	

STRIP LOG



DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

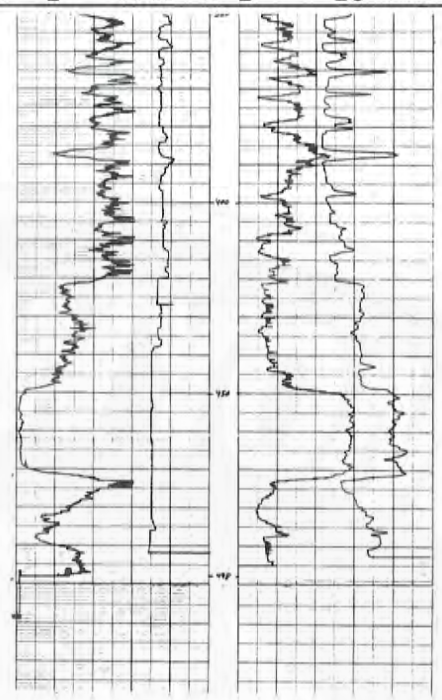
THE UNIVERSITY OF WYOMING		HOLE NO. R-6AC	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/16/82	DATE COMP.: 8/16/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: SW¼NE¼ SEC. 28 T16N. R. 118W		FOOTAGE LOCATION: 1950'FNL, 2250' FEL	
GROUND ELEVATION: 6865'	TOTAL DEPTH: 500'	DEPTH TO WATER: 48'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 469'	CORE FOOTAGE: 31'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

CORED INTERVALS	LITHOLOGY	STRIP LOG	LOGGED DEPTH: 498 FT. LOGGING SPEED: 20 FT./MIN. GAMMA CPS/IN 11 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 140 T.C. 2	RESISTIVITY --- OHMS DRY 20 OHMS WET	DEPTH (FEET)
	Refer to R-6A						0, 50, 100, 150, 200, 250, 300, 350

THE UNIVERSITY OF WYOMING | HOLE NO. R-6AC | SHEET 2 OF 2

LOGGED DEPTH 498 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTER-VALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 110 TC 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 140 TC 2	RESISTIVITY -- OHMS DRY 20 OHMS WET	DEPTH (FEET)



445

476

500 TD

350 400 450 500 550 600 650 700 750 800

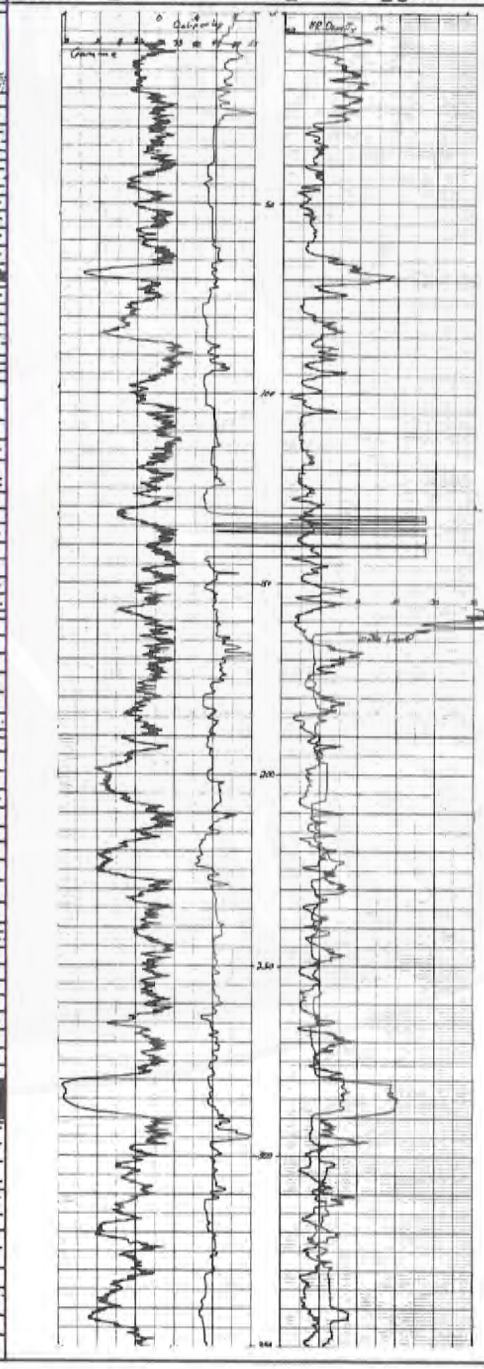
THE UNIVERSITY OF WYOMING		HOLE NO. R-7	SHEET 1 OF 2
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/13/82	DATE COMP.: 8/14/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 32 T. 16N R. 118W		FOOTAGE LOCATION: 2300'FSL, 100'FEL	
GROUND ELEVATION: 6940'	TOTAL DEPTH: 660'	DEPTH TO WATER: 163'	
SIZE, BIT TYPE: 5-1/8K, V	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 660'	CORE FOOTAGE: 0'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 660 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 11 T.C. 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 T.C. 2 | RESISTIVITY --- OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY
0	Soil, medium brown, sandy
16	Sandstone, orange-brown
21	Shale, dark brown
28	Shale, dark gray, carbonaceous near base
68.5	Coal
71	Shale, dark gray, and siltstone, medium gray, interbedded
280	Coal
290	Shale, dark gray, and siltstone, medium gray, interbedded

STRIP LOG



DEPTH (FEET): 0, 50, 100, 150, 200, 250, 300, 350

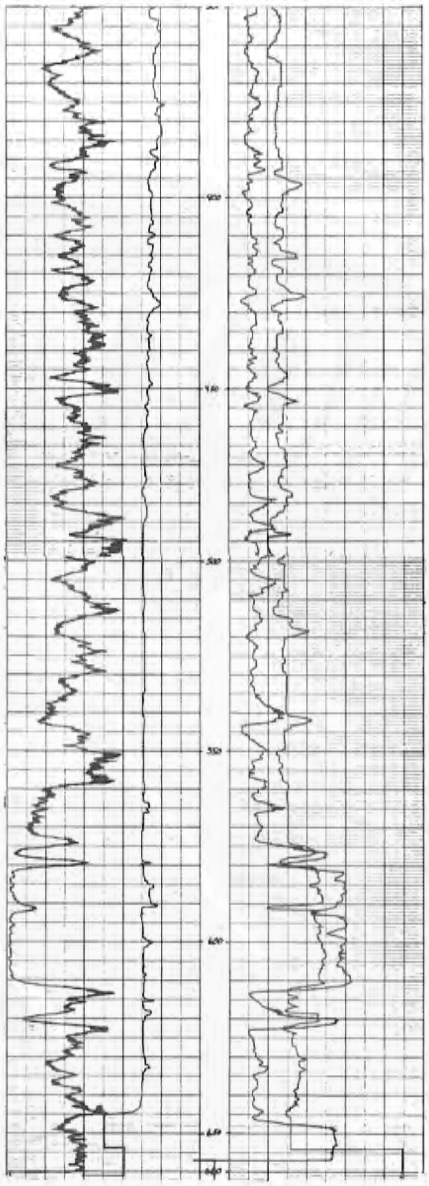
THE UNIVERSITY OF WYOMING | HOLE NO. R-7 | SHEET 2 OF 2

LOGGED DEPTH: 660 FT. LOGGING SPEED: 20 FT./MIN.

GAMMA CPS/IN 11 TC 2 | CALIPER 0 4 8 SCALE | H.R. DENSITY CPS/IN 140 TC 2 | RESISTIVITY -- OHMS DRY 20 OHMS WET

INTERVALS	LITHOLOGY
575	Coal
579	Shale, dark gray, carbonaceous
580.5	Coal
590.5	Shale?
591.5	Coal
611.5	Shale, dark gray
618.5	Coal?
621	Sandstone, light gray, fine grained, well rounded, well sorted, quartzose, 10% dark minerals.
660TD	

STRIP LOG

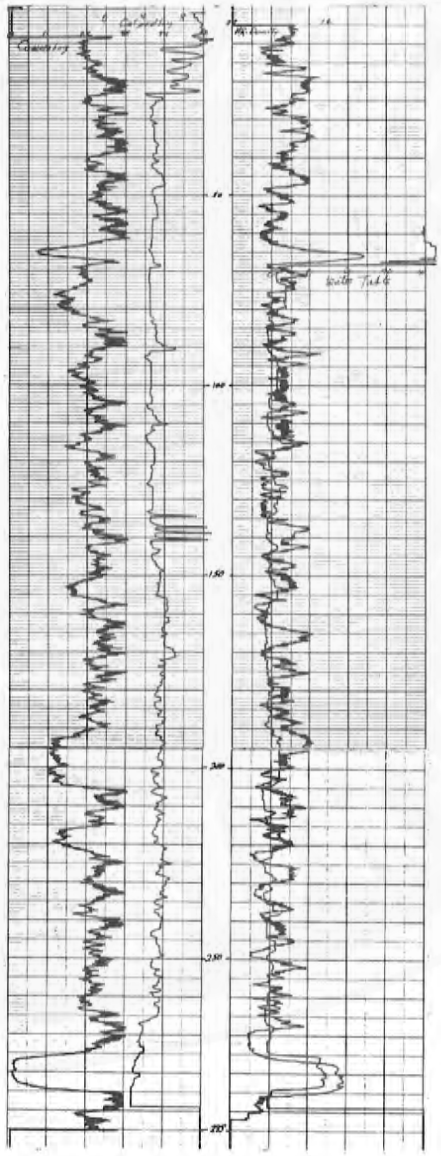


DEPTH (FEET): 350, 400, 450, 500, 550, 600, 650, 700, 750, 800

THE UNIVERSITY OF WYOMING		HOLE NO. R-7C	SHEET 1 OF 1
AREA: Kemmerer		QUAD. NAME: Ragan	
DATE STARTED: 8/15/82	DATE COMP.: 8/15/82	COUNTY: Uinta	STATE: Wyoming
LOCATION: NE¼SE¼ SEC. 32 T. 16N R. 118W		FOOTAGE LOCATION: 2300'FSL, 100'FEL	
GROUND ELEVATION: 6940'	TOTAL DEPTH: 300'	DEPTH TO WATER: 163'	
SIZE, BIT TYPE: 4¾ K,C	DRILL TYPE: Portadrill	ROTARY FOOTAGE: 270.5'	CORE FOOTAGE: 29.5'
DRILLED BY: Gordon Drilling		GEOPHYSICAL LOGGING BY: Reich Geophysical	
LITHOLOGY RECORDED BY: G. Huskey		GEOPHYSICAL PROBE TYPE: Comprobe #1	
REMARKS:			

LOGGED DEPTH: 295 FT. LOGGING SPEED: 20 FT./MIN.

CORED INTERVALS	LITHOLOGY	STRIP LOG	GAMMA CPS/IN 110 T.C. 2	CALIPER 0 4 8 SCALE	H.R. DENSITY CPS/IN 140 T.C. 2	RESISTIVITY -- OHMS DRY 50 OHMS WET	DEPTH (FEET)
	Refer to R-7						0
62–73							50
							100
							150
							200
							250
270–299.5	TD						300
							350



APPENDIX A. PROXIMATE AND ULTIMATE ANALYSES, HEAT VALUES, EQUILIBRIUM MOISTURES, HARDGROVE GRINDABILITY INDICES AND PERCENT OF SODIUM OXIDE IN ASH FOR INCREMENTAL SAMPLES, COMPOSITE SAMPLES, AND WEIGHTED AVERAGES OF COAL BEDS FROM CORE HOLES IN THE SALT WELLS AND KEMMERER AREAS, WYOMING.[1]

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT)				ULTIMATE ANALYSIS (PERCENT)					HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR					
Core Hole BD-1C (Paleocene Fort Union Formation)														
225.0-226.0*	13.5	32.4	46.0	8.1	6.79	60.78	1.06	22.42	0.86	10,490	A	----	----	----
1.0	----	37.5	53.1	9.4	6.10	70.31	1.23	12.00	1.00	12,140	B			
8.5	----	41.4	58.6	----	6.73	77.57	1.36	13.24	1.10	13,390	C			
226.0-227.0												----	45	----
1.0	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL													
8.5														
227.0-228.0*	14.8	29.9	45.0	10.3	6.57	57.92	0.99	23.35	0.84	9,820	A	----	----	----
1.0	----	35.1	52.8	12.1	5.77	67.99	1.16	11.96	0.99	11,520	B			
8.5	----	40.0	60.0	----	6.56	77.38	1.32	13.62	1.12	13,110	C			
228.0-228.8												----	----	----
0.8	NO ANALYSES FOR THIS INTERVAL													
8.5														
228.8-229.8*	13.9	31.0	45.1	10.0	6.64	59.05	1.07	22.75	0.49	10,180	A	----	----	----
1.0	----	36.0	52.4	11.6	5.91	68.61	1.24	12.05	0.57	11,830	B			
8.5	----	40.7	59.3	----	6.68	77.63	1.40	13.64	0.65	13,380	C			
229.8-230.6												----	46	----
0.8	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL													
8.5														
230.6-231.6*	15.4	28.7	44.7	11.2	6.50	56.64	0.95	24.18	0.57	9,730	A	----	----	----
1.0	----	33.9	52.9	13.2	5.65	66.97	1.13	12.37	0.68	11,500	B			
8.5	----	39.0	61.0	----	6.51	77.15	1.30	14.26	0.78	13,250	C			
231.6-232.4												----	----	----
0.8	NO ANALYSES FOR THIS INTERVAL													
8.5														
232.4-233.5*	15.3	30.8	42.0	11.9	7.63	55.10	1.09	22.61	1.70	9,610	A	----	----	----
1.1	----	36.4	49.6	14.0	6.99	65.05	1.28	10.66	2.00	11,350	B			
8.5	----	42.3	57.7	----	8.13	75.65	1.49	12.40	2.33	13,200	C			
225.0-233.5(C)[4] ***	13.3	31.1	45.8	9.8	5.35	59.29	0.81	23.93	0.78	10,130	A	----	----	1.84[5]
8.5	----	35.8	52.9	11.3	4.46	68.38	0.94	13.98	0.89	11,690	B			
8.5	----	40.4	59.6	----	5.03	77.14	1.06	15.76	1.01	13,180	C			
243.0-245.0*	11.5	28.6	24.8	25.1	6.32	48.45	0.77	18.35	1.03	8,420	A	----	----	----
2.0[6]	----	32.3	39.4	28.3	5.68	54.74	0.87	9.20	1.17	9,520	B			
3.0	----	45.1	54.9	----	9.93	76.39	1.22	12.83	1.63	13,280	C			
Core Hole CRNE-1C (Upper Cretaceous Almond Formation)														
157.6-158.5*	7.4	9.0	7.8	75.8	3.55	11.41	0.25	8.43	0.53	1,680	A	----	----	----
0.9[6]	----	9.7	8.4	81.9	2.93	12.33	0.27	2.01	0.57	1,820	B			
3.5	----	53.7	46.3	----	16.21	68.08	1.49	11.07	3.15	10,030	C			
158.5-159.5*	10.7	15.2	20.6	53.5	5.07	26.86	0.49	13.61	0.43	4,560	A	----	----	----
1.0[6]	----	17.1	22.9	60.0	4.34	30.10	0.55	4.54	0.48	5,100	B			
3.5	----	42.6	57.4	----	10.84	75.23	1.39	11.34	1.20	12,760	C			
159.5-161.4*	18.0	29.3	47.8	4.9	6.67	59.51	1.01	27.20	0.65	10,230	A	----	----	----
1.9	----	35.8	58.3	5.9	5.78	72.62	1.24	13.63	0.79	12,480	B			
3.5	----	38.1	61.9	----	6.14	77.21	1.32	14.49	0.84	13,270	C			
161.4-161.6												----	----	----
0.2[6]	NO ANALYSES FOR THIS INTERVAL													
3.5														
157.6-161.4(WA)[7]	13.5	20.7	31.0	34.8	5.49	39.32	0.69	19.11	0.57	6,680	A	----	----	----
3.8	----	24.6	37.0	38.4	4.71	46.92	0.83	8.45	0.66	7,970	B			
3.5	----	43.1	56.9	----	9.83	74.43	1.38	12.85	1.51	12,330	C			
157.6-161.6 (C) ***	12.9	20.8	33.5	32.8	4.11	41.72	0.60	20.27	0.51	7,000	A	----	----	0.306[8]
4.0	----	23.9	38.5	37.6	3.07	47.88	0.69	10.14	0.59	8,030	B			
3.5	----	38.2	61.8	----	4.92	76.76	1.11	16.27	0.94	12,880	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
APPENDIX A continued														
					Core Hole CRNE-1C continued									
226.0-228.0*	17.5	28.4	46.5	7.6	6.92	59.09	1.03	24.64	0.70	9,870	A			
2.0	----	34.5	56.3	9.2	6.02	71.63	1.25	11.01	0.85	11,960	B	----	----	
4.0	----	38.0	62.0	----	6.63	78.92	1.38	12.13	0.94	13,180	C			
228.0-229.0														
1.0	NO ANALYSES FOR THIS INTERVAL											----	----	----
4.0														
229.0-230.0*	16.2	24.5	35.6	23.7	6.45	43.67	0.76	24.99	0.40	7,610	A			
1.0	----	29.2	42.5	28.3	5.53	52.11	0.90	12.68	0.47	9,080	B	----	39	----
4.0	----	40.7	59.3	----	7.72	72.69	1.26	17.67	0.66	12,660	C			
232.0-234.0*	10.1	16.6	18.3	55.0	4.89	25.29	0.44	13.72	0.65	4,260	A			
2.0[9]	----	18.4	20.4	61.2	4.18	28.14	0.49	5.28	0.72	4,740	B	----	----	0.680[10]
1.0	----	47.5	52.5	----	10.76	72.51	1.27	13.60	1.86	12,210	C			
					Core Hole CRNE-4C (Paleocene Fort Union Formation)									
232.0-232.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
10														
232.2-234.2*	16.6	32.5	43.2	7.7	7.12	57.90	1.11	25.36	0.77	10,100	A			
2.0	----	38.9	51.8	9.3	6.31	69.45	1.33	12.71	0.92	12,110	B	12.9	----	----
10	----	42.9	57.1	----	6.95	76.56	1.46	14.01	1.02	13,350	C			
234.2-236.1														
1.9	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											13.4	----	----
10														
236.1-238.1*	16.8	32.2	45.2	5.8	7.30	59.82	1.11	25.32	0.67	10,360	A			
2.0	----	38.7	54.3	7.0	6.52	71.90	1.34	12.49	0.80	12,460	B	13.3	57	----
10	----	41.6	58.4	----	7.00	77.27	1.43	13.44	0.86	13,390	C			
238.1-240.0														
1.9	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL.											12.2	----	----
10														
240.0-242.0*	16.9	31.6	41.6	9.9	6.79	56.09	1.03	25.19	1.01	9,770	A			
2.0	----	38.0	50.1	11.9	5.90	67.51	1.23	12.24	1.21	11,750	B	13.2	----	----
10	----	43.2	56.8	----	6.70	76.63	1.40	13.89	1.38	13,340	C			
232.0-242.0(C)***	15.9	31.2	44.7	8.2	5.97	58.93	0.83	25.36	0.73	10,120	A			
10	----	37.2	53.1	9.7	4.98	70.10	0.98	13.33	0.88	12,040	B	----	----	0.428[11]
10	----	41.2	58.8	----	5.51	77.66	1.09	14.77	0.97	13,330	C			
244.0-245.5*	12.3	29.0	32.8	25.9	5.71	47.10	0.85	19.83	0.60	8,210	A			
1.5[12]	----	33.0	37.5	29.5	4.94	53.71	0.97	10.14	0.69	9,360	B	----	----	0.184
2.0	----	46.9	53.1	----	7.02	76.24	1.38	14.39	0.97	13,290	C			
					Core Hole CRNE-6C (Upper Cretaceous Almond Formation)									
78.0- 78.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
78.5- 80.5*	15.6	30.9	41.2	12.3	6.17	55.35	0.79	23.61	1.74	9,580	A			
2.0	----	36.6	48.8	14.6	5.24	65.60	0.94	11.54	2.06	11,350	B	----	----	0.174
3.5	----	42.8	57.2	----	6.13	76.84	1.10	13.52	2.41	13,300	C			
80.5- 81.5														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole CRNE-6C continued														
236.0-238.0*	13.3	29.1	11.6	46.0	5.09	30.08	0.58	17.41	0.81	4,920	A	----	----	0.060
2.0[6]	----	33.6	13.3	53.1	4.15	34.71	0.67	6.43	0.93	5,680	B			
0	----	71.7	28.3	----	8.85	74.02	1.44	13.70	1.99	12,100	C			
298.5-299.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.6														
1.5														
299.1-299.9*	12.6	20.0	24.1	43.3	4.35	32.89	0.58	17.99	0.88	5,440	A	----	----	0.143
0.8	----	22.9	27.6	49.5	3.37	37.61	0.67	7.82	1.00	6,230	B			
1.5	----	45.4	54.6	----	6.67	74.52	1.32	15.50	1.99	12,330	C			
299.9-300.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.1														
1.5														
368.5-370.7*	17.7	30.4	40.7	11.2	7.01	55.02	1.00	24.69	1.12	9,400	A	----	----	0.347
2.2	----	36.9	49.5	13.6	6.11	66.89	1.22	10.85	1.36	11,430	B			
2.5	----	42.7	57.3	----	7.06	77.40	1.41	12.56	1.57	13,230	C			
370.7-371.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.3														
2.5														
376.5-378.0*	12.5	19.1	23.8	44.6	3.79	31.57	0.61	18.85	0.59	5,350	A	----	----	0.180
1.5[5]	----	21.9	27.1	51.0	2.73	36.10	0.70	8.82	0.67	6,120	B			
1.0	----	44.6	55.4	----	5.57	73.65	1.43	17.98	1.37	12,480	C			
Core Hole CRNE-7C (Upper Cretaceous Almond Formation)														
311.5-312.4 ***	15.1	32.0	49.5	3.4	5.65	63.43	0.85	25.27	1.40	10,870	A	11.4	52	----
0.9	----	37.7	58.3	4.0	4.67	74.69	1.01	13.99	1.64	12,800	B			
9.5	----	39.3	60.7	----	4.86	77.81	1.05	14.57	1.71	13,330	C			
312.4-314.6 *	15.5	32.2	47.8	4.5	5.89	62.33	1.03	25.61	0.61	10,770	A	11.7	36	----
2.2	----	38.1	56.5	5.4	4.92	73.73	1.22	14.04	0.73	12,740	B			
9.5	----	40.3	59.7	----	5.20	77.91	1.28	14.84	0.77	13,460	C			
314.6-316.5 ***	16.0	30.1	45.5	8.4	5.45	58.17	0.80	26.80	0.35	9,960	A	11.6	42	----
1.9	----	35.8	54.2	10.0	4.36	69.23	0.95	15.01	0.42	11,860	B			
9.5	----	39.8	60.2	----	4.85	76.95	1.06	16.68	0.46	13,180	C			
316.5-318.7 *	16.3	30.8	47.1	5.8	5.73	59.97	1.07	27.07	0.39	10,340	A	12.2	42	----
2.2	----	36.8	56.3	6.9	4.67	71.66	1.28	15.02	0.47	12,350	B			
9.5	----	39.6	60.4	----	5.01	76.97	1.37	16.15	0.50	13,270	C			
318.7-319.4 ***	14.8	31.0	49.0	5.2	5.59	62.45	0.86	25.26	0.69	10,670	A	12.5	44	----
0.7	----	36.4	57.6	6.0	4.62	73.32	1.01	14.19	0.81	12,530	B			
9.5	----	38.7	61.3	----	4.92	78.04	1.08	15.10	0.86	13,330	C			
319.4-321.0 *	17.5	31.3	48.0	3.2	6.00	60.85	1.09	28.30	0.55	10,480	A	14.0	48	----
1.6	----	37.9	58.2	3.9	4.90	73.72	1.33	15.50	0.66	12,700	B			
9.5	----	39.5	60.5	----	5.10	76.70	1.38	16.13	0.69	13,210	C			
311.5-321.0(WA)	16.0	31.2	47.5	5.3	5.73	60.85	0.96	26.54	0.59	10,460	A	12.2	43	----
9.5	----	37.1	56.6	6.3	4.69	72.42	1.15	14.70	0.70	12,450	B			
9.5	----	39.7	60.4	----	5.01	77.32	1.23	15.71	0.74	13,290	C			
311.5-321.0(C) ***	15.1	31.0	48.4	5.5	5.44	61.28	0.75	26.42	0.56	10,520	A	----	----	0.705[13]
9.5	----	36.5	57.0	6.5	4.41	72.21	0.89	15.29	0.66	12,390	B			
9.5	----	39.1	60.9	----	4.72	77.26	0.95	16.36	0.71	13,260	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MSR-10C (Upper Cretaceous Almond Formation)														
168.5-169.1														
0.6	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
169.1-171.1*	13.4	32.4	48.6	5.6	6.62	63.39	1.16	22.27	0.91	10,900	A			
2.0	----	37.4	56.1	6.5	5.92	73.20	1.34	11.97	1.05	12,590	B	----	39	0.272
3.5	----	40.0	60.0	----	6.33	78.31	1.43	12.81	1.12	13,470	C			
171.1-172.0														
0.9	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
168.5-172.0(C)***	13.0	31.9	50.2	4.9	5.64	64.00	0.88	23.63	0.91	11,140	A			
3.5	----	36.7	57.6	5.7	4.81	73.58	1.01	13.88	1.04	12,810	B	----	----	----
3.5	----	38.9	61.1	----	5.10	78.01	1.07	14.71	1.11	13,580	C			
Core Hole MSR-11C (Upper Cretaceous Almond Formation)														
62.0- 63.4														
1.4[14]	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
63.4- 65.0 *	14.1	31.5	41.9	12.5	5.44	55.76	0.93	21.33	4.04	9,710	A			
1.6	----	36.7	48.7	14.6	4.49	64.95	1.08	10.21	4.71	11,310	B	----	----	----
4.5	----	42.9	57.1	----	5.26	76.02	1.26	11.95	5.51	13,230	C			
65.0- 66.5 *	15.5	34.4	42.7	7.4	6.64	60.13	0.98	22.26	2.59	10,420	A			
1.5	----	40.8	50.4	8.8	5.80	71.17	1.15	10.06	3.06	12,340	B	----	----	----
4.5	----	44.7	55.3	----	6.36	78.01	1.27	11.00	3.56	13,520	C			
62.0- 66.5(C)***	14.1	32.5	43.6	9.8	5.57	59.47	0.69	21.64	2.82	10,270	A			
4.5	----	37.8	50.8	11.4	4.65	69.22	0.80	10.62	3.29	11,950	B	----	----	0.202[15]
4.5	----	42.6	57.4	----	5.25	78.15	0.91	11.98	3.71	13,490	C			
155.0-155.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.0														
155.5-156.5 *	12.8	24.6	29.6	33.0	5.34	41.17	0.68	17.65	2.14	6,850	A			
1.0[16]	----	28.1	34.1	37.8	4.49	47.20	0.78	7.23	2.45	7,850	B	----	----	0.102
1.0	----	45.3	54.7	----	7.22	75.94	1.26	11.64	3.94	12,630	C			
330.0-330.9														
0.9	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
330.9-333.0*	14.5	31.7	48.9	4.9	6.87	63.41	1.12	22.91	0.83	10,800	A			
2.1	----	37.0	57.3	5.7	6.13	74.19	1.31	11.70	0.98	12,630	B	----	----	0.402
4.0	----	39.3	60.7	----	6.51	78.66	1.39	12.41	1.03	13,390	C			
333.0-334.0														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
Core Hole MSR-12C (Paleocene Fort Union Formation)														
226.0-226.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.0														

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX **	PERCENT Na_2O IN ASH *
					Core Hole MSR-12C continued									
226.2-227.6 *	14.7	32.4	48.7	4.2	6.15	62.96	1.09	24.55	1.05	10,950	A	----	----	----
1.4	----	37.9	57.2	4.9	5.28	73.82	1.77	13.47	1.23	12,840	B			
6.0	----	39.9	60.1	----	5.55	77.65	1.34	14.17	1.29	13,510	C			
227.6-228.3	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	48	----
0.7														
6.0														
228.3-229.7 *	16.8	29.4	48.0	5.8	6.81	60.63	1.06	24.92	0.78	10,310	A	----	50	----
1.4	----	35.3	57.7	7.0	5.93	72.84	1.27	12.06	0.94	12,390	B			
6.0	----	38.0	62.0	----	6.37	78.29	1.36	12.97	1.01	13,310	C			
229.7-230.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.6														
6.0														
230.3-231.7 *	16.1	29.3	46.9	7.7	6.12	59.44	0.99	25.00	0.79	10,130	A	----	----	----
1.4	----	34.9	56.0	9.1	5.15	70.81	1.18	12.78	0.95	12,070	B			
6.0	----	38.4	61.6	----	5.66	72.92	1.31	14.07	1.04	13,280	C			
231.7-232.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.3														
6.0														
226.0-232.0(C) ***	14.6	30.5	46.9	8.0	5.82	60.97	0.78	23.73	0.75	10,430	A	----	----	2.36[17]
6.0	----	35.8	54.9	9.3	4.91	71.37	0.92	12.62	0.87	12,210	B			
6.0	----	39.4	60.6	----	5.41	78.69	1.01	13.93	0.96	13,460	C			
271.0-272.8 *	12.5	27.8	37.6	22.1	5.69	51.07	0.87	19.35	0.95	8,740	A	----	----	0.736
1.8	----	31.7	43.1	25.2	4.91	58.36	0.99	9.43	1.09	9,990	B			
2.0	----	42.4	57.6	----	6.56	78.03	1.32	12.63	1.46	13,360	C			
272.8-273.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.2														
2.0														
					Core Hole MSR-14C (Upper Cretaceous Almond Formation)									
213.0-213.8	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.8														
3.5														
213.8-215.8 *	13.1	33.0	48.0	5.9	5.78	64.81	1.16	21.42	0.96	11,190	A	----	----	----
2.0	----	38.0	55.2	6.8	4.96	74.56	1.33	11.30	1.10	12,870	B			
3.5	----	40.7	59.3	----	5.32	79.96	1.43	12.11	1.18	13,810	C			
215.8-217.8 *[18]	9.6	24.2	29.2	37.0	4.16	41.20	0.84	15.90	0.92	7,140	A	----	----	----
2.0	----	26.8	32.3	40.9	3.42	45.58	0.93	8.14	1.02	7,900	B			
3.5	----	45.3	54.7	----	5.78	77.14	1.58	13.77	1.73	13,370	C			
213.0-217.8(C) ***	10.5	28.5	42.0	19.0	5.30	55.77	0.69	18.16	1.10	9,610	A	----	----	0.054[19]
4.8	----	31.8	47.0	21.2	4.61	62.31	0.78	9.87	1.23	10,730	B			
3.5	----	40.4	59.6	----	5.85	79.08	0.99	12.51	1.57	13,620	C			
362.0-363.8 *	12.4	33.1	49.6	4.9	6.07	65.32	1.18	21.50	1.00	11,360	A	----	----	----
1.8	----	37.8	56.6	5.6	5.34	74.53	1.35	12.02	1.14	12,960	B			
5.0	----	40.0	60.0	----	5.66	78.97	1.43	12.73	1.21	13,740	C			
363.8-365.6 *	12.5	33.6	50.3	3.6	6.06	66.28	1.19	22.27	0.55	11,750	A	----	42	----
1.8	----	38.3	57.5	4.2	5.33	75.72	1.36	12.79	0.63	13,420	B			
5.0	----	40.0	60.0	----	5.56	79.02	1.42	13.34	0.66	14,000	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MSR-14C continued														
365.6-367.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.4														
5.0														
362.0-367.0(C) ***	10.9	31.4	51.3	6.4	5.66	64.67	0.90	21.60	0.75	11,380	A			
5.0	----	35.3	57.5	7.2	4.98	72.62	1.01	13.34	0.84	12,770	B	----	----	0.173[20]
5.0	----	38.0	62.0	----	5.37	78.27	1.09	14.36	0.91	13,770	C			
422.2-424.0*	11.7	33.1	45.2	10.0	5.37	62.36	1.15	19.11	2.06	10,880	A			
1.8	----	37.5	51.2	11.3	4.59	70.64	1.30	9.86	2.33	12,320	B	----	----	0.116
1.8	----	42.2	57.8	----	5.18	79.62	1.47	11.11	2.62	13,890	C			
428.5-428.7														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
428.7-430.6*	13.3	32.5	51.5	2.7	6.22	66.99	1.32	22.06	0.74	11,570	A			
1.9	----	37.5	59.4	3.1	5.46	77.31	1.52	11.77	0.86	13,350	B	----	----	----
4.0	----	38.7	61.3	----	5.63	79.77	1.57	12.14	0.89	13,780	C			
430.6-432.5*	10.1	28.0	40.1	21.8	5.15	53.02	1.05	18.35	0.62	9,330	A			
1.9	----	31.2	44.5	24.3	4.47	59.00	1.17	10.40	0.69	10,390	B	----	----	----
4.0	----	41.2	58.8	----	5.90	77.91	1.54	13.74	0.91	13,720	C			
428.7-432.5(WA)	11.9	30.5	46.4	11.2	5.74	60.78	1.20	20.41	0.69	10,570	A			
3.8	----	34.7	52.8	12.5	5.02	69.17	1.36	11.16	0.78	12,030	B	----	----	0.270[21]
4.0	----	39.8	60.2	----	5.75	78.94	1.56	12.85	0.90	13,750	C			
Core Hole MSR-16C (Paleocene Fort Union Formation)														
209.0-210.1*	13.8	31.7	49.2	5.3	6.22	63.99	1.12	22.37	0.99	11,160	A			
1.1	----	36.7	57.1	6.2	5.42	74.23	1.30	11.74	1.15	12,950	B	----	----	----
5.0	----	39.1	60.9	----	5.78	79.10	1.39	12.51	1.22	13,800	C			
210.1-210.8***	8.6	29.9	40.1	21.4	4.82	55.55	0.89	15.96	1.38	9,710	A			
0.7	----	32.7	43.9	23.4	4.23	60.75	0.97	9.14	1.51	10,620	B	----	44	----
5.0	----	42.8	57.2	----	5.52	79.32	1.27	11.92	1.97	13,860	C			
210.8-211.9*	11.6	30.1	45.4	12.9	5.61	59.72	1.06	20.11	1.07	10,360	A			
1.1	----	34.0	51.4	14.6	4.37	67.57	1.20	11.07	1.21	11,720	B	----	51	----
5.0	----	39.8	60.2	----	5.11	79.10	1.41	12.96	1.42	13,720	C			
211.9-212.8***	11.8	32.3	51.7	4.2	5.92	67.04	0.88	20.71	1.26	11,630	A			
0.9	----	36.6	58.7	4.7	5.21	76.02	1.00	11.60	1.42	13,180	B	----	----	----
5.0	----	38.4	61.6	----	5.47	79.81	1.05	12.18	1.49	13,840	C			
212.8-214.0*	12.2	32.0	48.2	7.6	5.64	63.11	1.09	21.84	0.75	11,080	A			
1.2	----	36.4	55.0	8.6	4.87	71.84	1.24	12.57	0.86	12,610	B	----	----	----
5.0	----	39.9	60.1	----	5.33	78.62	1.36	13.75	0.94	13,800	C			
209.0-214.0(WA)	11.6	31.2	46.8	10.5	5.64	61.80	1.00	20.09	1.11	10,770	A			
5.0	----	35.2	53.1	11.7	4.82	69.97	1.14	11.14	1.25	12,190	B	----	----	----
5.0	----	37.6	60.0	----	5.45	79.23	1.29	12.60	1.44	13,800	C			
209.0-214.0(C) ***	10.9	30.8	47.7	10.6	5.42	62.17	1.01	19.76	1.07	10,860	A			
5.0	----	34.6	53.5	11.9	4.71	69.79	1.13	11.31	1.20	12,190	B	----	----	0.096[22]
5.0	----	39.3	60.7	----	5.34	79.18	1.28	12.84	1.36	13,830	C			
248.5-248.6														
0.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
APPENDIX A continued														
Core Hole MSR-16C continued														
248.6-249.8*	11.0	27.0	42.5	19.5	5.04	54.07	0.89	19.79	0.71	9,370	A			
1.2	----	30.3	47.8	21.9	4.29	60.74	1.00	11.27	0.80	10,530	B	----	----	----
2.5	----	38.8	61.2	----	5.49	77.78	1.28	14.42	1.03	13,480	C			
249.8-251.0*	12.6	28.5	50.5	8.4	5.40	63.46	1.00	21.00	0.69	10,820	A			
1.2	----	32.6	57.7	9.7	4.56	72.64	1.14	11.20	0.79	12,380	B	----	----	----
2.5	----	36.1	63.9	----	5.05	80.41	1.26	12.41	0.87	13,700	C			
248.6-251.0(WA)	12.1	28.0	47.8	12.1	5.28	60.33	0.96	20.60	0.70	10,340	A			
2.4	----	31.8	54.4	13.8	4.47	68.67	1.09	11.22	0.79	11,760	B	----	----	0.114[2,3]
2.5	----	37.0	63.0	----	5.20	79.53	1.27	13.08	0.92	13,630	C			
284.5-286.8*	11.2	33.2	46.1	9.5	6.47	63.58	1.15	18.46	0.82	11,020	A			
2.3	----	37.3	52.0	10.7	5.88	71.58	1.30	9.61	0.92	12,410	B	----	----	0.294
2.5	----	41.8	58.2	----	6.58	80.17	1.45	10.77	1.03	13,900	C			
286.8-287.0														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
Core Hole PM-10C (Upper Cretaceous Almond Formation)														
143.5-144.7														
1.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
144.7-146.5*	12.1	33.0	52.3	2.6	6.98	69.42	1.35	18.97	0.65	12,070	A			
1.8	----	37.5	59.5	3.0	6.41	78.95	1.54	9.37	0.74	13,730	B	----	----	0.156
3.5	----	38.7	61.3	----	6.60	81.39	1.59	9.66	0.76	14,160	C			
146.5-147.0														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
153.0-154.4														
1.4	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
154.4-156.5*	14.3	32.9	48.9	3.9	6.51	66.00	1.16	21.69	0.75	11,410	A			
2.1	----	38.4	57.1	4.5	5.73	76.99	1.35	10.53	0.87	13,320	B	----	----	0.202
3.5	----	40.2	59.8	----	6.00	80.64	1.42	11.03	0.91	13,950	C			
219.5-221.0***	10.9	33.5	51.3	4.3	5.59	67.98	1.01	20.32	0.81	11,760	A			
1.5	----	37.7	57.5	4.8	4.90	76.33	1.13	11.91	0.91	13,200	B	9.0	----	----
9.5	----	39.6	60.4	----	5.15	80.19	1.19	12.51	0.96	13,870	C			
221.0-223.2*	10.9	33.3	50.6	5.2	6.49	68.03	1.25	18.46	0.53	11,750	A			
2.2	----	37.4	56.7	5.9	5.91	76.39	1.41	9.80	0.60	13,190	B	7.6	----	----
9.5	----	39.8	60.2	----	6.28	81.16	1.49	10.44	0.63	14,020	C			
223.2-225.4*	11.4	38.8	45.3	4.5	6.55	68.33	1.30	18.53	0.75	11,860	A			
2.2	----	43.7	51.2	5.1	5.96	77.08	1.46	9.54	0.84	13,380	B	7.8	----	----
9.5	----	46.1	53.9	----	6.28	81.24	1.54	10.05	0.89	14,110	C			
225.4-227.7*	10.7	32.6	51.8	4.9	6.33	68.62	1.23	18.40	0.50	11,930	A			
2.3	----	36.5	58.0	5.5	5.75	76.87	1.38	9.93	0.56	13,370	B	7.8	----	----
9.5	----	38.6	61.4	----	6.09	81.36	1.46	10.50	0.59	14,150	C			
227.7-229.0***	12.1	31.4	50.6	5.9	5.60	65.76	1.09	20.83	0.80	11,440	A			
1.3	----	35.7	57.6	6.7	4.83	74.80	1.24	11.48	0.91	13,010	B	9.0	56	----
9.5	----	38.3	61.7	----	5.18	80.20	1.33	12.31	0.98	13,950	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole PM-10C continued														
219.5-229.0(C) ***	10.2	31.7	53.2	4.9	5.41	68.17	0.74	20.18	0.63	11,870	A			
9.5	----	35.3	59.3	5.4	4.75	75.88	0.82	12.43	0.70	13,220	B	----	----	0.551[24]
9.5	----	37.3	62.7	----	5.03	80.22	0.87	13.14	0.74	13,970	C			
265.5-266.1														
0.6	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
9.5														
266.1-267.8 *	12.4	32.1	53.5	2.0	6.56	69.81	1.26	19.96	0.45	12,130	A			
1.7	----	36.7	61.1	2.2	5.90	79.73	1.44	10.19	0.51	13,850	B	9.1	----	----
9.5	----	37.5	62.5	----	6.03	81.56	1.48	10.41	0.52	14,170	C			
267.8-269.7 ***	8.4	32.5	50.0	9.1	5.56	66.58	1.07	17.21	0.48	11,650	A			
1.9	----	35.5	54.6	9.9	5.04	72.71	1.16	10.62	0.53	12,730	B	6.9	----	----
9.5	----	39.5	60.5	----	5.60	80.74	1.29	11.78	0.59	14,130	C			
269.7-271.4 *	10.6	29.6	45.3	14.5	6.14	60.41	1.16	17.08	0.71	10,460	A			
1.7	----	33.1	50.7	16.2	5.54	67.61	1.30	8.54	0.79	11,710	B	7.9	----	----
9.5	----	39.5	60.5	----	6.62	80.70	1.55	10.19	0.94	13,980	C			
271.4-273.3 ***	10.3	30.4	48.3	11.0	5.28	63.53	1.03	18.71	0.44	11,020	A			
1.9	----	33.8	53.9	12.3	4.60	70.80	1.15	10.69	0.49	12,280	B	8.1	42	----
9.5	----	38.6	61.4	----	5.25	80.70	1.31	12.18	0.56	14,000	C			
273.3-275.0 *	9.3	28.3	41.7	20.7	5.66	56.00	1.12	15.90	0.59	9,770	A			
1.7	----	31.2	45.9	22.9	5.10	61.75	1.23	8.41	0.65	10,770	B	7.4	----	----
9.5	----	40.4	59.6	----	6.61	80.05	1.60	10.90	0.84	13,970	C			
266.1-275.0(WA)	10.2	30.7	48.0	11.1	5.85	63.57	1.13	17.85	0.53	11,060	A			
8.9	----	34.2	53.6	12.3	5.24	70.89	1.26	9.74	0.59	12,330	B	----	----	----
9.5	----	39.1	61.0	----	6.00	80.78	1.44	11.10	0.65	14,050	C			
265.5-275.0(C) ***	9.6	30.5	48.8	11.1	5.71	63.57	0.88	18.19	0.51	11,120	A			
9.5	----	33.7	54.0	12.3	5.13	70.32	0.97	10.70	0.56	12,300	B	----	----	0.324[25]
9.5	----	38.4	61.6	----	5.85	80.20	1.11	12.20	0.64	14,030	C			
300.5-301.5 *	13.3	30.8	51.6	4.3	6.57	67.09	1.26	20.24	0.52	11,700	A			
1.0	----	35.5	59.5	5.0	5.86	72.33	1.45	9.79	0.59	13,490	B	----	----	----
3.5	----	37.4	62.6	----	6.17	81.39	1.52	10.29	0.63	14,200	C			
301.5-303.5 *	12.5	31.7	47.4	8.4	6.11	63.80	1.29	19.82	0.61	11,110	A			
2.0	----	36.3	54.1	9.6	5.39	72.92	1.47	9.96	0.70	12,700	B	----	----	----
3.5	----	40.1	59.9	----	5.96	80.63	1.63	11.01	0.77	14,040	C			
303.5-305.0 *	5.5	16.6	11.7	66.2	3.46	20.62	0.41	8.76	0.53	3,450	A			
1.5[26]	----	17.6	12.4	70.0	3.01	21.81	0.43	4.14	0.57	3,650	B	----	----	0.300[27]
3.5	----	58.6	41.4	----	10.05	72.80	1.44	13.82	1.89	12,190	C			
Core Hole PM-12C (Upper Cretaceous Almond Formation)														
242.5-243.5														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
243.5-246.0 *	12.7	33.3	51.9	2.1	6.36	68.95	1.34	20.63	0.60	12,040	A			
2.5	----	38.1	59.5	2.4	5.66	78.95	1.54	10.74	0.69	13,790	B	----	----	0.170
4.0	----	39.0	61.0	----	5.80	80.91	1.58	11.01	0.70	14,130	C			
246.0-246.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														

APPENDIX A continued

Core Hole PM-12C continued

INTERVAL SAMPLED (DETPH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
253.5-254.7	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.2														
4.5														
254.7-256.7*	10.9	26.4	35.8	26.9	5.14	48.93	1.00	17.07	0.97	8,510	A	----	----	0.078
2.0	----	29.6	40.2	30.2	4.40	54.93	1.13	8.26	1.09	9,550	B			
4.5	----	42.5	57.5	----	6.31	78.67	1.61	11.84	1.57	13,680	C			
256.7-258.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.3														
4.5														
311.0-312.0***	13.7	31.5	49.0	5.8	5.38	65.01	0.96	22.11	0.77	11,260	A	----	----	----
1.0	----	36.5	56.8	6.7	4.45	75.36	1.12	11.48	0.90	13,050	B			
8.0	----	39.1	60.9	----	4.77	80.76	1.20	12.31	0.96	13,980	C			
312.0-314.1*	13.8	31.4	48.5	6.3	6.33	65.03	1.29	20.52	0.51	11,230	A	----	----	----
2.1	----	36.5	56.2	7.3	5.56	75.42	1.50	9.59	0.60	13,020	B			
8.0	----	39.4	60.6	----	6.00	81.39	1.62	10.35	0.64	14,050	C			
314.1-316.1***	10.0	32.3	54.3	3.4	5.67	70.14	1.15	19.21	0.40	12,280	A	----	----	----
2.0	----	35.9	60.3	3.8	5.05	77.98	1.27	11.45	0.44	13,650	B			
8.0	----	37.3	62.7	----	5.25	81.07	1.33	11.89	0.46	14,190	C			
316.1-318.3*	12.5	31.8	52.0	3.7	6.20	67.52	1.25	20.80	0.57	11,720	A	----	----	----
2.2	----	36.4	59.4	4.2	5.48	77.20	1.42	11.07	0.65	13,400	B			
8.0	----	38.0	62.0	----	5.72	80.57	1.49	11.55	0.67	13,980	C			
318.3-319.0***	12.3	31.1	55.4	1.2	5.74	70.19	1.02	21.26	0.55	12,140	A	----	----	----
0.7	----	35.5	63.1	1.4	4.98	80.03	1.16	11.78	0.63	13,840	B			
8.0	----	36.0	64.0	----	5.05	81.18	1.17	11.96	0.64	14,040	C			
311.0-319.0(WA)	12.3	31.8	51.2	4.7	5.97	67.20	1.19	20.45	0.53	11,670	A	----	----	----
8.0	----	36.3	58.4	5.2	5.30	76.65	1.36	10.95	0.61	13,310	B			
8.0	----	38.4	61.6	----	5.53	80.97	1.44	11.41	0.64	14,060	C			
311.0-319.0(C)***	11.8	30.7	53.2	4.3	5.66	67.68	1.07	20.75	0.52	11,760	A	----	----	0.172[28]
8.0	----	34.8	60.3	4.9	4.91	76.77	1.22	11.61	0.59	13,340	B			
8.0	----	36.6	63.4	----	5.17	80.72	1.28	12.21	0.62	14,030	C			
358.0-358.9***	9.8	31.7	53.3	5.2	5.51	69.05	0.96	18.84	0.47	12,060	A	----	----	----
0.9	----	35.2	59.1	5.7	4.89	76.56	1.07	11.23	0.52	13,370	B			
6.0	----	37.3	62.7	----	5.19	81.21	1.13	11.92	0.55	14,180	C			
358.9-360.4*	10.0	33.5	53.2	3.3	6.21	69.98	1.45	18.62	0.42	12,250	A	----	----	0.656
1.5	----	37.2	59.1	3.7	5.65	77.74	1.61	10.85	0.47	13,610	B			
6.0	----	38.7	61.3	----	5.87	80.71	1.68	11.26	0.48	14,130	C			
360.4-362.4***	11.0	29.4	50.0	9.6	5.27	63.67	0.79	20.28	0.42	11,120	A	----	----	----
2.0	----	33.1	56.1	10.8	4.54	71.51	0.88	11.85	0.47	12,480	B			
6.0	----	37.1	62.9	----	5.09	80.12	0.99	13.27	0.53	13,990	C			
362.4-364.0*	11.9	32.8	52.7	2.6	6.25	69.43	1.45	19.83	0.47	12,070	A	----	----	0.950
1.6	----	37.3	59.8	2.9	5.58	78.81	1.65	10.50	0.54	13,700	B			
6.0	----	38.4	61.6	----	5.75	81.18	1.70	10.82	0.55	14,110	C			
358.0-364.0(WA)	10.8	31.9	52.1	5.3	5.85	67.82	1.19	19.47	0.44	11,840	A	----	----	----
6.0	----	35.7	58.4	5.9	5.20	76.01	1.33	11.11	0.50	13,270	B			
6.0	----	38.0	63.8	----	5.51	80.72	1.41	11.83	0.52	14,090	C			

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
APPENDIX A continued														
Core Hole PM-12C continued														
358.0-364.0(C) ***	10.0	31.0	53.6	5.4	5.42	68.22	0.95	19.60	0.44	11,940	A			
6.0	----	34.5	59.5	6.0	4.78	75.84	1.05	11.87	0.49	13,270	B	----	----	----
6.0	----	36.7	63.3	----	5.08	80.65	1.12	12.62	0.53	14,110	C			
413.0-414.5 *	10.4	31.8	48.6	9.2	6.16	64.92	1.26	17.65	0.83	11,330	A			
1.5	----	35.5	54.3	10.2	5.58	72.44	1.40	9.41	0.93	12,640	B	----	----	----
6.5	----	39.6	60.4	----	6.22	80.70	1.56	10.48	1.04	14,080	C			
414.5-416.5 *	10.9	30.7	32.8	24.6	5.28	50.84	0.97	16.66	0.60	8,820	A			
2.0[29]	----	34.4	36.8	28.8	4.56	57.05	1.09	7.85	0.67	9,890	B	----	----	----
6.5	----	48.3	51.7	----	6.41	81.10	1.53	11.02	0.94	13,890	C			
416.5-416.9														
0.4	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
6.5														
416.9-419.5 *	9.5	25.7	33.7	31.1	5.55	45.62	0.95	16.15	0.61	7,900	A			
2.6[31]	----	28.4	37.2	34.4	4.96	50.39	1.04	8.56	0.67	8,730	B	----	----	0.243[30]
6.5	----	43.3	56.7	----	7.56	76.80	1.59	13.03	1.02	13,300	C			
Core Hole PM-16C (Upper Cretaceous Almond Formation)														
141.0-141.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
141.5-143.5*	9.6	31.1	45.7	13.6	5.81	61.62	1.15	17.24	0.53	10,740	A			
2.0	----	34.5	50.4	15.1	5.24	68.19	1.27	9.62	0.58	11,880	B	----	----	0.074
4.5	----	40.6	59.4	----	6.17	80.33	1.50	11.31	0.69	13,990	C			
143.5-145.5														
2.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.5														
141.0-145.5 (C)***	10.7	30.7	47.6	11.0	5.60	62.63	0.89	19.16	0.73	11,010	A			
4.5	----	34.4	53.3	12.3	4.93	70.12	0.99	10.84	0.82	12,330	B	----	----	----
4.5	----	39.2	60.8	----	5.62	79.95	1.13	12.37	0.93	14,060	C			
190.0-190.5														
0.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
5.0														
190.5-192.7 **	14.5	29.5	52.7	3.3	6.04	66.17	1.25	21.22	1.97	11,510	A			
2.2	----	34.6	61.5	3.9	5.17	77.40	1.47	9.75	2.30	13,460	B	----	----	----
5.0	----	36.0	64.0	----	5.38	80.55	1.53	10.14	2.40	14,010	C			
192.7-195.0 **	12.7	31.8	49.1	6.4	5.86	65.19	1.39	20.60	0.55	11,410	A			
2.3	----	36.5	56.2	7.3	5.09	74.68	1.59	10.66	0.63	13,070	B	----	----	----
5.0	----	39.4	60.6	----	5.49	80.60	1.72	11.51	0.68	14,110	C			
190.5-195.0(WA)	13.6	30.7	50.9	4.9	5.95	65.68	1.32	20.91	1.26	11,460	A			
4.5	----	35.6	58.9	5.6	5.13	76.04	1.53	10.21	1.47	13,270	B	----	52	----
5.0	----	37.7	62.3	----	5.44	80.58	1.63	10.83	1.54	14,060	C			
190.0-195.0(C) ***	12.1	31.0	52.1	4.8	5.51	67.06	0.78	20.44	1.37	11,620	A			
5.0	----	35.3	59.2	5.5	4.73	76.28	0.89	11.04	1.56	13,210	B	----	----	----
5.0	----	37.3	62.7	----	5.01	80.72	0.94	11.68	1.65	13,980	C			
265.5-267.5 *	13.3	33.2	51.2	2.3	6.48	67.55	1.30	21.46	0.89	11,830	A			
2.0	----	38.3	59.0	2.7	5.76	77.93	1.50	11.11	1.03	13,650	B	----	----	1.89
2.0	----	39.4	60.0	----	5.92	80.07	1.54	11.41	1.06	14,020	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2 IN ASH *
Core Hole PM-16C continued														
316.0-318.3 *	12.3	30.5	51.4	5.8	5.69	63.18	1.35	23.54	0.42	11,570	A	----	35	----
2.3	----	34.8	58.6	6.6	4.91	72.05	1.55	14.37	0.48	13,190	B			
5.5	----	37.2	62.8	----	5.26	77.17	1.65	15.41	0.51	14,130	C			
318.3-320.7 *	13.4	32.4	51.8	2.4	5.98	67.30	1.35	22.44	0.50	11,840	A	----	----	----
2.4	----	37.4	59.8	2.8	5.17	77.72	1.56	12.17	0.57	13,680	B			
5.5	----	38.5	61.5	----	5.32	79.97	1.60	12.52	0.59	14,070	C			
320.7-321.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.8														
5.5														
316.0-321.5(C)	12.0	31.2	52.7	4.1	5.74	67.74	1.04	20.89	0.48	11,860	A	----	----	1.25[32]
5.5	----	35.5	59.8	4.7	5.00	76.96	1.18	11.66	0.54	13,470	B			
5.5	----	37.2	62.8	----	5.24	80.72	1.23	12.24	0.57	14,130	C			
441.0-441.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.2														
8.0														
441.2-443.2 *	11.9	30.6	48.9	8.6	5.99	64.19	1.25	19.51	0.49	11,210	A	----	42	----
2.0	----	34.7	55.6	9.7	5.29	72.86	1.42	10.15	0.55	12,730	B			
8.0	----	38.5	61.5	----	5.86	80.71	1.57	11.25	0.61	14,100	C			
443.2-444.1	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	44	----
0.9														
8.0														
444.1-446.1 *	12.8	31.8	52.8	2.6	6.98	68.23	1.30	20.34	0.52	12,010	A	----	44	----
2.0	----	36.5	60.5	3.0	5.36	78.29	1.49	10.24	0.60	13,780	B			
8.0	----	37.7	62.3	----	5.56	80.73	1.54	10.55	0.62	14,210	C			
446.1-447.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.9														
8.0														
447.0-449.0 *	12.7	29.6	49.0	8.7	6.66	63.70	1.20	19.25	0.47	11,110	A	----	----	----
2.0	----	33.9	56.1	10.0	6.00	73.00	1.37	9.09	0.54	12,730	B			
8.0	----	37.6	62.4	----	6.66	81.11	1.52	10.12	0.59	14,140	C			
441.0-449.0(C) ***	11.4	31.0	49.6	8.0	5.77	64.75	0.96	19.97	0.51	11,380	A	----	----	0.768[33]
8.0	----	35.0	55.9	9.1	5.07	73.07	1.08	11.12	0.58	12,840	B			
8.0	----	38.5	61.5	----	5.58	80.37	1.19	12.22	0.64	14,130	C			
Core Hole PM-17C (Upper Cretaceous Almond Formation)														
134.5-134.9	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.4														
2.5														
134.9-136.5 *	15.1	31.6	51.8	1.5	6.48	66.78	1.22	23.35	0.63	11,720	A	----	----	0.358
1.6	----	37.2	61.0	1.8	5.65	78.63	1.44	11.73	0.74	13,800	B			
2.5	----	37.9	62.1	----	5.75	80.09	1.46	11.94	0.76	14,060	C			
136.5-137.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.5														
2.5														
212.0-214.0 *	13.4	31.8	51.8	3.0	6.33	67.51	1.27	21.05	0.83	11,770	A	----	34	----
2.0	----	36.8	59.7	3.5	5.58	77.97	1.47	10.54	0.96	13,590	B			
6.0	----	38.1	61.9	----	5.78	80.79	1.52	10.92	0.99	14,080	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) INTERVAL THICKNESS (FEET) BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole PM-17C continued														
214.0-216.0***	13.7	29.9	48.4	8.0	5.47	63.34	0.99	21.77	0.43	10,960	A			
2.0	----	34.7	56.0	9.3	4.56	73.44	1.15	11.07	0.50	12,710	B	----	----	----
6.0	----	38.2	61.8	----	5.02	80.95	1.27	12.21	0.55	14,000	C			
216.0-218.0*	13.0	32.5	51.1	3.4	6.05	67.37	1.34	21.28	0.52	11,810	A			
2.0	----	37.3	58.7	4.0	6.29	77.40	1.54	11.22	0.60	13,560	B	----	----	----
6.0	----	38.8	61.2	----	5.50	80.58	1.60	11.70	0.62	14,120	C			
212.0-218.0(WA)	13.4	31.4	50.4	4.8	5.95	66.07	1.20	21.37	0.59	11,510	A			
6.0	----	36.3	58.1	5.6	5.48	76.27	1.39	10.94	0.69	13,290	B	----	----	----
6.0	----	38.4	61.6	----	5.43	80.77	1.46	11.61	0.72	14,070	C			
212.0-218.0(C)***	12.1	31.0	52.0	4.9	5.64	67.04	1.03	20.85	0.56	11,630	A			
6.0	----	35.2	59.3	5.5	4.88	76.23	1.17	11.54	0.63	13,220	B	----	----	0.259[34]
6.0	----	37.3	62.7	----	5.17	80.71	1.24	12.21	0.67	14,000	C			
343.0-345.2*	15.3	30.7	50.1	3.9	6.17	65.43	1.26	22.72	0.55	11,440	A			
2.2	----	36.3	59.1	4.6	5.26	77.22	1.49	10.83	0.64	13,500	B	----	----	----
5.0	----	38.0	62.0	----	5.51	80.92	1.56	11.33	0.68	14,150	C			
345.2-345.8***	12.5	31.5	51.4	4.6	5.50	67.16	0.95	21.43	0.33	11,750	A			
0.6	----	36.0	58.7	5.3	4.68	76.78	1.08	11.79	0.38	13,430	B	----	----	----
5.0	----	38.0	62.0	----	4.94	81.07	1.15	12.44	0.40	14,180	C			
345.8-348.0*	12.9	30.9	51.6	4.6	6.02	66.66	1.34	20.66	0.68	11,590	A			
2.2	----	35.5	59.2	5.3	5.25	76.52	1.54	10.58	0.78	13,300	B	----	10	----
5.0	----	37.4	62.6	----	5.55	80.83	1.62	11.17	0.83	14,050	C			
343.0-348.0(WA)	13.8	30.9	51.0	4.3	5.99	66.27	1.23	21.64	0.56	11,560	A			
5.0	----	35.9	59.1	5.0	5.14	76.85	1.43	10.92	0.64	13,410	B	----	----	----
5.0	----	37.8	62.2	----	5.41	80.91	1.50	11.49	0.68	14,120	C			
343.0-348.0(C)***	12.4	30.8	52.3	4.5	5.66	67.17	1.10	21.05	0.51	11,670	A			
5.0	----	35.2	59.6	5.2	4.87	76.72	1.26	11.42	0.58	13,330	B	----	----	0.322[35]
5.0	----	37.1	62.9	----	5.13	80.88	1.32	12.06	0.61	14,060	C			
452.0-452.2														
0.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
5.0														
452.2-454.6*	13.1	32.2	50.7	4.0	6.18	67.14	1.38	20.49	0.82	11,810	A			
2.4	----	37.0	58.4	4.6	5.43	77.25	1.59	10.19	0.95	13,580	B	----	----	----
5.0	----	38.8	61.2	----	5.69	80.97	1.66	10.69	0.99	14,240	C			
454.6-457.0*	8.7	21.8	28.6	40.9	4.18	39.10	0.74	14.72	0.36	6,690	A			
2.4	----	23.9	31.3	44.8	3.51	42.83	0.81	7.67	0.39	7,320	B	----	----	----
5.0	----	43.3	56.7	----	6.37	77.56	1.47	13.89	0.71	13,260	C			
452.2-457.0(WA)	10.9	27.0	39.7	22.5	5.18	53.12	1.06	17.61	0.59	9,250	A			
4.8	----	30.5	44.9	24.7	4.47	60.04	1.20	8.93	0.67	10,450	B	----	----	0.066[36]
5.0	----	41.1	59.0	----	6.03	79.27	1.57	12.29	0.85	13,750	C			
462.5-463.2														
0.7	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.5														
463.2-465.7*	11.4	30.9	49.3	8.4	5.64	65.21	1.16	19.06	0.49	11,280	A			
2.5	----	34.8	55.7	9.5	4.92	73.60	1.31	10.09	0.55	12,730	B	----	----	0.198
3.5	----	38.5	61.5	----	5.44	81.35	1.45	11.15	0.61	14,070	C			

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole PM-17C continued														
465.7-466.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.3														
3.5														
Core Hole MD-1C (Upper Cretaceous Adaville Formation)														
381.0-383.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.5														
6.0														
383.5-385.5 **	19.7	33.2	40.5	6.6	6.36	55.16	1.13	30.48	0.31	9,570	A	----	----	----
2.0	----	41.4	50.4	8.2	5.18	68.69	1.41	16.16	0.39	11,920	B			
6.0	----	45.1	54.9	----	5.64	74.80	1.53	17.61	0.42	12,980	C			
385.5-387.0 **	19.0	31.0	38.2	11.8	5.98	51.73	1.03	29.27	0.23	8,920	A	----	----	----
1.5	----	38.3	47.2	14.5	4.75	63.90	1.28	15.26	0.28	11,020	B			
6.0	----	44.8	55.2	----	5.56	74.77	1.49	17.85	0.33	12,900	C			
439.0-441.0 **	20.4	32.0	40.4	7.2	6.56	54.55	1.03	30.33	0.31	9,450	A	----	----	----
2.0	----	40.2	50.7	9.1	5.37	68.48	1.29	15.40	0.39	11,870	B			
20.0	----	44.2	55.8	----	5.91	75.31	1.42	16.93	0.43	13,050	C			
441.0-443.0 **	23.5	32.1	40.2	4.2	6.86	54.75	0.95	33.07	0.20	9,440	A	----	----	----
2.0	----	41.9	52.7	5.4	5.53	71.54	1.24	15.98	0.26	12,340	B			
20.0	----	44.3	55.7	----	5.85	75.66	1.31	16.90	0.28	13,050	C			
443.0-444.0	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.0														
20.0														
444.0-445.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.0														
20.0														
445.0-447.0 **	19.9	31.4	39.8	8.9	6.68	54.07	0.88	29.32	0.20	9,350	A	----	----	----
2.0	----	39.1	49.9	11.0	5.57	67.46	1.10	14.58	0.25	11,660	B			
20.0	----	44.0	56.0	----	6.26	75.83	1.24	16.39	0.28	13,110	C			
447.0-449.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
20.0														
449.0-451.0 **	21.0	32.5	41.8	4.7	6.75	56.44	1.07	30.83	0.24	9,790	A	----	----	----
2.0	----	41.1	53.0	5.9	5.57	71.45	1.35	15.41	0.31	12,400	B			
20.0	----	43.7	56.3	----	5.92	75.94	1.43	16.39	0.32	13,180	C			
451.0-451.1	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.1														
20.1														
451.1-451.5	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.4														
20.0														
451.5-453.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.5														
20.0														
453.0-455.0 **	20.3	33.7	41.3	4.7	7.02	56.80	1.15	30.14	0.23	9,920	A	----	----	----
2.0	----	42.2	52.0	5.8	5.96	71.23	1.44	15.24	0.29	12,440	B			
20.0	----	44.9	55.1	----	6.33	75.65	1.53	16.18	0.31	13,210	C			
455.0-456.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.0														
20.0														

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH +
Core Hole MD-1C continued														
456.0-457.5														
1.5	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
20.0														
457.5-459.0 **	19.7	33.1	42.8	4.4	6.14	57.83	1.09	30.22	0.33	10,050	A			
1.5	----	41.3	53.2	5.5	4.90	72.01	1.36	15.85	0.41	12,520	B	----	----	----
20.0	----	43.6	56.4	----	4.19	76.17	1.43	16.78	0.43	13,240	C			
Core Hole MD-2C (Upper Cretaceous Adaville Formation)														
91.0- 92.8 **	19.5	23.3	19.3	37.9	4.56	30.94	0.54	25.81	0.27	5,280	A			
1.8	----	28.9	24.1	47.0	2.96	38.42	0.68	10.60	0.33	6,550	B	----	----	----
2.0	----	54.5	45.5	----	5.59	72.50	1.27	20.01	0.63	12,370	C			
92.8- 94.0														
1.2	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
96.0- 98.0 **	23.1	30.7	38.3	7.9	6.16	52.10	0.97	32.53	0.30	9,010	A			
2.0	----	39.9	49.8	10.3	4.65	67.74	1.26	15.63	0.40	11,710	B	17.0	----	----
25.0	----	44.5	55.5	----	5.18	75.53	1.40	17.45	0.44	13,060	C			
98.0- 99.8 ***	22.8	32.9	39.4	4.9	5.97	54.88	0.77	33.19	0.26	9,500	A			
1.8	----	42.6	51.0	6.4	4.43	71.04	1.00	16.81	0.34	12,290	B	18.4	9	----
25.0	----	45.5	54.5	----	4.73	75.88	1.06	17.97	0.36	13,130	C			
99.8-101.8 **	24.8	30.8	39.3	5.1	6.62	52.98	0.86	34.30	0.18	9,120	A			
2.0	----	41.0	52.3	6.7	5.11	70.46	1.14	16.32	0.25	12,130	B	17.8	45	----
25.0	----	44.0	56.0	----	5.48	75.53	1.23	17.50	0.26	13,000	C			
101.8-102.7 ***	22.4	32.8	41.0	3.8	5.94	55.89	0.66	33.52	0.17	9,660	A			
0.9	----	42.2	52.9	4.9	4.42	71.99	0.85	17.61	0.21	12,440	B	17.2	----	----
25.0	----	44.4	55.6	----	4.65	75.71	0.90	18.52	0.22	13,090	C			
102.7-104.7 **	22.4	32.5	40.3	4.8	6.31	54.57	0.93	33.16	0.20	9,460	A			
2.0	----	41.9	51.9	6.2	4.91	70.31	1.19	17.11	0.25	12,190	B	17.6	----	----
25.0	----	44.6	55.4	----	5.23	74.98	1.27	18.25	0.27	13,000	C			
104.7-106.2 ***	23.7	32.8	39.3	4.2	6.19	54.73	0.67	34.05	0.20	9,400	A			
1.5	----	43.0	51.5	5.5	4.64	71.76	0.87	17.00	0.26	12,320	B	18.9	----	----
25.0	----	45.4	54.6	----	4.91	75.91	0.92	17.99	0.27	13,030	C			
96.0-106.2(C) ***	22.7	32.3	39.8	5.2	6.22	54.32	0.71	33.35	0.23	9,396	A			
10.2	----	41.8	51.5	6.7	4.76	70.25	0.92	17.09	0.29	12,110	B	----	----	----
25.0	----	44.8	55.2	----	5.10	75.29	0.98	18.32	0.31	12,980	C			
106.2-108.3 **	21.0	32.8	39.3	6.9	6.38	54.19	0.92	31.41	0.20	9,420	A			
2.1	----	41.5	49.8	8.7	5.10	68.56	1.17	16.19	0.25	11,910	B	----	----	----
25.0	----	45.5	54.5	----	5.59	75.12	1.28	17.74	0.27	13,050	C			
96.0-108.3(WA)	23.2	32.1	39.6	5.1	6.20	54.19	0.81	33.46	0.22	9,360	A			
12.3	----	41.8	51.6	6.4	4.69	70.55	1.05	16.75	0.29	12,180	B	17.8	----	----
25.0	----	44.7	55.3	----	5.03	75.59	1.13	17.95	0.30	13,050	C			
108.3-109.8														
1.5	ROCK PARTING, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
25.0														
109.8-111.1 ***	25.4	31.4	38.2	5.0	6.06	52.99	0.75	34.99	0.17	9,110	A			
1.3	----	42.1	51.1	6.8	4.31	71.04	1.01	16.66	0.22	12,210	B	----	----	----
25.0	----	45.1	54.9	----	4.62	76.19	1.08	17.87	0.24	13,100	C			

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MD-2C continued														
111.1-113.2 **	23.2	31.5	40.5	4.8	6.43	54.40	0.98	33.24	0.15	9,380	A	----	59	----
2.1	----	41.0	52.8	6.2	4.99	70.86	1.28	16.47	0.20	12,200	B			
25.0	----	43.7	56.3	----	5.32	75.54	1.36	17.57	0.21	13,010	C			
113.2-114.2 ***	22.7	32.0	40.9	4.4	6.35	55.08	0.94	33.11	0.15	9,480	A	----	58	----
1.0	----	41.4	52.9	5.7	4.93	71.29	1.21	16.72	0.20	12,280	B			
25.0	----	43.9	56.1	----	5.22	75.56	1.29	17.72	0.21	13,010	C			
114.2-115.1 ***	24.4	31.5	40.3	3.8	6.57	53.85	0.81	34.77	0.16	9,300	A	----	----	----
0.9	----	41.7	53.2	5.1	5.09	71.19	1.07	17.37	0.21	12,290	B			
25.0	----	43.9	56.1	----	5.36	75.00	1.13	18.28	0.23	12,940	C			
115.1-117.6 **	20.9	32.9	41.1	5.1	6.31	55.46	0.99	32.02	0.14	9,570	A	----	----	----
2.5	----	41.6	52.0	6.4	5.01	70.15	1.25	16.98	0.18	12,100	B			
25.0	----	44.4	55.6	----	5.36	74.97	1.34	18.14	0.19	12,940	C			
117.6-118.5***	21.0	33.2	42.1	3.7	6.28	56.62	0.62	32.56	0.17	9,790	A	----	----	----
0.9	----	42.0	53.3	4.7	4.98	71.69	0.78	17.59	0.21	12,390	B			
25.0	----	44.1	55.9	----	5.22	75.26	0.82	18.48	0.22	13,010	C			
118.5-121.0**	22.4	31.7	40.8	5.1	6.37	54.45	1.06	32.81	0.24	9,480	A	----	----	----
2.5	----	40.8	52.7	6.5	4.99	70.13	1.36	16.68	0.31	12,220	B			
25.0	----	43.7	56.3	----	5.34	75.03	1.46	17.84	0.33	13,070	C			
106.2-121.0(C)***	22.2	32.4	40.4	5.0	6.76	54.42	0.79	32.83	0.19	9,440	A	----	----	----
14.8[37]	----	41.6	52.0	6.4	5.50	69.94	1.02	16.85	0.25	12,130	B			
25.0	----	44.5	55.5	----	5.87	74.76	1.09	18.01	0.27	12,970	C			
109.8-121.0(WA)	22.3	32.1	41.6	4.7	6.38	54.91	0.94	32.95	0.17	9,490	A	----	----	----
13.6	----	41.3	52.7	6.0	4.94	70.72	1.20	16.88	0.22	12,220	B			
25.0	----	43.9	56.1	----	5.32	75.21	1.28	17.95	0.25	13,000	C			
96.0-121.0(C)***	22.4	32.2	40.4	5.0	6.24	54.61	0.74	33.23	0.19	9,410	A	----	----	----
25.0[37]	----	41.5	52.1	6.4	4.82	70.38	0.96	17.17	0.24	12,120	B			
25.0	----	44.4	55.6	----	5.15	75.22	1.02	18.35	0.26	12,960	C			
Core Hole MD-3C (Upper Cretaceous Adaville Formation)														
175.0-177.0 **	22.9	30.9	39.8	6.4	6.35	52.91	0.96	32.31	1.11	9,200	A	----	----	----
2.0	----	40.1	51.7	8.2	4.91	68.62	1.25	15.52	1.45	11,930	B			
39.0	----	43.7	56.3	----	5.35	74.79	1.36	16.92	1.58	13,010	C			
177.0-179.0 **	25.1	32.6	37.7	4.6	6.40	53.62	0.90	34.19	0.29	9,280	A	----	----	----
2.0	----	43.5	50.4	6.1	4.80	71.59	1.21	15.88	0.38	12,390	B			
39.0	----	46.4	53.6	----	5.12	76.27	1.29	16.91	0.41	13,200	C			
179.0-183.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
4.0														
39.0														
183.0-184.0 **	24.2	31.3	37.9	6.6	6.19	52.91	0.87	33.06	0.40	9,150	A	----	----	----
1.0	----	41.3	50.0	8.7	4.59	69.78	1.15	15.30	0.52	12,070	B			
39.0	----	45.3	54.7	----	5.03	76.40	1.26	16.74	0.57	13,220	C			
184.0-185.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.0														
39.0														
185.0-187.0 **	20.9	29.5	32.1	17.5	5.65	45.47	0.70	30.32	0.31	7,900	A	----	46[38]	----
2.0	----	37.3	40.5	22.2	4.18	57.47	0.88	14.90	0.39	9,990	B			
39.0	----	47.9	52.1	----	5.38	73.85	1.13	19.14	0.50	12,840	C			

APPENDIX A continued

INTERVAL SAMPLED (DEPTH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole MD-3C continued														
187.0-191.0														
4.0	ONLY HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											----	54	----
39.0														
191.0-193.0 **	21.2	35.2	37.4	6.2	6.58	53.87	0.80	32.25	0.34	9,360	A			
2.0	----	44.6	47.6	7.8	5.34	68.34	1.02	17.05	0.44	11,880	B	----	----	----
39.0	----	48.4	51.6	----	5.79	74.13	1.10	18.50	0.48	12,880	C			
193.0-195.0														
2.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
39.0														
195.0-197.0 **	21.6	33.7	40.0	4.7	6.94	56.61	0.88	30.57	0.32	9,740	A			
2.0	----	43.0	51.0	6.0	5.77	72.26	1.13	14.46	0.41	12,440	B	----	----	----
39.0	----	45.8	54.2	----	6.14	76.85	1.20	15.37	0.44	13,220	C			
197.0-198.0														
1.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
39.0														
175.0-198.0(C) ***	21.7	32.8	38.5	7.0	6.10	54.01	0.49	31.81	0.54	9,380	A			
23.0[19]	----	41.9	49.1	9.0	4.69	68.99	0.63	15.99	0.70	11,980	B	----	----	----
39.0	----	46.1	53.9	----	5.15	75.82	0.69	17.58	0.76	13,160	C			
224.0-225.0 **	21.9	32.2	38.8	7.1	6.46	54.58	0.74	29.00	2.13	9,410	A			
1.0	----	41.2	49.7	9.1	5.13	69.90	0.95	12.22	2.72	12,050	B	----	----	----
1.0	----	45.3	54.7	----	5.64	76.88	1.05	13.43	3.00	13,260	C			
Core Hole R-6AC (Upper Cretaceous Adaville Formation)														
449.0-451.0 **	21.6	31.9	40.4	6.1	6.30	54.91	0.93	31.01	0.73	9,560	A			
2.0	----	40.6	51.6	7.8	4.96	70.03	1.18	15.08	0.94	12,200	B	15.7	----	----
23.5	----	44.1	55.9	----	5.38	75.96	1.28	16.37	1.01	13,230	C			
451.0-453.0														
2.0	ONLY EQUILIBRIUM MOISTURE AND HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											16.2	50	----
23.5														
453.0-455.0 **	22.0	32.6	40.7	4.7	6.28	55.77	0.95	31.86	0.44	9,730	A			
2.0	----	41.7	52.3	6.0	4.89	71.48	1.22	15.82	0.57	12,470	B	15.6	60	----
23.5	----	44.4	55.6	----	5.21	76.06	1.30	16.82	0.61	13,270	C			
455.0-457.0														
2.0	ONLY EQUILIBRIUM MOISTURE AND HARDGROVE GRINDABILITY INDEX DETERMINED FOR THIS INTERVAL											15.6	46	----
23.5														
457.0-459.0 **	23.9	32.4	39.7	4.0	6.59	54.76	0.87	33.59	0.22	9,610	A			
2.0	----	42.5	52.3	5.2	5.14	72.00	1.14	16.22	0.28	12,630	B	17.9	11	----
23.5	----	44.9	55.1	----	5.42	75.96	1.20	17.12	0.30	13,330	C			
459.0-462.0														
3.0	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											15.3	----	----
23.5														
462.0-464.0 **	20.4	33.6	41.6	4.4	6.45	57.52	0.90	30.25	0.47	10,080	A			
2.0	----	42.2	52.3	5.5	5.24	72.22	1.13	15.28	0.59	12,660	B	16.2	----	----
23.5	----	44.7	55.3	----	5.55	76.46	1.19	16.18	0.62	13,410	C			
464.0-467.0														
3.0	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											16.5	----	----
23.5														

APPENDIX A continued

INTERVAL SAMPLED (DETPH IN FEET) / INTERVAL THICKNESS (FEET) / BED THICKNESS (FEET)[2]	PROXIMATE ANALYSIS (PERCENT) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE ANALYSIS (PERCENT) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	HEATING VALUE (BTU/POUND)	BASIS[3]	EQUILIBRIUM MOISTURE (WT.%) ***	HARDGROVE GRINDABILITY INDEX ***	PERCENT Na_2O IN ASH *
Core Hole R-6AC continued														
467.0-469.0 **	21.5	32.9	41.2	4.4	6.42	56.73	0.86	30.43	1.15	9,900	A	16.2	----	----
2.0	----	41.9	52.5	5.6	5.11	72.26	1.10	14.44	1.47	12,610	B			
23.5	----	44.4	55.6	----	5.42	76.56	1.16	15.30	1.56	13,360	C			
469.0-471.0	ONLY EQUILIBRIUM MOISTURE DETERMINED FOR THIS INTERVAL											16.3	----	----
2.0														
23.5														
471.0-473.0 **	16.3	23.7	27.4	32.6	4.74	37.70	0.52	22.87	1.54	6,530	A	----	----	----
2.0[5]	----	28.3	32.7	39.0	3.48	45.06	0.62	10.00	1.84	7,800	B			
23.5	----	46.4	53.6	----	5.70	73.87	1.01	16.40	3.02	12,790	C			
449.0-473.0(C)***	21.3	33.8	40.3	4.6	6.44	56.51	0.70	31.10	0.66	9,870	A	----	----	----
24.0[5]	----	43.0	51.2	5.8	5.15	71.80	0.88	15.49	0.84	12,540	B			
23.5	----	45.6	54.4	----	5.47	76.25	0.94	16.45	0.89	13,310	C			
Core Hole R-7C (Upper Cretaceous Adaville Formation)														
64.0- 66.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
2.0														
3.5														
66.0- 67.5 **	18.8	31.9	38.3	11.0	6.17	52.07	1.19	29.21	0.33	9,040	A	----	----	----
1.5	----	39.2	47.2	13.6	5.02	64.09	1.47	15.43	0.41	11,130	B			
3.5	----	45.4	54.6	----	5.80	74.16	1.70	17.87	0.47	12,870	C			
275.0-277.0 **	21.6	32.8	41.0	4.6	6.38	55.29	1.19	32.33	0.26	9,600	A	----	----	----
2.0	----	41.9	52.3	5.8	5.06	70.55	1.51	16.73	0.34	12,250	B			
9.0	----	44.5	55.5	----	5.37	74.89	1.61	17.77	0.36	13,010	C			
277.0-278.3	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
1.3														
9.0														
278.3-280.3 **	25.1	31.4	40.0	3.5	6.81	53.45	1.06	34.97	0.21	9,260	A	----	----	----
2.0	----	41.9	53.4	4.7	5.35	71.36	1.41	16.93	0.28	12,370	B			
9.0	----	44.0	56.0	----	5.61	74.86	1.48	17.76	0.29	12,980	C			
280.3-281.0	NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
0.7														
9.0														
281.0-284.0	SAMPLE NOT RECOVERED, NO ANALYSES DETERMINED FOR THIS INTERVAL											----	----	----
3.0														
9.0														
275.0-281.0(C)***	22.9	32.3	40.8	4.0	6.07	55.08	0.86	33.75	0.22	9,470	A	----	----	----
6.0*[5]	----	41.9	52.9	5.2	4.56	71.43	1.11	17.40	0.28	12,270	B			
9.0	----	44.2	55.8	----	4.81	75.36	1.17	18.36	0.30	12,950	C			

[1] All analytical work by Wyoming Analytical Laboratories, Inc., Wyoming.

[2] Total coal bed thickness as determined by geophysical logs.

[3] Analyses reported as A, sample as received; B, sample dry; C, sample dry ash-free.

[4] (C) designates a composite sample made by physically combining incremental samples of the coal bed.

[5] Composite of the following intervals: 225.0-226.0, 227.0-228.0, 228.8-229.8, 230.6-231.6, and 232.4-233.5.

APPENDIX A continued

[6] Probably interbedded coal and noncoaly rock; interval was not entirely coal.

[7] (WA) designates a calculated weighted average derived from analyses of the incremental samples of the coal bed.

[8] Composite of the following intervals: 157.6-158.5, 158.5-159.5, and 159.5-161.4.

[9] Lower part of sampled interval was probably not coal.

[10] Composite of the following intervals: 229.0-230.0 and 232.9-234.0.

[11] Composite of the following intervals: 232.2-234.2, 236.1-238.1, and 240.0-242.0.

[12] Upper 0.5 feet not sampled.

[13] Composite of the following intervals: 312.4-214.6, 216.5-218.7, and 319.4-321.0.

[14] Includes 0.5 feet of noncoaly rock from 62.9-63.4.

[15] Composite of the following intervals: 63.4-65.0 and 65.0-66.5.

[16] Includes 0.5 feet of noncoaly rock at base of sample interval.

[17] Composite of the following intervals: 226.2-227.9, 228.3-229.7, and 230.3-231.7.

[18] Includes 1.3 feet of interbedded thin coals and noncoaly rock in lower part of sampled interval.

[19] Composite of the following intervals: 213.8-215.8 and 215.8-217.8.

[20] Composite of the following intervals: 362.0-363.8 and 363.8-365.6.

[21] Composite of the following intervals: 428.7-430.6 and 430.6-432.6.

[22] Composite of the following intervals: 209.0-210.1 and 210.8-211.9.

[23] Composite of the following intervals: 248.6-249.8 and 249.8-251.0.

[24] Composite of the following intervals: 221.0-223.2, 223.2-225.4, and 225.4-227.7.

[25] Composite of the following intervals: 221.6-267.8, 269.7-271.4, and 273.3-275.0.

[26] Lower 1.0 feet probably noncoaly rocks; interval sampled in not entirely coal.

[27] Composite of the following intervals: 300.5-301.5, 301.5-303.5, and 303.5-305.0.

[28] Composite of the following intervals: 312.0-314.1 and 314.1-316.1.

[29] Includes about 0.5 feet of noncoaly rock in lower part of interval.

[30] Composite of the following intervals: 413.0-414.5, 414.5-416.5, and 416.9-419.5.

[31] Includes about 0.6 feet of noncoaly rock in upper part of interval.

[32] Compostia of the following intervals: 316.0-318.3 and 318.3-320.7.

[33] Compsoite of the following intervals: 441.2-443.2, 444.1-446.1, and 447.0-449.0.

[34] Composite of the following intervals: 212.0-214.0 and 214.0-216.0.

[35] Compsoite of the following intervals: 343.0-345.2 and 345.8-348.0.

[36] Composite of the following intervals: 452.2-454.6 and 454.6-457.0.

[37] Interval includes 1.5 feet of noncoaly rock from 108.3 to 109.8.

[38] Compsoite of the following intervals: 183.0-184.0, 184.0-185.0, and 185.0-187.0.

[39] This analysis only refers to a composite sample of the upper 23 feet of the interval; the lower 16 feet of the coal bed was lost in coring and was not recovered.

[40] This analysis only refers to a composite sample of the upper 6 feet of the interval; the lower 3 feet of the coal bed was lost in coring and was not recovered.

* Analysis was completed in July, 1982.

** Analysis was completed in September, 1982.

*** Analysis was completed in November and December, 1982.

REPORTS OF INVESTIGATIONS:RI-24

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