

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

GEOPHYSICAL AND LITHOLOGIC LOGS OF TWO HOLES DRILLED IN THE  
BOOK CLIFFS COAL FIELD, DEADMAN CANYON QUADRANGLE,  
CARBON COUNTY, UTAH

By

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This report has not been edited for conformity with  
U. S. Geological Survey editorial standards or  
stratigraphic nomenclature.

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CONTENTS

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	Page
INTRODUCTION -----	1
REFERENCES -----	4
GEOPHYSICAL AND LITHOLOGIC LOGS -----	5

---

ILLUSTRATIONS

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Figure 1. Drill-hole locations in the Deadman Canyon quadrangle-----	2
2. Description of rocks in the Wellington area of the Book Cliffs coal field, Carbon County, Utah-----	4

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TABLE

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Table 1. Summary of information for two holes drilled in the Book Cliffs coal field, Deadman Canyon quadrangle, Carbon County, Utah -----	3
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INTRODUCTION

Two holes, totaling 2,185.7 feet, were rotary drilled and partially cored in the Book Cliffs coal field, Utah, for the U.S. Geological Survey in October 1978. The drilling was done by Himes Drilling Company, Grand Junction, Colorado, under contract no. 14-08-0001-17342, awarded by the USGS. The geophysical logging was done by Strata Surveys, Steamboat Springs, Colorado. Access to drill the federally owned coal underlying fee land was granted by the surface owners in Price, Utah.

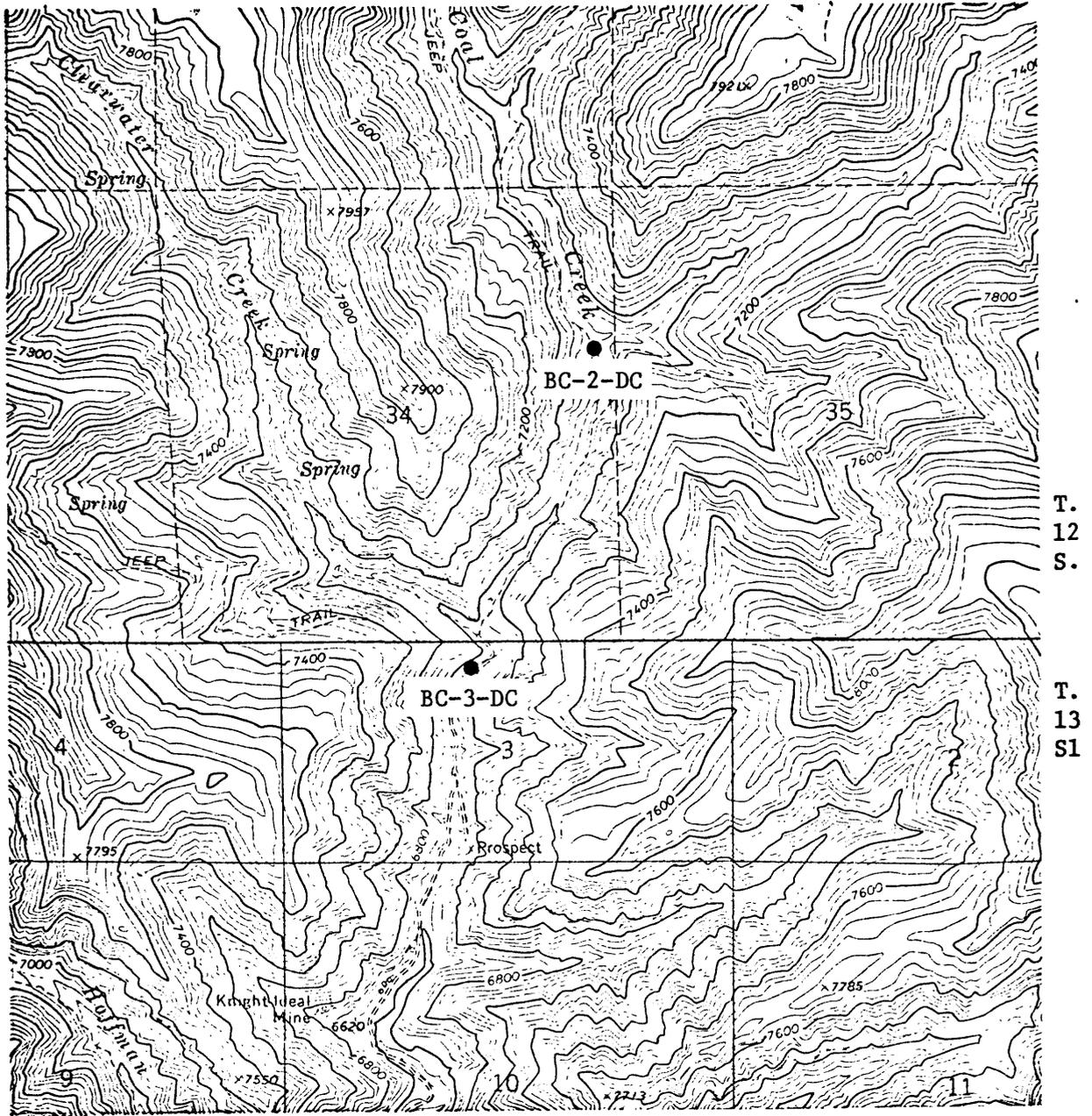
The purpose of the drilling was to obtain information on the thickness, quality, and extent of coal beds and the lithology of the enclosing rocks in the Upper Cretaceous Blackhawk Formation. The overall goal of the project is to evaluate and classify the coal lands.

Drilling was done in the Deadman Canyon quadrangle, Carbon County, Utah, using truck-mounted rotary drilling and coring rigs. Drilling media were air and foam for the rotary drilling and mud for the coring. Coring was done only in the coal-bearing part of the Blackhawk Formation.

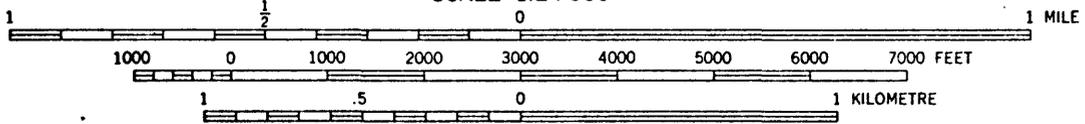
Both drill holes were logged by geophysical methods which included resistivity, natural gamma, density, and caliper. The logs were run at a scale of 1 inch to 10 feet; but for this report they were reduced to 1 inch to 50 feet.

All measurements are in feet; to convert to meters, multiply by 0.3048.

R. 11 E.



SCALE 1:24 000



CONTOUR INTERVAL 40 FEET  
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Figure 1.--Drill-hole locations in the Book Cliffs coal field, Deadman Canyon quadrangle, Carbon County, Utah.

Table 1.--Summary of information for two holes drilled in the Book Cliffs coal field, Deadman Canyon quadrangle, Carbon County, Utah

[FEL, from east line; FWL, from west line; FNL, from north line; FSL, from south line]

Drill-hole No.	Location	Rotary drilled depth (ft)	Cored interval (ft)	Depth logged (ft)	Total depth (ft)
BC-2-DC	T. 12 S., R. 11 E., sec. 34 1,900 FNL, 250 FEL	1,404	---	1,403	1,404
BC-3-DC	T. 13 S., R. 11 E., sec. 3 325 FNL, 2,150 FWL	201.4	201.4- 781.7	781.5	781.7

Geologic age	Group, formation, and member		Character of rocks	Thickness (feet)	Economic value	
UPPER CRETACEOUS	Mesaverde Group	Price River Formation	Non-coal-bearing member.	Mainly sandstone, shale, and sandy shale, gray to buff, with a prominent bed of sandstone, in places 200 feet or more in thickness, white at the top and buff near the base, near the middle of the member. The upper surface was eroded before the overlying Wasatch was deposited.	650-1,000	In places contains beds of carbonaceous shale but no coal beds of economic value. Building stone and sandstone perhaps pure enough for glass sand.
			Castlegate Sandstone Member	Massive gray to buff sandstone. The grains are semirounded quartz fairly well cemented. The rock is continuously exposed and in most places forms a vertical cliff 100 feet or more high.	150- 500	Used in places for building stone.
	Blackhawk Formation		Coal-bearing member	Thick sandstones with intervening beds of shale, sandy shale, and coal. The original color of the rocks is gray to buff, but the burning of the coal at surface has greatly altered the rock in color and composition. It is now predominantly red. The coal beds occur in the middle portion of this member.	500-1,000	Contains thick and extensive beds of bituminous coal, some of which is coked at Sunnyside
			Aberdeen Sandstone Member	Tongues of medium-grained buff sandstone separated by tongues of Mancos Shale.	60- 200	

Figure 2.--Description of rocks in the Wellington area of the Book Cliffs coal field, Carbon County, Utah. (Modified from Clark, 1928, p. 11.)

#### REFERENCES

- Clark, F. R., 1928, Economic geology of the Castlegate, Wellington, and Sunnyside quadrangles, Carbon County, Utah: U.S. Geological Survey Bulletin 793, 165 p.
- Fisher, J. D., Erdmann, C. E., and Reeside, J. R., Jr., 1960, Cretaceous and Tertiary formations of the Book Cliffs, Carbon, Emery, and Grand Counties, Utah, and Garfield and Mesa Counties, Colorado: U.S. Geological Survey Professional Paper 332, 80 p.

U.S. GEOLOGICAL SURVEY  
DRILL-HOLE LOG, CARBON COUNTY, UTAH

Hole No. BC-2-DC      Quadrangle Deadman Canyon      Elevation 6,880 ft

Location: T. 12 S., R. 11 E., sec. 34, 250' FEL 1,900' FNL

Rotary-  
drilled depth 1,404'      Cored interval \_\_\_\_\_      Logged depth 1,403'      Total depth 1,404'  
Drilling medium air and water

Geophysical logs:

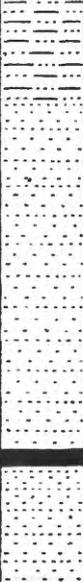
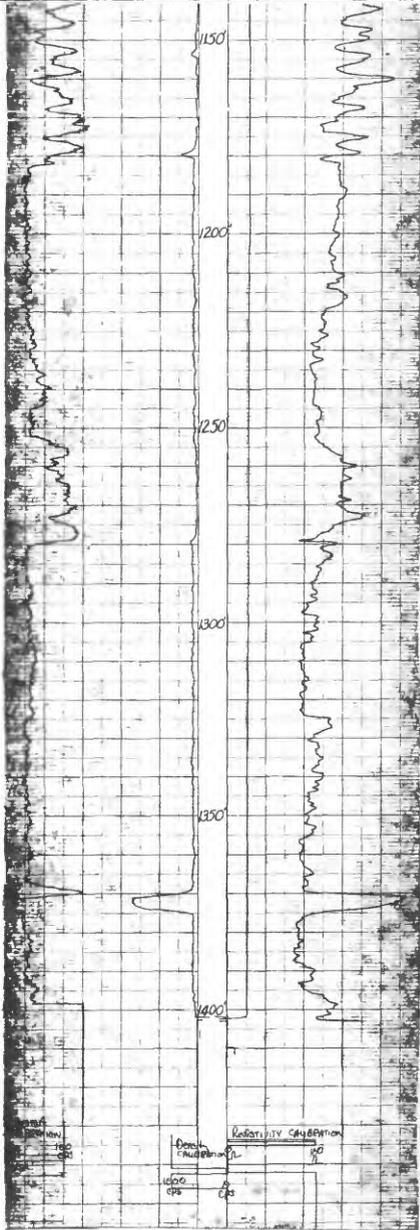
Caliper (Cal) - Logging speed: 50 ft/min.      Others: 20 ft/min  
Resistivity (Res):      Scale: 22 Ω/Log div.  
Gamma (Gam):      T.C. 2 sec.      Scale: 33 cps/Log div.  
Density (Den):      T.C. 2 sec.      Scale: 330 cps/Log div.

Remarks: \_\_\_\_\_

LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS			
		Gam	Den	Cal	Res
0-15 Alluvium					
15-25 Sandstone, light-gray, fine-grained, subangular					
25-45 Sandstone, medium-gray, fine-grained; interbedded dark-gray mudstone					
45-220 Sandstone, light-gray, fine-grained, subrounded; interbedded carbonaceous shale in lower part					
220-265 Shale, black					
265-280 Sandstone, light-gray, fine-grained, subrounded					
280-305 Sandstone, light-gray, fine-grained; interbedded dark-gray shale					
305-400 Sandstone, light-gray fine-grained; coaly material and interbedded dark-gray shale TOP OF CASTLEGATE SS MEMBER					
400-600 Sandstone, white, very fine grained; carbonaceous material at about 430 ft TOP OF BLACKHAWK FORMATION					
600-620 Sandstone, light-yellow, medium-to coarse-grained, poorly sorted, subrounded to subangular; carbonaceous shale in lower part					
620-650 Shale, medium-gray; some carbonaceous material and coal					

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS			
			Gam	Den	Cal	Res
650-675	Sandstone, medium-gray, medium-grained; interbedded dark-gray mudstone					
675-880	Sandstone and mudstone; interbedded coaly material and carbonaceous shale. Sandstone, minor, light-gray, fine-grained. Mudstone, dark-gray. Coal more common from 850 to 855 ft					
880-885	Coal - <u>Sunnyside bed</u>					
885-955	Sandstone, light-gray, fine-grained, subrounded; interbedded carbonaceous shale from 905 to 915 ft					
955-960	Coal					
960-980	Sandstone, light-gray, fine-grained, subrounded					
980-985	Coal					
985-1030	Sandstone, light-gray, fine-grained, subrounded					
1030-1035	Coal					
1035-1040	Carbonaceous shale					
1040-1050	Coal - <u>Rock Canyon bed</u>					
1050-1075	Siltstone, light-gray; interbedded carbonaceous shale					
1075-1080	Coal - <u>Gilson bed</u>					
1080-1085	Siltstone, light-gray					
1085-1095	Siltstone and coal					
1095-1105	Siltstone, light-gray					
1105-1130	Sandstone, light-gray, very fine grained; coal at about 1110 ft and shale near the bottom					
1130-1140	Carbonaceous shale; thin coal zone					
1140-1185	Sandstone, light-gray, very fine grained; interbedded carbonaceous shale. Coal zone from 1175 to 1185 ft					
1185-1255	Sandstone, light-gray, fine-grained, well-sorted, sub-angular					
1255-1280	Siltstone; interbedded carbonaceous material					
1280-1370	Sandstone, light-gray, fine-grained, well-sorted, sub-angular to angular					

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS			
			Gam	Den	Cal	Res
1370-1375	Coal - Aberdeen bed					
1375-1404	Sandstone, light-gray, fine-grained, subangular; interbedded carbonaceous shale at bottom					
T.D. - 1404 ft						

LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS			
		Gamma	Den	Cal	Res
					

U.S. GEOLOGICAL SURVEY  
DRILL-HOLE LOG, COUNTY, UTAH

Hole No. BC-3-DC      Quadrangle Deadman Canyon      Elevation 6,760 ft.

Location: T. 13 S., R. 11 E., sec. 3, 2,150'FWL 325' FNL

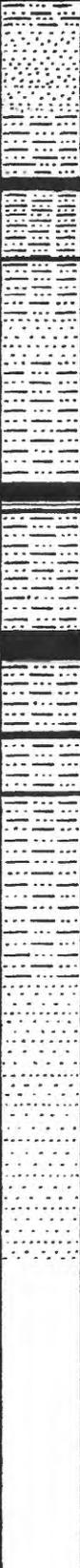
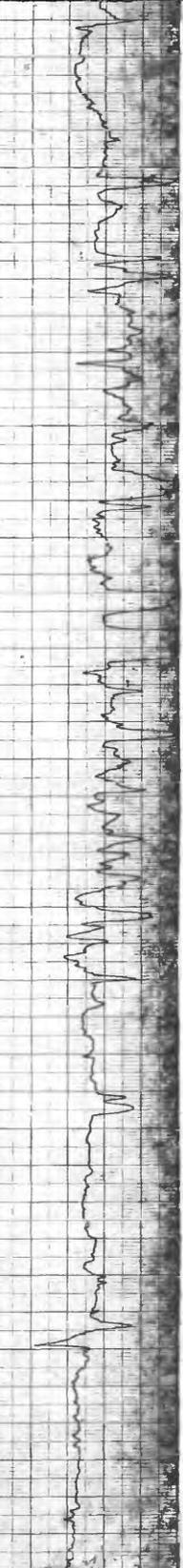
Rotary-  
drilled depth 201.4'      Cored interval 201.4'-781.7' Logged depth 781.5' Total depth 781.7'  
Drilling medium mud and water

Geophysical logs:

Caliper (Cal) - Logging speed: <u>    </u> ft/min.	Others: <u>20</u> ft/min
Resistivity (Res):	Scale: <u>40</u> Ω/Log div.
Gamma (Gam):                      T.C. <u>2</u> sec.	Scale: <u>25</u> cps/Log div.
Density (Den):                      T.C. <u>2</u> sec.	Scale: <u>290</u> cps/Log div.

Remarks: Caliper not logged

LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS			
		Gam	Den	Cal	Res
0-10      Sand - alluvial					
10-15      Sandstone, white, very fine grained, friable					
15-20      Shale, carbonaceous					
20-25      Sandstone, light-gray, very fine grained, friable					
25-40      Sandstone, light-gray, very fine grained; interbedded carbonaceous shale					
40-80      Shale, black, carbonaceous					
80-90      Sandstone, medium-gray, medium-grained, subangular; interbedded black shale					
90-105      Sandstone, light-gray, fine-grained, subangular					
105-125      Shale, carbonaceous; little coal; some sandstone at 125 ft					
125-135      Sandstone, light-gray, fine-grained; carbonaceous shale in lower 5 ft					
135-201.4      Sandstone, light-gray, fine-grained, subangular; interbedded carbonaceous shale and minor coal					
201.4-205.8      Shale, carbonaceous					
205.8-206      Coal					
206-241.3      Shale, carbonaceous; mudstone with abundant carbonaceous material; coal up to .1 ft.					
241.3-252      Siltstone; some carbonaceous material					
252-252.4      Coal					

	LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS			
			Gam	Den	Cal	Res
252.4-252.9	Shale, carbonaceous					
252.9-254.6	Mudstone; abundant carbonaceous material					
254.6-283	Siltstone; some carbonaceous material; minor interbedded shale					
283-286.9	Coal, 3.9 ft. <u>Sunnyside bed</u>					
286.9-287.5	Shale, carbonaceous					
287.5-287.7	Siltstone					
287.7-297.5	Sandstone, fine-grained, well-rounded; some carbonaceous material					
297.5-312.4	Mudstone, silty, crossbedded, burrow marked					
312.4-333.8	Sandstone, fine-to medium-grained, well-sorted, well-rounded					
333.8-351.9	Siltstone, carbonaceous; burrow marks and soft sediment deformation structures present					
351.9-354.9	Coal, 3.0 ft. <u>Unnamed bed</u>					
354.9-355.6	Shale, carbonaceous					
355.6-358.5	Mudstone, silty					
358.5-372.7	Siltstone					
372.7-373.2	Shale, carbonaceous					
373.2-374.4	Coal					
374.4-377.8	Mudstone, silty					
377.8-379.6	Siltstone					
379.6-383.8	Mudstone, silty					
383.8-389.6	Siltstone; abundant carbonaceous material					
389.6-401.9	Sandstone, fine-grained; some interbedded mudstone and carbonaceous material					
401.9-402.2	Shale, carbonaceous					
402.2-434.3	Mudstone, silty; interbedded siltstone					
434.3-438.3	Coal, 4.0 ft. <u>Rock Canyon bed</u>					
438.3-440.6	Shale, carbonaceous					
440.6-441.7	Coal					
441.7-444.1	Mudstone, silty; abundant carbonaceous material					
444.1-455.2	Siltstone					
455.2-463.6	Mudstone; some carbonaceous material					
463.6-471.5	Mudstone, calcite-cemented, very hard					
471.5-474.3	Mudstone, silty, very hard					

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS			
			Gamma	Den	Cal	Res
474.3-474.6	Shale, carbonaceous					
474.6-482.6	Coal, 8 ft. <u>Gilson bed</u>					
482.6-483	Shale, carbonaceous					
483-486	Mudstone, abundant carbonaceous material					
486-498.6	Siltstone; some carbonaceous material					
498.6-501.6	Mudstone, silty					
501.6-502.1	Shale, carbonaceous					
502.1-504	Coal					
504-512	Siltstone					
512-517.4	Mudstone, silty					
517.4-518.1	Coal					
518.1-521	Mudstone, silty; abundant carbonaceous material					
521-534.7	Mudstone; abundant fossils					
534.7-545.5	Siltstone; carbonaceous material					
545.5-548.1	Mudstone					
548.1-553.3	Siltstone					
553.3-559.4	Mudstone, silty; interbedded siltstone					
559.4-568.7	Mudstone, silty; abundant carbonaceous material					
568.7-569.6	Shale, carbonaceous					
569.6-570.6	Siltstone					
570.6-645.6	Sandstone, <u>fine- to medium-</u> grained, poorly sorted, sub-angular, becomes finer downward to silt-sized at 600 ft					
645.6-664.2	Mudstone, silty					
664.2-667.8	Mudstone					
667.8-752.7	Sandstone, fine-grained					
752.7-755	Siltstone; some interbedded mudstone					
755-756.65	Mudstone					
756.65-760.6	Coal - <u>Aberdeen bed</u>					
760.6-781.7	Sandstone, fine-grained T.D. 781.7 ft					