

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

DRILLING DURING 1978 IN THE DANFORTH HILLS COAL FIELD, EASTON GULCH,
DEVILS HOLE GULCH, AXIAL, AND NINEMILE GAP QUADRANGLES,
MOFFAT AND RIO BLANCO COUNTIES, COLORADO

By

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Open-File Report 78-1031

1978

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

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INTRODUCTION

Ten coal test holes, one of which was partly cored by wireline methods, were drilled in 1978 in the Danforth Hills coal field, Easton Gulch, Devils Hole Gulch, Axial, and Ninemile Gap quadrangles, Moffat and Rio Blanco Counties, Colorado. The U.S. Geological Survey awarded the drilling contract, 14-08-0001-17329, to McCabe Brothers, Inc., of Idaho Falls, Idaho. McCabe Brothers, Inc., subcontracted the geophysical logging (single-point resistance, spontaneous potential, natural-gamma, density, and caliper) to Digilog, Inc., of Broomfield, Colorado. The Survey's drilling program is part of a continuing effort to evaluate the thickness and extent of federally owned coal in the Danforth Hills coal field (Reheis, 1976; Reheis and Peterson, 1977; Nutt, 1978; Reheis, 1978).

Lithologies for rotary-drilled holes were compiled by Dorothy Sandberg of the U.S. Geological Survey from both the geophysical logs and the descriptions of sample cuttings, except where otherwise noted. In drill-hole D-38-EG, 440 ft were continuously cored by the wireline method; lithologies in this interval were described from the core. Similarity of the rock types permit the omission of full descriptions.

Sandstones, many of which are carbonaceous, are tan to orange to gray, fine to very fine grained, and well sorted. Siltstones and shales are gray; carbonaceous siltstones and shales are brown to black. Many lithologies have been combined in the descriptions to accommodate the reduced scale of the geophysical logs presented in this report (original logs were run at 1 in. to 10 ft).

All holes were spudded in the Upper Cretaceous Williams Fork Formation, and the drilling target was the Trout Creek Sandstone Member of the Iles Formation. Six holes penetrated the Trout Creek Member, three holes were abandoned because of circulation problems before reaching it, and one hole was drilled to within about 19 feet of it.

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

REFERENCES

- Nutt, C. J., 1978, Drilling during 1977 in the Danforth Hills coal field, Axial and Ninemile Gap quadrangles, Moffat and Rio Blanco Counties, Colorado: U.S. Geol. Survey Open-File Report 78-273, 17 p.
- Reheis, M. J., 1976, Reconnaissance drilling in the Danforth Hills coal field, Moffat and Rio Blanco Counties, Colorado, August-September 1978: U.S. Geol. Survey Open-File Report 76-870, 74 p.
- Reheis, M. J., 1978, Drilling during 1977 in the Danforth Hills coal field, Easton Gulch and Devils Hole Gulch quadrangles, Moffat County, Colorado: U.S. Geol. Survey Open-File Report 78-272, 29 p.

Reheis, M. J., and Peterson, J. E., 1977, Reconnaissance drilling
in the Danforth Hills coal field, Moffat and Rio Blanco Counties,
Colorado, September-October 1976: U.S. Geol. Survey Open-File
Report 77-42, 67 p.

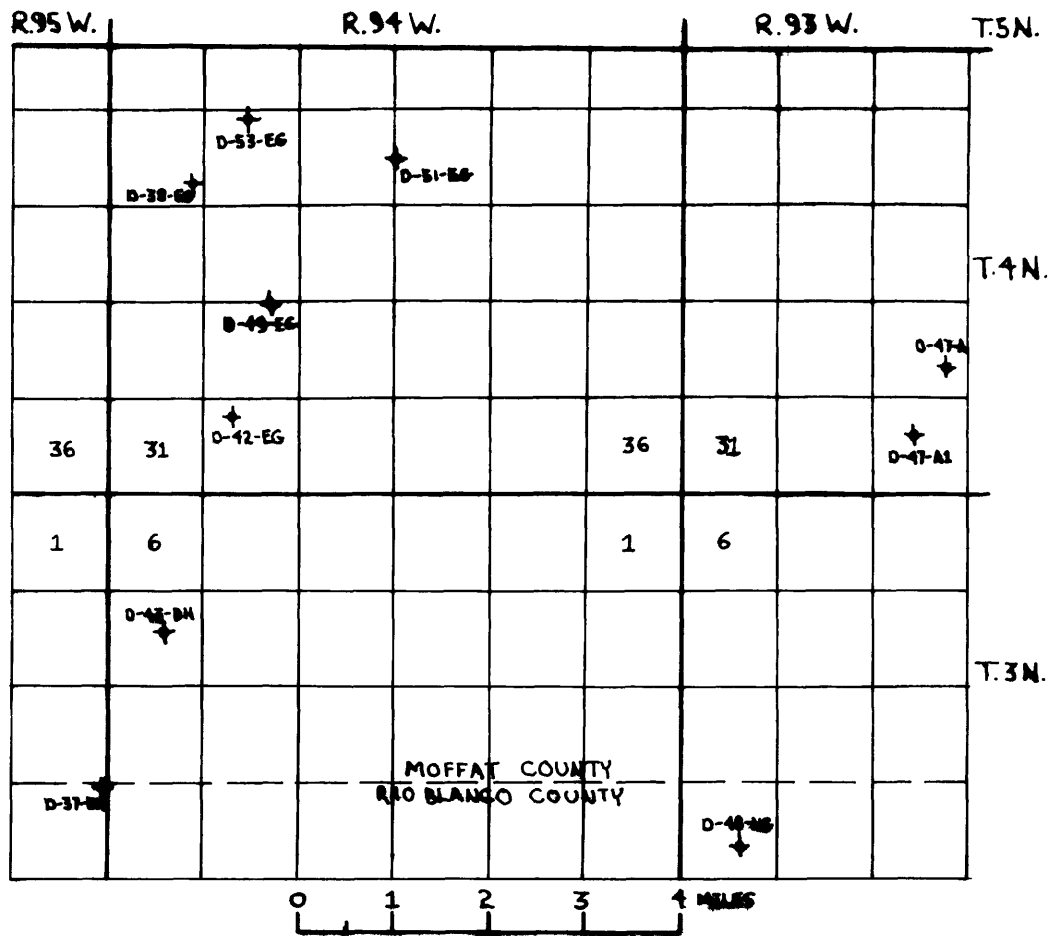


Figure 1.--Regional map showing drill-hole locations in the northern Danforth Hills coal field, Colorado.

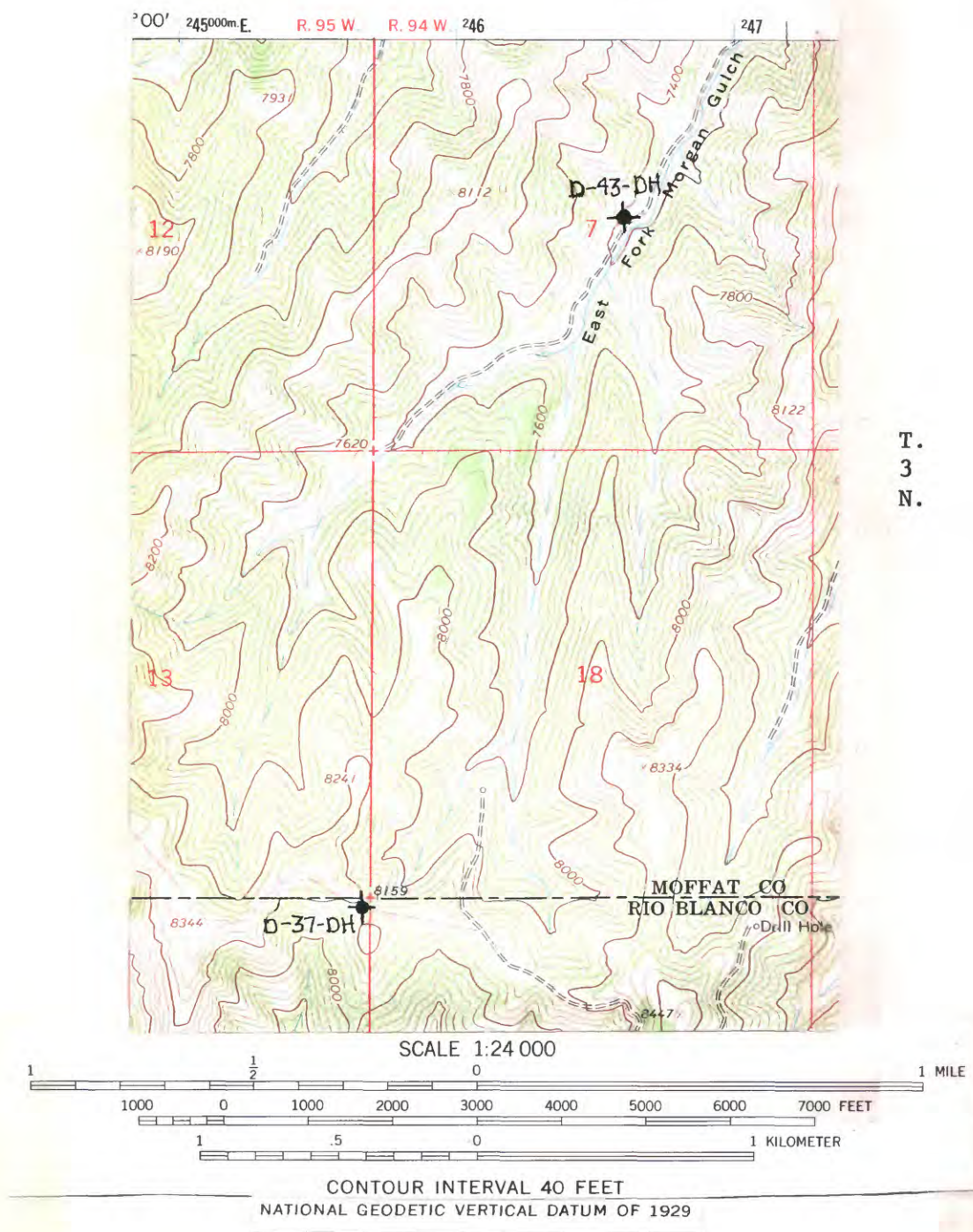


Figure 2.--Locations of drill holes in the Devils Hole Gulch quadrangle, Moffat and Rio Blanco Counties, Colorado.

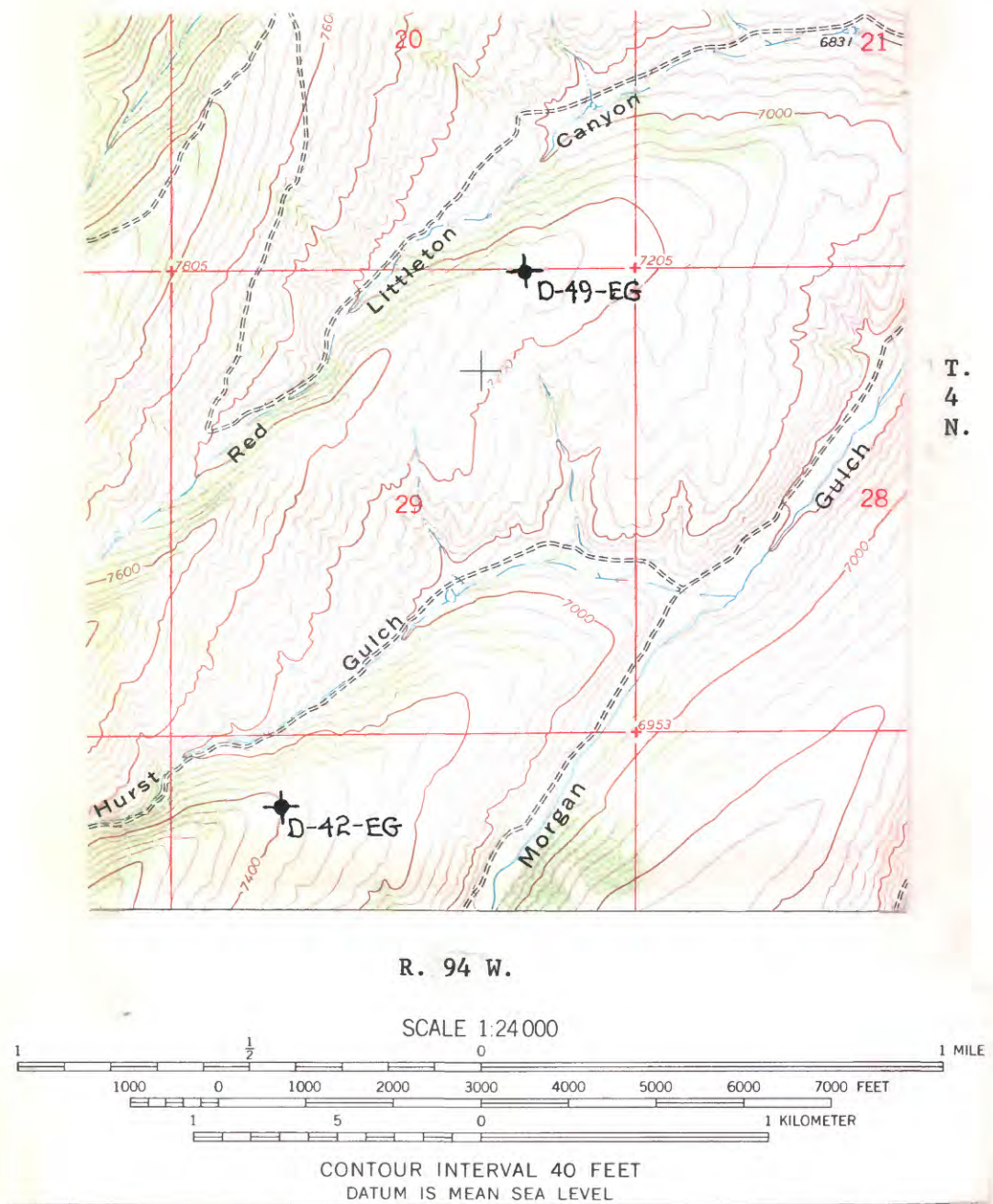
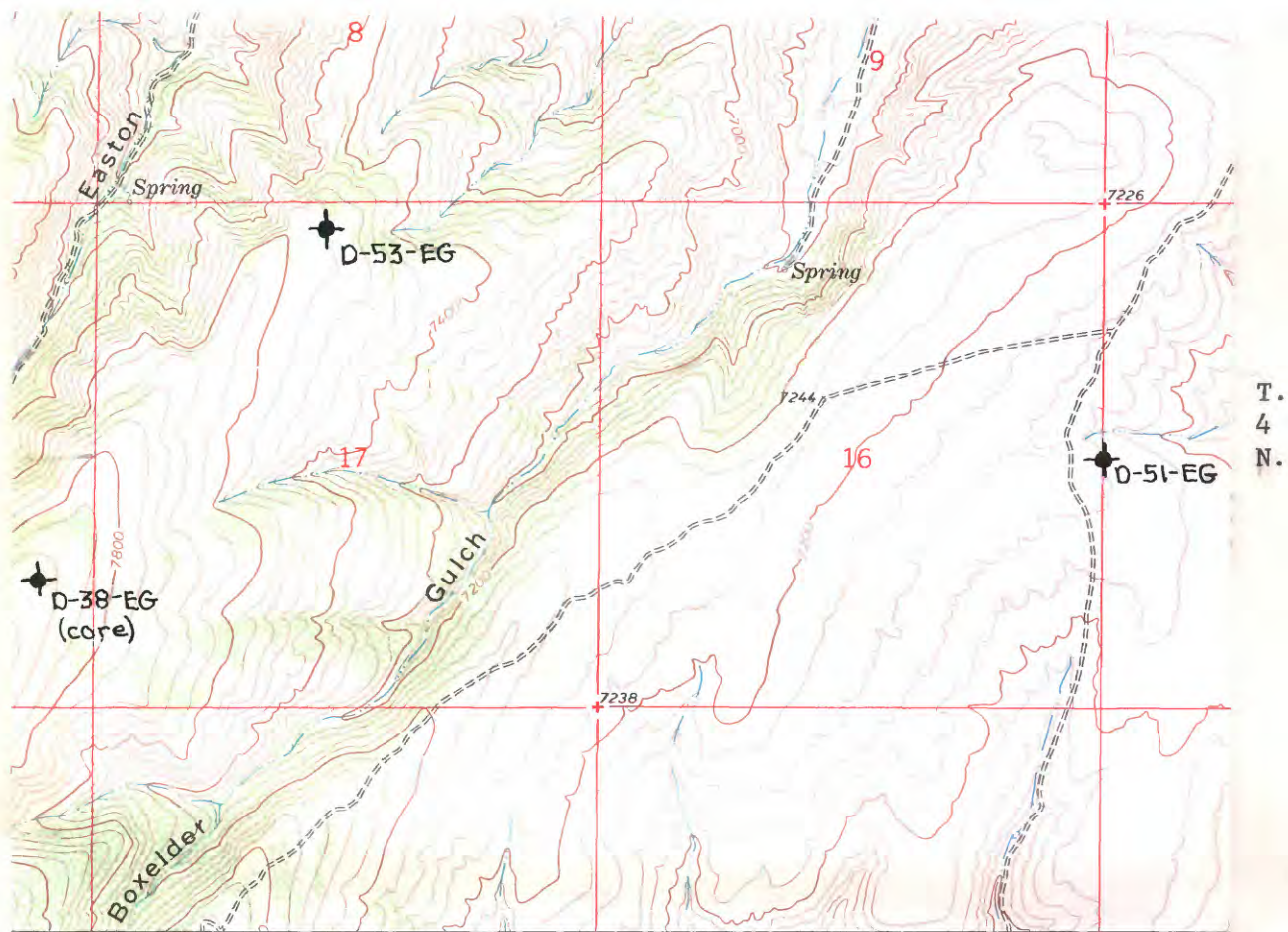
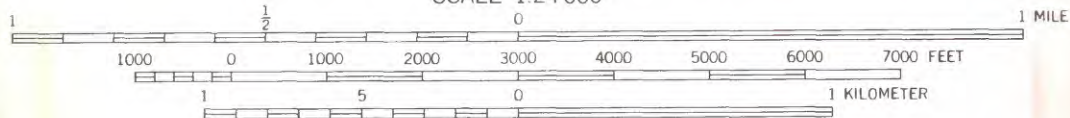


Figure 3.--Locations of drill holes in the Easton Gulch quadrangle, Moffat County, Colorado.



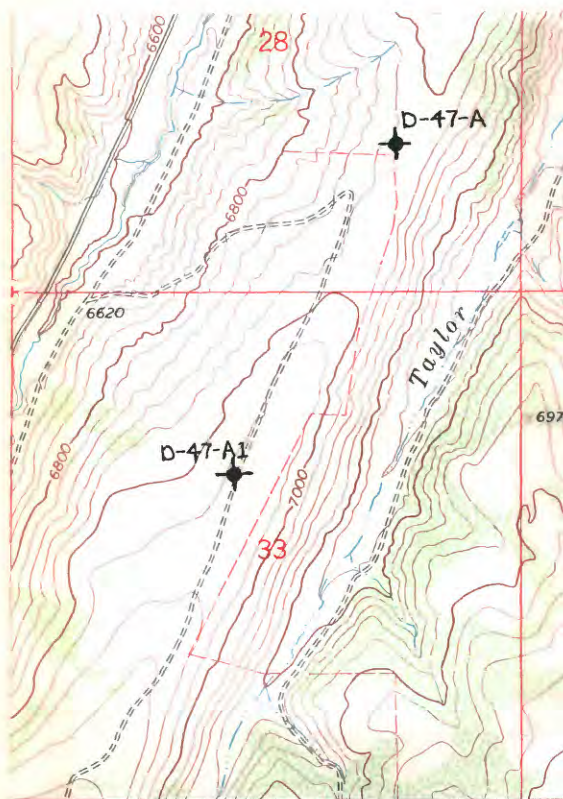
R. 94 W.

SCALE 1:24 000



CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

Figure 4.--Locations of drill holes in the Easton Gulch quadrangle, Moffat County, Colorado.



T.
4
N.

R. 93 W.

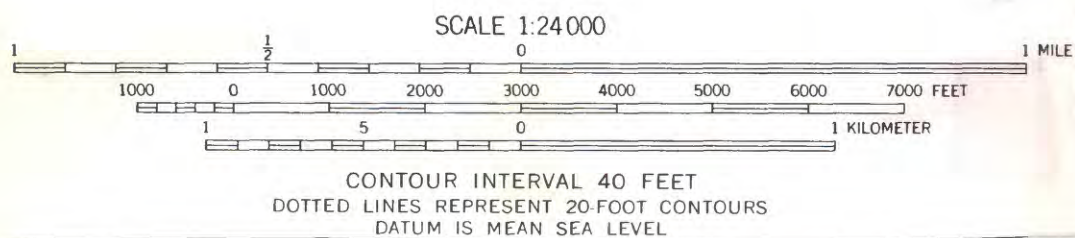
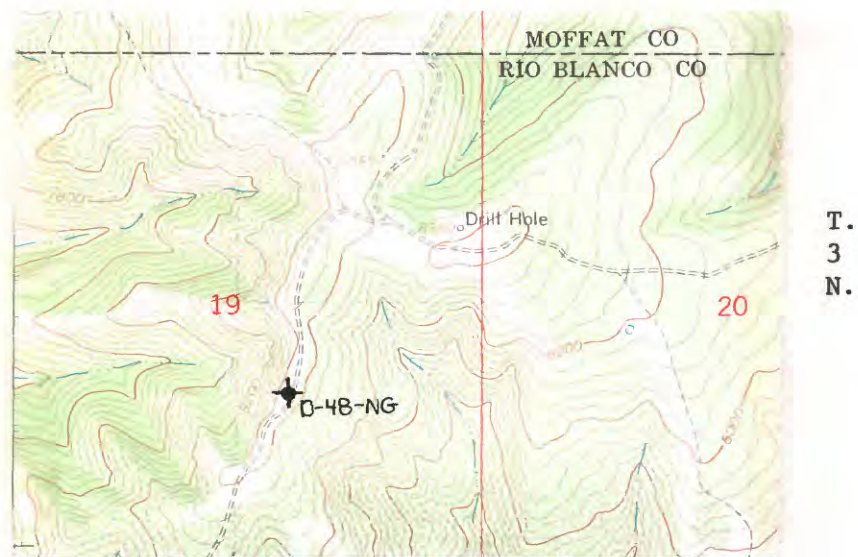


Figure 5.--Locations of drill holes in the Axial quadrangle,
 Moffat County, Colorado.



R. 93 W.

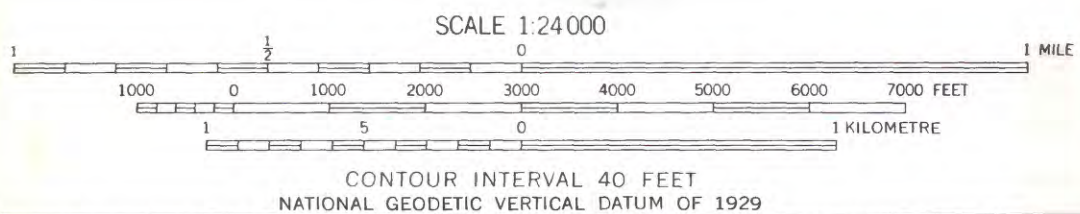


Figure 6.--Location of drill hole in the Ninemile Gap quadrangle, Rio Blanco County, Colorado.

U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-37-DH State Colorado County Rio Blanco Date logged 7/14/78 Elev.(ft) 8180

Location: T. 3 N., R. 95 W., sec. 24, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ Cored: Yes ☐ No ☒

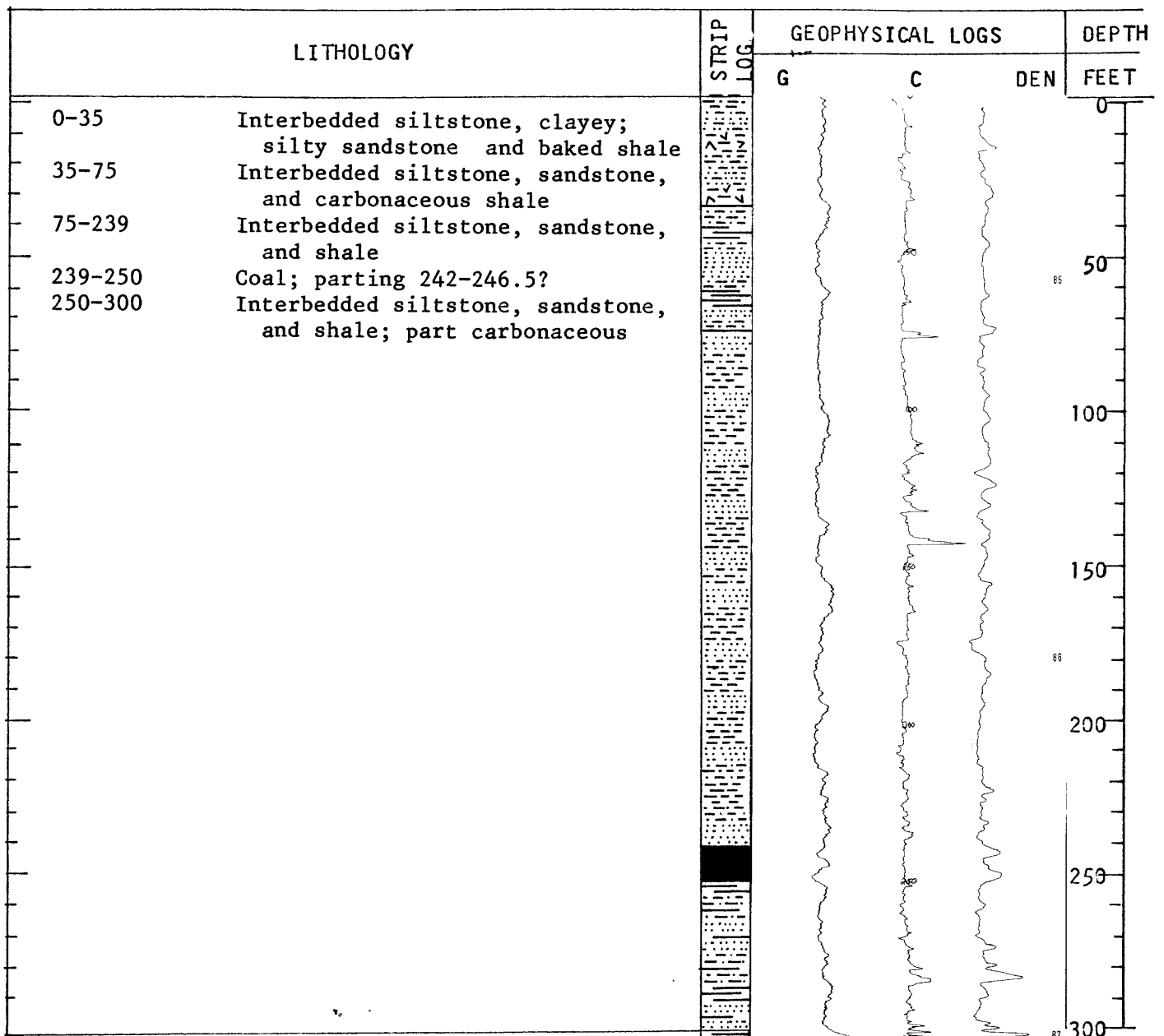
Drilled depth 715' Logged depth 710' Drilling medium air Fluid level 406'

Geophysical logs:

Gamma (G):	T.C. <u>2</u>	Scale <u>30 cps/in</u>	Logging speed <u>20</u>	fpm
Density (DEN):	T.C. <u>2</u>	Scale <u>80 cps/in</u>	Logging speed <u>10</u>	fpm
Caliper (C):		Scale <u>2 in/in</u>	Logging speed <u>10</u>	fpm

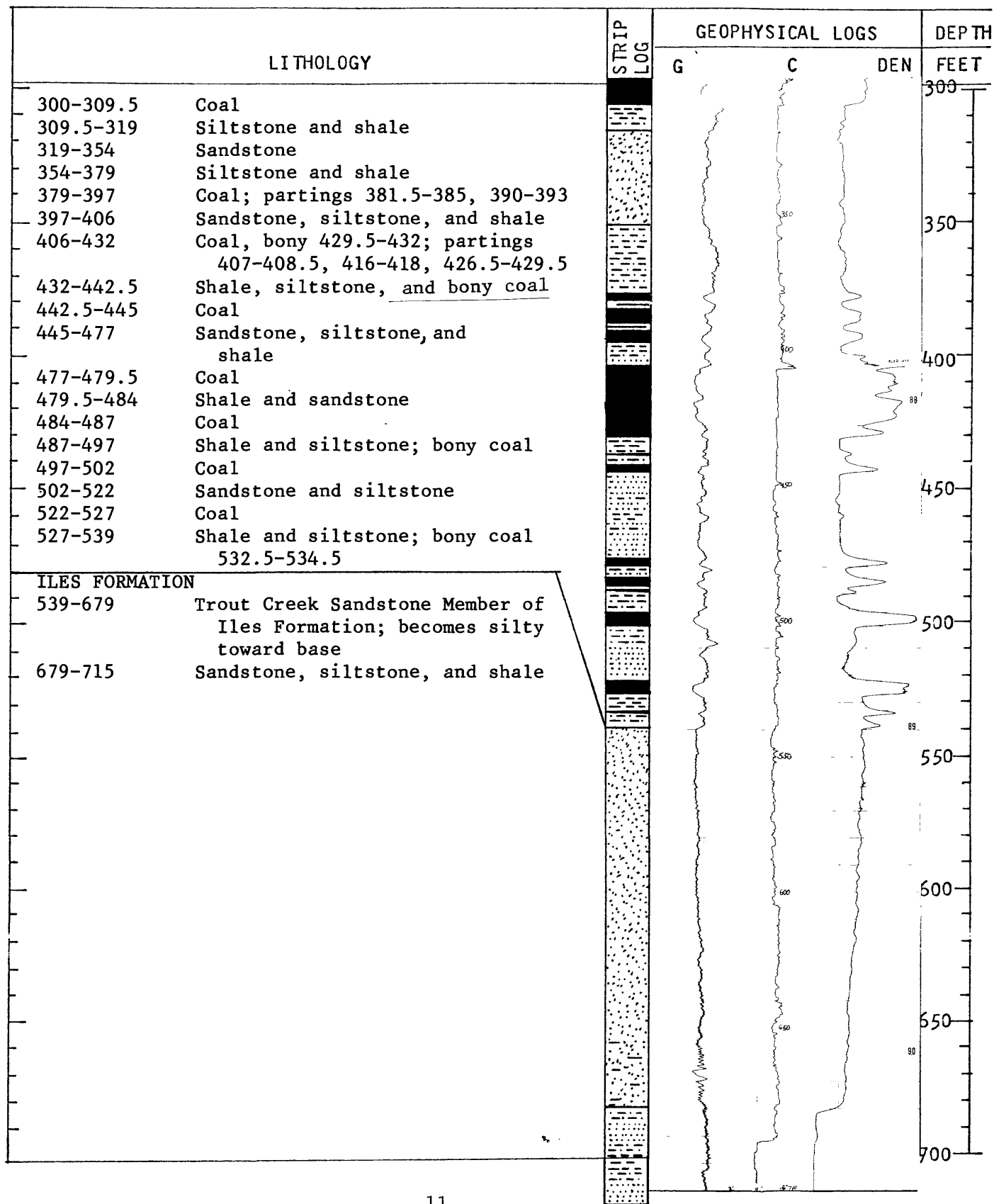
Remarks: Drilled with air. Very few cuttings; none at all from 240-700'.

Interpretation of lithology mainly from poor geophysical logs.



U.S. GEOLOGICAL SURVEY

Hole No. D-37-DH continued



U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-43-DH State Colorado County Moffat Date logged 7/11/78 Elev.(ft) 7400

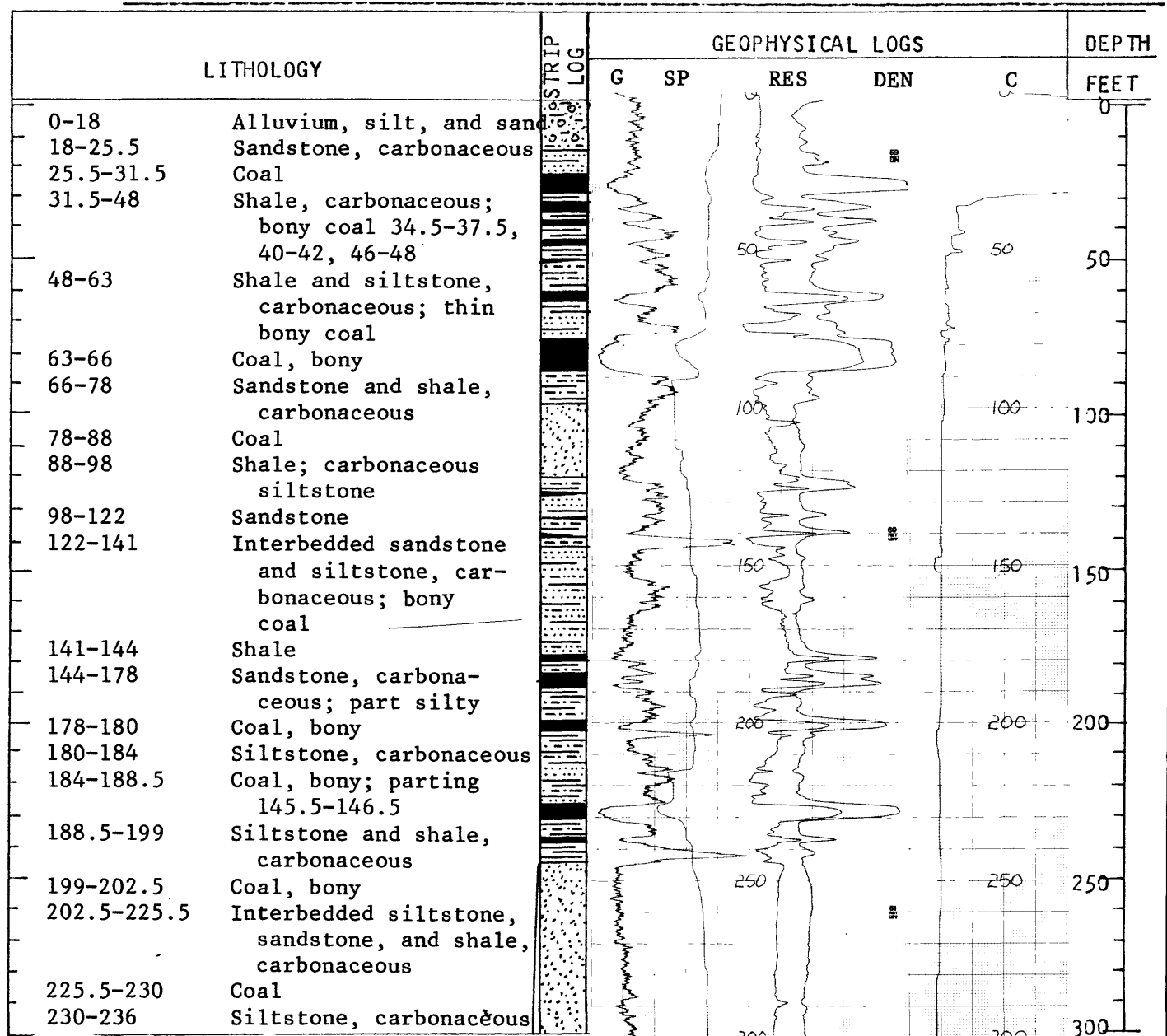
Location: T. 3 N., R. 94 W., sec. 7, SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ Cored: Yes ☒ No ☐

Drilled depth 560' Logged depth 546' Drilling medium mud Fluid level 0'

Geophysical logs:

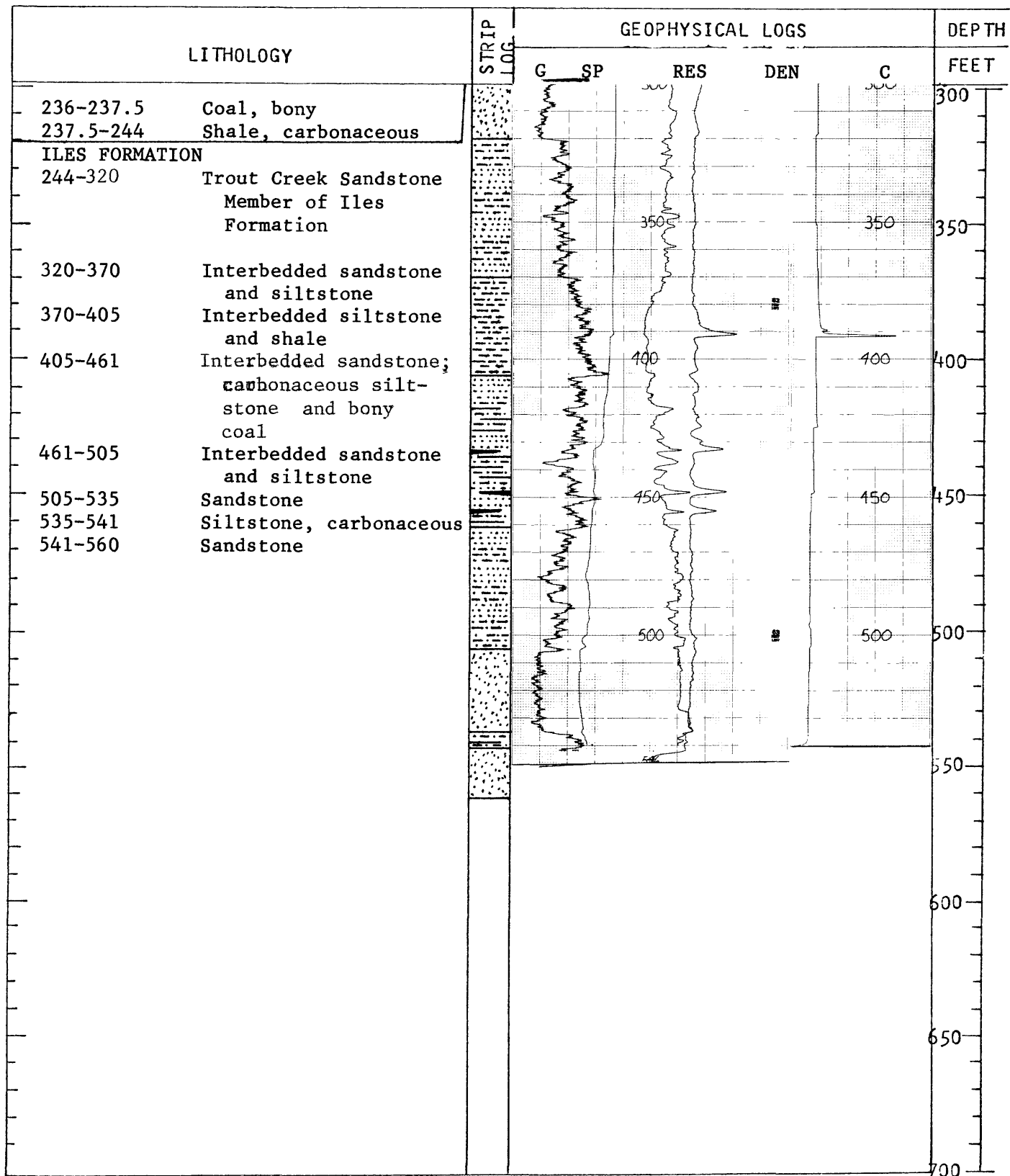
Spontaneous potential (SP):	Scale <u>50 mv/in</u>	Logging speed <u>20</u> fpm
Resistance (RES):	Scale <u>30 Ω/in</u>	Logging speed <u>20</u> fpm
Gamma (G): T.C. <u>2</u>	Scale <u>10 cps/in</u>	Logging speed <u>20</u> fpm
Density (DEN): T.C. <u>2</u>	Scale <u>60 cps/in</u>	Logging speed <u>20</u> fpm
Caliper (C)	Scale <u>2 in/in</u>	Logging speed <u>10</u> fpm

Remarks: Drilled with mud to 560'. No sample 20-25'.



U.S. GEOLOGICAL SURVEY

Hole No. D-43-DH - Continued



U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-42-EG State Colorado County Moffat Date logged 7/16/78 Elev.(ft)7400

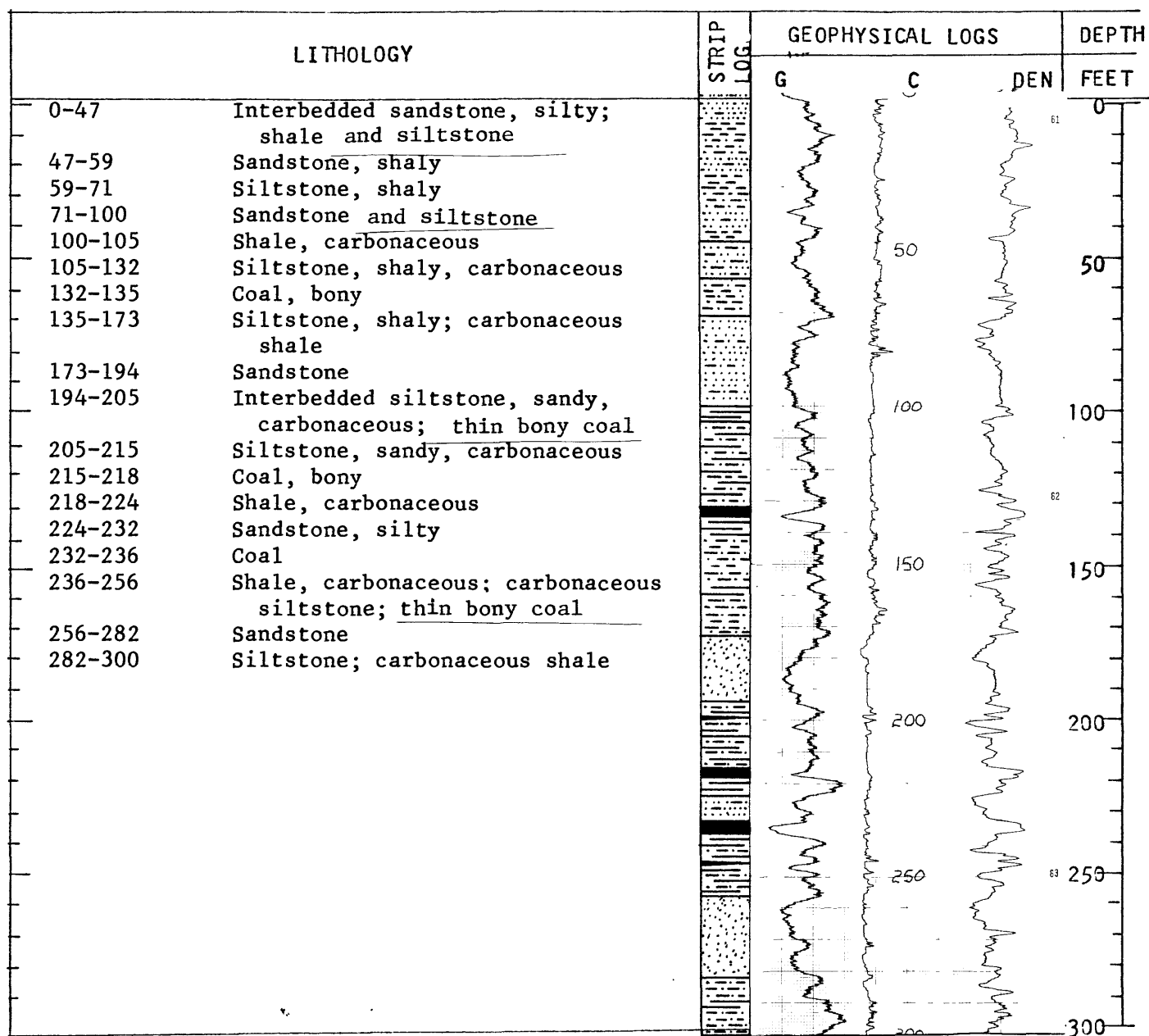
Location: T. 4 N., R. 94 W., sec. 32, SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Cored: Yes ☐ No ☒

Drilled depth 700' Logged depth 692' Drilling medium air, mud Fluid level --

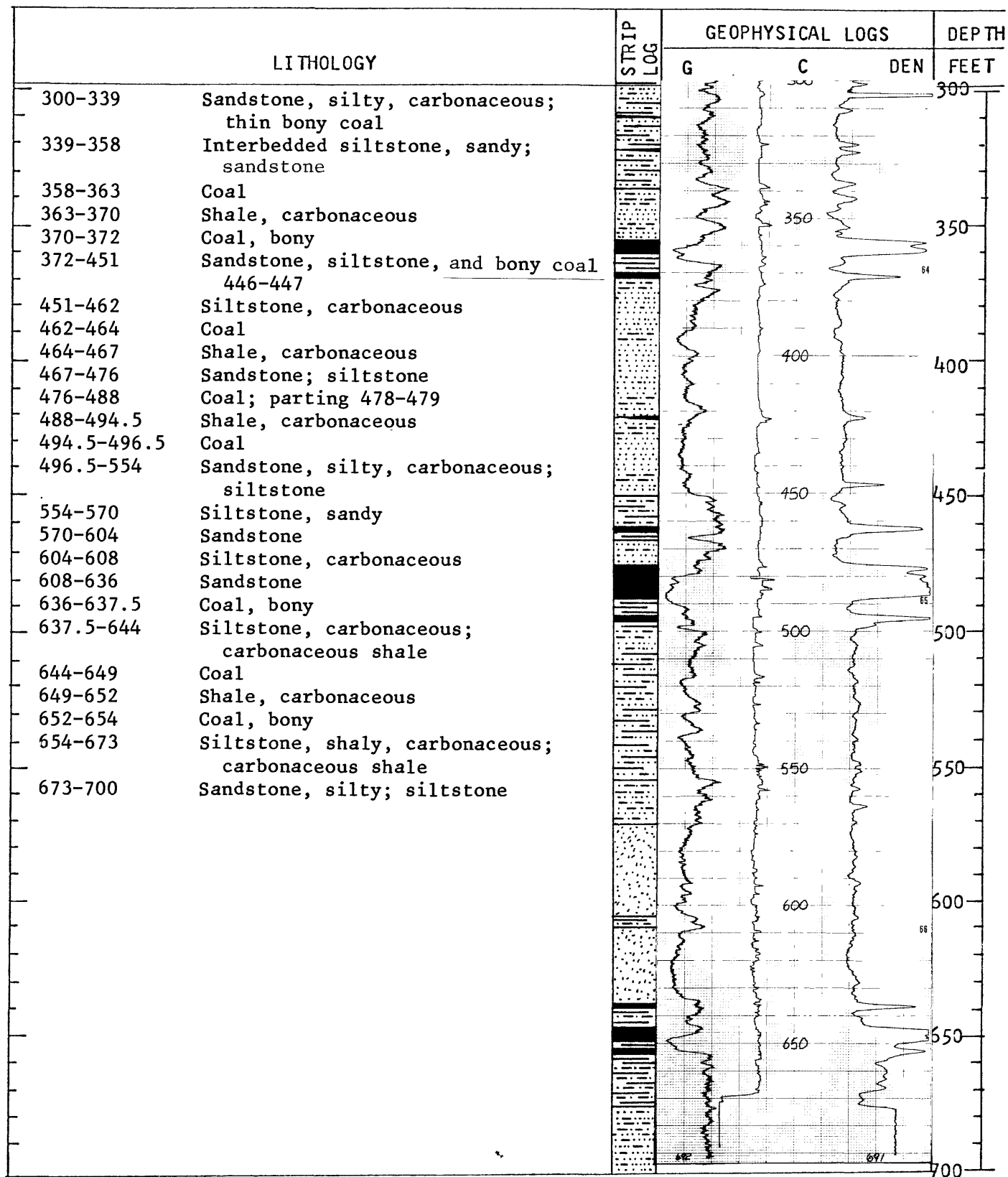
Geophysical logs:

Gamma (G):	T.C. <u>2</u>	Scale <u>10 cps/in</u>	Logging speed <u>20</u>	fpm
Density (DEN):	T.C. <u>2</u>	Scale <u>60 cps/in</u>	Logging speed <u>10</u>	fpm
Caliper (C):		Scale <u>2 in/in</u>	Logging speed <u>10</u>	fpm

Remarks: Drilled with air and foam to 520', with mud to 700'. No sample 520-530', 585-600'. Abandoned due to circulation problems.



U.S. GEOLOGICAL SURVEY

Hole No. D-42-EG continued


U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-49-EG State Colorado County Moffat Date logged 7/23/78 Elev.(ft) 7260

Location: T. 4 N., R. 94 W., sec. 29, NW¹NE¹NE¹ Cored: Yes ☒ No

Drilled depth 1425' Logged depth 1423' Drilling medium air & mud Fluid level 0'

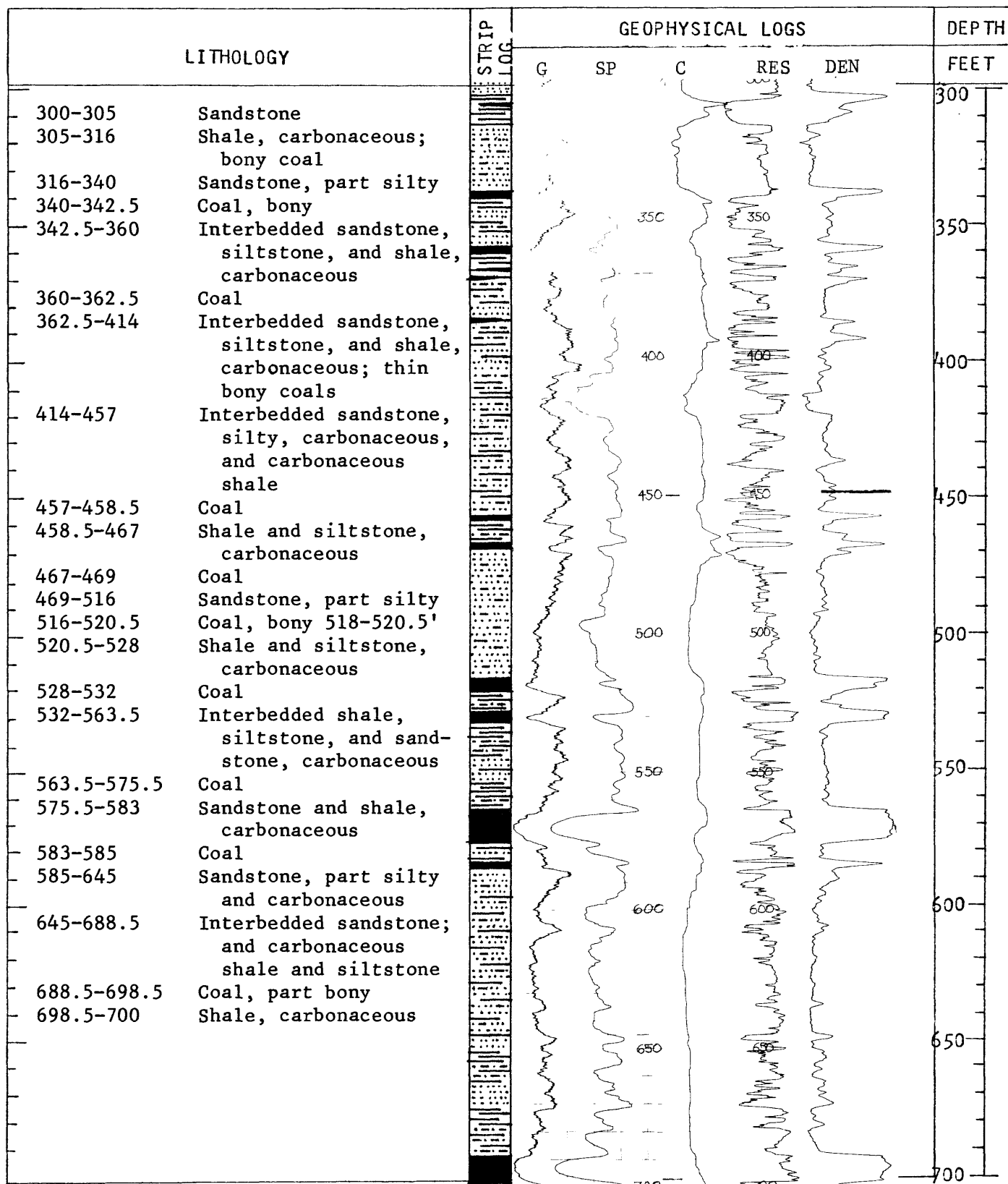
Geophysical logs:

Spontaneous potential (SP):	Scale <u>20 mv/in</u>	Logging speed <u>20</u> fpm
Resistance (RES):	Scale <u>20 Ω/in</u>	Logging speed <u>10</u> fpm
Gamma (G): T.C. <u>2</u>	Scale <u>10 cps/in</u>	Logging speed <u>20</u> fpm
Density (DEN): T.C. <u>2</u>	Scale <u>80 cps/in</u>	Logging speed <u>10</u> fpm
Caliper (C)	Scale <u>2 in/in</u>	Logging speed <u>10</u> fpm

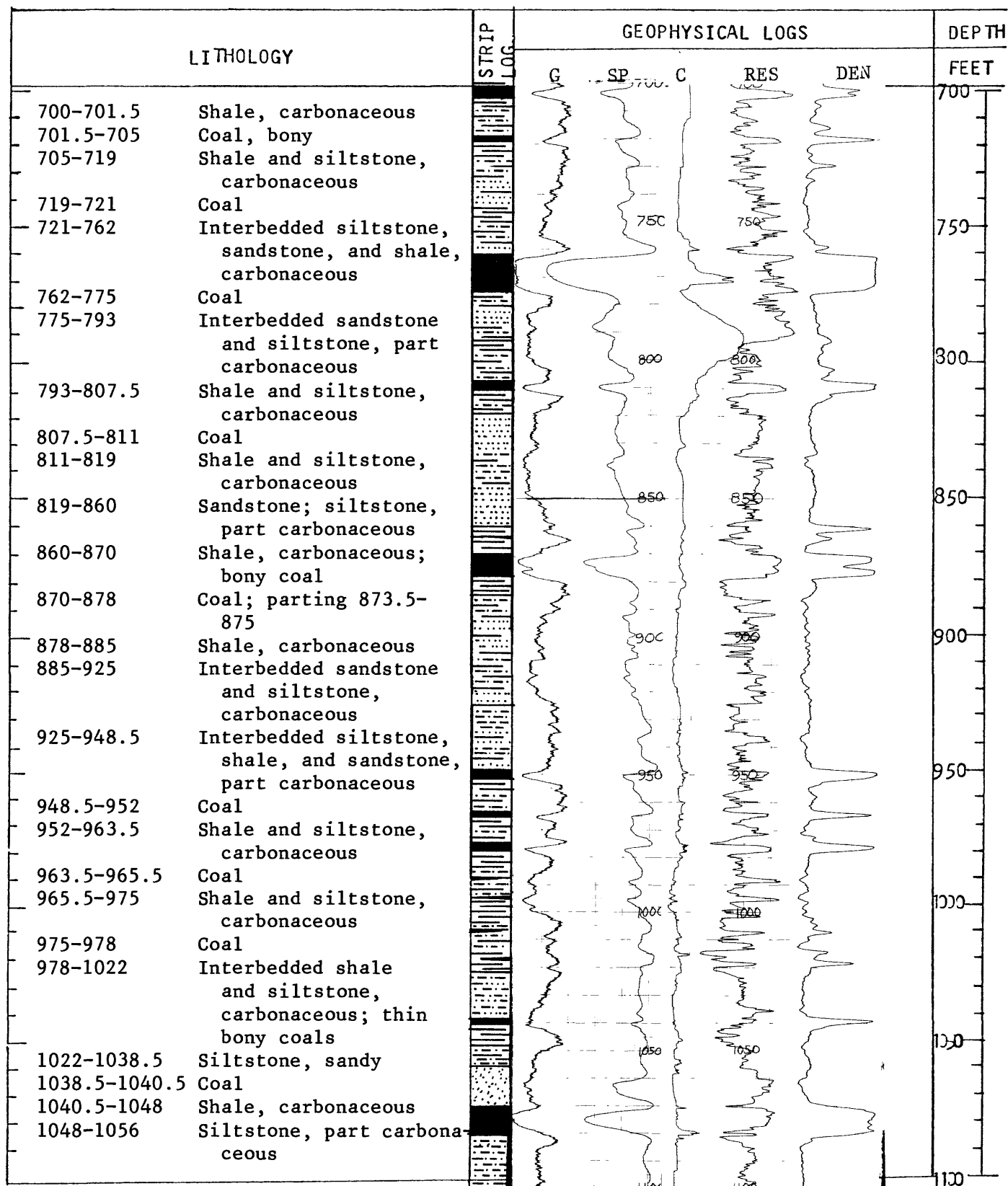
Remarks: Drilled with air and foam to 560', with mud 560-1425'. No sample 500-505'.

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS					DEPTH
			G	SP	C	RES	DEN	FEET
0-9	Sandstone, silty							0
9-36	Shale, carbonaceous							
36-42	Sandstone, medium-grained							
42-108	Interbedded siltstone, sandy, and silty shale; thin sandstone, carbonaceous shale, and bony coal				50			50
108-136	Interbedded sandstone and carbonaceous siltstone				100			100
136-153	Sandstone, medium-grained							
153-178	Siltstone, carbonaceous; sandstone							
178-204	Interbedded sandstone, part carbonaceous, and siltstone				150			150
204-224	Interbedded siltstone and shale, carbonaceous; thin bony coal							
224-248	Sandstone				200			200
248-265	Interbedded siltstone and carbonaceous shale							
265-276	Sandstone, part silty							
276-300	Interbedded sandstone, siltstone, and shale, carbonaceous; thin bony coal				250			250
					300			300

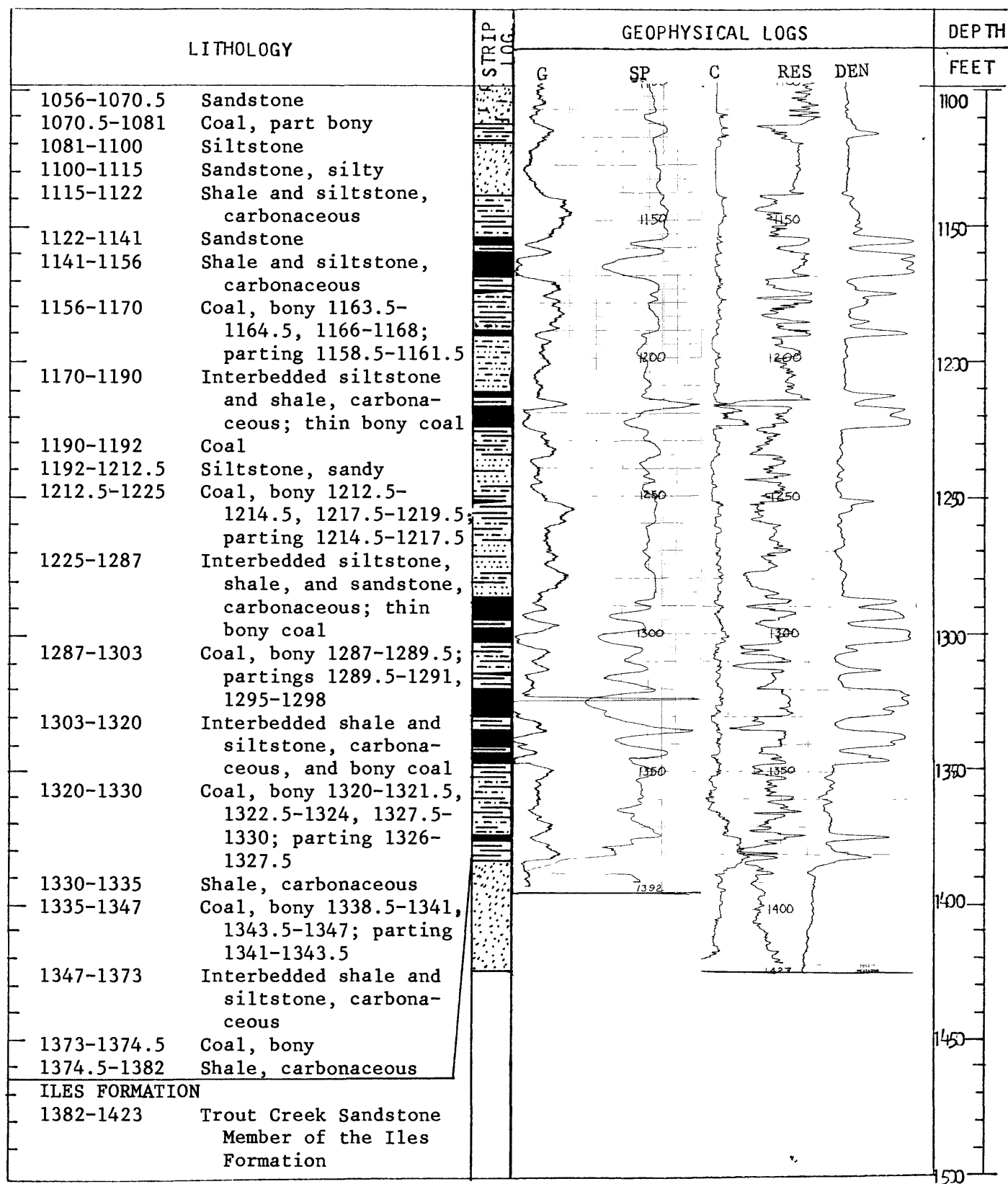
U.S. GEOLOGICAL SURVEY

Hole No. D-49-EG continued


U.S. GEOLOGICAL SURVEY

Hole No. D-49-EG continued


U.S. GEOLOGICAL SURVEY

Hole No. D-49-EG continued


U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-38-EG State Colorado County Moffat Date logged 9/3/78 Elev.(ft) 7895

Location: T. 4 N., R. 94 W., sec. 18, CE $\frac{1}{2}$ SE $\frac{1}{4}$ Cored: x Yes No

Drilled depth 1080' Logged depth 1060' Drilling medium air,mud Fluid level 612'

Geophysical logs:

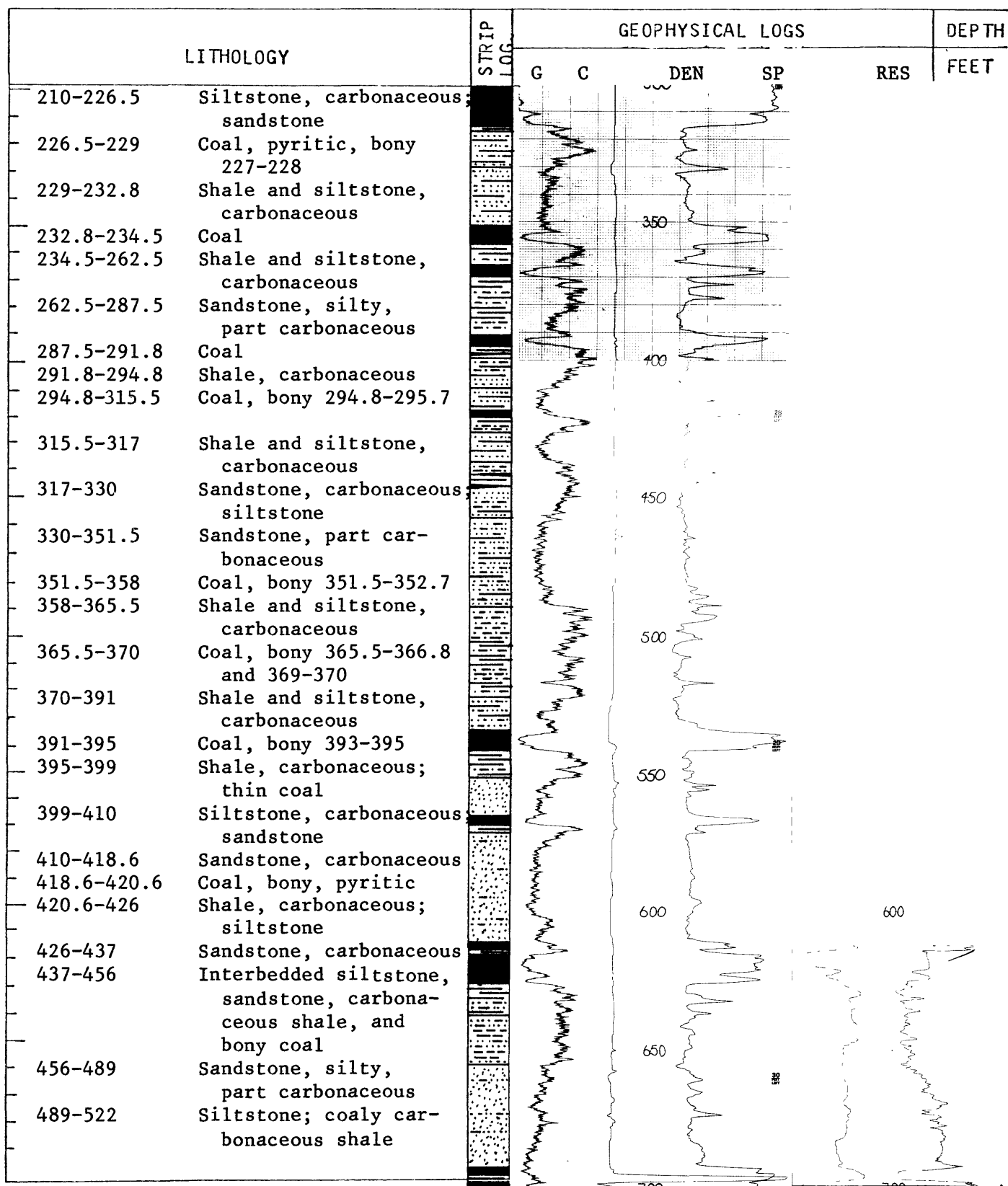
Spontaneous potential (SP):	Scale	<u>10 mv/in</u>	Logging speed	<u>20</u>	fpm
Resistance (RES):	Scale	<u>10 Ω/in</u>	Logging speed	<u>20</u>	fpm
Gamma (G): T.C. <u>2</u>	Scale	<u>10 cps/in</u>	Logging speed	<u>10</u>	fpm
Density (DEN): T.C. <u>2</u>	Scale	<u>50 cps/in</u>	Logging speed	<u>10</u>	fpm
Caliper (C)	Scale	<u>2 in/in</u>	Logging speed	<u>10</u>	fpm

Remarks: Rotary drilled 0-100', 540-1080'; wireline cored 100-540'. Drilled with air and foam 0-480', 540-1080'; with mud 480-540'. No sample 463-479', 550-590', 620-625', 760-765', 840-845', 850-855', 860-875', 925-930', 945-1080'.

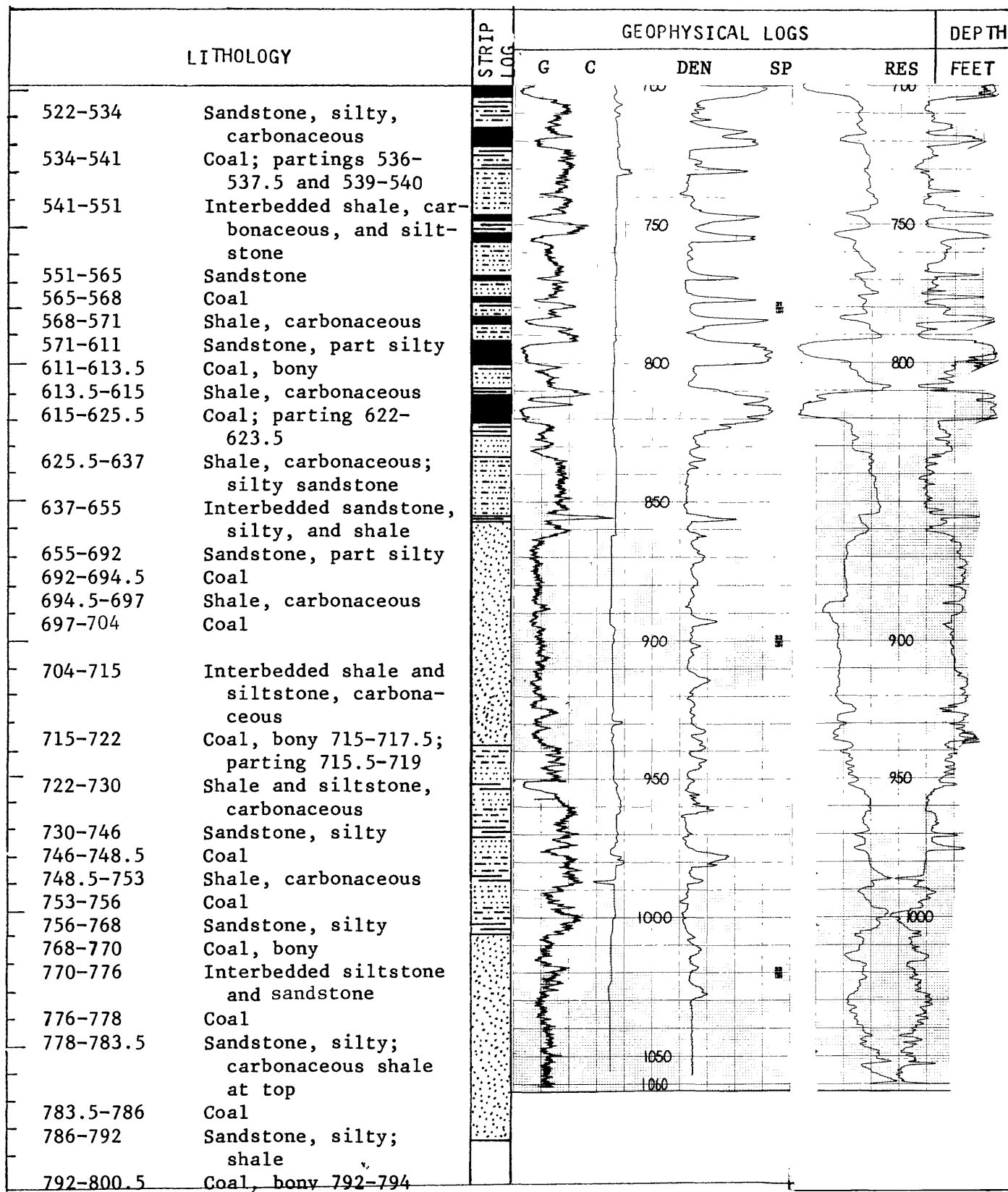
	LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS					DEPTH
			G	C	DEN	SP	RES	FEET
0-28	Sandstone, silty; silty shale							0
28-54	Sandstone, silty; clinker							
54-70	Shale; silty sandstone							
70-72	Coal							
72-74	Shale, carbonaceous							50
74-84	Interbedded shale, silty, and sandstone							
84-107	Sandstone, silty, carbonaceous, and medium-grained sandstone							100
107-111	Siltstone, carbonaceous							
111-144	Sandstone; thin carbonaceous siltstone							
144-157	Coal, bony at top							
157-163.5	Shale and siltstone, carbonaceous							150
163.5-183	Coal, part pyritic, bony 177-178.5 and 182-183							
183-198	Interbedded shale, silty sandstone, and siltstone, carbonaceous							200
198-199.5	Coal, bony							
199.5-202.5	Shale and siltstone, carbonaceous							
202.5-205.5	Coal, pyritic, bony 202.5-203.3; bony with carbonaceous shale 205-205.5							250
205.5-210	Sandstone, carbonaceous, pyritic							300

U.S. GEOLOGICAL SURVEY

Hole No. D-38-EG continued



U.S. GEOLOGICAL SURVEY

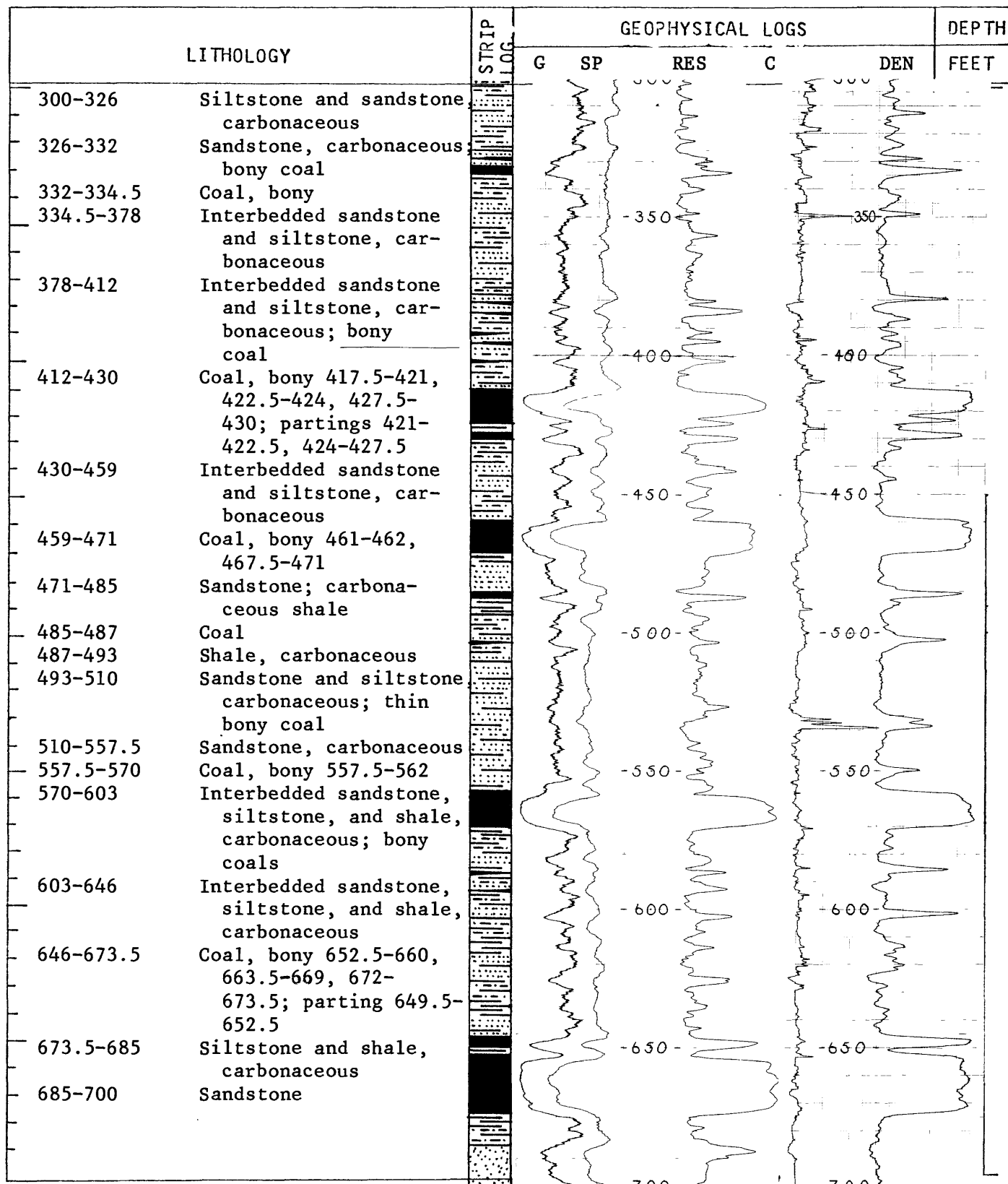
Hole No. D-38-EG continued


U.S. GEOLOGICAL SURVEY

Hole No. D-38-EG continued

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS					DEPTH
			G	C	DEN	SP	RES	FEET
800.5-809	Sandstone; carbonaceous shale at top							1100
809-811.5	Shale, carbonaceous							
811.5-821.5	Coal; partings 814-815, 818.5-819.5							
821.5-826	Shale, carbonaceous							1150
826-834	Sandstone							
834-855	Sandstone, silty							
855-857	Shale, carbonaceous							
ILES FORMATION								
857-938	Trout Creek Sandstone Member of the Iles Formation							1200
938-1006	Interbedded sandstone, siltstone, and carbonaceous shale							
1006-1080	Sandstone							1250
								1300
								1350
								1400
								1450
								1500

U.S. GEOLOGICAL SURVEY

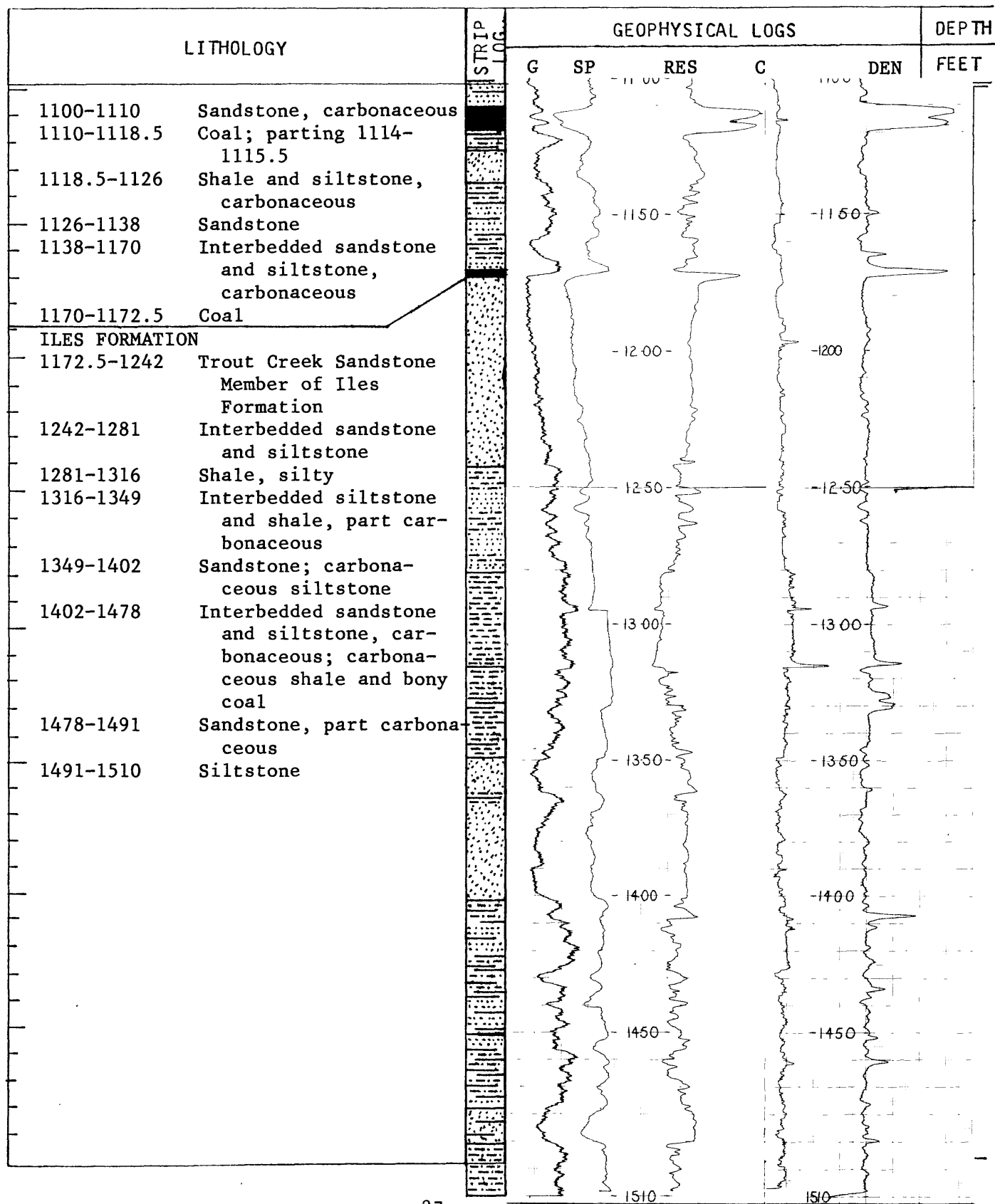
Hole No. D-51-EG continued


U.S. GEOLOGICAL SURVEY

Hole No. D-51-EG continued

	LITHOLOGY	STRIP LOG	GEOPHYSICAL LOGS					DEPTH
			G	SP	RES	C	DEN	FEET
700-702	Sandstone							
702-723	Coal, bony 702-704, 705-706.5; partings 704-705, 706.5-709, 711.5-717							
723-739.5	Sandstone and siltstone, carbonaceous				- 750 -		- 750 -	
739.5-743	Coal							
743-751	Shale, carbonaceous							
751-807.5	Sandstone and siltstone, part carbonaceous							
807.5-809.5	Coal, bony				- 800 -		- 800 -	
809.5-824	Siltstone and sandstone carbonaceous; bony coals							
824-826.5	Coal, bony							
826.5-832	Shale, carbonaceous							
832-847	Sandstone				- 850 -		- 850 -	
847-852	Coal							
852-863.5	Sandstone and shale, carbonaceous							
863.5-870	Coal							
870-891	Siltstone, sandy							
891-916	Sandstone				- 900 -		- 900 -	
916-931	Coal, bony, 929.5-931; parting 926-929.5							
931-946	Shale and siltstone, carbonaceous							
946-950.5	Coal							
950.5-958	Shale and siltstone, carbonaceous				- 950 -		- 950 -	
958-960.5	Coal, bony							
960.5-975	Siltstone and shale, carbonaceous							
975-1007	Sandstone, part carbonaceous				- 10-00 -		- 10-00 -	
1007-1014	Siltstone, carbonaceous							
1014-1042.5	Coal, bony 1014-1016, 1019-1022, 1031-1035, 1037-1040.5; partings 1016-1019, 1035-1037							
1042.5-1051	Shale, carbonaceous				- 10-50 -		- 1050 -	
1051-1092	Interbedded sandstone and siltstone, carbonaceous							
1092-1100	Sandstone, carbonaceous							

U.S. GEOLOGICAL SURVEY

Hole No. D-51-EG continued

U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-53-EG State Colorado County Moffat Date logged 7/29/78 Elev.(ft) 7560

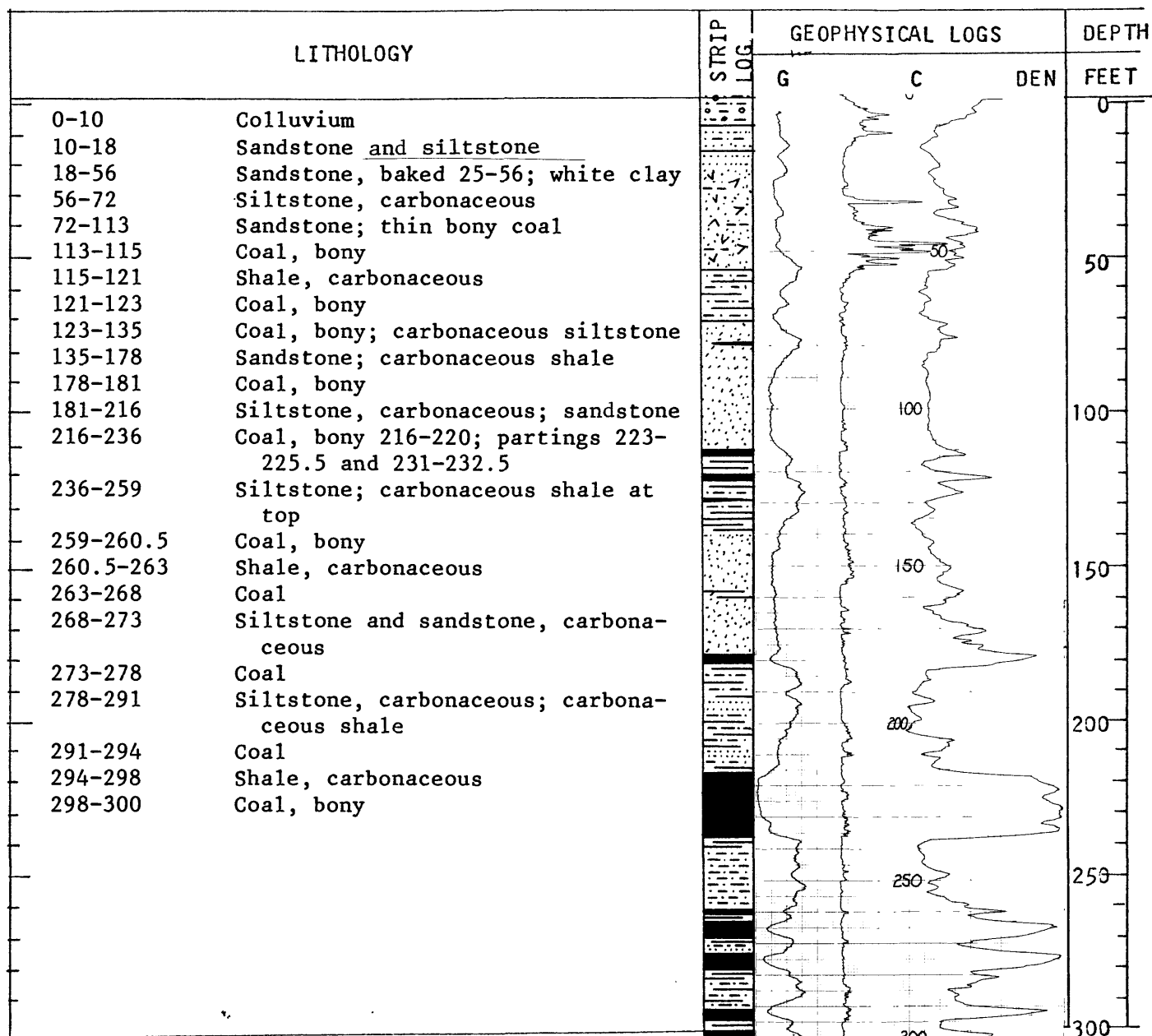
Location: T. 4 N., R. 94 W., sec. 17, NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ Cored: Yes ☒ No

Drilled depth 706' Logged depth 706' Drilling medium air Fluid level --

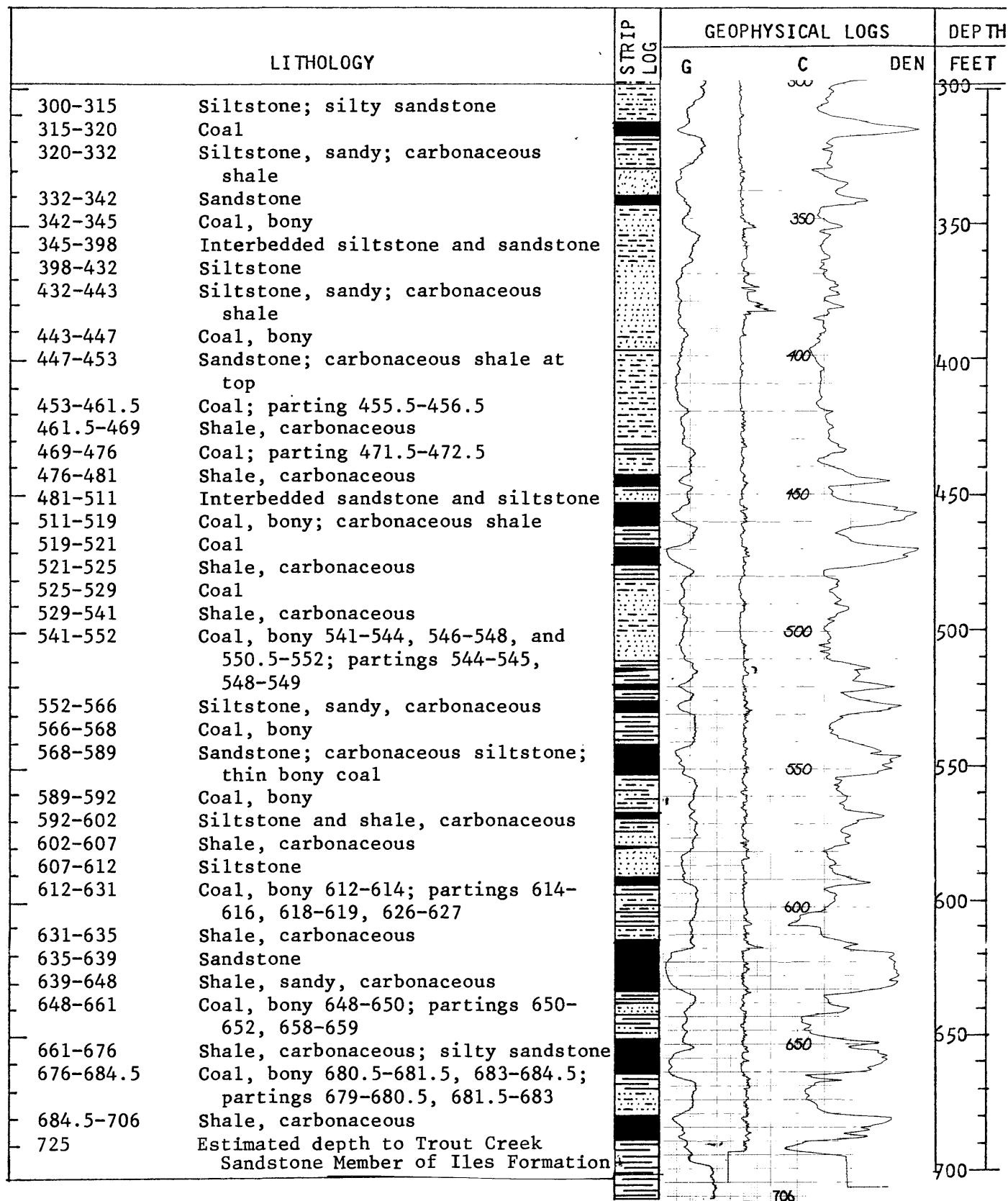
Geophysical logs:

Gamma (G):	T.C. <u>2</u>	Scale <u>10 cps/in</u>	Logging speed <u>10</u>	fpm
Density (DEN):	T.C. <u>1</u>	Scale <u>50 cps/in</u>	Logging speed <u>10</u>	fpm
Caliper (C):		Scale <u>2 in/in</u>	Logging speed <u>10</u>	fpm

Remarks: Drilled with air and foam. No sample 45-60', 75-80', 90-115', 175-185',
220-225', 230-235', 260-265', 300-305', 490-495', 630-640', 650-655'.



U.S. GEOLOGICAL SURVEY

Hole No. D-53-EG continued


U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-47-A State Colorado County Moffat Date logged 6/30/78 Elev.(ft) 9970

Location: T. 4 N., R. 93 W., sec. 28, SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ Cored: Yes ☒ No ☐

Drilled depth 715' Logged depth 705' Drilling medium air & mud Fluid level 244'

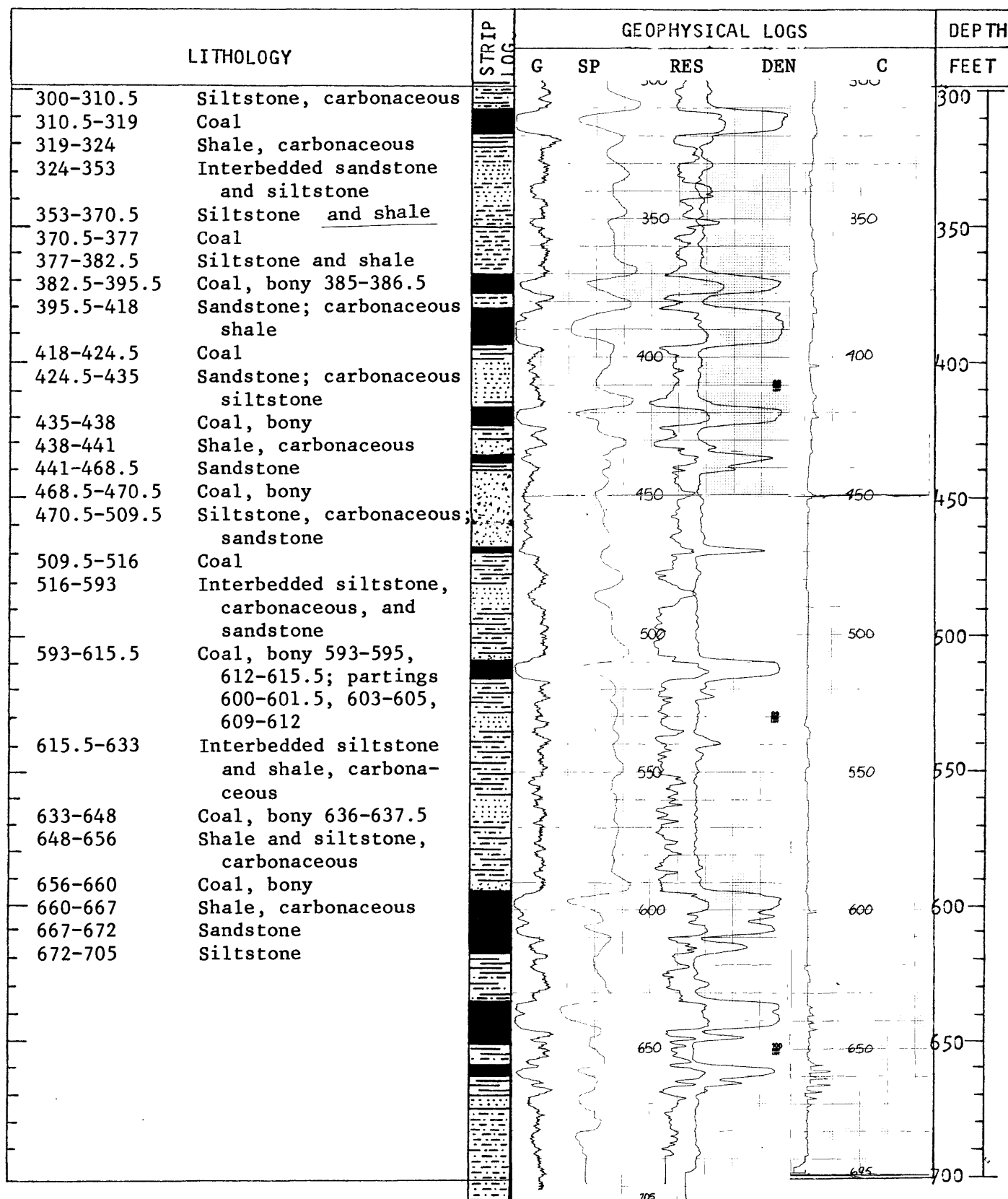
Geophysical logs:

Spontaneous potential (SP):	Scale	30 mv/in	Logging speed	20	fpm
Resistance (RES):	Scale	20 Ω /in	Logging speed	20	fpm
Gamma (G): T.C. <u>2</u>	Scale	20 cps/in	Logging speed	20	fpm
Density (DEN): T.C. <u>2</u>	Scale	60 cps/in	Logging speed	20	fpm
Caliper (C)	Scale	2 in/in	Logging speed	10	fpm

Remarks: Drilled with air and foam to 660', with mud 660-715'. No samples
95-120', 300-305', 660-715'. Abandoned due to circulation problems.

LITHOLOGY		STRIP LOG	GEOPHYSICAL LOGS					DEPTH
			G	SP	RES	DEN	C	FEET
0-36	Siltstone and shale, carbonaceous; thin coal							0
36-52.5	Sandstone and siltstone, carbonaceous							
52.5-58	Coal, bony 55-58; parting 54-55				50		50	50
58-61	Shale, carbonaceous							
61-85	Sandstone and siltstone, part carbonaceous							
85-100	Shale, carbonaceous; coal?				100		100	100
100-102.5	Coal							
102.5-130	Shale and siltstone, carbonaceous							
130-144	Sandstone and siltstone, carbonaceous							
144-148	Coal, bony 144-145.5				150		150	150
148-176	Interbedded shale and siltstone, carbonaceous							
176-182	Coal, bony 180-182							
182-198	Siltstone; carbonaceous shale				200		200	200
198-201	Coal							
201-236	Interbedded siltstone and shale, carbonaceous; thin bony coal							
236-251	Sandstone, carbonaceous				250		250	250
251-280.5	Interbedded siltstone and shale, carbonaceous							
280.5-286.5	Coal							
286.5-300	Siltstone, carbonaceous							300

U.S. GEOLOGICAL SURVEY

Hole No. D-47-A continued


U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-47-A1 State Colorado County Moffat Date logged 7/2/78 Elev.(ft) 6970

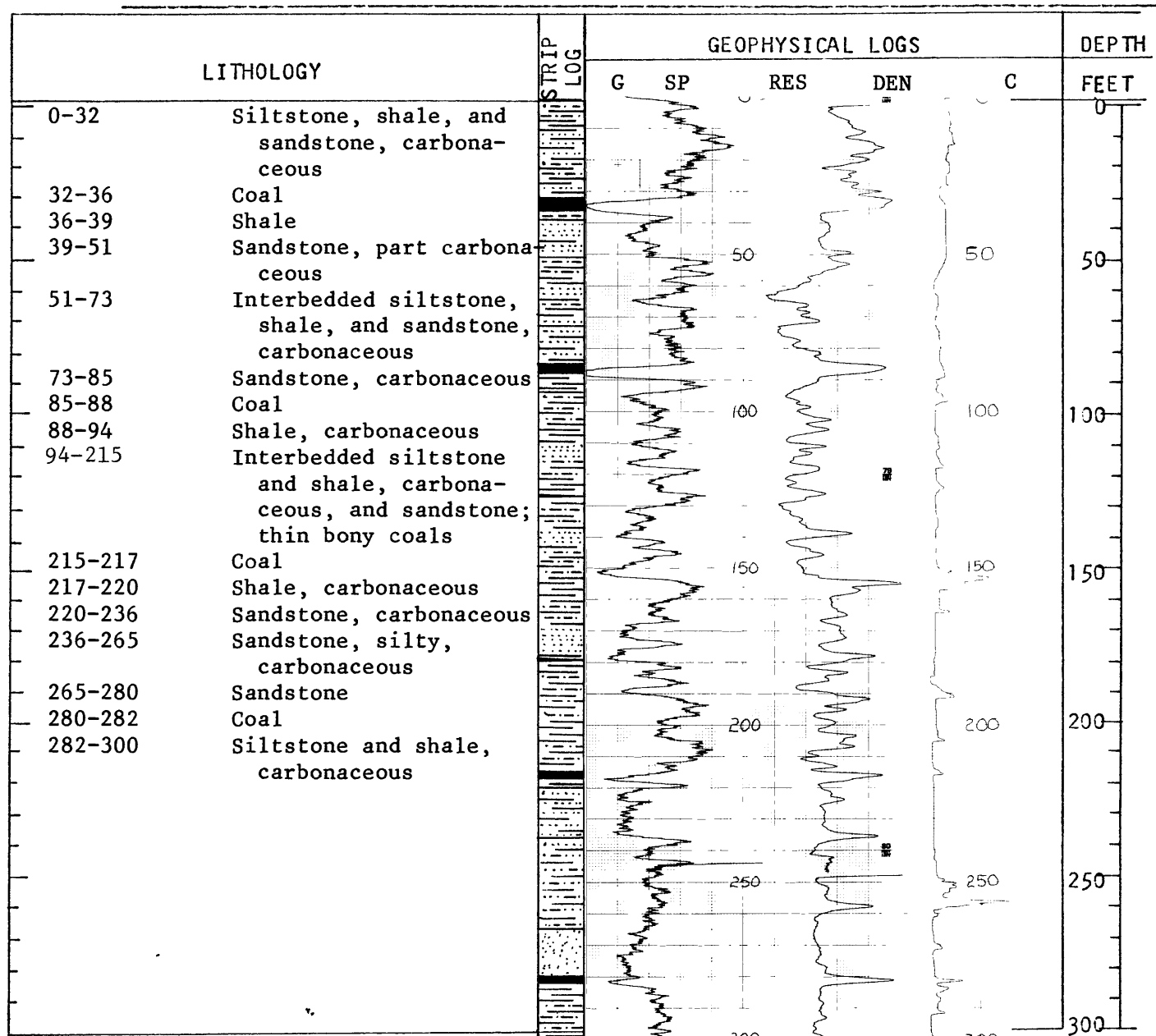
Location: T. 4 N., R. 93 W., sec. 33, NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ Cored: Yes x No

Drilled depth 975' Logged depth 969' Drilling medium air & mud Fluid level 606'

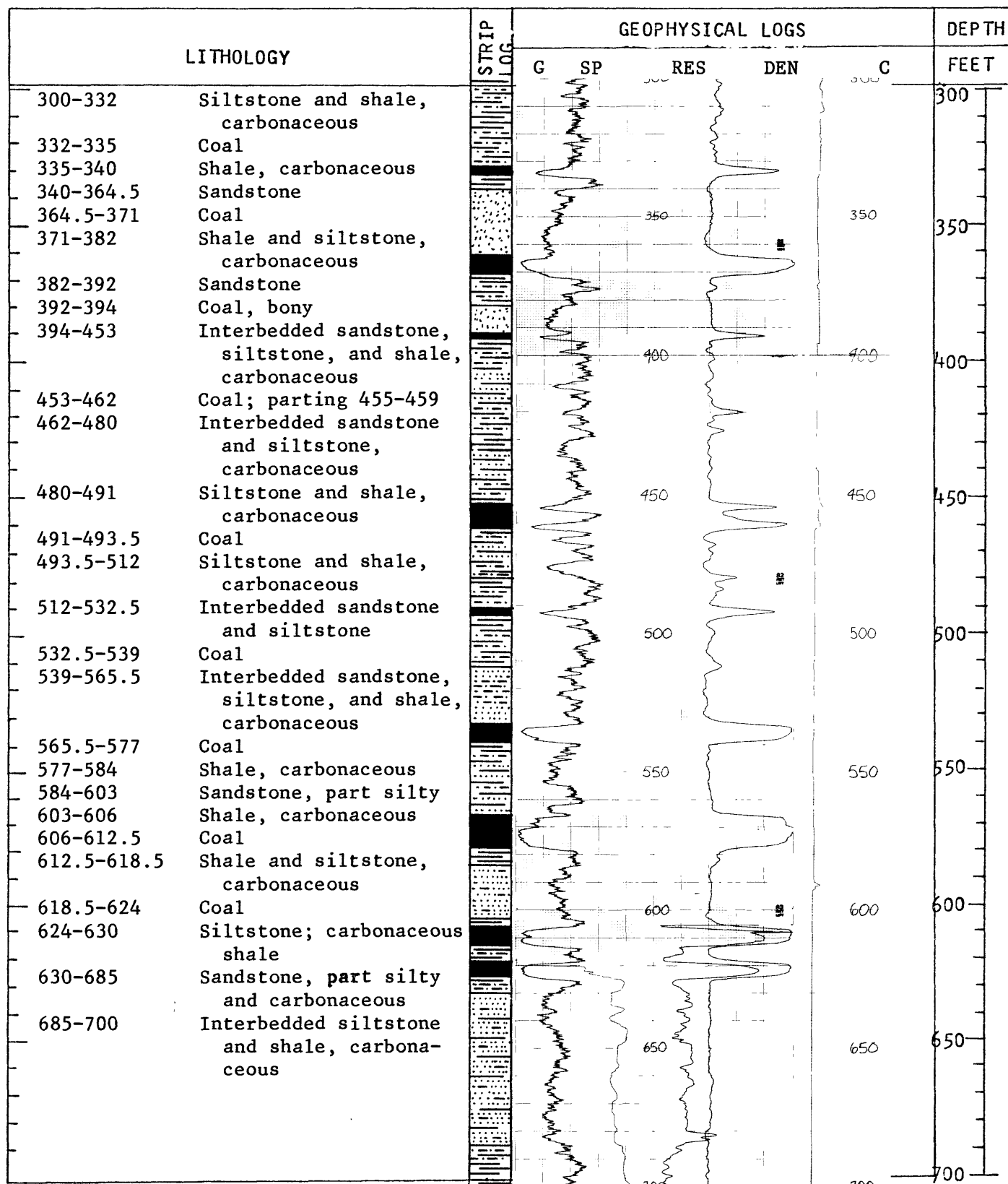
Geophysical logs:

Spontaneous potential (SP):	Scale	<u>20 mv/in</u>	Logging speed	<u>20</u> fpm
Resistance (RES):	Scale	<u>10 Ω/in</u>	Logging speed	<u>20</u> fpm
Gamma (G): T.C. <u>2</u>	Scale	<u>10 cps/in</u>	Logging speed	<u>20</u> fpm
Density (DEN): T.C. <u>2</u>	Scale	<u>60 cps/in</u>	Logging speed	<u>20</u> fpm
Caliper (C)	Scale	<u>2 in/in</u>	Logging speed	<u>10</u> fpm

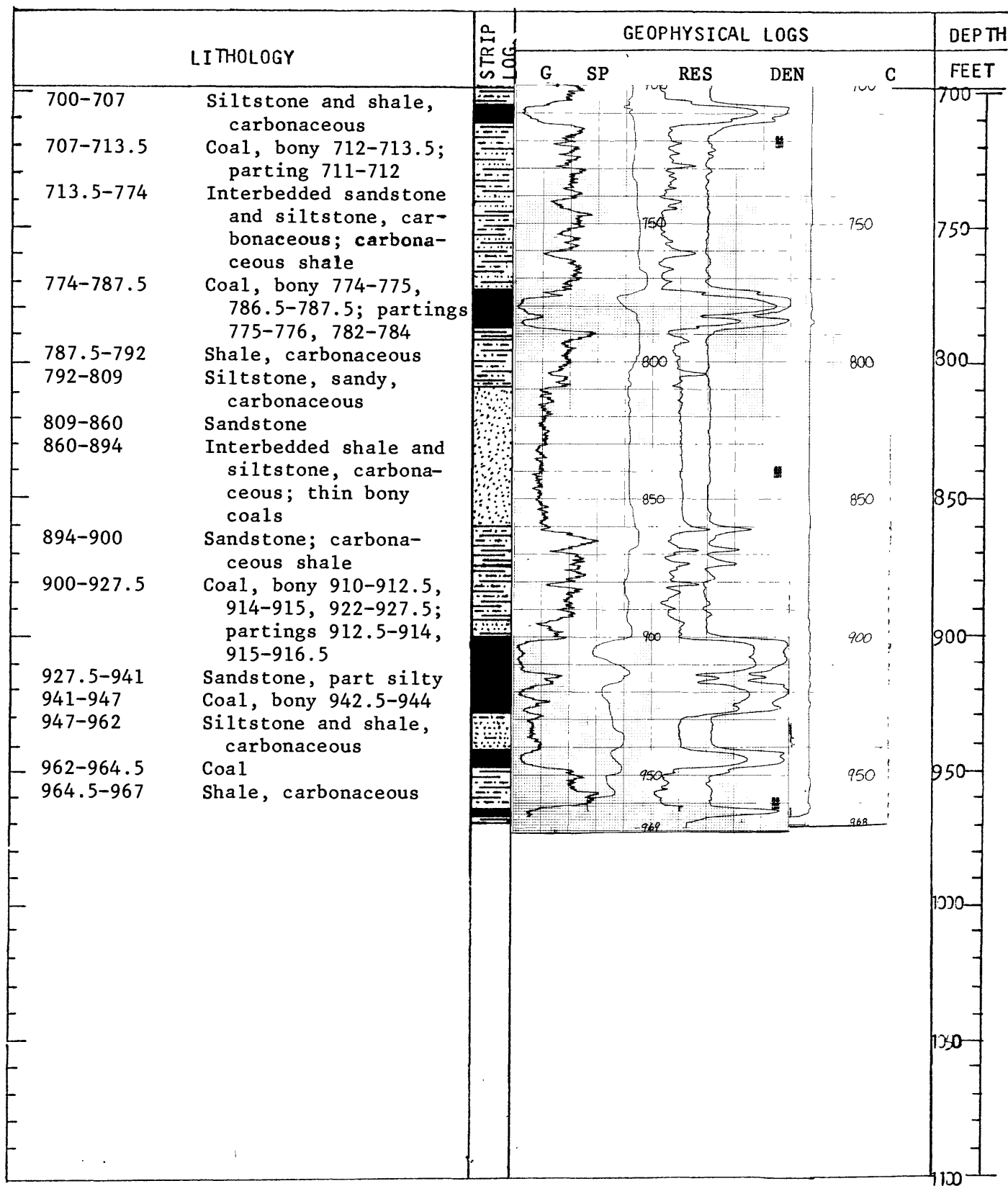
Remarks: Replacement for abandoned hole D-47-A. Drilled with air and foam to 940'; with mud 940'-970'. No samples 940-970'. Abandoned owing to circulation problems.



U.S. GEOLOGICAL SURVEY

Hole No. D-47-A continued


U.S. GEOLOGICAL SURVEY

Hole No. D-47-A1 continued


U.S. GEOLOGICAL SURVEY
DRILL-HOLE LOG, DANFORTH HILLS COAL FIELD

Hole No. D-48-NG State Colorado County Rio Blanco Date logged 7/8/78 Elev.(ft) 8420

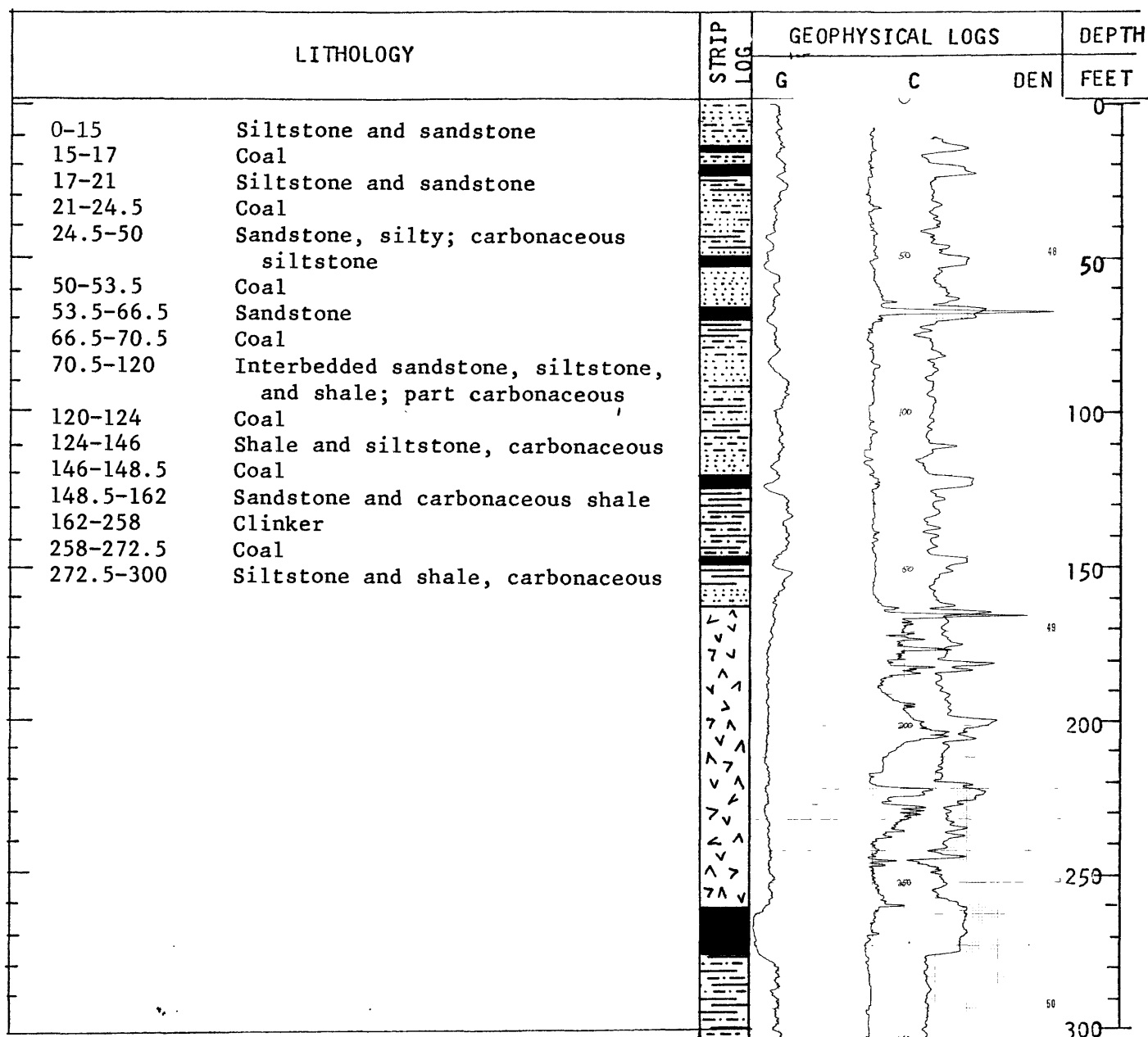
Location: T. 3 N., R. 93 W., sec. 19, SW 1/4 NW 1/4 SE 1/4 Cored: Yes ☒ No ☐

Drilled depth 1200' Logged depth 1140' Drilling medium air Fluid level 770'

Geophysical logs:

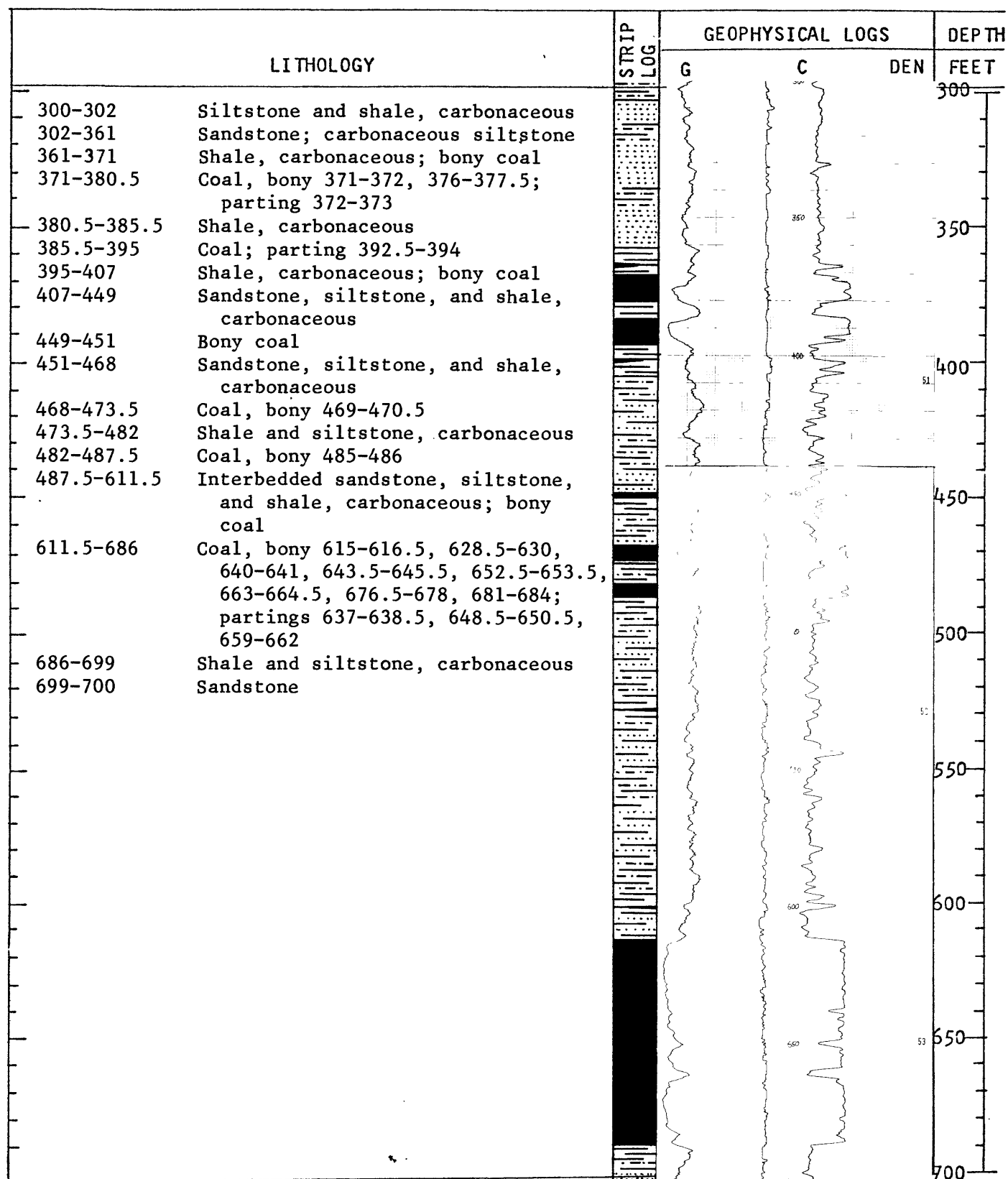
Gamma (G):	T.C. <u>2</u>	Scale <u>10 cps/in</u>	Logging speed <u>20</u>	fpm
Density (DEN):	T.C. <u>1</u>	Scale <u>80 cps/in</u>	Logging speed <u>10?</u>	fpm
Caliper (C):		Scale <u>2 in/in</u>	Logging speed <u>10</u>	fpm

Remarks: Drilled with air and foam. No samples 60-1200'. Interpretation from
poor geophysical logs.

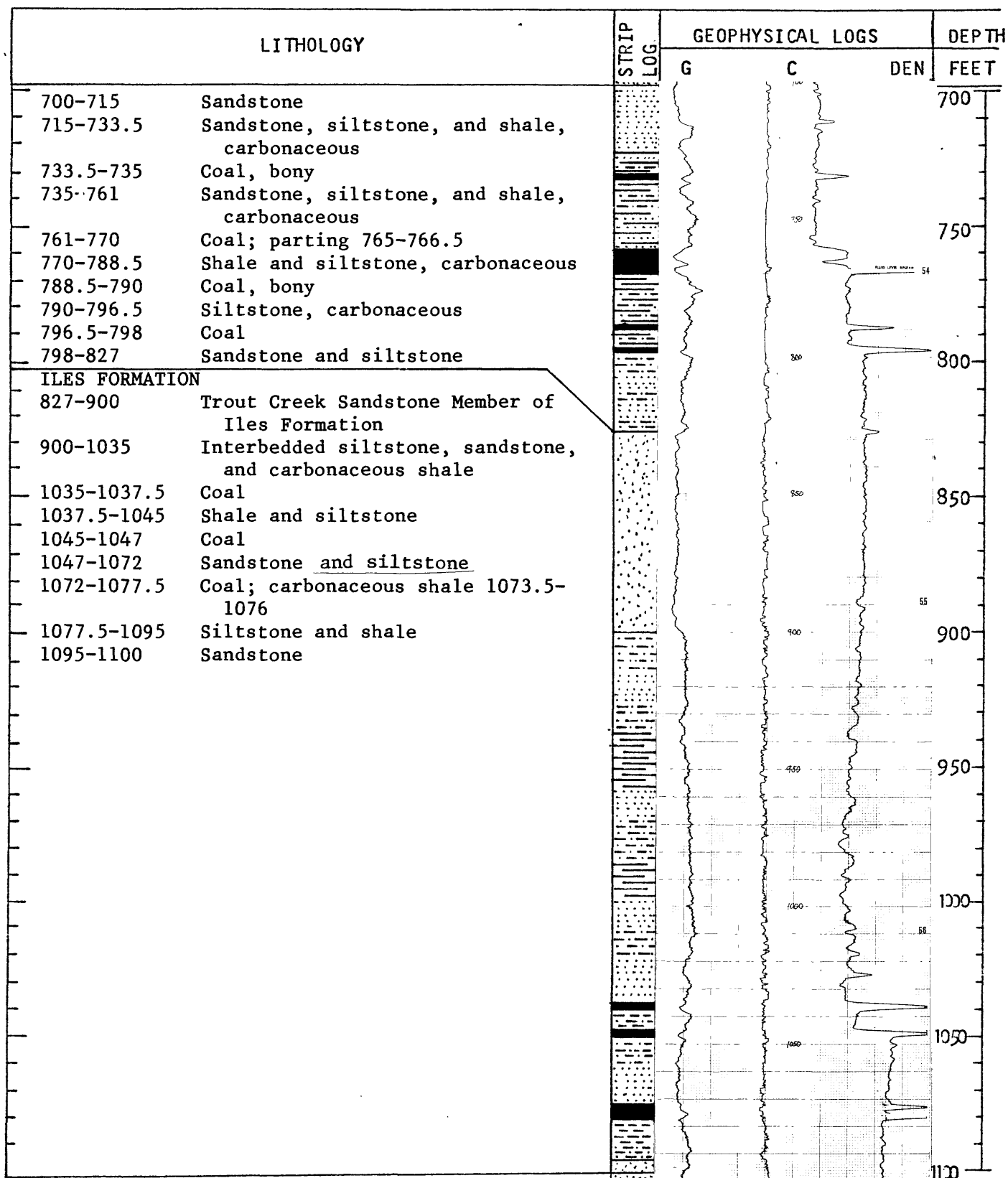


U.S. GEOLOGICAL SURVEY

Hole No. D-48-NG continued



U.S. GEOLOGICAL SURVEY

Hole No. D-48-NG continued


U.S. GEOLOGICAL SURVEY
Hole No. D-48-NG continued

