

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

COAL DRILLING DURING 1980 IN BIG HORN, DAWSON, McCONE,
POWDER RIVER, PRAIRIE, RICHLAND, ROSEBUD, AND
TREASURE COUNTIES, MONTANA

By
U.S. Geological Survey
and
Montana Bureau of Mines and Geology

Open-File Report 82-026

1981

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

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INTRODUCTION

Between January 17 and December 19, 1980, 128 coal test holes were drilled in the Big Horn, Dawson, McCone, Powder River, Prairie, Richland, Rosebud, and Treasure Counties, Montana (figs. 1-5). Drilling was done by the Montana Bureau of Mines and Geology (MBMG) under U.S. Geological Survey (USGS) grant No. 14-08-0001-18772 for the purpose of evaluating and classifying mineral lands in the public domain. Data were collected to determine the extent, correlation, and recoverability of coal beds and the petrographic characteristics of associated rocks in the Tertiary Fort Union and Wasatch Formations.

This report presents lithologic logs (depth intervals corrected to match the geophysical logs) and the geophysical logs of the drill holes. A rotary drill was used; where practical, water or air were the drilling fluids. All holes were logged from the bottom to the top and ten-foot sample intervals were logged by a geologist in the field. A "C" following the drill-hole number denotes a core sample.

The location of a drill hole within a section is identified on the lithologic and geophysical logs by a letter-designated tract and by _____ distance from the section lines. Each section is subdivided into four quadrants with the northeast quadrant designated as A and continuing counter-clockwise to D. Each quadrant is then subdivided into four equal parts with a similar letter designation. This is repeated until a section is subdivided into 256 units. Using this system, the largest subdivision in a section is listed first. For example, a tract designation of ABCD would be located in the $SE\frac{1}{4}SW\frac{1}{4}NW\frac{1}{4}NE\frac{1}{4}$ of the section.

Fieldwork was done by the following MBMG personnel: Jon Hargas, William
Jackson, Robert Matson, and Russell Patterson. Robert Matson (MBMG) and Marvin Millgate (USGS provided project coordination and technical guidance.

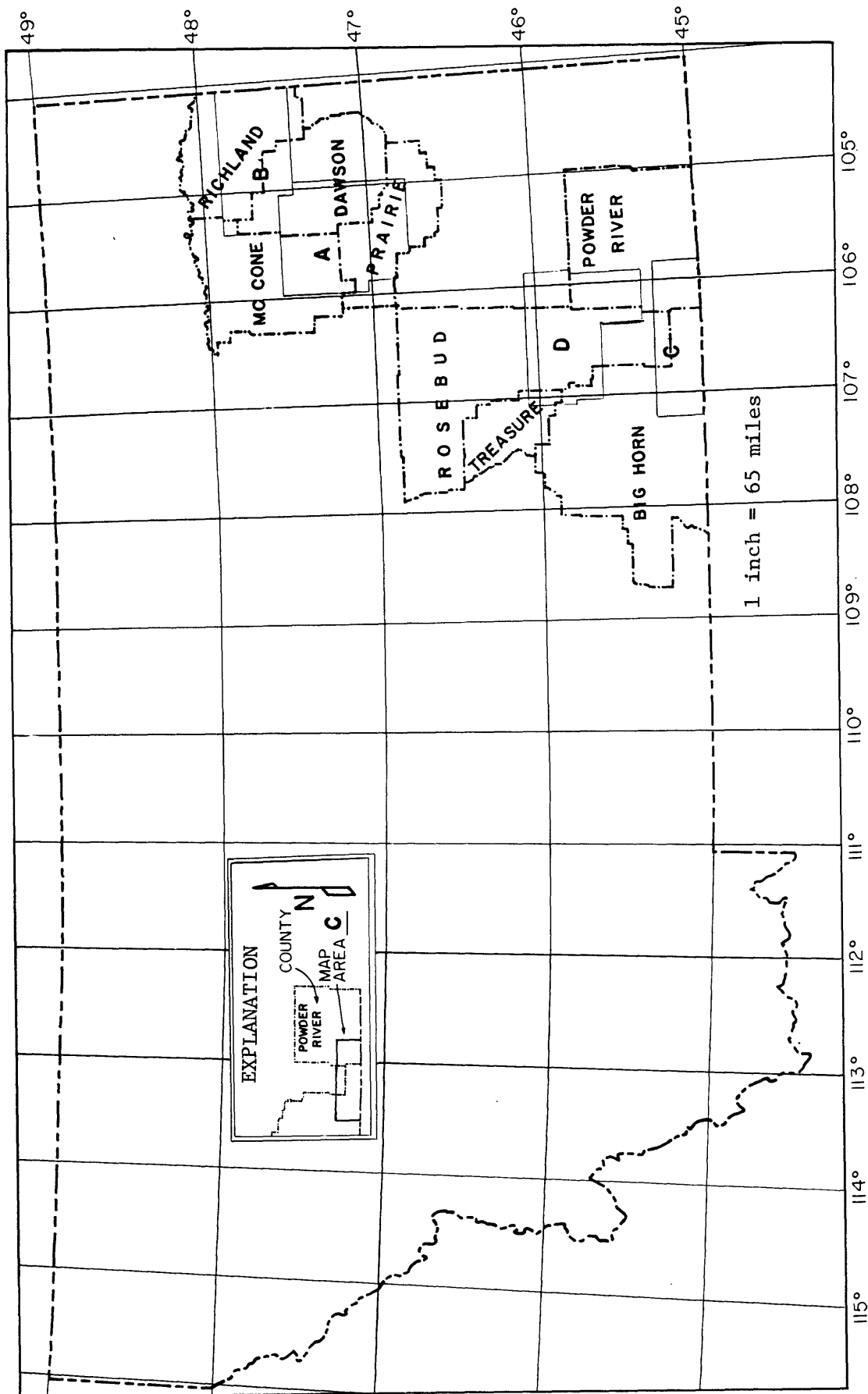


Figure 1.--Index map showing 1978 drilling areas in Big Horn, Dawson, McCone, Powder River, Prairie, Richland, Rosebud, and Treasure Counties, Montana. A, Dawson, Prairie, and McCone Counties; B, Dawson and Richland Counties; C, Big Horn and Powder River Counties; D, Treasure, Rosebud, and Powder River Counties.

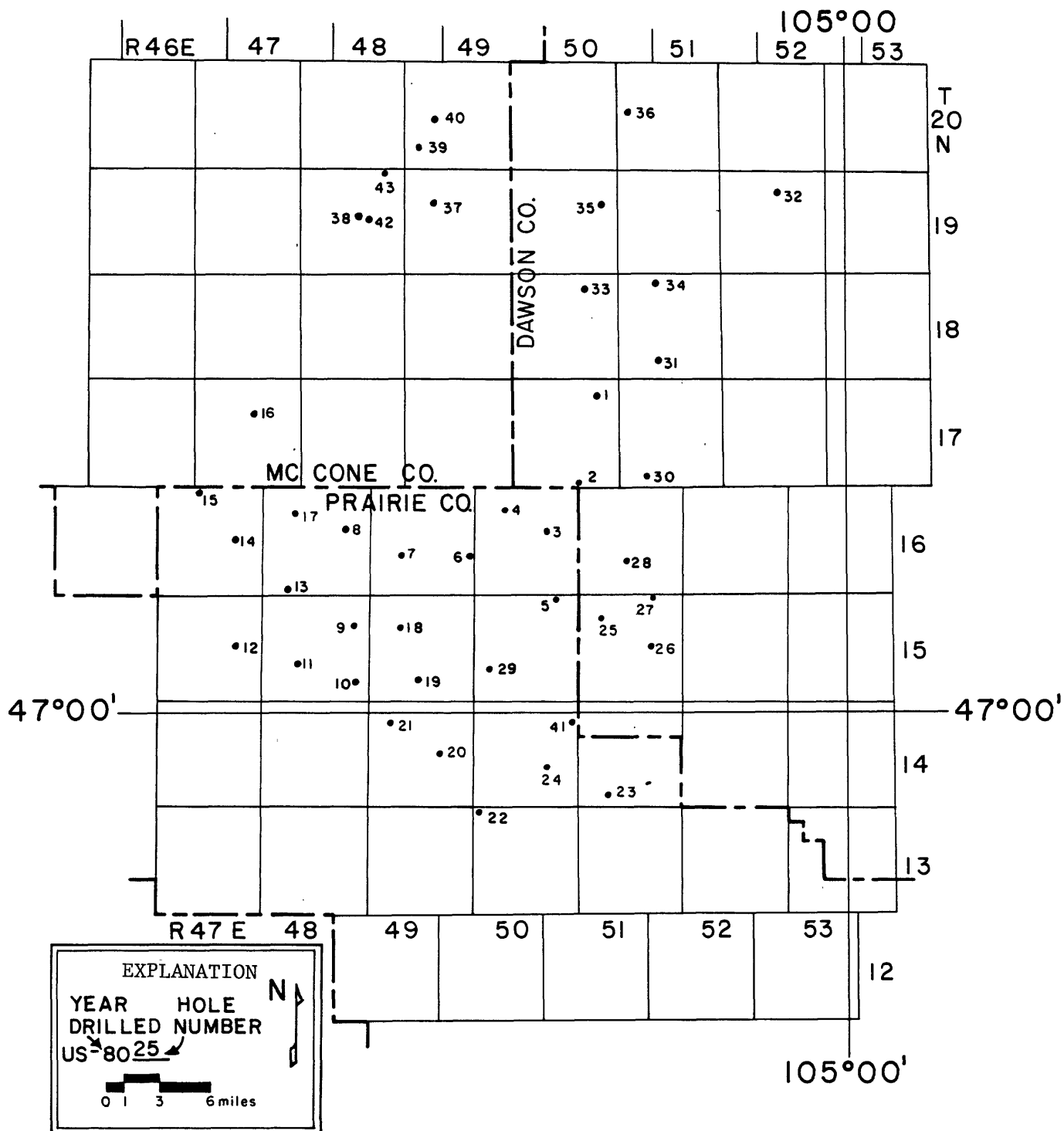


Figure 2.--Drill-hole locations for Area A, Dawson, Prairie, and McCone Counties, Montana. US-80 prefix omitted from each drill-hole number but included on logs.

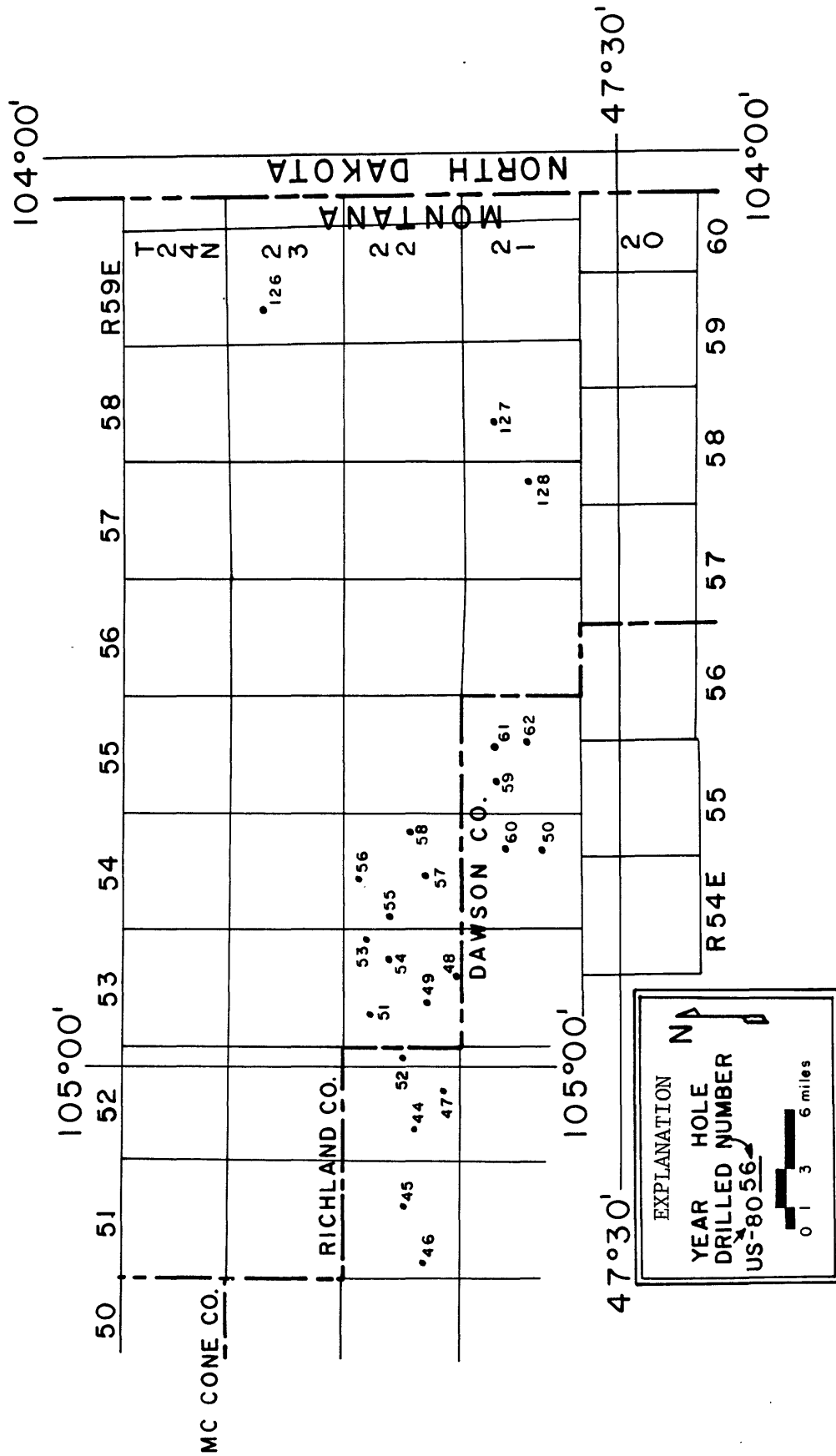


Figure 3.--Drill-hole locations for Area B, Dawson and Richland Counties, Montana. US-80 prefix omitted from each drill-hole number but included on logs.

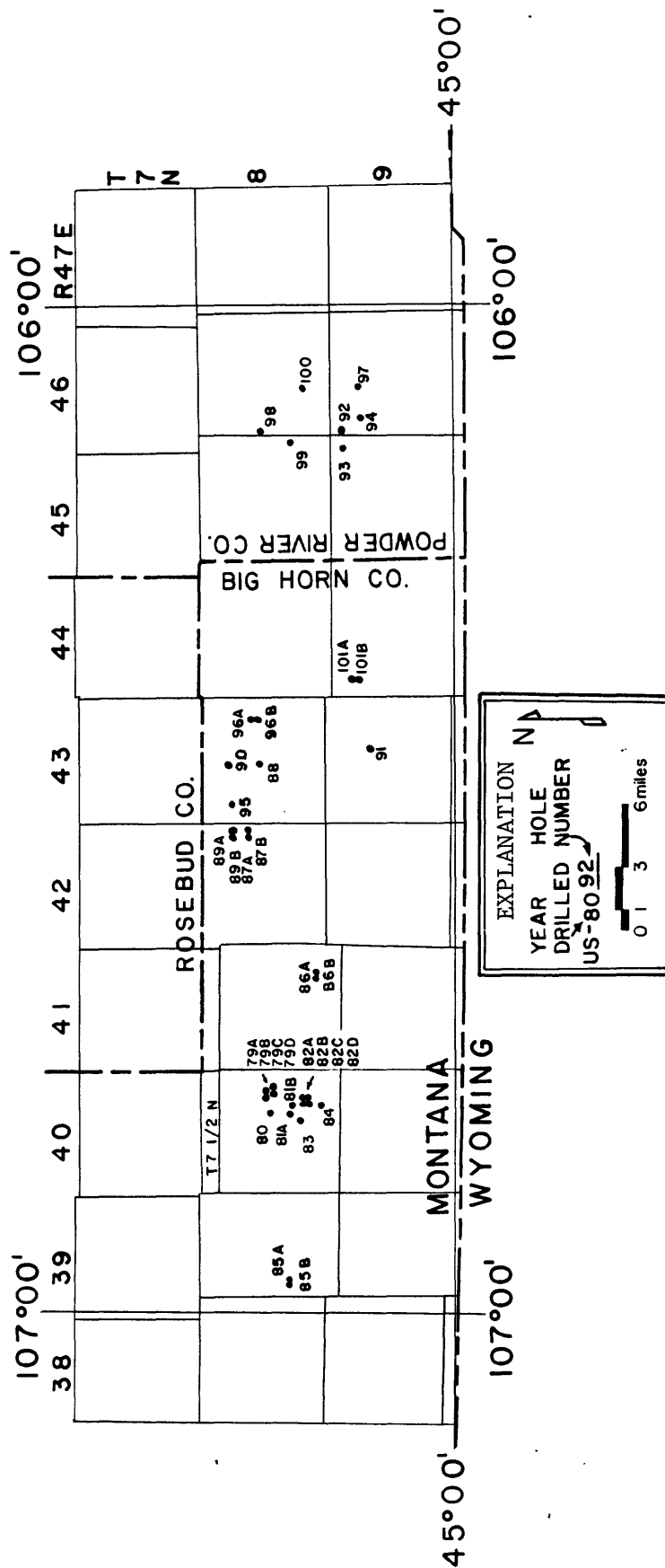


Figure 4.--Drill-hole locations for Area C, Big Horn and Powder Counties, Montana.
US-80 prefix omitted from each drill-hole number but included on logs.

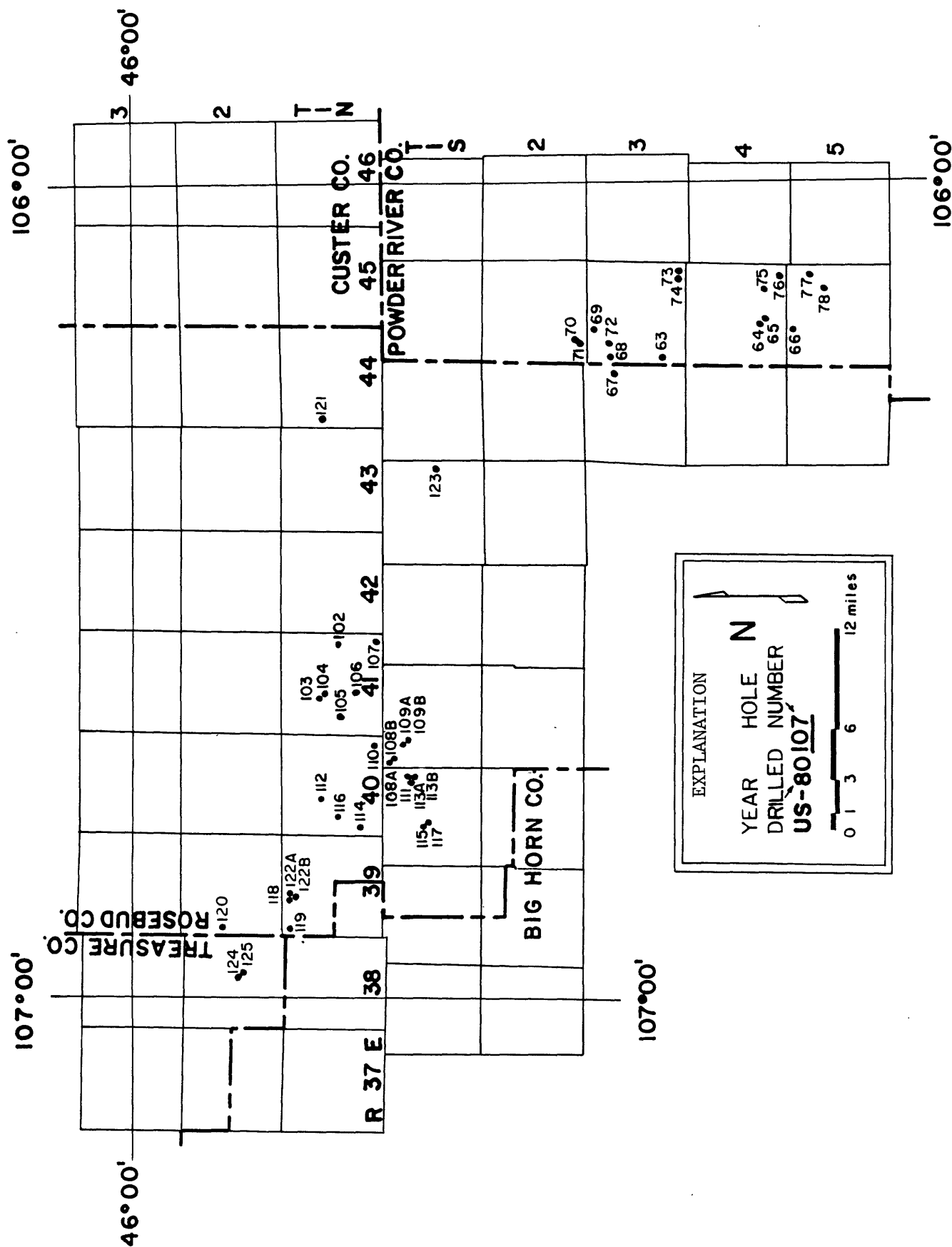
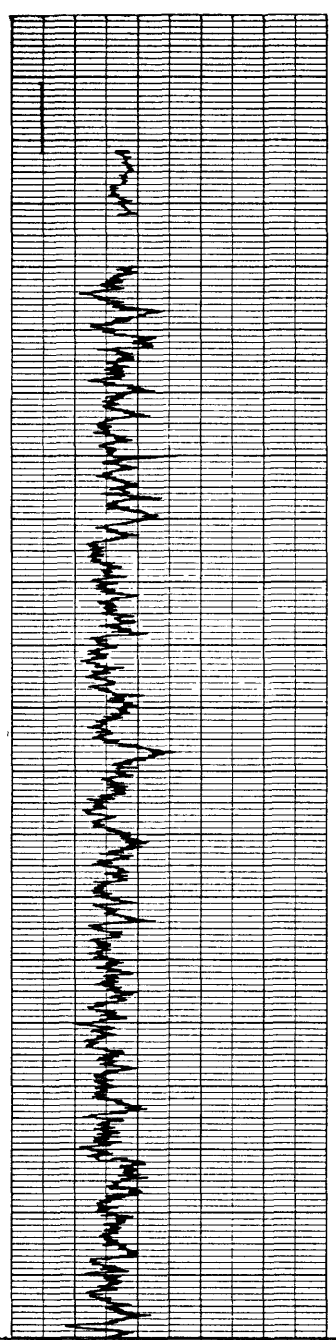
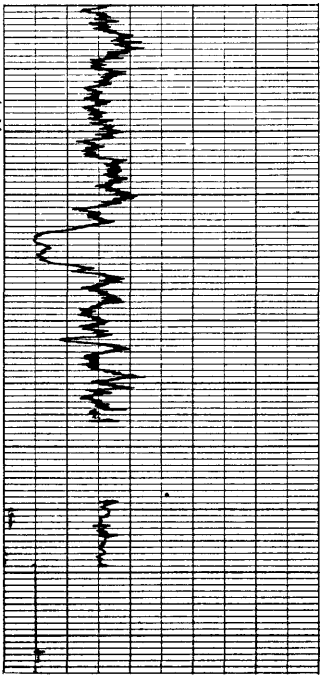
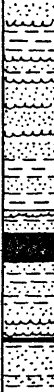
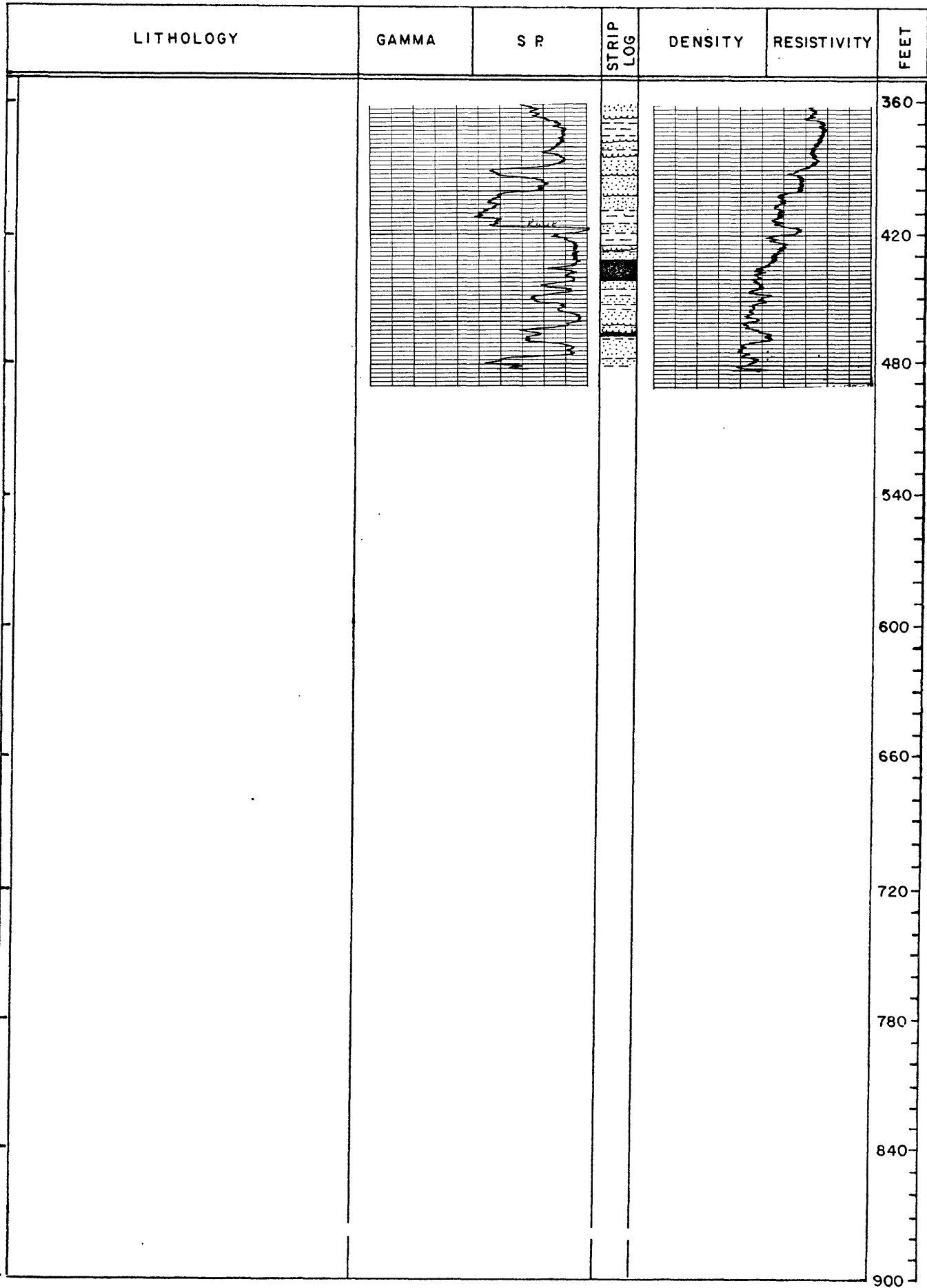


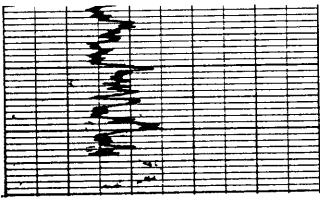
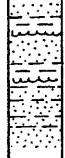
Figure 5.--Drill-hole locations for Area D, Treasure, Rosebud, and Powder River Counties, Montana. US 80 prefix omitted from each drill-hole but included on logs.

Hole No: US-80001 Map: Circle 2 SE Date: 1/17/80 State: Montana County: Dawson
 Elev.: 2890 FT. Location: T 17^N R 50^E, Sec 2 Tract DDDD Drilled depth 520 FT.
 Measured: 5 FT. ^{FMK}FSL 10 FT. ^{FEL}RWL FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

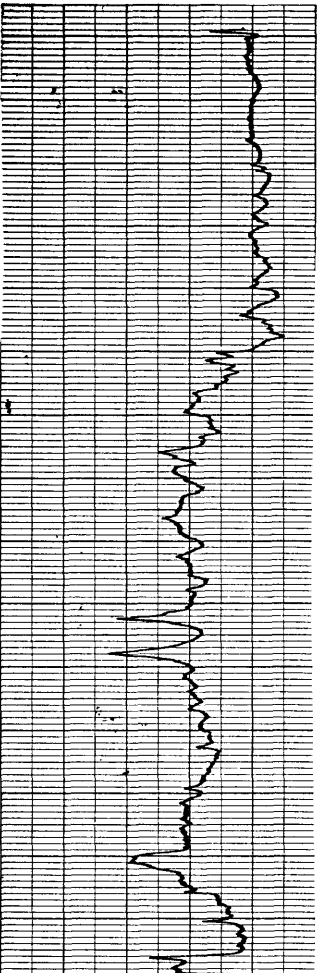
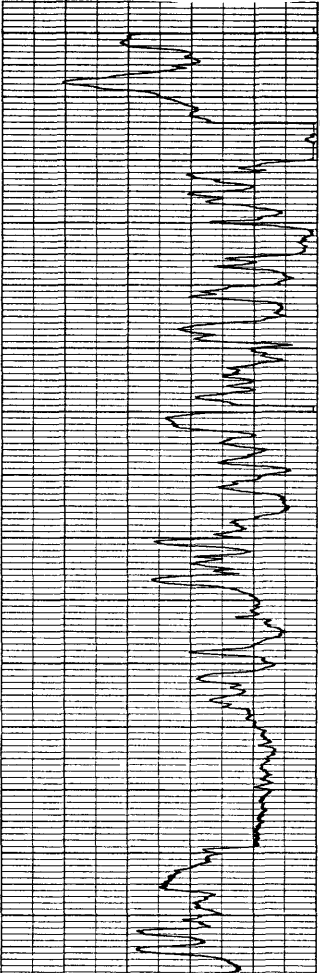
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>WILLIAM JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u> </u> RANGE <u> </u>
	LOGGED DEPTHS <u>492</u> FT. FT.		LOGGED DEPTHS FT. FT.
	STRIP LOG		
Silt, brown, alluvial; sandstone, brown; siltstone, brown, and claystone, brown. Sandstone, gray; siltstone, gray, and claystone, gray.			DEPTH FEET 60 0 60 120 180 240 300 360

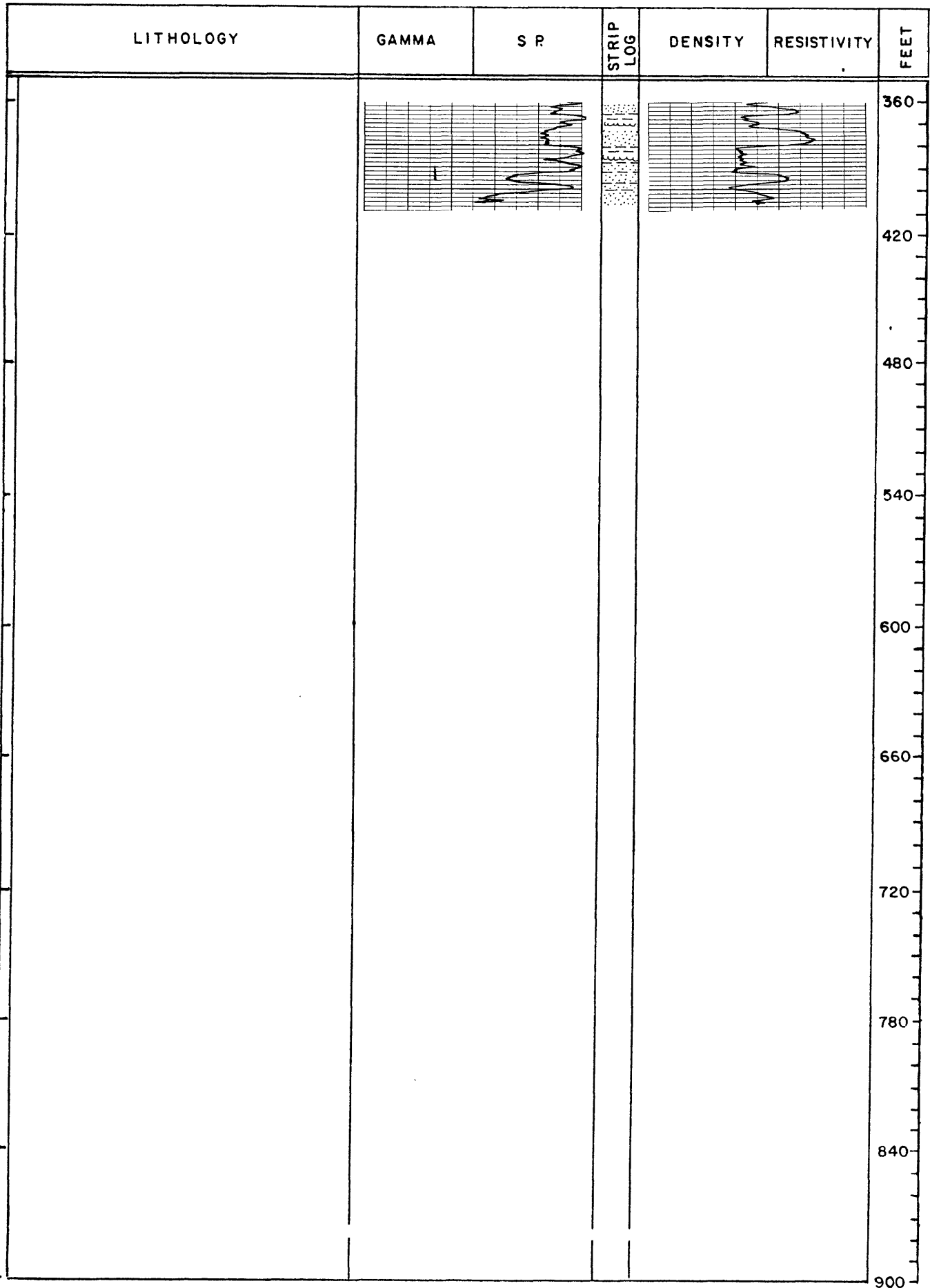
LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Sandstone, gray; siltstone, gray, and claystone, gray.						360
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.						420
Coal. Sandstone, gray, and claystone, gray.						480
						540
						600
						660
						720
						780
						840
						900

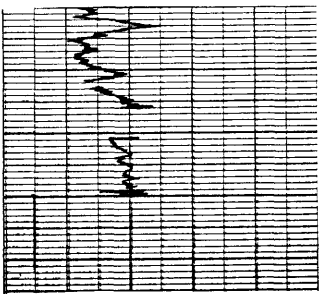
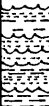
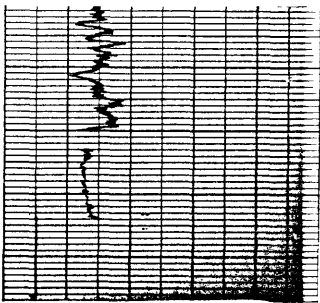


LITHOLOGY	GAMMA	S R	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

Hole No: US-80002 Map: Circle 3 NE Date: 1/20/80 State: Montana County: Dawson
 Elev.: 2952 FT. Location: T 17^N R 50^E, Sec 34 Tract DDDC Drilled depth 420 FT.
 Measured: 50 FT. ~~FSL~~ 650 FT. ~~FSL~~ FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Some gravel and much sand.

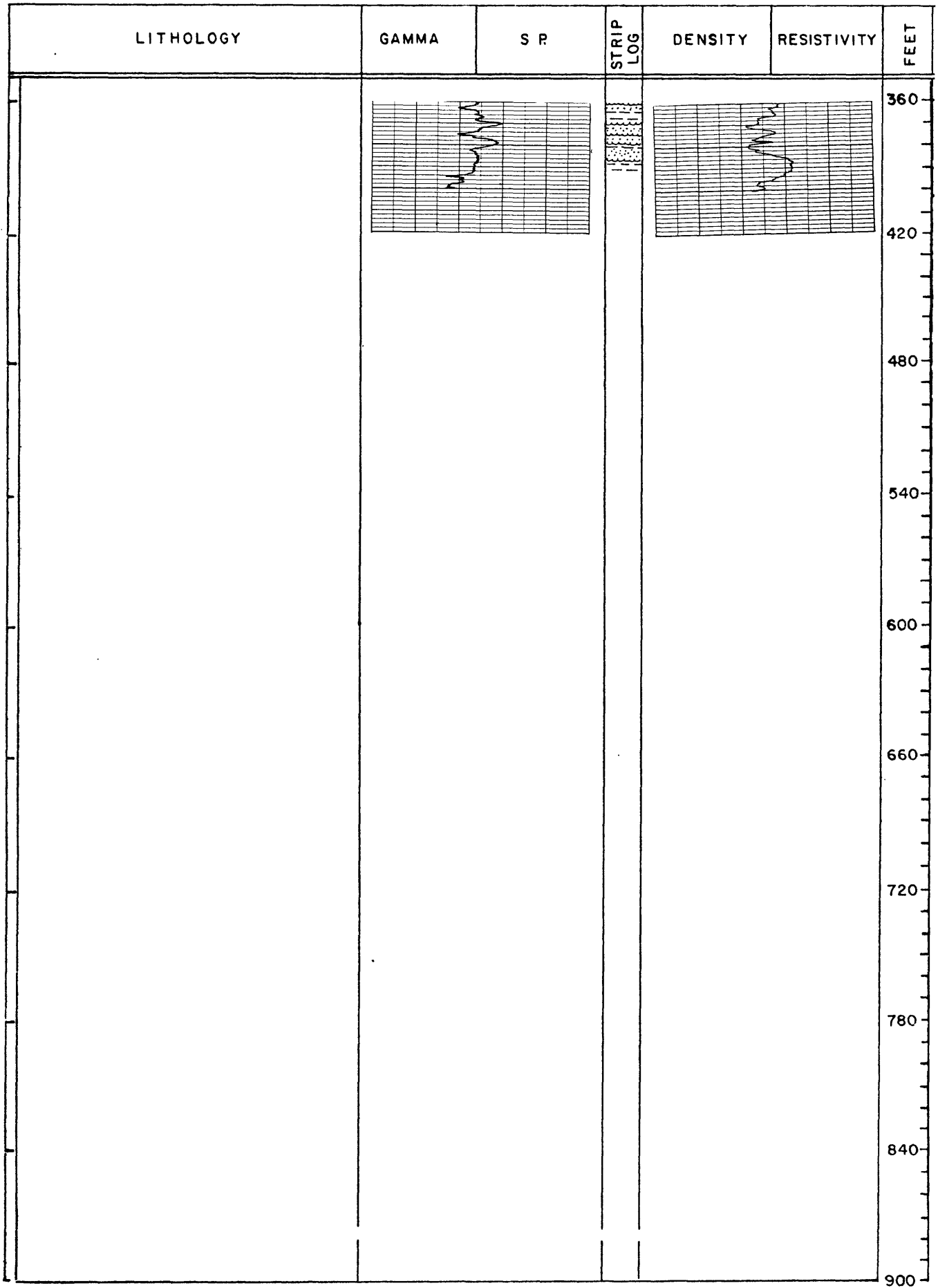
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>WILLIAM JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS FT. <u>406</u> FT.		RESISTIVITY SENS. SETTING <u>10</u>
	LOGGED DEPTHS FT. <u>408</u> FT.		DEPTH FEET
			60
			0
			60
			120
			180
			240
			300
			360



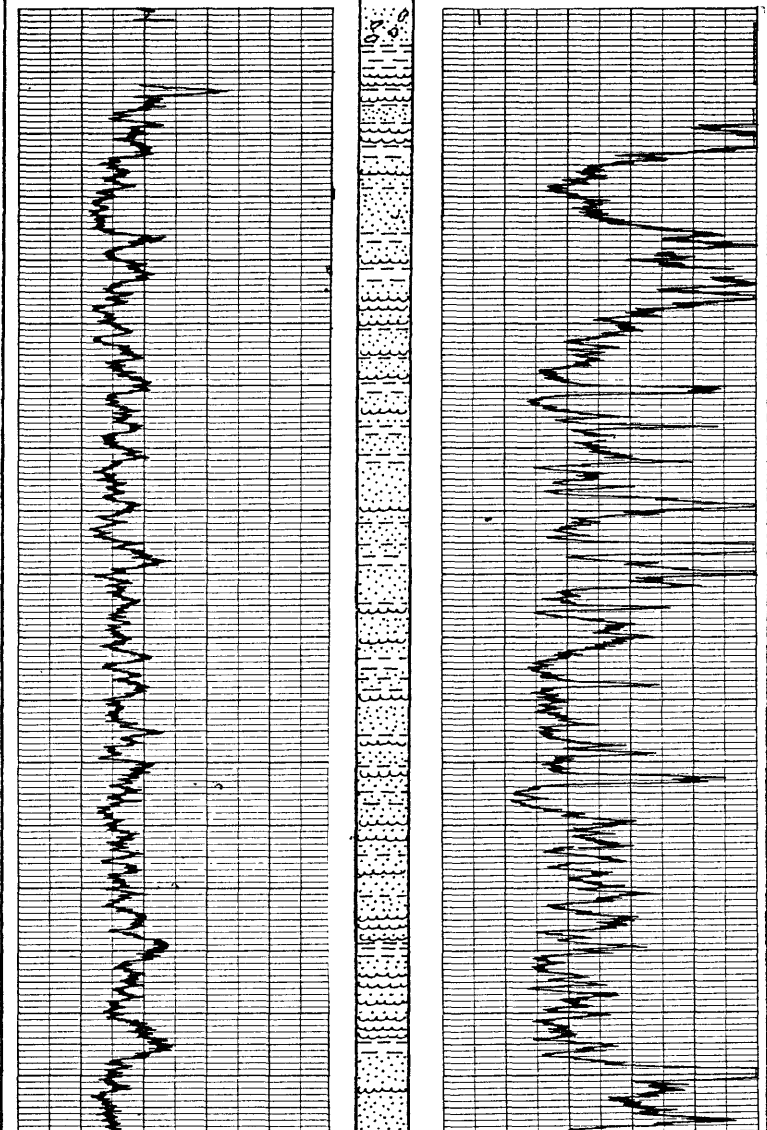
LITHOLOGY	GAMMA	S R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Shale, dark-brown, carbonaceous; sandstone, gray; siltstone, gray, and claystone, gray.						360 420 480 540 600 660 720 780 840 900

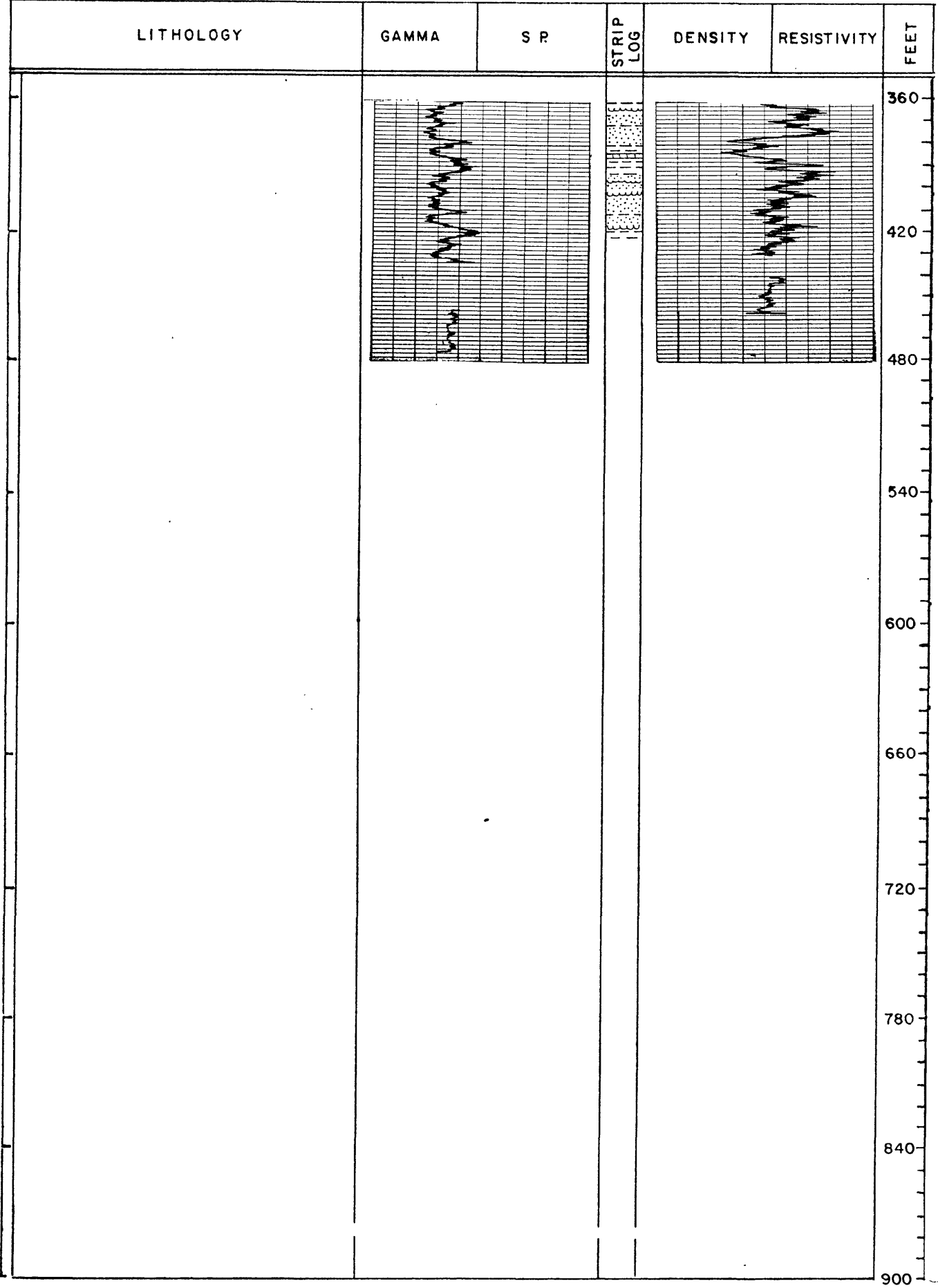
Hole No: US-80003 Map: Circle 3 NE Date: 1/20/80 State: Montana County: Prairie
 Elev.: 3196 FT. Location: T 16^N R 50^E W, Sec 14 Tract BBB Drilled depth 420 FT.
 Measured: 25 FT. ^{FNL} 60 FT. ^{FWL} 60 FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>WILLIAM JACKSON</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>500</u>	RESISTIVITY SENS. SETTING <u>20</u>	
	LOGGED DEPTHS FT. 400 FT.			LOGGED DEPTHS FT. 400 FT.		
	LOGGED DEPTHS FT. 400 FT.			LOGGED DEPTHS FT. 400 FT.		
						60
						0
						60
						120
						180
						240
						300
						360



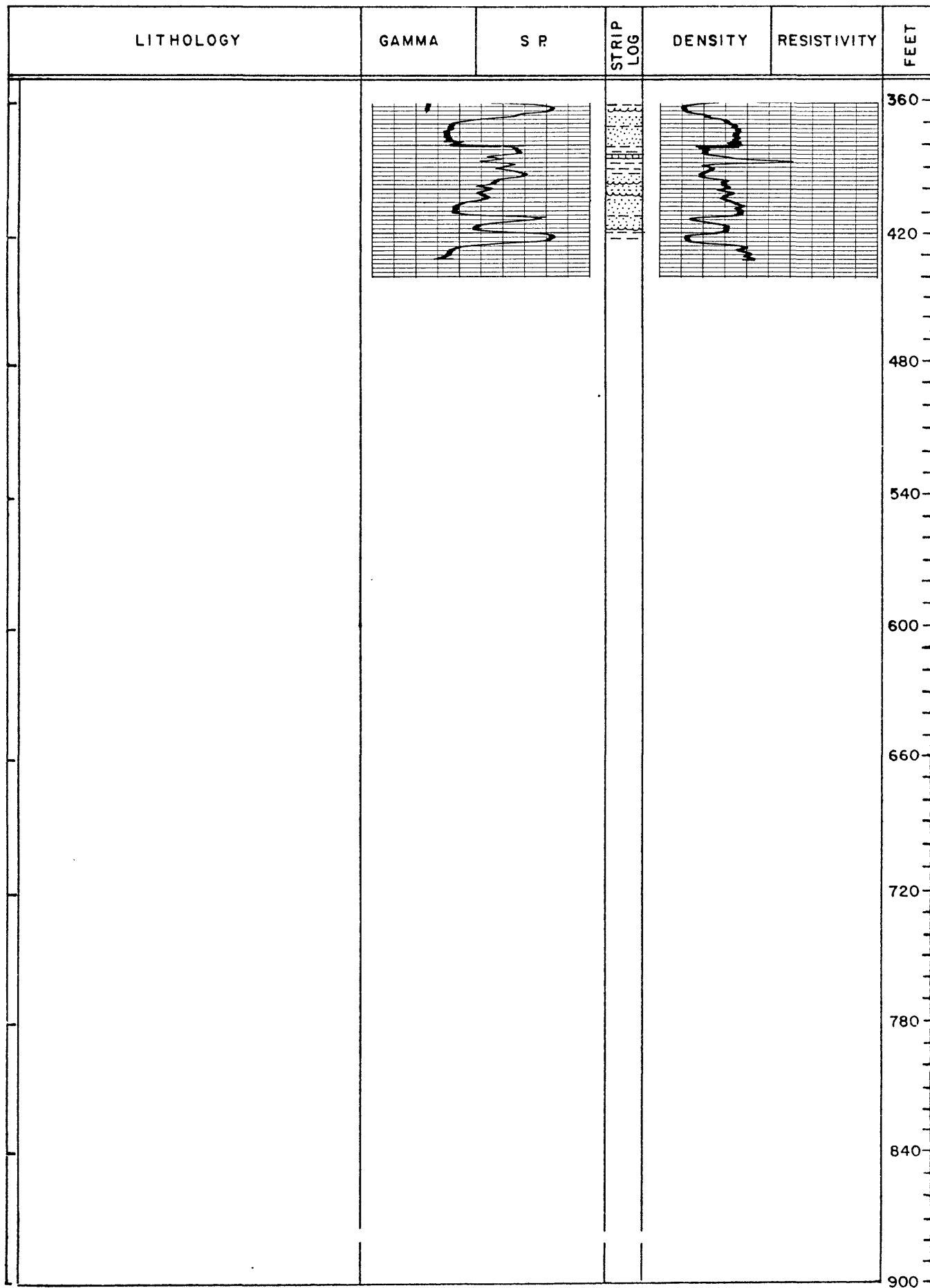
Hole No: US-80004 Map: Circle 3 NW Date: 1/20/80 State: Montana County: Prairie
 Elev.: 3280 FT. Location: T 16^N R 50^E, Sec 8 Tract AAAA Drilled depth 440 FT.
 Measured: 80 FT. ^{FNL} ~~FSX~~ 50 FT. ^{FEL} ~~RWX~~ FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W JACKSON</u> GEOLOGIST ^{NOX} YES		RECORDED BY <u>W JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>434</u> FT. FT.		RESISTIVITY SENS. SETTING <u>20</u>
	LOGGED DEPTHS <u>430</u> FT. FT.		DEPTH FEET
<p>Alluvium.</p> <p>Claystone, brown; sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and shale, black, carbonaceous.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p>	STRIP LOG		

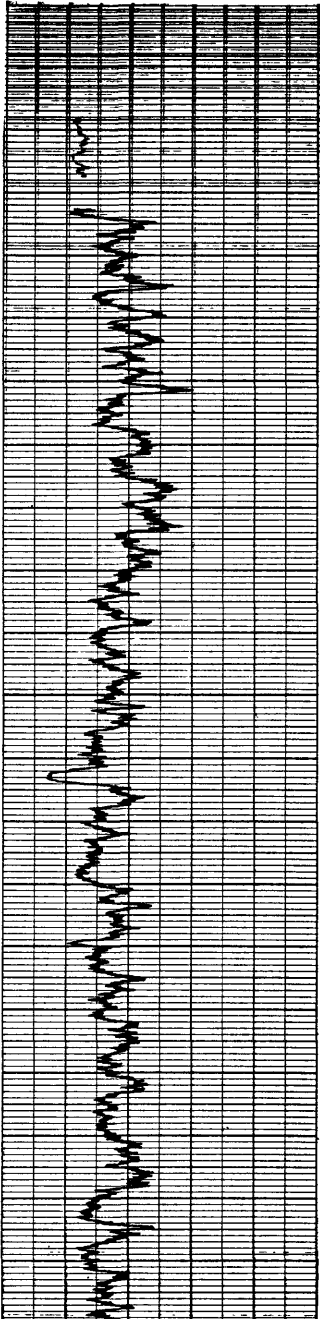
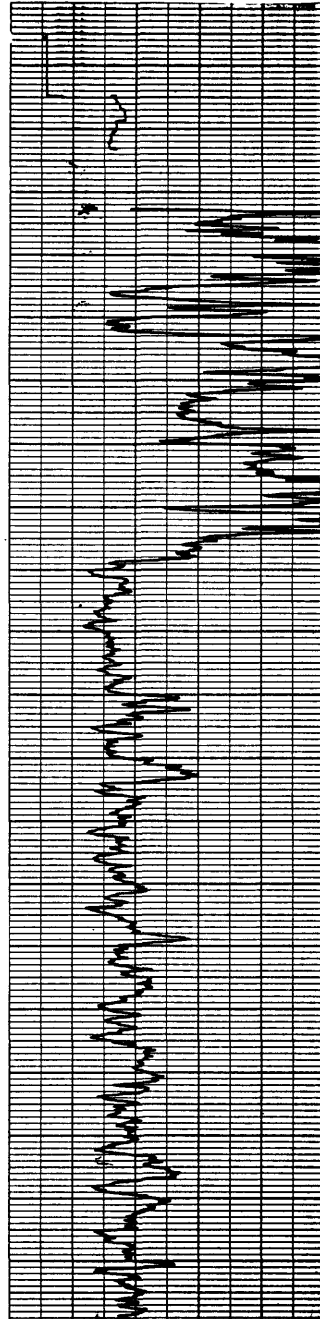
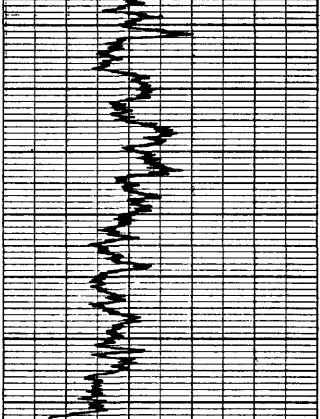
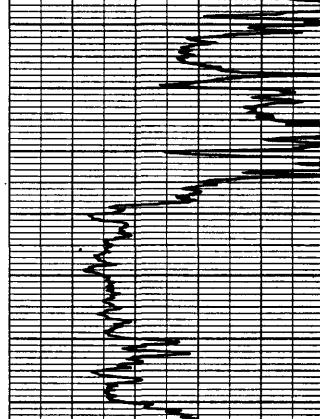
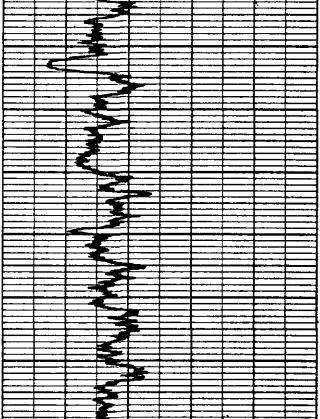
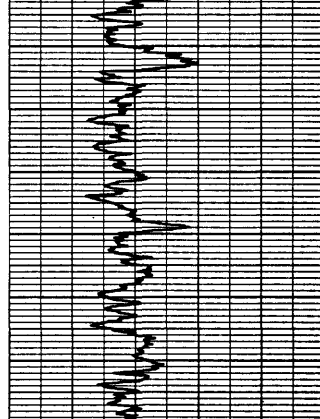
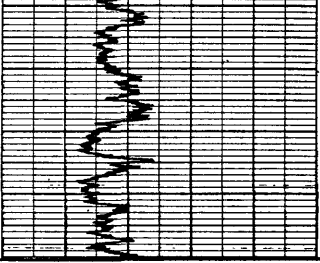
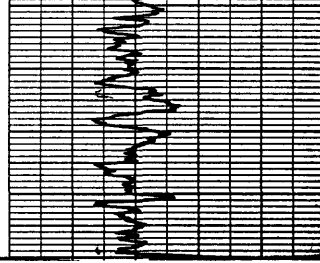
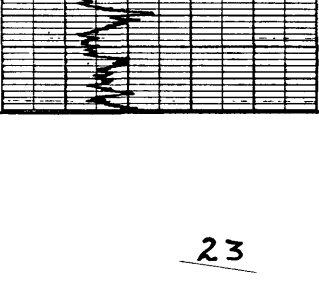
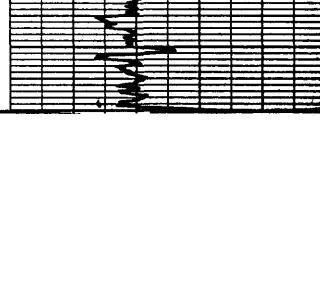
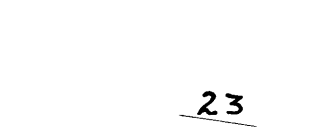



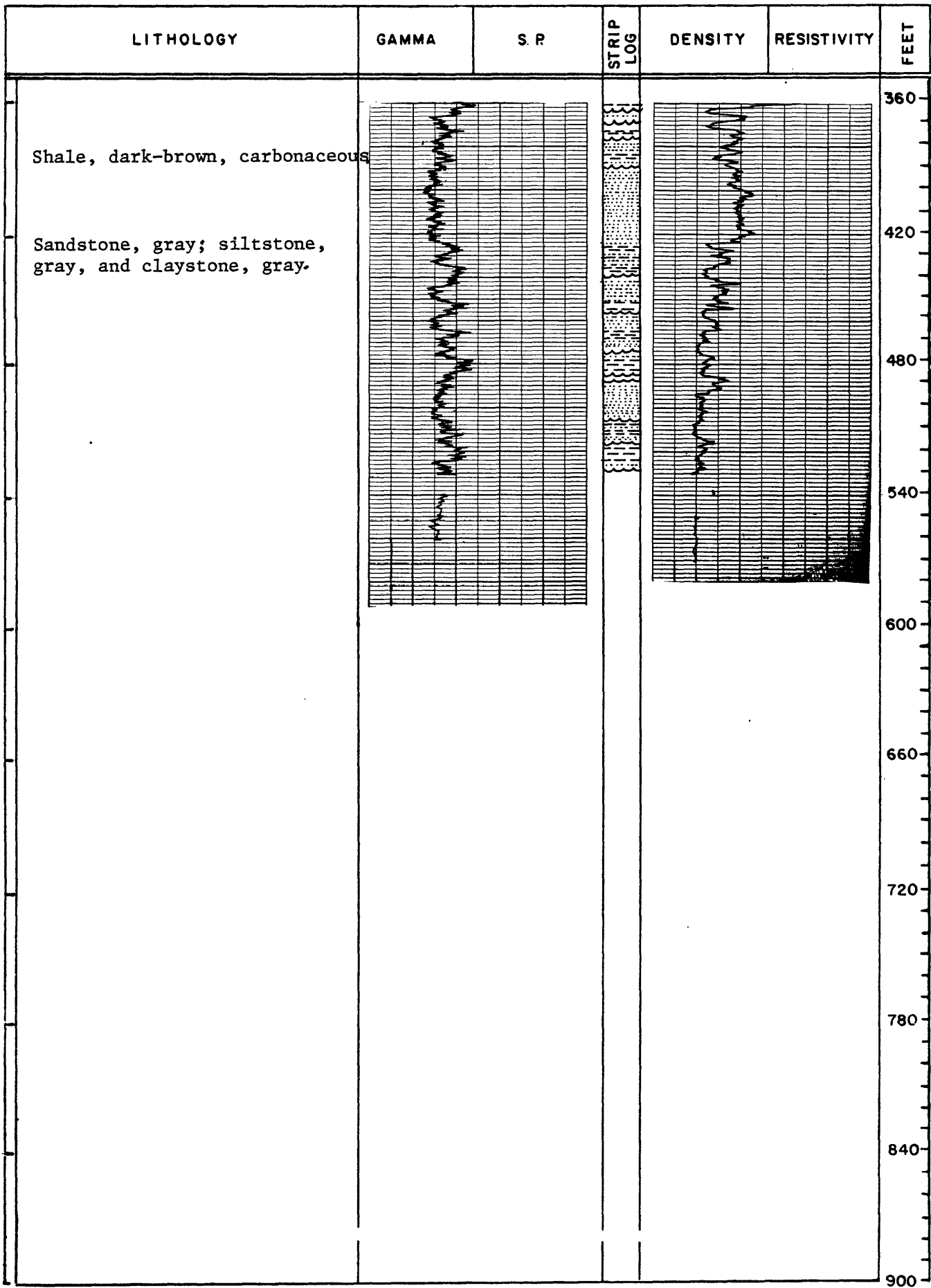
Hole No: US-80004 Map: Circle 3 NW Date: 1/20/80 State: Montana County: Prairie
 Elev.: 3280 FT. Location: T 16 ^N_S R 50 ^E_W, Sec 8 Tract AAAA Drilled depth 440 FT.
 Measured: 80 FT. ^{FNL}~~FSL~~ 50 FT. ^{FEL}~~FWL~~ FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W JACKSON</u> GEOLOGIST ^{NOX} YES		RECORDED BY <u>W JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	RESISTIVITY SENS. SETTING <u>20</u>		DEPTH
	LOGGED DEPTHS 432 FT. FT.		LOGGED DEPTHS 432 FT. FT.
STRIP LOG		FEET	
		60	
		0	
		60	
		120	
		180	
		240	
		300	
		360	



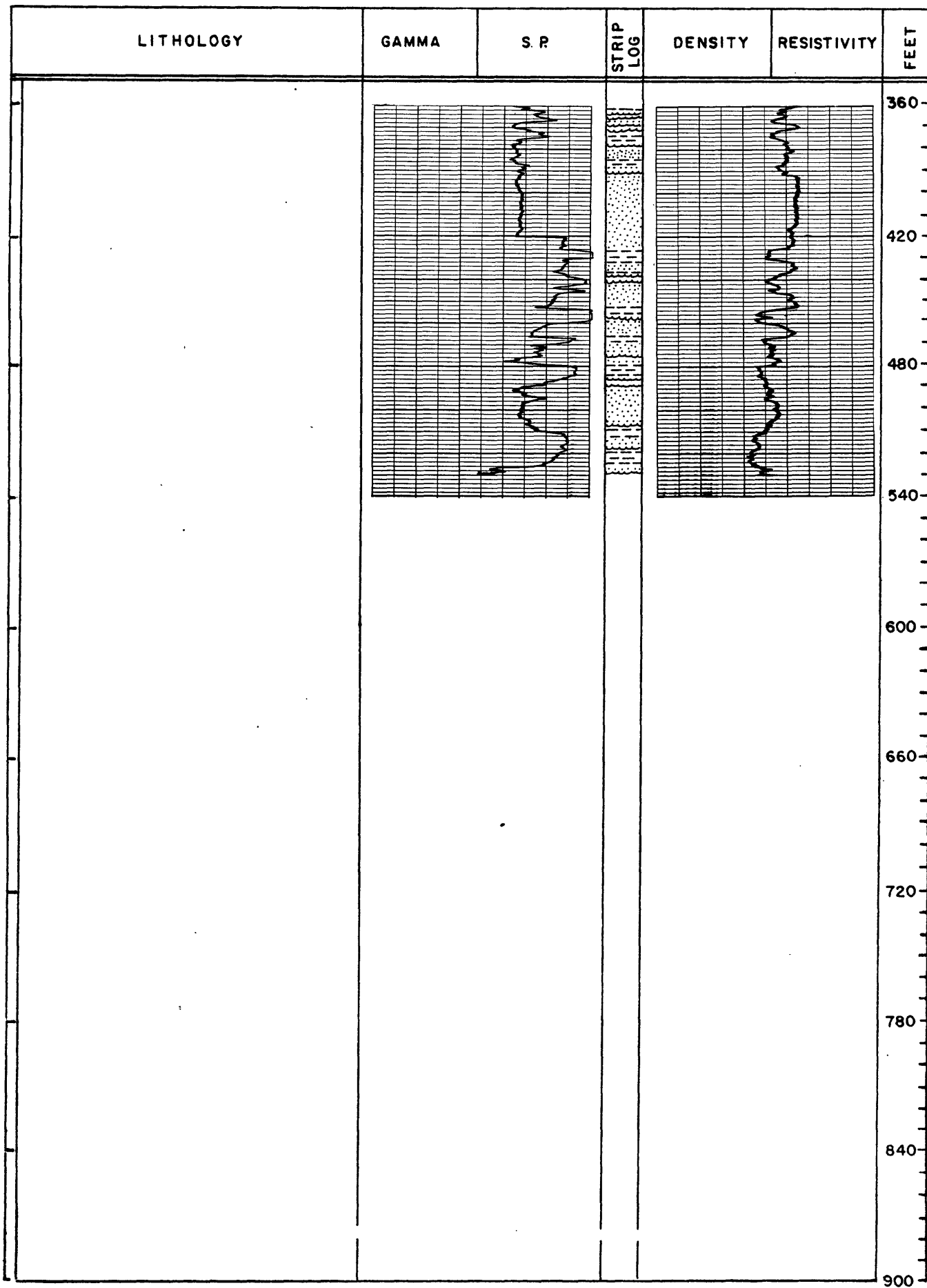
Hole No: US-80005 Map: Circle 3 SE Date: 1/20/80 State: Montana County: Prairie
 Elev.: 2951 FT. Location: T 15 ^N R 50 ^E W, Sec 2 Tract BBBB Drilled depth 540 FT.
 Measured: 20 FT. ^{FNL} ~~R&R~~ 155 FT. ^{FEET} ~~FEET~~ FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NR} YES		RECORDED BY <u>WILLIAM JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u>2</u> RANGE <u>500</u>	
	LOGGED DEPTHS 530 FT. FT.		RESISTIVITY SENS. SETTING <u>20</u>	
	LOGGED DEPTHS 530 FT. FT.		DEPTH FEET	
Clay, brown, alluvial.				60
Sandstone, brown; siltstone, brown, and claystone, brown.				0
Sandstone, gray; siltstone, gray, and claystone, gray.				60
Shale, black, carbonaceous.				120
Sandstone, gray; siltstone, gray, and claystone, gray.				180
Coal, and shale, black, carbonaceous.				240
Sandstone, gray; siltstone, gray, and claystone, gray.				300
Coal.				360
Sandstone, gray; siltstone, gray, and claystone, gray.				
Shale, black, carbonaceous.				
Sandstone, gray; siltstone, gray, and claystone, gray.				

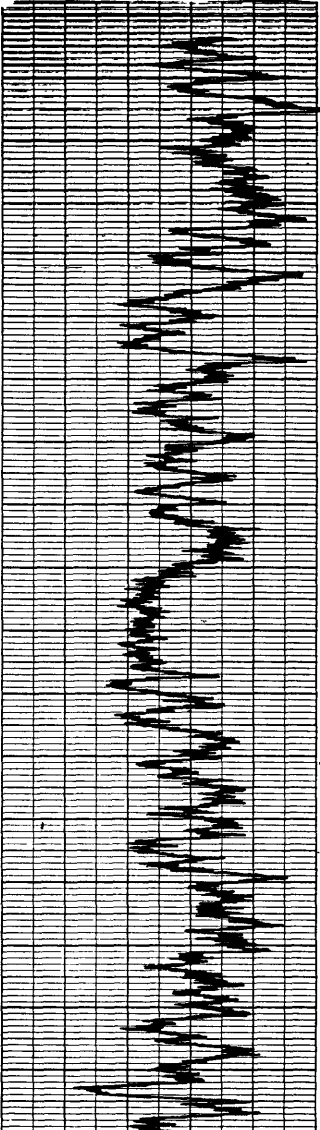
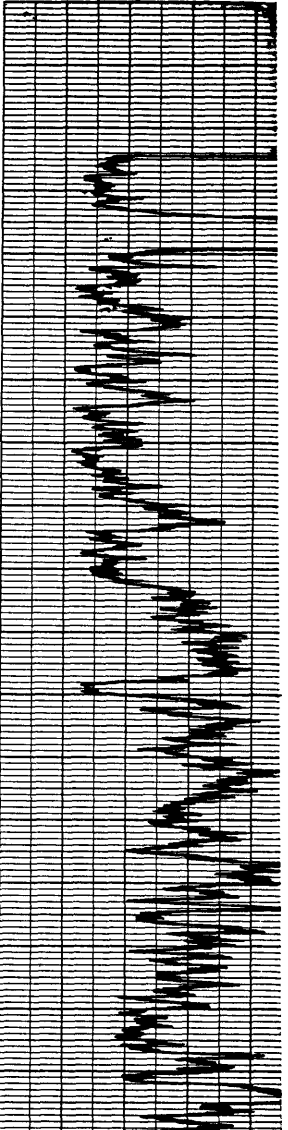
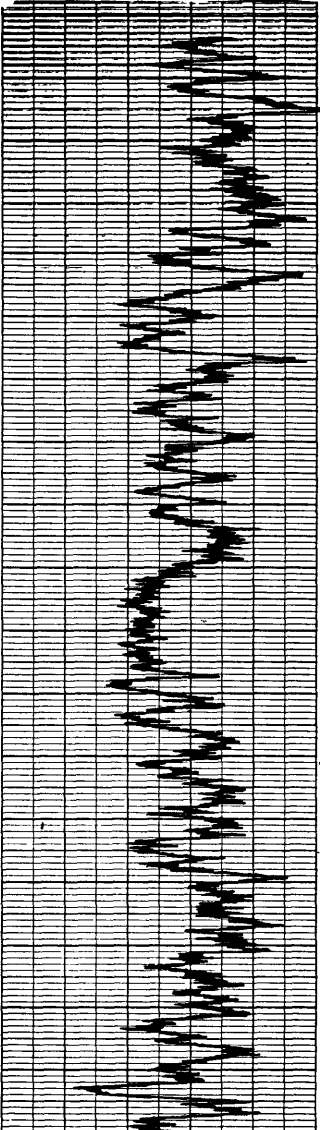
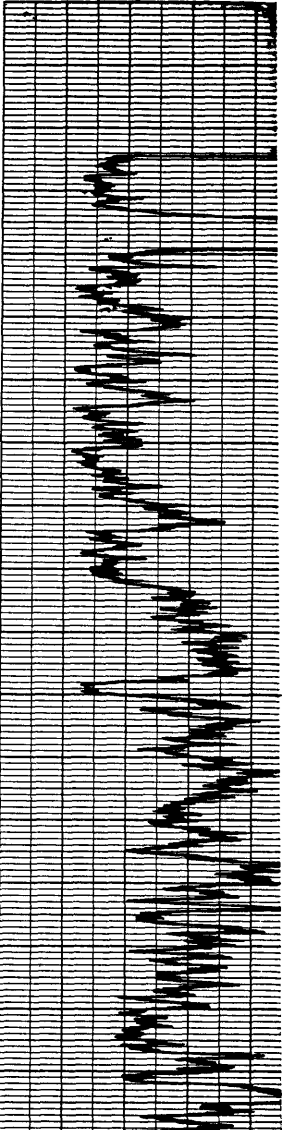
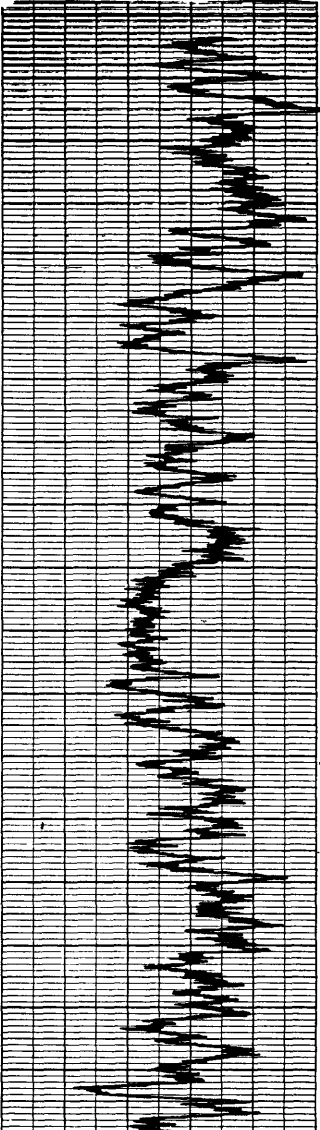
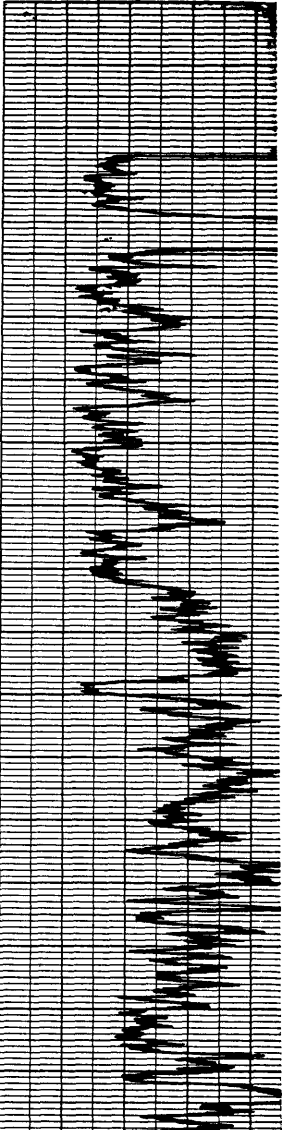
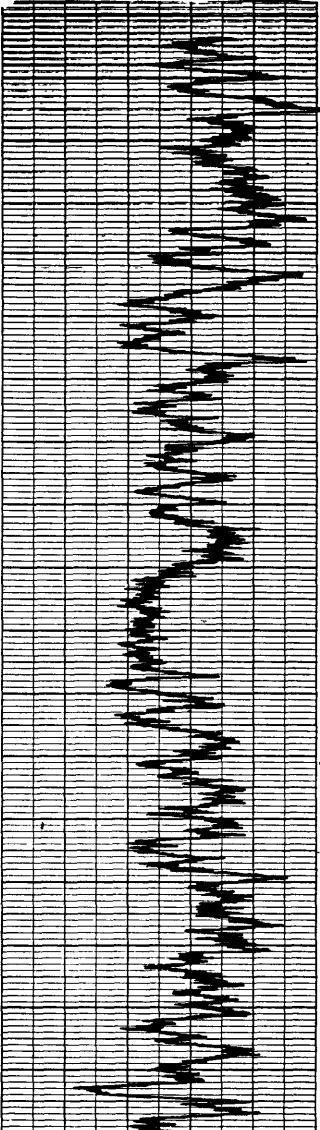
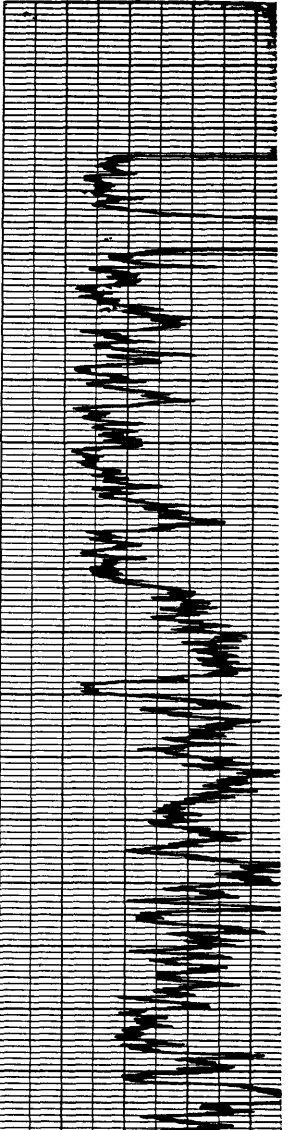
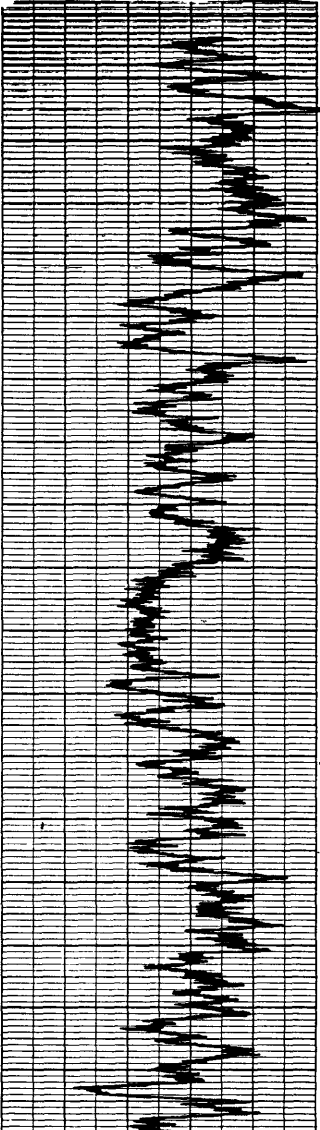
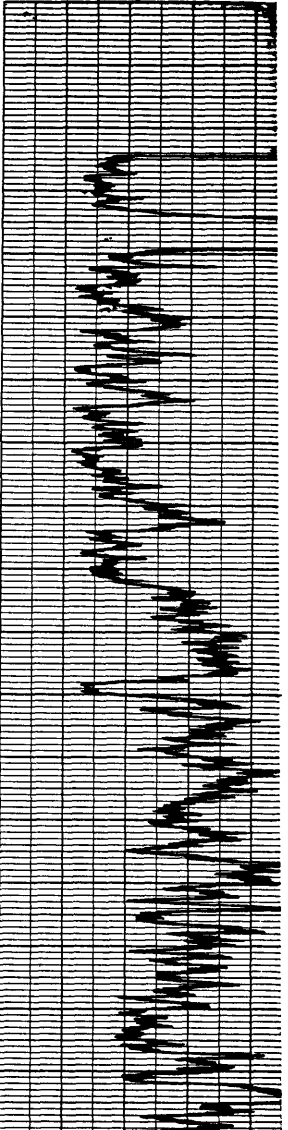


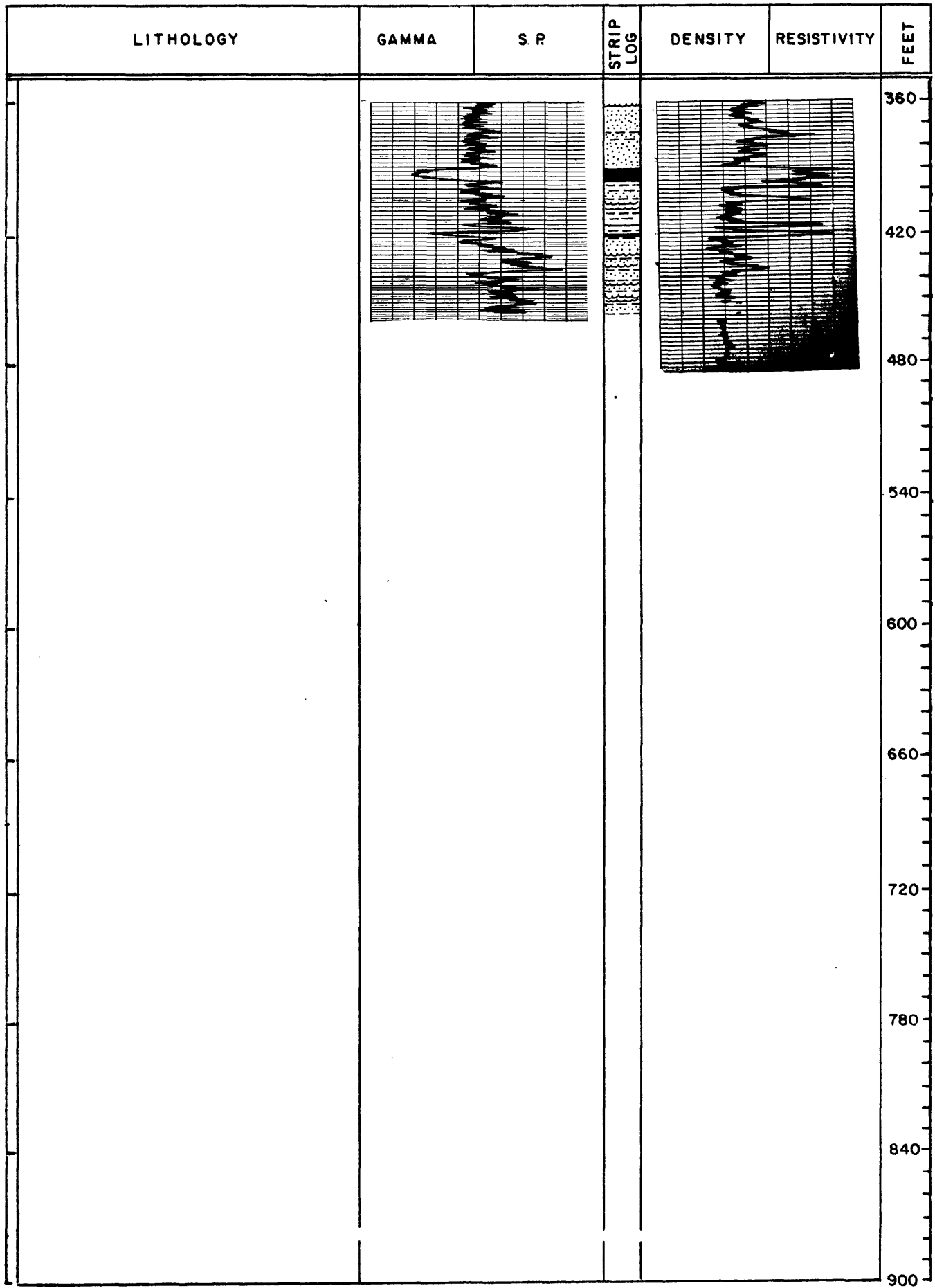
Hole No: US-80005 Map: Circle 3 SE Date: 1/20/80 State: Montana County: Prairie
 Elev.: 2951 FT. Location: T 15^N R 50^E W, Sec 2 Tract BBBB Drilled depth 540 FT.
 Measured: 20 FT. FNL 155 FT. FWL FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>WILLIAM JACKSON</u> <input checked="" type="checkbox"/> YES		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>500</u>	RESISTIVITY SENS. SETTING <u>20</u>
	LOGGED DEPTHS FT. <u>530</u> FT.			LOGGED DEPTHS FT. <u>530</u> FT.	
	LOGGED DEPTHS FT. <u>530</u> FT.			LOGGED DEPTHS FT. <u>530</u> FT.	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"></div> <div style="width: 30%; text-align: center;"> </div> <div style="width: 30%;"></div> </div>					
					DEPTH FEET 60 0 60 120 180 240 300 360

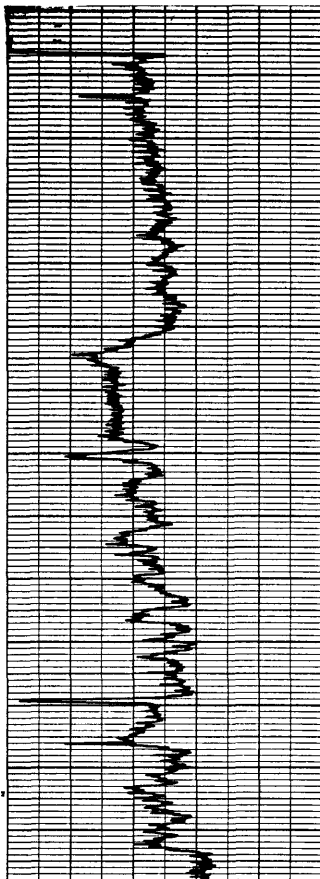


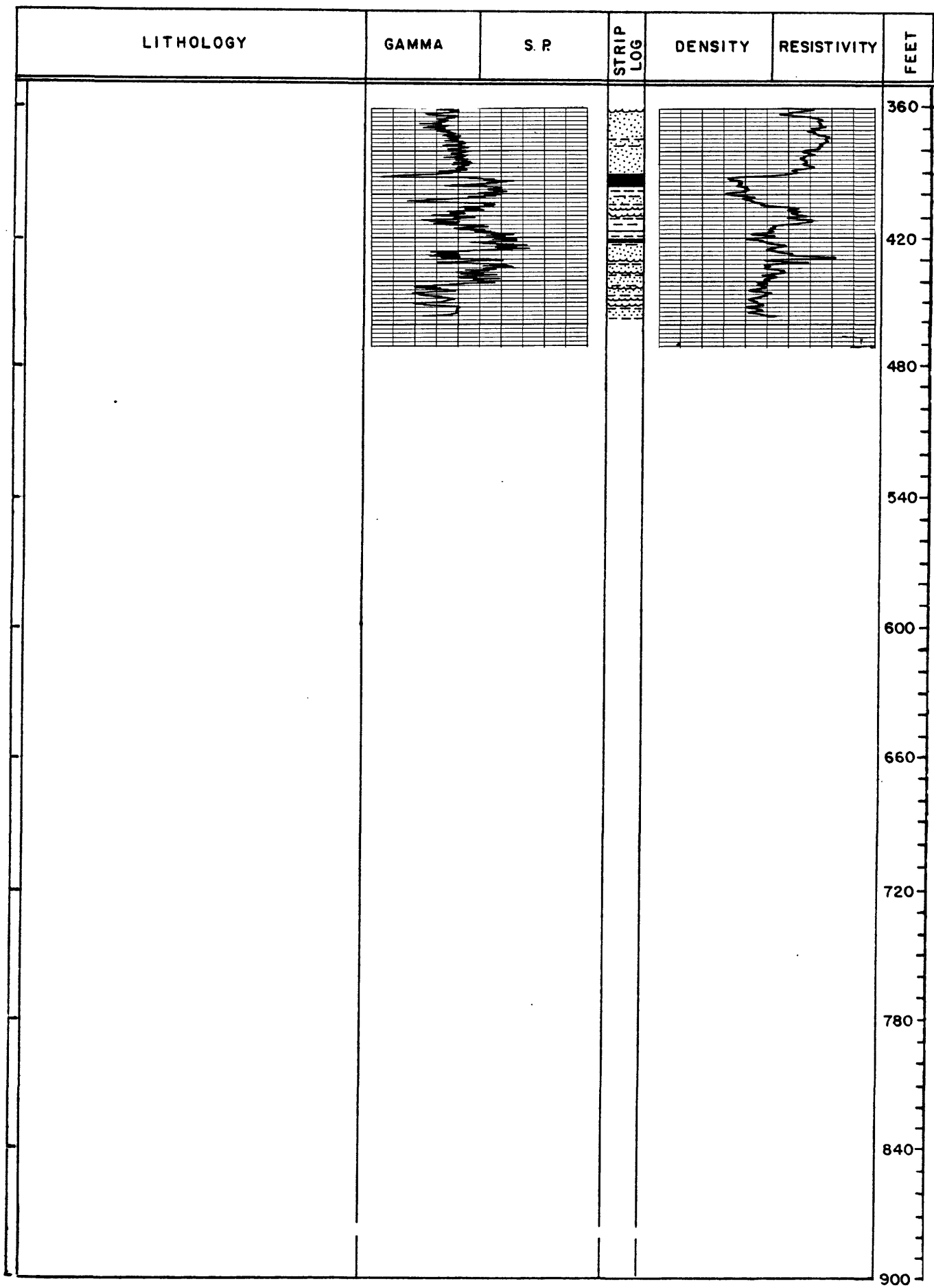
Hole No: US-80006 Map: Circle 3 SW Date: 1/22/80 State: Montana County: Prairie
 Elev.: 3150 FT. Location: T 16^N R 49^E Sec 24 Tract DDDD Drilled depth 460 FT.
 Measured: 110 FT. ~~PSL~~ 145 FT. ~~FEL~~ FWL FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

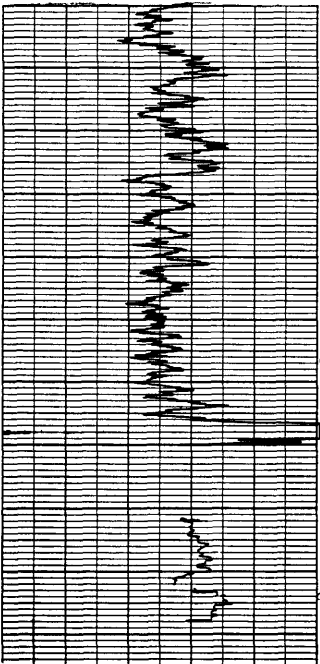

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>WILLIAM JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>20</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>	
	LOGGED DEPTHS <u>456</u> FT. FT.		RESISTIVITY SENS. SETTING <u>20</u>	
	LOGGED DEPTHS <u>450</u> FT. FT.		DEPTH FEET	
Silt, brown; sand, brown, alluvial.				0
Sandstone, gray; siltstone, gray, and claystone, gray.				60
Shale, black, carbonaceous.				60
Sandstone, gray; siltstone, gray, and claystone, gray.				120
Shale, black, carbonaceous.				120
Sandstone, gray; siltstone, gray, and claystone, gray.				180
Limestone, gray.				240
Sandstone, gray; siltstone, gray, and claystone, gray.				300
Coal; shale, carbonaceous.				360



Hole No: US-80006 Map: Circle 3 SW Date: 1/22/80 State: Montana County: Prairie
 Elev.: 3150 FT. Location: T 16 ^N R 49 ^E, Sec 24 Tract DDDD Drilled depth 460 FT.
 Measured: 110 FT. ^{FSL} 145 FT. ^{FEL} FWX FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

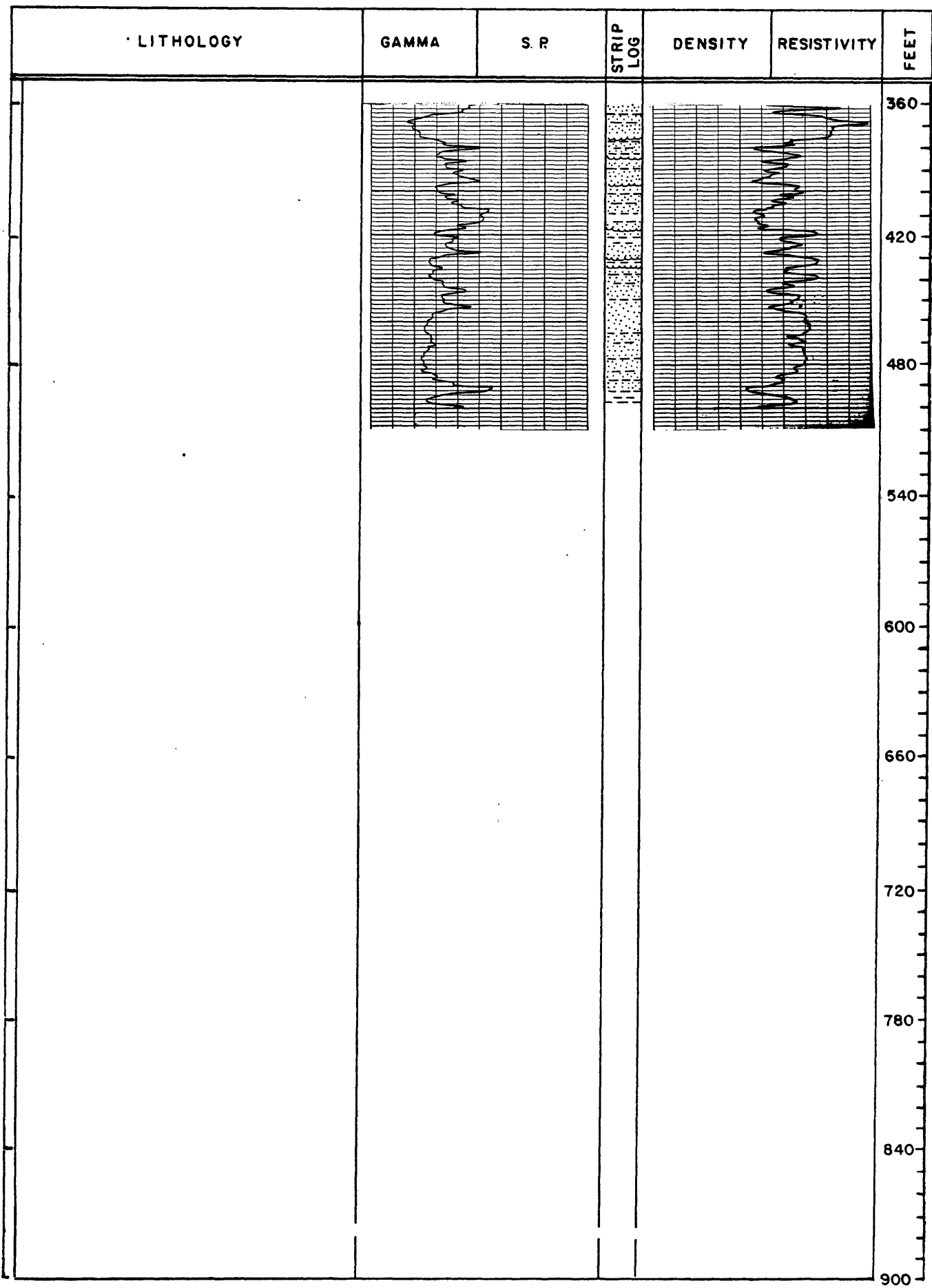
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST <input checked="" type="checkbox"/>		RECORDED BY <u>WILLIAM JACKSON</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>20</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	RESISTIVITY SENS. SETTING <u>20</u>		DEPTH
	LOGGED DEPTHS FT. <u>456</u> FT.		LOGGED DEPTHS FT. <u>456</u> FT.
STRIP LOG		FEET	
		60	
		0	
		60	
		120	
		180	
		240	
		300	
		360	



LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Sandstone, gray; siltstone, gray, and claystone, gray						360 420 480 540 600 660 720 780 840 900

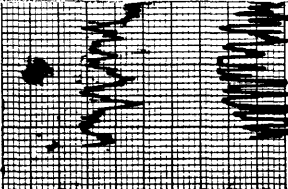
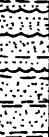
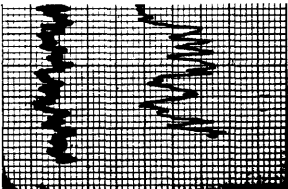
Hole No. US-80007 Map: Mtn Sheep Butte Date: 1/23/80 State: Montana County: Prairie
 Elev.: 3490 FT. Location: T 16 ^N R 49 ^E W, Sec 20 Tract DDDC Drilled depth 500 FT.
 Measured: 45 FT. ^{BNK} 685 FT. ^{FEL} XXXX FT. Hole size: 5 1/4 IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Glacial till first 70 feet.

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST XXX YES		RECORDED BY <u>WILLIAM JACKSON</u>		RECORDING SPEED <u>20</u>	FT. MIN.
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>20</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>20</u>
	LOGGED DEPTHS _____ FT. 500 FT.			LOGGED DEPTHS _____ FT. 500 FT.	
				DEPTH	
				FEET	
				60	
				0	
				60	
				120	
				180	
				240	
				300	
				360	

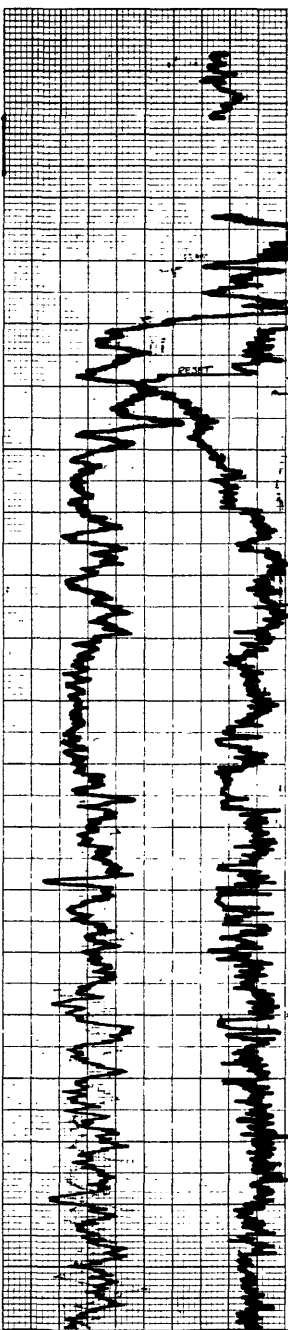

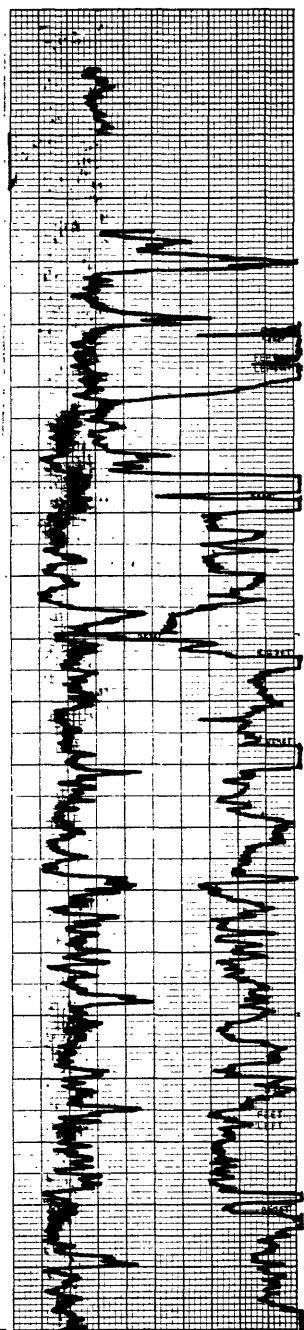


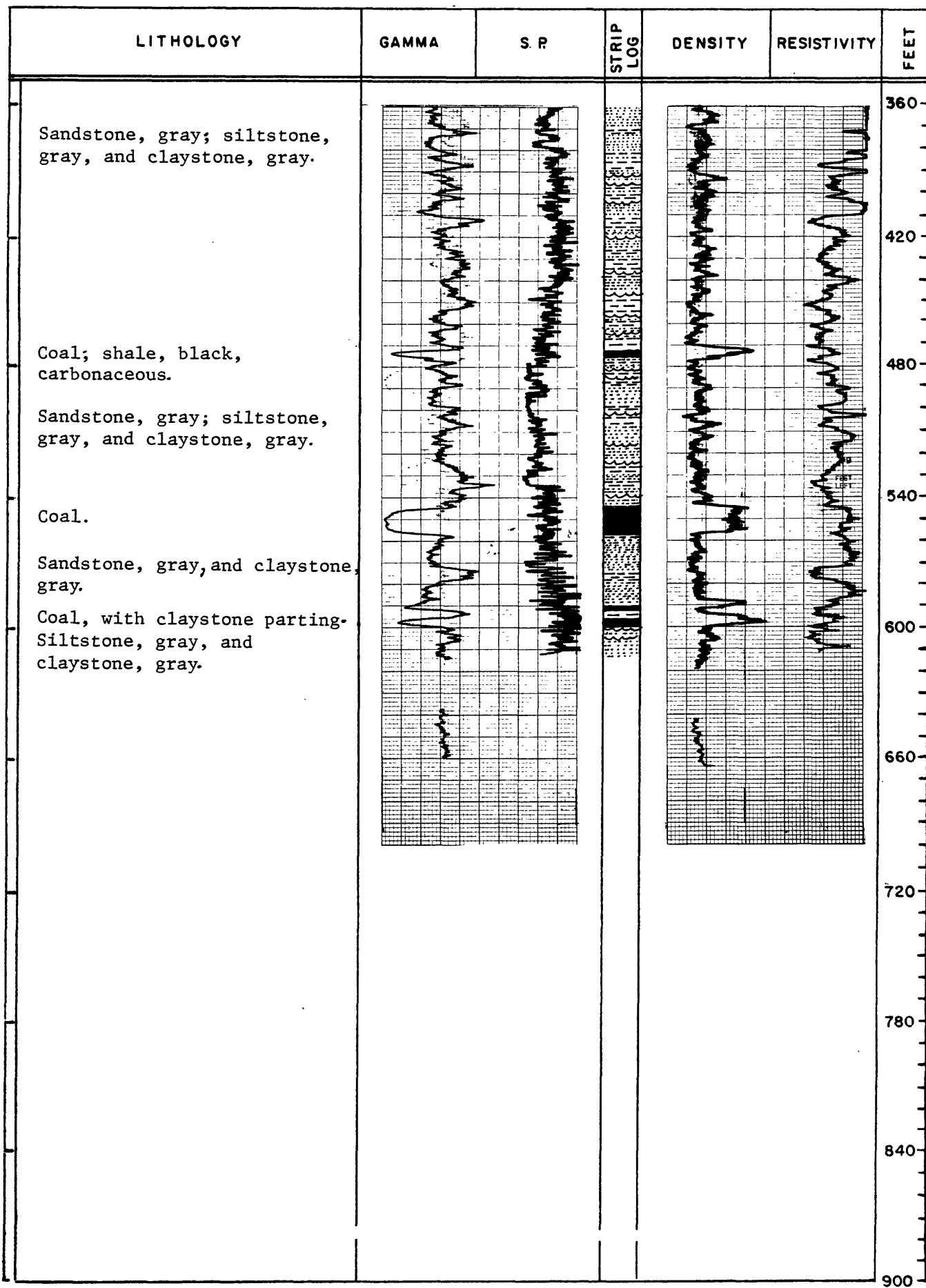
Hole No: US-80008 Map: Mtn Sheep Butte Date: 2/7/80 State: Montana County: Prairie
 Elev.: 3050 FT. Location: T 16 ^N R 48 ^E W, Sec 14 Tract BAAA Drilled depth 420 FT
 Measured: 200 FT. ^{FNL} ~~EST~~ 1280 FT. ^{FEL} ~~FNL~~ FT. Hole size: 5 5/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: New probe.

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>406</u> FT. <u>403</u> FT.			LOGGED DEPTHS <u>410</u> FT. <u>403</u> FT.	
	DEPTH FEET				
Gravel.			60		
Sandstone, gray; siltstone, gray, and claystone, gray.			0		
			60		
			120		
Coal; shale, black, carbonaceous. Coal.			180		
Sandstone, gray; siltstone, gray, and claystone, gray. Coal.			240		
Sandstone, gray; siltstone, gray, and claystone, gray.		300			
Coal; shale, black, carbonaceous.		360			
Sandstone, gray; siltstone, gray, and claystone, gray.					

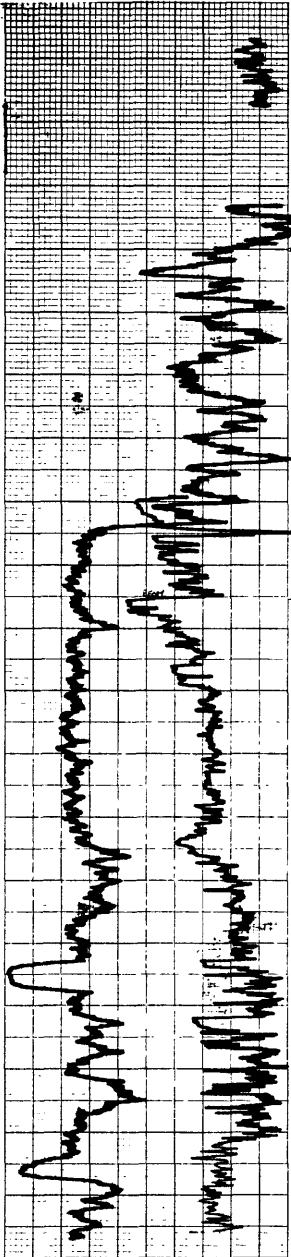
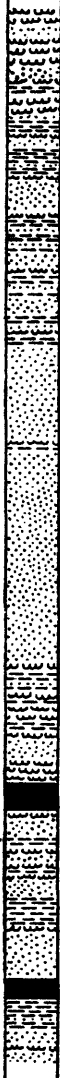
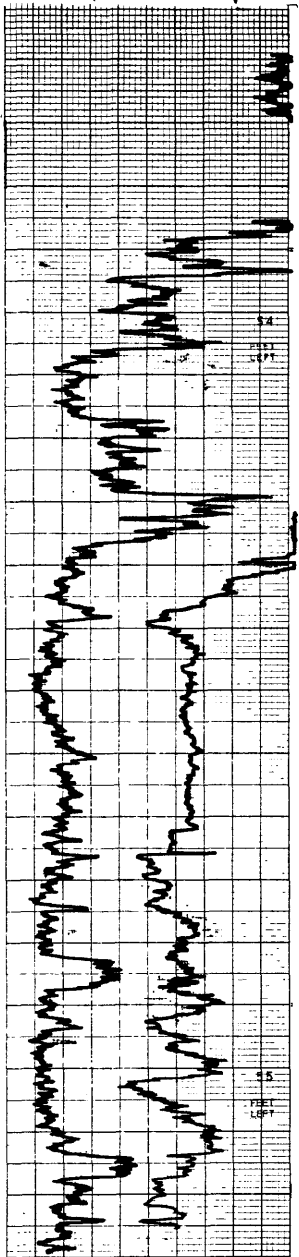
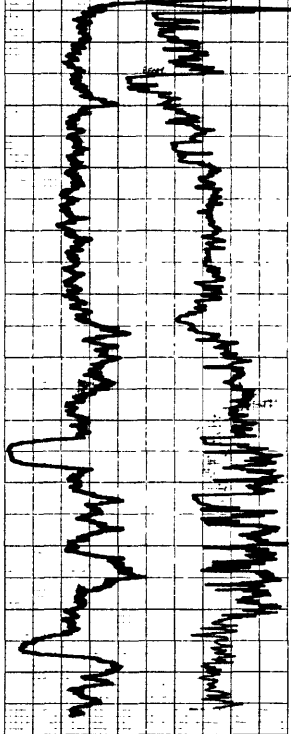
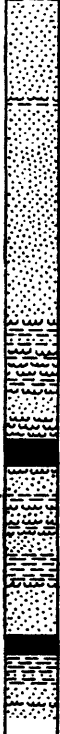
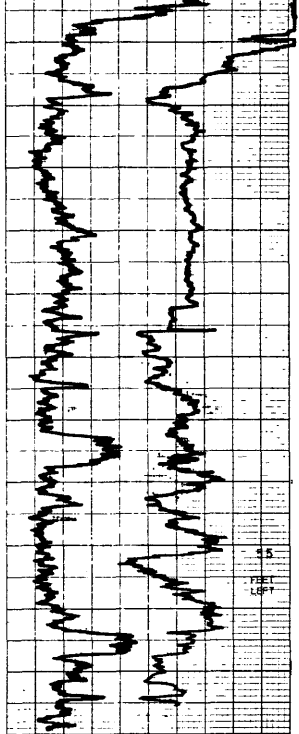
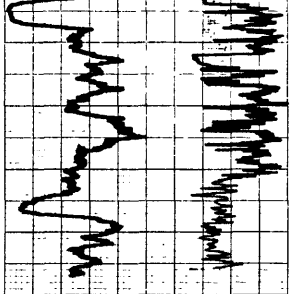

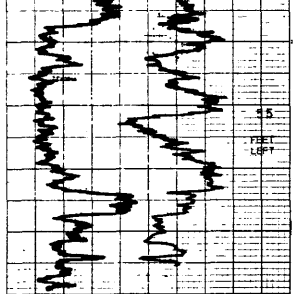
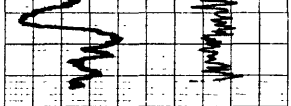

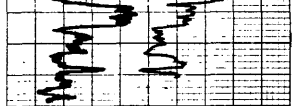
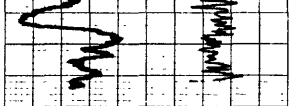

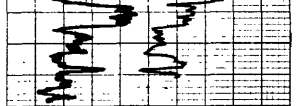
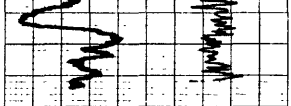

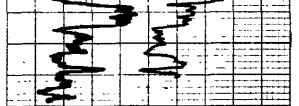
LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

Hole No: US-80009 Map: Mtn Sheep Butte Date: 2/8/80 State: Montana County: Prairie
 Elev.: 3140 FT. Location: T 15 ^N R 48 ^E W, Sec 12 Tract CBBC Drilled depth 620 FT.
 Measured: 1300 FT. ~~PSL~~ 150 FT. ~~FWL~~ 88 FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NQ} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS <u>614</u> FT. <u>612</u> FT.			LOGGED DEPTHS <u>619</u> FT. <u>612</u> FT.		
	<p>Sand, brown; clay, brown, alluvial; sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal; shale, black, carbonaceous.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal; shale, black, carbonaceous.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Limestone, gray.</p>					



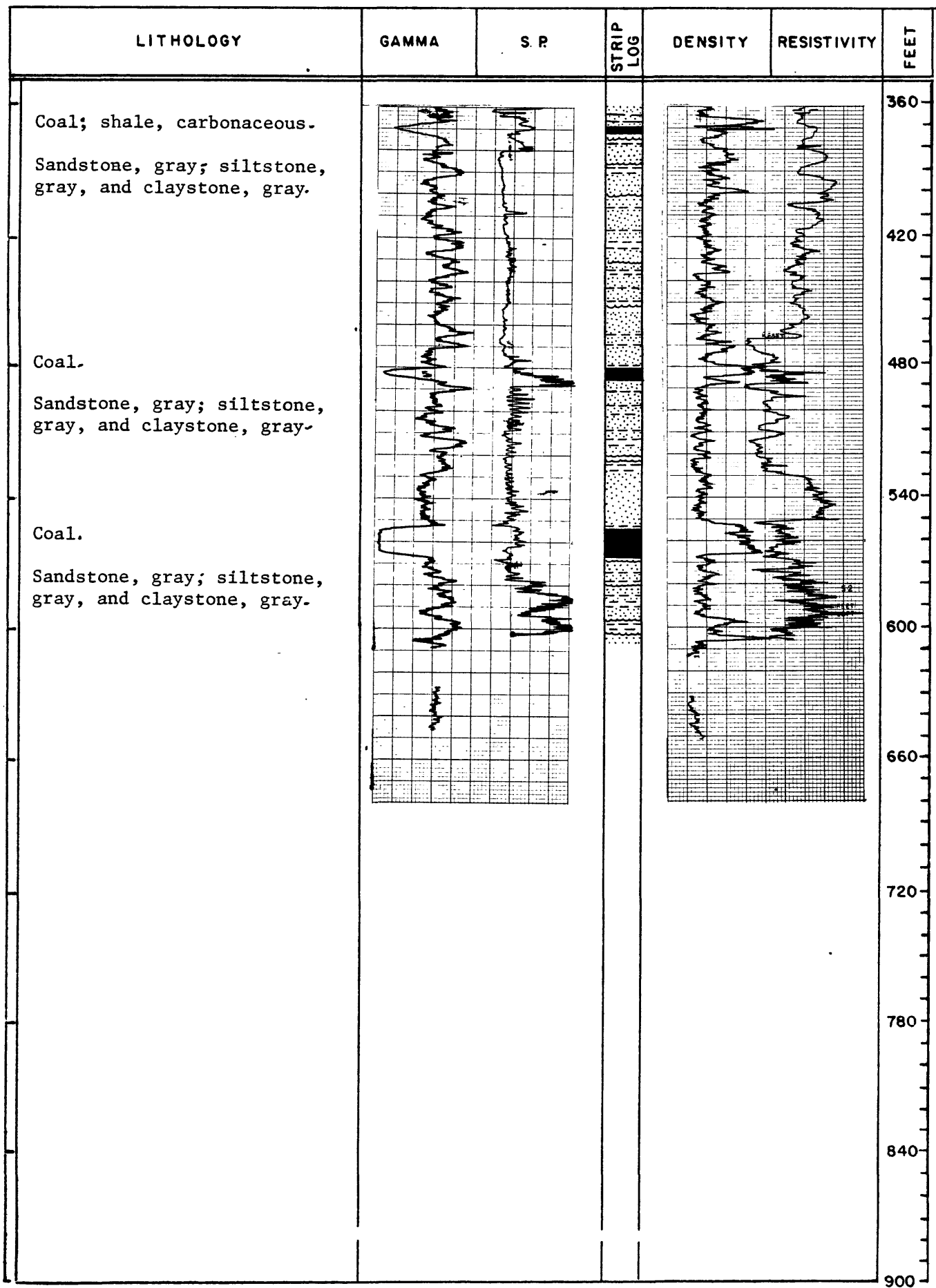
Hole No: US-80010 Map: Mtn. Sheep Butte Date: 2/8/80 State: Montana County: Prairie
 Elev.: 2898 FT. Location: T 15^N R 48^E, Sec 25 Tract CDDD Drilled depth 340 FT.
 Measured: 150 FT. FSL 1600 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NR} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>324</u> FT. <u>321</u> FT.			LOGGED DEPTHS <u>338</u> FT. <u>321</u> FT.	
	DEPTH FEET				
Silt, brown, alluvial.					
Shale, carbonaceous; sandstone, gray; siltstone, gray, and claystone, gray.					
Coal.					
Sandstone, gray; siltstone, gray, and claystone, gray.					
Coal.					
Sandstone, gray, and claystone, gray.					

Hole No: US-80011 Map: Mtn. Sheep Butte Date: 2/10/80 State: Montana County: Prairie
 Elev.: 3180 FT. Location: T 15^N R 48^E, Sec 20 Tract DDDD Drilled depth 615 FT.
 Measured: 300 FT. ~~FSL~~ 280 FT. ~~FEL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Top 72 feet of gamma at TC 2 and range 500, top 76 feet of density at TC 2 and range 100.

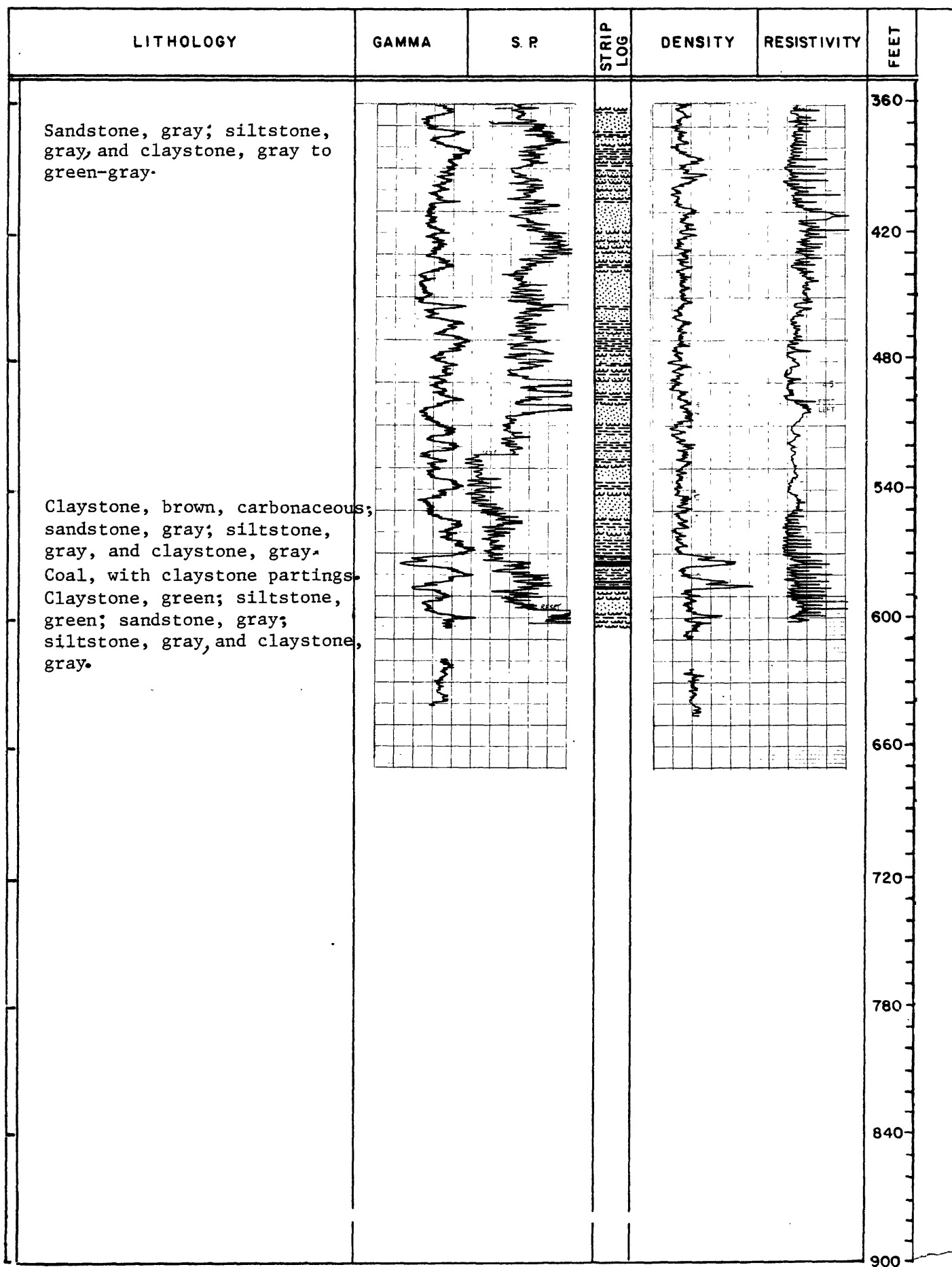
RECORDED BY WILLIAM JACKSON GEOLOGIST ~~NO~~ YES RECORDED BY JON HANGAS RECORDING SPEED 20 FT. MIN.

LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH FEET					
	T.C. 2	SENS. SETTING		T.C. 2	SENS. SETTING						
	RANGE 200	1000		RANGE 100	100						
	LOGGED DEPTHS			LOGGED DEPTHS							
	609 FT.	602 FT.		613 FT.	606 FT.						
Sand, tan; silt, tan; clay, tan, alluvial.						60					
Sandstone, brown; siltstone, brown, and claystone, brown.						0					
						60					
						120					
Sandstone, gray; siltstone, gray, and claystone, gray.						180					
Claystone, brown, carbonaceous.						240					
						300					
						360					
Sandstone, gray; siltstone, gray, and claystone, gray.						60					
Coal, with partings of sandstone, and claystone.						0					
						60					
						120					
Sandstone, gray; siltstone, gray, and claystone, gray.						180					
Coal, with partings of sandstone, and claystone.						240					
						300					
						360					



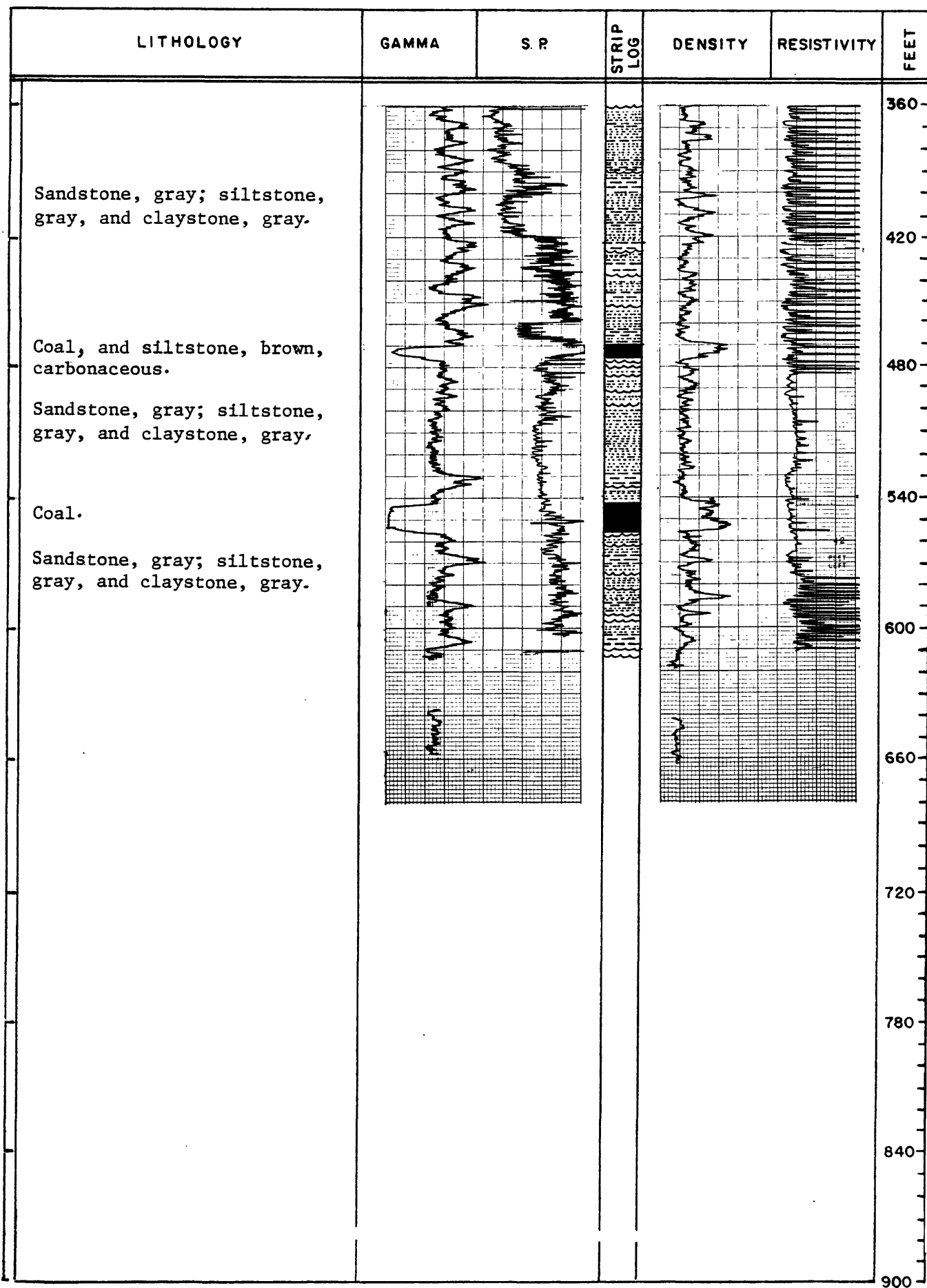
Hole No: US-80012 Map: Mtn Sheep Butte Date: 2/11/80 State: Montana County: Prairie
 Elev.: 3478 FT. Location: T 15 ^N R 47 ^E, Sec 14 Tract DACB Drilled depth 620 FT.
 Measured: 3160 FT. ^{FNL} ~~EST~~ 1590 FT. ^{FEL} ~~RWX~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>JON HANGAS</u> GEOLOGIST NO YES		RECORDED BY _____		RECORDING SPEED <u>20</u> FT. MIN.			
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>250</u>		
	LOGGED DEPTHS 605 FT. 602 FT.			LOGGED DEPTHS 609 FT. 602 FT.			
	DEPTH FEET			DEPTH FEET			
Sand, tan, very fine, Siltstone, tan; sandstone, tan, very fine. Sandstone, gray; siltstone, gray, and claystone, gray. Claystone, brown, carbonaceous; shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray. Claystone, brown, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray. Claystone, brown, carbonaceous, and claystone, green. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.							
						60	0
						60	60
						120	120
						180	180
						240	240
						300	300
						360	360



Hole No: US-80013 Map: Mtn. Sheep Butte Date: 2/12/80 State: Montana County: Prairie
 Elev.: 3120 FT. Location: T 16^N R 48^E W, Sec 32 Tract CCCC Drilled depth 620 FT.
 Measured: 100 FT. ~~PSL~~ 300 FT. ~~FWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

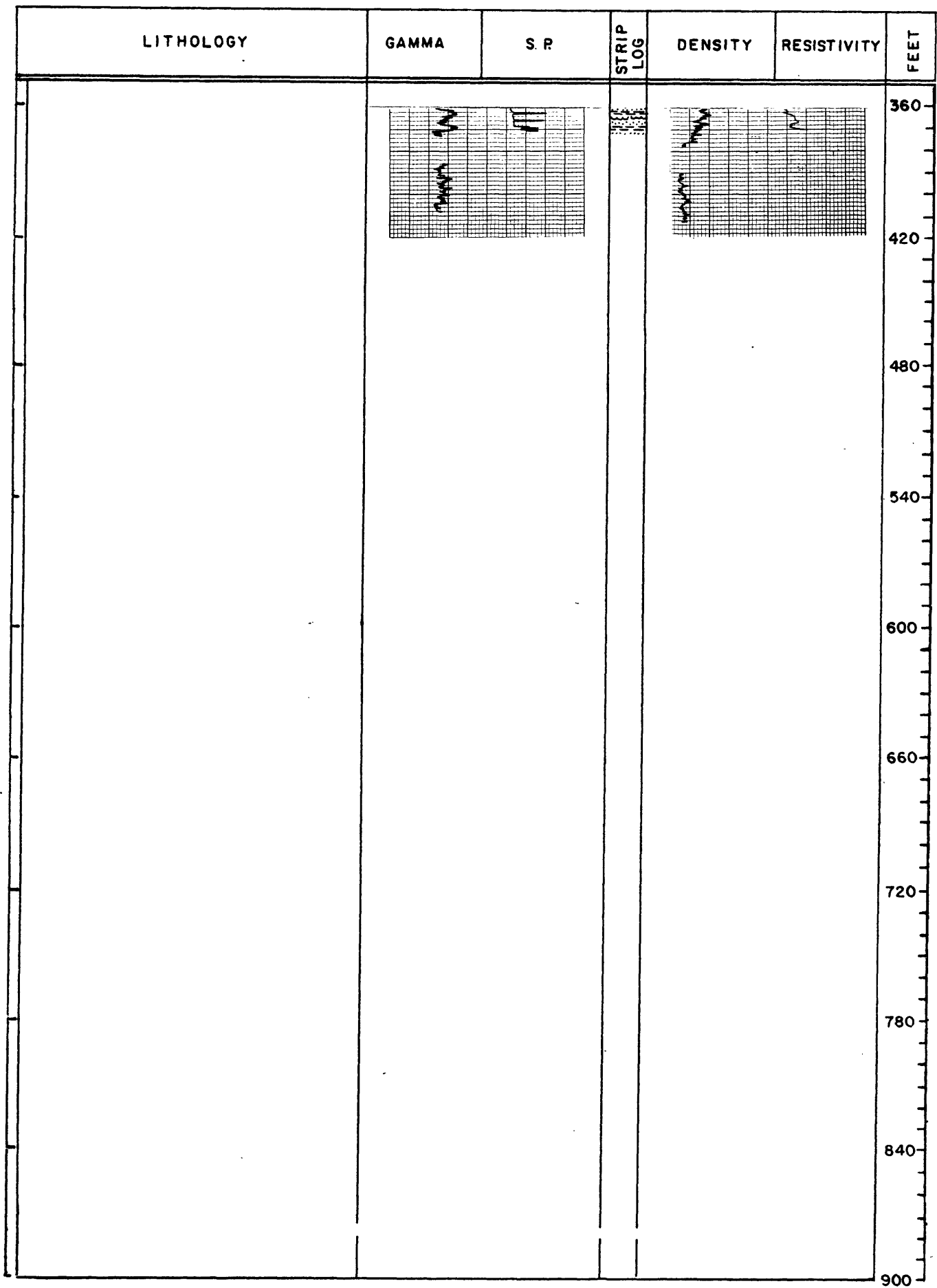
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>250</u>
	LOGGED DEPTHS <u>614</u> FT. <u>611</u> FT.			LOGGED DEPTHS <u>618</u> FT. <u>611</u> FT.	
	DEPTH FEET				
Alluvium.					
Sandstone, gray; siltstone, gray, and claystone, gray.					
Shale, black, carbonaceous; sandstone, gray; siltstone, gray, and claystone, gray.					
Coal.					
Sandstone, gray; siltstone, gray, and claystone, gray.					
Coal.					
Sandstone, gray; siltstone, gray, and claystone, gray.					
Coal.					



RECORDED BY <u>JON HANGAS</u>		GEOLOGIST <u>NO</u>		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u>		FT. MIN.		
LITHOLOGY	GAMMA		S.P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH FEET
	T.C.	RANGE	SENS.	SETTING		T.C.	RANGE	SENS.	SETTING	
	2	200	1000			2	100	250		
LOGGED DEPTHS					LOGGED DEPTHS					
313 FT.					310 FT.					
Sand, brown, and silt, brown, colluvial.										60
Sandstone, gray; siltstone, gray, and claystone, gray.										0
Shale, black, carbonaceous.										60
Sandstone, gray; siltstone, gray, and claystone, gray.										120
Coal.										180
Sandstone, gray; siltstone, gray, and claystone, gray.										240
Coal.										300
Sandstone, gray; siltstone, gray, and claystone, gray.										360
Coal.										
Siltstone, gray, and claystone, gray.										

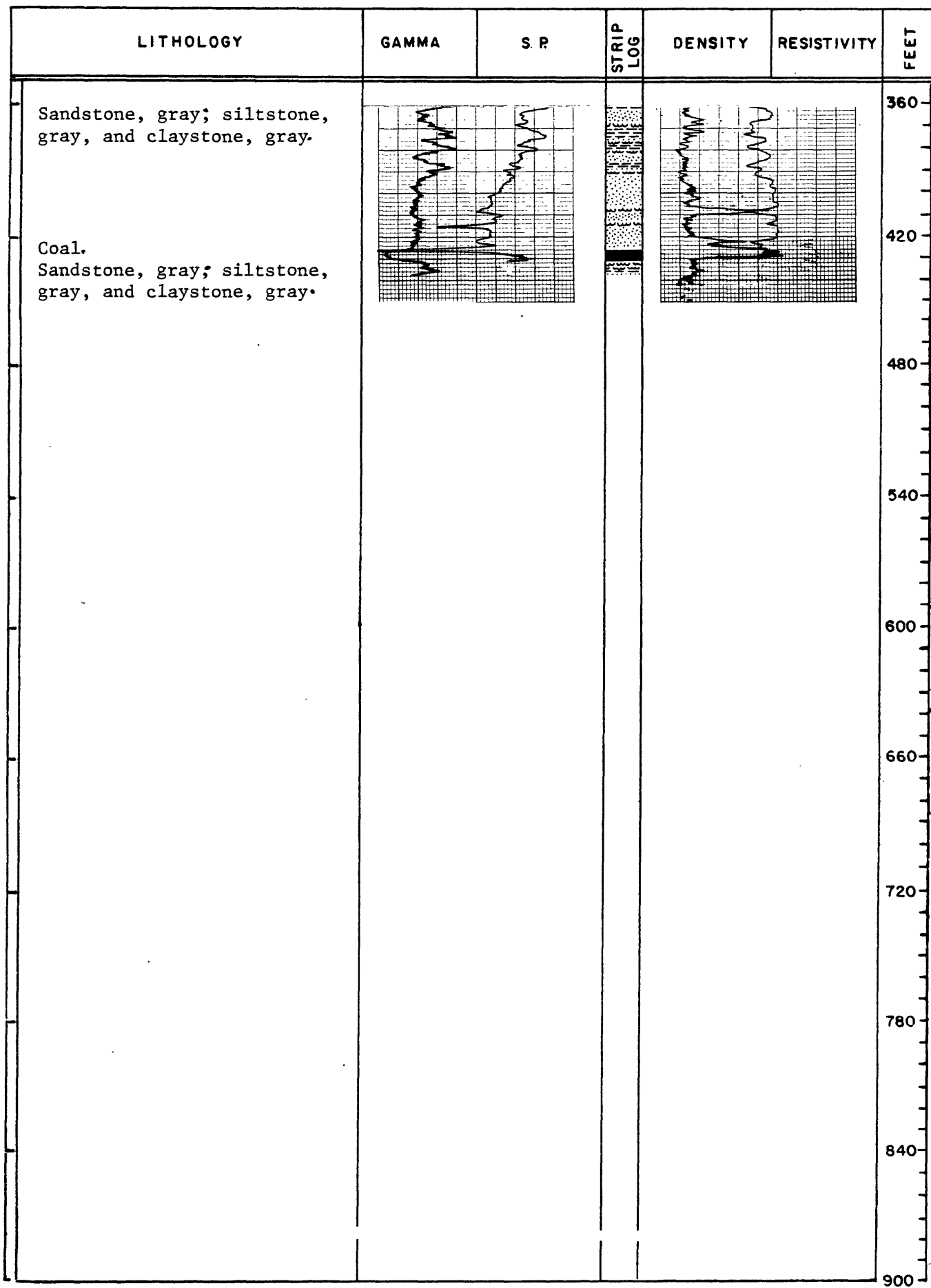
Hole No: US- 80016 Map: Mtn. Sheep Butte Date: 2/20/80 State: Montana County: McCone
 Elev.: 2721 FT. Location: T 17 ^N R 47 ^E W, Sec 10 Tract CCAD Drilled depth 380 FT.
 Measured: 640 FT. ~~FSL~~ 1600 FT. ~~FWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>JON HANGAS</u> GEOLOGIST NO YES		RECORDED BY <u>JON HANGAS</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>
	RESISTIVITY SENS. SETTING <u>100</u>		DEPTH
	LOGGED DEPTHS 373 FT. 371 FT.		LOGGED DEPTHS 378 FT. 370 FT.
	STRIP LOG		FEET
Sand, tan; silt, tan, and clay, tan.			60
Sandstone, gray; siltstone, gray, and claystone, gray.			0
Coal.			60
Sandstone, gray; siltstone, gray, and claystone, gray.			120
Coal.			180
Sandstone, gray; siltstone, gray, and claystone, gray.			240
Limestone, gray.			300
			360



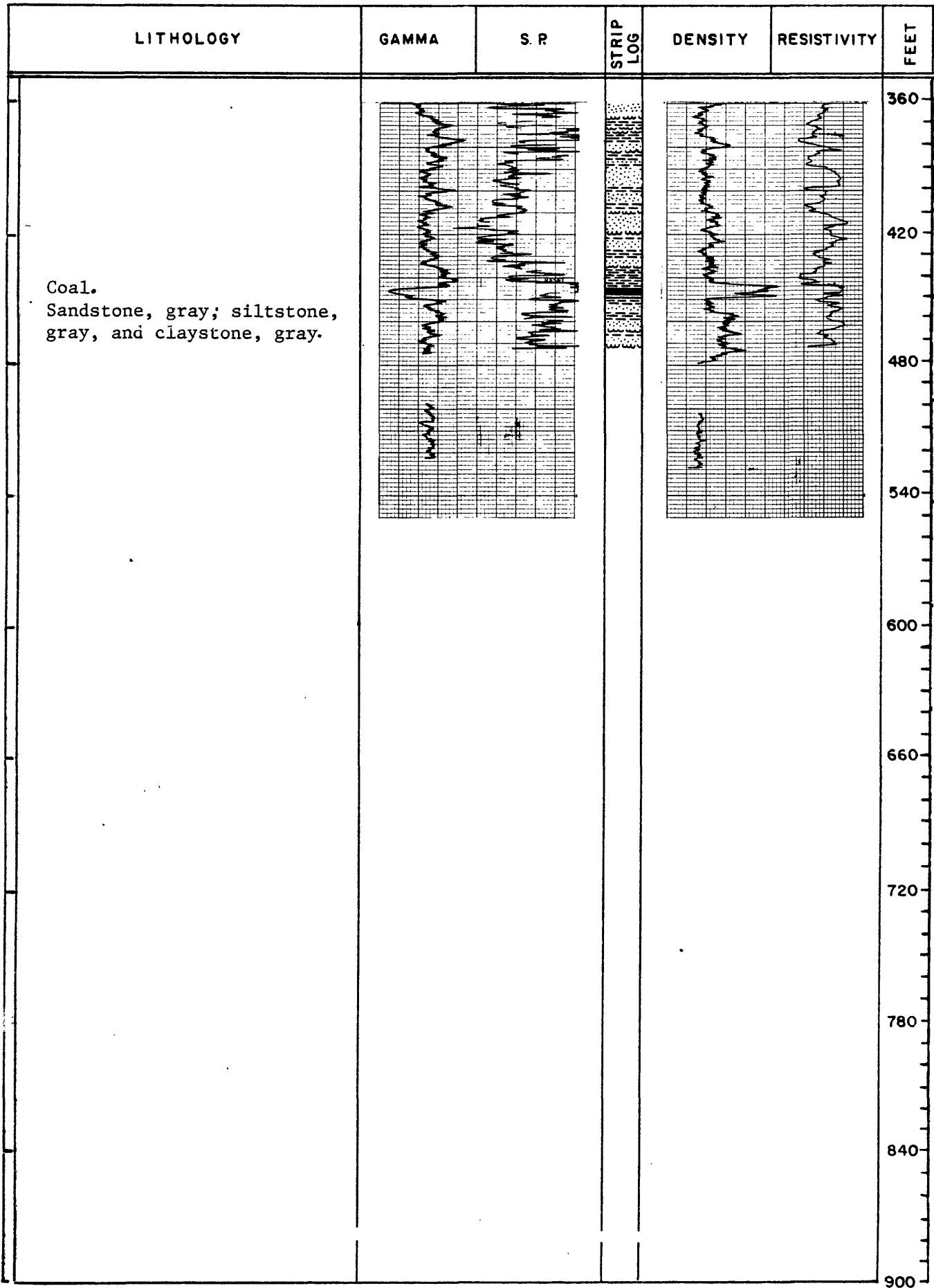
Hole No: US-80017 Map: Mtn Sheep Butte Date: 2/20/80 State: Montana County: Prairie
 Elev.: 3016 FT. Location: T 16 ^N R 48 ^E W, Sec 8 Tract ABCD Drilled depth 460 FT.
 Measured: 1100 FT. ^{FNL} ~~XXX~~ 2100 FT. ^{FEL} ~~XXX~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>30</u> FT. MIN.			
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>		
	LOGGED DEPTHS <u>438</u> FT. <u>431</u> FT.			LOGGED DEPTHS <u>442</u> FT. <u>431</u> FT.			
	FEET			FEET			
<p>Sand, tan, fine; silt, tan, and clay, tan.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Claystone, brown, carbonaceous. Sand, gray, and claystone, gray. Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal; shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray. Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p>							
						60	0
						60	60
						120	120
						180	180
						240	240
						300	300
						360	360



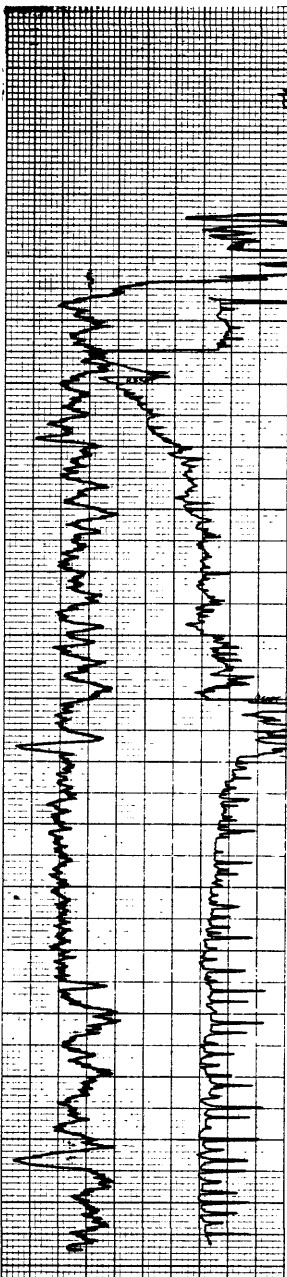

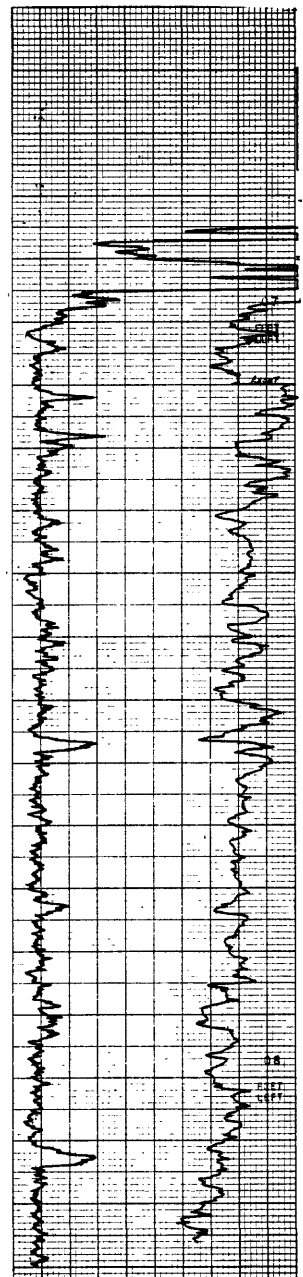
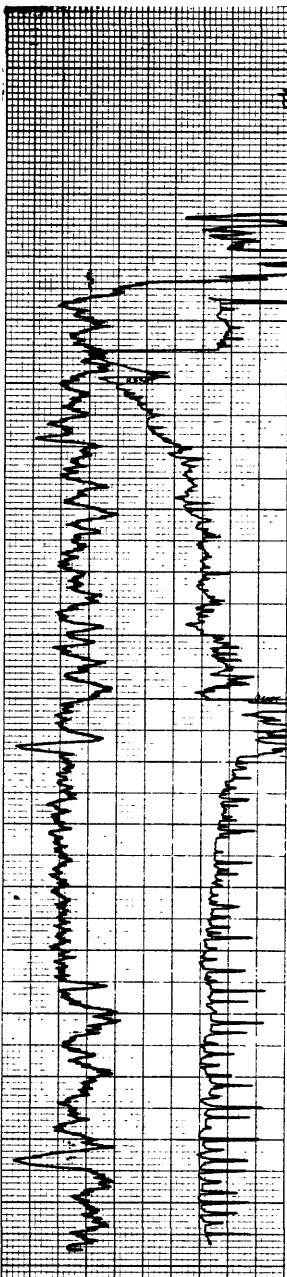

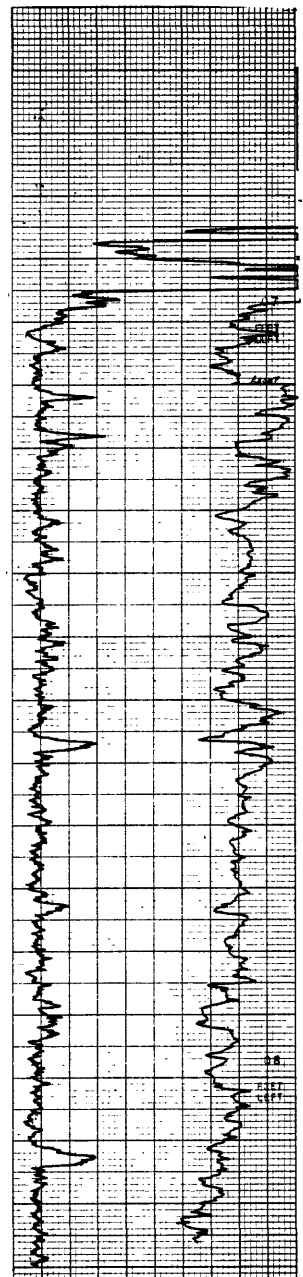
Hole No: US-80018 Map: Mtn Sheep Butte Date: 2/21/80 State: Montana County: Prairie
 Elev.: 3078 FT. Location: T 15 ^N R 49 ^E W, Sec 8 Tract DDAB Drilled depth 480 FT.
 Measured: 1210 FT. ^{FNL} 710 FT. ^{FEL} RWX FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>475</u> FT. <u>472</u> FT.			LOGGED DEPTHS <u>479</u> FT. <u>472</u> FT.	
	DEPTH FEET			S	
Sand, brown; silt, brown. Sandstone, brown, ferruginous. Siltstone, brown; claystone, brown. Sandstone, gray; siltstone, gray, and claystone gray. Coal. Coal; shale, black, carbonaceous. Sandstone, gray, and siltstone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			60		
			0		
			60		
			120		
			180		
240					
300					
360					



Hole No: US-80019 Map: Mtn. Sheep Butte Date: 2/21/80 State: Montana County: Prairie
 Elev.: 2891 FT. Location: T 15 ^N R 49 ^E, Sec 28 Tract DDDD Drilled depth 340 FT.
 Measured: 1430 FT. ^{KNK} FSL 880 FT. ^{FEL} FWT FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY WILLIAM JACKSON GEOLOGIST ^{NO} YES RECORDED BY JON HANGAS RECORDING SPEED 20 FT. MIN.

LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 335 FT. 333 FT.			LOGGED DEPTHS 340 FT. 333 FT.		FEET
Silt, brown; sand, brown, fine, and gravel, brown.						60
Shale, black, carbonaceous.						0
Sandstone, gray; siltstone, gray, and claystone, gray.						60
Coal.						120
Sandstone, gray; siltstone, gray, and claystone, gray.						180
Coal.						240
Sandstone, gray; siltstone, gray, and claystone, gray.						300
Coal.						360
Sandstone, gray; siltstone, gray, and claystone, gray.						
Coal.						

Hole No: US-80020 Map: Papps Reservoir Date: 2/21/80 State: Montana County: Prairie
 Elev.: 2681 FT. Location: T 14^N R 49^E W, Sec 14 Tract CCCC Drilled depth 240 FT.
 Measured: 150 FT. FSL 85 FT. FWL XXX FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>JON HANGAS</u> GEOLOGIST <u>XX</u> YES		RECORDED BY <u>JON HANGAS</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 195 FT. 193 FT.			LOGGED DEPTHS 200 FT. 192 FT.		FEET
Silt, tan, and sand, tan. Coal, and mudstone, dark-brown. Sandstone, gray; siltstone, gray, and claystone, gray. Coal, and siltstone, brown.						60 0 60 120 180 240 300 360
Sandstone, gray; siltstone, gray, and claystone, gray to brown.						
Limestone, greenish-gray; sandstone, gray; siltstone, gray, and claystone, gray.						

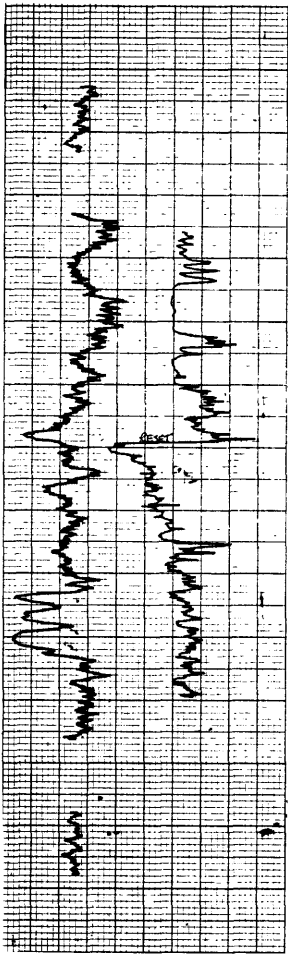
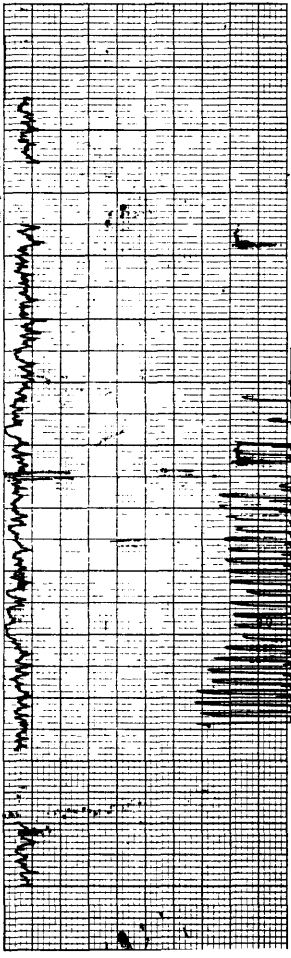
Hole No: US-80021 Map: McCloud Date: 2/23/80 State: Montana County: Prairie
Elev.: 2765 FT. Location: T 14^N R 49^E, Sec 8 Tract BBA Drilled depth _____ 320 FT.
Measured: 100 FT. ~~RKX~~ FNL 1200 FT. ~~RKX~~ FWL _____ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
Remarks:

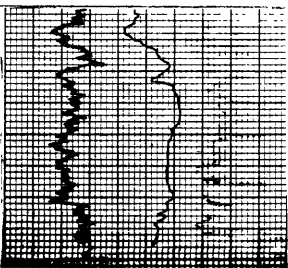

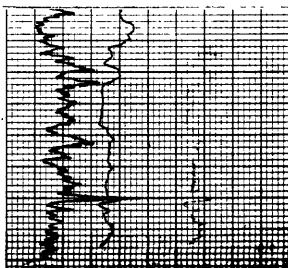
RECORDED BY		WILLIAM JACKSON		GEOLOGIST		NO		YES		RECORDED BY		JON HANGAS		RECORDING SPEED		20		FT.		MIN.	
LITHOLOGY						GAMMA		S.P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH						
						T.C.	RANGE	SENS. SETTING	T.C.		RANGE	SENS. SETTING									
						T.C. 2 RANGE 200		SENS. SETTING 500			T.C. 2 RANGE 100		SENS. SETTING 100								
						LOGGED DEPTHS					LOGGED DEPTHS										
						317 FT.		315 FT.			320 FT.		314 FT.								
Sand, brown, and gravel, brown, alluvial. Sandstone, brown; siltstone, brown, and claystone, brown. Coal. Shale, black, carbonaceous. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.														60							
														0							
													60								
													120								
													180								
													240								
													300								
													360								

Hole No: US-80022 Map: Papps Reservoir Date: 2/23/80 State: Montana County: Prairie
 Elev.: 2605 FT. Location: T 13 ^N R 50 ^E, Sec 6 Tract BBDA Drilled depth 240 FT.
 Measured: 1000 FT. ^{FNL} ~~RSL~~ 700 FT. ^{FWL} ~~RSL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS 236 FT. 233 FT.			LOGGED DEPTHS 240 FT. 233 FT.		
	Sand, brown, alluvial. Sandstone, red, ferruginous; siltstone, tan, and claystone, tan. Sandstone, gray; siltstone, gray, and claystone, gray. Claystone, brown, carbonaceous; sandstone, gray, and claystone, gray. Sandstone, gray; siltstone, gray, and claystone, gray. Limestone, gray.					

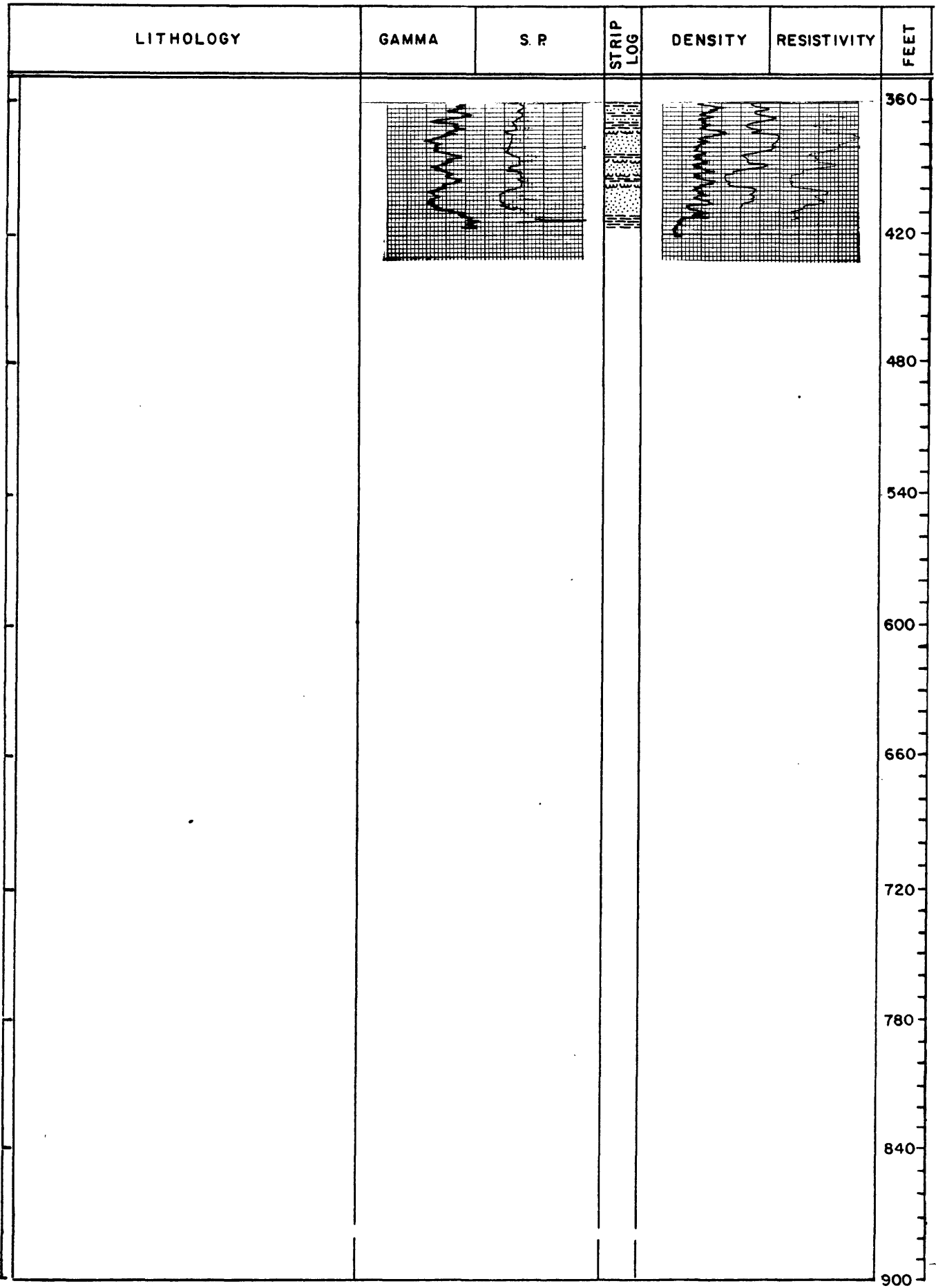
Hole No: US-80023 Map: Diamond G Creek Date: 2/23/80 State: Montana County: Prairie
Elev.: 2721 FT. Location: T 14 ^N R 51 ^E, Sec 32 Tract ABBA Drilled depth 220 FT.
Measured: 50 FT. ^{FNL} ~~RSK~~ 2200 FT. ^{FEL} ~~FWW~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
Remarks: Drill stem stuck at 100 feet - hole logged no source.

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{MS} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>50</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET		
	LOGGED DEPTHS <u>172</u> FT. <u>158</u> FT.			LOGGED DEPTHS <u>177</u> FT. <u>169</u> FT.				
Sandstone, tan; siltstone, buff to tan, and claystone, buff to tan. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal, with partings ^{of} shale, carbonaceous Sandstone, gray; siltstone, gray, and claystone, gray.				60				
				0				
				60				
				120				
				180				
				240				
				300				
				360				

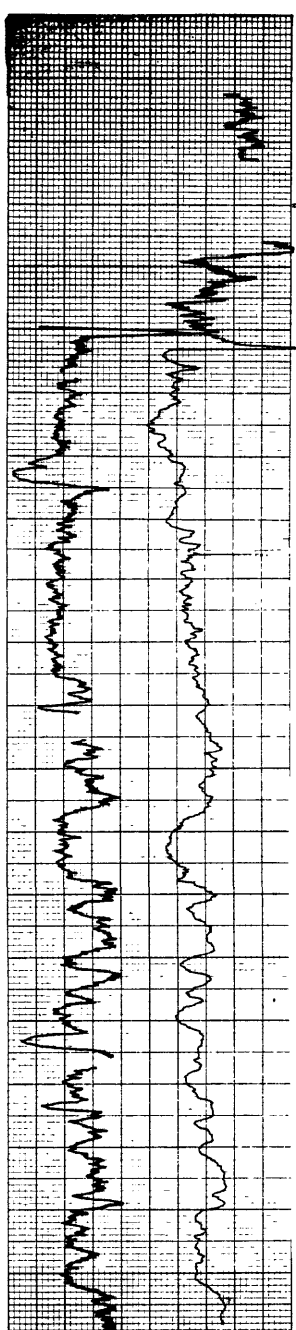

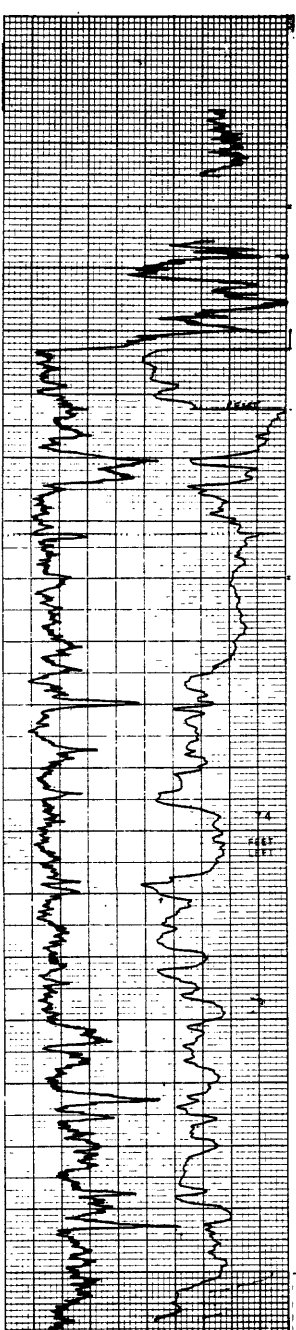
LITHOLOGY	GAMMA	S. P	STRIP LOG	DENSITY	RESISTIVITY	FEET
Sandstone, gray; siltstone, gray, and claystone, gray.						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

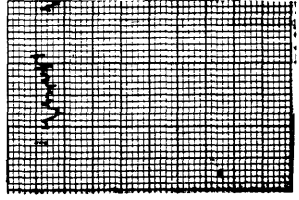
Hole No US-80025 Map: BLM Glendive ³⁹ Date: 2/26/80 State: Montana County: Dawson
 Elev.: 2839 FT. Location: T 15 ^N R 51 ^E W, Sec 8 Tract BDBB Drilled depth 420 FT.
 Measured: 1200 FT. ^{FNL} ~~PSX~~ 1400 FT. ^{XXX} FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Seperate E-log has less interference.

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{NOX} YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS <u>417</u> FT. <u>408</u> FT.			LOGGED DEPTHS <u>420</u> FT. <u>408</u> FT.		
Silt, tan, alluvial.						60
Sandstone, brown; siltstone, brown, and claystone, brown.						0
Sandstone, gray; siltstone, gray, and claystone, gray.						60
Coal.						120
Sandstone, gray; siltstone, gray, and claystone, gray.						180
Coal.						240
Sandstone, gray; siltstone, gray, and claystone, gray.						300
Coal.						360
Sandstone, gray; siltstone, gray, and claystone, gray.						360
Coal.						



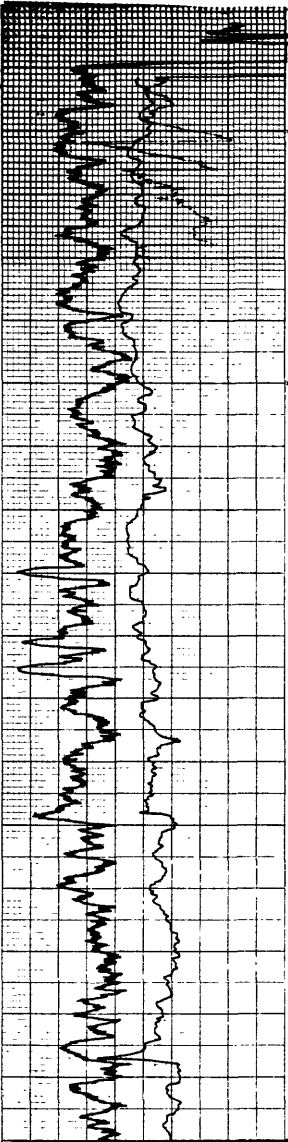

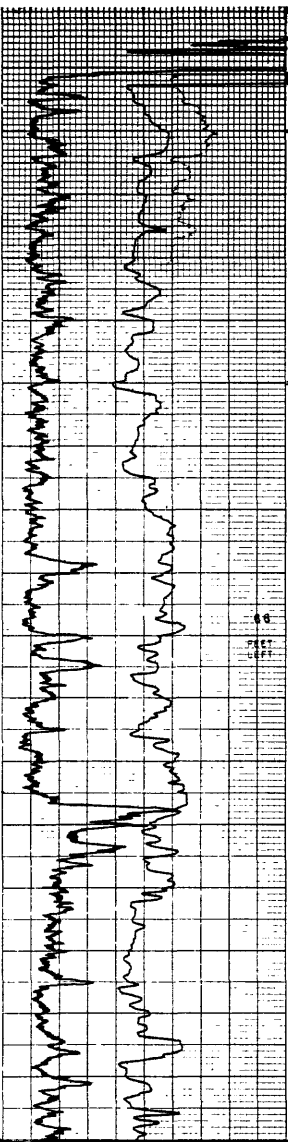
Hole No: US-80026 Map: Circle 4 SW Date: 2/26/80 State: Montana County: Dawson
 Elev.: 2743 FT. Location: T 15 ^N R 51 ^E W, Sec 14 Tract CCCC Drilled depth 360 FT.
 Measured: 230 FT. FSL 20 FT. FWL 55 FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Seperate E-log has less interference.

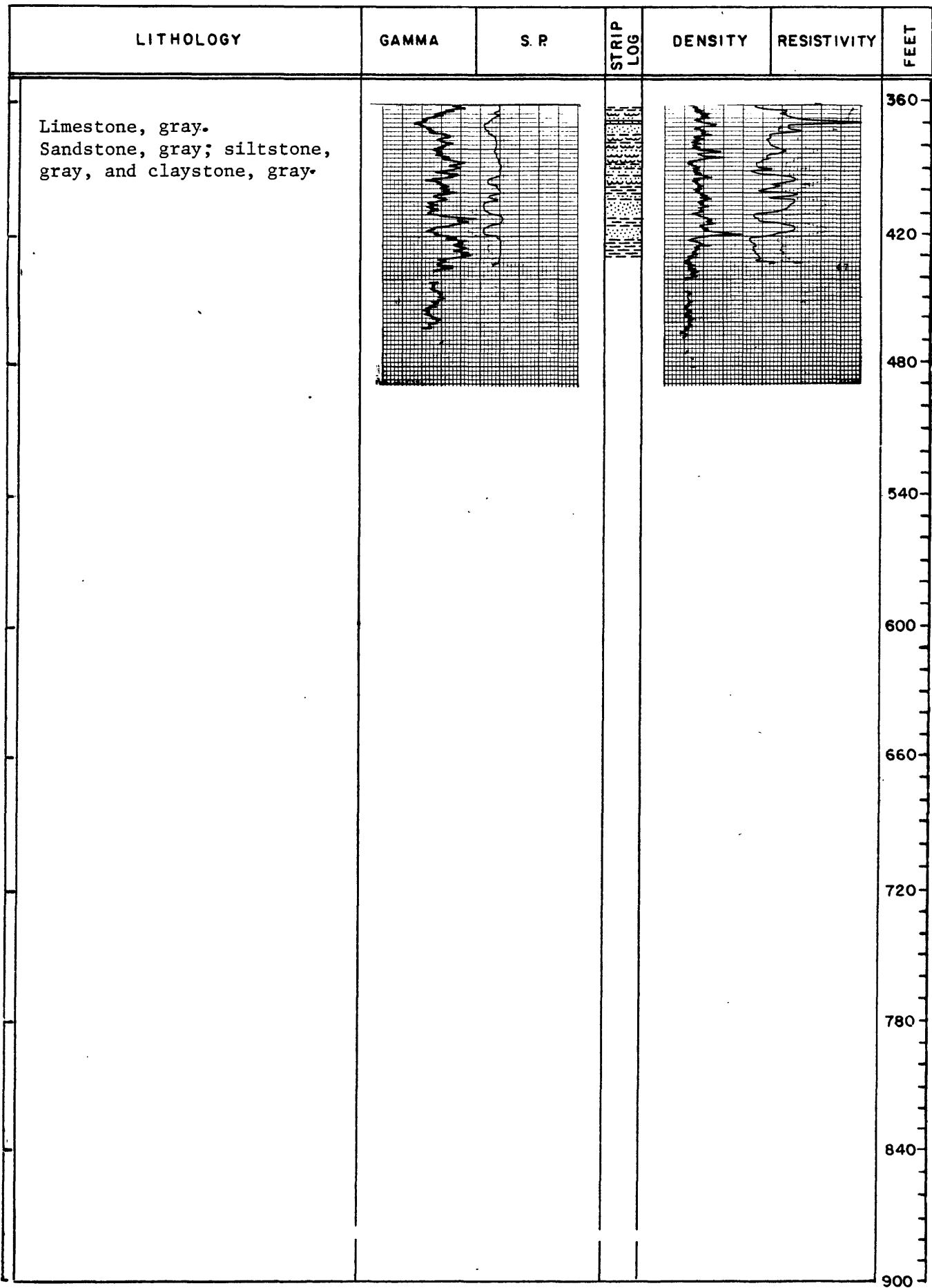
RECORDED BY <u>W Jackson</u> GEOLOGIST ^{XXX} YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS <u>358</u> FT. <u>356</u> FT.			LOGGED DEPTHS <u>360</u> FT. <u>355</u> FT.		
	Sand, brown; silt, brown, and clay, brown. Sandstone, brown; siltstone, brown. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Sandstone, gray; siltstone, gray, and claystone, gray.					

LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

Hole No: US-80027 Map: Circle 4 SW Date: 2/27/80 State: Montana County: Dawson
 Elev.: 2680 FT. Location: T 15 ^N R 51 ^E Sec 2 Tract BBBA Drilled depth 440 FT.
 Measured: 28 FT. ^{FNL} ~~28~~ 400 FT. ^{FWL} ~~28~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

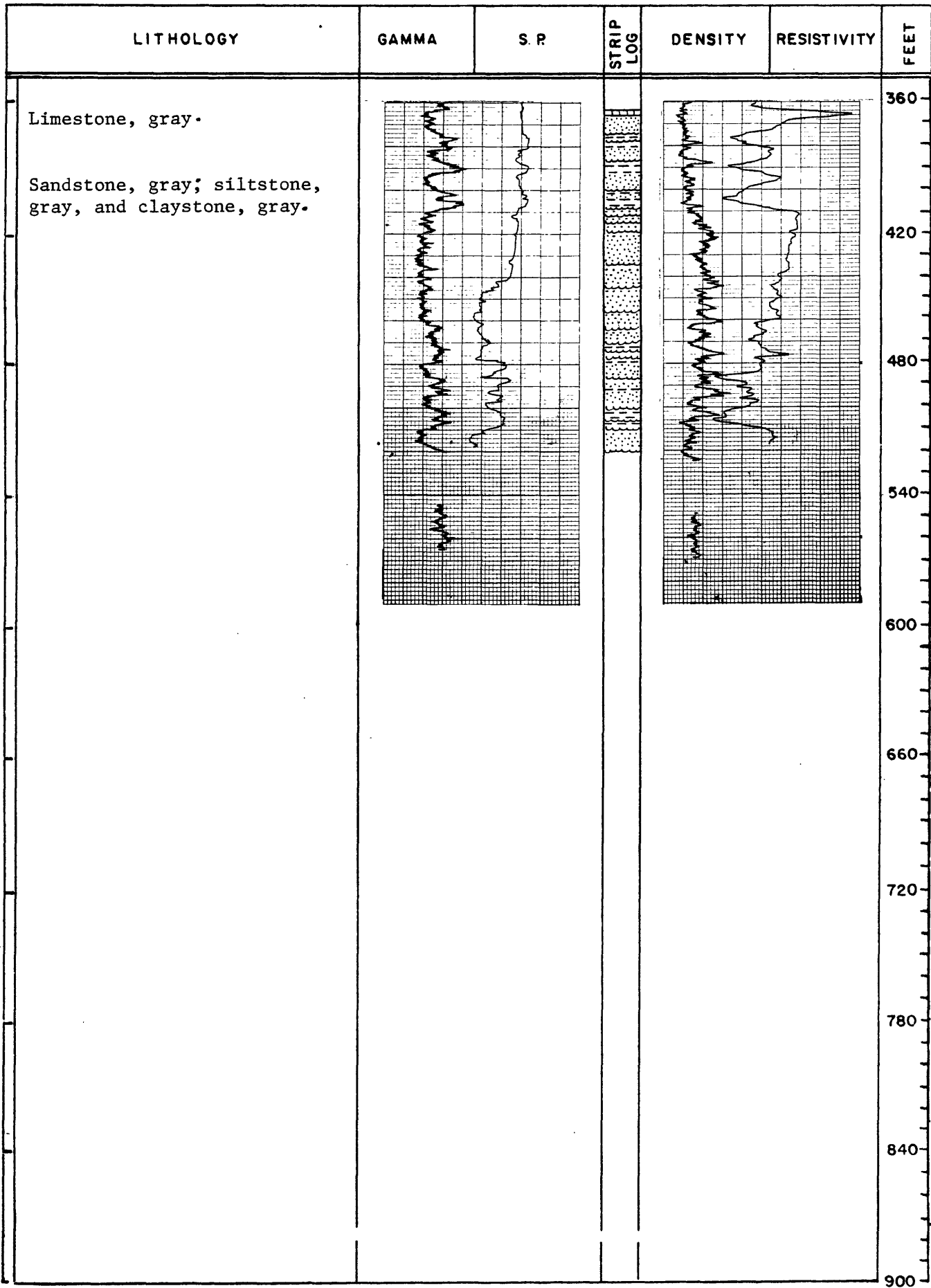
RECORDED BY WILLIAM JACKSON GEOLOGIST ^{NR} YES RECORDED BY JON HANGAS RECORDING SPEED 20 FT. MIN.

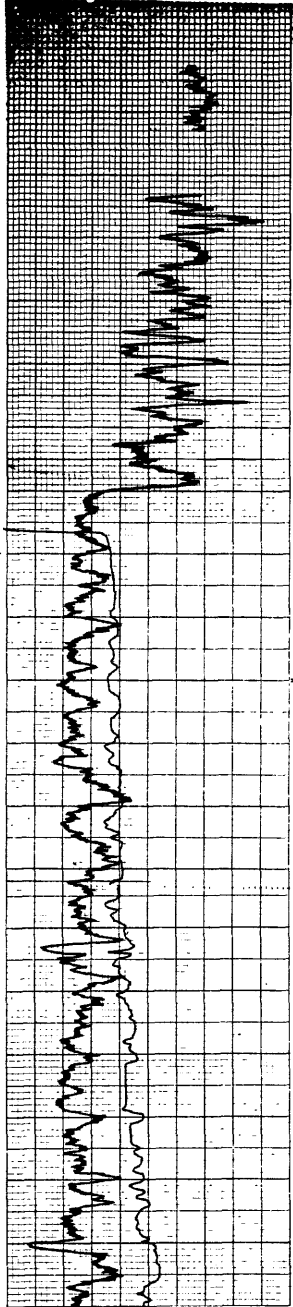

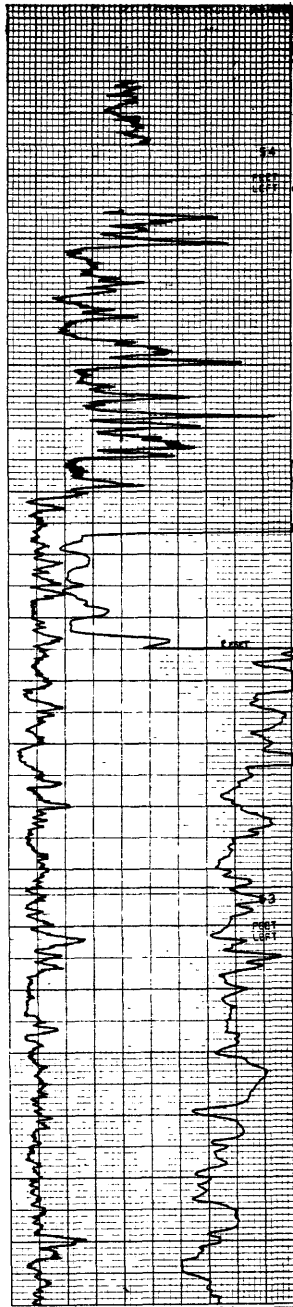

LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH FEET
	T.C. <u>2</u>	SENS. SETTING		T.C. <u>2</u>	SENS. SETTING	
	RANGE <u>200</u>	<u>250</u>		RANGE <u>100</u>	<u>100</u>	
	LOGGED DEPTHS			LOGGED DEPTHS		
	436 FT.	433 FT.		440 FT.	433 FT.	
Sand, fine, tan to buff, and silt, tan. Sandstone, tan; siltstone, tan, and claystone, tan. Claystone, black to blue-gray. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Coal, with claystone parting. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray, and claystone, gray. Shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray.						60 0 60 120 180 240 300 360

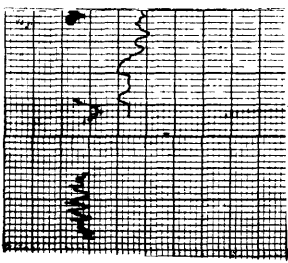




Hole No: US-80028 Map: Circle 3 SE Date: 2/27/80 State: Montana County: Dawson
 Elev.: 2849 FT. Location: T 16^N R 51^E Sec 28 Tract AAAA Drilled depth 520 FT.
 Measured: 11 FT. ~~FNL~~ 370 FT. ~~FEL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

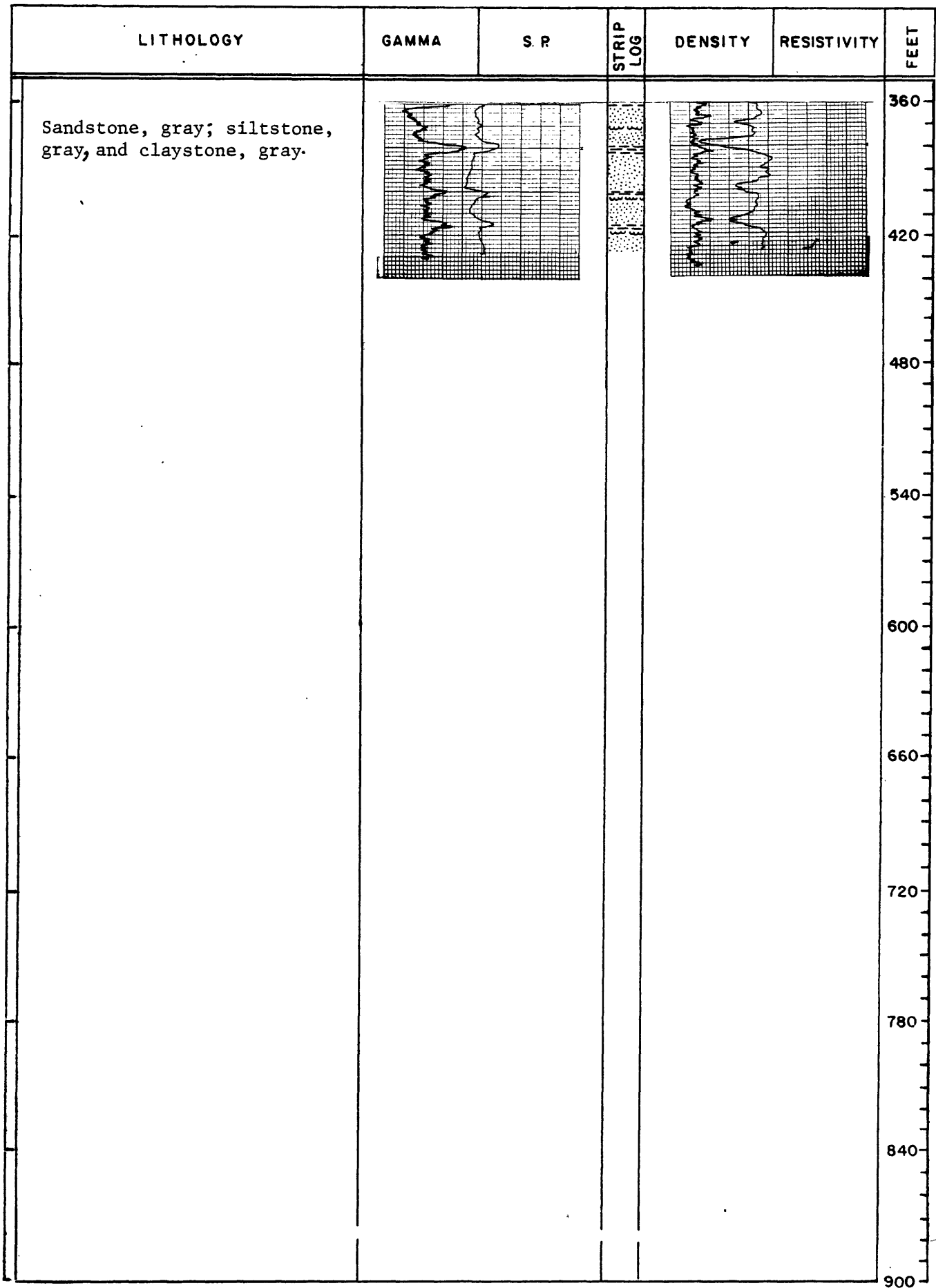
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST NO YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>520</u> FT. <u>517</u> FT.			LOGGED DEPTHS <u>524</u> FT. <u>517</u> FT.	
Sand, brown, alluvial. Sand, brown. Sandstone, gray; siltstone, gray; claystone, gray, and limestone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal.				DEPTH FEET 60 0 60 120 180 240 300 360	



RECORDED BY <u>RUSSELL PATTERSON</u> GEOLOGIST		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u>		FT. MIN.													
LITHOLOGY	GAMMA		S.P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH									
	T.C.	RANGE	SENS. SETTING			T.C.	RANGE	SENS. SETTING											
	2	200	250			2	100	100											
LOGGED DEPTHS					LOGGED DEPTHS														
364 FT.					393 FT.					400 FT.					393 FT.				
<p>Sand, very fine, light-brown; silt, brown; clay, brown.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p>										<p>60</p> <p>0</p> <p>60</p> <p>120</p> <p>180</p> <p>240</p> <p>300</p> <p>360</p>									

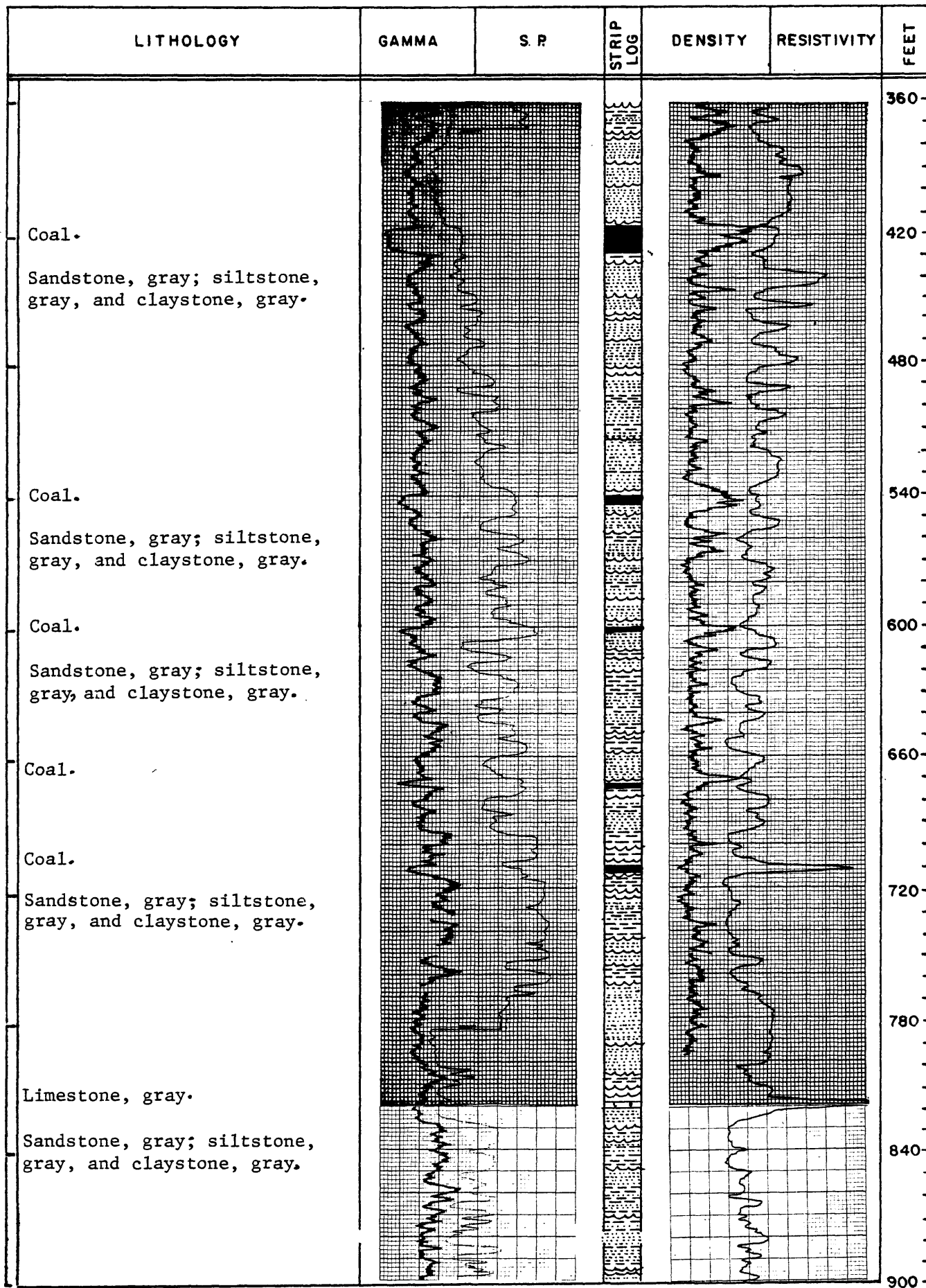
LITHOLOGY	GAMMA	S. P	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

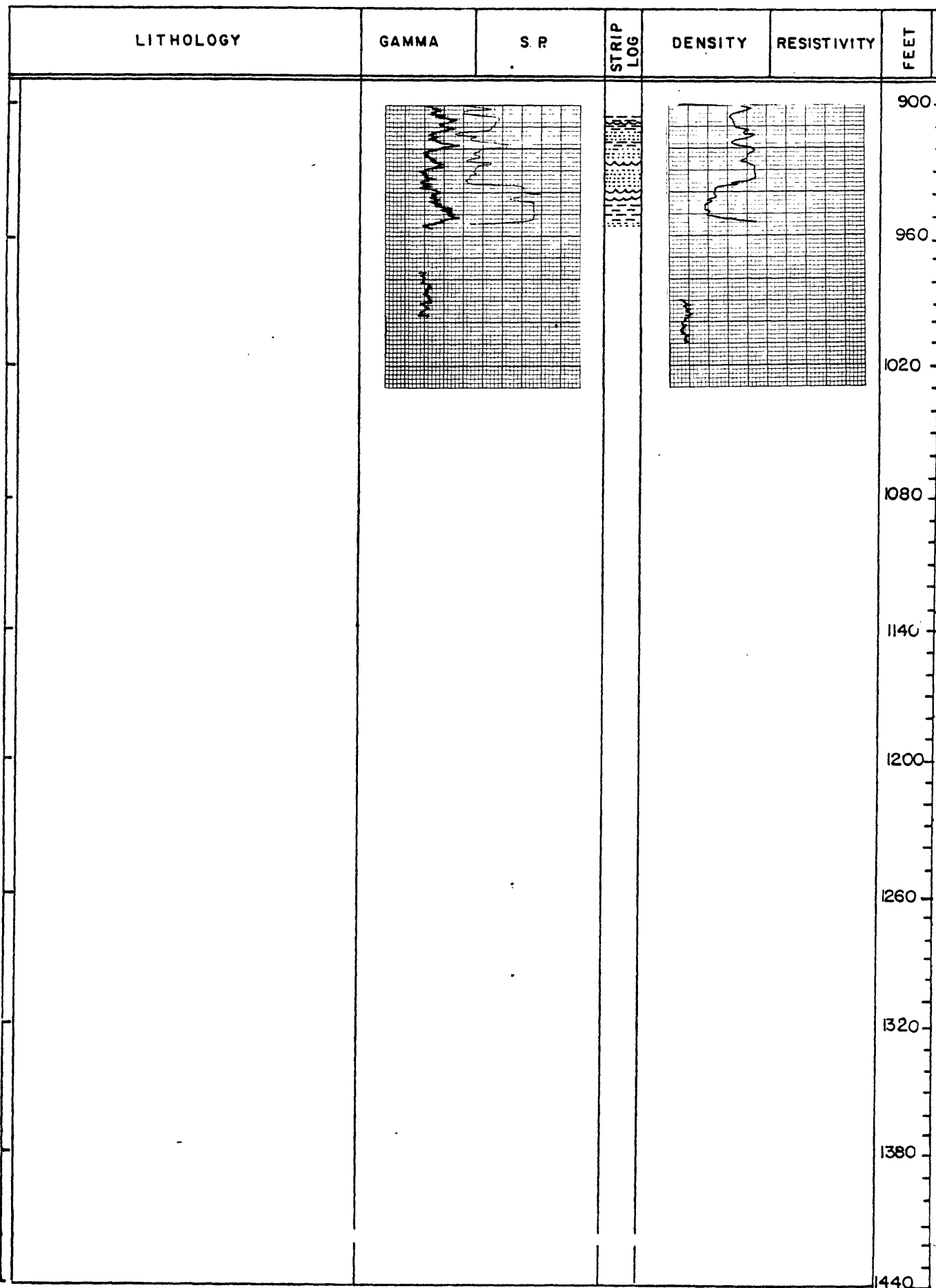
RECORDED BY <u>JON HANGAS</u> ^{N8} <u>GEOLOGIST</u> ^{YES}		RECORDED BY <u>JON HANGAS</u> ^{N8} <u>RECORDING SPEED</u> <u>20</u> ^{FT. MIN.}			
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>1000</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 431 FT. 428 FT.		LOGGED DEPTHS 435 FT. 428 FT.		FEET
Silt, brown. Sandstone, brown; siltstone, brown, and claystone, brown to black.					60
					0
Coal; claystone, black. Sandstone, gray; siltstone, gray, and claystone, gray.					60
					120
Coal.					180
					240
					300
					360



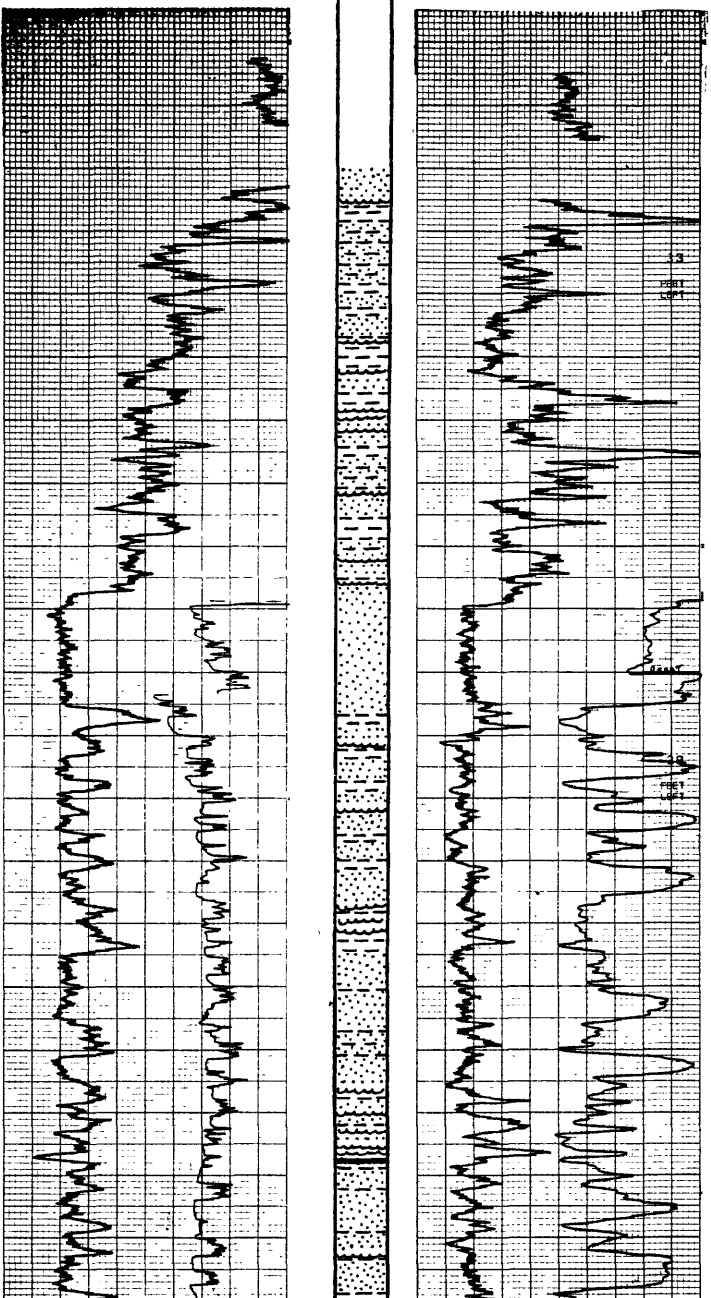
Hole No: US-80031 Map: Circle 1 SW Date: 3/8/80 State: Montana County: Dawson
 Elev.: 2941 FT. Location: T 18^N R 51^E, Sec 28 Tract CCCC Drilled depth 960 FT.
 Measured: 175 FT. FSL 230 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Seperate gamma log 800'-960' past obstruction; 0-640' air drilling
640-960' mud drilling.

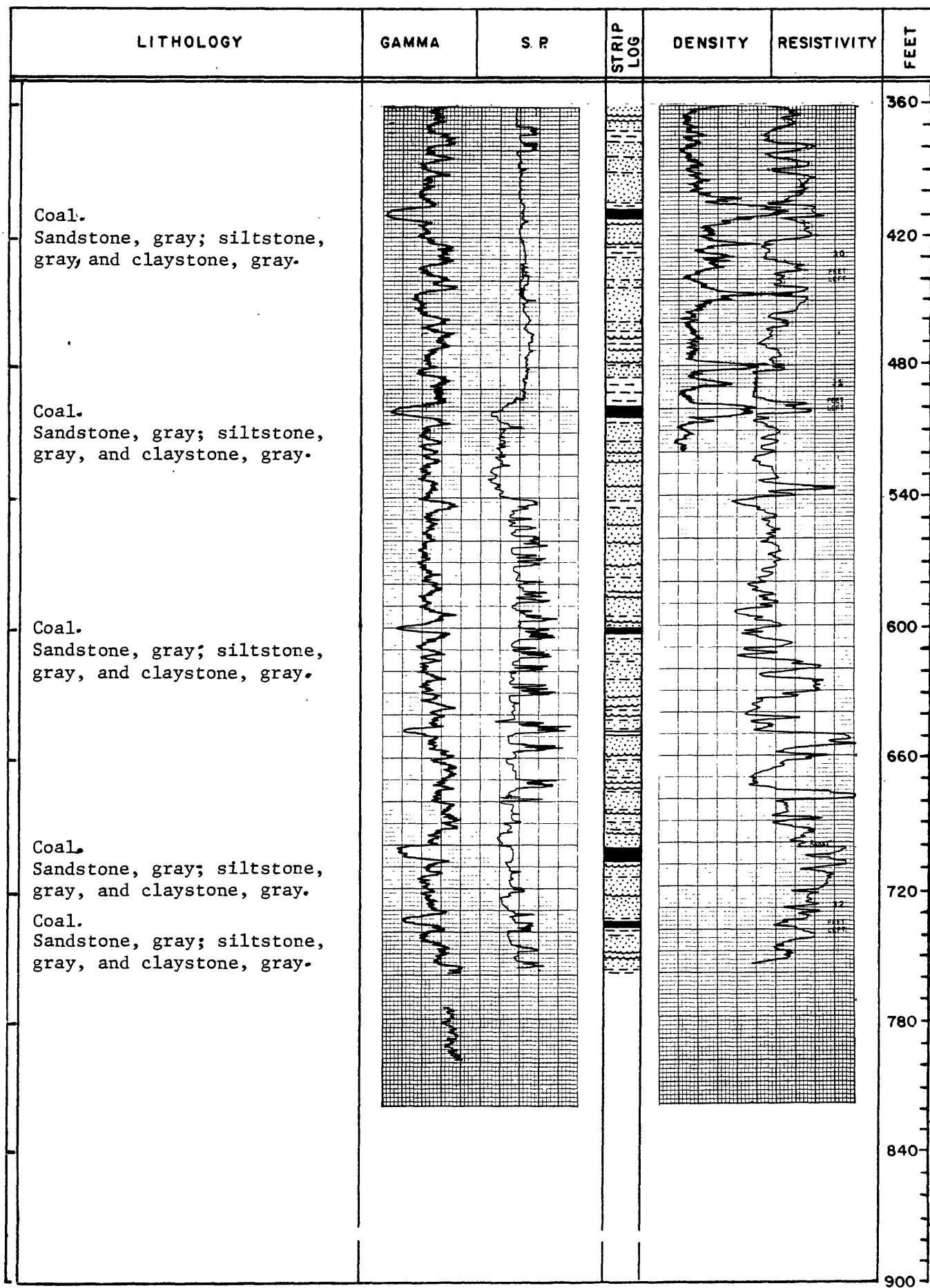
RECORDED BY <u>J Hargas</u> GEOLOGIST ^{MB} YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>
	RESISTIVITY SENS. SETTING <u>100</u>		DEPTH FEET
	LOGGED DEPTHS 957 FT. 954 FT.		LOGGED DEPTHS 898 FT. 954 FT.
Sandstone, brown; siltstone, brown, and claystone, brown.			60
Claystone, carbonaceous; coal. Sandstone, gray; siltstone, gray, and claystone, gray.			0
Coal; claystone, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray.			60
Coal.			120
			180
			240
			300
			360



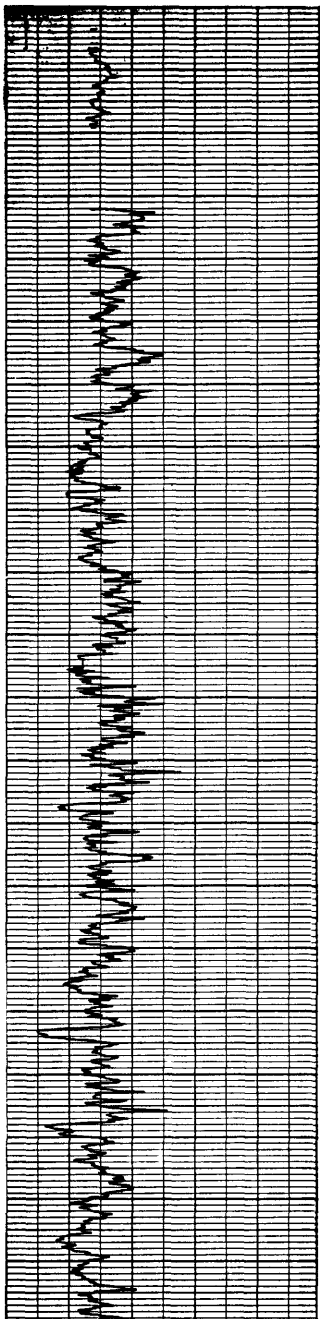
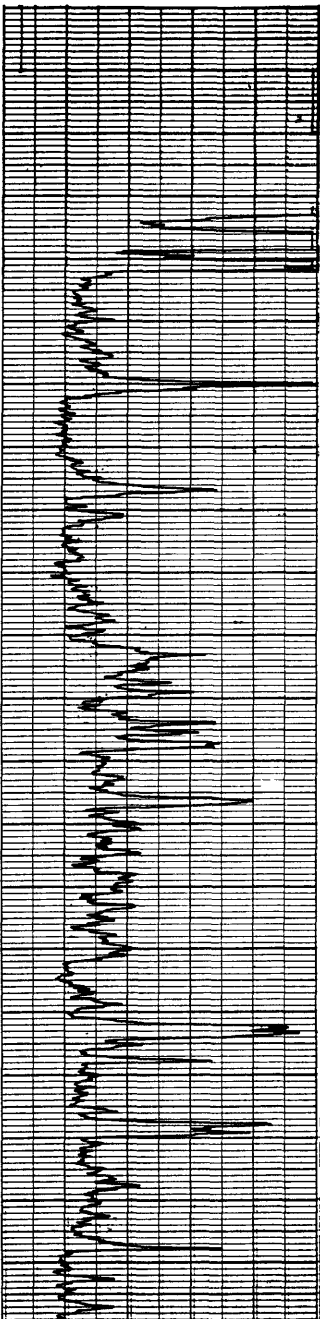
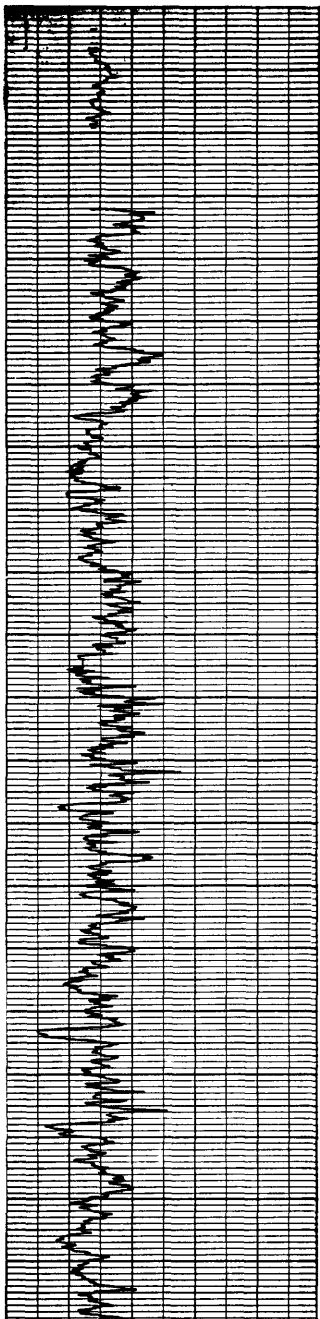
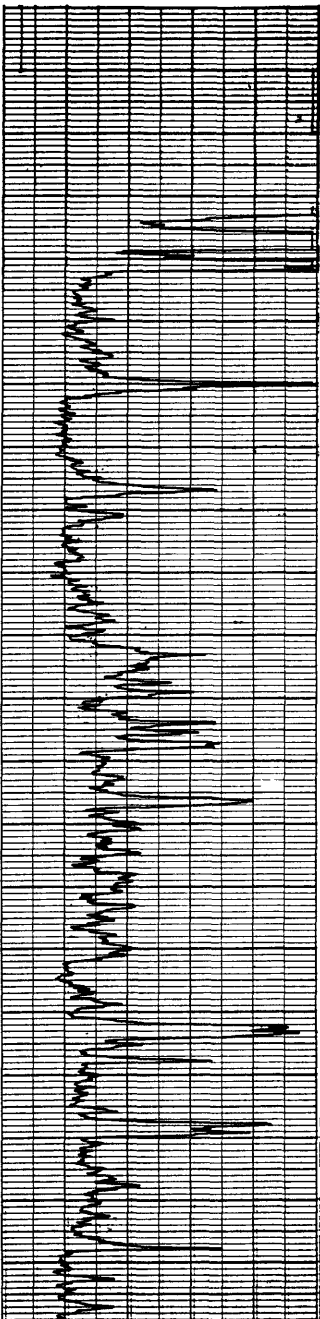


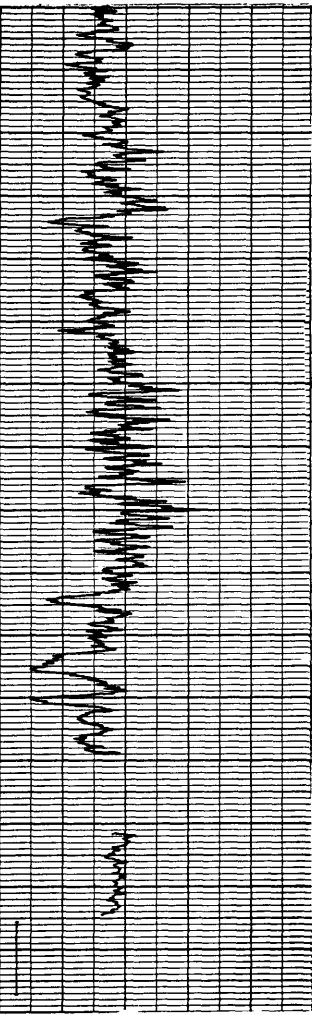

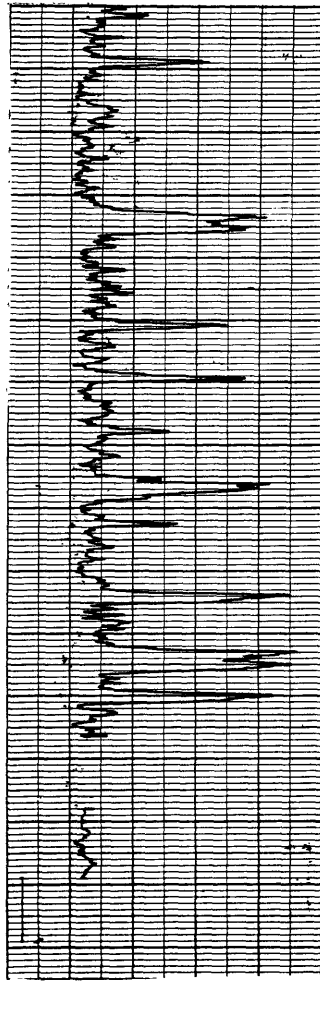
Hole No. US-80032 Map Circle 1 NE Date: 3/11/80 State: Montana County: Dawson
 Elev.: 3024 FT. Location: T19 S R 52 E, Sec. 10 Tract BBBB Drilled depth 760 FT.
 Measured: 30 FNL 130 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: 3 logs: density 0-500', gamma 500-760, E log 0-500. Obstruction at 520'

RECORDED BY <u>R Patterson</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>R Patterson</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	DEPTH
	LOGGED DEPTHS <u>759 FT.</u> <u>756 FT.</u>		FEET
	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	LOGGED DEPTHS <u>520 FT.</u> <u>756 FT.</u>
Sand, light-brown, very fine. Sandstone, gray, very fine; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.	STRIP LOG		
			60 0 60 120 180 240 300 360



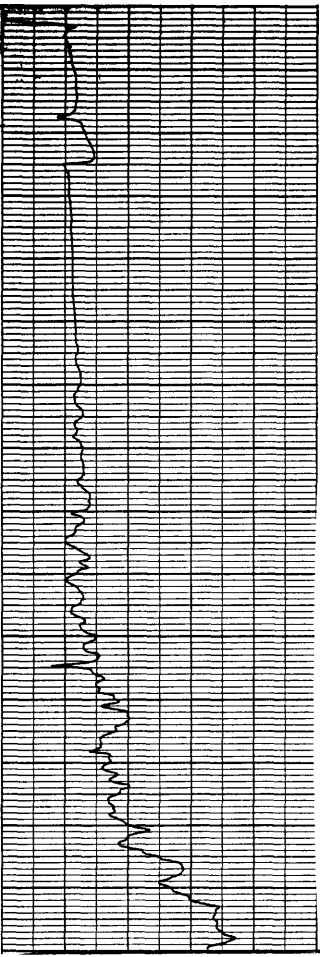
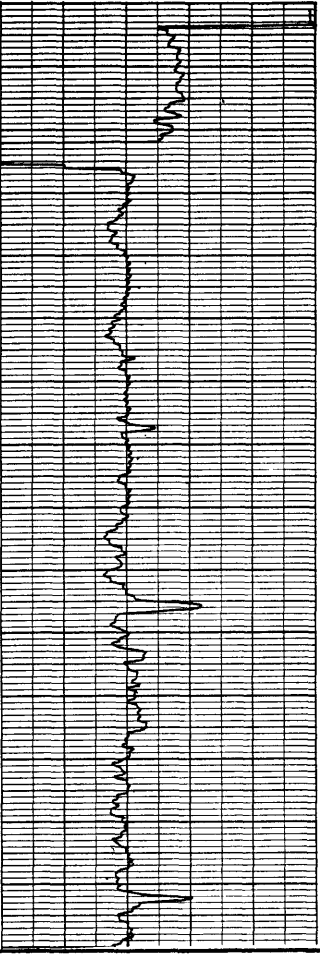
Hole No: US80033 Map: Circle 2 SE Date: 3/8/80 State: Montana County: Dawson
 Elev.: 2821 FT. Location: T 18^N R 50^E W, Sec 2 Tract CCCC Drilled depth 600 FT.
 Measured: 70 FT. FSL 70 FT. FWL 70 FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Field note: elevation to fit contour.

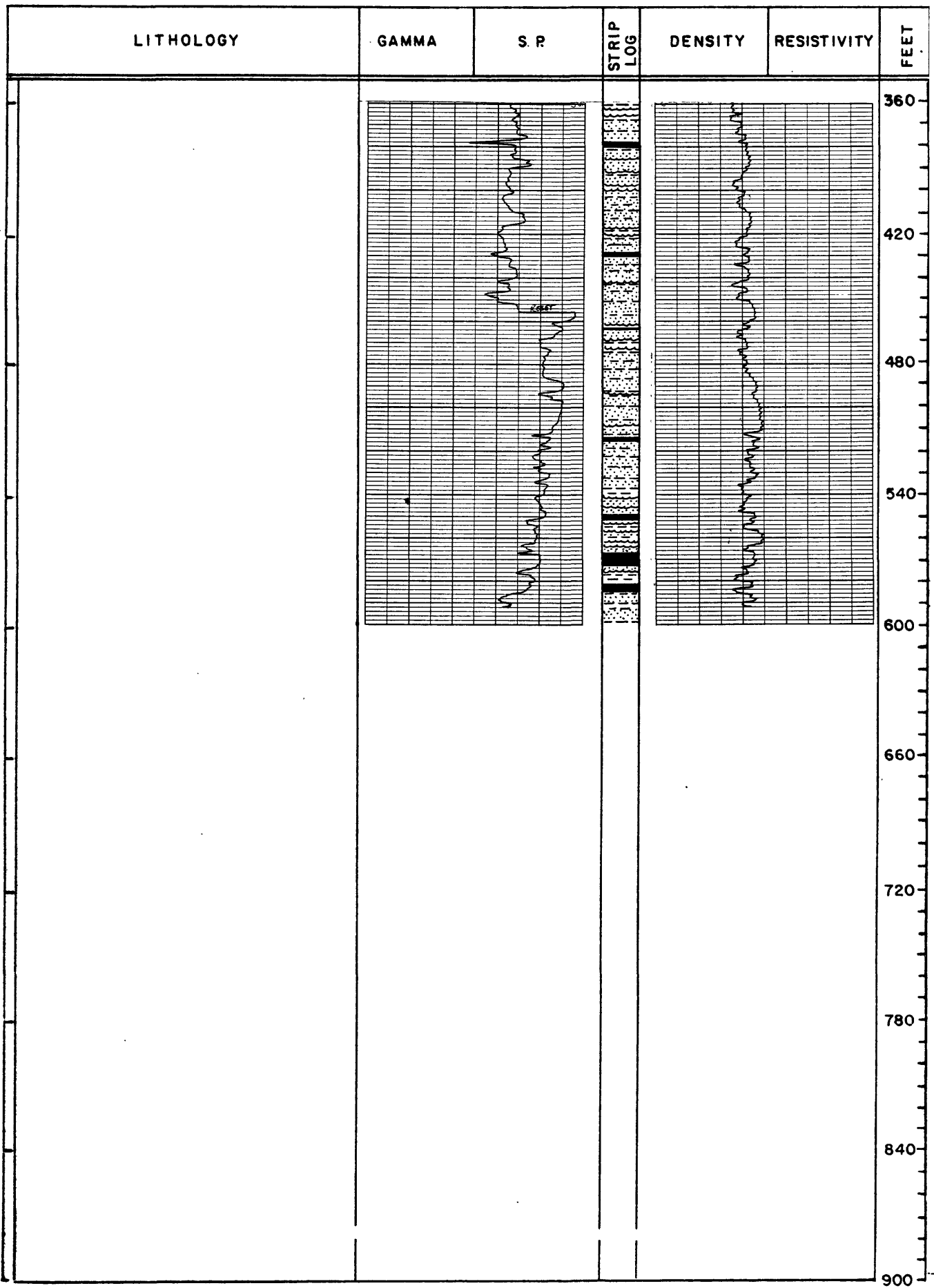
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>20</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>20</u>
	LOGGED DEPTHS 598 FT. FT.			LOGGED DEPTHS 592 FT. FT.	
	DEPTH FEET			DEPTH FEET	
Sandstone, tan; siltstone, tan and claystone, tan to brown.					60
Sandstone, gray; siltstone, gray, and claystone, gray.					0
Claystone, green to brown. Sandstone, gray; siltstone, gray, and claystone, gray.					60
Coal.					120
Sandstone, gray; siltstone, gray, and claystone, gray.					180
Shale, black, carbonaceous. Limestone, gray.					240
Coal.					300
Sandstone, gray; siltstone, gray, and claystone, gray.					360
Coal.					

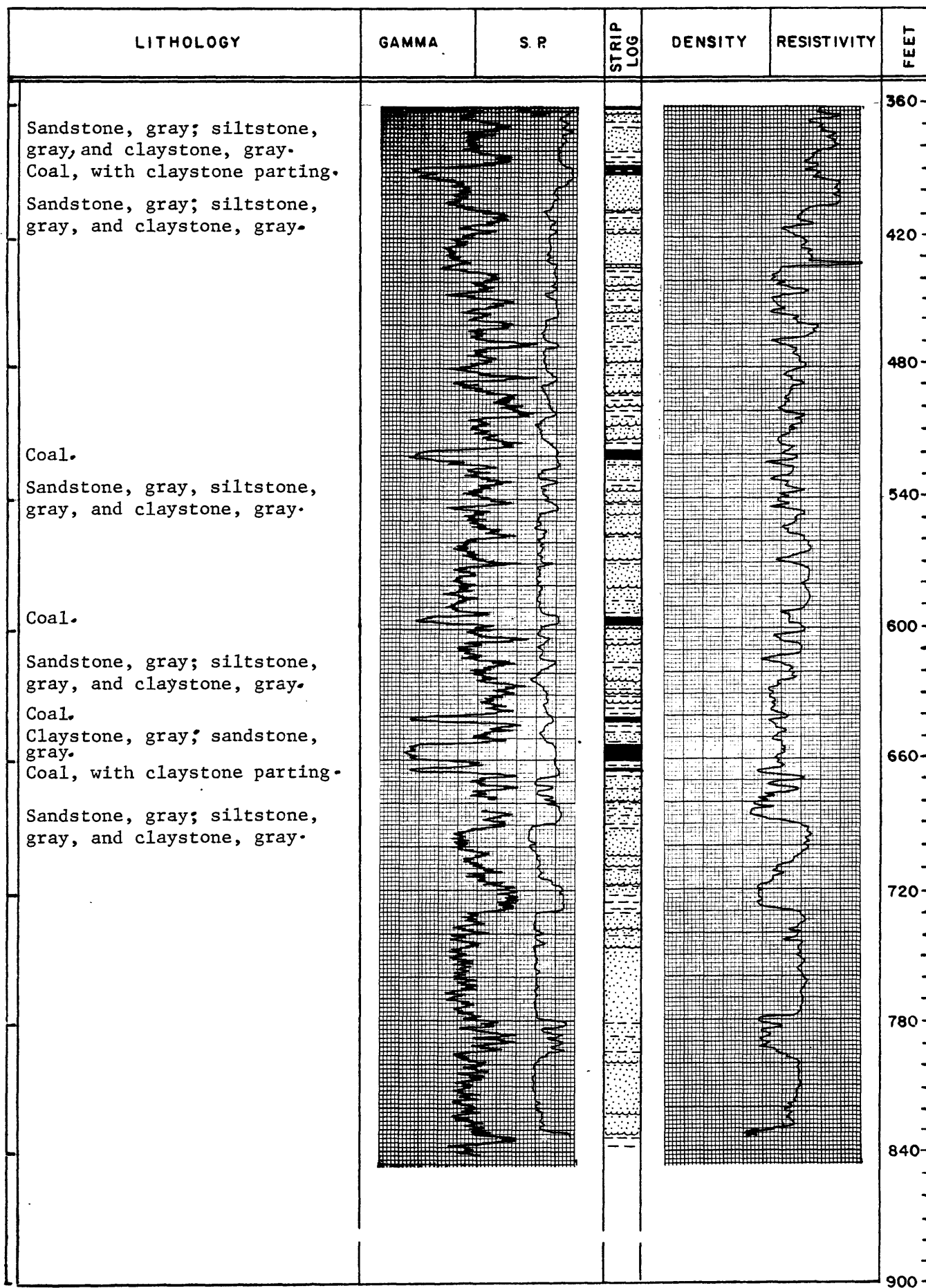
LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Coal.						360
Sandstone, gray; siltstone, gray, and claystone, gray.						
Coal.						420
Sandstone, gray; siltstone, gray, and claystone, gray.						
						480
Coal.						
						540
Coal.						
Sandstone, gray, and siltstone, gray.						600
Coal.						
Sandstone, gray, and claystone, gray.						660
						720
						780
						840
						900

033
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Hole No: US-80033 Map: Circle 2 SE Date: 3/8/80 State: Montana County: Dawson
Elev.: 2821 FT. Location: T 18 ^N R 50 ^E, Sec 2 Tract CCCC Drilled depth 600 FT.
Measured: 70 FT. FSL 70 FT. FWL 70 FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
Remarks: Field note: elevation to fit contour.

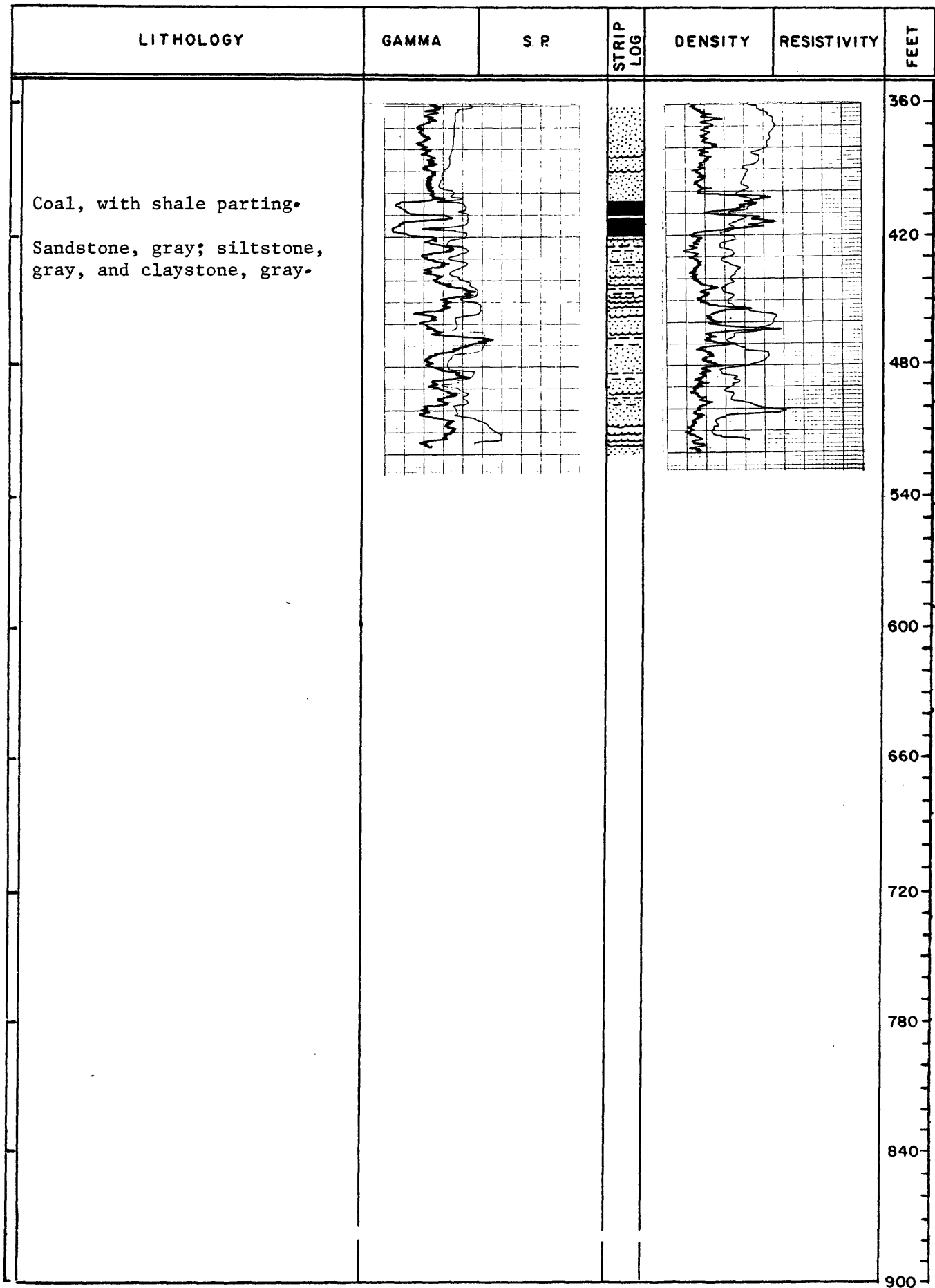
RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>40</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>20</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>20</u>	DEPTH
	LOGGED DEPTHS FT. <u>592</u> FT.			LOGGED DEPTHS FT. <u>592</u> FT.		FEET
						2
						60
						0
						60
						120
						180
						240
						300
						360



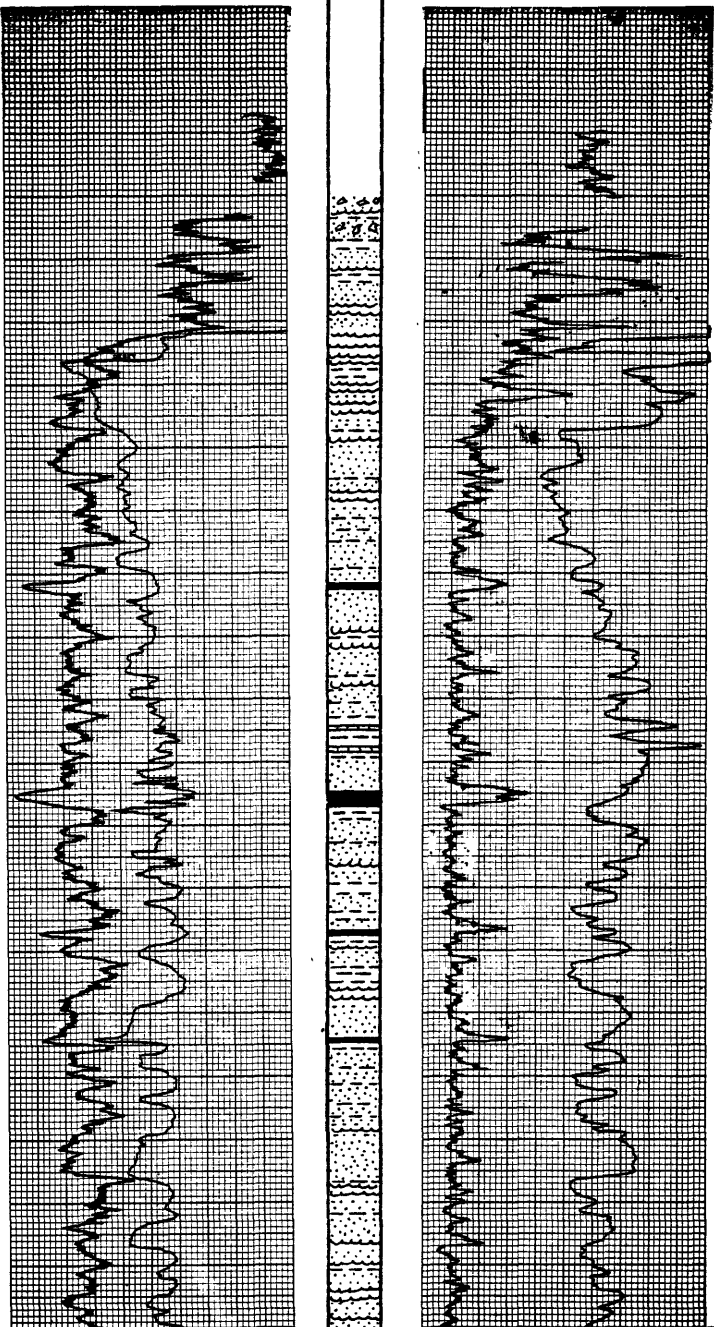




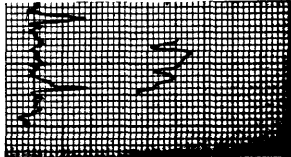
Hole No: US-80035 Map: Circle 2 NE Date: 3/20/80 State: Montana County: Dawson
 Elev.: 2705 FT. Location: T19N R 50E Sec 12 Tract CCCC Drilled depth 520 FT.
 Measured: 210 FT. FSL 20 FT. FWL 504 FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W Jackson</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>
	RESISTIVITY SENS. SETTING <u>100</u>		DEPTH
	LOGGED DEPTHS <u>517</u> FT. <u>515</u> FT.		LOGGED DEPTHS <u>520</u> FT. <u>515</u> FT.
<p>Sandstone, brown to buff, fine. Siltstone, brown; claystone, buff to brown.</p> <p>Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal, with claystone parting. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.</p>	STRIP LOG		
		FEET	FEET
		60	60
		0	0
		60	60
		120	120
		180	180
		240	240
		300	300
		360	360



Hole No: US-80036 Map: Circle 2 NE Date: 3/21/80 State: Montana County: Dawson
 Elev.: 2518 FT. Location: T 20^N R 51^E Sec 18 Tract DABD Drilled depth 400 FT.
 Measured: 230 FT. ^{BNL} FSL 2500 FT. ^{FEL} 2500 FT. Hole size: 5 1/2 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{NS} YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>
	RESISTIVITY SENS. SETTING <u>100</u>		DEPTH
	LOGGED DEPTHS 396 FT. 390 FT.		LOGGED DEPTHS 399 FT. 390 FT.
	STRIP LOG		FEET
Gravel, light-brown. Silt, light-brown. Sandstone, gray; siltstone, gray, and claystone, gray.			60
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			0
Limestone, gray.			60
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			120
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			180
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			240
Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			300
			360

LITHOLOGY	GAMMA	S. P	STRIP LOG	DENSITY	RESISTIVITY	FEET
Coal; claystone, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray.						360 420 480 540 600 660 720 780 840 900

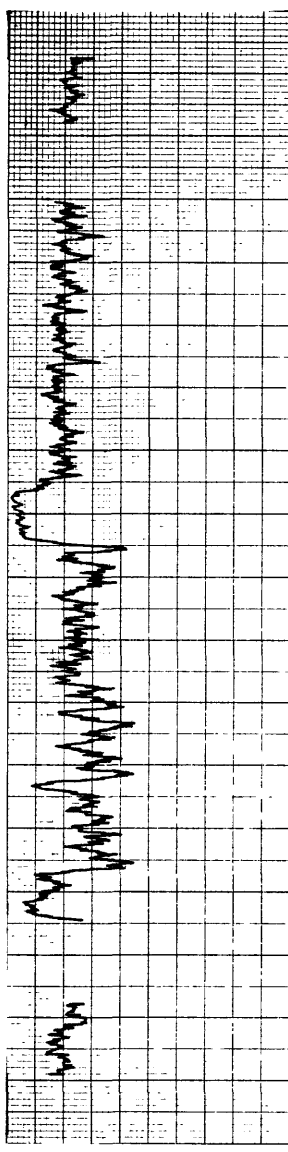
Hole No: US-80037 Map Mt. Sheep Butte Date: 3/21/80 State: Montana County: McCone
 Elev.: 2544 FT. Location: T 19^N R 49^E, Sec 8 Tract CCCC Drilled depth 340 FT.
 Measured: 225 FT. FSL 2800 FT. FWL FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>40</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS 339 FT. 335 FT.			LOGGED DEPTHS 340 FT. 335 FT.	
	FEET			FEET	
Sandstone, gray; siltstone, gray, and claystone, gray.			60		
Sandstone, brown; siltstone, brown, and claystone, brown.			0		
Sandstone, gray, and claystone, gray.			60		
Coal.			120		
Claystone, gray-brown, and siltstone, gray-brown.			180		
Coal.			240		
Sandstone, gray; siltstone, gray, and claystone, gray.			300		
Coal, with claystone parting.			360		
Sandstone, gray; siltstone, gray, and claystone, gray.					
Limestone, gray.					
Claystone, green-gray; sandstone green-gray.					
Sandstone, gray; siltstone, gray, and claystone, gray.					

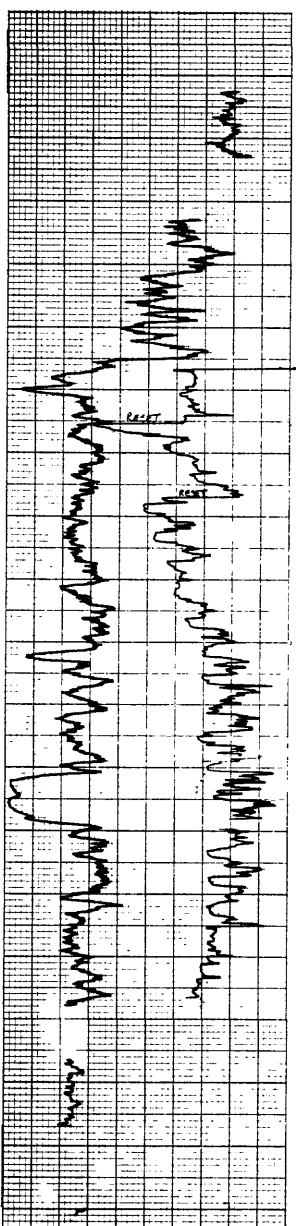
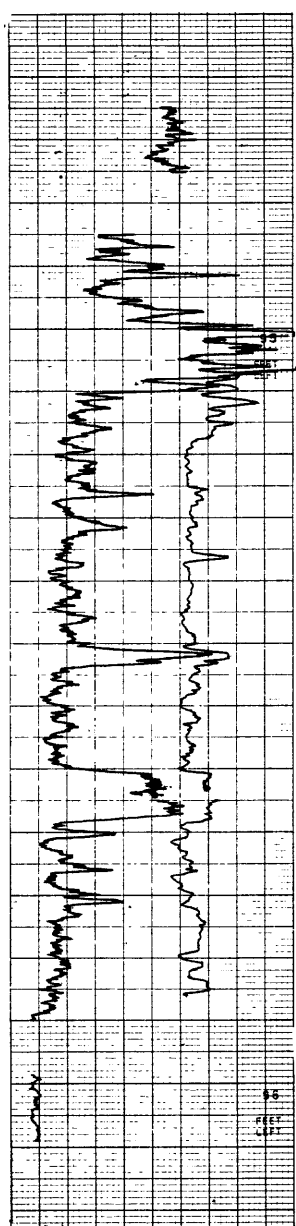
Hole No. US-80038A Map Mtn. Sheep Butte Date: 3/21/80 State: Montana County: McCone
 Elev.: _____ FT Location: T19 ^N R 48 ^E W, Sec 15 Tract BCCC Drilled depth _____ 50 FT
 Measured: 2000 FT PSL 300 FT FWL _____ FT. Hole size: 5 ¹/₄ IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Abandoned hole, no log; no elevation available.

RECORDED BY <u>R Patterson</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hancas</u>		RECORDING SPEED _____ FT. MIN.		
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S P SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH FEET
	LOGGED DEPTHS FT. FT.			LOGGED DEPTHS FT. FT.		
	Gravel.					

Hole No US-80039 Map Mtn. Sheep Butte Date: 3/22/80 State: Montana County: McCone
 Elev.: 2379 FT. Location: T 20^N R 49^E, Sec 30 Tract DDCD Drilled depth 240 FT.
 Measured: 150 FT. FSL 900 FT. X FEL X FT. Hole size: 5 1/2 IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W Jackson</u> GEOLOGIST <u>NOX</u> YES		RECORDED BY <u>Jackson</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>50</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS 329 FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. FT.		DEPTH FEET
Clay, brown; and silt, brown. Gravel, brown, medium, sandy.			60
Sandstone, gray; siltstone, gray, and claystone, gray.			0
Claystone, black, carbonaceous.			60
Coal.			120
Sandstone, gray; siltstone, gray, and claystone, gray.			180
Coal.			240
Sandstone, gray; siltstone, gray, and claystone, gray.			300
Coal.			360

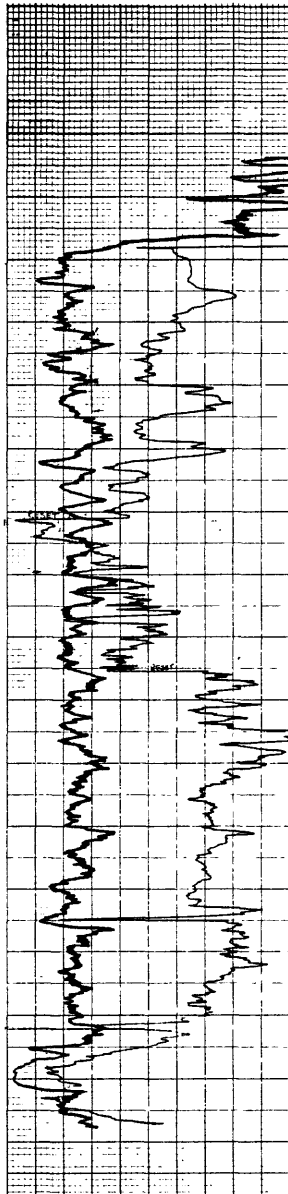

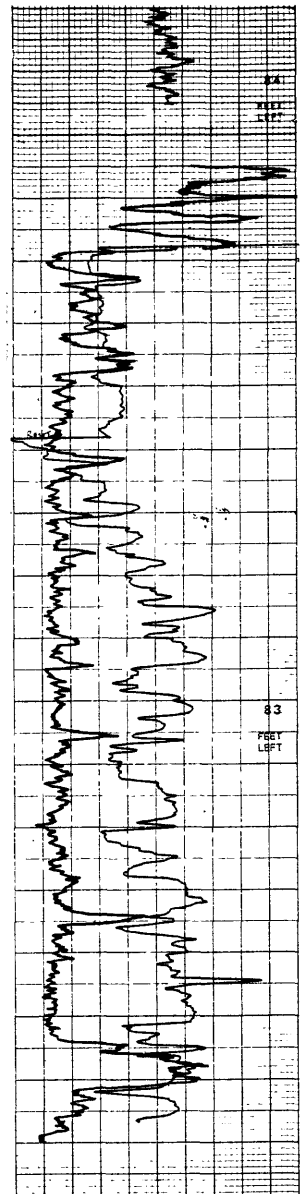
Hole No: UIS-80040 Map Mtn. Sheep Butte Date: 3/22/80 State: Montana County: McCone
 Elev.: 2469 FT. Location: T 20 ^N R 49 ^E _W, Sec 20 Tract BAAA Drilled depth 260 FT.
 Measured: 70 FT. ^{FNL} ~~FEI~~ 2650 FT. ^{FEL} ~~PWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W Jackson</u> GEOLOGIST NO YES		RECORDED BY <u>Hangas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>256</u> FT. <u>253</u> FT.			LOGGED DEPTHS <u>260</u> FT. <u>253</u> FT.	
	DEPTH FEET				
Sandstone, tan; siltstone, tan, and claystone, tan. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.					60 0 60 120 180 240 300 360

Hole No US-80041 Map Diamond G Creek Date: 3/24/80 State: Montana County: Prairie
 Elev.: 2582 FT. Location: T 14^N R 50^E, Sec 23 Tract CCAA Drilled depth 380 FT.
 Measured: 1420 FT. ~~FSL~~ 1500 FT. ~~FWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>W Jackson</u> GEOLOGIST ^{NOX} YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS 313 FT. 310 FT.		LOGGED DEPTHS 317 FT. 310 FT.		
	STRIP LOG				
Sandstone, tan; siltstone, tan, and claystone, tan. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray.					60 0 60 120 180 240 300 360

Hole No: US-80042 Map: Mt. Sheep Butte Date: 3/24/80 State: Montana County: McCone
 Elev.: 2441 FT. Location: T 19^N R 48^E, Sec 15 Tract DDAD Drilled depth 320 FT.
 Measured: 950 FT. ~~KMX~~ FSL 225 FT. ~~KMX~~ ^{FEL} FT. Hole size: 5 1/8 IN Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>WILLIAM JACKSON</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>30</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>50</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>50</u>	DEPTH FEET
	LOGGED DEPTHS 316 FT. 314 FT.			LOGGED DEPTHS 320 FT. 314 FT.		
	Claystone, tan to buff. Claystone, black, carbonaceous. Sandstone, tan; siltstone, tan, and claystone, tan. Claystone, black, carbonaceous. Sandstone, gray; claystone, gray. Shale, black, carbonaceous. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Claystone, blue-gray. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal, with claystone parting. Sandstone, gray; siltstone, gray, and claystone, gray.					

Hole No: US-80043 Map Mt. Sheep Butte Date: 3/25/80 State: Montana County: McCone
 Elev.: 2407 FT. Location: T 19 S R 48 E Sec 2 Tract AAAB Drilled depth 200 FT.
 Measured: 450 FT. ^{FNL} 40 FT. ^{FEL} 40 FT. ^{RWK} 40 FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Logged thru pipe, no source, density acts as gamma.

RECORDED BY <u>W Jackson</u> GEOLOGIST ^{X06} YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>50</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>50</u>	RESISTIVITY SENS. SETTING	
	LOGGED DEPTHS 180 FT. FT.			LOGGED DEPTHS 184 FT. FT.		
Sandstone, brown; siltstone, brown, and claystone, brown. Gravel. Sandstone, gray, fine; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal, with siltstone parting-						60
						0
						60
						120
						180
						240
						300
						360

RECORDED BY WILLIAM JACKSON GEOLOGIST ~~NO~~ YES RECORDED BY JON HANGAS RECORDING SPEED 20 FT. MIN.

LITHOLOGY	YES		STRIP LOG	DENSITY		RESISTIVITY		DEPTH	
	GAMMA			S.P.		T.C.			
	T.C. 2			SENS. SETTING		T.C. 2		SENS. SETTING	
	RANGE 200			100		RANGE 100		50	
LOGGED DEPTHS			STRIP LOG	LOGGED DEPTHS			FEET		
312 FT. 310 FT.				317 FT. 310 FT.					

Silt, brown, alluvial.

Sandstone.

Sandstone, gray; siltstone, gray, and claystone, gray.

Coal.

Sandstone, gray; siltstone, gray, and claystone, gray.

Coal.


Claystone, gray, and sandstone, gray.

Coal.

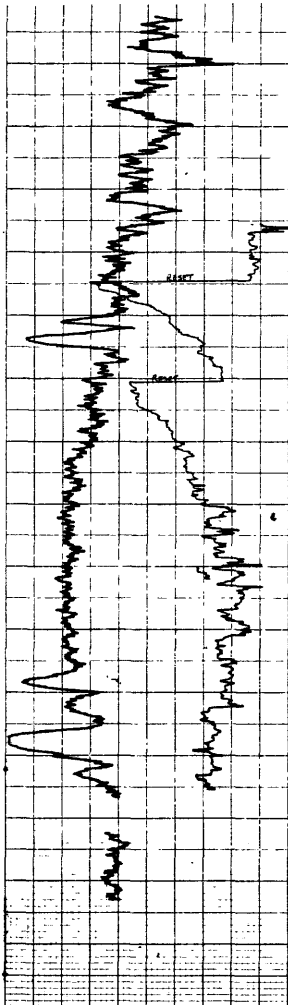

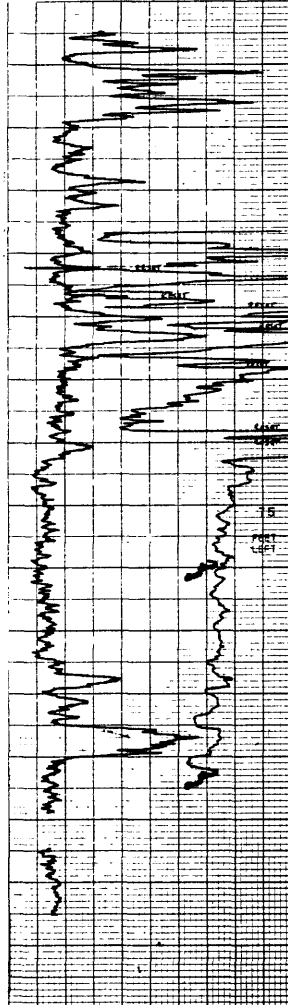
Sandstone, gray; siltstone, gray, and claystone, gray.

The image displays a geological log with two vertical columns of data. The left column contains a series of wavy, irregular lines representing stratigraphic boundaries. The right column contains a series of horizontal lines, some of which are labeled with text such as 'SANDSTONE', 'SILTSTONE', and 'CLAYSTONE'. To the right of the columns is a vertical scale with depth markers at 0, 60, 120, 180, 240, 300, and 360. The log is set against a background of a fine grid.

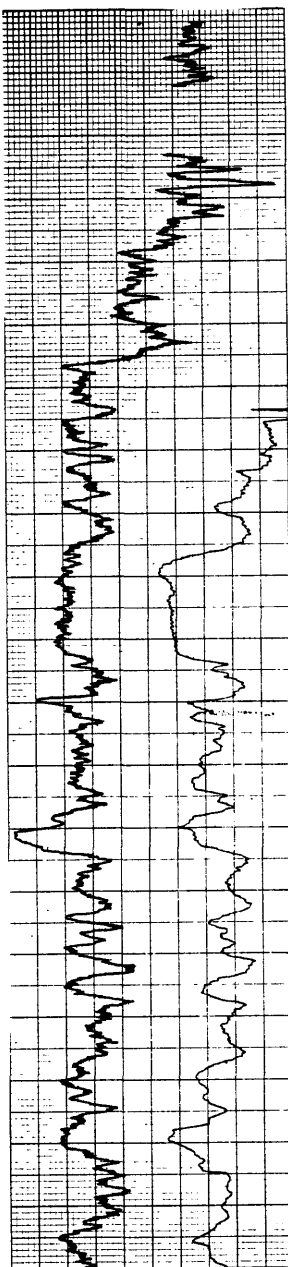
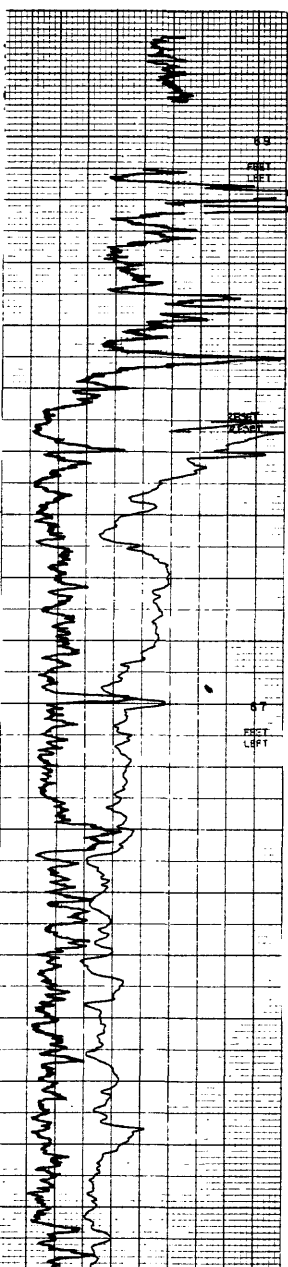
Hole No: US-800448 ^A BLM Richey NE31 Date: 3/25/80 State: Montana County: Dawson
 Elev.: FT Location: T 22 ^N R 52 ^E Sec 20 Tract DDAA Drilled depth 120 FT
 Measured: 500 FT FSL 700 FT ~~xxx~~ ^{FEL} FT Hole size: IN Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned no log; no elevation available.

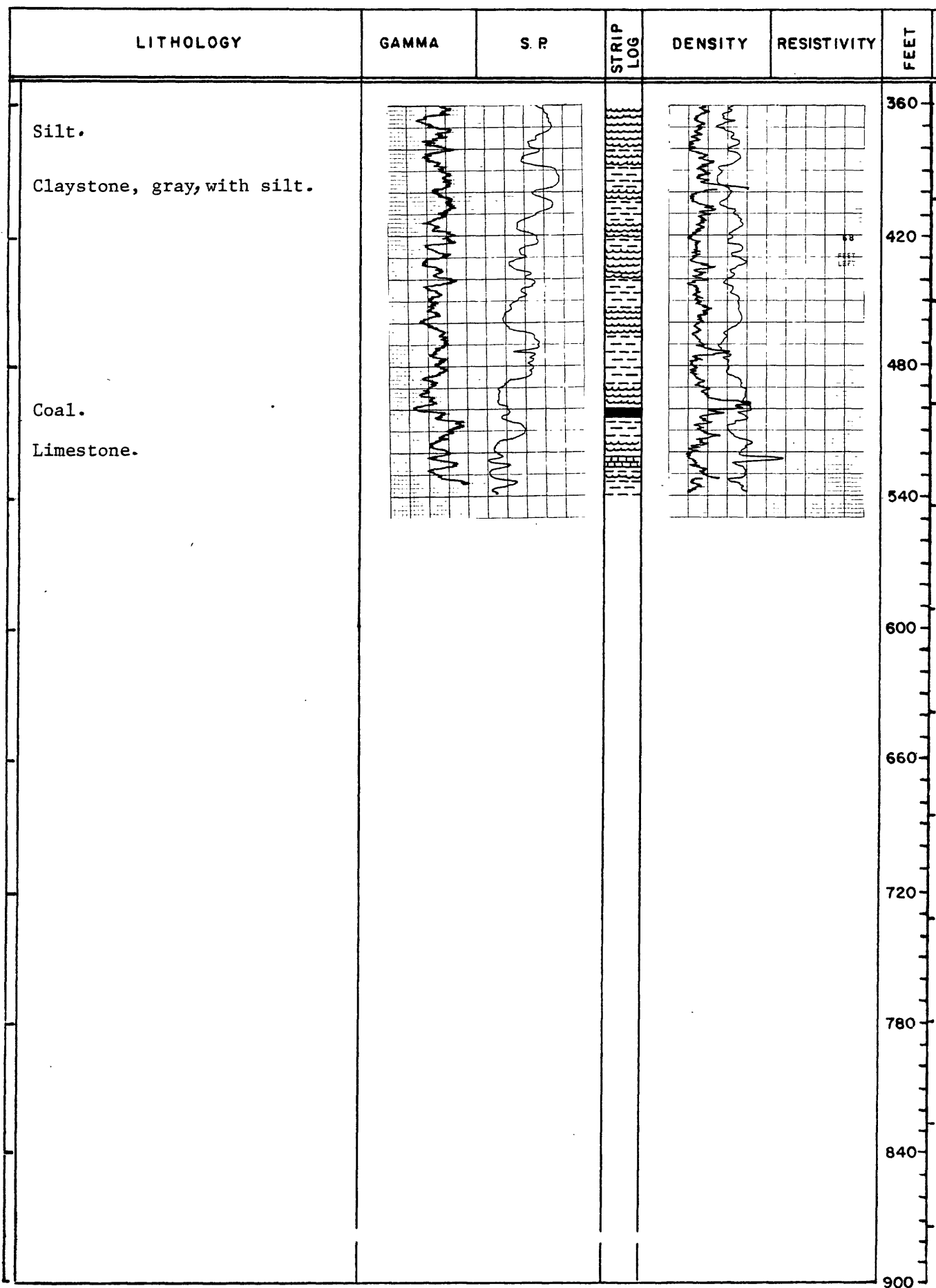
RECORDED BY <u>W Jackson</u> GEOLOGIST ^{NOX} YES		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S P SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>	DEPTH
	LOGGED DEPTHS			LOGGED DEPTHS		FEET
	FT.	FT.		FT.	FT.	
Sandstone, fine, buff to tan.						50
						0
						50
						100
Sandstone, fine; some carbonaceous clay.						150
Sandstone, fine, brown to tan; claystone, buff, and sandstone, fine.						200
Sandstone, fine to very fine.						250
						300
						350

Hole No: US-80045 Map BLM Richey NE31 Date: 3/25/80 State: Montana County: Dawson
 Elev.: _____ FT. Location: T 22 S R 51 E Sec 22 Tract AAAA Drilled depth 260 FT.
 Measured: 230 FT. ^{FNL} 60 FT. ^{FEL} _____ FT. Hole size: 5 1/2 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: E-log run on a sepearte chart: no elevation available.

RECORDED BY <u>J Hargas</u> ^{NO} GEOLOGIST ^{YES}		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500/100</u>	DEPTH
	LOGGED DEPTHS <u>254</u> FT. <u>250</u> FT.		FEET
	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	
	LOGGED DEPTHS <u>258</u> FT. <u>250</u> FT.		
Silt, brown; gravel. Sandstone, brown; siltstone, brown, and claystone, brown. Sandstone, gray; siltstone, gray, and claystone, gray. Shale, dark-brown, carbonaceous. Coal, with claystone parting. Shale, dark-brown, carbonaceous. Sandstone, gray, and siltstone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray. Coal. Sandstone, gray; siltstone, gray, and claystone, gray.			

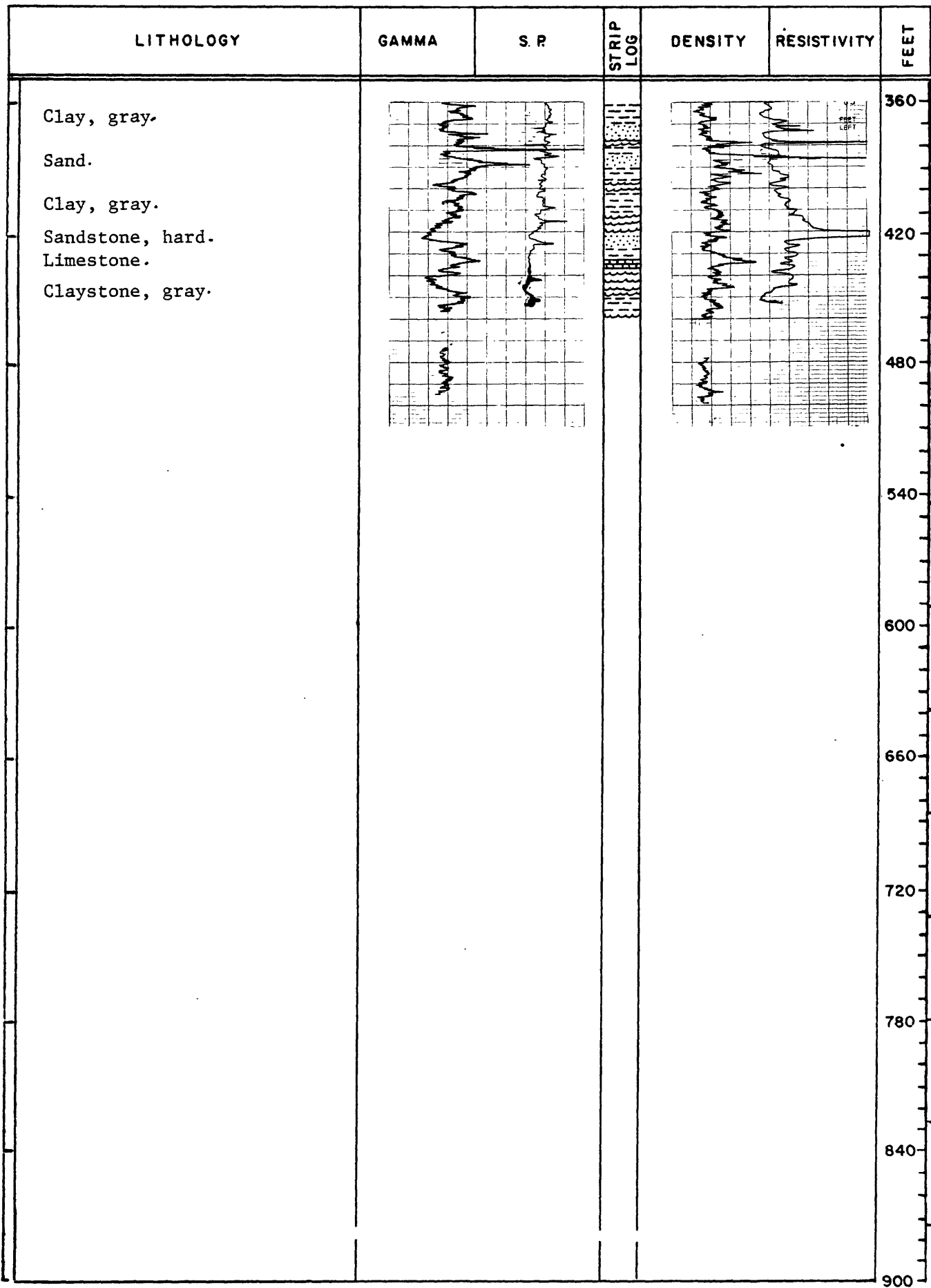
Hole No US-80046 Map: BLM NE 31 Richey Date: 3/26/80 State: Montana County: Dawson
 Elev.: _____ FT. Location: T22 ^N R51 ^E W, Sec 30 Tract AAAA Drilled depth 540 FT.
 Measured: 200 FT. ^{FNL} ~~X90~~ ^{FEL} ~~100~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP and resistivity on a separate chart; no elevation available.

RECORDED BY <u>W. Jackson</u> GEOLOGIST X06 YES		RECORDED BY <u>J. Hargis</u>		RECORDING SPEED <u>20</u> FT. MIN.
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>526</u> FT. <u>539</u> FT.		LOGGED DEPTHS <u>539</u> FT. <u>539</u> FT.	
	STRIP LOG			DEPT FEET
Clay, buff to tan. Sandstone, fine, with some siltstone. Claystone, gray, and sandstone. Clay, carbonaceous, gray. Coal. Silt with clay. Coal. Silt with clay. Sand with clay, Clay, gray, Sand with silt. Claystone, gray. Sand with silt.				60 0 60 120 180 240 300 360



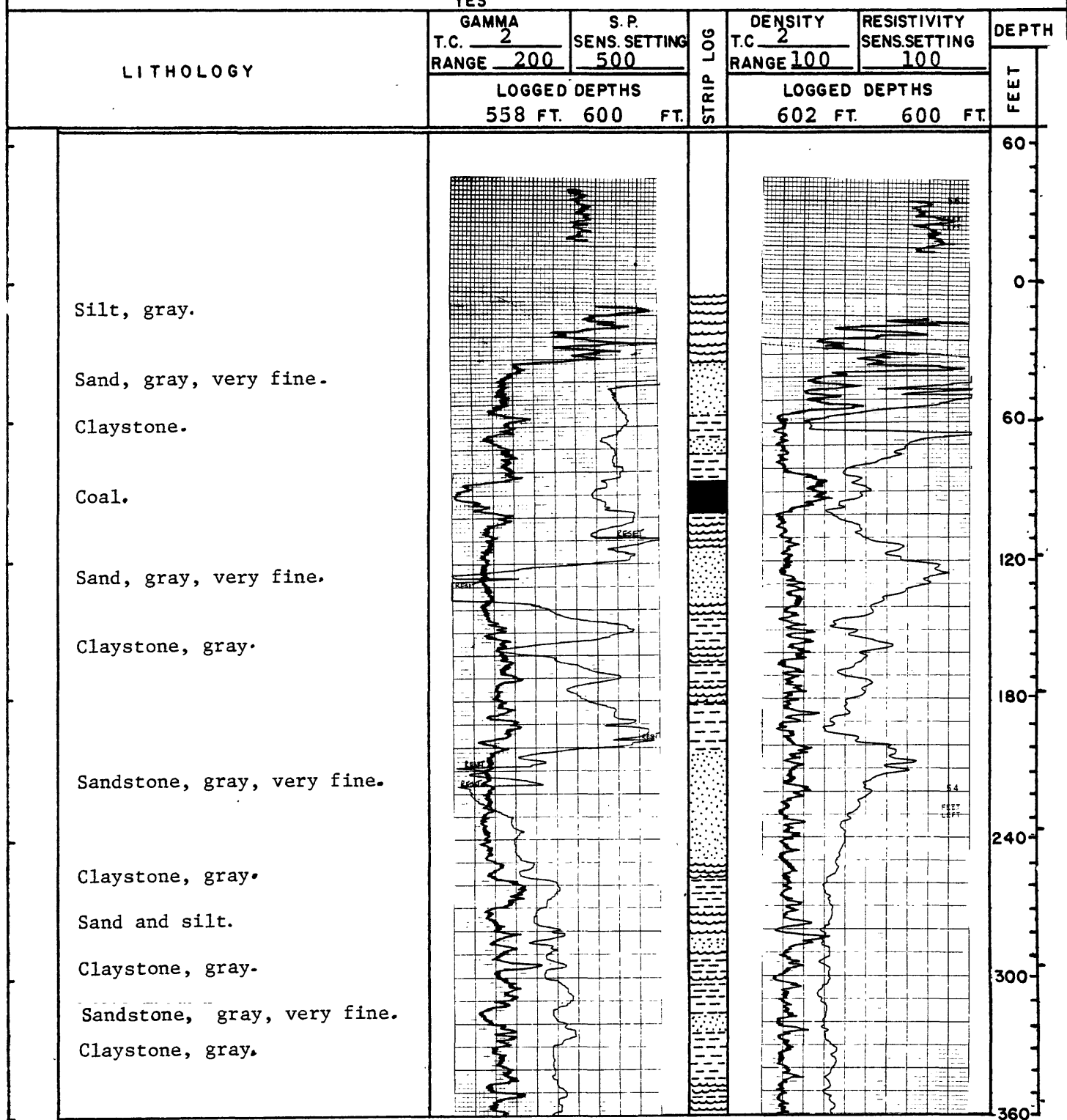
Hole No. US-80047 Map BLM Richey NE 3 Date: 3/26/80 State: Montana County: Dawson
 Elev.: _____ FT. Location: T 22^N R 52^E W, Sec 34 Tract AAAC Drilled depth _____ 460 FT.
 Measured: 400 FT. ~~xxx~~^{FNL} 600 FT. ~~xxx~~^{FEL} FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Top 116' of density at TC 2, range 200; No elevation available.

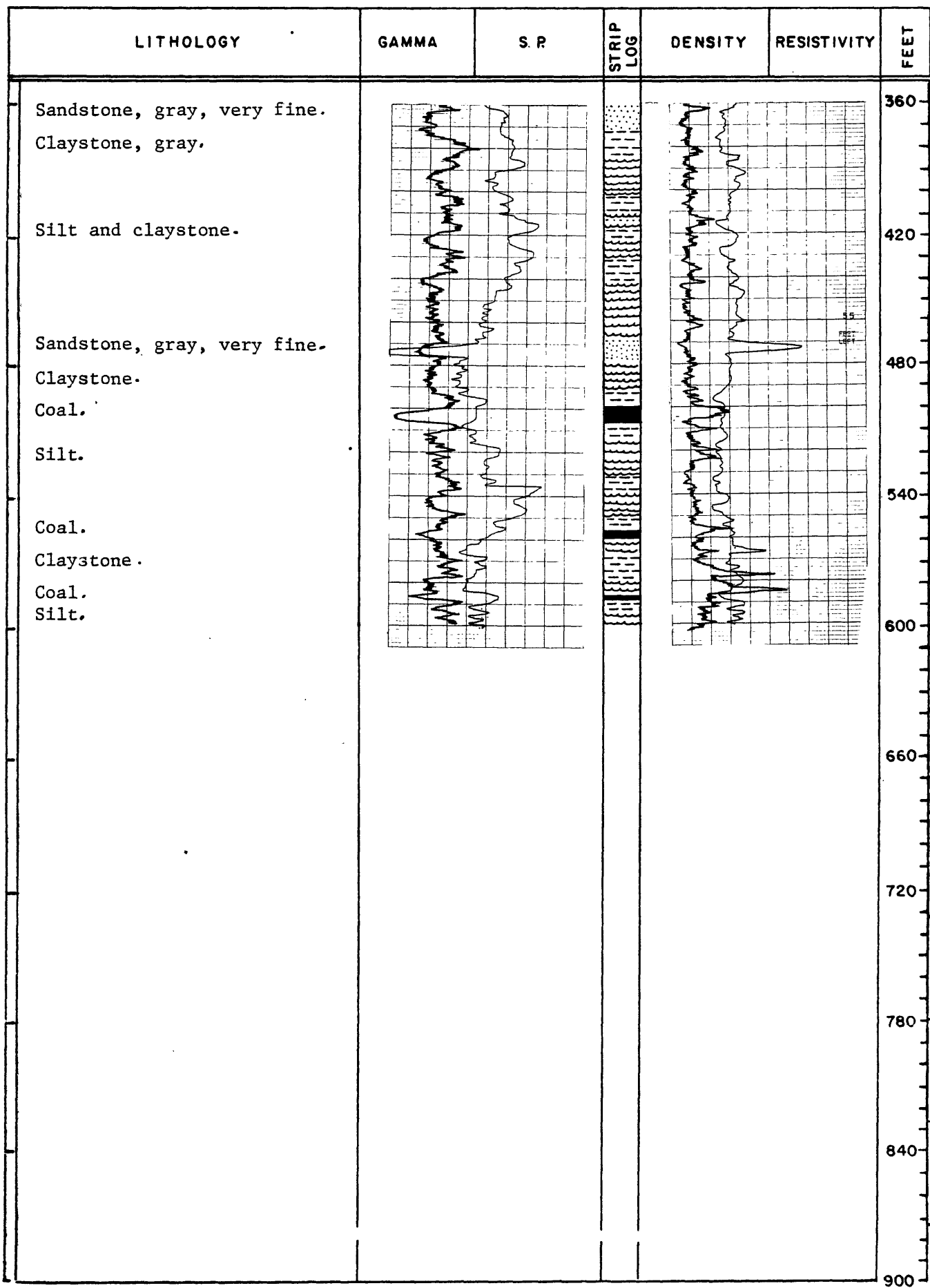
RECORDED BY <u>W Jackson</u> GEOLOGIST YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>500</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	
	LOGGED DEPTHS 456 FT. 454 FT.			LOGGED DEPTHS 460 FT. 454 FT.		
	DEPTH FEET			DEPTH FEET		
Clay, brown.						60
Silt, tan.						0
Clay, dark-brown.						60
Coal.						120
Clay and silt.						180
Coal with clay; gray parting.						240
Clay, gray.						300
Sand.						360
Coal.						
Shale, carbonaceous,						
clay, gray.						
Silt.						
Coal.						
Sand.						
Coal.						



Hole No: US-80048 Map: Clay Butte Date: 4/2/80 State: Montana County: Richland
 Elev.: 2765 FT. Location: T22 ^N ~~S~~ R 53 ^E ~~W~~, Sec 34 Tract CCDB Drilled depth 620 FT.
 Measured: 500 FT. FSL 1000 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Separate E log run; interference in spontaneous potential.

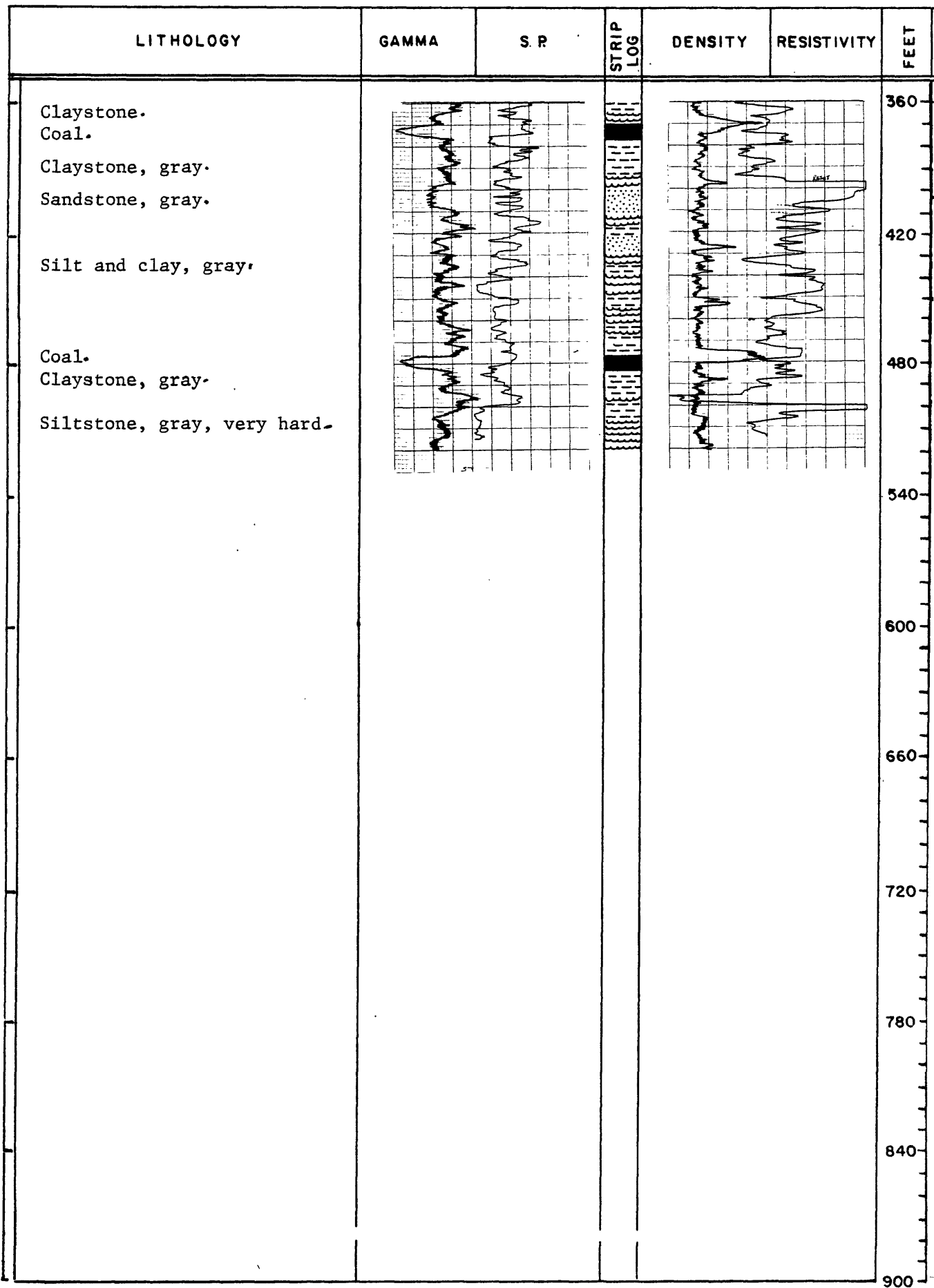
RECORDED BY R Patterson GEOLOGIST ^{NGK} YES RECORDED BY J Mangas RECORDING SPEED 20 FT. MIN.












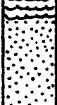



Hole No: US-80049 Map: Kuester Lake Date: 4/2/80 State: Montana County: Richland
 Elev.: 2680 FT. Location: T 22 ^N R 53 ^E ^W, Sec 28 Tract BBBB Drilled depth 520 FT.
 Measured: 600 FT. ^{FNL} ~~200~~ FT. ^{PWL} ~~200~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP and resistivity run on a sepearte chart.

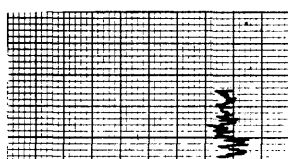

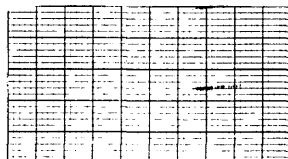
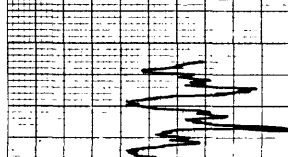
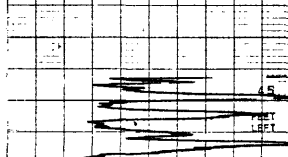
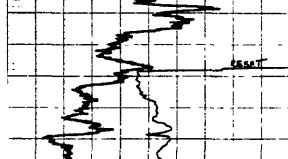
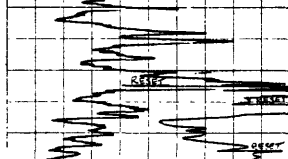
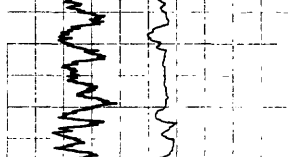
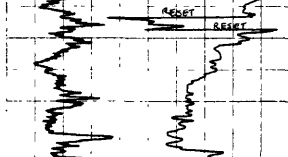
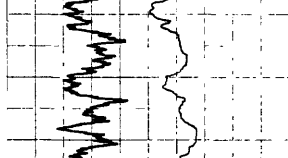
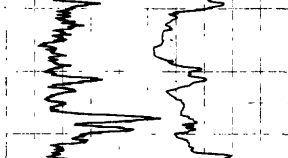
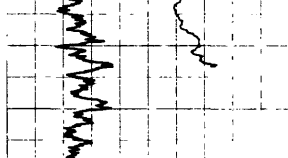
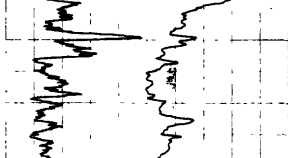
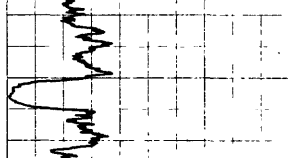
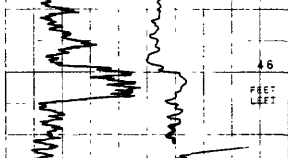
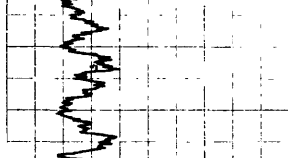
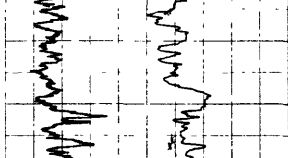
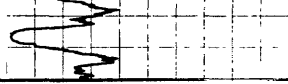
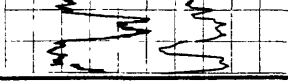
RECORDED BY <u>R Patterson</u> GEOLOGIST NO YES		RECORDED BY <u>Hangas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>519</u> FT. <u>516</u> FT.			LOGGED DEPTHS <u>520</u> FT. <u>516</u> FT.	
	DEPTH FEET				
Soil. Alluvium. Sandstone, light-brown, very fine. Coal. Siltstone, gray- Claystone, gray- Coal. Claystone, light-gray- Siltstone, gray- Sandstone, gray, very fine. Claystone. Claystone.					60 0 60 120 180 240 300 360

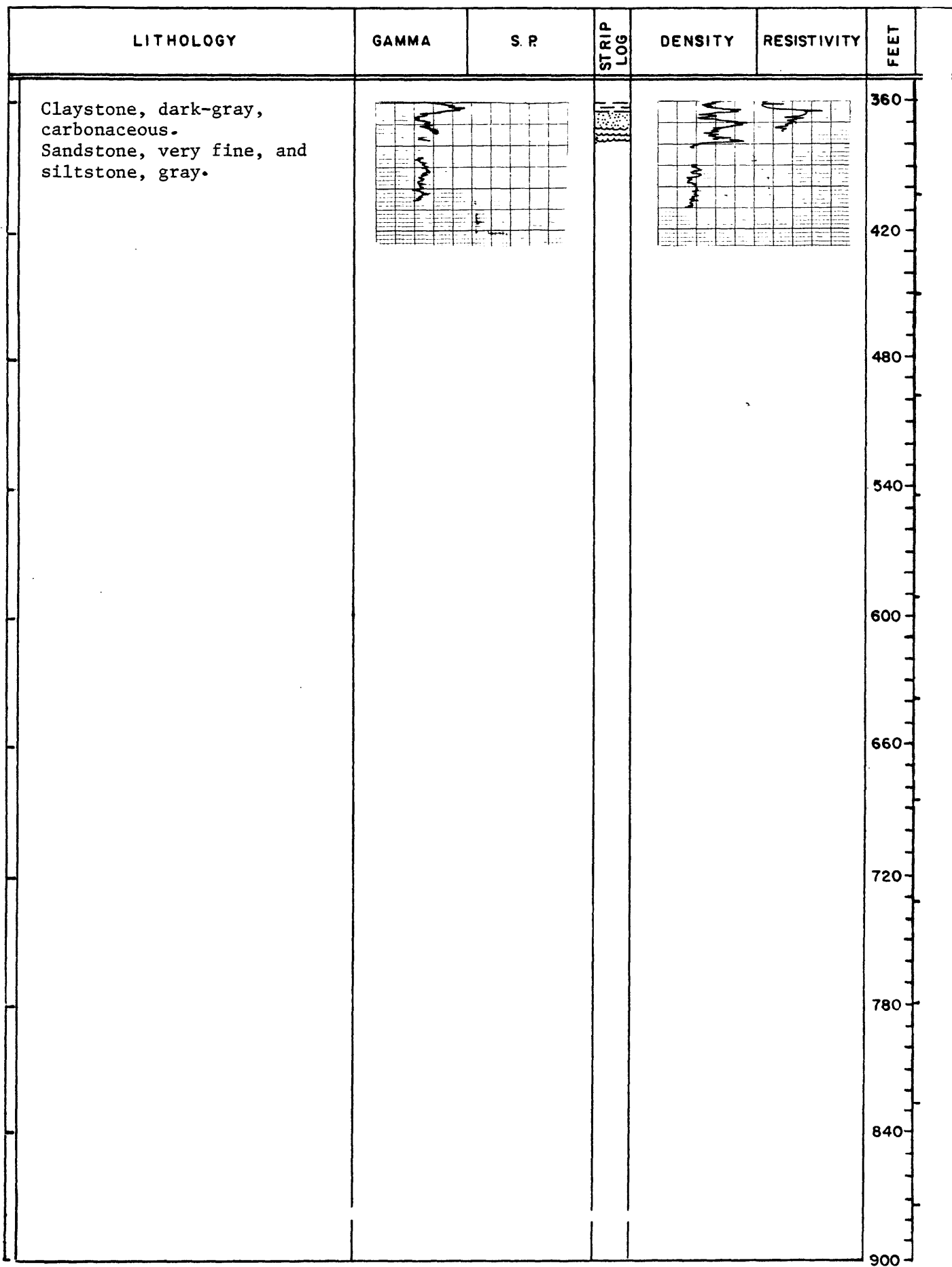


Hole No: US-80050 Map: Enid SE Date: 4/2/80 State: Montana County: Dawson
 Elev.: 2770 FT Location: T 21^N R 54^E, Sec 26 Tract BBBB Drilled depth 300 FT.
 Measured: 35 FT. ^{ENL} 25 FT. ^{PEX} FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole caved in so no logs and no T. D.

RECORDED BY <u>R Patterson</u> GEOLOGIST <input checked="" type="checkbox"/>		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S P SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>	DEPTH
	LOGGED DEPTHS			LOGGED DEPTHS		FEET
	FT.	FT.		FT.	FT.	
Gravel.						50
Claystone, light-brown.						0
Sandstone, gray, very fine.						50
Claystone, gray.						100
Sandstone, gray, very fine.						150
Claystone, blue-gray.						200
Claystone, gray.						250
Claystone, gray; some coal.						300
Coal.						350
Claystone, dark-gray, carbonaceous, and claystone, gray.						
Sandstone, gray, fine.						

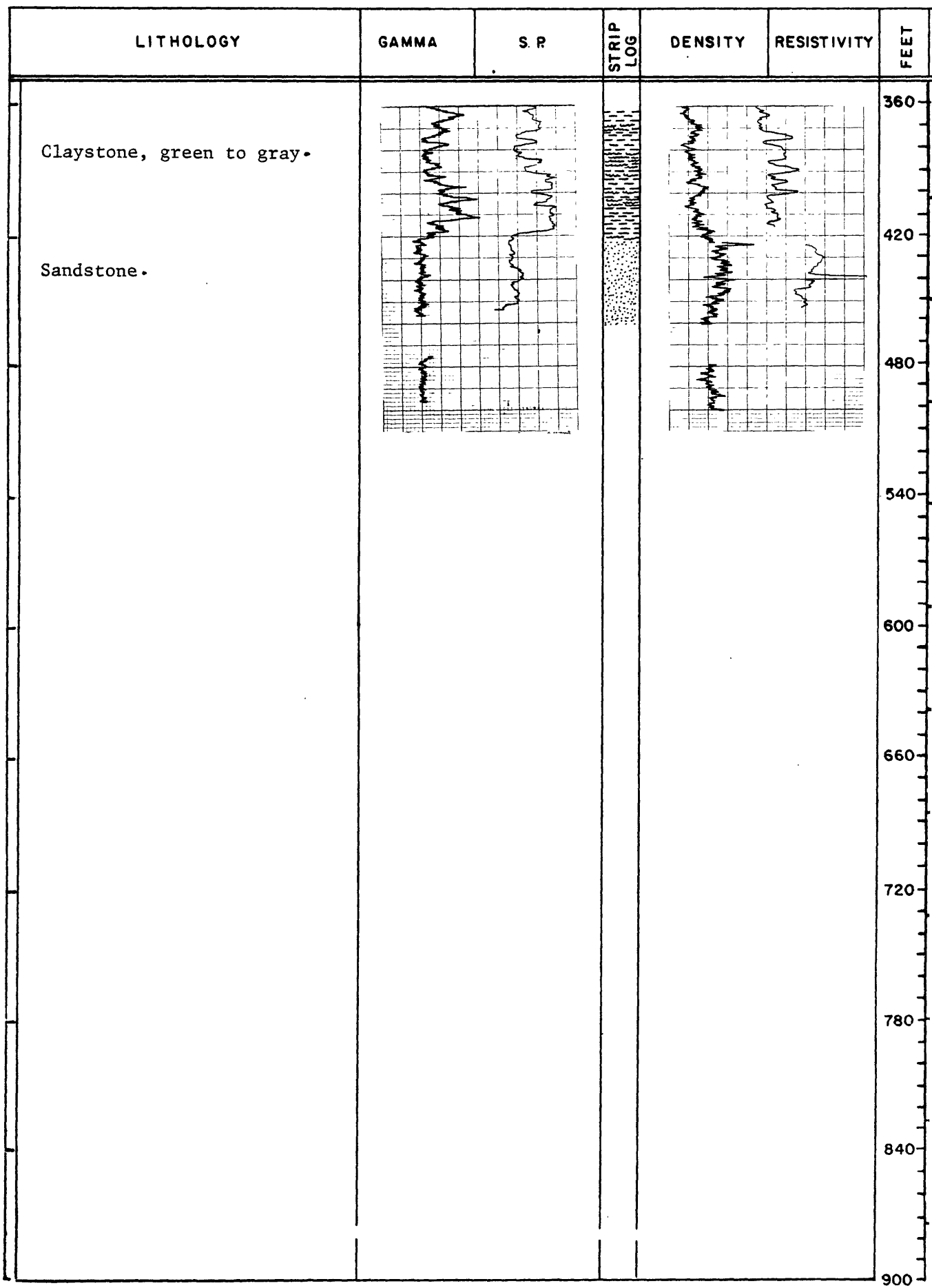
Hole No: US-80051 Map: Kuester Lake Date: 4/3/80 State: MT County: Richland
 Elev.: 2560 FT. Location: T22N R 53E Sec 8 Tract ABBC Drilled depth 380 FT.
 Measured: 500 FT. FNL 2500 FT. FEI FT. Hole size: 5 1/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: S? was run on a separate run; surface rerun gamma, density.

RECORDED BY <u>R. Patterson</u> GEOLOGIST		NO YES		RECORDED BY <u>J. Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2 S</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH	
	LOGGED DEPTHS 377 FT. 207 FT.			LOGGED DEPTHS 380 FT. 374 FT.		FEET	
Siltstone, light-brown, and claystone. Siltstone.						60	
Sandstone, gray, very fine.						0	
Claystone, gray, carbonaceous.						60	
Sandstone, gray, and siltstone, gray.						120	
Claystone, gray, carbonaceous.						180	
Coal.						240	
Siltstone, gray.						300	
Coal.						360	
Claystone, gray.							
Siltstone, gray.							
Claystone, dark-gray, carbonaceous.							
Coal.							
Sandstone and siltstone.							
Sandstone, gray.							
Coal, with siltstone parting.							

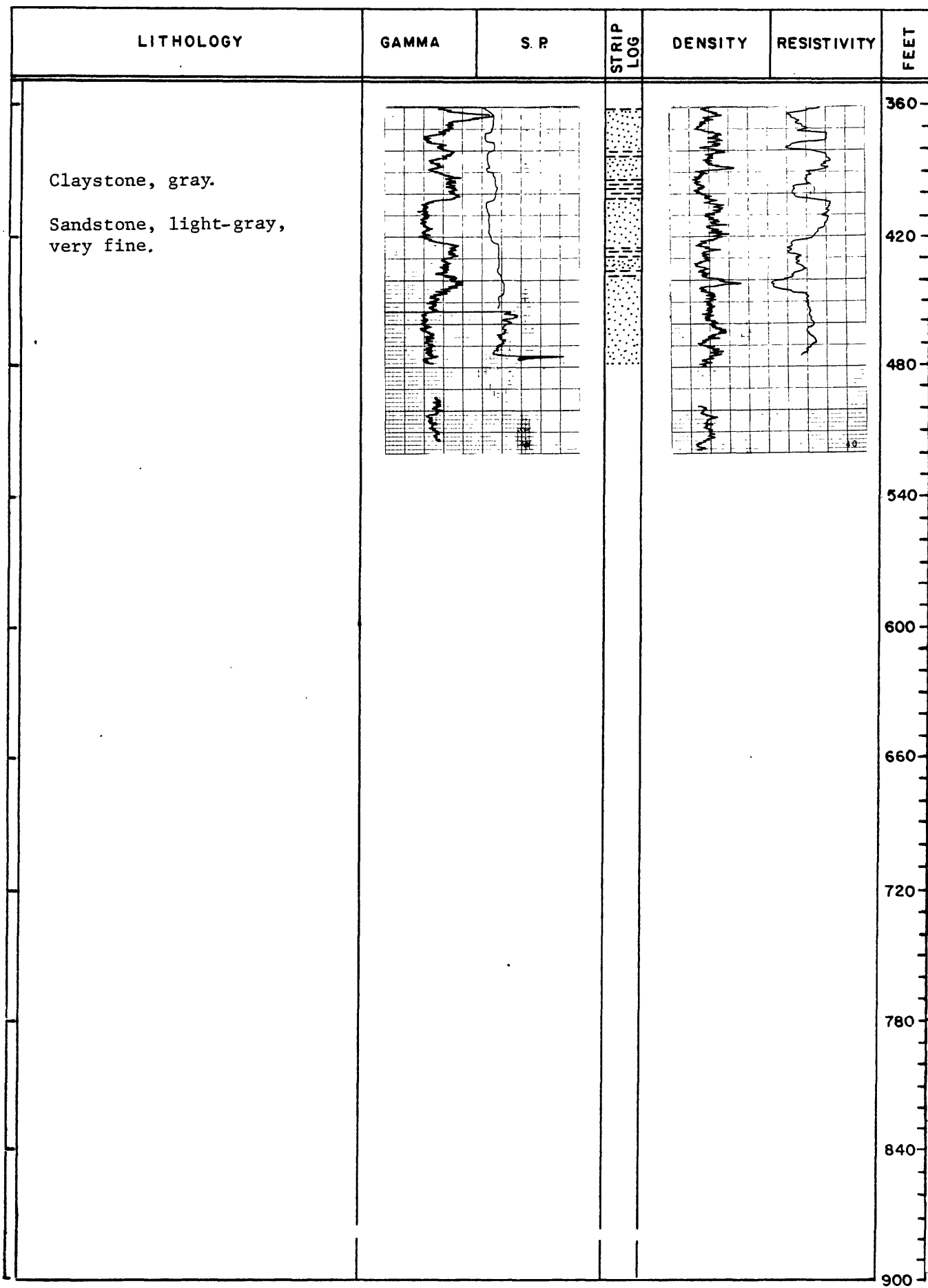


Hole No: US-80052 Map: Kuester Lake Date: 4/3/80 State: MT County: Dawson
 Elev.: 2595 FT. Location: T 22^N R 52^E Sec 24 Tract ABBA Drilled depth 460 FT.
 Measured: 120 FT. FNL 2200 FT. FEEL 2200 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: 3P done on a sererate run.

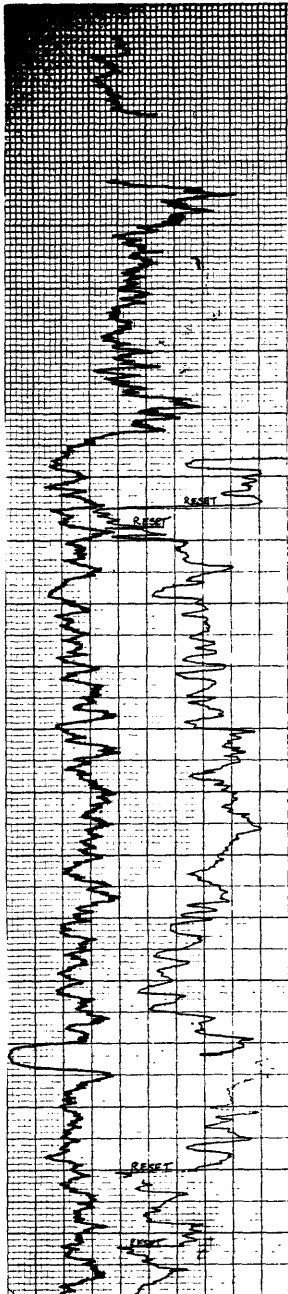

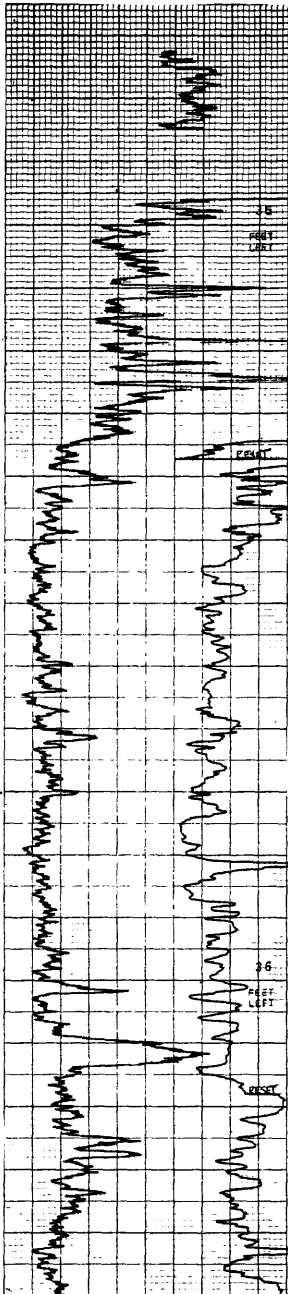
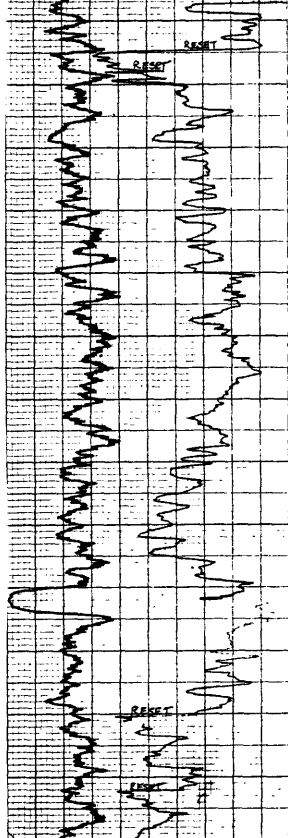

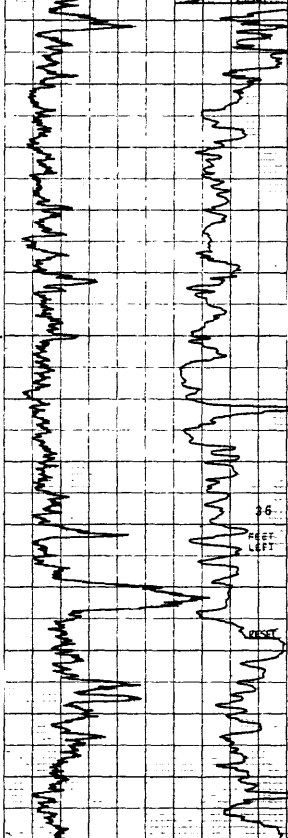
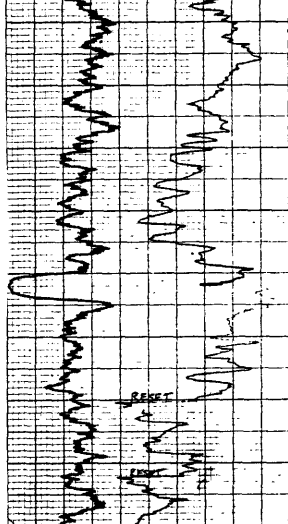

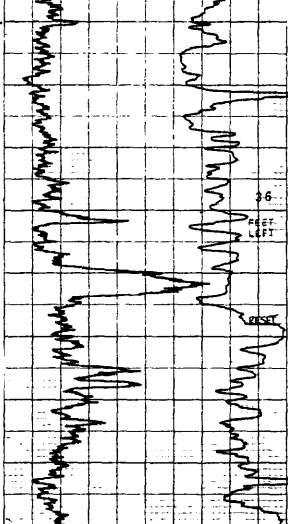
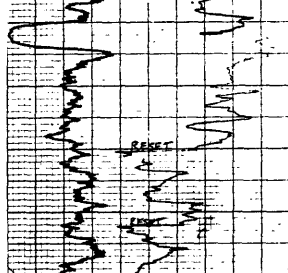

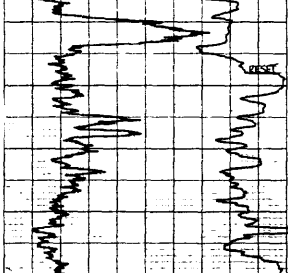


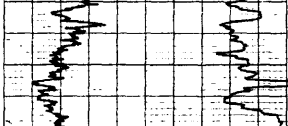
RECORDED BY <u>J. Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DENSITY T.C. <u>2</u> RANGE <u>100</u>
	LOGGED DEPTHS <u>456</u> FT. <u>454</u> FT.		RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>460</u> FT. <u>453</u> FT.		DEPTH FEET
Silt, yellow-brown. Silt, tan. Claystone, gray. Coal, with claystone parting. Claystone, gray-brown. Siltstone. Coal. Claystone, gray. Claystone, gray. Sand, gray, very fine. Claystone, gray, with carbonaceous shale. Coal. Claystone, gray, carbonaceous, claystone. Sandstone. Claystone, brown. Coal. Siltstone. Coal. Coal.	STRIP LOG		

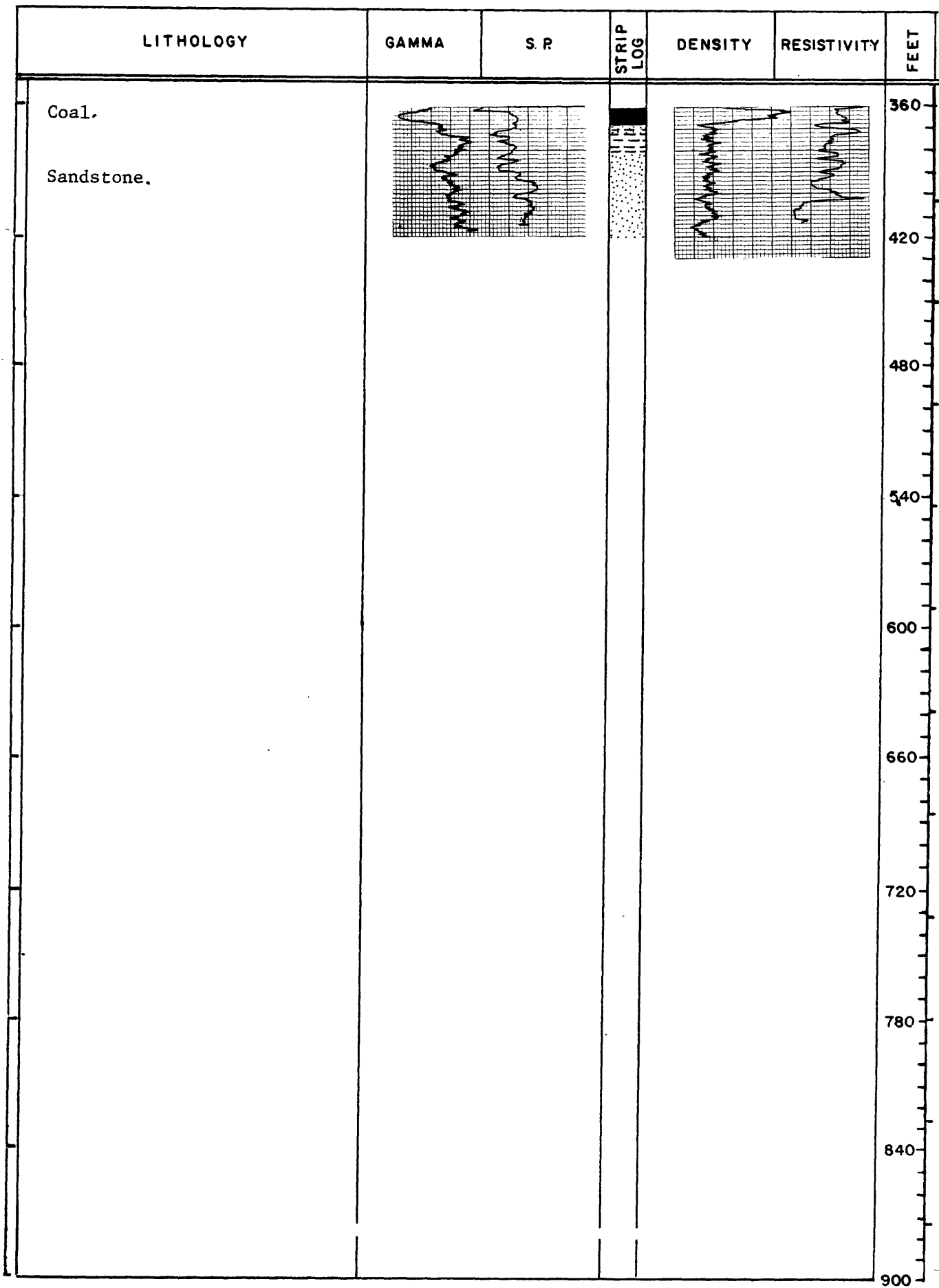


RECORDED BY <u>R, Patterson</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS 478 FT. 475 FT.			LOGGED DEPTHS 480 FT. 475 FT.	
				DEPTH FEET	
Sand, light-brown, very fine.				60	
Claystone, gray.				0	
Sandstone, light-gray, very fine.				60	
				120	
				180	
Coal.				240	
Coal.				300	
Coal.				360	



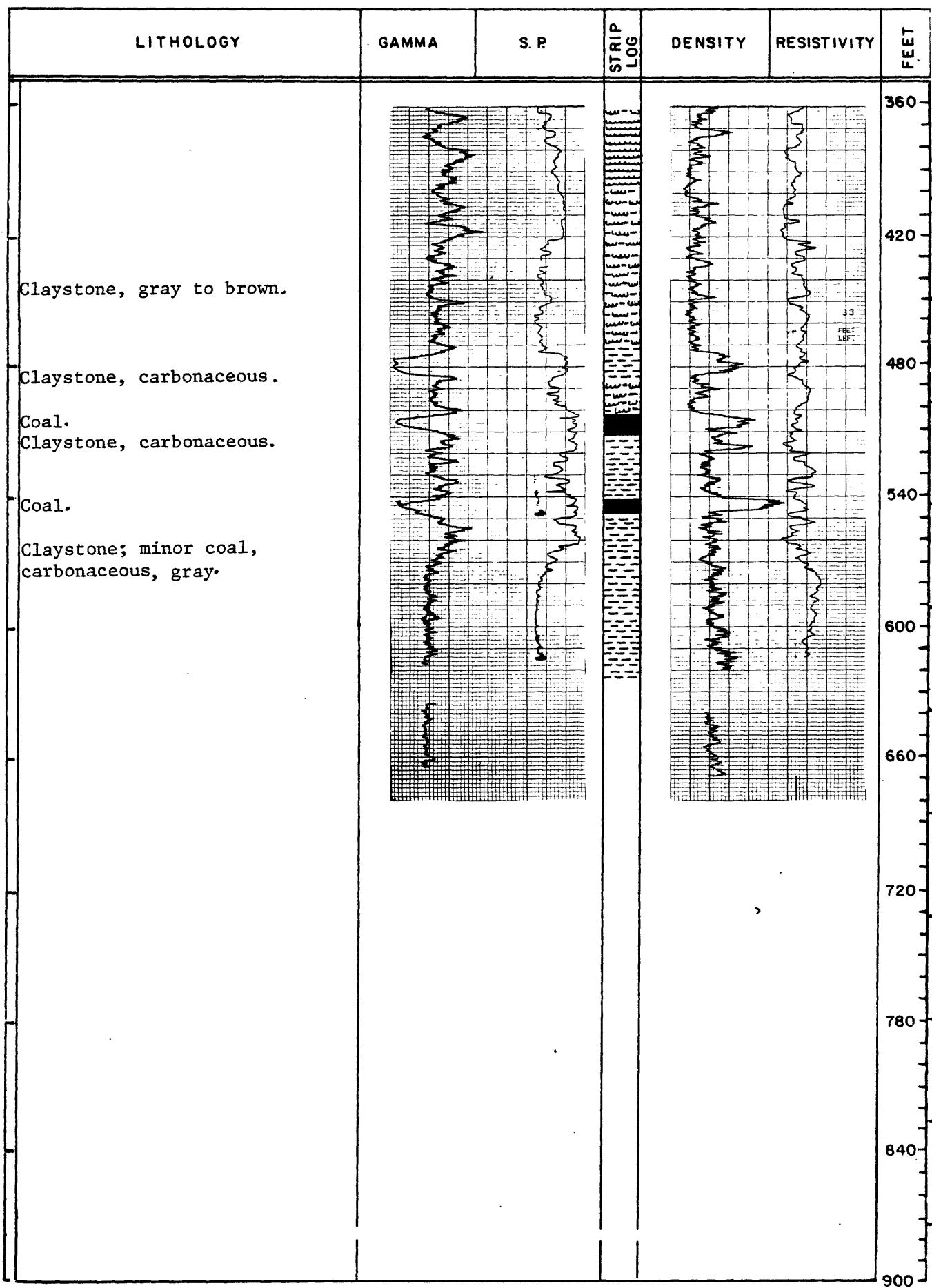
Hole No US-80054 Map: Kuester Lake Date: 4/3/80 State: MT County: Richland
 Elev.: 2558 FT. Location: T 22^N R 53^E, Sec 14 Tract BBCD Drilled depth 420 FT.
 Measured: 100 FT. ~~FNL~~ 000 FT. ~~FWL~~ 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP done on seperate run.

RECORDED BY <u>R Patterson</u> GEOLOGIST NO YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS <u>417</u> FT. <u>415</u> FT.			LOGGED DEPTHS <u>420</u> FT. <u>414</u> FT.		
	Sandstone, light-brown; minor coal					
Claystone, gray.						120
Sandstone, gray, very fine.						180
Coal.						240
Claystone.						300
						360



Hole No: US-80055 Map: Enid Date: 4/4/80 State: MT County: Richland
 Elev.: 2630 FT. Location: T22N R54E Sec 18 Tract DBBD Drilled depth 620 FT
 Measured: 2000 FT. FSL 2000 FT. 2000 FT. Hole size: 3 1/2 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP run sepearte; rerun of gamma, density from 120'; first 100' density run at TC 200 Range 2

RECORDED BY <u>J Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 617 FT. 614 FT.		FEET
	DENSITY T.C. <u>2</u> RANGE <u>100</u>		RESISTIVITY SENS. SETTING <u>100</u>
LOGGED DEPTHS 620 FT. 614 FT.		FEET	
Coal.			60
Claystone, gray, carbonaceous.			0
Claystone, gray to brown.			60
Coal.			120
Coal.			180
Siltstone, very sandy.			240
Claystone, gray,			300
			360



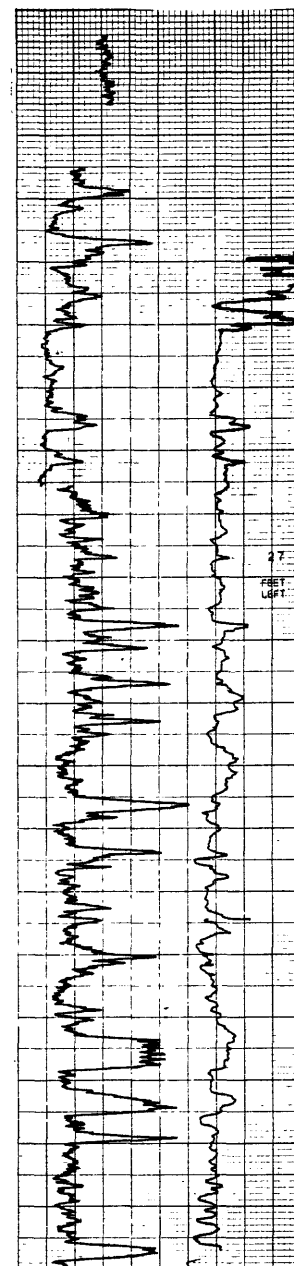
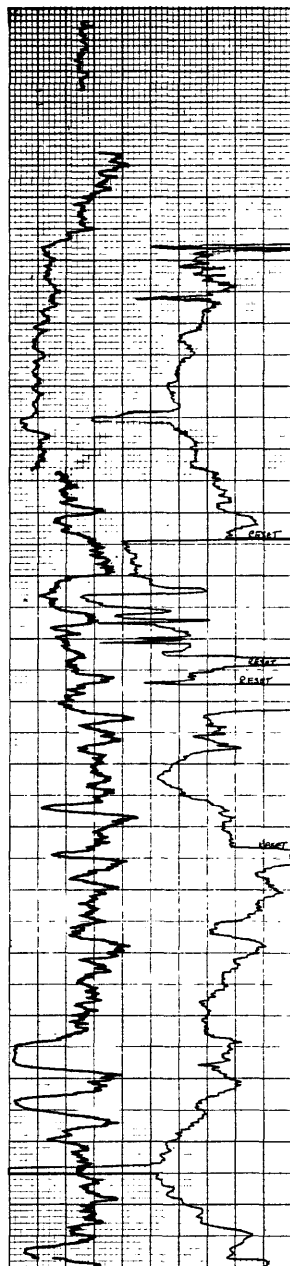
Hole No: US-80056 Map: Enid Date: 4/4/80 State: MT County: Richland
 Elev.: 2448 FT. Location: T 22^N R 54^E S 4 Tract DDAA Drilled depth 440 FT.
 Measured: 102 FT. FSL 30 FT. FWL FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP sepearte run; top 106' of gamma at range 500 TC 2 top 110 density at range 200 TC 2

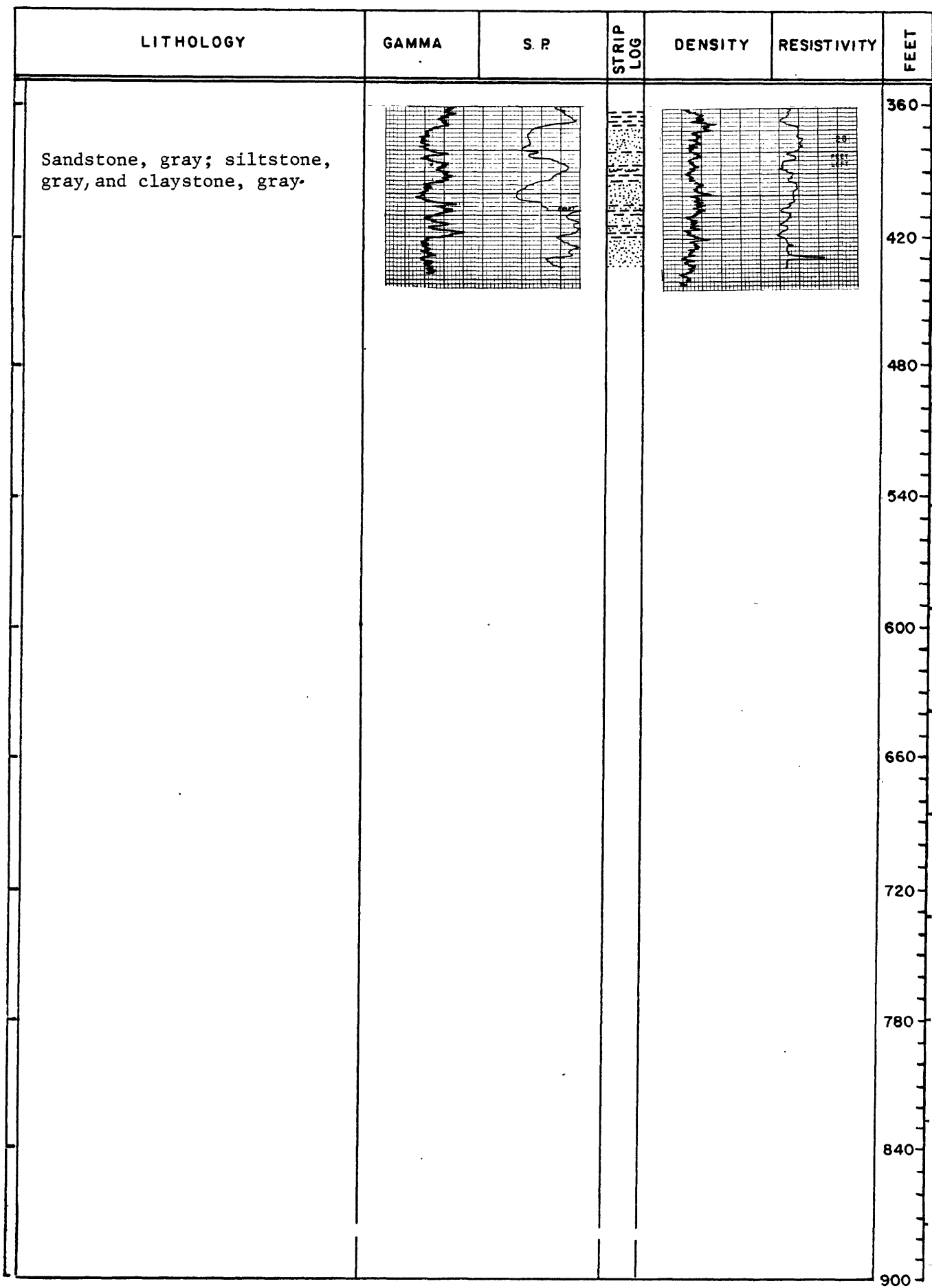
RECORDED BY R Patterson GEOLOGIST NO YES RECORDED BY Hangas RECORDING SPEED 20 FT. MIN.

LITHOLOGY	GAMMA		S.P.	STRIP LOG	DENSITY		RESISTIVITY		DEPTH FEET
	T.C.	2	SENS. SETTING		T.C.	2	SENS. SETTING	SENS. SETTING	
	RANGE	200	50		RANGE	100	100		
	LOGGED DEPTHS				LOGGED DEPTHS				
	437 FT. 434 FT.				442 FT. 434 FT.				

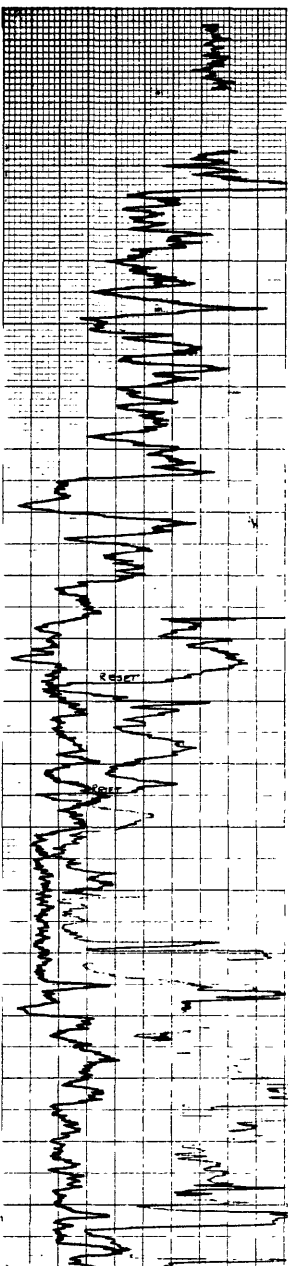

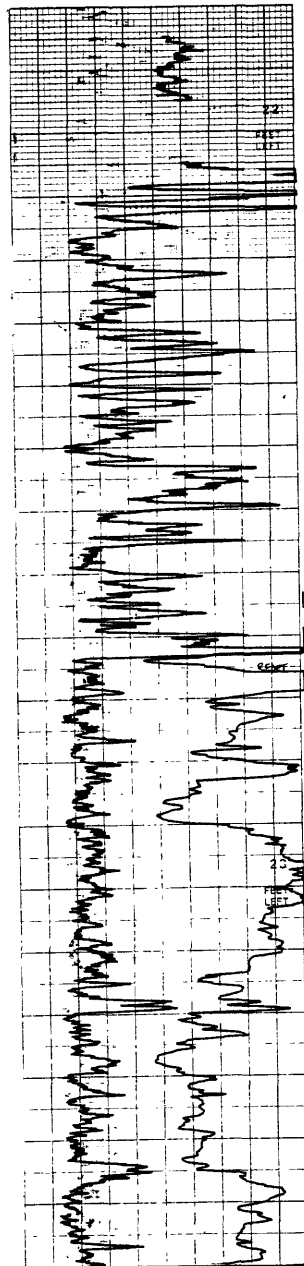
Sand, light-brown, fine.
 Sandstone, gray to brown;
 siltstone, gray to brown, and
 claystone, gray to brown.
 Sandstone, gray; siltstone,
 gray, and claystone, gray.
 Coal.
 Sandstone, gray; siltstone,
 gray, and claystone, gray.
 Coal; claystone, carbonaceous.
 Sandstone, gray; siltstone,
 gray, and claystone, gray.

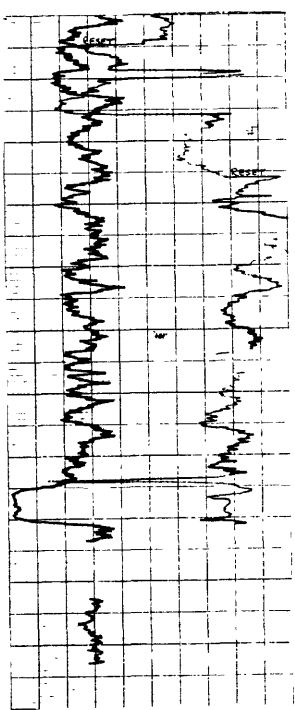

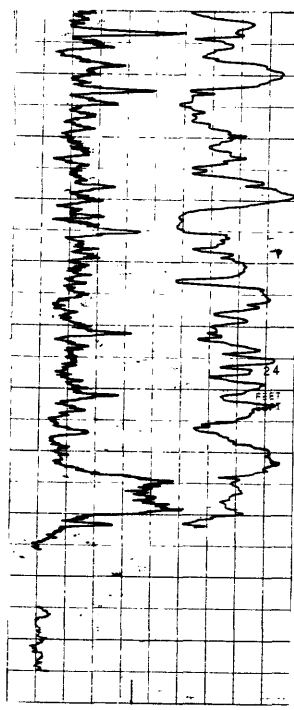
Coal.
 Coal.
 Sandstone, gray; siltstone,
 gray, and claystone, gray.
 Coal; claystone, carbonaceous.
 Coal.
 Claystone, gray.
 Coal.
 Sandstone, gray; siltstone,
 gray, and claystone, gray.
 Coal.



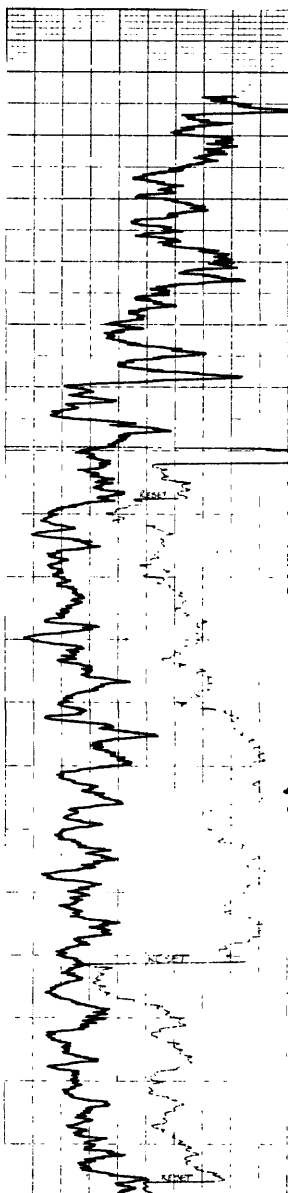

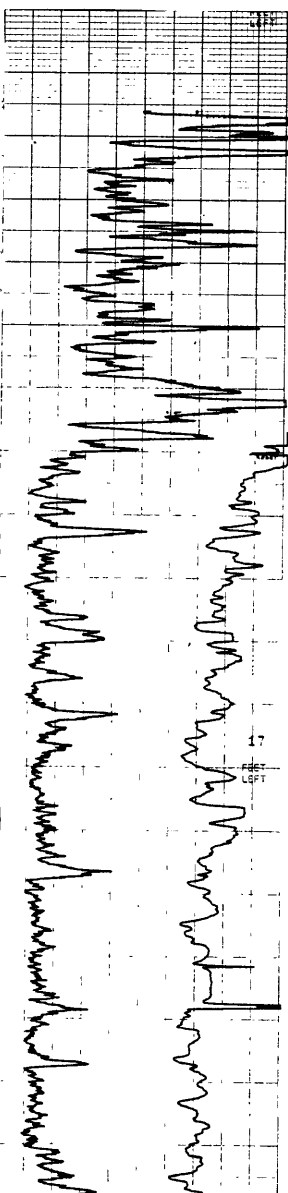


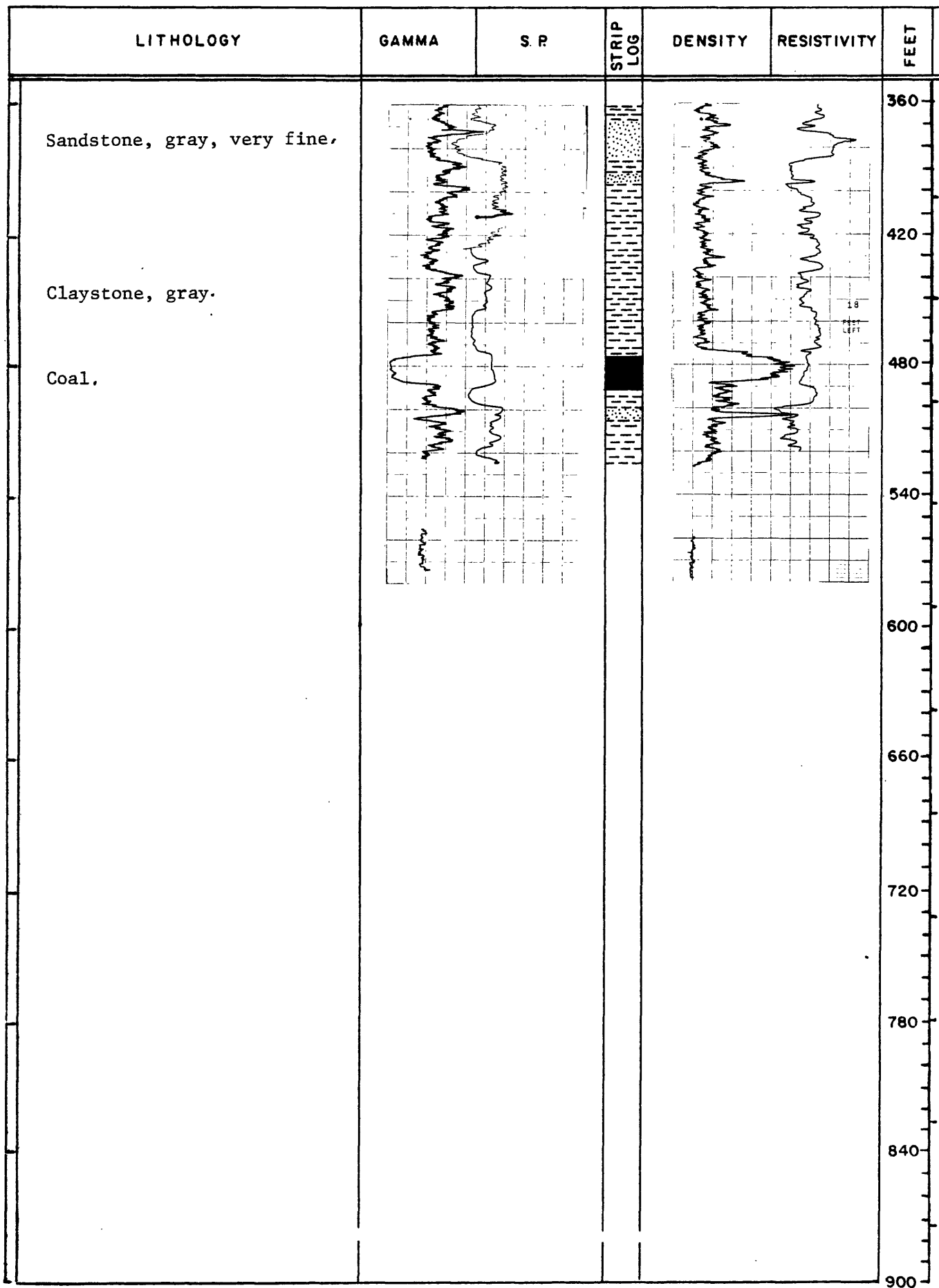
Hole No: US-80057 Map: Enid Date: 4/4/80 State: MT County: Richland
 Elev.: 2555 FT. Location: T 22 ^N R 54 ^E Sec 28 Tract ACAD Drilled depth 540 FT.
 Measured: 1800 FT. ^{FNL} 1600 FT. ^{FEL} FT. Hole size: _____ IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: SP run seperate

RECORDED BY <u>J Hargas</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>50</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>50</u>	DEPTH
	LOGGED DEPTHS <u>527</u> FT. <u>522</u> FT.			LOGGED DEPTHS <u>531</u> FT. <u>524</u> FT.		FEET
Sand, light-brown, very fine.						60
Clay and claystone.						0
Coal.						60
Claystone, gray.						120
Coal.						180
						240
						300
Sand, gray.						360

LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	FEET
Clay, light-gray to blue.						360
Coal.						420
						480
						540
						600
						660
						720
						780
						840
						900


Hole No US-80058 Map: Fox Lake Date: 4/4/80 State: MT County: Richland
 Elev.: 2558 FT. Location: T 22^N R 54^E Sec 24 Tract BCAD Drilled depth 540 FT.
 Measured: 1800 FT. ^{FNL} 1800 FT. ^{FWL} FT. Hole size: 5 1/2 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>R Patterson</u> GEOLOGIST ³⁰⁰ YES		RECORDED BY <u>Hangas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS 523 FT. 525 FT.			LOGGED DEPTHS 526 FT. 520 FT.	
Coal.					
Sandstone, gray, very fine.					
Sandstone, gray, very fine.					
Claystone, gray.					
				60 0 60 120 180 240 300 360 FEET	



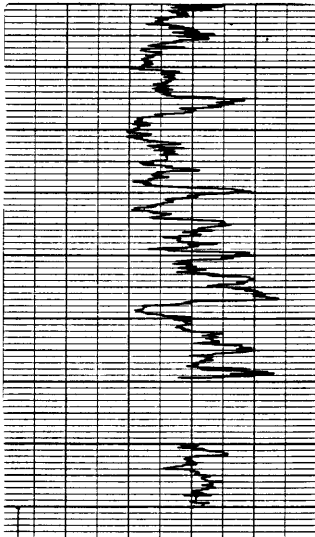
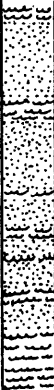
#190059

Hole No: US-80059 Map: Butler Table Date: 4/5/80 State: MT County: Dawson
Elev.: 2405 FT. Location: T21 ^N ^E R 55 ^W Sec 8 Tract CCDC Drilled depth 140 FT.
Measured: 300 FT. FSL 950 FT. FWL FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
Remarks: May be possible to drill, but caving in constantly; if repeated will
have to log thru pipe. No log.

RECORDED BY <u>J Hancas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>	DEPT FEET
	LOGGED DEPTHS			LOGGED DEPTHS		
	FT.	FT.		FT.	FT.	
						60
						0
						60
						120
						180
						240
						300
						360

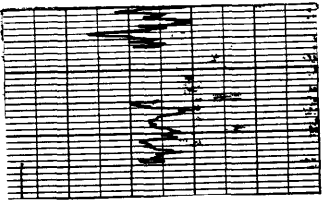

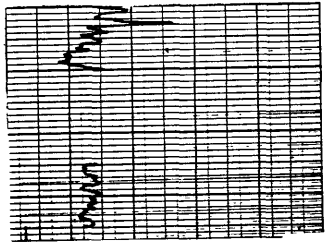
RECORDED BY R Patterson GEOLOGIST ☒ NO
YES RECORDED BY Hargis RECORDING SPEED 20 FT. MIN.

LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>		S.P. SENS. SETTING		STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>		RESISTIVITY SENS. SETTING		DEPTH FEET
	LOGGED DEPTHS					LOGGED DEPTHS				
	479 FT.		FT.			222 FT.		FT.		
Sand, light-brown, very fine.										60
Claystone, gray-										0
Sandstone, light-gray.										60
Claystone, gray.										
Sandstone, gray, very fine.										120
Claystone, gray, and sandstone, gray.										180
Claystone, gray.										240
Coal, with claystone parting.										300
Sandstone, gray, very fine.										360
Claystone, gray, carbonaceous.										

LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Sandstone, gray, very fine.						360
Claystone, gray.						420
Sandstone, with minor coal.						
Claystone, gray.						480
						540
						600
						660
						720
						780
						840
						900

Hole No: US-80061 Map: Butler Table Date: 4/5/80 State: MT County: Dawson
 Elev.: 2480 FT. Location: T 21^N R 55^E Sec 10 Tract DCAD Drilled depth 380 FT.
 Measured: 800 FT. PSL 1500 FT. ^{FEL} ~~FWL~~ FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: First 100' of gamma ran at TC 2, range 200

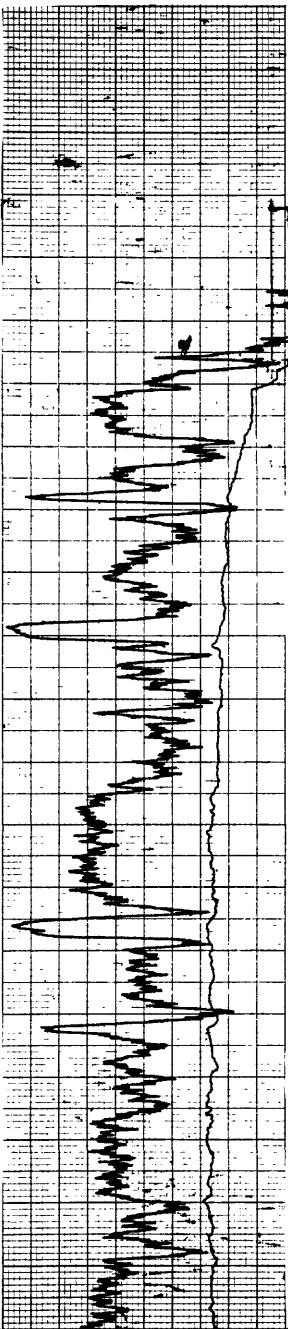

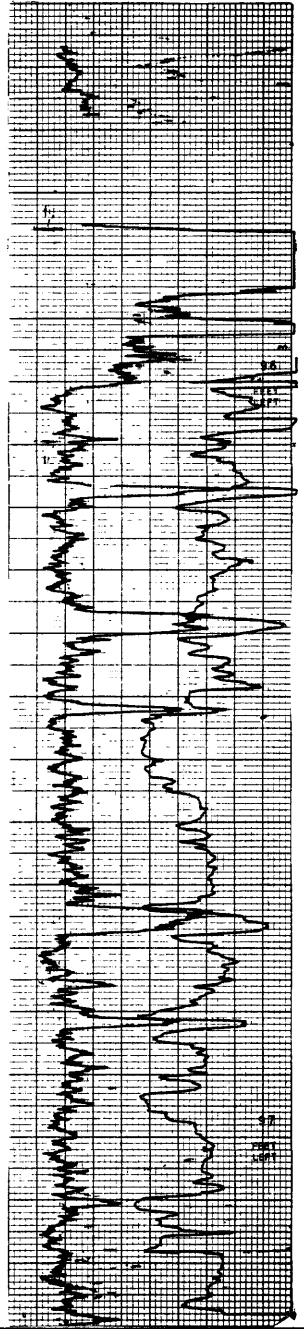
RECORDED BY <u>J Hangan</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>Hangan</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING
	LOGGED DEPTHS <u>372</u> FT.			LOGGED DEPTHS <u>380</u> FT.	
					DEPTH FEET
Sand, light-brown, very fine.					60
Sand, light-brown, very fine, with coal stringers.				0	
Sand, gray, very fine.				60	
Claystone, gray, with shale.				120	
Sand, gray.				180	
Coal.				240	
Shale.				300	
Coal.				360	
Claystone, gray, with shale.					
Sand, very fine.					
Claystone, gray.					
Shale.					
Sand, light-gray.					
Claystone, grading into shale.					
Coal.					
Shale, blue-gray.					

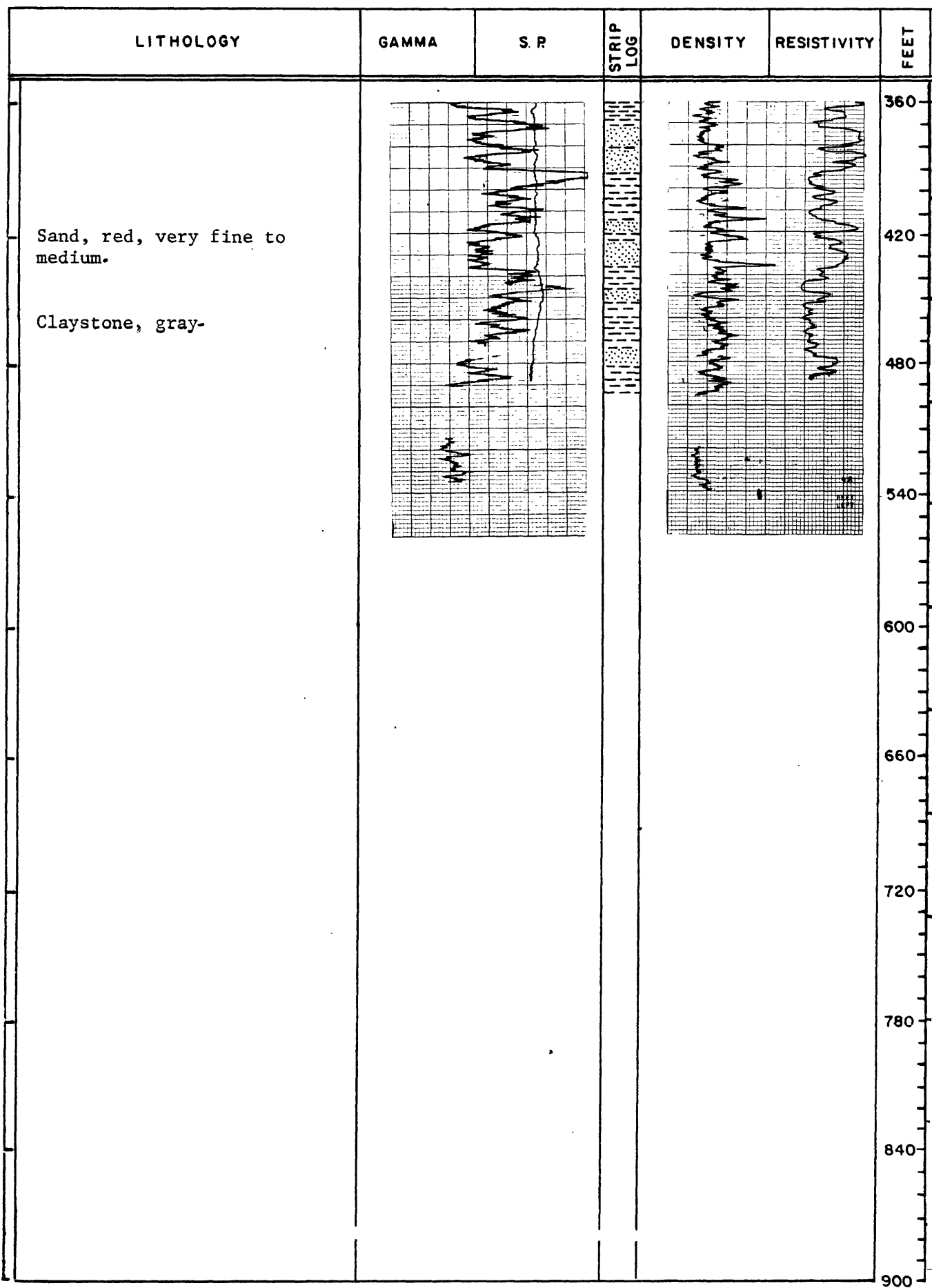
LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	FEET
Claystone, blue-gray. Shale.						360 420 480 540 600 660 720 780 840 900

Hole No: US-80062 Map: Butler Table Date: 4/5/80 State: MT County: Dawson
 Elev.: 2360 FT. Location: T 21^N~~S~~ R 55^E~~W~~ Sec 22 Tract AAAD Drilled depth 80 FT.
 Measured: 600 FT. ~~XXX~~ 10 FT. ~~XXX~~ FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No log.

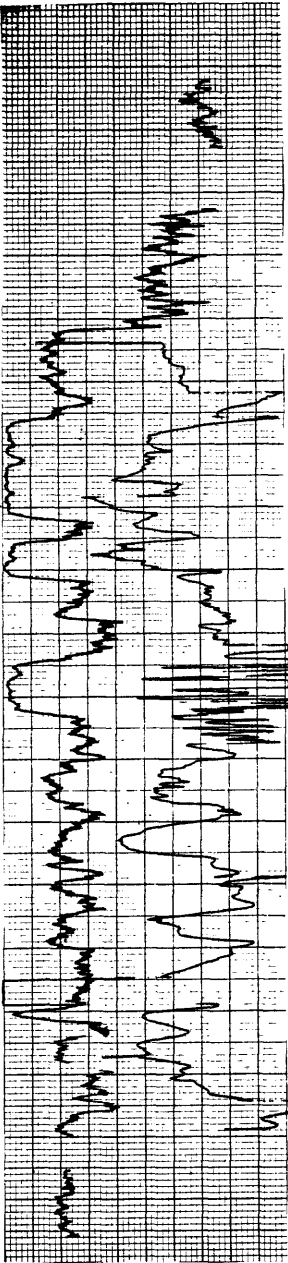

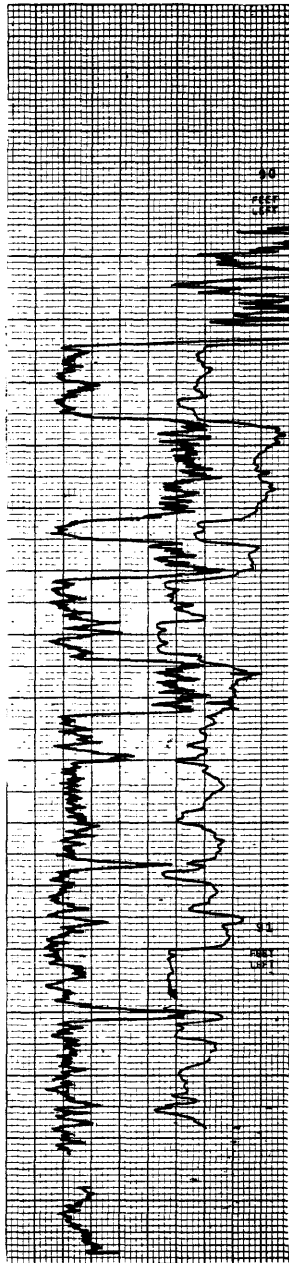
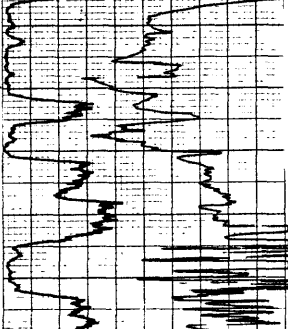

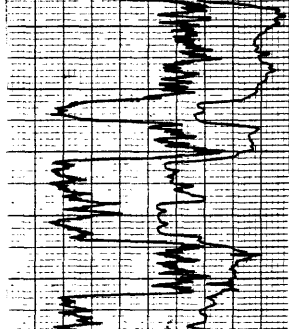
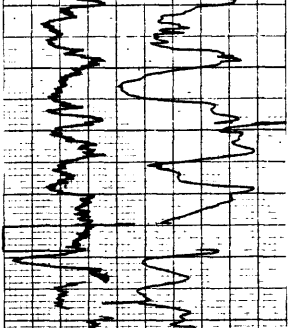

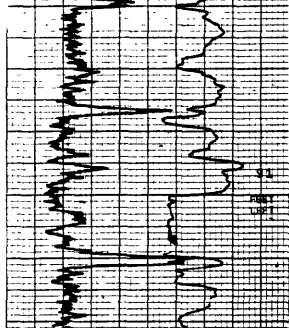
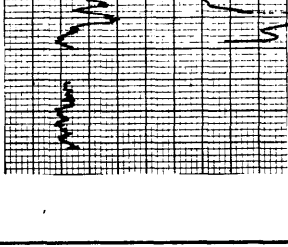

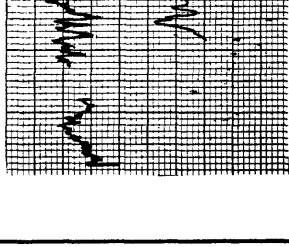



RECORDED BY <u>J Hargas</u> GEOLOGIST NO YES		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH FEET 25
	LOGGED DEPTHS FT. FT.			LOGGED DEPTHS FT. FT.		
	Sand.					
					0	
						60
						120
						180
						240
						300
						360

Hole No US-80063 Map: Willow Crossing Date: 9/14/80 State: MT County: Powder River
 Elev.: 3039 FT. Location: T 3 S R 45 E, Sec 30 Tract DACB Drilled depth 500 FT.
 Measured: 200 FT. FSL 650 FT. FSL 550 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: First hole with J. C. Drilling.

RECORDED BY <u>R. Patterson</u> GEOLOGIST NOX YES		RECORDED BY <u>Hangas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH FEET
	LOGGED DEPTHS <u>491</u> FT. <u>487</u> FT.			LOGGED DEPTHS <u>495</u> FT. <u>487</u> FT.		
	Alluvium. Coal. Alluvium. Sandstone, light-gray, very fine. Coal. Coal. Claystone, gray. Coal. Coal. Sand, red.					

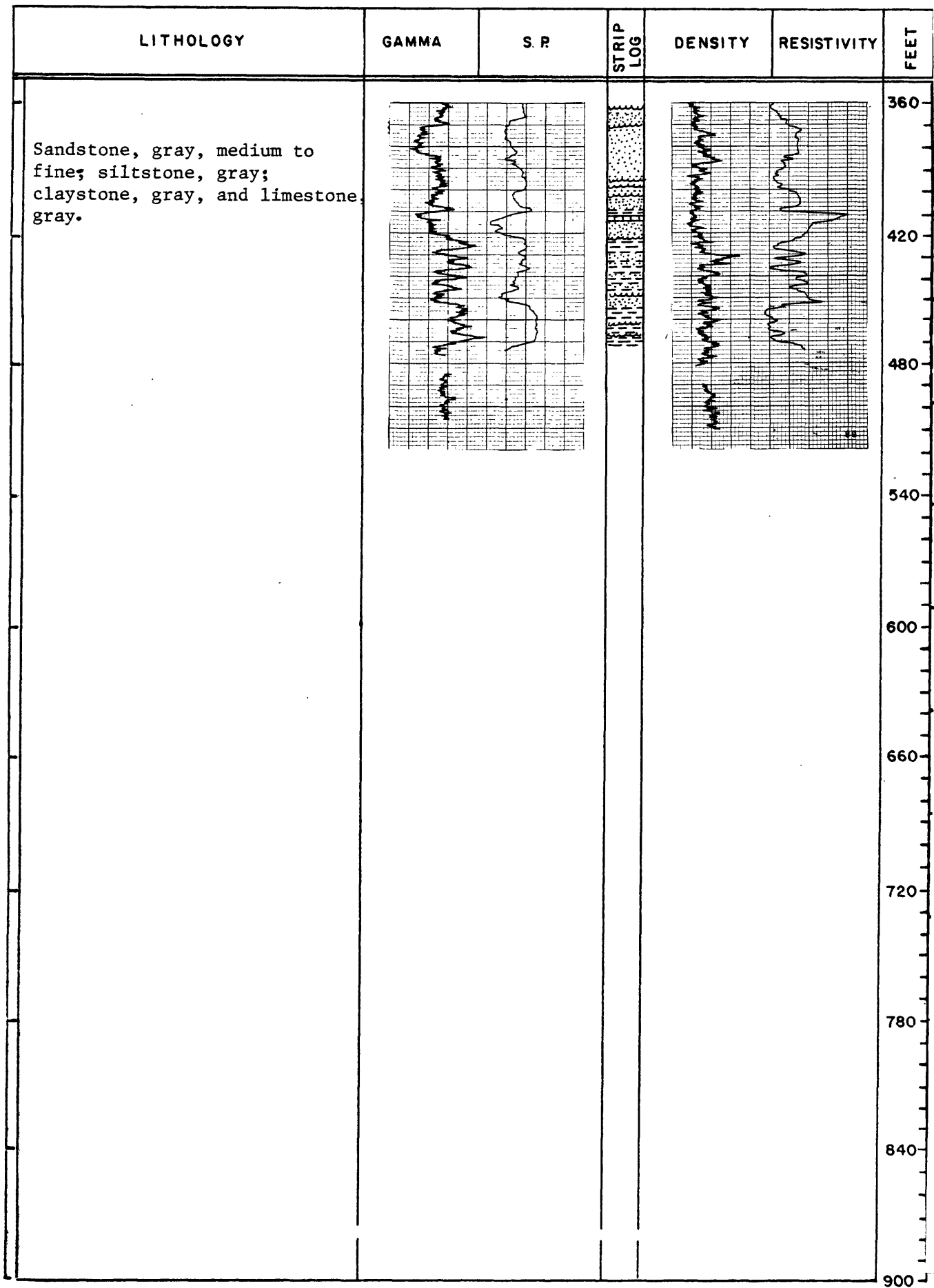


Hole No. US-80064 Map: King Mnt. Date: 9/14/80 State: MT County: Powder River
 Elev.: 3140 FT. Location: T 4 S R 45 W, Sec 28 Tract Irreg Drilled depth 300 FT.
 Measured: 2850 FT. FSL 200 FT. ~~FEEL~~ FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>J Hargas</u> YES GEOLOGIST		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>300</u> FT. <u>298</u> FT.			LOGGED DEPTHS <u>305</u> FT. <u>296</u> FT.	
	DEPTH FEET			FEET	
Silt, brown, fine, sandy- Sand, brown, medium to fine.					
Coal.					
Coal.					
Claystone, gray.					
Siltstone, dark-brown.					
Coal.					

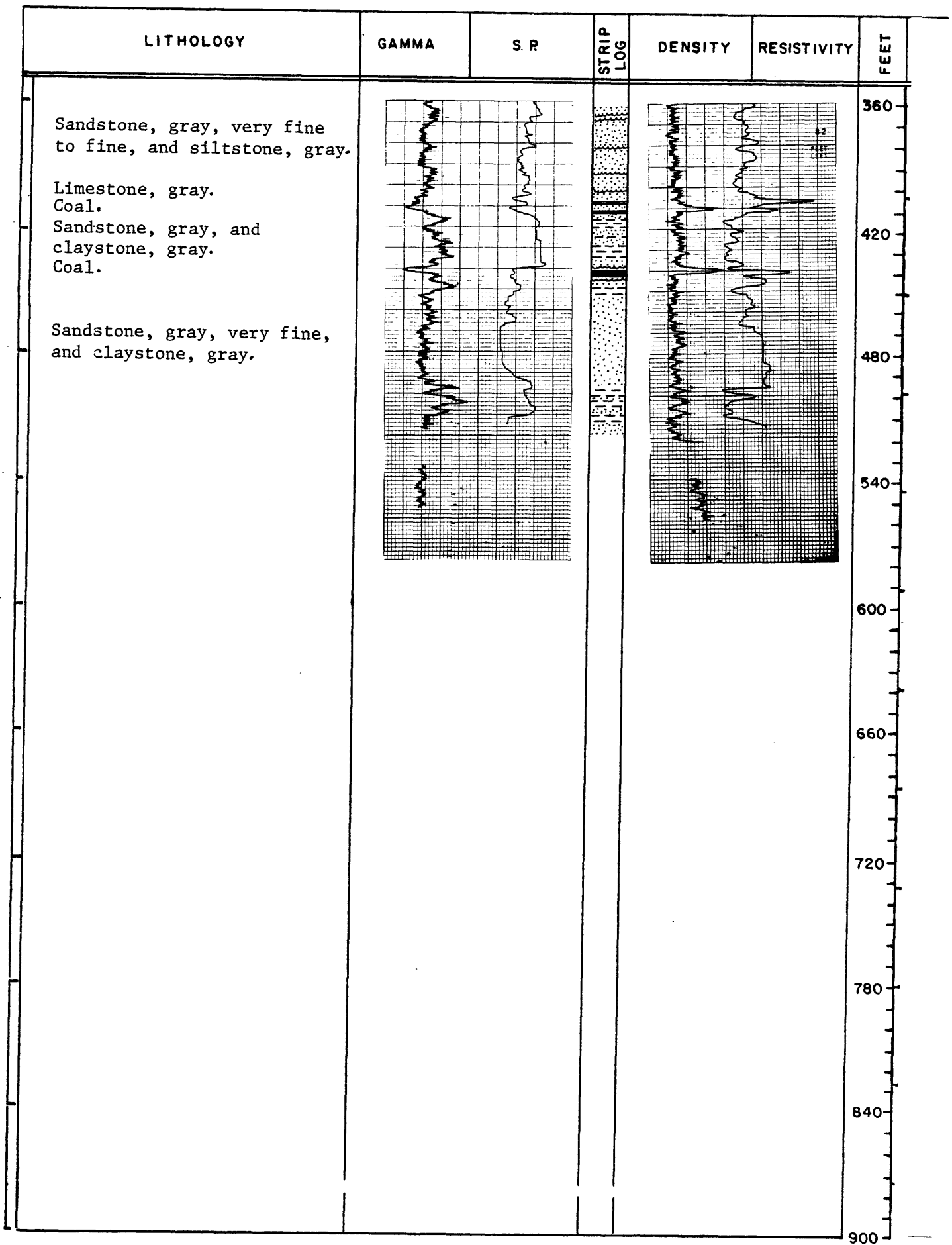
Hole No. US-80065 Map: King Mnt. Date: 9/15/80 State: MT County: Powder River
 Elev.: 3230 FT. Location: T 4 S R 45 E, Sec 28 Tract CCCA Drilled depth 480 FT.
 Measured: 400 FT. FSL 200 FT. FWL 280 FT. Hole size: IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks:


RECORDED BY <u>R Patterson</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>Hargas</u> <input checked="" type="checkbox"/> YES		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	
	LOGGED DEPTHS <u>476</u> FT. <u>474</u> FT.			LOGGED DEPTHS <u>481</u> FT. <u>474</u> FT.		
	DEPTH FEET					
Sandstone, brown, medium. Claystone, brown; sandstone, brown, medium to fine, and claystone, gray. Coal, with claystone parting. Sandstone, gray, medium to fine; siltstone, gray; claystone, gray, and limestone, gray. Coal. Sandstone, gray, medium to fine; siltstone, gray, and claystone, gray.						
						60
						0
						60
						120
180						
240						
300						
360						



Hole No: US-80066 Map: King Mnt. Date: 9/15/80 State: MT County: Powder River
 Elev.: 3290 FT. Location: T5 ^{SE} R 45 ^E W, Sec 4 Tract CDDC Drilled depth 530 FT.
 Measured: 150 FT. FSL 2200 FT. FWL 554 FT. Hole size: IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>R Patterson</u> GEOLOGIST NO YES		RECORDED BY <u>Hangas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>526</u> FT. <u>524</u> FT.			LOGGED DEPTHS <u>532</u> FT. <u>524</u> FT.	
	DEPTH FEET				
<p>Sand, light-brown, very fine, and claystone, brown.</p> <p>Sandstone, gray; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Claystone, light-gray.</p> <p>Coal, with claystone partings.</p> <p>Sandstone, gray, very fine; siltstone, gray, and claystone, gray.</p> <p>Coal.</p> <p>Sandstone, gray, very fine; siltstone, gray, and claystone, gray.</p> <p>Shale, carbonaceous.</p> <p>Coal.</p> <p>Sandstone, gray, very fine; siltstone, gray, and claystone, gray.</p>					



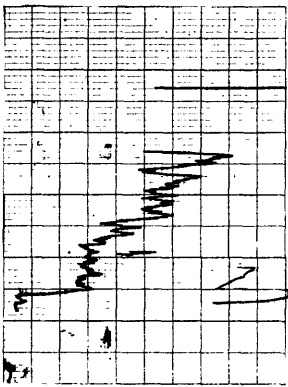

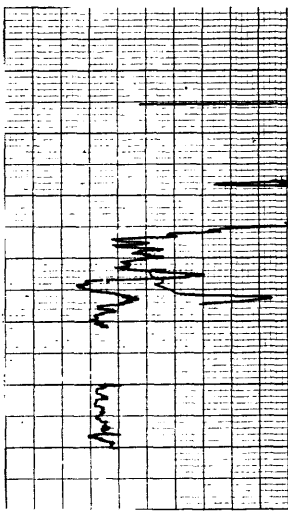
RECORDED BY <u>John Hangan</u>		GEOLOGIST		NO YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY		GAMMA		S.P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH
		T.C. _____ RANGE _____		SENS. SETTING _____			T.C. _____ RANGE _____	SENS. SETTING _____			
		LOGGED DEPTHS				LOGGED DEPTHS				FEET	
		FT.		FT.		FT.		FT.		FT.	
Clinker.										60	
								0			
								60			
								120			
								180			
								240			
								300			
								360			

RECORDED BY <u>Jon Hargas</u> GEOLOGIST		NO YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.		
LITHOLOGY	GAMMA T.C. _____ RANGE _____		S.P. SENS. SETTING _____		STRIP LOG	DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING _____		DEPTH FEET
	LOGGED DEPTHS		LOGGED DEPTHS			LOGGED DEPTHS				
	FT.	FT.	FT.	FT.		FT.	FT.			
Clinker.										60
										0
										60
										120
										180
										240
										300
										360

Hole No: US-80069 Map: Willow Crossing Date: 9/17/80 State: MT County: Powder River
 Elev.: 3330 FT. Location: T3 ^E R 45^W Sec 4 Tract CDCB Drilled depth 320 FT.
 Measured: 350 FT. FSL 2180 FT. FWL FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>Jon Hargas</u> GEOLOGIST ^{NS} YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG
	LOGGED DEPTHS <u>315</u> FT. <u>313</u> FT.		
	DENSITY T.C. <u>2</u> RANGE <u>100</u>	RESISTIVITY SENS. SETTING <u>100</u>	
	LOGGED DEPTHS <u>320</u> FT. <u>313</u> FT.		DEPTH FEET
Claystone, brown.			60
Claystone, gray; sandstone, gray, fine.			0
Coal.			60
Sandstone, gray, fine; siltstone, gray, and claystone gray.			120
			180
Claystone, dark-brown; shale, dark-brown.			240
Coal.			300
Sandstone, gray, fine, and claystone, gray.			360

Hole No: US-80070 Map: Willow Crossing Date: 9/17/80 State: MT County: Powder River
 Elev.: 3288 FT. Location: T 2 S R 45 W, Sec 32 Tract DCBC Drilled depth 80 FT.
 Measured: 1400 FT. FSL 2600 FT. FEL 2600 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: At 65' no coal was left in samples.

RECORDED BY <u>J Hargas</u> YES GEOLOGIST YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 57 FT. 54 FT.			LOGGED DEPTHS 62 FT. 54 FT.		FEET
Sand, brown. Claystone, brown. Claystone, gray. Coal. Claystone, gray.						60
						0
						60
						120
						180
						240
						300
						360

Hole No: US-80071 Map Willow Crossing Date: 9/17/80 State: MT County: Powder River
 Elev.: 3304 FT. Location: T 2 S R 45 W, Sec 32 Tract BCCC Drilled depth 320 FT.
 Measured: 2590 FT. FNL 40 FT. FSL 40 FT. FWL FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No density, collapsing hole.

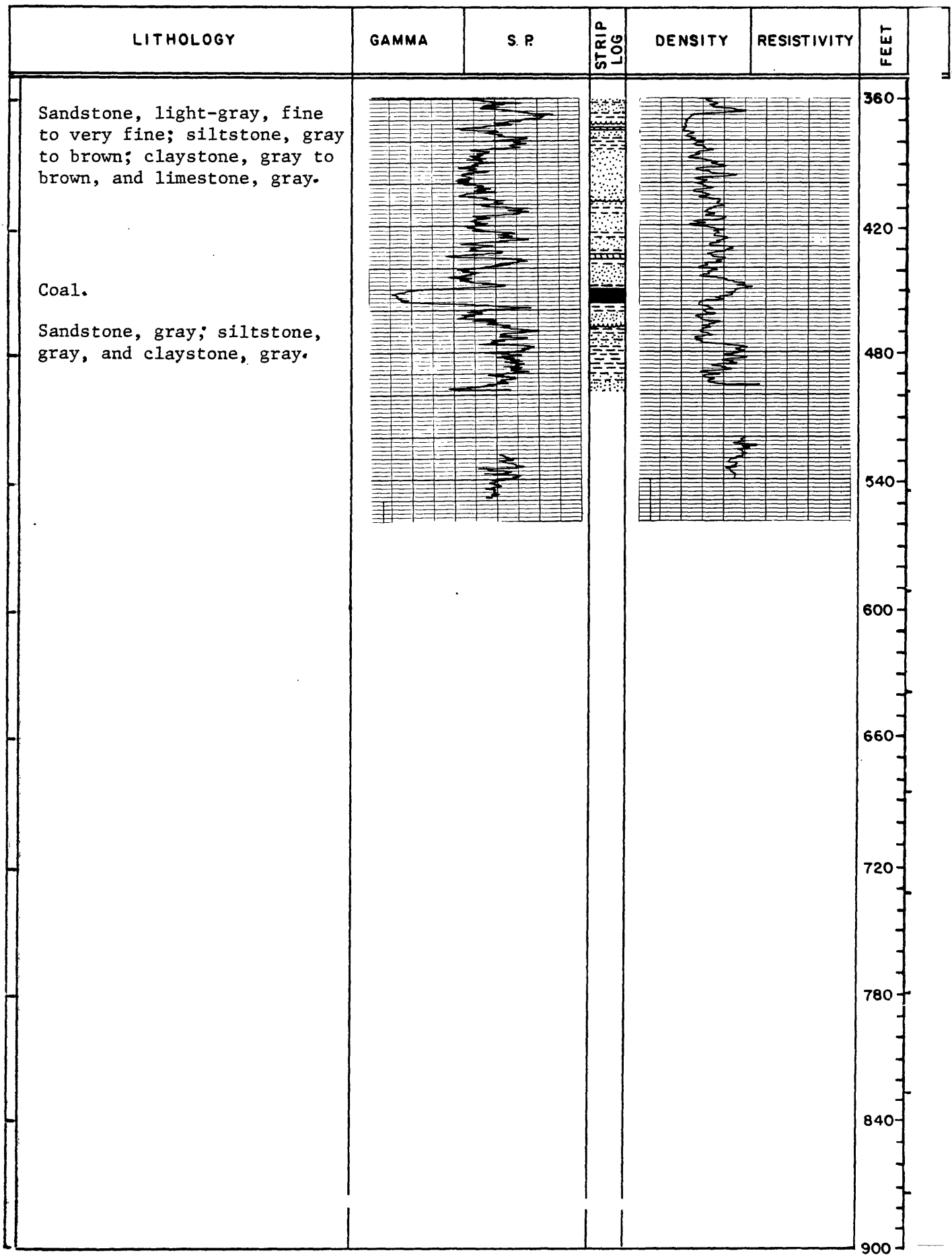
RECORDED BY <u>J Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u> </u> RANGE <u> </u>
	LOGGED DEPTHS <u>300</u> FT. <u> </u> FT.		LOGGED DEPTHS <u> </u> FT. <u> </u> FT.
	STRIP LOG		RESISTIVITY SENS. SETTING <u>10</u>
Silt, brown, alluvial. ClinKer. Claystone, brown. Sandstone, gray, fine; siltstone, gray, and claystone, gray. Limestone, gray. Sandstone, gray, and claystone, gray. Claystone, dark-brown. Shale, dark-brown, carbonaceous. Coal, with claystone partings. Sandstone, gray, very fine, and claystone, gray.			DEPT FEET 60 0 60 120 180 240 300 360

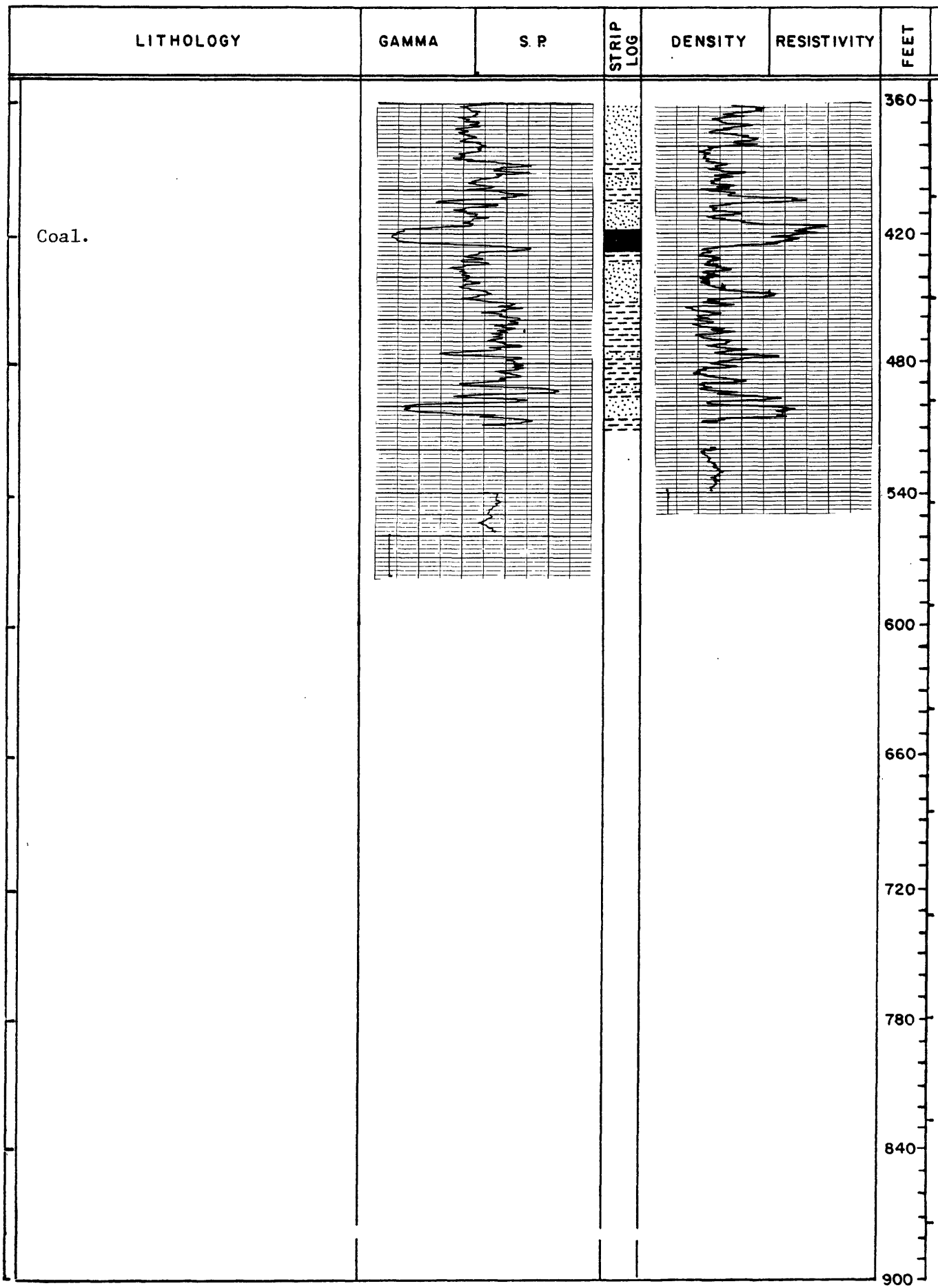
Hole No: US-80072 Map: Willow Crossing Date: 9/23/80 State: MT County: Powder River
 Elev.: 3270 FT. Location: T 3 S R 45 E, Sec 8 Tract DDDD Drilled depth 360 FT.
 Measured: 210 FT. FSL 100 FT. FE L FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Plug mud: sure gel, 30'/min E log.

RECORDED BY <u>J Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>10</u>
	LOGGED DEPTHS <u>312</u> FT.			LOGGED DEPTHS <u>305</u> FT.	
	FEET			FEET	
<p>Silt, brown.</p> <p>Sandstone, brown, fine, and siltstone, brown to reddish-brown.</p> <p>Sandstone, gray, fine; siltstone, gray, and claystone, gray.</p> <p>Coal stringers.</p> <p>Sandstone, gray to greenish-gray, fine, and claystone, gray.</p> <p>Claystone, dark-brown.</p> <p>Coal.</p> <p>Sandstone, gray, fine; siltstone, gray; claystone, dark-gray to light-gray.</p> <p>Coal stringers.</p>					
<p>60</p> <p>0</p> <p>60</p> <p>120</p> <p>180</p> <p>240</p> <p>300</p> <p>360</p>					

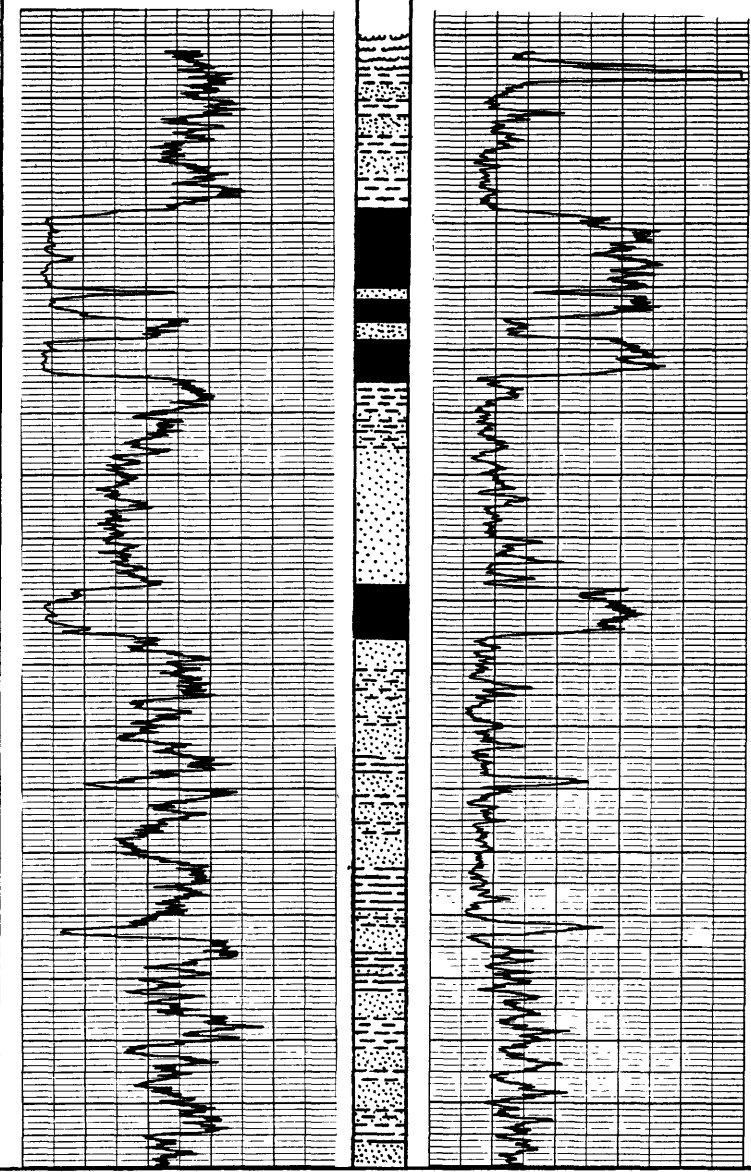
Hole No: US-80073 Map: Coleman Draw Date: 9/23/80 State: MT County: Powder River
 Elev.: 3330 FT. Location: T3 ^N~~S~~ R 45 ^E~~W~~, Sec 36 Tract CDBC Drilled depth 500 FT.
 Measured: 100 FT. ^{FSL}~~FSL~~ 2800 FT. ^{FEL}~~FEL~~ FT. Hole size: IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks:

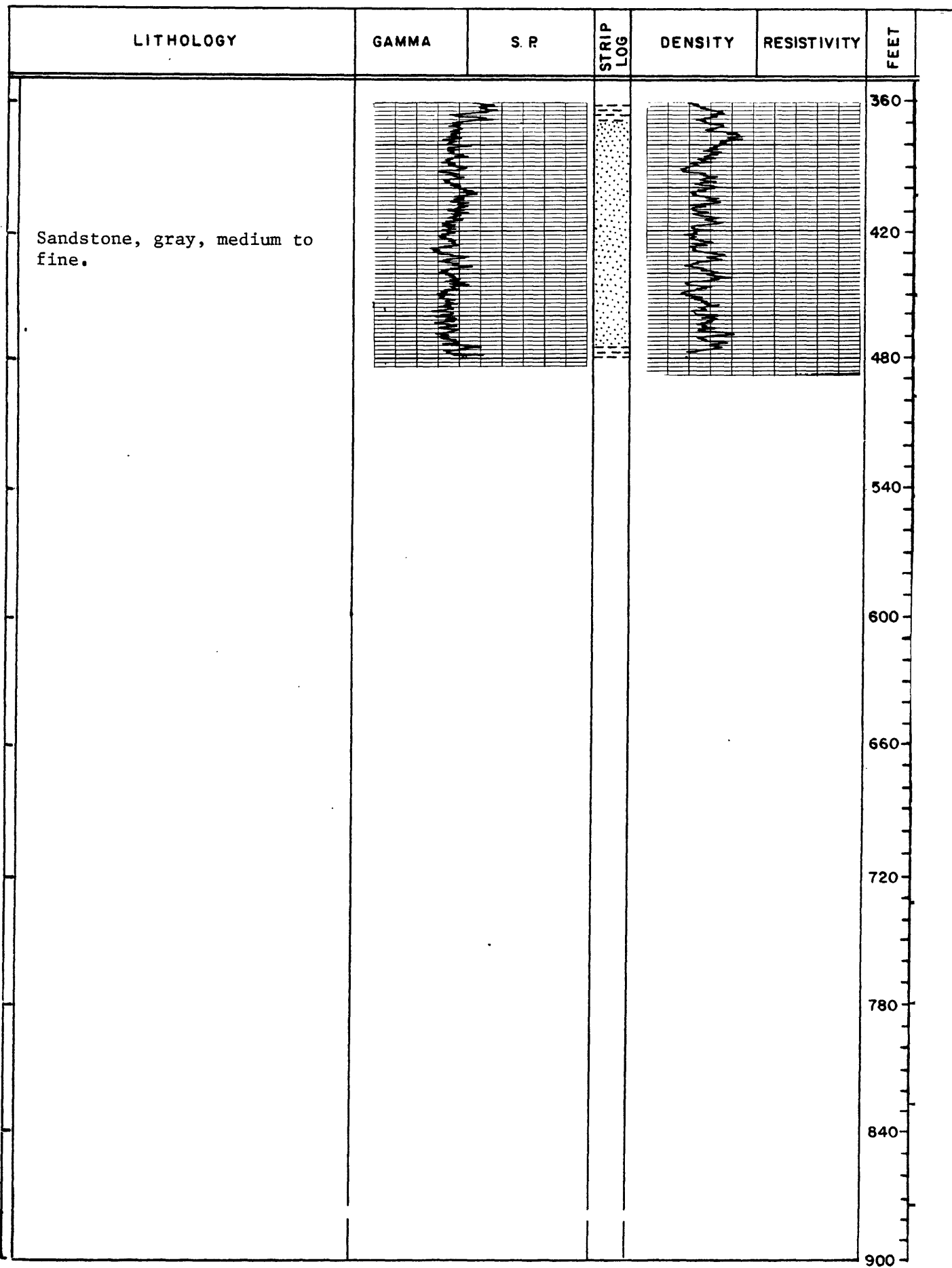
RECORDED BY <u>J Hargas</u> GEOLOGIST ^{NB} YES		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>10</u>
	LOGGED DEPTHS <u>497</u> FT. <u> </u> FT.			LOGGED DEPTHS <u>495</u> FT. <u> </u> FT.	
	DEPTH FEET			FEET	
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Sand, brown, fine; claystone, gray; siltstone, gray. Shale, dark-brown, carbonaceous; shale, dark-gray, and coal stringers.</p> <p>Limestone, gray. Sandstone, gray, fine; siltstone, gray, and claystone, gray.</p> <p>Coal, with claystone parting.</p> </div> <div style="width: 30%; text-align: center;"> </div> <div style="width: 30%; text-align: center;"> </div> <div style="width: 10%;"> <p>60</p><p>0</p><p>60</p><p>120</p><p>180</p><p>240</p><p>300</p><p>360</p> </div> </div>					





Hole No: US-80075 Map: King Mountain Date: 9/24/80 State: MT County: Powder River
 Elev.: 3155 FT. Location: T4 ^{XXX} S R 45 ^E Sec 26 Tract Irreg Drilled depth 480 FT.
 Measured: 150 FT. FSL 2000 FT. FWL FT. Hole size: IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: E log was run at 30'/min.

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{YES}		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>10</u>
	LOGGED DEPTHS <u>478</u> FT. FT.			LOGGED DEPTHS <u>476</u> FT. FT.	
Siltstone, gray to brown.			60		
Claystone, gray.			0		
Coal.			60		
Sandstone, gray, very fine.			120		
Coal.			180		
Claystone, gray.			240		
			300		
			360		



0580076

Hole No: US-80076 Map: Yager Butte Date: 9/25/80 State: MT County: Powder River
 Elev.: 3265 FT. Location: T 4 S R 45 E Sec 36 Tract I reg Drilled depth 360 FT
 Measured: 2050 FT. FSL 2300 FT. FEEL FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{YES}		RECORDED BY <u>Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>10</u>	DEPTH
	LOGGED DEPTHS <u>358</u> FT.		LOGGED DEPTHS <u>355</u> FT.
	STRIP LOG		
Sand.			60
Siltstone, gray.			0
Coal.			60
Claystone, gray.			120
Coal.			180
Sandstone, gray, fine to medium.			240
Coal.			300
Claystone, gray.			360

US 80077


Hole No: US-80077 Map: King Mountain Date: 9/25/80 State: MT County: Powder River
 Elev.: 3264 FT. Location: T 5 S R 45 E Sec 12 Tract BABB Drilled depth 340 FT.
 Measured: 300 FT. FNL 1680 FT. FWL 1680 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: E log was run at 30'/min.

RECORDED BY <u>R Patterson</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>J Hargas</u> <input checked="" type="checkbox"/> YES		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>10</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>10</u>	DEPTH FEET
	LOGGED DEPTHS 338 FT. 338 FT.			LOGGED DEPTHS 335 FT. 338 FT.		
	Sand, brown, fine to very fine.					
Siltstone, gray.						0
Sand, fine to very fine.						60
Coal.						120
Claystone, gray.						180
Coal.						240
Sandstone, fine to very fine.						300
Coal.						360
Claystone, light-gray.						

Hole No: US-80078 Map: King Mountain Date: 9/30/80 State: MT County: Powder River
 Elev.: 3185 FT. Location: T 5 ^N R 45 ^E Sec 14 Tract DADD Drilled depth 160 FT.
 Measured: 1500 FT. ^{FSL} 150 FT. ^{FEL} 150 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Plug mud in hole.

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>155</u> FT. FT.		RESISTIVITY SENS. SETTING <u>10</u>
	LOGGED DEPTHS <u>152</u> FT. FT.		DEPTH FEET
Silt, brown, sandy. Siltstone, and claystone, gray. Claystone, gray. Coal. Sandstone, gray, very fine. Claystone, gray.	STRIP LOG		


Hole No: US-80079A Map: Tongue River Dam Date: 10/1/80 State: MT County: Big Horn
 Elev.: 3610 FT. Location: T8 ^N ~~S~~ R 40 ^E ~~W~~, Sec 14 Tract DACC Drilled depth 40 FT.
 Measured: 2500 FT. ^{BSK} FSL 1100 FT. ^{FEL} ~~BSK~~ FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned.

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{BSK} YES		RECORDED BY <u>Hargas</u> RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	DENSITY T.C. <u> </u> RANGE <u> </u>	
	LOGGED DEPTHS FT. FT.		RESISTIVITY SENS. SETTING <u> </u>	
	LOGGED DEPTHS FT. FT.		DEPTH FEET	
Clinker.			STRIP LOG 	60
				0
				60
				120
				180
				240
				300
				360

Hole No: US-80079 ^B Map Tongue River Dam Date: 10/1/80 State: MT County: Big Horn
 Elev.: 3610 FT. Location: T 8 ^N R 40 ^E W, Sec 14 Tract DACC Drilled depth 20 FT.
 Measured: 2500 FT. ^{BACK} FSL 1100 FT. ^{FEL} 3000 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned.

RECORDED BY <u>J Hargas</u> GEOLOGIST NO YES		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>
	LOGGED DEPTHS			LOGGED DEPTHS	
	FT.	FT.		FT.	FT.
Sand, fine to very fine.					60
					0
					60
					120
					180
					240
					300
					360

Hole No: US-80079 ^C Map Tongue River Da te 10/1/80 State: MT County: Big Horn
 Elev.: 3540 FT Location: T 8 ^S R 40 ^E W Sec 14 Tract DABA Drilled depth 40 FT
 Measured: 1650 FT ^{FSL} 750 FT ^{FEL} XXX FT Hole size: IN Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned.

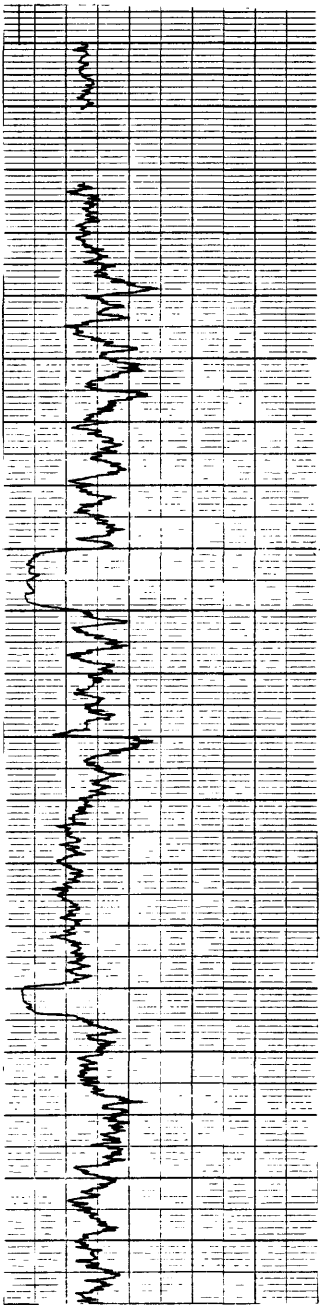
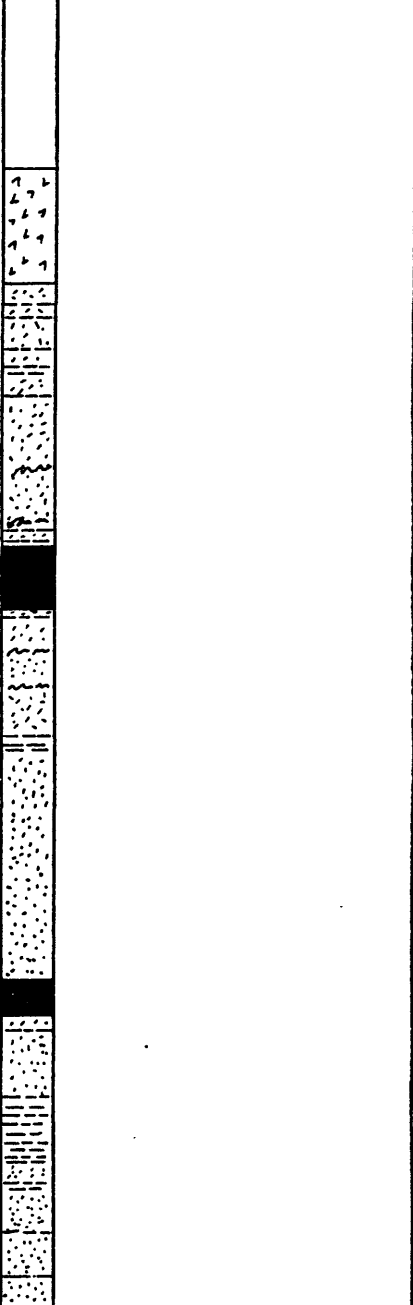
RECORDED BY <u>J Hargas</u> ^{XXX} <u>YES</u> GEOLOGIST		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> <u>FT. MIN.</u>		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>	DEPTH
	LOGGED DEPTHS			LOGGED DEPTHS		FEET
	FT.	FT.		FT.	FT.	
Sand. Clinker.						60
						0
						60
						120
						180
						240
						300
						360

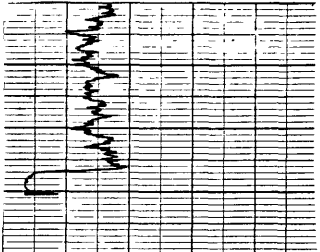

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R-4

Hole No: US-80079 Map: Tongue River Dam Date: 10/2/80 State: Montana County: Big Horn
Elev.: 3540 FT. Location: T 8 S R 40 E, Sec 14 Tract DABA Drilled depth 430 FT.
Measured: 1650 FT. RKX FSL 750 FT. RWX FEL FT. Hole size: 5 1/8 IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒

Remarks: Lithology modified from the geophysical log. Losing circulation at 430', cannot
redrill with air because of terrace gravel, water level stable at 89' at abandonment no density
log.

RECORDED BY JON HANGAS GEOLOGIST HW YES RECORDED BY JON HANGAS RECORDING SPEED 20 FT. MIN.


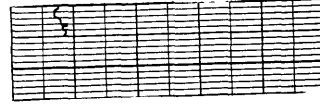
LITHOLOGY	GAMMA		S. P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH	
	T.C.	2	SENS. SETTING			T.C.		SENS. SETTING			
	RANGE	200	10			RANGE		20			
LOGGED DEPTHS					LOGGED DEPTHS					FEET	
420 FT. FT.					FT. FT.						
Clinker.											60
Claystone, gray; sandstone, gray, and siltstone, gray-											0
Sandstone, gray, and siltstone, gray-											60
Coal.											120
Sandstone, gray, very fine grained, and siltstone, gray.											180
Sandstone, gray, very fine grained.											240
Coal.											300
Sandstone, gray, fine to very fine grained.											
Claystone, brown to gray.											
Sandstone, gray, and claystone, gray.											

LITHOLOGY	GAMMA	S. P	STRIP LOG	DENSITY	RESISTIVITY	FEET
Coal.						360
						420
						480
						540
						600
						660
						720
						780
						840
						900


Hole No: US-80079D Map: Tongue River Date: 10/2/80 State: Montana County: Big Horn
 Elev.: 3540 FT. Location: T 8 ^N R 40 ^E Sec 14 Tract DABA Drilled depth 430 FT.
 Measured: 1650 FT. FSL 750 FT. ^{FEL} ~~FWL~~ FT. Hole size: 5 1/8 N. Air ☐ Water ☒ Cored: Yes ☐ No ☒

Remarks: Lithology modified from the geophysical log. Losing circulation at 430'
cannot redrill with air because of terrace gravel, water level stable at 89' at
abandonment.
 RECORDED BY J Hargas ~~NO~~ ^{YES} GEOLOGIST RECORDED BY J Hargas RECORDING SPEED 20 FT. MIN.


LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH FEET
	T.C.	SENS. SETTING		T.C.	SENS. SETTING	
	RANGE	10		RANGE	20	
	LOGGED DEPTHS FT. 370 FT.			LOGGED DEPTHS FT. 370 FT.		
					60	
					0	
					60	
					120	
					180	
					240	
					300	
					360	

LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900


Hole No: US-80080 Map Tongue River Dam Date: 10/3/80 State: Montana County: Big Horn
 Elev.: 3605 FT. Location: T 8 ^N R 40 ^E, Sec 15 Tract ADDA Drilled depth 30 FT.
 Measured: 2200 FT. ^{ENL} 150 FT. ^{FEL} XXXX FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No log - hole abandoned

RECORDED BY <u>JON HANGAS</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.			
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH	
	LOGGED DEPTHS			LOGGED DEPTHS		FEET	
	FT.	FT.		FT.	FT.		
Clinker.						60	
						360	

Hole No. US-80081A Map: Decker Date: 10/5/81 State: Montana County: Big Horn
 Elev.: 3590 FT. Location: T 8 S R 40 W, Sec 22 Tract DADA Drilled depth 35 FT.
 Measured: 2300 FT. FSL 150 FT. FW FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No log - Clinker

RECORDED BY <u>JON HANGAS</u> GEOLOGIST YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH
	LOGGED DEPTHS			LOGGED DEPTHS		FEET
	FT.	FT.		FT.	FT.	
Clinker.						60
						0
						60
						120
						180
						240
						300
						360

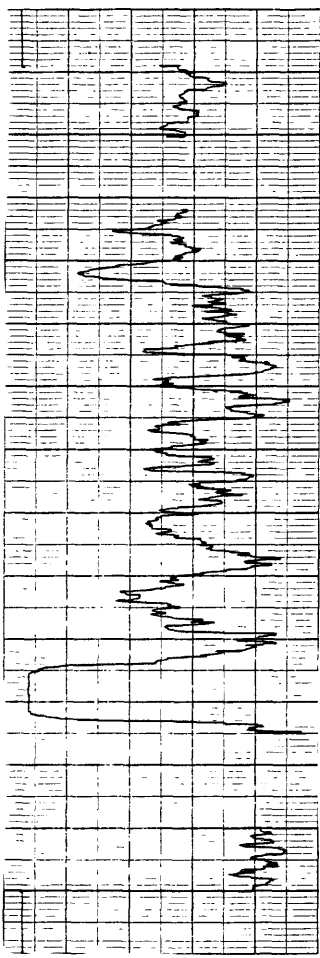

Hole No: US-80081 Map: Decker Date: 10/5/81 State: Montana County: Big Horn
 Elev.: 3565 FT. Location: T 8 ^N S R 40 ^E W, Sec 23 Tract CBCD Drilled depth 120 FT.
 Measured: 1350 FT. ^{FWL} 400 FT. ^{FWL} FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No Log - Clinker

RECORDED BY <u>JON HANGAS</u> GEOLOGIST <input checked="" type="checkbox"/>		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH	
	T.C. _____	SENS. SETTING _____		T.C. _____	SENS. SETTING _____		
	RANGE _____	_____		RANGE _____	_____		
LOGGED DEPTHS		LOGGED DEPTHS		FEET		FEET	
FT. FT.		FT. FT.		FT. FT.		FT. FT.	
Clinker.						60	
						0	
						60	
						120	
						180	
						240	
						300	
						360	

Hole No: UIS-80082 Map: Decker Date: 10/5/80 State: Montana County: Big Horn
 Elev.: 3460 FT. Location: T 8 S R 40 E, Sec 26 Tract BDAA Drilled depth 280 FT.
 Measured: 1650 FT. ~~FNL~~ 2600 FT. ~~RXX~~ FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>RUSSELL PATTERSON</u> GEOLOGIST <input checked="" type="checkbox"/>		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED _____		FT. MIN.		
LITHOLOGY	GAMMA T.C. _____ RANGE _____		S.P. SENS. SETTING _____		DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING _____	
	LOGGED DEPTHS <u>274</u> FT. FT.		STRIP LOG	LOGGED DEPTHS <u>272</u> FT. FT.		DEPTH FEET		
Clinker. Coal. Claystone, gray. Coal. Sandstone, light-gray, very fine grained; siltstone, gray, and claystone, light-gray. Sandstone, light-gray, very fine grained. Siltstone, gray, and claystone, light-gray. Sandstone, light-gray, fine to medium-grained. Coal. Claystone, gray, and sandstone. Coal. Sandstone, gray, very fine grained.								

Hole No US 80082B Map: Decker Date: 10/5/80 State: MT County: Big Horn
 Elev.: 3460 FT. Location: T 8 S R 40 E, Sec 26 Tract BDAA Drilled depth 172 FT.
 Measured: 1650 FT. ^{FNL} 2600 FT. ^{FWL} FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: Cored at 142-172: thru plastic casing - gamma only.

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{XNO} YES		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING
	LOGGED DEPTHS			LOGGED DEPTHS	
	169 FT.	FT.		FT.	FT.
<p>Clinker. Coal. Claystone, gray. Coal.</p> <p>Claystone, light-gray; siltstone, and sandstone.</p> <p>Claystone, gray; siltstone, gray, and sandstone.</p> <p>Claystone, light-gray. Sandstone, light-gray, fine- to medium-grained. Claystone, gray. Coal.</p>				<div style="display: flex; align-items: center;"> <div style="flex: 1; border-left: 1px solid black; border-right: 1px solid black; position: relative;"> <div style="position: absolute; top: 0; right: 0; transform: rotate(90deg);">FEET</div> <div style="position: absolute; bottom: 0; right: 0; transform: rotate(90deg);">360</div> </div> <div style="flex: 1; text-align: center;"> <div style="margin-bottom: 10px;">60</div> <div style="margin-bottom: 10px;">0</div> <div style="margin-bottom: 10px;">60</div> <div style="margin-bottom: 10px;">120</div> <div style="margin-bottom: 10px;">180</div> <div style="margin-bottom: 10px;">240</div> <div style="margin-bottom: 10px;">300</div> </div> </div>	


Hole No: US-800820 Map: Decker Date: 10/6/80 State: Montana County: Big Horn
 Elev.: 3460 FT. Location: T 8 ^N R 40 ^E W, Sec 26 Tract BDAA Drilled depth 30 FT.
 Measured: 1650 FT. ^{FNL} ~~EST~~ 2600 FT. ^{CEM} ~~FWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned.

RECORDED BY <u>JON HANGAS</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>JON HANGAS</u> RECORDING SPEED _____		FT. MIN.		
LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH
	T.C. _____	SENS. SETTING _____		T.C. _____	SENS. SETTING _____	
	RANGE _____	_____		RANGE _____	_____	
	LOGGED DEPTHS			LOGGED DEPTHS		
	FT.	FT.		FT.	FT.	FEET
						60
						0
						60
						120
						180
						240
					300	
					360	

Hole No: US-80082 Map: Decker Date: 10/6/80 State: Montana County: Big Horn
 Elev.: 3460 FT. Location: T 8 ^N S R 40 ^E W, Sec 26 Tract DBAA Drilled depth 38 FT.
 Measured: 1650 FT. ^{FNL} ~~FSB~~ 260 FT. ^{KRX} ~~FWL~~ FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned

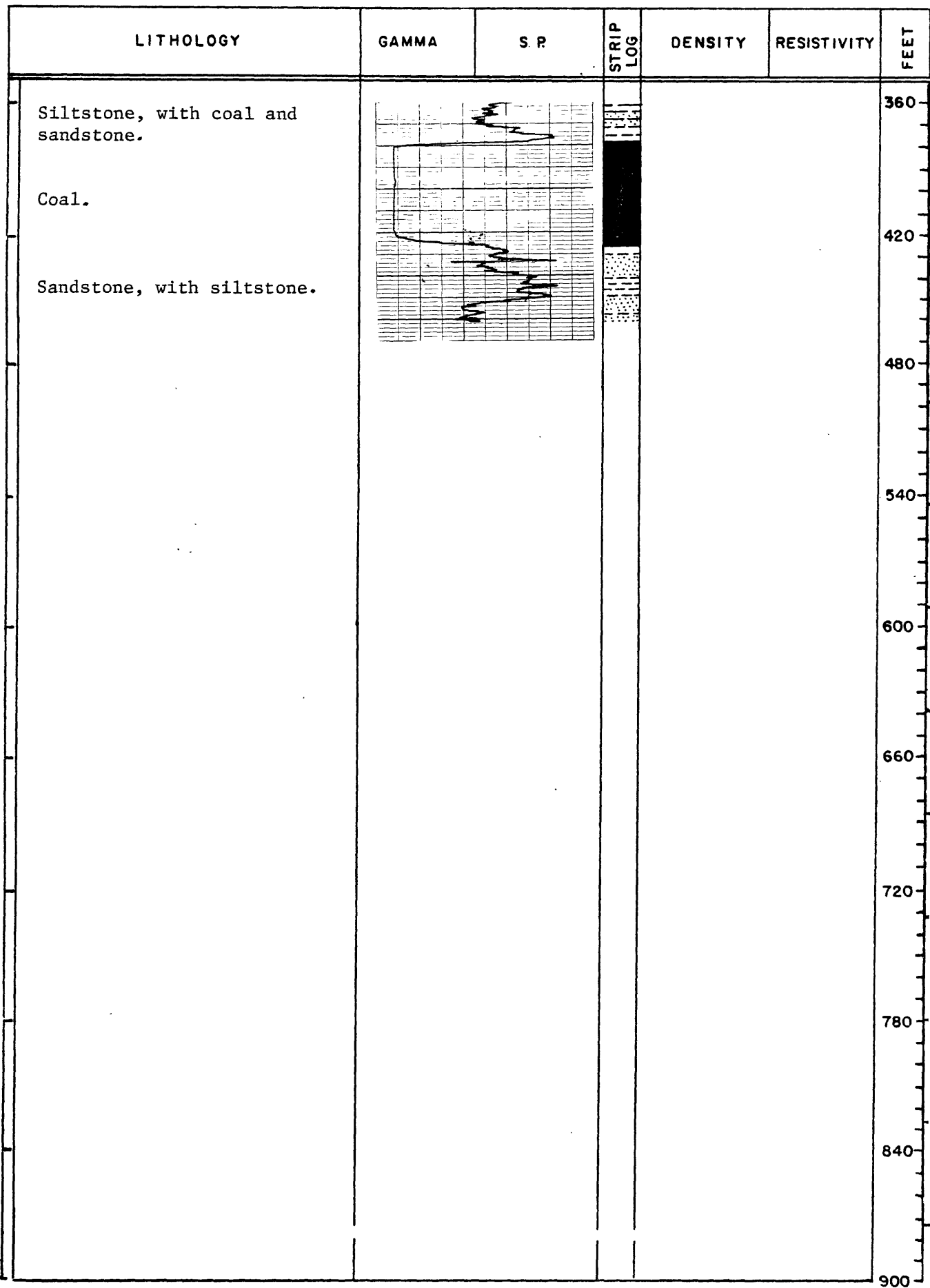
RECORDED BY <u>JON HANGAS</u> GEOLOGIST YES		RECORDED BY <u>JON HANGAS</u> RECORDING SPEED _____ FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	DENSITY T.C. _____ RANGE _____ RESISTIVITY SENS. SETTING _____
	LOGGED DEPTHS		LOGGED DEPTHS
	FT.	FT.	FT.
		STRIP LOG	DEPTH FEET
			60
			0
			60
			120
			180
			240
			300
			360

Hole No: US-80083 Map: Decker Date: 10/7/80 State: Montana County: Big Horn
 Elev.: 3520 FT. Location: T 8 ^N R 40 ^E W, Sec 22 Tract DCCC Drilled depth 70 FT.
 Measured: 150 FT. ^{PNK} FSL 2450 FT. ^{FEL} FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No log - Clinker

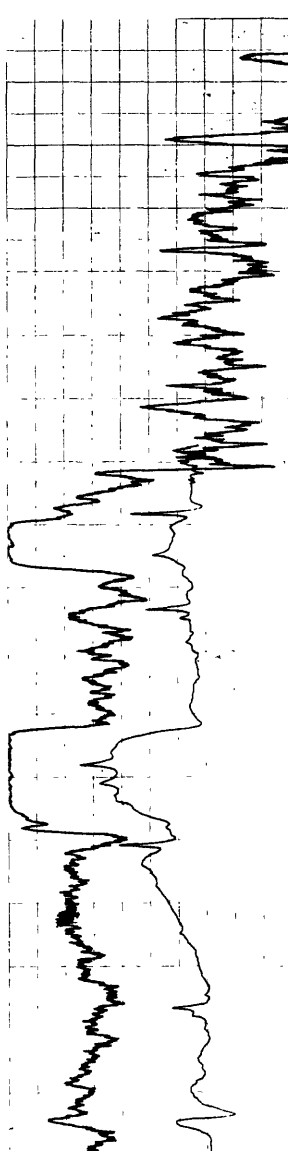

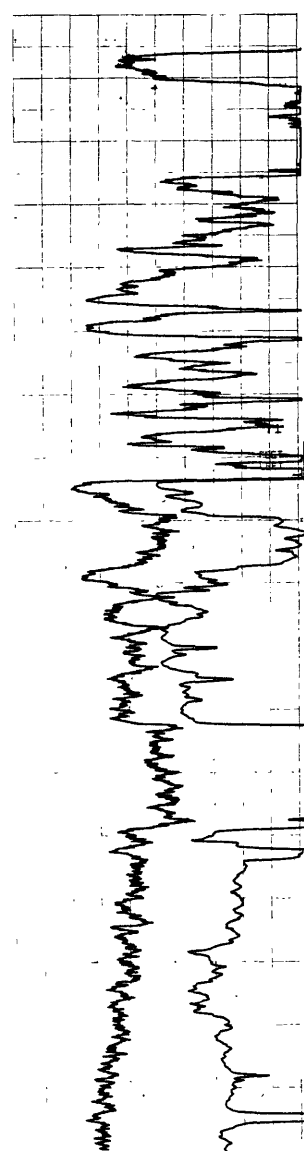
RECORDED BY <u>JON HANGAS</u> GEOLOGIST ^{NE} YES		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>
	LOGGED DEPTHS			LOGGED DEPTHS	
	FT.	FT.		FT.	FT.
Clinker.					
					60
					0
					60
					120
					180
					240
					300
					360

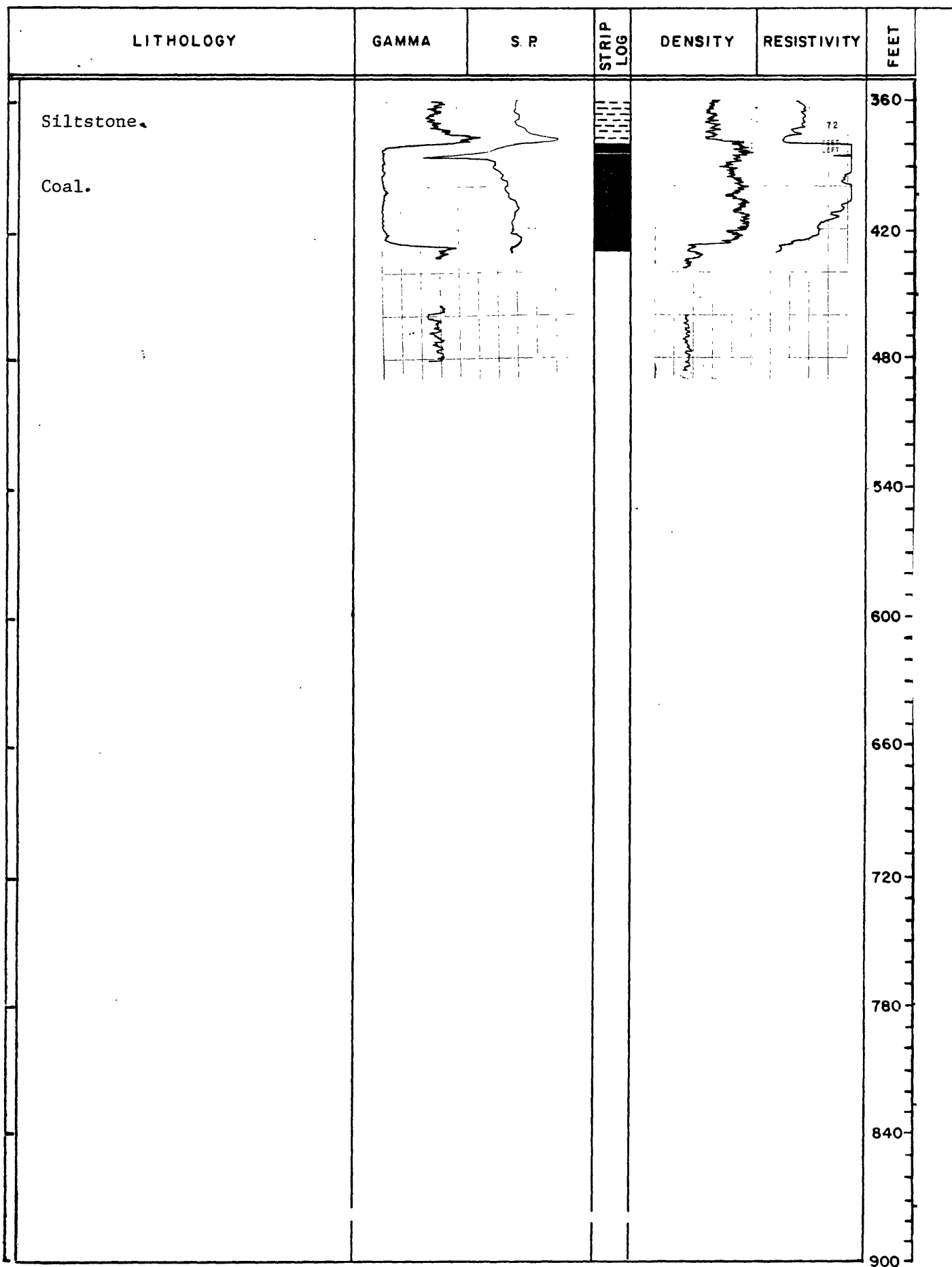
Hole No: US-80084 Map: Decker Date: 10/7/86 State: MT County: Big Horn
 Elev.: 3450 FT. Location: T 8 S R 10 E, Sec 35 Tract BACB Drilled depth 240 FT.
 Measured: 750 FT. FNL 1500 FT. FWL 1000 FT. Hole size: IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>Karl Jepsen</u> GEOLOGIST NO YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING	DEPTH
	LOGGED DEPTHS			LOGGED DEPTHS		FEET
	233 FT.	FT.		FT.	FT.	FT.
Clinker.				60		
				0		
				60		
Sandstone and shale.				120		
				180		
Coal.		240				
Sandstone and claystone.		300				
Coal.		360				


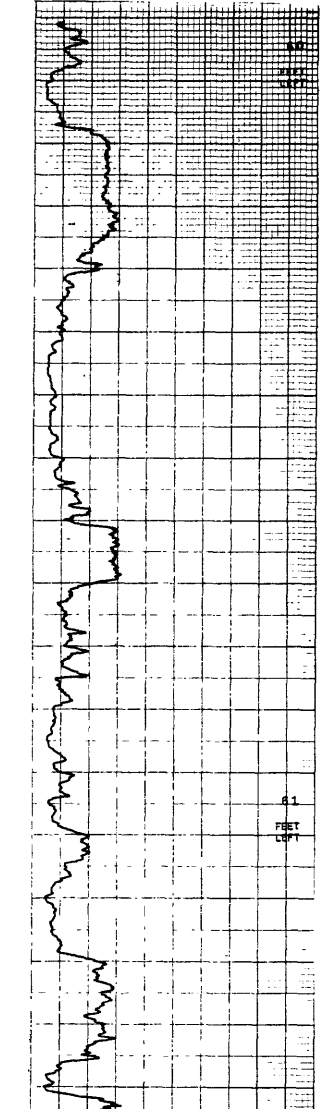


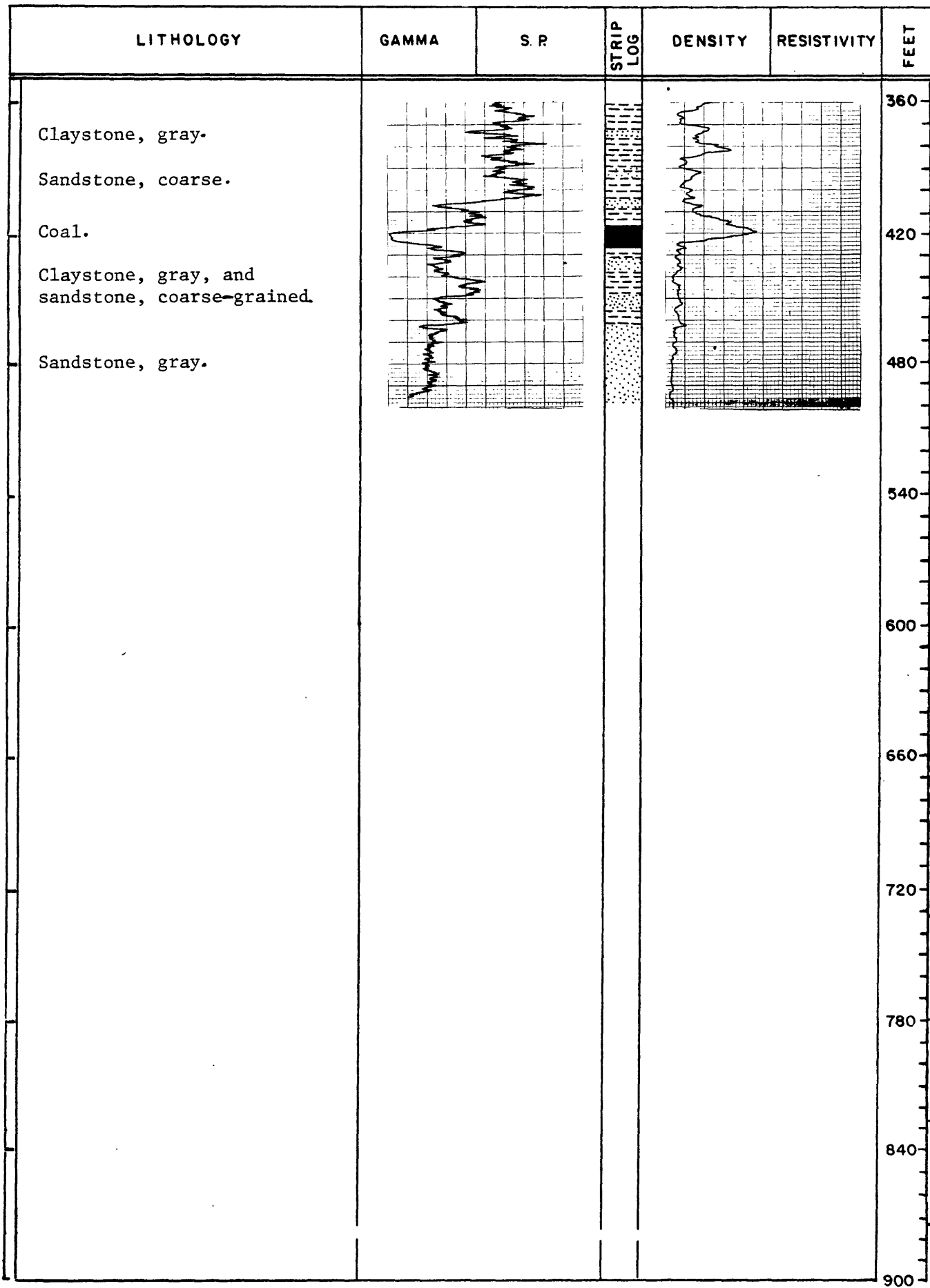
Hole No: US-80085B Map: Pearl School Date: 10/8/80 State: Montana County: Big Horn
 Elev.: 4170 FT. Location: T 8 S R 39 E Sec 20 Tract DACD Drilled depth 440 FT.
 Measured: 1400 FT. FSL 1050 FT. FWL FEEL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: Cored 220-260, and 372-432.

RECORDED BY <u>J Hargas</u> GEOLOGIST YES YES		RECORDED BY <u>Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 433 FT. 431 FT.			LOGGED DEPTHS 437 FT. 431 FT.		FEET
Sandstone, tan.						60
Claystone. Coal.						0
Siltstone, carbonaceous, with claystone and sandstone.						60
Claystone, carbonaceous, and sandstone.						120
Coal.						180
Sandstone and siltstone.						240
Coal.						300
Sandstone.						360
Claystone, gray, and sandstone.						
Coal.						

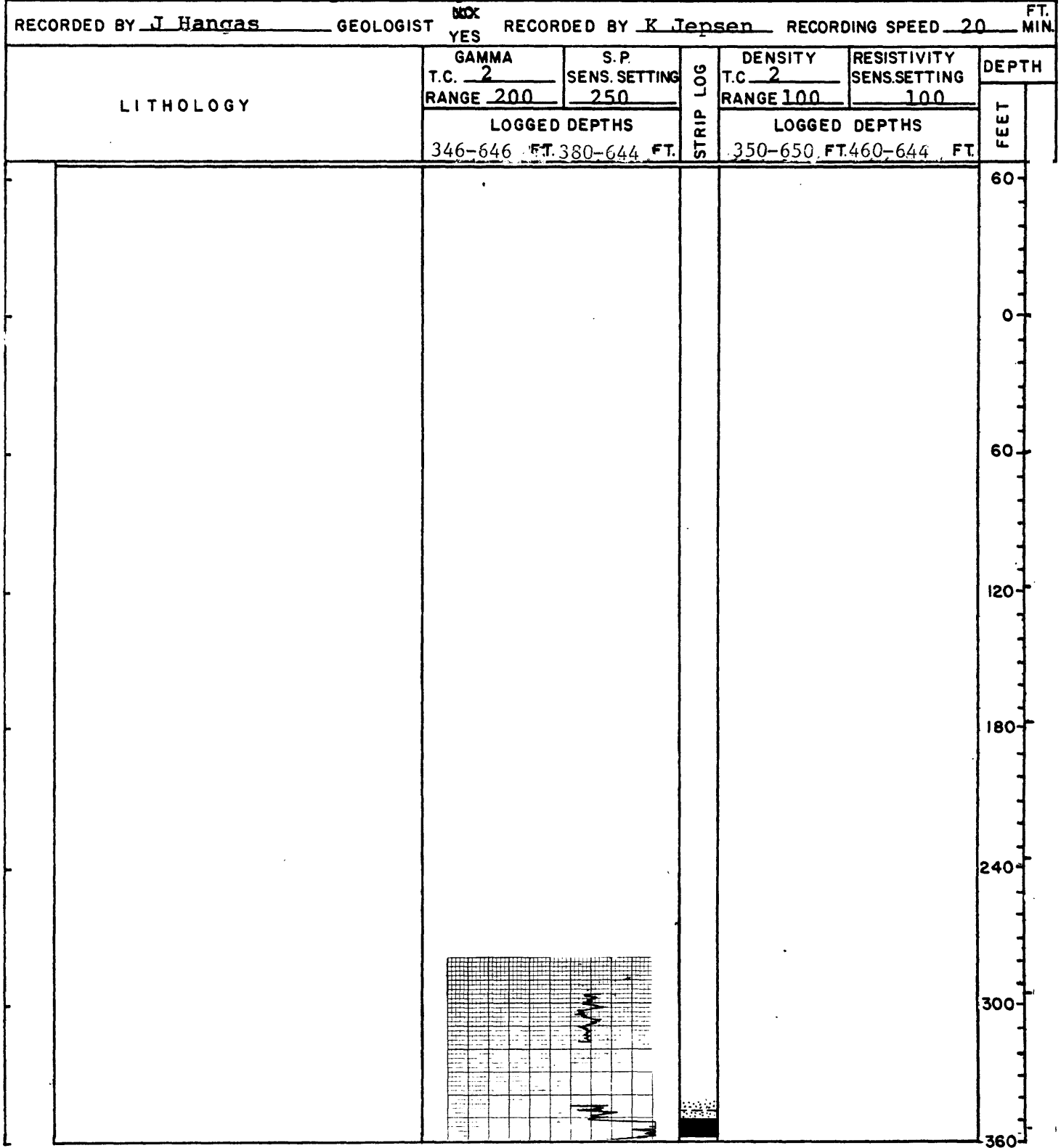


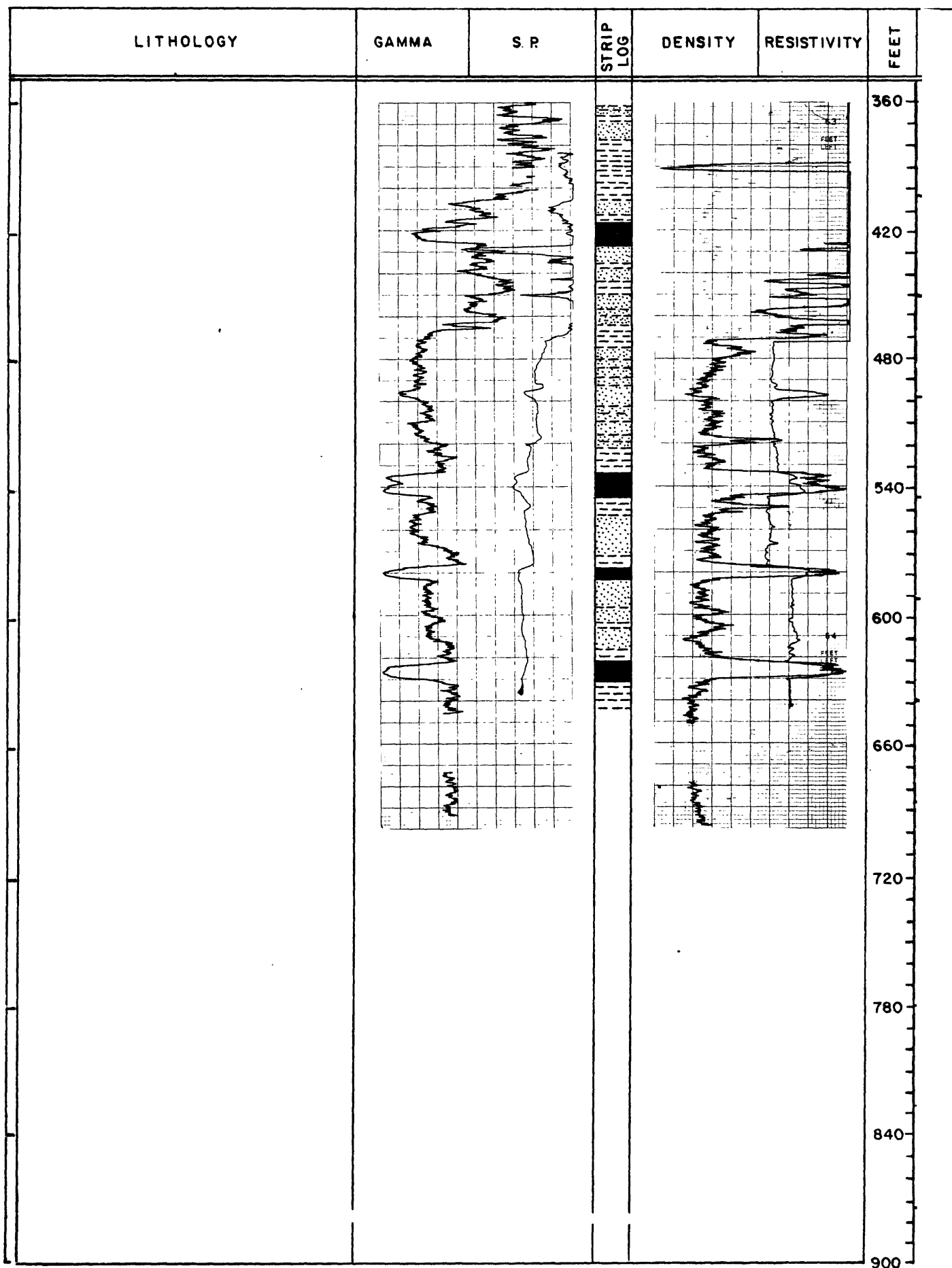
Hole No: US-80086A Map: Holmes Ranch Date: 10/21/86 State: Montana County: Big Horn
 Elev.: 4040 FT. Location: T 8 S R 41 E Sec 26 Tract CCDA Drilled depth 660 FT.
 Measured: 500 FT. FSL 1150 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: Logged at a higher scale because of low water level at 350'

RECORDED BY <u>J Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>I Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	DENSITY T.C. <u>2</u> RANGE <u>1 K</u>
	LOGGED DEPTHS <u>496 FT.</u> FT.		LOGGED DEPTHS <u>500</u> FT. FT.
	STRIP LOG		
Sandstone. Siltstone; claystone. Coal. Sandstone. Claystone and shale. Coal. Sandstone, gray, medium-grained, and claystone, brown to gray. Claystone. Coal. Sandstone, gray. Claystone, brown. Claystone, dark-gray, and sandstone, coarse-grained. Coal.			
			DEPTH FEET
			60 0 60 120 180 240 300 360



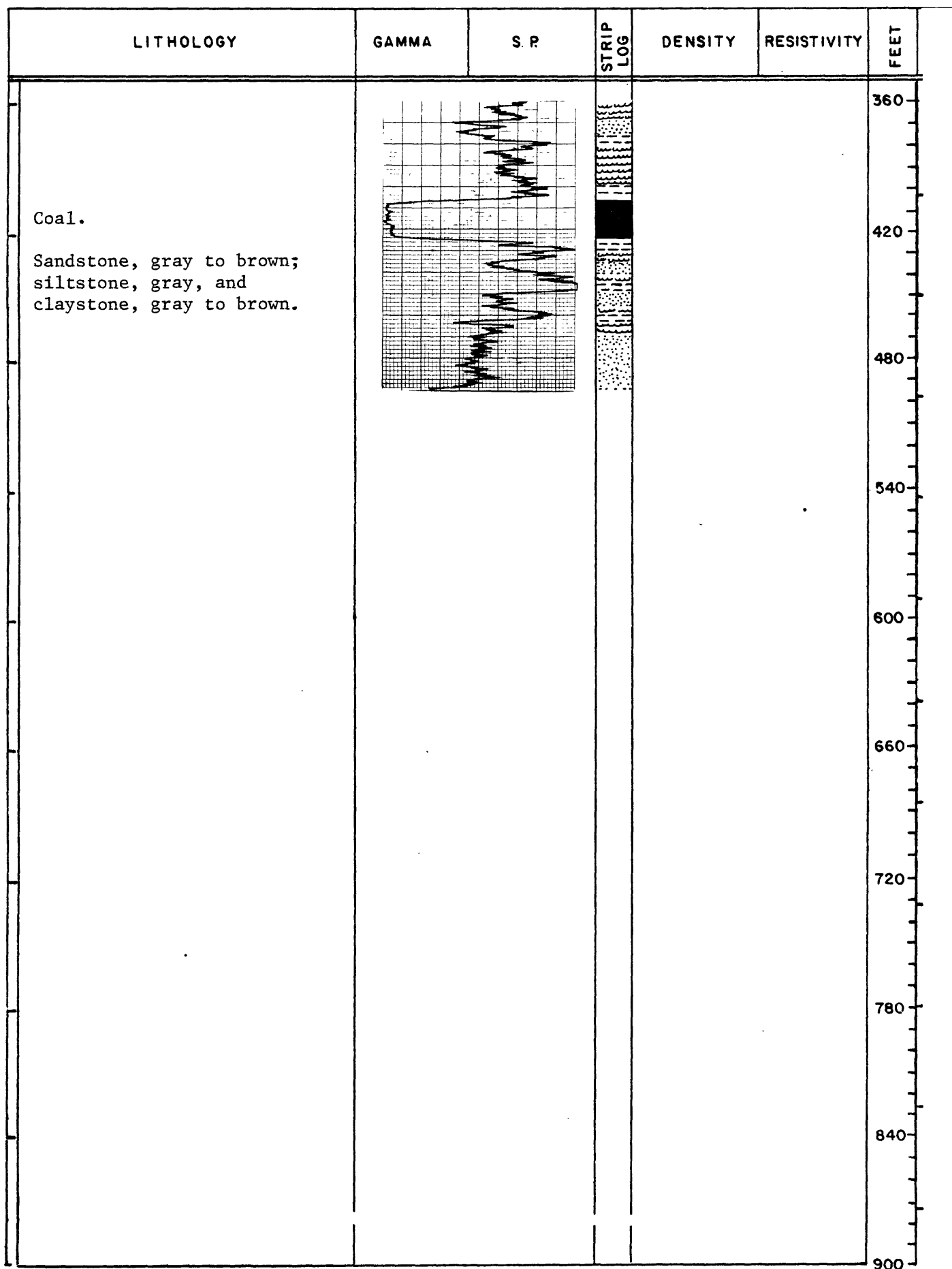
Remarks: Hole was logged 3 times: gamma, density, SP & resistivity 650-350;
gamma and density 500-0: gamma 500-0





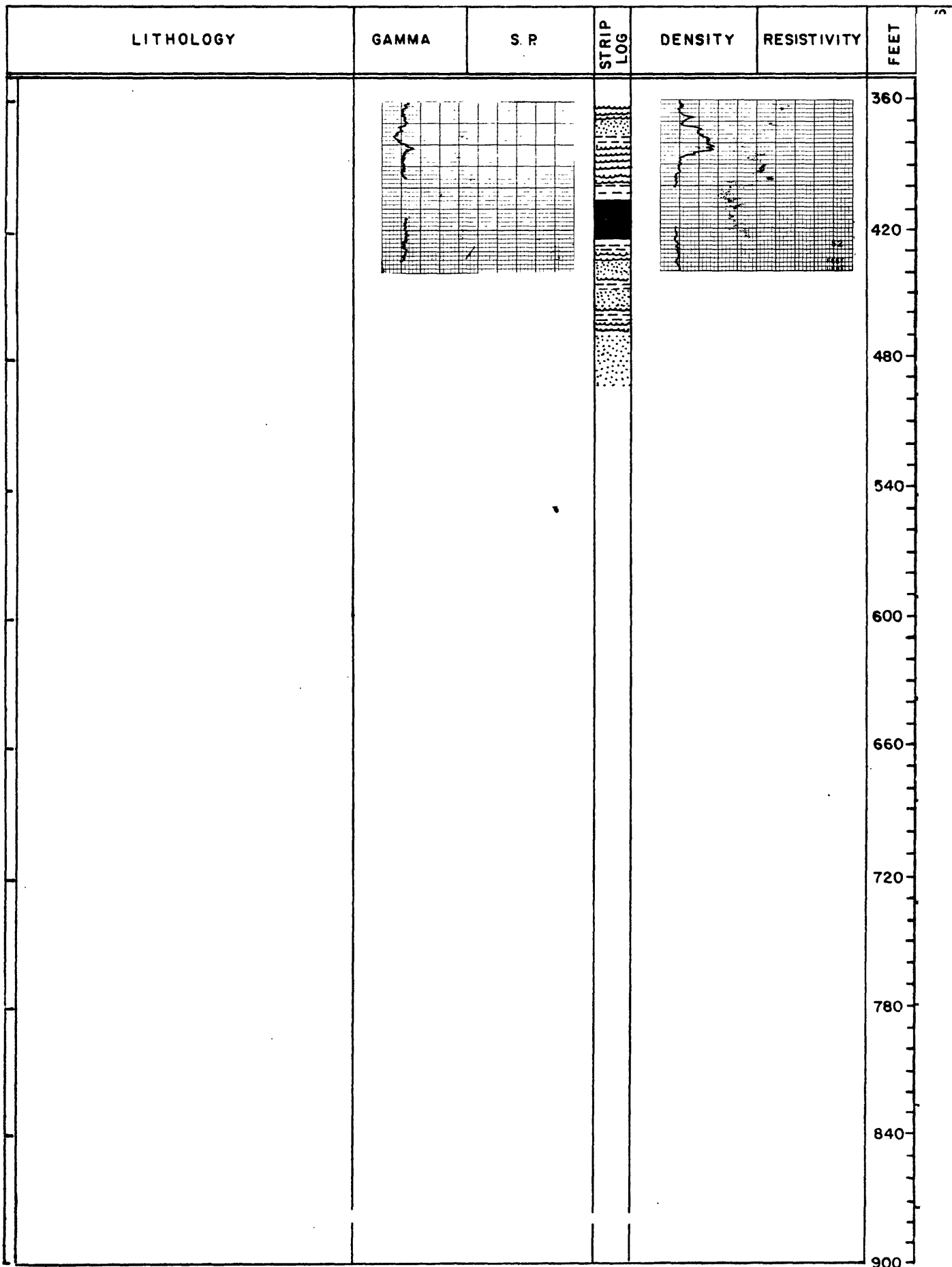
RECORDED BY K Jepsen GEOLOGIST ~~NO~~ YES RECORDED BY Hangas RECORDING SPEED 20 FT. MIN.

MBMG Form 170 (Rev. 1979)

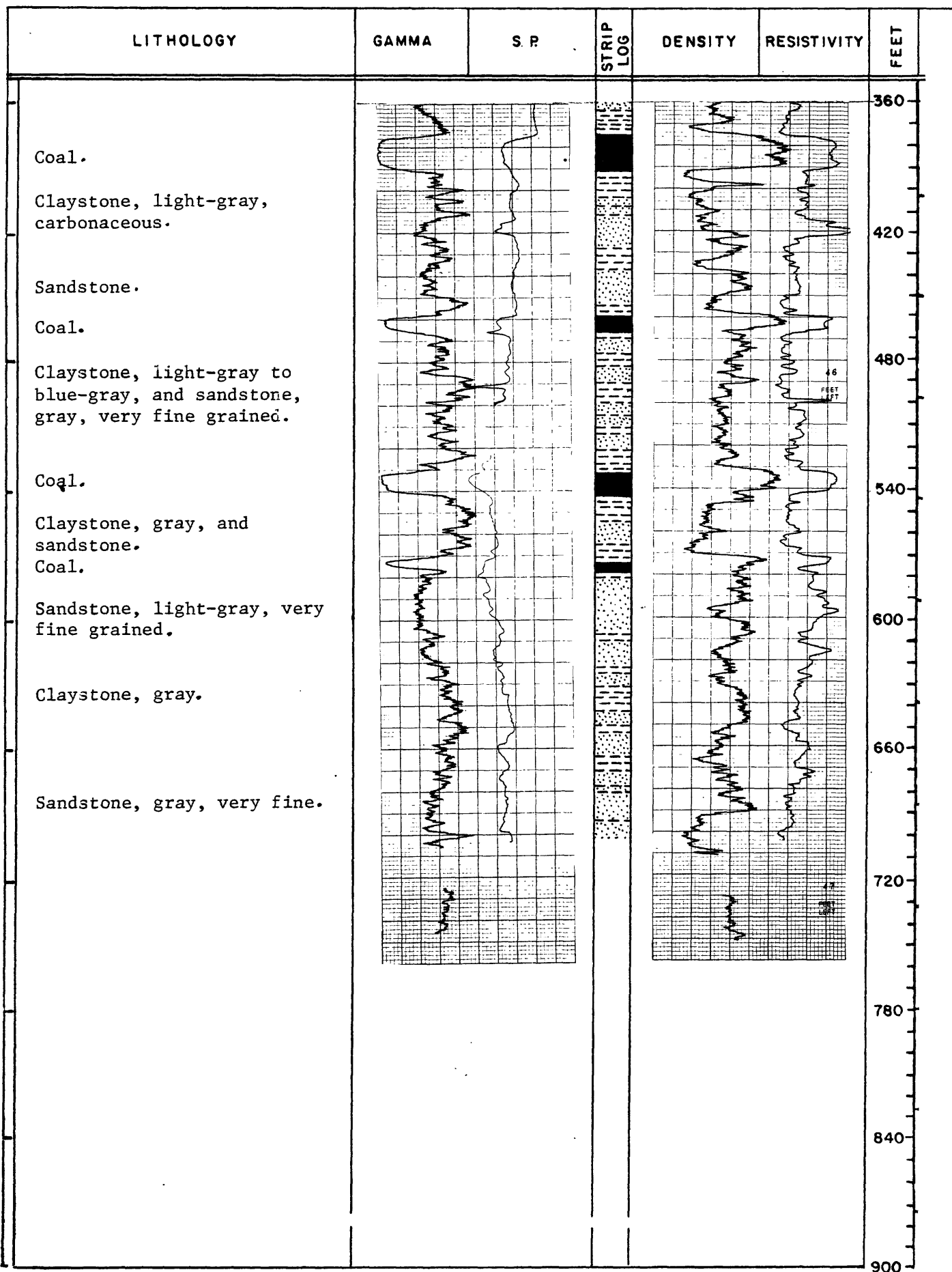


RECORDED BY K Jepsen GEOLOGIST ☒ YES RECORDED BY Hangas RECORDING SPEED 20 FT. MIN.

Geological log showing two columns of data on a grid. The left column contains a line graph with peaks and troughs. The right column contains a line graph with a similar pattern. A vertical scale on the far right is labeled "FEET" and "SPT" with values 60, 0, 60, 120, 180, 240, 300, and 360. A legend box in the middle of the right column contains the text "S1" and "FEET SPT".



RECORDED BY <u>R. Patterson</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>Hargis</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 706 FT. 704 FT.			LOGGED DEPTHS 711 FT. 704 FT.		FEET
Claystone. Sandstone, very fine.						60
Coal.						0
Sandstone, gray, very fine grained, and claystone, gray, carbonaceous.						60
Coal.						120
Sandstone, light-gray, very fine, and claystone, light-gray.						180
Sandstone, gray, very fine grained.						240
						300
						360



Hole No: US-80087B Map: Lacey Gulch Date: 10/24/80 State: Montana County: Big Horn
 Elev.: 3660 FT. Location: T 8 S R 42 E Sec 13 Tract ADBA Drilled depth 160 FT.
 Measured: 1550 FT. FNL 600 FT. FEL 600 FT. Hole size: 5 1/8 Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: No log for cored hole.

RECORDED BY <u>R Patterson</u> GEOLOGIST <u>NE</u>		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA		S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH
	T.C.	RANGE	SENS. SETTING		T.C.	SENS. SETTING	
	LOGGED DEPTHS		LOGGED DEPTHS				
	FT.	FT.			FT.	FT.	FEET
							60
							0
							60
							120
							180
							240
							300
							360

182

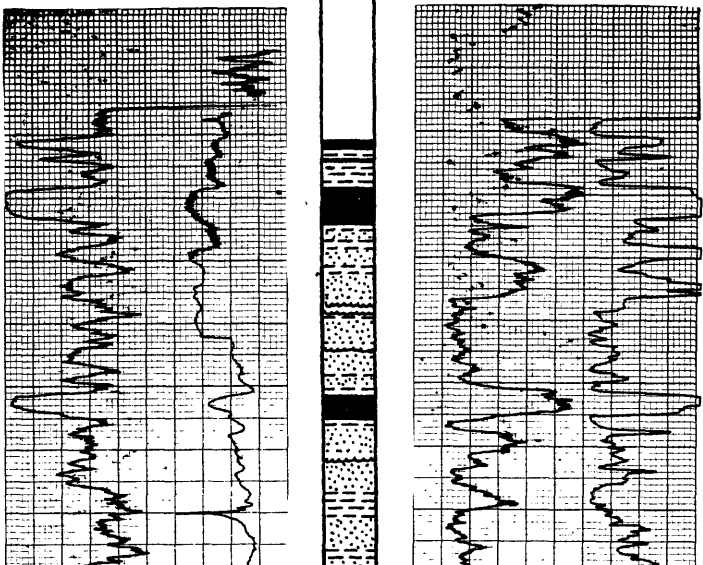
Hole No: US-80088 Map: Stroud Creek Date: 10/25/80 State: Montana County: Big Horn
 Elev.: 3678 FT. Location: T 8 S R 43 E, Sec 16 Tract DADB Drilled depth 560 FT.
 Measured: 1600 FT. FSL 400 FT. FEL FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned, probe could descend only 40' due to caving of clinker.

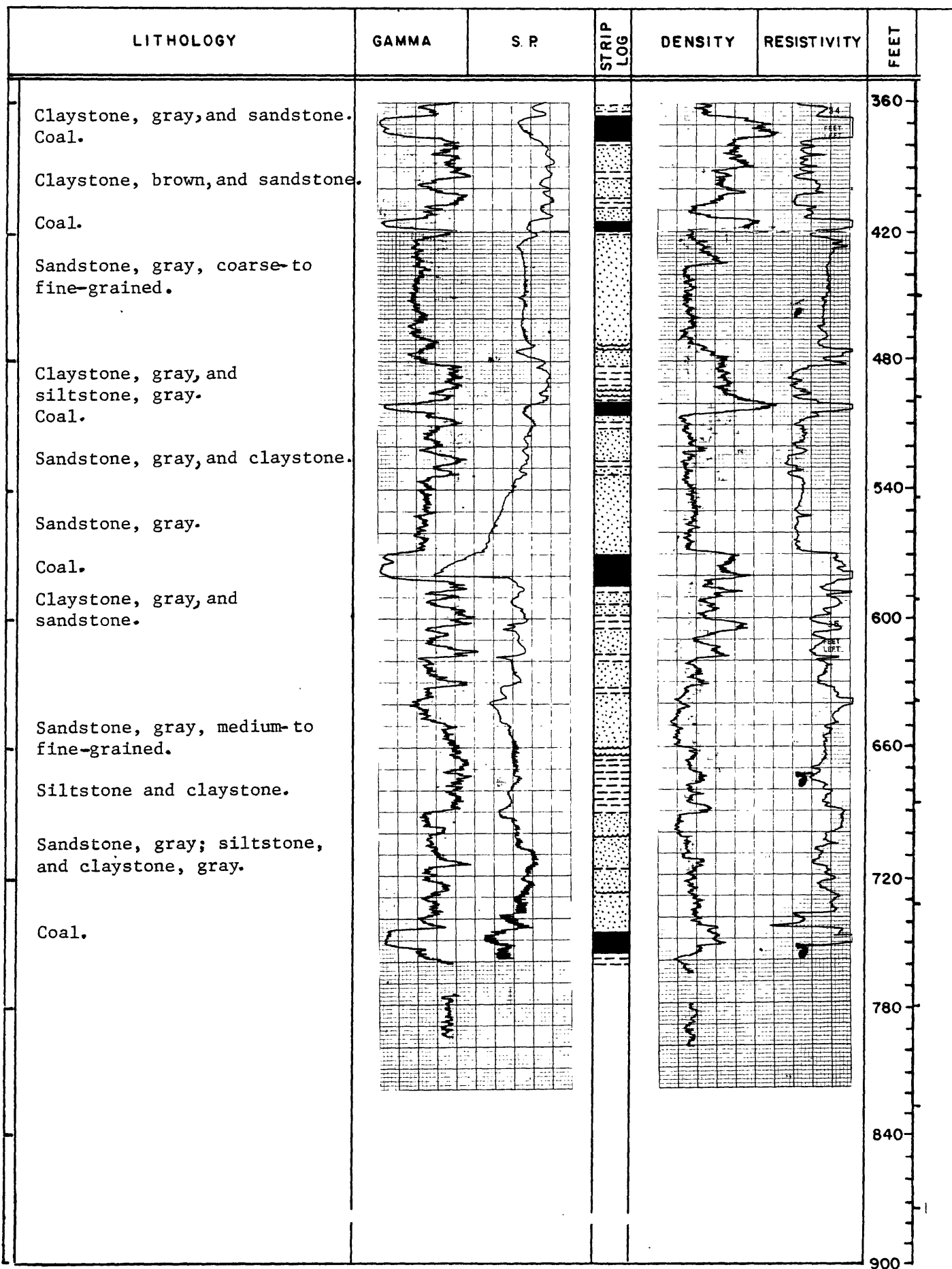
RECORDED BY <u>Karl Jepsen</u> GEOLOGIST <u>YES</u>		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH	
	LOGGED DEPTHS			LOGGED DEPTHS		FEET	
	FT.	FT.		FT.	FT.		
						60	
						0	
						60	
						120	
						180	
						240	
						300	
						360	

Hole No. US-80089A Map: Lacey Gulch Date: 10/25/80 State: Montana County: Big Horn
 Elev.: 3710 FT. Location: T 8 S R 42 E Sec 12 Tract BACD Drilled depth 60 FT.
 Measured: 1000 FT. FNL 1900 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: No surface casing, no circulation, no cuttings up.

RECORDED BY <u>J Hargas</u> GEOLOGIST NO YES		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH FEET
	T.C. <u> </u>	SENS. SETTING <u> </u>		T.C. <u> </u>	SENS. SETTING <u> </u>	
	RANGE <u> </u>	LOGGED DEPTHS FT. <u> </u> FT. <u> </u>		RANGE <u> </u>	LOGGED DEPTHS FT. <u> </u> FT. <u> </u>	
						60
						0
						60
						120
						180
						240
						300
						360

673
Hole No: US-80089B Map: Lacey Gulch Date: 10/26/80 State: Montana County: Big Horn
Elev.: 3650 FT Location: T 8 ^N R. 42 ^E Sec 12 Tract BDAA Drilled depth 780 FT.
Measured: 1400 FT. ^{FNL} 2400 FT. ^{F&B} FWL FT. Hole size: 3 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
Remarks: Klinker washed out from surface during logging.

RECORDED BY <u>J Hangan</u> GEOLOGIST ^{YES}		RECORDED BY <u>J Hangan</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG
	DENSITY T.C. <u>2</u> RANGE <u>200</u>		
	RESISTIVITY SENS. SETTING <u>100</u>		
	LOGGED DEPTHS <u>761 FT.</u> <u>759 FT.</u>		DEPTH FEET
			60
			0
			60
			120
			180
Coal.			240
Claystone, gray to brown.			
Coal.			
Claystone, gray to brown; siltstone and sandstone.			
Coal.			300
Claystone, gray; siltstone, dark-gray to brown, and sandstone.			360



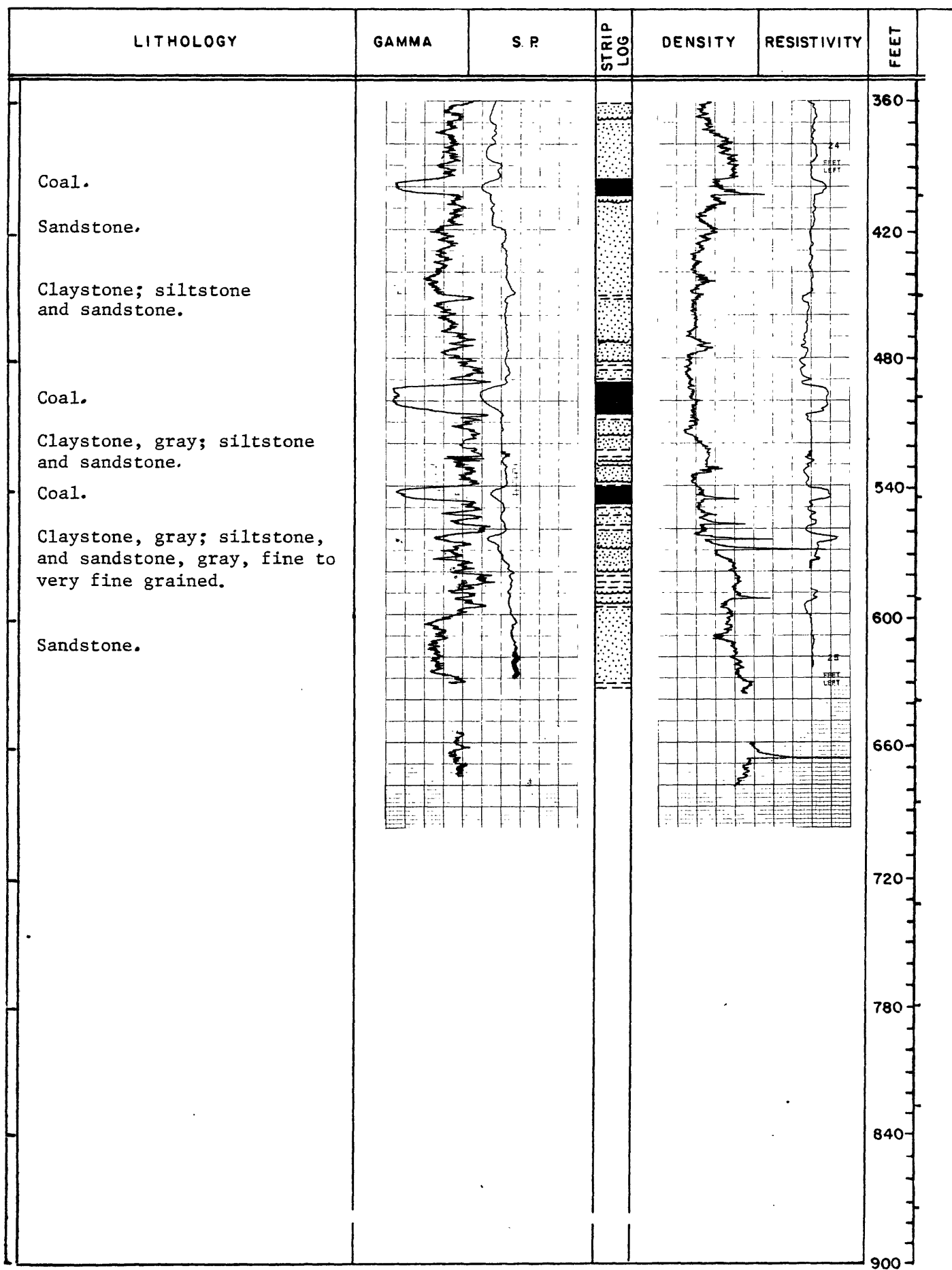
Hole No: US-80090 Map: Stroud Creek Date: 10/27/80 State: Montana County: Big Horn

Elev.: 3680 FT. Location: T 8 ^N~~S~~ R 43 ^E~~W~~ Sec 9 Tract AADC Drilled depth 500 FT.

Measured: 110 FT. ^{FNL}~~BSL~~ 550 FT. ^{FEL}~~BSL~~ FT. Hole size: IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒

Remarks: Hole abandoned, drilling could not be completed due to caving of
clinker.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{NOK} YES		RECORDED BY <u> </u>		RECORDING SPEED <u> </u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u> </u> RANGE <u> </u>	S.P. SENS. SETTING <u> </u>	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING <u> </u>	DEPTH FEET
	LOGGED DEPTHS			LOGGED DEPTHS		
	FT.	FT.		FT.	FT.	FT.
						60
						0
						60
						120
						180
						240
						300
						360



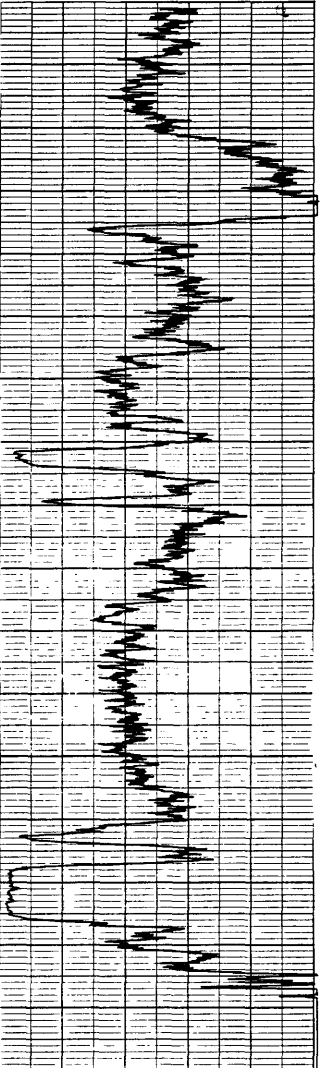
Hole No US-80092 Map Bear Creek School Date 10/29/80 State Montana County Powder River
 Elev.: 3930 FT. Location: T 9 ^N~~S~~ R 46 ^E~~W~~, Sec 6 Tract BDCB Drilled depth 330 FT.
 Measured: 2100 FT. ^{FNL}~~PSL~~ 1400 FT. ^{FEX}~~FWL~~ FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	
	LOGGED DEPTHS 302 FT. 300 FT.			
	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>		
LOGGED DEPTHS 307 FT. 300 FT.		DEPTH FEET		
Claystone, silty, gray to carbonaceous. Claystone, silty, carbonaceous, dark-gray. Coal. Sandstone and claystone. Sandstone, gray; siltstone and silty claystone. Claystone, silty, gray. Coal. Coal. Coal.				60
				0
				60
				120
				180
				240
				300
				360

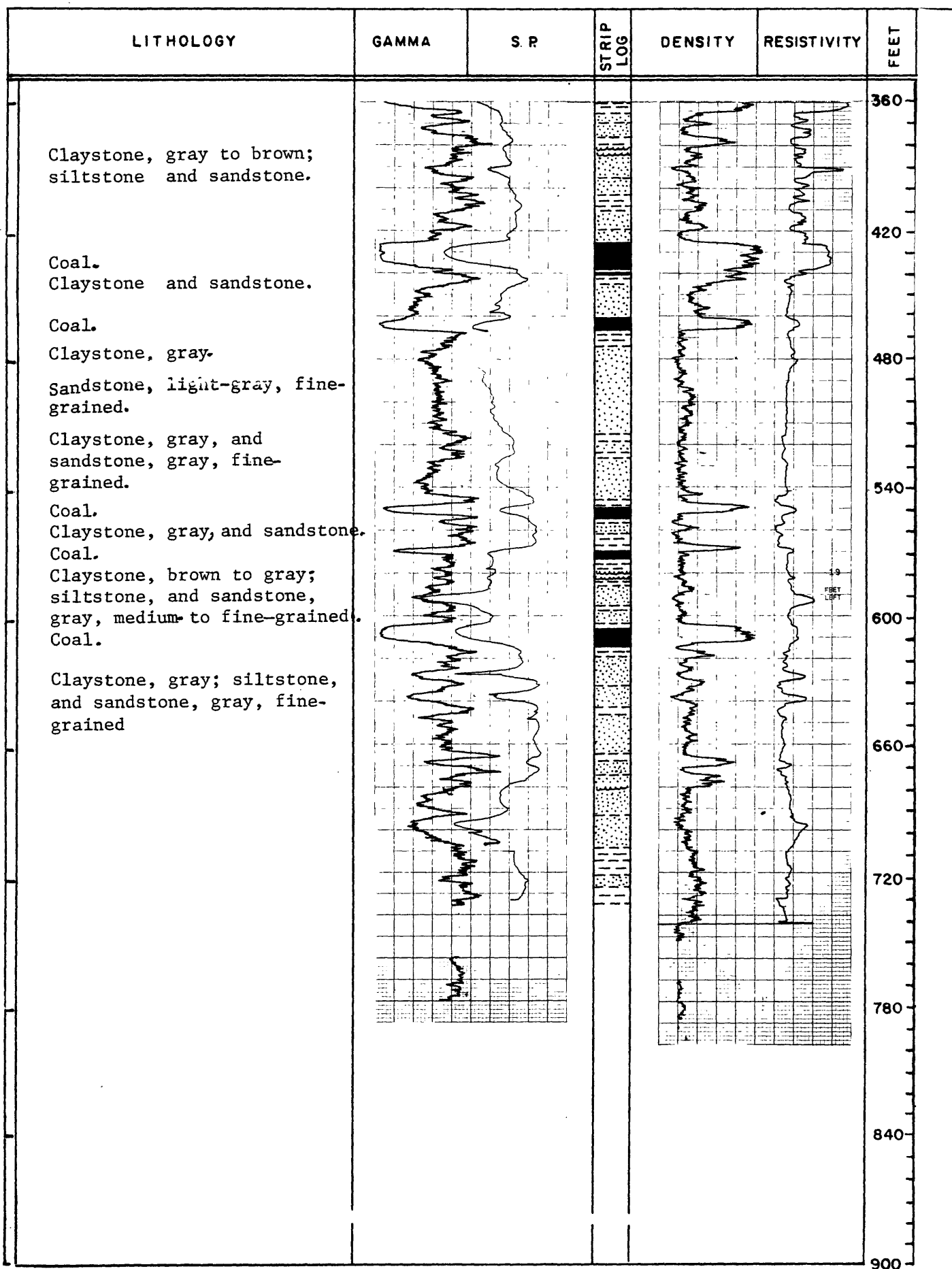
Hole No: UIS-80093 Map: Bear Creek School Date: 10/28/80 State: Montana County: Powder River
 Elev.: 3990 FT. Location: T 9 S R 45 E Sec 1 Tract CACA Drilled depth 300 FT.
 Measured: 1800 FT. FSL 1900 FT. FWL 1854 FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Density log not taken because of caving in hole and malfunction of equipment.

RECORDED BY <u>K Jepsen</u> GEOLOGIST YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>500</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS 300 FT. FT.		RESISTIVITY SENS. SETTING LOGGED DEPTHS FT. FT.
Claystone, dark-gray, carbonaceous. Claystone, silty, gray to dark gray; siltstone, gray, and sandstone, light-gray. Coal. Claystone, silty, gray, and siltstone. Sandstone. Claystone, siltstone, and sandstone.			DEPTH FEET 60 0 60 120 180 240 300 360

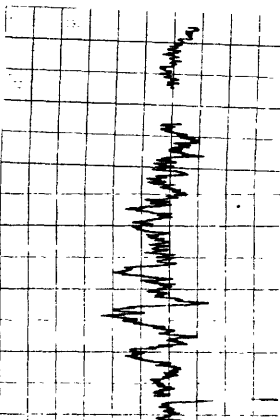
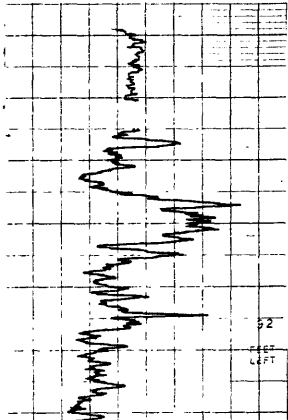
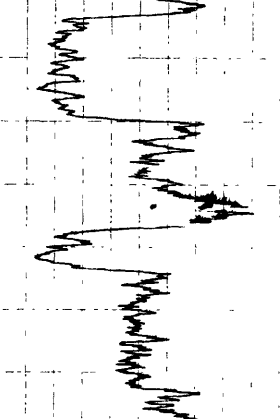
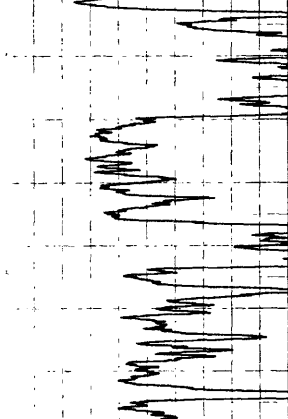
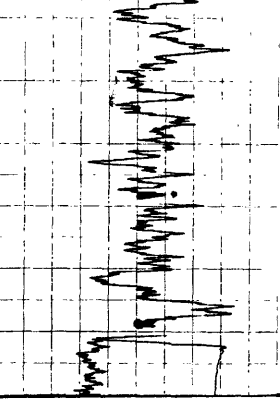
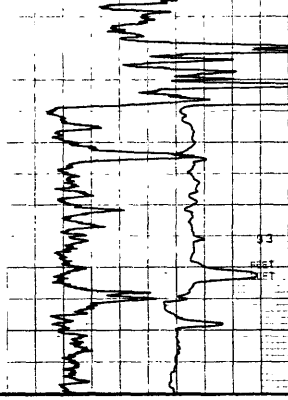
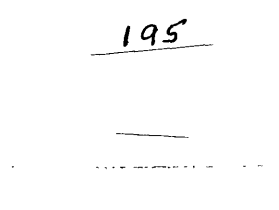
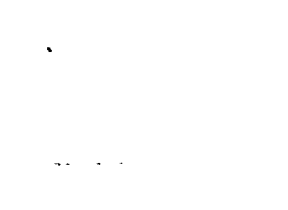
Hole No: US-80094 Map: Sayle Hall Date: 10/29/80 State: Montana County: Powder River
 Elev.: 3880 FT. Location: T 9 S R 46 E Sec 7 Tract ADAA Drilled depth 360 FT.
 Measured: 1620 FT. ENL 25 FT. FEL FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: _____

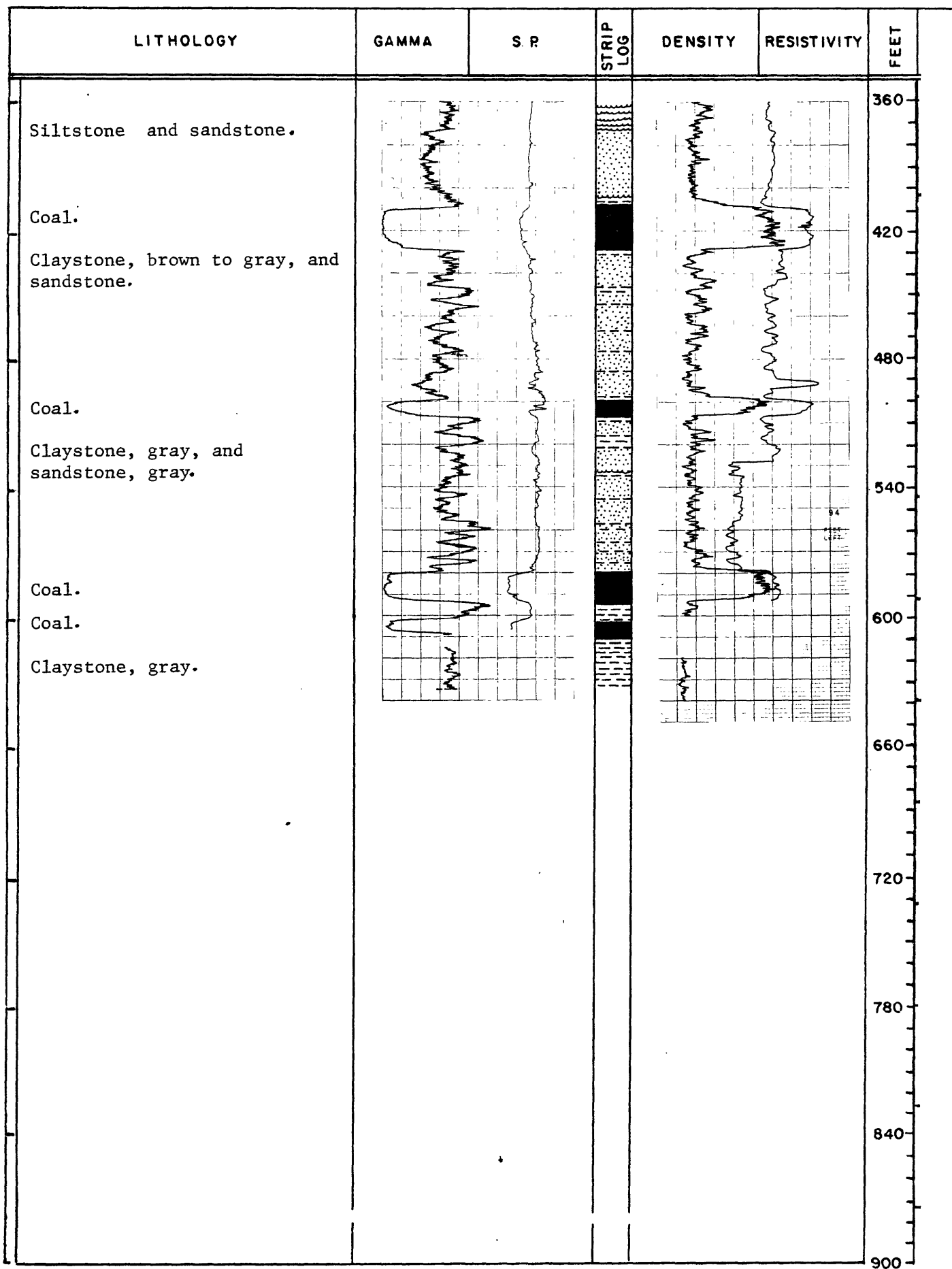
RECORDED BY <u>K Jepsen</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS <u>306</u> FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. FT.		
Siltstone, clayey, brown, and sandstone, silty, brown.			60
Claystone, silty, light-brown to dark-gray; siltstone and sandstone.			0
Claystone, carbonaceous.			60
Sandstone, and claystone, silty, gray.			120
Coal.			180
Claystone, dark-gray.			240
Coal.			300
Claystone, silty, gray; siltstone and sandstone.			360

RECORDED BY <u>J Hancas</u>		GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hancas</u>		RECORDING SPEED <u>20</u>		FT. MIN.		
LITHOLOGY	GAMMA		S.P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH
	T.C. <u>2</u>		SENS. SETTING			T.C. <u>2</u>		SENS. SETTING		
	RANGE <u>200</u>		<u>250</u>			RANGE <u>200</u>		<u>100</u>		
LOGGED DEPTHS					LOGGED DEPTHS					
735 FT. 733 FT.					751 FT. 744 FT.					
Coal.										60
Claystone, brownish-gray to dark-gray, and sandstone.										0
Coal.										60
Claystone, gray, and sandstone, very fine grained, silty.										120
Coal.										180
Claystone, gray; siltstone, gray, and sandstone, light-gray, very fine grained.										240
Coal.										300
Claystone, gray, and sandstone, very fine grained.										360
Coal.										420
Sandstone, light-gray, very fine grained; siltstone, brownish-gray, and claystone, gray.										480
Coal.										540
Sandstone, brown, fine-grained; siltstone, and claystone, brown to gray.										600
Coal.										660



Hole No: US80096A Map: Stroud Creek Date: 10/30/80 State: Montana County: Big Horn
 Elev.: 3790 FT. Location: T 8 S R 43 E, Sec 14 Tract CBBC Drilled depth 620 FT.
 Measured: 2000 FT. FSL 50 FT. FWL 550 FT. Hole size 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: Caliper log 10" scale, 398-0.

RECORDED BY <u>J Hargas</u> GEOLOGIST ³⁸⁰ YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>	
	LOGGED DEPTHS 609 FT. 607 FT.		RESISTIVITY SENS. SETTING <u>100</u>	
	LOGGED DEPTHS 599 FT. 593 FT.		DEPTH FEET	
Claystone, brown to tan; some minor clinker.				60
Claystone, siltstone, and sandstone, gray, fine- grained				0
Coal.				60
Claystone, dark-brown to gray. Sandstone.				120
Coal.				180
Sandstone, light-gray to gray, fine-grained.				240
Claystone and sandstone.				300
Coal.				360
Claystone, brown to gray; siltstone, and sandstone, gray, fine-grained				
Sandstone.				



Hole No: US80096B Map: Stroud Creek Date: 10/30/80 State: Montana County: Big Horn
 Elev.: 3790 FT. Location: T 8 ^N ~~E~~ S R 43 ^E ~~W~~ W, Sec 14 Tract CBBC Drilled depth _____ FT.
 Measured: 2000 FT. FSL 50 FT. FWL _____ FT. Hole size: _____ IN. Air ☒ Water ☐ Cored: Yes ☐ No ☐
 Remarks: Hole abandoned - no log.

RECORDED BY <u>JON HANGAS</u> GEOLOGIST NO YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH	
	LOGGED DEPTHS FT. FT.			LOGGED DEPTHS FT. FT.		FEET	
						60	
						0	
						60	
						120	
						180	
						240	
						300	
						360	

RECORDED BY <u>KARL JEPSEN</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>KARL JEPSEN</u> RECORDING SPEED <u>20</u>		FT. MIN.		
LITHOLOGY	GAMMA		S.P.	DENSITY	RESISTIVITY	DEPTH
	T.C. <u>2</u>	SENS. SETTING	T.C. _____	SENS. SETTING	_____	
	RANGE <u>100</u>	_____	RANGE _____	_____	_____	
LOGGED DEPTHS			STRIP LOG	LOGGED DEPTHS		FEET
250 FT. FT.				FT. FT.		
Sandstone, tan, fine-grained; siltstone, gray, and claystone, dark-gray, carbonaceous.						60
Coal.						0
Sandstone, gray, fine-grained; siltstone, gray, and claystone, gray.						60
Coal. Claystone, gray. Coal,						120
Siltstone, gray, and claystone, gray.						180
						240
						300
						360

Hole No: US-80098 Map: Otter Date: 10/30/80 State: Montana County: Powder River
 Elev.: 3782 FT. Location: T 8 ^N R 46 ^E, Sec 18 Tract CCCA Drilled depth 140 FT.
 Measured: 400 FT. ~~ENK~~ FSL 550 FT. ~~FWL~~ FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

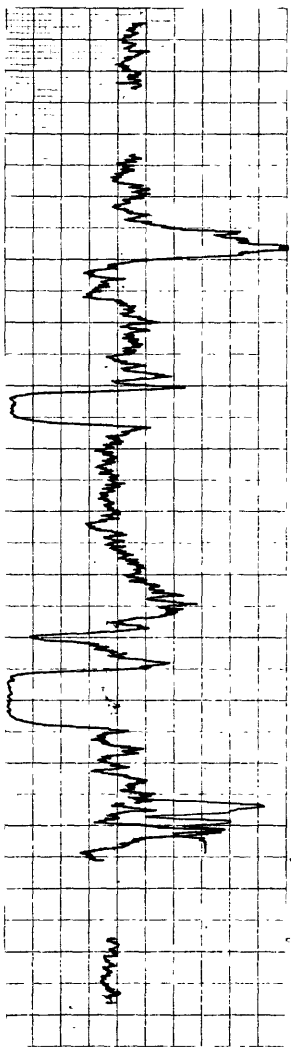
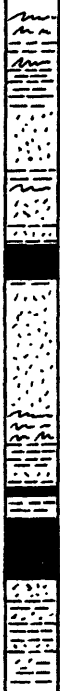
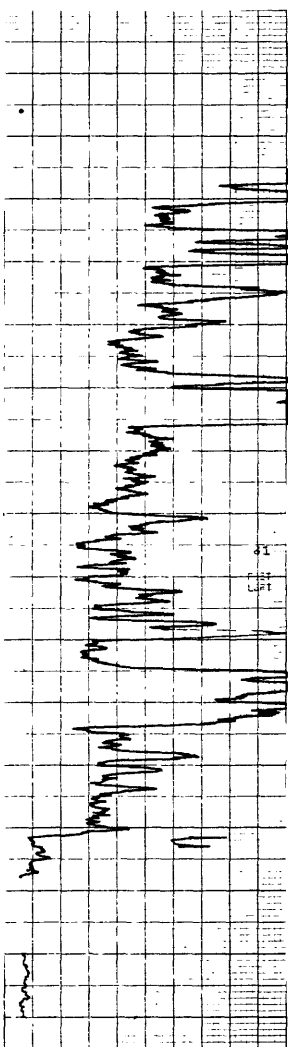
RECORDED BY <u>KARL JEPSEN</u> GEOLOGIST <u>NO</u> YES		RECORDED BY <u>KARL JEPSEN</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>126</u> FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. <u>130</u> FT.		DEPTH FEET
Sandstone, gray, fine-grained; siltstone, tan, and claystone, gray. Coal. Sandstone and siltstone, dark-gray, carbonaceous. Coal. Sandstone and siltstone, gray, and claystone, gray.			

Hole No: US-80099 Map: Bear Creek School Date: 11/5/80 State: Montana County: Powder River
 Elev.: 3805 FT. Location: T 8 ^N_S R 45 ^E_W, Sec 25 Tract ACAC Drilled depth 200 FT.
 Measured: 1950 FT. ^{FNL}~~FSL~~ 1750 FT. ^{FEL}~~KWL~~ FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Lithology modified by the geophysical logs

RECORDED BY <u>KARL JEPSEN</u> GEOLOGIST NO YES		RECORDED BY <u>KARL JEPSEN</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>195</u> FT. <u>192</u> FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. <u>200</u> FT.		DEPTH FEET
Coal.			60
Sandstone, silty, gray, fine-grained.			0
Claystone, silty, gray; siltstone, clayey, gray and carbonaceous; sandstone, gray.			60
Coal.			120
Coal.			180
Claystone; siltstone, clayey, gray, and sandstone, gray, fine-grained, carbonaceous.			240
			300
			360

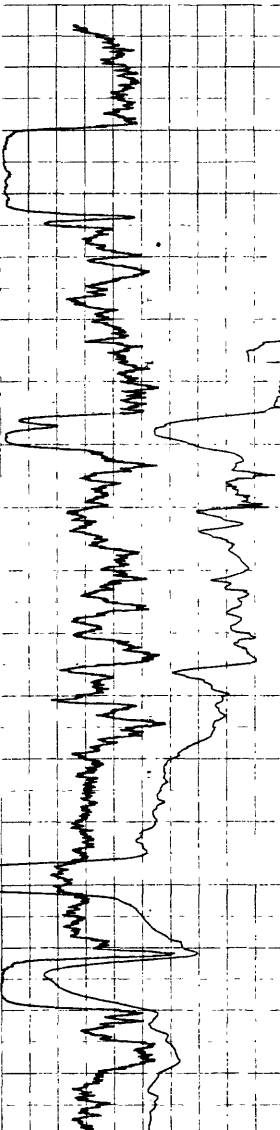
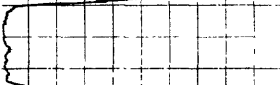
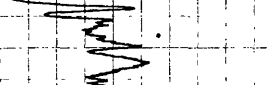


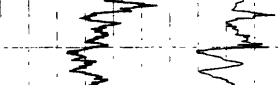
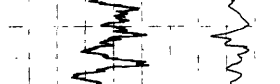




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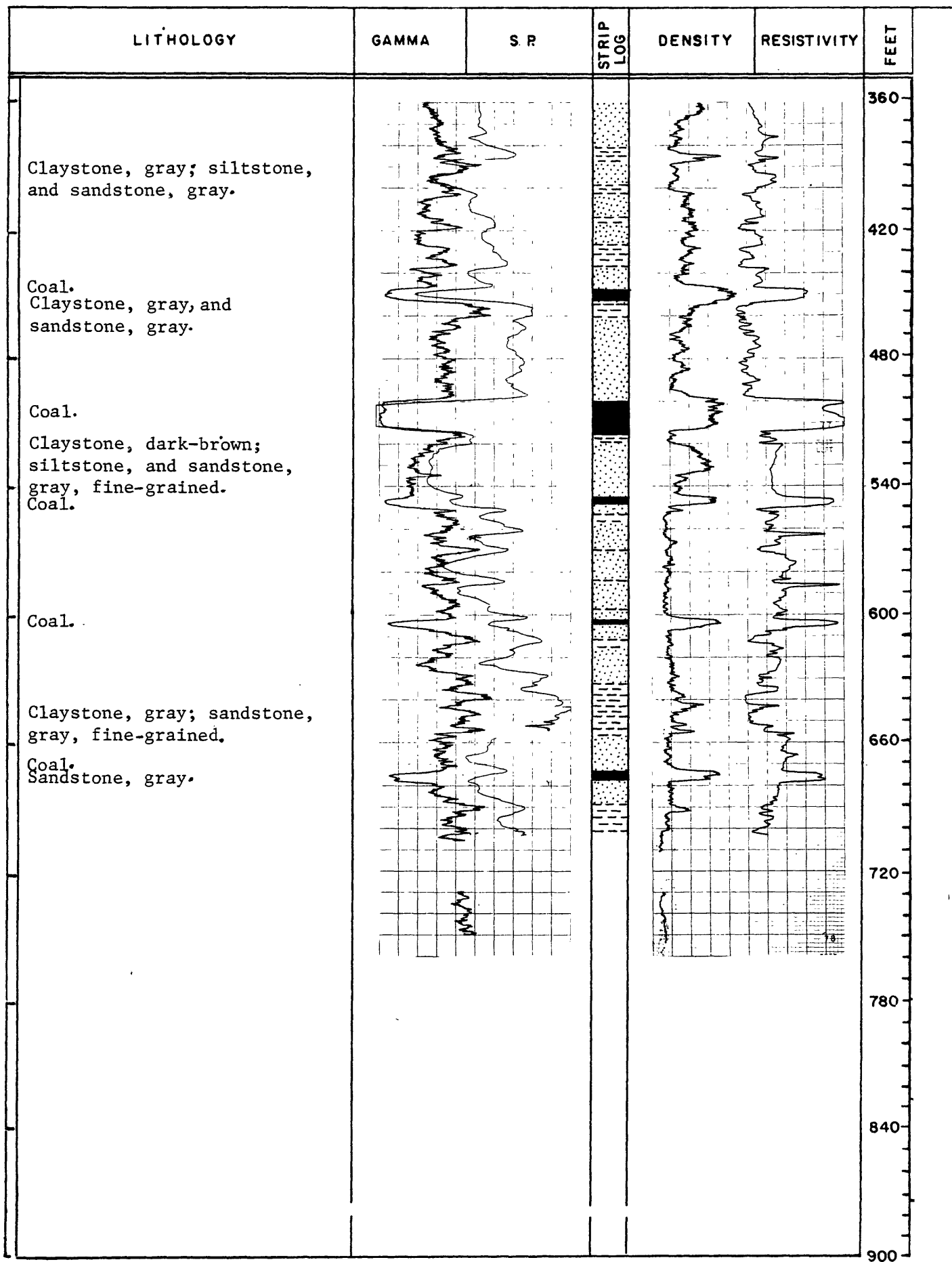
Hole No: US-80100 Map: Sayle Hall Date: 11/5/80 State: Montana County: Powder River
 Elev.: 3930 FT. Location: T 8 ^N R 46 ^E W, Sec 28 Tract DCCB Drilled depth 240 FT.
 Measured: 400 FT. ~~FSL~~ 2440 FT. ~~FEL~~ 2440 FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Lithology modified from the geophysical logs.

RECORDED BY <u>KARL JEPSEN</u> GEOLOGIST <input checked="" type="checkbox"/>		RECORDED BY <u>JON HANGAS</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING	
	LOGGED DEPTHS <u>235</u> FT. FT.			LOGGED DEPTHS <u>235</u> FT. FT.		
	FEET			FEET		
<p>Siltstone and claystone, gray, with gypsum, carbonaceous.</p> <p>Sandstone, beige, very-fine grained.</p> <p>Claystone, gray-black; siltstone, gray, and sandstone.</p> <p>Coal.</p> <p>Sandstone, gray, silty.</p> <p>Siltstone, gray, and claystone, silty.</p> <p>Coal.</p> <p>Claystone, carbonaceous.</p> <p>Coal.</p> <p>Sandstone and claystone, silty, gray, carbonaceous.</p>						<p>60</p> <p>0</p> <p>60</p> <p>120</p> <p>180</p> <p>240</p> <p>300</p> <p>360</p>

201

Hole NDUS-80101A Map: Forks Ranch Date: 11/5/80 State: Montana County: Big Horn
 Elev.: 3630 FT. Location: T 9S R 44E, Sec 7 Tract Irreg Drilled depth 710 FT.
 Measured: 1800 FT. ~~FNL~~ 4500 FT. ~~FWL~~ FWL FT. Hole size: 2 1/8 IN. Air ☒ Water ☐ Cored: Yes ☒ No ☐
 Remarks: US80101B was not logged, located 10' to the west.

RECORDED BY <u>J Hargas</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG
	LOGGED DEPTHS <u>706</u> FT. <u>704</u> FT.		
	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	
LOGGED DEPTHS <u>710</u> FT. <u>704</u> FT.		DEPTH FEET	
Sandstone and siltstone, yellow-tan; claystone, light- gray, buff, brown, gray.			60
Coal.			60
Claystone, gray.			
Sandstone, light-gray to gray, very fine grained, and minor siltstone.			120
Coal.			
Claystone, gray to brown; siltstone; sandstone, gray, fine-grained.			180
Claystone, carbonaceous, gray, and siltstone.			240
Sandstone, gray, fine- grained.			300
Coal.			
Claystone, gray, and sandstone, gray.			360
Sandstone, gray, very fine grained.			

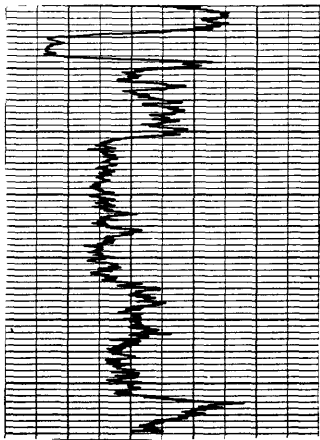



Hole No: US-80102 Map: Colstrip SE Date: 11/6/80 State: Montana County: Rosebud
 Elev.: 3280 FT. Location: T 1 ^N R 41 ^E W, Sec 24 Tract BABA Drilled depth 160 FT.
 Measured: 150 FT. ^{FNL} ~~XXX~~ 650 FT. ^{FWL} ~~XXX~~ FT. Hole size: 6 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Water was used for only the last few feet so S.P. and Resistivity were not used.

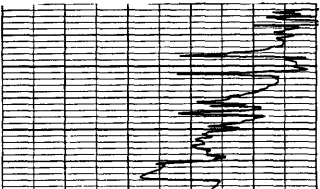
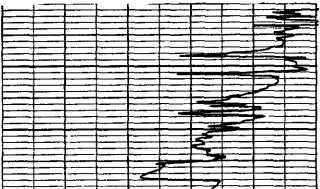
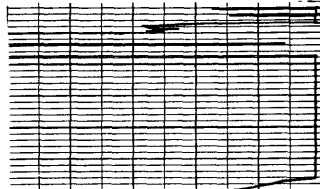
RECORDED BY <u>K Jepsen</u> GEOLOGIST NOX YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>145</u> FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS <u>150</u> FT. FT.		RESISTIVITY SENS. SETTING
	STRIP LOG		DEPTH FEET
Sand, light-brown, fine, clayey. Coal. Silty claystone, gray Silty sandstone, gray, fine.			60 0 60 120 180 240 300 360

Hole No US-80103 Map Colstrip SW Date 11/8/80 State Montana County Rosebud
 Elev. 3590 FT. Location: T 1^N R 41^E Sec 16 Tract DADA Drilled depth 500 FT.
 Measured: 1800 FT. FSL 200 FT. ^{FEL} 200 FT. ^{FWL} 200 FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

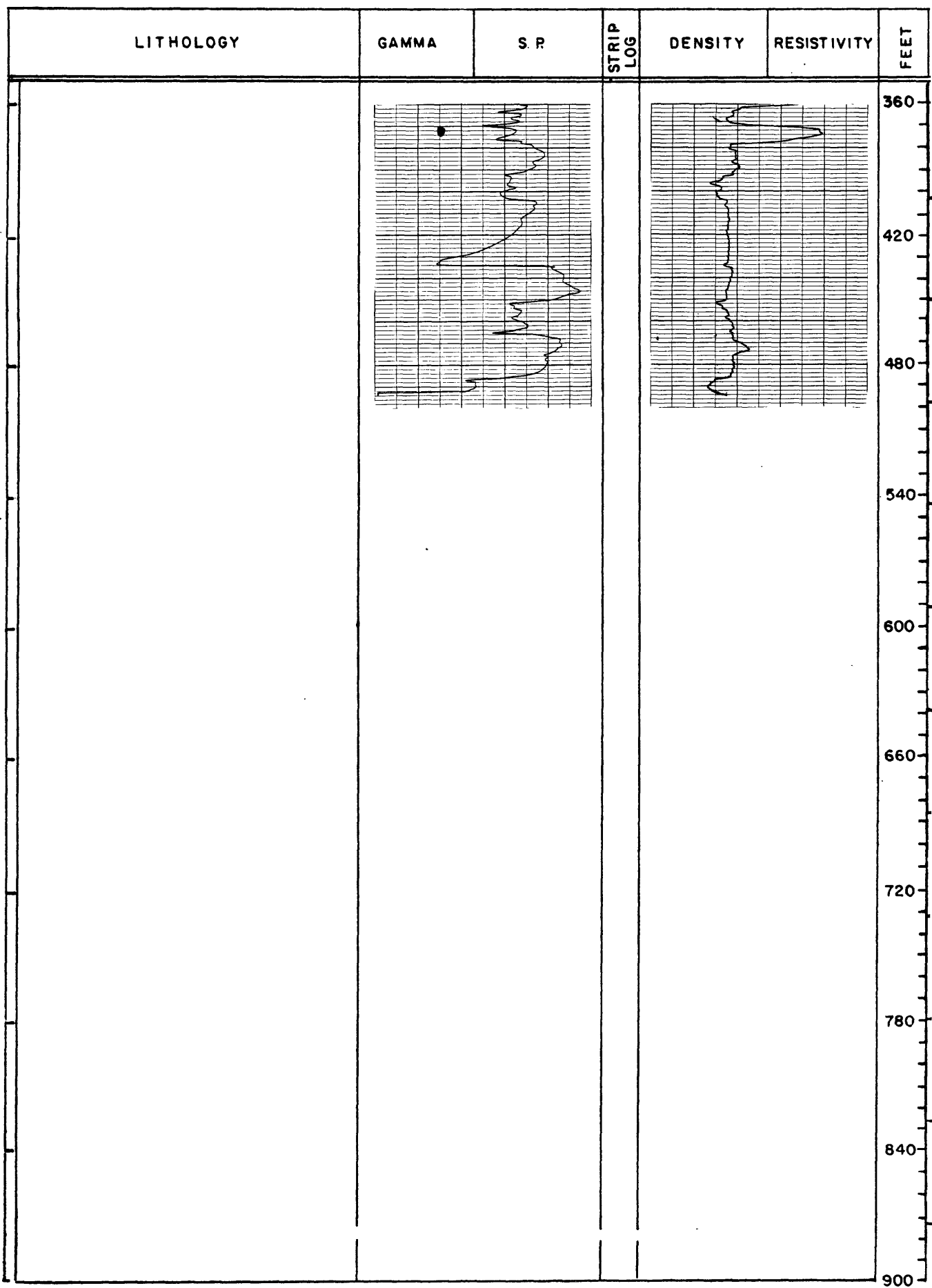
RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{YES} NO		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS 495 FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. FT.		DEPTH FEET
Siltstone, tan.			60
Sandstone, gray, fine.			0
Sandstone, gray, medium.			60
Silty sandstone, gray, fine.			120
Sand, gray, fine.			180
Silty sand, gray, fine.			240
Silty clay, gray.			300
Coal.			360

LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Coal.						360
Silty claystone, dark-gray, carbonaceous.						420
Silty sand, gray, fine.						480
Sandy siltstone, gray.						540
						600
						660
						720
						780
						840
						900

Hole No US 80103 Map: Colstrip SW Date: 11/8/80 State: Montana County: Rosebud
 Elev.: 3590 FT. Location: T 1 ^N ~~S~~ R 41 ^E ~~W~~, Sec 16 Tract DADA Drilled depth 500 FT.
 Measured: 1800 FT. ~~FSL~~ ^{FSL} 200 FT. ~~FSL~~ ^{FSL} FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>K Jepsen</u> GEOLOGIST NOX YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.			
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING <u>10</u>	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>20</u>	DEPTH
	LOGGED DEPTHS FT. <u>494</u> FT.		LOGGED DEPTHS FT. <u>494</u> FT.		FEET
					60
					0
					60
					120
					180
					240
					300
					360

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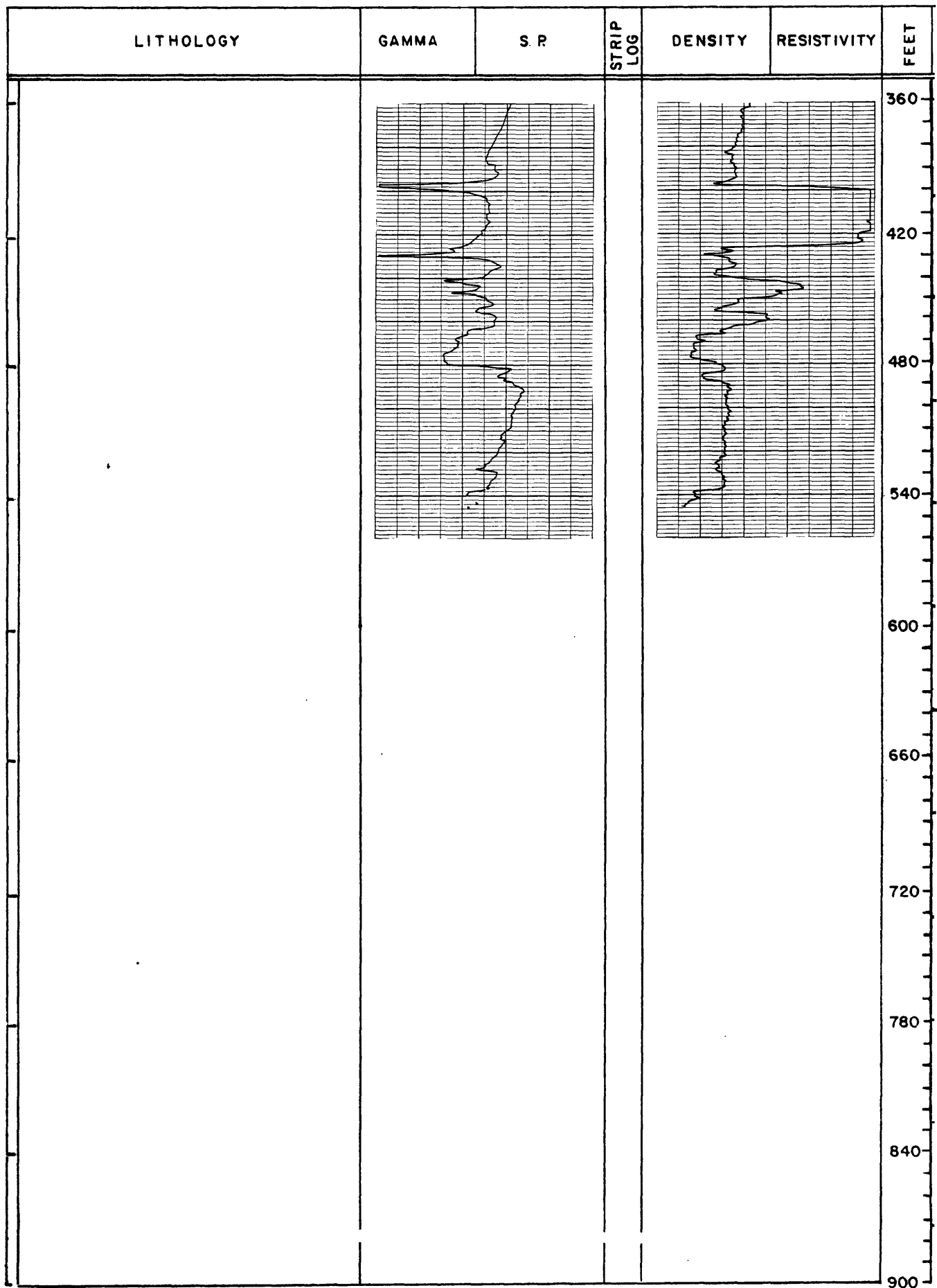


Hole No US-80104 Map: Colstrip SW Date: 11/8/80 State: Montana County: Rosebud
 Elev.: 3615 FT. Location: T 18 N 841 E, Sec 16 Tract CBAC Drilled depth 600 FT.
 Measured: 1800 T. ~~PSL~~ 900 FT. ~~FWL~~ FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>K Jepsen</u> GEOLOGIST NOX YES		RECORDED BY <u>Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING <u>20</u>	DENSITY T.C. _____ RANGE _____
	RESISTIVITY SENS. SETTING <u>20</u>		DEPTH
	LOGGED DEPTHS <u>545</u> FT. _____ FT.		LOGGED DEPTHS FT. FT.
Sandy silt, light-brown. Silty claystone, light-brown. Siltstone, light-gray. Silty claystone, gray. Silty sand, gray, fine. Silty sandstone, gray, fine.			60 0 60 120 180 240 300 360

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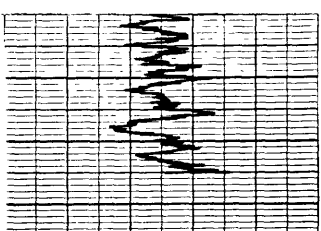

RECORDED BY <u>K Jepsen</u>		GEOLOGIST NOX YES	RECORDED BY <u>K Jepsen</u>		RECORDING SPEED <u>20</u>	FT. MIN.
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS.SETTING <u>20</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS.SETTING <u>20</u>	DEPTH
	LOGGED DEPTHS FT 312-540 FT.			LOGGED DEPTHS FT. 312-545 FT.		FEET
						60
						0
						60
						120
						180
						240
						300
						360



Hole No US-80105 Map: Colstrip SW Date: 11/9/80 State: Montana County: Rosebud
 Elev.: 3545 Location: T 18 N R 41 E, Sec 20 Tract ABCB Drilled depth 440 FT.
 Measured: 800 FT. ~~FNL~~ 2600 FT. ~~FEL~~ FT. Hole size: 2 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative.

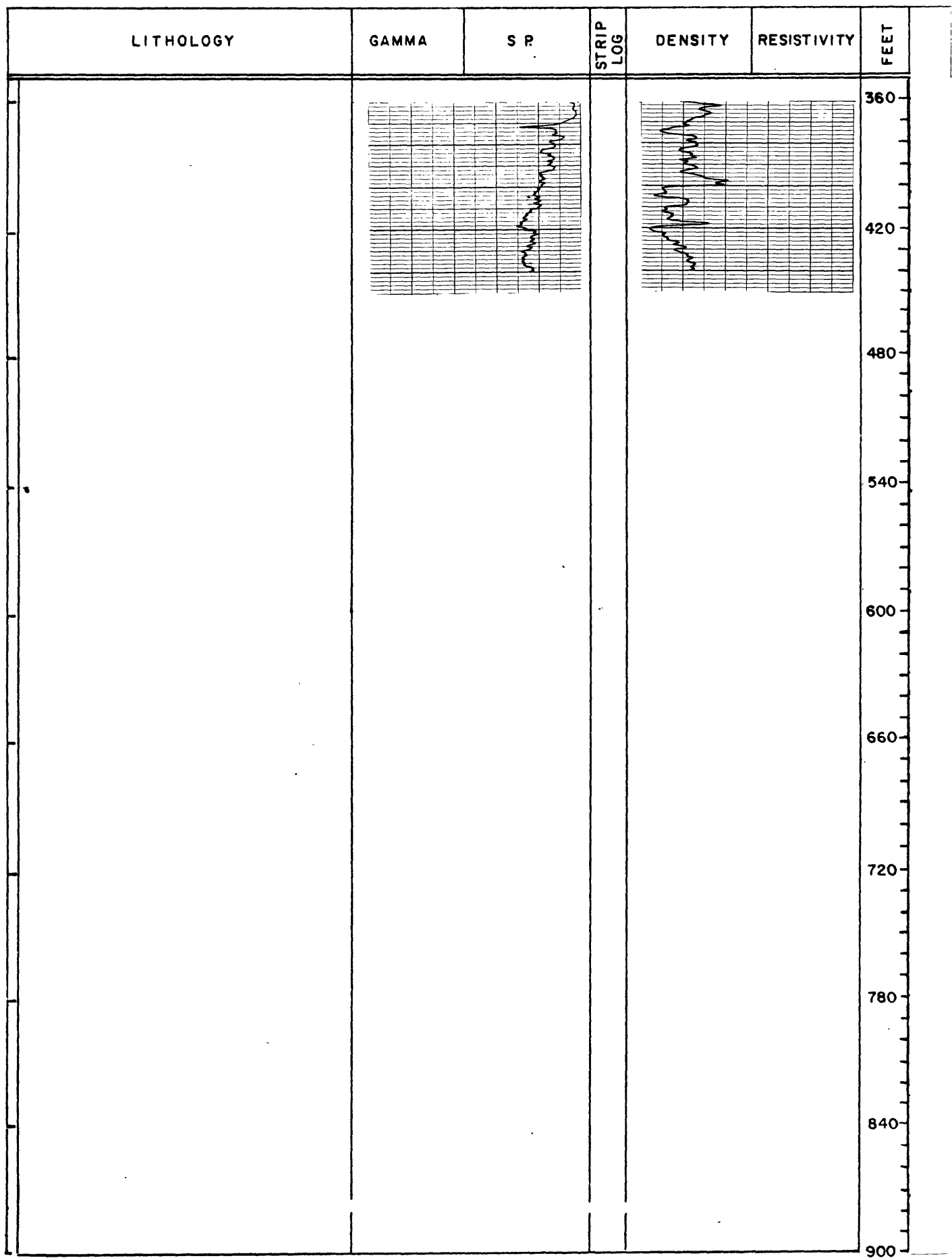
RECORDED BY <u>K Jepsen</u> GEOLOGIST NO YES		RECORDED BY <u>J Hansas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS <u>410</u> FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT. FT.		DEPTH FEET
Sandy siltstone, gray, and sandstone, brown, medium. Claystone, carbonaceous, gray-black; silty sandstone, gray, and sandy siltstone, gray. Sandstone, gray, medium. Sand, gray, fine. Sandstone, gray, medium. Coal. Claystone, gray. Coal. Claystone, gray.			60
			0
			60
			120
			180
			240
			300
			360

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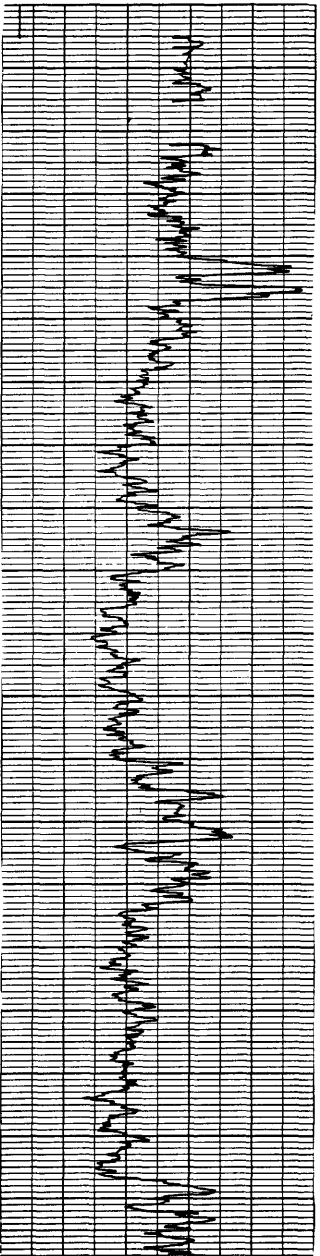
LITHOLOGY	GAMMA	S. P	STRIP LOG	DENSITY	RESISTIVITY	FEET
Claystone, gray.						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

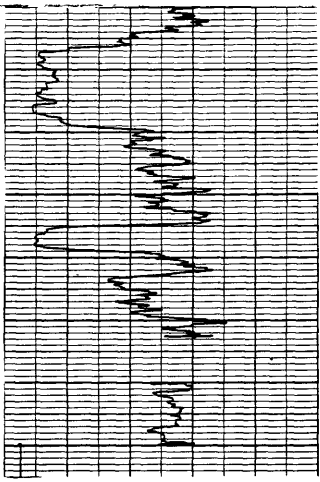

Hole No US-80105 Map: Colstrip SW Date: 11/9/80 State: Montana County: Rosebud
 Elev.: 3545 FT. Location: T. 18^N R. 41^E Sec. 20 Tract ABCB Drilled depth 440 FT.
 Measured: 800 FT. ^{FNL} ~~BSX~~ 2600 FT. ^{FEL} ~~BSX~~ FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u>	FT. MIN.	
LITHOLOGY	GAMMA	S.P.	STRIP LOG	DENSITY	RESISTIVITY	DEPTH FEET
	T.C. _____	SENS. SETTING		T.C. _____	SENS. SETTING	
	RANGE _____	<u>20</u>		RANGE _____	<u>20</u>	
	LOGGED DEPTHS			LOGGED DEPTHS		
	FT. <u>440</u>	FT.		FT. <u>440</u>	FT.	
			STRIP LOG			60
						0
						60
						120
						180
						240
						300
						360



Hole No US-80106 Map: Colstrip SW Date: 11/9/80 State: Montana County: Rosebud
 Elev.: 3610 FT. Location: T 18 N R 41 E, Sec 28 Tract BAAC Drilled depth 465 FT.
 Measured: 575 FT. FNL 2150 FT. FWL xxx FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Lithology not taken because samples were washed away, density probe inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST <u>YES</u>		RECORDED BY <u>J Hansas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	RESISTIVITY SENS. SETTING		DEPTH
	LOGGED DEPTHS 465 FT. FT.		LOGGED DEPTHS FT. FT.
		STRIP LOG	60 0 60 120 180 240 300 360

LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

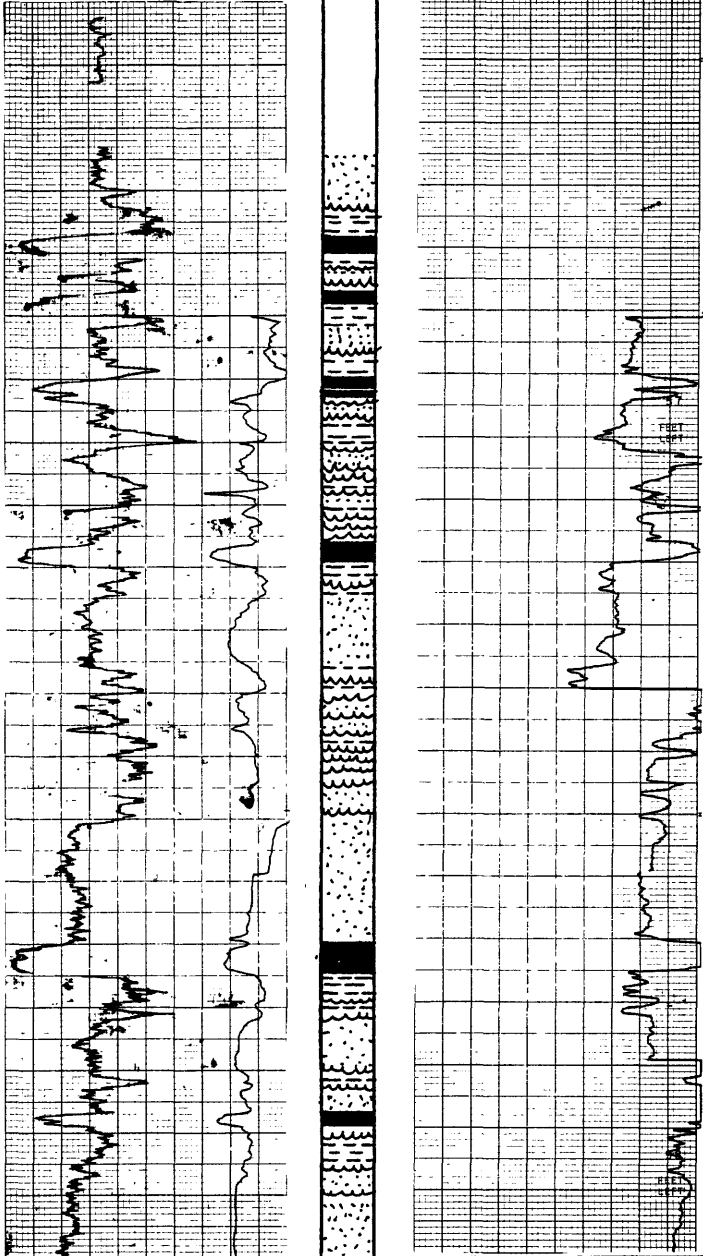
RECORDED BY R Patterson GEOLOGIST ^{NO}_{YES} RECORDED BY K Jepsen RECORDING SPEED 20 ^{FT.}_{MIN.}

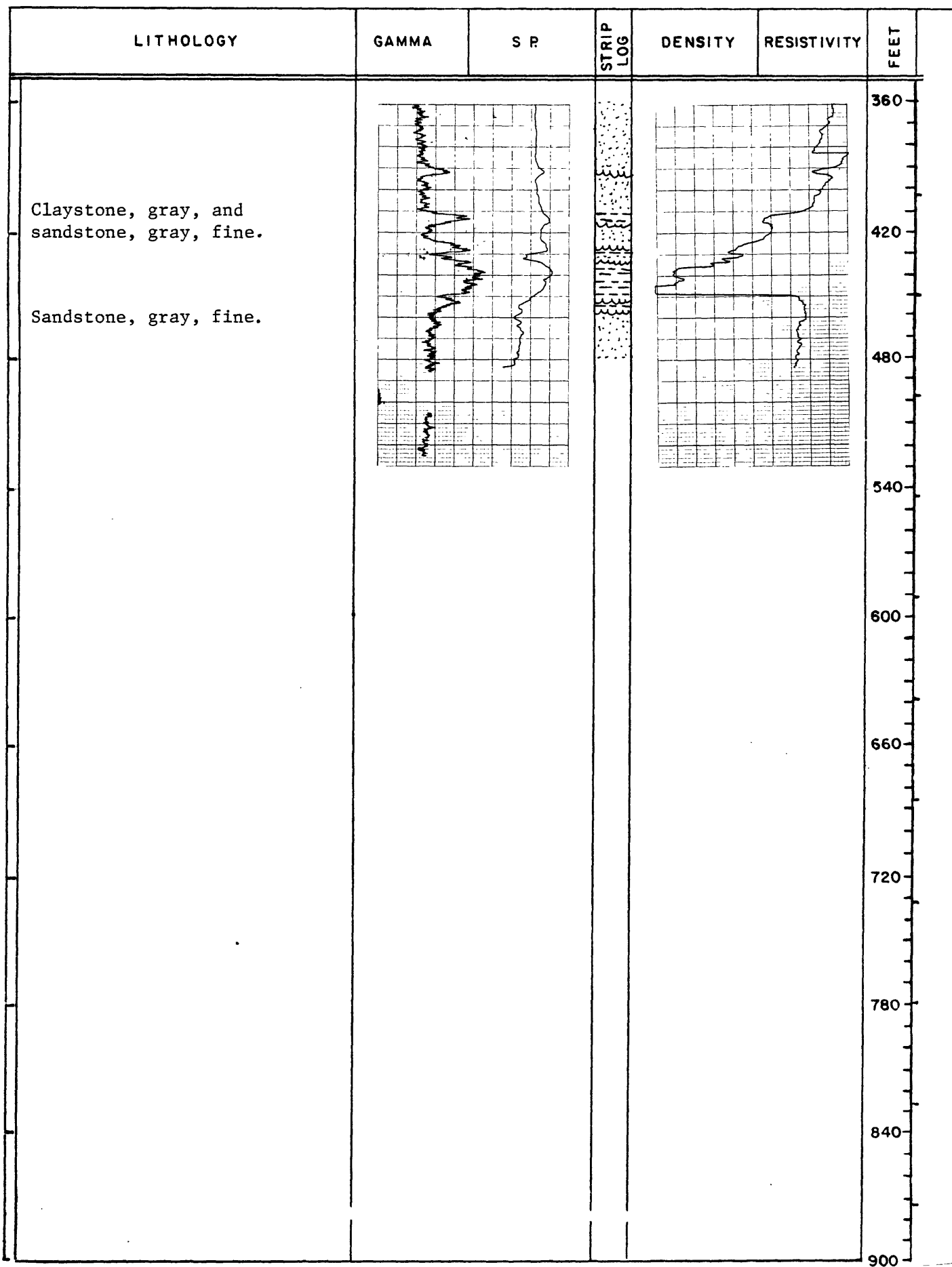
MBMG Form 170 (Rev. 1979)

Hole No US-80108A Map: Colstrip SW Date: 11/11/80 State: Montana County: Rosebud
 Elev.: 3360 FT. Location: T 15 R 41 E, Sec 6 Tract BAAA Drilled depth 200 FT.
 Measured: 90 FT. FNL 2550 FT. FWL 2550 FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative.

RECORDED BY <u>R Patterson</u> GEOLOGIST YES		RECORDED BY <u>K Jepsen</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING <u>20</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>20</u>
	LOGGED DEPTHS FT. <u>190</u> FT.			LOGGED DEPTHS FT. <u>190</u> FT.	
	FEET			FEET	
				60	
				0	
				60	
				120	
				180	
				240	
				300	
				360	

Hole ~~N~~^S ~~S~~-80108B Map: Colstrip SW Date: 11/18/80 State: Montana County: Rosebud
 Elev.: 3360 -FT. Location: T 1^S R 41^W, Sec 6 Tract BAAA Drilled depth 500 FT.
 Measured: 90 FT. ~~2550~~ FT. ^{FNL} ~~2550~~ FT. ^{FWL} ~~2550~~ FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

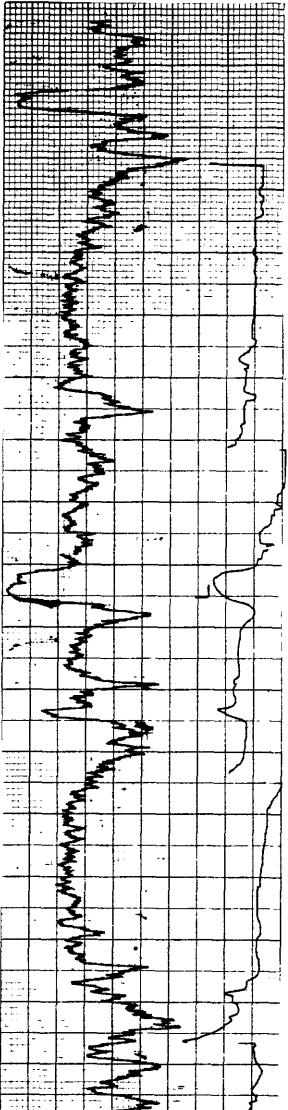

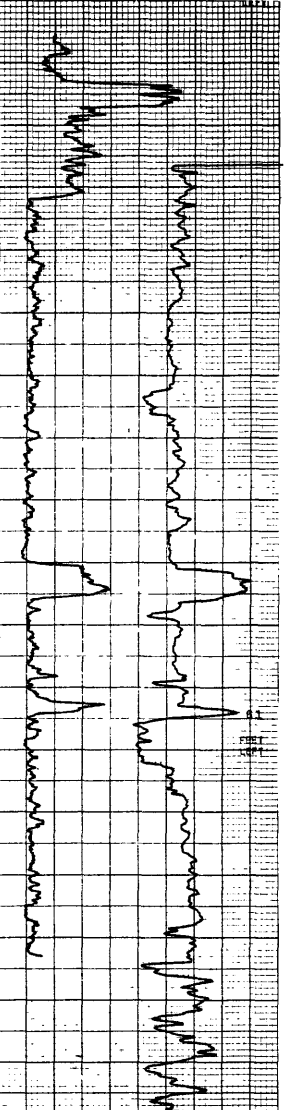
RECORDED BY <u>J Hargas</u> GEOLOGIST ^{XNO} YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	DENSITY T.C. _____ RANGE _____
	STRIP LOG		RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS 486 FT. 484 FT.		LOGGED DEPTHS FT. 484 FT.
Sandstone, brown, fine; silt, brown. Claystone, gray. Coal. Coal. Claystone, gray, and sandstone, gray. Coal. Sandstone, gray, fine, and claystone, gray. Coal. Sandstone, gray, fine. Claystone, gray, and sandstone, gray. Sandstone, gray, fine. Coal. Claystone, gray. Sandstone, gray, fine. Coal. Sandstone, gray, fine.			DEPTH FEET 60 0 60 120 180 240 300 360



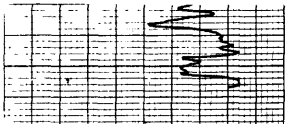


Hole No: US-80109^A Map: Colstrip SW Date: 11/11/80 State: Montana County: Rosebud
 Elev.: 3265 FT. Location: T 1 S. R 41 E, Sec 8 Tract BBAB Drilled depth 220 FT.
 Measured: 50 FT. FNL 500 FT. FWL 500 FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperable.

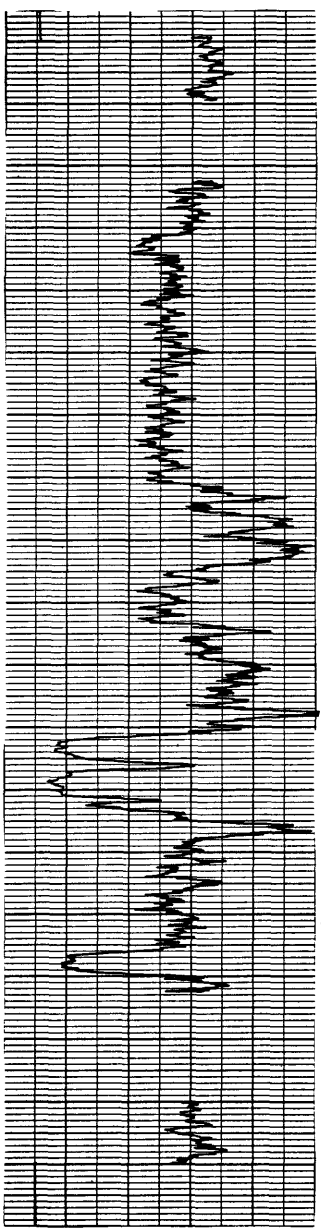

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{NO} YES		RECORDED BY <u>K Jepsen</u>		RECORDING SPEED <u>20</u> FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING	DEPTH FEET
	LOGGED DEPTHS 210 FT. FT.			LOGGED DEPTHS FT. FT.		
Siltstone, tan. Coal. Claystone, gray. Siltstone, gray. Sandstone, gray, fine to medium. Claystone, gray; minor shale, carbonaceous. Siltstone, gray, and sandstone, gray. Coal. Claystone, gray. Sandstone, gray, medium.						

Hole No US-80109B Map: Colstrip SW Date: 11/18/80 State: Montana County: Rosebud
 Elev.: 3265 FT. Location: T 1 S R 41 E, Sec 8 Tract BBBA Drilled depth 400 FT.
 Measured: 50 FT. FNL 500 FT. FWL 500 FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

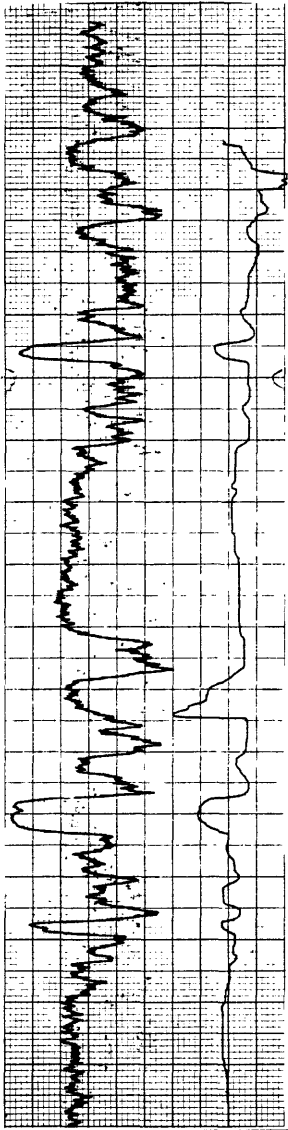

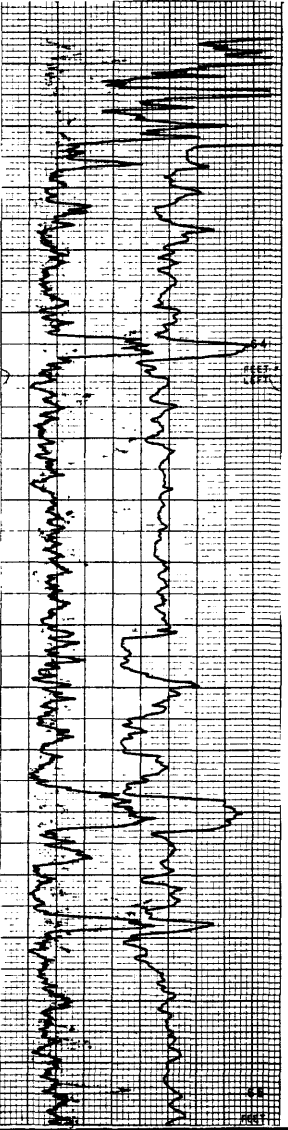
RECORDED BY <u>J Hargas</u> GEOLOGIST NO YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>500</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 389 FT. 387 FT.			LOGGED DEPTHS 306 FT. 387 FT.		FEET
Siltstone, tan.						60
Coal.						0
Claystone, gray.						60
						120
Sandstone, fine.						180
Claystone, gray, and sandstone, fine.						240
Coal.						300
Claystone, gray.						360

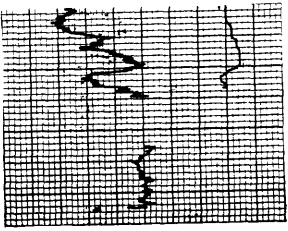

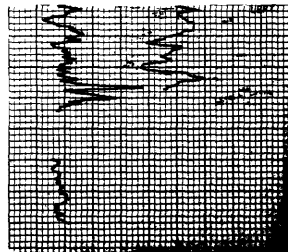
LITHOLOGY	GAMMA	S R	STRIP LOG	DENSITY	RESISTIVITY	FEET
Sandstone, very fine.						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

Hole No US-80110 Map: Colstrip SW Date: 11/18/80 State: Montana County: Rosebud
 Elev.: 3490 FT. Location: T 1 S R 40 W Sec 36 Tract BDBD Drilled depth 265 FT.
 Measured: 1725 FT. ^{FNL} 1640 FT. ^{FEL} FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative, pilot hole cased to 265', casing is 4 1/2"
second hole cased to 200'

RECORDED BY <u>K Jepsen</u>		GEOLOGIST <u>YES</u>		RECORDED BY <u>K Jepsen</u>		RECORDING SPEED <u>20</u>		FT. MIN.			
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>		S.P. SENS. SETTING		STRIP LOG	DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING		DEPTH	
	LOGGED DEPTHS 265 FT. FT.					LOGGED DEPTHS FT. FT.				FEET	
Silty sand, fine to medium.										60	
										0	
Claystone, gray.										60	
Sandstone, gray, fine.										120	
Claystone, gray.											
Coal.										180	
Silty claystone, gray, carbonaceous.											
Coal.										240	
										300	
										360	

Hole No. US-80111 Map: Colstrip SW Date: 11/18/80 State: Montana County: Rosebud
 Elev.: 3325 FT. Location: T 1 S R 40 E, Sec 12 Tract. AAAA Drilled depth 400 FT.
 Measured: 100 FT. ~~XXX~~ ^{FNL} 300 FT. ~~XXX~~ ^{FEL} FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>J Hargas</u> GEOLOGIST XXX YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 389 FT. 387 FT.			LOGGED DEPTHS 393 FT. 387 FT.		FEET
Sand, fine to very fine.						60
Coal.						0
Claystone, gray.						60
Coal.						120
Claystone, gray.						180
Sandstone, gray, fine.						240
Claystone, gray, and sandstone, gray, fine.						300
Coal.						360
Claystone, gray.						
Coal.						
Sandstone, gray, fine.						

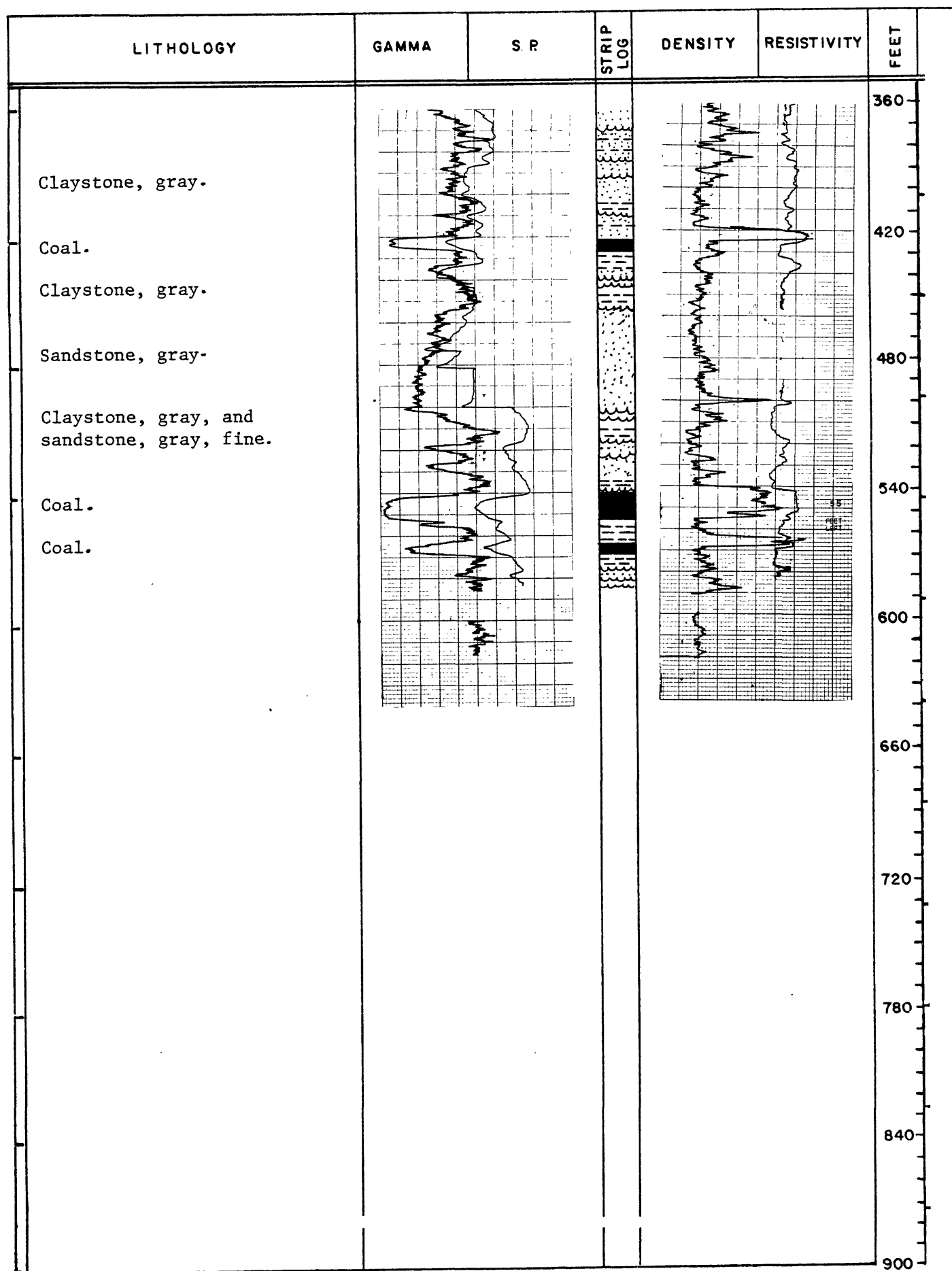
LITHOLOGY	GAMMA	S P	STRIP LOG	DENSITY	RESISTIVITY	FEET
Claystone, gray, and sandstone, gray, fine.						360 420 480 540 600 660 720 780 840 900

Hole No: US-80112 Map: Rough Draw Date: 11/19/80 State: Montana County: Rosebud
 Elev.: 3605 FT. Location: T 1 ^N ~~S~~ R 40 ^E ~~W~~, Sec 16 Tract DDAC Drilled depth 350 FT.
 Measured: 825 FT. FSL 550 FT. ^{FEL} ~~RKX~~ FT. Hole size: 6 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative, cased to 350' with 4 1/2" casing.

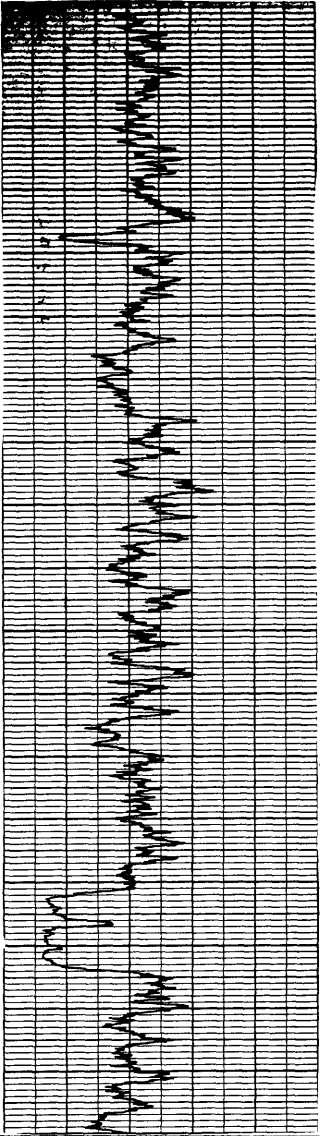
RECORDED BY <u>K Jepsen</u> GEOLOGIST NO YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DEPTH
	LOGGED DEPTHS		FEET
	350 FT. FT.		FT.
Siltstone, gray, and silty clay.		STRIP LOG	60
			0
Silty claystone, gray.			60
			120
Silty sandstone, gray, fine.			180
Sandstone, gray, fine to medium.			240
Coal.			
Sandstone, gray, fine to medium.			
			300
Sandy siltstone, gray.			
Coal.			360

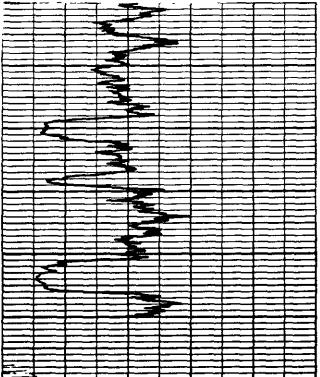

Hole No: US-80113 Map: Colstrip SW Date: 11/19/80 State: Montana County: Rosebud
 Elev.: 3580 FT. Location: T 1 S R 40 E, Sec 12 Tract Irreg Drilled depth 600 FT.
 Measured: 1150 FT. FSL 1150 FT. FWL FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>J Hargas</u> GEOLOGIST XXX YES		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	LOGGED DEPTHS <u>586</u> FT. <u>583</u> FT.		RESISTIVITY SENS. SETTING <u>250</u>
	LOGGED DEPTHS <u>590</u> FT. <u>583</u> FT.		DEPTH FEET
Claystone, brown. Sandstone, gray. Coal. Claystone, gray. Sandstone, gray. Claystone, gray. Coal. Claystone, gray. Sandstone, gray, fine.	STRIP LOG		



Hole No. JS-80114 Map: Rough Draw Date: 11/21/80 State: Montana County: Rosebud
 Elev.: 3650 FT. Location: T 18 N R 40 E Sec 30 Tract ABAB Drilled depth 500 FT.
 Measured: 25 FT. FNL 1775 FT. FEL 500 FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative; last forty feet blocked.

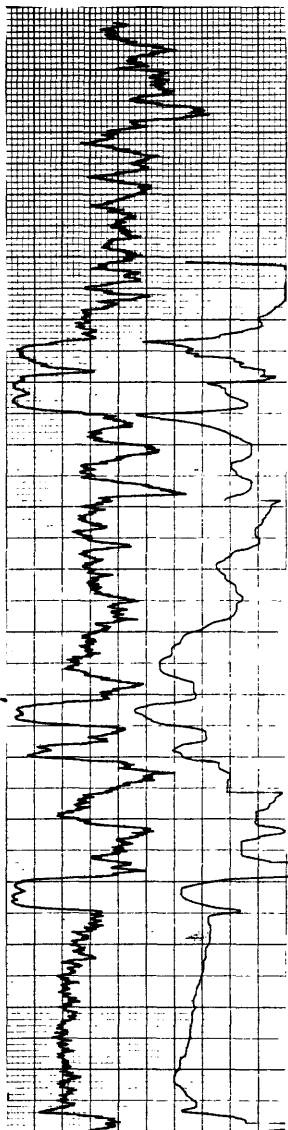

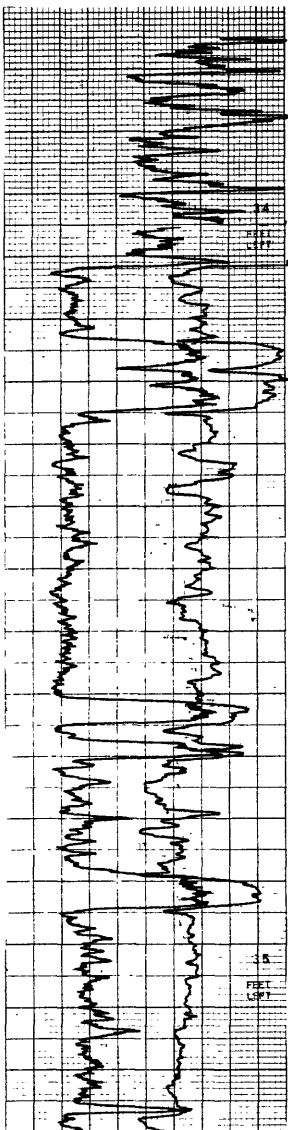
RECORDED BY <u>K Jepsen</u> GEOLOGIST NR YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS <u>460</u> FT. FT.		RESISTIVITY SENS. SETTING
	LOGGED DEPTHS FT.		DEPTH FEET
Sandstone, gray, medium.			60
Coal. Siltstone, gray.			0
Silty sand, gray.			60
Silty claystone, gray.			120
Siltstone, gray, and claystone, gray.			180
Coal.			240
Siltstone, gray.			300
			360

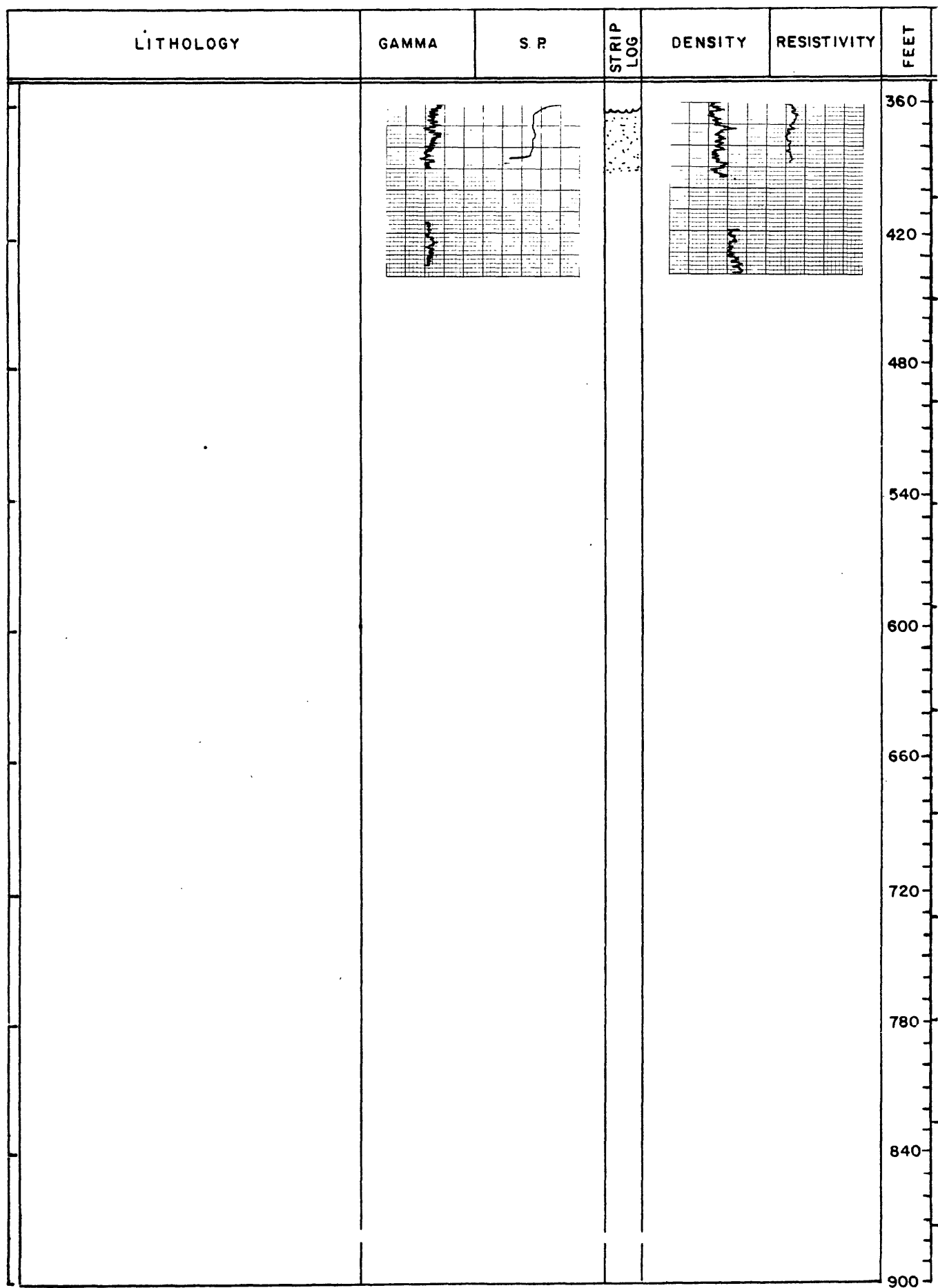
LITHOLOGY	GAMMA	S. R.	STRIP LOG	DENSITY	RESISTIVITY	FEET
Siltstone, gray.						360
Coal.						420
Coal.						480
Silty claystone, and siltstone, gray.						540
Coal.						600
						660
						720
						780
						840
						900

Hole No: US-80115 Map: Black Spring Date: 11/20/80 State: Montana County: Rosebud
 Elev.: _____ FT. Location: T 1 ^N S R 40 ^E W, Sec 16 Tract _____ Drilled depth _____ 620 FT.
 Measured: 550 FT. ^{RWX} FSL 1050 FT. ^{FEL} ~~RWX~~ FT. Hole size: _____ IN. Air ☐ Water ☐ Cored: Yes ☐ No ☐
 Remarks: Lithologic and geophysical logs not publicly available.

RECORDED BY _____ GEOLOGIST		NO YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____		S.P. SENS. SETTING _____		STRIP LOG	DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING _____	
	LOGGED DEPTHS		LOGGED DEPTHS			LOGGED DEPTHS		LOGGED DEPTHS	
	FT.	FT.	FT.	FT.		FT.	FT.		
					360	60		0	
					120				
					180				
					240				
					300				

Hole No US-80116 Map: Rough Draw Date: 11/21/80 State: Montana County: Rosebud
 Elev.: 3510 FT. Location: T 18 N R 40 E Sec 20 Tract DDDD Drilled depth 400 FT.
 Measured: 100 FT. FSL 100 FT. ~~FWL~~ ~~FWL~~ FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: _____

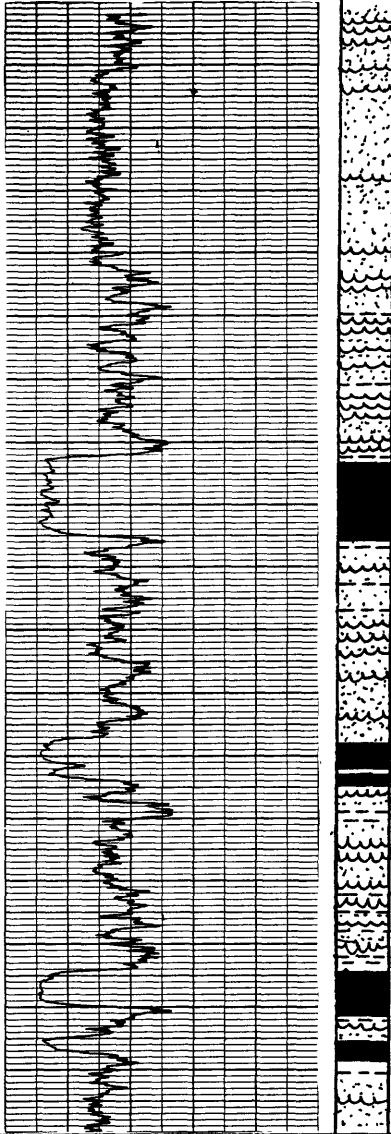
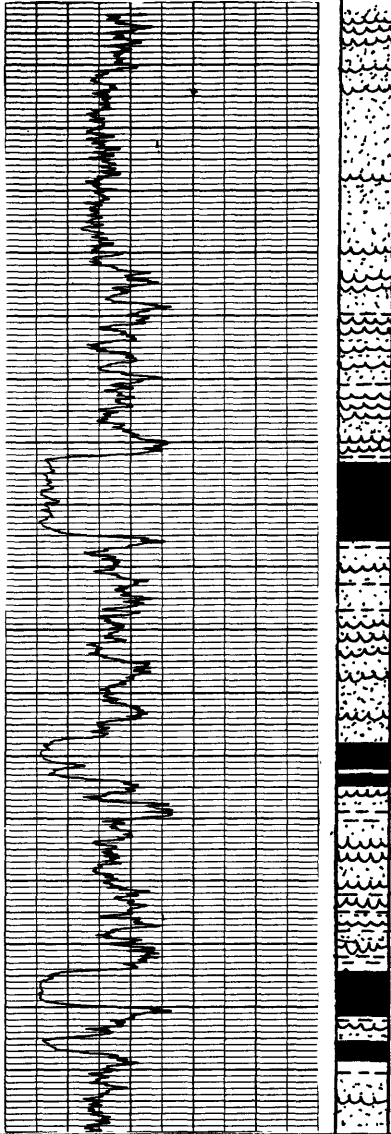
RECORDED BY <u>Jepsen</u> GEOLOGIST XXX YES		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u>	FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>100</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>100</u>	DEPTH
	LOGGED DEPTHS 390 FT. 385 FT.			LOGGED DEPTHS 395 FT. 388 FT.		FEET
Siltstone, gray, carbonaceous.						60
Coal.						0
Silty claystone, gray.						60
Sandstone, gray, fine to medium.						120
Coal.						180
Coal.	240					
Siltstone, gray-green; silty sandstone, gray, fine to medium.	300					
Coal.	360					
Sandstone, gray, fine to medium.						

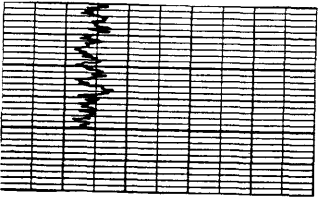


Hole No: US-80117 Map: Rough Draw Date: 11/20/80 State: Montana County: Rosebud
 Elev.: _____ FT. Location: T 1 S R 40 W, Sec 16 Tract _____ Drilled depth _____ 440 FT.
 Measured: 800 FT. FNL 300 FT. FEL FT. Hole size: _____ IN. Air ☐ Water ☐ Cored: Yes ☐ No ☐
 Remarks: Lithologic and geophysical logs not publicly available.

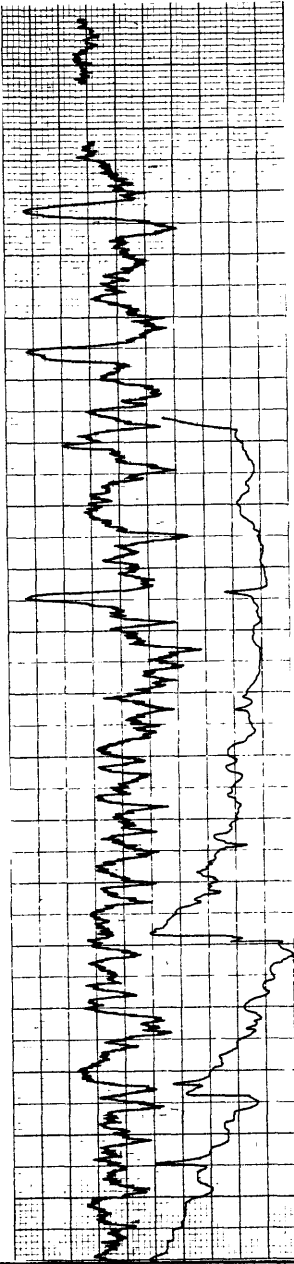
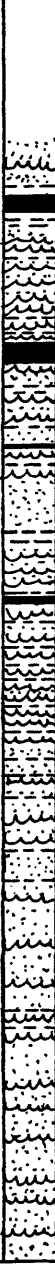
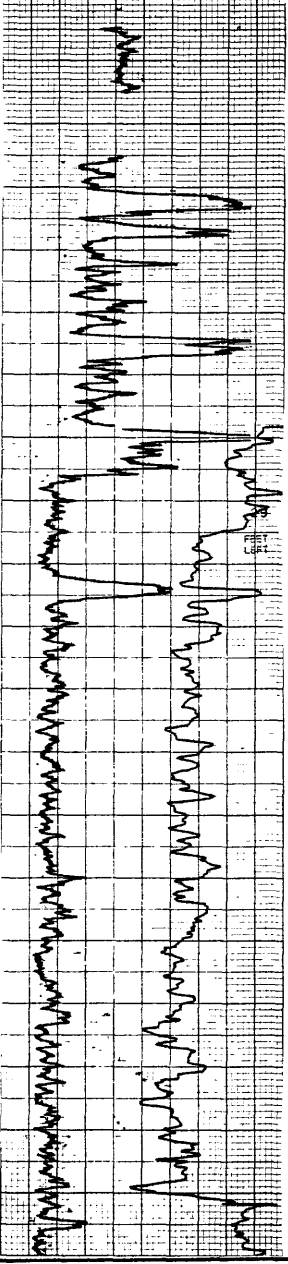
RECORDED BY _____		GEOLOGIST <input type="checkbox"/> NO <input type="checkbox"/> YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.		
LITHOLOGY	GAMMA		S. P.		STRIP LOG	DENSITY		RESISTIVITY		DEPTH FEET
	T.C. _____		SENS. SETTING			T.C. _____		SENS. SETTING		
	RANGE _____					RANGE _____				
		LOGGED DEPTHS				LOGGED DEPTHS				
		FT.		FT.		FT.		FT.		
										60
										0
										60
										120
										180
										240
										300
										360

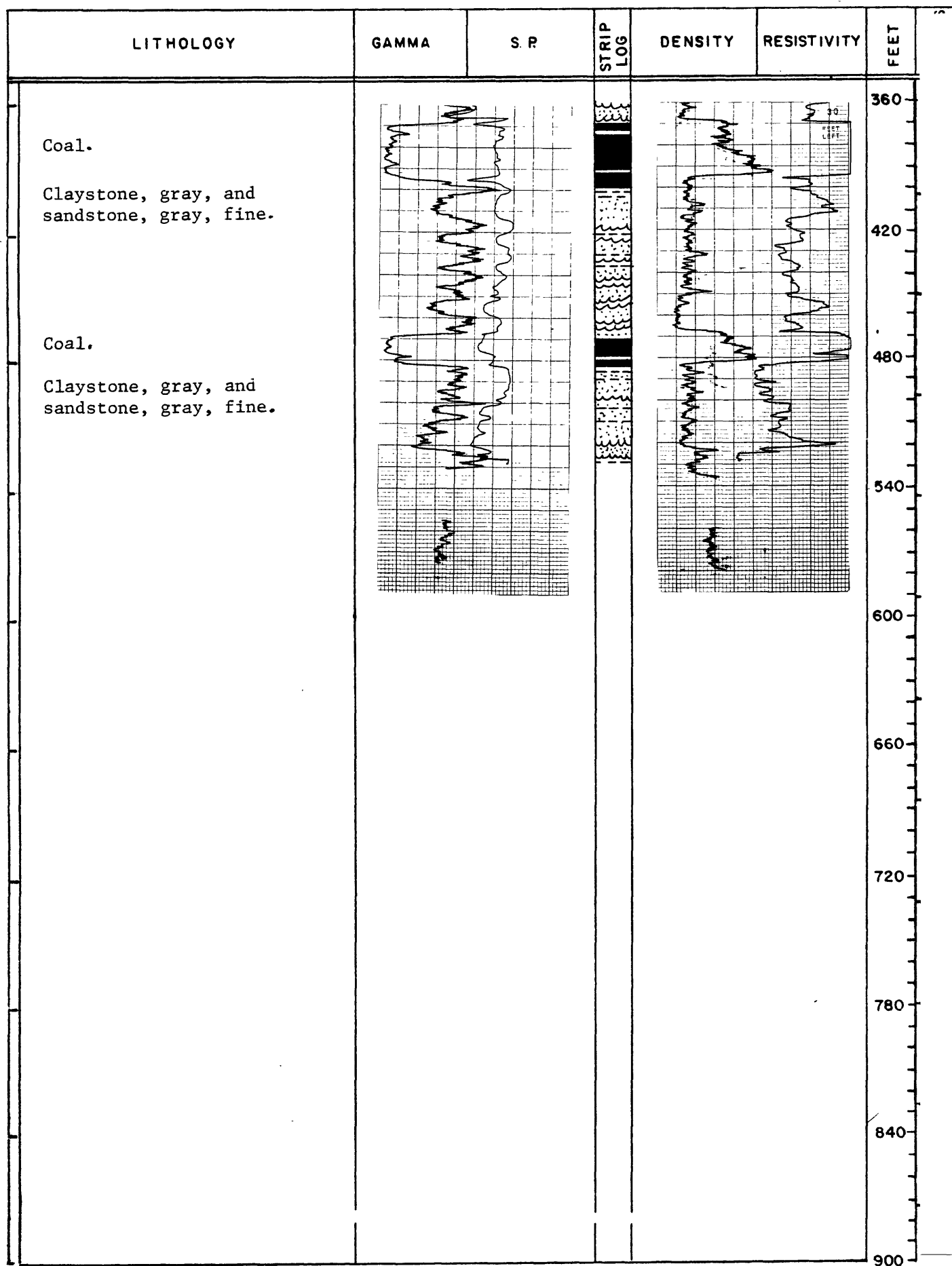
Hole No US-80118 Map Sarpy School Date 11/22/80 State Montana County Rosebud
Elev. 3540 FT. Location: T 1 ^N R 39 ^E, Sec 4 Tract ABAA Drilled depth 400 FT.
Measured: 325 FT. ^{FNL} ~~PSL~~ 1400 FT. ^{FEL} ~~SWL~~ FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
Remarks: Density probe inoperative.

RECORDED BY <u>K Jepsen</u> _____		GEOLOGIST <u>YES</u>		RECORDED BY <u>K Jepsen</u> _____		RECORDING SPEED <u>20</u>		FT. MIN.		
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>		S.P. SENS. SETTING		STRIP LOG	DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING		DEPTH FEET
	LOGGED DEPTHS 400 FT. FT.		LOGGED DEPTHS FT. FT.							
Sand, brown, medium to coarse.										60
Siltstone, gray; sandstone, gray, fine to medium.										0
Coal.										60
Siltstone, gray, and sandstone, gray, fine to medium.										120
Coal.										180
Sandy siltstone, gray.										240
Coal.										300
Coal.										
Sandstone, gray, fine to medium.										360

LITHOLOGY	GAMMA	S. R	STRIP LOG	DENSITY	RESISTIVITY	FEET
						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

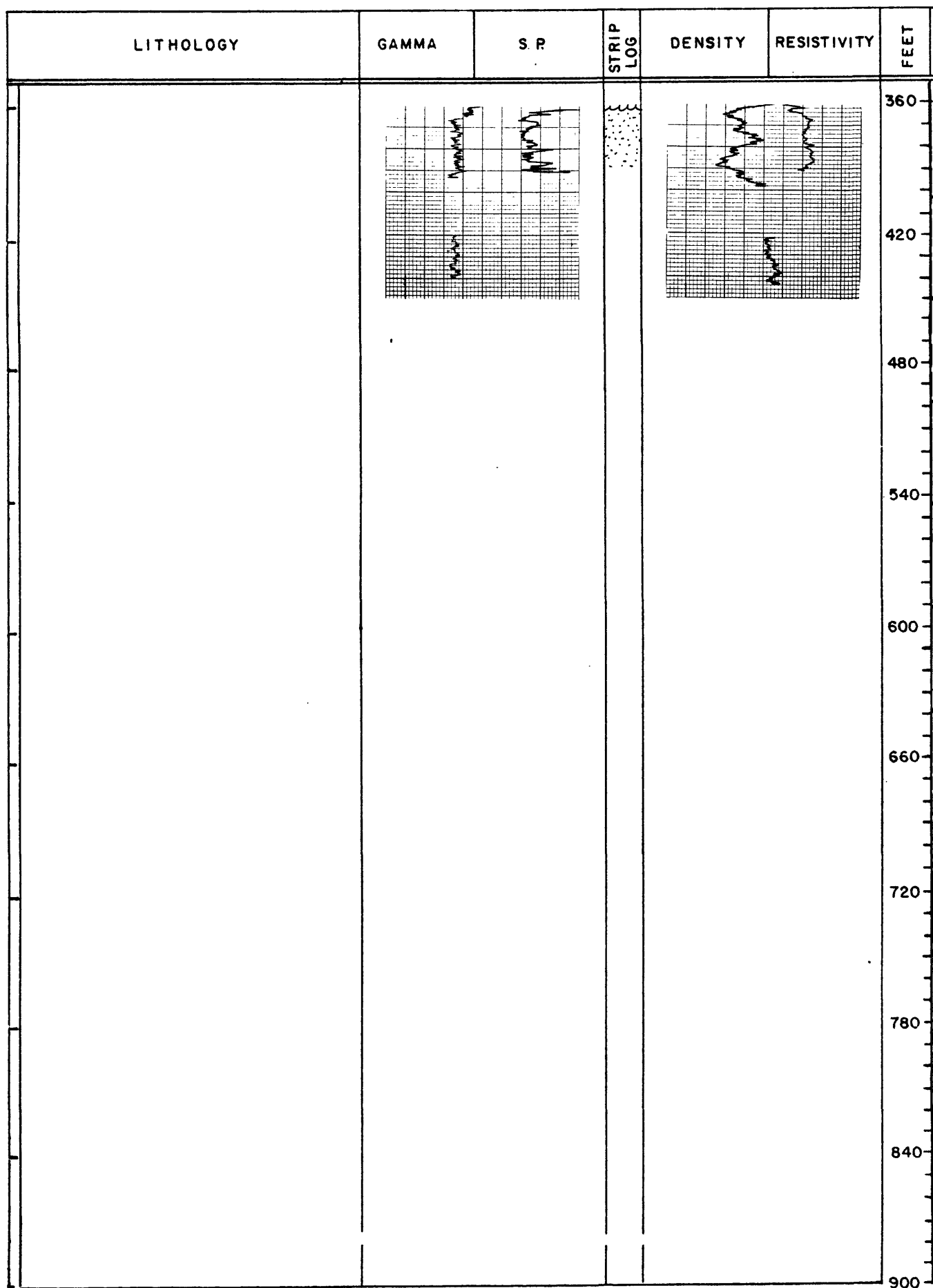
Hole No US-80119 Map: Sarpy School Date 11/22/80 State: Montana County: Rosebud
 Elev.: 3750 FT. Location: T 1 S R 39 E, Sec 6 Tract Irreg Drilled depth 540 FT.
 Measured: 1000 FT. ~~FNL~~ 1700 FT. ~~FEL~~ XXX FT. Hole size: 5 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{YES}		RECORDED BY <u>J Hargas</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. <u>2</u> RANGE <u>200</u>	RESISTIVITY SENS. SETTING <u>250</u>	DEPTH
	LOGGED DEPTHS 530 FT. 528 FT.			LOGGED DEPTHS 536 FT. 528 FT.		FEET
Claystone, brown. Coal.						60
Claystone, gray. Coal.						0
Sandstone, gray, and claystone, gray.						60
Coal. Sandstone, gray, and claystone, gray.						120
Coal. Claystone, gray.						180
Sandstone, gray, fine.						240
						300
						360

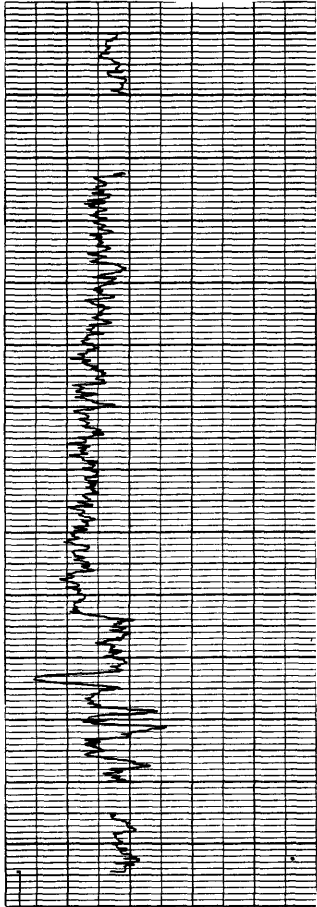


Hole No: US-80120 Map: McClure Creek Date: 11/23/80 State: Montana County: Rosebud
 Elev.: 3490 FT. Location: T 2 ^N S R 39 ^E W, Sec 18 Tract CCCB Drilled depth 400 FT.
 Measured: 700 FT. FSL 550 FT. FWL FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Spring on the density probe was loose.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{YES}		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	DENSITY T.C. <u>2</u> RANGE <u>200</u>
	RESISTIVITY SENS. SETTING <u>100</u>		DEPTH
	LOGGED DEPTHS <u>393</u> FT. <u>391</u> FT.		LOGGED DEPTHS <u>398</u> FT. <u>391</u> FT.
	STRIP LOG		FEET
Silty claystone, gray, carbonaceous.			60
Coal.			0
Silty sandstone, gray, fine to medium.			60
Coal.			120
Sandstone, gray, fine to medium.			180
Coal.			240
Claystone, gray-green.			300
Sandstone, gray, fine to medium.			360

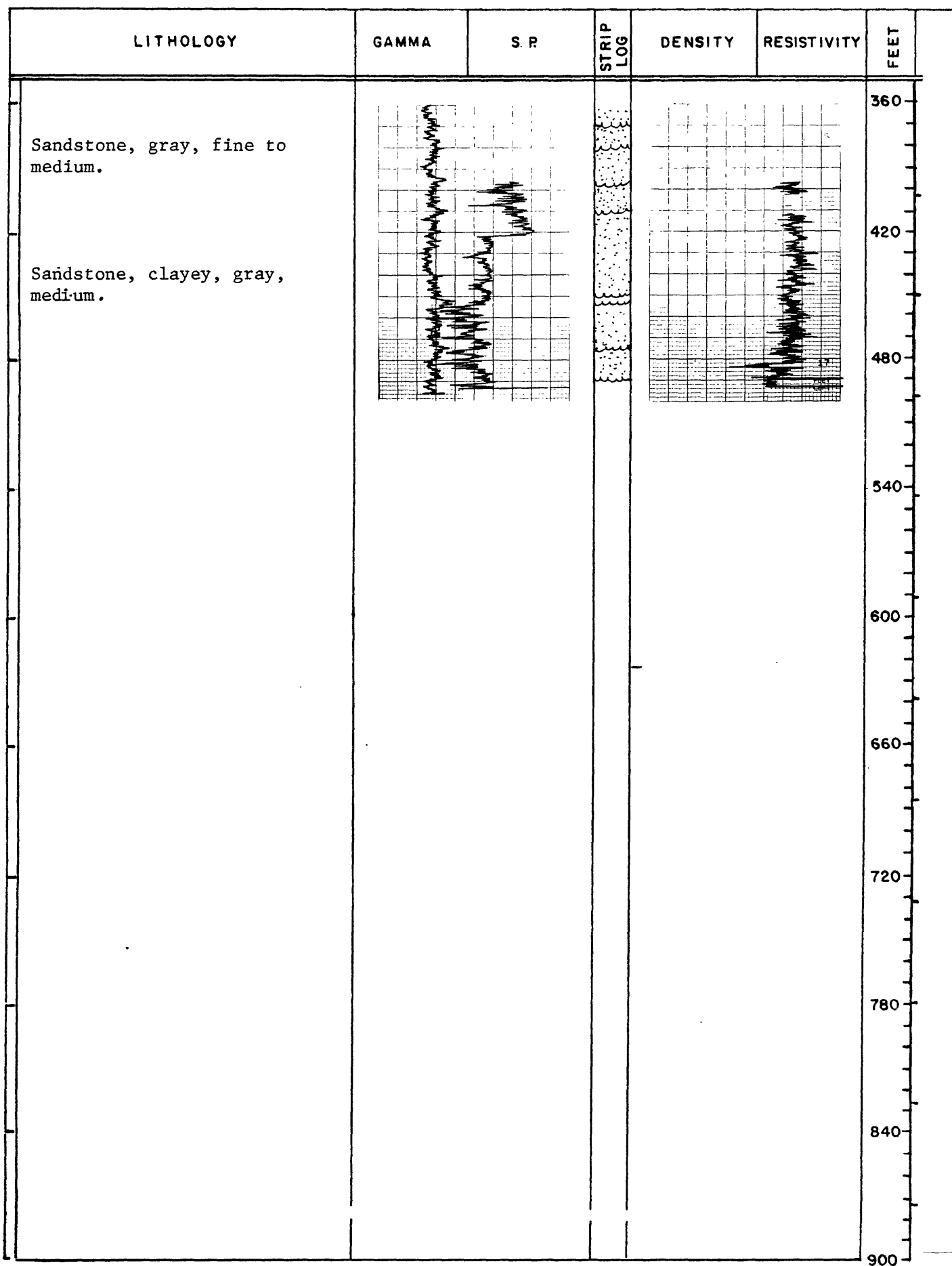


Hole No US-80121 Map: Hammond Draw Date: 11/23/86 State: Montana County: Rosebud
 Elev.: 3120 FT. Location: T 1 ^N R 44 ^E W, Sec 18 Tract CCBC Drilled depth 200 FT.
 Measured: 750 FT. FSL 100 FT. FWL FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks:

RECORDED BY <u>K Jepsen</u> GEOLOGIST <input checked="" type="checkbox"/> YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>100</u>	S.P. SENS. SETTING	DENSITY T.C. <u> </u> RANGE <u> </u>
	RESISTIVITY SENS. SETTING		DEPTH
	LOGGED DEPTHS 200 FT. FT.		LOGGED DEPTHS FT. FT.
Sand, light-brown, fine.		STRIP LOG	60
			0
Claystone, gray.			60
Coal.			120
Claystone, gray, and sandstone, gray, fine.			180
			240
			300
			360

Hole No: US-80122 Map: McClure Creek Date: 12/3/80 State: Montana County: Rosebud
 Elev.: 3555 FT. Location: T 1 ^N R 39 ^E W, Sec 4 Tract BABB Drilled depth 500 FT.
 Measured: 75 FT. ^{FNL} ~~xxx~~ 1400 FT. ^{FWL} ~~xxx~~ FT. Hole size: 5 IN. Air ☐ Water ☒ Cored: Yes ☒ No ☐
 Remarks: Density probe inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{YES} NO		RECORDED BY <u>J Hargas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>496</u> FT. <u>493</u> FT.			LOGGED DEPTHS FT. <u>493</u> FT.	
	DEPTH FEET				
<p>Silty sand, light-brown, fine to medium.</p> <p>Siltstone; silty claystone, gray.</p> <p>Coal.</p> <p>Claystone, gray, and sandstone, gray, medium.</p> <p>Coal.</p> <p>Claystone, gray, and sandstone, gray, medium.</p> <p>Limestone, gray.</p> <p>Claystone, gray.</p> <p>Coal.</p> <p>Coal.</p> <p>Sandstone, gray, fine to medium.</p>					

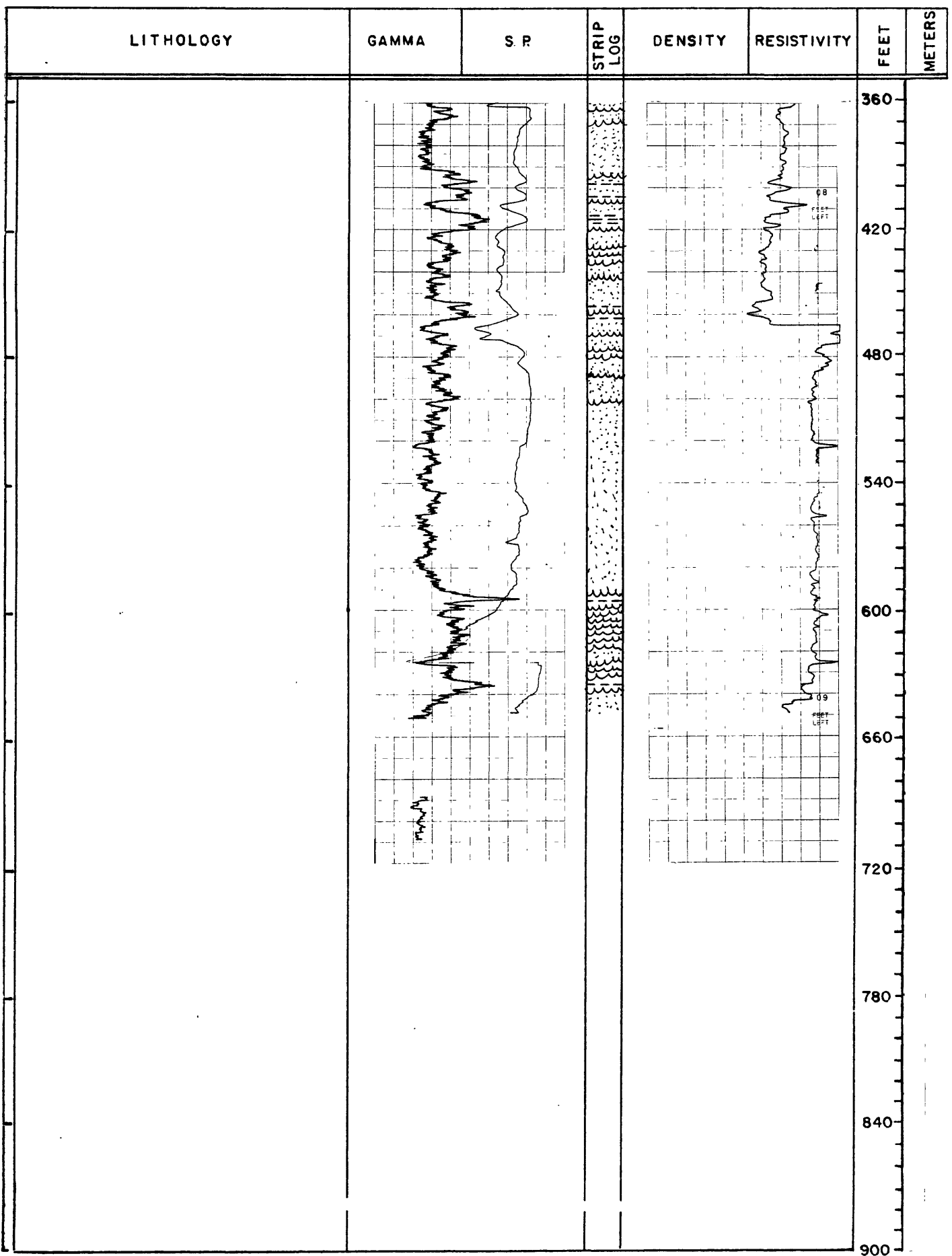


Hole No: US-80123 Map: Hammond Draw Date: 11/24/80 State: Montana County: Rosebud
 Elev.: 3225 FT. Location: T 1 ^N R 43 ^E W, Sec 24 Tract CCBC Drilled depth 300 FT.
 Measured: 750 FT. ~~FSL~~ 200 FT. ~~FWL~~ 200 FT. Hole size: 4 3/4 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: _____

RECORDED BY <u>J Hargas</u> GEOLOGIST ^{YES} NO		RECORDED BY <u>K Jepsen</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS 290 FT. 288 FT.			LOGGED DEPTHS FT. 288 FT.	
Coal. Claystone, gray. Sandstone, gray, fine. Claystone, gray, and sandstone, gray, fine. Minor coal. Sandstone, gray, fine. Claystone, gray.					
				DEPT H FEET	
				60	
				0	
				60	
				120	
				180	
				240	
				300	
				360	

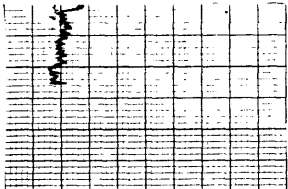

Hole No: US-80124 Map: McClure Creek Date: 12/8/80 State: Montana County: Treasure
 Elev.: 3630 FT. Location: T 2 ^N R 38 ^E W, Sec 22 Tract AAAD Drilled depth 658 FT.
 Measured: 375 FT. ^{FNL} 100 FT. ^{FEL} 5 FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Density probe inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{XDD} YES		RECORDED BY <u>J Hansas</u>		RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING <u>100</u>
	LOGGED DEPTHS <u>652</u> FT. <u>648</u> FT.			LOGGED DEPTHS FT. <u>648</u> FT.	
					DEPTH FEET
Sand, brown, medium.					60
Siltstone, sandy, gray.					0
Coal.					60
Siltstone, gray, and sandstone, gray, fine to medium.					120
Coal.					180
Silt, gray.					240
Sand, gray, fine to medium.					300
Coal.					360
Silty claystone, gray.					
Siltstone, gray, sandy.					
Coal.					
Sandstone, gray, fine.					



Hole No: US-80125 Map: McClure Creek Date: 12/9/80 State: Montana County: Treasure
 Elev.: 3670 FT. Location: T 2 ^N R 38 ^E, Sec 22 Tract CCAD Drilled depth 400 FT.
 Measured: 875 FT. FSL 1125 FT. FWL FT. Hole size: 5 1/8 IN. Air ☒ Water ☐ Cored: Yes ☐ No ☒
 Remarks: Dry hole, SP & Resistivity not logged; Density spring inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{XPS} YES		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.				
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING	STRIP LOG	DENSITY T.C. <u> </u> RANGE <u> </u>	RESISTIVITY SENS. SETTING	DEPTH FEET
	LOGGED DEPTHS 385 FT. FT.			LOGGED DEPTHS FT. FT.		
Sand, light-brown, fine to medium.				60		
Shale, gray, and siltstone, gray-				0		
Coal.				60		
Sand, gray, fine to medium.				120		
Sand, gray, medium to coarse.				180		
Coal.				240		
Coal.						
Sandy siltstone, gray.				300		
Siltstone, gray-black, carbonaceous.						
Coal.				360		

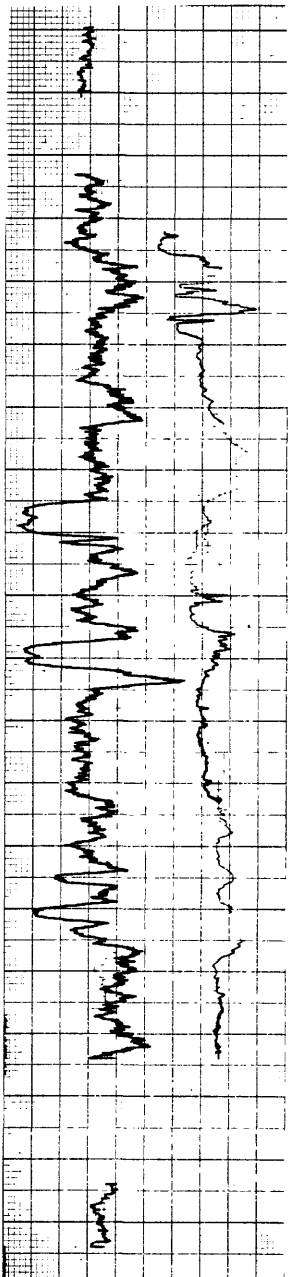
LITHOLOGY	GAMMA	S. P.	STRIP LOG	DENSITY	RESISTIVITY	FEET
Clayey sand, gray, fine to medium.						360
						420
						480
						540
						600
						660
						720
						780
						840
						900

Hole No: US-80126 Map: Fairview SW Date: 12/16/80 State: Montana County: Richland
 Elev.: 2177 FT. Location: T 23 N R 59 E Sec 8 Tract DCDC Drilled depth 240 FT.
 Measured: 100 FT. FSL 1850 FT. FSL 1850 FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Hole abandoned because of slumping gravel, no logs recorded.

RECORDED BY <u>K Jepsen</u> GEOLOGIST YES <u>NO</u>		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.	
LITHOLOGY	GAMMA T.C. _____ RANGE _____	S.P. SENS. SETTING _____	STRIP LOG	DENSITY T.C. _____ RANGE _____	RESISTIVITY SENS. SETTING _____	DEPTH	
	LOGGED DEPTHS			LOGGED DEPTHS		FEET	
	FT.	FT.		FT.	FT.	FT.	FT.
						60	
						0	
						60	
						120	
						180	
						240	
						300	
						360	

254

Hole No: US-80127 Map: Crane Date: 12/17/80 State: Montana County: Richland
 Elev.: 2124 FT. Location: T21N R58E Sec 8 Tract ADDD Drilled depth 300 FT.
 Measured: 2620 FT. FNL 40 FT. FEL FT. Hole size: 5 IN. Air ☒ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Spring for density inoperative.

RECORDED BY <u>K Jepsen</u> GEOLOGIST <u>NE</u>		RECORDED BY <u>K Jepsen</u> RECORDING SPEED <u>20</u> FT. MIN.	
LITHOLOGY	GAMMA T.C. <u>2</u> RANGE <u>200</u>	S.P. SENS. SETTING <u>250</u>	STRIP LOG
	LOGGED DEPTHS <u>288</u> FT. <u>286</u> FT.		DENSITY T.C. _____ RANGE _____
	LOGGED DEPTHS FT. <u>286</u> FT.		RESISTIVITY SENS. SETTING <u>100</u>
			DEPTH FEET
Sand, brown, medium to coarse; pebbles, fine to medium.			60
Claystone, gray.			0
Coal.		60	
Siltstone, gray, and claystone, gray.		120	
Coal.		180	
Siltstone, gray.		240	
Coal.		300	
Coal.		360	
Siltstone, gray.			

Hole No: US-80128 Map: Crane Date: 12/19/80 State: Montana County: Richland
 Elev.: 2238 FT. Location: T 21^N R 57^E W, Sec 24 Tract BBBB Drilled depth 160 FT.
 Measured: 50 FT. ^{FNL} ~~xxx~~ 40 FT. ^{FWL} ~~xxx~~ FT. Hole size: 5 IN. Air ☐ Water ☒ Cored: Yes ☐ No ☒
 Remarks: Hole no logged due to instability; hole not completed to designated depth because mud pump became inoperable.

RECORDED BY <u>K Jepsen</u> GEOLOGIST ^{XXX} YES		RECORDED BY _____		RECORDING SPEED _____		FT. MIN.					
LITHOLOGY	GAMMA T.C. _____ RANGE _____		S.P. SENS. SETTING _____		STRIP LOG	DENSITY T.C. _____ RANGE _____		RESISTIVITY SENS. SETTING _____		DEPTH	
	LOGGED DEPTHS		LOGGED DEPTHS			LOGGED DEPTHS		LOGGED DEPTHS		FEET	
	FT.		FT.			FT.		FT.		FT.	
										60	
										0	
										60	
										120	
										180	
										240	
										300	
										360	