

ATOKA

COAL LABS

Englewood, Colorado
1-800-853-5113
FAX 303-617-8956

FORMATION EVALUATION LOG

SCALE: 1:240 (1"=20', 5" = 100')



















COMPANY: Heartland Oil and Gas, Inc
WELL: Mauersberger 15 -14
FIELD: Wildcat
COUNTY: Nemaha **STATE:** KS

API #: 15-131-20186-00-00
LOCATION: se sw se
810 fsl 2130 fel
Sec 14 Twp 4S Rge 14E

ELEV GL: 1182 ft
ELEV KB: 1190 ft
Log Measured from: KB

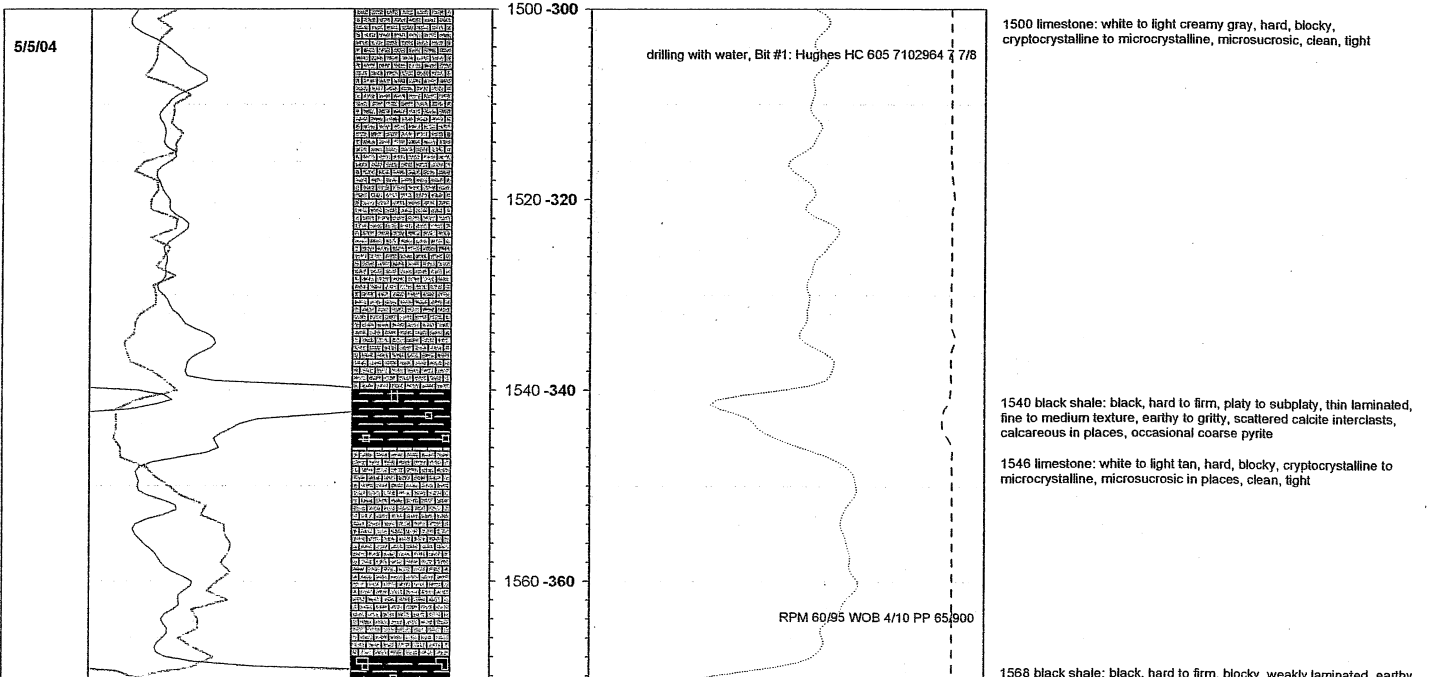
Spud Date	May 4, 2004
Surface Casing	8 5/8" 0 - 281 ft
Hole Size	7 7/8
Total Depth	2675 ft
Logging Dates	May 4 - 6, 2004
Interval Logged	1500 - 2675 ft
Drilling Fluid	native mud, bentonite gel
Mud Pumps	Skytop-Brewster 6x14
Drilling Contractor	Gulick Drilling, Inc.
Rig Pusher	Ron Gulick
Company Geologist	Bill Hayworth
Company Engineer	Layle Robb
Logging Geologist	Chris Ryan

LEGEND

	LIMESTONE		BRECCIA		FOSSILS
	SHALE		SILTY SHALE		GLAUCONITE
	SAND		BLACK SHALE		COAL
	DOLOMITE		OOLITIC LIMESTONE		CHERT
	LIMEY SHALE		SILTSTONE		PYRITE
	SANDY SILT		CLAY		BENTONITE

RECEIVED
KANSAS CORPORATION COMMISSION
SEP 29 2004
CONSERVATION DIVISION
WICHITA, KS

DATE/TIME	PEN. RATE (MIN/FT)	GAMMA RAY (API UNITS)	LITHOLOGY	CORE	DEPTH (FT)	ELEVATION (FT)	TOTAL GAS (UNITS)			LITHOLOGIC DESCRIPTION
							BULK DENSITY (g/cc)	Caliper (in)		
	0 ————— 2	0 ————— 150					0 ————— 100			
							2 ————— 3			
								16 ————— 8		



BKC/PLEASANTON 1600

MARMATON 1632

1580 -380

1600 -400

1620 -420

1640 -440

1660 -460

1680 -480

1700 -500

1720 -520

1740 -540

1760 -560

total show 12 units

total show 16 units

total show 37 units

total show 21 units

1576 limestone: white to light creamy gray, hard, blocky, cryptocrystalline to microcrystalline, microsugrosic, clean, light

1593 black shale: black, hard to firm, sub-blocky, weakly laminated, fine to medium texture, earthy to gritty, scattered calcite interclasts, scattered pyrite

1600 shale: pale green to light gray brown, firm, sub-blocky, gritty, coarse texture, occasional coarse pyrite

1632 limestone: white to light creamy tan to clear, hard, blocky, cryptocrystalline to microcrystalline, microsugrosic, sparry in places, clean, light, trace fine pyrite

1644 shale: light gray to dark red, soft to firm, sub-blocky, fine texture, earthy, weakly laminated

1652 limestone: white to light tan, hard, blocky, cryptocrystalline to microcrystalline, microsugrosic in places, clean, light

1658 black shale: black, hard to firm, platy, weakly laminated, coarse texture, gritty, abundant calcite interclasts, trace pyrite

1664 shale: pale green to light gray brown, firm, sub-blocky, gritty, coarse texture, occasional coarse pyrite

1682 limestone: white to light creamy gray, hard, blocky, cryptocrystalline to microcrystalline, microsugrosic, clean, light

1686 black shale: black, hard to firm, subplaty, weakly laminated to massive, coarse texture, gritty, abundant calcite interclasts, coarse pyrite

1694 shale: pale green to light grayish green, soft to firm, weakly laminated, coarse texture, gritty, calcareous, trace pyrite

1710 limestone: white to light tan to light honey yellow, hard, blocky, cryptocrystalline, clean, light, trace fine disseminated pyrite

1718 shale: pale green to light gray, firm, sub-blocky, weakly laminated, fine to medium texture, earthy to gritty, calcareous, trace fine pyrite

1730 limestone: light creamy tan to white, hard, platy, cryptocrystalline, clean, light, scattered pyrite

1734 shale: light gray, firm, platy, splintery, well laminated, earthy, fine texture

1740 black shale: black, hard to firm, blocky, weakly laminated, earthy to gritty, medium texture, scattered pyrite, scattered calcite interclasts

1746 coal: black, hard to firm, blocky, dull to soft velvety luster, thin laminated with bright microbands, fine pyrite laminations

1750 shale: pale blue green to gray brown, soft to firm, weakly laminated, medium texture, gritty, calcareous

1755 limestone: white to light tan, hard, blocky, microcrystalline to fine crystalline, sparry, fragmental in places, clean, trace fine pyrite

1759 shale: dark gray to dark greenish gray, firm, subplaty, well laminated, earthy to gritty, medium texture, calcareous

1764 limestone: white to light gray, hard, blocky, fine to medium crystalline, granular, fragmental in places, clean, scattered fine pyrite, trace vuggy porosity

1768 shale: dark gray to dark greenish gray, firm, subplaty, well laminated, earthy to gritty, medium texture, calcareous

1775 black shale: black, hard to firm, sub-blocky, weakly laminated, fine to medium texture, earthy to gritty, scattered calcite interclasts,

CHEROKEE/Excello-1784

Squirrel Sand 1822

Ardmore Lime 1884

V-Shale 1890

1:00

1783 survey = 1 degree

total show 46 units

total show 34 units

1780 limestone: light tan to light brown to gray brown, hard, blocky, microcrystalline, microsugrosic, clean, trace fine pyrite

1784 black shale: black, hard to firm, subplaty, weakly laminated, fine texture, earthy, scattered fine calcite, fine pyrite

1798 limestone: white to light gray, hard, blocky, fine to medium crystalline, granular, fragmental in places, clean, scattered fine pyrite, trace vuggy porosity

1806 shale: dark gray to gray brown, soft to firm, weakly laminated, medium to coarse texture, gritty, calcareous, scattered calcite

1822 sandstone: white, medium to coarse grained, subrounded, well sorted, clean, friable, poor to fair intergranular porosity, scattered fine epidote green glauconite, abundant scattered fine pyrite

1832 shale: graybrown to brown, firm, subplaty, gritty, coarse texture, weakly laminated

1838 sandstone: white to light creamy gray, medium grained, subrounded to subangular, clean, weakly friable, moderately cemented, trace intergranular porosity, trace fine pyrite

1850 shale: pale green to very pale creamy gray, soft, gummy, clay rich, very fine texture, weakly calcareous, abundant scattered pyrite

1872 sandstone: white to light gray to light gray brown, medium grained, subangular to angular, moderately sorted, shale fillings, friable, weakly cemented, scattered pyrite

1880 shale: light gray to light gray brown, soft, sub-blocky, weakly laminated, medium to coarse texture, gritty, clay rich, scattered fine pyrite

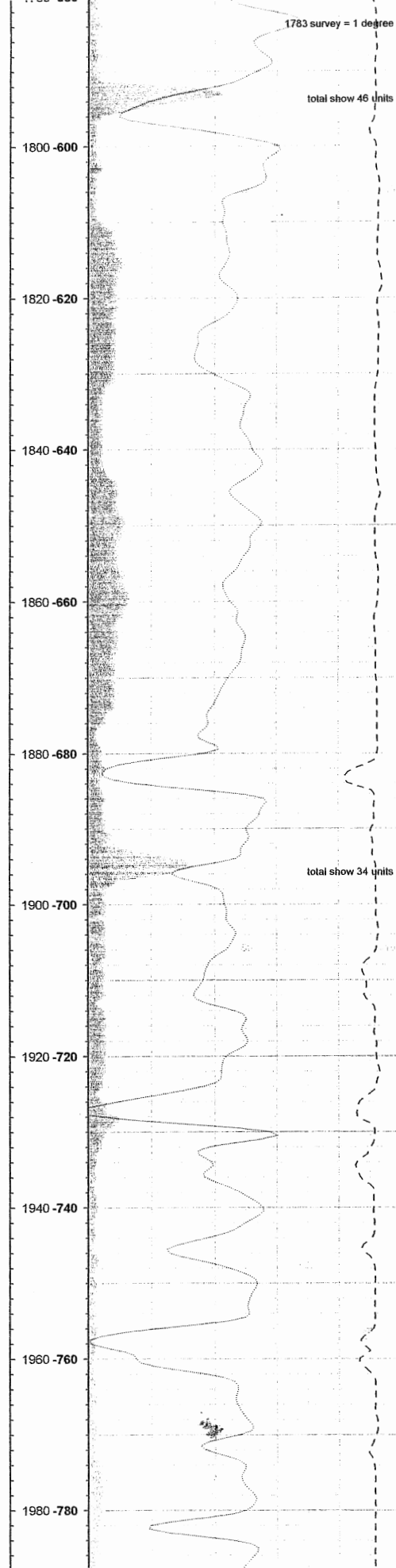
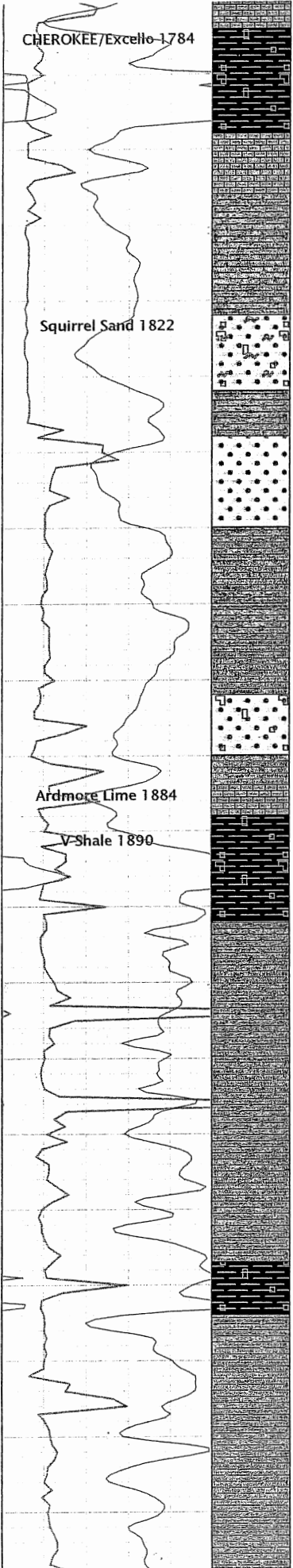
1884 limestone: white to clear, hard, blocky, coarse crystalline, sparry, coarse bladed calcite rhombs, clean, sparry cement, occasional coarse pyrite

1888 black shale: very dark gray to black, firm, platy, thin laminated, gritty, medium texture, calcareous, scattered calcite interclasts, scattered coarse pyrite

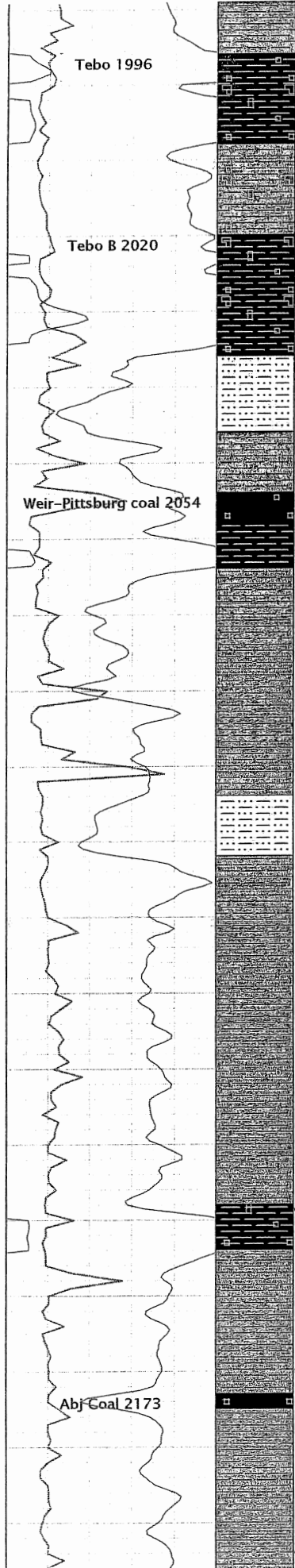
1902 shale: light gray to light grayish green, soft to firm, subplaty, weakly laminated, fine texture, earthy to gritty, calcareous

1947 black shale: black, hard to firm, sub-blocky, weakly laminated, fine to medium texture, earthy to gritty, scattered calcite interclasts, scattered pyrite

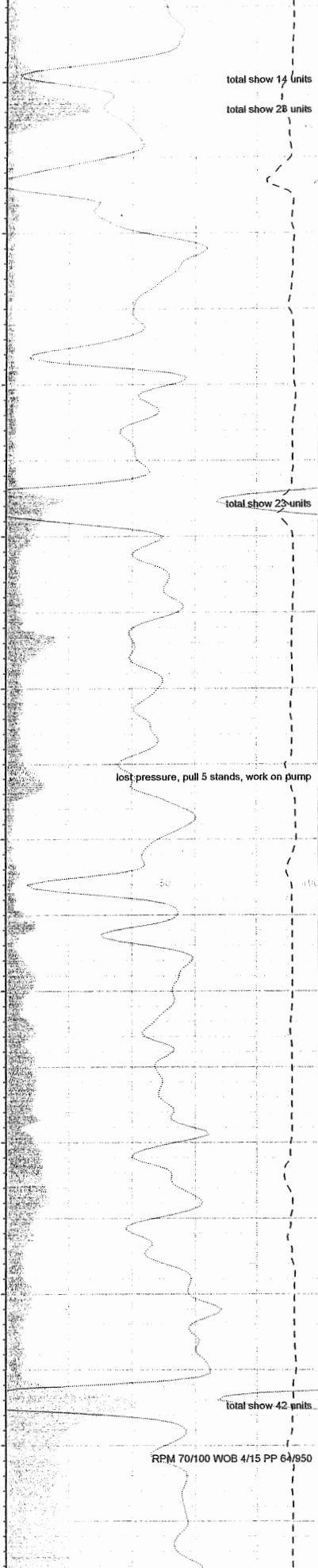
1954 shale: light green to blue green to light gray, thin laminated, fine texture, earthy, calcareous, trace pyrite



2:00



2000 -800
 2020 -820
 2040 -840
 2060 -860
 2080 -880
 2100 -900
 2120 -920
 2140 -940
 2160 -960
 2180 -980
 2259



1996 black shale: black, hard, sub-blocky, well laminated, coarse texture, earthy to gritty, abundant calcite, abundant coarse pyrite

2008 shale: light tan to gray brown to dark gray, firm, blocky, coarse texture, gritty, calcareous, scattered fine pyrite

2020 black shale: black, hard to firm, blocky, weakly laminated, earthy to gritty, medium texture, scattered pyrite, scattered calcite interclasts

2036 siltstone: light gray to light tan to brown, firm, sub-blocky, weakly friable, fine texture, gritty to powdery

2046 shale: varicolored, dull olive to dark red, soft to firm, platy, fine texture, earthy to waxy

2054 coal: black, hard, blocky, well laminated, bright velvety to vitreous luster, fine pyrite laminations, trace calcite

2058 black shale: black, hard to firm, subplaty, earthy, weakly laminated, fine texture, trace pyrite

2064 shale: varicolored, dull olive to dark red, soft to firm, platy, fine texture, earthy to waxy

2094 siltstone: light gray to light tan, soft to firm, weakly indurated, gritty, fine texture, powdery

2102 shale: dark grayish green to gray brown, soft to firm, platy, well laminated, earthy, fine texture

2148 black shale: black, hard to firm, platy to subplaty, thin laminated, fine to medium texture, earthy to gritty, scattered calcite interclasts, calcareous in places, occasional coarse pyrite

2154 shale: olive green to gray brown, soft to firm, blocky, medium texture, earthy, fine black carbonaceous fragments

2173 coal: black, hard, blocky, dull luster, well laminated, vitreous bands, fine pyrite, abundant calcite

2175 shale: dark gray to gray brown to dark green, hard to firm, sub-blocky, thin laminated, earthy to gritty, coarse texture, calcareous, trace pyrite

10:00

Bbj Coal 2202

22091000

total show 35 units

2202 coaly shale: black, hard, blocky, dull luster, flaky, shaly, thin laminated, fine pyrite laminations, fine calcite
2204 shale: dark gray to grayish green to pale green, soft to firm, sub-blocky, fine texture, earthy to waxy, calcareous

22291020

4

22491040

5

Drywood Coal 2246

total show 63 units

2246 coal: black, hard, blocky, well laminated, dull luster with bright bands, graphitic luster in places, trace pyrite, fine calcite
2249 shale: dark gray to gray brown to dark green, hard to firm, sub-blocky, thin laminated, earthy to gritty, coarse texture, calcareous, trace pyrite

Rowe Coal 2254

total show 68 units

2254 coal: black, hard, blocky, dull luster, occasional bright microbands, thin laminated, trace pyrite, fine calcite

22691060

7

Aw Coal 2282

total show 57 units

2282 coal: black, hard, blocky, microlaminated, dull luster, uniform texture, trace fine pyrite, poorly developed cleats, fine calcite

23391100

8

Bw Coal 2290

total show 30 units

2285 shale: dark gray to dark grayish green, soft to firm, subplaty, fine texture, thin laminated, earthy to gritty, calcareous

2290 coaly shale: black, hard, blocky, dull luster, flaky, shaly, thin laminated, fine pyrite laminations, fine calcite

2293 shale: dark gray to grayish green to pale green, soft to firm, sub-blocky, fine texture, earthy to waxy, calcareous

23091100

11:00

Cw Coal 2310

total show 50 units

2310 coal: black, hard, blocky, microlaminated, dull luster with bright microbands, fine pyrite laminations, poorly developed cleats, fine pyrite, calcite

2312 shale: light gray to light greenish gray to light creamy gray, hard to firm, platy, splintery, very fine texture, earthy to waxy, silty, very fine pyrite

23291120

9

23781140

2344 siltstone: light creamy gray to light tan, soft to firm, blocky, very fine texture, waxy to earthy, clay rich in places, abundant fine pyrite

2354 shale: light gray to gray brown to pale grayish green, soft to firm, platy, well laminated, medium to coarse texture, gritty, micaceous in places, fine pyrite

23691160

Upper Riverton 2368

total show 39 units

2368 coal: black, hard to firm, blocky, dull to greasy luster, microlaminated, uniform texture, clean, occasional coarse pyrite

2371 shale: dark grayish green to gray brown, soft to firm, platy, well laminated, earthy, fine texture

23891180

2390 black shale: black, hard to firm, subplaty, weakly laminated, earthy, fine texture, scattered pyrite

total show 29 units

2396 siltstone: light creamy gray to light tan, hard to firm, blocky, weakly laminated, fine texture, gritty to chalky, abundant scattered pyrite

24091200

Lower Riverton 2400

2400 coaly shale: black, hard to firm, blocky, dull luster, flaky, shaly, weakly laminated, trace fine pyrite

2402 shale: dark greenish gray to dark gray, firm, sub-blocky, medium texture, earthy to gritty, calcareous, scattered fine pyrite

2442 coaly shale: black, hard, blocky, dull luster, flaky, shaly, thin laminated, fine pyrite laminations, fine calcite

2444 shale: dark gray to grayish green, firm, subplaty to sub-blocky, weakly laminated, medium texture, earthy to gritty, calcareous, scattered fine pyrite

2476 coaly shale: black, hard to firm, blocky, dull luster, flaky, shaly, weakly laminated, trace fine pyrite

2479 shale: dark greenish gray to dark gray, firm, sub-blocky, medium texture, earthy to gritty, calcareous, scattered fine pyrite

2504 coaly shale: black, hard to firm, blocky, dull luster, flaky, shaly, weakly laminated, trace fine pyrite

2512 shale: dark greenish gray to dark gray, firm, sub-blocky, medium texture, earthy to gritty, calcareous, scattered fine pyrite

2534 siltstone: light creamy gray to white, hard to firm, blocky, weakly laminated, very fine texture, abundant scattered fine pyrite

2548 shale: dark gray to dark greenish gray, firm, platy, tabular, earthy to gritty, fine to medium texture, thin laminated, silty in places, trace fine pyrite

2586 limey shale: brown and white, speckled, conglomeritic, coarse spherical to elliptical milky white chert clasts and skeletal fragments in light tan sparry lime matrix, clast supported, occasional subangular quartz grains, hard, well cemented

2606 limestone: milky white to clear, very hard, blocky, fine to medium crystalline, fragmental, interclastic, large angular clasts of milky white cryptocrystalline lime with clear sparry calcite cement, clean, tight

2610 limestone: light tan to light brown, hard, blocky, microcrystalline, microseric, trace to poor intercrystalline porosity, clean, scattered

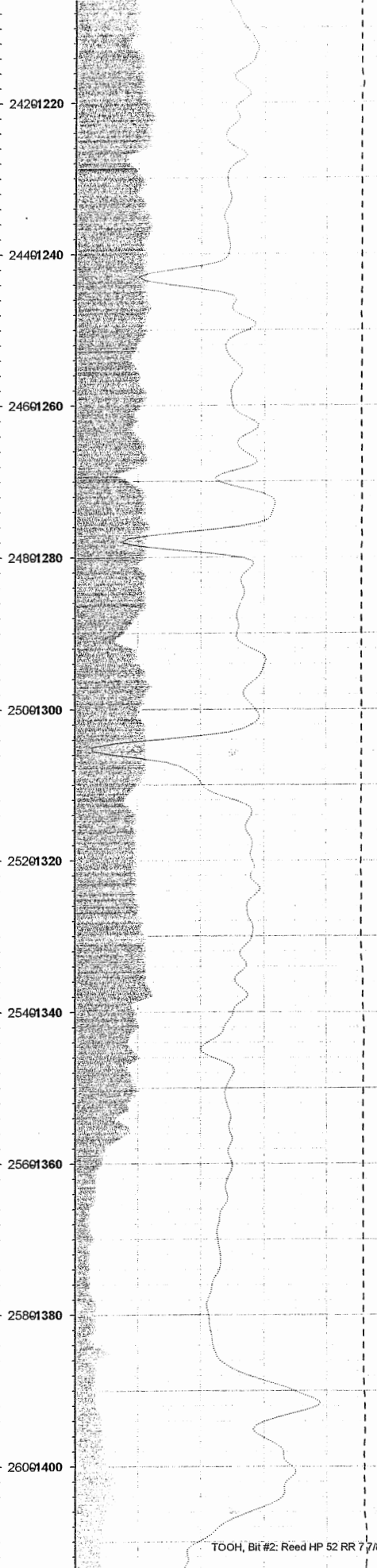
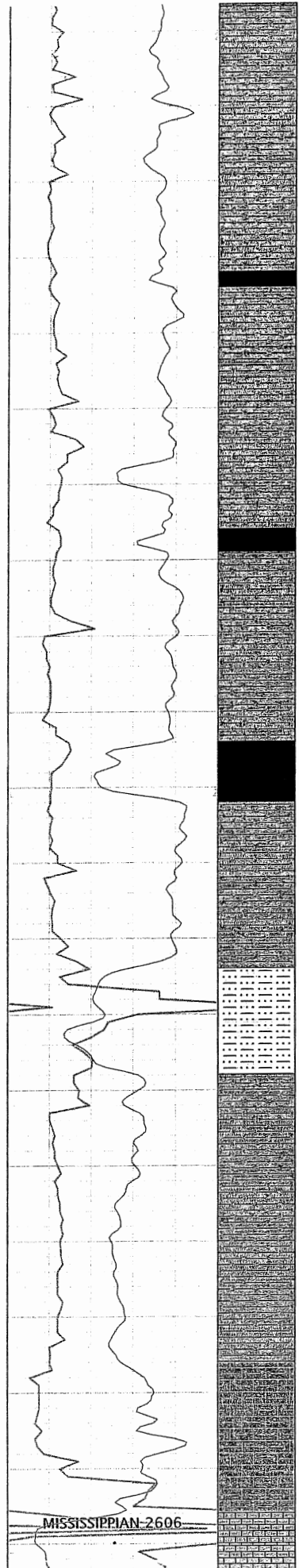
12:00

13:00

13:51

MISSISSIPPIAN-2606

TOOH, Bit #2: Reed HP 52 RR 7 7/8



fine pyrite

2616 limestone: white to light creamy gray, hard, blocky, cryptocrystalline, light, clean, trace fine pyrite

2625 limestone: light creamy tan to light honey yellow, hard, blocky, cryptocrystalline to microcrystalline, microsugrosic, clean, trace to poor intercrystalline porosity, trace pinpoint vuggy porosity, abundant pyrite

2630 limestone: white to light creamy tan to light creamy gray, hard, blocky, cryptocrystalline to microcrystalline, clean, light, sparry in places, scattered fine pyrite

19:00

20:00

21:00

TD 2675

26201420

26401440

26601460

26801480

RPM 50/70 WOB 25/30 PP 64/950, mix 25 gel, cs 1, sa 1, tahn

