

FORMATION EVALUATION LOG

SCALE: 1:120 (1"=10', 2.5" = 100')

COMPANY: Heartland Oil and Gas, Inc
WELL: Atwater Farms 5-14 SWD
FIELD: Wildcat
COUNTY: Jackson **STATE:** KS

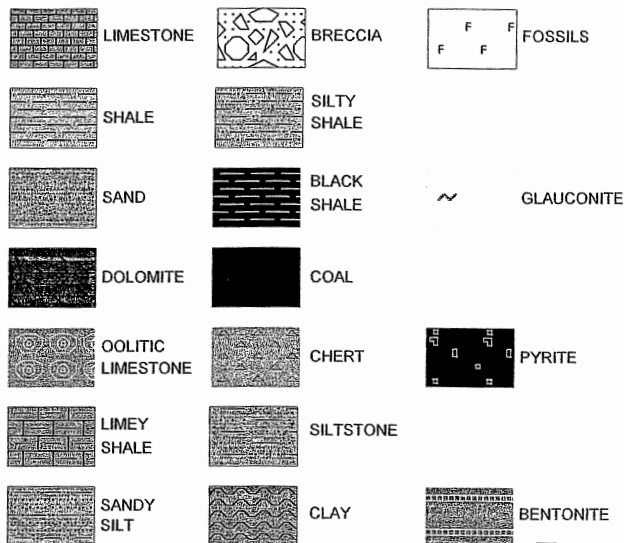
API #: 15-085-20076-00-00
LOCATION: s/2 s/2 sw nw
 2790 fsl 710 fwl
 Sec 14 Twp 5S Rge 15E

ELEV GL: 1079 ft
ELEV KB: 1087 ft
Log Measured from: KB

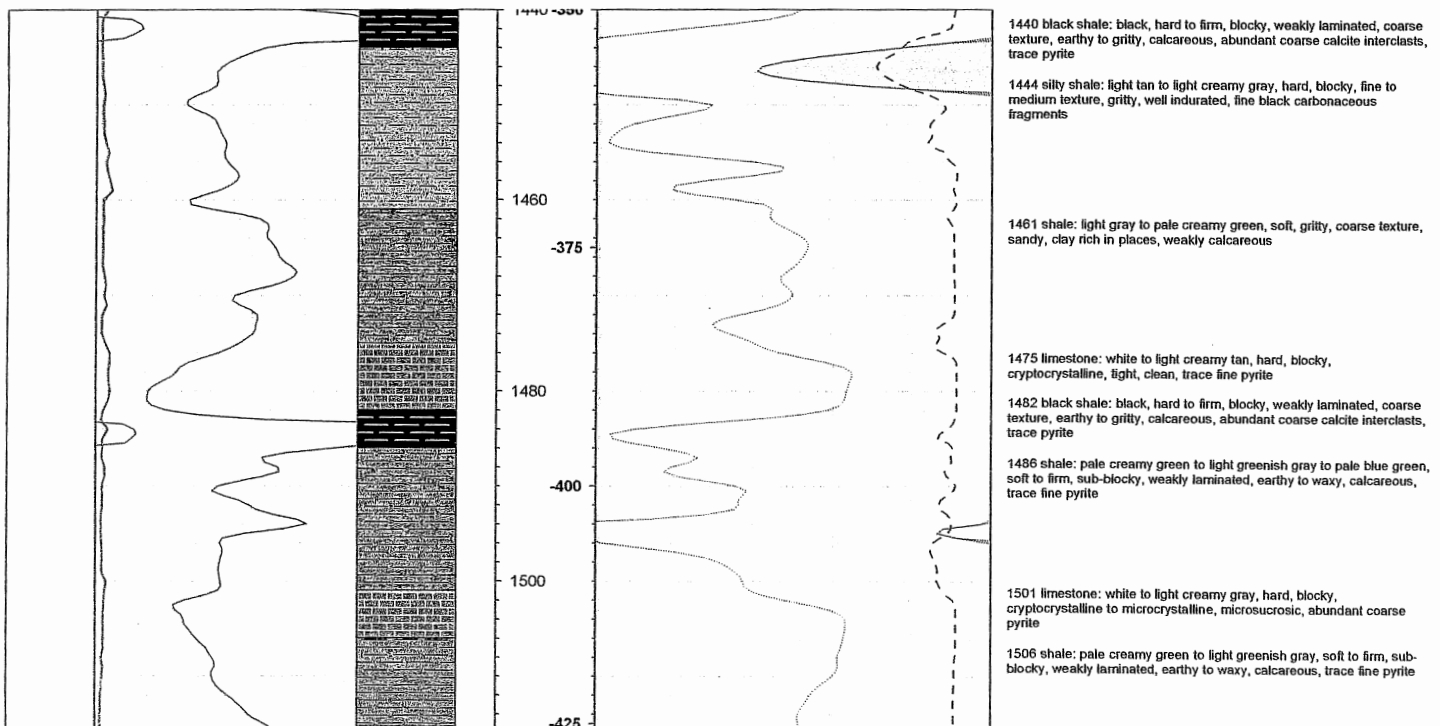
Spud Date June 22, 2004
Surface Casing 8 5/8" 0 - 242 ft
Hole Size 7 7/8
Total Depth 3637 ft
Logging Dates June 23 - 28, 2004
Interval Logged 1440 - 3637 ft
Drilling Fluid native mud, bentonite gel
Mud Pumps Skytop-Brewster 6x14
Drilling Contractor Gulick Drilling, Inc.
Rig Pusher Ron Gulick
Company Geologist Bill Hayworth
Company Engineer Layle Robb
Logging Geologist Chris Ryan

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

LEGEND



DATE/TIME	PEN. RATE (MIN/FT)	LITHOLOGY	CORE	DEPTH (FT)	ELEVATION (FT)	TOTAL GAS (UNITS)	LITHOLOGIC DESCRIPTION
	GAMMA RAY (API UNITS)					BULK DENSITY (g/cc)	
	0 — 150					0 — 250	
						2 — 3	
						Caliper (in) 16 — 8	



CHEROKEE/Excella
1585

Ardmore Lime 1657

V Shale 1681

1520

1540 -450

1560

-475

1580

-500

1600

-525

1620

1640 -550

1660

-575

1680

-600

1700

-625

1720

1539 black shale: black, firm, sub-platy, well laminated, flaky, medium to coarse texture, bony, abundant coarse calcite interclasts, scattered pyrite

1543 shale: pale creamy green to light greenish gray, soft to firm, sub-blocky, weakly laminated, earthy to waxy, calcareous, trace fine pyrite

1548 limestone: white to light creamy gray, hard, blocky, cryptocrystalline to microcrystalline, microcrystalline, abundant coarse pyrite

1558 shale: pale creamy green to light gray, soft to firm, sub-blocky, weakly laminated, fine to medium texture, gritty, calcareous, scattered pyrite

1570 black shale: black, firm, blocky, weakly laminated, fine to medium texture, earthy to gritty, clean, trace fine pyrite

1576 limestone: light honey yellow, hard, blocky, cryptocrystalline, tight, clean, trace fine pyrite

1579 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

1585 black shale: black, firm, blocky, weakly laminated, fine to medium texture, earthy to gritty, clean, trace fine pyrite

1582 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

1607 silty sand: white to light gray, very fine grained to fine grained, well rounded, well sorted, weakly friable, hard, clean, trace fine pyrite, fine black carbonaceous fragments

1613 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

1627 siltstone: light tan to light creamy gray, hard, blocky, fine to medium texture, gritty, well indurated, fine black carbonaceous fragments

1633 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

1657 limestone: white to light honey yellow, hard, blocky, cryptocrystalline to microcrystalline, fragmental in places, coarse skeletal fragments, scattered fine pyrite

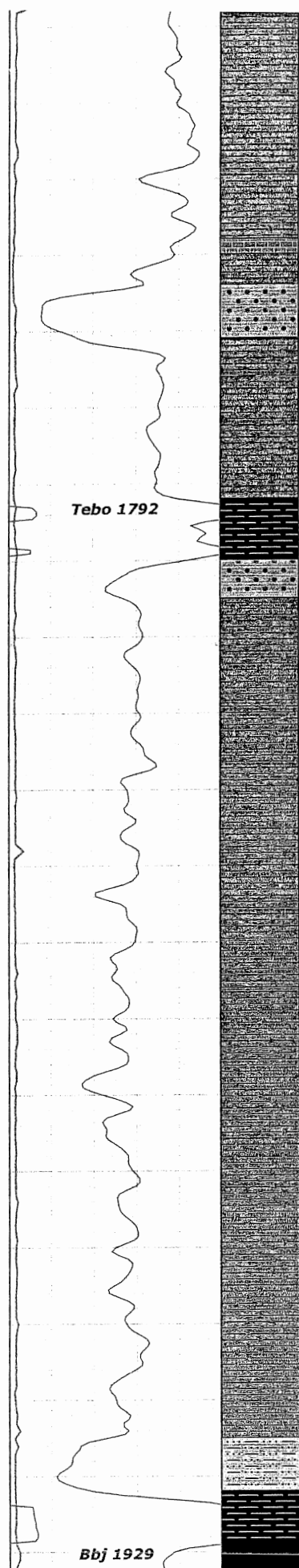
1662 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

1681 black shale: black, hard to firm, platy, fine texture, earthy, well laminated, trace fine pyrite

1688 silty shale: light tan to light creamy gray, hard, blocky, fine to medium texture, gritty, well indurated, fine black carbonaceous fragments

1701 shale: light gray, firm, subplaty, weakly laminated, medium to coarse texture, gritty, weakly calcareous, trace fine pyrite

total show 50 units



1740-650

begin mixing mud, mix 30 gel 1 cs 1 sa 1 tann 1/2 chispac

1760

-675

1764 sandstone: white to clear, medium to coarse grained, subangular, moderately sorted, weakly friable, hard, clean, light, scattered coarse pyrite

1771 shale: light gray to pale creamy green to light brown, soft to firm, subplaty, weakly laminated, gritty, coarse texture, calcareous, abundant coarse pyrite

1780

-700

1792 black shale: black, hard to firm, blocky to platy, splintery, thin laminated, fine to medium texture, earthy to gritty, calcareous, coarse calcite interclasts, scattered coarse pyrite

1800

1800 sandstone: white to clear, medium to coarse grained, sub rounded to subangular, well sorted, weakly friable, hard, clean, light, scattered coarse pyrite

1805 shale: light gray to pale creamy green, soft to firm, sub-blocky, fine texture, weakly laminated, earthy to gritty, calcareous, trace pyrite

RPM 70/100 WOB 4/10 PR 65/850

-725

1820

1840-750

1860

-775

1856 shale: light gray to pale creamy green, soft to firm, sub-blocky, fine texture, weakly laminated, earthy to gritty, calcareous, trace pyrite

1880

-800

1900

-825

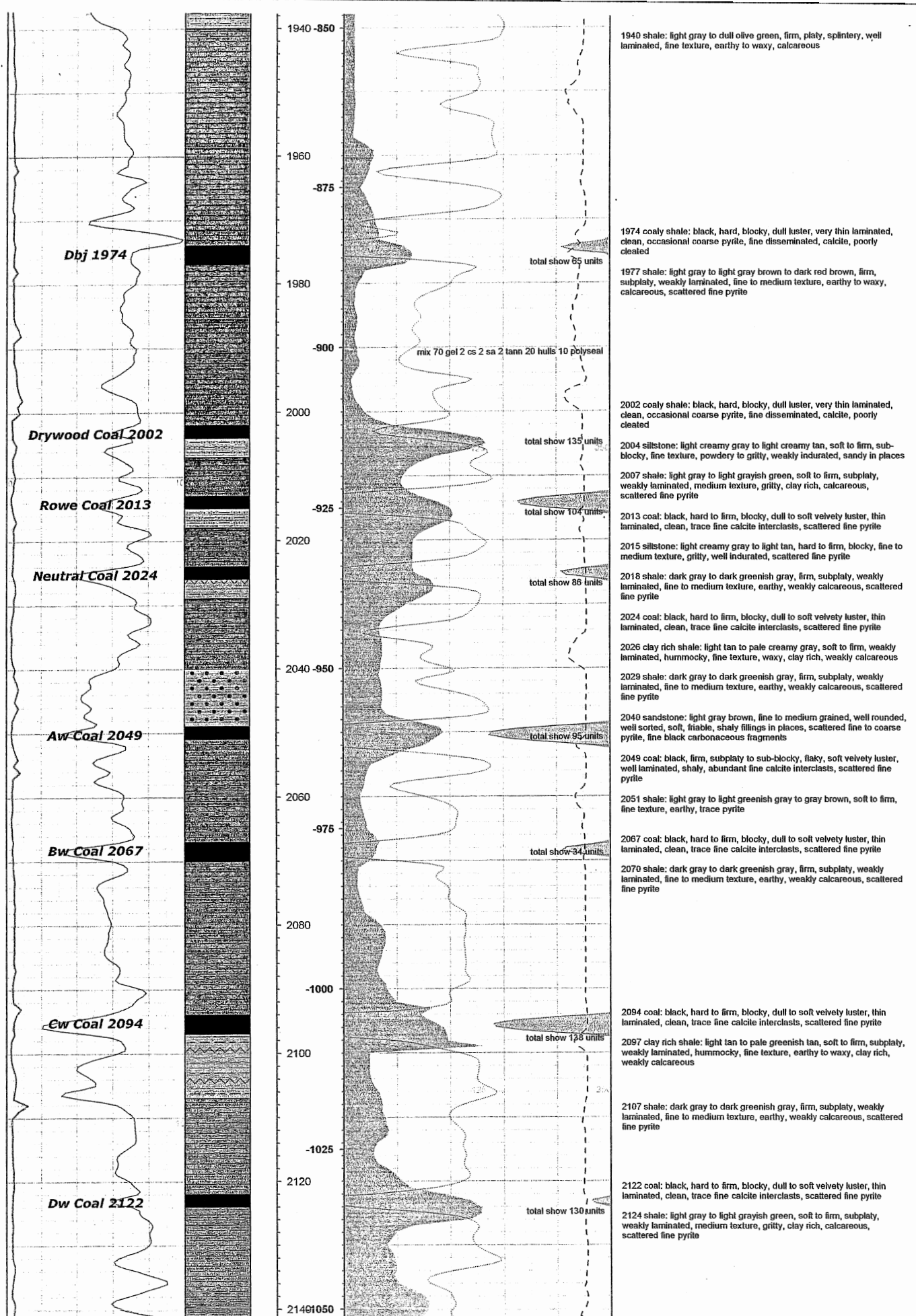
1920

1915 siltstone: light gray to light brown, firm, sub-blocky, fine to medium texture, earthy to gritty, sandy in places, trace black carbonaceous fragments

1922 black shale: black, hard to firm, subplaty, weakly laminated, fine to medium texture, earthy to gritty, abundant calcite interclasts, scattered fine pyrite

1929 coaly shale: black, hard to firm, blocky to flaky, well laminated, dull velvety luster, shaly, fine pyrite laminations, weakly calcareous

Bbj 1929



Upper Riverton Coal
2146

Lower Riverton Coal
2154

Upper McClouth 2173

Lower McClouth 2267

Burgess Sand 2298

MISSISSIPPIAN 2322

total show 150 units

total show 150 units

2148 shale: dark gray to dark greenish gray, firm, subplaty, weakly laminated, fine to medium texture, earthy, weakly calcareous, scattered fine pyrite

2154 coal: black, hard, sub-blocky, dull to soft velvety luster, very thin laminated, clean, trace fine pyrite, trace calcite, poorly cleated

2157 shale: dark gray to dark greenish gray, firm, subplaty, weakly laminated, fine to medium texture, earthy, weakly calcareous, scattered fine pyrite

2173 sandstone: white to clear, fine to medium grained, subrounded, moderately sorted, thin bedded, abundant lithic fragments, fine black carbonaceous fragments, interbedded with dark gray to green shale, scattered fine pyrite

2190 sandstone: white to clear, fine to medium grained, subrounded, moderately sorted, abundant lithic fragments, fine black carbonaceous fragments, scattered fine pyrite

2204 shale: dark gray, firm, sub-platy, weakly laminated, gritty, coarse texture, weakly calcareous, trace fine pyrite

2233 siltstone: light creamy gray to light tan, hard to firm, blocky, fine to medium texture, gritty, well indurated, scattered fine pyrite

2237 shale: dark gray to dark greenish gray, firm, platy, medium texture, earthy to gritty, weakly calcareous, occasional coarse pyrite clusters

2267 sandstone: white to clear, fine to medium grained, subrounded, moderately sorted, abundant lithic fragments, fine black carbonaceous fragments, scattered fine pyrite

2278 shale: dark gray to dark greenish gray, hard to firm, subplaty to sub-blocky, medium texture, weakly laminated, earthy to gritty, calcareous, trace pyrite

2302 sandstone: white to clear to light yellow, coarse grained, subangular, well sorted, hard, weakly friable, thin bedded, shaly fillings in places, scattered fine pyrite, trace to poor intergranular porosity

2322 limestone: light creamy tan to light honey yellow, hard, blocky, cryptocrystalline, light, scattered milky white to pale blue gray chert, scattered fine pyrite

2342 limestone: light yellow to light brown, hard, blocky, microcrystalline, sucrosic, clean, trace visible porosity, trace fine pyrite

2324 TOOH, Bit#2: Varel EDT 47, mix 30 gel 1 c@0@h Bit#8
15 hulls 10 polyseal, MW 9.2 VIS 34 LCM 1

KINDERHOOK 2460

2360

-1275

RPM 60/75 WOB 28/30 PP 62/650, mix 25 gel 1 cs 1 sa 1 tann
25 hulls 4 polyseal 1/4 drispac, MW 9.2 VIS 32 LCM 1

2380

-1300

2400

-1325

2420

2440

-1350

2460

-1375

2480

-1400

2500

-1425

2520

2540

-1450

2372 limestone: light creamy tan to brown, mottled in places, hard,
platy, cryptocrystalline, fragmental in places, coarse sparry calcite
cement, stylolitic, clean, light, trace fine pyrite

2402 limestone: light creamy tan to brown, mottled in places, hard,
platy, cryptocrystalline, fragmental in places, coarse sparry calcite
cement, stylolitic, clean, light, trace fine pyrite

2433 limestone: light creamy tan to brown, mottled in places, hard,
platy, cryptocrystalline, fragmental in places, coarse sparry calcite
cement, stylolitic, clean, light, trace fine pyrite

2460 shale: varicolored, pale creamy green to light gray to dark gray
brown to black, firm, platy to blocky, fine to medium texture, earthy to
gritty, well laminated, scattered coarse pyrite

2495 shale: varicolored, pale creamy green to light gray to dark gray
brown to black, firm, platy to blocky, fine to medium texture, earthy to
gritty, well laminated, scattered coarse pyrite

2522 shale: varicolored, pale creamy green to light gray to dark gray
brown to black, firm, platy to blocky, fine to medium texture, earthy to
gritty, well laminated, scattered coarse pyrite

2557 shale: varicolored, pale creamy green to light gray to dark gray

HUNTON 2708

-1475

RPM 60/70 WOB 25/30 PP 65/700, mix 15 gel 1 cs 1 tann
45 hulls 30 polyseal 1/4 drispac, MW 9.4 VIS 36 LCM 3

2580

-1500

2600

-1525

2620

26491550

2593 shale: varicolored, pale creamy green to light gray to dark gray brown to black, firm, platy to blocky, fine to medium texture, earthy to gritty, well laminated, scattered coarse pyrite

RPM 60/70 WOB 25/30 PP 60/700, MW 9.4 VIS 36, LCM 8

2660

-1575

2680

-1600

2700

2708 limestone: light tan to light brown, hard blocky, mottled, fine crystalline, fragmental, stylolitic, coarse sparry calcite cement, clean, trace fine pyrite

-1625

2720

2712 limestone: light tan to light honey yellow, hard, blocky, fine crystalline, sucrosic, trace to poor intercrystalline porosity, clean, scattered fine pyrite

2727 limestone: white to light creamy tan, hard, platy, cryptocrystalline, clean, light, trace fine pyrite

RPM 50/60 WOB 20/30 PP 60/700, mix 20 gel 1 cs 1 tann
25 hulls 10 polyseal, MW 9.4 VIS 36, LCM 6

27491650

2739 limestone: light tan to light gray to brown, hard, blocky, microcrystalline to fine crystalline, mottled, microsucrosic, fragmental in places, stylolitic, coarse sparry calcite cement, trace intercrystalline porosity, scattered fine pyrite

2751 limestone: white to light creamy tan, hard, platy, cryptocrystalline, light, clean, trace fine pyrite

2760

-1675

RPM 50/70 WOB 15/25 PP 52/500, mix 25 gel 1 cs 1 tann
50 hulls 10 polyseal 1/2 drispac, MW 9.4 VIS 36, LCM 6

2780

-1700

2800

-1725

2820

2840

2860

-1775

2880

-1800

2900

-1825

2920

2940

2960

-1875

2785 limestone: white to light tan to light creamy gray, hard, platy, cryptocrystalline to microcrystalline, microsucrosic in places, clean, trace very poor intercrystalline porosity, trace fine pyrite

2820 limestone: light gray to light creamy tan, hard, blocky to platy, cryptocrystalline, clean, light, trace fine pyrite

2850 limestone: light creamy gray to white, hard, blocky, microcrystalline to fine crystalline, sucrosic, large vugs with coarse drusy calcite, well developed rhombs, trace to poor vuggy porosity, very clean

2865 limestone: white to light creamy gray, hard, platy to blocky, cryptocrystalline to microcrystalline, sparry, granular in places, very clean

2885 limestone: white to light creamy tan, hard, blocky, fine to coarse crystalline, sparry, drusy, large calcite rhombs, very vuggy

2890 limestone: white to light creamy gray, hard, platy, cryptocrystalline, tight, very clean, trace fine pyrite

2896 limestone: white to light creamy gray to light honey yellow, hard, blocky, microcrystalline to fine crystalline, microgranular, trace to poor intergranular porosity, very clean, trace fine pyrite

2938 limestone: white, hard, platy, cryptocrystalline, tight, very clean, very uniform

2965 limestone: white to light creamy gray to light honey yellow, hard, blocky to platy, cryptocrystalline to microcrystalline, microsucrosic in places, very clean, trace intergranular porosity

RPM 50/70 WOB 15/25 PP 55/525, MW 9.3 VIS 36 LCM 9

MAQUOKETA 3178

-1900

3000

-1925

3020

3040

1950

3060

-1975

3080

-2000

3100

-2025

3120

3140

2050

3160

-2075

3180

RPM 50/70 WOB 15/25 PP 55/600, mix 20 gel 1 cs 1 sa 1 tann
20 hulls 5 polyseal, MW 9.4 VIS 36 LCM 8

RPM 60/70 WOB 25/28 PP 58/700, mix 20 gel 2 cs 2 sa 1 tann
20 hulls 5 polyseal, MW 9.4 VIS 38 LCM 9

3000 limestone: white to light creamy gray, hard, blocky,
cryptocrystalline to microcrystalline, microsucrosic in places, poor to fair
vuggy porosity, occasional large vugs with coarse drusy calcite, very
clean, trace fine pyrite

3040 limestone: white to light creamy gray, hard, blocky,
cryptocrystalline to microcrystalline, microsucrosic in places, poor to fair
vuggy porosity, occasional large vugs with coarse drusy calcite, very
clean, trace fine pyrite

3085 limestone: light creamy tan to light gray, hard to firm, blocky,
microcrystalline to fine crystalline, sucrosic, moderate to good vuggy
porosity, abundant small vugs, drusy, sparry calcite, clean

3095 limestone: white to light creamy tan to light creamy gray, hard,
blocky, cryptocrystalline to microcrystalline, microsucrosic in places,
trace vuggy porosity, clean, scattered fine pyrite

3135 limestone: light tan to light brown to gray brown, hard to firm,
blocky, microcrystalline to fine crystalline, sucrosic, vuggy, poor to fair
vuggy porosity, drusy, scattered fine pyrite

3157 limestone: white to light gray to brown to gray brown, hard, blocky,
microcrystalline to fine crystalline, microgranular to sucrosic,
argillaceous in places, fine shale fillings, light, scattered fine pyrite

3178 shale

VIOLA 3254

SIMPSON 3386

RPM 60/70 WOB 25/28 PP 58/700, MW 9.4 VIS 37 LCM 8

RPM 50/70 WOB 20/30 PP 60/650, mix 15 gel 1 cs 1 sa 1 tann
1/4 drispac, MW 9.4 VIS 37 LCM 8

3226 limestone: white to light tan, hard, blocky, fine to medium crystalline, granular, sparry, trace pinpoint vuggy porosity, clean, scattered pyrite

3238 shale: gray to greenish gray to blue green, firm, sub-blocky, fine to medium texture, weakly laminated, earthy to gritty, calcareous, scattered fine pyrite

3254 dolomite: white to light gray brown to brown, hard, blocky, medium to coarse crystalline, granular, sucrosic, clean, coarse interbladed dolomite rhombs, trace pinpoint vuggy porosity, trace patchy black dead oil stain, scattered fine pyrite

3277 dolomite: white to light gray to clear brown, hard, blocky, fine to medium crystalline, granular, sucrosic, interbladed dolomite rhombs, trace pinpoint vuggy porosity, trace patchy black to dark brown dead oil stain, scattered fine pyrite

3303 dolomite: light gray to gray brown to dark gray brown, hard, blocky, fine crystalline, granular, sucrosic, trace to poor pinpoint vuggy porosity, clean, trace patchy black dead oil stain, scattered fine pyrite

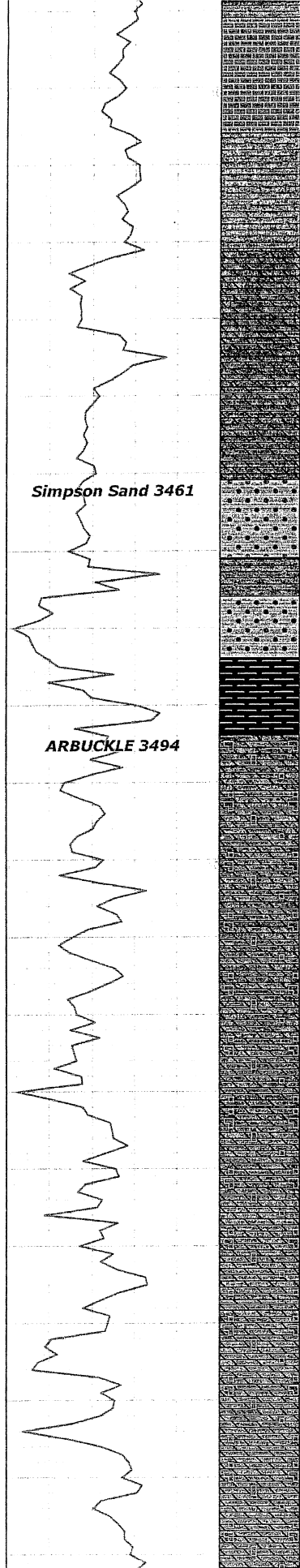
3319 dolomite: light gray to gray brown to dark gray brown, hard, blocky, fine to medium crystalline, granular, sucrosic, trace to poor pinpoint vuggy porosity, clean, scattered fine pyrite

3351 dolomite: light gray to gray brown to dark gray brown, hard, blocky, microcrystalline to fine crystalline, granular, sucrosic, tight, trace vuggy porosity, clean, scattered fine pyrite

3363 dolomite: light gray to gray brown to dark gray brown, hard, blocky, fine to medium crystalline, granular, sucrosic, trace to poor vuggy porosity, drusy bladed dolomite rhombs, clean, scattered fine pyrite

3375 dolomite: light gray to gray brown to dark gray brown, hard, blocky, microcrystalline to fine crystalline, granular, sucrosic, tight, trace vuggy porosity, clean, scattered fine pyrite

3386 shale: very dark gray to black, hard to firm, subplaty, fine to medium texture, weakly laminated to massive, earthy



RPM 50/70 WOB 20/28 PP 60/650, mix 23 gel 1 cs 1 sa 1 lann 8 hulls

3401 limestone: white to light creamy tan, hard, blocky, medium to coarse crystalline, granular, sparry, coarse interlocking calcite rhombs, clean, trace pinpoint vuggy porosity, scattered coarse pyrite

3416 shale: dark gray to dark grayish green, hard to firm, blocky, fine to medium texture, weakly laminated to massive, earthy

3431 dolomite: light clear brown to dark brown, hard, blocky, fine crystalline, sucrosic, clean, trace pinpoint vuggy porosity, scattered coarse pyrite

3461 sandstone: clear, medium to coarse grained, subrounded to well rounded, well sorted, very friable, abundant loose quartz grains, good intergranular porosity, patchy black dead oil stain, scattered coarse pyrite, interbedded pale green earthy shale

3484 black shale: black, hard to firm, subplaty to blocky, fine texture, weakly laminated to massive, earthy to gritty, clean, weakly calcareous

3494 dolomite: light brown to light gray brown, hard, blocky, microcrystalline, microsucrosic, clean, trace very poor intercrystalline porosity, trace pinpoint vuggy porosity, scattered fine pyrite

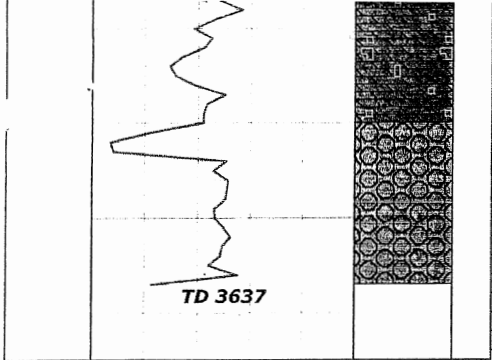
3526 dolomite: white to light gray to light gray brown, hard, blocky, fine to medium crystalline, sucrosic, clean, poor to fair intercrystalline porosity, trace to poor pinpoint vuggy porosity, scattered coarse pyrite

3542 dolomite: white to light gray to light brown, hard, blocky, fine crystalline, sucrosic, uniform texture, trace to poor intercrystalline porosity, clean, scattered coarse pyrite

short trip 21 stands, circulate for logs, TOOH, run logs, trip in

3567 dolomite: white to light gray to light brown to brown, hard, blocky, microcrystalline to fine crystalline, variable texture, light in places, trace to poor intercrystalline porosity, vuggy in places, trace to poor pinpoint vuggy porosity, scattered pyrite

3586 dolomite: white to clear to light gray, hard, blocky, microcrystalline to fine crystalline, sucrosic, uniform texture, trace to poor intercrystalline porosity, clean, scattered fine pyrite



-2525

3620

36402550

lost circulation 3637, TD

to the claystone, sandstone, rock is not heavily fractured, no porosity, no
pinpoint vuggy porosity, clean, scattered coarse pyrite

3620 lost circulation: lost circulation at 3637, no returns