

ATOKA

COAL LABS

Englewood, Colorado
1-800-853-5113
FA X 303-617-8956

FORMATION EVALUATION LOG

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



















COMPANY: Heartland Oil and Gas, Inc
WELL: Bloom 13-14
FIELD: Wildcat
COUNTY: Nemaha **STATE:** KS

API #: 15-131-20185-00-00
LOCATION: ne sw sw
810 fsl 810 fwl
Sec 14 Twp 4S Rge 14E

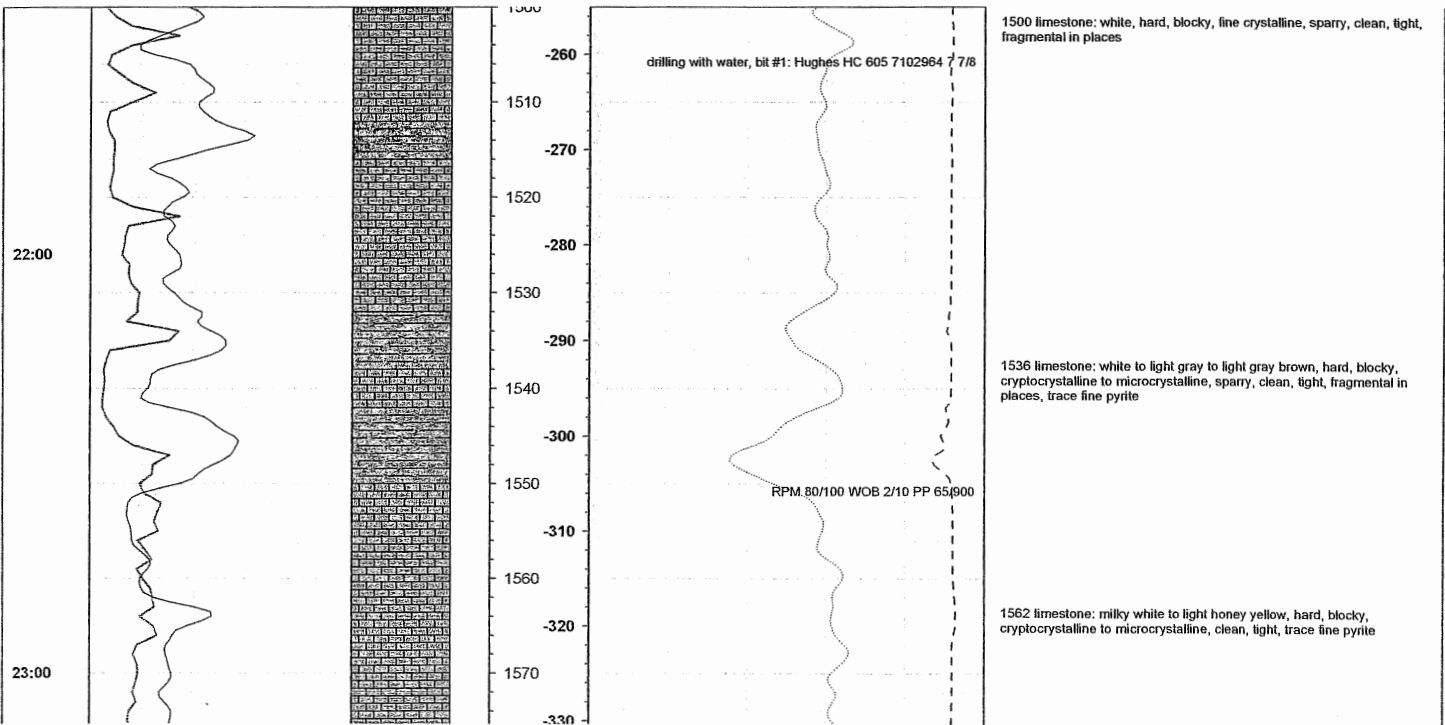
ELEV GL: 1237 ft
ELEV KB: 1245 ft
Log Measured from: KB

Spud Date	May 12, 2004
Surface Casing	8 5/8" 0 - 282 ft
Hole Size	7 7/8
Total Depth	2728 ft
Logging Dates	May 13 - 15, 2004
Interval Logged	1500 - 2675 ft
Drilling Fluid	native mud, bentonite gel
Mud Pumps	Skytop-Brewster 6x14
Drilling Contractor	Gulick Drilling, Inc. RECEIVED KANSAS CORPORATION COMMISSION
Rig Pusher	Ron Gulick SEP 29 2004
Company Geologist	Bill Hayworth CONSERVATION DIVISION WICHITA, KS
Company Engineer	Layle Robb
Logging Geologist	Chris Ryan

LEGEND

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

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



5/14/04

BKC/PLEASANTON 1662

MARMATON 1682

01:00

02:00

1580
-340
1590
-350
1600
-360
1610
-370
1620
-380
1630
-390
1640
-400
1650
-410
1660
-420
1670
-430
1680
-440
1690
-450
1700
-460
1710
-470
1720
-480
1730
-490
1740
-500
1750
-510
1760
-520
1770
-530
1780

- 1594 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
- 1598 limestone: white to light creamy gray, hard, blocky, cryptocrystalline, clean, light, trace fine pyrite
- 1624 black shale: black, hard to firm, blocky, weakly laminated, earthy to gritty, medium texture, scattered pyrite, scattered calcite interclasts
- 1630 limestone: white to light honey yellow, hard, blocky, cryptocrystalline, clean, light, trace fine pyrite
- 1650 black shale: black, firm, subplaty, earthy, fine texture, weakly laminated, abundant calcite interclasts
- 1656 limestone: white to light honey yellow, hard, blocky, microcrystalline to fine crystalline, sparry, fragmental, clean, light, trace fine pyrite
- 1662 shale: gray to graybrown, firm, subplaty, earthy, fine texture, weakly laminated
- 1682 limestone: white to light honey yellow, hard, blocky, microcrystalline to fine crystalline, sparry, fragmental, clean, light, trace fine pyrite
- 1700 shale: light gray to dark gray to dark greenish gray, firm, platy, weakly laminated, medium to coarse texture, earthy
- 1706 limestone: light gray brown to brown, mottled, microcrystalline to fine crystalline, sparry, fragmental, stylolitic, trace fine pyrite
- 1710 black shale: black, hard to firm, sub-blocky, weakly laminated, fine to medium texture, earthy to gritty, scattered calcite interclasts, scattered pyrite
- 1715 shale: dark gray to dark gray brown to brown, firm, subplaty, weakly laminated, gritty, coarsened texture, black carbonaceous fragments
- 1734 limestone: white to light tan to light brown, hard, blocky, cryptocrystalline, clean, light, trace fine pyrite
- 1738 black shale: black, hard to firm, subplaty, weakly laminated to massive, coarse texture, gritty, abundant calcite interclasts, coarse pyrite
- 1744 limestone: white to light honey yellow to light brown, hard, blocky, cryptocrystalline to microcrystalline, clean, light, trace pyrite
- 1750 shale: light gray to gray brown, firm, subplaty, earthy, fine to medium texture, soft, clay rich in places
- 1754 coal: black, hard to firm, blocky, flaky, dull luster, clean, trace fine pyrite, poorly cleated
- 1756 shale: varicolored, pale green to dark gray to light red brown, soft to firm, weakly laminated, fine to medium texture, earthy to gritty, soft, clay rich in places
- 1761 limestone: white to light honey yellow, hard, blocky, cryptocrystalline to microcrystalline, sparry, clean, light, trace fine pyrite
- 1774 shale: varicolored, pale green to dark gray to light red brown, soft to firm, weakly laminated, fine to medium texture, earthy to gritty, soft, clay rich in places
- 1780 limestone: white to light honey yellow, hard, blocky, cryptocrystalline to microcrystalline, sparry, clean, light, trace fine pyrite

slope test 3/4 degree deviation

total show 30 units

medium to coarse texture, weakly calcareous, trace fine pyrite

1790 black shale: black, hard to firm, sub-blocky, fine texture, weakly laminated, clean, earthy to gritty

1798 coaly shale: black, hard, blocky to flaky, shaly, thin laminated, dull luster, bright coal microbands, clean, trace fine pyrite

1802 limestone and shale interbeds: white to light creamy tan, hard, blocky, microcrystalline, microcrystalline, sparry, fragmental, clean, trace fine pyrite, interbedded dark gray to greenish gray waxy shale

1820 shale: light gray to light greenish gray, soft to firm, subplaty, weakly laminated, coarse texture, gritty, calcareous

1827 black shale: black, hard, sub-blocky, coarse texture, gritty, trace calcite, clean, trace pyrite

1832 limestone: white to light creamy tan, hard, blocky, microcrystalline to fine crystalline, sparry, fragmental in places, clean, occasional coarse pyrite

1836 shale: light gray to light greenish gray, soft to firm, subplaty, weakly laminated, coarse texture, gritty, calcareous

1842 black shale: black, hard, sub-blocky, weakly laminated, coarse texture, gritty, trace calcite, clean, trace pyrite

1850 shale: light gray to pale greenish gray, firm, subplaty, weakly laminated, earthy to waxy, fine texture, calcareous

1862 sandstone: white to light gray to pale greenish gray, fine to medium grained, well rounded, well sorted, clean, weakly friable, trace fine pyrite

1866 shale: light gray to pale greenish gray, firm, subplaty, weakly laminated, earthy to waxy, fine texture, calcareous

1876 sandstone: white to light gray to pale greenish gray, fine to medium grained, well rounded, well sorted, clean, weakly friable, trace fine pyrite

1882 shale: light gray to pale greenish gray, firm, subplaty, weakly laminated, earthy to waxy, fine texture, calcareous

1888 sandstone: white to light tan, fine to medium grained, subrounded, moderately sorted, weakly friable, trace intergranular porosity, trace black carbonaceous fragments, trace pyrite, shale fillings

1898 shale: light greenish gray to light brown to brown, soft to firm, subplaty, fine texture, earthy, calcareous in places

1916 sandstone: white to light gray brown, fine to medium grained, subrounded, well sorted to moderately sorted and clean in places, black carbonaceous fragments

1923 shale: light greenish gray to light brown to brown, soft to firm, subplaty, fine texture, earthy, calcareous in places

1932 limestone: light tan to light gray brown, hard, blocky, fine to medium crystalline, fragmental, abundant skeletal fragments, crinoids, bivalves, trace fine pyrite

1938 black shale: black, firm, sub-blocky, massive, fine to medium texture, gritty, clean, trace calcite

1956 siltstone: light gray to light tan, soft to firm, weakly indurated, gritty, fine texture, powdery

1960 shale: light gray to light greenish gray to gray brown, firm, sub-blocky, medium to coarse texture, earthy to gritty, weakly laminated

1968 siltstone: light gray to light tan to brown, firm, sub-blocky, weakly friable, fine texture, gritty to powdery

1972 shale: light gray to light gray brown pale green, soft to firm, sub-blocky, fine texture, earthy, clay rich in places, calcareous

1986 limestone: light gray brown to brown, hard, blocky, medium to coarse crystalline, fragmental, abundant skeletal fragments, crinoids, bryozoans, bivalves, trace pyrite

1990 shale: varicolored, dull olive to dark red, soft to firm, platy, fine

03:00

04:00

05:00

Fort Scott Lime 1802

CHEROKEE/Excello 1842

Squirrel Sand 1862

Ardmore 1932

V Shale 1938

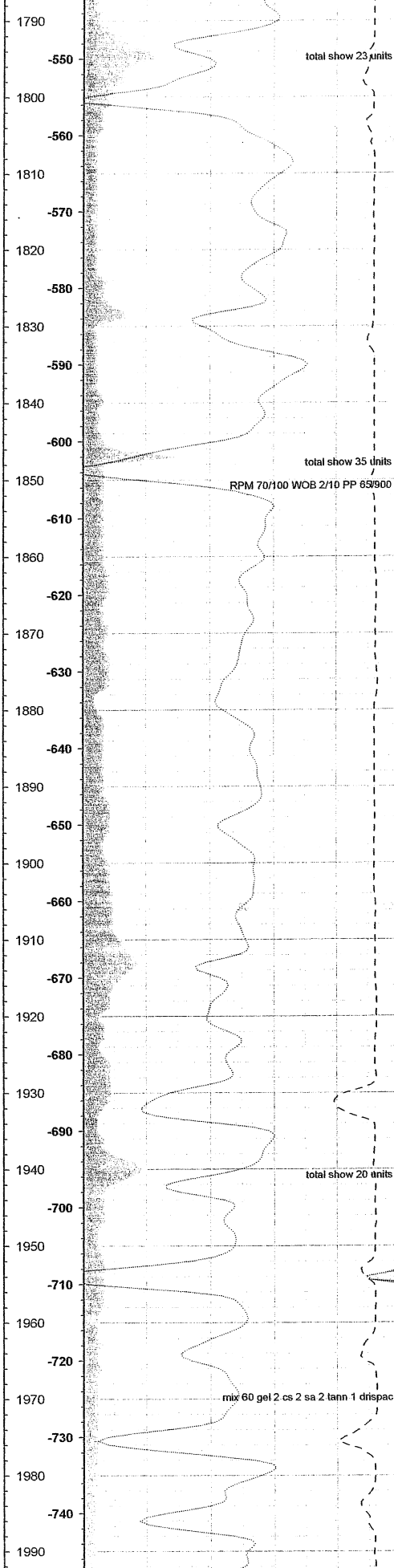
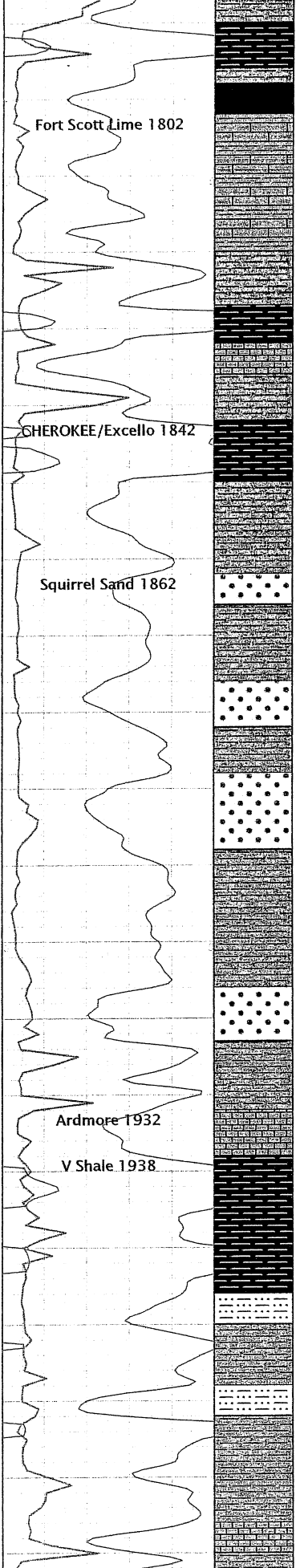
total show 23 units

total show 35 units

RPM 70/100 WOB 2/10 PP 65/900

total show 20 units

mix 60 gel 2 cs 2 sa 2 tann 1 drispac



Detailed lithological descriptions for units 1790 through 1990, including color, texture, and mineralogical observations. Key units labeled include Fort Scott Lime 1802, CHEROKEE/Excello 1842, Squirrel Sand 1862, Ardmore 1932, and V Shale 1938.

1996 sandstone: clear to pale orange pink to pale green, coarse to very coarse grained, angular to subangular, weakly consolidated, abundant coarse loose quartz grains, scattered fine pyrite, scattered dark blue green glauconite, well cemented, weakly friable

2020 black shale: black, hard to firm, subplaty, earthy, fine texture, weakly laminated, clean, trace fine pyrite

2026 siltstone: white to light creamy gray, soft to firm, weakly laminated, medium texture, gritty, trace pyrite

2036 shale: varicolored, dark greenish gray, gray brown, dark red, soft to firm, weakly laminated, fine texture, gritty

2045 black shale: black, firm, platy, splintery, thin laminated, fine to medium texture, earthy, clean

2054 shale: light gray to light greenish gray to gray brown, soft to firm, clay rich in places, trace pyrite

2062 siltstone: light gray to light tan to brown, firm, sub-blocky, weakly friable, fine texture, gritty to powdery

2080 black shale: black, firm, platy, splintery, thin laminated, fine to medium texture, earthy, clean

2086 sandstone: clear to pale orange, medium to coarse grained, subrounded to subangular, poorly consolidated, friable, trace to poor intergranular porosity, clean, trace fine pyrite

2116 black shale: black, firm, platy, splintery, thin laminated, fine to medium texture, earthy, clean

2128 sandstone: clear to pale orange, medium to coarse grained, subrounded to subangular, poorly consolidated, friable, trace to poor intergranular porosity, clean, trace fine pyrite

2146 shale: light gray to gray brown to light greenish gray, soft to firm, subplaty, weakly laminated, fine to medium texture, earthy to gritty, weakly calcareous

2160 black shale: black, hard to firm, subplaty to sub-blocky, weakly laminated, earthy to gritty, scattered calcite

2170 shale: varicolored, pale green to pale blue green to gray to gray brown to brick red, soft to firm, sub-blocky, earthy to gritty, medium texture, weakly laminated, calcareous

06:00

07:00

Tebo Black Shale 2045

