

JAMES C. MUSGROVE*Petroleum Geologist*

2021 Forest

P. O. Box 1162

Great Bend, Kansas 67530

COPY

Office (316) 792-7716

Res. Claflin (316) 587-3444

Hallwood Petroleum, Inc.

Letch "B" No. 12

~~NE-SE-SW~~, Section 4-15s-13w

Russell County, Kansas

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DRY AND ABANDONED

CONTRACTOR: Allen Drilling Company, Inc. (Rig #3)

COMMENCED: 04-12-93

COMPLETED: 04-20-93

ELEVATIONS: 1777' K.B., 1775' D.F., 1772 G.L.

CASING PROGRAM: Surface - 8 5/8" @ 744'
Production - None

SAMPLES: Samples saved and examined 2200 feet to Rotary Total Depth.

DRILLING TIME: One (1) ft. drilling time recorded 2200' to the Rotary Total Depth.

MEASUREMENTS: All depths measured from the Kelly Bushing.

ELECTRIC LOG: By Halliburton Logging Services, Inc.; Dual Guard Micro Guard Log, Compensated Density Dual Spaced Neutron Log, Micro Log and Computer Analyzed Log.

FORMATION TESTING: There were six (6) Drill Stem Tests run by Trilobite Testers.

<u>FORMATION</u>	<u>ELECTRIC LOG DEPTH</u>	<u>SUB-SEA DATUM</u>
Anhydrite	739	+1038
Grand Haven	2300	- 523
1st Tarkio Sand	2317	- 540
2nd Tarkio Sand	2827	- 560
Tarkio Lime	2376	- 599
3rd Tarkio Sand	2411	- 634
Elmont	2440	- 663
Howard	2579	- 802
Severy	2633	- 856
Topeka	2649	- 872
Heebner	2876	-1099
Toronto	2892	-1115
Base Kansas City	3198	-1421
Conglomerate Sand	3243	-1466
Arbuckle	3249	-1472
Rotary Total Depth	3330	-1553
Log Total Depth	3332	-1555

(All tops and zones corrected to Electric Log measurements.)

SAMPLE ANALYSIS, SHOWS OF OIL, TESTING DATA, ETC.TARKIO SECTION1st Tarkio Sand
2317-2328'

Sand; very fine grained, gray to grayish green, sub-angular to sub-rounded, fair to good sorting, friable, good intergranular porosity, spotty stain, few gas bubbles, no show of free oil or odor in fresh samples.

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2nd Tarkio Sand
2337-2341'

Sand; very fine grained, grayish green, sub-angular to sub-rounded, micaeous, shaley in part, trace pyrite inclusions, fair intergranular porosity, spotty stain, show of free oil and no odor in fresh samples.

DRILL STEM TEST #1 2302-2350'
Times; 30-45-60-90

Blow: Strong blow gas to surface in 5 minutes, gas gauged as follows:

I.F.P.		
5 minutes	196,000	cfgpd
10 minutes	233,000	cfgpd
15 minutes	285,000	cfgpd
20 minutes	323,000	cfgpd
25 minutes	368,000	cfgpd
30 minutes	393,000	cfgpd

F.F.P		
5 minutes	394,000	cfgpd
10 minutes	406,000	cfgpd
15 minutes	418,000	cfgpd
20 minutes	418,000	cfgpd
25 minutes	429,000	cfgpd
30 minutes	429,000	cfgpd
35 minutes	429,000	cfgpd
40 minutes	440,000	cfgpd
45 minutes	440,000	cfgpd
50 minutes	440,000	cfgpd
55 minutes	440,000	cfgpd
60 minutes	440,000	cfgpd

Recovery: 90' watery mud

Pressure:	ISIP	630	psi
	FSP	620	psi
	IFP	88-98	psi
	FFP	137-98	psi
	HSH	1116-1086	psi

3rd Tarkio Sand

2403-2409'

Sand; very fine grained, poorly developed, highly shaley, no shows.

TOPEKA SECTION

2756-2760'

Limestone; gray to tan, granular, few fossiliferous, scattered porosity, spotty poor stain, weak show of free oil and no odor in fresh samples.

2816-2821'

Limestone; gray to white, fossiliferous, sub-oocastic, fair porosity, spotty golden brown stain, trace of free oil and fair odor in fresh samples.

2827-2833'

Limestone; cream to gray, fossiliferous, fair fossil cast to vuggy porosity, fair to good stain and saturation, show of free oil and faint odor in fresh samples.

2838-2846'

Limestone; as above, decreasing stain, no show of free oil and questionable odor in fresh samples.

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TORONTO SECTION

2898-2902'

Limestone; tan, slightly dolomitic, fossiliferous, good fossil cast to vuggy type porosity, good light brown to golden brown stain, weak show of free oil and faint odor in fresh samples.

DRILL STEM TEST #2 2870-2916'

Times; 30-45-60-120

Blow: Weak building to fair (1/2 inch to 5")

Recovery: 135' muddy water

Pressures: ISIP 1276 psi
FSIP 1306 psi
IFP 20-49 psi
FFP 59-88 psi
HSH 1436-1386 psi

LANSING SECTION

2944-2950'

Limestone; gray, oolitic, slightly cherty, plus white chalky limestone, no shows.

2959-2966'

Limestone; white to gray, fossiliferous, sub-oolitic, fair porosity, dull gray to brown stain, weak show of free oil and faint odor in fresh samples.

2971-2998'

Limestone; cream to white, oolitic, good oolitic porosity, good stain and saturation, good show of free oil and strong odor in fresh samples.

DRILL STEM TEST #3 2970-3000'

Times; 30-45-60-120

Blow: Strong

Recovery: 712' muddy water, show of oil on top.

Pressures: ISIP 1286 psi
FSIP 1336 psi
IFP 59-118 psi
FFP 187-305 psi
HSH 1556-1466 psi

3021-3027'

Limestone; gray to cream, oolitic, fossiliferous, scattered porosity, dull gray to brown stain, trace of free oil and no odor in fresh samples.

3034-3039'

Limestone; cream to white, oolitic, oolitic, fair to good porosity, spotty stain, trace of free oil and no odor in fresh samples.

3039-3050'

Limestone; gray, oolitic, good oolitic porosity, good brown to golden brown stain and saturation, fair show of free oil and faint odor in fresh samples.

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DRILL STEM TEST #4 3027-3050'

Times; 30-45-60-120

Blow: Strong

Recovery: 1828' gas in pipe
154' oil cut gassy mud
(10% gas, 30% oil, 60% mud)
434' muddy water

Pressures: ISIP 1086 psi
FSIP 1066 psi
IFP 59-127 psi
FFP 187-314 psi
HSH 1586-1486 psi

3050-3070' Limestone; cream to gray, oocastic, scattered stain (decreasing) weak show of free oil and faint odor in fresh samples.

3103-3110' Limestone; white, fossiliferous, oocastic, chalky, trace spotty brown stain, trace of free oil and no odor in fresh samples.

3122-3129' Limestone; white, fossiliferous, chalky, scattered vuggy type porosity, fair brown stain and saturation, trace of free oil, faint odor in fresh samples.

3140-3154' Limestone; cream to gray, fossiliferous, oocastic, oolitic, fair vuggy to sub-oocastic porosity, spotty stain, trace of free oil and no odor in fresh samples.

3183-3190' Limestone; gray, oolitic, fossiliferous, poor visible porosity, trace brown stain, no show of free oil or odor in fresh samples.

CONGLOMERATE SECTION

3243-3248' Abundant loose unconsolidated quartz grains, plus trace orange to tan boney chert. No shows.

ARBUCKLE SECTION

3249-3252' Dolomite; cream to white, fine to medium crystalline, poor visible porosity, trace iron pyrite, no show.

3252-2360' Dolomite; cream to white to gray to pink, fine to medium crystalline, fair intercrystalline porosity, few sandy, spotty brown to dark brown stain and saturation, show of free oil and faint odor in fresh samples.

DRILL STEM TEST #5 3250-3260'

Times; 30-45-45-45

Blow: Weak

Recovery: 10' Water

Pressures: ISIP 660 psi
FSIP 492 psi
IFP 19-19 psi
FFP 29-29 psi
HSH 1606-1566 psi

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3260-3272' Dolomite; white to cream, coarse crystalline, good intercrystalline porosity, fair brown stain and saturation, fair show of free oil and fair odor in fresh samples.

DRILL STEM TEST #6 3260-3272'
Times; 30-45-45-60

Blow: Weak building to strong

Recovery: 496' Muddy water

Pressures: ISIP 1046 psi
FSIP 1066 psi
IFP 49-98 psi
FFP 127-187 psi
HSH 1686-1626 psi

3272-3280' Dolomite; as above.

3280-3290' Dolomite; gray to white, medium to coarse crystalline, fair intercrystalline to vuggy type porosity, spotty dark brown stain, show of free oil and faint odor in fresh samples.

3290-3300' Dolomite; gray to cream, fine to medium crystalline, poor visible porosity, cherty, no shows.

3300-3310' Dolomite; gray, sucrosic, fair pin point porosity, no shows.

3310-3320' Dolomite; white, fine to medium crystalline, scattered intercrystalline to vuggy porosity, few sandy, no shows.

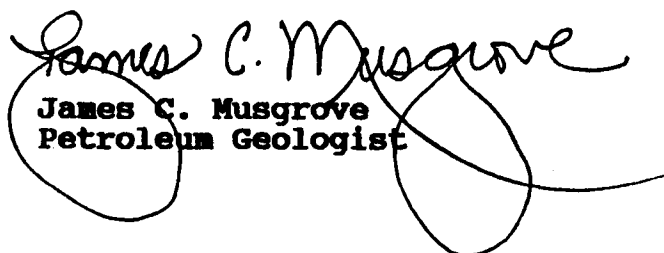
3272-3280' Dolomite; as above, no show.

ROTARY TOTAL DEPTH: 3330 (-1553)
LOG TOTAL DEPTH: 3332 (-1555)

RECOMMENDATIONS:

On the basis of the low structural position and negative Drill Stem Tests of the Arbuckle Dolomite, it was recommended by all parties involved to plug and abandon the Letsch "B" #12 at the Rotary Total Depth 3330 (-1553).

Respectively submitted,


James C. Musgrove
Petroleum Geologist