

36-32-33W



PAUL F. GODOWIC

CONSULTING GEOLOGIST

MEMBER AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

5500 MEADOWGREEN DRIVE — AMARILLO, TEXAS 79110 — BUS. (806)353-2021 — RES. (806)355-0165

May 13, 1994

Geological Well Report

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Murfin Drilling Company, Inc.
Oxy-LB No. 1-36
100' E & 60' S of N/W SW,
Section 36-T32S-R33W,
Seward County, Kansas

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API 15-175-21395

KCC

Elevations:

2703' KB (Datum Used)
2701' DF
2695' GL

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Contractor:

Murfin Drilling Company, Inc., Rig-21

Spud Date:

April 18, 1994

Drilling Completed:

May 8, 1994

Total Drilling Time:

21 Days

Total Depth:

5982' (Driller)
5986' (Electrical Survey)

Hole Size:

12 1/4" to 1535'
7 7/8" to T.D.

Casing:

20" Conductor at 40'
8 5/8" set at 1535'

Gas Detector:

Earth Tech of Hooker, Oklahoma, un-
maned unit from 3000' to TD.

Electric Logs:

Schlumberger, Liberal, Kansas,
Casey Chadwick, Engineer, Phasor In-
duction Log from 5980' to 1536' with
Gamma Ray from TD to 100' (also detailed
from from 5980' to 1536'), a Compensated
Neutron Lithodensity from 5983' to 2500',
a Microlog from 5957' to 2500', and a
Borehole Compensated Sonic log from 5950'
to 1538'

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Murfin Drilling Company, Inc.
Suite 300
250 North Water Street
Wichita, Kansas 67202

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Gentlemen:

I have witnessed the drilling and examined samples on the Oxy-LB No. 1-36 from 3000' to a total depth of 5982' in Spergen (Mississippian) rocks. A sample log with lithological descriptions, two foot drilling time, gas detector readings and other pertinent data was plotted on a 5"=100' scale from 3000' to T.D.

Samples on this test are being sent to the Kansas Geological Society Sample Library, 4150 Monroe Street, Wichita, Kansas 67209.

Geological tops corrected to the electrical survey and correlated with the Anadarko Petroleum Corporation - Frazier "B" No. 1 (4620' FS&EL of Section 1-T33S-R33W, Seward County, Kansas) a 7310' Arbuckle test about 1/2 mile south are as follows:

Formation	Murfin/Canyon No. 1-36 Oxy-LB	Anadarko Frazier "B" No. 1
Elevation-Datum	2703 KB	2738 GL
Base of Stone Corral	1538 +1165	1541 +1197
Wellington	2056 +647	2109 +629
Wolfcamp	2460 +243	2513 +225
Krider	2537 +166	2592 +146
Winfield	2587 +116	2643 +95
Council Grove Mark	3154 -451	3206 -468
Base of Heebner	4060 -1357	4106 -1368
Toronto	4070 -1365	4114 -1376
Lansing	4185 -1480	4229 -1491
Iola	4460 -1757	4508 -1770
Swope	4636 -1933	4697 -1959
Hertha	4717 -2014	4764 -2026
Marmaton	4816 -2113	4866 -2128
Cherokee	4984 -2281	5025 -2287
Atoka	5184 -2481	5232 -2494
Morrow	5346 -2643	5394 -2656
Chester	5460 -2757	5554 -2816
Ste. Genevieve	5659 -2956	5658 -2920
St. Louis	5716 -3013	5766 -3028
Spergen	5862 -3159	5911 -3173
Arbuckle	NDE	7253 -4515
T.D. - E.S.	5986 -3283	7296 -4558
T.D. - Driller	5982 -3279	7310 -4572

Zones of interest are discussed below:

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Council Grove Mark (3154) Samples indicate a buff to very light gray finely crystalline to chalky to very finely sucrosic oolitic limestone at 3151'. Some intra oolitic and fine size vuggy porosity was noted, but no sample shows were present. A 46 unit gas detector reading (background was about 13 units) was recorded from 3151 to 3156'. This gas show lasted about four minutes. A four foot drilling break of one min/ft took place at 3151 (the rate above was 2 min/ft). A similar break with no shows took place from 3161 to 3168'. DST No. 1 covering both of these breaks yielded 15' of slightly oil & gas cut watery mud and 1445' of salt water. This is a significant show, but it does not warrant further testing. The oil & gas probably came from the 3151 - 3155' zone.

Lansing (4185) Samples were poor over this limestone formation. About 100 barrels of mud was lost near 4156 and a hole in the drill pipe forced a trip at 4188'. A very strong 229 unit trip gas (background was 25 units) was recorded at 4185'. DST No. 2 over this questionable zone from 4177-4220 yielded only five feet of drilling mud with no show of gas, oil or water. This test was conclusive.

Swope (4636) This formation is a buff to tan finely crystalline to very finely sucrosic oolitic limestone. Sample quality was poor over this section. No shows were seen although a trace was noted above the main porosity. A 192 unit gas detector reading (with a 15 unit background) was recorded from a carbonaceous shale at 4635' and a strong 237 unit reading that lasted ten minutes was plotted from 4650 to about 4646'. A modest ten foot drilling break of about 2 to 2 1/2 min/ft (compared to 4 min/ft above) took place at 4650'. Samples were circulated at 4677'. DST No. 3 over this show had gas to surface in three minutes and oil to surface in nine minutes. This zone looks very good and deserves further testing.

Hertha (4717) This formation is a buff, finely crystalline to very finely sucrosic oolitic limestone. Sample quality was poor and no shows were seen. A 340 unit gas detector reading (background was 200 units) was recorded at 4706' and a 425 unit reading that persisted for 15 minutes was plotted from 4718 to 4728'. The drilling rate was about 2 1/2 min/ft (compared to 7 min/ft above) at 4706, but a good 16' break of one min/ft or less took place at 4718'. Samples were circulated at 4711 and again at 4730'. DST No. 4 over this section had oil & mud to surface 58 minutes in the final flow period. Some water was recovered, but this formation deserves further evaluation thru casing.

Marmaton (4816) Samples indicate a buff to brown, finely crystalline to very finely sucrosic, oolitic limestone at 4843'. No sample shows were seen. A 760 unit gas reading (background was 550 units) was plotted from 4742 to 4750'. A good seven foot drilling break of one min/ft (compared to 4 1/2 min/ft above) took place at 4843' and samples were circulated at 4855'. DST No. 5 over this show had 3346' of gas in the pipe, but also had almost 600' of water. This was an important show that may point to additional prospects in the area, but no further testing is needed.

Morrow (5346) No developed Morrow sands were present. This section was included in DST No. 6 that also covered the Chester.

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Chester (5460) Samples indicate a four foot gray to light gray, finely crystalline, oolitic and fossiliferous limestone at 5548'. No porosity or sample shows were seen. A 224 unit gas show (background was 110 units) was recorded. A four foot drilling break of 2 1/2 min/ft (compared to 3 1/2 min/ft above) was plotted at 5544'.

A similar limestone at 5560' had a strong 503 unit gas show. Some oolitic limestone with a show was noted here, but was not believed to be in place. Two feet at 5560 were drilled at 2 min/ft (compared to almost 4 min/ft above). Samples were circulated at 5643' and DST No. 6 covering these shows had gas to surface in 28 minutes, but the flow decreased from 19.5 mcf/d to too small to measure. The low formation pressures indicate this may be a depleted formation and no further testing could be recommended.

St. Louis (5716) Samples indicate some asphaltic residue at 5744' that gave a fair cut. A 160 unit gas reading (background was about 83 units) that lasted 15 minutes was plotted from 5744 to 5748'.

A questionable sample show was logged at 5760'. A 152 unit gas reading was noted from 5759 to 5766'. There was a poor six foot drilling break of about 3 min/ft (compared to 5 min/ft above) at 5759' and samples were circulated at 5766'.

Another trace of a light colored limestone with good secondary crystals that had asphaltic residue was logged at 5788'. This was not accompanied by any gas increase and may not be in place.

DST No. 7 covering the St. Louis yielded 3138' of gas in the pipe and a total of 210' of gas and oil cut mud. No water was recovered. This is a questionable formation, but may be checked before the more promising zones are tested thru casing.

Spergen (5862) Samples indicate a gray to light brown, finely sucrosic dolomite with fine vuggy porosity at 5890'. Some light stain, yellow fluorescence and fair cut were noted. A 250 unit gas reading (background was about 118 units) was recorded for about eight minutes. A good drilling break of one min/ft took place from 5890 to 5897'. Samples were circulated at 5900'. DST No. 8 over this zone had 110' of gas in pipe and 10' of slightly water cut mud. This zone does not have good effective porosity and does not warrant further testing, but should be closely checked in future drilling.

A second similar dolomite from 5906 to 5911 had a sample show and a 208 unit gas reading (background was 150 units) from a five foot drilling break at 5906. Samples were circulated at 5921' but it was decided to drill ahead. Another drilling break of about 2 min/ft took place from 5940 to 5950' and samples were circulated at 5952'. A similar sample show was noted, but no appreciable gas increase was plotted. DST No. 9 over these shows yielded 217' of gas in the pipe, but also had over 2500' of salt water. This test indicated the formation has good porosity, but it does not warrant further testing.

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Summary and Conclusions

The Swope Limestone (4636) and the Hertha Limestone (4717) look very promising and should be thoroughly tested thru casing. The St. Louis (5716) also deserves testing. All the oil & gas shows encountered in this test, from the Council Grove (3154) thru the Spergen (5862) should encourage further drilling in the area.



Paul F. Godowic

DRILL STEM TEST FIELD RESULTS

DST No. 1, 3148-3183', Council Grove, 35' of anchor, 30 minute initial flow period opened with a weak blow steadily increasing to strong (off bottom of bucket in two minutes), No gas at surface, 60 minute initial shut in period, 60 minute final flow period opened with a weak blow steadily increasing to strong (off bottom of bucket in five minutes) no gas at surface, 90 minute final shut in period, Recovered 15' of slightly oil & gas cut watery mud with H₂S odor (2% gas, trace of oil, 52% water, & 45% mud), and 1445' of salt water with an H₂S odor (100% water).

IHP 1524, 30" IFP 163-481, 60" ISIP 817, 60" FFP 585-740, 90" FSIP 830, FHP 1448, BHT 100° F

Sample chamber recovery was 4000 cc of water at zero pressure. No oil, gas or mud present. Chamber capacity is 4000 cc.

Top Rw	was	0.313	ohms	at	59°	F	with	chlorides	of	30,000	ppm
Middle		0.170	"		59		"			100,000	"
Bottom		0.170	"		59		"			100,000	"
Sampler		0.170	"		59		"			100,000	"
Pit										2,250	"

Trilobite Testing Company, Satanta, Kansas, Robert Collins, engineer, April 22 & 23, 1994. This was a good test mechanically.

DST No. 2, 4177-4220', Lansing, 43' of anchor, 30 minute initial flow period opened with a very weak blow (1/4" in water thru out), 45 minute initial shut in period, 30 minute final flow period opened with no blow, 45 minute final shut in period, recovered five feet of mud with no shows.

IHP 2012, 30" IFP 30-30, 45" ISIP 1077, 30" FFP 30-30, 45" FSIP 1047, FHP 1047, BHT 105° F

Sample chamber recovery was 4000 cc of mud at zero pressure. No oil, gas or water present. Chamber capacity is 4000 cc.

Trilobite Testing Company, Satanta, Kansas, Robert Collins, engineer, April 26, 1994. This was a good test mechanically.

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DST No. 3, 4628-4677, Swope Limestone, 49' of anchor, 30 minute initial flow period opened with a strong blow (off bottom of bucket in 15 seconds) gas to surface in three minutes and gauged 1,036 mcf/d thru a 1 1/2" choke, then oil to surface in seven minutes in a very gassy spray, 60 minute initial shut in period, 60 minute final flow period had oil to surface in five minutes, 180 minute final shut in period, shut down over night, reversed out 4600' total fluid (4510' of oil & gas & 90' of 100% water)

IHP 2219, 30" IFP 1152-1152, 60" ISIP 1309, 60" FFP 1096-1051, 180" FSIP 1230, FHP 2185, BHT 119°F

Sampler chamber recovery was 1.3 cu ft of gas and 3400 cc of oil at a pressure of 800 psi. No water or mud present. Chamber capacity is 4000 cc.

Rw was 0.12 ohms at 70°F with chlorides of 70,000 ppm
Pit 1.5 " 95 " 3,000 "

Recovery oil had a 44° gravity (corrected to 60°)
Sampler " 46 " "

Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, April 27 & 28, 1994. This was a good test mechanically.

DST No. 4, 4702-4730', Hertha Limestone, 28' of anchor, 30 minute initial flow period opened with a strong blow (off bottom of bucket in 15 seconds), gas to surface in nine minutes and a fog of oil in 12 minutes (This oil may have been in surface connections from DST No. 3) Gas gauged as follows thru a 1/2" choke:

78.1 mcf	5 minutes
90.1	10
90.1 "	15 "
94.5	20
94.5 "	25 "
101.0	30

60 minute initial shut in period, 60 minute final flow period gauged as follows thru a 1/2" choke:

16.5 mcf	5 minutes
33.9	10
78.1 "	15 "
90.1	20
94.5	25
94.5 "RELEASED	30 "
97.8	35
97.8 "OCT 26 1995	40
105.0 "	45 "
116.0	50
129.0	55
129.0	58

oil and mud surfaced in 58 minutes, 120 minute final shut in period, the total recovery of 4674' was reversed out:

4554' of oil & gas
60' of oil & mud cut water (10% oil, 60% water & 30% mud)
60' of salt water (100% water)

IHP 2219, 30" IFP 201-381, 60" ISIP 1432, 60" FFP 459-783, 120" FSIP 1432, FHP 2162, BHT 120°F

Sample chamber recovery was 2.07 cu ft of gas, 2900 cc of oil and 850 cc of water at a pressure of 725 psi. No mud present. Chamber capacity is 4000 cc.

Recovery Rw is	0.15	ohms	at	63°F	with	chlorides	of	65,000	ppm
Sampler	"	0.15	"	63	"	"	"	65,000	"
Pit	"	0.75	"	90	"	"	"	600	"

Oil gravity was 45° corrected to 60°

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Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, April 29, 1994. There was some trouble reversing out the recovery, but otherwise this was a good test mechanically.

DST No. 5, 4840-4855', Marmaton Limestone, 15' of anchor, 20 minute initial flow period opened with a strong blow (off bottom of bucket in 15 seconds) and remained strong but no gas at surface, 40 minute initial shut in period, 40 minute final flow had a strong blow (off bottom of bucket in five minutes), blow was decreasing at end, no gas at surface, 80 minute final shut in period, recovered 3346' of gas in pipe and 630' of total fluid: 45' of gas & water cut mud (5% gas, 25% water & 70% mud) and 585' of gas cut salt water (1% gas & 99% water)

IHP 2290, 20" IFP 56-89, 40" ISIP 224, 40" FFP 168-224, 80" FSIP 336, FHP 2219, BHT 123°F

Sample chamber recovery was 0.92 cu ft of gas & 3800 cc of water at a pressure of 120 psi. No oil or mud present. Chamber capacity is 4000 cc.

Middle Rw was	0.17	ohms	at	70°F	with	chlorides	of	42,000	ppm
Bottom	"	0.10	"	80	"	"	"	71,000	"
Sampler	"	0.10	"	70	"	"	"	72,000	"
Pit	"				"	"	"	4,500	"

Trilobite Testing Company, Scott City Kansas, Mark herskowitz, engineer, April 30, 1994. This was a good test mechanically.

DST No. 6, 5337-5643', Morrow & Chester, 306' of anchor, 30 minute initial flow period opened with a strong blow (off bottom of bucket in two minutes) gas to surface in 28 minutes and guaged 19.5 mcf/d thru a 1/4" choke in 30 minutes, 60 minute initial shut in period, 60 minute final flow period opened with a weak blow steadily increasing to strong (off bottom of bucket in eight minutes), then blow was decreasing, 120 minute final shut in period, recovered 5130' of gas in pipe and 180' of fluid: all gas cut mud (1% gas & 99% mud), no oil or water present.

IHP 2649, 30" IFP 145-112, 60"ISIP 134, 60" FFP 123-112, 120" FSIP 145, FHP 2614, BHT 124°F

Sample chamber recovery was 0.75 cu ft of gas & 3800 cc of mud at a pressure of 25 psi. No oil or water present. Chamber capacity is 4000 cc

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Top recovery	Rw was	1.50 ohms	at	70°F	with chlorides of	3,800 ppm	
Middle	"	1.49	"	71	"	3,800	"
Bottom	"	1.50	"	68	"	3,800	"
Sampler	"	1.50	"	70	"	3,800	"
Pit	"	1.20	"	98	"	3,500	"

Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, May 4, 1994. This was a good test mechanically.

DST No. 7, 5690-5880', St. Louis Limestone, 190' of anchor, 30 minute initial flow period opened with a weak blow steadily increasing to strong (off bottom of bucket in 13 minutes) no gas at surface, 60 minute initial shut in period, 60 minute final flow period opened with a strong blow (off bottom of bucket in one minute) no gas at surface, 120 minute final shut in period, recovered 3138' of gas in pipe and 210' of total fluid: 60' of gas cut mud (3% gas & 97% mud), 60' of gas & oil cut mud (10% gas, 2% oil & 88% mud) and 90' of gas & oil cutmud (8% gas, 4% oil and 88% mud), no water present.

IHP 2782, 30" IFP 55-66, 60" ISIP 1678, 60" FFP 88-111, 120" FSIP failed (1008 reported), FHP 2748, BHT 128°F

Sample chamber recovery was 0.90 cu ft of gas, 1800 cc of oil & 1800 cc of mud at a pressure of 300 psi. No water present. Chamber capacity is 4000 cc.

Top Rw was	1.20 ohms	at	73°F	with chlorides of	4,800 ppm
Sampler	1.20	"	73	"	4,800
Pit	1.00	"	93	"	4,500

Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, May 6, 1994. Except for the final shut in pressure, this was a good test mechanically.

DST No. 8, 5888-5900', Spergen, 12' of anchor, 30 minute initial flow period opened with a very weak blow slowly increasing (1 1/4" in water at end), 45 minute initial shut in period, 30 minute final flow period opened with no blow for 12 minutes then a very weak blow (1/4" in water at end), 45 minute final shut in period, recovered 110' of gas in pipe and 10' of slightly watery mud: (5% water & 95% mud), no oil present.

IHP 2864, 30" IFP 22-33, 45" ISIP 1309, 30" FFP 44-56, 45" FSIP 1152, FHP 2830, BHT 131°F

Sample chamber recovery was 0.10 cu ft of gas, 1560 cc of mud and 2340 cc of water at a pressure of 300 psi. No oil present. Chamber capacity is 4000 cc.

Recovery	Rw was	0.40 ohms	at	65°F	with chlorides of	18,000 ppm
Sampler	"	0.40	"	65	"	18,000
Pit	"	0.68	"	93	"	6,750

Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, May 7, 1994. This was a good test mechanically.

DST No. 9, 5904-5952', Spergen, 48' of anchor, 30 minute initial flow period opened with a strong blow (off bottom of bucket in 1 1/2 minutes) no gas at surface, 60 minute initial shut in period, 60 minute final flow period opened with a strong blow (off bottom of bucket in two minutes) no gas at surface, 120 minute final shut in period, recovered 217' of gas in pipe & 2731' of total fluid: 210' of gas & water cut mud with a trace of oil (1% gas, trace of oil, 25% water & 74% mud), and 2521' of gas cut water with H₂S odor (1% gas & 99% water).

IHP 2894, 30" IFP 122-658, 60" ISIP 1793, 60" FFP 726-1286, 120" FSIP 1815, FHP 2860, BHT 158°

Sample chamber recovery was 0.01 cu ft of gas and 4000 cc of water at a pressure of 25 psi. No oil or mud present. Chamber capacity is 4000 cc.

Top recovery Rw was 0.10 ohms at 70°F with chlorides of 70,000 ppm
 Middle " 0.09 " 73 " 83,000 "
 Bottom " 0.09 " 71 " 83,000 "
 Sampler " 0.08 " 77 " 91,000 "
 Pit " 0.70 " 93 " 6,250 "

Trilobite Testing Company, Scott City, Kansas, Mark Herskowitz, engineer, May 8, 1994. This was a good test mechanically.

BIT RECORD

Bit No.	Size	Make	Type	Depth Out	Feet	Hours
1.	12 1/4"	Smith	MIS	1535'	1495'	19 3/4
2.	7 7/8"	HTC	ATJ05C	3183'	1648'	38 3/4
3.	"	"	ATJ22S	5643'	2460'	146 1/2
4.	"	"	ATJ22	5982'	339'	23 1/2

DEVIATIONS

166'	1/2°	1194'	3/4°	4220'	1/4°
346	1/4	1351	3/4	4677	1/2
461	1/8	1535	1	4855	MR
604	1/4	2161	1	5643	1
821	1/2	2948	1	5880	1
1008	1/8	3183	1/4	5982	

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