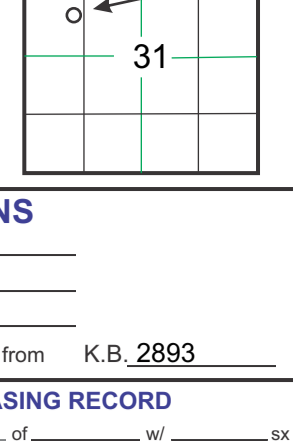


GEOLOGICAL REPORT

Larry A. Nicholson

NAD 83
38.970838
-100.699721

COMPANY Murfin Drilling Company, Inc.		ELEVATIONS	
API # 15-063-22239	FIELD <u>Gaeland West</u>	K.B. 2893	
LEASE <u>Abell Ranch 'B'</u>	WELL # <u>#3-31</u>	D.F.	
LOCATION <u>E2 NE SW NW</u>		G.L. 2881	
SURVEY <u>1650 FNL 1160 FWL</u>		All measurements from K.B. 2893	
SECTION <u>31</u>	TWP <u>12S</u>		
COUNTY <u>Gove</u>	STATE <u>Kansas</u>		
CONTRACTOR <u>Murfin Drilling Company, Inc. Rig # 21.</u>			
SPUD <u>5:30 pm 12-29-14</u>	COMP. _____		
RTD <u>4:30 8:10 pm 01/08/2015</u>	LTD <u>4631</u>		
MUD UP AT _____			
MUD TYPE <u>Chemical, Morgan Mud</u>			
SAMPLING SAVED FROM 3600 TO _____		CASING RECORD	
DRILLING TIME FROM 3600 TO _____ RTD		Conductor _____ of _____ wf _____ sx	
SAMPLER EXAMINED FROM 3600 TO _____ RTD		Surface 221' of 8 5/8 23# wf 170 _____ sx	
GEOLOGICAL SUPERVISION FROM 3600 TO _____ RTD		Production _____ of _____ wf _____ sx	
WELL SITE GEOLOGIST <u>LARRY A. NICHOLSON</u>			



ELECTRICAL SURVEYS Pioneer, Den, Neu, Dual, Micro, Sonic

FORMATION TOPS & STRUCTURAL POSITION

FORMATION	SAMPLE TOPS	SUBSEA DATUM	ELEC LOGS		SUBSEA		REFERENCE WELL	
			TOPS	DATUM	A	B	A	B
Anhydrite	2380	+513	2380	+513	2395	+512	+1	
Bl/Anhydrite	2406	+487	2406	+487	2421	+486	+1	
Topeka	3692	-799	3692	-799	3703	-796	-3	
Heebner Sh	3910	-1017	3910	-1017	3923	-1016	-1	
Lansing	3954	-1061	3954	-1061	3964	-1057	-4	
Stark Sh	4176	-1283	4176	-1283	4188	-1281	-2	
Pawnee	4366	-1473	4366	-1473	4386	-1479	+6	
Fort Scott Ls	4423	-1530	4423	-1530	4444	-1537	+7	
Johnson Zone	4499	-1606	4499	-1606	4514	-1607	+1	
Miss	4516	-1623	4516	-1623	4531	-1624	+1	
Miss Dol	4522	-1629	4522	-1629	4546	-1639	+10	
RTD	4630	-1737			4625	-1718		
LTD			4631	-1738	4627	-1720		

A: Murfin Drilling, Abell Ranch "B" #1-3', 330' FNL 330' FWL, Sec 31 T12S R30W KB 2907'

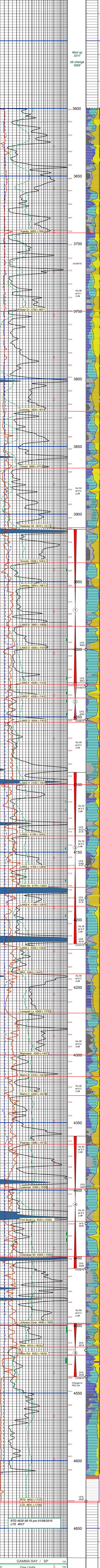
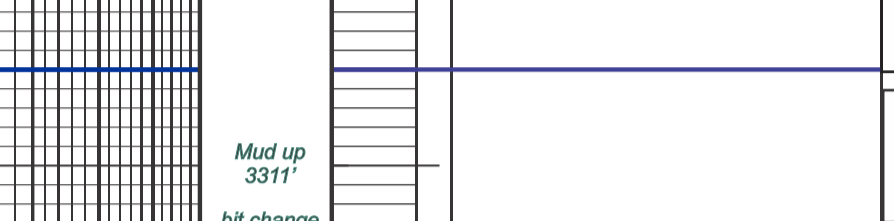
B: _____

REMARKS & RECOMMENDATIONS:
Based on sample shows and dst results csg was set.

*NOTE: ROP & DST are roughly 1' low to e log curves.
Formation tops have been corrected to Log tops

LAN 7892, Modified 5/05, 11/11, 4/12 Hanover, KS 66945 1inch = 25.4mm 8.5 x 97.5 216 mm x 2460 mm

LEGEND



DEPTH	LITHOLOGY	SAMPLE DESCRIPTIONS	REMARKS
0 - 3600	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Spud 05:30 PM, 12-29-2014 RTD 08:10 PM 01-09-2014
3600 - 3700	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	"BIT RECORD" Surface Bit - VM-1, 12-1/4, #5216957 out at 222' Bit No. 2, PDC, M1-616, 7-7/8" #JF4635 in at 222' out at 3596' Bit No. 3, OX22, 7-7/8", #5251062, in at 3596' - out at 4538' Bit No. 4, PDC, M1-616, 7-7/8", #JG6646, in at 4538' - out at 4630'
3700 - 3800	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	"VERTICAL SURVEYS" 1/2" @ 222' 1" @ 4458' 1/2" @ 1026' 1" @ 4530' 1/2" @ 1819' 1/2" @ 2517'
3800 - 3900	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	"PUMP DATA" Emco DB-550 Stroke 16", Liner 6" National K380 Stroke 14", Liner 6"
3900 - 4000	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	"DAILY REPORT" 12-29-2014 - 5:30 AM Spud Drig to 12 1/4" to 222' Set 8-5/8" 5 Jts 23# set @ 221' 170 sx A Comm 3% C.C. Allied circ 10 bbls to pits Plug down 11:30 AM 01-30-14 Drig plug 11:00 AM 12-02-15
4000 - 4100	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	01-03-2015 - 7:00 AM Drig @ 2803' 01-04-2015 - 7:00 AM Drig @ 3,714' 01-05-2015 - 7:00 AM Dst #1 @ 4,027' 01-06-2015 - 7:00 AM CFS @ 4,052' 01-07-2015 - 7:00 AM DST @ 4,218' 01-08-2015 - 7:00 AM CFS @ 4,458' 01-09-2015 - 7:00 AM TOH Dst @ 4,538' 01-09-2015 - 8:10 AM RTD @ 4,630' 01-10-2014 - 12:30 PM Pioneer Truck 108 Hays LTD @ 4,631'
4100 - 4200	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 4 at 3,893' vis: 54 wt: 9.1 Chlor: 2,700 LCM: 2.0# Ph: 11.5 WL: 5.2
4200 - 4300	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	DST (1) 3911-4027 Toronto - Lans D 30-60-60-90 IF: 1 inch blow IS: No return FF: 3 in blow FS: No return Total Rec: 240' 90' SOCM 15% 99% 160' GP FP: 24-75 FFP: 81-135 SIP: 1030 FSP: 106 HP: 1924 FHP: 1921 Temp 115 F BHT
4300 - 4400	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 5 at 4,027' vis: 54 wt: 9.1 Chlor: 2,900 LCM: 4.0# Ph: 11.0 WL: 6.0
4400 - 4500	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	DST (2) 4025-4052 Lans E & F 30-60-60-90 IF: 8 in blow IS: No return FF: 3 in blow FS: No return Total Rec: 159' 90' SOCM 15% 99% 69' SOCM 25% 99% FP: 15-33 FFP: 38-73 SIP: 1210 FSP: 1199 HP: 2002 FHP: 1992 Temp 116 F BHT Grav 40 F
4500 - 4600	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 6 at 4,089' vis: 55 wt: 9.2 Chlor: 2,500 LCM: 4.0# Ph: 11.0 WL: 5.6
4600 - 4700	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	DST (3) 4091-4218 Lan H-K 30-60-60-90 IF: 2 in blow IS: No return FF: 3 in blow FS: No return Total Rec: 80' 90' SOCM 15% 99% 160' GP FP: 20-37 FFP: 40-56 SIP: 991 FSP: 1006 HP: 2082 FHP: 2022 Temp 117 F BHT
4700 - 4800	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 6 at 4,218' vis: 74 wt: 9.2 Chlor: 3,000 LCM: 4.0# Ph: 10.5 WL: 6.0
4800 - 4900	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	DST (4) 4360-4458 Pawnee-Ft Scott 30-60-60-90 IF: 2 1/2 in blow IS: No return FF: 3 in blow FS: No return Total Rec: 270' 90' SOCM 15% 99% 180' SOCM 15% 99% FP: 20-83 FFP: 81-144 SIP: 1071 FSP: 1046 HP: 2009 FHP: 2202 Temp 125 F BHT
4900 - 5000	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 8 at 4,458' vis: 55 wt: 9.3 Chlor: 2,200 LCM: 3.0# Ph: 10.5 WL: 6.0
5000 - 5100	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Strap 447275 Diff 1.13
5100 - 5200	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	DST (5) 4498-4538 Johnson-Miss Dol 30-60-60-90 IF: Built to 7" blow IS: no blow FF: BGS in 40 min FS: no blow Total Rec: 248' 62" 124 GO 40% 89% 62 OSM 10% 99% 62 OSM 50% 99% FP: 21-73 FFP: 79-131 SIP: 1083 FSP: 1023 HP: 2304 FHP: 2242 Temp 128 F BHT
5200 - 5300	Sh, md gry - blk	Ls. tan, vfn xln, fossilif, dns, ool granular ip, n stn, n odor, n sho	Mud Check 9 at 4,538' vis: 89 wt: 9.4 Chlor: 2,700 LCM: 3.0# Ph: 10.0 WL: 6.4

COMPANY Murfin Drilling Company, Inc.		ELEVATIONS	
LEASE <u>Abell Ranch 'B' #3-31</u>	E2 NE SW NW	K.B. 2893	
LOCATION <u>1650 FNL 1160 FWL</u>		D.F.	
SECTION <u>31</u>	TWP <u>12S</u>	G.L. 2881	
COUNTY <u>Gove</u>	STATE <u>Ks</u>	All measurements from K.B. 2893	

