

# Jeff Christian

## PETROLEUM GEOLOGIST

Wichita, Kansas

### GEOLOGISTS' REPORT

DRILLING TIME AND SAMPLE LOG

OPERATOR **MURFIN DRILLING COMPANY**  
 LEASE **SCHWAB A #2-5**  
 LOCATION **550' FSI & 2310' FWL**

SEC. **5** TWP. **2 S** R. **26 W**  
 COUNTY **DECATUR** STATE **KANSAS**  
 FIELD **LESTER SOUTH**  
 API **15-039-21157**

CONTRACTOR **COMPANY TOOLS** RIG NO. **8**  
 DRILLING STARTED **8/17/2012** COMPLETED **8/23/2012**  
 MUD DISGAGED **2958** MUD TYPE **CHEMICAL**  
 DRILLING TIME (LEFT FROM) **3000'** TO **RTD**  
 SAMPLES SAVED FROM **3000'** TO **RTD**  
 SAMPLES EXAMINED FROM **3000'** TO **RTD**  
 GEOLOGICAL SUPERVISION FROM **3200'** TO **RTD**

FORMATION NAME LOG TOP DATE TIME TOP DATE TIME SAMPLE

ANHYDRITE 2040' (-554) 2039' (-555)  
 ANHYDRITE 2071' (-523) 2070' (-524)  
 TOPEKA 3184' (-590) 3183' (-589)  
 HEBNER 3380' (-756) 3346' (-782)  
 TOLONTO 3379' (-785) 3376' (-782)  
 LANSGING 3388' (-794) 3387' (-793)  
 STARK 3546' (-952) 3546' (-952)  
 BKC 3592' (-998) 3591' (-997)

ELEVATIONS  
 BK 2594'  
 GL 2589'

MEASUREMENTS FROM KB  
 CASING RECORD  
 CONDUCTOR NONE  
 SURFACE 8.9' @ 262'  
 W/ 210 SX @ 262'  
 W/ 190 SX @ 267.5'  
 PRODUCTION 1 1/2" @ 267.5'

ELECTRICAL SUPPLIES  
 LOG TECH INC.  
 DIL  
 CML/DCL  
 MEL  
 BHCs

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DATE	7:00 AM DEPTH	REMARKS
8/17/12	MIRT	SPUD 4:30 pm
8/18/12	330'	DRLG dev. 1/2 deg. @ 262'
8/19/12	1760'	DRLG
8/20/12	2970'	DRLG
8/21/12	3399'	OB w/ DST #1 dev. 1/2 deg. @ 3399'
8/22/12	3495'	DRLG
8/23/12	3690'	TOH for LOG RTD 3690' @ 4:30 am dev. 1/4 deg. @ 3690'

**Remarks**

5 1/2" production casing set to further test the Lansing / KC formation.

Electric log measurements correlate about 1' deep compared to rotary measurements. Sample tops adjusted to the electric log.

Samples deposited at the Kansas Geological Survey.

Respectfully Submitted,  
*Jeff Christian*  
 Jeff Christian

LITH	DRILL TIME (MIN-FT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		2050		ANHYDRITE 2039' (-555) E Log 2040' (-554)
				Base ANHYDRITE 2070' (-524) E Log 2071' (-523)
		3100	Ls: crm-lt gry-gr, fn xln, dns, foss in part, pr vis por, ns w/ Sh: gry-drk gry	
		3100	Ls: lt gry, some crm-lt brn, yell stnd in part, fn xln, dns, foss, pr vis por, ns w/ Sh: red & siltst: prpl/red-lt gry	
		3100	Ls: lt gry-gr, some crm, fn xln, sli gmlr, part dns, vy foss, pr vis por, ns	
		3100	Ls: crm-lt gry, fn xln, sli gmlr, part dns, sli foss, sct pp-vug por, ns, fr amnt wt chlk	
		3100	Sh: red, gummy	
		3150	Ls: crm-lt gry, fn xln, chiky, foss-ool in part, pr-fr intrpart-vug por, 2-3 pcs/tray w/ sptd brn stn, nsfo, no odor	
		3150	Ls: crm-lt gry, fn xln, gmlr, subchiky, foss, pr-fr pp-vug por, ns	
		3150	Sh: red, gummy	
		3200	Ls: wt-crm-lt gry, fn xln, vy foss-ool, gluc in part, pr-fr intrpart-vug por, 1 pc w/ sli stn, nsfo (from above?)	
		3200	Ls: wt-crm-lt gry, fn xln, part dns, chiky, foss-ool w/ red sh strks	
		3200	Sh: red-brn, gummy	TOPEKA 3183' (-589) E Log 3184' (-590)
		3200	Sh: as above w/ Ls: crm-lt gry, fn xln, dns, sli foss-ool in part, pr vis por, ns	
		3250	Ls: crm-lt brn-lt gry, fn xln, part dns, vy ool-foss in part, pr-fr intrpart-vug por, ns w/ sct wt chlk	
		3250	Some	
		3250	Ls: crm-lt gry, fn xln, dns, foss-ool in part, pr vis por, ns	
		3250	Ls: crm-lt gry, fn xln, sli gmlr, subchiky, foss, pr intrxln-vug por, ns	
		3250	Ls: crm-lt gry-gr, fn xln, dns, sli foss, pr vis por, ns fr amnt Sh: blk, carb (3300' smp)	
		3250	Sh: red-brn-grn, sndy-silty in part	
		3300	Ls: lt brn-lt gry, fn xln, dns, foss-mott, sandy in part, no vis por, ns	
		3300	Sh: red-brn, some gry & grn	
		3300	Ls: crm-lt gry, fn xln, part dns, foss-ool, pr intrpart por, ns	Morgan Mud @ 3324': 8/20/12 Wt: 8.9, Vis: 58, WL: 6.4, Chl: 3,500, LCM: 5
		3350	Ls: lt gry, fn xln, ool, pr-fr introol-vug por, sli-fr sfo, sli odor, brn-drk brn sptd-sat stn	Pipe Strap @ 3399': 71' long to board
		3350	Ls: as above w/ incns Ls: wt-crm, fn xln, sli gmlr, chiky, sli foss, pr-trc fr pp-vug por, ns	
		3350	vy sct Sh: blk, carb	HEEBNER 3349' (-755) E Log 3350' (-756)
		3350	Sh: gry-grn, some red & brn	Morgan Mud @ 3399': 8/21/12 Wt: 9.0, Vis: 48, WL: 6.0, Chl: 2,000, LCM: 4
		3350	Sh: red-brn-gry-grn	
		3400	Ls: crm, fn xln, subchiky, ool in part, pr trc fr pp-vug introol por, sli-fr sfo, frnt odor, brn-drk brn sptd-sat stn	TORONTO 3378' (-784) E Log 3379' (-785)
		3400	Ls: crm-lt gry, fn xln, ool-oolmid, fr oolmid-some vug por, gsfo, frnt odor, brn-drk brn sptd-sat stn, some barren oolmid por	LANSING 3387' (-793) E Log 3388' (-794)
		3400	Ls: crm-lt gry, fn xln, dns, subchiky w/ chrt: gry-brn, pr vis por, ns	DST #1 3321' to 3399' (Oread - Lns 'A') 30"-60"-90" IF: BOB/ 12" ISI: No Return FF: BOB/20" FSI: Surface Blow RECOVERY: 511' total fluid 10' Clean Oil 315' OCWA (20%O, 30%W, 50%M) 186' MW (90%W, 10%M) IFP: 65-159# ISIP: 812# FFP: 159-254# FHP: 790# IHP: 1576# FHP: 1548# BHT: 95 deg F CHL: 65,000 ppm (mudman)
		3400	Sh: red-brn-grn, some gry w/ Ls: lt gry-grn/gry-brn, fn xln, dns, sndy, pr vis por, blk dead stn	DST #2 3396' to 3440' (LKC 'B & D') 30"-60"-30"-60" IF: Blow Built to 3/4" ISI: No Return FF: No Blow FSI: No Return RECOVERY: 65' Mud no IFP: 19-32# ISIP: 1064# FFP: 34-49# FHP: 1040# IHP: 1680# FHP: 1619# BHT: 95 deg F
		3400	Ls: crm-lt gry, fn xln, ool in part, pr-trc fr introol-vug por, ssfo, frnt odor, brn sptd-sat stn, some blk sptd stn	
		3400	Ls: crm-lt brn, fn xln, sli foss-trc ool, vy chrt: blu-gry, pr vis por, ssfo, fr-gd odor (sli sour?), abndnt brn sat stn	
		3400	Ls: as above, sli mone foss, vy sct foss-vug por, ssfo, fr-gd odor, abndnt brn sat stn	
		3400	Sh: red-brn-grn, some siltstn: tan-lt prpl	
		3450	Sh: as above, gummy in part	
		3450	Ls: wt-lt gry, fn xln, dns, foss-ool in part, pr vis por, ns	
		3450	Ls: crm-lt gry, fn xln, dns, some strik w/ red sh, no vis por, ns	
		3450	Ls: crm-lt gry-grn/gry, fn xln, dns, chiky in part, foss-ool in part, some yell ool, pr vis por, ns	Morgan Mud @ 3505': 8/22/12 Wt: 8.9, Vis: 64, WL: 6.0, Chl: 2,000, LCM: 6
		3450	Sh: red-brn, gummy	DST #3 3475' to 3580' (LKC 'H - K') 15"-60"-15"-60" IF: BOB/ 30 sec. ISI: No Return FF: BOB/ 15 sec. FSI: No Return RECOVERY: 2350' total fluid 372' M&WCO (50%O, 30%W, 20%M) 372' SMCWCO (15%O, 60%W, 20%W, 5%M) 496' CGO (20%G, 80%O) 738' SMCW (95%W, 5%M) IFP: 245-298# ISIP: 1139# FFP: 1091-1066# FHP: 1098# IHP: 1680# FHP: 1688# BHT: 100 deg F
		3500	Ls: ool-lt brn, fn xln, part dns, sct chiky, foss-ool in part, pr vis por, nsfo, no odor, vy sctlt brn sptd-sat stn	
		3500	Ls: crm-lt brn-gry, fn xln, dns, subchiky, foss in part, no vis por, ns	
		3500	Sh: red-lt gry, vy gummy	
		3500	Same	
		3550	Ls: wt-crm-lt gry, fn xln, dns, chiky in part, vy sct pcs sli foss-ool, pr vis por, nsfo, no odor, vy sctlt brn sptd stn	STARK 3546' (-952) E Log 3546' (-952)
		3550	Sh: red-brn, gummy in part, some gry & gry	
		3550	Ls: crm-lt brn-lt gry, fn xln, vy foss-sli ool, pr-fr some gd intrpart-vug por, sli-fr sfo, fr odor, gd drk brn sat stn	
		3550	Ls: fn-med xln, foss, vy calcitic, fr-gd por, ssfo, sli odor, lt brn-subsat-sat stn	
		3550	Ls: crm-lt gry, fn xln, part dns, part chiky, some red & yell stnd, foss-mott, pr vis por, ns	BKC 3591' (-997) E Log 3592' (-998)
		3550	Sct sst: brn, some gry & grn	
		3600	Sh: red-lt gry-tan, vy fn grn, calc, fri-mushty, pr vis por, ns	
		3600	Ls: crm-lt gry, fn xln, dns, sli chiky, foss in part, pr vis por, ns	
		3600	Sh: red-brn	
		3600	Ls: crm-lt gry, fn xln, dns, sli foss, pr vis por, ns	
		3600	Sh: red-brn, gummy in part w/ Ls: fn xln, dns, sndy, pr vis por, ns	
		3600	Same	
		3650	Sh: red-brn, gummy in part	
		3650	Ls: wt-crm-lt gry, fn xln, dns, chiky in part, sndy in part, pr vis por, ns	Morgan Mud @ 3690': 8/23/12 Wt: 8.8, Vis: 65, WL: 4.8, Chl: 3,600, LCM: 4
		3650	Sh: red-brn, gummy in part	
		3650	Sh: red-brn-prpl	RTD 3690' (-1096) E Log 3683' (-1089)

