Jeff Christian
PETROLEUM GEOLOGIST
Wichita, Kansas

GEOLOGIST'S REPORT
DRILLING TIME AND SAMPLE LOG

OPERATOR: MURFIN DRILLING COMPANY
LEASE: HILGER UNIT # 1-31
LOCATION: 600' FSL & 2000' FWL
SEC. 32 TWSP 30 S RNG 3 W
COUNTY: SUMNER STATE: KANSAS
FIELD: WILDCAT
API: 15-191-22642

CONTRACTOR: MAVERICK RLG. RIG NO. 106
DRILLING STARTED: 02/13/2012 COMPLETED: 02/24/2012
MUD DISPLACED: 2683' MUD TYPE: CHEMICAL
DRILLING TIME KEPT FROM 2700' TO RTD
SAMPLES SAVED FROM 2700' TO RTD
SAMPLES EXAMINED FROM 2700' TO RTD
GEOLOGICAL SUPERVISION FROM 2993' TO RTD

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
HEEBNER	2735'	(-1329)	2735'	(-1329)
STALNAKER	3032'	(-1626)	3038'	(-1632)
KANSAS CITY	3335'	(-1929)	3332'	(-1926)
STARK	3465'	(-2059)	3463'	(-2057)
BKC	3550'	(-2144)	3550'	(-2144)
CHEROKEE	3807'	(-2401)	3802'	(-2396)
MISSISSIPPIAN	3946'	(-2540)	3948'	(-2542)
KINDERHOOK	4293'	(-2887)	4288'	(-2882)
SIMPSON SAND	4372'	(-2966)	4367'	(2961)
TOTAL DEPTH	4054'	(-3048)	4450'	(-3044)

ELEVATIONS
KB 1406'
GL 1397'
MEASUREMENTS FROM K.B.

CASING RECORD
Conductor NONE
Surface 8 5/8" @ 263' W/ 190 SX
Production 5 1/2" @ 4445' w/ 200 SX

ELECTRICAL SURVEYS:
LOG TECH, INC:
DIL
CNL/CDL
MEL
BHCS

Section 32

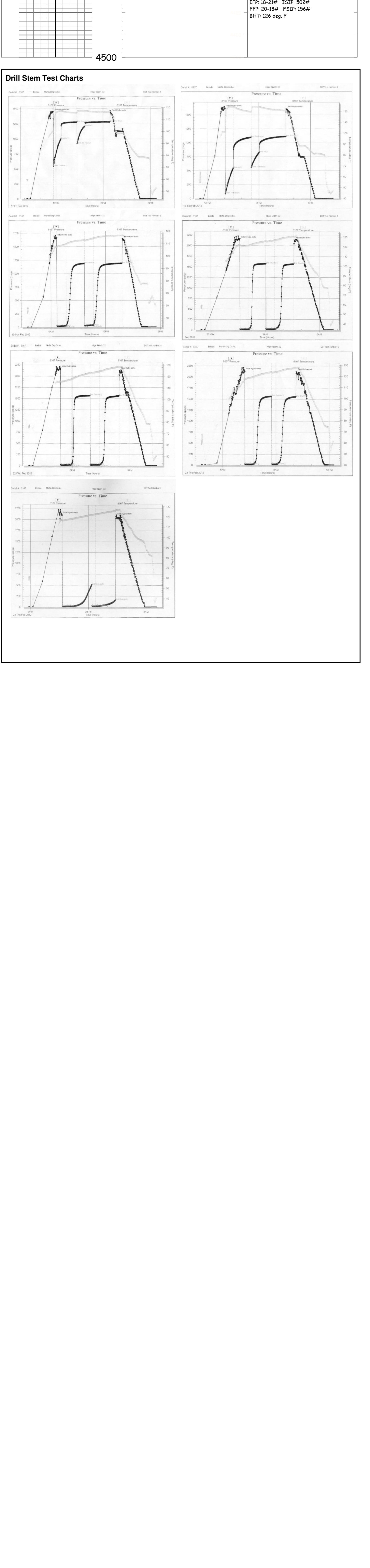
DATE	7:00 AM DEPTH	REMARKS
16/12	0'	MIRT
2/14/12	71'	SPUD 3:45 am
2/15/12	263'	WOC dev. 3/4 deg
2/16/12	1770'	DRLG.
2/17/12	3055'	TOH for DST # 1 dev. 3/4 deg
2/18/12	3356'	CFS 3356'
2/19/12	3487'	TOH for DST # 3 dev. 1 1/4 deg.
2/20/12	3715'	DRLG.
2/21/12	4195'	DRLG.
2/22/12	4370'	TIH after DST # 4 dev. 1 1/2 deg.
2/23/12	4376'	TIH for DST # 6
2/24/12	4386'	RTD 4450' @ 8:40 pm dev. 1 1/4 deg.
2/25/12	4450'	Finish Logging at 6:30 am

Remarks
5 1/2" production casing run to further test the Kansas City formation.

Electric log measuremente correlate about 2' to 4' low compared to rotary measurements.
Sample tops within this report adjusted to the electric log.

Samples deposited at the Kansas Geological Survey.

Respectfully Submitted,
Jeff Christian

DEPTH	SAMPLE DESCRIPTIONS	REMARKS
2700		Well drilled w/ PDC bit from 263' to 3055'
	Sh: blk, carb 2760' smpl	
		HEEBNER 2733' (-1327) E Log 2735' (-1329)
	inc Sh: blk, carb 2800' smpl	
2750	Ls: crm-brn-gry, fn xln, dns, foss w/ Sh: gry	
	Same	
2800	Ls: crm-brn-lt gry, fn xln, dns, sli foss in part	
		DOUGLAS 2815' (-1409) E Log 2817' (-1411)
	Sh: gry w/ sct Sst: lt gry, vy fn grain, calc, sli mica, hard-some fri, pr vis por, ns	
	Sh: gry, silty & mica w/ Sst: as above	
2850	Same	
	Sh: gry-lt gry, sli mica w/ sct Sst: lt gry, vy fn grain, sli calc, hard, mica, ns	
2900	Sh & Sst: as above	
	Same	
2950	Sh: gry, sli silty & mica, vy sct Sst: as above	
	Same	
3000	Sh: gry, slity, mica, sndy w/ trc Ls: brn-lt gry, fn xln, dns	Mud-Co @ 3055' Wt. 9.1, Vis. 50, WL. 9.2 Chl. 4,000, LCM. 0
		STALNAKER 3030' (-1624) E Log 3032' (-1626)
	Sst" clear-lt gry, fn grain, subrnd, fri, sli mica, trc glauc, nsfo-g, no odor, sli sct flur, trc gd flur w/ gd cut	DST # 1 3040' to 3055' 30"-60"-30"-60" IF: BOB/1" ISI: Blow Built to 1.5" FF: BOB/1" FSI: No Return RECOVERY: 2465' total fluid 180' MW (80%W, 20%M) 2285' Wtr (119,000 ppm) IFP: 542-995# ISIP: 1278# FFP: 919-1209# FSIP: 1283# BHT: 116 deg. F RW: .09 @ 54 deg. F
3050	Sst: as above: vy sct flur, rare pcs w/ fr flur, gd cut	Pipe Strap: .34' long to board dev. 3/4 deg.
	Sst: clear-lt gry, fn-some med grain, subrnd, fri, sli mica & glauc, ns, trc flur	
	Same	
3100	Sst: as above, some crs grain, trc flur	
	Same	
3150	Same	
	Sh: lt gry-gry, sli silty	
	Same	
3200	Sh: gry, sli silty	
	Same	
3250	Same	
	Same	
	Same	
3300	Sh: gry-drk gry	
		KANSAS CITY 3332' (-1926) E Log 3335' (-1929)
	Ls: lt brn-lt gry, fn xln, dns, sli foss	DST # 2 3334' to 3356' 30"-60"-30"-60" IF: BOB/2" ISI: Blow Built to 1" FF: BOB/2.5" FSI: No Return RECOVERY: 1625' total fluid 125' MW (63%W, 37%M) 1500' Wtr (122,000 ppm) IFP: 87-542# ISIP: 1097# FFP: 552-822# FSIP: 1113# BHT: 121 deg. F RW: .10 @ 49 deg. F
3350	Ls: lt brn, fn xln, ool-oomld, fr introol-oomld por, mostly barren, cpl pcs/tray w/ ssfo, no odor, pr flur, trc stn	Mud-Co @ 3356' Wt. 9.2, Vis. 49 WL. 9.0 Chl. 4,000, LCM. 0
	Ls: crm-lt gry, fn xln, part dns, sli foss-ool, pr-fr vug-suboomld por, ns, no odor	
	Ls: crm-lt brn-lt gry, fn xln, part dns, part chlky, foss-ool in part, pr-trc fr vug por, ns, no odor	
	Ls: as above, trc chrt, pr vis por, ns	
3400	Same	
	Ls: crm-lt brn-lt gry, fn xln, dns, sli chlky, sli foss, trc chrt, pr vug por, ns, no odor	
	Ls: crm-brn, micro-vy fn xln, dns, sli chrty, sli foss, pr isolted vug por, ns, no odor	
3450	Ls: crm-brn-lt gry, micro-vy fn xln, dns, subchlky in part, chrty, sli foss, pr vis por, ns	
		STARK 3463' (-2057) E Log 3465' (-2059)
	Sh: blk, carb	
	Sh: gry w/ Ls: brn-gry, vy fn xln, dns, foss	DST # 3 3460' to 3487' 30"-60"-30"-60" IF: BOB/14" ISI: No Return FF: BOB/12" FSI: No Return RECOVERY: 430' GIP 61' G&OCWM (20%G,18%O,20%W,42%M) IFP: 16-26# ISIP: 1187# FFP: 28-40# FSIP: 1190# BHT: 116 deg. F Chl: 23,500 ppm RW: .38 @ 52 deg. F
	Ls: lt brn, fn xln, grnlr in part, ool-sli foss-oomld, fr intrpart-oomld por, ssfo, fr odor, sct lt brn sat stn, sct gd flur	
3500	Ls: brn-lt gry, vy fn-fn xln, dns, subchlky in part, no vis por, ns	Mud-Co @ 3487' Wt. 9.2, Vis. 47 WL. 9.2 Chl. 5,000, LCM. 0
	Sh: blk, carb	
	Ls: lt brn-lt gry, fn xln, dns, subchlky in part, sli foss-ool in part, trc oomld por, ns, no odor, no flur	
	Ls: lt brn-lt gry-gry, vy fn xln, dns, subchlky, no vis por, ns	
		BKC 3548' (-2142) E Log 3550' (-2144)
3550	Ls: gry, vy fn xln, dns, some lt gry, subchlky w/ Sh: drk gry, calc	
	Ls: as above w/ Sh: drk gry-blk, trc chrt	
	Sh: gry-drk gry, calc	
3600	Same	
		MARMATON 3630' (-2224) E Log 3632' (-2226)
	Ls: lt gry-gry, vy fn xln, dns, subchlky in part, no vis por, ns	
3650	Ls: lt brn-lt gry, fn xln, dns,foss-ool in part, pr vis por, ns	
	Same	
	Same	
	Sh: gry-drk gry-some grn/gry	
3700	Sh: gry-drk gry w/ Ls: brn-lt gry, vy fn xln, dns, sli foss-ool in part, pr vis por, ns	
	Same	
		PAWNEE 3722' (-2316) E Log 3724' (-2318)
	Ls: lt brn-lt gry, vy fn-fn xln, dns, sli foss in partpr vis por, ns	
3750	Sh: blk, carb	
	Ls: crm-lt brn, fn xln, dns, ool in part, pr vis por, ns	
	Sh: blk, carb	
	Ls: lt brn-lt gry, vy fn xln, dns, sli foss, no vis por, ns	
3800	Sh: blk, carb	CHEROKEE 3805' (-2399) E Log 3807' (-2401)
	Ls: lt brn-lt gry, vy fn-fn xln, dns, sli foss, shly	
	Sh: lt gry-grn/gry, sli silty	
	Sh: gry-grn-brn w/ Ls: brn, vy fn xln,dns	
3850	Ls: lt gry-lt brn, fn xln, dns	Mud-Co @ 3855' Wt. 9.4, Vis. 47 WL. 9.6 Chl. 4,000, LCM. 0
	Sh: lt gry-gry-some grn	
	Sh: gry-brn-grn, soft	
	Sh: as above, sct red sh	
3900	Clock Stopped	
	Sh: gry-grn	
	Same	
		MISS. 3944' (-2538) E Log 3946' (-2540)
3950	Chrt: lt brn-lt gry, fresh, subtranslcnt & sct lt gry, weath, pr vis por, ns	
	Ls: brn, fn xln, dns, sli foss, sli pyrtic w/ Chrt: brn-lt gry, fresh, opq, foss, pr vis por, ns	
	Same, trc sli weath chrt, ns	
	Ls: brn-lt gry, fn xln, chlky, dolo in part, foss,w/ Chrt: lt gry, fresh-weath, calc in part, ns, no odor, vy sct dull flur	
	Ls: lt gry, fn xln, chlky w/ Chrt: lt gry, weath, calc, foss, ns	
4000	Chrt: wt-lt gry, weath-sct fresh, calc, foss w/ Ls: lt gry, fn xln, chlky, foss, ns, nf	
	Same	
	Chrt: wt-lt gry, weath-trip, sct fresh, calc, foss, ns, no odor, trc flur	
4050	Chrt: lt gry, weath-sct fresh, calc, foss & sct ls: lt gry-lt brn, fn xln, chlky, argil	
	Chrt: wt-lt gry, weath-trip, sct fresh, calc, foss, ns	
4100	Same, inc sh, gry-grn	
	Same	
4150	Chrt: wt-lt gry, weath-trip, sct fresh, opq, calc, foss	
	Same	
	Chrt: as above w/ sct Ls: lt gry, fn xln, chlky	
4200	Same	
	Same	
4250	Chrt: wt-lt gry, fresh-weath 30/70, some trip, calc, foss, ns	Smpls becoming very fine.
	trc Ls: lt brn, fn xln, dns	
		KINDERHOOK 4288' (-2882) E Log 4293' (-2887)
	Sh: gry-some brn & blk	
4300	Sh: as above, trc grn	
	Sh: gry	DST # 4 4360' to 4370' 30"-60"-30"-60" IF: Blow Built to 1/2" ISI: No Return FF: Blow Built to 1/4" FSI: No Return RECOVERY: 15' Mud IFP: 15-19# ISIP: 1571# FFP: 19-22# FSIP: 1562# BHT: 131 deg. F
4350	Sh: drk gry-blk, carb	Mud-Co @ 4352' Wt. 9.4, Vis. 43 WL. 9.0 Chl. 3,500, LCM. 4
		SIMPSON SD. 4368' (-2962) E Log 4372' (-2966)
	Sst: clear-wt, med-crs grain, subrnd, pr-fr srt, some subfri, most well cmntd, nsfo, few gas bubls, no odor, sct bright flur, wk cut, trc stn	DST # 5 4363' to 4373' 30"-60"-30"-60" IF: Blow Built to 1/2" ISI: No Return FF: Surface Blow FSI: No Return RECOVERY: 12' Wtry Mud (18%W,82%M) IFP: 14-24# ISIP: 1568# FFP: 21-23# FSIP: 1555# BHT: 128 deg. F Chl: 9,400 ppm
	4373' Sst: as above, sli more friable, nso-g, vy sct sptd flur	
	4376' Sst: lt brn-lt gry, fn grain, subfri-well cmntd, some fri, blk inclusions, ns, sct dull flu, no cut	
	4382': Sst: as above, fnt odor, dull flur	
	4386': Same, ns, no odor, dull flur	
4400	Kelly Short; Bit Trip. 4386'-94'; Sst: lt brn-lt gry, vy fn-fn grn, well cmntd w/ blk inclusions, ns, nf	Mud-Co @ 4400':Wt. 9.1, Vis. 47 WL. 11.2, Chl. 7,000, LCM. 3
	4394'-4400'; Sst: wt-clear, med-some fn & crs grn, subrnd, fr srt, fri-subfri, ns, nf	DST # 6 4366' to 4376' 30"-60"-20"-60" IF: Blow Built to 1/2" ISI: No Return FF: No Blow FSI: No Return RECOVERY: 10' Wtry Mud (28%W,72%M) IFP: 18-20# ISIP: 1562# FFP: 21-24# FSIP: 1552# BHT: 127 deg. F Chl: 33,000 ppm
	4404'-4408'; Sst: wt-clear, med grn, subfri-well cmntd, sli pyritic w/ blk inclusions in part, ns, nf	
	Sh: gry-some grn-some gry/grn, sct pyrite, sndy in part	
	Sst: wt-lt gry, vy fn grnwell cmntd, qtzitic, some blk inclusions, ns, nf	
4450		RTD 4450' (-3044) E Log 4454' (-3048)
		DST # 7 4376' to 4386' 30"-60"-10"-60" IF: Blow Built to 1/4" ISI: No Return FF: No Blow FSI: No Return RECOVERY: 5' Mud nso IFP: 18-21# ISIP: 502# FFP: 20-18# FSIP: 156# BHT: 126 deg. F
4500		

Drill Stem Test Charts