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GEOLOGISTS REPORT

DRILLING TIME AND SAMPLE LOGS

OPERATOR	MURKIN DRILLING COMPANY	ELEVATIONS	
LEASE	DATSY # 1-27	H#	2926'
LOCATION	2200 FNL & 2200' FEL	CL	2921'
SEC	27	TWSP	4 5
COUNTY	RAWLINS	STATE	KANSAS
FIELD	WILLCAT		
API	15-153-20996	RIN NO.	8
CONTRACTOR	MURKIN	DATE	02/29/2011
DRILLING STARTED	02/29/2011	COMPLETED	03/09/2012
MUD DISPLACED	3209'	MUD TYPE	HEAVY OIL
DRILLING TIME KEPT FROM	3950'	TO	CHIMICAL
SWAMERS SAVED FROM	3970'	TO	R/D
SWAMERS EXAMINED FROM	3970'	TO	R/D
GEOLOGICAL SUPERVISION FROM	3650'	TO	R/D
FORMATION NAME	LOG	TOP DATUM	SAMPLE
ANHYDRITE	2679' (-247)	2679' (-247)	(-248)
TOPEKA	3743' (-817)	3740' (-818)	(-818)
HEEBNER	3908' (-982)	3907' (-983)	(-983)
LANSING	3996' (-1002)	3997' (-1001)	(-1001)
STARK	4127' (-1203)	4126' (-1202)	(-1202)
BKC	4179' (-1253)	4176' (-1250)	(-1250)
PAWNEE	4286' (-1360)	4289' (-1363)	(-1363)
CHEROKEE	4371' (-1445)	4366' (-1442)	(-1442)
MUSKOGEE	4484' (-1558)	4480' (-1564)	(-1564)
MISSISSIPPIAN	4554' (-1628)	4550' (-1624)	(-1624)
TOTAL DEPTH	4955'	(-1628)	(-1624)

DATE	7:00 AM DEPTH	REMARKS
2/29/12	MIRT	SPUD 1:30 pm
3/1/12	620'	DRL6 dev. 1 deg. @ 220'
3/2/12	2300'	DRL6.
3/3/12	3250'	DRL6.
3/4/12	3930'	DRL6.
3/5/12	4034'	CFS dev. 1/2 deg.
3/6/12	4135'	TIH for DST # 3
3/7/12	4180'	TOH w/ DST # 4
3/8/12	4465'	RTD 4550' @ 12:30 pm DST # 5 dev. 1 deg.
3/9/12	4550'	LOGGING

Remarks

5 1/2" production casing run to further test the Lansing/Kansas City and Marmaton formations.

Electric log measurements correlate about 1' to 2' low compared to rotary measurements.

Sample tops inside this report adjusted to the electric log.

Samples deposited at the Kansas Geological Survey.

Respectfully Submitted,

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LITH	DRILL TIME (MINFT)	DEPTH	SAMPLE DESCRIPTIONS	REMARKS
		2650		ANHYDRITE 2678' (-248) E Log 2679' (-247)
		2700		Base ANHYDRITE 2711' (-215) E Log 2712' (-214)
		2750		
		3650	Sh: red, gummy-act gry & grn Ls: crm-lt gry, fn xln, sli grmlr, dolo in part, part des, foss, pr vis por, ns Ls: crm-lt brn-lt gry, fn xln, sli grmlr, part des, sli foss, sct pp-vug-intrxn por, ns	
		3700	Same, chily in part Ls: crm-lt gry, fn xln, grmlr, sli foss, pr intrxn por, ns Sh: red, sndy in part	
		3750	Ls: lt brn-lt gry, fn xln, foss-sli ool, vy sct vug por, ns Ls: crm-lt gry, fn xln, grmlr, dolo in part, subchily in part, sct intrxn por, ns Ls: crm-lt gry, vy fn-fn grain, calc, hard-subfri, few blk inclusions, pr vis por, ns Sh: red-brn, sndy in part, gummy in part Ls: crm-lt brn, fn xln, ool-sli foss, much wt chik, pr vis por, ns Ls: crm-lt brn-lt gry, fn xln, ool-foss, pr vug-intrpart por, ns Ls: crm-lt gry, fn xln, dns, chily in part, sli foss, no vis por, ns Sh: blk, carb (3850' smpl) Sh: red-some gry & grn	TOPEKA 3740' (-814) E Log 3743' (-817)
		3800	Ls: crm-lt gry, fn xln, dns, sli foss-ool in part pr vis por, ns Sh: red	
		3850	Ls: crm-lt gry, fn xln, dns, sli foss-ool in part pr vis por, ns Sh: red	
		3900	Ls: crm-lt brn-lt gry, fn xln, dns, sli foss, sct wt chik, pr vis por, ns Sh: blk, carb Ls: brn-gry, vy fn xln, dns Sh: red-brn, gummy, sndy, calc in part w/ cpl pcs Ls: fr gry, fn xln, dns, sli foss, pyritic, pr vis por, ss hyv fo, no odor, drk brn sptd stn Sh: as above	HEEBNER 3907' (-981) E Log 3908' (-982)
		3950	Ls: wt-lt gry, fn xln, ool, pr introol por, ss hyv fo, sli odor, drk brn-blk, substat-stn Ls: crm-lt gry, fn xln, ool, pr-fr introol-vug por, sli-fr sfgo, sli odor, drk brn sptd-stn Sh: varicolor w/ sct ls: lt gry, fn xln, dns, sli foss, vsfso, pr pp por, drk sptd-stn Ls: crm-lt gry, fn xln, ool-sli foss, pr sct fr-vug-intrpart por, sfo, bleeding o dg, sli odor, drk brn sptd-sub stn Ls: wt-crm-lt gry, fn xln, chily in part, vy chrt, foss-ool in part, pr sct fr-vug-intrpart por, sfo, no odor, drk brn sptd stn Ls: wt-lt gry, fn xln, dns, chily in part, few pcs w/ show as above sct Sh: blk, carb Sh: red-grn	LANSING 3957' (-1031) E Log 3958' (-1032) DST # 1 3956' to 3994' 30"-60"-30"-60" IF: BOB/23' ISI: No Return FF: Blow Built to 3" FSI: No Return RECOVERY: 392' total fluid 20' VSCM (110.5%W,94%W) 372' WCM (30%W,70%M) TFF: 30-144# ISIP: 1290# FFP: 140-174# FSP: 1283# BHT: 118 deg F CHL: 12,500 RW: 5 @ 70 deg F
		4000	Ls: wt-crm-lt gry, fn xln, dns, sli foss, sct wt chik, pr vis por, ns Sh: blk, carb Ls: brn-gry, vy fn xln, dns Sh: red-brn, gummy, sndy, calc in part w/ cpl pcs Ls: fr gry, fn xln, dns, sli foss, pyritic, pr vis por, ss hyv fo, no odor, drk brn sptd stn Sh: as above	MORGAN MUD: 3930' Wt: 9.0, Vis: 50, WL: 5.2 Chl: 1,800, LCM: 7
		4050	Ls: wt-lt gry, fn xln, dns, chily in part, few pcs w/ show as above sct Sh: blk, carb Sh: red-grn	STARK 4126' (-1200) E Log 4127' (-1201)
		4100	Ls: wt-crm-lt gry, fn xln, part des, part chily, chrt, sli foss, pr vug por, sli-fr sfo, sli odor, drk brn substat stn Ls: wt-crm-lt gry, fn xln, dns, chily in part, chrt, pr vis por, ns Sh: grn-red-some gry	HEEBNER 3907' (-981) E Log 3908' (-982)
		4150	Ls: wt-lt gry, fn xln, dns, sli foss, sct wt chik, pr vis por, ns Sh: varicolor, trc blk Ls: lt gry, fn xln, dns, chily in part, no vis por, ns Sh: varicolor Sh: as above w/ Sst: tan-lt gry, vy fn grain, calc, hard, trc glauc, pr por, ns Ls: lt gry-gry, fn xln, dns, foss in part	TORONTO 3941' (-1015) E Log 3942' (-1016)
		4200	Sh: red-grn-some gry, sli sndy in part w/ Ls: as above Ls: brn-gry, fn xln, dns, foss-ool in part, pr vis por, ns Sh: red-varicolor, sli sndy in part, trc chrt	LANSTING 3957' (-1031) E Log 3958' (-1032) DST # 4 4124' to 4180' 30"-60"-15"-60" IF: BOB/7' ISI: Surface Blow FF: Blow Built to 2" FSI: No Return RECOVERY: 506' total fluid 236' GP 10' GO (20%G,80%L) Growth: 36.4 186' SOG6CWM (5%G,10%G,30%W,50%M) 124' SOG6CWM (5%G,5%O,60%W,30%M) 186' VSO6CWM (5%G,2%O,73%W,20%M) TFF: 52-178# ISIP: 1307# FFP: 173-25# FSP: 1297# BHT: 125 deg F CHL: 38,000 RW: 19 @ 69 deg F Pipe Strap @ 4034': 1.97 long to board dev. 1/2 deg
		4250	Ls: lt gry-lt brn, fn xln, dns, foss in part, no vis por, ns Sh: brn-red, trc omg chrt Sh: brn-varicolor Sh: as above, inc gry & grn	MUNICIE CREEK 4058' (-1132) E Log 4059' (-1133) Morgan Mud: 4034' Wt: 9.1, Vis: 60, WL: 5.6 Chl: 3,000, LCM: 7
		4300	Ls: crm-lt gry, fn xln, dns, sli foss, sct wt chik, pr vis por, ns Sh: drk gry-blk	STARKE 4126' (-1200) E Log 4127' (-1201)
		4350	Ls: crm, fn xln, sli grmlr, sli foss-subool, vy sct wt chik, pr vis por, ns Ls: crm-lt gry-gry, fn xln, dns, sli foss-subool, no vis por, ns Sh: blk, carb-drk gry	MORGAN MUD: 4135' Wt: 9.3, Vis: 55, WL: 6.4 Chl: 3,300, LCM: 8
		4400	Ls: crm-lt brn, fn xln, dns, sli foss, no vis por, ns Ls: lt brn-lt gry, fn xln, dns, sli foss, no vis por, ns Sh: gry-grn, drk gry (mostly ls as)	DST # 4 4124' to 4180' 30"-60"-15"-60" IF: BOB/5' ISI: No Return FF: No Blow RECOVERY: 134' total fluid 10' MCO (60%O,40%M) 62' OCM (30%O,70%M) 62' VSO6CWM (5%O,95%M) TFF: 28-47# ISIP: 1274# FFP: 49-55# FSP: 87# BHT: 118 deg F
		4450	Sst: lt gry-rose, fn-crs grain, pr srt, submd, calc, hard, rane fri, pr por, ns, no odor, no flur, no cut Ls: crm-lt brn-lt gry, fn xln, dns, chily in part, sli foss, no vis por, ns Sh: gry-grn-red Sh: varicolor w/ Sst: clear, crs grain, subanglr, sli calc, hard-subfri, pr-fr por, ns, no odor, no flur, no cut Sh: as above w/ Sst: red/brn-lavdr, vy fn-fn grain, shly, no vis por, ns Sst: wt-clear, fr-crs grain, pr srt, submd, andl, calc, sct fri w/ Ls: wt-crm, fn xln, chily, snd stdd in part, pr por, ns Sh: red-grn-some grn-trc yell, snd stdd w/ sct trz frags Some w/ few Sst cluata: clear, fr-med grain, fri, qtz cmit, ns, no odor, no flur, no cut Sh: varicolor w/ vy sct Chrt: crm-yell, sli weath, spg, ns Some, sli inc yell chrt 20' Ggl type Chrt: omg-yell, opp 80% Chrt: wt-crm, fresh-some weath, foss, sct wug-frac por, ns, no odor, no flur, no cut Chrt: as above w/ sct Ls: wt-lt gry, fn xln, dns, chily	MISSISSIPPIAN 4554' (-1628) E Log 4484' (-1557)
		4500	Chrt: wt-lt gry-ton, fresh, 20%weath, foss, sct wug-frac por, ns, no odor, no flur, no cut Some Ls: lt brn-lt gry, fn xln, dns Ls: wt-crm, fn xln, chily, chrt	DST # 5 4481' to 4550' 15"-60"-15"-60" IF: BOB/5' ISI: No Return FF: Blow Built to 2" FSI: No Return RECOVERY: 255' total fluid 124' WCM (20%W, 80%M) 212# WTR (Chl: 25,000) TFF: 501-934# ISIP: 1170# FFP: 975-1146# FSP: 1170# BHT: 136 deg F RW: 13 @ 140 deg F
		4550	Ls: wt-crm, fn xln, chily, chrt, pr vis por, ns Chrt: acco-lt gry, fresh, opp-transluent, frag por, ns, no odor, no flur, no cut Ls: wt-crm, fn xln, chily, chrt, pr vis por, ns	MORGAN MUD: 4498' Wt: 9.4, Vis: 62, WL: 5.6 Chl: 2,400, LCM: 8
		4600		RTD 4550' (-1624) E Log 4554' (-1628)

