GEOLOGISTS REPORT

OPERATOR: MURFIN DRILLING CO, INC.
LEASE: SANDLIN #1-32
LOCATION: 854' FNL 1461' FEL
SEC: 32 TWSP: 10S RGE: 23W
COUNTY: GRAHAM STATE: KANSAS
FIELD: WILDCAT

ELEVATIONS
KB: 2368'
GL: 2363'
ALL MEASUREMENTS FROM K.B.

CONTRACTOR: MURFIN DRILLING
RIG NO. 16
SPUD: 03/26/2007 COMPLETED: 04/04/2014
TOTAL DEPTH: 3990 MUD TYPE: CHEMICAL
DRILLING TIME KEPT FROM: 3300 TO: 3990
SAMPLES SAVED FROM: 4000 TO: 3990
GEOLOGICAL SUPERVISION FROM: 3300 TO: 3990
GEOLOGIST ON WELL: STEPHEN L. MILLER

CASING RECORD
Conductor: ____
Surface: 8-5/8"@207'
Production: ____

ELECTRICAL SURVEYS:
PIONEER
DUAL INDUCTION
SONIC LOG
MICRORESISTIVITY

FORMATION NAME	LOG TOP	LOG DATUM	SAMPLE TOP	SAMPLE DATUM
ANHYDRITE	1910	+458	1931	+432
B/ ANHYDRITE	3148	-780	3170	-807
TOPEKA LIME	3405	-1037	3411	-1048
HEEBNER SHALE	3623	-1255	3624	-1261
TORONTO LIME	3645	-1277	3647	-1279
LANSING LIME	3662	-1294	3662	-1294
STARK SHALE	3852	-1484	3852	-1484
B/KANSAS CITY	3889	-1521	3893	-1525
Total Depth	3992	-1624	3990	-1622

REMARKS
API 15-065-24088
Drilling Fluids: MORGAN MUD
Drill Stem Testing: TRILOBITE
Gas Trailer: NONE
Reserve Pit Chlorides:

DRILL TIME (MIN/FT)	DEPTH	LITHOLOGY	SHOWS	SAMPLE DESCRIPTIONS	REMARKS
	3300			Shale lt gray sandy mica silty	
				Limestone tan f-xln v fos sli chalky p int-fos por NS	
	3350			Limestone lt gray f-xln v fos dense	
				Shale brn gray sil fos soft	
				Limestone tan gray f-xln sil fos dense	
				Shale gray limy sil fos	
	3400			Limestone crm f-xln sil fos sli chalky	TOPEKA LIME 3411 -1048
				Shale gray brn sil silty	
				Limestone dk gray f-xln fos dense	
				Shale gray brn sil mica	
	3450			Shale grn gray carb inclusions sil fis	
				Limestone crm f-xln fos carb inclusions chalky scat fos-cast por NS	
				Shale gray grn sil sandy	
				Limestone crm wht fos chalky scat fos-cast por NS	
	3500			Shale blk gray brn carb sil fis silty	
				Shale gray brn sil sandy	
				Limestone crm f-xln sil chalky v fos scat fos-cast por NS	
				Sandstone lt gray vf grain silty	
				Shale gray brn sil silty	
	3550			Shale brn grn gray	
				Shale black carb	
				Limestone crm tan v fos gd int-fos por NS w/ chert tan fresh spic	
				Limestone tan gray wht chalky v fos	
	3600			Limestone crm f-xln ool fos f oocl& fos-cast por NS	
				Shale black carb	HEEBNER SHALE 3624 -1279
				Limestone gray f-xln dense	
				Shale grn gray brn sil sandy	
	3650			Limestone lt gray f-xln fos sli chalky f int-fos por VSSFO(faley) scat dk brn stain	TORONTO LIME 3647 -1279
				Shale gray sil silty Limestone crm f-xln fos sli chalky	LANSING LIME 3662 -1294
CFS@3656		DST #1		Limestone gray f-xln fos v pyr, f int-fos por SSFO(gassy) fair odor scat lt brn stain	DST #1 3631-3704 30-60-60-90 BOB 13 MIN/13 MIN REC 60' OS MUD 480' MW 300' SW FP 20-124# 128-269# SIP 882-842#
CFS@3676				Limestone gray f-xln fos dense	
	3700			Shale gray grn brn blocky	
				Limestone crm sil fos chalky	
CFS@3704		DST #2		Shale gray brn grn sil sandy	DST #2 3700-3718 30-60-30-60 11/4"BLOW/NOBLOW REC 10' MUD FP 12-16# 17-19# SIP 426-402#
				Limestone gray crm f-xln fos sli chalky p int-fos &ppt por SSFO(gassy) fair odor spotted lt brn stain	
CFS@3718				Limestone gray f-xln sil fos dense	
	3750			Shale gray grn	
				Limestone tan f-xln fos f int-fos por VSSFO fair odor spotted lt brn stain	
CFS@3752				Limestone wht f-xln chalky soft	DST #3 3722-3752 15-60-15-60 BOB 1 MIN/11/2 MIN REC 240' OS MCW 3080' SW FP 129-390# 411-604# SIP 812-808#
				Shale gray sil silty	
				Limestone gray f-xln v ool f int-ool por SSFO faint odor spotted dk brn stain consid chalky material	
				Limestonecrm gray f-xln dense	
				Shale black carb blocky	DST #4 3782-3846 30-60-60-90 BOB 6 MIN/13 MIN REC 1' OIL 759' MW FP 24-144# 149-339# SIP 1087-1041#
	3800			Shale grn brn gray sli sandy mica	
				Limestone tan f-xln small ool f int-ool por VSSFO faint odor lt brn stain	
				Shale gray grn sil pyritic	
				Limestone lt gray f-xln ool fos p int-ool por NSFO scat dark brn stain	
				Shale gray brn	
				Limestone tan f-xln fos small ool chalky in part p int-fos&.ool por VSSFO no odor scat brn stain	
CFS@3846	3850			Shale black carb	STARK SHALE 3852 -1484
CFS@3866				Limestone crm f-xln fos p fos-cast por VSSFO(vesv) faint odor on break spotted lt brn stain	DST #5 3848-3868 30-60-60-90 BLOW 61/2" 61/2" REC 195' SW FP 15-53# 57-107# SIP 1197-1173#
				Shale dk gray fis	
				Limestone crm wht f-xln sil fos sli chalky p fos-cast por scat dk stain NSFO	
	3900			Shale brn silty sil sandy	B/ KANSAS CITY 4291 -1449
				Limestone lt gray f-xln sil fos sli chalky dense	
				Shale brn red soft sandy	
				Limestone crm f-xln sil fos sli chalky	
	3950			Shale brn gray silty	
TD CFS					TOTAL DEPTH 3990
	4000				

Operator: MURFIN DRILLING CO, INC.
Lease: SANDLIN #1-32
Location: 854' FNL 1461' FEL SEC. 32 TWSP 10S RGE 23W
County: GRAHAM State: KANSAS