GEOLOGIST'S REPORT

Max R.Lovely

Company or Operator	Ritchie Exploration, Inc
Well Name	Wunderlin #3D
Location	SW NE SE
Section	36
Township	2S
Range	31W
County	Gove
State	Ks
Elevation	2805 KB
Total Depth	4624
Date Spud	2-2-13
Date T.D.	2-13-13
Date Comp.	2-13-13
API #	15-063-21,908-00-00
Drilling Contractor	Gram Drilling #3
Mud Type	Chem
Bit Type	7 7/8
Size of Hole	7 7/8
Rig Time	Full Time
Samples Saved	Yes
Drill Stem Tests Run	3
Drill Stem Tests Rec.	Yes
Logs Run	Yes
Surface Casing	8 5/8" @ 224' w/ 160 sks
Production Casing	Dry & Abd.
Elevations	KB 2805' GL 2800'
Formation Tops (Log Measurements)	Anhydrite 1728 (+1077) Topeka 3400 (-595) Heebner 3622 (-817) Toronto 3642 (-837) Lansing 3680 (-875) Muncie Creek 3844 (-1039) Stark 3923 (-1118) Base Kansas City 4000 (-1195) Marmaton 4012 (-1207) Pawnee 4097 (-1292) Fort Scott 4150 (-1345) Cherokee Sh. 4176 (-1371) Mississippi 4457 (-1652)
Rotary Total Depth	4624'
Log Total Depth	4623'
Formation at T.D.	Chert
Ground Elevation	2800'
Log Measurements	KB
Drill Stem Tests Run	3
Drill Stem Tests Rec.	Yes
Samples Saved	Yes
Drilling Time Kept	Yes
Drilling Time Recorded	Full Time
Samples Examined	Yes
Geologist Name	Max R. Lovely
Date Completed	2-13-13

REMARKS

LEGEND

Anhydrite · Salt · Sandstone · Shale · Sandy Sh. · Limestone · Dol.Lime · Chert · Dolomite

DRILLING TIME IN MINUTES PER FOOT (Rate of Penetration Decreases)	DEPTH	LITHOLOGY	SAMPLE DESCRIPTIONS	SOL. SHOWS	REMARKS
0" 10" 15" 20" 30"					
	Anhydrite 1728 (+1077)				
	2250 (+555) 2252 (+553)				
	3400		SH, GRY, GRN		
			SH, GRY, GRN		
			LS, CRM, F-CR, X-BRK, FOSS + FRAG, SOME PYRITE, P.P.		
			SH, GRY, GRN		
	Topeka 3426 (-621)		LS, GRY, F-CR, X-CR, SOME ARGILL, TRACE PYRITE		
			LS, CRM, TAN, F-X, FOSS, FRAG, SOME PYRITE, SOME OOLITIC & FOSS. IN P.P.		
	3500		LS, CRM, F-X, F-CR, SOME ARGILL, SOME PYRITE		
			LS, GRY, F-X, F-CR, SOME ARGILL, SOME PYRITE, SOME OOLITIC		
			SH, GRY, + FOSS		
			LS, TAN, BRN, F-X, F-CR, ARGILL, SOME PYRITE		
			SH, GRY		
			SH, GRY, + FOSS		
	3600		SH, GRY		
	Topeka 3622 (-837)		LS, GRY, FOSS, F-X, F-CR, FOSS, SOME PYRITE, SOME OOLITIC		
			SH, GRY, F-X, + FOSS, SOME OOLITIC		
			LS, CRM, F-X, F-CR, X-X, SOME PYRITE		
			CHERT		
			LS, BUFF, F-X, F-CR, SOME ARGILL, SOME PYRITE		
			SH, GRY		
			LS, CRM, F-X, F-CR, SOME ARGILL, SOME PYRITE		
			SH, GRY		
	3700		LS, CRM, F-X, F-CR, SOME ARGILL, SOME PYRITE		
			SH, GRY		
			LS, CRM		
			SH, GRY		
			LS, CRM, F-X, F-CR, SOME ARGILL, SOME PYRITE