

**OPERATOR**

Company: TDI, INC  
 Address: 1310 BISON ROAD  
 HAYS, KANSAS 67601

Contact Geologist: TOM DENNING  
 Contact Phone Nbr: 785-628-2593  
 Well Name: NICHOLSON UNIT # 1  
 Location: NE NE NW NE Sec.7-13s-20w  
 Pool: WILDCAT  
 State: KANSAS  
 API: 15-051-26,598-00-00  
 Field: UNNAMED  
 Country: USA



**TDI, Inc.**  
 1310 BISON ROAD  
 HAYS, KANSAS 67601  
 (785) 628-2593

Scale 1:240 Imperial

Well Name: NICHOLSON UNIT # 1  
 Surface Location: NE NE NW NE Sec.7-13s-20w  
 Bottom Location:  
 API: 15-051-26,598-00-00  
 License Number: 4787  
 Spud Date: 10/11/2013 Time: 3:30 PM  
 Region: ELLIS COUNTY Time: 6:49 AM  
 Drilling Completed: 10/16/2013  
 Surface Coordinates: 267' FNL & 1426' FEL  
 Bottom Hole Coordinates:  
 Ground Elevation: 2150.00ft  
 K.B. Elevation: 2160.00ft  
 Logged Interval: 3100.00ft To: 3925.00ft  
 Total Depth: 3925.00ft  
 Formation: ARBUCKLE  
 Drilling Fluid Type: CHEMICAL/FRESH WATER GEL

**SURFACE CO-ORDINATES**

Well Type: Vertical  
 Longitude: -99.5811879 Latitude: 38.942102  
 N/S Co-ord: 267' FNL  
 E/W Co-ord: 1426' FEL

**LOGGED BY**

Company: SOLUTIONS CONSULTING, INC.  
 Address: 108 W 35TH  
 HAYS, KS 67601

Phone Nbr: (785) 639-1337  
 Logged By: Geologist Name: HERB DEINES

**CONTRACTOR**

Contractor: SOUTHWIND DRILLING, INC.  
 Rig #: 1  
 Rig Type: MUD ROTARY  
 Spud Date: 10/11/2013 Time: 3:30 PM  
 TD Date: 10/16/2013 Time: 6:49 AM  
 Rig Release: 10/17/2013 Time: 6:15 AM

**ELEVATIONS**

K.B. Elevation: 2160.00ft Ground Elevation: 2150.00ft  
 K.B. to Ground: 10.00ft

**NOTES**

RECOMMENDATION TO RUN PRODUCTION CASING BASED ON LOG ANALYSIS AND FAVORABLE STRUCTURE. LOST CIRCULATION PROBLEMS BEFORE AND AFTER MUD UP REQUIRED HEAVY LEVELS OF LCM TO MAINTAIN CIRCULATION. PROBLEM AREA MOST LIKELY IN LOWER SALT SECTION.

OPEN HOLE LOGGING BY PIONEER ENERGY SERVICES: DUAL INDUCTION LOG, DUAL COMPENSATED POROSITY LOG, MICRORESISTIVITY LOG

NO DRILL STEM TESTS WERE RAN

**FORMATION TOPS SUMMARY AND CHRONOLOGY OF DAILY ACTIVITY**

<b>NICHOLSON UNIT # 1</b>	<b>Kohl #1</b>
<b>NE NE NW NE</b>	<b>E2 NW NW NW</b>
<b>Sec. 7-13s-20w</b>	<b>Sec. 8-13s-20w</b>
<b>2138' GL 2148' KB</b>	<b>Reference Well</b>

<u>FORMATION</u>	<u>SAMPLE TOPS</u>	<u>LOG TOPS</u>	<u>LOG TOPS</u>
Anhydrite	1508+ 652	1508+ 652	+ 658
B-Anhydrite	1546+ 614	1546+ 614	+ 620
Topeka	3186-1026	3186-1026	-1020
Heebner Shale	3412-1252	3414-1254	-1249
Toronto	3436-1276	3434-1274	-1270
LKC	3450-1290	3450-1290	-1287
BKC	3682-1522	3694-1534	-1533
Marmaton-Pawnee	3750-1590	3755-1595	-1584
Arbuckle	3810-1650	3820-1660	-1643
RTD	3925-1765		
LTD		3927-1767	-1799

**SUMMARY OF DAILY ACTIVITY**

10-11-13 RU, spud 4:00PM, set 8 5/8" to 224' w/ 150 sxs Common 2%Gel 3%CC, plug down 9:45PM, WOC 8 hrs, slope 1 degree

10-12-13 288', drill plug at 5:45AM

10-13-13 1868', drilling

10-14-13 2850', drilling, displaced 3058'-3090'

10-15-13 3480', drilling

10-16-13 3925', RTD 3925'@6:49AM, ST, CCH, TOWB, logs, TIWB, LDDP

10-17-13 3925', finish running casing and cementing, RD

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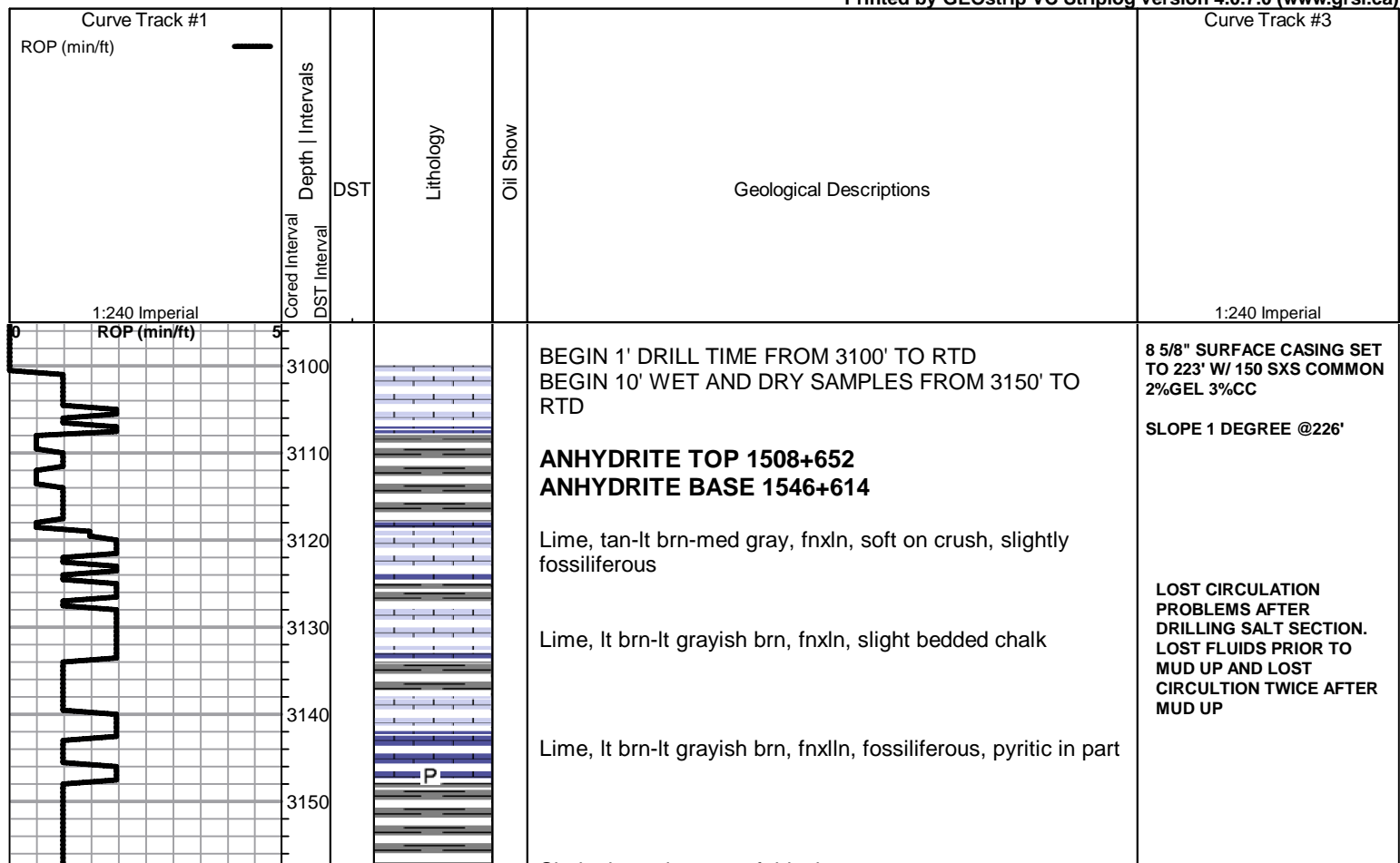


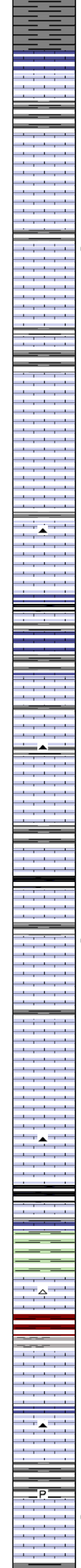
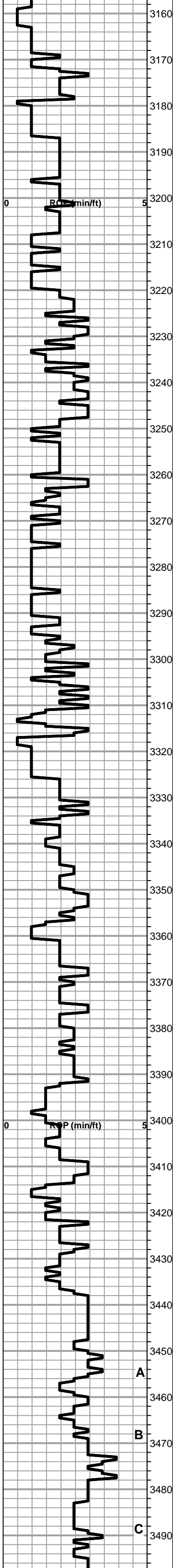
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ROCK TYPES							
	Clystgy		Dol Lime		Lscongl		Carbon Sh
	Chtcongl		Lmst fw<7		shale, grn		shale, red
	Dolprim		Lmst fw7>		shale, gry		Shcol

ACCESSORIES	
<b>MINERAL</b>	
▲ Chert, dark	
≡ Nodules	
P Pyrite	
.* Sandy	
⋄ Varicolored chert	
△ Chert White	

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Shale, lt-med gray, soft blocky

Lime, tan-lt brn, fnxln,

Lime, tan-lt brn, fnxln, slight bedded chalk in part  
Shale, lt-med gray, soft blocky to soft mud

**TOPEKA ELog 3186-1026**

Lime, tan-lt brn, fnxln, fusulinids, slight bedded chalk

Lime, lt brn-lt grayish brn, fnxln

Lime, tan, granular with fine oomoldic in part, few specks of oil on crush

Lime, tan-lt brn, fnxln, bedded chalk

Lime, tan-lt brn, fnxln-granular in part

Shale, lt gray, soft blocky

Lime, tan-lt brn, fnxln, slight bedded chalk in part

Lime, tan-lt brn, fnxln-granular in part, slight bedded chalk

Lime, tan-lt brn, fnxln, brittle on crush

Lime, tan-lt brn, fnxln, slightly fossiliferous, slight chalk

Lime, tan-lt brn-lt gray, fnxln

Lime, lt-med brn, granular, slightly fossiliferous, lt bedded chalk

Shale, dark gray-black carbonaceous, soft blocky

Lime, lt brn-lt grayish brn, fnxln

Lime, lt brn, fnxln-granular in part, slight bedded chalk

Lime, tan-lt brn, fnxln-granular

Lime, tan, granular

Lime, crm-tan, fnxln

Lime, crm-tan-lt gray, fnxln-granular in part

Shale, black carbonaceous, soft blocky

Lime, tan, fnxln

Lime, tan, fnxln, few chips granular/fine vuggy, dolomitic, minor show of oil specks on crush

Lime, tan-crm, fnxln

Lime, tan-lt brn, fnxln, slight bedded chalk

Lime, crm-lt grayish brn, fnxln, slight bedded chalk

Lime, tan-lt brn, fnxln-granular

Lime, tan-lt brn-lt grayish brn, fnxln

**HEEBNER SHALE ELog 3414-1254**

Shale, black carbonaceous, fissile, blocky  
Lime, lt-med brn, fn-vfxln

Shale, dove gray-lime green, soft blocky

**TORONTO ELog 3434-1274**

Lime, white-crm, fn-vfxln, hard bedded chalk, lithographic in part, NS

**LKC ELog 3450-1290**

Lime, crm-lt brn, fn-vfxln, hard on crush, slightly fossiliferous, NS

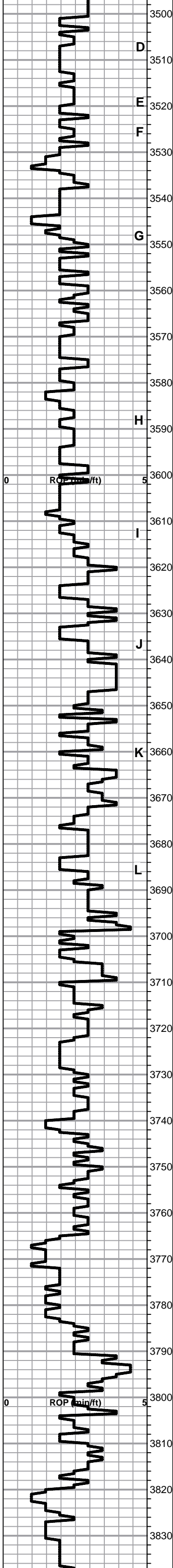
Lime, lt-med brn, fn-vfxln, hard on crush

Lime, lt gray, fn-vfxln, slight bedded chalk, NS

Shale, dove gray forming soft mud

Lime, crm-tan, fnxln, bedded chalk with few chips, oolitic, spotty stain in interoolitic voids, NFO, V Lt Odor, appears poorly developed from sample examination

STARTED LOSING MUD VOLUME. STOPPED AND REBUILT VOLUME AND REESTABLISHED CIRC WITH HEAVY LCM LEVELS



Shale, lt gray, soft-firm blocky, waxy

Lime, crm, fn-vfxln, slight bedded chalk

Lime, crm-tan, fn-vfxln, bedded chalk

Shale, gray-black, soft blocky  
Lime, lt grayish green, fnxln

Lime, tan, fnxln, dolomitic in part, fossiliferous with spotty staining in foss voids and scattered vugs, minor SFO under heat with lt odor

Lime, tan, fnxln, bedded chalk

Lime, crm-tan, fn-micro xln, bedded chalk

Lime, crm-tan, fn-micro xln, bedded chalk, white chert

Lime, crm-tan-lt gray near shale boundary, fnxln, lt gray mottling near base of lime section

Shale, gray-black, cherty

Lime, med brn, fossiliferous, scattered to saturated staining, NFO, V LT Odor, little visible porosity noted

Lime, crm-med brn-med grayish brn, fn-vfxln, slight bedded chalk

Lime, crm-lt brn, fn-vfxln

Lime, tan, fn-micro xln, spotty dead oil stain, NFO, No Odor

Lime, crm-tan, fn-micro xln, slight bedded chalk

Shale, med-dark gray, firm blocky

Lime, off white-lt brn, fn-micro xln grading into granular lime with spotty dark oil stain, NFO, No Odor

Lime, offwhite-lt brn, fn-vfxln

Shale, med-dark gray, firm blocky

Lime, lt brn-crm, few oolitic chips with lt spotty staining, NFO, no detectable odor

Lime, lt brn-lt gray, fn-vfxln

Shale, gray-black carbonaceous

Lime, crm-tan, fnxln, bedded chalk

Lime, crm-off white, fnxln, white chert

**BKC ELog 3694-1534**

Shale, dark brn-grays, firm blocky with clastic lime rubble in mix

Shale, tan, soft mud with lt red wash

Lime, crm-tan, fn-vfxln

Shale, red wash, soft blocky with dark chert nodules

Shale, red-dark brn, some clastic lime mix with red staining

**MARMATON-PAWNEE ELog 3755-1595**

Lime, crm-tan, fnxln-granular in part, dolomitic, orange chert

Lime, crm-tan-lt brn, granular, dolomitic, fine grain granular, lt even staining, NFO, no odor,

Lime, crm-tan, fnxln, increasing chert content with tan, white, orange cherts, fresh, sharp

Shale, maroon-gray, soft blocky

Shale, maroon-gray, soft blocky

**ARBUCKLE ELog 3820-1660**

Dolomite, ivory, fn-med xln, granular-sucrosic, lt-fair odor and saturated staining

Dolomite, ivory, fn-med xln, granular-sucrosic, lt odor with spotted to saturated staining, some gilsonitic specks in part

STARTED LOSING MUD VOLUME WITH EVENTUAL LOST CIRCULATION. PULLED 5 STANDS AND MIXED MUD TO REBUILD VOLUME. REGAINED CIRCULATION WITH HEAVY LCM LEVELS TO MAINTAIN CIRCULATION

