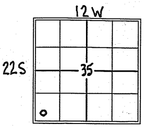
CHARLES SCHMALTZ

CONSULTING GEOLOGIST
WICHITA, KANSAS

GEOLOGIC REPORT LOG

COMPANY MURFIN DRILLING CO.

WELL KLS # 1-35
FIELD MIKE'S METEOR
LOCATION 330' FSL 330' FWL
SEC 35 TWSP 22S RGE 12W
COUNTY STAFFORD
STATE KANSAS
API#: 15-185-23879



PRODUCTION:

ELEVATION:
KB 1842
DF
GL 1831
DRILLING MEASURED FROM KB

MUD COMPANY MUDCO/SERVICE MUD, INC
CONTRACTOR MURFIN DRILLING CO RIG # 21
COMMENCED 15 AUG 2014 COMPLETED 20 AUG 2014

CASING RECORD:
SURFACE 8 5/8 @ 643' PRODUCTION 5 1/2" @ 3978'
TOTAL DEPTH DRLS. 3910
TOTAL DEPTH LOG 3904

SAMPLES SAVED FROM 10' - 2700' TO RTD
DRILLING TIME KEPT FROM 1' - 2700' TO RTD
SAMPLES EXAMINED FROM 2700' TO RTD
GEOLOGICAL SUPERVISION FROM 2700' TO TOTAL DEPTH
DRILL STEM TESTS TRILOBITE TESTING INC
ELECTRICAL SURVEYS PIONEER ENERGY SER
DIL
CNL-CDL
BHCS-MEL

FORMATION TOPS & STRUCTURAL POSITION

FORMATION	SAMPLE TOP	ELECTRIC LOG TOP	SUB-SEA DATUM	STRUCTURAL POSITION
ANHYDRITE - TOP	605	606	+ 1236	+ 1
ANHYDRITE - BASE	628	626	+ 1216	+ 3
TOPEKA	2809	2805	- 963	- 8
OREAD	3079	3074	- 1232	- 6
HEEBNER	3181	3176	- 1334	- 5
TORONTO	3201	3196	- 1354	- 7
DOUGLAS	3216	3212	- 1370	- 7
LANSING	3318	3314	- 1472	- 6
STARK	3540	3534	- 1692	- 8
BKC	3595	3588	- 1746	- 9
VIOLA	3622	3619	- 1777	- 13
SIMPSON	3703	3700	- 1858	+ 45
ARBUCKLE	3836	3832	- 1990	- 15
TOTAL DEPTH (DRILLED DEEPER)	3910	3904	- 2062	

✱ SEE DETAIL

REFERENCE WELL FOR STRUCTURE MURFIN DRILLING CO., RANK 'OWWO' # 1-2
4260' FSL, 330' FWL, SEC 2-T23S-R12W, STAFFORD CTY, KS

DRILL STEM TESTS

No.	Interval	IFP/Time	ISIP/Time	FFP/Time	FSIP/Time	IHH-FHH	RECOVERY
1	3570 - 3712 VIOLA	103# - 184# 30"	768# 60"	232# - 199# 60"	738# 90"	1938# 1949# 114° F	65' MUD (MODERATE PLUGGING DURING IFP & FFP)

BIT RECORD

NO	SIZE	MAKE	TYPE	DEPTH OUT	FEET	HOURS
1	12 1/4	HTC	VM1	643	643	7 1/4
2	7 7/8	HTC	DP506	2705	2062	18 1/4
3	7 7/8	HTC	GX2DC	3910	1205	35 1/2
4	7 7/8	HTC	DP506	4615	705	12 3/4

PIPE STRAPS & DEV. SURVEYS

PIPE STRAP:
@ 2705' : 6.04 SHORT
DEVIATION SURVEYS:
@ 643' : 0.2 @ 2303' : 0.2
@ 1191' : 0.2 @ 2705' : 0.2
@ 1794' : 0.1 @ 3910' : 0.7
@ 4615' : 2.9

DAILY PENETRATION

DATE	DEPTH
8-15	MIRT
8-16	643'
8-17	2347'
8-18	3365'
8-19	3712'
8-20	3910'
8-21	4615'

MUD RECORD

MUD TYPE: PUMP SIZE: BPS:

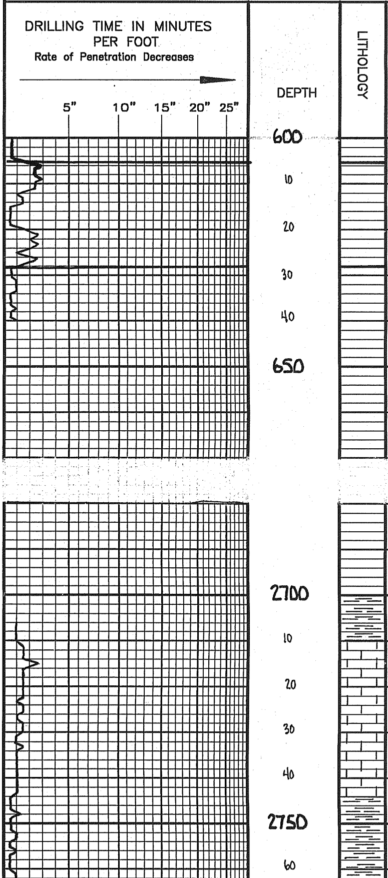
NO	DATE	DEPTH	ACTIVITY	WT	VIS	WL	VP	PH	GS	LCM	CHL
3	8-17	2705	BIT TRIP	8.9	56	13.6	13	10.5	10/54	TR	11400
4	8-18	3408	DRLG	9.4	53	12.0	12	10.5	11/52	TR	11300
5	8-19	3712	TIH	9.5	62	9.2	26	10.0	35/58	1#	13700
6	8-20	3910	LOGGING	9.4	48	10.2	24	9.0	26/36	1#	14400
7	8-21	4615	TOOH	9.9	48	16.8	31	7.5	36/43	4#	13500

LOG 7710

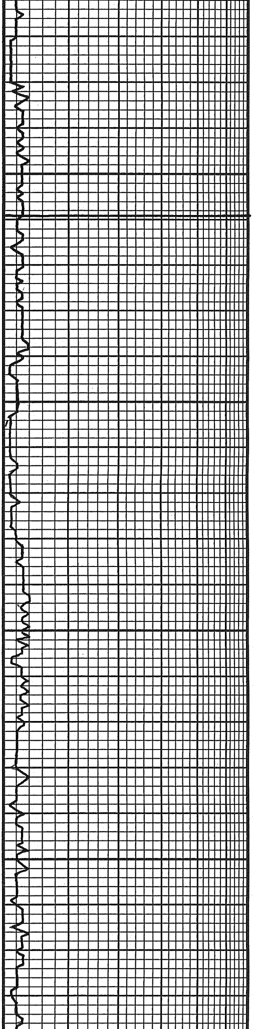
LEGEND

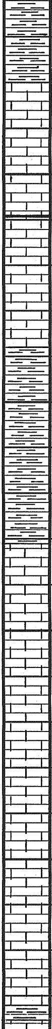
Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite
▥	▦	▒	▤	■	▦	▦	△	▨

DRILLING TIME IN MINUTES PER FOOT
Rate of Penetration Decreases



DEPTH	SAMPLE DESCRIPTIONS	OIL SHOWS	REMARKS
600			ANHYDRITE -TOP 605 (+1237)
620			ANHYDRITE-BASE 628 (+1214)
2700	sh: grey lt. grey micaceous		
2710	ls: tan, grey, fn-medxtln, pelletal, sli foss, no vis ø no show		
2720	ls: as above; no vis ø, no show		
2730	ls: tan, brown, grey, fn-medxtln, foss, granular in part, app pr interxtln ø, no show		
2740	ls: as above w/ sh: grey, sli silty		
2750	sh: grey, lt. grey, silty in part		





sh: as above

70

sh: lt. grey, grey, silty, micaceous, w/ ss: grey, vfngrained, well-sorted, friable, shaley in part, no vis ø, no show

80

ls: tan lt. brown grey fn-medxtln sli foss no vis ø no show

90

ls: as above, sli chalky, no show

2800

ls: tan, lt. brown, fn-medxtln, sli foss, few pcs w/ pr interxtln ø, no show

10

TOPEKA
2809 (-967)

ls: off wh, tan, lt. grey, fnxtln, sli chalky, granular in part, scat pr interxtln ø, no show

20

ls: as above, no show

30

ls: as above; w/ ls: dk brown, grey, fn-medxtln, dense

40

sh: lt. grey, grey, micaceous

2850

sh: as above, sli silty

60

sh: as above; w/ few pcs brown sh

70

sh: as above w/ ss: grey, vfngrned, well sorted, friable, no vis ø, no show

80

ls: off wh, tan, brown, fn-medxtln, sli foss, no vis ø no show

90

ls: as above; no vis ø, no show

2900

ls: as above; sli chalky

10

ls: tan, lt brown, greyish-brown, fn-medxtln, sli mottled, no vis ø, no show

20

ls: off wh, tan, fn-medxtln, granular in part, scat pr vuggy & interxtln ø; sli chalky; no show

30

ls: as above: w/ ls: grey, fn-medxtln, sli mottled, no vis ø, no show

40

ls: tan, brown, lt. grey, fn-medxtln, sli foss, sli granular, scat pr interxtln ø, no show

2950

ls: as above; becoming sli chalky

60

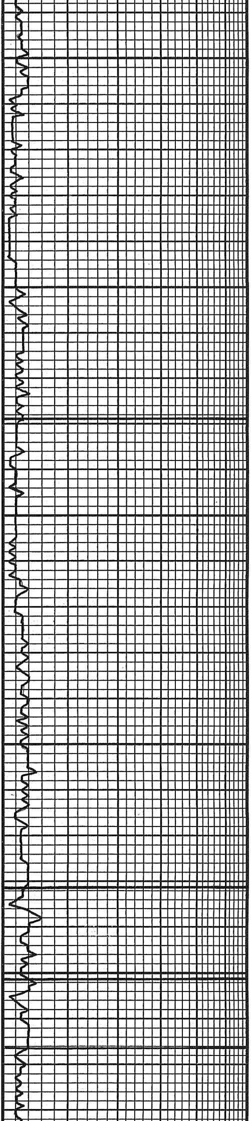
ls: as above; w/ ls: grey, fn-med xtln, sli ool, mottled, no vis ø, no show

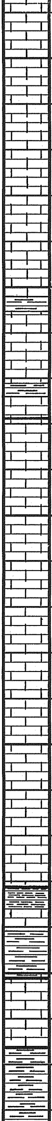
70

ls: off wh, tan, lt. grey, fn-medxtln, scat pr interxtln ø, no show; ls: wh fnxtln, chalky

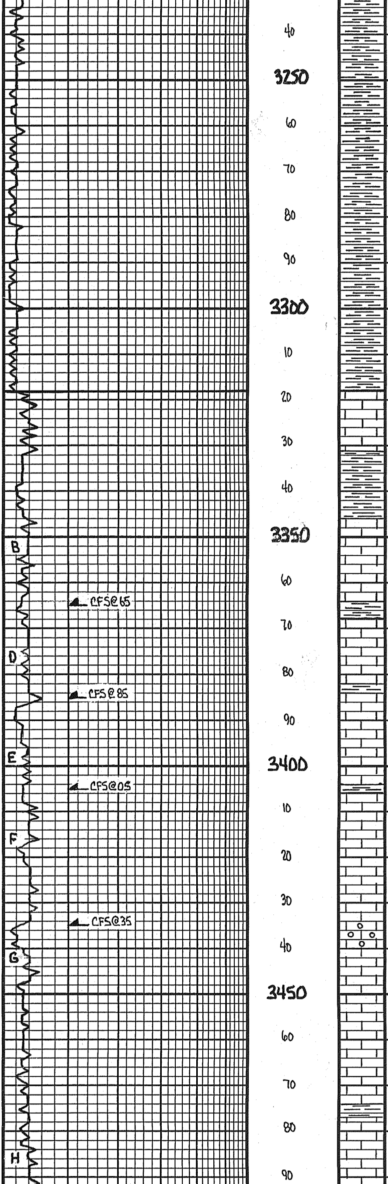
80

ls: as above; w/ grey shale





90	ls: offwh, tan, grey, fn-medxtln, sli foss, scat pr interxtln ø, no show	
3000	ls: tan, grey, fn-medxtln, some mottled, sli foss, no vis ø, wh chalky ls	
10	ls: tan, grey, fn-medxtln, scat calcitic, sli foss, pr interxtln ø, NS	
20	ls: as above: few pcs Δ, dk grey, fresh, opaque	
30	ls: tan, grey, fn-medxtln, sli foss, app pr interxtln ø, no show; considerable wh chalk, Δ lt. grey, fresh, opaque	
40	ls: off wh, tan, fn-med xtln, granular, foss, pr-fr interxtln & vuggy ø, NS; scat sh: grey, green-grey	
3050	ls: tan, grey, dk grey, fn-medxtln, few pcs w/ pr interxtln ø, no show; scat grey, brown	
60	ls: off wh, grey, some brown, fn-med xtln, no vis ø, no show	
70	ls: off wh, lt. grey, scat tan, fn-med xtln, sli foss, chalky in part, scat pr interxtln ø, no show.	
80	ls: off wh, tan, lt. grey, fn-medxtln, foss, granular in part, app pr interxtln ø, no show	**OREAD** 3079 (-1237)
90	ls: tan, lt. grey, fn-medxtln, foss, granular, pr-fr vuggy & interxtln ø, no show.	
3100	ls: as above, becoming chalky, NS	
10	ls: as above	
20	ls: tan, grey, fn-medxtln, foss, mottled in part, no vis ø, no show	
30	ls: as above, cpl pcs w/ pr interxtln ø; w/ wh chalky ls	
40	ls: off wh, lt. grey, fn-medxtln, sli foss, granular in part, scat pr interxtln ø, no show	
3150	ls: as above, w/ ls: tan, lt. brown, vfn-fnxtln, dense	
60	ls: off wh, tan, lt. grey, mostly fn xtln, scat pr interxtln ø, no show	
70	ls: tan, lt. brown, fn-some medxtln, sli foss, no vis ø; NS, w/ wh, chalky, ls	
80	sh: black, dk grey, grey ls: tan, brown, grey, vfnxtln, dense	**HEEBNER** 3181 (-1339)
90	sh: grey, green-grey, cpl pcs brwn	
3200	ls: tan, lt. grey, tan, fn-some med-xtln, v sli foss, few pcs granular, scat pr interxtln & vuggy ø,	**TORONTO** 3201 (-1359)
10	no show	**DOUGLAS** 3216 (-1374)
20	sh: lt. grey, grey, sli micaceous, few pcs brown	
30		



sh: as above

sh: as above, few pcs sli silty

sh: lt. grey, grey, micaceous in part, sli silty

sh: as above

sh: as above

sh: lt. grey, grey, micaceous, sli silty sli sandy

sh: as above

sh: lt. grey, grey, few pcs brown

sh: as above

ls: brown, tan, vfn- some medxtln, sli foss, dense, no vis Ø, no show

ls: lt. grey, grey, few pcs brown, green

sh: as above

ls: tan, lt. brown, fn-medxtln, sli calcitic, tr pr interxtln Ø, no show

ls: as above, w/ ls: grey, fn-med xtln, mottled in part, v. sli foss, no vis Ø, no show

ls: tan, lt. brown, vfn-fnxtln, dense; no vis Ø, no show: ls: dk brown, medxtln, sli foss, sli pelletal, no vis Ø, no show

ls: as above w/ ls: brown, grey, microxtln, dense: w/ sh: grey, green-grey

ls: off wh, tan, lt grey, fn- some medxtln, sli chalky, granular in part, scat vpr interxtln Ø & pr, small vuggy por; few pcs w/ pr spotty st, no show live oil, no odor; scat grey sh

ls: tan brown lt. grey vfn-medxtln, dense ls: tan, lt. brown, grey-brown, fn-medxtln, sli foss, sli granular, scat calcite streaks, pr interxtln & vuggy Ø, cpl ppts FO in calcite veins, tr pr st, no odor.

ls: tan, brown, grey, fn-medxtln, sli foss, sli chalky, no vis Ø, no show

ls: brown, fn-medxtln, ool & ooc, w/ fr-gd ooc Ø; no show

ls: off wh, tan, fnxtln, sli ooc, sli foss, no vis Ø, no show; ls: dk grey, med xtln, ool, no vis Ø, no show

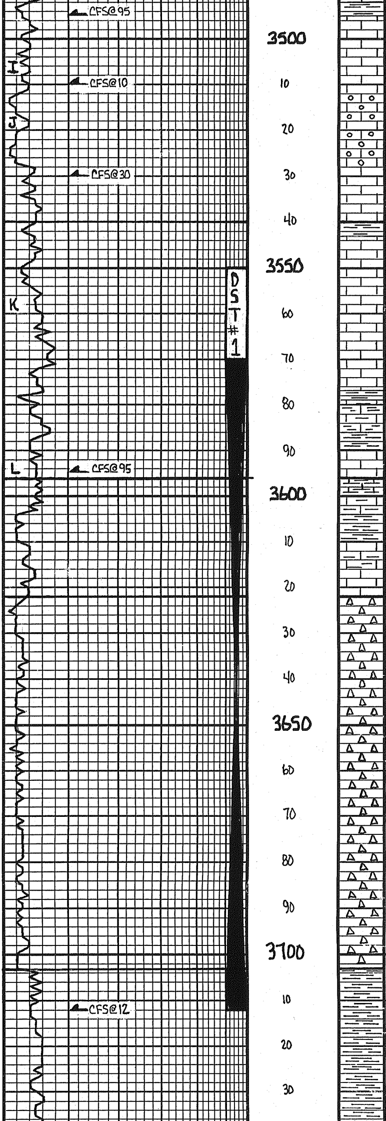
ls: wh, lt. grey, vfn-fnxtln, no vis Ø, no show

ls: as above; w/ ls: grey, fn-med xtln, sli foss, mottled in part, no vis Ø, no show

ls: tan, brown, grey, fn-medxtln, tr pr interxtln Ø, no show; w/ sh: grey, green-grey, calc

ls: off wh, tan, fnxtln, sli granular, few pcs w/ pr interxtln por, no fluor, cut, st, odor, NSO

LANSING
3318 (-1476)



sh: grey, dk grey

ls: wh, tan, fn-medxtln, ool, w/ few foss frags, most well-cemented, vry scat pr interool/interxtln ø, vpr vuggy ø; no fluor, cut, st, odor, NSO.

ls: off-wh, tan, fn-medxtln, ool & ooc, fr-gd ooc ø, no fluor, cut, st, odor; NSO

ls: tan, lt. brown, fn-medxtln, ool & ooc, fr-gd ooc ø, no fluor, cut, st, odor; NSO

ls: tan, brown, some grey, vfn-some medxtln, sli ool, no vis ø; no show

sh: grey, dk grey

ls: tan, lt brown, fn-medxtln, sli ool, few pcs w/ pr interxtln ø, vry scat pr interool ø, no show

ls: tan, brown, some grey, vry fn-some medxtln, dense; no show

ls: tan, brown, micro-fnxtln, dense

ls: as above, no show

ls: tan, brown, some grey, fn-med sli foss w/ some grey, brown sh infill w/ sh: grey, some brown

ls: tan, brown, grey, fn-medxtln, no vis ø, no show

sh: grey, dk grey, scat ls inclusions, w/ ls: brown, fn-medxtln, sli ool, no vis ø, no show

sh: grey, brown, purple-brown, silty, in part

ls: brown, fn-medxtln, some fragmental, w/ green, grey sh infill; ls: lt. grey, vfnxtln, some green; no vis ø

Δ: wh, tan, lt brown, fresh, opaque → semi-trans, scat weathered edges scat pr fluor, wk cut, pr st; w/ Δ: wh, weathered/tripolitic, app pr ppt & vuggy ø, fr fluor, pr cut. (fr-vry gd crush cut), pr-some fr st & sat, SSFO & gd show gas on break; ft. odor; some jasper; sh: grey; few clusters ss: grey, vfngrained, well sorted, w/ siliceous cement, dense → v. pr ø, dk st, NSO, few gas bubbles on break

Δ: as above; dec in sh.

Δ: as above: samples consistent % fresh to weathered same @ 70/30 show remaining as above

Δ: as above

Δ: as above w/ sli inc in dk brown/blk st in weathed Δ.

Δ same as above

sh: grey, brown, few pcs green, rust; scat ls: tan, brown, fn-medxtln, dense

sh: brown, green, some grey, rust; few pcs Δ; wh, fresh, opaque

shale: as above; few clusters ss: clear, fngrained, fr sorting, sub-round, firm, tr pr intergrned ø, tr dd oil residue, NS live oil, some w/ green sh/pyrite matrix

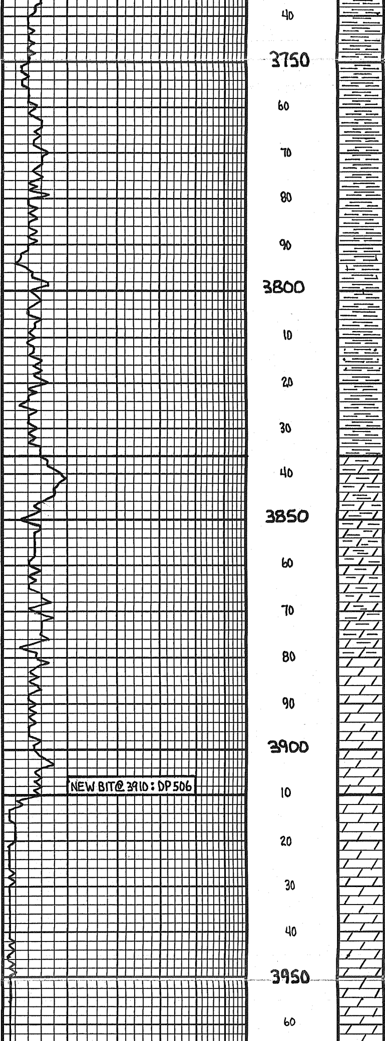
STARK
3540 (-1698)

BKC
3596 (-1754)

VIOLA
3622 (-1780)

DST # 1
(3570 - 3712)
30"-60"-60"-90"
IFP: WK BLOW BLDG TO 2"
FFP: NO BLOW
RECOVERED:
65' MUD
HSP: 1938# - 1949#
FP: 103#-184#/232#-199#
SIP: 768# - 738#
BHT: 114° F
(MODERATE PLUGGING DURING IFP & FFP)

SIMPSON
3703 (-1861)



sh: brown, green, some grey, rust

sh: brown, green, some grey, rust, cpl pcs yellow; cpl pcs brown, vfn-xtln, dense, dolomite

sh: brown, grey, some green; w/ ss: wh fngrained, fr sorting, firm-hard, calc, no vis ø, no show

sh & ss: as above; no show

sh: grey, green, brown

sh: as above; green sh sandy in part; ss: clear, grey, fn grained, fr sorting, firm, some w/ green sh/calc matrix, no vis ø, no show

sh: green, sandy in part, grey, brown, some rust; ls: lt. brown, fnxtln, dense

sh: as above

sh: as above few clusters ss: clear, fn grained, well-sorted, w/ green sh matrix

sh: green, sli sandy, grey, brown

sh: as above w/ dolo: tan, grey, greenish-grey, vfnxtln, dense

dolo: lt grey, tan, vfnxtln, dense; still carrying considerable sh a.a.

dolo: lt grey, mostly vfnxtln, few pcs fn-medxtln, sli sandy, tr vpr interxtln ø, no show

dolo: as above; few pcs green-grey, dense, no show, w/ sh: green, grey, brown

dolo & sh: as above, no show few pcs wh, fnxtln, dolo w/ green sh

dolo: lt. grey, tan, brown, vfn-fn xtln, dense; sh: as above, sli dec in %

dolo: wh, lt grey, tan, vfn-fnxtln, no vis ø, few pcs w/ interbedded green sh, sli sandy

dolo: wh, lt grey, tan, vfn-fnxtln, dense, some sandy

predominately grey green sh w dolo: tan, grey, fn-few pcs medxtln, tr pr interxtln ø, no show

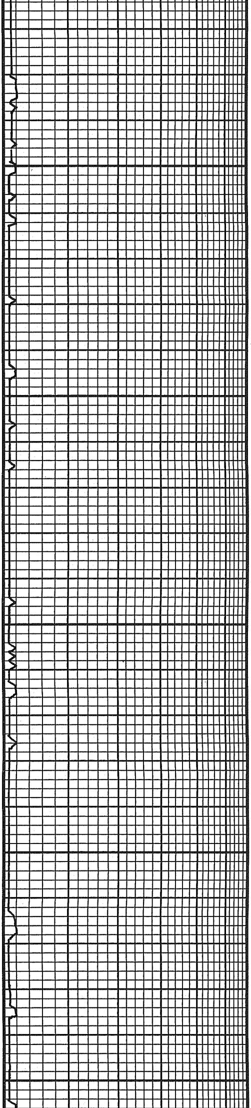
dolo: tan, lt. brown, fn-scat medxtln, no vis ø, no show; dolo: lt. grey, fnxtln, sandy no vis ø, no show

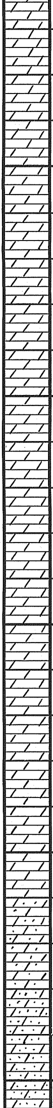
ARBUCKLE
3836 (-1994)

LTD 3904 (-2062)
RTD 3910 (-2068)

@ 3910: WELL WAS LOGGED AND THE GEOLOGIST RELEASED. OPERATOR THEN MADE THE DECISION TO DRILL THE WELL DEEPER TO THE GRANITE WASH

* 3910 — DDTD
— JOINT SAMPLES
— 5' DT / 1' AVG





70

dolo: tan, lt brown, fn-medxtln, no vis 0, no show; w/ dolo: lt. grey, sandy, fnxtln, interbedded green sh in part, no show

80

90

4000

dolo: tan, fn-some medxtln, few pcs w/ pr interxtln 0; dolo: lt grey fn-medxtln, sandy scat ool; no vis 0, no show

10

20

30

40

dolo: offwh, tan, lt. brown, lt. grey, fn-medxtln, sandy in part, no vis 0, no show

4050

60

70

dolo: tan, lt. brown, lt. grey, fn-some medxtln, v sli sucrosic, sli sandy few pcs w/ app pr interxtln 0, NS

80

90

4100

dolo: tan, lt. brown, fn-medxtln, no vis 0, no show; dolo: wh, fn-medxtln, sli rhombic, pr interxtln 0, no show

10

20

30

dolo: tan, lt. brown, fn-medxtln, scat vry pr interxtln 0, no show

40

4150

60

dolo: wh, fn-medxtln, sli sandy, few pcs sli rhombic w/ pr interxtln 0, no show; dolo: tan, lt. brown, fn-medxtln, no vis 0, no show

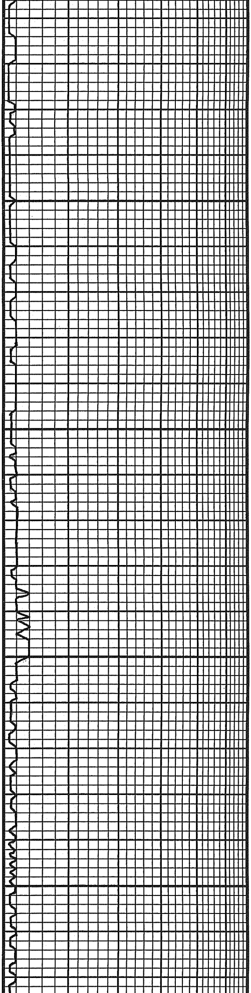
70

80

90

dolo: wh, some tan, fn-medxtln, most dense, scat pr interxtln 0, no show; dolo: lt. grey, fnxtln, sandy, no vis 0, NS

4200



10

20

dolo: as above; w/ few pcs dolo: brown, vfnxtln, dense

30

40

4250

dolo: wh, tan, fn-medxtln, scat pr interxtln ø, no show; dolo: lt. grey, fnxtln, very sandy, no vis ø; N.S

60

70

80

dolo: wh, tan, fn-medxtln, scat pr-some fr interxtln ø, no show; dolo: lt. grey, fnxtln, sandy, lt. brown, fnxtln, dense

90

4300

10

dolo: wh, lt. grey, fn-medxtln, very sandy → ss: wh, fn grained, w/ calc cement, no vis ø, no show

20

30

40

dolo: wh, fn-medxtln, vry scat pr interxtln ø, no show; dolo: wh, lt. grey, fn-medxtln, very sandy (fn-med grained sd), no vis ø; dolo: tan, grey-tan, vfnxtln, dense

4350

60

70

80

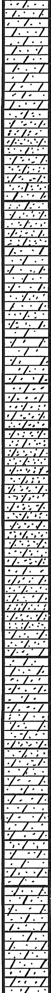
dolo: wh, lt. grey, fn-medxtln, sandy in part, scat pr-some fr interxtln ø, NS; dolo: brown, grey-brown, medxtln, sandy (fn-coarse grained), no vis ø, no show

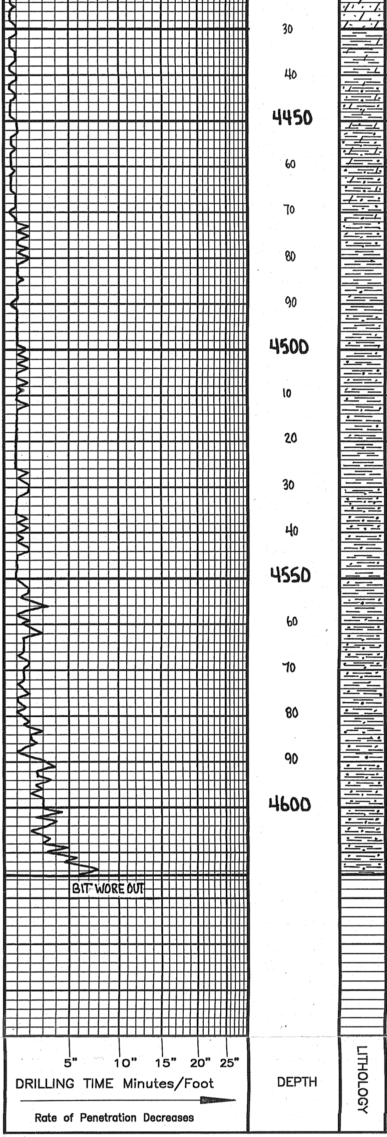
90

4400

10

20





DEPTH	SAMPLE DESCRIPTIONS	OIL SHOWS	REMARKS
30			GRANITE WASH 4430 (-2588)
40	dolo: as above; sli inc in sh: green, brown; scat quartz, clear, orange, fractured, tr biotite.		
60–90	dolo: as above, w/ dolo: brown, grey fn-medxtln, no vis ø; no show; significant inc in sh: grey, green, brown; ss: clear, fn-med grained, rnded, well sorted, grey, green sh matrix, no vis ø; no show; quartz, clear-orange, fractured, w/ biolite & feldspar inclusions		4479' SAMPLE: 1ST SHOW GRANITIC MATERIAL LAG BACK TO 4430' +/-
10–20	predominately sh; grey, green, sandy, in part (fn-med grained sand), no vis ø, no show; granite, pink-orange, tr grey, w/ significant quartz, scat biotite, no show		
30	as above: sh sli pyritic, sli inc in granite & quartz as above; few clusters wh fngrained, ss: well-sorted, calc, shaley (green), no vis ø; NS		
40	as above; w/ few pcs yellow-grn sh		
4550	as above; dec in granitic material		1' DT & 10' SPLS 4550' – 4615'
60–70	predominately sh: grey, green, sli pyritic, sli sandy; some brown; granite & quartz as above; few clusters ss: wh, clear, fn grained, sub round, fr sorting, calc, no vis ø; no show; cpl large, clear, loose, rnded sd grns		
80–90	predominately sh; grey, green, sandy in part; granite same as above; ss: scat clusters wh, grey, fn-med grained, shaley, no vis ø; no show; few pcs wh, fresh, opaque Δ		
4600	sh: grey, green, sandy; ss: clear, grey, fn-med grained, sub rnd, fr sorting, firm, app pr intergrned ø, no show; significant dec in granitic material; few large, loose, clear, rnded, sand grains.		LTD 4611 (-2769) DDTD 4615 (-2773)