

ROBERT STOLZLE

CONSULTING PETROLEUM GEOLOGIST

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 AAPG Cert. # 3224

DRILLING TIME AND SAMPLE LOG

OPERATOR: Mikro Oil LLC
 LEASE: Haberer WELL NO.: 1-27
 FIELD: Unamed
 LOCATION: NE 1/4, SE 1/4, SW 1/4, SE 1/4 (580' 158')
 SEC.: 27 TWP.: 10S RANGE: 16W
 COUNTY: Rooks STATE: KS
 API NO.: 15-163-23990

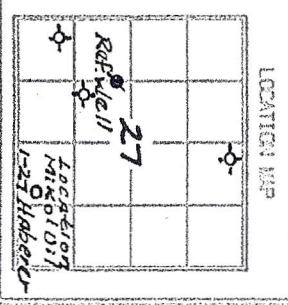
CONTRACTOR: Discovery Drilling, Rig # 4
 COMMENCED: Nov. 23, 2011 COMPLETED: 12/1/11
 ROTARY TOTAL DEPTH: 3700' LOG TOTAL DEPTH: 3700'
 GEOLOGICAL SUPERVISION FROM: 2900' to: T.D.
 MUD-UP DEPTH: 2802' MUD TYPE: Chemical/Polymer

FORMATION	SAMPLE		LOG		STRUCTURAL DEPRESSION
	TOP	THICKNESS	TOP	THICKNESS	
Stone Arch/Anth.	1236'(4813)		1235'(4814)		N/A.
Base Anhydrite	1271'(4778)		1268'(4781)		N/A.
Topoka Em.	2975'(926.)		2975'(926.)		+4'
Haberer Sh.	3201(-1158')		3201(-1158')		+6'
Toronto Ls	3230(-1181)		3230(-1181)		+5'
Lansing Gp.	3252(-1203)		3251(-1202)		+6'
G. Zone Porosity	3350(-1301)		3347(-1298)		+12'
Stank Shale	3453(-1404)		3452(-1403)		+8'
Basak's City Gp.	3503(-1454)		3501(-1452)		+10'
Comglomate Zn.	3528(-1479)		3531(-1482)		+39'
Simpson Sandstone	3596(-1547)		3595(-1546)		+20'
Abuckle Em.	3619(-1570)		3619(-1570)		+14'
Total Depth	3700		3700		

ELEVATIONS
 KB 2049'
 CL 2041'
 Measurements are all from KB

CASING RECORD
 SURFACE: 8 5/8" @
222' KB, Circ.
 PRODUCTION: 5 1/2" 1550#
@ 3699' W/1555X,
PC @ 1222'

WIRELINE SURVEYS
 The Parformers LLC
 Compensated Density
 - Heatlog, Dual
 Induction, BHC
 Sonic and Mikro
 Resistivity Logs



Reference Well for Structural Comparison: Paterson #1 Nelson NE 1/4 SW 1/4 27
 Comments and Recommendations: Recommendations: Completions as Oil Product

DST # 1 ZONE: Lansing B'-F' Zones
 INTERVAL: 3256'-3348'

Pressures:	Time	Press.	RECOVERY
1. Initial Hydrostatic		1634 psi	1055' Gas in Pipe
2. Initial Flow: Start	0	59 psi	105' Clean Oil (5% Mud)
3. Initial Flow: End	15	84 psi	75' Gas + Oil / Cut Mud
4. Initial Shut-in: End	30	466 psi	(5% gas, 40% oil)
5. Final Flow: Start	0	89 psi	45' Gas + Oil / Cut Mud
6. Final Flow: End	45	137 psi	(25% gas, 30% oil)
7. Final Shut-in: End	90	478 psi	15' gas + oil / cut mud
8. Final Hydrostatic		1602 psi	(55% gas, 20% oil)

BHT: 97°F
 Rv: Strap .28' long, deviation 1 1/4°

Blows: I.F. - BOB 4 1/2 min.
 I.S.I. - died in 7 min.
 F.F. - BOB - 4 min.
 F.S.I. - BOB 14 min.

DST # 1 8734 Chart
 Interval: 3256'-3348' Depth: 3262'

DST # 2 ZONE: LKC "H"-L" Zones
 INTERVAL: 3370'-3510'

Pressures:	Time	Press.	RECOVERY
1. Initial Hydrostatic		1735 psi	10' Drilling Mud
2. Initial Flow: Start	0	86 psi	
3. Initial Flow: End	15	88 psi	
4. Initial Shut-in: End	30	176 psi	Blows:
5. Final Flow: Start	0	87 psi	I.F. - 1" blow
6. Final Flow: End	30	102 psi	I.S.I. - No blow
7. Final Shut-in: End	60	153 psi	F.F. - No blow
8. Final Hydrostatic		1688 psi	F.S.I. - No blow

BHT: 95°F
 Rv: _____

DST # 2 8734 Chart
 Interval: 3370'-3510' Depth: 3373'

Stone Corral
Anhydrite
(+813')

Base of
Anhydrite
(+778')

start 1' drilling time at
2900'

start 10' wet + dry samples
at 3,000'

Topeka Frm.
(-926')

Ls: gry, m, hrd, dns, vfg xln, occ
foss, tr. sdy, N @ NSFOC

Ls: gry - crm, hrd, dns, vfg xln,
occ foss, tr. sh. std, tr.
sdy, N @ NSFOC

Sh: dk gry, m, hrd, dns, hazy
Ls: crm - gry, m, hrd - fnd, dns,
vfg xln, occ foss, tr. vfg,
no ldic, vug. ϕ , 1 ga. stn. + odor,
tr. cut + fl. ? perm.

Weak Show

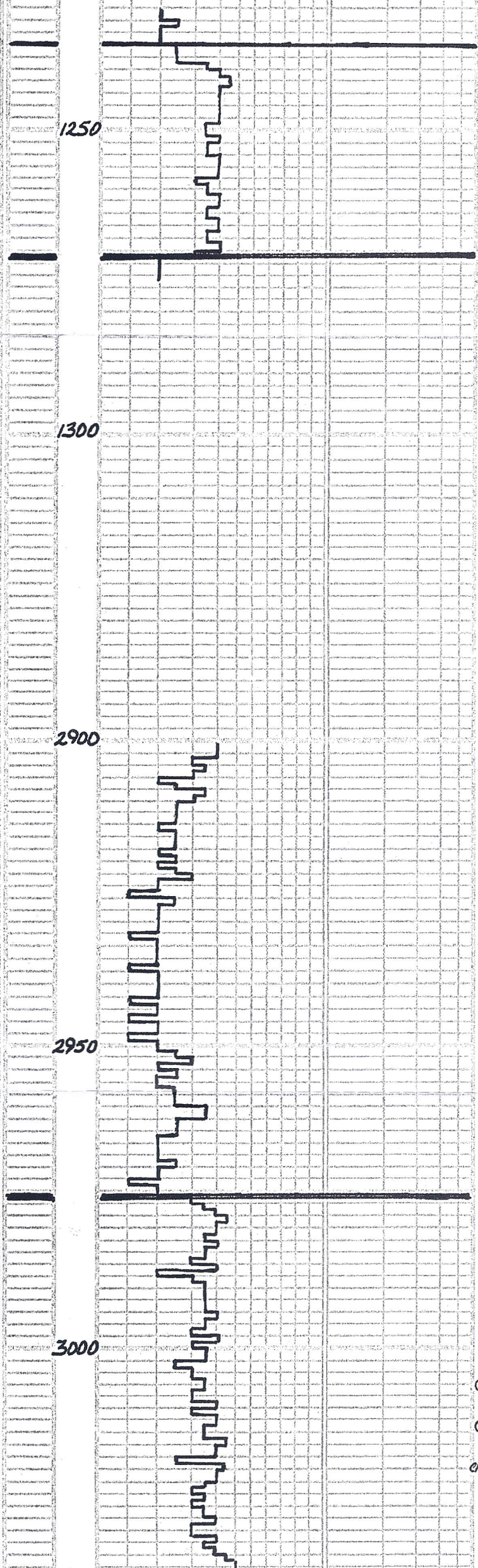
Ls: P, A, mod. - udif. str. ite.
bldg gas + oil, tr. F, O, 1 ga.
cu + fl., vfg. moldic ϕ ,
? perm.

Fair Show

Sh: gry - dk gry, m, stf, dns,
earthy - stfy, tr. carb.

Ls: crm - gry, m, hrd, dns, vfg xln,
occ foss. + sh. std. N @ NSFOC

Ls: crm - tan, hrd, dns, vfg - mxln,
mic, occ foss. + sh. std, tr.
chky N @ NSFOC



3050

Ls: A.A. NΦ NSFOC
 Fr. ss. gry., hrd., dns., VEG, VEG,
 W/C.M.D., pr. s.t.d., sh. stn.,
 mic. A. NΦ NSFOC
 Ls. crm.-gry., hrd., dns., VEG-mxln.,
 mic., occ. ph. gry., occ. foss.
 sh. stnd. NΦ NSFOC
 Ls. crm.-gry., hrd., dns., VEG, xln.
 foss., sh. stnd., tr. ch. NΦ NSFOC

3100

Ls: crm.-tan-gry., hrd., dns., VEG,
 xln., foss., abun., sh. stn.,
 1-2 pc. w/ wk. cut & fl., no vis. φ
 v. v. wk. show
 sh. bik., m. hrd., dns., heavy-fiss.
 Ls: crm.-dk. gry., hrd., dns., VEG,
 -mxln., mic., tr. foss. NΦ NSFOC
 Sh: m. sst.-m. hrd., dns., carb., earthy
 Ls: crm.-tan, m. hrd., m. sst., dns.,
 VEG-mxln., tr. mic., tr. ch., occ.
 foss., tr. sh. stnd., NΦ NSFOC
 Ls: wh.-tan, hrd., dns., VEG-mxln.,
 mic., tr. foss., tr. sh. stnd.,
 tr. ch. NΦ NSFOC

Kung Hill Shale (-1032')

3150

Ls: A.A., abun. gry. ch. occ.
 m. sst., sh. stn., tr. chiky.
 tr. foss. NΦ NSFOC
 Ls: crm.-tan-gry., m. sst., chik.-
 hrd., dns., mxln., mic., occ. sh.
 stnd., tr. foss. NΦ NSFOC
 Sh: gry., sst., stn., earthy
 sh. A.A.
 Ls: A.A., 1-2 pc. w/ gd. vug. φ
 lt. brn. stn., tr. cut & fl., wk.
 odor, no F.O. v. thin zone v. wk. show

Queen Hill Shale (-1088')

3200

Sh: dk. gry.-bik., m. hrd., dns., carb.
 earthy, occ. dk. gry. ch.
 Ls: crm.-gry., m. sst., hrd., mxln.-
 mxln., tr. v. xid., sh. stn. NΦ NSFOC
 Ls: crm.-tan-gry., m. sst.-hrd., dns.
 VEG-mxln., mic., abun. sh. stn.,
 foss., tr. chik. NΦ NSFOC
 Ls: crm.-tan-gry., hrd.-m. sst., chik.
 VEG-mxln., occ. foss., abun. sh.
 stnd., tr. pyr. NΦ NSFOC
 Ls: crm.-tan, m. hrd., dns., VEG xln.,
 foss., sh. stn., tr. tr. int. part.
 vug. φ, lt. brn. stn., bldg. gas, gd.
 cut & fl., thin zone, ? perm.

Mud Check at 3170'
 M.W. 8.7 lb./gal
 Vis. 76 sec./qt.
 Wt. 6.4 ml./30 min
 chl. 2000 ppm
 Solids 2.2 %
 LCM 2 lbs./bbl.

Weak Show

3250

Ls: crm.-gry., hrd., dns., VEG-mxln.,
 mic., sh. stnd., occ. foss.
 NΦ NSFOC
 Ls: crm.-tan-gry., hrd.-m. sst.,
 dns., tr. chik., VEG-mxln., tr.
 ch., abun. sh. stn., tr. foss.
 NΦ NSFOC
 Ls: A.A., less. sh. stnd., occ.
 ch. NΦ NSFOC
 Sh: gry.-tr. bik., m. sst.-m. hrd.,
 dns., earthy, tr. carb.
 Sh: dk. gry.-bik., hrd., dns., carb.,
 earthy-hackly
 Ls: crm.-gry., hrd., dns., VEG-mxln.,
 sh. stnd. NΦ NSFOC
 Sh: gry., m. sst.-m. hrd., dns., earthy
 Ls: crm.-gry., m. sst.-m. hrd., dns.,
 VEG-mxln., occ. chik., abun. sh.
 stn. NΦ NSFOC
 Ls: crm., hrd.-m. sst. & chik., tr. xln.
 mxln., mic., occ. sh. stnd., tr.
 foss. NΦ NSFOC

Hecbner Shale (-1158')

Toronto Ls. (-1181')

3300

Ls: crm.-gry., hrd., dns., VEG-mxln.,
 mic., sh. stnd. NΦ NSFOC
 Sh: gry. gry.-dk. gry., m. hrd., dns.
 occ. stn., earthy-hackly
 Ls: crm., hrd., dns., VEG-mxln.,
 mic., rare foss. NΦ NSFOC
 Sh: mar. m. sst., dns., m. sst.,
 dns., earthy
 Ls: crm., hrd., dns., VEG-mxln.,
 mic., tr. foss., tr. pr.-v. pr.,
 vug. moldic φ w/ lt. brn. stn.
 2-3 pc., wk. cut & fl., v. wk. show
 Ls: crm.-tan-gry., hrd., dns.,
 VEG xln., tr. mic., sh. stnd.,
 foss. NΦ NSFOC

Lansing Group (-1203')

DST #1
3256'-3348'
 REC. 240' GUSMCO
 strap .28' long
 Dev. 1' 1/4"

Weak Show

3350

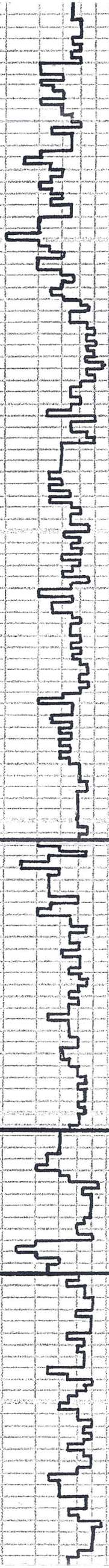
2

3400

3450

3500

3550



Ls: wh. crm., hrd. - sft. + chik,
 fr. foss. + ool. w/ pr. oom. ϕ ,
 lt. brn. stn., wk. - fr. cut + fl.,
 fr. odor., No F.O., V? perm. **Weak Show**

Ls: crm. - wh., hrd., dns. - sft. + chik
 vfg. mxln., tr. foss. + ool. w/ pr.
 int part. + oom. ϕ , lt. brn. stn.
 wk. odor., wk. cut + fl., V? perm **Weak Show**

Ls: A. A., tr. ϕ + snows, A, A.
 Sh: dk. gry. - blk., m. hrd., dns., earthy
 Ls: crm., hrd., dns., sft. - vfg. mxln., tr. fr.
 - pr. vug. ϕ , w/ lt. brn. stn., fr. odor., No F.O. **Weak Show**

Ls: A. A. sft. - vfg. vug. + pr. vug. ϕ
 gp. unit. stn., fr. - gp. cut + fl.
 fr. odor., No F.O., ? perm. **Fair Show**

Ls: crm., hrd., vfg. mxln., ool. w/
 fr. - gp. oom. ϕ , gp. odor., lt.
 brn. stn., fr. - gp. cut + fl., No F.O.
 some barren ϕ v. pr. - No perm. **Weak Show**

Ls: crm. - gry., hrd., dns., vfg. - mxln.
 mic., occ. sft. + chik. + pr.
 foss. + ool., tr. pr. oom. ϕ
 NSFOC **Mud Check @ 3366'**
 M.W. 8.8
 Vis. 75
 W.L. 7.6
 Chl. 4500 ppm
 Solids 3.3%
 L.C.M. 1.5#

DST # 2
3370' - 3510'
Rec. 10' Mud

Ls: crm. - H. gry., hrd., dns., vfg. -
 mxln., rare foss., occ. sft. +
 chiky. **NSFOC**
 Sh: gry. - blk., m. sft. - m. hrd., dns. hack.
 sft. A. A., occ. carb., earth. hack. **Chl. 4500 ppm**
Solids 3.3%
L.C.M. 1.5#

Ls: crm., hrd., dns., vfg. - mxln., tr.
 ool. w/ oom. ϕ , lt. stn., wk. cut
 + fl., No perm. V. V, wk. show **DST # 2**
3370' - 3510'
Rec. 10' Mud

Ls: crm. - lt. gry., hrd., dns., vfg. -
 mxln., mic., tr. chl., occ. sft. +
 chiky., rare foss. **NSFOC**

Ls: crm. - tan - lt. gry., hrd., dns.,
 vfg. - mxln., mic., tr. chl., tr.
 sft. + chik. **NSFOC**
 Sh: dk. gry. - m. sft., dns. hack.
 Ls: crm. - lt. gry., hrd., dns., vfg.
 - mxln., mic., occ. foss. + ool.,
 tr. pr. vug. ϕ , tr. v. H. oil stn.,
 wk. cut + fl., some barren ϕ v. wk. show

Ls: crm. - tan - lt. gry., hrd., dns.,
 vfg. - mxln., mic., occ. chik.
 tr. pyr., occ. foss. **NSFOC**
 Sh: dk. gry., m. sft., dns., earthy
 Ls: crm. - tan - lt. gry., hrd., dns.
 vfg. - mxln., occ. foss. + ool., 1-2
 pr. w/ pr. int part. vug. ϕ - vfg.
 lt. brn. stn., wk. cut + fl., v. wk. show

Ls: crm. - tan - lt. gry., hrd., dns., vfg.
 - mxln., mic., occ. chik., tr. foss.
 tr. pyr. **NSFOC**

Sh: dk. gry. - blk., m. sft. - m. hrd.,
 dns., occ. carb., earthy - hacky
 Ls: crm. - lt. gry., hrd., dns., vfg. -
 mxln., mic., occ. chik. **NSFOC**
 Sh: gry. - rd. brn., m. sft., earthy
 Ls: crm. - tan - gry., m. sft. - hrd., dns.,
 vfg. - mxln., chik., tr. ool. w/ oom. ϕ
 fr. - 1-2 pc. oil stn., V? perm **Weak Show**

Ls: A. A. crm. - gry., sft. chik. -
 hrd., dns., occ. foss. + ool.
NSFOC

Sh: dk. gry. - blk., m. sft. - m. hrd., dns.
 carb., earthy
 Ls: crm. - gry., hrd. - sft., dns., vfg. -
 mxln., mic. - chik. **NSFOC**
 Ls: crm. - tan - gry., hrd., dns., vfg. - mxln.
 mic., tr. sft. + chik., occ. foss. + ool.
 w/ tr. pr. int part. vug. ϕ , lt. brn. stn.,
 wk. odor., tr. cut + fl., thin zone **Weak Show**

Ls: A. A., 1-2 pc. w/ ϕ + stn. A. A.

Sh: dk. gry. - tr. rd. brn., m. sft.,
 earthy. - sly **Base of**
Kansas City
Group (-1454')

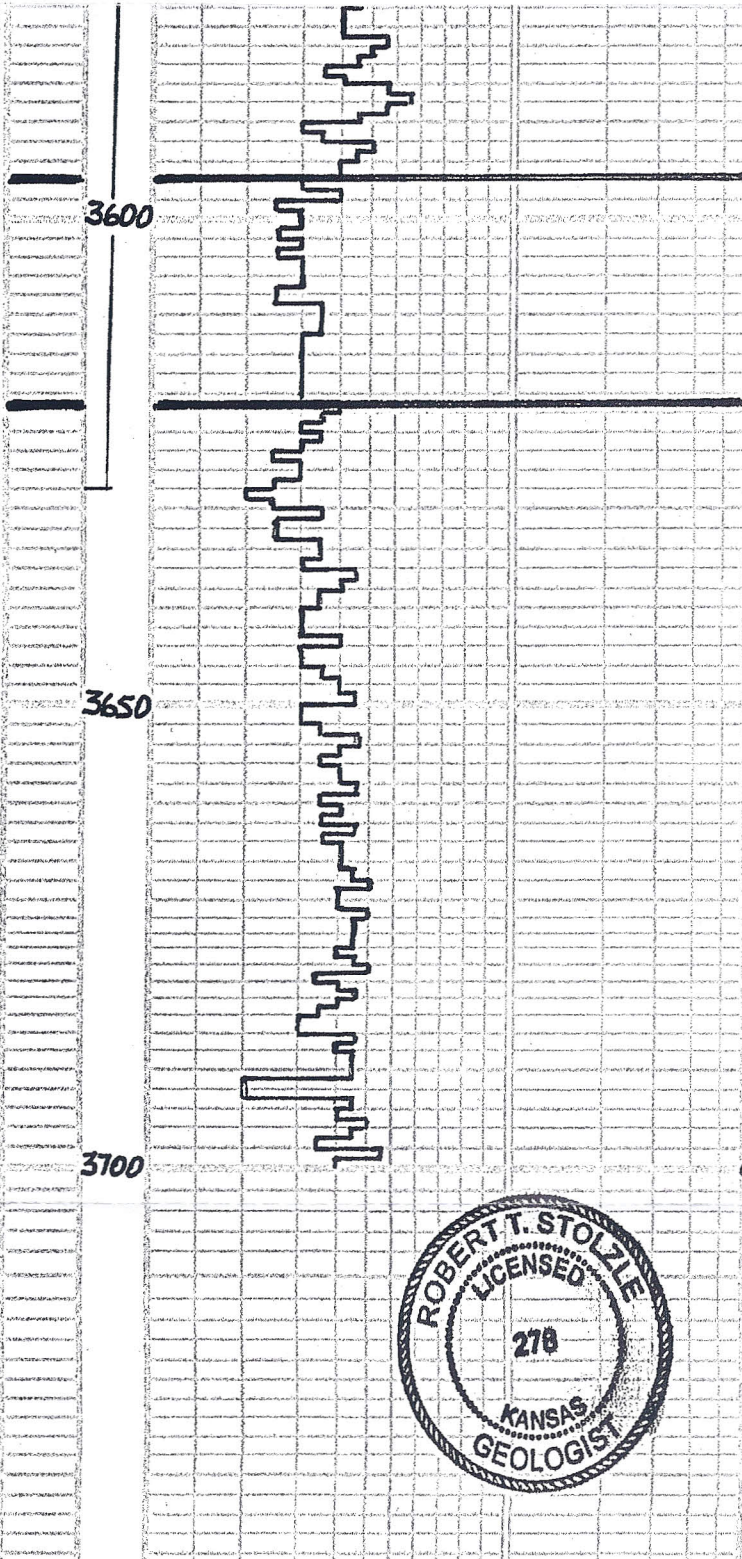
Sh: gry. - rd. - dk. gry. - rd. brn.,
 pyr., occ. sly, sandy, earthy
 Ls: crm. - tan, hrd., dns., mxln.,
 mic., rare foss. **NSFOC**
 Sh: gry. - rd. - ylw - rd. brn., m. sft.,
 sly - sandy, earthy
 tr. ss: gry. - wp., hrd. dns., vfg.
 mod. sft., v. w. cond. **NSFOC**

Ls: crm. - tan, hrd., dns., vfg. -
 mxln., mic., occ. chl., rare
 foss., occ. ls. + chl. pebb. **Conglomerate**
Zone (-1479')

Sh: A. A. **NSFOC**
 Sh: gry. - rd. - rd. brn., m. sft.,
 sly. - apr. ny
 Ls: wh - rd. sh. stnd., hrd., dns.
 occ. chl., occ. pebb. **NSFOC** **Mud Check @ 3510'**
IT. W. 8.9
Vis. 76
W.L. 7.6
Chl. 61000 ppm
Solids 3.8%
L.C.M. 1.5#

Cg: sh: ch. + ls. pebb. A. A. **NSFOC**
 tr. ss - rd. stnd. **NSFOC**
 Ls: crm. - gry., hrd., dns., mxln.,
 mic. **NSFOC**
 Cg: sh: A. A. **NSFOC**
 Ls: crm., hrd., dns., vfg. - mxln.,
 mic., occ. pebb. surf., occ.
 sh. stnd. **NSFOC**
 Cg: ls: sh: chl. vlg. chl. pebb.,
 wh. hrd. dns. ls., rd. - gry. sh.
 earthy. **NSFOC**

05183
3498-3628'
REC. 744'
O+GCWM



Cg: Sh. mar.-gray.-rd. brn. m. st. dms. sandy, earthy
ls. + ch. wh.-ylw. hrd. dms
S.A. stnd. ppbb. surf. NSFOC
Cg: Sh. rd. st. clayey, ls. ch.
A.A. occ. ss. gray, hrd. dms.,
fr. - VEG. w. cmtd. fr. A. No
Vis. NSFOC

Sh: A. A., fr. blu-grn. waxy simp. sh.
ss. pt. brn. m. hrd. fr. A. med.
fr. grnd. sub ang. sub rhd. w. cmtd.
V. pr. Vis. 0, 1-2 pt. fr. cut + fl. No odor V. weak show

○ tr. ss. A. A. fr. stn. fr. F.O. in
fr. A. smpls. No odor
Weak Show

Sh: fr. blu-grn. waxy simp. sh.
mar. rd. brn. m. st. dms. hrd.

Dol: crm.-tan, m. hrd. fr. xln. occ. fr. -
gd. vug. 0, fr. fr. grnd. int.
xln. 0, gd. od. fr. F.O. on break
fr. - wk. cut + fl. fr. ool. ch.

○ Dol: crm. m. hrd. fr. xln. dms. occ.
fr. - pt. vug. moldic 0, 7 in xln.
0, fr. stn. fr. odor, wk. cut
+ fl., No. 0, Abun. carings

○ Dol: crm. m. hrd. fr. - VEG. xln. dms.
fr. fr. vug. 0, some pom. pr.
No int xln. 0, wk. od. fr. F.O.
on break, fr. - wk. cut + fl. looks wet

Dol: crm. m. hrd. - hrd. dms. fr. -
VEG xln. occ. gd. vug. 0, fr. int.
xln. 0, fr. od. 0, 1 stn. V. wk. cut
+ fl., No odor, No. 0, V. weak show

Dol: crm.-tan, hrd. fr. - VEG xln.,
occ. gd. vug. 0 - some pom. fr.
pr. int xln. 0, fr. od. 0, 1 stn. V. wk. cut
+ fl., V. wk. cut + fl. V. weak show

Dol: crm.-tan-pink, hrd. dms., fr. -
fr. - VEG xln., pr. - No int xln. 0
fr. fr. vug. 0, fr. rexed. Abun.
carings, fr. ch. NSFOC

Dol: crm.-tan-pink, m. st. - hrd.,
dms. fr. - VEG xln., pr. int xln. 0,
fr. - pt. vug. 0, Abun. ch. fr.
rexed. NSFOC

Dol: wh.-tan-pink, fr. - VEG xln. occ.
fr. A. w. lg. - ex. int xln. 0, fr. vug. 0,
fr. ch., fr. pyr. fr. rexed.
NSFOC

Simpson ss.
(-1550')

Weak Show

Arbuckle fm.
(-1570')

Fair Show

Weak Show

Weak Show

Mud Chack @ 3667'
M. w. 9.0
Vis. 67
W.L. 8.0
Chi. 6,000 ppm
Solids 4.6%
L.C.M. 1.5#

D.T.D. 3700'
L.T.D. 3700'

Deviation 2°

Robert Stolzle
11/30/11

