ROBERT STOLZLE

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AAPG Cert. # 3244

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DRILLING TIME AND SAMPLE LOG

OPERATOR: Murfin Drilling Co., Inc.
LEASE: Luetta WELL NO.: 1-15
FIELD: Wildcat
LOCATION: 970'FNL, 960'FEL (NESWNENE)
SEC.: 15 TWP: 2S RANGE: 29W
COUNTY: Decatur STATE: KS
API NO.: 15-039-21172-00-00

CONTRACTOR: Murfin Drilling Co., Rig #8
COMMENCED: April 29, 2013 COMPLETED: 5/6/13
ROTARY TOTAL DEPTH: 3990' LOG TOTAL DEPTH: 3992'
GEOLOGICAL SUPERVISION FROM: 2985' to: T.D.
MUD-UP DEPTH: 2789' MUD TYPE: Chemical Polymer

ELEVATIONS

KB 2679'
GL 2674'
Measurements are all from KB

CASING RECORD

SURFACE: 8 5/8" 23# @218' w/190SK, Circ.
PRODUCTION: None-P&A.

WIRELINE SURVEYS

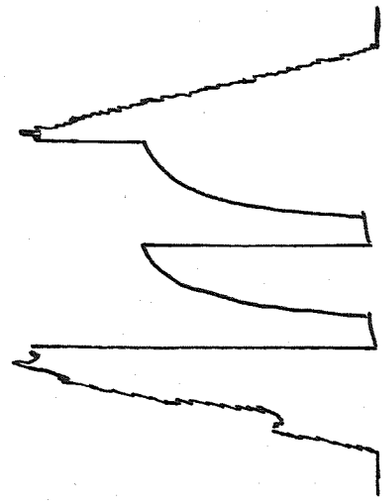
Pioneer Energy Services: Dual Comp. Porosity, Dual Induction, BHC Sonic and Micro-resistivity logs were run.

FORMATION	SAMPLE TOP	SAMPLE SUBSEA	LOG TOP	LOG SUBSEA	STRUCTURAL COMPARISON
Stone Corral Anhy.	2413	(+266)	2414	(+265)	-11'
Base of Anhydrite	2445	(+234)	2445	(+234)	-10'
Neva Ls.	3090	(-411)	3090	(-411)	-7'
Foraker Ls.	3207	(-528)	3207	(-528)	-4'
Stotler Ls.	3360	(-681)	3362	(-683)	-6'
Topeka Fm.	3473	(-794)	3476	(-797)	-5'
Dread Ls.	3623	(-944)	3623	(-944)	-5'
Heebner Sh.	3637	(-958)	3638	(-959)	-4'
Lansing Group	3680	(-1001)	3680	(-1001)	-1'
Stark Shale	3848	(-1169)	3848	(-1169)	-9'
Base KS City Gp.	3894	(-1215)	3894	(-1215)	-9'
Total Depth	3990		3992		

LOCATION MAP

Reference Well for Structural Comparison: MDC #1-14 Pollnow Sec. 14 T2S-R29W
Comments and Recommendations: Recommended well be plugged and abandoned.

DST # 1 Interval: 3639'-3705' Chart Depth: 3640' 8791



DST # 1 ZONE: Lansing 'A' Zone
INTERVAL: 3639'-3705'

Pressures:	Time	Press.
1. Initial Hydrostatic		1886 psi
2. Initial Flow: Start	0	19 psi
3. Initial Flow: End	30	49 psi
4. Initial Shut-in: End	60	1203 psi
5. Final Flow: Start	0	48 psi
6. Final Flow: End	30	62 psi
7. Final Shut-in: End	60	1191 psi
8. Final Hydrostatic		1814 psi

BHT: 110°F
Rw: ____

RECOVERY
124' Oil spotted Drilling Mud

Blow Desc.:
I.F.-1/4" died in 20 min.
I.S.I.-No blow
F.F.-No blow
F.S.I.-No blow

Deviation 1°

DST # 2 Interval: 3691'-3820' Chart Depth: 3692' 8791

DST # 2 ZONE: LKC 'D', 'G' + 'H' Zones
INTERVAL: 3691'-3820'

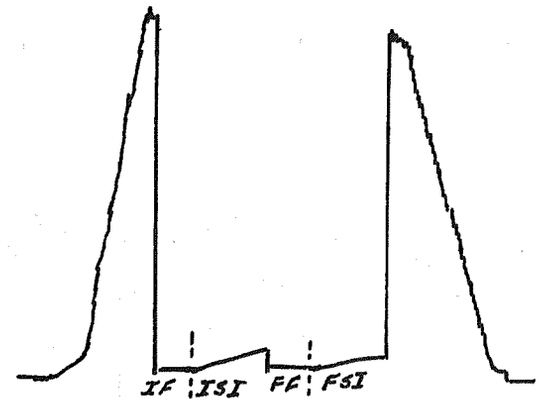
Pressures: Time Press.

RECOVERY

Pressures:	Time	Press.	RECOVERY
1. Initial Hydrostatic		1922 psi	20' Oil
2. Initial Flow: Start	0	36 psi	60' Oil cut Mud
3. Initial Flow: End	30	48 psi	(30%) oil
4. Initial Shut-in: End	60	155 psi	Blow Desc:
5. Final Flow: Start	0	51 psi	I.F.-1/4" died in 25 Min.
6. Final Flow: End	30	59 psi	I.S.I.-No blow
7. Final Shut-in: End	60	117 psi	F.F.-No blow
8. Final Hydrostatic		1903 psi	F.S.I.-No blow

BHT: 109°F

Rw:



Strap 1.49' long

DST # 3 ZONE: Ks. City 'J' & 'K' Zones

INTERVAL: 3809'-3885'

Pressures:	Time	Press.	RECOVERY
1. Initial Hydrostatic		1963 psi	20' Drilling Mud
2. Initial Flow: Start	0	22 psi	
3. Initial Flow: End	30	31 psi	Blow Desc:
4. Initial Shut-in: End	30	563 psi	I.F.-surf. blow <1 Min.
5. Final Flow: Start	0	31 psi	I.S.I.-No blow
6. Final Flow: End	30	34 psi	F.F.-No blow
7. Final Shut-in: End	30	514 psi	F.S.I.-No blow
8. Final Hydrostatic		1959 psi	

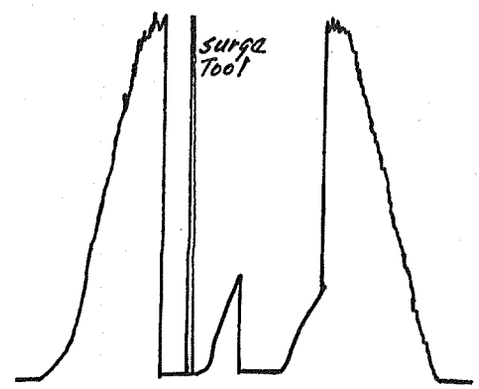
BHT: 107°F

Rw:

Surged tool to verify tool was open

DST # 3 8791 Chart

Interval: 3809'-3885' Depth: 3810'



ABBREVIATIONS USED

ROCK TYPES:

Ls - limestone
Sh - Shale
Ss - Sandstone
Slts - Siltstone
Cg - Conglomerate
Cht - Chert
Qtz - Quartzite
Gran - Granite
Dol - Dolomite
Chlk - chalky

COLOR:

Wh - White
Crm - Cream
Clr - Clear
Rd - Red
Grn - Green
Gry - Grey
Blk - Black
Mot - Mottled

HARDNESS:

Sft - Soft
M.Sft - Moderately soft
Hrd - Hard
V.Hrd - Very hard

FABRIC:

Fn.grn - finegrained
VFG - Very fine grained
Med - Medium
Crs - Coarse
Det - Detrital
Foss - Fossiliferous
Xln - Crystalline
Mxln - Microcrystalline
Ool - Oolitic
Oop - Oopoldic
Mat - Matrix

OTHER TERMS:

Fl - Fluorescence (of oil)
min fl - mineral fluorescence
pyr - pyritic
glau - glauconitic
carb - carbonaceous
stn - stain (of oil)
cut - oil cut
AA - as above
Ø - porosity
NSFOC - no stain, fluorescence, odor, or cut (of oil)
smpl - sample
perm - permeability
F.O. - free oil
vug - vugular
tr - trace
w/ - with

MODIFIERS:

gd - Good
fr - Fair
pr - Poor
ex - excellent
v - very
w - well
tr - trace
occ - occasional
vis - visible
N - no
gran - granular
intergran - intergranular
pp - pinpoint
dd - dead
away - away

TEXTURE:

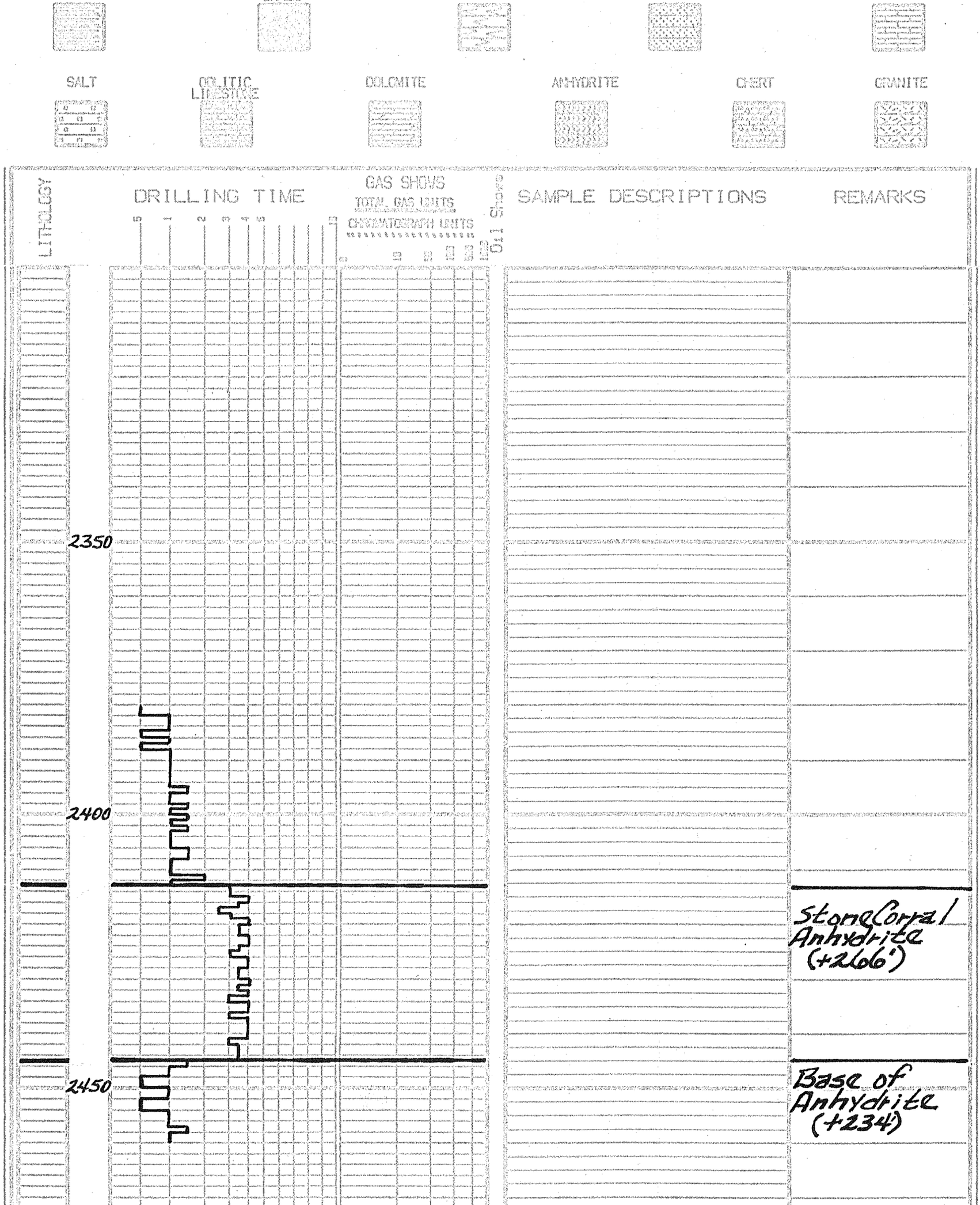
Dns - Dense
Cly - Clayey
Frl - Friable
Earth - Earthy
Hack - Hackly
Fiss - Fissile
Vit - Vitreous
Vug - Vugular
Mic - Micritic

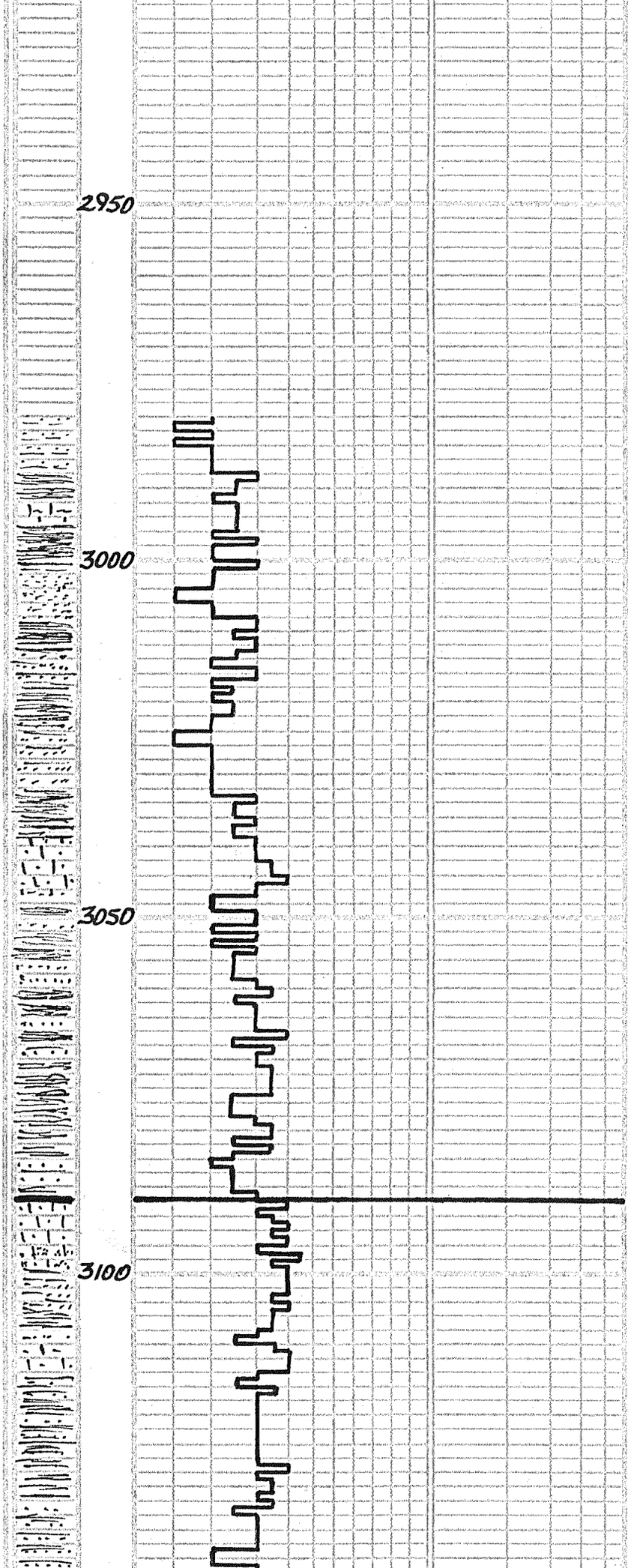
OIL SHOWS

- Weak Oil Show
- Fair Oil Show
- Good Oil Show
- Excellent Oil Show

ROCK TYPE SYMBOLS

SHALE | CARBONACEOUS SHALE | QUARTZITE | SANDSTONE | LIMESTONE


SALT
OOLITIC LIMESTONE
DOLOMITE
ANHYDRITE
CHERT
GRANITE
LITHOLOGY
DRILLING TIME
GAS SHOWS
TOTAL GAS UNITS
CHROMATOGRAPH UNITS
Oil Shows
SAMPLE DESCRIPTIONS
REMARKS
2350
2400
2450
Stone Corral Anhydrite (+266')
Base of Anhydrite (+234')



Start 1' drilling time and 10' wet and dry samples at 2980'

Sh: rd brn-lt gry, sft, clayey, occ. m. sft, earthy, occ. slty-sndy tr. Ss: gry, hrd, dns, vfg, w. cmtd. mod. srtd. NØ NSFOC

Sh: lt gry.-rd. brn, sft.-v. sft., clayey, sndy., tr. Ss: AA. NØ tr. Ls: gry, m. hrd, dns, sh. stnd. poss. pebbles NØ NSFOC

Sh: A.A.
Ss: gry.-rd. brn, m. sft, dns, vfg. pr. srtd. w. cmtd. NØ NSFOC

Sh: rd. brn, sft, slty-sndy, clay-earthy, occ. Ss:-slts: A.A., rd. brn., tr. gry NØ NSFOC

Sh: A.A.
Ss: crm-gry., hrd, -m. hrd, dns, fn-vfg., mod-pr. srtd, sub. Ang. w-v.w. cmtd. NØ NSFOC
Ss: A.A. NØ NSFOC

Sh: rd. brn.-dk. gry., m. sft.-sft., clayey-earthy
Ls: gry., hrd, dns., vfg, sndy-v. sndy-calc. Ss: fn grnd, tan, hrd, dns., mod. srtd., v.w. cmtd. NØ NSFOC
Ss: A.A. NØ NSFOC, tr. Ls: crm-tan, m. hrd, dns, vfg-mxln, mic, rare foss. NØ NSFOC
Sh: rd. brn., sft., clayey

Sh: rd. brn.-lt gry., v. sft. & clayey -sft., earthy, tr. sndy

Sh: rd. brn.-lt. lt. gry., v. sft., clayey, occ. sft. & earthy

Sh: rd. brn., sft.-v. sft., clayey, sndy., tr. blu-grn-gry. grn. earthy.

Ls: crm.-gry., hrd-m. hrd, dns., vfg-mxln, sh. stnd., sndy.-v. sndy-calc. Ss: fn-vfg., mod.-w. srtd., v.w. cmtd. NØ NSFOC

Nava Ls. (-411')

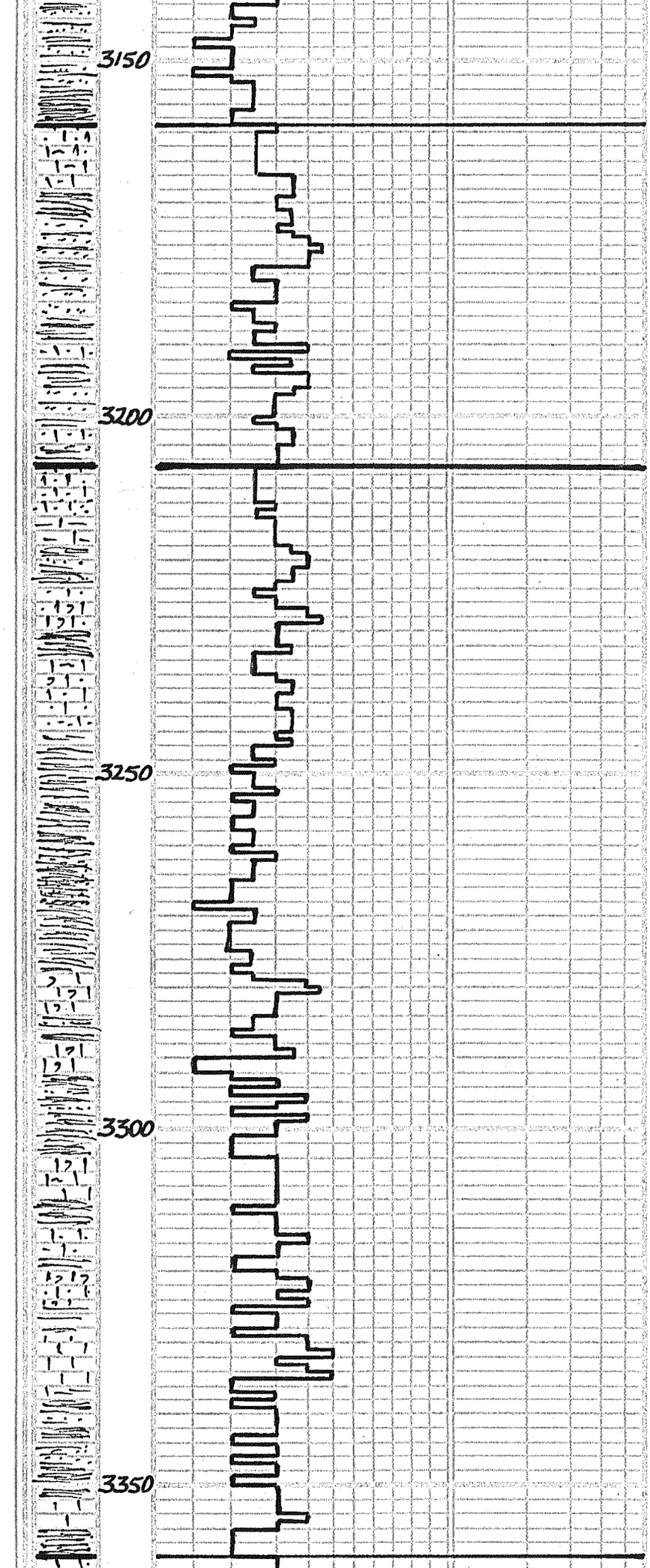
Ls: gry., hrd.-m. hrd, dns, vfg-mxln, occ. chky., occ. blk. foss. tr. sh. stnd, occ. sndy.-calc. Ss: A.A. NØ NSFOC

Ls: A.A., less sndy. NØ NSFOC
Sh: rd. brn., sft., clayey, occ. sndy.

Sh: rd. brn-gry. grn., sft. & clayey-m. sft., earthy, occ. sndy.

Sh: rd. brn, v. sft., clayey, occ. sft., earthy, occ. sli. sndy.

Sh: rd. brn-lt gry, v. sft., clayey



Sh: rd, brn-lt. gry., v. sft, clayey -sli. sndy., earth., tr. blu-gry., earthy

Sh: lt. gry.-gry., v. sft., clayey.- occ. rd. brn., less. sndy. tr. Ls. gry., hrd., dns., VFG-mxln., sndy NØ NSFOC

Ls: crm-dk. gry., hrd., dns., VFG-mxln., mic., occ. chiky., sndy-v. sndy.-w. cmtd., occ. sh. stnd. NØ NSFOC

Ls: A.A., sli. less. sndy., fn-VFG. Sd NØ NSFOC

Sh: rd. brn.-gry., sft., clayey., slty.-sndy.

Sh: lt. gry.-rd. brn., v. sft., clayey. tr. earthy., tr. slty.-sndy.

Sh: rd. brn.-lt.-dk. gry., sft., clayey., occ. m. sft., earthy. occ. sndy.

Ls: wh.-crm., sft., chiky., VFG-mxln. tr. sh. stnd., occ. sndy.-v. sndy -calc. Ss: crm., m. sft., VFG., pr. srtd., w. cmtd. NoVis ØNSFOC

Ls: gry.-dk. gry., m. hrd.-hrd., dns. VFG-mxln., occ. sft. + chiky., dk. gry. foss., sh. stnd., occ. sndy NØ NSFOC

Ls: gry.-dk. gry., sft. + chiky.-m. hrd., dns., VFG-mxln., foss.- dk. gry. foss., tr. sndy., tr. sh. stnd. NØ NSFOC

Ls: crm-dk. gry., sft. + chiky.-hrd. dns., VFG-mxln., dk. gry. foss., occ. sndy. + sh. stnd., occ. foss. NØ NSFOC

Ls: A.A. NØ NSFOC

Sh: dk. gry.-lt. gry., sft.-m. hrd. dns., clayey-earthy

Sh: rd. brn., sft., clayey.-earthy occ. slty.-sndy.

Sh: rd. brn.-gry., sft.-v. sft., clayey occ. slty.-sndy., tr. Ls. gry-lt. gry., sft., chiky. NØ NSFOC

Sh: A.A., occ. dk. gry., sft., clayey
Ls: crm.-gry., hrd-sft. + chiky., VFG-mxln., mic., NØ NSFOC

Ls: crm-gry., Abun. chiky., occ. hrd., dns., VFG-mxln., mic., tr. foss. w/dk. gry. foss. NØ NSFOC

Ls: A.A. NØ NSFOC
Sh: rd. brn-dk. gry., sft. + clay. -m. hrd., earthy-hackly., occ. sndy

Sh: A.A.
Ls: crm-tan, hrd., dns., VFG-mxln., mic., occ. foss., occ. rd. sh. stnd. NØ NSFOC
Sh: rd. brn., sft. + clayey.-m. sft., dns., earthy., occ. slty.-sndy.
Ls: gry.-dk. gry., hrd., dns., VFG xln. occ. sndy. + sh. stnd. NØ NSFOC

Sh: A.A.
Ls: crm.-lt. gry., m. hrd.-hrd., dns., VFG xln, occ. foss.-y wish. foss. occ. sndy NØ NSFOC
Ls: A.A. NØ NSFOC
Sh: gry.-rd. brn., sft., clayey occ. m. sft., earthy, slty

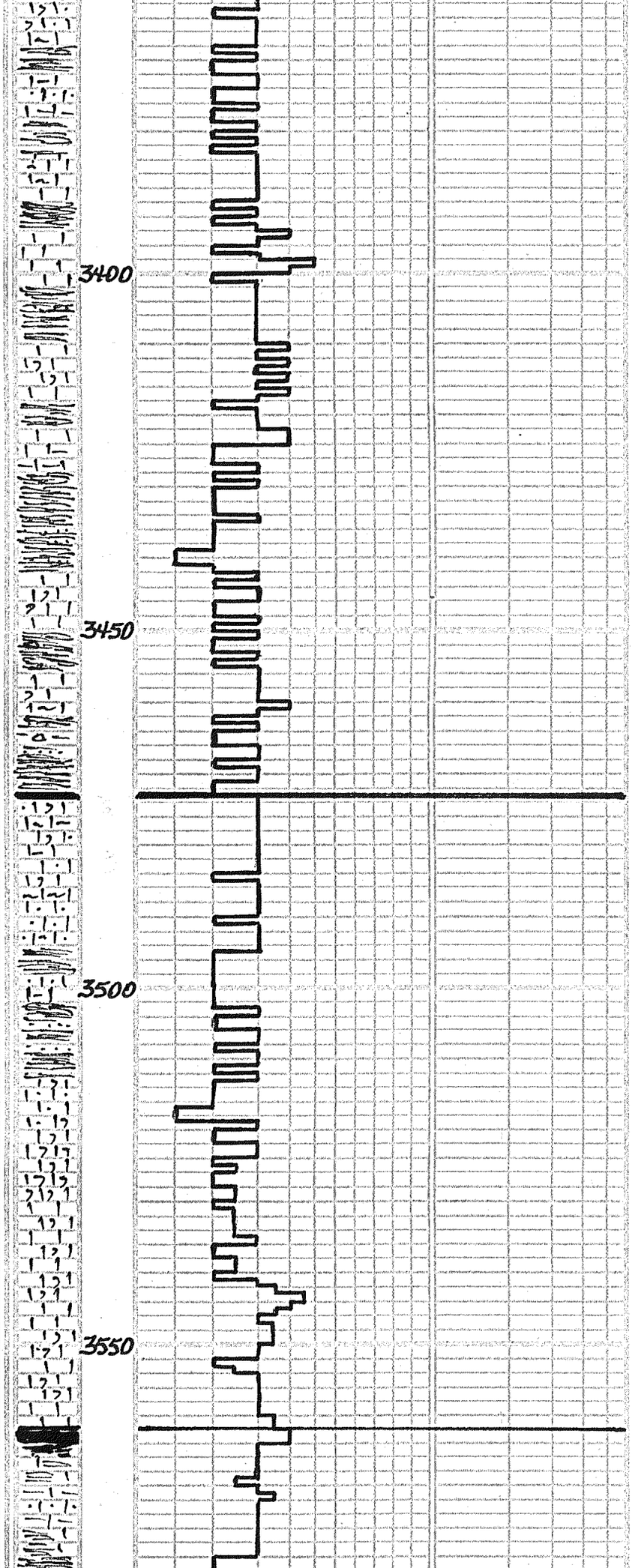
Sh: A.A., more slty.-sndy

Ls: crm.-gry., m. sft.-m. hrd., dns., VFG xln., occ. chiky. NØ NSFOC
Ls: A.A., more chiky. NØ NSFOC
Sh: rd. brn.-gry., sft. + clayey.- m. sft., dns., earthy., occ. slty.-sndy.

Red Eagle Ls (-480')

Foraker Ls. (-528')

Mud Check @ 3274'
M.W. 8.8 lb./gal.
Vis. 57 sec./qt.
W.L. 5.2 cc./30 min.
Chl. 1,000 PPM.
Solids 3.5%
LCM. 3 lb./bbl.



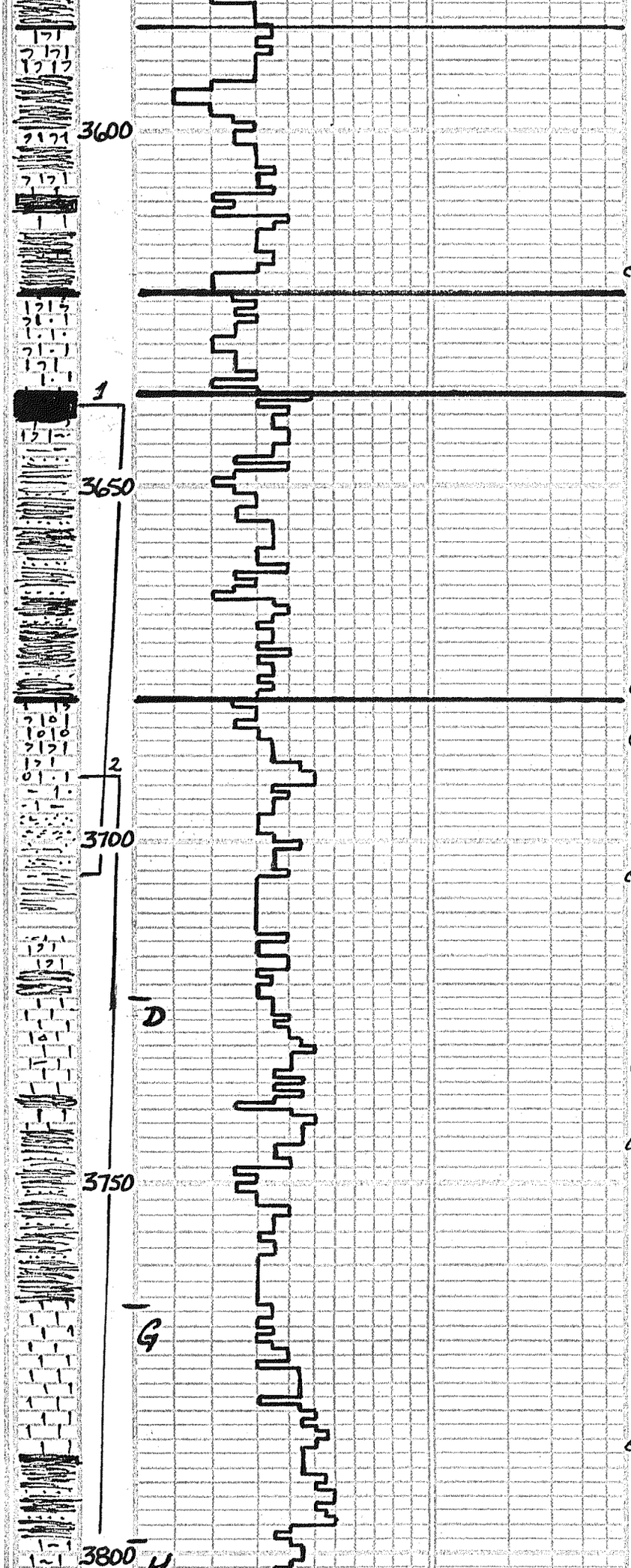
Sh: gry.-gry.-sft.-m.hrd.,dns. earthy-hackly.,occ.rd.brn.
Ls: gry.,hrd,dns.,vfg-mxln,occ chiky.,foss. NØNSFOC
tr. Sh: A.A. more rd. brn. clayey
Ls: crm.-gry.,hrd.,dns,vfgxln., foss.,occ.sndy.,occ.sh.stnd. NØNSFOC
tr. Sh: A.A.
Ls: crm.-gry.-occ,ylw,sh.stnd., hrd.,dns,vfg.-mxln.,mic., foss.,sndy. NØNSFOC
Sh: rd.brn-gry,mott.,sft,earthy
Ls: gry.-tr.ylw.,m.sft.-hrd.,dns. vfg-mxln.,mic.,foss.,sndy. NØNSFOC
Ls: A.A. NØNSFOC
Sh: gry.-ylw.brn.,sft.,earthy-clayey
Ls: wh.-crm.-lt.gry.,m.sft.,chiky -hrd.,dns.,vfg-mxln.,tr.mic. foss. NØNSFOC
Ls: A.A. NØNSFOC
Sh: gry.-gry.grn.-rd.brn.,sft.+ clayey.-m.hrd.,hackly
Sh: A.A.
Ls: crm-gry.,sft.+chiky.-hrd., dns.,mic.,vfg-mxln.,occ. foss.-v.foss. NØNSFOC
Sh: rd.brn-gry.grn,sft.,earthy-clayey,,tr.sndy.
Ls: crm-tan,hrd,dns.,occ.sft. +chiky.,mic.,occ.foss. NØNSFOC
Sh: A.A.
Ls: crm-tan.,hrd.,dns.,vfg,-mxln. mic.,occ.foss.,occ.pebb.surf. rd.sh.stnd. NØNSFOC
Sh: rd.brn,tr.gry.grn.,sft.clayey -m.sft.,earthy.,tr.sndy.,tr. Ls.pebb.
Ls: crm.,hrd.,dns.,occ.m.sft., chiky.,vfg-mxln.,tr.mic.,occ. foss.,sh.stnd. NØNSFOC

Topeka Fm. (-794')

Ls: crm.,hrd.-sft.+chiky.,dns., vfg-mxln.,mic.,occ.foss.) rd.sh.stnd.,tr.sndy NØNSFOC
Ls: crm.,hrd.,dns.,vfg-mxln., mic.,occ.sft.+chiky.,occ.foss. occ.sh.stnd.,tr.sndy. NØNSFOC
Ls: A.A.,occ.sndy. NØNSFOC
Sh: rd.,sft.,clayey.,slty.-sndy
Ls: wh.-crm.,sft.,chiky.-hrd.) dns,mic.,vfg-mxln.,occ.foss. occ.sndy.,tr.rd.sh.stnd. NØNSFOC
Ls: wh.-crm.,sft.+chiky.,-hrd., dns.,vfg-mxln.,mic.,occ. foss.-v.foss. NØNSFOC
Ls: wh.-crm,sft.+chik.-hrd., dns.,mic.,vfg-mxln.,occ. foss. NØNSFOC
Ls: crm.-wh.,hrd.,dns.,occ.sft. +chiky.,vfg-mxln.,occ.foss. w/1-2pc.tr.-pr.intpart.Ø NSFOC
Ls: crm.,hrd.,dns.,vfg-mxln., occ.,sft.+chiky.,tr.mic.,foss -v.foss.+ool.,tr.pr.intpart.Ø tr.v.pr.vug.moldicØ NSFOC
tr. Sh: gry.-blk,m.sft.,dns.earthy
Ls: crm-gry.,m.sft.-hrd.,dns.,tr- vfgxln.,foss.,abun.dk.sh.stn. looks like oil stn. NØNSFOC

King Hill Sh. (-883')

Sh: rd.brn.,sft.,clayey.w/sh: gry.-blk,m.hrd.carb.,hack.
Ls: crm.-ltgry,hrd.,dns,vfg-mxln.,tr.sndy., NØNSFOC
Ls: crm.,tan,hrd.,dns,vfg-



Ls.-tan, hrd., gns., v.f.-f.gss.
-v.f.gss., occ. sndy. N Ø NSFOC
Sh: rd. brn-gry. grn., sft. + clayey-
m.sft. + earthy
Sh: A.A., occ. pebb.
Ls: crm.-tan, tr. ylw., hrd., dns., vfg
-mxln., f.gss.-v.f.oss., sh. stnd.
rd. pebb. surf. N Ø NSFOC
Sh: rd. brn., sft., clayey-earthy.
Tr. Sh: dk. gry.-blk., m.sft. carb., earth.
Ls: crm.-tan, hrd., dns., foss.-v.foss.
Abun. rd. sh. stn. N Ø NSFOC
Ls: A.A. N Ø NSFOC
Sh: rd. brn., sft., clayey.-earthy
occ. v. sndy.-slty. Ss: rd.,
m. hrd., dns., fn. grn. @ N Ø NSFOC
CFS
Ls: wh.-crm.-lt. gry., sft. + chiky.-
hrd., dns., f-mxln-mxln., occ.
pr. intxln Ø w/tr. fr. vug. Ø, tr.
foss., occ. sndy N S FOC
Ls: A.A., mory hrd., dns., mic.
1-2 pc. w/dd. gilsonite on
frac. surface, No vis. Ø
N F OC
Ls: crm., hrd., dns., vfg-mxln.,
mic., occ. foss. + sh. stnd.
N Ø NSFOC
Sh: dk. gry.-blk., m.sft., earthy
Ls: A.A. N Ø NSFOC
Sh: rd. brn.-gry., mott., sft.-
m.sft., clayey-earthy,
sndy.
Sh: rd. brn., sft., clayey.-m.sft.
sndy., earthy
Sh: A.A. occ. gry.
Tr. Ls: crm., m.sft., vfg-xln., foss. +
ool. w/gd.-ex. vug. Ø-some moldic
wk. odor, tr. F.O., gd. stn, cut + fl.
Ls: crm.-tan, m. hrd-hrd., f-xln-mxln
occ. foss. + ool. w/tr.-pr. vug. Ø-
sh, smaller vugs., gd. stn, cut + fl
gd. odor, SFO., sl. less Ø, pyr.
Ls: A.A. tr. pr. Ø + shows. A.A. ? perm.
Ss: brn., m.sft., fria., vfg., calc. cmt.,
mod. srtd., subrnd., ? Ø, gd. sat.
stn., ex. cut + fl., tr. F.O., ? perm.
Tr. Ss: A.A. Sh: rd. brn, sft., clayey
-earthy
CFS
Sh: rd. brn., sft., clayey-earthy
Sh: rd. brn-gry. grn.-dk. gry., sft. +
clayey-m. hrd. dns., earthy-
hackly., occ. Ls: pebb., tr.
sndy
Ls: crm.-lt. gry., hrd., dns., vfg-mxln.
mic., occ. sft. + chiky, tr. foss. +
opl., occ. tr.-pr. vug. Ø w/lt. brn. stn.
tr-wk. cut + fl., tr. dd oil, wk. odor.
Ls: wh.-crm., hrd., dns., vfg-mxln.
mic., occ. tr.-pr. vug Ø-g. vugs.
w/lt. brn stn., tr. cut + fl., No F.O.
wk. odor., ? perm.
Ls: crm-tan, hrd., vfg-mxln N Ø NSFOC
occ. sh. gry., m.sft., dns., earthy
CFS
Sh: rd. brn.-gry., mott., sft. + clayey
-m.sft., earthy. occ. sndy
Sh: rd. brn., sft., clayey-m.sft.,
earthy., occ. sndy., tr. gry-
grn.
Ls: lt. gry., hrd., dns., vfg-mxln.,
mic., occ. chiky., tr (2-3 pc) tan
pr. vug. Ø w/brn stn., No odor, No
F.O., wk. cut + fl. v. ? perm, thin zn.
Ls: crm-lt. gry., hrd., dns., mxln.,
mic., occ. sft. + chiky N Ø NSFOC
Sh: rd. brn-gry., m.sft., earthy.
occ. sndy.-cavings ?
Ls: crm-lt. gry., hrd., dns., vfg-mxln.
mic., occ. chiky., rare foss. N Ø NSFOC
CFS
Ls: A.A. N Ø NSFOC
Sh: sft-m.sft., clayey-earthy
Sh: rd. brn., m.sft., earthy, sndy
Ls: crm-lt. gry., hrd., dns., vfg-mxln.
mic., tr. sh. stnd. N Ø NSFOC
tr. chiky
Ls: crm-lt. gry., hrd., dns., vfg-mxln

Lecompton Ls.
(-906')

Oread Ls.
(-944')

Heebner Sh.
(-958')

DST #1
3639'-3705'
Rec. 124' OSM
Deviation 1°

Good Show
(thin zone)
Lansing Grp.
Fair Show
(-1001')
Fair Show

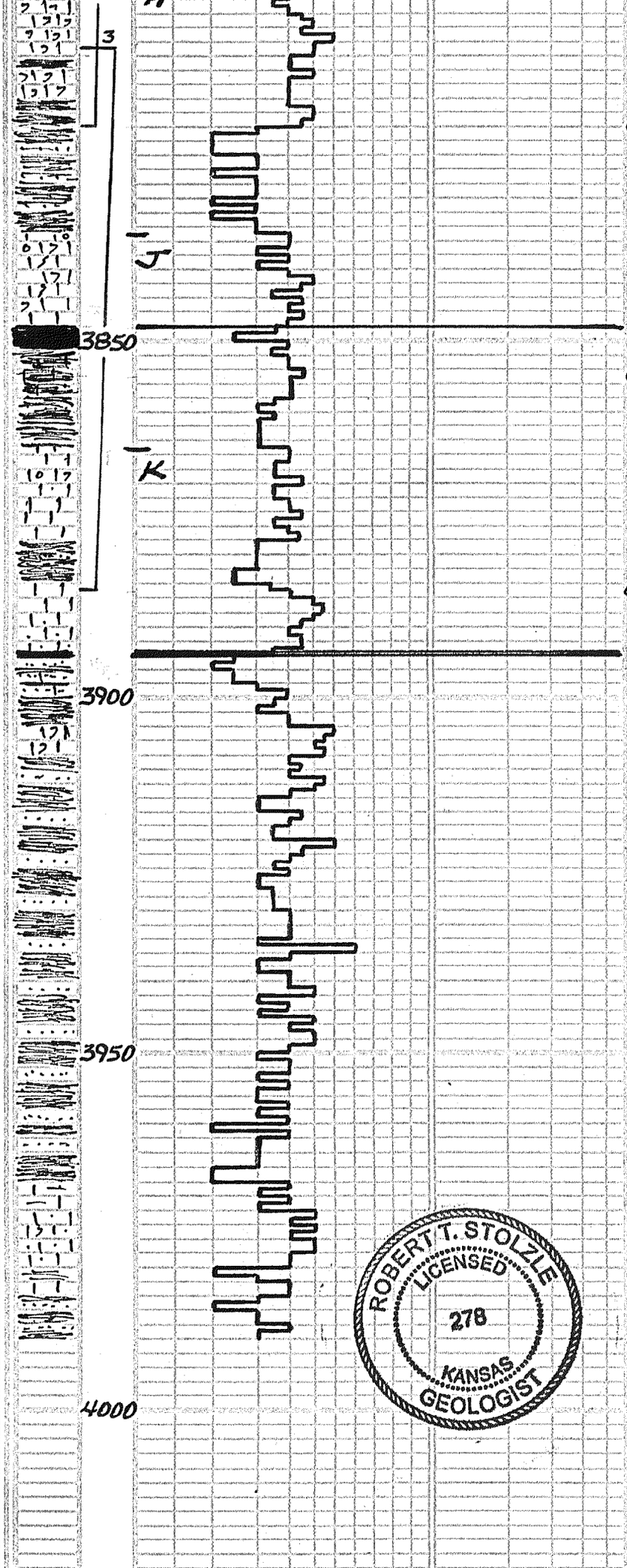
Mud Check @ 3705'
M.W. 9.1 chl. 1,300
Vis. 50 LCM. 6#
W.L. 6.0
Solids 5.7%

Weak Show

Weak Show

DST #2
3691'-3820'
Rec. 20' oil
60' OCM
Strap 1.49' long
(No Correction)

Very Weak Show



mic, tr. chiky., 2pc. pr. pp vug ⊕ w/ lt. brn. stn., wk. cut + fl., No F.O. No odor Very V. weak show

DST #3
3809-3885'
Rec. 20' Mud

Ls: crm.-ylw. stnd., hrd., dns., vfg-mxln, mic., occ. chiky., foss-v. foss. NO NSFOC

CFS Sh: rd. brn-gry., sft., clayey

Sh: rd. brn-gry. grn., sft.-m. sft., clayey-earthy., occ. sndy

Ls: crm., hrd., dns. vfg-mxln., occ. mic., occ. chiky, tr. foss. dol, w/ pr.-fr. int. part ⊕ + pp. vug. ⊕ tr. mo/dic., dk. brn. stn., fr. cut + fl. No F.O.

Weak Show (-1169')

Ls: crm-lt. gry. A.A., occ. fn. pp. vug ⊕ around. foss. grns., tr. frac., dk. brn. stn., No odor, 1-2 drops F.O. fr. cut + fl., ? perm., tr. pyr.

Stark Shale
Fair-Weak Show

Sh. dk. gry.-blk. m. sft., earthy, carb

CFS w/ Sh. rd. brn-lt. gry., sft, clay-earth.

Sh: rd. brn-gry. grn.-dk. gray., m., sft.-sft., clayey-earthy., sndy

Mud Check @ 3843'
M.W. 9.0
Vis. 62
W.L. 6.4
Chl. 1,700
Solids 5.0%
LCM. 5#

Sh. A.A., freedom. rd. brn., earthy

Ls: crm.-gry., hrd., dns., vfg-mxln. mic., rare foss., tr. pyr. tr. chiky NO NSFOC

Ls. wh-crm.-lt. gry., hrd.-sft. + chiky, vfg-mxln., mic., rare foss dol., 4-5pc, w/ pr., pp ⊕. dk. stn. wk. cut + fl., No odor, No F.O.

Very weak Show

Ls: A.A. 2-3pc. w/ ⊕ + show A.A. v.v. wk show

CFS Sh: rd. brn., m. sft., earthy

Sh: rd. brn-mar.-dk. gry., m. sft.-sft., earthy, sndy-v. sndy

Ls. wh.-crm., hrd.-m. sft., vfg xln. sndy.-v. sndy.-calc. Ss: vfg., mod. std., w. cmtd., sub rnd., frib. tr. Sh: A.A. NO NSFOC

Base of Kansas City Group (-1215')

calc. Ss: A.A. occ. hrd, w. cmtd. NO NSFOC

Ls: crm-lt. gry., hrd.-sft. + chiky. occ. foss, vfg-mxln. NO NSFOC

Sh. A.A.

Ls: A.A. NO NSFOC

Sh: rd. brn-gry. grn., sft. + clayey.-m. sft., earthy, sndy.

Sh: rd. brn-mar.-gry. grn., sft. + clay.-m. sft., earthy., sndy.

Sh: vari c., A.A., more sft. + clayey, sndy.

Sh: vari c., sft.-m. sft., clay-earth. occ. v. sndy-slty., tr. ls. pebb.

Sh: A.A.-occ. ylw., sndy

Sh: A.A, tr. cht. + ls. pebb.

Sh: rd. brn., v. sft., clayey., occ. sft. + sndy., tr. lt. gry., earthy

Sh.-slts: rd. brn.-mar.-ylw. m. sft., sndy.-v. sndy., earthy.

Ls: lt. gry., hrd., dns., occ. sndy. rare foss. NO NSFOC

tr. Ls: A.A. NO NSFOC

Sh: rd. brn.-mar., v. sft. clayey.-m. sft., earthy, sndy

D.T.D. 3990'
L.T.D. 3992

Deviation 1¼°
Robert Stolzle
4/5/13