

JERRY A. SMITH

CERTIFIED PETROLEUM GEOLOGIST

GEOLOGIST'S REPORT

DRILLING TIME and SAMPLE LOG

COMPANY: ABERCROMBIE ENERGY, LLC		ELEVATIONS	
LEASE: COX #7-12		K.B. 2971	
FIELD: SANTA FE NORTH		D.F.	
LOCATION: 1089' FNL & 991' FWL		G.L. 2961	
SEC. 12	TWSP. 28	RNG. 33W	Measurements Are All From:
COUNTY: HASKELL	STATE: KANSAS		KB
CONTRACTOR: VAL ENERGY, RIG #2		CASING	
SPUD: 8/3/14	COMP. 8/17/14	SURFACE: 8 5/8" @ 1845'	
RTD. 5640	LTD. 5637	PRODUCTION : 5 1/2" @ TD	
MUD UP: 3561	TYPE MUD: CHEMICAL	ELECTRICAL SURVEYS	
API No. 15-081-22072		NABORS: DIL, FDC-CNL, MICRO, SONIC	
SAMPLES SAVED FROM: 4000	TO: RTD		
DRILLING TIME KEPT FROM: 3800	TO: RTD		
SAMPLES EXAMINED FROM: 4000	TO: RTD		
GEOLOGICAL SUPERVISION FROM: 4060	TO: RTD		
GEOLOGIST ON WELL: JERRY A. SMITH			
FORMATION TOPS	LOG	SAMPLES	
HEEBNER	4124 (-1153)	4122 (-1151)	
LANSING	4208 (-1237)	4206 (-1235)	
KANSAS CITY 'A'	4626 (-1655)	4624 (-1653)	
MARMATON	4752 (-1781)	4750 (-1779)	
PAWNEE	4856 (-1885)	4855 (-1884)	
FT. SCOTT	4882 (-1911)	4886 (-1915)	
ATOKA	4995 (-2024)	4999 (-2028)	
MORROW SH	5162 (-2191)	5164 (-2193)	
CHESTER SS	5316 (-2345)	5312 (-2341)	
STE GENEVIEVE	5422 (-2451)	5421 (-2450)	
ST. LOUIS	5462 (-2491)	5461 (-2490)	

LEGEND

Anhydrite	Salt	Sandstone	Shale	Carb. sh	Limestone	Ool. Lime	Chert	Dolomite

DEPTH	DRILLING TIME IN MINUTES PER FOOT Rate of Penetration Increases	SAMPLE DESCRIPTIONS	REMARKS
	5" 10" 15" 20" 25"	S.H.T.'S	GAS DETECTOR: MBC WELL LOGGING DST'S (4): TRILOBITE MUD: MUD-CO
		1032' 2 1/2° 1808' 1 3/4°	
		1125' 2 1/2° 1857' 1 1/2°	
		1402' 4° 2489' 3/4°	
		1434' 4° 4074' 3/4°	

1464' 5° 4866' ¼°
1621' 3 ¼° 5640' 1°
1715' 2°

VERT. LOG SCALE: 5" = 100'

3800

20

40

60

80

3900

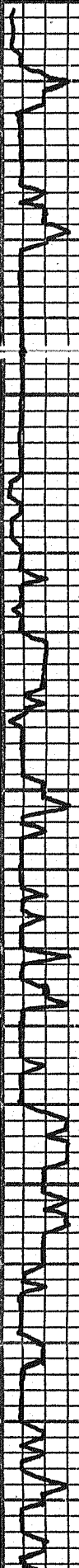
20

40

60

80

1715



4000

20

LM - GY - M GY - FX
DSE. w/ ABD WH
SET CHRY LA. SEAT
RD SH.

40

LM - GY - M GY - GY -
M. FX. DSE. -
SEAT VGY. NS. w/
ABD WH, SET CHRY.

MUD @ 4046':
8.85 WT, 46 VIS, 9.2 FILT,
3800 CHLOR, 1# LCM

60

LM & CHK - AA.

LM - AA w/ DK GY, FX
DSE. LA. CHRY. OPA
SHD, DSE CHRY.

80

LM - GY - M GY, FX. DSE
CHRY. LA. - DK
GY. FX. DSE. SH. CHRY
GY - GEN.

LM - M GY, GY - TA. FX
DSE. Dolo IN PT?

4100

20

LA - AA.

LM - GY - TA. FX. DSE.

HEEBNER
4122 (-1151) SMPL
4124 (-1153) LOG

SH - BLK, CARB.

SH - GY, GY - GN.

40

LM - CARB. FX. No KES
D. ABD WH, SET
CHK.

60

LM - GY - M TA. FX
SPSL. CASE. DSE.
SEAT M - DK GY
SH.

80

LM - M TA. FX. DSE.
TR. CRD. OPA, SHD,
DSE CHRY.

ABD SH - M - DK GY,
GY - GEN.

4200

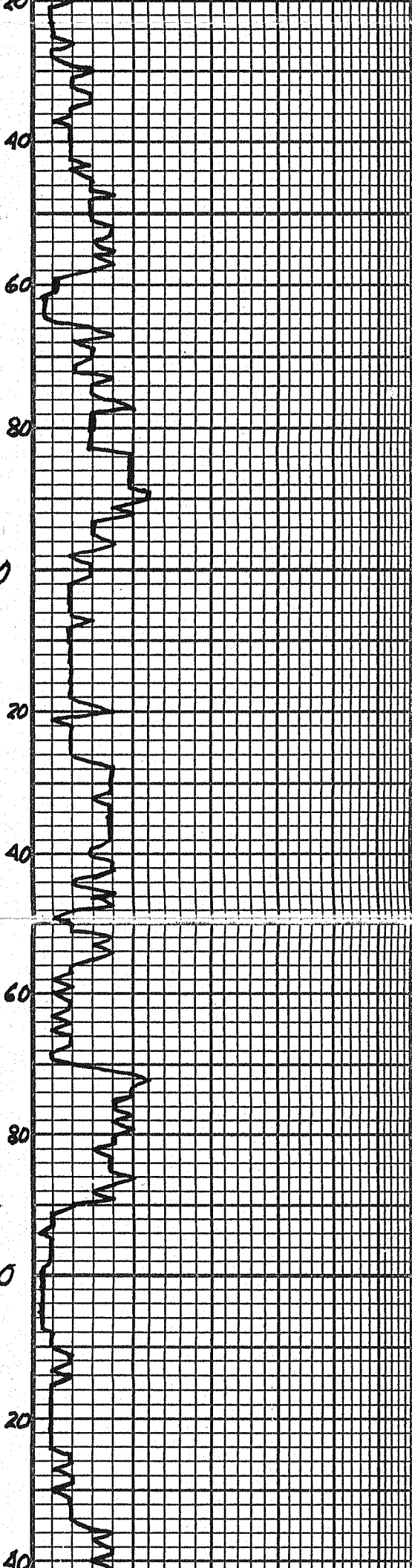
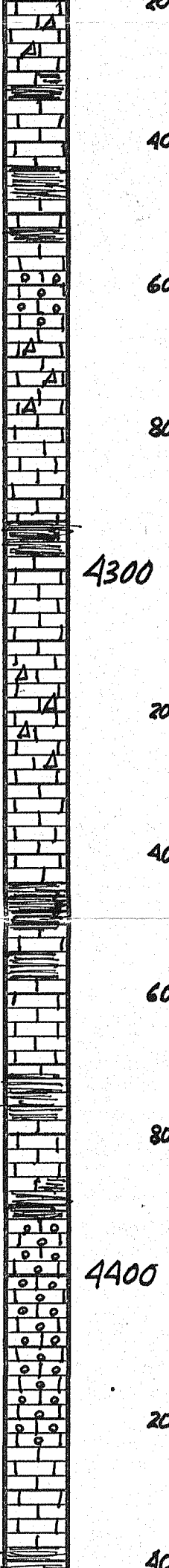
20

LM - M GY, GY - TA. FX
DSE. ABD GY, GY - WH
SH.

LANSING
4206 (-1235) SMPL
4208 (-1237) LOG

LM - GY - M TA. FX
CASE. DSE. SEAT
CRD. OPA, SHD, DSE
CHK.

LM - CRD. FX. ABD
OP. VGY & INTRN. O
NS.



Ln - AA, LOSING D.
 CMT - OPO, JHP, DSE.

SH - M - DR Gy.

SHLY LN / LMP SH - AA

Ln - LPM, Lr Gy - TN,
 VIS D. DONALD D.
 NS. No ODR. KARE
 VN CHK.

Ln - M TN, FX. No
 VIS D. SEATT. LMP -
 Lr Gy, OPO, JHP, DSE.

Ln - AA.

INC LN DR Gy SH.

4300

Ln - M TN, FX. SEATT.
 DR. VIS. LMP -
 D. NS.

Ln - AA / SEATT.
 CMT - LPM, OPO, JHP,
 DSE.

Ln - TN, FX. DSE.

Ln - AA. CHERTY.

Ln - LPM, FX. SHLY
 NO NS. SEATT. LMP -
 VIS. D. OPO, JHP, DSE.
 NS. APP VN CHK.

Ln - Lr Gy, Lr TN, FX.
 DSE.

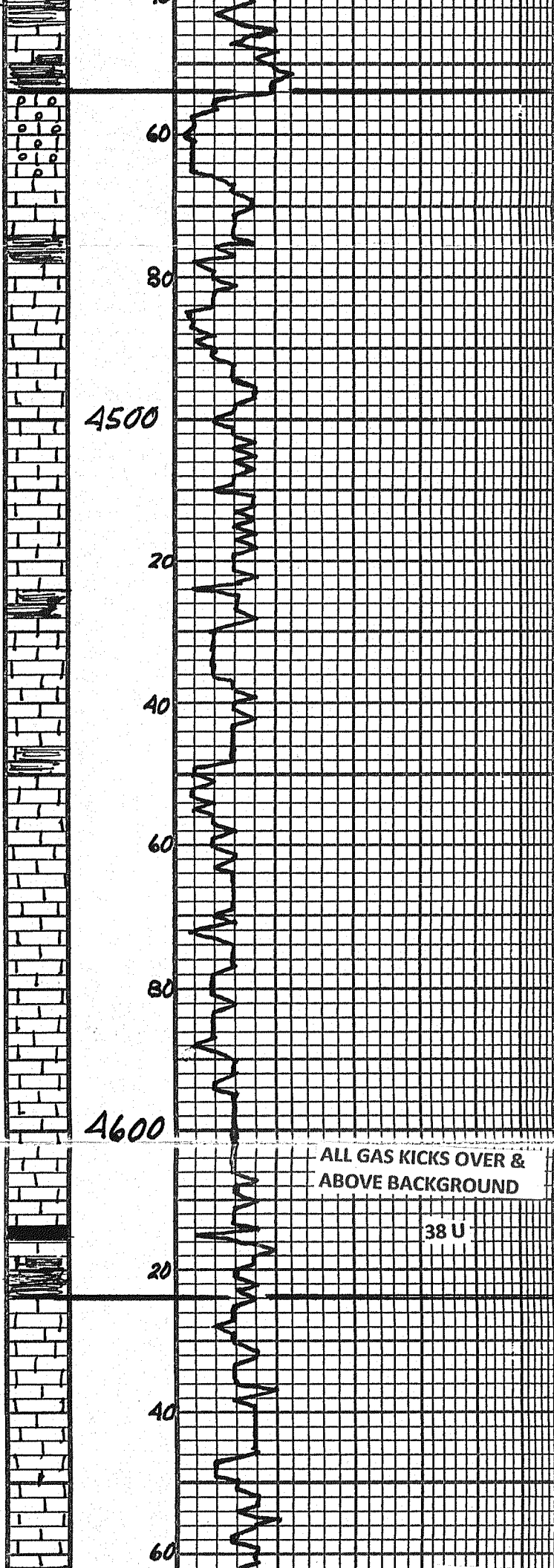
4400

Ln - Lr - M TN, FX.
 DONALD D. No
 ODR, No VIS SH.

Ln - AA.

Ln - AA.

Ln - Lr Gy, Lr - M TN,
 FX. DSE.



SH-BLK, CARB.

SH-GY-CRN. Calc.

LM-M-TN GY-TN FX
 GO DAKOTA Q. NS. NO
 ODR.

LM-GY-TN FX. SPLY
 FOSS. DSE.

SH-DR GY → BLK, CARB

LM-M-TN FX. FOSS. DSE
 → CHRY.

LM-TN FX. FOSS. CHRY. IN
 FT. → RARE VGT. O. NS.

LM-LT GY, LT TN. FX. DSE.

LM-AA.

LM-AA.

LM-LM, LT TN. FX
 CHRY. FT.

LM-AA. DSE.

LM-LM, LT TN. FX. GO
 VGT. IN TEXAS Q. NS.

LM-LT → M GY, GY-TN.
 FX. DSE. HD.

LM-M-TN GY-TN. FX
 DSE. HD.

LM-AA.

LM-M-TN GY-TN. FX.
 DSE. No VIS. SPLY
 FOSS.

LM-DR GY-TN. FX.
 DSE. HD.

SH-BLK, CARB.

LM-M-TN. FX. FOSS
 CHRY. SPLY DSE.
 VGT. VGT. FOSS. HD
 Q. NS.

LM-M GY, GY-TN. FX.
 DSE. HD.

LM-AA. SALT BLK. DEAD
 FLAKY EGGS JRN.

LM-AA.

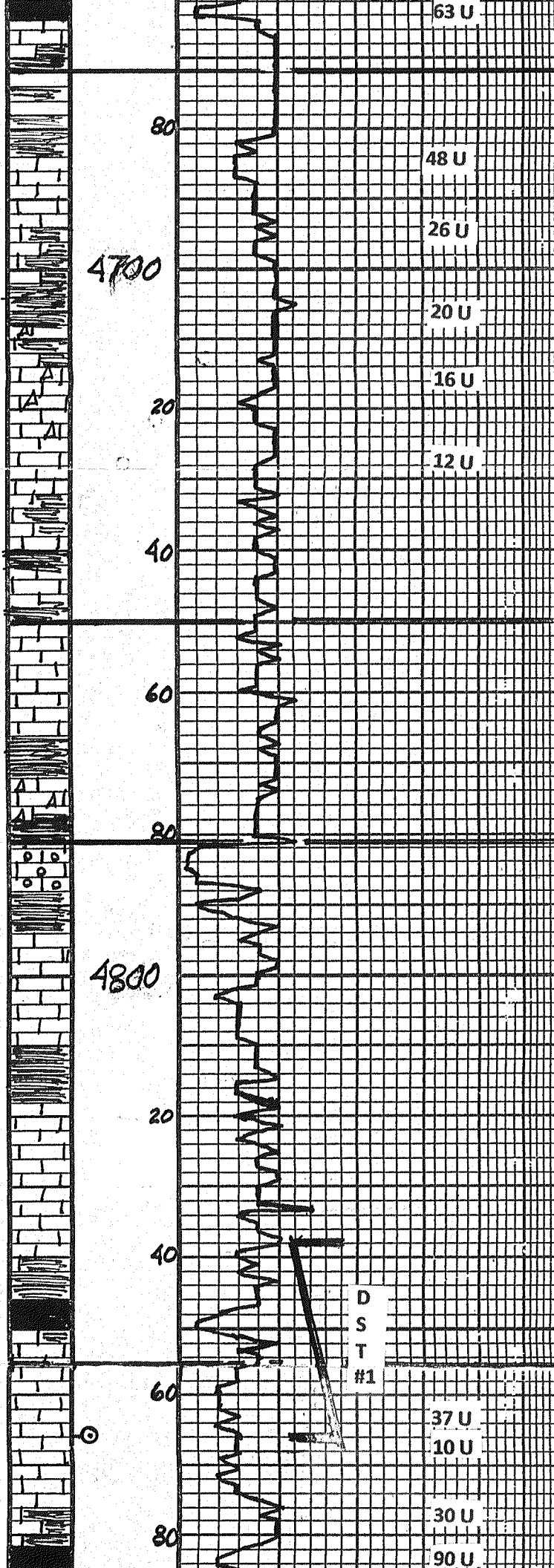
LANSING 'G'
 4454 (-1483) SMPL
 4456 (-1485) LOG

MUD @ 4577':
 9.25 WT, 57 VIS, 9.2 FILT,
 4300 CHLOR, 2# LCM

ALL GAS KICKS OVER &
 ABOVE BACKGROUND

38 U

KANSAS CITY 'A'
 4624 (-1653) SMPL
 4626 (-1655) LOG



SH - BLK, CARR.
 LM - DR BY - TA, FX.
 ARGILL. DSE.
 LM - DR TA BY - TA, FX.
 DSE - CHRY IN PT.
 LM - AA. TA BY
 OPO, SHP, DSE CNT.
 SH - DR BY - BLK, CARR.
 LM - LT - M BY, BY - TA.
 FX, TA, SCAT, CO -
 NIS. No VIS. φ.
 LM - AA, DSE w/ SCAT.
 CNT, M BY, OPO, SHP,
 DSE.
 LM - DR BY, FX. DSE.
 ARGILL.
 SHY LM - AA.
 SHY LM - AA.
 SHY LM - AA.
 LM - GRM. FX. DSE.
 HD.
 LM - AA.
 LM - AA. BECOMING
 CNTY.
 LM - GRM. LT - M BY, FX.
 CNTY w/ GR. GRM. φ.
 NS. ADD IN CNT.
 LM - AA. LOSING φ.
 LM - GRM. LT BY, FX.
 SP. CNTY. DSE
 - CHRY.
 LM - DR BY, FX. DSE -
 CNTY. w/ ABD RD, BY,
 GRN SH.
 FREDDON SH - BY, BY - GRM.
 SCAT BROKEN LM.
 LM - GRM. LT BY, FX. DSE
 - CNTY. w/ ABD RD,
 BY, GRN SH.
 LM - AA. DEC IN SH.
 SH - BLK, CARR.
 SH - M BY, BY - GRM.
 TA - TA - M BY, FX. DSE.
 LM - LT - M BY, FX. SCAT - NO VIS
 φ. DR SH IN SOME φ.
 SOME φ BARREN. W/ COOR.
 SCAT. W/ CNTY. φ. LM -
 AA. No VIS. SHOW. TAG DUNE
 VEAL - ENDR. V W/ ODR.
 LM - AA. NIS. No COOR.
 LM - LT BY, FX. DSE. HD - CHRY
 IN PT.
 SH - BLK, CARR.

KANSAS CITY 'B'
 4662 (-1691) SMPL
 4672 (-1701) LOG

MARMATON
 4750 (-1779) SMPL
 4752 (-1781) LOG

MARMATON 'B'
 4781 (-1810) SMPL & LOG

PAWNEE
 4855 (-1884) SMPL
 4856 (-1885) LOG

PIPE STRAP @ 4866':
 4883.20 BOARD
 4878.32 STRAP
 4.88 SHORT

FT. SCOTT

D
 S
 T
 #1

4900

75 U

HIGH BACKGROUND
CHEROKEE TO STE. GEN.

Lm - Gy - TA - FX - DSE. No
Vis D.

SH - BLK, CARB.

Lm - M - DR Gy - TA - FX - MY
FR LUTKAN Q. FR V&Y Q.
BLK DEAD STN. No DOOR,
No L.O. No F&UR.

Lm - L - M - DR Gy - FX.
DSE w/ ABD SH - M -
DR Gy - GRN SH.

Lm 1/2 SH - AA.

Lm - M Gy - FX DSE HD
w/ SCAT SH - DR Gy -
GY - GRN SH.

Lm 1/2 SH - AA w/ 1/2 M Gy
FOUR SH, DSE LHT.

Lm - AA w/ ABD SH - M -
DR Gy - DR Gy - GRN.

Lm 1/2 SH - AA w/ ABD
M Gy, V&Y, HD, TIDE,
MIC SD - NS.

Lm - GRN L - GRN FX.
DSE. w/ SCAT M Gy
SH.

Lm - L Gy - L TA - FX - GRN.
PYRITIC IN IT. DSE.

SH - BLK CARB w/ DR Gy, Gy -
GRN SH.

Lm - GRN Gy - TA - FX - GRN
DSE. Wk DOOR. NS.
No Vis D.

SH - BLK, CARB.

Lm - L Gy - L TA - FX - GRN
Q. FR - V&Y Q. FR
DOOR. GR SH DR STAIN Q.
CPL F&S BROKE DR FD. FR
GO SCAT FINGER.

Lm - M - DR Gy - FX - DSE.
HD.

Lm - AA. w/ ABD DR Gy SH.

Lm - L - M - DR Gy - FX - MY.
SPECY F&S. FR - FR LHT -
XEN Q. FR - GR V&Y F&S
MED Q. FR DOOR. GR DR
STN. Q. FR FINGER. No
FO. CPL GAS BUBB.

Lm - L - M Gy - FX - DSE.
TRG LHT - DR Gy
W&O. SH, DSE. SCAT
DR Gy, Gy - GRN SH.

Lm - Gy - TA - FX - DSE. No
Vis D. w/ SCAT LHT -
DR Gy - TA, CPL, SH, DSE.

Lm 1/2 LHT - AA.

SH - DR Gy.

52 U

Lm - DR Gy, DR Gy - TA - FX.
DSE HD.

4886 (-1915) SMPL
1882 (-1911) LOG
CHEROKEE SHALE
4894 (-1923) SMPL
4892 (-1921) LOG

MUD @ 4915':
9.1 WT, 50 VIS, 9.2 FILT,
3500 CHLOR, 2# LCM

ATOKA
4999 (-2028) SMPL
4995 (-2024) LOG

MUD @ 5055':
9.2 WT, 47 VIS, 9.2 FILT,
3200 CHLOR, 2# LCM

5000

20

40

60

80

20

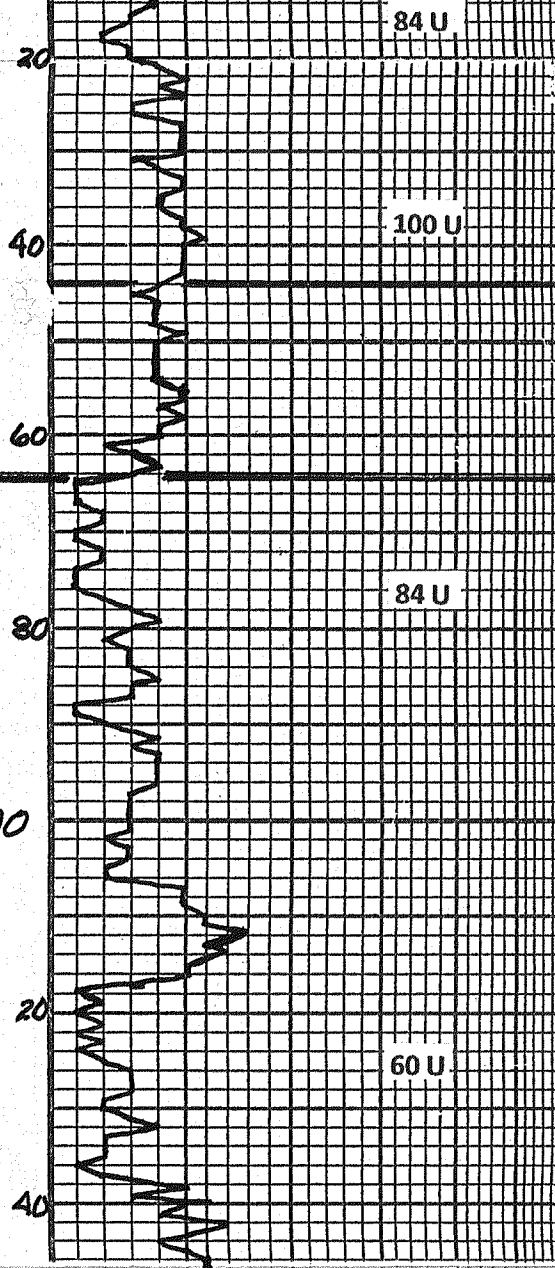
40

60

80

5100

D 140 U
S
T #2
120 U



84 U SH-BLK, CARB.

SH-DK GY → BLK, CARB.

LM-M GY → GY-GRN. SPLY FOS. DISE. HAD. SCAT DK GY. DK GY-GRN. OPA, SHP, DSE CNT.

100 U LM & SCAT CNT-AA.

LM & SCAT CNT-AA.

LM & SCAT CNT-AA BE-
COMING SHLY.

84 U SH-BLK, CARB.

SH-DK GY, GY-GRN. SPLY. CALS IN FT. TAG PRITE.

SH-AA. w/ SCAT DK RD SH.

SH-M → DK GY, GY-GRN, RD. BKK. SPLY IN FT. TAG PRITE. SCAT LT → M GY L.M. FX. DSE.

SH & SCAT LM-AA.

SH & SCAT LM-AA w/ QUER CAR LOOSE STRAINS IN TRAY. NO OPOP.

SH & SCAT LM-AA.

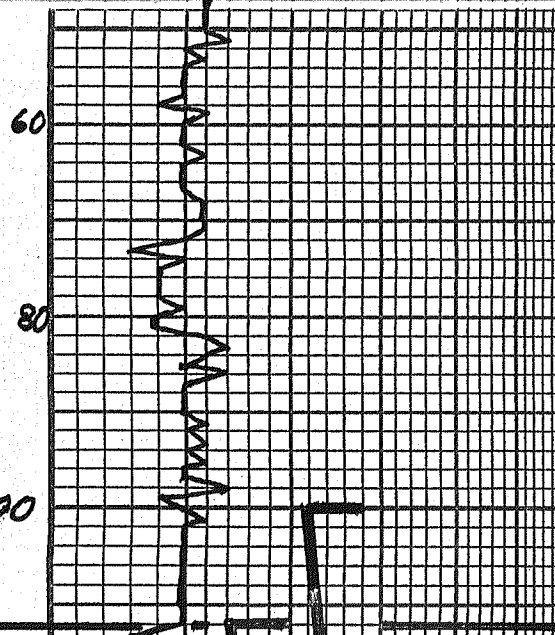
SH-DK GY → GY-GRN. SPLY. GRITTY. HAD LOOSE L.M. OPA. GENE IN TRAY. NO OPOP. No Vis SH.

60 U PREDOM SH-M → DK GY, GY-GRN. BKK. RD. w/ SCAT LM-GRN. L.M. GY. FX. DSE. SH IS GRITTY.

SH & SCAT LM-AA.

SH-AA. SPLY IN LM-GRN. FX. DSE. MICROFRACS.

MORROW SHALE
5164 (-2193) SMPL
5162 (-2191) LOG



SH & LM-AA w/ SCAT
M GY. TAG. HAD. L.M. SH.

PREDOM M GY SH. CALS.
IN FT.

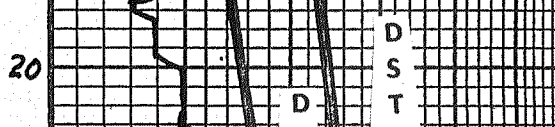
PREDOM LM → M GY SH.
w/ SCAT LM-GRN. L.M. GY. FX. DSE. CHKY IN FT.

SH & LM-AA.

SH-M → DK GY. w/ SCAT.
WHA, SUB-CHKY L.M.

SH & LM-AA.

CHESTER SANDSTONE
5312 (-2341) SMPL
5316 (-2345) LOG

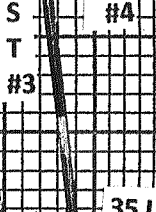


SH-AA w/ SD - GR. Qtz. to TAG.
FG. W. RD. W. JRT. FAL. FR.
OPA. GR. SH. FD. GR. FLUR. RARE GA BUBB.

SD-AA w/ LESS SHALE-AA
L.M. → DK GRN. L.M. FX.

MUD @ 5332':

D
S
T
D



9.2 WT, 52 VIS, 9.2 FILT,
5400 CHLOR, 3# LCM

No GAS BURB?
So - AA. W.C. IN L.M. GRN. D.
STR. GR. IN GRN. D. FRI.
GR -> STR. ODR.

So - CR. ODR. L.F. IN SAT. FC. W.R.D.
W.STR. GR. IN GRN. D. FRI.
STR. ODR. GR. IN GRN. D. FRI.

PREDOM SH - L.F. -> M. BY. BY - GRN.
FC. -> SCAT. WH. CHK. FAL.
SP - L.F. BY. VEG. MIC. NO
VIS. D. NS.
ABD. SD - L.F. BY. FC. W.R.D. W.STR.
FRI. GR. ODR. GR. IN GRN. D. FRI.

PREDOM Lm - L.F. BY. GRN. VEX. SUB-
ANHY. DISE. -> SCAT. L.F. BY. SH.

PREDOM SH - L.F. -> GRN. BY -
GRN. D.K. BY. D.K. FC. -> SCAT.
SP -> M. GR. FC. MIC.
HO. NS.
SH & SD - AA.

SH - VARICOL. SURT. E. P.V.
-> SCAT. Lm - L.F. -> M. BY.
FX. DSE. HO.

Lm - L.F. -> M. BY. FX. DSE.
-> SCAT. SD - M. BY. FC.
MIC. NS. ABD. L.F. -> M. BY.
SH.

Lm - GRN. L.F. BY. FX. DSE.
-> SD - AA. NS. ABD. SH -
AA.

Lm, SD - AA. ABD. SH - AA.

PREDOM Lm - GRN. FX.
SUB - ANHY. -> DISE. NO
VIS. D. NS.

SH - L.F. M. D.K. BY. ->
SCAT. Lm - AA.

SH - M -> D.K. BY. / BY - GRN.
BLK. SH. -> SCAT. Lm -
GR. M. VEX. DSE. NO VIS
D. NS.

SH - L.F. -> M -> D.K. BY. / BY - GRN.
BLK. SD. -> SCAT. Lm -
L.F. BY. VEX. DSE.
SDY IN FE.

SH - BY. GRN. REGR. M.
Lm - Lm. VEX. GRN. NS.
DSE. NO VIS. D.

SH & GRAINY Lm - AA.

SH & GRAINY Lm - AA.

Lm - GRN. WH. L.F. -> FX. SDY
IN FE. -> VEX. DISE. NS.
DISE. NO VIS. D. NS. DEC
IN SH.

Lm - GRN. WH. FX. SDY IN FE. -
AA. SPSLY. CHALK. NO
VIS. D. NS. SUB - CHKY IN
FE.

Lm - AA.

Lm - WH. GRN. FX. DSE.

Lm - WH. GRN. FX. CHALK.
DISE. SPSLY. FE. NS.
No VIS. D. NS.

Lm - GRN. FX. SPSLY.
CHALK. DSE. NS.

Lm - GRN. FX. SPSLY. CHALK.

STE. GENEVIE
5421 (-2450) SMPL
5422 (-2451) LOG

ST. LOUIS
5461 (-2490) SMPL
5462 (-2491) LOG

MUD @ 5485':
9.1 WT, 54 VIS, 10.0 FILT,
6600 CHLOR, 3# LCM

5400

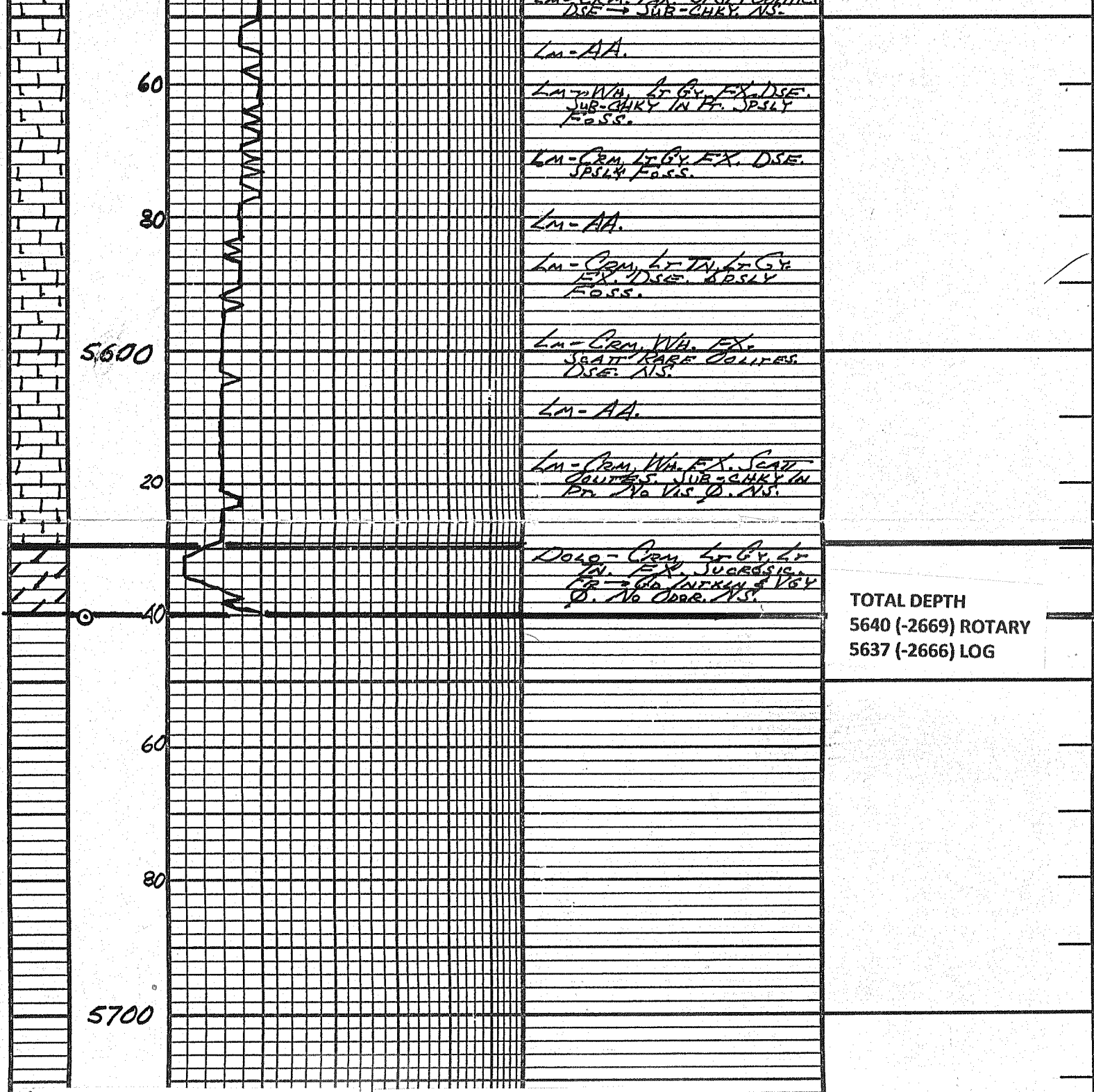
5500

40
60
80
20
40
60
80
20
40

35 U

35 U

15 U



DST #1: 4838-66
30-60-60-90

IF: BOB IN 3 SECS
 ISI: GTS IN 1 MIN
 WHILE BLEEDING OFF
 NO BLOW BACK

FF: BOB IMMED.
 GAUGED GAS (1/4" CHK)
 10 MIN 1.5 PSI 25.2 MCF/D
 20 MIN 1.5 PSI 25.2 MCF/D
 30 MIN 1.5 PSI 25.2 MCF/D
 40 MIN 1.5 PSI 25.2 MCF/D

DST #2: 5005-55
30-45-30-30

IF: 3/4" BLOW
 ISI: NO BLOW BACK
 FF: 1/2" BLOW
 FSI: NO BLOW BACK

RECOVERY:
 90' GIP
 150' GCM (2% G, 98% M)

SIP'S: 271-137#
 FP'S: 96-110/104-104#
 HP'S: 2516-2470#

DST #3: 5312-49

PACKER FAILURE
 RECOVERY:
 630' DRLG MUD

BHT: 130° F

50 MIN 1.5 PSI 25.2 MCF/D
 60 MIN 1.5 PSI 25.2 MCF/D

FSI: NO BLOW BACK

RECOVERY:

40' SGCM (3% G, 97% M)
 NO WATER

SIP'S: 989-944#
 FP'S: 18-19/21-20#
 HP'S: 2340-2301#
 BHT: 124°

TIP S: 2310-2170#
 BHT: 126° F

DST #4: 5300-49

30-60-60-90

IF: BOB IN 30 SECS

GTS IN 10 MINGAUGED GAS

15 MIN 1/4" CHK 72 PSI 137.065 MCF/D

20 MIN 1/4" CHK 96 PSI 175.139 MCF/D

30 MIN 1/4" CHK 110 PSI 197.34% MCF/D

ISI: 6" BLOW BACK

FF: GAUGED GAS

10 MIN 1/4" CHK 69 PSI 125.960 MCF/D

20 MIN 1/4" CHK 115 PSI 205.281 MCF/D

30 MIN 1/4" CHK 140 PSI 244.941 MCF/D

40 MIN 1/2" CHK 55 PSI 468.151 MCF/D

50 MIN 1/2" CHK 25 PSI 265.780 MCF/D

60 MIN 1/2" CHK 26 PSI 272.526 MCF/D

RECOVERY:

4885' GIP

83' OCM (10% O, 90% M)

189' GOCM (25% G, 33% O, 40% M)

126' GOCM (20% G, 20% O, 60% M)


NO WATER

SIP'S: 491-489#

FP'S: 190-276/229-244#

HP'S: 2712-2642#

BHT: 131°

LITHOLOGY	DEPTH	DRILLING TIME MINUTES/FOOT	SAMPLE DESCRIPTIONS	REMARKS
		 Rate of Penetration Increases		
		5" 10" 15" 20" 25"		

COMPANY: ABERCROMBIE ENERGY, LLC		ELEVATION: 2971 KB		
LEASE: COX #7-12				
LOCATION: 1089' FNL & 991' FWL	SEC 12	TWP 28	RGE 33 W	
COUNTY: MCKENNA				

COUNTY: HASKELL

STATE: KANSAS