

# Arden Ratzlaff

PETROLEUM GEOLOGIST

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DRILLING TIME

AND

SAMPLE LOG

COMPANY **CHIEFTAIN OIL CO. INC.**

LEASE **DOUGLAS-KENT NO. 2-18**

FIELD **RHODES SOUTH**

LOCATION **NE SW SW SE**

SECTION **18** TOWNSHIP **34S** RANGE **11W**

COUNTY **BARBER** STATE **KANSAS**

CONTRACTOR **FOSSIL DRILLING** RIG NO. **2**

COMMENCED DRILLING **11-25-11**

COMPLETED DRILLING **12-3-11**

RTD **5240** FEET LTD **5243** FEET

MUD UP AT **3220** FEET MUD TYPE **CHEMICAL**

ELEVATIONS

KB **1415**

DF **1413**

GL **1407**

Measurements Are All From **K.B.**

CASING

**1 3/8" @ 84' W. 225 ST.**

**5 1/2" @ 5187 W. 200 ST.**

ELECTRICAL SURVEYS

LOGGED - GAMMA RAY, DUAL TRACK, COMPRESSED AIR LOG & DENSITY. S.P. & CALIBER

FORMATION TOPS

SAMPLE

ELECTRIC LOG

MEMBER

LANSING

CHEROKEE

MISSISSIPPIAN

KUMBERNAK

YALOA

SIMPSON

SIMPSON SAND

ARBuckle

5731 (2301)

4087 (2272)

4611 (3186)

4489 (3274)

4448 (3490)

4795 (3304)

5105 (3646)

5155 (3728)

5206 (3881)

5730 (2315)

4088 (2673)

4615 (3198)

4705 (3290)

4870 (3495)

8005 (3500)

5105 (3690)

5184 (4719)

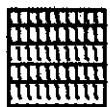
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MARKS AFTER ANALYZING ALL OF THE PERTINENT INFORMATION IT WAS THE DECISION THAT PRODUCTION CASING BE CEMENTED AT THE EXPERTISE OF A COMMERCIAL WELL.

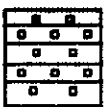
Arden Ratzlaff, Petroleum Geologist

THE PLATONIC AMERICAN FURNISHED THE MUD - SAMPLES DEPOSITED AT THE K.C.S. SURVEY.

## LEGEND



Anhydrite



Salt



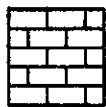
Sandstone



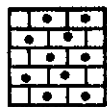
Shale



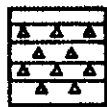
Carb sh



Limestone



Dol. Lime



Chert



Dolomite

DRILLING TIME IN MINUTES PER FOOT  
Rate of Penetration Increases



SAMPLE DESCRIPTIONS

REMARKS

DEPTH

3400

SAMPLE DESCRIPTIONS

REMARKS

20

40

60

80

3500

20

40

60

80

3600

SH. MED TO DK GRAY. SCAT GRAY-CRN  
L BLK W. MED. CR. L. BEN. EN. YIN.  
PRES. DENSE. HARD LIM.

SAME IN TR. IT. GRAY. S. BLK. SP. SILTY  
L. PARTLY MICA. SILT GRADING TO TR.  
IT. IT. CR. EN. CO. INES. S. CR. ROR. POR.  
N.S.

SH. S. M. IN. AS. ABOVE. IN. CONC. RAY.  
SILTY IT. L. MED. CR. RICH. SILT.

SILT. L. M. EN. GRAY. S. CR. IT. CR. L.  
BLK. S. BLK. S. CR. S. CR. IN. ROR. ROR.  
ROR. S. CR. INTER. GRAN. POR. N.S.

SAME AS ABOVE

SILT. IT. CR. L. BLK. ROR. BLK. SP. M.  
MICA. IN. ROR. L. SILT. IN. ROR. S. CR.  
INTER. GRAN. POR. N.S.

20  
40  
60  
80  
3700  
20  
40  
60  
80  
3800  
20

SAME AS ABOVE

SOME AS ABOVE IN MED GRAY GRAY-GRA  
DY GRAY SH & PART TAN. IN GRAY & TAN  
EN. IN. PROD. DENSE. HARD & TR. ONLY  
1M

SAME AS ABOVE

SH. MED GRAY GRAY-GRA & TR. BLK. IN SCOR  
IT GRAY. BLK. SPY. PROD. SILTY & SCOT  
1M AS ABOVE

SH AS ABOVE IN TR. GRAY & BLK. PART  
COAR. SH & SCOT. BLUE GRAY & TAN. EN  
YIN. PROD. DENSE. HARD 1M

SAME IN COAR. BLK & SH. DENISE-BLK  
COAR. SILTY. SCOT. CRAT. BLUE GRAY. TAN &  
BRN. EN. YIN. PROD. DENSE. HARD 1M

NEEDLER 3736  
-2521

1M. CRAT. BLUE IT GRAY & TR. TAN. EN. YIN  
SUB. FILLY TO PROD. DENSE. HARD 1M

1M AS ABOVE IN SCOT. BRN. TAN. TAN. TAN  
HARD 1M PLUS PROD. TO DY GRAY GRAY  
GRAY-GRA & BLK. SH

SH AS ABOVE - STILL CONTAINS ABOVE

SH. MED GRAY GRAY-GRA. U. SILTY IN  
SM 1M AS ABOVE

SH AS ABOVE IN SM. LT. GRAY & TR. BLK.  
RED & MAR SH

40  
60  
80  
3900  
20  
40  
60  
80  
4000  
20  
40

SAME AS ABOVE

SH. MED. GR. F. GR. L. GR. GRN. SILTY SILTY  
IN PART IN SCRT. IN AS ABOVE

SAME IN TR. BLK. CR. SH. IN PART

SH. AS ABOVE

SH. MED. GR. F. GR. GRN. V. SILTY TR.  
CR. & TAN. F. Y. IN. DENSE. HARD LN.

SAME IN TR. BLK. F. Y. IN. DENSE. HARD LN.

SH. AS ABOVE IN V. SCRT. CR. BLK. TAN.  
F. GRN. F. Y. IN. DENSE. HARD LN.

SH. AS ABOVE IN INCL. IN LN. AS ABOVE

SH. MED. GR. F. GR. GRN. IN BLK. TAN.  
F. TR. BLK. F. Y. IN. DENSE. HARD LN.  
TR. CHOCOLATE. DENSE. HARD LN.

SAME IN LT. GR. TR. DE. SP. V. F. Y.  
GR. MED. SILTY. DENSE. SILTY

SAME AS ABOVE

SILT-LT GRAY SLT DOLD IN POOR  
HACTE-CRBN BOR-ALS-W DR AS ABOVE

SILT AS ABOVE W/ CRBN BLK-TRM  
GRY & BRN EN YIN SUR-CHKY TO DENSE  
HARD IM PILL SH AS ABOVE

DANSON 4087  
-2672

1M CRBN BLK & LT GRY EN YIN SUR-  
CHKY & TR CHKY & BLK-TRM & BRN  
EN YIN DENSE HARD IM - SH SLT DOLD  
SILT AS ABOVE

1M CRBN BLK GRY TRM & BRN EN YIN  
SUR-CHKY TO DENSE & HARD

SAME AS ABOVE

SAME SORT LT GRY SILTY & SUY SLT  
DOLD SILT - POOR BOR-ALS PILL IMP  
IN MED GRY & GRY-CRN SLT SILTY SH

SH MED TO TH GRY GRY-CRN IN BLK  
GRY TRM & BRN EN YIN SUR-CHKY  
TO DENSE HARD IM & TR SILT AS ABOVE

4200 SIL MED TO TH GRY BLK-CRBN IN DENSE  
IN SORT BLK GRY TRM & BRN EN YIN SUR-  
CHKY TO DENSE & HARD & RARE LT GRY  
EN YIN SILTY & SUY SLT DOLD SILT POOR  
BOR-N S

SH-LT (MED GRY & BLK-LT GRY SORT &  
"MILKY" BLK) CRBN BLK GRY & TRM & BRN  
EN YIN SUR-CHKY TO DENSE & HARD IM

SH-LT GRY & BLK-CRBN (TRM & BUBBLES)  
IN BLK GRY TRM & BRN EN YIN DENSE  
TO DENSE & TR CHKY SUR-CHKY TO  
CHKY IM

60

80

4100

20

40

60

80

4200

20

40

60  
80  
4300  
20  
40  
60  
80  
4400  
20  
40  
60

100-1000 CARB. LT GRAY BUCKLE STAIN EN YIN  
CHUCKY & SUB-CHUCKY TO DENISE & HARR IN  
CONC. SH AS ABOVE

SH-BLK. PART CARB. W. MID. COV. GRAY-  
CON. W. YIN. CARB. BUCKLE STAIN EN YIN  
SUB-CHUCKY & TR. CHUCKY TO DENISE & HARR &  
SOFT. SH AS ABOVE

SAME AS ABOVE ~ PRED. LN.

SAME W. TR. MID. GRAY STAIN EN YIN LN. /  
MID. LT. GRAY. KEEN. SUB-TRANS. TO DENISE  
HARR

100-BLUE. GRAY STAIN & BUCKLE EN YIN. PRED.  
TRANS. & HARR. W. V. SCAT. CARB. & MID. GRAY LN.  
SUB-CHUCKY & TR. CHUCKY BULL. LT. GRAY & BUCKLE  
EN YIN. SUB-TRANS. CHRT.

SAME AS ABOVE

100-CR. LT. GRAY & BUCKLE EN YIN. SUB-TRANS.  
TO DENISE & HARR. IN. PRED. TRAN. & BUCKLE EN  
YIN. BUCKLE. HARR. IN. PLUS SCAT. BY GRAY &  
BANK CARB. IN. HARR. LN.

**STARK** 4393  
-3076

SH-BLUE (V. CARB.) AND GAS BUBBLES W.  
YIN. CARB. LT. GRAY SUB-CHUCKY & TR. CHUCKY  
TO DENISE & HARR. EN YIN. DENISE.  
HARR LN.

**HUSHPUCKNEY** 4423  
-3088

SH-BLUE CARB. SOFT GAS BUBBLES IN LN.  
AS ABOVE

SH-TR. GRAY & BUCKLE (PRED. IN HARR) W. TRAN.  
BUCKLE. GRAY STAIN & BUCKLE EN YIN. SUB-  
CHUCKY TO DENISE. HARR LN.

**HARR K.E.** 4454  
-3089

SAME AS ABOVE

80  
4500  
20  
40  
60  
80  
4600  
20  
40  
60  
80

1 M. CRIM. BLUE, GRAY, TAN, & BROWN, IN VARIOUS  
SIZES, CHALKY TO CHALKY TO FRESH, BROWN &  
HARD, IN BULK (CARB. IN PART), HARD TO THE  
GRAY TO GRAN. SH.

SH. MED TO DV. GRAY, BLK, GRN & GRN, GRN  
IN LAM. AS ABOVE - SH. CHALKY & SUR-  
CHALKY, SM. IT. G.DY. SUR. TRANS. FRESH  
CURRY.

1 M. WIL. COAL, BLUE, GRAY, TAN & BROWN, IN  
VAR. SIZES & SUR. CHALKY TO DENSE &  
HARD IN GRAN. (TAN TO DK GRAY & BLK  
(CARB.) SH.

1 M. GRN. BLUE, GRAY, TAN & TR. WML. IN  
VAR. SIZES - CHALKY TO CHALKY TO DENSE  
& HARD IN FOOT GRAN. BLK & TR. GRAY SH.

CRACK AT ABOVE

1 M. WIL. COAL, BLUE, GRAY, TAN, GRAY, IN  
SUR. CHALKY TO DENSE & HARD IN LIT GRAY  
& TAN, FRESH, SUR. TRANS. CURRY & SH.  
AS ABOVE, BLK, GRN, GRN, GRN.

1 M. WIL. COAL, IT. GRAY, IN VAR. SIZES, CHALKY TO  
CHALKY TO DENSE & HARD IN BULK  
GRAY, TAN & BROWN, IN VAR. SIZES, HARD  
1 M. IN SORT. BLK, GRN, GRAY, GRN, GRN, GRN.

SH. BLK. CARB. TO GRAY & GRAN. & TAN. W.  
COAL, BLUE, GRAY, TAN & BROWN, IN VARIOUS  
SIZES, HARD, LAM.

1 M. CRIM. BLUE, GRAY & TAN, IN VARIOUS SIZES -  
CHALKY TO DENSE, HARD, LAM. TO SAND, SUR.  
TRANS. AS IN SH. AS ABOVE.

1 M. AS ABOVE IN BLUE, IN VARIOUS SIZES, IN  
SORT. IT. GRAY, FRESH, HARD, GRN, GRN,  
DENSE & HARD, IN V. BROWN, SUR. SUR.  
DENSE, BLUE, TO GRAY, IN BULK, IN BULK, IN  
NO. SH. BLUE, IT. GRAY, IN V. GRAN. (TAN TO  
TAN, GRAY, SUR. IN PART, TO GRAY, IN BULK, IN  
BULK, IN BULK, AS ABOVE, IN BULK, SUR. GRN,  
GRN, IN BULK, SUR. SUR. SUR. SUR. SUR. SUR.  
CAL. BULK, SUR. SUR. SUR. SUR. SUR. SUR.

1 M. AS ABOVE IN TAN & GRAY, CARB. (CARB.)  
HARD, BRITTLE, IN VARIOUS SIZES, SUR. SUR.  
IN BULK, TO GRAY & TR. CHALKY, BLUE, IN BULK,  
GRAY & GRAY, GRN, SH.

SH. AS ABOVE (DENSE, TAN, IN BULK, IN BULK)  
BLUE, FRESH, COAL, BLUE, GRAY & TR. BROWN, IN  
BULK, TAN, IN BULK, COAL, IN.

1 M. & SH. AS ABOVE IN FRESH, GRAY, GRAY, GRN

**ALTAMONT 4532**  
-3137

**PAWNEE 4567**  
-3152

**CHEROKEE 4611**  
-3196

**SAND 4636**  
-3221

**MISSISSIPPIAN 4689**

IN 1/2" BORE DRILLING - 1/2" DIA. HOLE  
HARD IN PLUG & TEST (GRN DRILL, HARD  
CH (W/OUT FOSSILS)

4700

1/2" CH AS ABOVE W. SCAT LT GRV.  
WH (OBS) 1/2" TR. FCN. SUB-TRANS.  
CHRT

20

SEMI W. UNL. LT GRV. BENT ACROSS GRN.  
TR. SCRIPLED. SUB-TRANS. TO ODR.  
TR. DOL. CHRT. TR. STN. ON EDGES &  
SIDES. FAIR ODR.

CHRT. UNL. CRN. LT GRV. FRESH BENT SUB-  
TRANS. TO ODR. IN 1/2" BORE IN GRV.  
F. BK. STN. IN TINY FRAC'S & BENT EDGES.  
STILL ODR.

40

CHRT. UNL. LT GRV. SLY. YELLOW TINT.  
GRN. SHRD. SUB-TRANS. IN TR. DOL.  
IN SCAT. LT GRV. & YELLOW TINTED FRAC'S  
& UNL. W. BENT. LT GRV. & BK. STN. IN ODR.  
TR. GAS BUBBLES & CLEAR OIL DROPLETS  
FLOATING ON WATER IN 1/2" BORE. LISTLESS  
OIL DROPLETS - W/O ODR.

60

CHRT. LT GRV. SUB-TRANS. TO UNL. ODR.  
SCAT. FRAC'S. UNBENTED & UNL. BENT.  
BK. STN. IN ODR. OIL STN. ON WATER & TR.  
BENT OIL DROPLETS - W/O ODR.

80

CHRT. AS ABOVE. BENT. GRN. IN SCAT.  
ODR. & FRAC'S. BK. STN. IN ODR. IN 1/2" BORE.  
LISTLESS OIL DROPLETS ON WATER. W/O ODR.

4800

CHRT. AS ABOVE. W. BENT & GRN. BENT. IN  
XIAL. SLI. TINT. TEST TO BENT. TR. DOL.  
HARD. SLI. SHLY. DOL. - NO ODR.

20

DOL. BENT & GRV. BENT. IN 1/2" BORE. SLI.  
TEST. W. SLI. SHLY. BENT. DOL. & HARD.  
SM. MED. GRV. & TR. GRV. - GRN. SH.

40

1/2" UNL. CRN. & TRN. IN 1/2" BORE. CHRT.  
TO DENSE & HARD. IN 1/2" BORE. FCN. GRN. SH.  
SHRD. BENT. SUB-TRANS. CHRT. PLUG. DOL.  
CR. & GRV. BENT. DOL. - SH. & SHLY. DOL.

**KINDERHOOK 4865**

-3450

60

1/2" UNL. CRN. BENT & GRV. CHRT. CHRT.  
& TR. CHRT. TO DENSE & HARD. W. CHRT. AS  
ABOVE & SHLY. DOL. IN DOL. - SH. & SHLY.

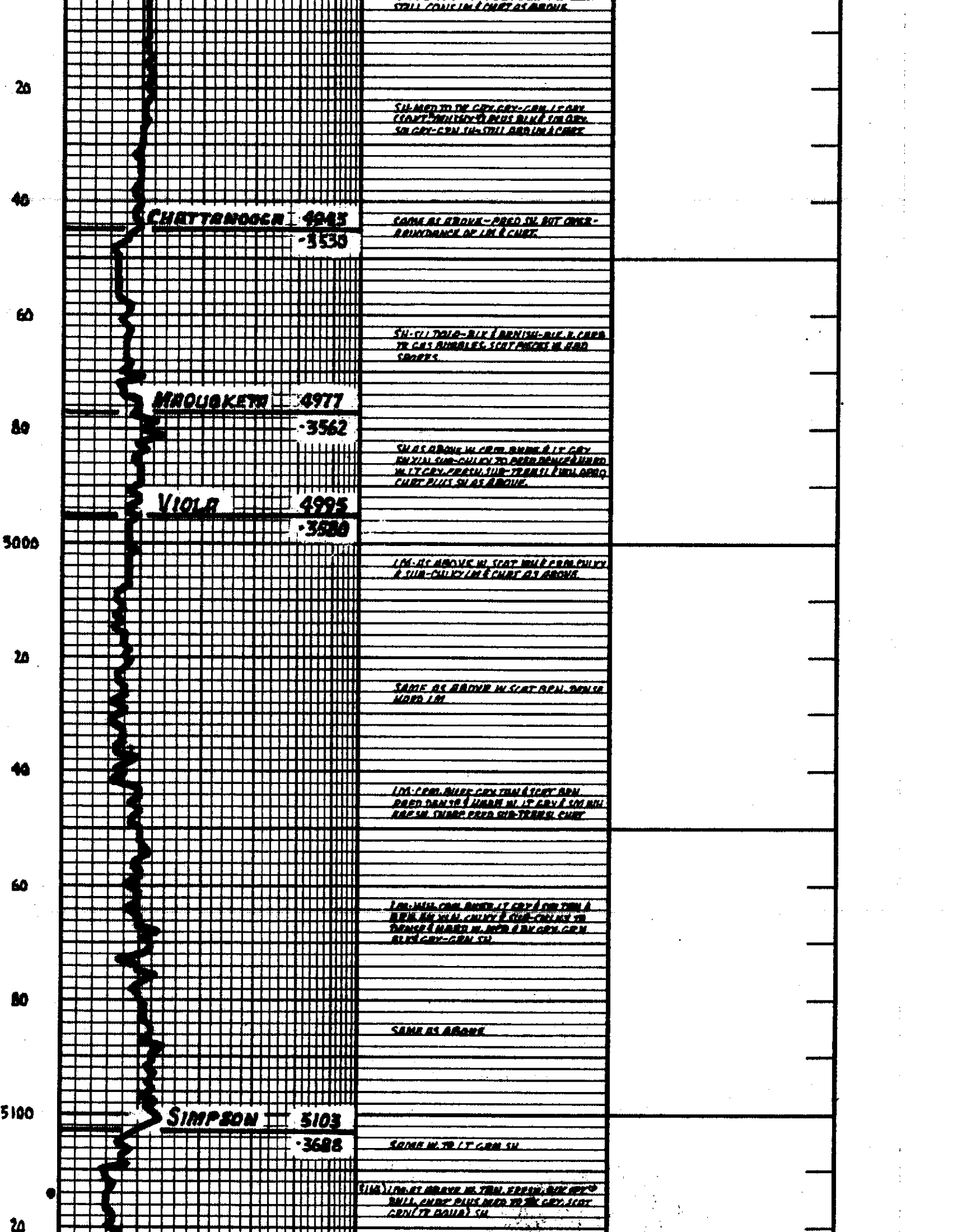
80

1/2" CHRT. AS ABOVE. W. SCAT. DOL. TO TR.  
GRV. BK. TR. GRN. & GRV. - GRN. SH.

4900

SH. MED. TO DK. GRV. BK. SCAT. GRV. GRN.





STILL CONTAINING COALS AS ABOVE

**CHATTANOOGH 4943**  
**-3530**

CAME AS ABOVE - PREC. SH. BUT OVER-  
RAN IN PLACE OF LIM & CHST.

**MROUKETA 4977**  
**-3562**

SH-CLY TALL - BLK / BRN SH - BLK & GRN  
TR GAS BUBBLES, SFT PRCT IN HARD  
SPOTS.

**VIOLA 4995**  
**-3580**

SH AS ABOVE IN FORM. BROWN & LT GRN  
FRYAL SH - CHLKY TO BRN DENSE HARD  
W/ LT GRN FRESH SUR - TRASHY FINE GRN  
CHST PLUS SH AS ABOVE.

LIM - HC ABOVE IN SPAT. W/ FINE CHLKY  
& SUR - CHLKY LIM CHST AS ABOVE.

SAME AS ABOVE IN SPAT. GRN. DENSE  
HARD LIM.

LIM - FINE. BARE. CHLKY. TAN & SPOT. GRN.  
PREC. DENSE & HARD. W/ LT GRN / SFT. W/  
FRESH. THING FROM SUR - TRASHY. CHST.

LIM - W/LL. GRN. BARE. LT GRN / GRN TAN. A  
BARE. W/LL. CHLKY & SUR - CHLKY TO  
DENSE. HARD. W/ GRN. FRYAL GRN.  
BLK GRN - GRN SH.

SAME AS ABOVE

**SIMPSON 5103**  
**-3688**

SAME W/ TR. LT GRN SH.

(110) LIM - FT. BARE. W/ TAN. FRESH. BLK. SPOT.  
BALL. CHST. PLUS. HARD. TR. GRN. SFT.  
GRN / TR. BARE. SH.

SIMPSON SD 5135

3720

(130) SAND IN TR AREA SH & CRIT A TR AND  
ERY EN GRAINED PORT BRAG-TRIT  
GOOD TO GOOD POR - N.S. - NO BRAG  
SIST IT GRY BUDS FULL MED GRAINS RI  
SIB-RIBRO TO WELL RIBED GRINE  
RED FAIR TO GOOD POR - N.S.

SIST IT GRY IN REPAIR GRY STRIP PILL  
IT GRY & BUET EN GRAINED STRIP. SUB-  
RIBRO TO WELL RIBED. INTER. DAY. NO  
GOOD INTER. GRAN. POR. N.S.

SOIL IN IT GRY. BUET I TRIN IN RIX. SIB'S  
EN GRAINED. CHIN I TICE TO GRY. IT GRY  
BUET IN. FIB. CRIT. RIBRO. INTER. GRAN  
POR. N.S.

SIST AS BRAG IN IT GRY STR. BILIB. GRY  
RIX. SIB'S. AND EN MED GRAINS. SIB. RIB  
TO WELL RIBED. PART TO X EN I RIBRO. V  
CRIT. RIB. EN I MED GRAINS ON TRIN BOTTOM.  
NO BRAG OR SHOW - SO BRAG. SH

SIST AS BRAG IN GRY. RIX I IN. RIXIA  
SIB. CONT. IN RIBRO. NO. WALK. PILL. TRIN I  
RIB. RIBRO. RIB. RIBRO. RIX. TRIN. GRY. RIBRO.  
SIB. BRAG. I. CRIT. RIBRO. SIB. RIBRO.

SIB. IN. TRIN. IN. RIBRO. EN. GRY. AND. RIBRO.  
I. RIX. IS.

SH. RIXIA. RIBRO. TO. RIX. GRY. I. RIX. RIBRO.  
RIBRO. SIB. I. EN. I. CRIT. RIBRO. SIB. RIBRO.

SH. I. EN. CRIT. I. SEN. RIBRO. IN. I. IT. GRY. EN.  
V. EN. GRAINED. SIB.

(130) V. SIB. I. SIB. IN. RIBRO. - CRIT. RIBRO. I. IT. GRY. EN.  
EN. GRAINED. SIB. RIBRO. TO. IN. GOOD. INTER.  
GRAN. POR. N.S. PILL. TO. BUET. MED. GRAINS.  
WELL. RIBRO. GRINE. R. RIB. V. GOOD. POR. N.S.  
MED. GRAINS. ON. TRIN. BOTTOM.

(130) SIST. IT. GRY. RIBRO. RIBRO. EN. GRAINED. RIBRO.  
RIBRO. TO. SIB. GOOD. POR. N.S. IN. CRIT. SIB.

SIST. IT. GRY. EN. BUET. EN. I. EN. MED. GRAINS.  
RIBRO. SIB. RIBRO. I. WELL. RIBRO. GRINE.  
HARD. IN. RIBRO. RIBRO. TO. SIB. CRIT. RIBRO. V. RIX.  
IN. GOOD. POR. N.S.

ARRUCKLE 5296

3800

DOLA. TRIN. TO. GRY. I. RIBRO. EN. RIX. SIB. CRIT.  
RIBRO. TO. V. RIBRO. INTER. - IN. RIBRO. N.S.

RIBRO. AS. RIBRO. IN. CRIT. IT. GRY. EN. RIBRO. RIBRO.  
V. CRIT. I. RIBRO.

DOLA. GRY. I. TRIN. IN. RIX. V. RIBRO. RIBRO. I.  
TO. I. RIBRO.

(130) DOLA. CRIT. RIBRO. RIBRO. ON. RIX. V. RIBRO. RIBRO.  
I. TO. RIBRO. TO. RIBRO. RIBRO. I. V. SIB. RIBRO. RIBRO.

TOTAL DEPTH 5340  
-3979

1/4 INCH BUREAU - PROD. NO. VII PER.

