

Arden Catzloff

PETROLEUM GEOLOGIST

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DRILLING TIME
AND
SAMPLE LOGS

COMPANY **CHIEFTAN OIL CO. INC.**

LEASE **MOLZ No. 22**

FIELD **STRANATHAN**

LOCATION **NW SE SE NE**

SECTION **10** TOWNSHIP **35S** RANGE **12W**

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

CONTRACTOR **FOSSIL DRILLING** RIG NO. **3**

COMMENCED DRILLING **10-31-16**

COMPLETED DRILLING **11-04-16**

RTD. **5621** FEET LTD. **5621** FEET

MUD UP AT **3200** FEET MUD TYPE **CHEMICAL**

ELEVATIONS

KB **1409**

IF **1407**

EL **1396**

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

CASING

1 3/4" @ 312' W. 250.55L.

5/8" @ 5624' W. 300.55L.

ELECTRICAL SURVEYS

RESISTORS - COMPENSATED
METERING & DENSITY, P.E. LOG
DUAL INDUCTION/ALIGNED LOG

FORMATION TOPS

SAMPLE

ELECTRIC LOG

HEEDNER 5625 (-2416)
LANSING 4585 (-2874)
CHEMOKEE 4781 (-3542)
MISSISSIPPIAN 4828 (-3419)
KANDERNOOK 5025 (-3600)
VIOLA 5335 (-3826)
SIMPSON 5326 (-3917)
SIMPSON SDST 5345 (-3956)
ARBuckle 5560 (-4151)
TOTAL DEPTH 5621 (-4212)

5625 (-2411)
4576 (-2267)
4746 (-3387)
4826 (-3417)
5024 (-3615)
5232 (-3825)
5326 (-3917)
5350 (-3947)
5559 (-4150)
5621 (-4212)

REMARKS AFTER ANALYZING ALL OF THE PERTINENT INFORMATION WITH DRILLING ON THE WELL PLUS THE KNOWLEDGE OF PRODUCTION IN THE AREA. PRODUCTION CASING WAS SET IN EXPECTANCE OF A GOOD WELL.

Arden Catzloff, Petroleum Geologist

NOTE! BARCAS FURNISHED THE MUD ~~~ SAMPLES DEPOSITED AT THE K.C.S. SURVEY.

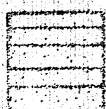
LEGEND



Anhydrite



Salt



Sandstone



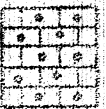
Shale



Carb sh



Limestone



Dol. Lme



Chert



Dolomite

DRILLING TIME IN MINUTES
PER FOOT

Rate of Penetration Increases

LITHOLOG

AGE

DEPTH

5' 10' 15' 20' 25'

SAMPLE DESCRIPTIONS

REMARKS

3700

SH-MED TO DK GRY GRN GRN & BLK
GRN GRN PLUS SCAT DK GRN & BLK
FN XLN. DENSE. HARD LM.

20

SH-MED GRY. Y. BLK. WITH GRADING TO
V. SHLY. MED TITE SILT IN SCAT LF GRN
& BLK SH

40

SOME AS-PRED SILT. SHLY IN PART.

60

SH-MED TO DK GRY. TR GRN GRN & BLK
PLUS ADD SILT AS ABOVE.

80

SAME IN SCAT TRN & BRN. FN XLN
DENSE. HARD LM.

2000

SH-MED TO DK GRY. GRY GRN & BLK
IN SCAT. BURE GRN TRN & BRN. FN XLN
DENSE. HARD LM.

20

NEEDLER

3025

-2416

SAME INCR IN FN XLN. DENSE. HARD
LM & TR BLK. COAR SH.

40

LM-WH. COAR. BLK GRY & TRN. FN XLN.
SUB-CHUNKY TO DENSE & HARD. STILL
SCAT BLK (COAR). DK GRY GRN GRN SH

60

LM-AS ABOVE. W. SCAT BLK (PART COAR)
SCAT DK GRY & TR GRY GRN SH.

80

SH-MED TO DK GRY. GRY GRN & BLK
SH W. SCAT SILT SILTY SH. LTM & BLK
COAR. SH AS ABOVE.

3900

SH-PRED MED GRY. SCAT GRY GRN
CM TR GRY & BLK

20

SH-MED GRX GRX GRN W GRN BLUF
GRY & TRN FA XIN SUB-CHKY TO
DENSE HARD LM.

40

SH-MED GRX TR SILTY W SCAT DK GRX
BLK & GRX GRN W SCAT GRN BLUF
TRN & BN FRN FRD DENSE HARD
LM

60

SAME AS ABOVE

80

SH-MED GRX (TR SILTY) TO SCAT DK
GRY & GRX GRN SH.

4000

SH-MED TO DK GRX GRX GRN (TR
BLK W SCAT BLUF & LT GRX GRN XIN
SUB-CHKY TO DENSE HARD LM.

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SAME AS ABOVE IN TR LT GRX SCAT
MUSKY SH

40

SH-MED TR GRX GRX GRN (TR
LM AS ABOVE.

60

SAME AS ABOVE

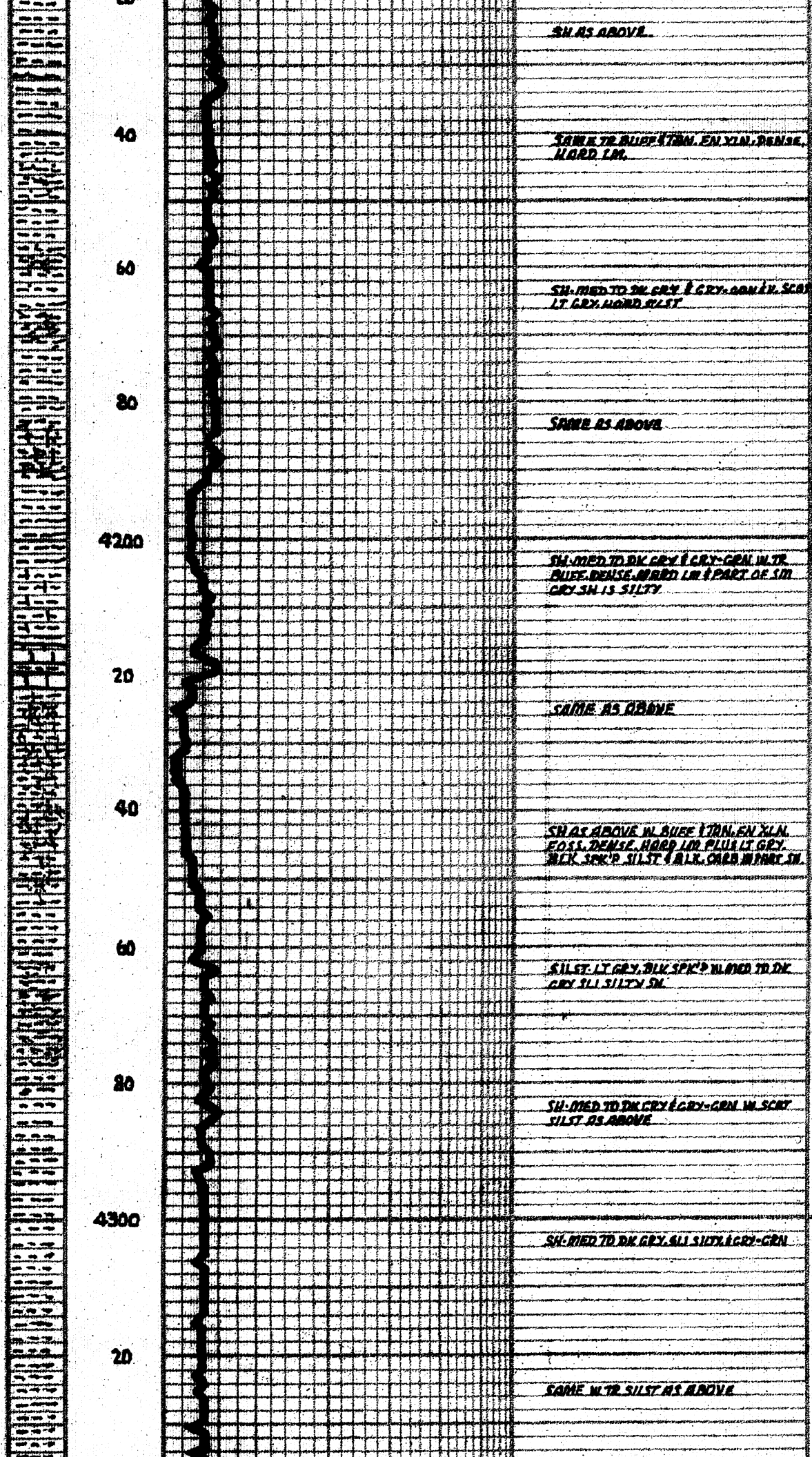
80

SH-MED TO DK GRX & GRX GRN W
SCAT SILTY SH & SHY SH & BLK SPK'S
SH SOFT MUSKY SH.

4100

SH-MED TO DK GRX GRX GRN (TR BLK

20



40

60

80

4400

20

40

60

80

4500

20

40

LANSING-K.C.

4383

-2974

SH-MED GRV & GRV-CRAI SILTY IN V.
SCOT LT GRV BLK SPK'S SLTLM-TNLT BRN TR BUFF ENXIN, PRE-
DENSE & HARD WARD SHAS ABOVE & BLK
CARB SHLM-CRM BUFF GRV TRN & BRN ENXIN
SUB-CULKY TO DENSE & HARD IN CORN
DIED TO BK GRV BLK CARB IN PART & TR
GRV-CRM SHLM-BUFF GRV TRN & BRN ENXIN SUB-
CULKY TO PRE-DENSE & HARDLM-CRM BUFF GRV TRN & BRN ENXIN
SUB-CULKY TO DENSE & HARD IN CORN
WH-CRM & BUFF CULKY & SUB-CULKYLM-WH CRM & BUFF AS ABOVE (CULKY & SUB-
CULKY) IN SCOT TRN & BRN ENXIN TANTR
& HARD LMLM AS ABOVE IN SCOT GRV & TRN WARD
SUB-TRNLT SHAP CHRT W. TRN GRV
GRV-CRM & TR BLK SHLM-WH CRM BUFF & TRN SUB-CULKY &
TR CULKY TO DENSE & HARD TR CHRT
AS ABOVELM-CRM BUFF TRN & TR BRN ENXIN
DENSE & HARD-TR BLK CARB SH &
TR CHRT AS ABOVE

STARK

4527

-3118

LM-CRM BUFF GRV TRN & TR BRN ENXIN
SUB-CULKY TO DENSE & HARD

SH-BLK CARB IN LM AS ABOVE

60
HUSHPUCKEY 4562
-3153
SH. BLK. CORR. W. WH. CR. BLUFF GR. TAN. BRN. FN. XIN. SUB. CHLY. & CALLY. TO PRE. DENSE. HARD LM.

20
LM. AS ABOVE W. LT. (MED GR. GR. GRN. & BLK. CORR. IN PART) SH.

BARRE KANSAS CITY 4592
-3183

4600
LM. CR. BLUFF GR. TAN. & BRN. FN. XIN. SUB. CHLY. TO DENSE. HARD W. SCAT. MED. & DK. GR. & BLK. CORR. IN PART) SH.

20
LM. WH. CR. BLUFF GR. & GR. TINTED. FN. XIN. SUB. CHLY. & CALLY. TO DENSE. HARD IN SCAT. MED. TO DK. GR. & BLK. CORR. IN PART) SH.

40
LM. BLUFF GR. SH. GR. TINTED. IN CONS. GRN. SH. V. SCAT.

60
LM. BLUFF GR. TAN. BRN. FN. XIN. PRE. DENSE. & HARD W. BLK. CORR. & GR. & SCAT. GRN. SH.

ALTAMONT 4613
-3264

80
LM. BLUFF GR. TAN. BRN. FN. XIN. PRE. DENSE. & HARD W. BLK. CORR. & GR. & SCAT. GRN. SH.

4700
SH. BLK. CORR. GR. GR. & BRN. W. BLUFF GR. TAN. BRN. FN. XIN. PRE. DENSE. & HARD LM.

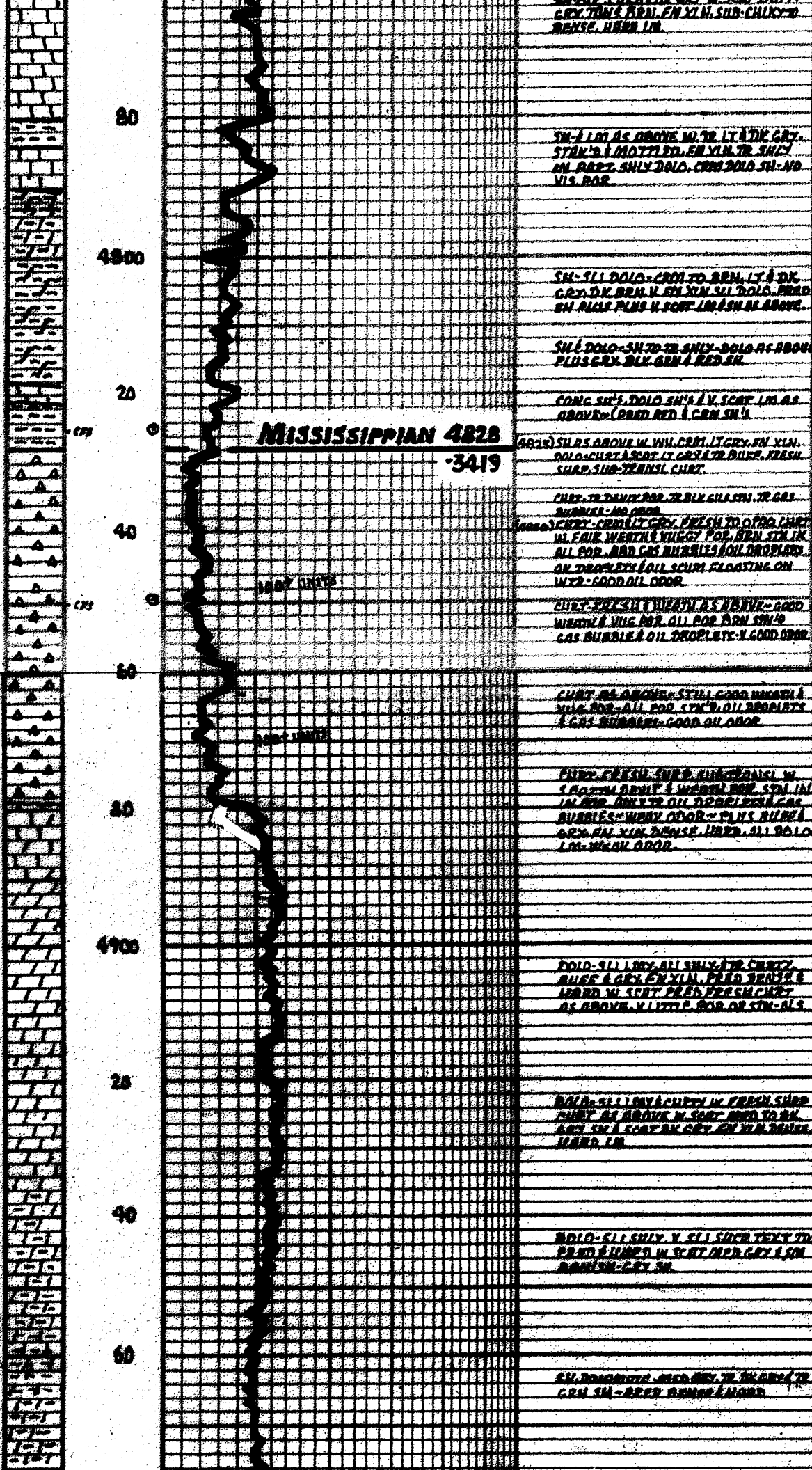
PRINCE 4714
-3308

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SH. BLK. & DK. GR. CORR. IN DK. GR. GRN. & GR. GRN. SH. PLUS CR. BLUFF GR. TAN. & BRN. FN. XIN. SUB. CHLY. & CALLY. TO PRE. DENSE. & HARD LM.

40
LM. CR. BLUFF GR. TAN. BRN. FN. XIN. SUB. CHLY. TO PRE. DENSE. & HARD

CHEROKEE 4751
-3362

60
SH. BLK. CORR. GR. GR. & BRN. W. BLUFF GR. TAN. BRN. FN. XIN. PRE. DENSE. & HARD LM.



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5000
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5100
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5000

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60

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5100

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60

80

TOLD-SH OR SHLY-TOLD-GRY-CRY-
BRL PRD TENSEE HARD W COIS
CRN BLK SH

TOLD-SHLY W HBR TOLD-SH GRY-CRY-
CRN W V SCOT CRN BLK SH

SAME AS ABOVE W BOLS CRN SH

SH-SH TOLD-RENTED BY CRN SCOT ARM
W BOLS & TOL SHYIN-RENTED HARD IM

IM-BOLS-CRY-TOL-GRY W BOLS
RENTED & HARD W SH & TOLD-SH AS
ABOVE

KINDERHOOK 5075

3666

SH-MED TO BK GRV-BLY & GRV-CRN
W SCOT IM AS ABOVE

SH-MED TO BK GRV-GRV-CRN-BLY
W IM AS ABOVE

SAME AS ABOVE

SH-MED GRV-CRY-CRN-BLY-TOL-GRV
BOLS GRV-BRL OR BOLS-BLY
CR-TOLD-SH-CRN-TOLD-SH W BOLS
CR-BOLS-BOLS-NO BOLS

CLINTONWOOD 5152

3743

SH-MED TO BK GRV-CRN-BLY-TOL-GRV
BLY-TOL-GRV-CRN-SH SCOT-GRV
CR-BOLS-BOLS-BOLS-BOLS-BOLS
BOLS

MISNER 5173

3764

SH-MED TO BK GRV-CRN-BLY-TOL-GRV
CR-BOLS-BOLS-BOLS-BOLS-BOLS
BOLS-BOLS-BOLS-BOLS-BOLS-BOLS
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SH-MED TO BK GRV-CRN-BLY-TOL-GRV
IM-BOLS-BOLS-BOLS-BOLS-BOLS-BOLS
BOLS-BOLS-BOLS-BOLS-BOLS-BOLS

5200

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5300

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5400

VIOLA

5235

-3826

CH. IN FACES. SOFT AS ABOVE IN SOFT
THE LATER CRY. IN VIA. CH. IN FACES
CH. IN FACES. SOFT AS ABOVE IN SOFT

SOFT IN SOFT (IN) AS ABOVE. POOR
SOFT (IN) TO HARD. SOFT AS ABOVE

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AND HARD. SOFT AS ABOVE IN SOFT
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CH. IN FACES. SOFT AS ABOVE

SIMPSON

5324

-3917

SOFT. CH. IN FACES. SOFT AS ABOVE
CH. IN FACES. SOFT AS ABOVE IN SOFT

SIMPSON SAND 5345

-3936

SOFT. CH. IN FACES. SOFT AS ABOVE
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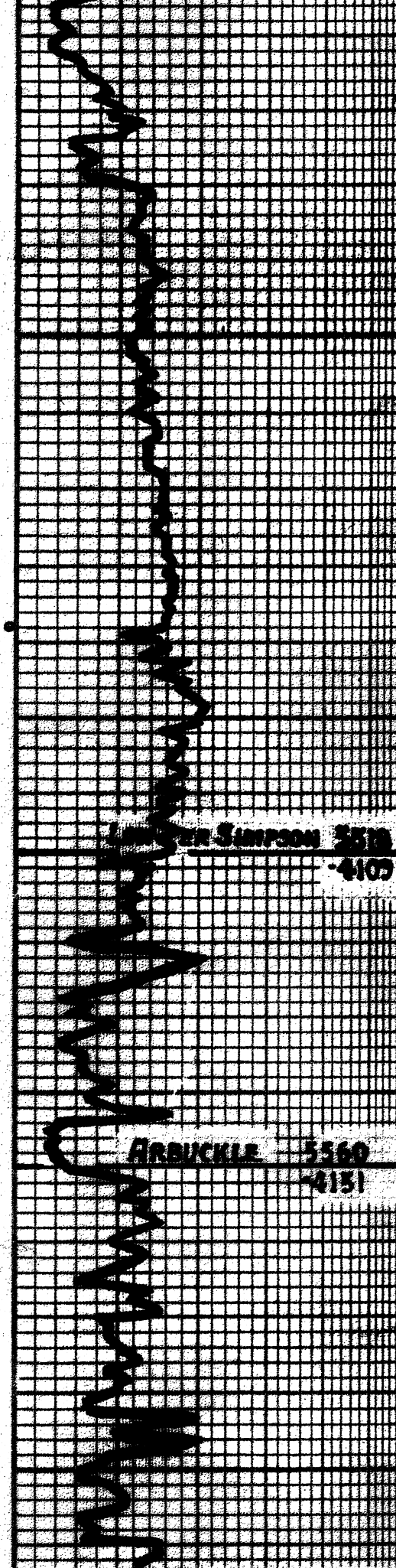
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SIMPSON 3510
4105

ARBUCKLE 5560
4131

TOTAL DEPTH 5621

TO GOOD FOR IN SCOT TAIL V. EN I EN GRAY
CLUSTERS IN GOOD FOR (PARTIALLY) PLUS
GRY I GRAY SH

SCOT V. EN I GRAY EN GRAY EN GRAY
TITE IN GOOD INTER. GRAY FOR - MS PLUS
SCOT FOSTER AS ABOVE - GRAY I GRAY SH

SCOT LT GRAY W. WHITE GRAY SH (DULL)
CLUSTERS IN GRAY W. GRAY GRAY I
GRAY GRAY GRAY GRAY GRAY GRAY
GRAY GRAY GRAY GRAY GRAY GRAY
FOR I. EN I GRAY GRAY GRAY GRAY
GRAY GRAY GRAY GRAY GRAY GRAY

SCOT V. EN I GRAY EN GRAY FOR
V. GRAY FOR FOR - MS - COUPLE FEET
W. SPOTTY GRAY SH IN GRAY GRAY GRAY
CLUSTERS PLUS CONS GRAY GRAY GRAY

GRAY GRAY GRAY GRAY W. SCOT V. EN I GRAY
TITE EN I EN GRAY GRAY GRAY GRAY
SCOT - MS

SH GRAY GRAY GRAY W. GRAY I GRAY GRAY
GRAY I IN PART FOR GRAY FOR - MS I
TO GRAY GRAY GRAY GRAY GRAY GRAY
GRAY I

SAME AS ABOVE - GRAY SH

SCOT I GRAY PART GRAY GRAY W. V. EN
I EN GRAY GRAY GRAY GRAY GRAY GRAY
W. SH AS ABOVE I GRAY GRAY GRAY
I GRAY GRAY GRAY GRAY GRAY GRAY

SCOT GRAY GRAY GRAY GRAY GRAY GRAY
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5626	ACTUAL TOTAL DEPTH.	-4212
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NOTE: 5' OF ADDITIONAL HOLE
WAS DRILLED BELOW THE ORIGINAL
TOTAL DEPTH PRIOR TO SETTING 5"
CASING.