

KIM B. SHOEMAKER

CONSULTING GEOLOGIST

316-684-9709 * WICHITA, KS

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

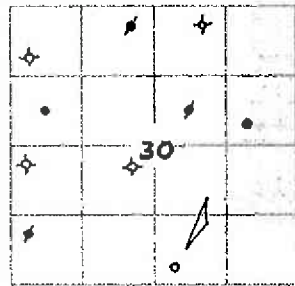
COMPANY L. D. DRILLING, INC.
 LEASE # 1-30 HARLEY
 FIELD LUNDGREN
 LOCATION 330' ESL $\frac{1}{2}$ 2235' FEL
 SEC 30 TWP 14s RGE 29w
 COUNTY GOVE STATE KANSAS
 CONTRACTOR L. D. DRILLING, INC.
 SPUD 2-24-14 COMP 3-6-14
 RTD 4400 LTD 4402
 MUD UP 3417 TYPE MUD CHEMICAL

ELEVATIONS
 KB 2607
 DF _____
 GL 2602
 Measurements Are All
 From 2607 KB

CASING
 SURFACE 8 5/8" @ 347'
 PRODUCTION 5 1/2" @ _____
 ELECTRICAL SURVEYS
 DUAL IND., DENS.-N., MICRO

SAMPLES SAVED FROM 3400 TO 4400
 DRILLING TIME KEPT FROM 3150 TO 4400
 SAMPLES EXAMINED FROM 3400 TO 4400
 GEOLOGICAL SUPERVISION FROM 3500 TO 4400
 GEOLOGIST ON WELL KIM B. SHOEMAKER

FORMATION TOPS	LOG	SAMPLES
ANHYDRITE	2004+603	2007+600
B/ANH.	2034+573	2037+570
STOTLER	3253-646	3253-646
HEEBNER	3627-1020	3628-1021
LANSING	3669-1062	3664-1057
STARK	3905-1298	3906-1299
MARMATON	3999-1392	3995-1388
FORT SCOTT	4158-1551	4156-1549
CHEROKEE	4182-1575	4180-1573
MISSISSIPPI ST LOUIS	4252-1645	4259-1652
MISS. SPERGEN	4276-1669	4276-1669



API: 15-063-22163

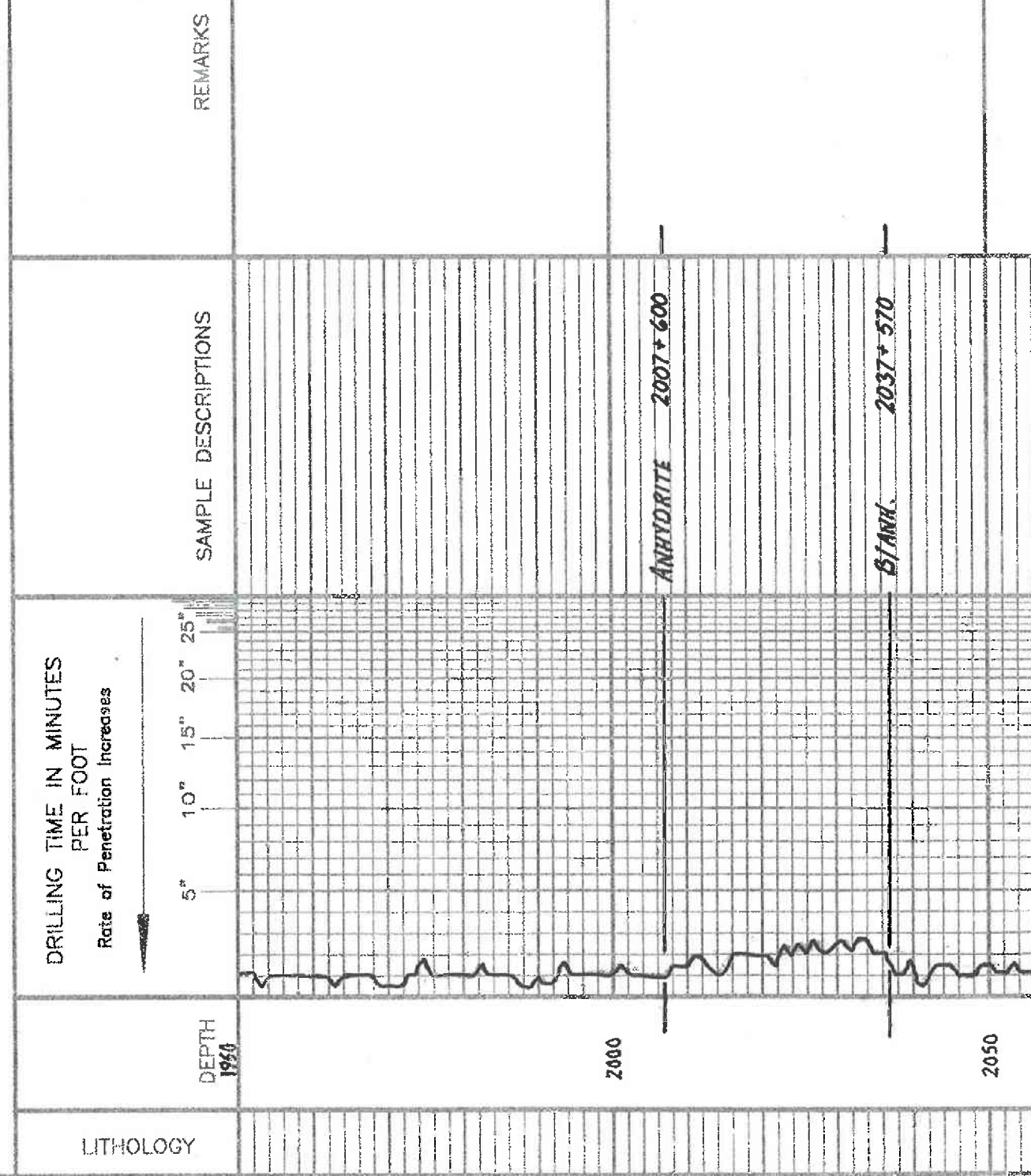
REMARKS

2-24-14 SPUD
 2-25 @ 175'
 2-26 @ 865'
 2-27 @ 2116'
 2-28 @ 2895'
 3-1 @ 3415'
 3-2 @ 3910'
 3-3 @ 4148'
 3-4 @ 4250'
 3-5 @ 4307'
 3-6 @ 4400'

LEGEND

- Dolomite
- Chert
- Cal. Lime
- Limestone
- Carb sh
- Shale
- Sandstone
- Salt
- Anhydrite

SHOEC1-06



3150

3200

3300

3400

STOTLER 3253-616

Samples are bagged

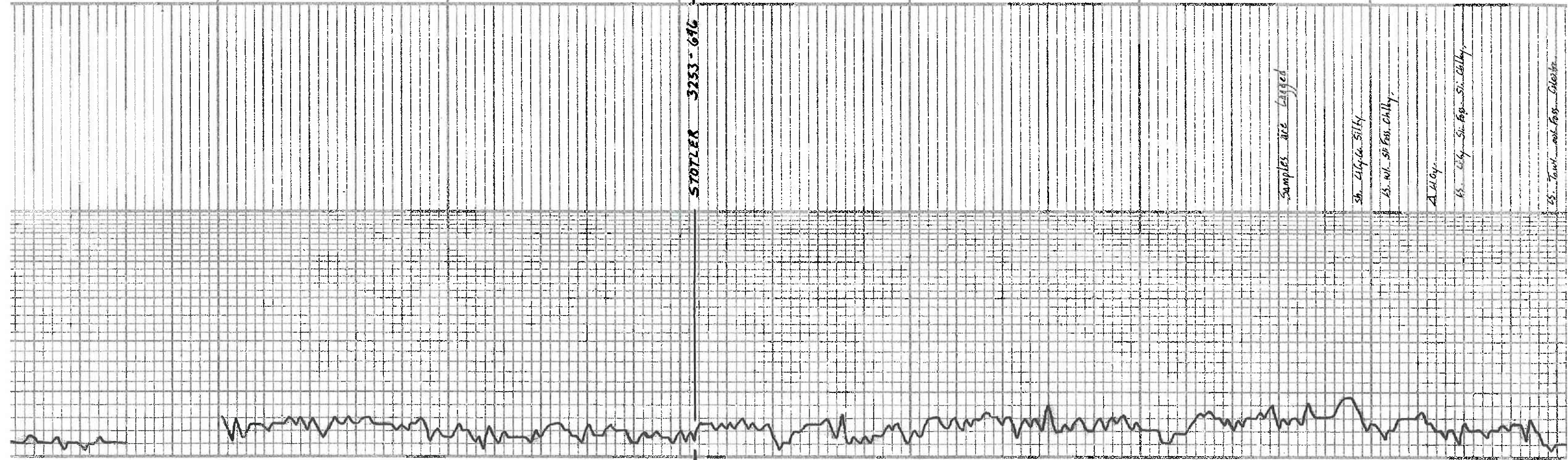
Sh. clay. Silty

Es. wt. sh. fss. clay.

A clay.

Es. clay. Silty fss. clay.

Es. fss. clay. fss. clay.



3500

3600

3700

VIS 51
WTS 8.7
ML 6A
CWC 1400

✓ LANSING

KANSAS CITY

LS. W. Calif.

LS. W. S. Foss. S. Calif.

LS. To Alacran. S. A.

Sh. Calif.

LS. Calif. D. S. Foss.

Sh. Calif. S. A.

A. Calif. Foss.

LS. Calif. Foss.

Sh. Calif.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.

LS. W. S. Foss. Calif.

HEEBNER 3628-1021

Sh. Calif. S. A.

Sh. Calif.

LS. W. S. Foss. S. A.

Sh. Calif.

LANSING 3661-1057

LS. To Calif. Foss. S. A.

Sh. Calif.

LS. To Calif. Foss. S. A.

Sh. Calif.

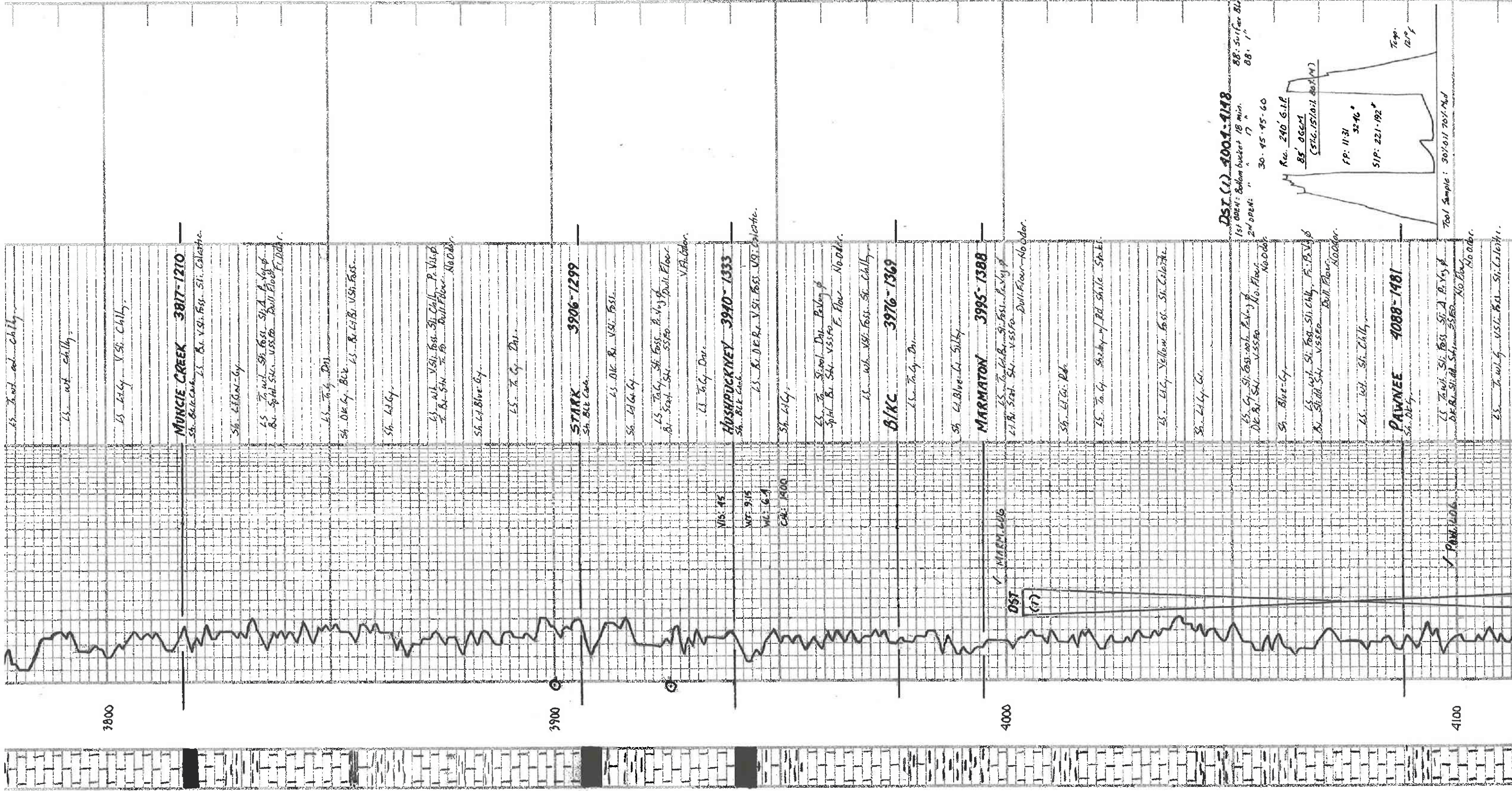
Sh. Calif.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.

LS. To Calif. Foss. S. A.



3800

3900

4000

4100

MUNCIE CREEK 3817-1210

SS. Blue-Gay
 LS. Reddish Yellow. Foss. St. Caliche.
 Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

LS. Tan. Silty.

SS. Blue-Gay. Bl. Sand. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty.

STARK 3906-1299

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

Sh. Blue-Gay

HUSHPUCKNEY 3940-1333

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.

VIS. 45

W.C. 9.15

W.C. 6.1

Cal. 1400

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

B/KC 3976-1369

Sh. Blue-Gay

Sh. Blue-Gay

MARMATON 3995-1388

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.
 Bl. Sand. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

PAWNEE 4088-1481

Sh. Blue-Gay

LS. Tan. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

LS. Tan. Silty. Foss. St. Caliche.

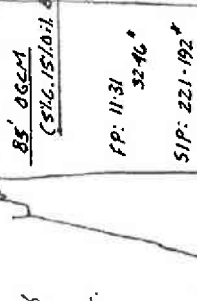
✓ MARMATON
 DST (17)

✓ PAWNEE

DST (1) 4004-4148

1st OPEN: Bottom bucket 18 min. 88' Surface Blue
 2nd OPEN: " 17 " 88' "

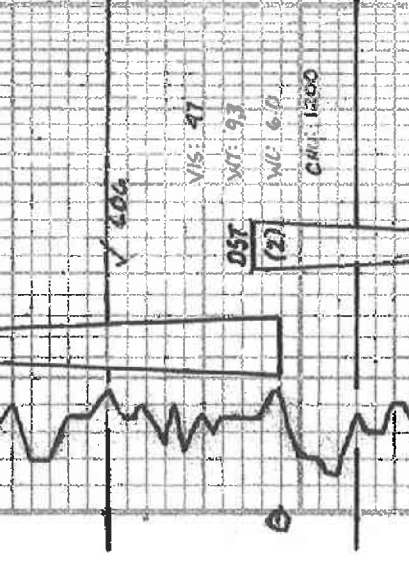
30. 45. 45-60



700' Sample: 30' 0.17 707-Md

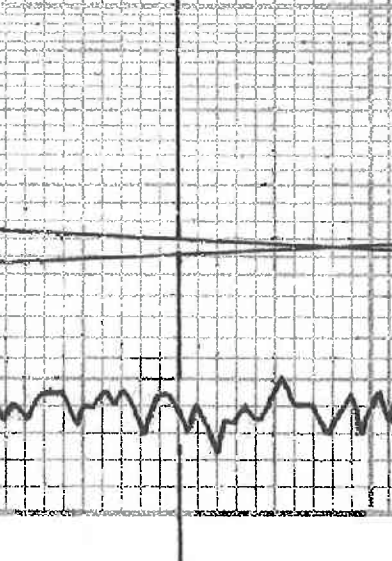
Top 120'

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.



Vis: 47
 WT: 93
 W: 6 P
 CW: 1200

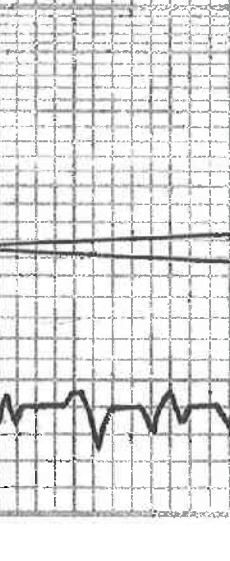
FORT SCOTT 4156-1549
 Ls. Ark. Carb. Sil. Calcitic
 Ls. Ltg. US. Sil. Foss. Sil. A.
 Ls. B. S. H. Sil. Foss. P. V. sp. No. Odor.
 DE. B. S. H. V. S. sp. No. Odor.
CHEROKEE 4180-1573
 Sh. Ark. Carb.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Sp. Ark. Carb. V. S. sp. No. Odor.
 Ls. T. J. V. S. sp. No. Odor.
 Ls. B. S. H. V. S. sp. No. Odor.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

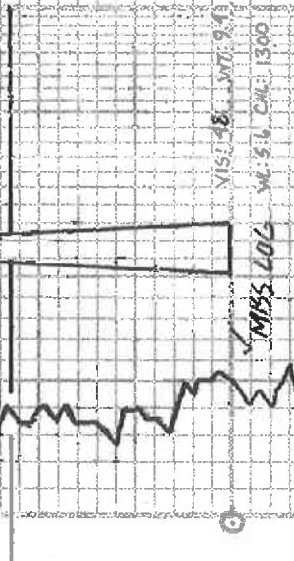
JOHNSON 4227-1620
 Ls. wt. Sil. Foss. Sil. A. P. V. sp.
 DE. B. S. H. V. S. sp. No. Odor.
 Ls. T. J. Dtl. A. Ltg.
 Sh. Co. Blue. Yellow. Suby.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

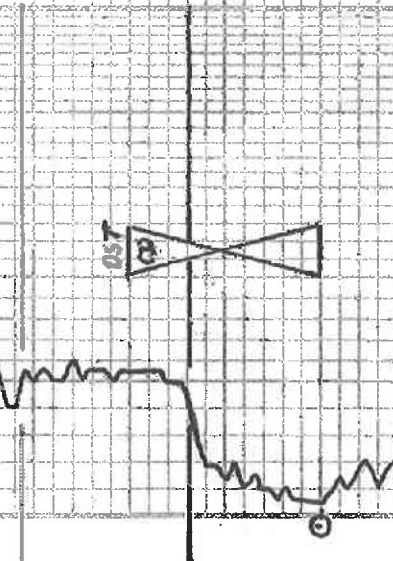
MISSISSIPPI 4259-1652
 Ls. T. J. Dtl. Sil. Chlg.
 Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Co. Blue. Yellow. Suby.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

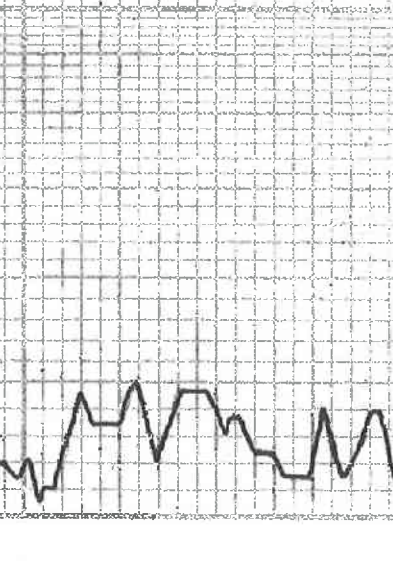
MISS SPERGEN 4276-1669
 Dol. T. J. B. V. Foss. Sil. Foss. V. S. sp.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 F. od. Foss. G. od. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 Ls. B. S. H. V. S. sp. No. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

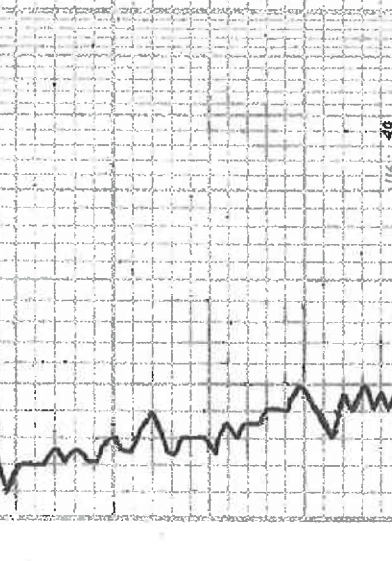
RTD 4400-1593
 Ls. B. S. H. V. S. sp. No. Odor.
 Ls. T. J. Dtl. Sil. Chlg.
 Ls. B. S. H. V. S. sp. No. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 F. od. Foss. G. od. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

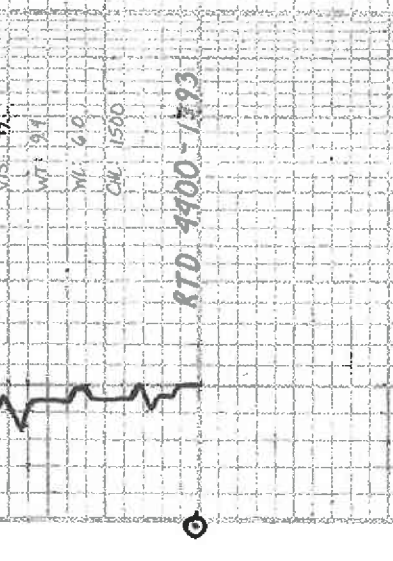
MISSISSIPPI 4259-1652
 Ls. T. J. Dtl. Sil. Chlg.
 Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Co. Blue. Yellow. Suby.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

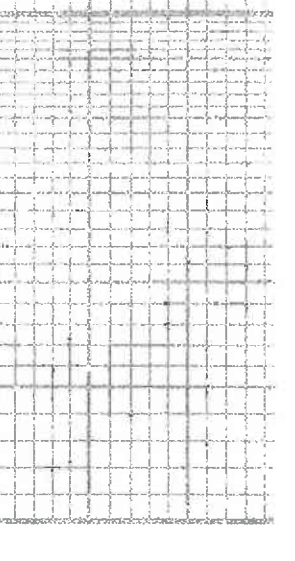
MISS SPERGEN 4276-1669
 Dol. T. J. B. V. Foss. Sil. Foss. V. S. sp.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 F. od. Foss. G. od. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 Ls. B. S. H. V. S. sp. No. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.



Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

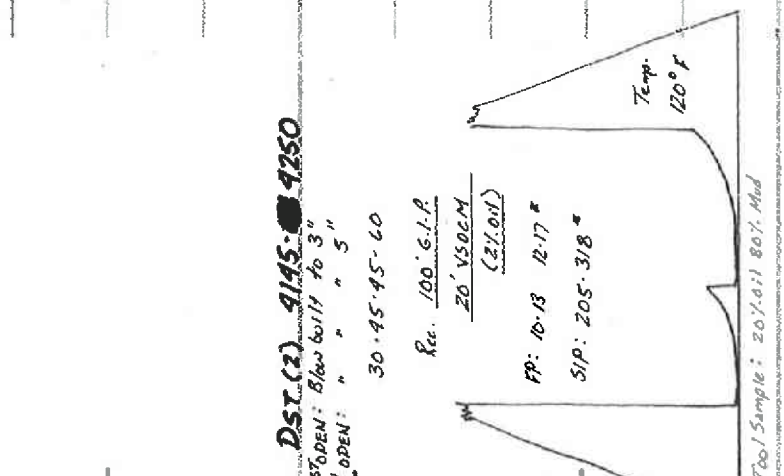
Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.

RTD 4400-1593
 Ls. B. S. H. V. S. sp. No. Odor.
 Ls. T. J. Dtl. Sil. Chlg.
 Ls. B. S. H. V. S. sp. No. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 F. od. Foss. G. od. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.

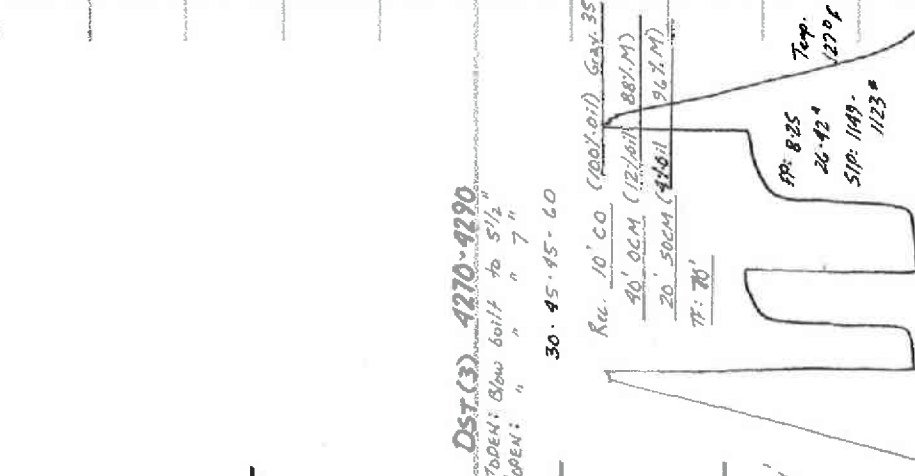


Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

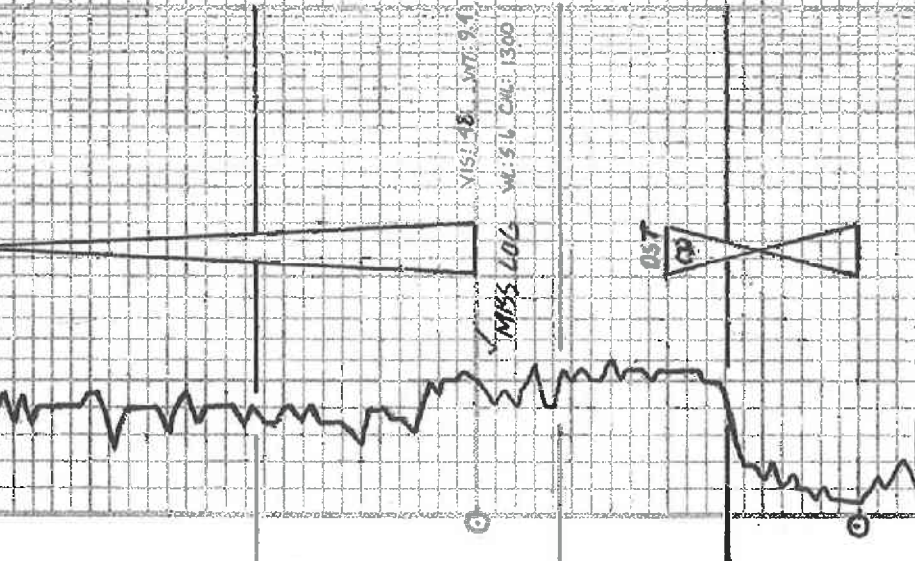
Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.



DST (2) 4145-9250
 1st OPEN: Blow bolt to 3"
 2^d OPEN: " " " 5"
 30-45-45-60
 Rec. 100' G.I.P.
 20' V.S. 0.0M
 (21' ON)
 PP: 10-13 12-17
 SIP: 205-318
 Tool Sample: 20'-01' 80% Mud



DST (3) 4270-9290
 1st OPEN: Blow bolt to 5 1/2"
 2^d OPEN: " " " 7"
 30-45-45-60
 Rec. 10' CO. (100' oil) GRAY 35
 40' OCM (12' oil) 88% M
 20' 50CM (42' oil) 90% M
 TF: 70'
 PP: 825
 26-42
 SIP: 1149-1123
 Tool Sample: 32'-01' 68% Mud

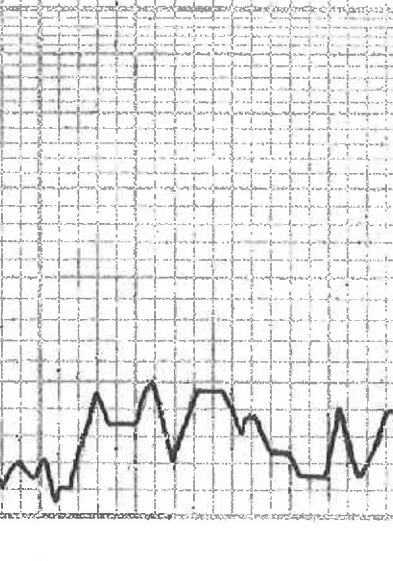


Vis: 48
 WT: 94
 W: 5 P
 CW: 1300

Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.



RTD 4400-1593
 Ls. B. S. H. V. S. sp. No. Odor.
 Ls. T. J. Dtl. Sil. Chlg.
 Ls. B. S. H. V. S. sp. No. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.
 F. od. Foss. G. od. Odor.
 Dol. T. J. B. V. Foss. Sil. Foss.
 F. od. V. sp. Ls. B. S. H. V. S. sp. No. Odor.



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 W: 5 P
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Sh. Ark. Carb. ES. DE. H. Dtl.
 Sh. Ltg. G.
MYRICK STATION 4130-1523
 ES. wt. Sh. Foss. Sil. A. P. V. sp.
 To DK. B. S. H. T. Fo. No. E. w. No. Odor.
 Ls. T. J. Sil. Foss. P. V. sp. No. Odor.
 Ls. Ltg. Dtl. Ls. B. S. H. V. S. sp. No. Odor.
 Sh. Ark. Carb.