

WPC GEOLOGIST'S REPORT

DRILLING TIME & SAMPLE LOG

COMPANY Berexco LLC
 LEASE Dennis Unit NO. 4-3
 LOCATION 541' FNL + 233' FEL
 SEC. 3 TWP. 29S RNG. 33W
 COUNTY Haskell, STATE Kansas
 FIELD US 83 Northwest

CONTRACTOR Beredco Dalg Rig #1
 COMM. 8-22-2014 COMP. 9-7-2014
 RTD 5600 LTD 5600
 No. of DST'S One No. of CORES None

SAMPLES SAVED FROM 3900 TO TD
 DRILLING TIME KEPT FROM 3900 TO TD
 SAMPLES EXAMINED FROM 3900 TO TD
 GEOLOGICAL SUPERVISION FROM 3900 TO TD
 GEOLOGIST ON WELL Edwin H. Grieves

FORMATION TOPS

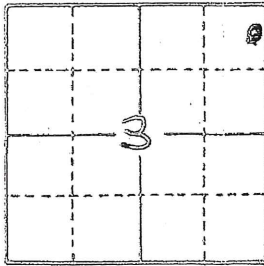
FORMATION	SAMPLE	LOG	SUBSEA
Base Heebner	4114	4116	-1149
Toronto	4126	4126	-1159
Lansing Fm.	4201	4208	-1241
Kansas City Fm	4626	4626	-1659
BKC	4765	4764	-1797
Marmaton	4785	4778	-1811
Pawnee	4895	4891	-1924
Ft Scott	4930	4928	-1961
Cherokee	4946	4944	-1977
Morrow	5271	5273	-2306
Chester	5436	5431	-2464
St Genevieve	5486	5496	-2529
St Louis	5567	No Pen.	=====
TD	5600	5600	=====

ELEVATIONS
 KB 2967
 DF 2965
 GL 2955

MEASUREMENTS ARE ALL FROM KB

CASING RECORD
8 5/8" of 1750 w/ sx.
 of w/ sx.
 of w/ sx.
 of w/ sx.

EL. LOG AC Res. SP. GR
Den. Neut GR. Caliper
ML. Sonic



API# 15-081-22074

REMARKS Earth-Tech had an unmanned gas detection trailer on this well from 3900 feet to total depth.

Edwin H. Grieves
 Geologist
 WPC
 10101
 10101
 10101

GAS CHROMATOGRAPH

C1 = METHANE
 C2 = ETHANE
 C3 = PROPANE
 C4 = ISOBUTANE
 C5 = BUTANE
 C6 = ISOPENTANE
 C7 = PENTANE

SANDSTONE
 LIMESTONE
 SHALE
 CHERT

GRANITE WASH
 SANDSTONE
 LIMESTONE
 SHALE
 CHERT

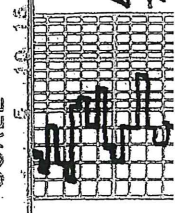
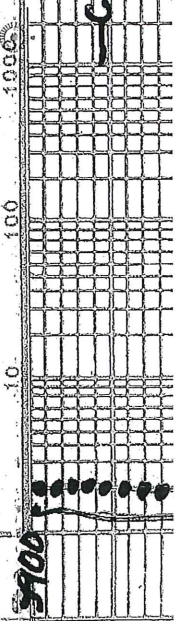
SANDSTONE
 LIMESTONE
 SHALE
 CHERT

HOT WIRE BY TOTAL GAS VOLUME

SAMPLE DESCRIPTION

DRILL TIME SCALE

GAS SCALE



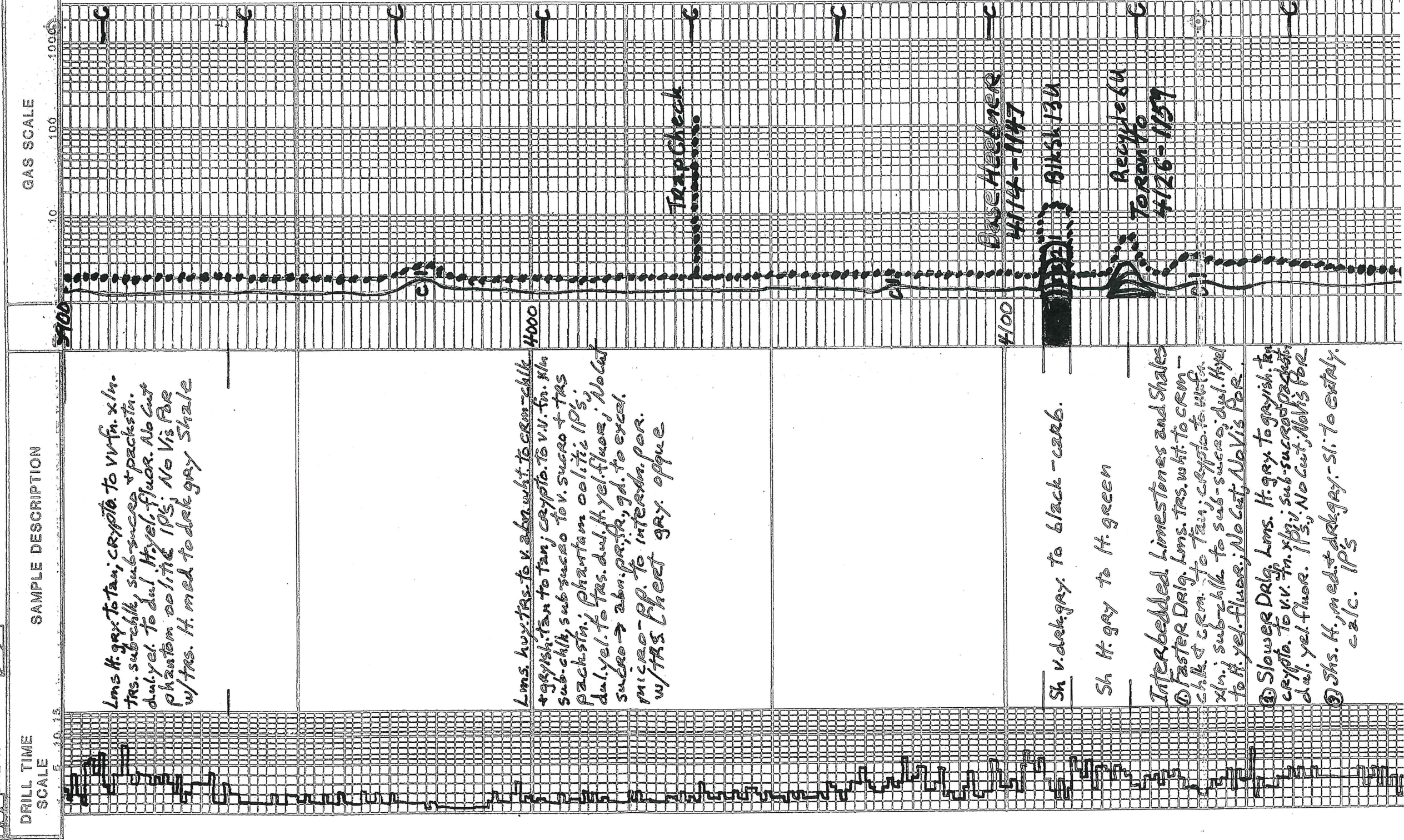
Lms H. gray to tan, cryptic to v. fm. x. in. TRS. sub-chalk, sub-sand, & packstr.

LIMESTONE
SHALE
CHERT

DILOMITE
GRANITE WASH
ANAT B GP

MI WITE BI
TOTAL GAS VOLUME

CS = BUTANE
CO = ISOPENTANE
C1 = PENTANE



SAMPLE DESCRIPTION

Lms. H. gray to tan, crypto to v.v. fn. xln. trs. sub-chlk, sub-sucro + packsth. dul. yel. to dul. H. yel. fluor. No cut phantom oolitic IPS; No Vis POR w/trs. H. med to drk gray shale

Lms. hvy. trs. to v. abn. wht. to CRM-chlk + grayish. tan to tan; crypto. to v.v. fn. xln. sub-chlk, sub-sucro to v. sucro + trs. packsth.; phantom oolitic IPS; dul. yel. to trs. dul. H. yel. fluor; No cut sucro → abn. pr. fr., gd. to excel. micro-PP. to interm. por. w/trs. chert gray. opaque

Sh v. dk. gray. to black-carb.

Sh H. gray to H. green

Interbedded Limestones and Shales

- ① Faster Drig. Lms. trs. wht. to CRM-chlk + CRM. to tan; crypto. to v.v. fn. xln.; sub-chlk to sub-sucro; dul. H. yel. to H. yel. fluor.; No cut; No Vis POR.
- ② Slower Drig. Lms. H. gray to grayish. tan crypto. to v.v. fn. xln.; sub-sucro packsth. dul. yel. fluor. IPS; No cut; No Vis POR.
- ③ Shs. H., med. + drk gray. - sl. to extaly. calc. IPS

Trapcheck

BASE HERBERNER
4114-1117

4134

Acrylate 64
Torson 4126-1157

GAS SCALE

DRILL TIME SCALE

Xln. sub-chlk. to sub-sucro; dul. H. yel to H. yel. fluor.; No Cut; No Vis. For.

② Slower Drlg. Lms. H. gray to grayish. tan crypto. to v.v. tan. xln.; sub-sucro; packstr; dul. yel. fluor. IP's; No Cut; No Vis. For.

③ Shs. H. med. + dark gray. sl. to extaly. calc. IP's

Lms. trs. whit. calc. chlk. tan; crypto to v.v. tan. sub-chlk. sub-sucro to sucro. dul. yel. fluor.; No Cut; wxtes poor; micro-pp. for IP's

Lms. H. gray; grayish. tan to tan; crypto to v.v. tan. xln.; sub-chlk. sub-sucro & packstr; trs. phantom oolitic; dul. yel. to yel. fluor.; No Cut; No Vis. For.

Lms. hxt. trs. to abn. wht. to cream-chlk. grayish. tan to tan; crypto. to v.v. tan; sub-chlk. sub-sucro to sl. trs. Sucro. & packstr. abn. sl. to voolitic & trs. sl. to faly oolizastic. dul. H. to H. yel. fluor.; No Cut; hxt. trs. PR. to fr. & sl. trs. gd. oolizastic for. and abn. pp. to fr. micro-pp. for.

Lms. H. gray to tan; crypto. to v.v. tan; sub-chlk. sub-sucro. & packstr. sl. trs. sub-lithog. R.; dul. H. yel. fluor. IP's; No Cut; No Vis. For.

Lms. H. gray; tan to dark tan; crypto. to v.v. tan; trs. sub-chlk. sub-sucro. & packstr; and trs. sub-lithog. R.; dul. yel. fluor. IP's; No Cut; No Vis. For.

Lms. tan, grayish. IP's; crypto. to v.v. tan; matrix oolizastic for sl. oolitic IP's sub-sucro, sucro & packstr; dul. H. yel. fluor.; No Cut; abn. fr. gd. to ext. oolizastic for.; v. Quest. PERAL

Lms. similar 4366-4386 with much less oolizastic & much more oolitic

Lms. H. gray; grayish. tan to tan; crypto. to v.v. tan. sub-sucro; packstr & sub-lithog. R.; dul. H. to H. yel. fluor.; No Cut; No Vis. For.

Sh. v. dark gray to black. - carb.

4443-4458 Lms. similar 4416-4438

Lansing Fm
4201-4234
MD 8 3000-3800
RPM 65-70
SPM 52
PPM 1100

4200

4300

4400

Blk-sk 534

much less oolitic & much more oolitic

Lms. H. gray, grayish tan, to tan; crypto. to v. sh. xln. sub-sucro, packets & sub-litho R.; dul. H. to H. yel. fluor.; No Cut; No Vis Por

Sh. v. dk. gray to black. - carb.

4443-4458 Lms. similar 4416-4438

4458-4463 Lms. 2bn. wht. to cream. chlk. grayish tan to tan; crypto. to v. v. fa. xln; IP's. v. to extly. oolitic for sil to 4 oolitic; matrix sub-sucro & packets and IP's. sub-ghly sub-sucro. to sucro dul. H. to H. yel. fluor.; No Cut; 2bn. R. P. to excel. oolitic for. Quest. Perm v. abn. w/ pr. to be micro. pp & pass

4463-4478 Lms. similar 4416-4438

4478-4480 Sh. v. dk. gray to blk carb Lms. similar 4416-4438 Lms. has wht. to cream. chlk. & tan; grayish IP's crypto. to v. v. fa. xln; v. to extly. oolitic for sil to v. oolitic. matrix sub-sucro & packets dul. H. yel. fluor. IP's; No Cut; abn. p. to pr. to excel. oolitic for. Quest. Perm.

Lms. grayish tan. to tan; crypto. to v. sh. xln; has sub-chlk. sub-sucro & packets; dul. H. yel. fluor. IP's; No Cut; No Vis Por

Lms. v. 2bn. wht. to cream. chlk. & tan; crypto. to v. v. fa. xln; IP's. sil. to v. oolitic for sil; to v. oolitic; matrix sub-sucro & packets; dul. H. yel. fluor. IP's; No Cut; IP's. to pr. to excel. oolitic for. IP's; No Cut; Perm

Lms. H. gray, grayish tan to tan; crypto. to v. sh. xln; sub-chlk, sub-sucro & packets; dul. yel fluor; No Cut; No Vis Por.

Lms. similar 4533-4544 w/ less chlk.

Lms. H. gray to tanish. gray; crypto to v. v. fa. xln; sub-chlk. sub-sucro, packets; v. dul. yel. fluor. IP's No Cut; No Vis. Por.

Sh. v. dk. gray to black - carb. Lms. H. to med. gray. Sh. xln; crypto. to v. sh. packets; v. dul. yel. fluor. IP's; No Cut; No Vis Por Lms. extra. abn. with cream. chlk. & tan to tan; crypto. to v. v. fa. xln; v. to extly. oolitic for. sil to v. oolitic; matrix sub-sucro to tan. sucro & packets; dul. yel. fluor.; No Cut; abn. pr. to pr. & sh. to sil; to excel. oolitic for. V. Quest. Perm

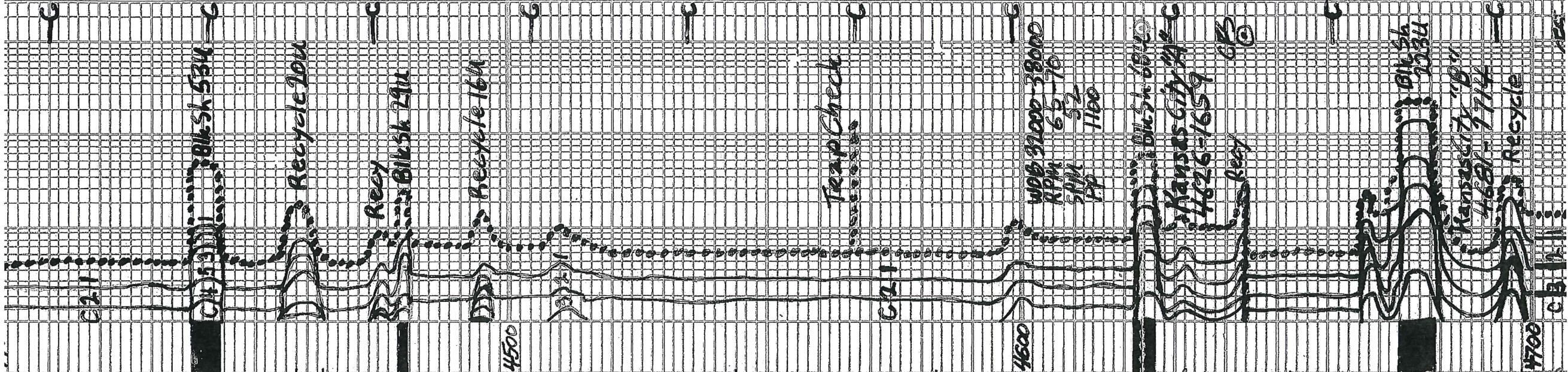
Lms. has wht. to cream. chlk & H. tan to tan; grayish. IP's; crypto. to v. v. fa. xln; sub-chlk sub-sucro. & packets; dul. yel. fluor.; No Cut; No Vis Por.

Sh. v. dk. gray. to black - carb.

Lms. med. to dk. gray. v. to extly. Sh. gray to extly. calc. sh. crypto. xln; sub-chlk for Sh. y. and packets; No Cut; No Vis Por

4658-4704 Lms. 2bn. wht. to cream. chlk. has. w/ chlk. oolitic & grayish; tan to tan. crypto. to v. v. fa. xln; sub-chlk. sub-sucro & packets; dul. yel. fluor. IP's; No Cut; No Vis Por.

Perm v. to extly. oolitic; crypto. to v. v. fa. xln; sub-chlk. sub-sucro & packets; dul. yel. fluor. IP's; No Cut; No Vis Por.



Sub-sacros. + packets in dul. yellow
No Cut; No Vis for

Sh. v. drk. gry. to black-carb.
Lms. med. to drk. gry. v. to extly. Shy
grdng to extly. calc. Shs. crypto. xln.
Sub- chlk. for Shly and packets;
No fluor. No Cut; No Vis for

4698-4704 Lms. abn. whit. to crm. chlk.
Trs. w/ chlk. oolitic. grayish. tan. f. tan.
crypto. f. tan. v. drk. gray. sl. to calc. calcite

4708-24 Lms. lt. gry. to tanish. gry. crypto. xln.
Sub- chlk. packets. sub- litho. xln. f. tan.
Sh. v. drk. gry. to black-carb

Lms. grading to Sh. similar to 4681-4698
Lms. huy. trs. wht. to crm. - chlk. + grayish. tan
tanish. crypto. to v. v. f. tan. xln. extly.
oolitic w/ trs. sl. oolitic. calcite
oolitic layers gray. tan. to tanish.

4740-65 Lms. lt. gry. to tanish. gry.
crypto. to trs. v. v. f. tan. xln. f. tan.
sub- chlk. trs. sub- sacros. packets
sl. trs. sub- litho. xln. f. tan. dul. yellow. blue
IPs; No Cut; No Vis for.

4665-88 Sh. med. to drk. gry. sl. to extly.
calc. grading to Shly. Lmsts. IPs

4788 - 4890 Lmsts w/ scattered thin Shs
Lms. lt. gry. grayish. tan to tanish. crypto. to
v. v. f. tan. xln. f. tan. sub- chlk. sub- sacros.
packets. trs. sub- litho. xln. f. tan. dul. yellow. blue
No Vis for

scattered thin Shs med. to drk
gry. - sl. to extly. calc

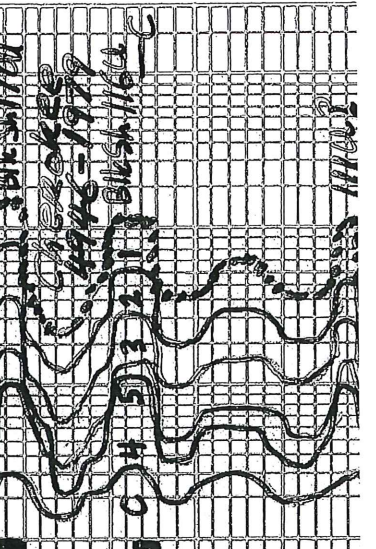
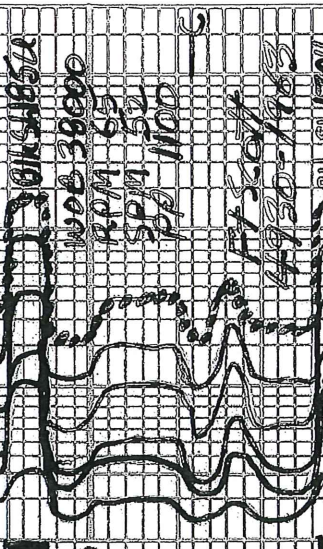
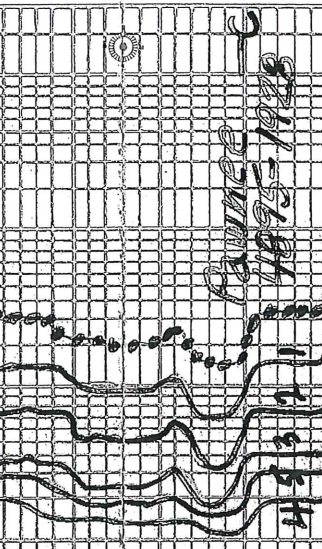
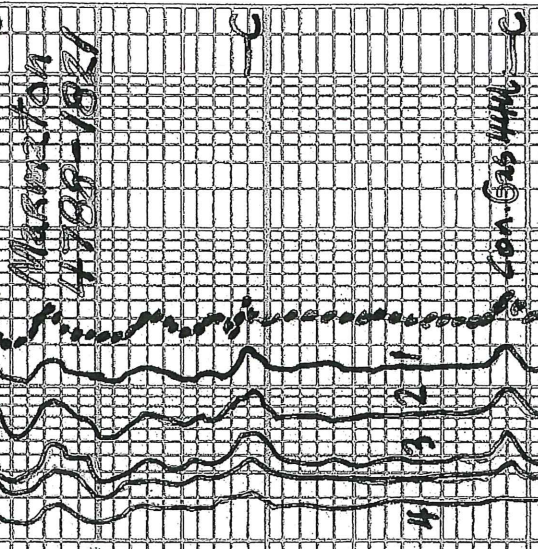
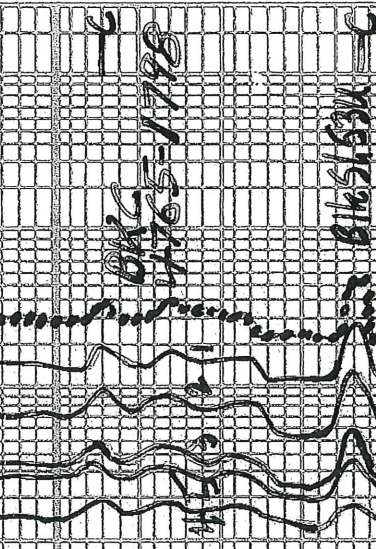
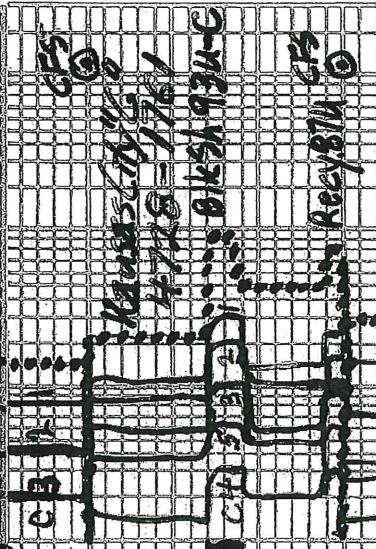
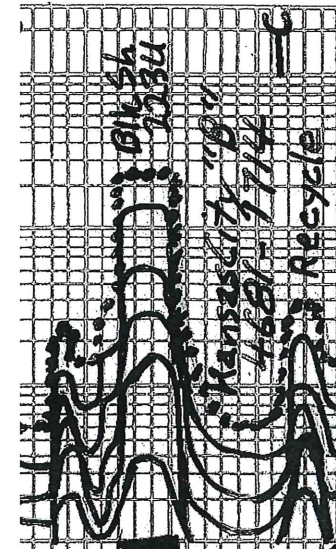
Sh. v. drk. gry. to black-carb
Lms. lt. gry. crypto. xln. f. tan. packets. IP
sub- litho. xln. f. tan. dul. yellow. blue. No Cut; No Vis for

Lms. tan. grayish. IPs; crypto. xln. f. tan. chlk.
sub- chlk. dul. yellow. blue. No Cut; No Vis for
4908-27 Lms. grayish. tan to tanish. crypto. to
v. v. f. tan. xln. f. tan. sub- chlk. sub- sacros. +
packets. oolitic. IPs; trs. to tan. f. tan.
No Vis for. sl. to drk. gry. to h. yellow. blue. No Cut

Sh. v. drk. gry. to black-carb
Lms. w/ sl. trs. chert similar to 4908-4927

Sh. v. drk. gry. to black-carb
Lms. w/ sl. trs. chert similar to 4908-27

4954-5271 Interbedded Lmsts + Shs
Lms. lt. gry. to tanish. crypto. to v. v. f. tan. xln.
trs. chlk. trs. sub- chlk. sub- sacros.



Lms. w/ sl. trs. chert similar 4908-4927

Sh v. drk. gray to black - carb
Lms. w/ sl. trs. chert similar 4908-27

4954-5271 Interbedded Lmsts + Shs
1. Lms. H. gray to tan; crypto. to v. fin. xlb
trs. chlk, trs. sub-chlk., sub-sucrad,
packstn. + sub-lithogr.; scattered
IPs; No cut; v. dul. to dul. yel. fluor
2. Lms. lt., med to drk. gray - sh. to
extraly. Shly. grdg. to calc. Shs;
crypto. xln.; sub-chlk for Shly. +
packstn.; No fluor; No cut;
No Vis. for.

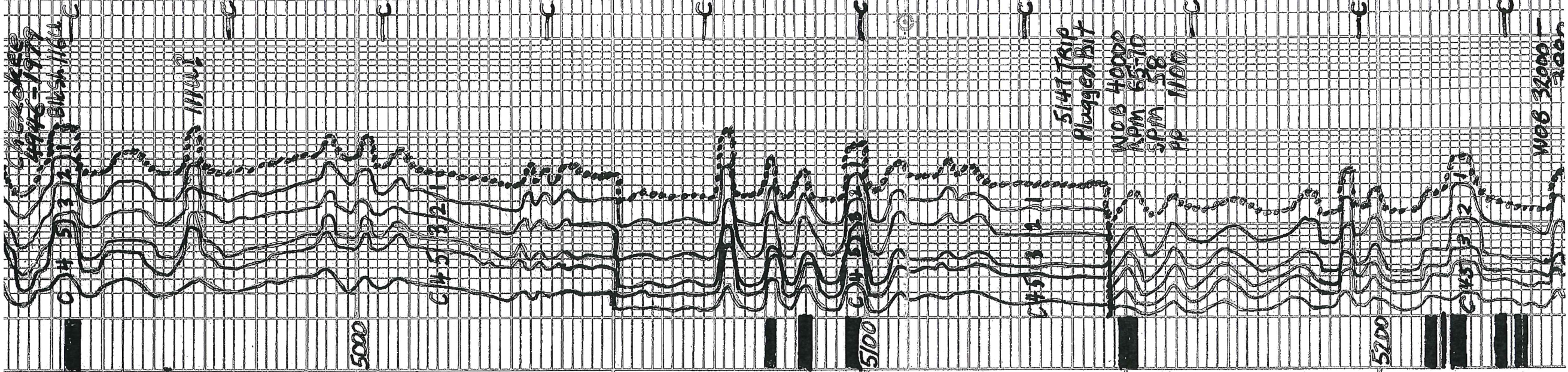
3. Sh med to drk. gray to v. to
extraly. calc. IPs.
4. Shs. v. drk. gray to black - carb.

A 5271-5302 Sh med. gray
w/ silky luster + drk. gray.
splintery IP w/ trs to hyp. trs
pyrite

B 5302-5364 Interbedded
Shs + Lmsts
5271-5302 w/ trs greenish
to trs H. green
C Lms. H. gray to tan; crypto. to
v. fin. xln.; trs. sub-chlk, sub-sucra.
+ packstn.; trs v. dul. H. yel. fluor.
No cut; No Vis. for.

C 5364-5385 Sh med. to drk.
gray; a bn. v. to extraly. calc
grdg. to shly. Lms. +
granular looking IPs
No. foss.; trs. med. mixture
of sh. + thusts, trs. crypto. +
sub-sucrad + packstn. foss.
IPs, trs. v. dul. yel. fluor.
No cut; No Vis. for.

D 5385-5390 1. 3/4 Qtz Sds
Tan to brn. from oil stain, v. w/fin
to fin. gr. - ang. - pr. to fine sort;
slit fac. finely disseminated
Pyr.; faint oil odor; gl. du. yel
fluor. flush to gl. stain; gl. lats
pr. to tr. microp. to intergr
por.
2. 1/3 Lm. Sd Tan w/ drk. tan to brn
oil stain; crypto. to w/fin xln
sub-sucrad to sucrad + packstn
Trs. foss. fragm. IP; faint
oil odor; gl. du. yel. fluor.
flush to gl. staining cuts; por. to
+ trs. gl. microp. to intergr
por.
E 5390-5393 Sh. v. or. Dense Lms.



5. 1/3 Lms. Tan w/ dektan to den oil stn; crypto. to w/ sm xln sub-succo to succo + plecth trng. foss. fragm. IP; faint oil adere; gl'dn. yel. fluor. flush to gd. stnng cuts; plectr + trng. gd. micro-pp. interly por.

E 5490-5493 Sh. to Dense Lms. F 5493-5401 1.852 Qtz sd similar 5385-90 gd oil order w/ pr. ta. to 1.5. 9d. to excel mng. pp. to mte. q. 0.00 R w/ a bn to q. 0.00 GFS

2. 15 Lms. sd. similar 5385-90 w/ hvy tes w/ u. fa. to coarse Lmples. + foss. fragm. w/ sub-succo to succo + plecth. w/ trng. w/ sp'd. tan oil stn. gl'dn. yel. fluor. flush to gd. stnng cuts; tes pr micro-pp. por. 1.5. GFS

A
G 5401-5404 Sh. to Dense Lms. H 5404-5408 Qtz Sdst. Tan, dek. tan brown, dek. brown to black from oil stn. v. v. fa. to fa. q. r. - ang. fr. to gd. solet. good oil order

Rainbow of oil on wash water. dek. gl'dn. yel. fluor. with flush to gd. stnng cuts abn. pr. to re. micro-pp. to intergr. por.

B
I 5408-5431 Qtz Sdst. wht. to grayish wht w/ hvy tes to abn. w/ sp'd. tan, brn. to blk oil stn; w/ dek. gd. to gl'dn. yel. fluor. w/ flush to gd. stnng cuts; dense t. fa. + trng. No Vis. por.

w/ poss. interbeds Qtz Sdsts similar 5404-5408

J 5431-5436 Sh. med. gray w/ silky luster to dek. gray splintery

C
K 5436-5472 Lms. trng. wht. to cream - ch. l. k. H. gray to tan; crypto. to v. v. xln; sub-p. h. s. sub-succo + plecth. trng. tes. v. d. w. H. yel. fluor.; No cuts; No Vis. por.

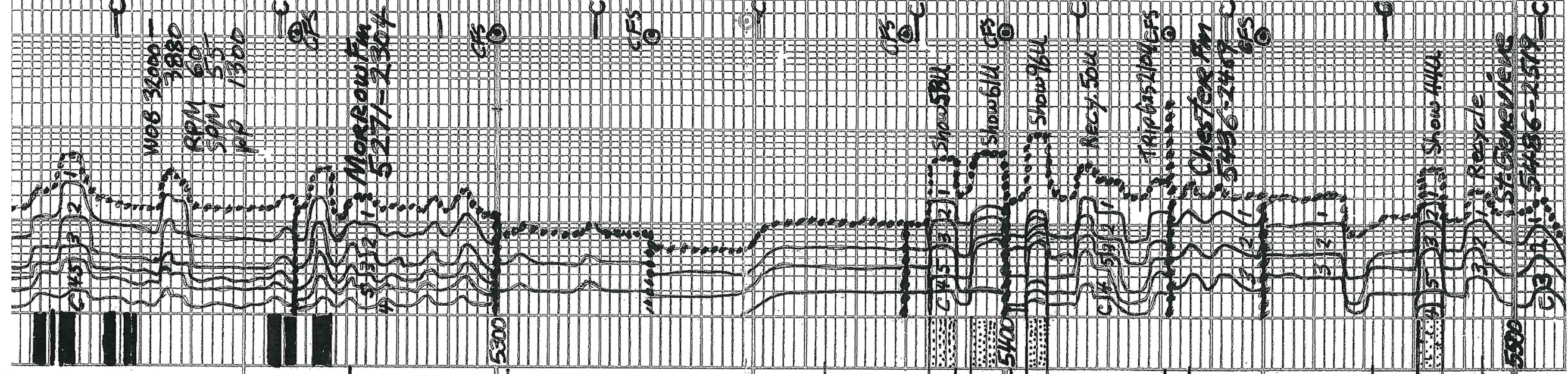
D
L 5472-5481 Lms. similar 5436-5472 w/ abn Lms. H. gray; crypto. to v. v. xln; v. Qtz sd. - w. trng. - ang. v. on micro-oolitic. No fl. w. No cuts; No Vis. por. w/ tes. Sh. med. to dek. gray and tes. green

E
M 5481-5486 Qtz Sdst. H. gray + H. green w/ abn. dek. tan to brn. foam oil stn; v. v. to q. r. - ang. - good sp. t. - completely

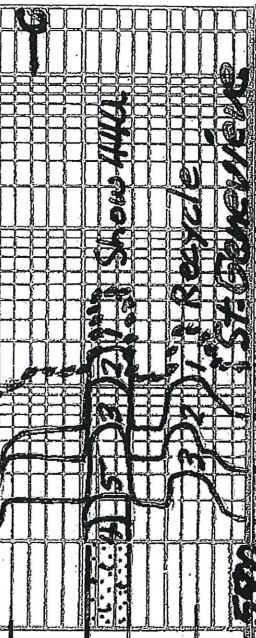
F
N. Lms. similar 5494-5567 clay filled, dense, tite + hard; dk. yel. fluor. w/ gd. stnng cuts; No Vis. por.

G
O. Lms. similar 5494-5567 weathered looking IP. S. abn. w/ black-dead oil stn. No fluor.; Slow good stnng cuts. No Vis. por. ←

5494-5567 Lms. H. gray to tanish



L WEATHERED LAMING "1"
 abn. w/black-dead oil
 stn. No fluor; Slow
 good STRONG Cut
 No Vis POR.
 ←



5494-5567 Lms. H. grx. to tanish
 H. grx. - top half zone extr
 abn. H. green + trs v. H. Red
 bottom half of zone extr. abn
 v. H. Red + trs. H. green.
 extrly micro-oolitic or Qtz sd
 v. v. fn. gr. - ang; matrix tes
 sub-alk + sub-sucro; v. du; H.
 yel fluor. 1P; Nocut; No visior

Lms. tan to grayish. tan. crypto to
 v. v. fn. x. in. v. to extrly oolitic (s. to med)
 matrix. trs. sub-alk; sub-sucro +
 pedest; in. j. du; H. yel fluor. 1P; Nocut
 No Vis por w/ trs; chert tan to orange
 opaque to Transl
 Lms. v. abn. wht. to orange blk w/ blk oolites
 1P; + Trn crypto to v. v. fn. x. in. v. to extrly
 oolitic; mp. to 19 trs; sub-alk; sub-sucro; 1P; Nocut
 H. yel. fluor; Nocut No Vis por; hy. tes
 to v. abn loose oolites; trs chert tan
 to orange; Transl to opaque

TD 5600

7 7/8" Bit Info:
 #1 New Smith FHI 18 YVFS
 In 1750 Out 5600 TD
 Cir. Points:

1. 4644 5. 5300 9. 5432
2. 4710 6. 5330 10. 5450
3. 4740 7. 5380 11. 5600
4. 5260 8. 5400

Dev. Surev.
 1. 1129 3/4° 4. 5147 3/4°
 2. 1450 1/4° 5. 5432 1/2°
 3. 3848 1° 6. 5800 3/4° TD

Daily Drlg. Progress

1. 3743 AT 7:00 AM 8-30-2014
2. 3900 AT 12:14 PM 8-30-2014
3. 4311 AT 7:00 AM 8-31-2014
4. 4670 AT 7:00 AM 9-1-2014
5. 4943 AT 7:00 AM 9-2-2014
6. 5147 AT 7:00 AM 9-3-2014
7. 5317 AT 7:00 AM 9-4-2014
8. 5432 AT 7:00 AM 9-5-2014
9. 5506 AT 7:00 AM 9-6-2014
10. 5600 AT 7:00 AM 9-7-2014

DST #1 Morrow Sd 5388-5432
 IO BOB 45 Sec. GTS 14 min will be run
 FO BOB 30 Sec Flowing Gas
 Rec 94 ft GCM 5 29 gds 95 S Mud
 BHT 135°

IHP 2722 #
 IFP 32-63 # in 30 min
 JSIP 103 # in 60 min
 FFP 57-78 # in 60 min
 FSIP 102 # in 120 min
 FHP 2658 #

Flow Info IO FO
 Time PSI ck MCFD Time PSI ck MCFD
 15 6 4 32.363 5 6 3/8 74.790

ST. LOUIS
 5567-2600

5500
 5486-2579

