



# WHITEHALL EXPLORATION

87 De France Way • Golden, Colorado • (303) 279-6894

## GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

OPERATOR GREAT PLAINS ENERGY, INC.  
 LEASE REYNOLDS WELL NO. L-30  
 FIELD DREIL  
 LOCATION N/2-N/2-5W  
 SEC. 30 TWP. 9S RGE. 24W  
 COUNTY GRAHAM STATE KS

ELEVATION  
 KB 2,553'  
 DF \_\_\_\_\_  
 GL 2546  
 Measurements Are All  
 From K.B.

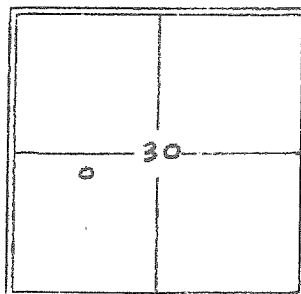
### CASING RECORD

SURFACE 8 5/8" @ 261'  
 PRODUCTION 5 1/2" @ 4178'

CONTRACTOR STP DRILLING, LLC  
 COMM: SEPT. 19, 2017 COMP: SEPT. 28, 2017  
 RTD 4180' LOG TO 4176'  
 SAMPLES SAVED FROM 3600' TO 4180' RTD  
 DRILLING TIME KEPT FROM 3600' TO 4180' RTD  
 SAMPLES EXAMINED FROM 3600' TO 4180' RTD  
 GEOLOGICAL SUPERVISION FROM 3600' TO 4180' RTD  
 MUD UP 3,052' TYPE MUD CHEMICAL  
 WELL SITE GEOLOGIST RICHARD J. HALL, CPG #5820

### ELECTRICAL SURVEYS PIONEER ENERGY SERVICES

- DUAL INDUCTION
- DUAL COMP. POROSITY
- MICROLOG



FORMATION	LOG		SAMPLE		STRUCT. COMP.
	TOP	DATUM	TOP	DATUM	
S.C. ANHYDRITE	2214	+339	2214		-7
TOPEKA	3626	-1073	3627		FLAT
HEBNER SH.	3845	-1292	3850		-2
LANSING	3880	-1327	3885		-3
'F' ZONE	3966	-1413	3972		-1
'J' ZONE	4062	-1509	4068		-1
BKC	4112	-1559	4116		FLAT

REFERENCE WELL FOR STRUCTURAL COMPARISON H&M PETROLEUM CORP. BETTY

LITHOLOGY REMARKS DST'S

START  
GEO. SUPERVISION  
9/22/17

SH, LS, DK GY, W/BN CLN LS INCL,  
 HD SH, MED-DK GY, SILTY, CMC IP,  
 FIRM-DCG HD.

LS, BF-TAN IP, LT GY, PRED VF  
 XLN, OCC F XLN IP, SM PCS MOD  
 AREN, CLAT PAR INCL, PR INTXN  
 POR, NS.

SH, DK GY, HD, CACC, SM VY  
 AREN, PYR INCL

LS, BF-TAN, VF XLN COLCAST,  
 SM, SHLY IP, GY, VY AR - EX VUG  
 POR, PR INTXN POR, NS.

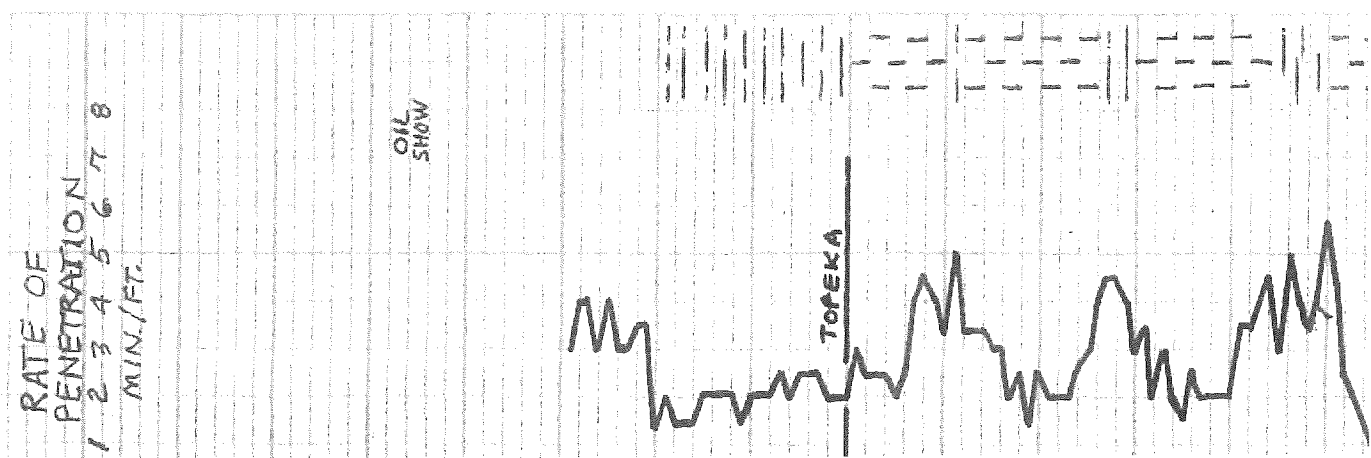
SH, MED-DK GY, CALS - LMY,  
 HD-DNS, SILTY / SDY PCS.

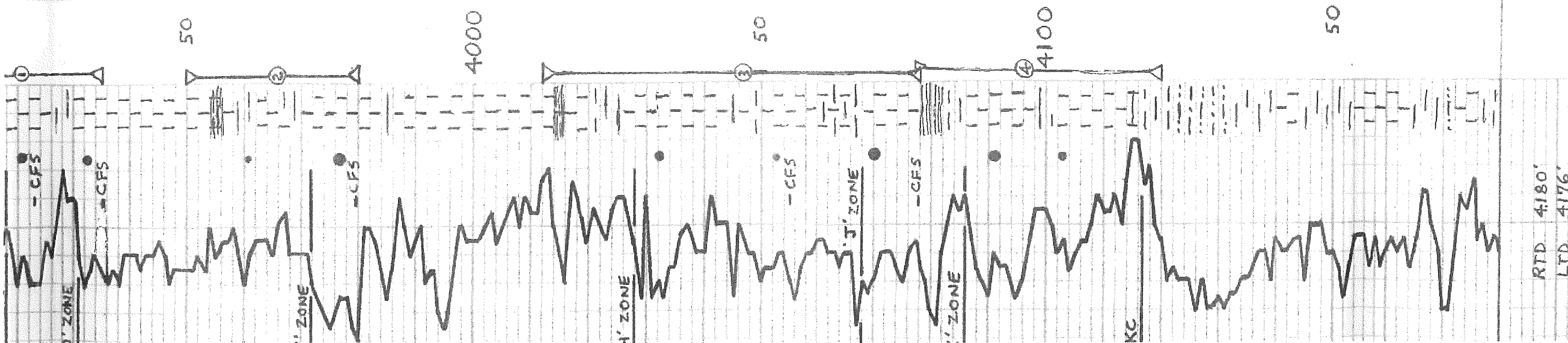
LS, OFF WH-LTGY, BF, VF - MICRO  
 XLN, PMS, HD, CHRT INCL, OCC FOS  
 FRAG, VY PR - NO VIS PDE, NS.

SLTST - SH, MED - DK GY, SUBBK  
 FOS, FOS, FRAG, VY CALS,  
 MVA WH CHALK ACS  
 LS, BF-TAN, F-VX XLN HD, MVA

3600

50





SEY/FIRM SCAT FOS FRAG  
MOD CHKY, SM VY F GR AREA  
MED INTXN, FOR SLOD, EVEN  
SPITY/DIC AND STN, BR SFO/  
BREAK.

LS, OFF WH-LT GY, TAN, PRED VY  
XLN, DOL, HD, WELL CIMP, SCAT  
POLYDOL, VUGS, VY VIF XLN INTO OL  
INTRX, INT MED, FOR, INTX, MED OD,  
UNEVEN-WEAR, EVEN STAINING VY,  
GD OIL SHEEN ON SFTL SURF, FR  
SFO/BREAK.

LS, OFF WH-LT/MED GY, PRED MICRO  
XLN, DNS, TIGHT, SC BRN, NO VIS  
POR, NS, GRDS TO GN DNS LS, AA.  
SH, BLACK, CARB, FIRM

LS, MED GY, MICRO XLN, DNS, SM  
MICROVUGS, TI, NO VIS INTXN, PIG, BN  
STN IP, USO. SCAT TAN-BN CHRT.

SH, DK BN-BACK, SUBGLKY.

LS, TAN F-VF XLN, FIRM-HD, SL CHKY  
FOS, IF CMC POS FRAG, SCAT VUGS, FR  
INTXN FOR, GD UNEVEN DK BN Q STN,  
VY GD SFO/BREAK-DROPLETS, FR YEL FL  
GD CUT & DRID HND CUT. CARBONATE  
SD CLR/TM, LW, VY-MED GR, PIG SRTS  
FR-MED INTXN, FOR, GD ODOR SAT PCS  
LT TAN OIL STN, VY GD SFO DRUPLETS/  
BREAK, DULL FL GD MOD FAST STRMG  
CUT, GD DRIED HND CUT FL.

LS, OFF WH-BF, GRST F XLN, FIRM  
GRIT, VY GR, SL CHKY-VY CHKY TCS,  
CAL INCL, GD INTXN FOR, NS.

LS, OFF WH IP, PRED LT-GC, MED  
GY, VY-MICRO XLN, DNS, MINR SPLY  
INCL, TI, NO VIS POR, NS.

LS, BN-DK BN, MICRO XLN, DNS,  
TI, NO VIS POR, NS.

SH, GRCK, CARB, FIRM, MOD FISS.

LS, DK TAN-BN F XLN, GRIT, HD, FR-  
MED INTXN FOR, EVEN STN, SL SFO-DIS-  
SEMY BRK, FR AULL FL, SW STRMG CUT

LS, OFF WH/LT GY IF, BF-TAN, SL  
MOT, FIRM-HD, F-VF XLN, SL CHKY  
PCS, IP, MED INTXN, FOR, IP, NO VIS POR  
IF (MOD-HOMO), FR ODOR, UNEVEN GD BN  
OIL STN, SL-FR DISSEM, SFO/BRK, FR  
DULL YELLISH FL, IP, FR SLOW STRMG  
CUT, GRDS TO GD BULL MLKY CUT, MED  
DULL HND DRIED FL.

LS, OFF WH-LT GY, CHALK-VF  
XLN, SFT-HD, FOR, INTXN, MED  
IP, NO OD, UNEVEN BN OIL STN,  
SL SFO/DISEM, BREAK, SFTY FR  
FL, SL CUT-TI.

LS, OFF WH-LT GY, BF, VY-PRED  
MED XLN, WELL DEV, GRST, SCAT TO  
MSTLY OOL PCS, SCAT INTXN, VUGS,  
MED-GD INTXN, INT PART FOR SLOD,  
DULL YELISH FL, UNEVEN-VAT, LT BN  
OIL STN, FR-MED SFO/BREAK,  
QTY, MICRO-DROF, INT MED FLASH  
CUT, VY GD MOD FAST STRMG TO MLKY  
RING, FL, MOD BRIGHT, YEL DRIED  
FL.

SH, BRK, CARB, FIRM.

LS, BF, BN, MED VY XLN, IP, FIRM-HD  
CAL INCL, SCAT FAST FRAG, VY OOL  
SCAT ABNT VUGS, INT MED-VY GD INTXN  
& INT OOL MTRX, FOR, NO OD, UNEVEN-  
SAT, BN-BK, OIL STN, VY GD BK BN SFO/  
BREAK, NO FL, INT MED, FLASH MLKY CUT  
VY STRMG MLKY CUT, EX VY PRED DULL  
DRIED FL.

LS, OFF WH-LT GY, F-VF XLN, HB, FR  
INTXN FOR, SFTY, UNEVEN BN/BK  
OIL STN, MED SFO/BREAK, VY SLOW  
STRMG CUT, PR MLKY CUT, FR DRIED FL.

SH, MED-DK GY, SALTY-FULTY, FIRM

SH, GN, PLTY, SOFT, MOD WXY

SILTST, MED-DK GY, SUBGLKY;  
SILTST, UNEN/GY, MOT.

LS, LT GY, BF, MICRO XLN-CHERT,  
MICRATIC, NO VIS POR.

SH, MED GY, PLTY, SL SILTY

LS, OFF WH-LT GY, VY-MICRO XLN,  
MOD AREN-VY GR, SCAT GLANG  
ING, TI, NO VIS POR

SILTST, LS GRDG TO:

SILTST, BN-UNEN, FIRM, MOD CARB.

SH, MED-DK GY, PLTY, SILTY.

LS, BF, VY-MICRO XLN, BN, MOD  
DOL, TI, NO VIS POR, ALS.

CH: NO BLOW  
REC 10' MUD

IHP: 1925  
ISIP: 20-27  
IHP: 276  
ISIP: 28-32  
IHP: 277  
ISIP: 1911

3995'-RTD  
-7:00 AM-9/24/17

MUD V  
-3940'  
WT: 90  
VIS: 64  
FIL: 80  
CHL 2300  
LCM 10.0 F

DST NO. 2

LKC: E-F  
3950-3980'  
15-30-30-90"  
IHP: 8.0, B IN 14"  
IHP: WK SUFF  
BLOW, DIED IN S'  
FHP: 8.0-8. IN 11"  
FHP: 5 SURF, BLOW  
BACK THRU-OVT  
REC. 442' GIP  
126' CGO (20%  
6,80% OIL)  
185' OCWM  
(5% OIL, 35% W,  
60% MUD)  
TOTAL FLUID-311'  
AFK-35'  
IHP: 1953  
IHP: 27-90  
IHP: 658  
IHP: 77-143  
FHP: 666  
FHP: 1897

DST NO. 3

LKC: J, ZNS  
4012-4078"  
30-60-15-90"  
IHP: STRONG BLOW  
8.0, B, IN 11"  
ISIP: BUILT TO  
1 3/4' BLOWBACK  
FHP: 8.0, B, IN 11"  
FHP: 311' BLOWBACK  
REC. 584' GIP  
233' GOCM  
(10% G, 35% OIL,  
55% M)  
AFK: 34'  
BHT: 1160  
IHP: 1960  
IHP: 27-92  
IHP: 119  
IHP: 84-111  
FHP: 1197  
FHP: 1919

DST NO. 4

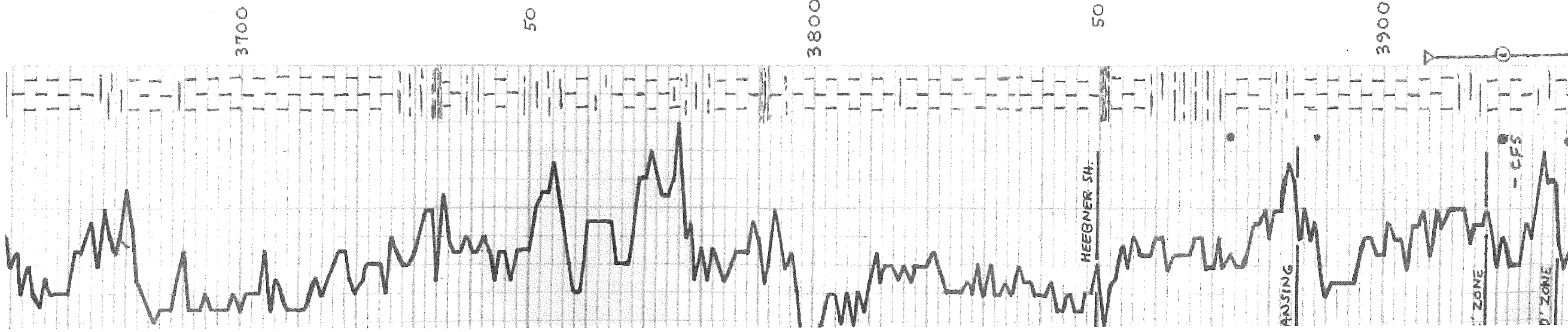
LKC: K-L  
4011-4120"  
30-60-45-90"  
IHP: SLOW BLOW  
BUILT TO 3'  
FHP: BUILT TO  
2 1/2"

SIP: NO BLOW  
REC. 188' GIP  
30' GOCM  
(40% O, 60% M)  
AFK: 114' F  
IHP: 2026  
IHP: 26-36  
ISIP: 29-47  
IHP: 209  
FHP: 1978

4120'-RTD  
-7:00 AM-9/24/17

MUD V  
-4120'  
WT: 90  
VIS: 75  
FIL: 72  
CHL 2100  
LCM 1/2#

4180'-RTD  
-7:00 AM-9/27/17



3 H, MED-DK GR, CALS - LMY,  
 HD-DNS, SILTY / SDR PCS.  
 LS, OFF WH-LT GR, BF, VF - MICRO  
 XLN, DNS, HD, CHRT INCL, OCC FOS  
 FRAG, VY PR - NO VIS POR, NS.  
 SLT ST - SH, MED - DK GR, SUB BK  
 FUS FOS, FRAG, VY CALS,  
 MNR WH GRK PCS  
 LS, BF-TAN, F - VF XLN, HD, MOD  
 AREN, SCAT OOL, VY SL CHALKY,  
 FR - MED INTXN POR, NS.  
 SCAT TAN CHERT, LT GR.  
 LS, BF-TAN, CLN, MOD HD, F-VF  
 XLN, OOL & AREN PCS W CALS  
 INCL, MOTT, MOD-VY AREN IP PCS,  
 PR - INTMED INTXN POR, NS.

3700

LS, BF-TAN, VE - MICRO XLN,  
 HD-DNS, SL BRIT, NO VIS POR,  
 MED GR, VY XLN LS, T.  
 LS, OFF WH, BF-LT TAN, MOD  
 CHKY, IF SCAT FOS FRAGS, MED  
 INTXN POR, NS.  
 HD-DNS, CHRT PCS, SCAT CAL INCL,  
 TI, NO VIS POR, NS.

SH, BLACK, CARB, FISS, FIRM  
 LS, BF-TAN MOTT, VF-F XLN  
 FR-GOOD GRST DEV, CLN, MED-GR  
 INTXN POR, NS.  
 LS, LT GR, BE, VE MICRO XLN,  
 SL ARG, TI, NO VIS POR.

50

LS, OFF WH-LT GR, F XLN, F  
 GRST DEV, FIRM, CD VIS POR,  
 NS.  
 LS, BN, F XLN, FRI, CRST DEV.  
 LS, LT BN-TAN, VE XLN, MOD  
 DIRTY PCS, W DIPS FYR INCL.

3780' - RTD  
 @ 7:00 AM  
 9/23/77

LS TAN, VE XLN, VY (MICRO) OOL,  
 CAL FILL, PR INTXN POR, NS.  
 LS, LT GR, TR GRNTH, F-VF XLN,  
 FUS CHRT FOSS, MOD AREN,  
 FIS INTXN POR, NS.  
 SH, VY DK GR, MOD CRAB.

3800

LS, BF-TAN, V-VE XLN, GD F-  
 MED GRST, SM OOL SL-MOD  
 CHKY, MED INTXN POR, INT-  
 PART POR.  
 LS, BF-TAN, LT GR, VE - MICRO  
 XLN, CHRT PCS, TI, NO VIS POR.

LS, OFF WH-WH CHALKY -  
 BF-WH LS, VE XLN SL MOTT  
 PR INTXN POR, NS.  
 LS, DK GR, VY SL, VY VF - MICRO  
 XLN, PR, NO VIS POR.  
 SH, GN, BLKY, GRK.

LS TAN-DK BN, VY XLN, MOTT  
 FOSSIF, AREN, DIRTY TA, PR - NO VIS  
 POR.

50

SH, BLACK, SUBBLKY, VY CARB  
 LS, LT GR, VE - MICRO XLN, NS

- MUD V  
 3860'  
 WT 8.9  
 VIS 57  
 EHL 266  
 LGM 1#

SH, SLT ST IP, MED - DK GR, VY -  
 CALC-LMY,  
 LS, LT GR, VY - MICRO XLN, VY  
 OOL W CAL INCL, FOSSIF IP W/  
 MNR INTXN POR, FRED TA SCAT  
 BN-BLK ST IP, SL SFO/BRK BLEED  
 OIL, GEN TI, GRG TO CLN OOL  
 LS.

LS, OFF WH-BE F-VE XLN,  
 CD GRST DEV IF SCAT FOS &  
 FUS FRAG SM W/ ABNT OOL,  
 PR FYR INCL, MNR LT-BN OIL  
 STN IP, NS.  
 ABNT WH CHRT PCS, SOFT

3900

ABNT CHRT, OFF WH, GR, GF.

LS, OFF WH-BE, F-VF XLN,  
 SET FIRM SCAT FOS FRAG,  
 MOD CHKY, SM VY F GR AREN  
 MED INTXN POR, SL OOL, EVEN  
 SPITY/DLS AND STN, PR SFO/  
 BREAK.

DST. NO. 1

LKC 'C-D'  
 3907-3935'  
 30-30-30-60  
 IFF: 1/4" BLOW  
 IFF: 10 BLOW  
 REC 10' MUD  
 IFF 1925  
 IFF 20-27  
 IFF 276  
 IFF 2827