



Scale: 5" / 100'  
Measured Depth Log

**Well Name** Ruegge 3E-4H-N165

**Location** Sec. 4 T1N R65W

**State** Colorado

**County** Weld

**Country** USA

**Rig Number** Ensign 140

**API Number** 05123465650000

**AFE #** 16190981

**Geographic Region** Rockies

**Field** Wattenberg

**Spud Date** 6/3/2018

**Drilling Completed** 6/5/2018

**Surface Coordinates** Lat/Long: 40.075233/-104.670986

SHL: Sec: 4 Twp: 1N 65W  
Footage: 697 FSL 2077 FWL

**Bottom Hole Coordinates** Proposed BHL: Sec: 4 Twp: 1N 65W  
Footages: 460 FNL 700 FWL

**Ground Elevation** 4,917'

**K.B. Elevation** 4,940'

**Logged Interval** 6,600' **To** 12,202'

**Total Depth** 12,202'

**Formation** Codell

**Type of Drilling Fluid** Synthetic Oil Based Mud

## Operator

**Company** Crestone Peak Resources

**Address** 370 17th Street #2170  
Denver, CO 80202



**CRESTONE PEAK**  
RESOURCES

Geologist

Zone Color Coding

## Geologist

**Name** John Ready

**Company** Crestone Peak Resources

**Address** 370 17th Street #2170  
Denver, CO 80202



## Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

## Other

**Loggers:** Brian Ferwerda / Nick Watkins

**Services Provided:** 2-Man Mudlogging / Geosteering

**Equipment:** ML-533

**Contractor:** Empirica, Reservoir Group  
6360 West Sam Houston Pkwy N  
Houston, Texas, 77041

## Rock Types

UNKNOWN	ANHYDRITE	DOLOMITE	SHALE GRAY	TILL
GYPSUM	SALT	COAL	SHALE COLORED	BENTONITE
SALT	SIDERITE or LIMONITE	MARLSTONE	SILTSTONE	TUFF
SALT	LIMESTONE	CHALK	SANDSTONE	IGNEOUS
		SHALE	CONGLOMERATE	METAMORPHIC
			BRECCIA	CEMENT

## Accessories

### Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID
ECHINOID
FISH
FORAMINIFERA

### Fossil

GASTROPOD
OOLITE
OSTRACOD
PELECYPOD
PELLET
PISOLITE
PLANT REMAINS
PLANT SPORES
SCAPHOPOD
STROMATOPOROID

### Minerals

ANHYDRITIC
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### Argillaceous

ARGILLITE GRAIN
BENTONITE
BITUMENOUS SUBSTANCE
BRECCIA FRAGMENTS
CALCAREOUS
CARBONACEOUS FLAKES
CHTDK
CHTLT
COAL - THIN BEDS
DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS

### Glaucconite

GYPSIFEROUS
HEAVY MINERAL
KAOLIN
MARLSTONE
MINERAL CRYSTALS
NODULES
PHOSPHATE PELLETS
PYRITE
SALT CAST
SANDY
SILICEOUS
SILTY
TUFFACEOUS

### Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Other Symbols

Oil Show

- DEAD
- EVEN
- QUESTIONABLE
- SPOTTED STAINING

Porosity

- EARTHY
- FENESTRAL
- FRACTURE
- INTERCRYSTALLINE
- INTEROOLITIC
- MOLDIC

- ORGANIC
- PINPOINT
- VUGGY

Engineering

- BIT
- CASING
- CONNECTION (LEFT)
- CONNECTION (RIGHT)
- CONNECTION GAS
- CORE - LOST
- CORE - RECOVERED
- DST INTERVAL
- FAULT

- FORMATION TOP
- GAS SHOW
- MN DEPTH
- NORMAL FAULT
- OIL SHOW
- OVERTURNED STRATA
- REVERSE FAULT
- SIDEWALL CORE (LEFT)
- SIDEWALL CORE (RIGHT)
- SLIDE
- SURVEY
- TRIP GAS
- WIRELINE TESTED - LEFT
- WIRELINE TESTED - RT

Rounding

- ANGULAR
- ROUNDED
- SUBANG
- SUBRND

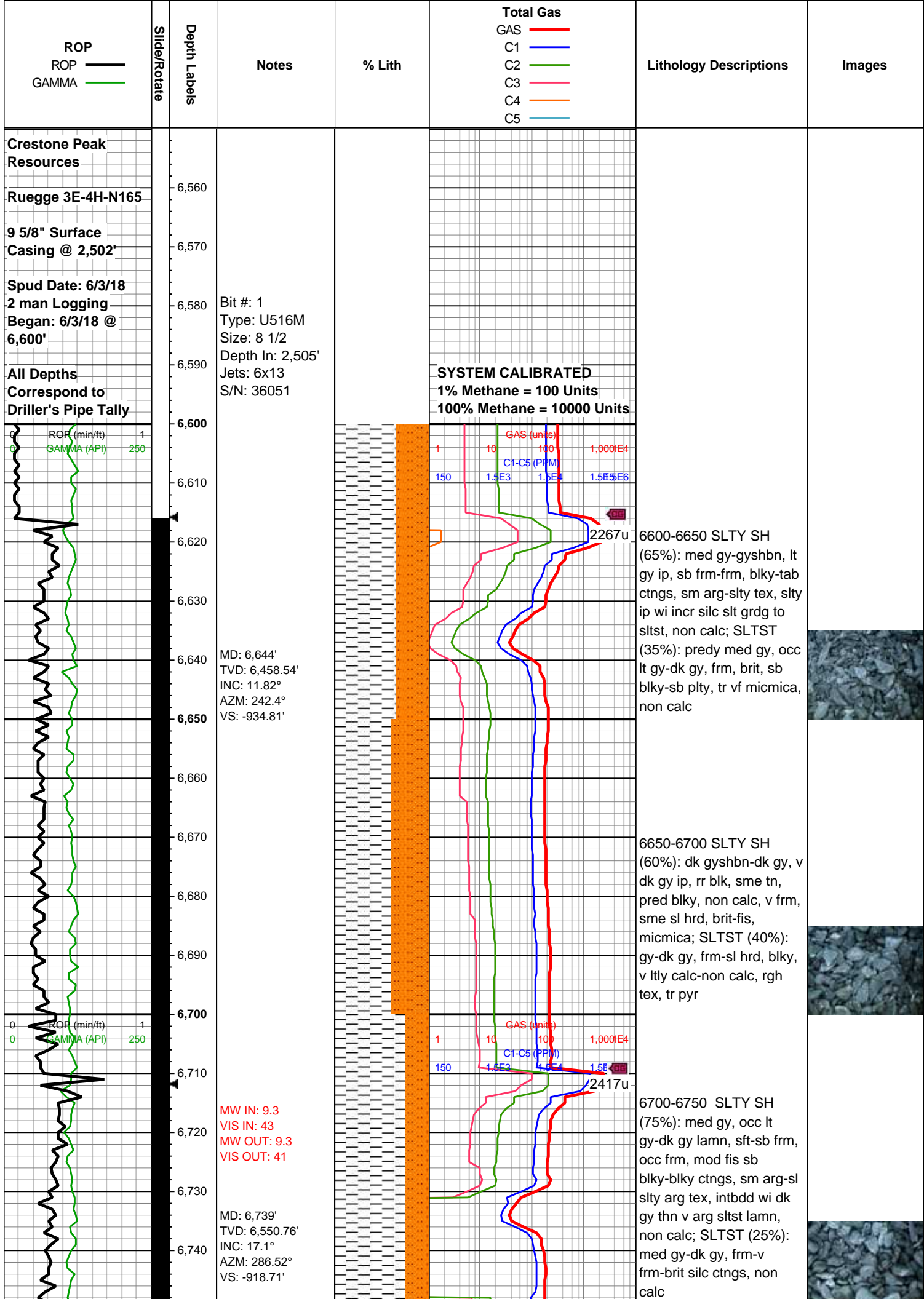
Textures

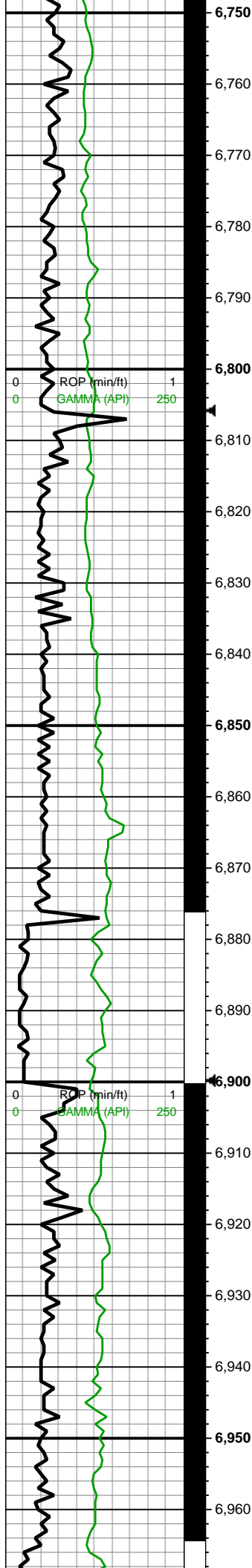
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE

- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

Sorting

- MODERATE
- POOR
- WELL





WOB: 14.8klbs  
RPM: 0  
SPM: 206  
SPP: 3,734psi

MINDEPTH 6/4/2018

MD: 6,833'  
TVD: 6,639.93'  
INC: 20.48°  
AZM: 315.17°  
VS: -902.72'

MW IN: 9.5  
VIS IN: 41  
MW OUT: 9.4  
VIS OUT: 40

MD: 6,928'  
TVD: 6,727.29'  
INC: 25.71°  
AZM: 314.91°  
VS: -875.98'

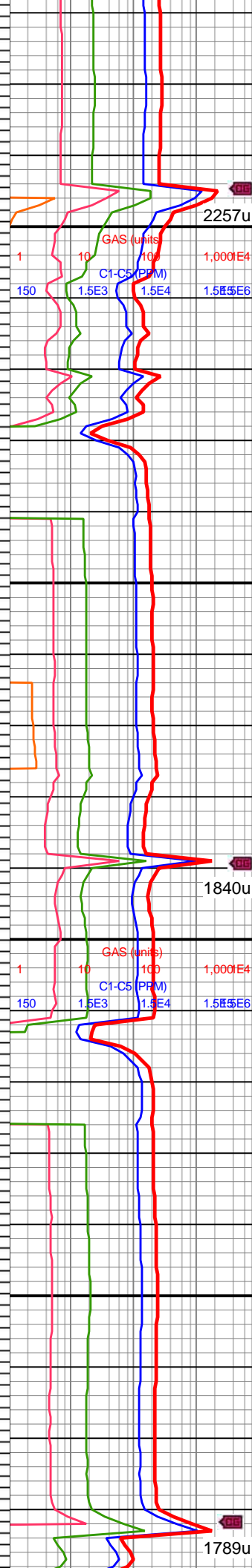
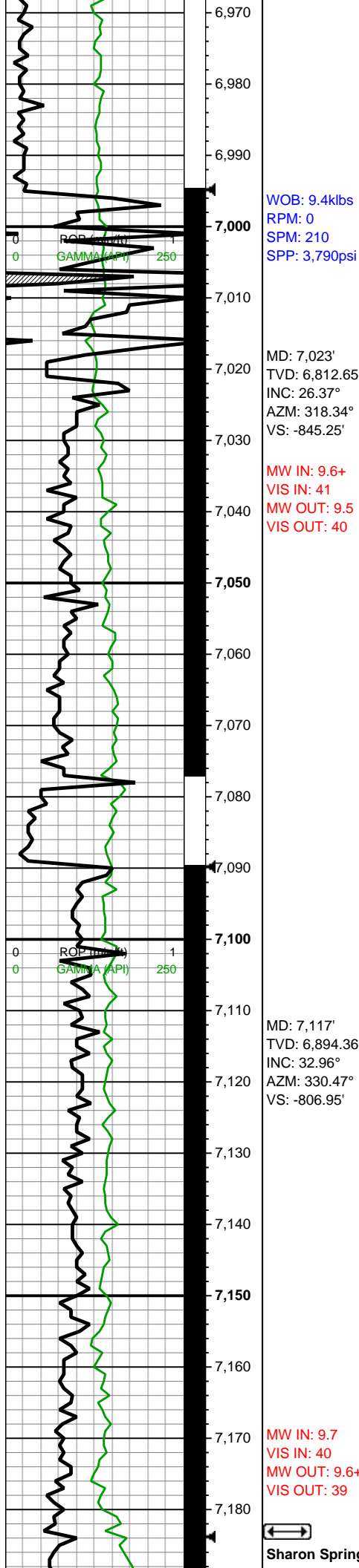


6750-6800 SLTY SH  
(90%): gy-dk gy, sme v dk  
gy-blk, frm, fri-brit ip, blk,  
sme plty, non calc, slty,  
rgh tex, com micmica;  
SLTST (10%): gy-dk gy,  
frm-sl hrd, blk, v ltly  
calc-non calc, rgh tex

6800-6850 SH (100%):  
med gy-med gyshbn, dk  
gy, med frm-sl hd, sb  
blk-tab ctngs, sl slty thru,  
vf lam, tr mic pyr, non calc

6850-6900 SH (100%):  
dk gy-med gyshbn, frm-sl  
hd, predy sb blk, spl  
ctngs, sl slty thru, tr  
imbd/pp mic pyr, non-sl  
calc

6900-6950 SH (100%):  
dk gy-dk gyshbn, sb  
frm-frm, l-mod fis, sb  
rd-sb blk, occ rgh tex  
mot wi sc, occ sl slty, tr  
pp mic pyr, non calc



6950-7000 SLTY SH  
(100%): lt-med gyshbn,  
scat blkgy, frm, brit, sb  
plty-sb blkgy, dull, com v  
thnly lam, v wkly calc,  
micmica, rr dissd pyr

7000-7050 SLTY SH  
(100%): med-dk gy, occ  
bnshgy, sme dk gy, sb  
hd-v frm, predy ply fis, sb  
plty-sb blkgy, slty tex, v wkly  
calc, scat micmica

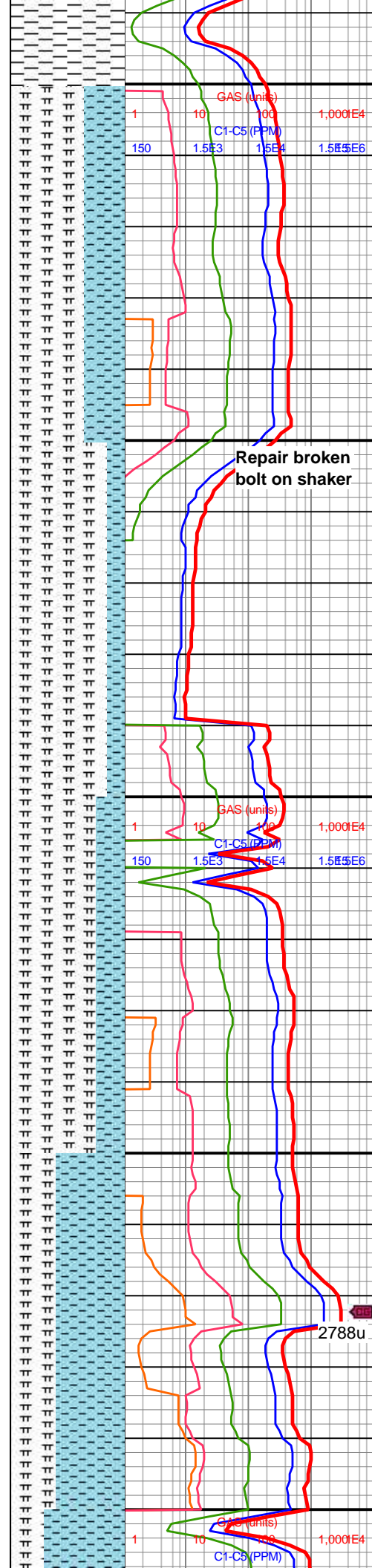
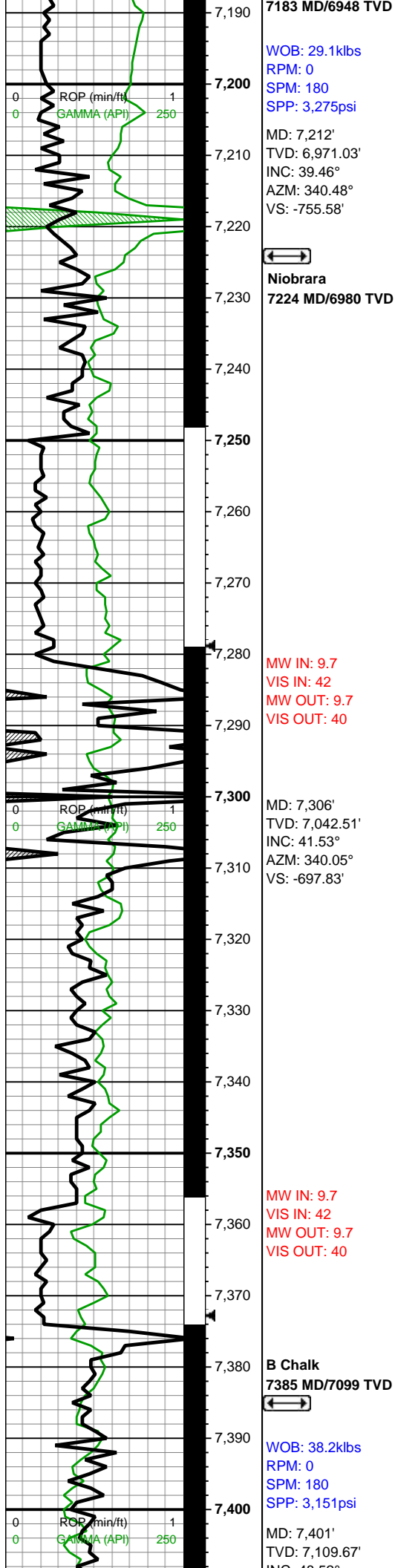
7050-7100 SLTY SH  
(100%): dk gy-dk gyshbn,  
sb frm-frm, l-mod fis, sb  
rd-sb blkgy, occ rgh tex  
mot wi sc, occ sl slty, tr  
pp mic pyr, non calc

7100-7150 SLTY SH  
(100%): lt-med gyshbn,  
scat blkgy, frm, brit, sb  
plty-sb blkgy, dull, com v  
thnly lam, v wkly calc,  
micmica, rr dissd pyr

7150-7200 SH (100%):  
dk gy-dk gyshbn, sb  
frm-frm, l-mod fis, sb







rd-sb blkly, occ rgh tex  
mot wi sc, occ sl slty, tr  
pp mic pyr, non calc

7200-7250 MRLST  
(65%): dk gy-dk gyshbn,  
sl hd, sb blkly-splt ctngs,  
mnr Chk intbds, brit, mod  
calc, tr diss mic pyr;  
CHK (35%): gyshbn-med  
brn, sl frm-brit, sb blkly-sb  
tab ctngs, chky tex, tr vf  
lam, hi calc

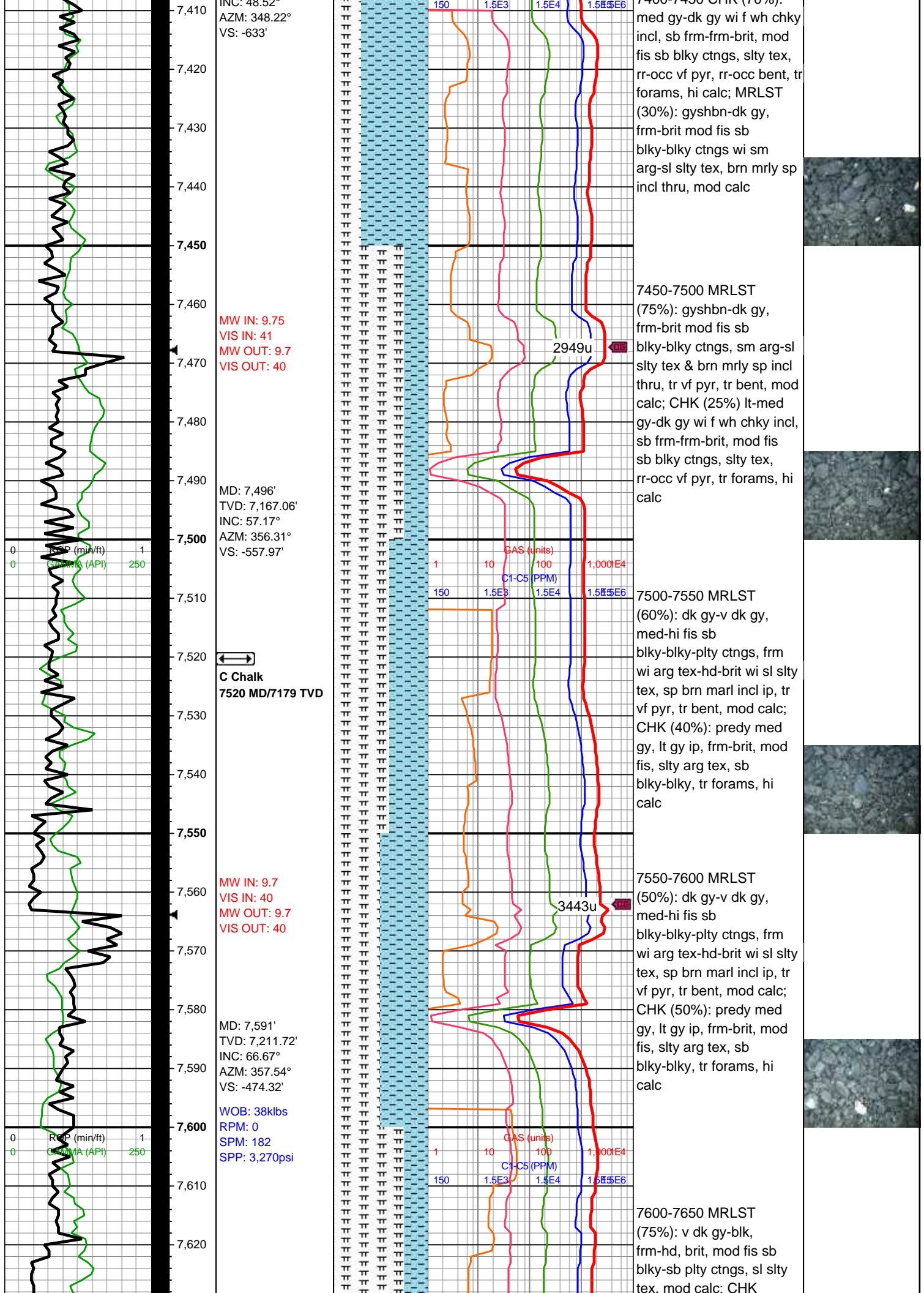
7250-7300 MRLST  
(85%): dk gy-dk gyshbn,  
sl hd, sb blkly-splt ctngs,  
mnr Chk intbds, tr diss  
mic pyr, mod calc; CHK  
(15%): lt gy-gyshbn, sb  
blkly-sb tab ctngs, sl  
frm-brit, tr vf lam, hi calc

7300-7350 MRLST  
(75%): dk gy-dk gyshbn,  
sb blkly-splt ctngs, sl hd,  
brit, mnr chk intbds, tr  
diss mic pyr, mod-hi  
calc; CHK (25%): med  
gy-gyshbn, mot, sb  
blkly-sb tab ctngs, sl  
frm-frm, brit, mnr vf lam,  
hi calc

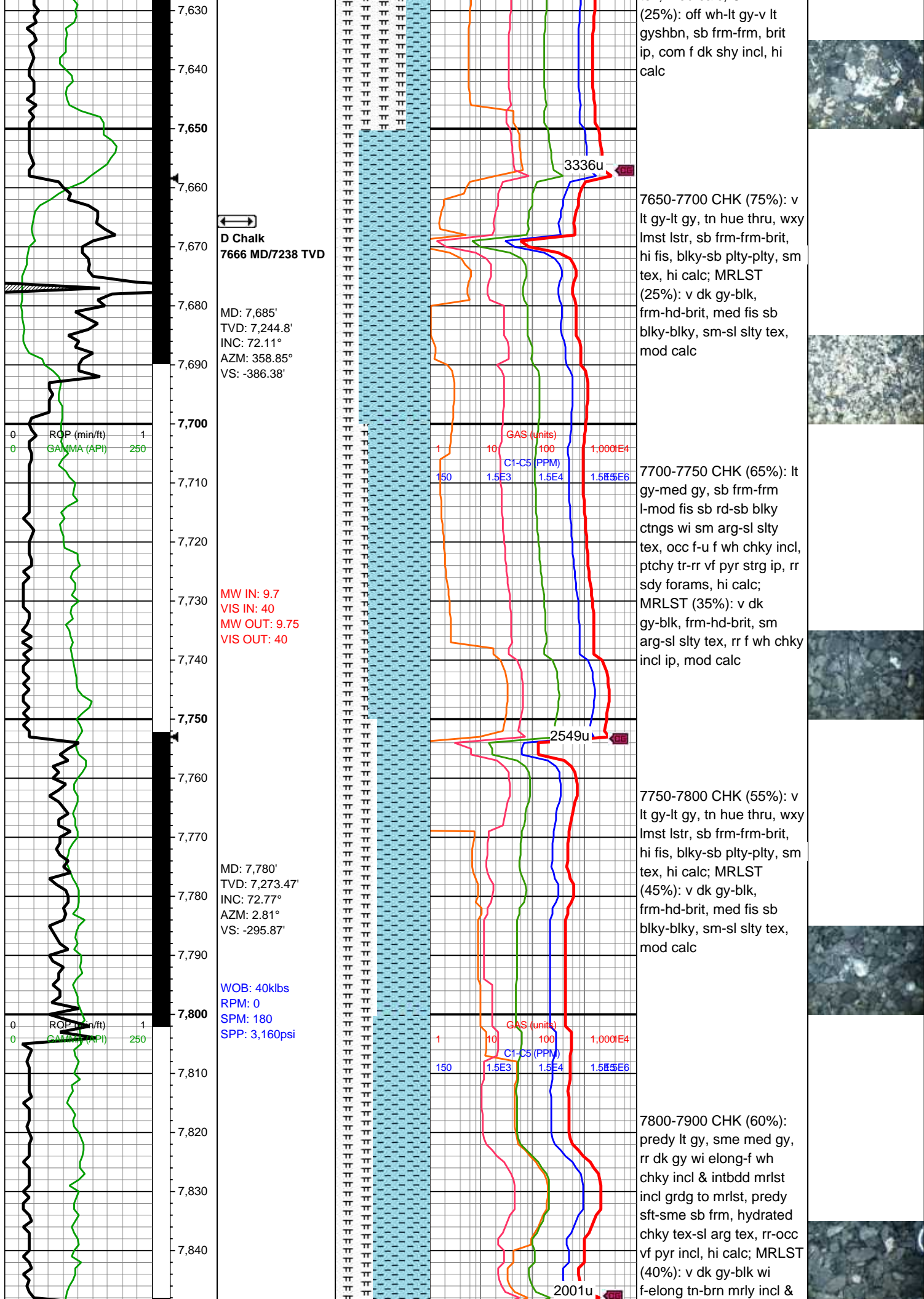
7350-7400 CHK (60%):  
med gy-gyshbn, sb  
blkly-sb tab ctngs, mnr vf  
lam, sl frm-frm, mnr free  
CHK, brit, scat pyrc nod,  
hi calc; MRLST (40%): dk  
gy-dk gyshbn, sl hd, sb  
blkly-splt ctngs, brit, tr  
diss mic-vf pyr, mnr  
chky intbds, mod calc, tr  
cal vns

7400-7450 CHK (70%):









D Chalk  
7666 MD/7238 TVD

MD: 7,685'  
TVD: 7,244.8'  
INC: 72.11°  
AZM: 358.85°  
VS: -386.38'

MW IN: 9.7  
VIS IN: 40  
MW OUT: 9.75  
VIS OUT: 40

MD: 7,780'  
TVD: 7,273.47'  
INC: 72.77°  
AZM: 2.81°  
VS: -295.87'

WOB: 40klbs  
RPM: 0  
SPM: 180  
SPP: 3,160psi

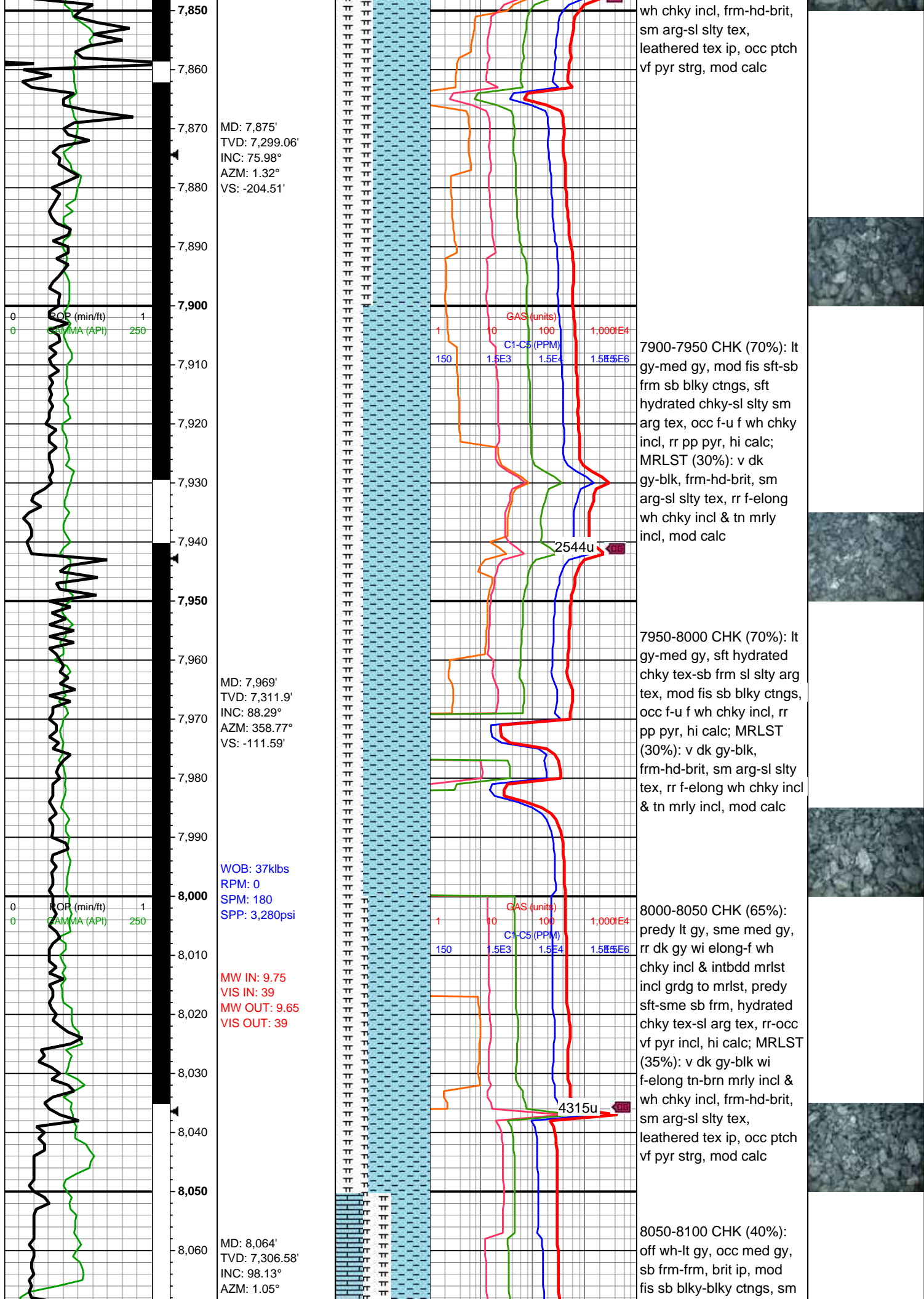
(25%): off wh-lt gy-v lt  
gyshbn, sb frm-frm, brit  
ip, com f dk shy incl, hi  
calc

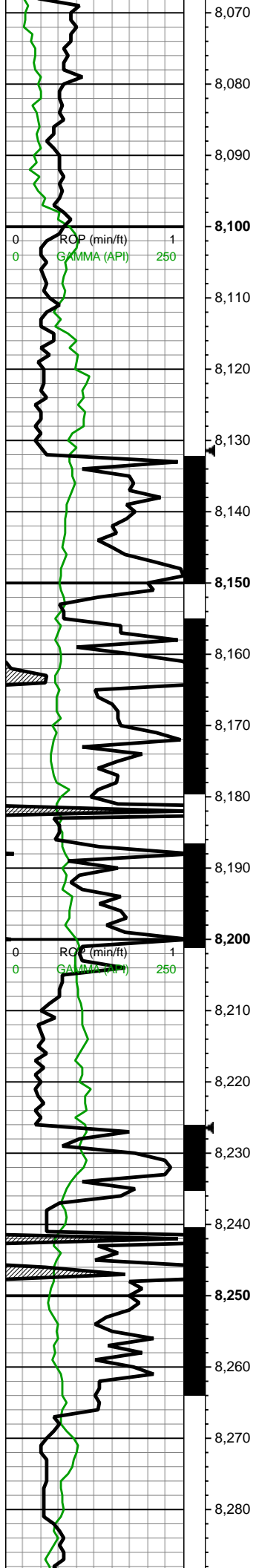
7650-7700 CHK (75%): v  
lt gy-lt gy, tn hue thru, wxy  
lmst lstr, sb frm-frm-brit,  
hi fis, blkly-sb plty-plty, sm  
tex, hi calc; MRLST  
(25%): v dk gy-blk,  
frm-hd-brit, med fis sb  
blkly-blky, sm-sl slty tex,  
mod calc

7700-7750 CHK (65%): lt  
gy-med gy, sb frm-frm  
l-mod fis sb rd-sb blkly  
ctngs wi sm arg-sl slty  
tex, occ f-u f wh chkly incl,  
ptchy tr-rr vf pyr strg ip, rr  
sdy forams, hi calc;  
MRLST (35%): v dk  
gy-blk, frm-hd-brit, sm  
arg-sl slty tex, rr f wh chkly  
incl ip, mod calc

7750-7800 CHK (55%): v  
lt gy-lt gy, tn hue thru, wxy  
lmst lstr, sb frm-frm-brit,  
hi fis, blkly-sb plty-plty, sm  
tex, hi calc; MRLST  
(45%): v dk gy-blk,  
frm-hd-brit, med fis sb  
blkly-blky, sm-sl slty tex,  
mod calc

7800-7900 CHK (60%):  
predy lt gy, sme med gy,  
rr dk gy wi elong-f wh  
chkly incl & intbdd mrlst  
incl grgd to mrlst, predy  
sft-sme sb frm, hydrated  
chkly tex-sl arg tex, rr-occ  
vf pyr incl, hi calc; MRLST  
(40%): v dk gy-blk wi  
f-elong tn-brn mrlly incl &





VS: -16.87'

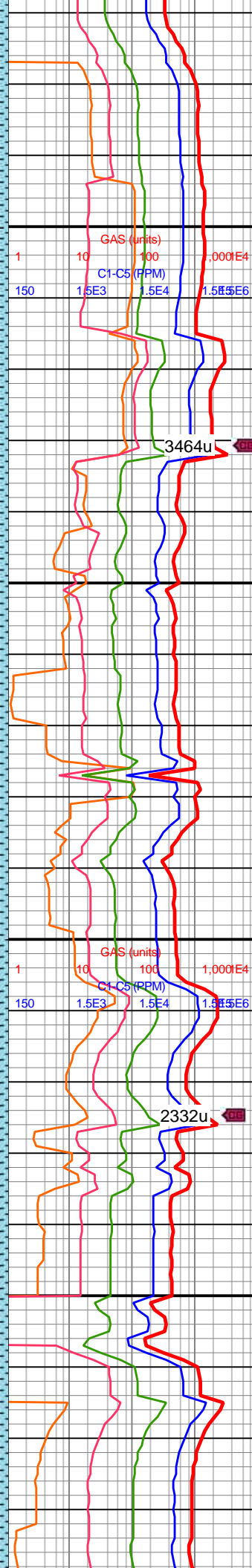
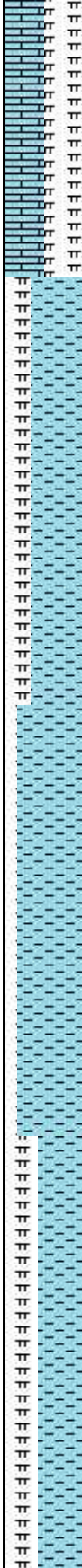
MW IN: 9.75  
VIS IN: 39  
MW OUT: 9.7  
VIS OUT: 39

MD: 8,159'  
TVD: 7,295.68'  
INC: 95.05°  
AZM: 0.17°  
VS: 77.46'

WOB: 44klbs  
RPM: 0  
SPM: 205  
SPP: 3,730psi

MW IN: 9.75  
VIS IN: 38  
MW OUT: 9.7  
VIS OUT: 38

MD: 8,253'  
TVD: 7,293.06'  
INC: 88.15°  
AZM: 4.39°  
VS: 171.2'



sl slty arg tex, hi calc;  
MRLST (30%): dk gy, frm,  
brit, mod fis sb blkylky  
ctngs, sm sl slty tex, occ  
tn elong marl incl & lamn,  
mod calc; LS (30%): lt  
gy-lt gyshbn-bf, frm,  
microIn grst-pkst, hi calc

8100-8150 80% CHK: off  
wh-lt gy, occ med gy,  
predy sb frm-frm, com sft  
hydrated chk, mod fis sb  
blkylky ctngs, sm  
chky-sl slty arg tex, hi  
calc; MRLST (20%): dk  
gy, frm, brit, mod fis sb  
blkylky ctngs, sm sl slty  
tex, occ tn elong marl  
incl, mod calc

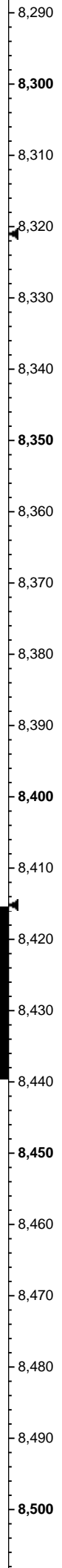
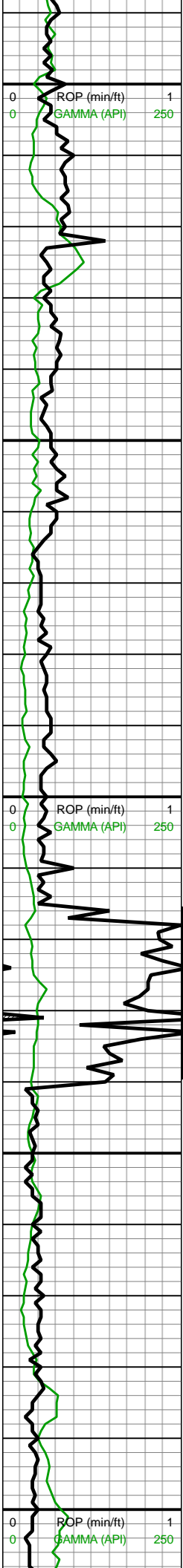
8150-8200 90% CHK: v lt  
gy-lt gy, med gy ip, sft-sb  
frm-frm mod fis sb  
blkylky ctngs, sm  
chky-sl slty arg tex, hi  
calc; MRLST (10%): dk  
gy-blk wi occ brn marl  
incl, frm, brit, mod fis sb  
blkylky ctngs, sm sl slty  
tex, mod calc

8200-8250 CHK (75%): v  
lt gy-lt gy, lt gyshbn-med  
gy ip, sft-sb frm-frm, mod  
fis sb blkylky ctngs,  
sm-sl slty arg tex, tr c pyr  
strg, hi calc; MRLST  
(25%): dk gy-blk wi occ  
brn marl incl, frm, brit,  
mod fis sb blkylky  
ctngs, sm sl slty tex, mod  
calc

8250-8300 CHK (90%): v  
lt gy-lt gy, med gy ip,  
sft-sb frm-frm mod fis sb  
blkylky ctngs, sm  
chky-sl slty arg tex, tr c pyr  
strg, hi calc; MRLST  
(10%): dk gy-blk wi occ  
brn marl incl, frm, brit,  
mod fis sb blkylky







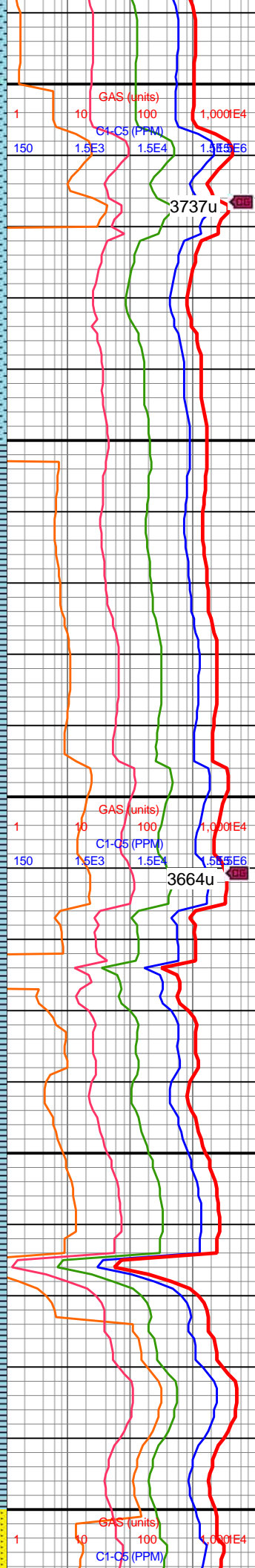
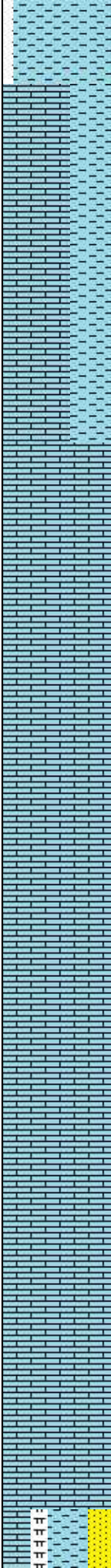
Fort Hayes  
8329 MD/7296 TVD

MD: 8,348'  
TVD: 7,297.87'  
INC: 86.05°  
AZM: 4.48°  
VS: 265.68'

WOB: 39klbs  
RPM: 70  
SPM: 205  
SPP: 4,200psi

MD: 8,443'  
TVD: 7,304.96'  
INC: 85.39°  
AZM: 1.05°  
VS: 360.21'

MW IN: 9.75  
VIS IN: 38



ctngs, sm sl slty tex, mod calc

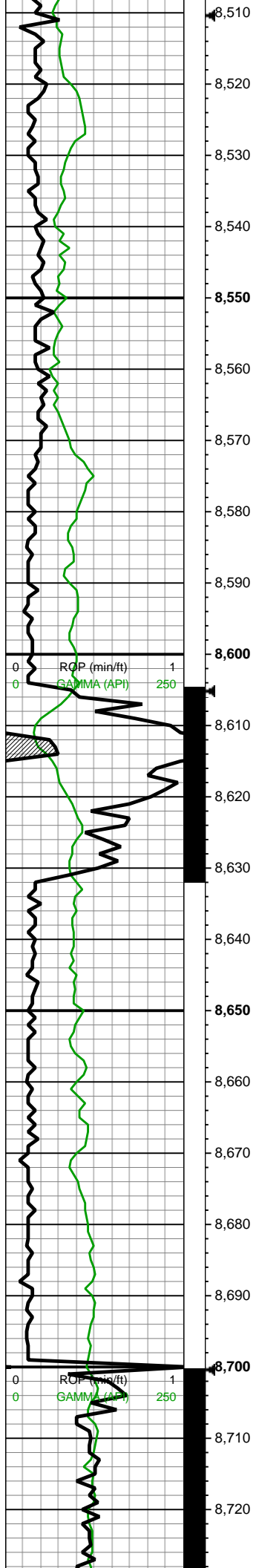
8350-8400 LS (100%):  
off wh-tn-lt gyshbn, rr dk  
gy calc intbds, frm-hd,  
crpxln mudst, wxy lstr, tr  
vf-u f pyr, hi calc

8400-8450 LS (100%):  
off wh-tn-lt gyshbn, lt gy-rr  
dk gy calc intbds ip,  
frm-hd, crpxln mudst, wxy  
lstr, tr vf-u f pyr, hi calc

8450-8500 LS (100%): lt  
gy, sme off wh-tn-lt  
gyshbn, occ dk gy calc  
intbds, frm-hd, crpxln  
mudst, wxy lstr, tr vf-u f  
pyr, hi calc







MW OUT: 9.7  
VIS OUT: 38

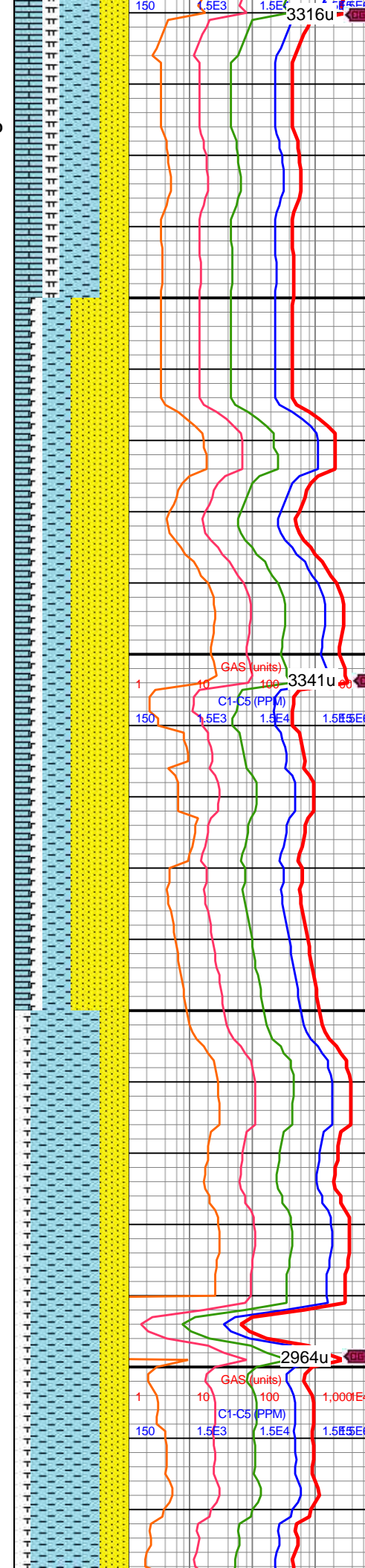
**Codell**  
**8520 MD/7311 TVD**

MD: 8,538'  
TVD: 7,313.36'  
INC: 84.46°  
AZM: 1.67°  
VS: 454.77'

WOB: 36klbs  
RPM: 70  
SPM: 204  
SPP: 4,220psi

MD: 8,633'  
TVD: 7,320.79'  
INC: 86.57°  
AZM: 0.08°  
VS: 549.42'

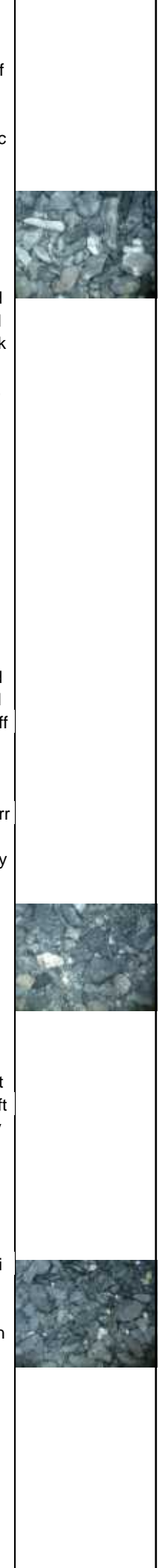
MD: 8,727'  
TVD: 7,322.99'  
INC: 90.75°

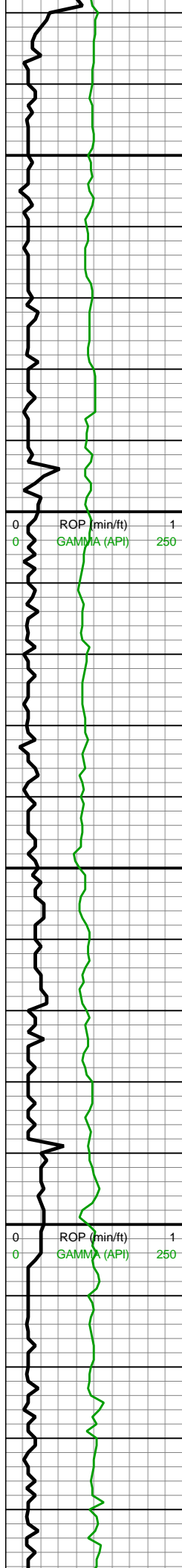


8500-8550 CHK (35%):  
sft off wh w hydrated  
chk-sb frm-frm lt gy chk, f  
gr sd incl ip, hi calc; LS  
(25%): off wh-tn-lt  
gyshbn, lt gy-rr dk gy calc  
intbds ip, frm-hd, crpxln  
mudst, wxy lstr, tr vf-u f  
pyr, hi calc; SST (25%):  
gy-dk gy-dk gyshbn wet  
clus, frm sli fri gr sup ss  
clus cons wi silc & sl arg  
cmt, p-mod srted vf-f sb rd  
sd grs, predy non calc, sl  
calc ip; MRLST (15%): dk  
gy, frm, brit, mod fis sb  
blky ctngs, sm-sl slty tex,  
wi f wh chky incl & brn  
mrly incl ip, mod calc

8550-8650 SST (50%):  
gy-dk gy-dk gyshbn wet  
clus, frm sli fri gr sup ss  
clus cons wi silc & sl arg  
cmt, p-mod srted vf-f sb rd  
sd grs, predy non calc, sl  
calc ip; CHK (25%): sft off  
wh w hydrated chk-sb  
frm-frm lt gy chk, f gr sd  
incl ip, hi calc; LS (15%):  
off wh-tn-lt gyshbn, lt gy-rr  
dk gy calc intbds ip,  
frm-hd, crpxln mudst, wxy  
lstr, tr vf-u f pyr, hi calc;  
10% MRLST: dk gy, frm,  
brit, mod fis sb blky  
ctngs, sm-sl slty tex, wi f  
wh chky incl & brn mrly  
incl ip, mod calc

8650-8700 CHK (60%): lt  
gy-med gy, sb frm-frm, sft  
ip, l-mod fis sb rd-sb blky  
ctngs, sm arg-sl slty tex,  
rr vf pyr, hi calc; SST  
(25%): gy-gyshbn-dk gy  
hydrated ctngs, p-mod  
srted vf-f sd grs, frm-hd sli  
fri ss clus, gr sup cons wi  
silc & arg cmt, predy non  
calc; MRLST (15%): dk  
gy, frm-hd, f wh chky & tn  
marly incl, mod calc





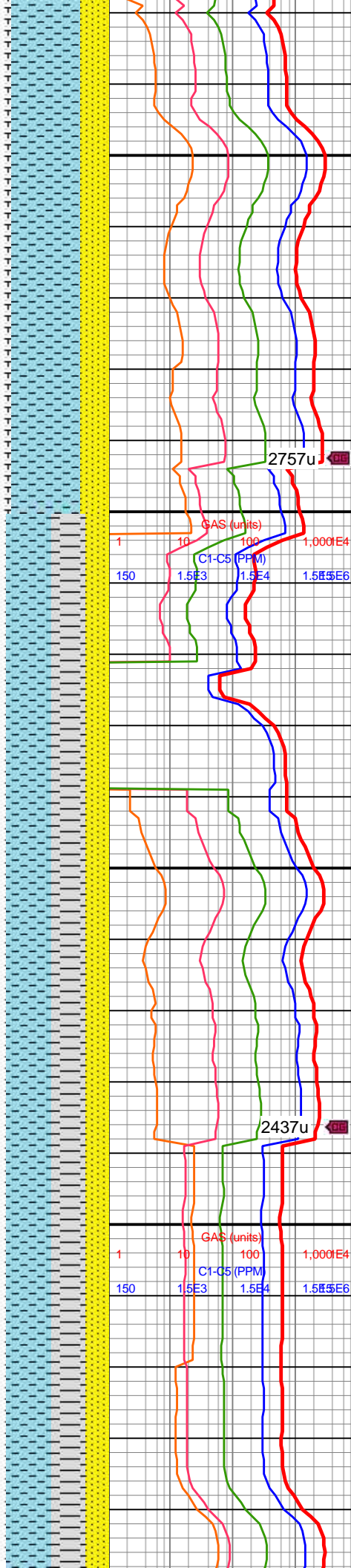
AZM: 358.94°  
VS: 643.37'

WOB: 31klbs  
RPM: 70  
SPM: 206  
SPP: 4,000psi

MD: 8,822'  
TVD: 7,321.82'  
INC: 90.66°  
AZM: 358.68°  
VS: 738.36'

MW IN: 9.8  
VIS IN: 38  
MW OUT: 9.75  
VIS OUT: 38

MD: 8,916'  
TVD: 7,321.28'  
INC: 90°  
AZM: 358.77°  
VS: 832.36'

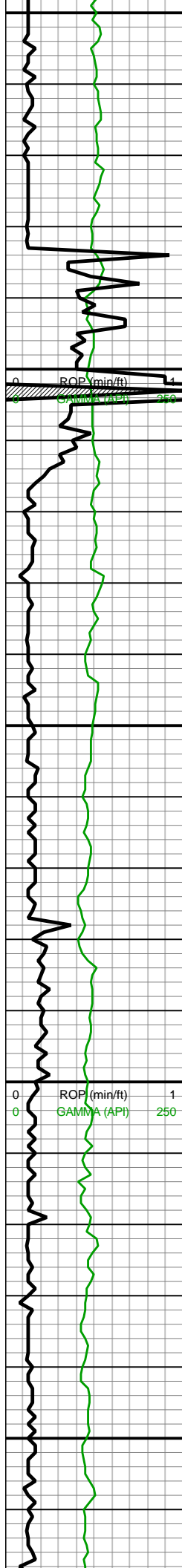


8700-8800 CHK (60%): lt gy-med gy, sb frm-frm, sft ip, l-mod fis sb rd-sb blk y ctngs, sm arg-sl slty tex, rr vf pyr, hi calc; SST (25%): gy-gyshbn-dk gy hydrated ctngs, p-mod srted vf-f sd grs, frm-hd sli fri ss clus, gr sup cons wi silc & arg cmt, predy non calc; MRLST (15%): dk gy, frm-hd, f wh chky & tn marly incl, mod calc



8800-8900 CHK (50%): lt gy-med gy, sft-sb frm, occ frm, slty-sdy incl thru, hi calc; SDY SH (30%): dk gy, frm-hd-brit, v arg sst clus, vf p srted sd grs, rr vf pyr, predy non calc-l calc; SST (20%): gy-dk gy, p-mod srted vf-f sb rd sd grs, gr sup sst clus cons wi silc & arg cmt grd to sdy sh, non-sl calc



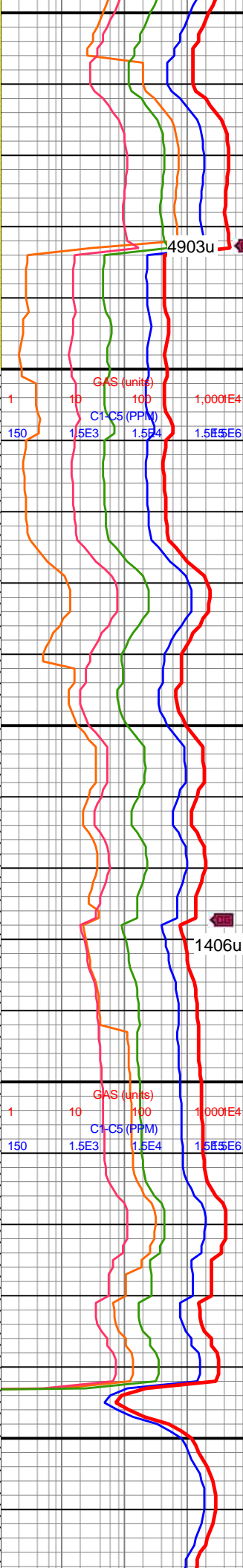
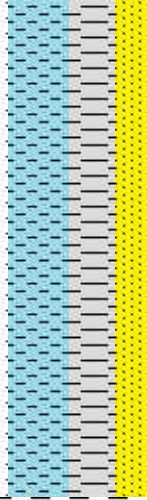


MW IN: 9.75  
VIS IN: 39  
MW OUT: 9.8  
VIS OUT: 38

WOB: 51klbs  
RPM: 0  
SPM: 204  
SPP: 3,590psi

MD: 9,011'  
TVD: 7,319.79'  
INC: 91.8°  
AZM: 0.26°  
VS: 927.34'

MD: 9,105'  
TVD: 7,316.25'  
INC: 92.51°  
AZM: 359.56°  
VS: 1,021.26'



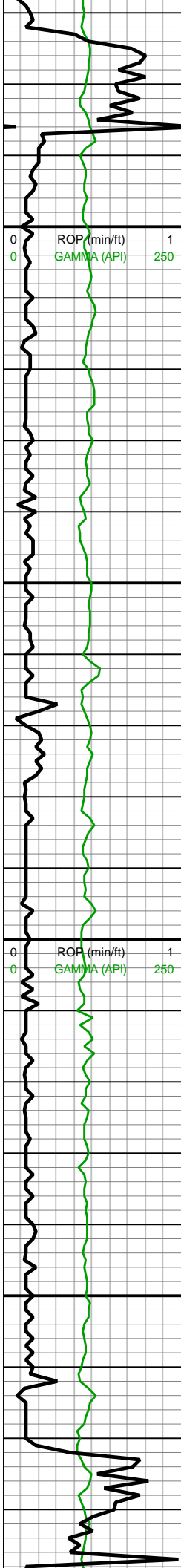
8900-9000 CHK (50%): lt  
gy-med gy, sft-sb frm, occ  
frm, slty-sdy incl thru, hi  
calc; SDY SH (30%): dk  
gy, frm-hd-brit, v arg sst  
clus, vf p srted sd grs, rr vf  
pyr, predy non calc-l calc;  
SST (20%): gy-dk gy,  
p-mod srted vf-f sb rd sd  
grs, gr sup sst clus cons  
wi silc & arg cmt grd to  
sdy sh, non-sl calc



9000-9100 SHY SST  
(100%): gy-dk gy, frm, v  
arg sst, mtx sup clus,  
non-sl-l mod calc







MW IN: 9.7+  
VIS IN: 39  
MW OUT: 9.7+  
VIS OUT: 38

WOB: 37.3klbs  
RPM: 70  
SPM: 205  
SPP: 4,243psi

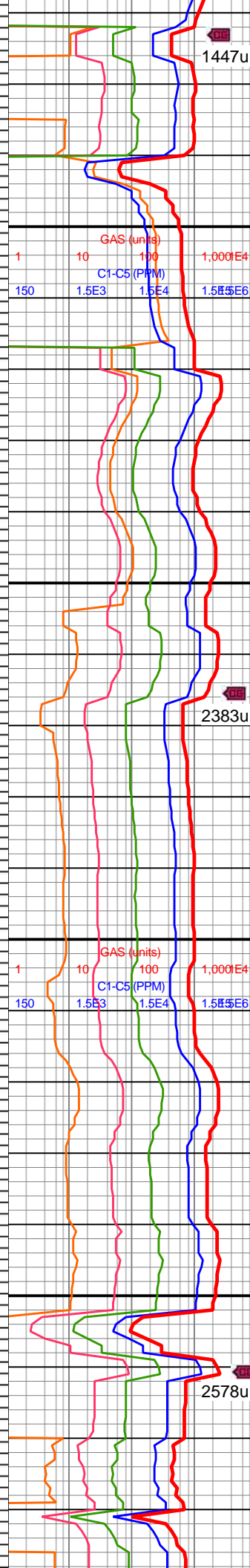
MD: 9,200'  
TVD: 7,314.1'  
INC: 90.09°  
AZM: 0.52°  
VS: 1,116.22'

MD: 9,294'  
TVD: 7,314.17'  
INC: 89.82°  
AZM: 0.17°  
VS: 1,210.2'

MW IN: 9.7+  
VIS IN: 40  
MW OUT: 9.8  
VIS OUT: 38

WOB: 37.5klbs  
RPM: 70  
SPM: 206  
SPP: 4,368psi

MD: 9,389'  
TVD: 7,313.27'



1447u

2383u

2578u

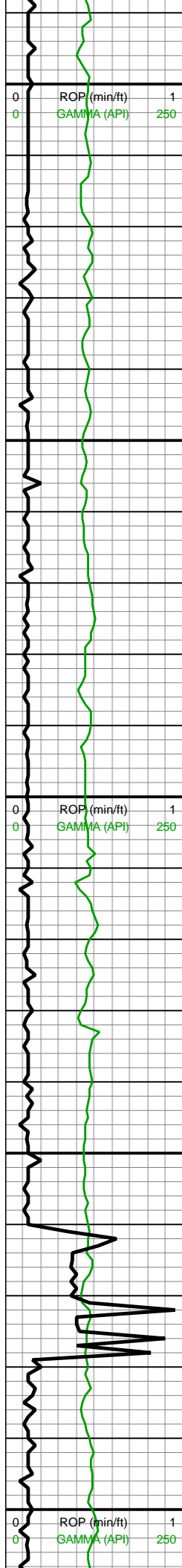
9100-9200 SH (100%):  
pred v dk gy-dk  
gyshbn-blk, frm-hrd, blk,  
sme plty, com micmica,  
com f diss m pyr, calc, rgh  
tex, occ slty

9200-9300 SH (100%):  
dk gy-blk, sme gyshbn,  
frm-sl hrd, com hrd, pred  
blk, micmica, scat pyrc  
nod & f diss m pyr, calc-v  
calc

9300-9400 SH (100%):  
dk gy-blk, y frm hrd, blk







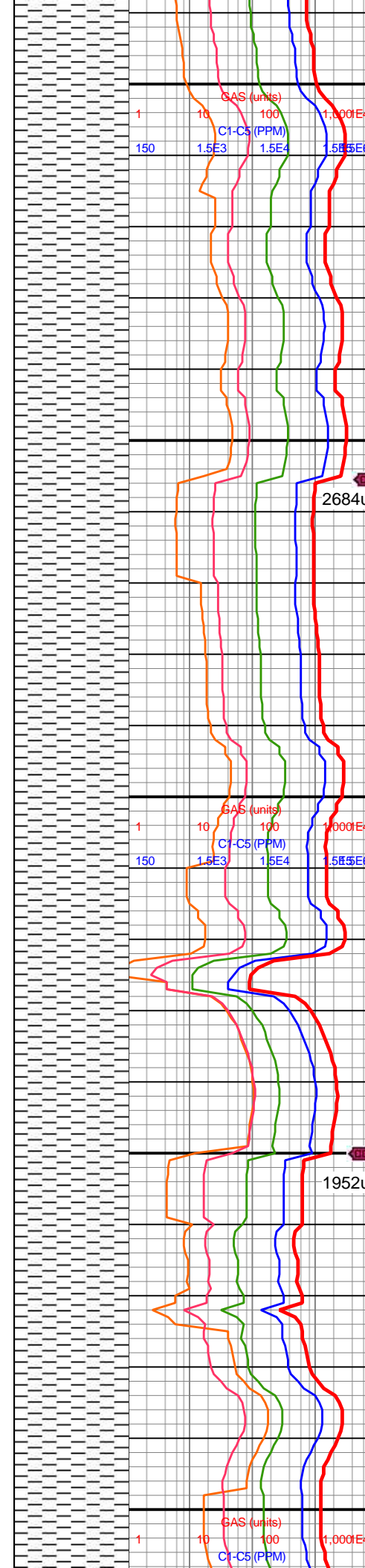
9,390  
9,400  
9,410  
9,420  
9,430  
9,440  
9,450  
9,460  
9,470  
9,480  
9,490  
9,500  
9,510  
9,520  
9,530  
9,540  
9,550  
9,560  
9,570  
9,580  
9,590  
9,600

INC: 91.27°  
AZM: 0.35°  
VS: 1,305.18'

MD: 9,484'  
TVD: 7,311.19'  
INC: 91.23°  
AZM: 359.82°  
VS: 1,400.14'

MD: 9,579'  
TVD: 7,307.91'  
INC: 92.73°  
AZM: 1.14°  
VS: 1,495.05'

WOB: 37.5klbs  
RPM: 70  
SPM: 204  
SPP: 4,338psi

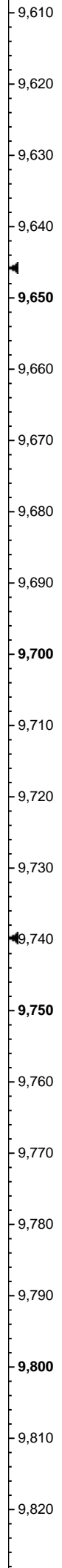
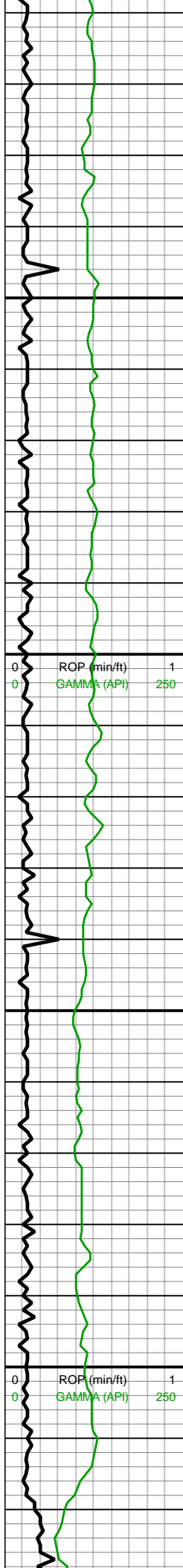


dk gy-blk, v hrd, blk, sme plty, calc, micmica, tr pp pyr, scat cal vns, rgh tex

9400-9500 SH (100%):  
pred dk gy-v dk gy, sme dk brn-blk, frm-sl hrd, blk, occ lam, calc, micmica, com f diss pyr, rgh tex, occ slty

9500-9600 SH (100%):  
pred v dk gy, sme blk-v dk brn, blk, sme plty, frm-hrd, com micmica, calc, rgh tex, slty, occ pp pyr



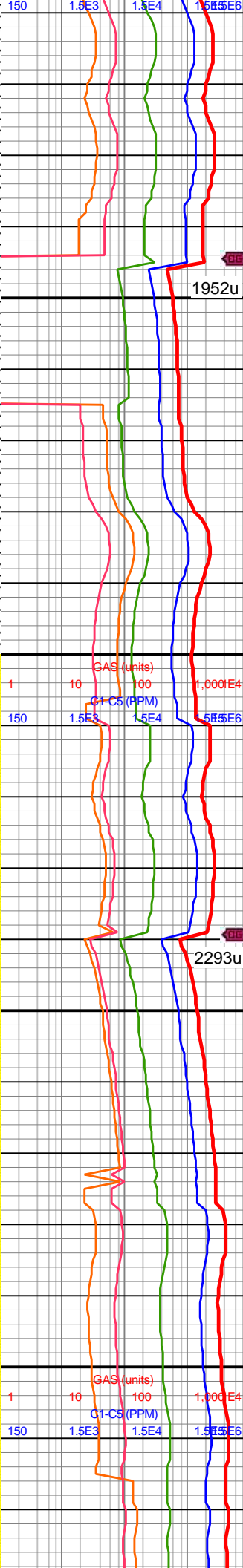
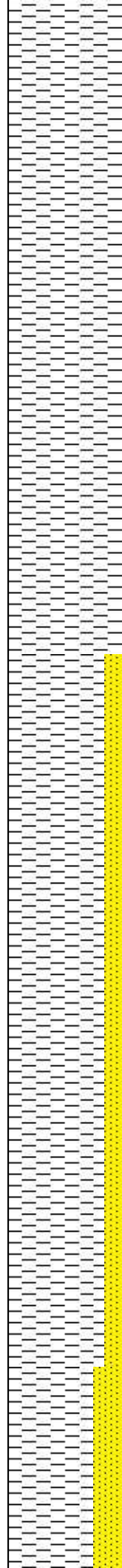


MD: 9,673'  
TVD: 7,303.29'  
INC: 92.9°  
AZM: 0.61°  
VS: 1,588.9'

MW IN: 9.8  
VIS IN: 40  
MW OUT: 9.7+  
VIS OUT: 38

MD: 9,768'  
TVD: 7,298.78'  
INC: 92.55°  
AZM: 0.26°  
VS: 1,683.77'

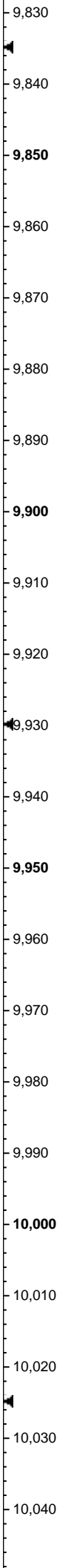
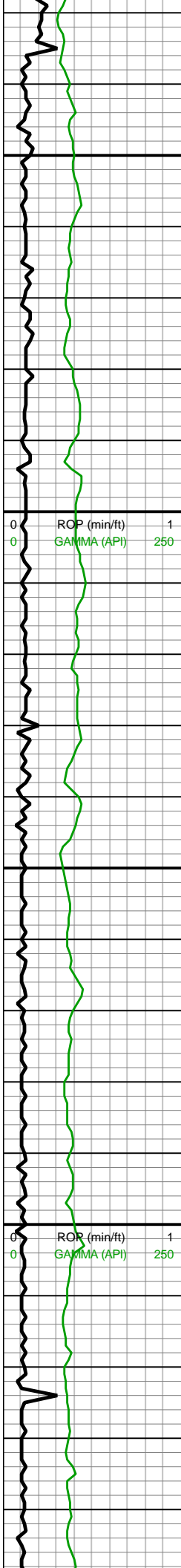
WOB: 37.6klbs  
RPM: 70  
SPM: 206  
SPP: 4,467psi



9600-9700 SH (100%):  
dk gy-blk, sme gyshbn,  
frm-sl hrd, com hrd, pred  
blky, micmica, scat pyrc  
nod & f dissn pyr, calc-v  
calc, rgh tex, com slty

9700-9800 SH (85%): dk  
gy-blk, v frm-hrd, blkky,  
sme plty, calc, micmica,  
tr pp pyr, rgh tex; SST  
(15%): med brn, mot,  
slty-vf gr, sb rd-sb ang, p  
srted SS clus, frm-sl fri,  
mtx sup, cons wi silc/arg  
cmt, non calc





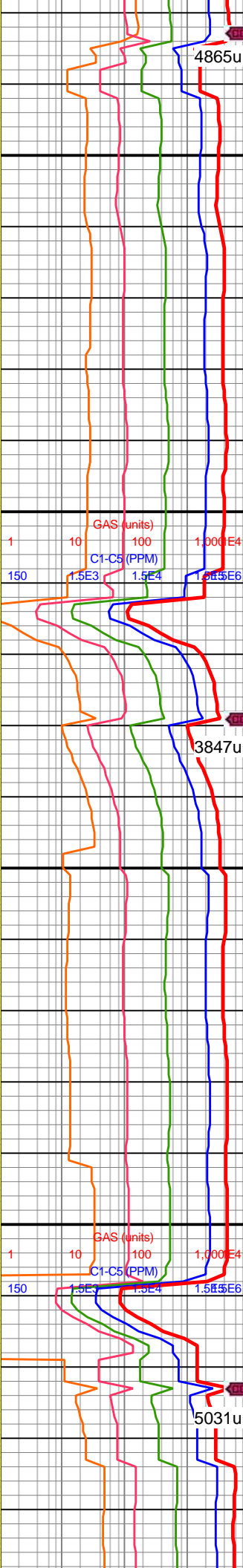
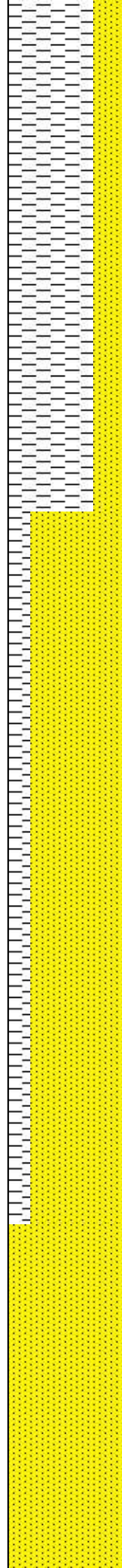
MD: 9,863'  
TVD: 7,294.58'  
INC: 92.51°  
AZM: 0.61°  
VS: 1,778.65'

MD: 9,958'  
TVD: 7,290.79'  
INC: 92.07°  
AZM: 0.08°  
VS: 1,873.55'

WOB: 34.6klbs  
RPM: 70  
SPM: 208  
SPP: 4,613psi

MW IN: 9.8  
VIS IN: 40  
MW OUT: 9.8+  
VIS OUT: 38

MD: 10,052'



9800-9900 SH (75%):  
pred v dk gy-dk  
gyshbn-blk, frm-hrd, blkly,  
sme plty, com micmica,  
calc, rgh tex, occ slty; SS  
(25%): pred lt brn-brn, sb  
rd-sb ang, vf-f gr, slty gr,  
mod srted SS clus, frm-v  
frm, mtx sup ip, cons wi  
silc cmt, non calc



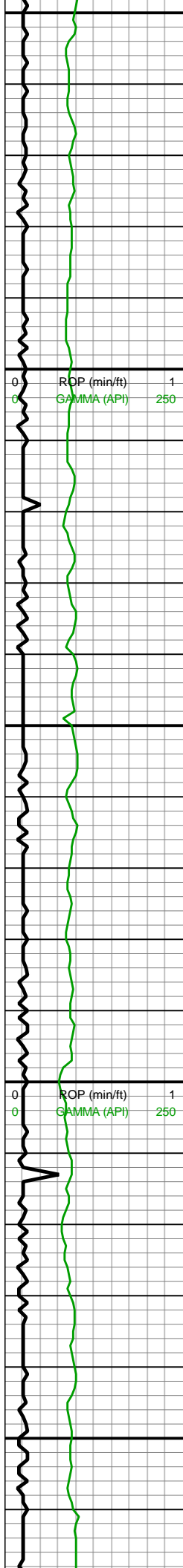
9900-10000 SST (80%):  
dk gy-dk gy brn gr-mtx  
sup clus, occ lt gy-gy mtx  
sup shy ss, pred dk gy wi  
f sb rd qtz sd gr incl, p  
srted vf-f sd grs, pred sb  
rd-rd sli fri gr sup ss clus  
cons wi silc & arg cmt,  
uncons ip, non calc; SH  
(20%): pred v dk gy, sme  
blk-v dk brn, blkly, sme  
plty, frm-hrd, com  
micmica, calc, rgh tex,  
slty, occ pp pyr



4865u

3847u

5031u

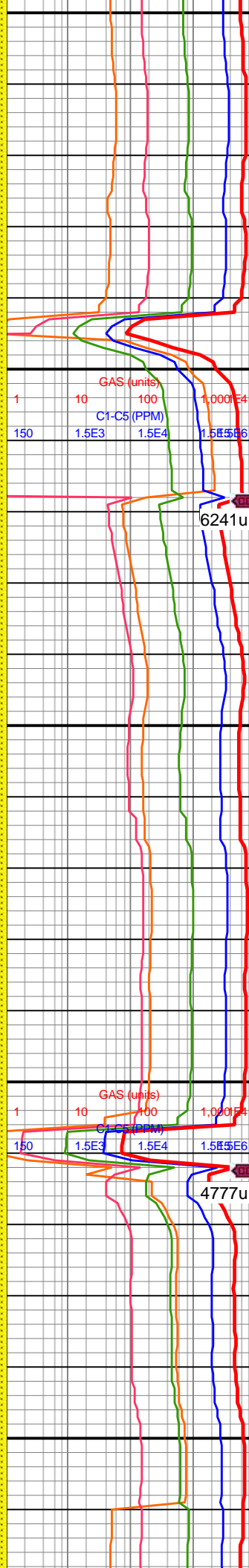


TVD: 7,287.9'  
INC: 91.45°  
AZM: 359.47°  
VS: 1,967.5'

MD: 10,147'  
TVD: 7,285.86'  
INC: 91.01°  
AZM: 359.65°  
VS: 2,062.48'

WOB: 37.9klbs  
RPM: 70  
SPM: 208  
SPP: 4,789psi

MD: 10,241'  
TVD: 7,284.78'  
INC: 90.31°  
AZM: 358.77°  
VS: 2,156.47'

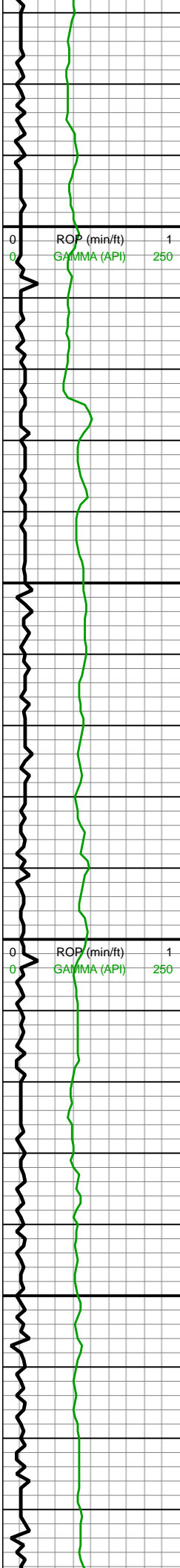


10000-10100 SST  
(100%): predy gyshbn,  
gy-lt gy, occ dk gy, mod  
srted, vf-f sb ang-sb rd sd  
grs, sb frm-frm, lt gy mtx  
sup arg ss clus-com  
frm-hd sl fri, silc cmt,  
gy-dk gy gr sup ss clus,  
l-no calc

10100-10200 SST  
(100%): med-lt gy, occ dk  
gy, mod srted, vf-f sb  
ang-sb rd sd grs, sb  
frm-frm, lt gy mtx sup arg  
ss clus-com frm-hd sl fri,  
gy-dk gy gr sup ss clus  
cons wi silc cmt, l-no calc







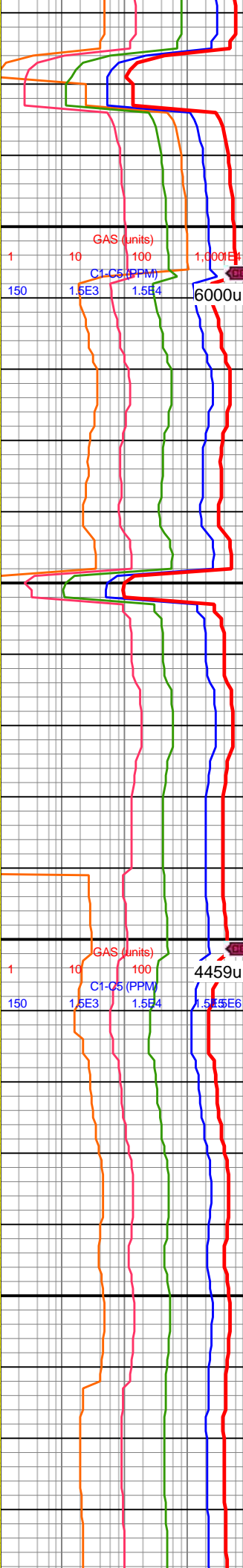
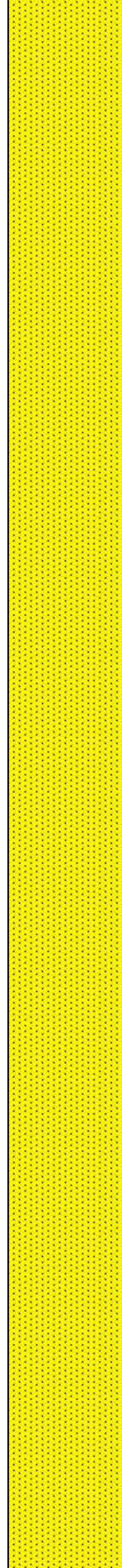
10,270  
10,280  
10,290  
10,300  
10,310  
10,320  
10,330  
10,340  
10,350  
10,360  
10,370  
10,380  
10,390  
10,400  
10,410  
10,420  
10,430  
10,440  
10,450  
10,460  
10,470  
10,480

MD: 10,336'  
TVD: 7,284.74'  
INC: 89.74°  
AZM: 358.41°  
VS: 2,251.46'

MW IN: 9.8+  
VIS IN: 41  
MW OUT: 9.8  
VIS OUT: 38

WOB: 37.6klbs  
RPM: 71  
SPM: 208  
SPP: 4,878psi

MD: 10,430'  
TVD: 7,285.71'  
INC: 89.08°  
AZM: 358.33°  
VS: 2,345.45'



10200-10300 SST  
(100%): pred med gy-dk  
gy brn wi f sb rd qtz sd gr  
incl, fri-sli fri gr sup shy  
ss clus cons wi arg & silc  
cmt, occ lt gy-gy mtx sup  
shy ss cons wi arg cmt, p  
srted vf-f sd grs, com  
uncons sd, non calc

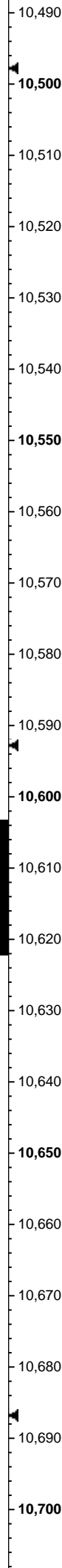
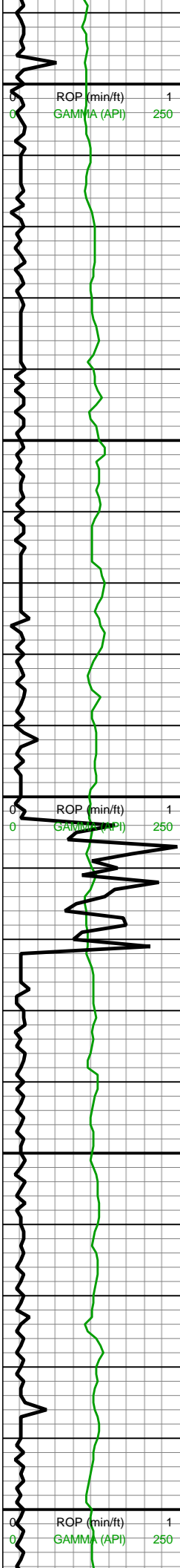


10300-10400 SST  
(100%): dsky brn-rdshbr,  
com lt gy, frm-hd, fri, sme  
brit, blk-y-sb blk-y, sb  
rnd-sb ang grs, vf-f gr,  
mod-w srt, predy cls sup,  
mtx sup ip, qtz mtx,  
silc-calc cmt, scat pp pyr



10400-10500 SST  
(100%): dk gy-dk gy brn  
gr-mtx sup clus, occ lt  
gy-gy mtx sup shy ss,  
pred dk gy wi f sb rd qtz  
sd gr incl, p srted vf-f sd  
grs, pred sb rd-rd sli fri gr



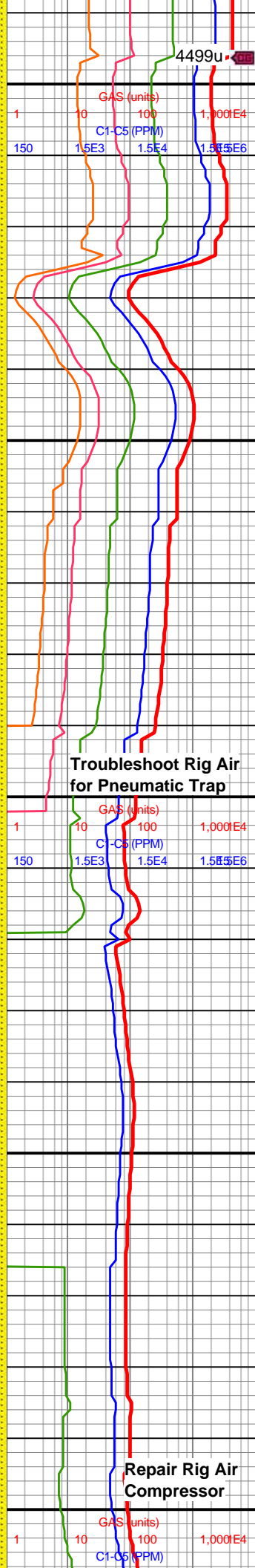
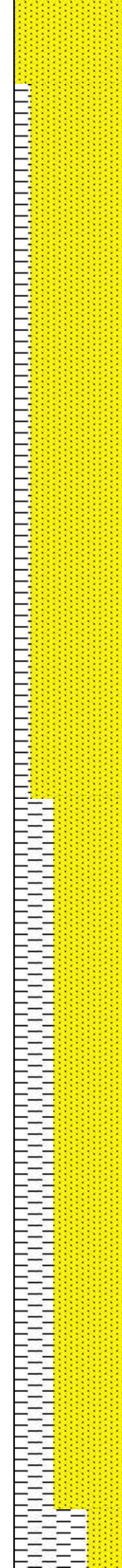


MD: 10,526'  
TVD: 7,287.58'  
INC: 88.68°  
AZM: 357.89°  
VS: 2,441.42'

WOB: 40.6klbs  
RPM: 70  
SPM: 208  
SPP: 4,876psi

MD: 10,620'  
TVD: 7,288.95'  
INC: 89.65°  
AZM: 359.65°  
VS: 2,535.4'

MW IN: 9.9  
VIS IN: 41  
MW OUT: 9.9+  
VIS OUT: 40



Troubleshoot Rig Air  
for Pneumatic Trap

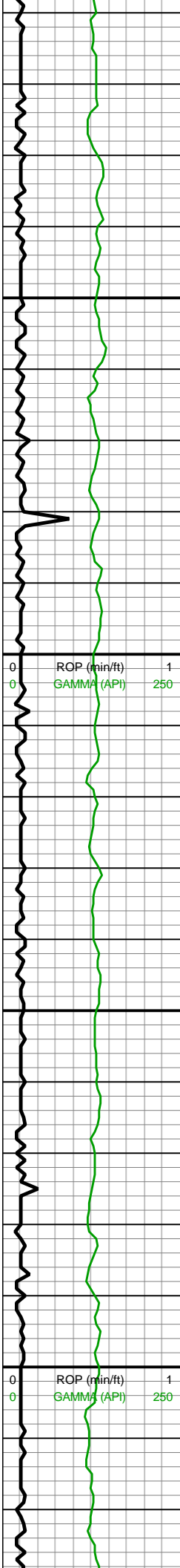
Repair Rig Air  
Compressor

grs, pred sb rd-rd silc g  
sup ss clus cons wi silc  
& arg cmt, unconsp, non  
calc

10500-10600 SST (85%):  
dk brn-dk gyshbn, p-mod  
srtd vf-u f sd grs, pred dk  
gy frm, sl fri gy-dk gy sst  
clus cons wi silc cmt  
grdg to sltst ip, com med  
frm mtx sup arg sst clus,  
com unconsp vf-u f sb  
rd-rd sd grs, rr vf pyr, non  
calc; SH (15%): pred v dk  
gy, sme blk-v dk brn, blk,  
sme plty, frm-hrd, com  
micmica, calc, rgh tex,  
slty, occ pp pyr

10600-10700 SST (65%):  
gy-dk gy s&p sst clus,  
sme tn sst clus, mod srtd  
f sb rd-rd sd grs, frm-hd  
sli fri predy gr sup ss  
clus cons wi silc cmt, occ  
mtx sup ss clus cons wi  
arg & sl silc cmt, predy  
non calc, v sl calc ip; SH  
(35%): pred v dk gy-dk  
gyshbn-blk, frm-hrd, blk,  
sme plty, com micmica,  
calc, rgh tex, occ slty



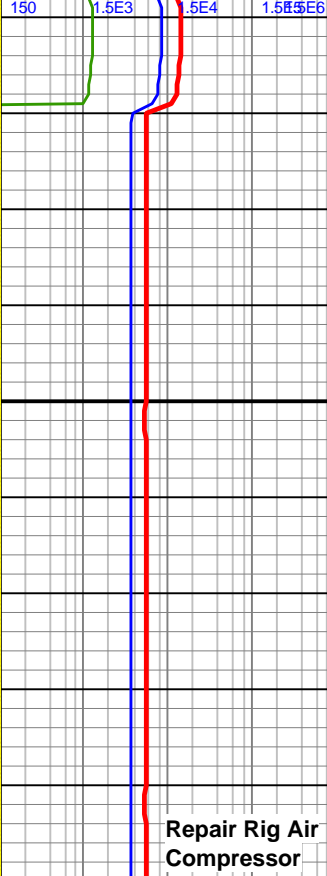
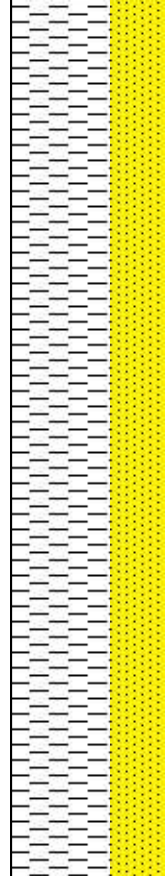


MD: 10,715'  
TVD: 7,289.53'  
INC: 89.65°  
AZM: 0.08°  
VS: 2,630.39'

WOB: 38.7klbs  
RPM: 72  
SPM: 208  
SPP: 4,924psi

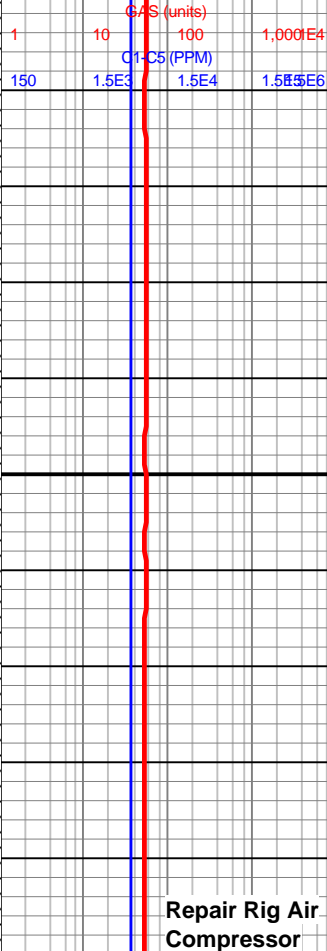
MD: 10,810'  
TVD: 7,290.37'  
INC: 89.34°  
AZM: 360°  
VS: 2,725.37'

MD: 10,904'  
TVD: 7,291.81'  
INC: 88.9°  
AZM: 0.44°  
VS: 2,819.35'



Repair Rig Air  
Compressor

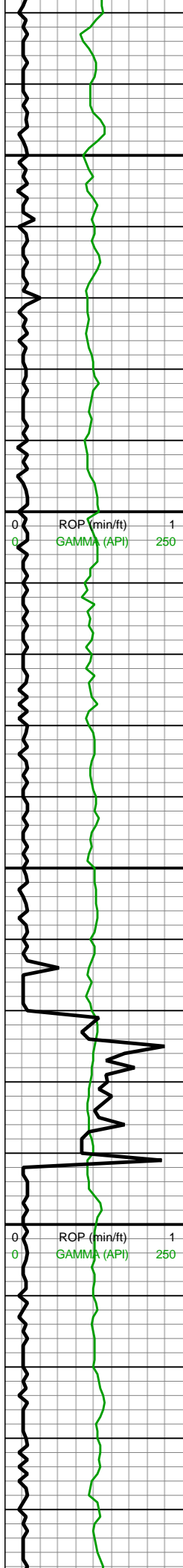
10700-10800 SH (65%):  
dk gy-blk, sme gyshbn,  
frm-sl hrd, com hrd, pred  
blky, micmica, scat pyrc  
nod & f diss m pyr, calc-v  
calc, rgh tex, com slty;  
SST (35%): lt gy-gy-dk gy,  
p-mod srtd vf-f sd grs,  
sft-crunchy lt gy mtx sup  
arg sst clus-gy-dk gy gr  
sup gr sup ss clus cons  
wi silc cmt, uncons ip, f  
lamn ip, predy non calc,  
sl calc ip



Repair Rig Air  
Compressor

10800-10900 SH  
(100%): pred v dk gy-dk  
gyshbn-blk, frm-hrd, blky,  
sme plty, com micmica,  
com f diss m pyr, calc, rgh  
tex, occ slty





10,930  
10,940  
10,950  
10,960  
10,970  
10,980  
10,990  
11,000  
11,010  
11,020  
11,030  
11,040  
11,050  
11,060  
11,070  
11,080  
11,090  
11,100  
11,110  
11,120  
11,130  
11,140

MW IN: 9.9+  
VIS IN: 40  
MW OUT: 9.9+  
VIS OUT: 39

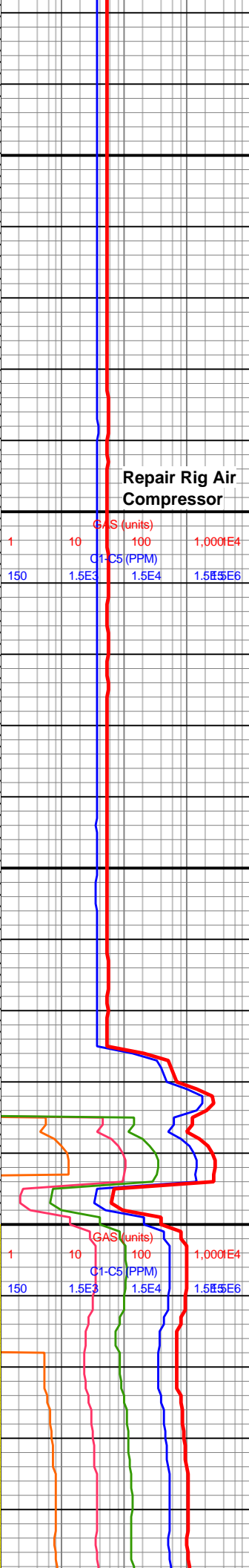
MD: 10,999'  
TVD: 7,293.67'  
INC: 88.86°  
AZM: 0.96°  
VS: 2,914.29'

WOB: 39klbs  
RPM: 70  
SPM: 204  
SPP: 4,945psi

MINDEPTH 6/5/2018

MW IN: 9.9+  
VIS IN: 41  
MW OUT: 9.9+  
VIS OUT: 40

MD: 11,093'  
TVD: 7,294.5'  
INC: 90.13°  
AZM: 358.5°  
VS: 3,008.28'



Repair Rig Air Compressor

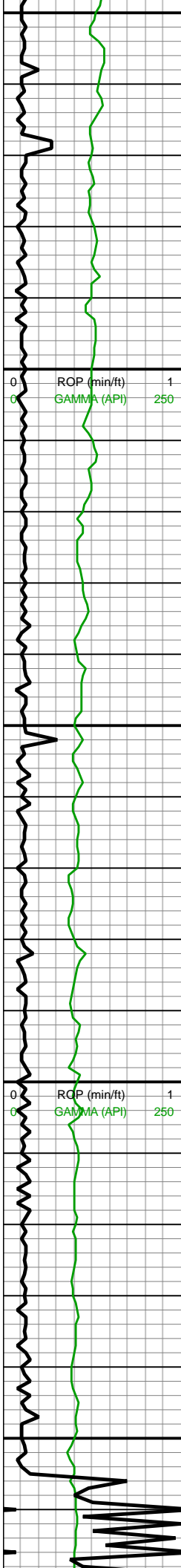
10900-11000 SH  
(100%): pred v dk gy,  
sme blk-v dk brn, blk,  
sme plty, frm-hrd, com  
micmica, calc, rgh tex,  
silty, occ pp pyr



11000-11100 SH  
(100%): dk gy-blk, sme  
gyshbn, frm-sl hrd, com  
hrd, pred blk, micmica,  
scat pyrc nod & f diss  
pyr, calc-v calc, rgh tex,  
com slty







11,150  
11,160  
11,170  
11,180  
11,190  
11,200  
11,210  
11,220  
11,230  
11,240  
11,250  
11,260  
11,270  
11,280  
11,290  
11,300  
11,310  
11,320  
11,330  
11,340  
11,350  
11,360

MD: 11,187'  
TVD: 7,294.11'  
INC: 90.35°  
AZM: 358.06°  
VS: 3,102.26'

WOB: 38.4klbs  
RPM: 71  
SPM: 208  
SPP: 5,027psi

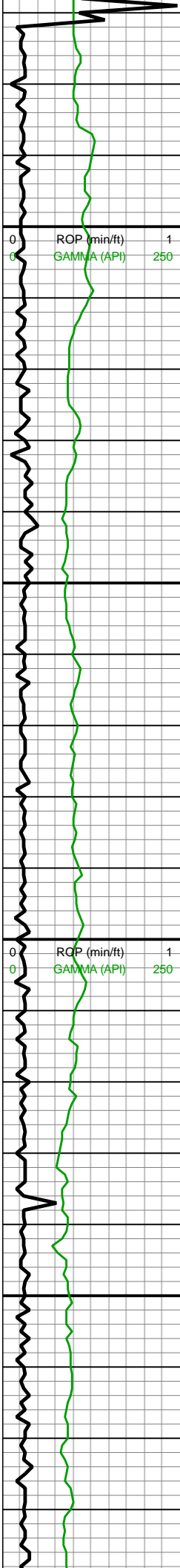
MD: 11,282'  
TVD: 7,293.89'  
INC: 89.91°  
AZM: 357.54°  
VS: 3,197.24'



11100-11200 SH (75%):  
pred v dk gy-dk  
gyshbn-blk, frm-hrd, blk,  
sme plty, com micmica,  
com f diss pyr, calc, rgh  
tex, occ slty; SST (25%):  
med-brn dk brn, com  
rdshbr, hd, brit-smewh  
fri, sb blk, ang-sb ang  
grs, vf-f gr, mod-w srt, qtz  
cls, silc cmt, cls sup-mtx  
sup ip, non calc

11200-11300 SST (50%):  
med brn-dk gyshbn, dk  
brn, mot, slty-vf gr, sb  
rd-sb ang, p srted SS clus,  
frm-sl fri, gr sup clus, mtx  
sup ip, cons wi silc/arg  
cmt, tr lamn, tr pp mic  
pyr/pyrc nod, non calc;  
SH (50%): pred dk gy-v  
dk gy, sme dk brn-blk,  
frm-sl hrd, blk, occ lam,  
calc, micmica, com f  
dissm pyr, rgh tex, occ  
slty





11,370  
11,380  
11,390  
11,400  
11,410  
11,420  
11,430  
11,440  
11,450  
11,460  
11,470  
11,480  
11,490  
11,500  
11,510  
11,520  
11,530  
11,540  
11,550  
11,560  
11,570  
11,580

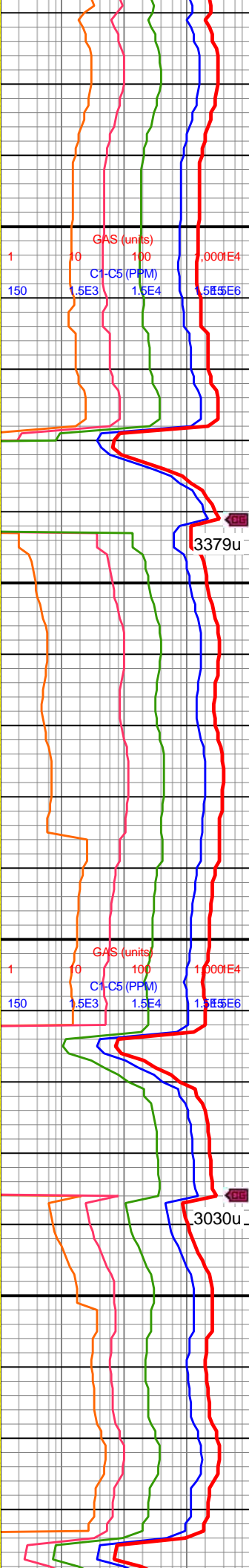
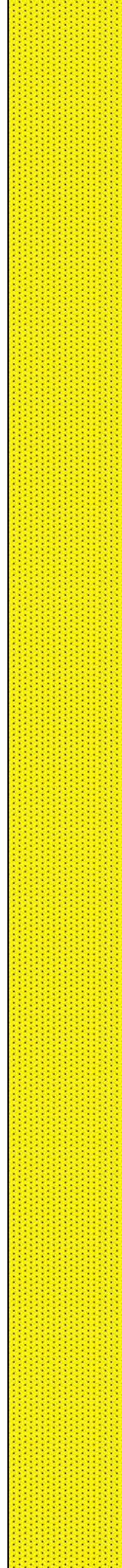
MD: 11,377'  
TVD: 7,292.84'  
INC: 91.36°  
AZM: 357.01°  
VS: 3,292.18'

WOB: 40.3klbs  
RPM: 72  
SPM: 208  
SPP: 5,232psi

MW IN: 10  
VIS IN: 41  
MW OUT: 10  
VIS OUT: 40

MD: 11,471'  
TVD: 7,290.1'  
INC: 91.98°  
AZM: 357.89°  
VS: 3,386.09'

MD: 11,566'  
TVD: 7,286.86'  
INC: 91.93°  
AZM: 357.18°  
VS: 3,481'

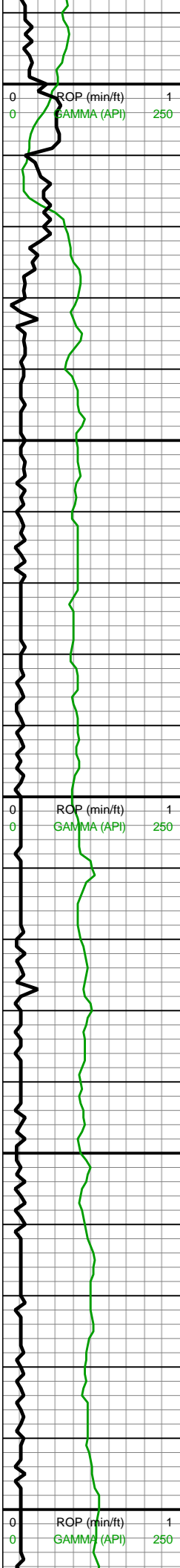


11300-11400 SST  
(100%): predy med gy,  
sme lt gy-gyshbn ip, mod  
srted vf-f grs, occ u f, sb  
ang-sb rd sd, frm-hd sli  
fri gr sup ss clus cons wi  
silc cmt, arg cmt ip, non  
calc-v sl calc

11400-11500 SST  
(100%): lt gy-gy-dk gy,  
p-mod srted vf-f sd grs,  
sft-crunchy lt gy mtx sup  
arg sst clus-gy-dk gy gr  
sup gr sup ss clus cons  
wi silc cmt, unconsl ip, f  
lamn ip, predy non calc

11500-11600 SST  
(100%): predy lt gy-dk gy,  
p-mod srted vf-f sb ang-sb  
rd sd grs, med frm-frm lt  
gy mtx sup ss clus cons  
wi arg cmt, con frm hd cl





11,590  
11,600  
11,610  
11,620  
11,630  
11,640  
11,650  
11,660  
11,670  
11,680  
11,690  
11,700  
11,710  
11,720  
11,730  
11,740  
11,750  
11,760  
11,770  
11,780  
11,790  
11,800

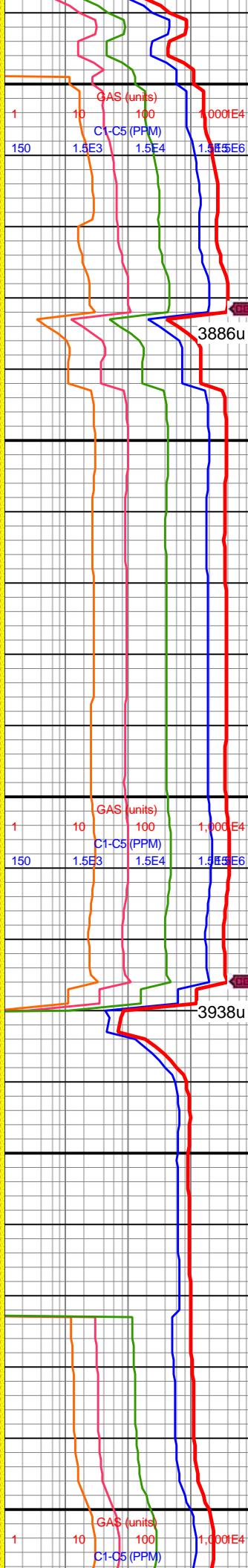
WOB: 39klbs  
RPM: 72  
SPM: 208  
SPP: 5,093psi

MD: 11,660'  
TVD: 7,283.87'  
INC: 91.71°  
AZM: 357.18°  
VS: 3,574.9'

MW IN: 10.0+  
VIS IN: 41  
MW OUT: 10.0+  
VIS OUT: 40

MD: 11,756'  
TVD: 7,280.96'  
INC: 91.76°  
AZM: 357.18°  
VS: 3,670.79'

WOB: 41.3klbs  
RPM: 72  
SPM: 208  
SPP: 5,239psi



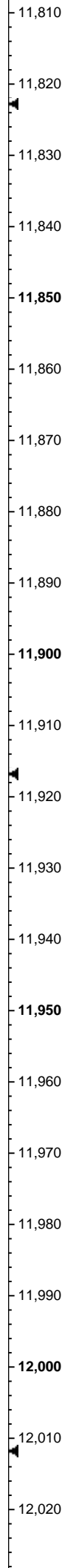
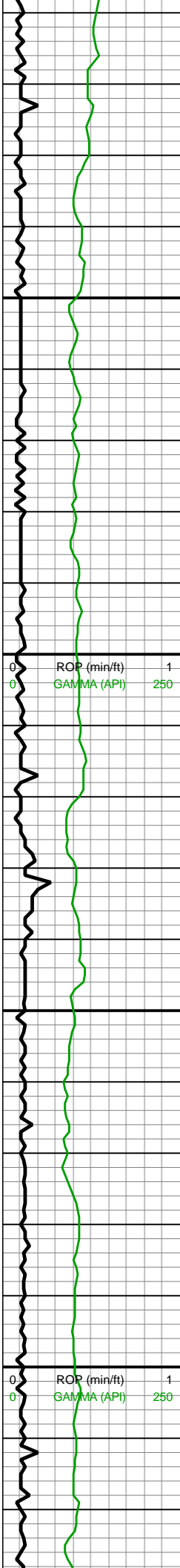
wi arg cmt, com frm-hd sl  
fri gy-dk gy gr sup ss clus  
cons wi silc cmt wi sl arg  
cmt, non calc

11600-11700 SST  
(100%): gyshbn-lt gy, dk  
gy ip, p-mod srtd vf-f sb  
ang-sb rd sd grs, predy  
mod frm-frm lt gy mtx,  
sup ss clus cons wi arg  
cmt, com frm-hd sl fri  
gy-dk gy gr sup ss clus  
cons wi silc cmt, tr pp  
mic pyr, sme arg

11700-11800 SST  
(100%): gyshbn-lt gy, dk  
gy ip, mod-p srtd vf-f sb  
ang-sb rd sd grs, mod  
frm-frm, lt gy mtx, sup ss  
clus cons wi arg cmt,  
com frm-hd sl fri gy-dk gy  
gr sup ss clus cons wi  
silc cmt wi sl arg cmt,  
non calc





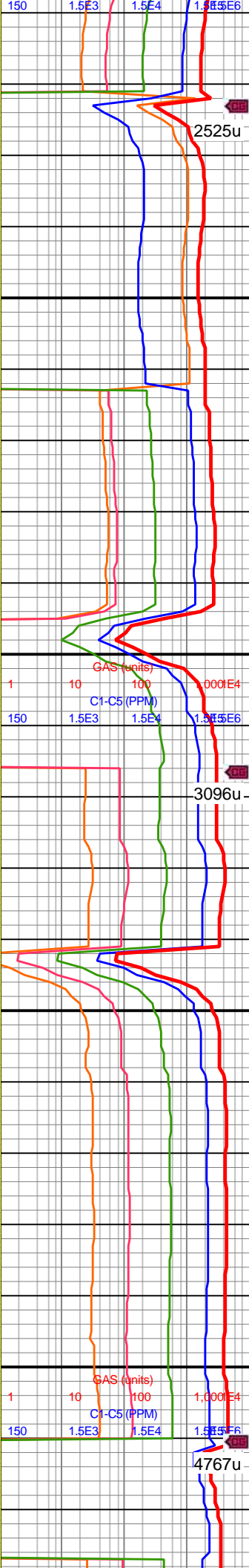
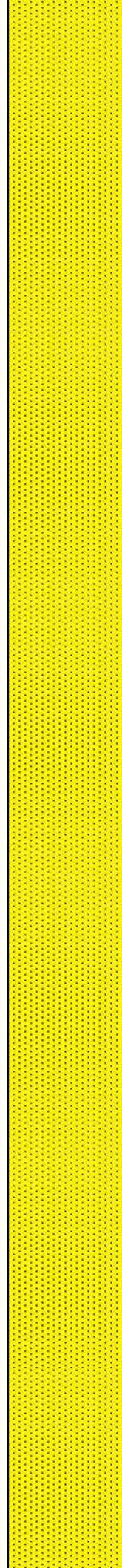


MD: 11,850'  
TVD: 7,278.18'  
INC: 91.63°  
AZM: 357.27°  
VS: 3,764.7'

MD: 11,945'  
TVD: 7,275.63'  
INC: 91.45°  
AZM: 356.74°  
VS: 3,859.6'

WOB: 34.1klbs  
RPM: 72  
SPM: 208  
SPP: 5,138psi

MW IN: 10  
VIS IN: 42  
MW OUT: 10.+  
VIS OUT: 41

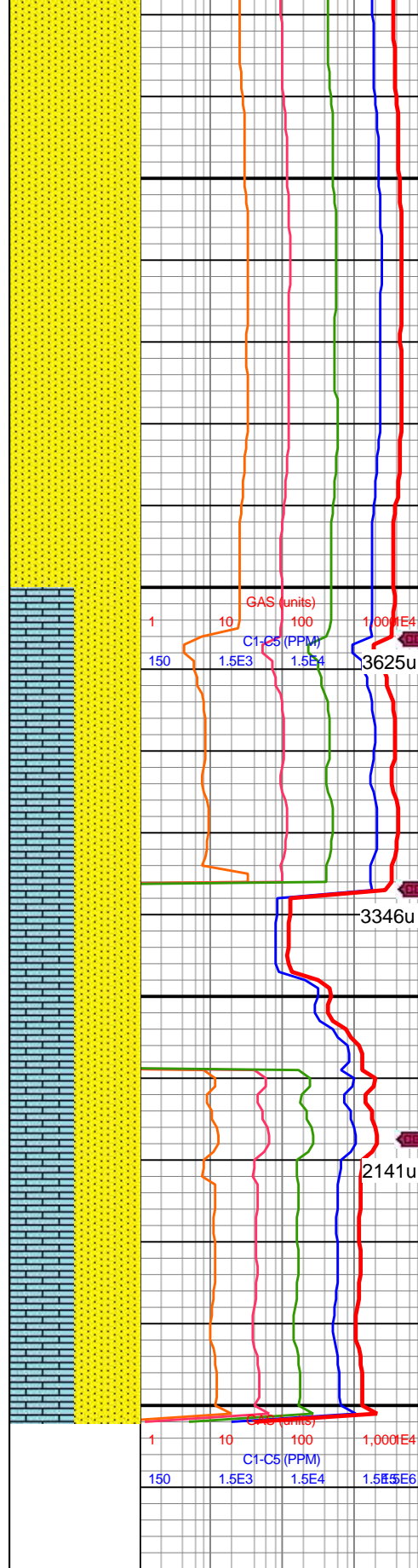
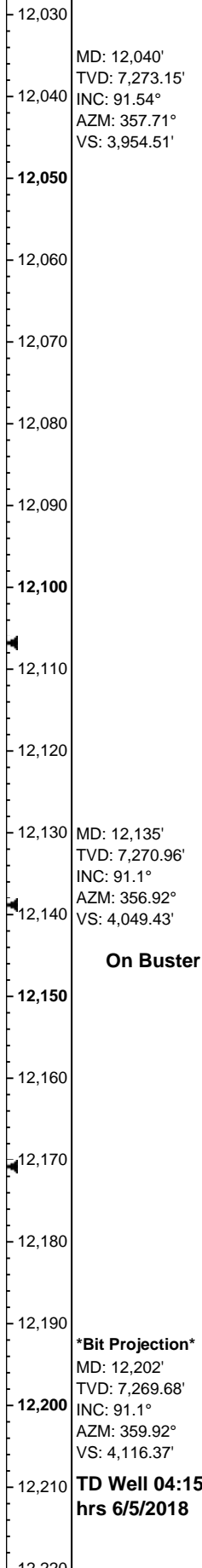
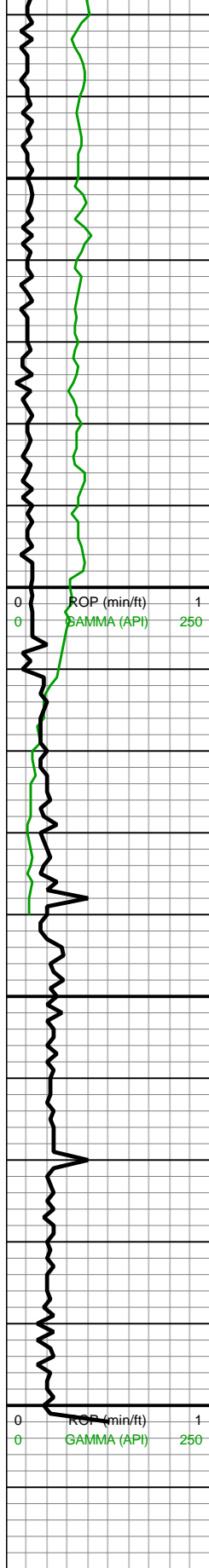


11800-11900 SST  
(100%): gy-dk gy s&p sst  
clus, sme tn sst clus,  
mod srted f sb rd-rd sd  
grs, frm-hd sl fri predy gr  
sup ss clus cons wi silc  
cmt, occ mtx sup ss clus  
cons wi arg & sl silc cmt,  
predy non calc

11900-12000 SST  
(100%): dk gy-dk gyshbn,  
med gy, mot, sb rd-sb  
ang, vf-f gr, slty gr, mod  
srted SS clus, frm-v frm, gr  
sup clus, mtx sup ip,  
cons wi silc cmt, tr diss  
mic-vf pyr/pyrc nod,  
non-sl calc







12000-12100 SST (100%): pred med gyshbn, occ lt gy-lt brn, sme red-brn, frm-v frm, blkly, pred mod-w cons gr sup cls cons wi silc cmt, non calc, vf-f grnd, occ grdg to slt, com micmica, tr imbd pyr, scat sh frags



12100-12202 SST (50%): pred brn- dk brn brnsh-red, occ gyshbn, frm-sl hrd, pred w cons cls, cons wi silc cmt, vf-f sb ang-ang grns, p srt grns, tr occ-pp pyr, pred non calc; LS (50%): offwht-lt gy-lt tn-tn, occ gy, rr dk gy, frm-hd, crpxln mudst, sm tex, wxy lstr, rr f pyr, hi calc

