



RESERVOIR GROUP

Scale: 5" / 100'
Measured Depth Log

Well Name Lion Creek 23-0362B

State Colorado

County Weld

Country U.S.

Rig Number Savanna 802

API Number 05-123-47399

AFE #

Geographic Region Rockies

Field Hereford

Spud Date 7/28/2018

Drilling Completed 8/18/2018

Ground Elevation 5391.2'

K.B. Elevation 5411.2'

Logged Interval 3,000' **To** TBD

Total Depth 18096'

Formation Nio B

Type of Drilling Fluid Fresh Water

Operator

Company HighPoint Resources

Address 1099 18th Street, Suite 2300
Denver, CO 80202



Geologist

Zone Color Coding

Name Aryn Rowe, Ben Burke

Company HighPoint Resources

Address 1099 18th Street, Suite 2300
Denver, CO 80202



Oil

Condensate

Gas

Note

Core

Pressure

Error

Water

Seal

Other

Services Provided 2-Man Logging, ISO Tubes/Jars, Mass Spec, AGS

Loggers: Byron Pitulski / Reed Pellicore

Equipment: ML-597

Address Reservoir Group - Empirica
6360 West Sam Houston Pkwy N
Houston, Texas 77041

Service Start Date: 08/09/2018

Service End Date: TBD

Hole Profile

Casing Records

Size	Wgt	From	To	Test
9.625	-	0	1538	-
7	-	0	8064	-

Rock Types

UNKNOWN

ANHYDRITE
GYPSUM
SALT
CHALK
LIMESTONE
DOLOMITE

CHERT

COAL
MARLSTONE
CLAYSTONE
SHALE
SHALE GRAY
SHALE COLORED

SILTSTONE
SANDY SILTSTONE
SANDSTONE
CONGLOMERATE
BRECCIA
TILL
BENTONITE

TUFF
IGNEOUS
METAMORPHIC
CEMENT

Accessories

Fossils

ALGAE
AMPHIPORA
BELEMNITE
BIOCLASTIC
BRACHIOPOD
BRYOZOA
CEPHALOPOD
CORAL
CRINOID

FOSSIL

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

ARGILLACEOUS

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

GLAUCONITE

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

Stringer

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

- GRINDS
- ECHINOID
- FISH
- FORAMINIFERA

- STRUMINIFEROUS
- ### Minerals
- ANHYDRITIC

- BOLEMINES
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS

- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

- SANDSTONE STRINGER
- SHALE STRINGER
- SILTSTONE STRINGER

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

Other Symbols

- 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

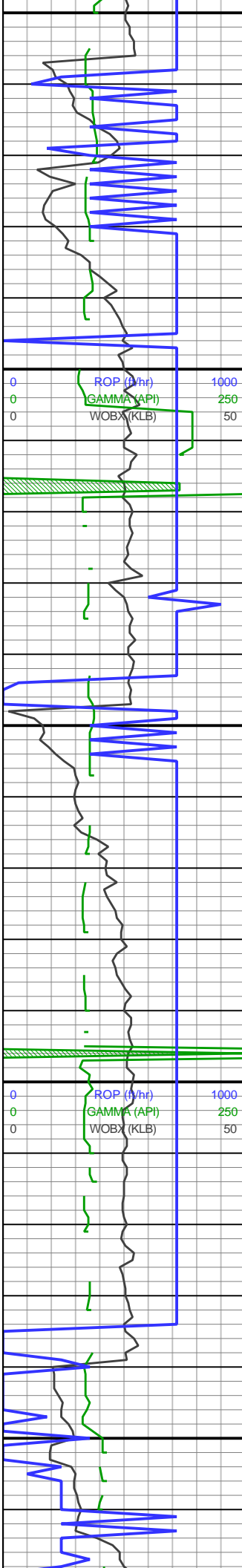
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE

- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

Sorting

- MODERATE
- POOR
- WELL

ROP ROP GAMMA WOBX	Slide/Rotate	Depth Labels	Notes	% Lith	Total Gas GAS C1 C2 C3 C4 C5	Interp Lith	Lithology Descriptions	Images
High Point Resources Lion Creek 23-0362B Weld County, CO Spud Date: 08/10/2018 Surface Casing: 9.625" -1,500' MD 2 Man Logging Began on 05/10/2018 14:57hrs MST All Depths Correspond to Drillers Pipe Tally								
Loggers Were Rigged Up and Ready on 08/09/2018								
0 1250 0 50		3,000	Bit #: 2 Type: MMD55 Size: 8 3/4" Depth In: 1,538' Jets: 5x16 S/N: 12372562		Note: Using Yellow Box ML-597 for Gas, ROP & WOBX			
		3,010			SYSTEM CALIBRATED 1% Methane = 100 units 100% Methane = 10000 units			
		3,020	MD: 3,020' INC: 14.15° AZM: 358.77° TVD: 2,954.21' VS: -480.14'					
		3,030						
		3,040						
		3,050						
		3,060	MW: 8.65 VIS: 28					
		3,070						
		3,080						
		3,090						
0 1000 0 250 0 50		3,100	MD: 3,111' INC: 11.91° AZM: 10.11° TVD: 3,042.88' VS: -500.54'					
		3,110						
		3,120						
		3,130						
		3,140						



3,150
3,160
3,170
3,180
3,190
3,200
3,210
3,220
3,230
3,240
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3,320
3,330
3,340
3,350
3,360

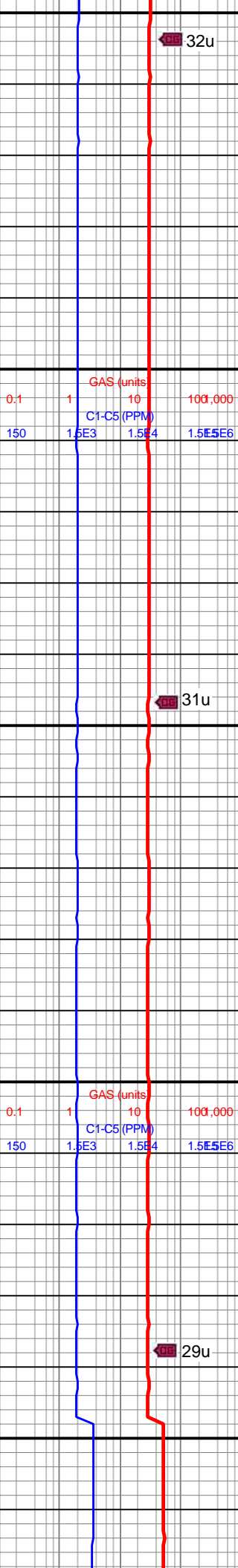
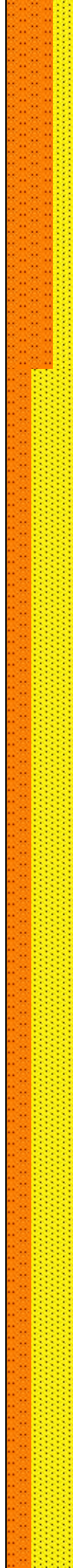
MW: 8.8
VIS: 61

WOB: 26
RPM: 51
SPM: 224
SPP: 3,619

MD: 3,202'
INC: 11.43°
AZM: 7.74°
TVD: 3,132'
VS: -518.76'

MD: 3,293'
INC: 11.3°
AZM: 6.86°
TVD: 3,221.21'
VS: -536.58'

MW: 8.8
VIS: 28



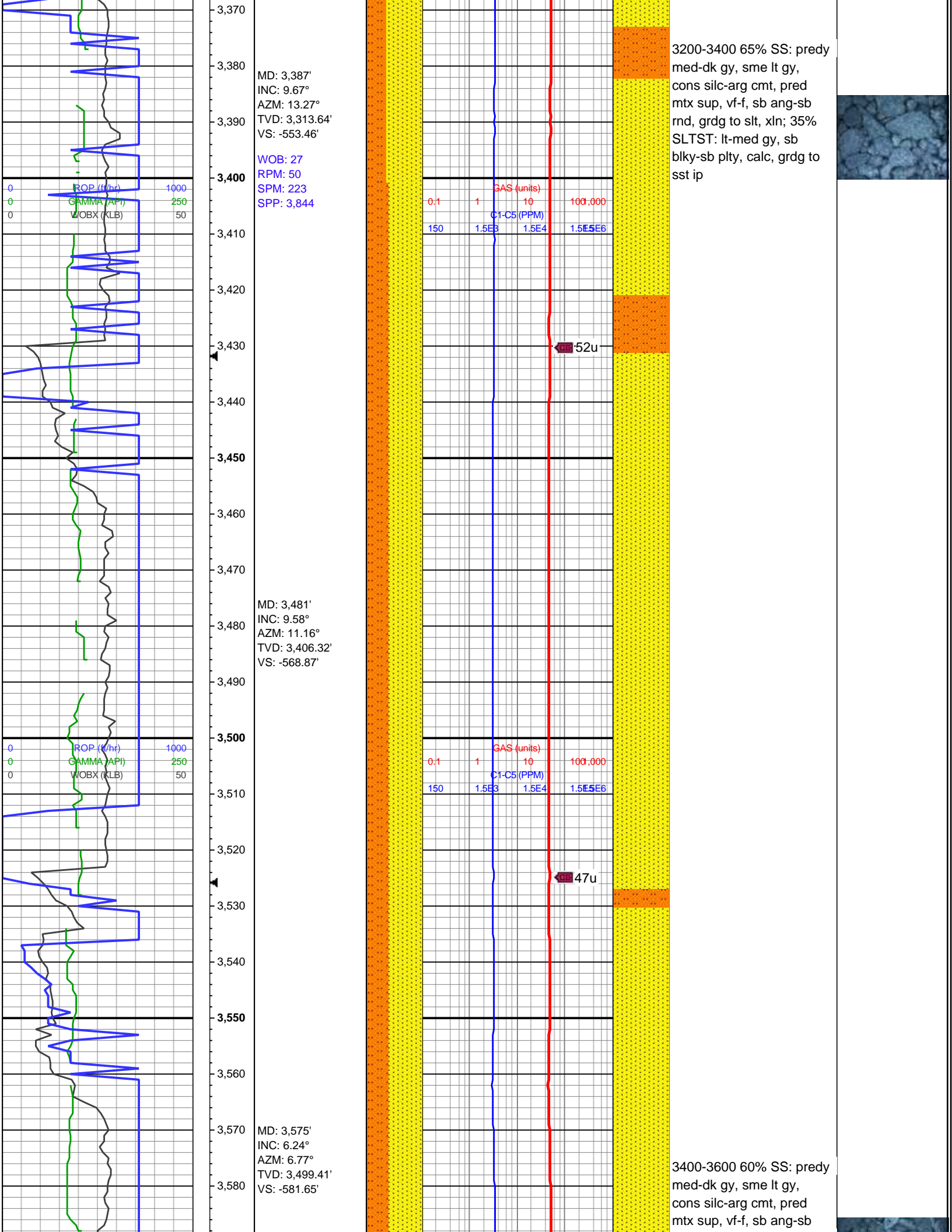
32u

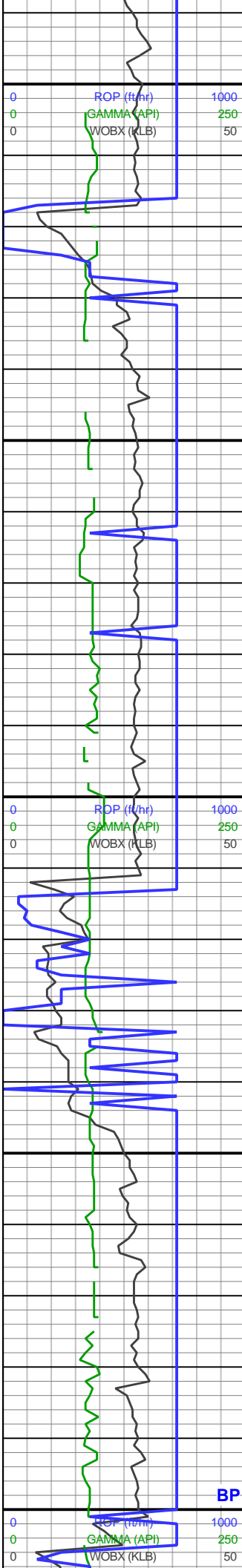
31u

29u

3000-3200 65% SLTST:
lt-med gy, sb blkly-sb plty,
calc, grdg to ss ip; 35%
SS: predy med-dk gy, sme
lt gy, cons silc-arg cmt,
pred mtx sup, vf-f, sb
ang-sb rnd, grdg to slt, xln







WOB: 28
RPM: 50
SPM: 224
SPP: 4,027

MD: 3,669'
INC: 6.15°
AZM: 3.34°
TVD: 3,592.87'
VS: -591.77'

MD: 3,763'
INC: 4.04°
AZM: 6.24°
TVD: 3,686.49'
VS: -600.1'

WOB: 28
RPM: 50
SPM: 223
SPP: 4,096

BP

GAS (units)
C1-C5 (PPM)

52u

GAS (units)
C1-C5 (PPM)

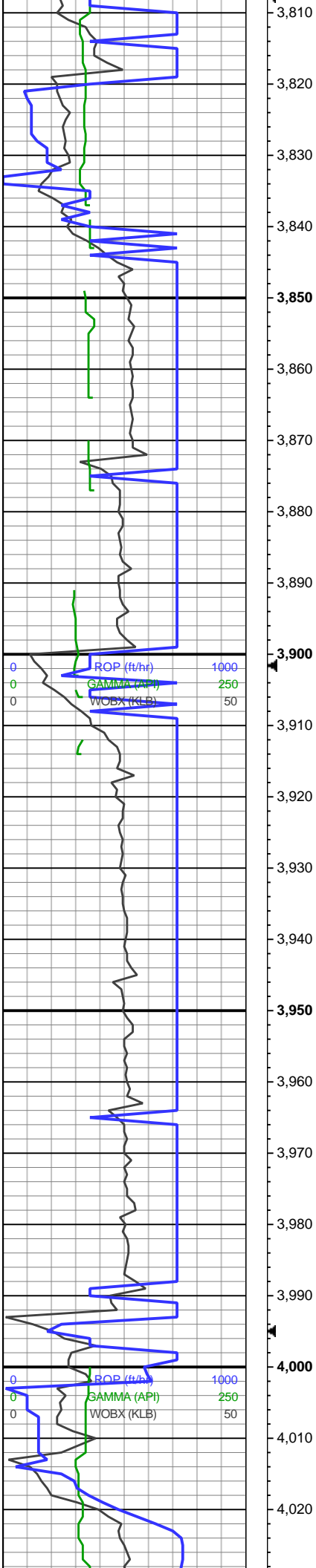
51u

GAS (units)
C1-C5 (PPM)

38u

rnd, grdg to slt, xln, occ pyr
nod; 40% SLTST: lt-med
gy, sb blkgy-sb plty, calc,
grdg to sst ip

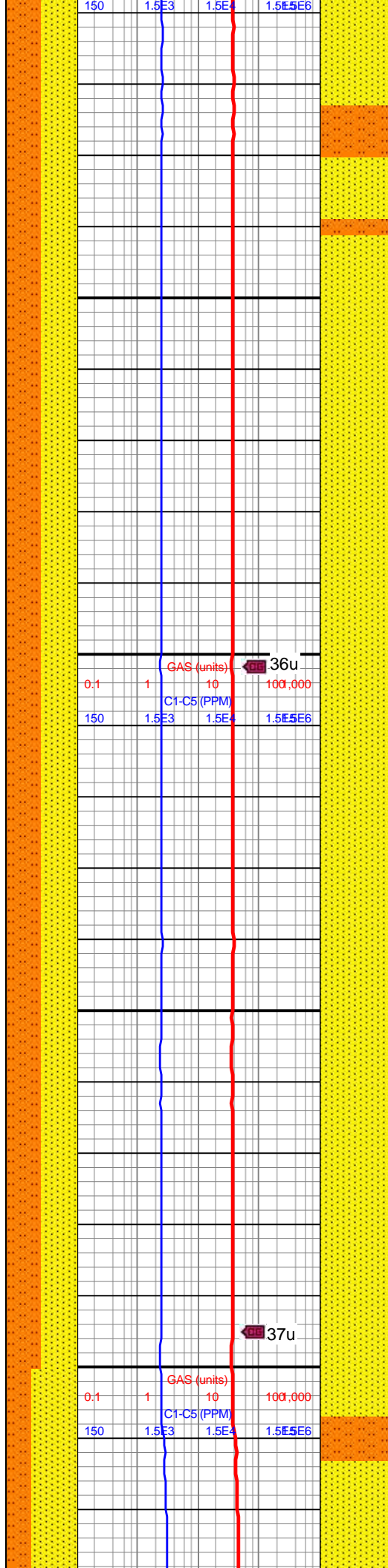
3600-3800 70% SS:
med-dk gy, sme lt gy,
cons silc-arg cmt, pred
mtx sup, vf-f, sb ang-sb
rnd, grdg to slt, xln; 30%
SLTST: lt-med gy, sb
blkgy-sb plty, calc, grdg to
sst ip



MD: 3,857'
INC: 2.07°
AZM: 15.56°
TVD: 3,780.35'
VS: -605.04'

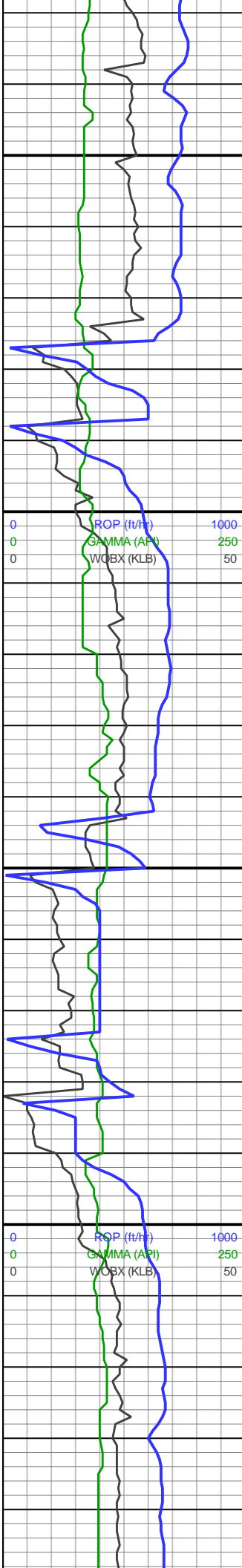
MD: 3,950'
INC: 1.89°
AZM: 31.03°
TVD: 3,873.3'
VS: -607.99'

WOB: 14.9
RPM: 52
SPM: 224
SPP: 4,101



3800-4000 50% SS: predy
lt-med gy, cons silc-arg
cmt, pred mtx sup, vf-f, sb
ang-sb rnd, grdg to slt, xln,
rr glau; 50% SLTST:
med-dk gy, sb blk-y-sb plty,
non calc, hrd, grdg to ss ip





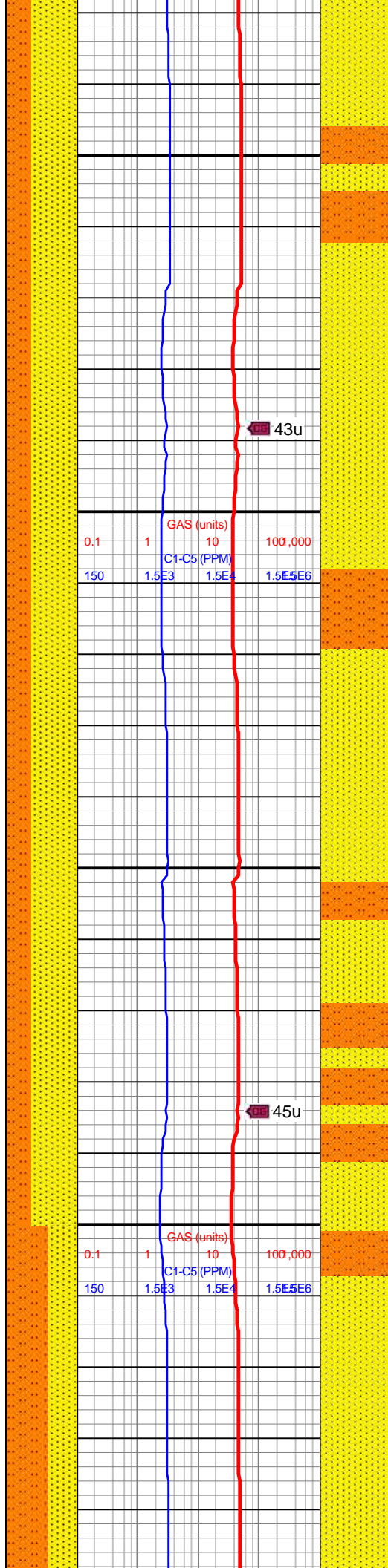
4,030
4,040
4,050
4,060
4,070
4,080
4,090
4,100
4,110
4,120
4,130
4,140
4,150
4,160
4,170
4,180
4,190
4,200
4,210
4,220
4,230
4,240

MD: 4,045'
INC: 0.79°
AZM: 326.52°
TVD: 3,968.27'
VS: -609.89'

MD: 4,139'
INC: 0.13°
AZM: 324.05°
TVD: 4,062.27'
VS: -610.5'

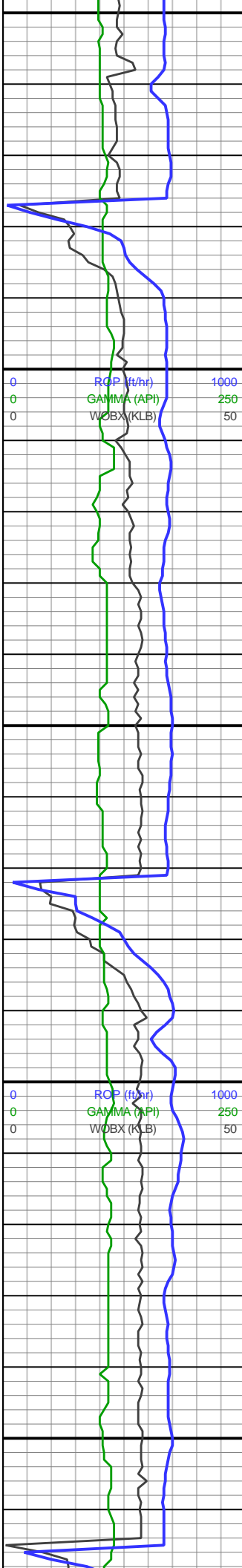
WOB: 18.7
RPM: 50
SPM: 223
SPP: 4,207

MD: 4,233'
INC: 0.35°
AZM: 203.29°
TVD: 4,156.27'
VS: -610.32'



4000-4200 65% SS:
lt-med gy, sme gyshbn,
vf-f, sb rnd-sb ang, mod
srt, cons silc-arg cmt,
grdg to slt; 35% SLTST:
med-dk gy, sb plty-sb blk,
calc, grdg to ss ip, mmica



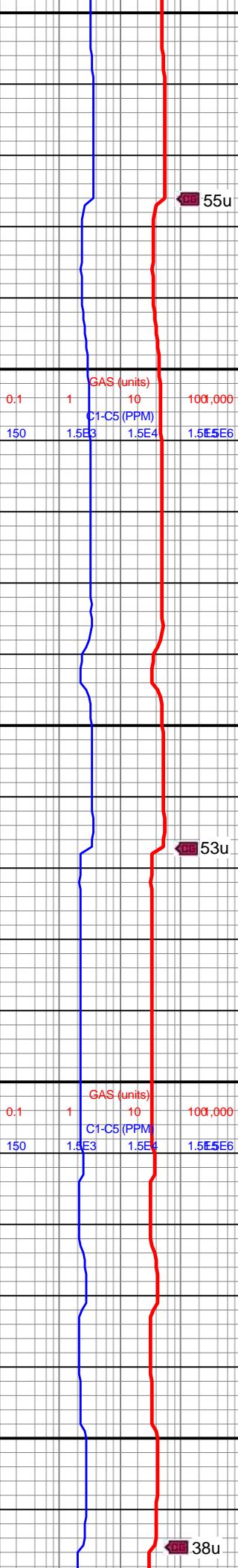
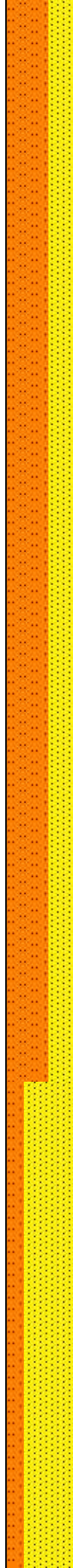


4,250
4,260
4,270
4,280
4,290
4,300
4,310
4,320
4,330
4,340
4,350
4,360
4,370
4,380
4,390
4,400
4,410
4,420
4,430
4,440
4,450
4,460

MD: 4,328'
INC: 0.57°
AZM: 153.81°
TVD: 4,251.27'
VS: -609.64'

WOB: 28.4
RPM: 50
SPM: 223
SPP: 4,293

MD: 4,422'
INC: 1.32°
AZM: 113.56°
TVD: 4,345.25'
VS: -608.8'



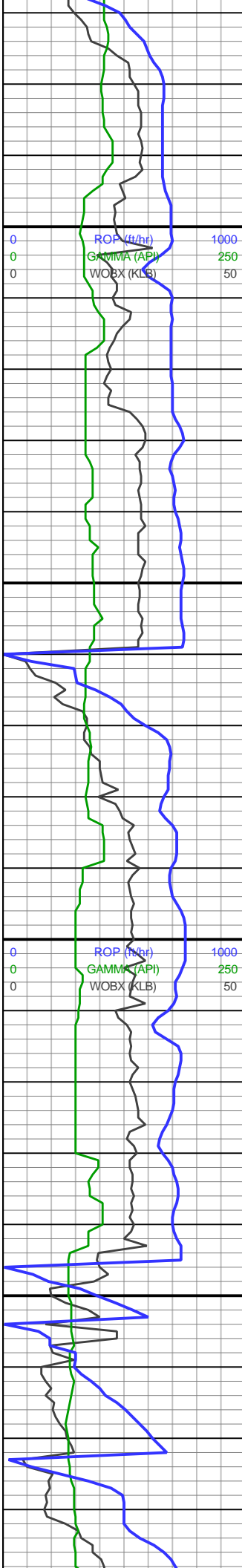
55u

53u

38u

4200-4400 60% SLTST:
predy med gy, sme dk gy
grns, sb blkly-sb plty, vf-f
grnd, calc, grdg to ss ip,
mmica; 40% SS: lt-med
gy, sme gyshbn, sb
ang-sb rnd, f grnd, cons
silc-arg cmt, grdg to slt,
suc





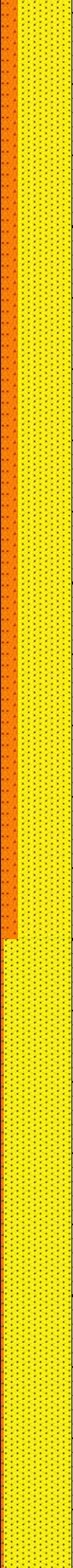
4,470
4,480
4,490
4,500
4,510
4,520
4,530
4,540
4,550
4,560
4,570
4,580
4,590
4,600
4,610
4,620
4,630
4,640
4,650
4,660
4,670
4,680

Parkman
4,478'MD/4,401'TVD

MD: 4,517'
INC: 1.19°
AZM: 112.41°
TVD: 4,440.23'
VS: -608.02'

WOB: 22.3
RPM: 49
SPM: 223
SPP: 4,372

MD: 4,611'
INC: 1.54°
AZM: 97.21°
TVD: 4,534.2'
VS: -607.53'



GAS (units)
0.1 1 10 100,000
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5E6

GAS (units)
0.1 1 10 100,000
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5E6

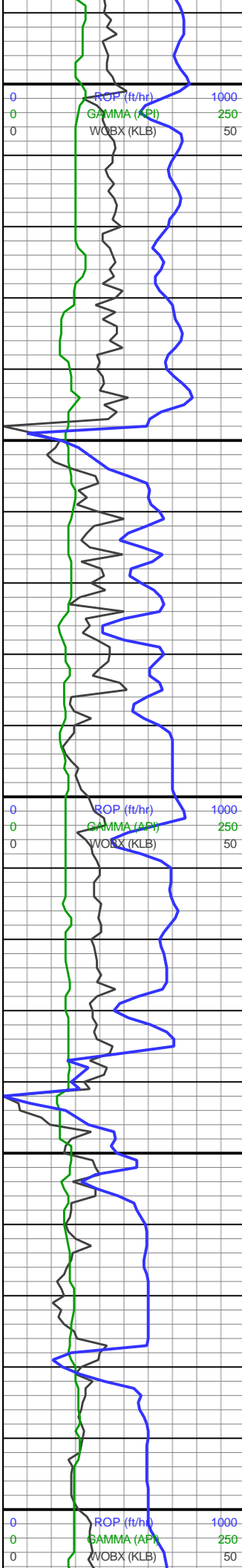


4400-4600 75% SS: predy
lt-med gy, cons silc-arg
cmt, pred mtx sup, vf-f, sb
ang-sb rnd, grdg to slt, xln,
occ pyr nod, rr glau; 25%
SLTST: med-dk gy, sb
blky-sb plty, non calc, grdg
to ss ip, hrd



29u

27u



4,690
4,700
4,710
4,720
4,730
4,740
4,750
4,760
4,770
4,780
4,790
4,800
4,810
4,820
4,830
4,840
4,850
4,860
4,870
4,880
4,890
4,900

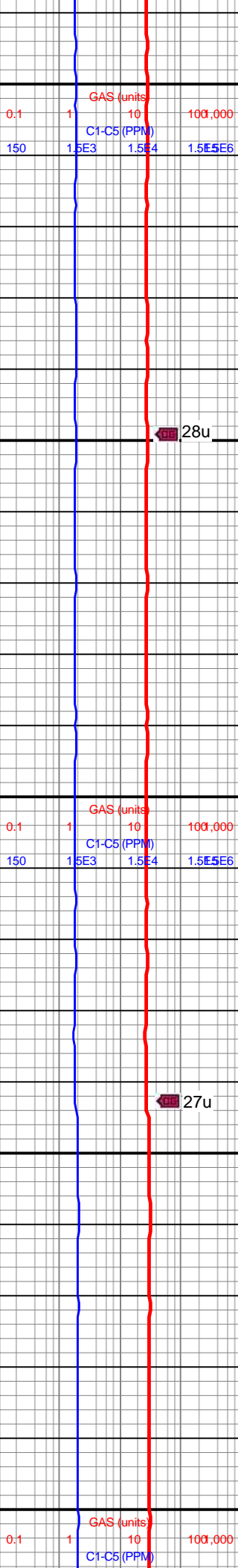
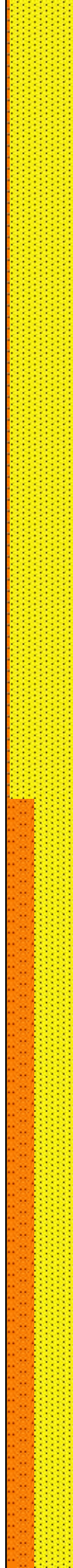
MD: 4,705'
INC: 1.01°
AZM: 92.64°
TVD: 4,628.18'
VS: -607.37'

MD: 4,799'
INC: 1.1°
AZM: 94.84°
TVD: 4,722.17'
VS: -607.28'

WOB: 15.5
RPM: 48
SPM: 223
SPP: 4,292

MW: 9.1
VIS: 30

MD: 4,892'
INC: 1.1°
AZM: 86.13°
TVD: 4,815.15'
VS: -607.3'

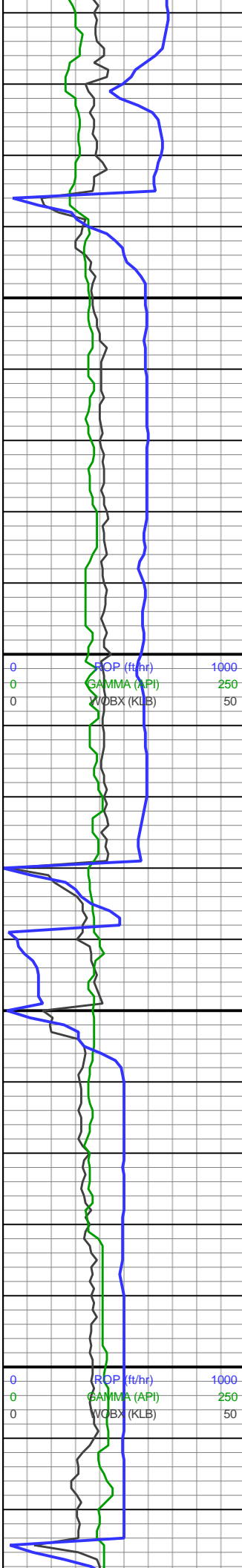


28u

27u

4600-4800 95% SS: predy
lt gy-clr, sme offwht grns,
xln, sb ang-sb rnd, sme
sb-blky, vf-f, predy mtx
sup, cons silc-arg cmt;
5% SLTST: med-dk gy,
sme blk grns, sb plty-sb
blky, sme sb-ang, f grnd,
grdg to ss ip, non-calc; tr
glau



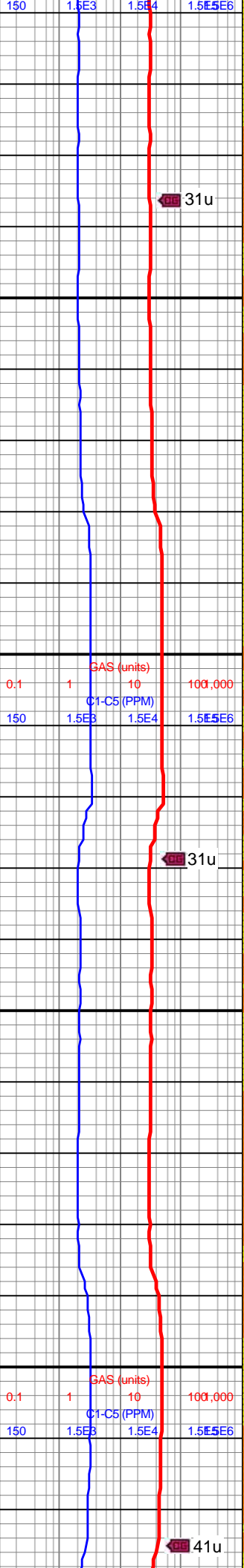
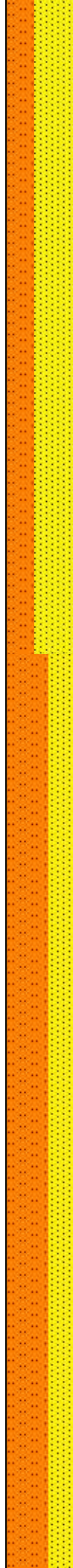


4,910
4,920
4,930
4,940
4,950
4,960
4,970
4,980
4,990
5,000
5,010
5,020
5,030
5,040
5,050
5,060
5,070
5,080
5,090
5,100
5,110
5,120

MD: 4,986'
INC: 1.49°
AZM: 98.26°
TVD: 4,909.12'
VS: -607.22'

WOB: 18.3
RPM: 49
SPM: 223
SPP: 4,426

MD: 5,081'
INC: 1.19°
AZM: 280.81°
TVD: 5,004.12'
VS: -607.23'



0.1 1 10 100,000
GAS (units)
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5E6

0.1 1 10 100,000
GAS (units)
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5E6



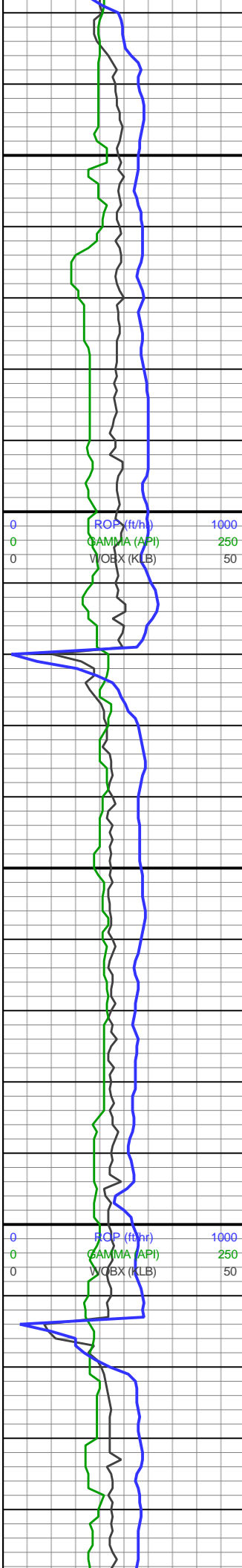
4800-5000 65% SS:
lt-med gy, sme gyshbn,
vf-f, sb rnd-sb ang, mod
srt, cons silc-arg cmt,
grdg to slt; 35% SLTST:
med-dk gy, sb plty-sb blkky,
calc, grdg to ss ip, mmica



31u

31u

41u

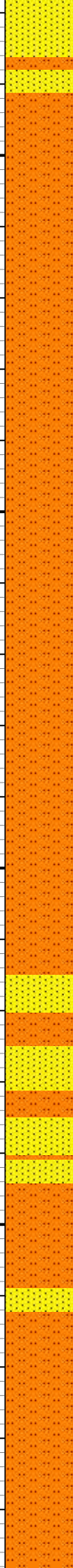
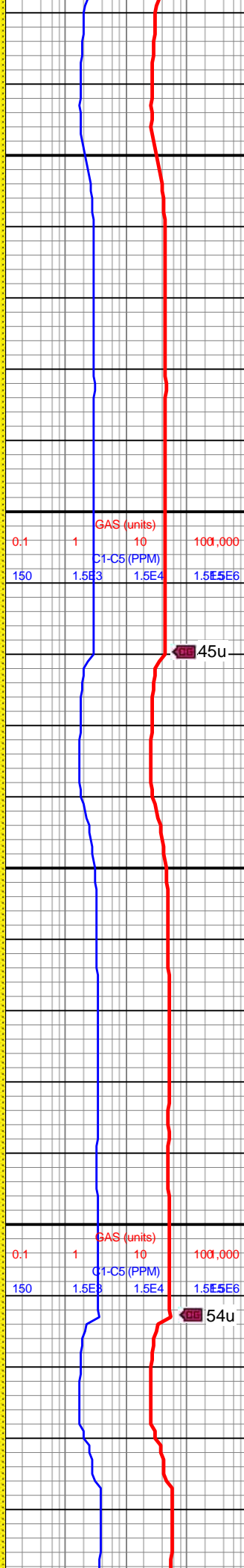
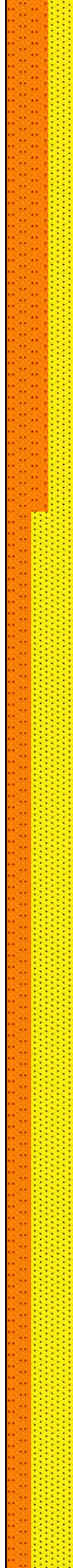


5,130
5,140
5,150
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5,170
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5,230
5,240
5,250
5,260
5,270
5,280
5,290
5,300
5,310
5,320
5,330
5,340

MD: 5,176'
INC: 1.01°
AZM: 275.63°
TVD: 5,099.1'
VS: -607.46'

WOB: 17.4
RPM: 49
SPM: 223
SPP: 4,337

MD: 5,270'
INC: 0.79°
AZM: 286.7°
TVD: 5,193.09'
VS: -607.71'

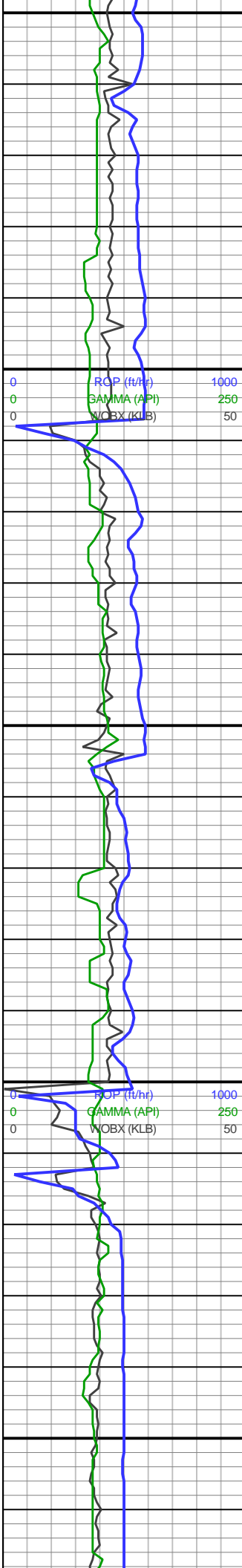


500-5200 60% SLTST:
predy med gy, sme dk gy
grns, sb blkly-sb plty, vf-f
grnd, calc, grdg to ss ip,
mmica; 40% SS: lt-med
gy, sme gyshbn, sb
ang-sb rnd, f grnd, cons
silc-arg cmt, grdg to slt,
suc; mnr tr SH



45u

54u



5,350
5,360
5,370
5,380
5,390
5,400
5,410
5,420
5,430
5,440
5,450
5,460
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5,540
5,550
5,560

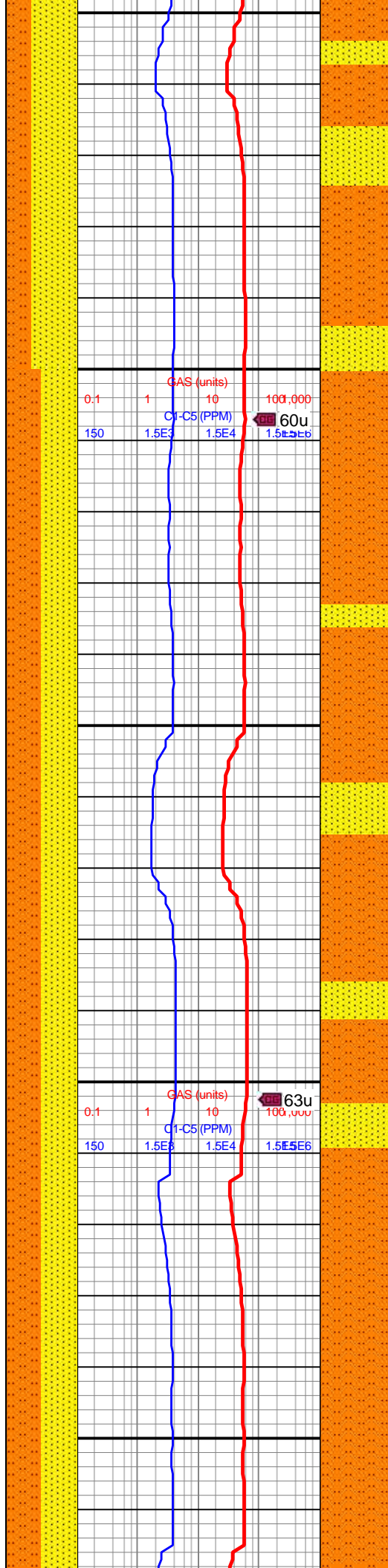
MD: 5,364'
INC: 0.57°
AZM: 325.29°
TVD: 5,287.08'
VS: -608.26'

WOB: 18.9
RPM: 49
SPM: 223
SPP: 4,650

MD: 5,458'
INC: 0.75°
AZM: 351.21°
TVD: 5,381.07'
VS: -609.25'

MW: 9
VIS: 30

MD: 5,551'
INC: 0.84°
AZM: 349.89°
TVD: 5,474.06'
VS: -610.52'

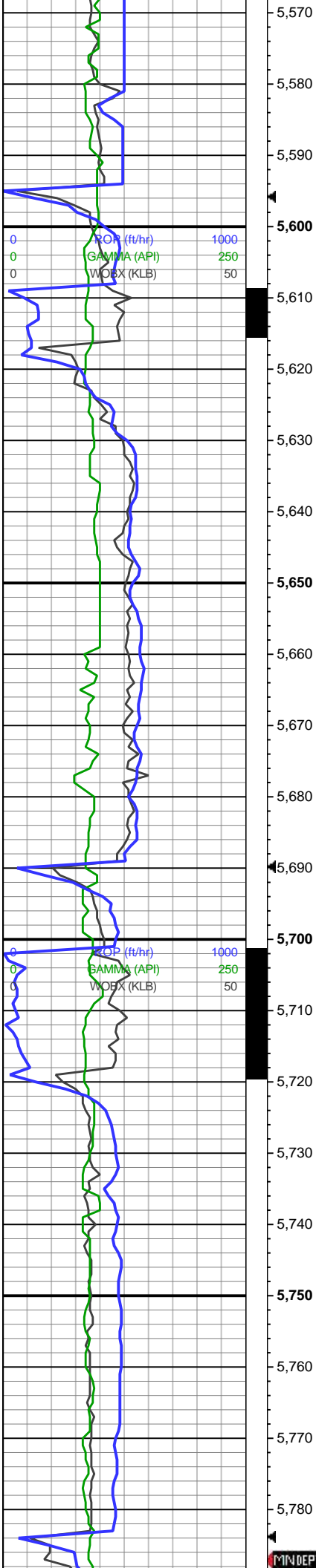


GCS (units)
C1-C5 (PPM)
WOBX (KLB)

GCS (units)
C1-C5 (PPM)
WOBX (KLB)

5200-5400 65% SS:
lt-med gy, sme gyshbn,
vf-f, sb rnd-sb ang, mod
srt, cons silc-arg cmt,
grdg to slt; 35% SLTST:
med-dk gy, sb plty-sb blk,
calc, grdg to ss ip, mmica





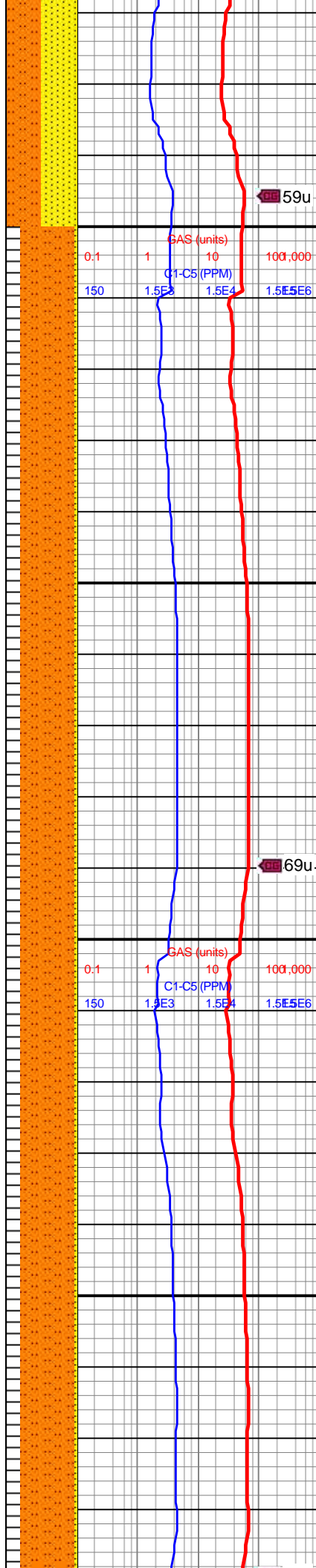
WOB: 15.7
RPM: 46
SPM: 222
SPP: 4,685

MD: 5,646'
INC: 0.97°
AZM: 24.52°
TVD: 5,569.05'
VS: -611.94'

MD: 5,740'
INC: 0.48°
AZM: 282.39°
TVD: 5,663.05'
VS: -612.75'

MW: 9.2
VIS: 30

08/11/18

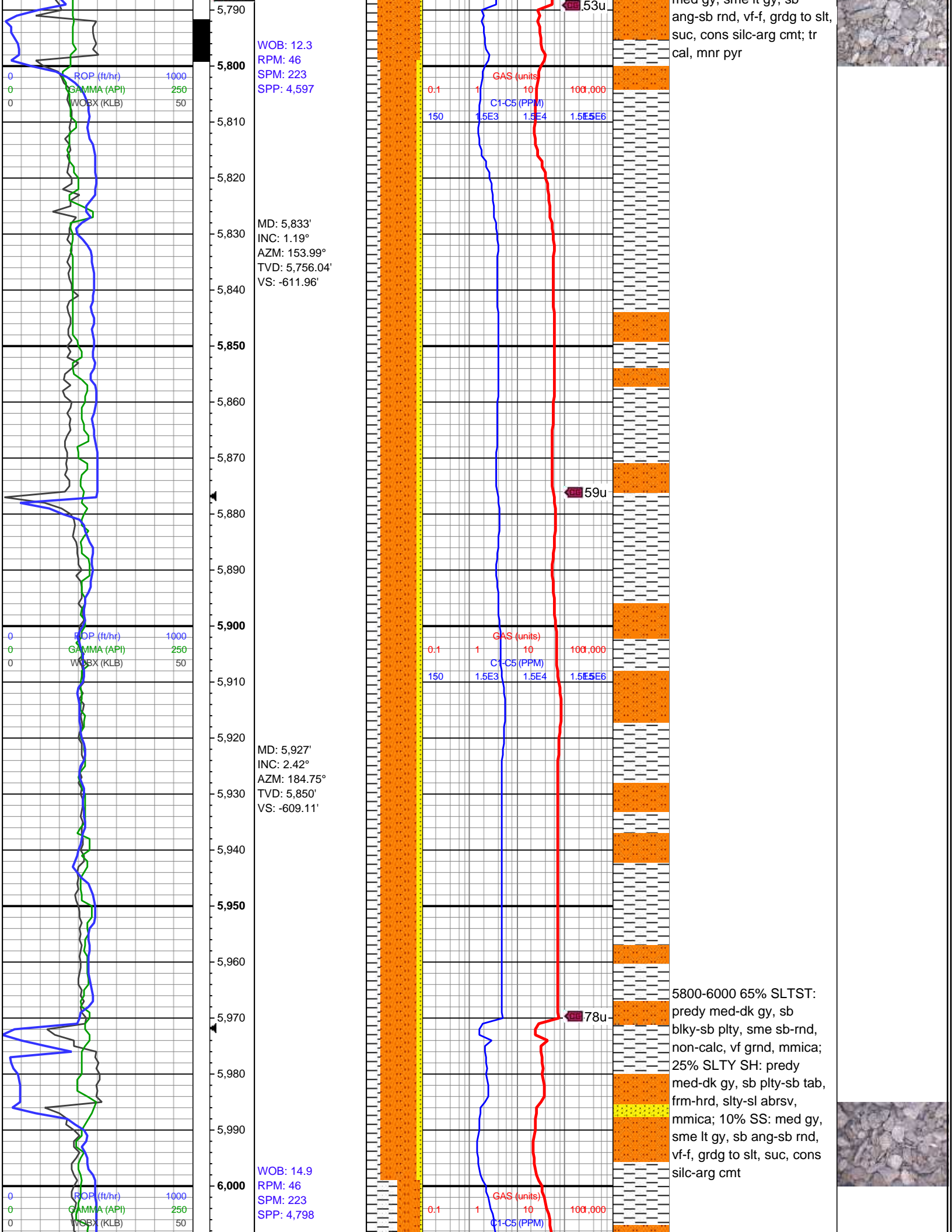


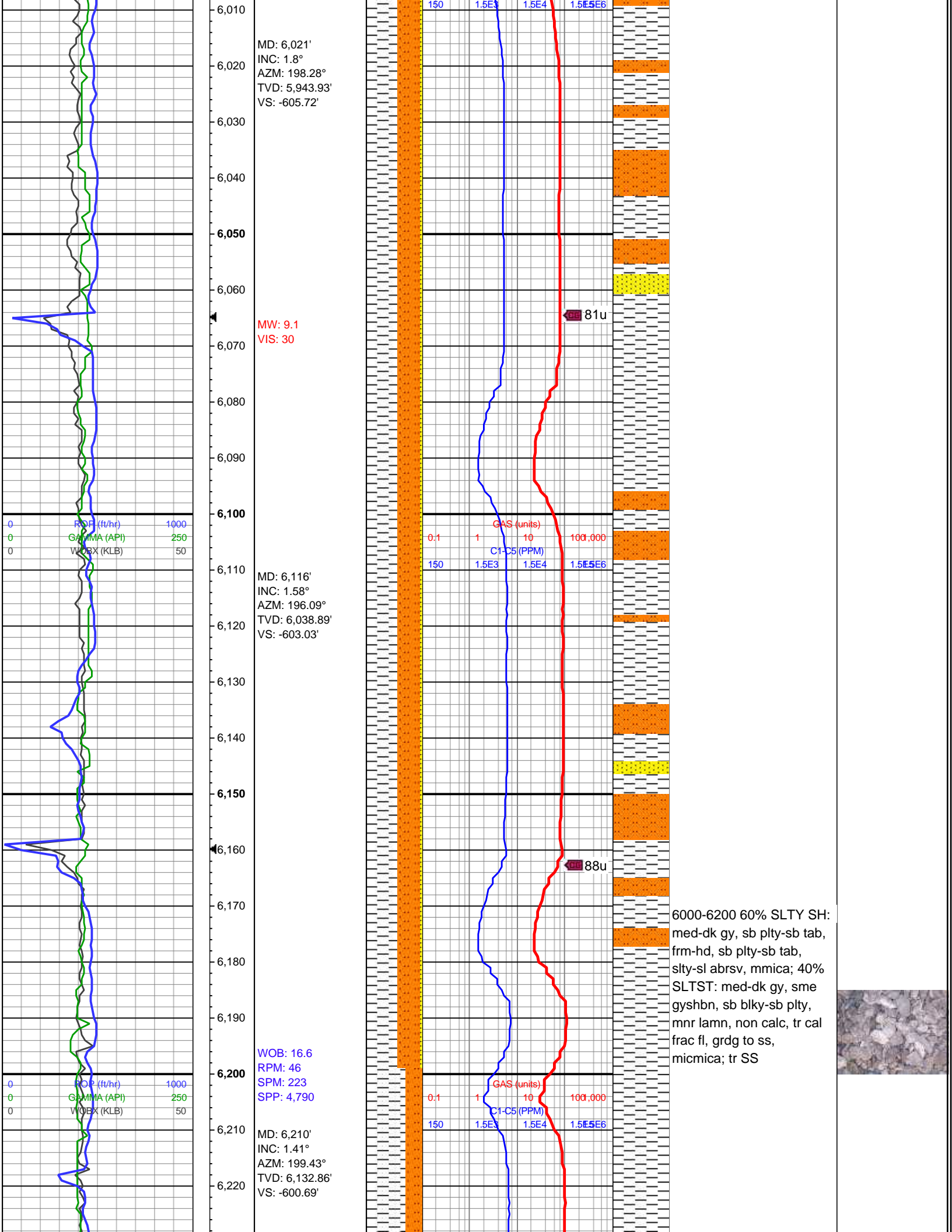
59u

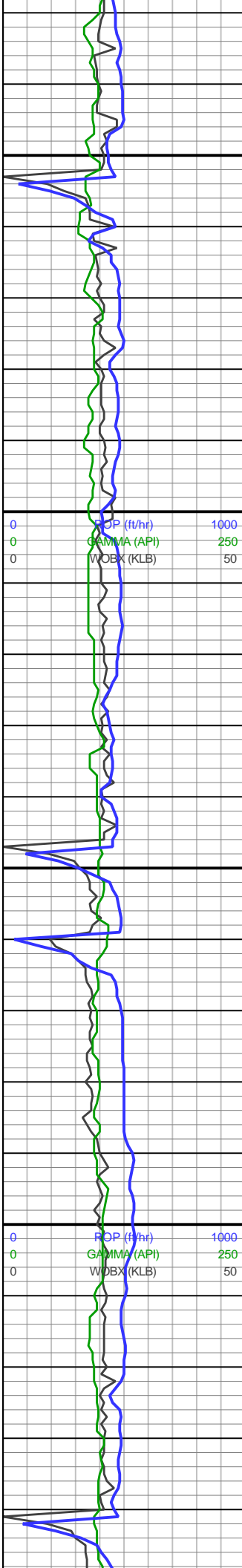
69u

5400-5600 50% SS: predy
lt-med gy, sme gyshbn, sb
ang-sb rnd, f grnd, cons
silc-arg cmt, grdg to slt,
suc; 50% SLTST: predy
med gy, sme dk gy grns,
sb ang-sb blkly, vf-f grnd,
non-calc, grdg to ss ip,
mmica; tr cal, tr pp pyr

75% SLTST: med-dk gy,
sb blkly-sb plty, sme
sb-rnd, non-calc, vf grnd,
mmica; 20% SLTY SH:
med-dk gy, sb plty-sb tab,
frm-hrd, slty-sl abrsv,
mmica; 5% SS: predy
med gy, sme lt gy, sb





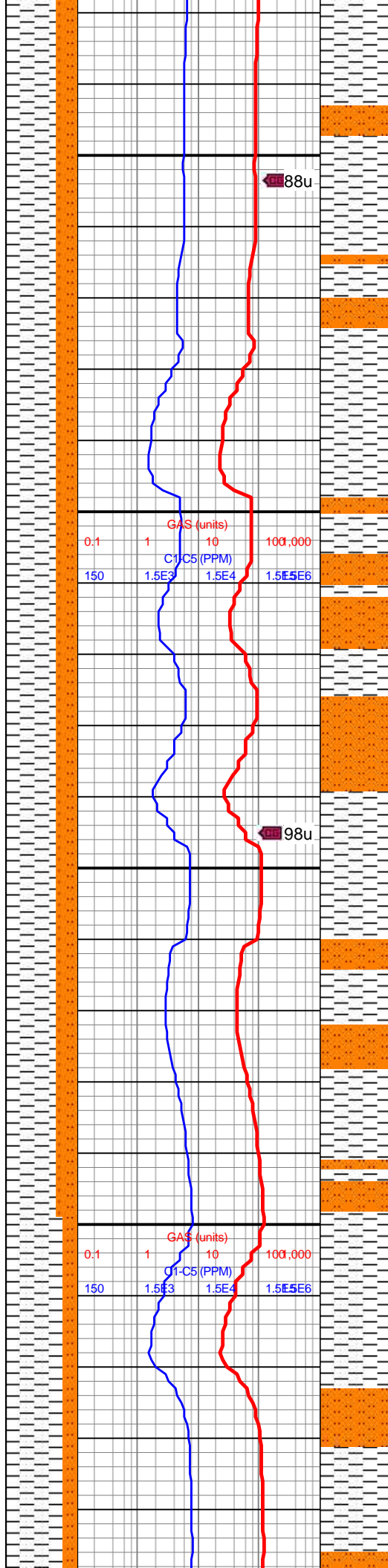


6,230
6,240
6,250
6,260
6,270
6,280
6,290
6,300
6,310
6,320
6,330
6,340
6,350
6,360
6,370
6,380
6,390
6,400
6,410
6,420
6,430
6,440

MD: 6,304'
INC: 0.7°
AZM: 223.07°
TVD: 6,226.84'
VS: -599.16'

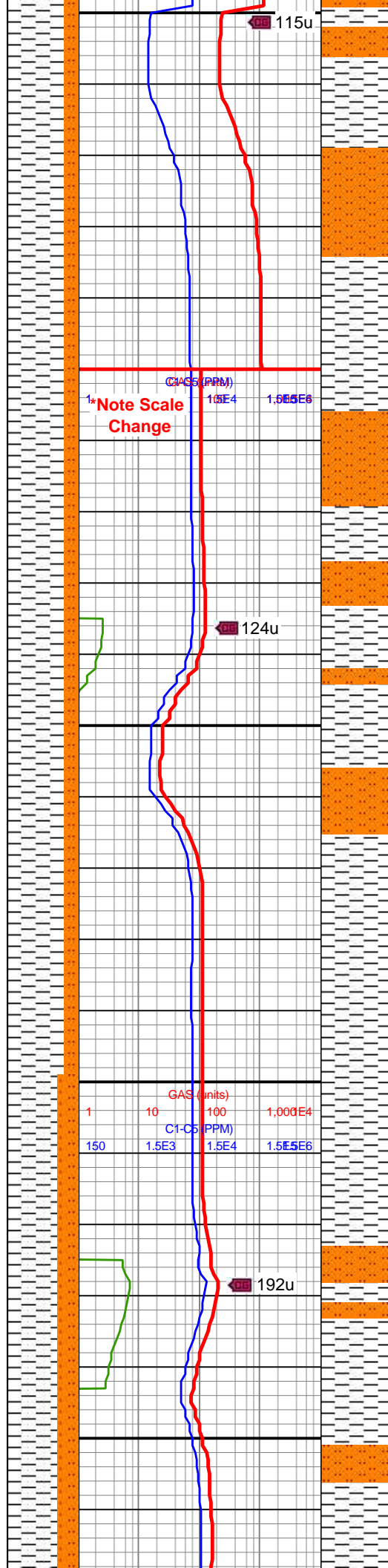
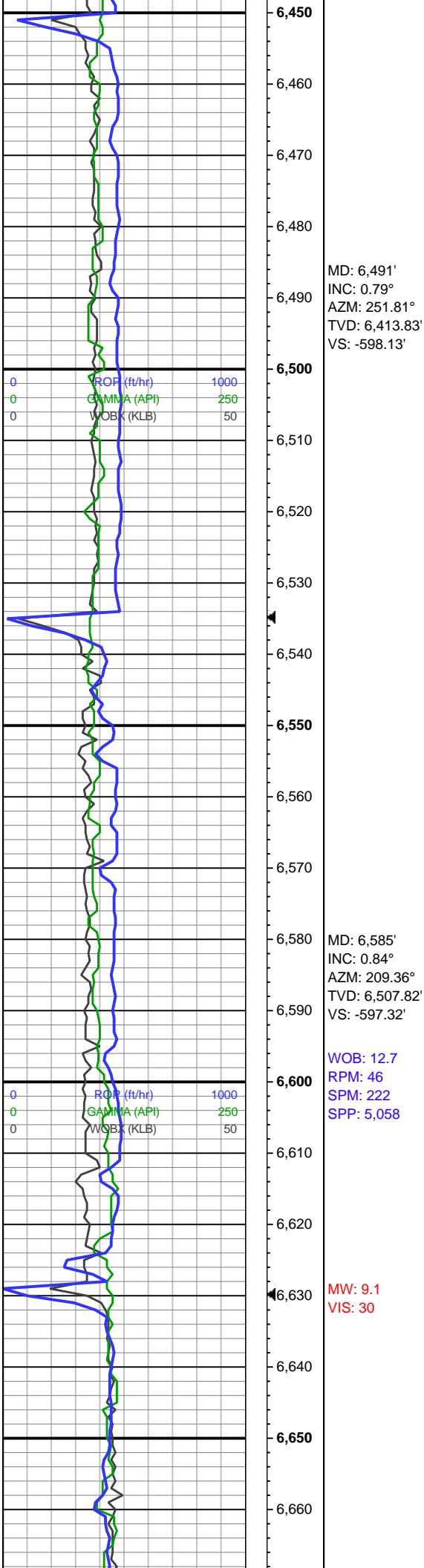
MD: 6,397'
INC: 0.53°
AZM: 243.9°
TVD: 6,319.84'
VS: -598.55'

WOB: 17
RPM: 46
SPM: 224
SPP: 4,981



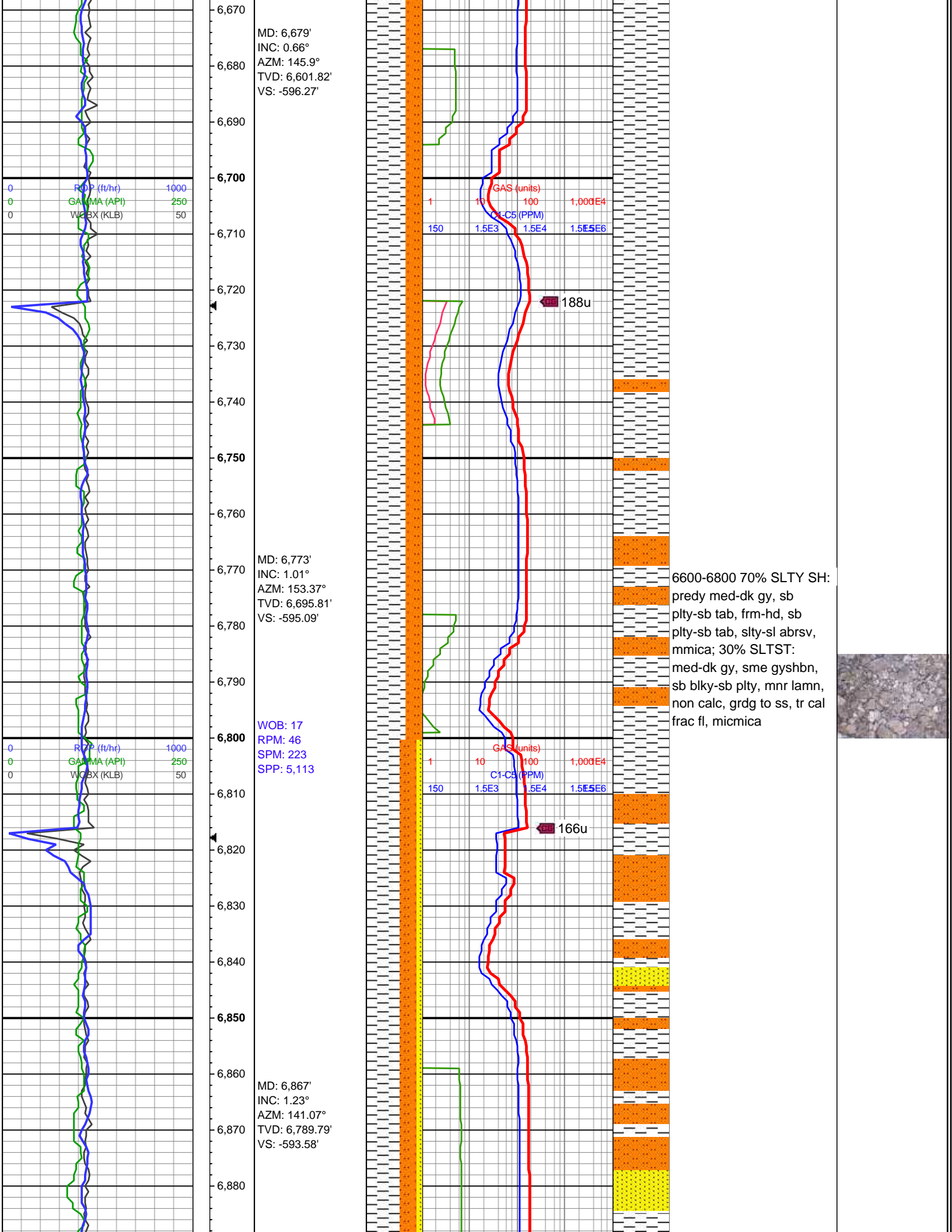
6200-6400 70% SLTY SH:
predy med-dk gy, sb
ppty-sb tab, frm-hd, sb
ppty-sb tab, slty-sl abrsv,
mmica; 30% SLTST:
med-dk gy, sme gyshbn,
sb blkgy-sb ppty, mnr lamn,
non calc, grdg to ss, tr cal
frac fl, micmica

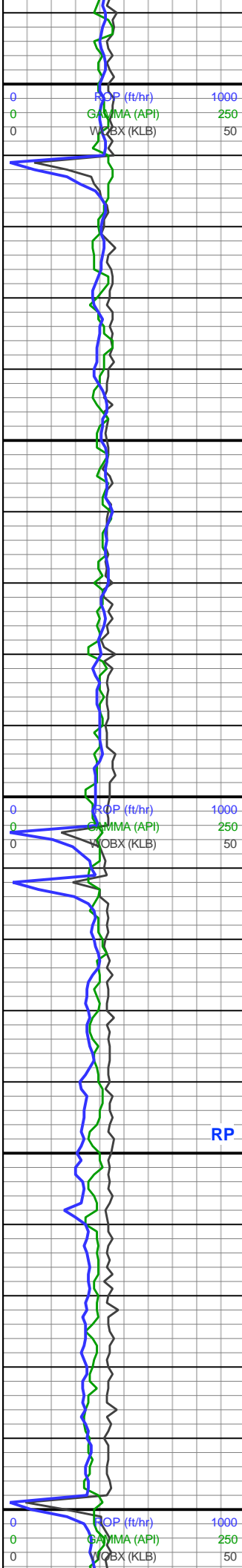




6400-6600 80% SLTY SH:
med-dk gy, sb plty-sb tab,
frm-hd, sb plty-sb tab,
sly-sl abrsv, mmica; 20%
SLTST: predy med-dk gy,
sme gyshbn, sb blkly-sb
plty, mnr lamn, non calc,
grdg to ss, cal frac fl,
micmica; tr pp pyr nod







6,890
6,900
6,910
6,920
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
7,020
7,030
7,040
7,050
7,060
7,070
7,080
7,090
7,100

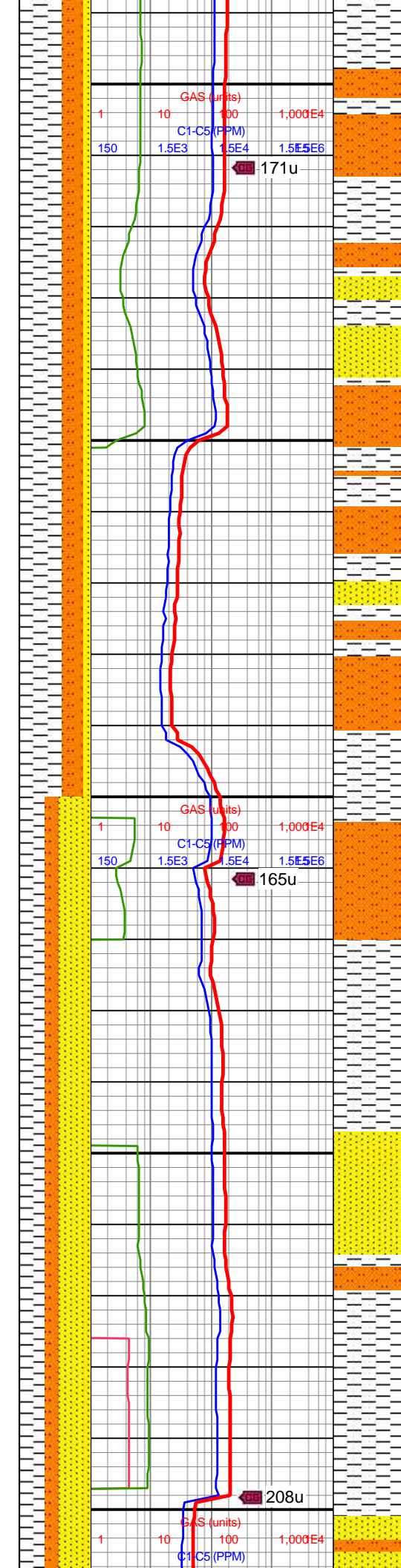
MD: 6,960'
INC: 1.23°
AZM: 148.54°
TVD: 6,882.77'
VS: -591.97'

WOB: 16.4
RPM: 46
SPM: 224
SPP: 5,234

MD: 7,055'
INC: 1.45°
AZM: 152.67°
TVD: 6,977.74'
VS: -590.05'

MW: 9.6
VIS: 36

RP



GAS (units)
1 10 100 1,000E4
C1-C5 (PPM)
1.5E3 1.5E4 1.5E5 1.5E6

171u

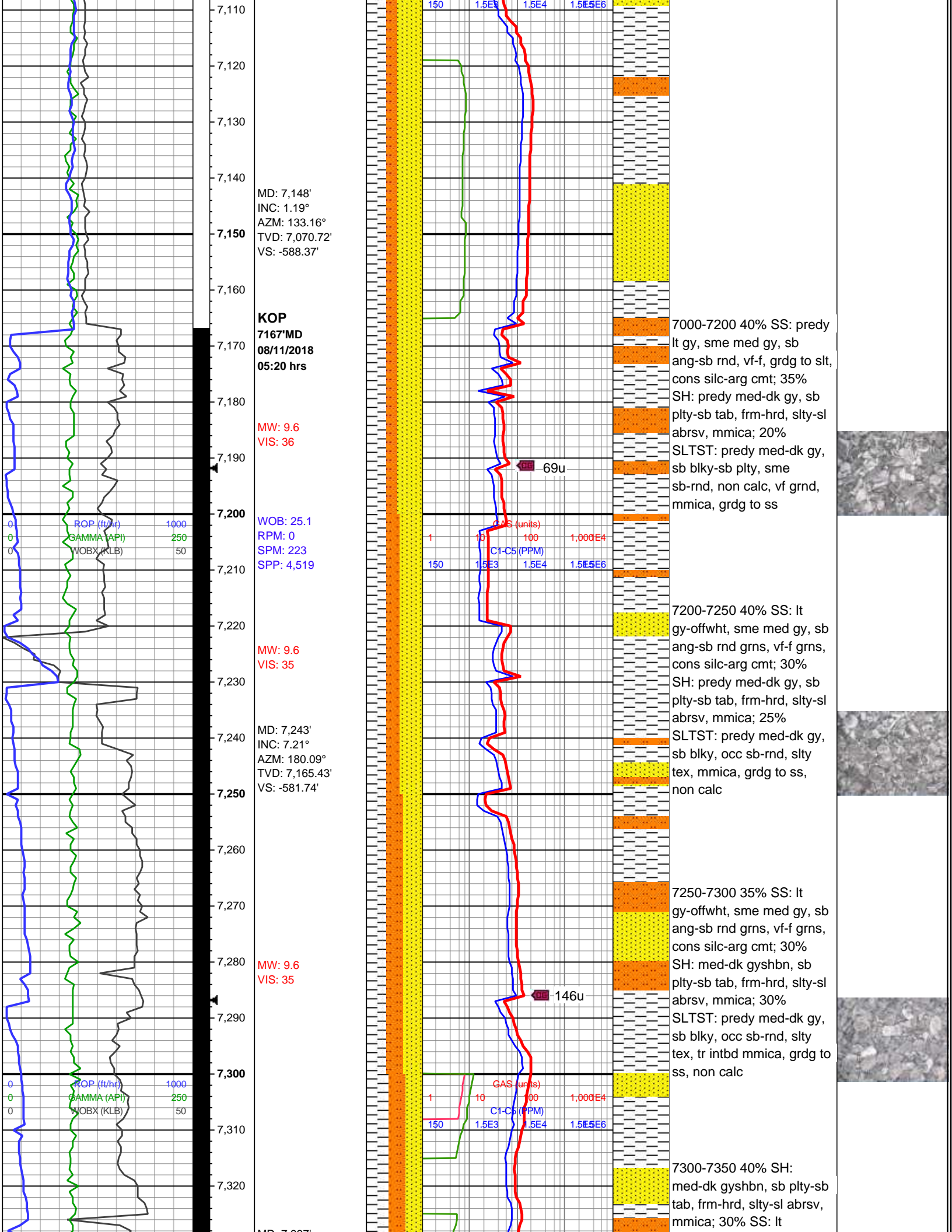
GAS (units)
1 10 100 1,000E4
C1-C5 (PPM)
1.5E3 1.5E4 1.5E5 1.5E6

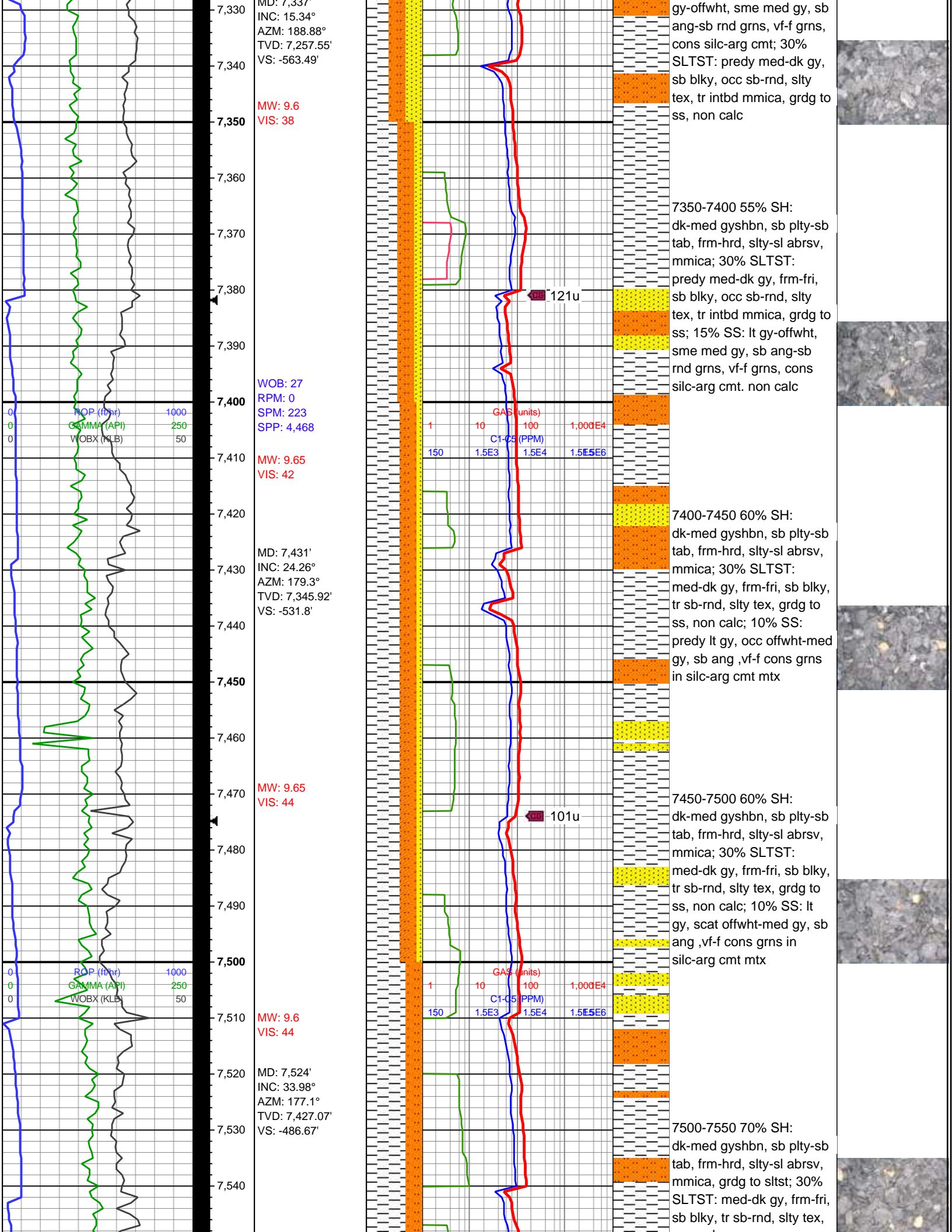
165u

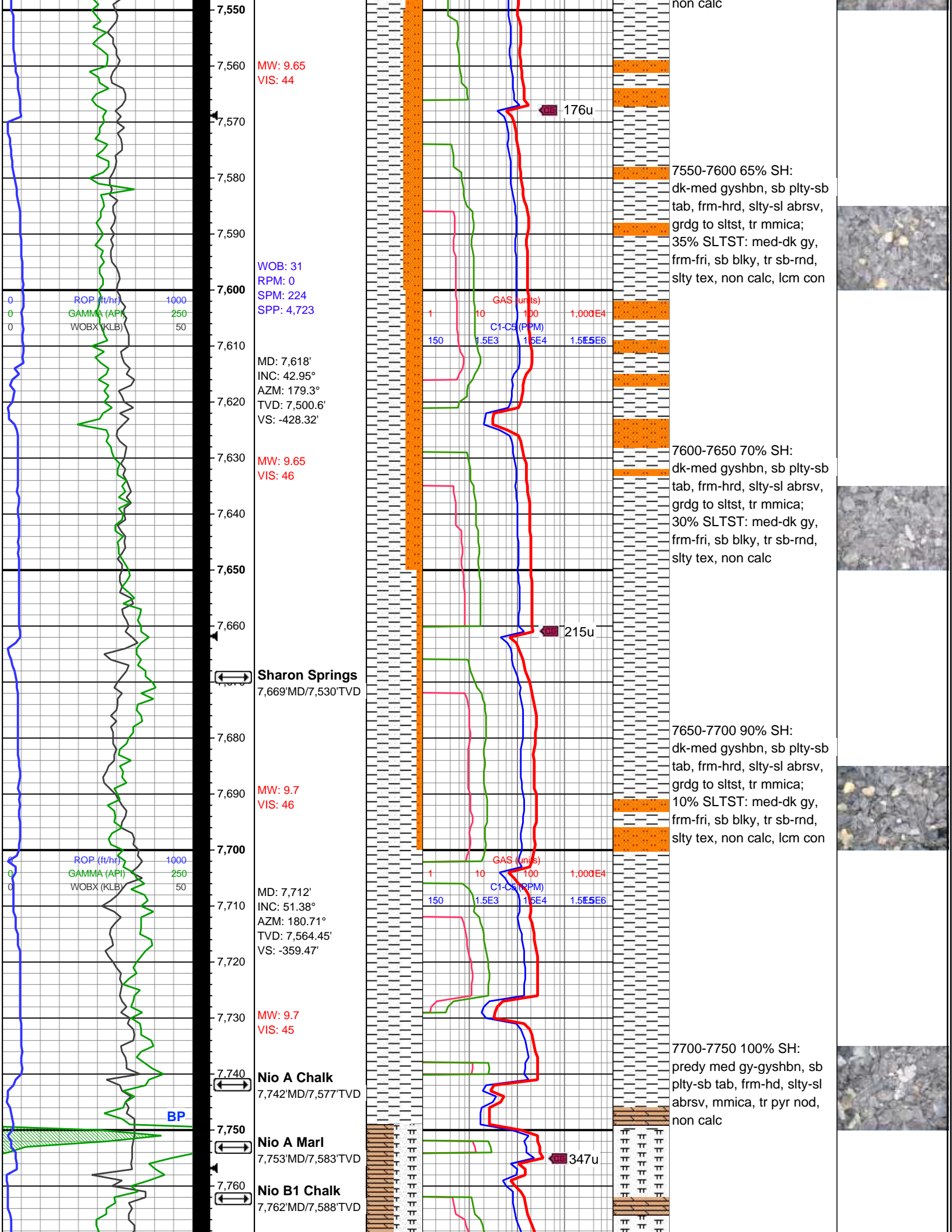
208u

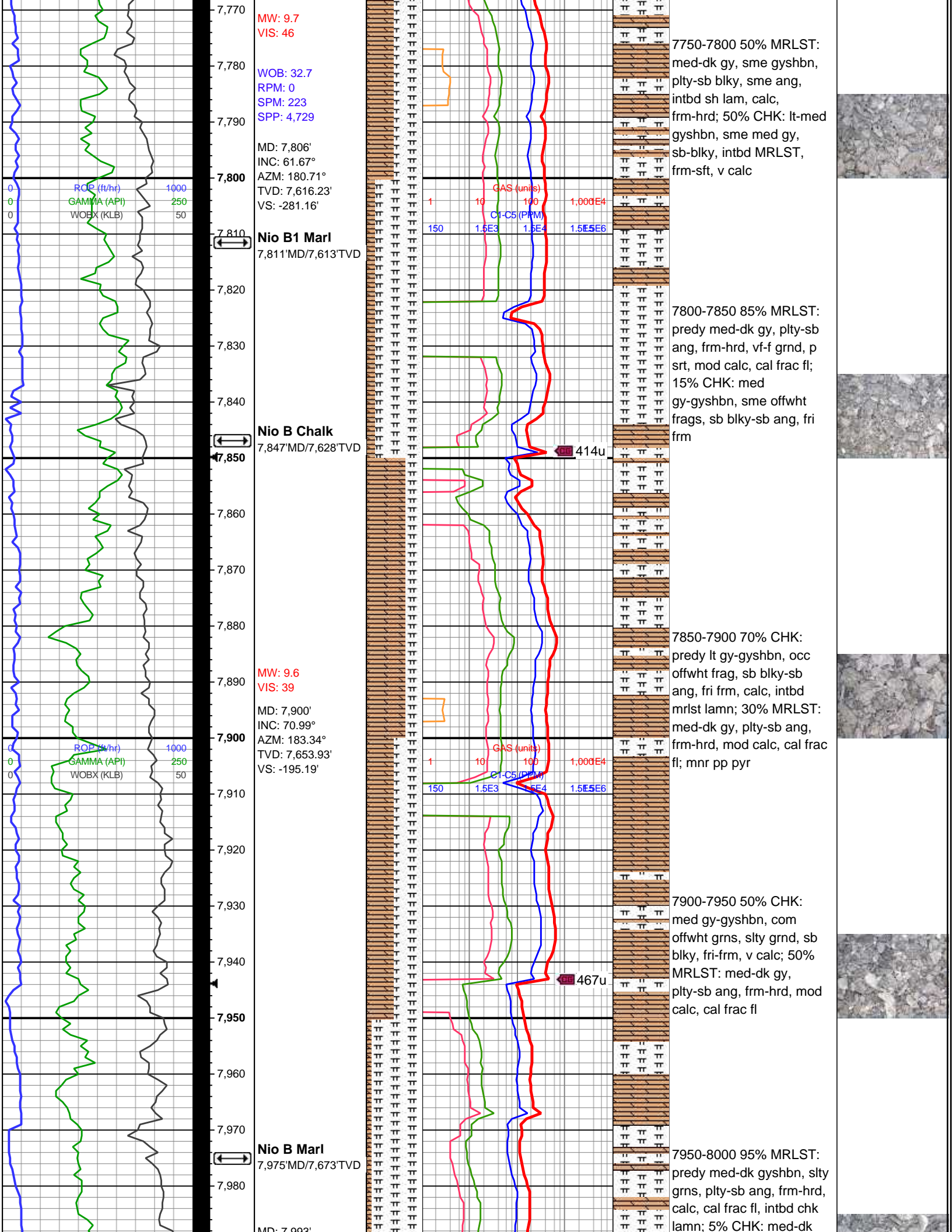
6800-7000 60% SLTY SH:
predy med-dk gy, sb
pity-sb tab, frm-hrd, slty-sl
abrsv, mmica; 30%
SLTST: predy med-dk gy,
sb blkgy-sb plty, sme
sb-rnd, non-calc, vf grnd,
mmica, grdg to ss; 10%
SS: predy lt gy, sme med
gy, sb ang-sb rnd, vf-f,
grdg to slt, cons silc-arg
cmt

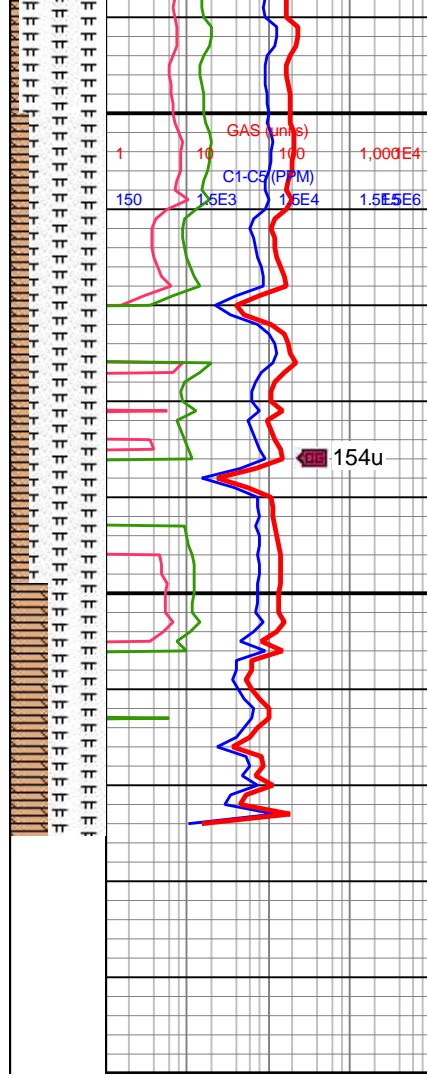
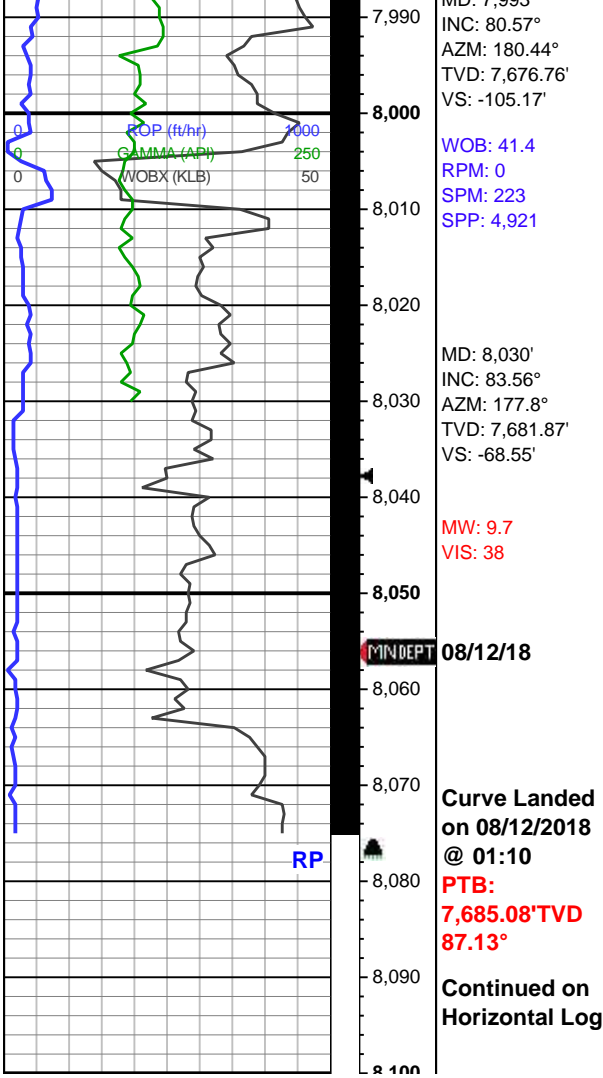












gy-gyshbn, sb blk-y-sb
ang, fri frm, calc; com pyr
nod

8000-8050 80% MRLST:
med-dk gyshbn, plty-sb
ang, frm-hrd, calc, cal frac
fl, intbd chk lamn; 20%
CHK: predy med-dk
gy-gyshbn, sb blk-y-sb
ang, fri frm, calc; com pyr
nod

8050-8075 60% MRLST:
med-dk gyshbn, plty-sb
ang, frm-hrd, mn calc, cal
frac fl, intbd chk lamn;
40% CHK: predy med-dk
gy-gyshbn, occ offwhit frag,
sb blk-y-sb-ang, fri frm, v
calc, cal frac fl, intbd mrlst
lamn