



7136 South Yale Avenue, Suite 414

Tulsa, Oklahoma 74136-6378

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WWW.HZMUD.COM

Customer Information

Operator: Noble Energy Inc
1625 Broadway
Suite 2200
Denver, Colorado 80202

Geologist: Holly Sell
Noble Energy Inc.

Well Information

Well Name: Bronco State AF10-64-1HN

Location: 10-5N-62W
1650' FSL, 250' FEL

County: Weld
State: Colorado

Mud Logging Details

Logger: Nikki Graber
Andrew Christiano

Log Interval: 2500' MD to 6450' MD
Start Date: March 20, 2013
Release Date: March 27, 2013

Drilling Rig: H&P 343
Total Depth: 10705' MD
TD Date: March 27, 2013
Formation: Niobrara C Chalk
KB Elevation: 4706'
GR Elevation: 4646'
API Number: 05-123-36580

ROCK TYPES

- Anhy
- Bent
- Brec
- Cht
- Clyst
- Coal
- Congl

- Dol
- Gyp
- Igne
- Chk
- Lmst
- Meta
- Mrlst

- Salt
- Shale
- Shcol
- Shgy
- Slstt
- Ss
- Till

- gw
- lmywash
- ogw
- olmywash
- oshly gw
- shly gw
- sdygw

- hvycrbsh
- nosmpl
- Lsdetrit
- sltst
- sdy sh
- Cement

Drill Depth v. Time		Survey Data	Lithology	Photographs	Geological Descriptions	Total Gas, C1-C4		
ROP (Ft/Hr)	Gamma (API)					TG (units)	C1 (units)	C2 (units)
0	550		24		NOBLE ENERGY INC BRONCO STATE AF10-64-1HN 10-5N-62W 1650' FSL, 250' FEL WELD CO., CO H&P 343 LOGGERS: NIKKI GRABER ANDREW CHRISTIANO CALLED OUT BY COMPANY MAN ON 3/20/2013. COMMENCED LOGGING @ 2500' @ 8:00 AM ON	-300	TG, C1-C4	2700
	300							
SLIDE=RED ROTATE=WHITE							CONNECTIONS MARKED WITH RED TRIANGLES	
ROP SCALE: 0 TO 550							GAS SCALE: -300 TO 2700 (300 UNITS/DIVISION)	
GAMMA SCALE: 0 TO 300							DRILLING ON WBM	

WOB 15.1K
PP 2855
RPM 40
SPM 67/67

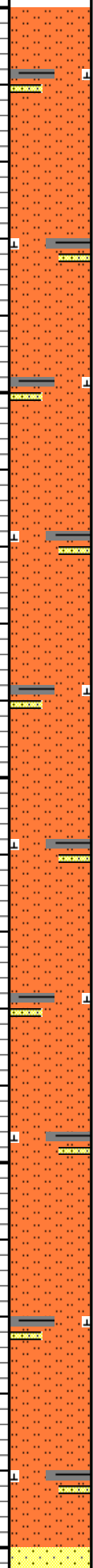
MD 2502 TVD 2501.8
INC 2.03 AZ 64
VS -1.87

MD 2597 TVD 2596.76
INC 1.54 AZ 49.47
VS -4.38

MD 2692 TVD 2691.73
INC 1.11 AZ 48.55
VS -6.07

ROP (Ft/Hr) 350
Gamma (API) 300

2500
2550
2600
2650
2700



SLTST: 70%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SLTST: 65%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SLTST: 60%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

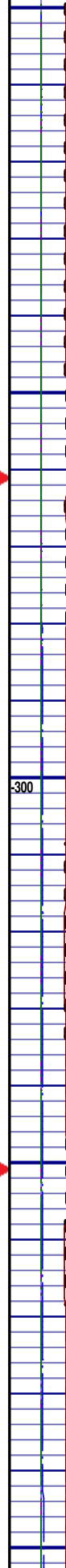
SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

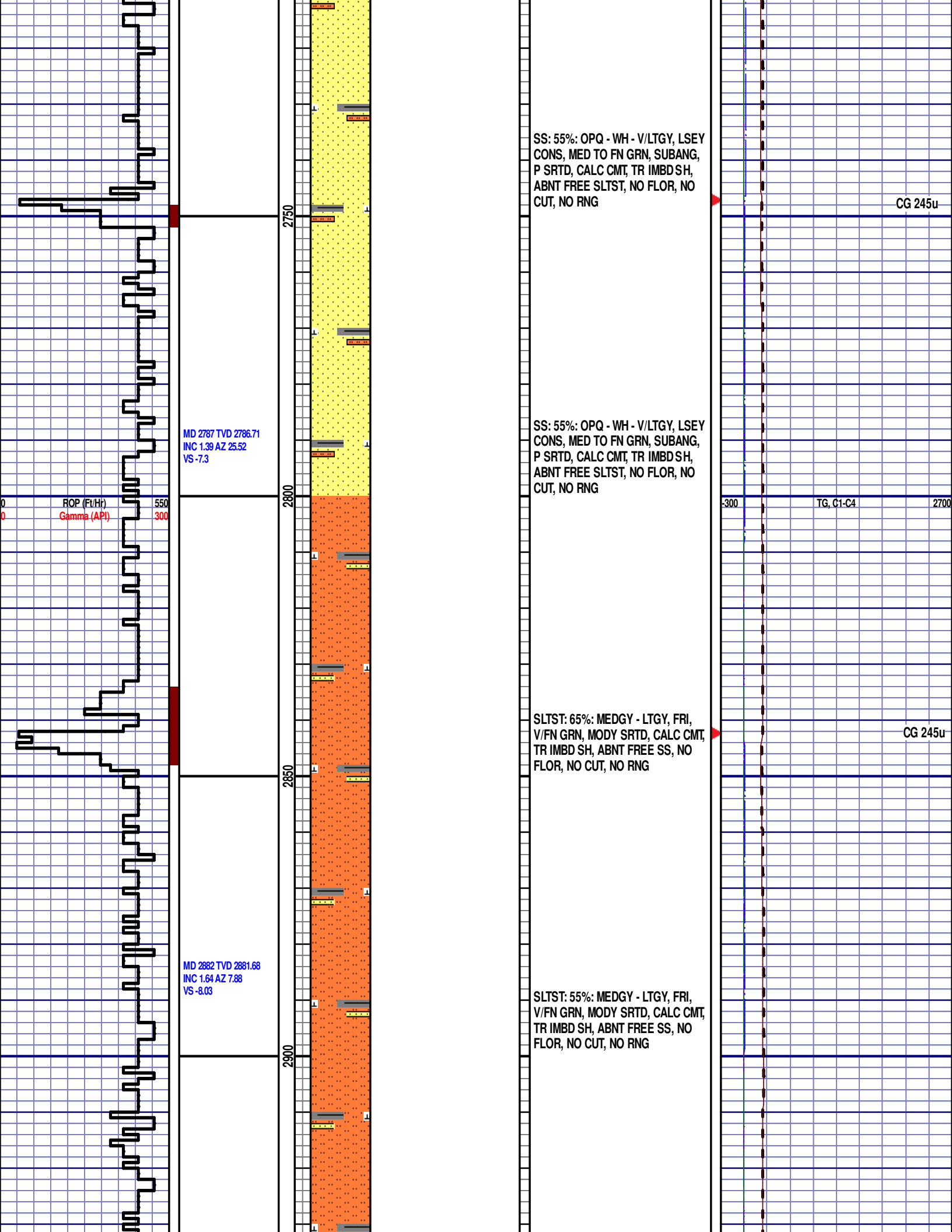
MD 1896'
WT 8.45
VIS 27
PV 1
YP 4
GEL 1/2/3
FIL 50.6
SOL 0.7
H2O 99
PH 9.3
CL 2000
CAL 140
OIL 0

CG 256u

-300 TG, C1-C4 2700

CG 247u





SS: 55%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

CG 245u

MD 2787 TVD 2786.71
INC 1.39 AZ 25.52
VS -7.3

SS: 55%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

-300 TG, C1-C4 2700

ROP (Ft/Hr) 550
Gamma (API) 300

SLTST: 65%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

CG 245u

MD 2882 TVD 2881.68
INC 1.64 AZ 7.88
VS -8.03

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

2900

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

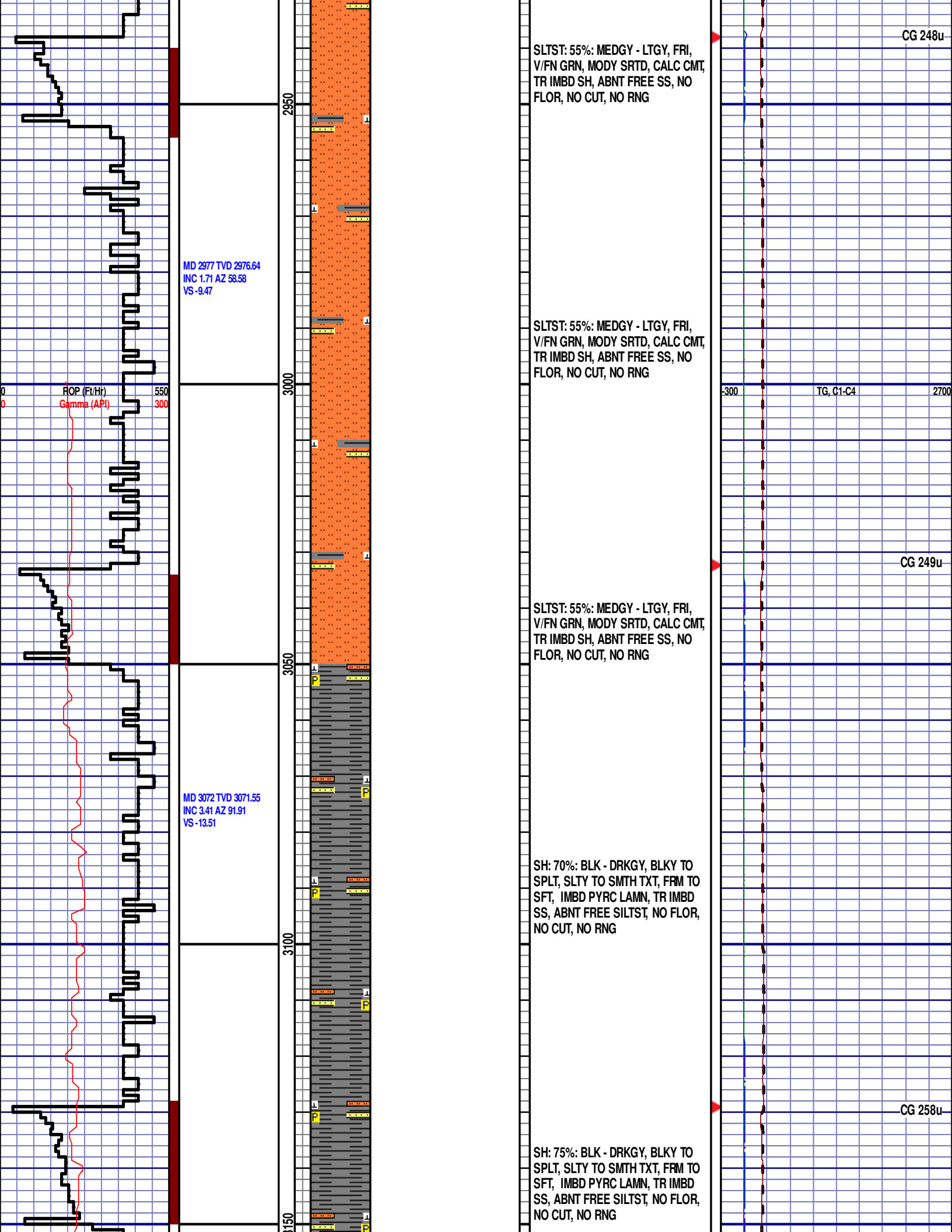
SH: 70%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD PYRC LAMN, TR IMBD
SS, ABNT FREE SILTST, NO FLOR,
NO CUT, NO RNG

SH: 75%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, IMBD PYRC LAMN, TR IMBD
SS, ABNT FREE SILTST, NO FLOR,
NO CUT, NO RNG

MD 2977 TVD 2976.64
INC 1.71 AZ 58.58
VS -9.47

MD 3072 TVD 3071.55
INC 3.41 AZ 91.91
VS -13.51

ROP (Ft/Ht) 550
Gamma (API) 300



MD 3167 TVD 3166.22
INC 5.95 AZ 98.45
VS -21.19

ROP (Ft/H)
Gamma (API)

MD 3262 TVD 3260.48
INC 8.33 AZ 87.64
VS -32.93

MD 3357 TVD 3354.15
INC 10.81 AZ 88.76
VS -48.72

SH: 75%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, IMBD PYRC LAMN, TR IMBD SS, ABNT FREE SILTST, NO FLOR, NO CUT, NO RNG

SH: 70%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, IMBD PYRC LAMN, TR IMBD SS, ABNT FREE SILTST, NO FLOR, NO CUT, NO RNG

SLTST: 55%: MEDGY - LTGY, FRI, V/FN GRN, MODY SRTD, CALC CMT, TR IMBD SH, ABNT FREE SS, NO FLOR, NO CUT, NO RNG

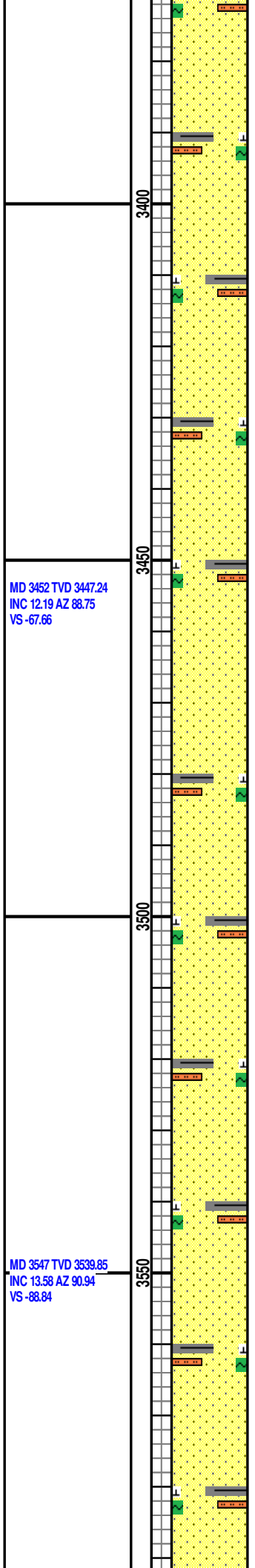
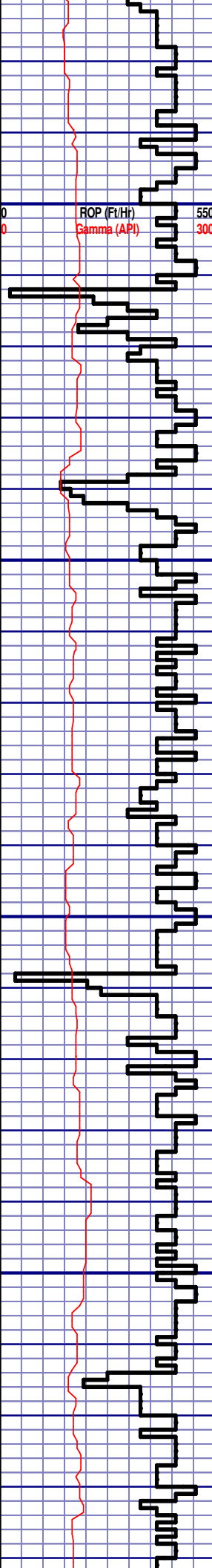
PARKMAN
3300' MD 3297' TVD

SS: 95%: WH - V/LTGY, UN CONS, FN TO MED GRN, SUBANG, P SRTD, CALC CMT, SCAT IMBD GLAU, TR IMBD SH, SCAT FREE SLTST, NO FLOR, NO CUT, NO RNG

TG, C1-C4

CG 371u

CG 266u



MD 3452 TVD 3447.24
INC 12.19 AZ 88.75
VS -67.66

MD 3547 TVD 3539.85
INC 13.58 AZ 90.94
VS -88.84

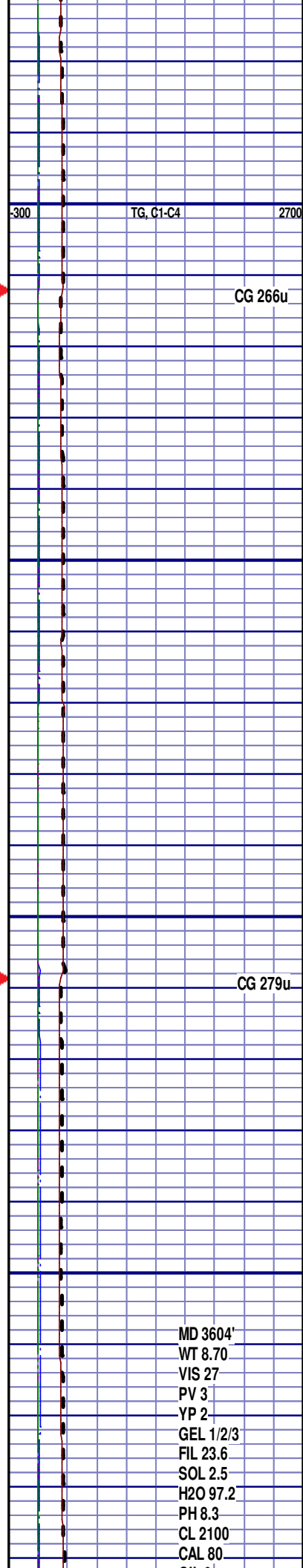
SS: 95%: WH - V/LTGY, UN CONS,
FN TO MED GRN, SUBANG, P
SRTD, CALC CMT, SCAT IMBD
GLAU, TR IMBD SH, SCAT FREE
SLTST, NO FLOR, NO CUT, NO RNG

SS: 95%: WH - V/LTGY, UN CONS,
FN TO MED GRN, SUBANG, P
SRTD, CALC CMT, SCAT IMBD
GLAU, TR IMBD SH, SCAT FREE
SLTST, NO FLOR, NO CUT, NO RNG

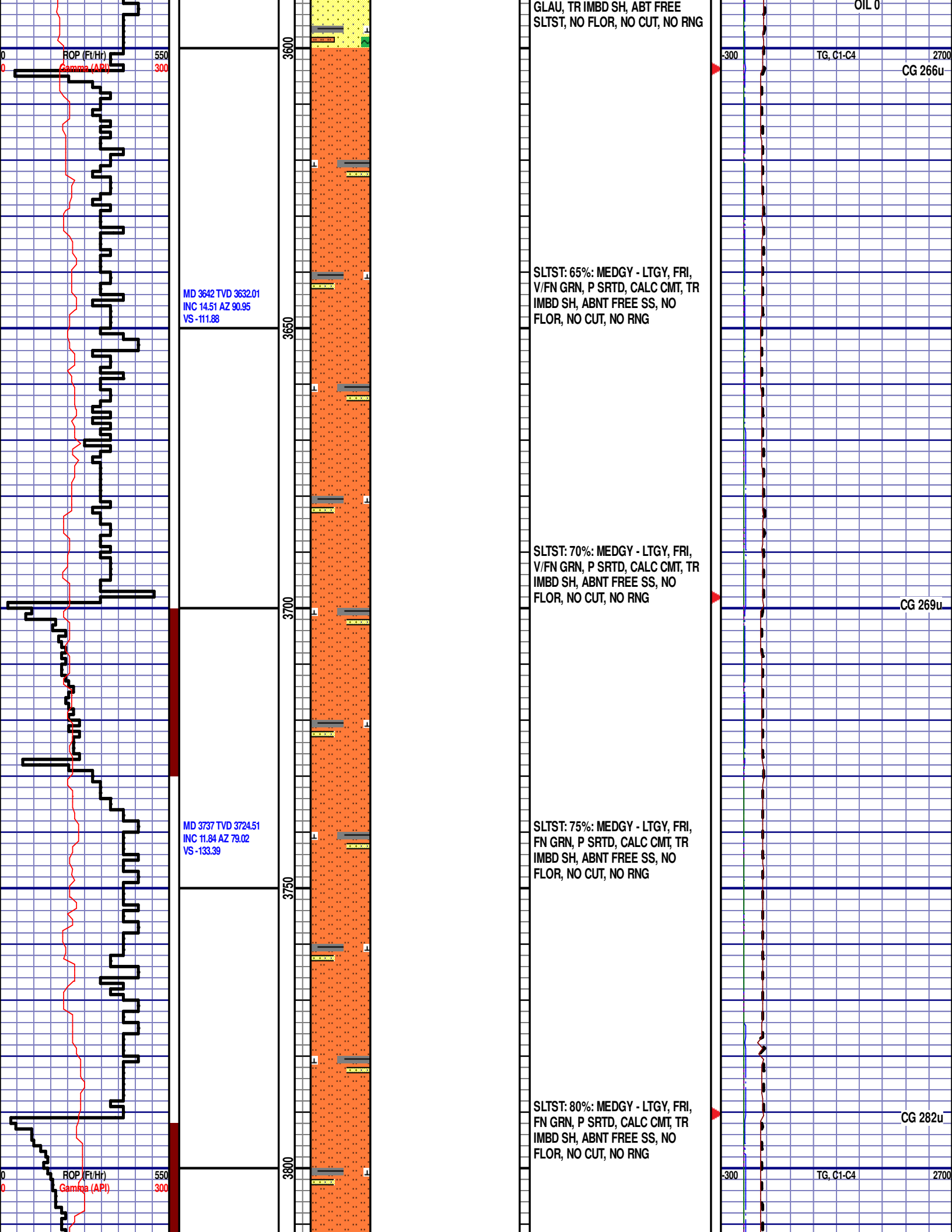
SS: 95%: WH - V/LTGY, UN CONS,
FN TO MED GRN, SUBANG, P
SRTD, CALC CMT, SCAT IMBD
GLAU, TR IMBD SH, SCAT FREE
SLTST, NO FLOR, NO CUT, NO RNG

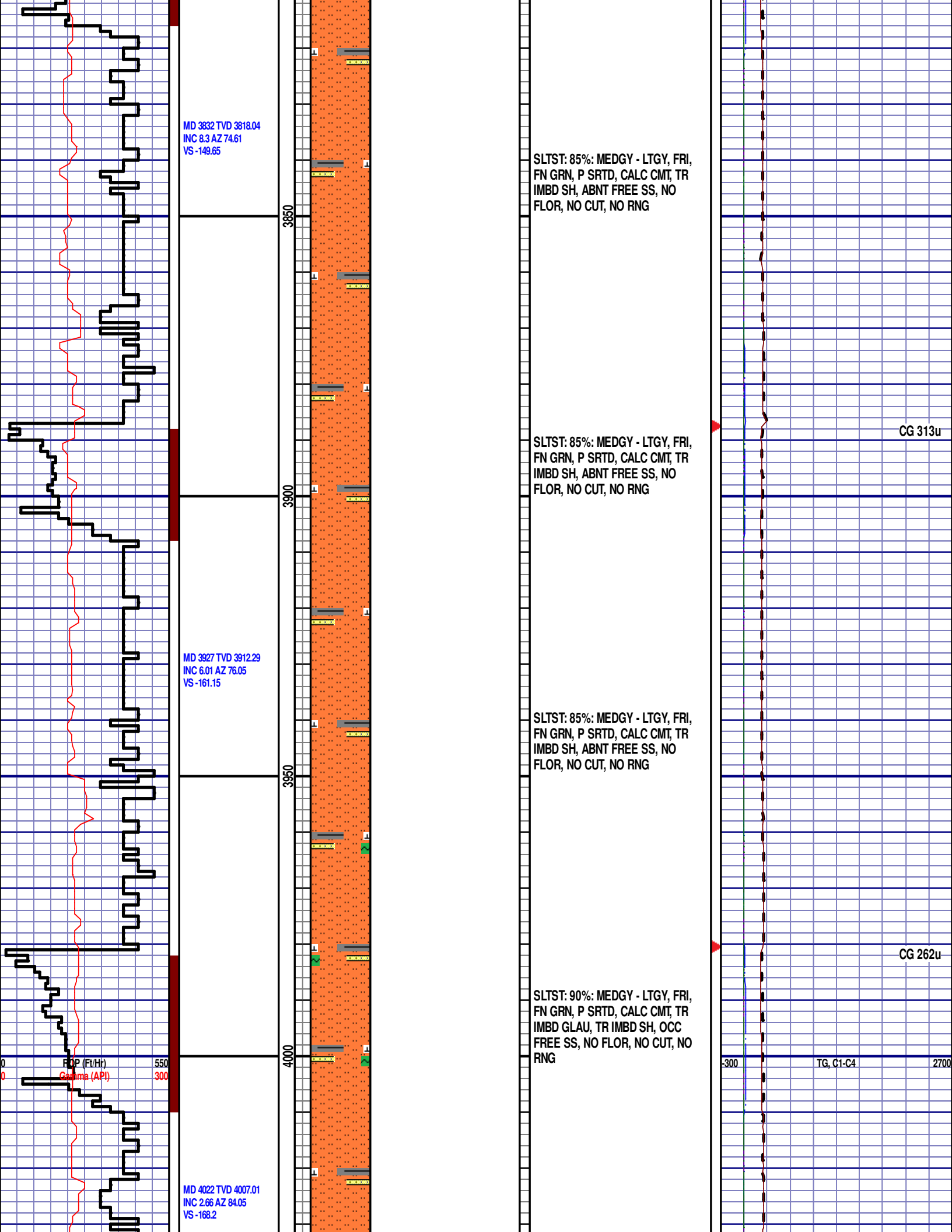
SS: 95%: WH - V/LTGY, UN CONS,
FN TO MED GRN, SUBANG, P
SRTD, CALC CMT, SCAT IMBD
GLAU, TR IMBD SH, SCAT FREE
SLTST, NO FLOR, NO CUT, NO RNG

SS: 85%: WH - V/LTGY, MOD CONS,
FN TO MED GRN, SUBANG, P
SRTD, CALC CMT, SCAT IMBD



MD 3604'
WT 8.70
VIS 27
PV 3
YP 2
GEL 1/2/3
FIL 23.6
SOL 2.5
H2O 97.2
PH 8.3
CL 2100
CAL 80





MD 3832 TVD 3818.04
INC 8.3 AZ 74.61
VS -149.65

SLTST: 85%: MEDGY - LTGY, FRI,
FN GRN, P SRTD, CALC CMT, TR
IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

3850

3900

SLTST: 85%: MEDGY - LTGY, FRI,
FN GRN, P SRTD, CALC CMT, TR
IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

CG 313u

MD 3927 TVD 3912.29
INC 6.01 AZ 76.05
VS -161.15

SLTST: 85%: MEDGY - LTGY, FRI,
FN GRN, P SRTD, CALC CMT, TR
IMBD SH, ABNT FREE SS, NO
FLOR, NO CUT, NO RNG

3950

4000

SLTST: 90%: MEDGY - LTGY, FRI,
FN GRN, P SRTD, CALC CMT, TR
IMBD GLAU, TR IMBD SH, OCC
FREE SS, NO FLOR, NO CUT, NO
RNG

CG 262u

FOP (Ft/Ht)
Gamma (API)

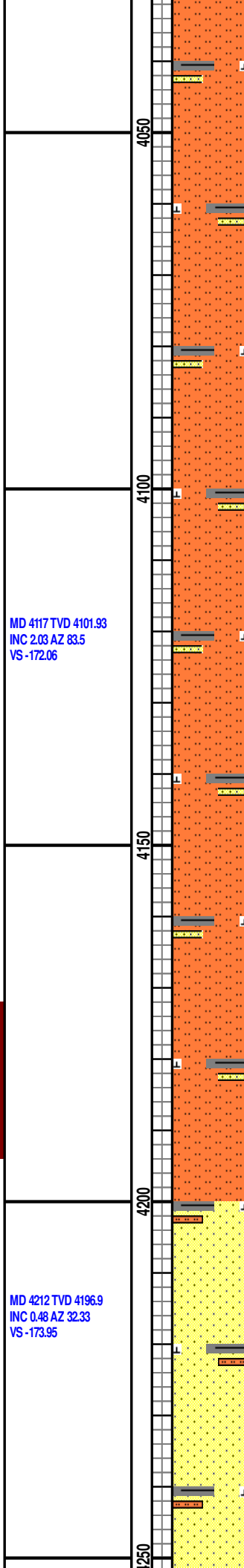
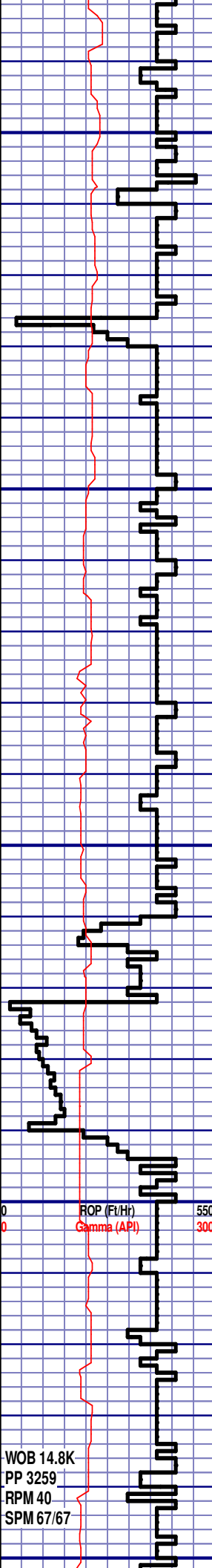
550
300

MD 4022 TVD 4007.01
INC 2.66 AZ 84.05
VS -168.2

-300

TG, C1-C4

2700



MD 4117 TVD 4101.93
 INC 2.03 AZ 83.5
 VS -172.06

MD 4212 TVD 4196.9
 INC 0.48 AZ 32.33
 VS -173.95

WOB 14.8K
 PP 3259
 RPM 40
 SPM 67/67

SLTST: 90%: MEDGY - LTGY, FRI,
 FN GRN, P SRTD, CALC CMT, TR
 IMBD SH, OCC FREE SS, NO FLOR,
 NO CUT, NO RNG

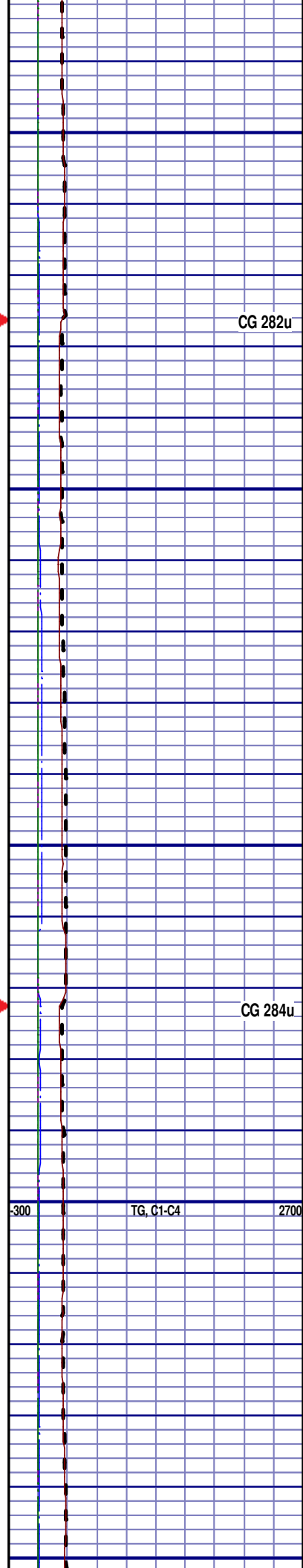
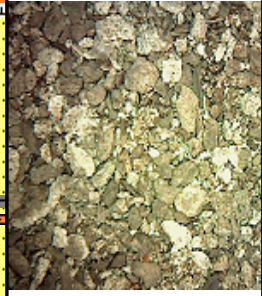
SLTST: 75%: MEDGY - LTGY, FRI,
 FN GRN, P SRTD, CALC CMT, TR
 IMBD SH, OCC FREE SS, NO FLOR,
 NO CUT, NO RNG

SLTST: 60%: MEDGY - LTGY, FRI,
 FN GRN, P SRTD, CALC CMT, TR
 IMBD SH, OCC FREE SS, NO FLOR,
 NO CUT, NO RNG

SLTST: 55%: MEDGY - LTGY, FRI,
 FN GRN, P SRTD, CALC CMT, TR
 IMBD SH, OCC FREE SS, NO FLOR,
 NO CUT, NO RNG

SUSSEX
 4200' MD 4185' TVD

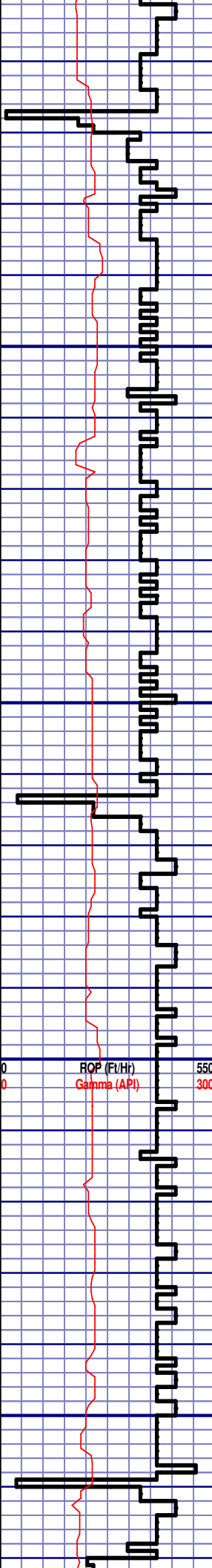
SS: 55%: OPQ - WH - V/LTGY, LSEY
 CONS, MED TO FN GRN, SUBANG,
 P SRTD, CALC CMT, TR IMBD SH,
 ABNT FREE SLTST, NO FLOR, NO
 CUT, NO RNG



CG 282u

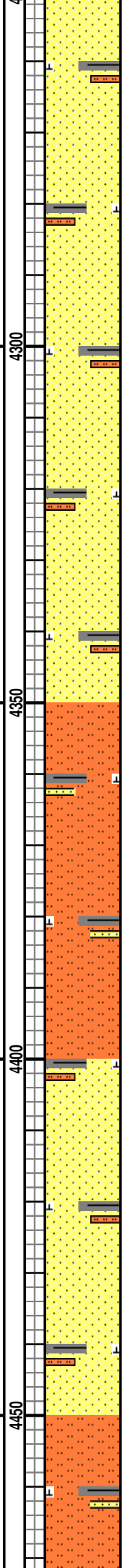
CG 284u

-300 TG, C1-C4 2700



MD 4307 TVD 4291.9
 INC 1.06 AZ 333.5
 VS -173.8

MD 4402 TVD 4386.88
 INC 1.26 AZ 332.27
 VS -172.96

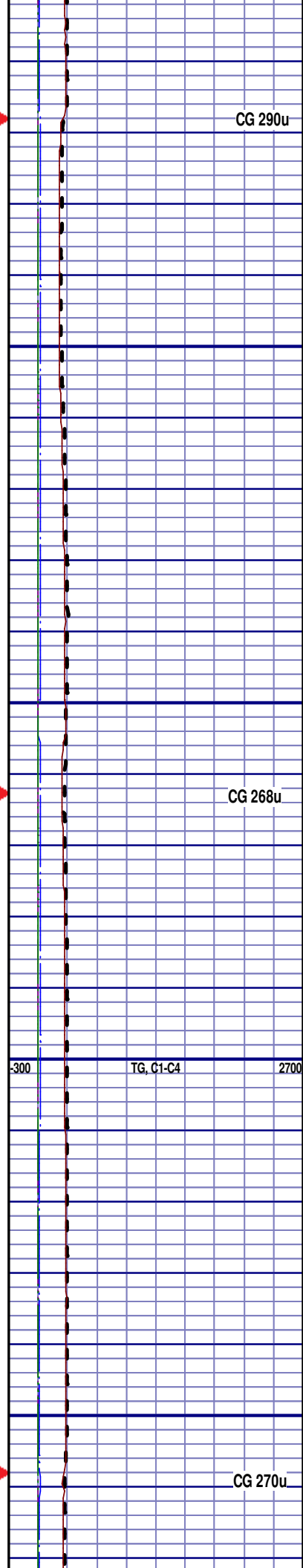


SS: 65%: OPQ - WH - V/LTGY, LSEY
 CONS, MED TO FN GRN, SUBANG,
 P SRTD, CALC CMT, TR IMBD SH,
 ABNT FREE SLTST, NO FLOR, NO
 CUT, NO RNG

SS: 65%: OPQ - WH - V/LTGY, LSEY
 CONS, MED TO FN GRN, SUBANG,
 P SRTD, CALC CMT, TR IMBD SH,
 ABNT FREE SLTST, NO FLOR, NO
 CUT, NO RNG

SLTST: 65%: MEDGY - LTGY, FRI,
 V/FN GRN, MODY SRTD, CALC CMT,
 TR IMBD SH, SCAT FREE SS, NO
 FLOR, NO CUT, NO RNG

SS: 55%: OPQ - WH - V/LTGY, LSEY
 CONS, MED TO FN GRN, SUBANG,
 P SRTD, CALC CMT, TR IMBD SH,
 ABNT FREE SLTST, NO FLOR, NO
 FLOR, NO RNG

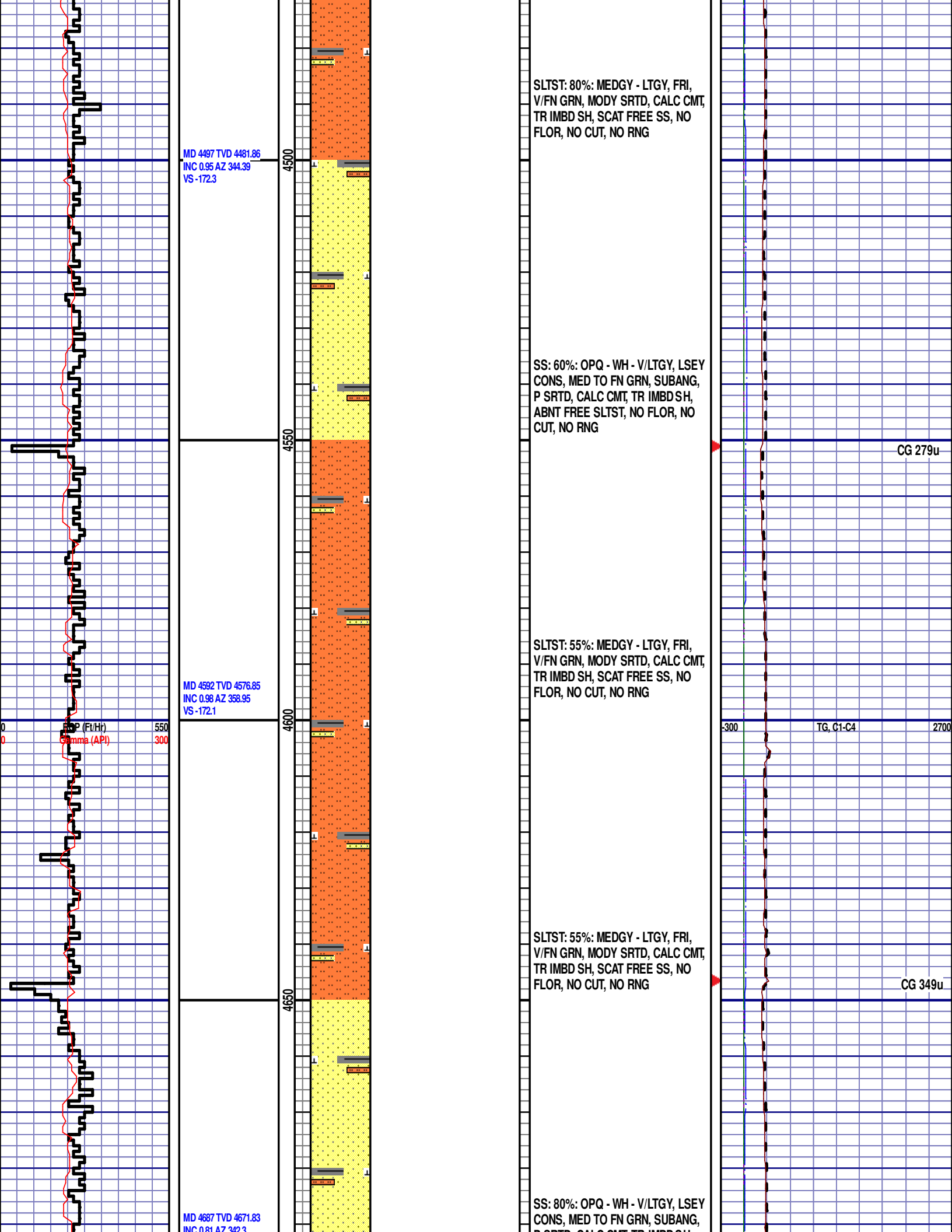


CG 290u

CG 268u

TG, C1-C4

CG 270u



MD 4497 TVD 4481.86
INC 0.95 AZ 344.39
VS -172.3

4500

SLTST: 80%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS, NO
FLOR, NO CUT, NO RNG

4550

SS: 60%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

CG 279u

MD 4592 TVD 4576.85
INC 0.98 AZ 358.95
VS -172.1

4600

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS, NO
FLOR, NO CUT, NO RNG

550
300
Gamma (API)

-300 TG, C1-C4 2700

4650

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS, NO
FLOR, NO CUT, NO RNG

CG 349u

MD 4687 TVD 4671.83
INC 0.81 AZ 342.3

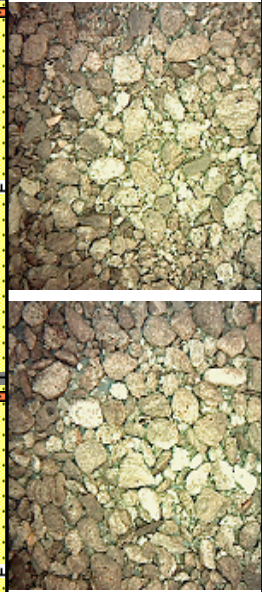
4650

SS: 80%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBD SH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

VS -171.91

P SRTD, CALC CMT, TR IMBDSH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

4700
4750
4800
4850
4900



SHANNON
4732' MD 4717' TVD

SS: 65%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBDSH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

CG 356u

MD 4782 TVD 4766.82
INC 1 AZ 353.15
VS -171.64

SS: 80%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBDSH,
ABNT FREE SLTST, NO FLOR, NO
CUT, NO RNG

TG, C1-C4

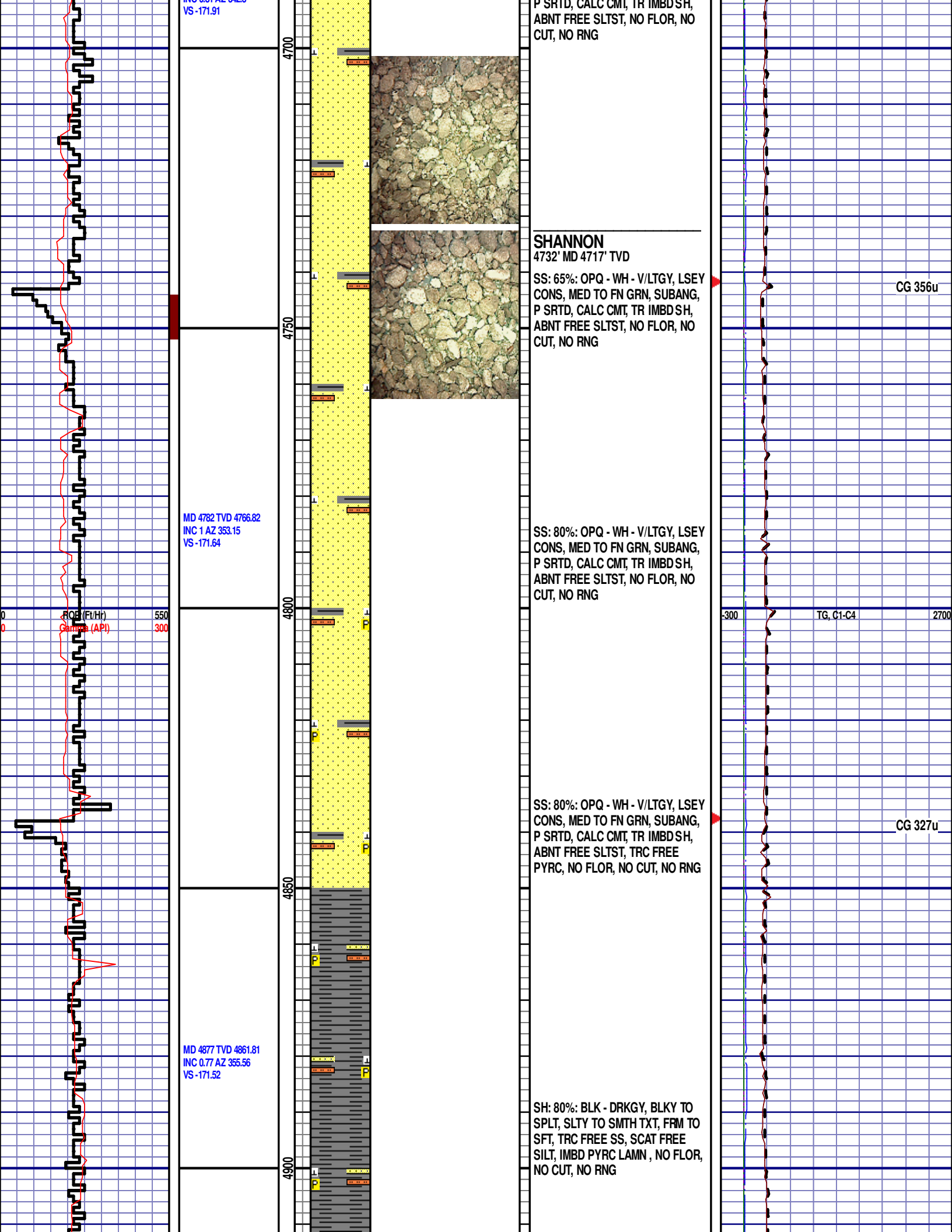
ROE (Ft/Ht) 550
Gamma (API) 300

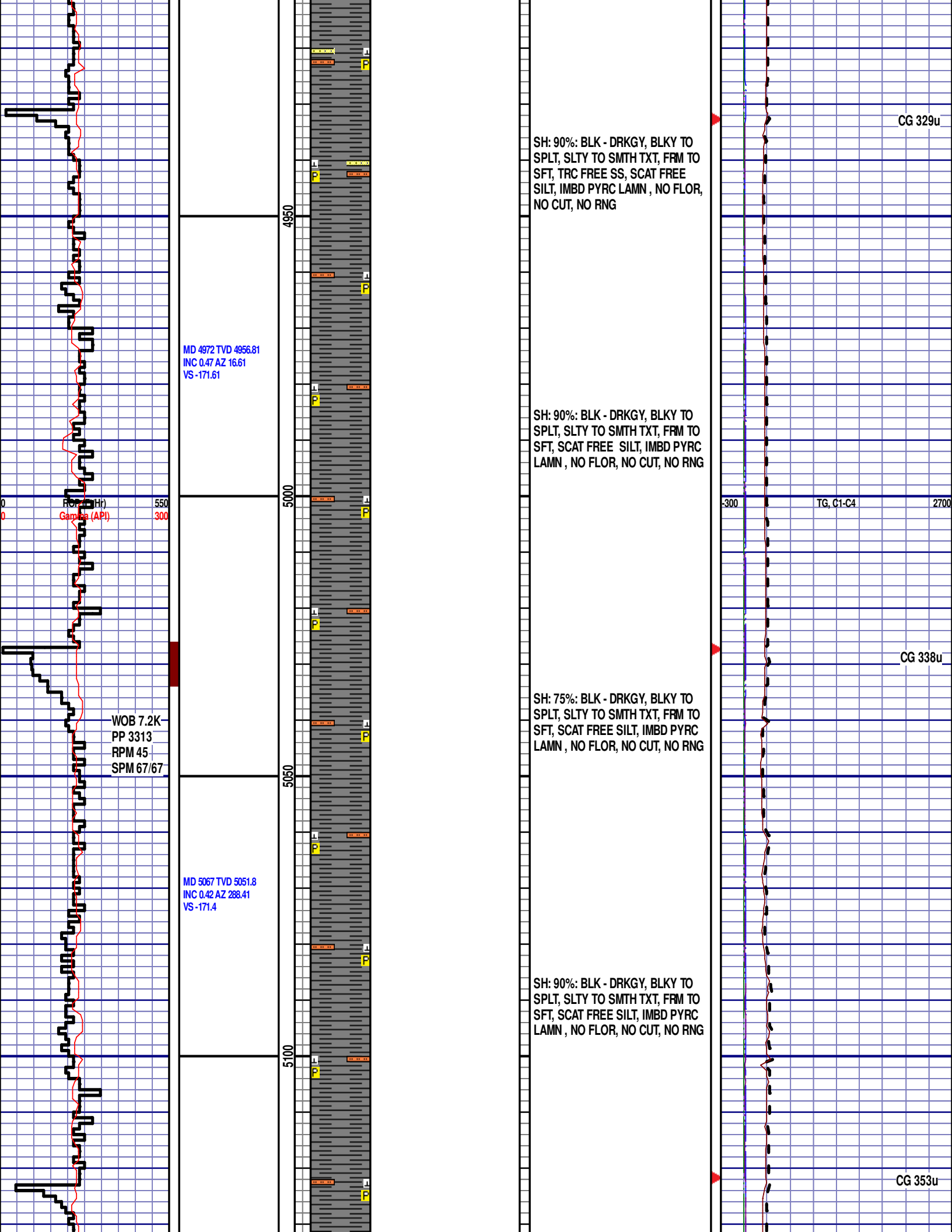
SS: 80%: OPQ - WH - V/LTGY, LSEY
CONS, MED TO FN GRN, SUBANG,
P SRTD, CALC CMT, TR IMBDSH,
ABNT FREE SLTST, TRC FREE
PYRC, NO FLOR, NO CUT, NO RNG

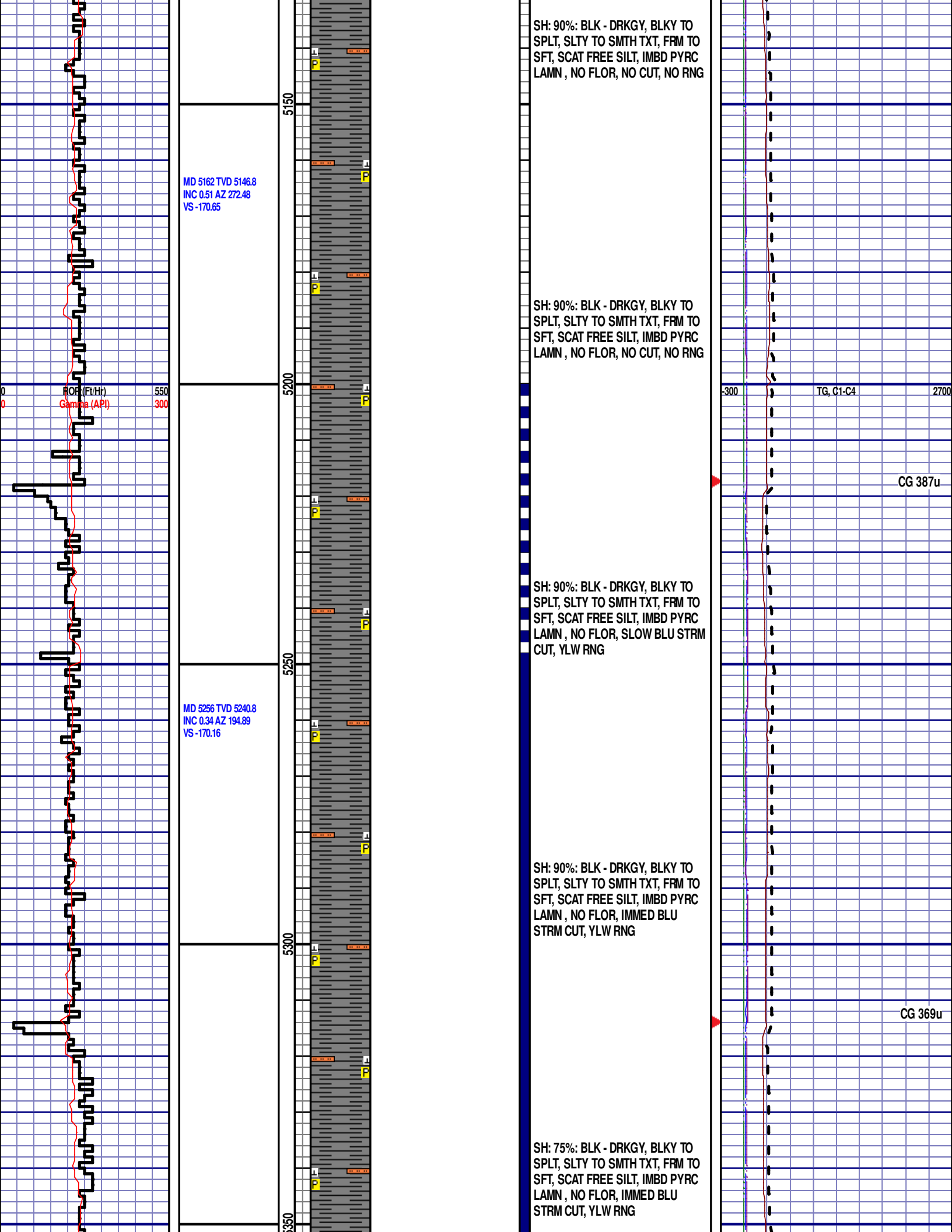
CG 327u

MD 4877 TVD 4861.81
INC 0.77 AZ 355.56
VS -171.52

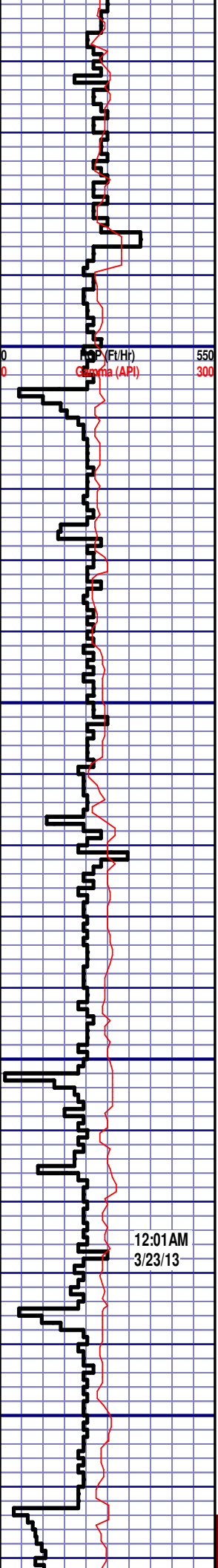
SH: 80%: BLK - DRKGY, BLKY TO
SPLT, SLTY TO SMTH TXT, FRM TO
SFT, TRC FREE SS, SCAT FREE
SILT, IMBD PYRC LAMN, NO FLOR,
NO CUT, NO RNG







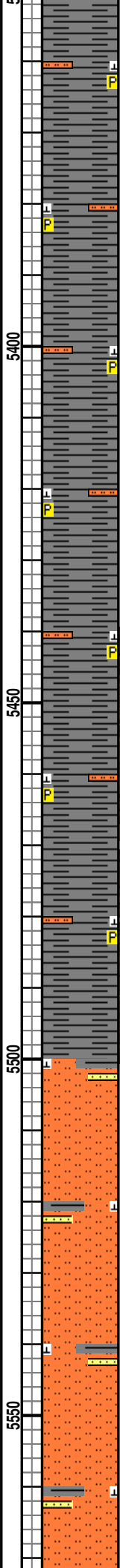
MD 5351 TVD 5335.79
INC 0.73 AZ 188.23
VS -169.98



MD 5446 TVD 5430.78
INC 1.16 AZ 195.13
VS -169.61

MD 5541 TVD 5525.76
INC 1.43 AZ 203.68
VS -168.84

12:01 AM
3/23/13



SH: 75%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, SCAT FREE SILT, IMBD PYRC LAMN , NO FLOR, IMMED BLU STRM CUT, YLW RNG

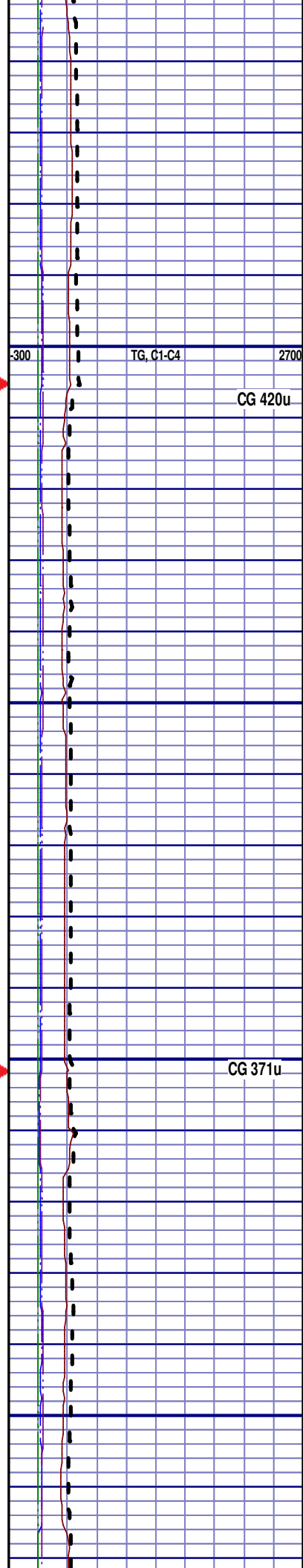
SH: 75%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, SCAT FREE SILT, IMBD PYRC LAMN , NO FLOR, IMMED BLU STRM CUT, YLW RNG



TEEPEE BUTTES
5470' MD 5454' TVD

SH: 65%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, SCAT FREE SILT, IMBD PYRC LAMN , NO FLOR, IMMED BLU STRM CUT, YLW RNG

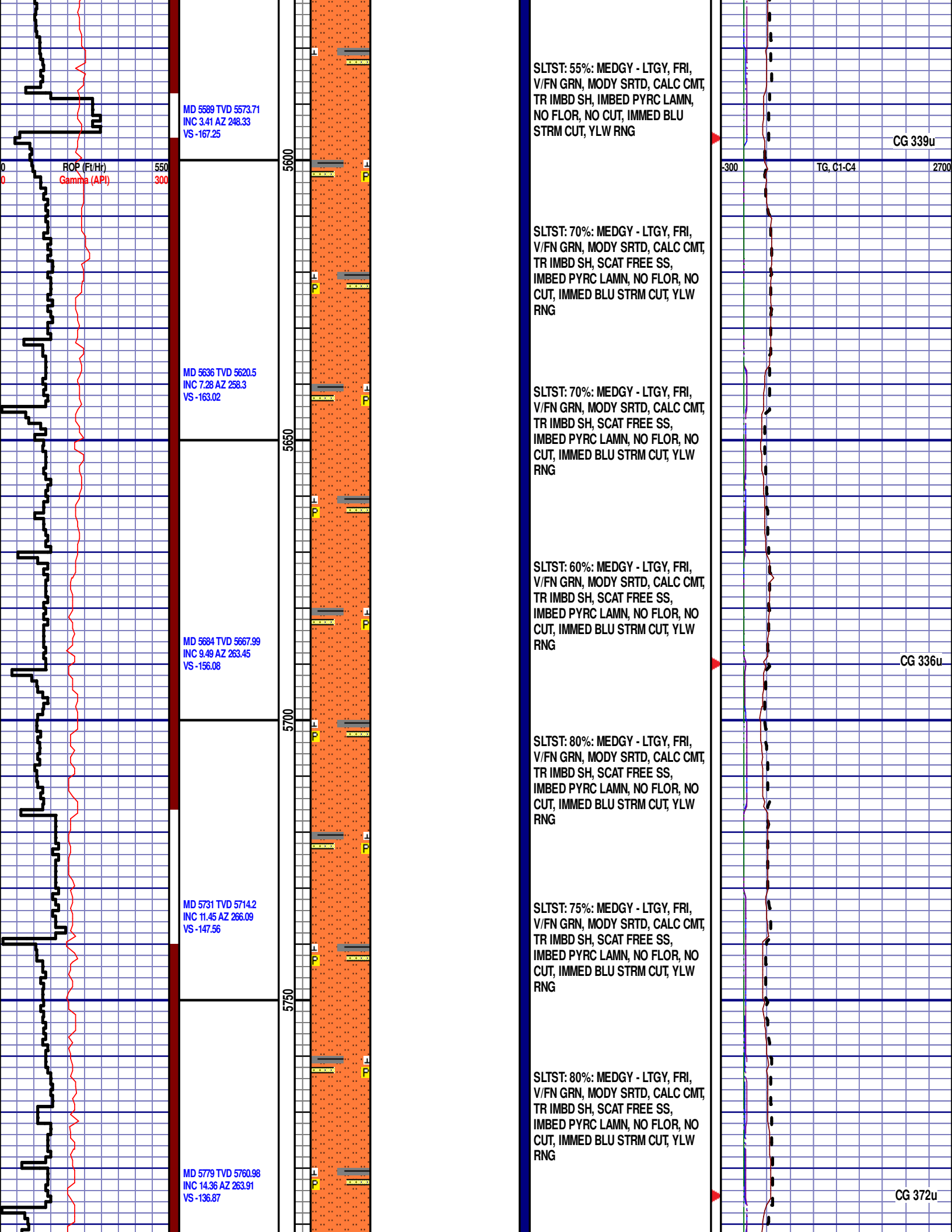
SLTST: 55%: MEDGY - LTGY, FRI, V/FN GRN, MODY SRTD, CALC CMT, TR IMBD SH, IMBED PYRC LAMN, NO FLOR, NO CUT, IMMED BLU STRM CUT, YLW RNG



TG, C1-C4

CG 420u

CG 371u



MD 5589 TVD 5573.71
INC 3.41 AZ 248.33
VS -167.25

ROP (Fe/Ht) 550
Gamma (API) 300

SLTST: 55%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, IMBED PYRC LAMN,
NO FLOR, NO CUT, IMMED BLU
STRM CUT, YLW RNG

CG 339u

-300 TG, C1-C4 2700

MD 5636 TVD 5620.5
INC 7.28 AZ 258.3
VS -163.02

SLTST: 70%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

MD 5684 TVD 5667.99
INC 9.49 AZ 263.45
VS -156.08

SLTST: 70%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

CG 336u

MD 5731 TVD 5714.2
INC 11.45 AZ 266.09
VS -147.56

SLTST: 60%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

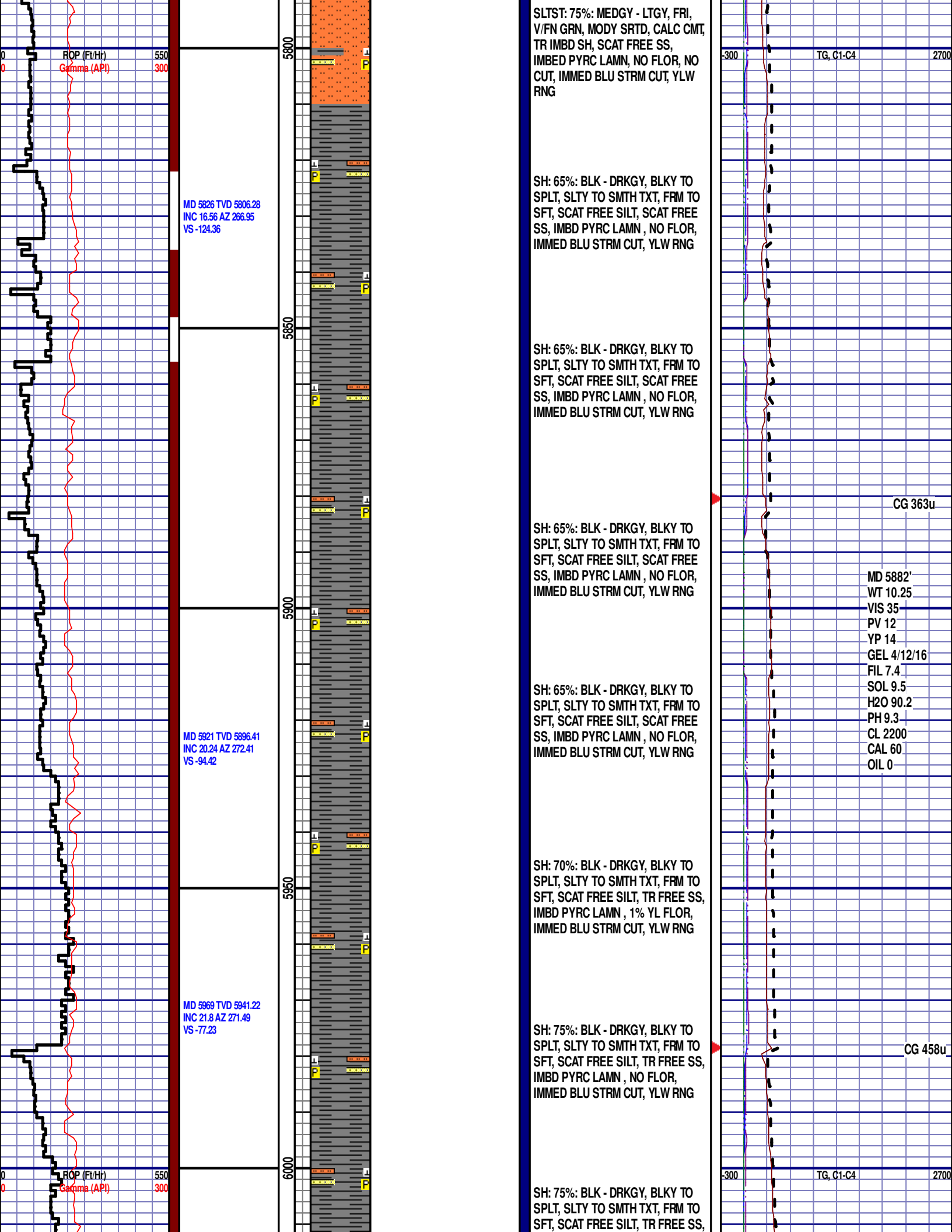
SLTST: 80%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

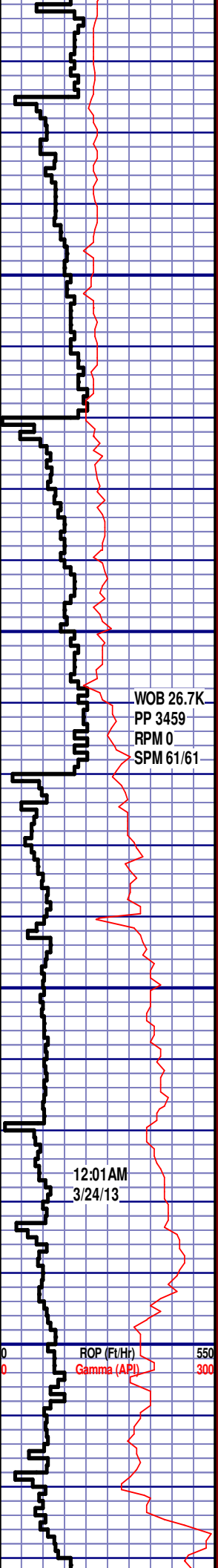
MD 5779 TVD 5760.98
INC 14.36 AZ 263.91
VS -136.87

SLTST: 75%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

SLTST: 80%: MEDGY - LTGY, FRI,
V/FN GRN, MODY SRTD, CALC CMT,
TR IMBD SH, SCAT FREE SS,
IMBED PYRC LAMN, NO FLOR, NO
CUT, IMMED BLU STRM CUT, YLW
RNG

CG 372u





MD 6016 TVD 5984.49
 INC 24.13 AZ 271.18
 VS -58.91

MD 6064 TVD 6027.84
 INC 26.7 AZ 269.95
 VS -38.32

MD 6111 TVD 6069.23
 INC 29.86 AZ 269.31
 VS -16.06

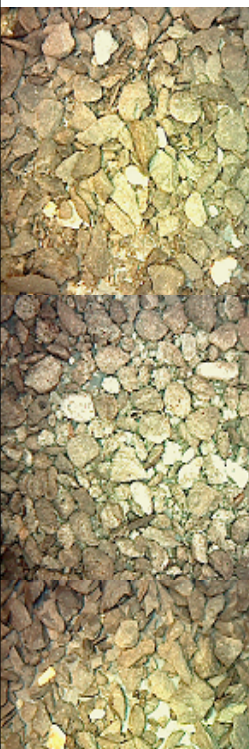
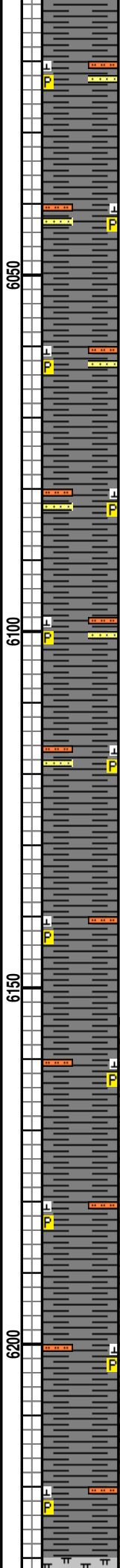
MD 6159 TVD 6109.93
 INC 34.09 AZ 269.05
 VS 9.36

MD 6206 TVD 6147.73
 INC 38.82 AZ 269
 VS 37.28

WOB 26.7K
 PP 3459
 RPM 0
 SPM 61/61

12:01 AM
 3/24/13

ROP (Ft/Hr) 550
 Gamma (API) 300



IMBD PYRC LAMN , NO FLOR,
 IMMED BLU STRM CUT, YLW RNG

SH: 70%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, TR FREE SS,
 IMBD PYRC LAMN , NO FLOR,
 IMMED BLU STRM CUT, YLW RNG

SH: 75%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, TR FREE SS,
 IMBD PYRC LAMN , NO FLOR,
 IMMED BLU STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, TR FREE SS,
 IMBD PYRC LAMN , NO FLOR,
 IMMED BLU STRM CUT, YLW RNG
 TOOH @ 8:15 AM ON 3/23/2013
 @6120' MD FOR NEW BIT AND
 MOTOR. TIH @ 4:00 PM ON
 3/23/2013. RESUMED DRILLING @
 11:15PM ON 3/23/13 W/ BIT #4 8.75
 HBBS FXD55M S/N 12038504 IN @
 6120' MD

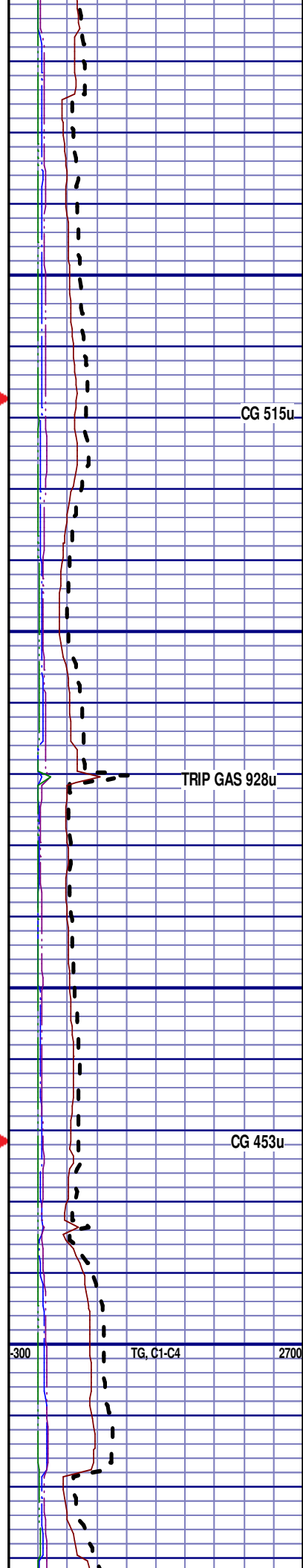
SH: 80%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, IMBD PYRC
 LAMN , 1% YL FLOR, IMMED BLU
 STRM CUT, YLW RNG

SH: 80%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, IMBD PYRC
 LAMN , NO FLOR, IMMED BLU
 STRM CUT, YLW RNG

SHARON SPRINGS
 6183' MD 6129' TVD

SH: 85%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, IMBD PYRC
 LAMN , 3% YL FLOR, IMMED BLU
 STRM CUT, YLW RNG

SH: 65%: BLK - DRKGY, BLKY TO
 SPLT, SLTY TO SMTH TXT, FRM TO
 SFT, SCAT FREE SILT, IMBD PYRC
 LAMN , 5% YL FLOR, IMMED BLU
 STRM CUT, YLW RNG



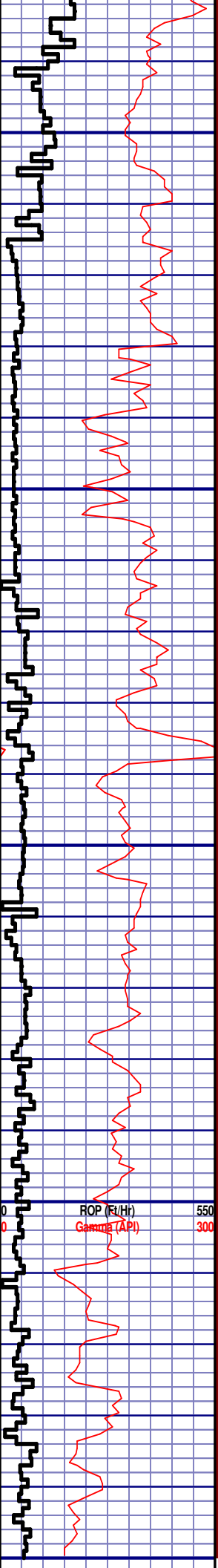
CG 515u

TRIP GAS 928u

CG 453u

TG, C1-C4

2700



MD 6254 TVD 6184.58
 INC 40.87 AZ 271.19
 VS 68.02

MD 6301 TVD 6218.86
 INC 45.45 AZ 271.01
 VS 100.13

MD 6349 TVD 6250.55
 INC 51.86 AZ 271.25
 VS 136.12

MD 6396 TVD 6277.64
 INC 57.71 AZ 270.27
 VS 174.48

MD 6444 TVD 6300.96
 INC 64.12 AZ 267.75
 VS 216.4

6200
6300
6350
6400
6450



NIOBRARA
 6230' MD 6168' TVD

MRL: 30%: BLK - DRKGY, BLKY, SLTY TO SMTH TXT, FRM TO SFT, TRC IMBD PYRC LAMN, IMB SH LAMN, IMBED CALC INCLUS, 3% YLW FLOR, IMMED BLU STRM CUT, YLW RNG

MRL: 32%: BLK - DRKGY, BLKY, SLTY TO SMTH TXT, FRM TO SFT, TRC IMBD PYRC LAMN, IMB SH LAMN, IMBED CALC INCLUS, 8% YL FLOR, IMMED BLU STRM CUT, YLW

NIOBRARA A CHALK
 6280' MD 6204' TVD

NIOBRARA A MARL
 6306' MD 6222' TVD

CHLK: 52%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, IMBD PYRC NOD, IMBD SH INCLUS, NO STN, 5% YL FLOR, IMMED BLU STRMG CUT, NO RNG

MRL: 37%: BLK - DRKGY, BLKY, SLTY TO SMTH TXT, FRM TO SFT, TRC IMBD PYRC LAMN, IMB SH LAMN, IMBED CALC INCLUS, 3% YL FLOR, IMMED BLU STRM CUT, YLW RNG

NIOBRARA B CHALK
 6353' MD 6253' TVD

CHLK: 52%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, IMBD SH INCLUS, NO STN, 3% YL FLOR, IMMED BLU STRMG CUT, YLW RNG

CHLK: 62%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, IMBD PYRC NOD, IMBD SH INCLUS, NO STN, 1% YL FLOR, IMMED BLU STRMG CUT, YLW RNG

CHLK: 69%: LTGY - V/LTGY, BLKY, V/FXLN TO FXLN, SFT, IMBD PYRC NOD, IMBD SH INCLUS, NO STN, 1% YL FLOR, IMMED BLU STRMG CUT, YLW RNG

CG 516u

MD 6318'
 WT 10.50
 VIS 36
 PV 12
 YP 15
 GEL 5/14/18
 FIL 8.6
 SOL 10.2
 H2O 89.5
 PH 9.2
 CL 2100
 CAL 80
 OIL 0

CG 788u

-300 TG, C1-C4 2700

END OF VERTICAL LOG @ 6450'
MD ON 3/24/2013, CONTINUED ON
HORIZONTAL LOG.

00