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Tulsa, Oklahoma 74136-6378

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fax 866.534.4559

WWW.HZMUD.COM

### Customer Information

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

**Geologist:** Holly Sell  
Noble Energy Inc.

### Mud Logging Details

**Logger:** Nikki Graber  
Cory Shorette

**Log Interval:** 2500' MD to 6800' MD

**Start Date:** April 11, 2013

**Release Date:** April 16, 2013

### Well Information

**Well Name:** Wells Ranch AE05-63HN

**Location:** 6-T6N-R62W  
1322' FSL, 105' FEL

**County:** Weld  
**State:** Colorado

**Drilling Rig:** H&P 343

**Total Depth:** 11116' MD

**TD Date:** April 16, 2013

**Formation:** Niobrara B Chalk

**KB Elevation:** 4969'

**GR Elevation:** 4945'

**API Number:** 05-123-36770

### ROCK TYPES

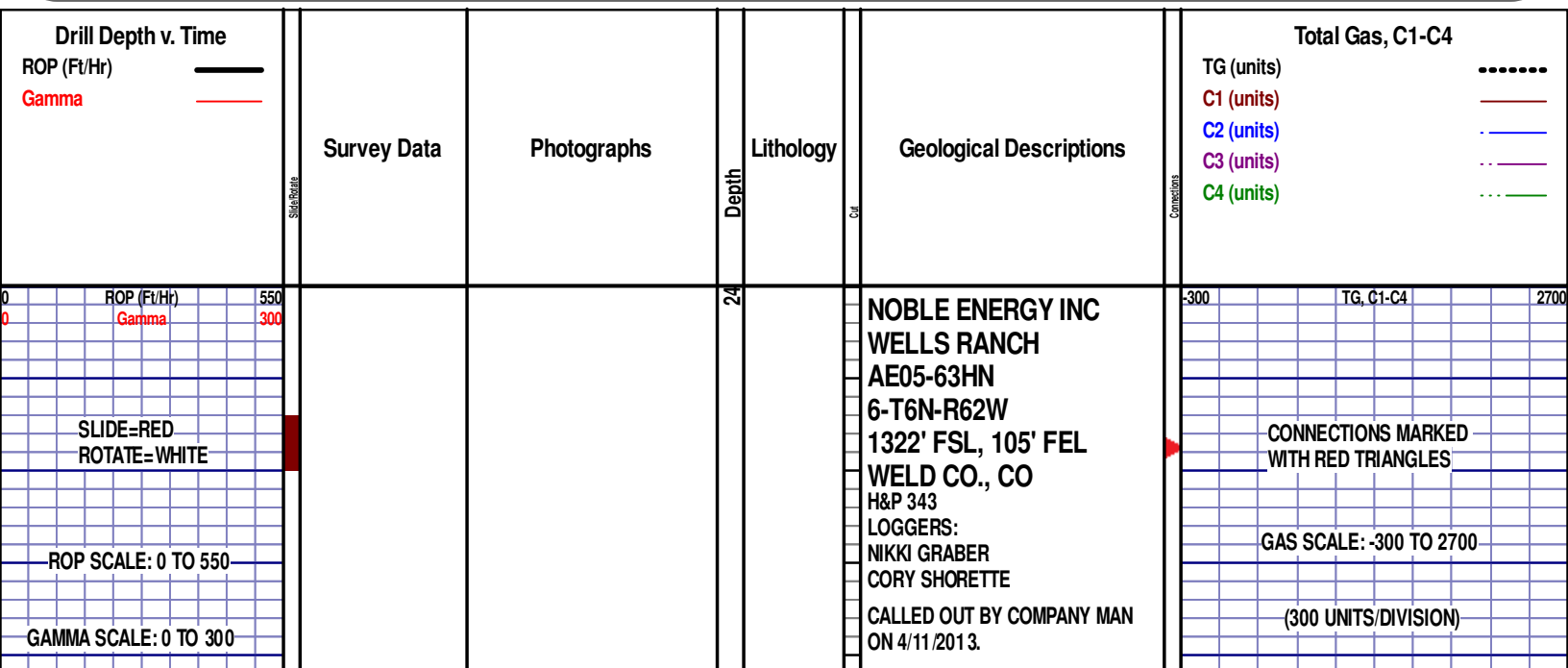
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 Bent  
 Brec  
 Cht  
 Clyst  
 Coal  
 Congl

Dol  
 Gyp  
 Igne  
 Chk  
 Lmst  
 Meta  
 Mrlst

Salt  
 Shale  
 Shcol  
 Shgy  
 Sltst  
 Ss  
 Till

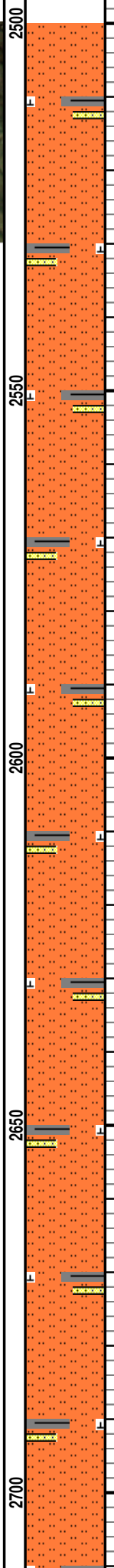
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 ogw  
 olmywash  
 oshly gw  
 shly gw  
 sdygw

hvycrbsh  
 NO SMPL  
 nosmpl  
 Lsdetrst  
 sltst  
 sdy sh  
 Cement



WOB 4.2K  
PP 2194  
RPM 75  
SPM 67/67

MD 2509 TVD 2508.67  
INC 3.17 AZ 124.56  
VS -12.65



COMMENCED LOGGING @ 2500'  
MD @ 10:30 PM ON 4/11/2013 W/  
BIT #2 8.75" SMITH MDi516 S/N  
JG7601 IN @ 677' MD.  
**PIERRE**  
(TOP CALL PRIOR TO SAMPLES)

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

SLTST: 85%: MEDGY - LTGY, FRI,  
V/FN GRN, MODY SRTD, CALC CMT,  
ABNT IMBD SH, TRC FREE SS, NO  
FLOR, NO CUT, NO RNG

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

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

MD 2603 TVD 2602.46  
INC 4.5 AZ 108.73  
VS -7.11

MD 2699 TVD 2698  
INC 6.62 AZ 105.22  
VS 1.71

DRILLING ON WBM

MD 637'  
WT 8.60  
VIS 26  
PV 4  
YP 1  
GEL 1/2/3  
FIL 21.0  
SOL 1.6  
H2O 98.1  
PH 7.9  
CL 2500  
CAL 340  
OIL 0

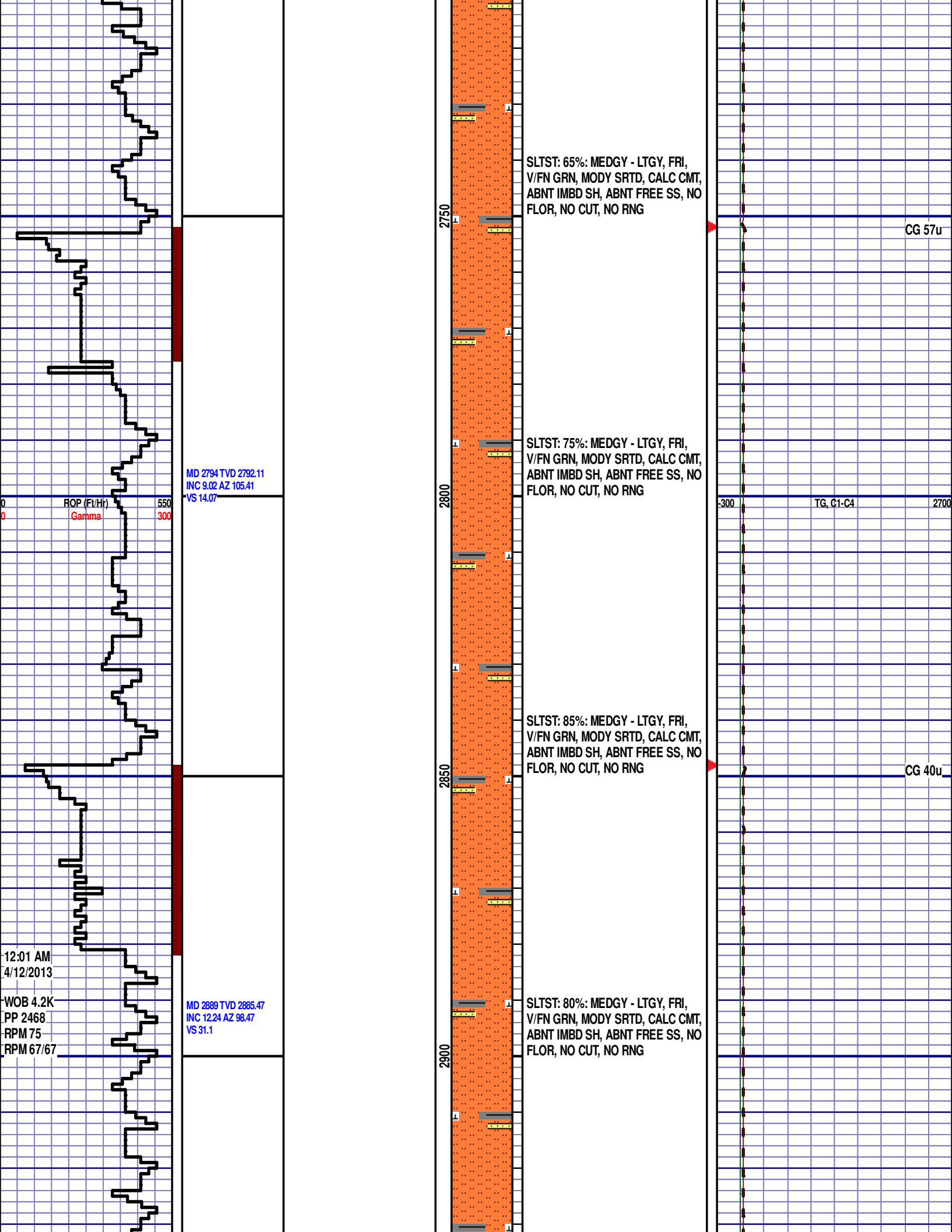
CG 39u

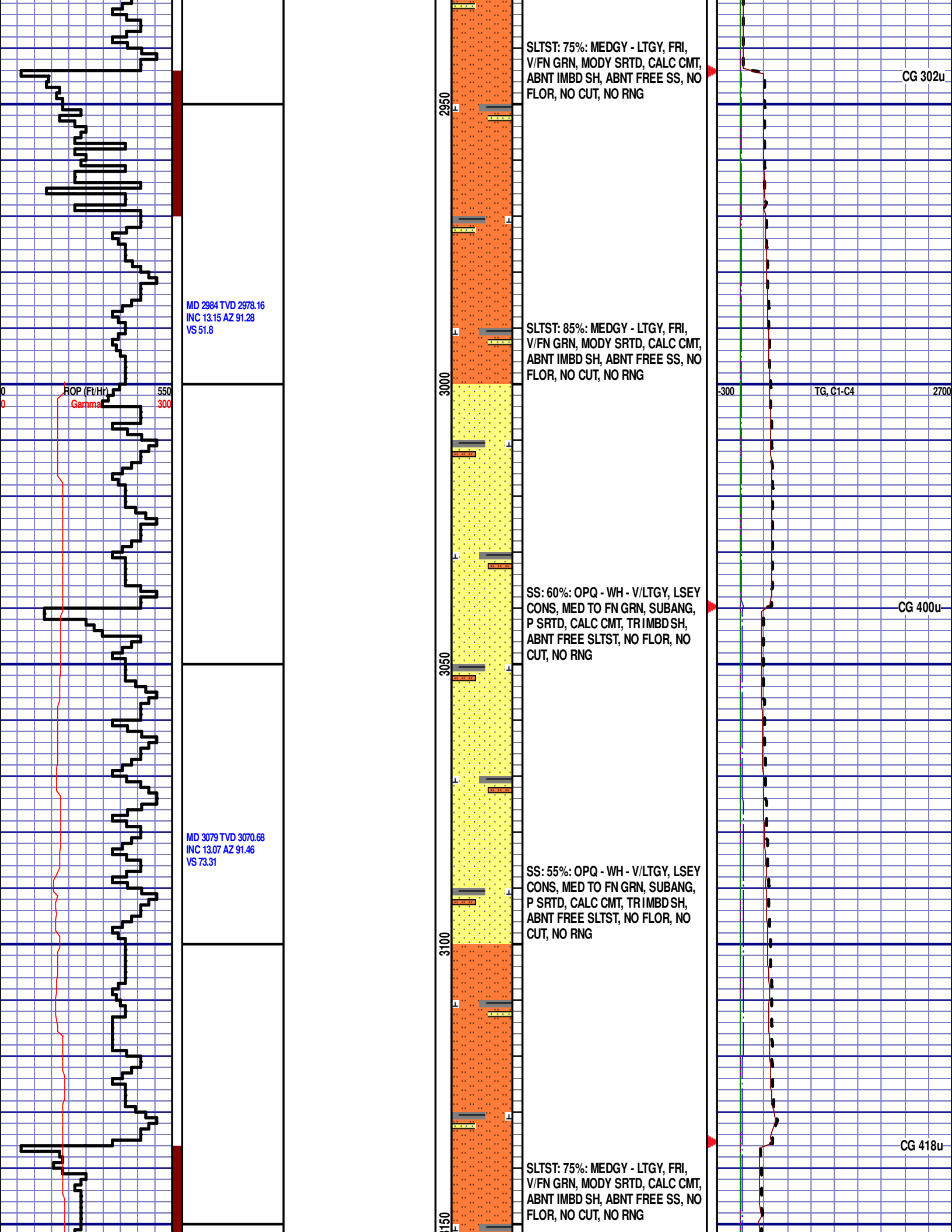
TG, C1-C4

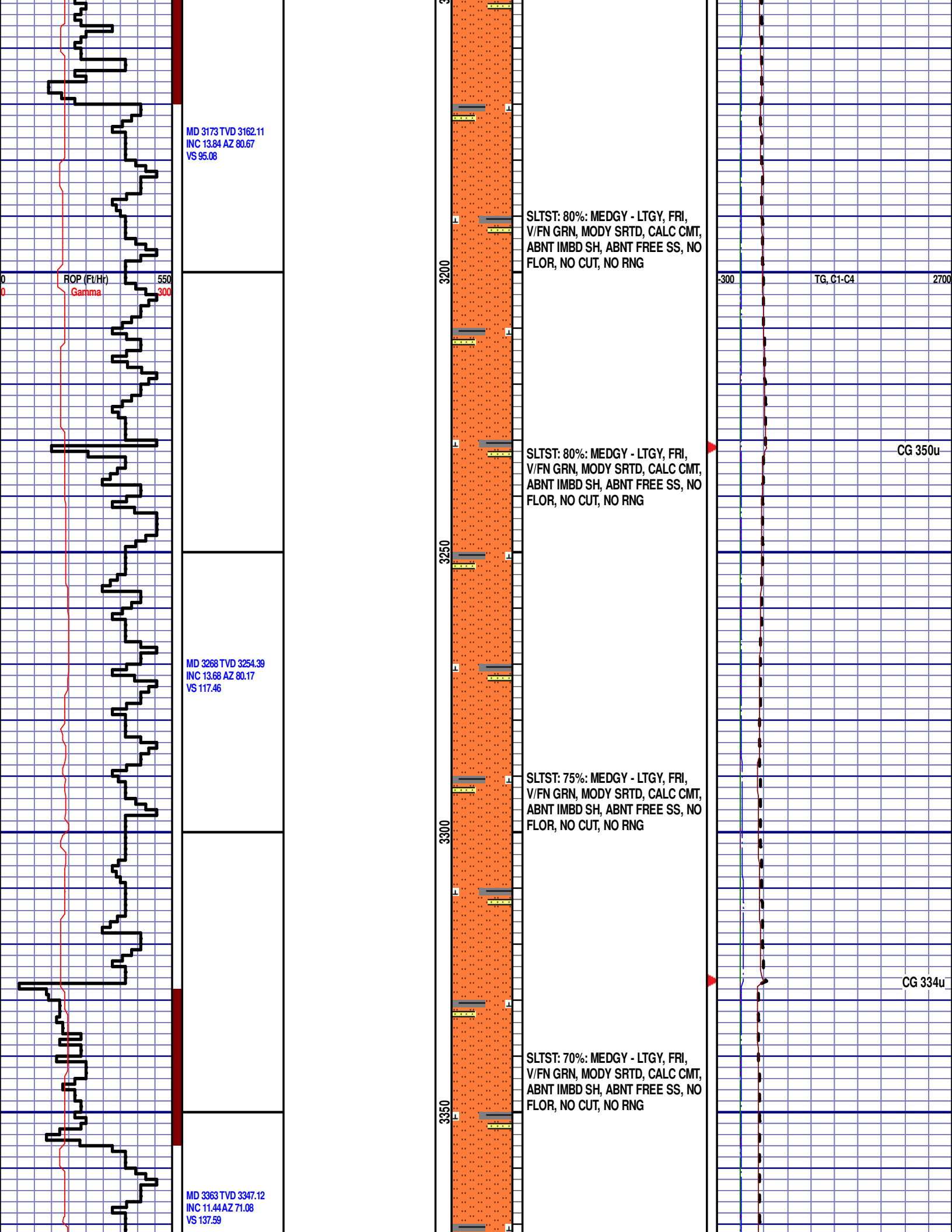
CG 38u

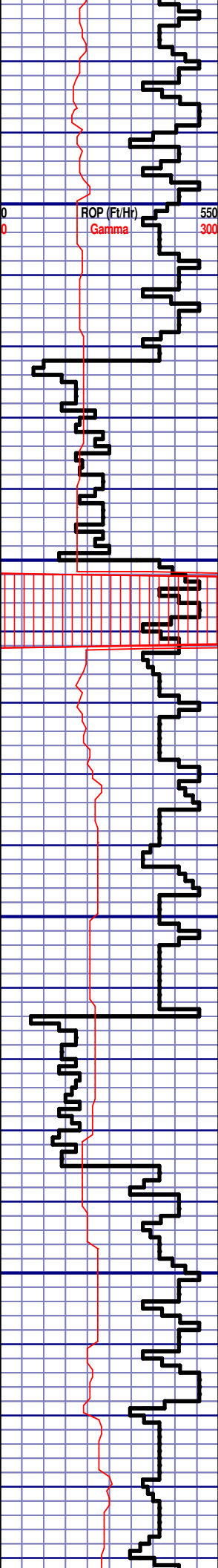
ROP (Ft/Hr)  
Gamma



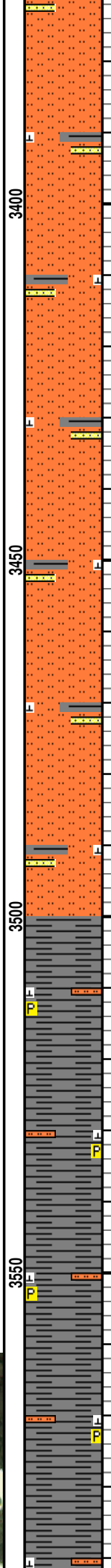
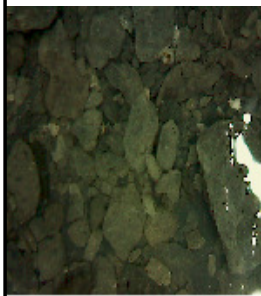








MD 3458 TVD 3440.7 INC 8.33 AZ 66.42 VS 152.99	
MD 3553 TVD 3534.92 INC 6.32 AZ 61.43 VS 164.05	



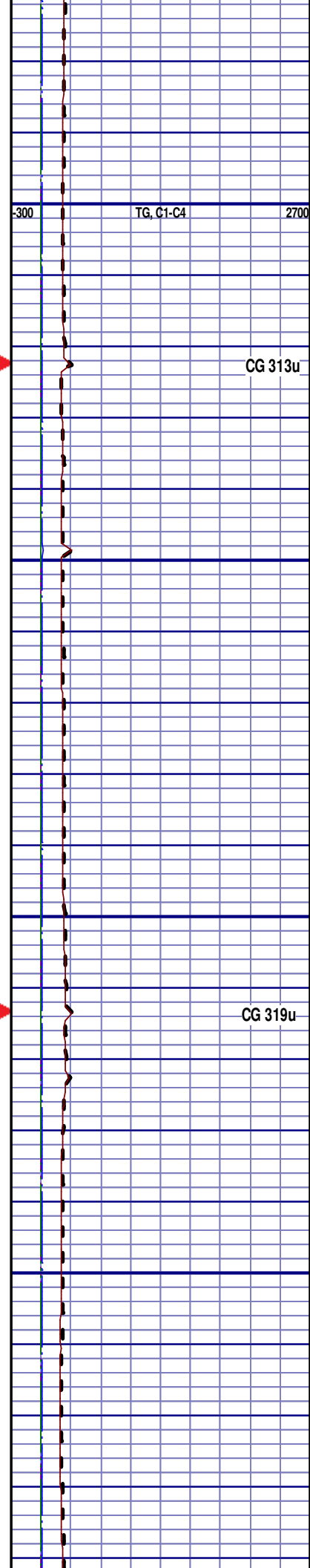
SLTST: 90%: MEDGY - LTGY, FRI,  
V/FN GRN, MODY SRTD, CALC CMT,  
ABNT IMBD SH, ABNT FREE SS, NO  
FLOR, NO CUT, NO RNG

SLTST: 95%: MEDGY - LTGY, FRI,  
V/FN GRN, MODY SRTD, CALC CMT,  
ABNT IMBD SH, ABNT FREE SS, NO  
FLOR, NO CUT, NO RNG

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

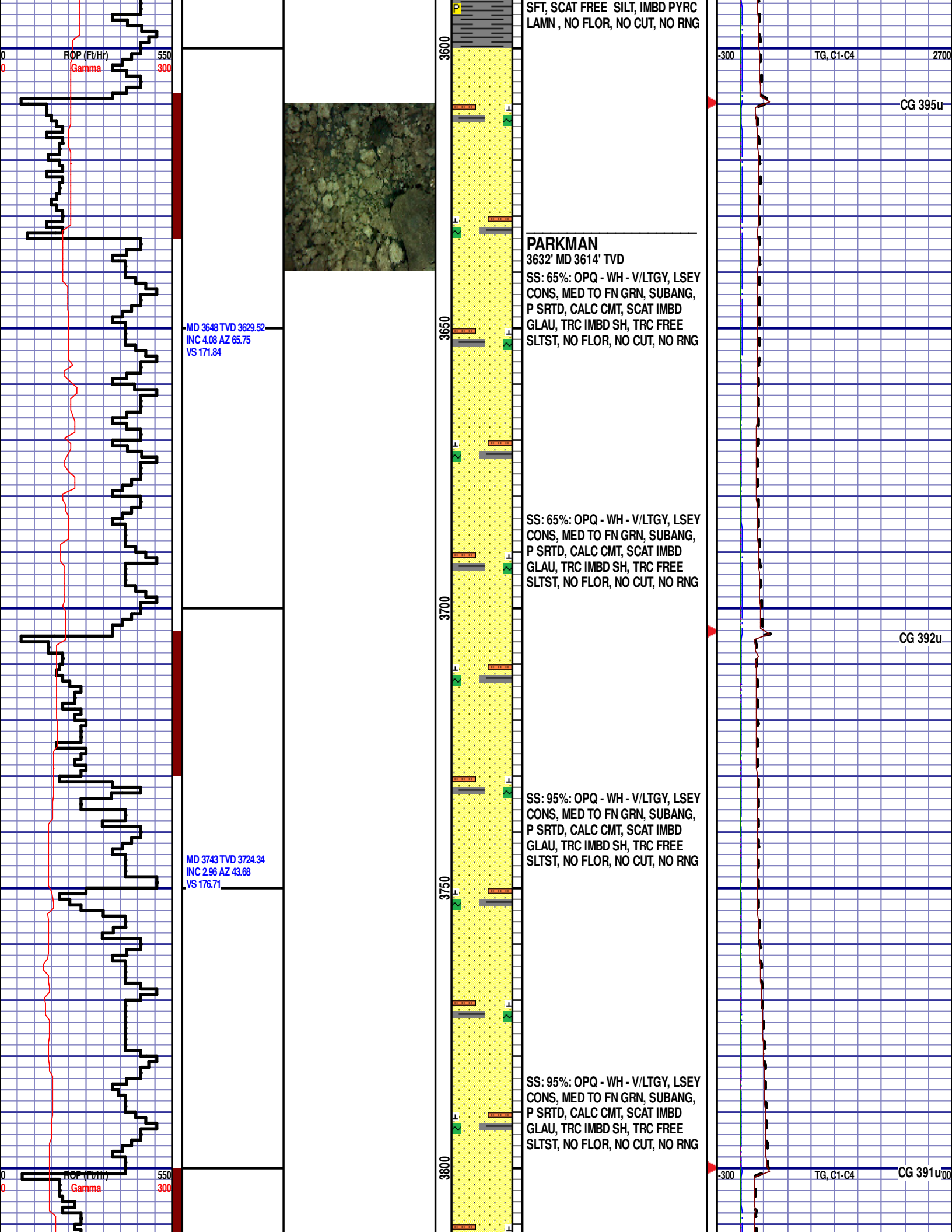
SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, SCAT FREE SILT, IMBD PYRC  
LAMN , NO FLOR, NO CUT, NO RNG

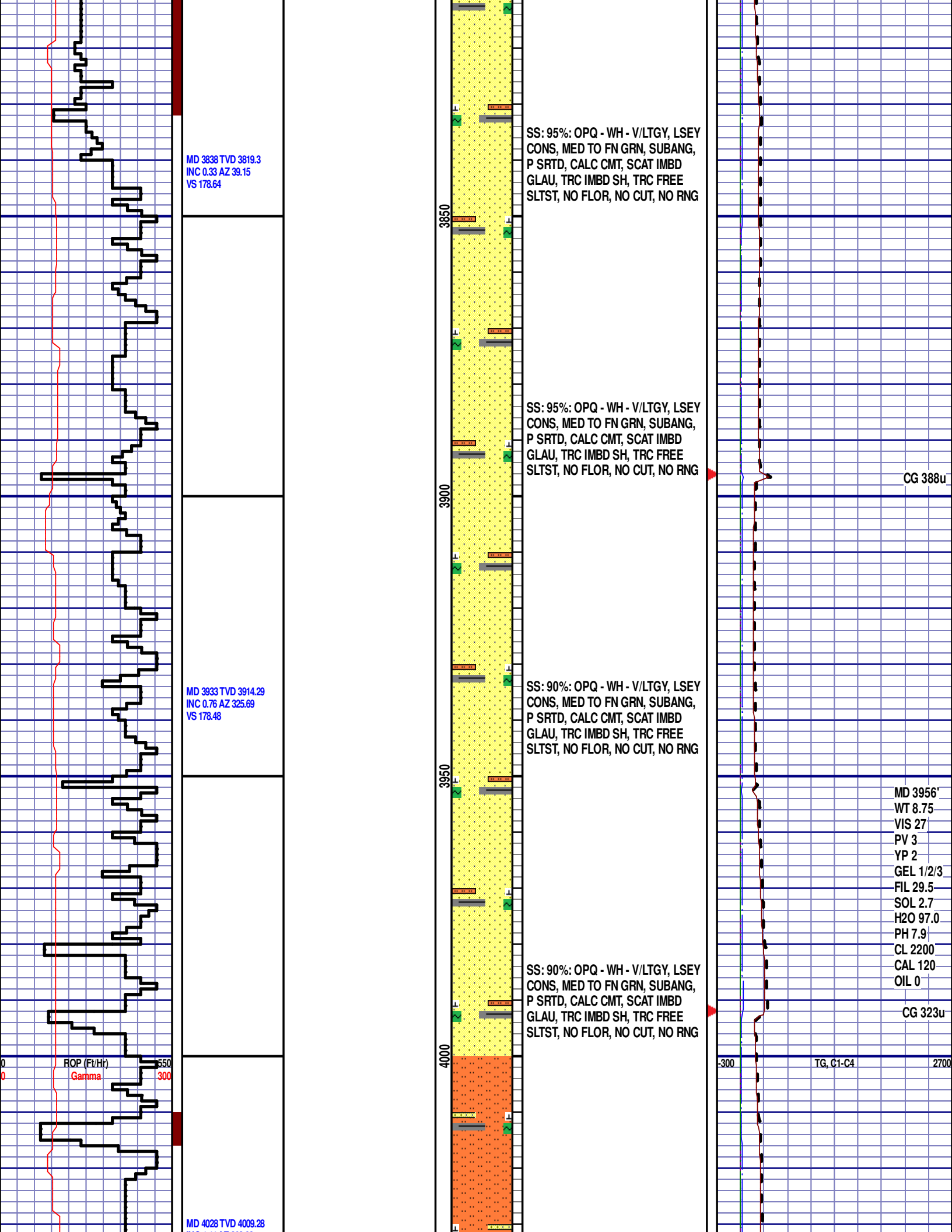
SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO



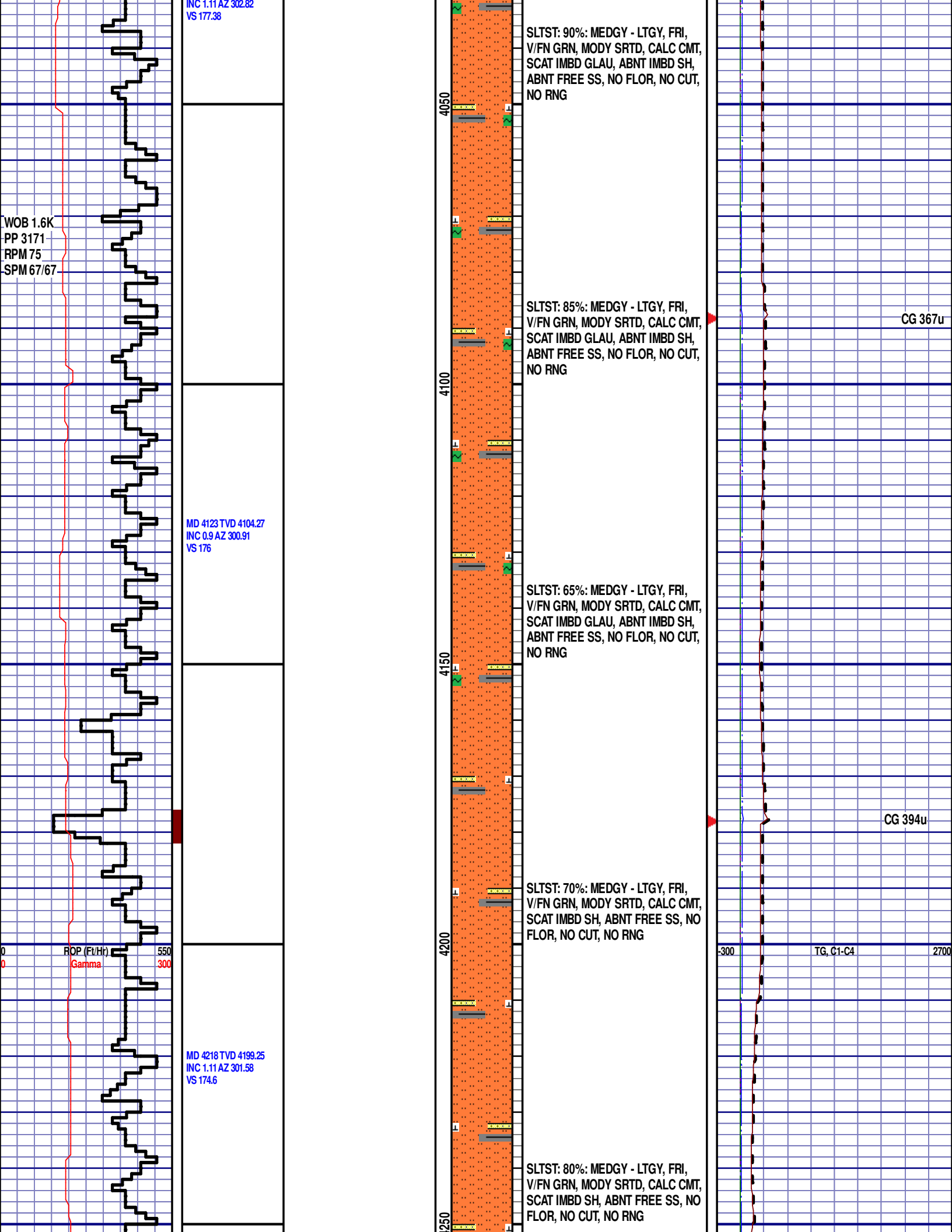
CG 313u

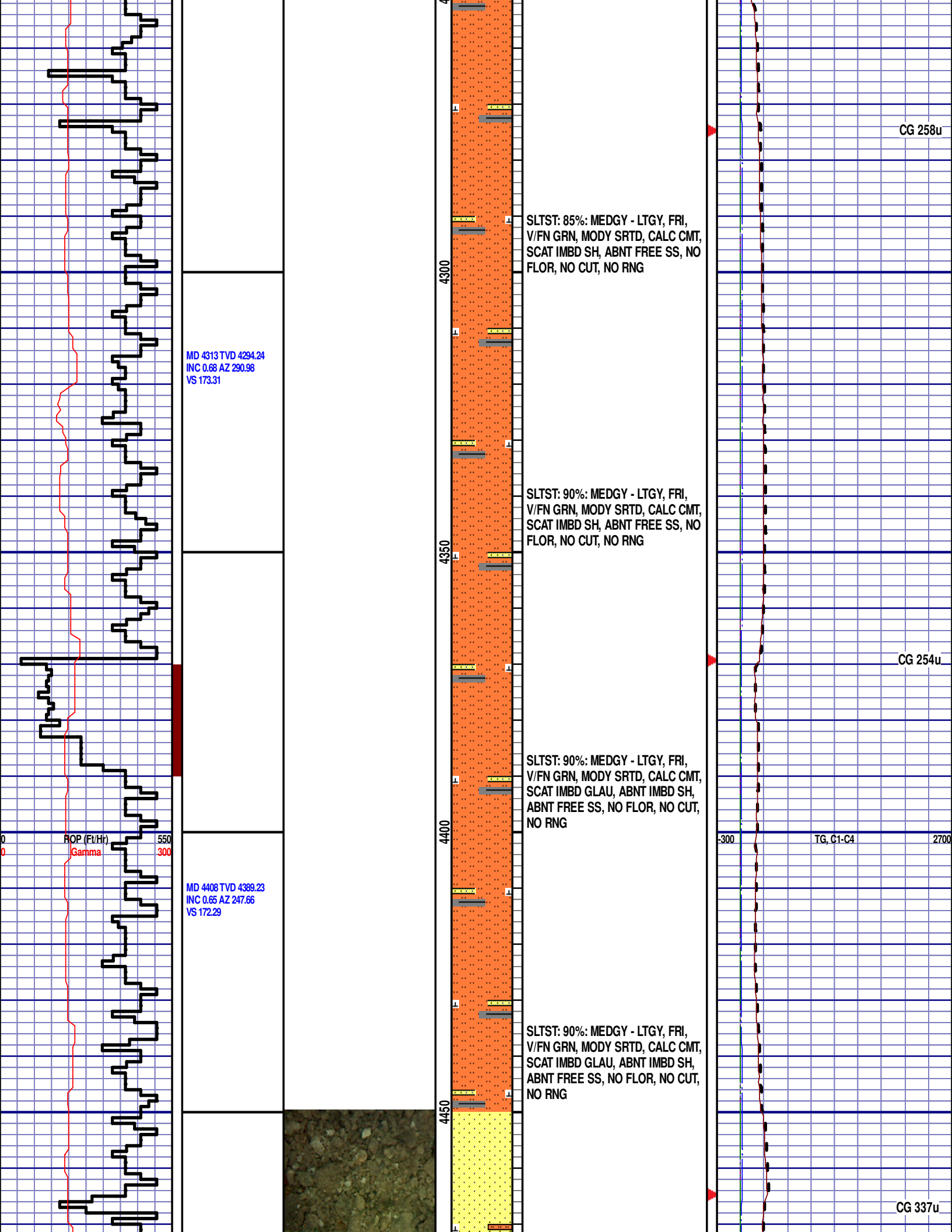
CG 319u

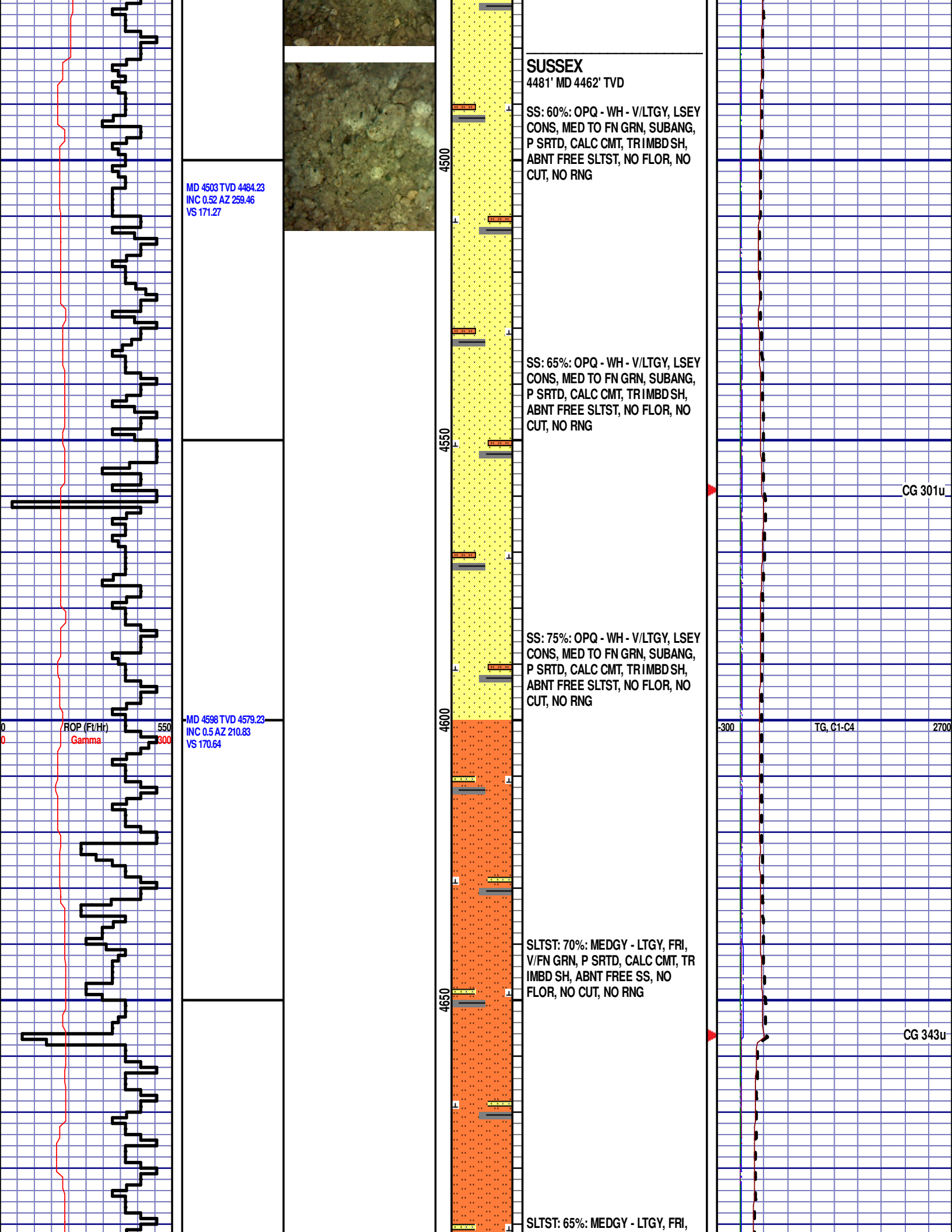


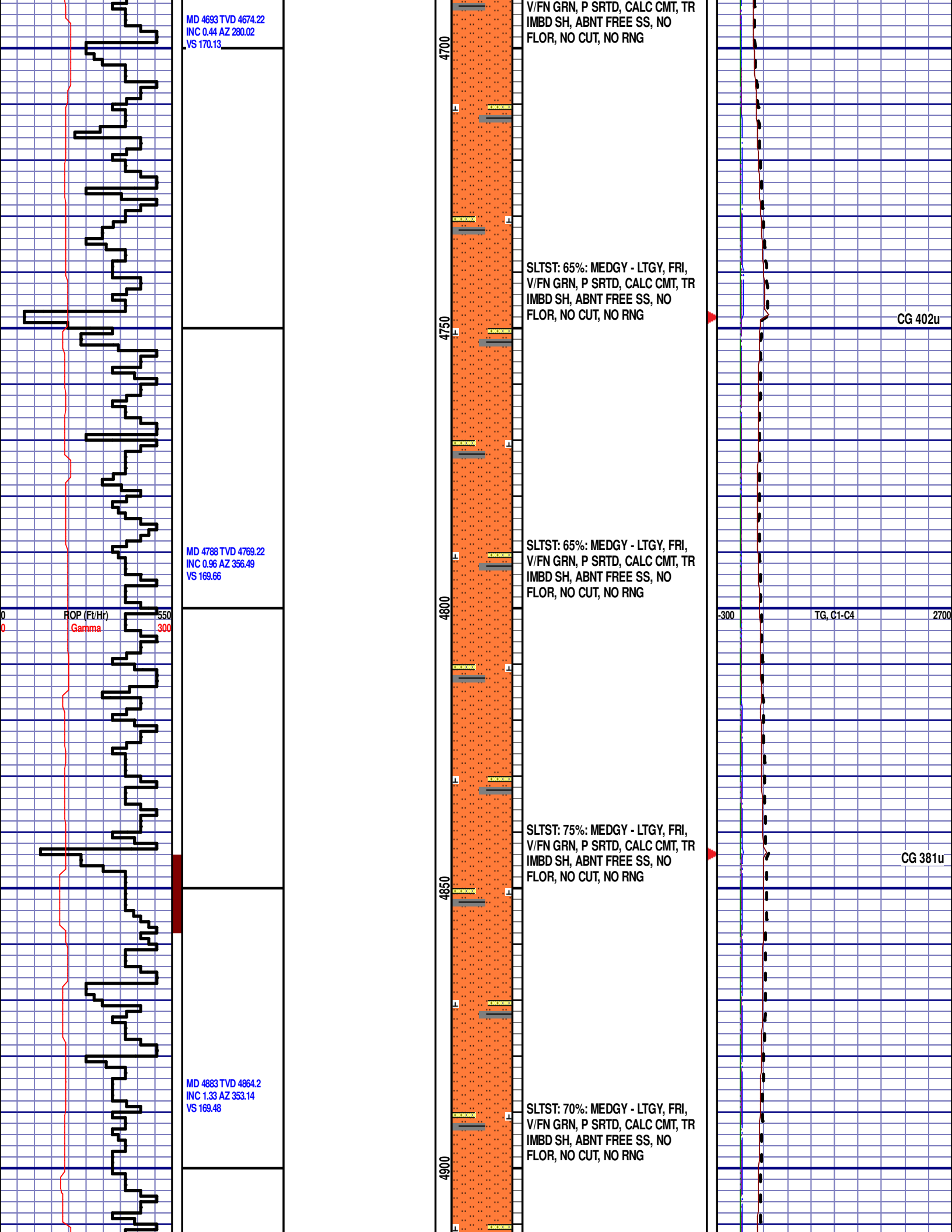


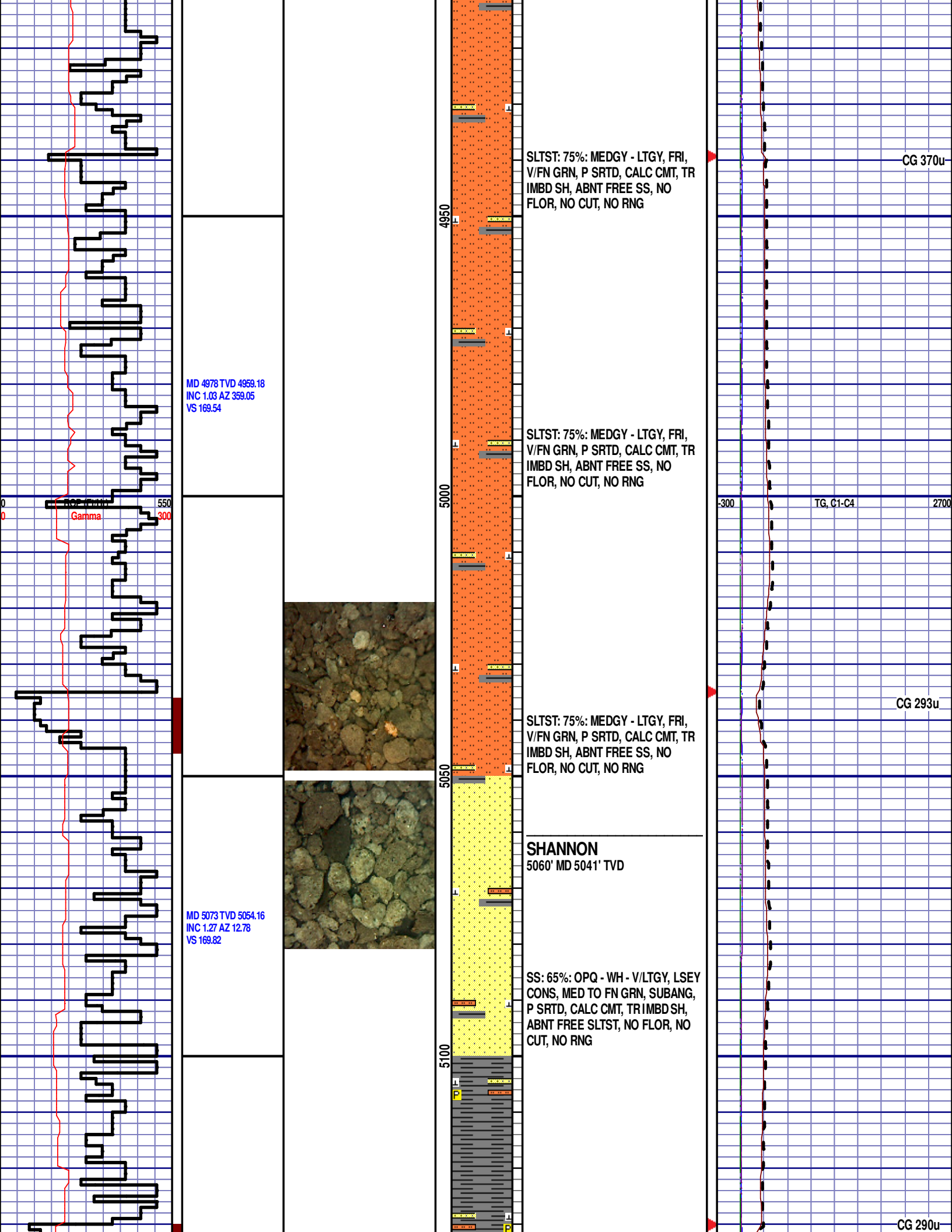


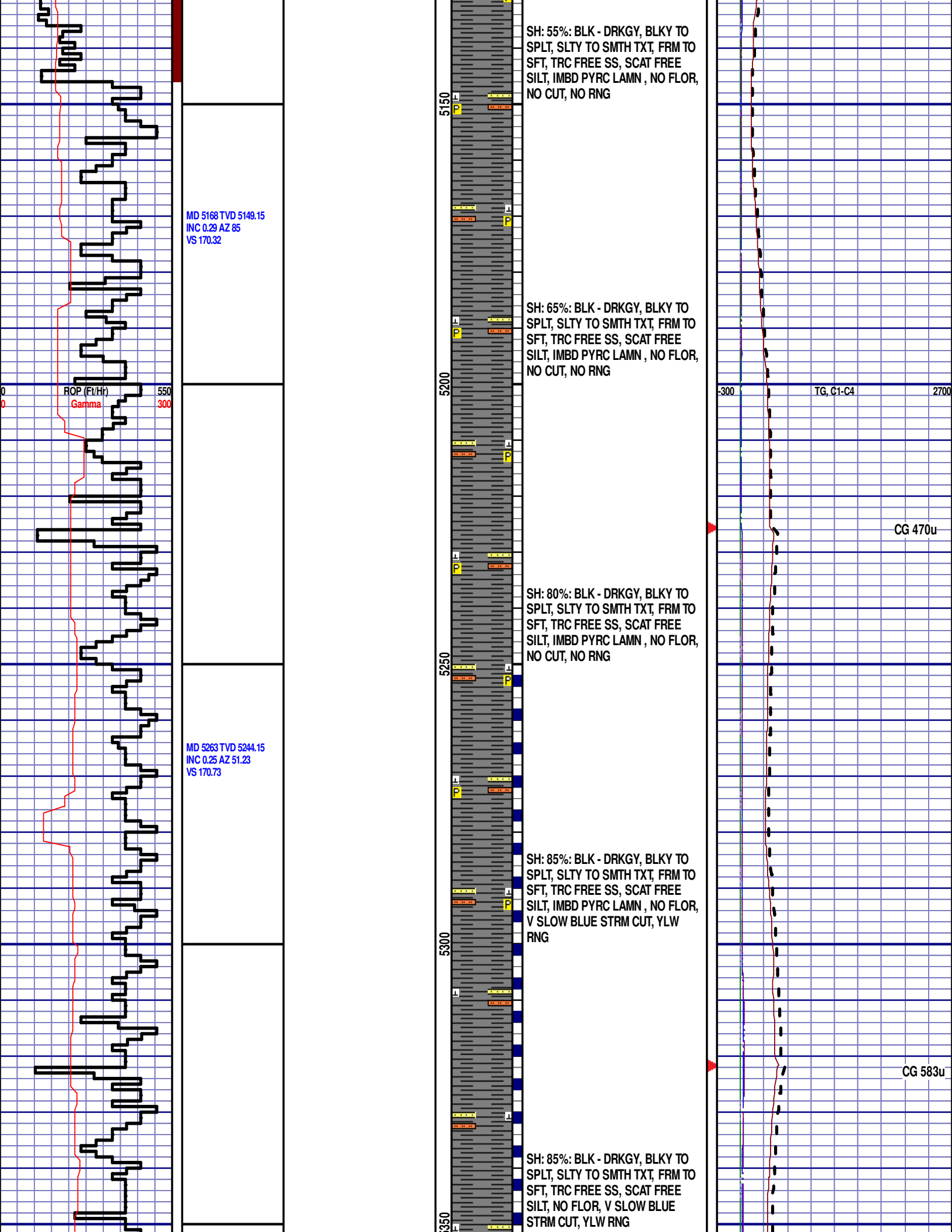


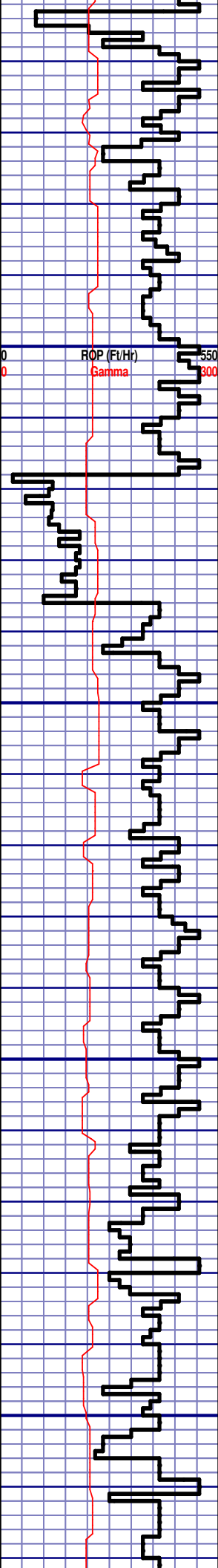








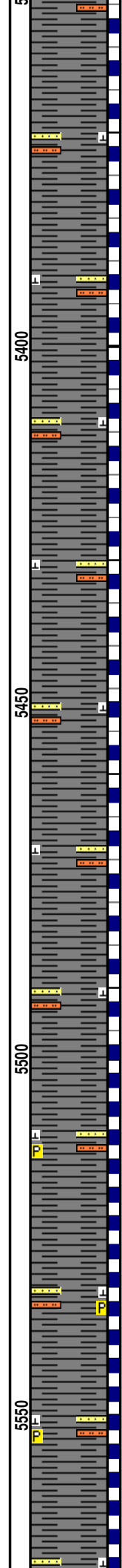




MD 5358 TVD 5339.15  
INC 0.2 AZ 32.13  
VS 170.99

MD 5453 TVD 5434.14  
INC 1.24 AZ 239.84  
VS 170.17

MD 5548 TVD 5529.11  
INC 1.72 AZ 268.54  
VS 167.84

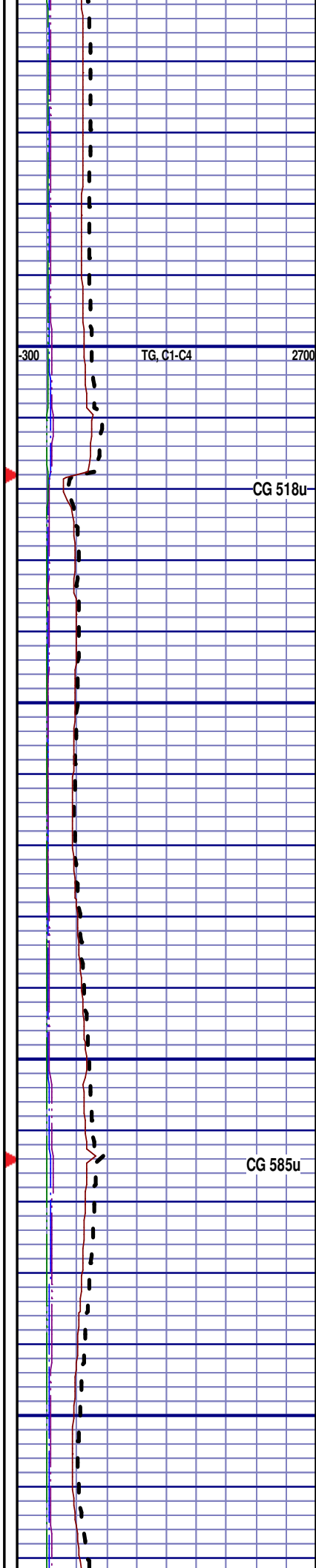


SH: 85%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, TRC FREE SS, SCAT FREE SILT, NO FLOR, V SLOW BLUE STRM CUT, YLW RNG

SH: 85%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, TRC FREE SS, SCAT FREE SILT, NO FLOR, V SLOW BLUE STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, TRC FREE SS, SCAT FREE SILT, NO FLOR, V SLOW BLUE STRM CUT, YLW RNG

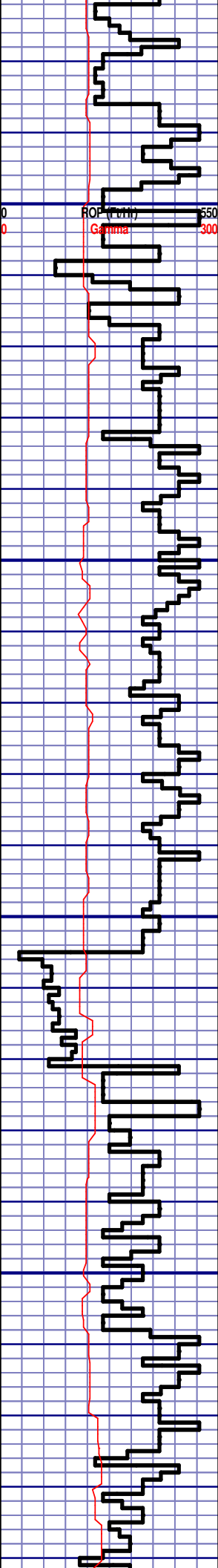
SH: 85%: BLK - DRKGY, BLKY TO SPLT, SLTY TO SMTH TXT, FRM TO SFT, TRC FREE SS, SCAT FREE SILT, IMBD PYRC LAMN, NO FLOR, SLOW BLUE STRM CUT, YLW RNG



TG, C1-C4

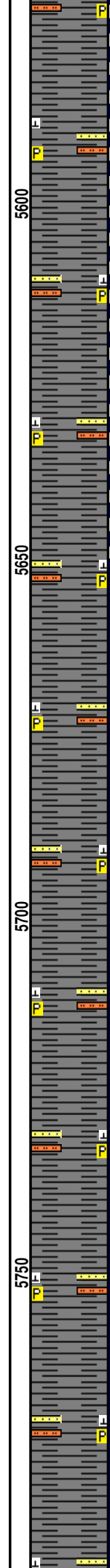
CG 518u

CG 585u



MD 5643 TVD 5624.08  
INC 1.2 AZ 268.59  
VS 165.42

MD 5738 TVD 5719.06  
INC 1.37 AZ 233.62  
VS 163.49



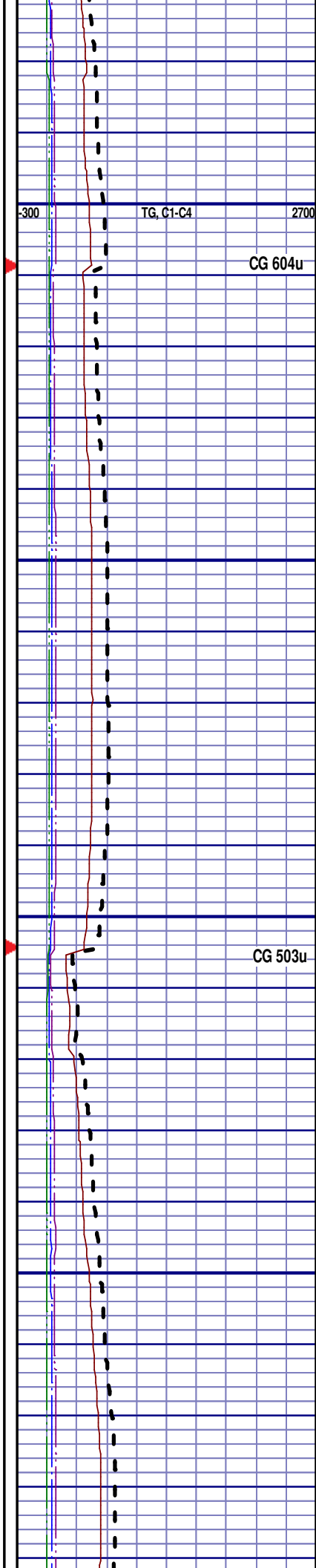
SH: 85%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN , NO FLOR,  
SLOW BLUE STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN , NO FLOR,  
SLOW BLUE STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN , NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

SH: 90%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN , NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE

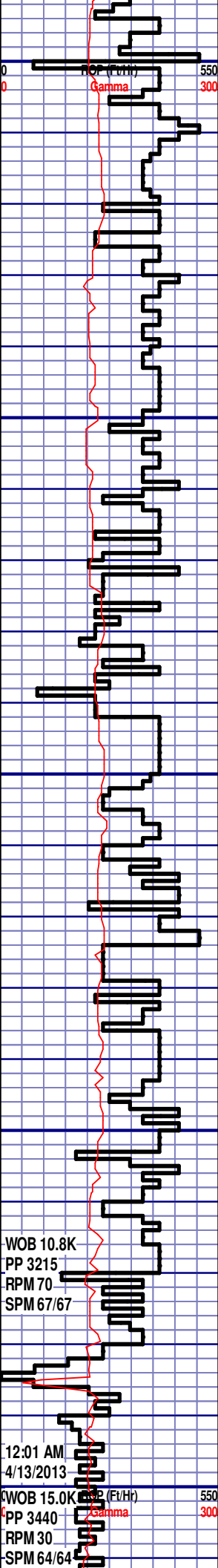


TG, C1-C4

CG 604u

CG 503u





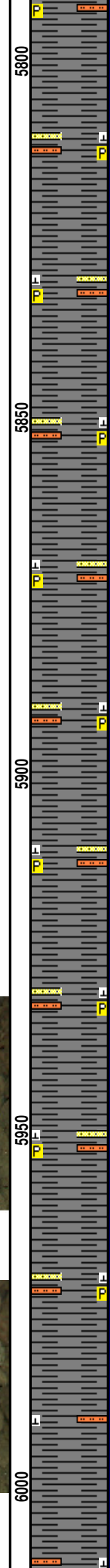
MD 5833 TVD 5814.03  
INC 1.19 AZ 235.82  
VS 161.73

MD 5928 TVD 5909.01  
INC 1.55 AZ 263.21  
VS 159.61

WOB 10.8K  
PP 3215  
RPM 70  
SPM 67/67

12:01 AM  
4/13/2013

WOB 15.0K  
PP 3440  
RPM 30  
SPM 64/64



SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN, NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN, NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

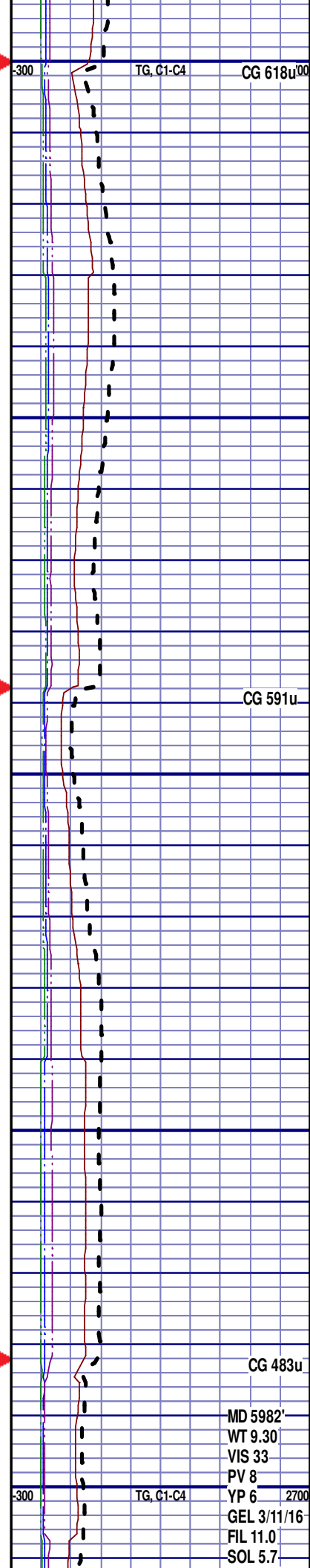
SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN, NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, TRC FREE SS, SCAT FREE  
SILT, IMBD PYRC LAMN, NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG

TOOH @ 12:10 PM ON 4/12/2013 @  
5982' MD TO PICK UP A NEW BIT  
AND MOTOR. TIH @ 5:15 ON  
4/12/2013. RESUMED DRILLING @  
11:50 PM ON 4/12/2013 W/ BIT #3  
8.75" HDBS FXD55 (S/N) 12025998  
IN @ 5982' MD.

**TEEPEE BUTTES**  
5965' MD 5946' TVD

SH: 95%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, SCAT FREE SILT, NO FLOR,  
IMMED BLUE STRM CUT, YLW RNG



TG, C1-C4

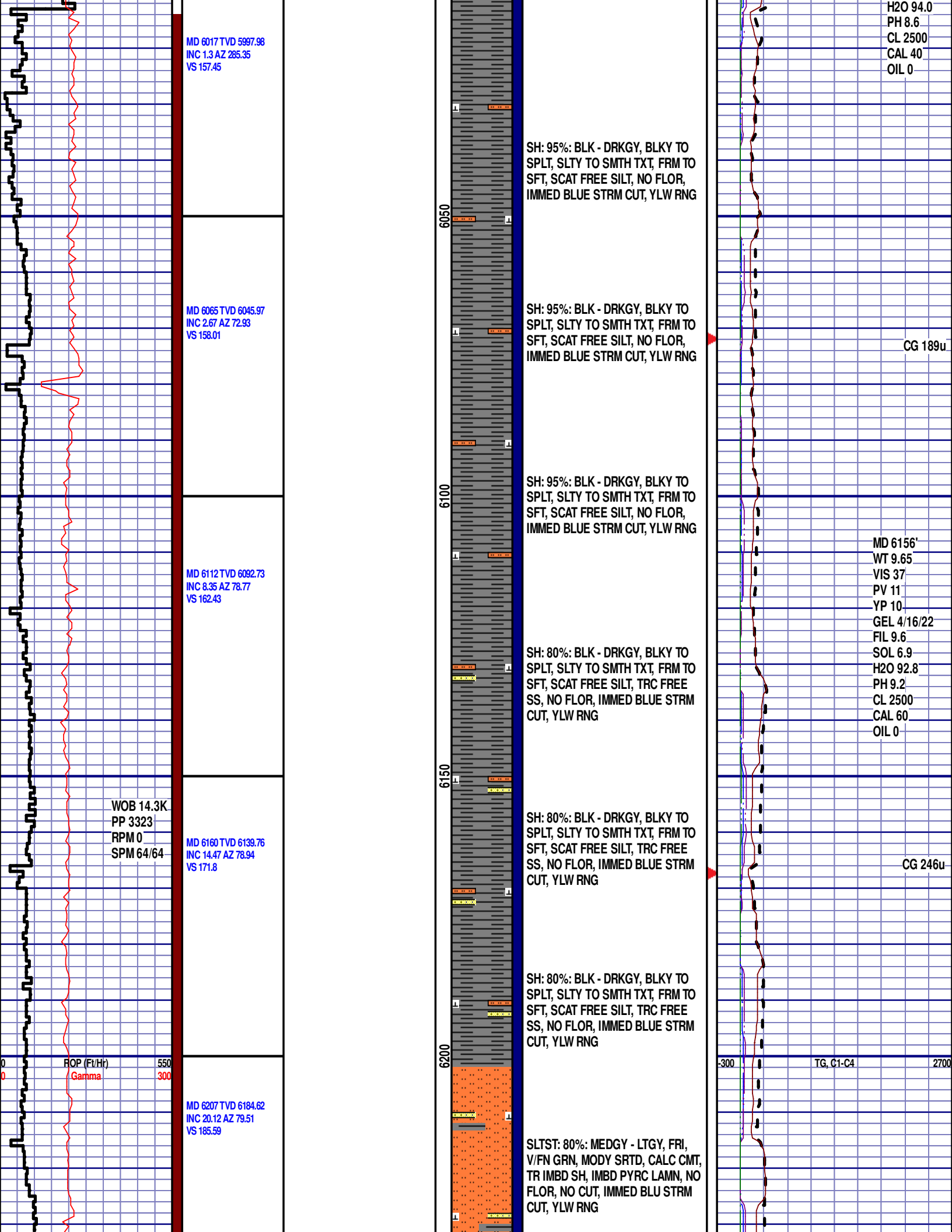
CG 618u00

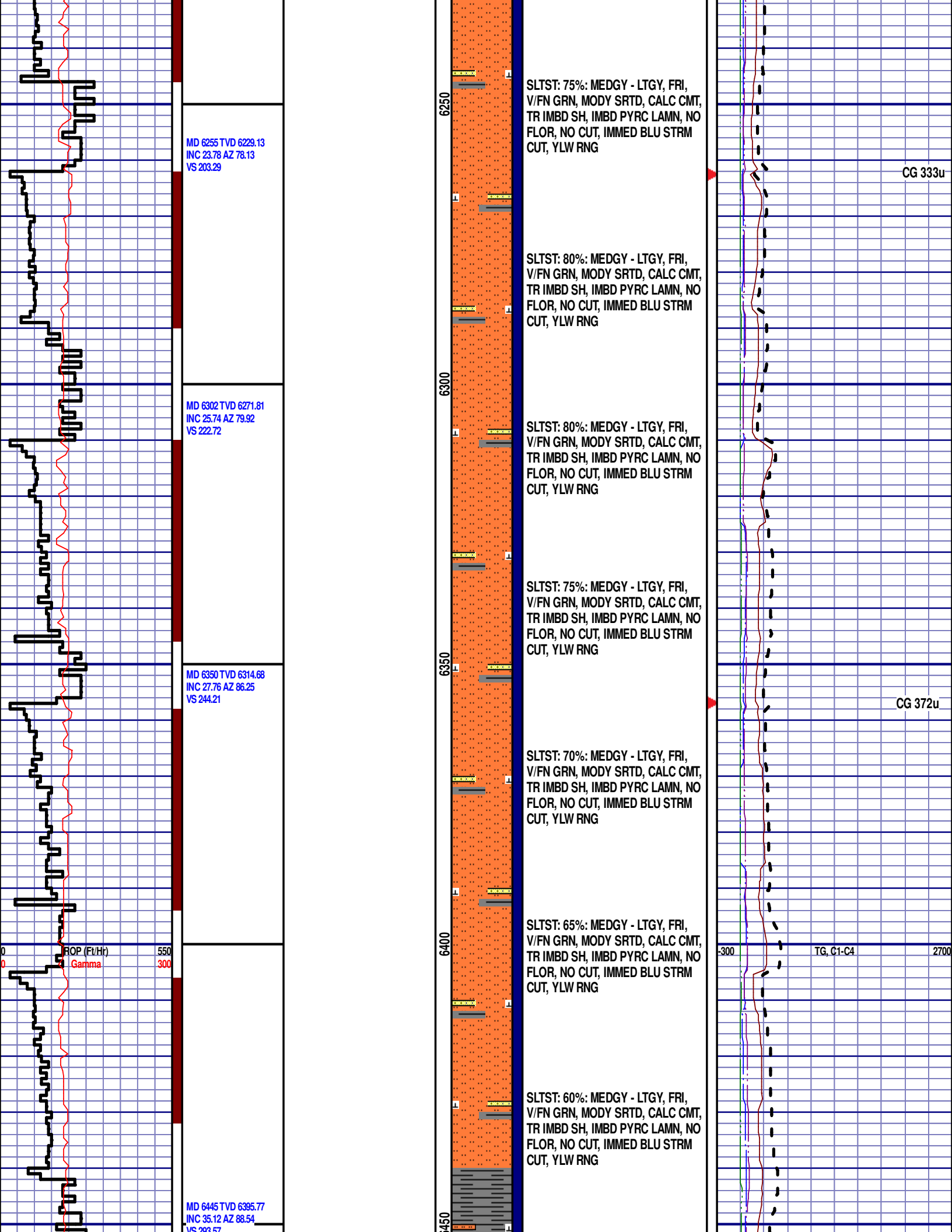
CG 591u

CG 483u

MD 5982'  
WT 9.30  
VIS 33  
PV 8

YP 6  
GEL 3/11/16  
FIL 11.0  
SOL 5.7





MD 6255 TVD 6229.13  
INC 23.78 AZ 78.13  
VS 203.29

MD 6302 TVD 6271.81  
INC 25.74 AZ 79.92  
VS 222.72

MD 6350 TVD 6314.68  
INC 27.76 AZ 86.25  
VS 244.21

MD 6445 TVD 6395.77  
INC 35.12 AZ 88.54  
VS 293.57

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

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

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

SLTST: 65%: MEDGY - LTGY, FRI,  
V/FN GRN, MODY SRTD, CALC CMT,  
TR IMBD SH, IMBD PYRC LAMN, NO  
FLOR, NO CUT, IMMED BLU STRM  
CUT, YLW RNG

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

CG 333u

CG 372u

TG, C1-C4

2700

