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## Customer Information

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

**Geologist:** Teresa Malesardi  
Noble Energy Inc

## Mud Logging Details

**Logger:** Alec Walker & Cory Shorette

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

**Start Date:** June 15, 2013

**Release Date:** June 22, 2013

## Well Information

**Well Name:** Wells Ranch USX AE07-69-1HN

**Location:** 12-6N-62W  
847' FNL, 66' FEL

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

**Drilling Rig:** H&P 277

**Total Depth:** 11096' MD

**TD Date:** June 22, 2013

**Formation:** Niobrara B Chalk

**KB Elevation:** 4912'

**GR Elevation:** 4888'

**API Number:** 05-123-37185

## ROCK TYPES

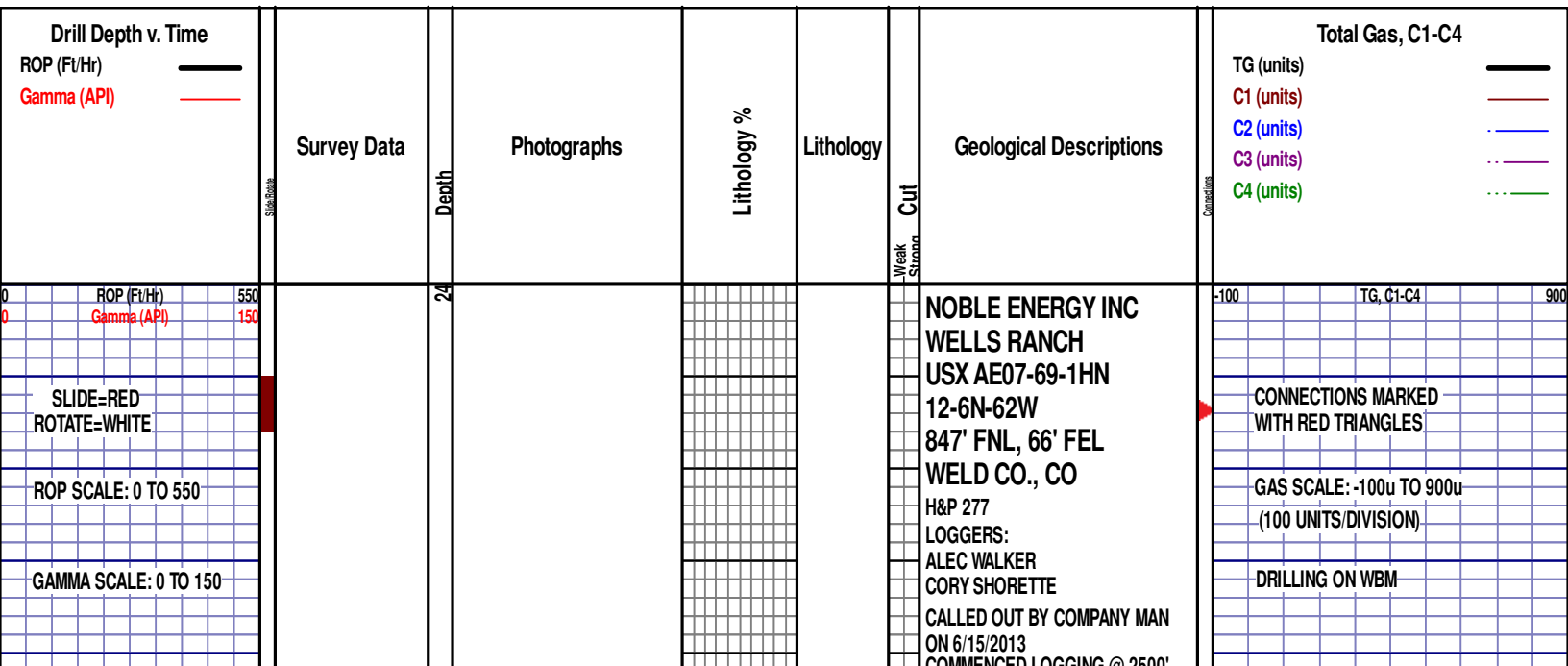
Anhy  
 Bent  
 Brec  
 Cht  
 Clyst  
 Coal  
 Congl

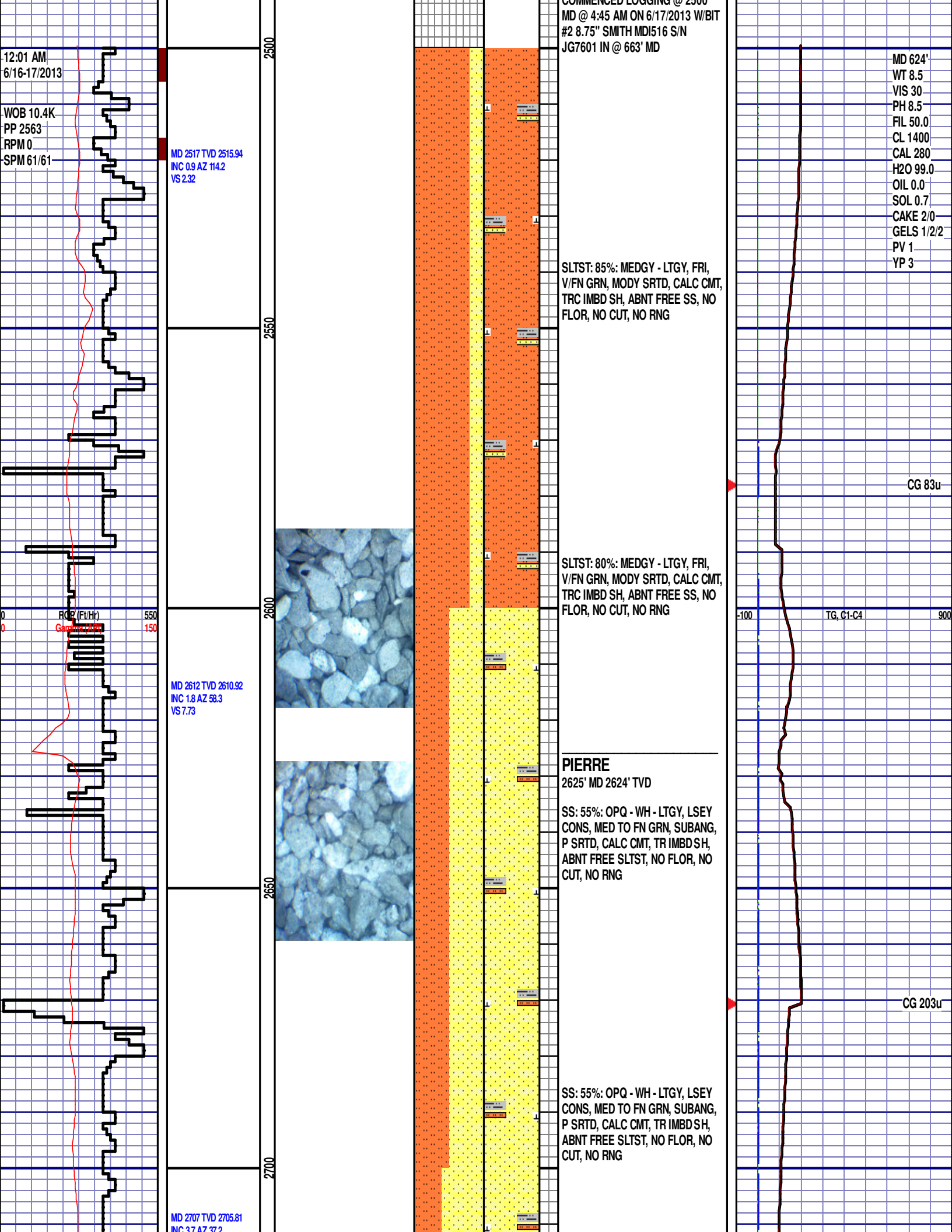
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 Gyp  
 Igne  
 Chk  
 Lmst  
 Meta  
 Mrlst

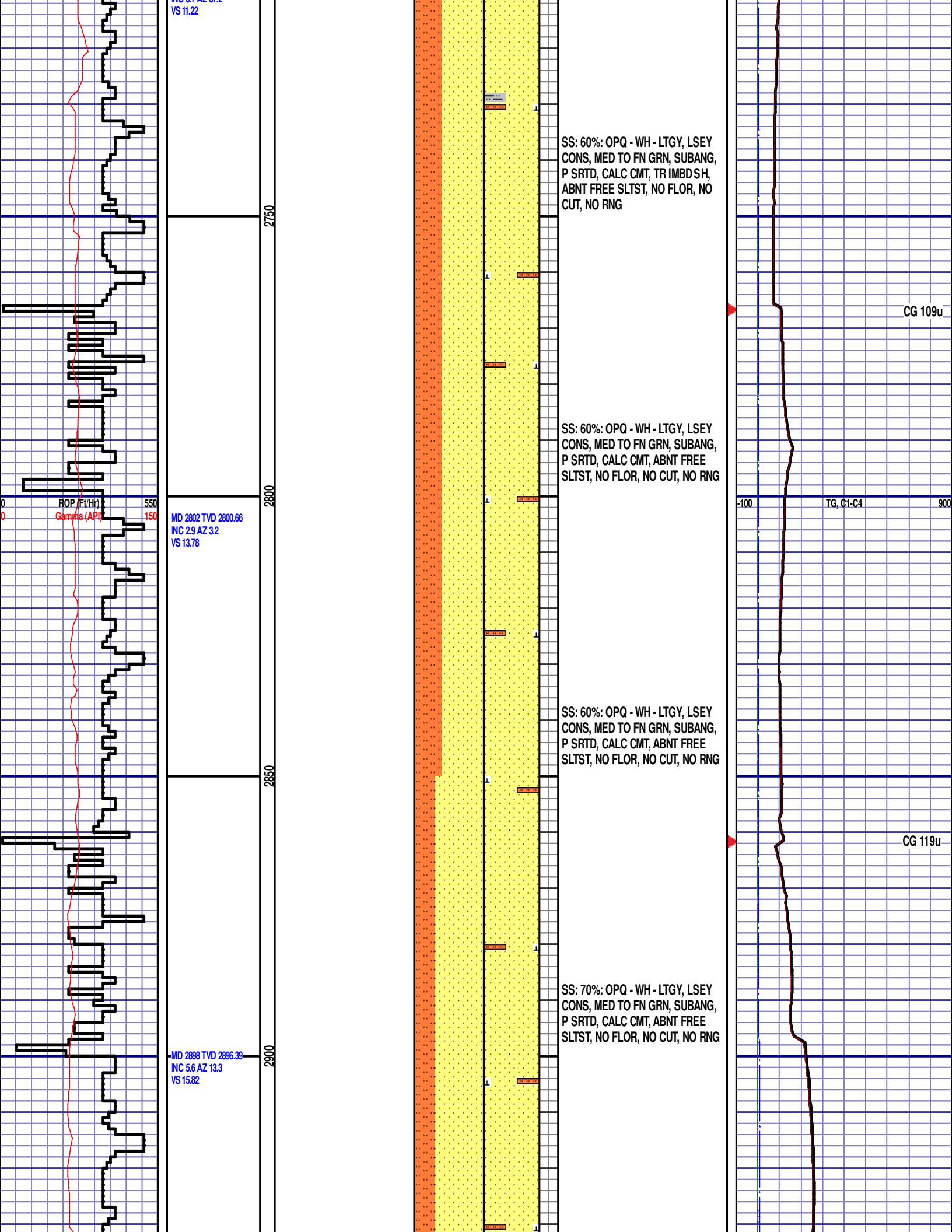
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 Shale  
 Shcol  
 Siltysh  
 Sltst  
 Ss  
 Till

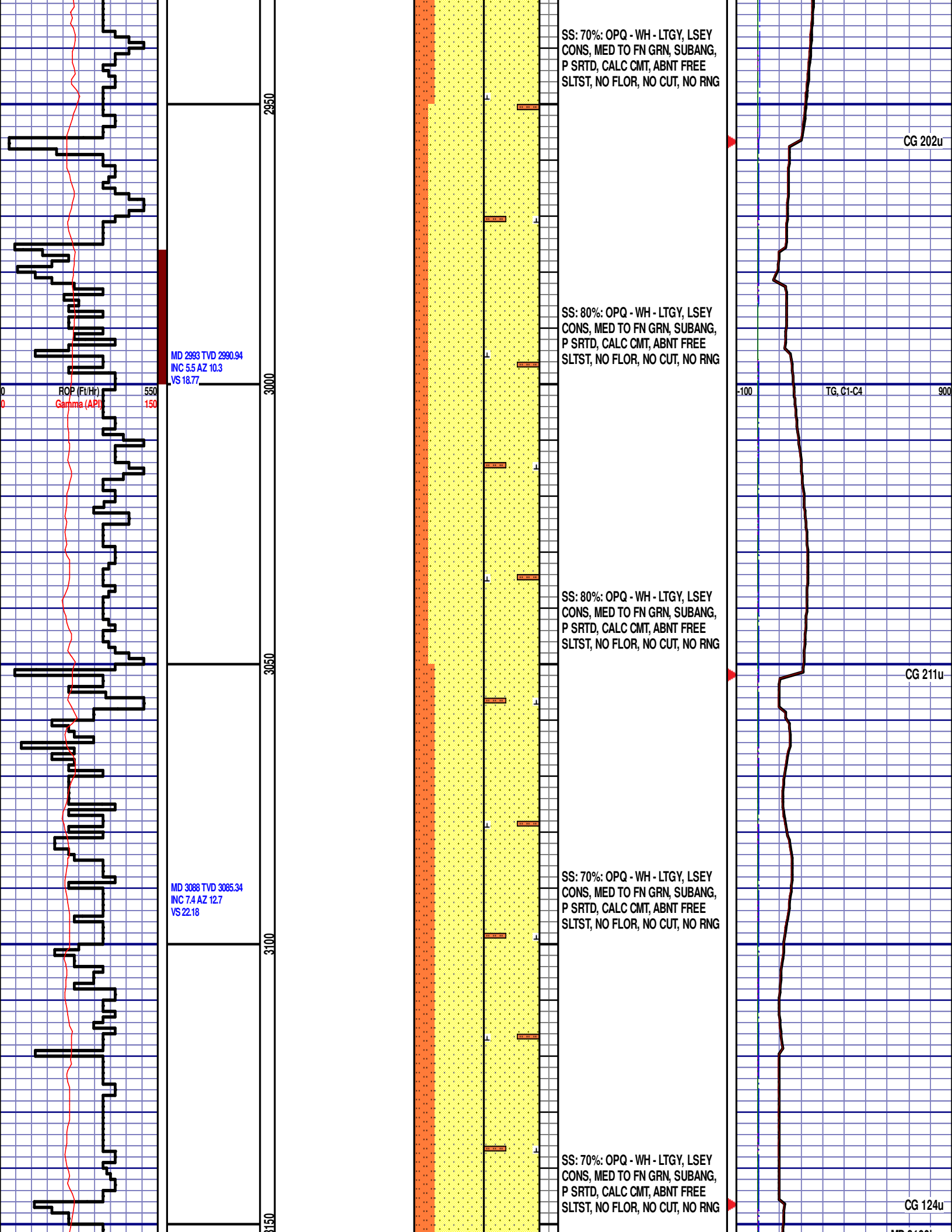
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 lmywash  
 ogw  
 olmywash  
 oshly gw  
 shly gw  
 sdygw

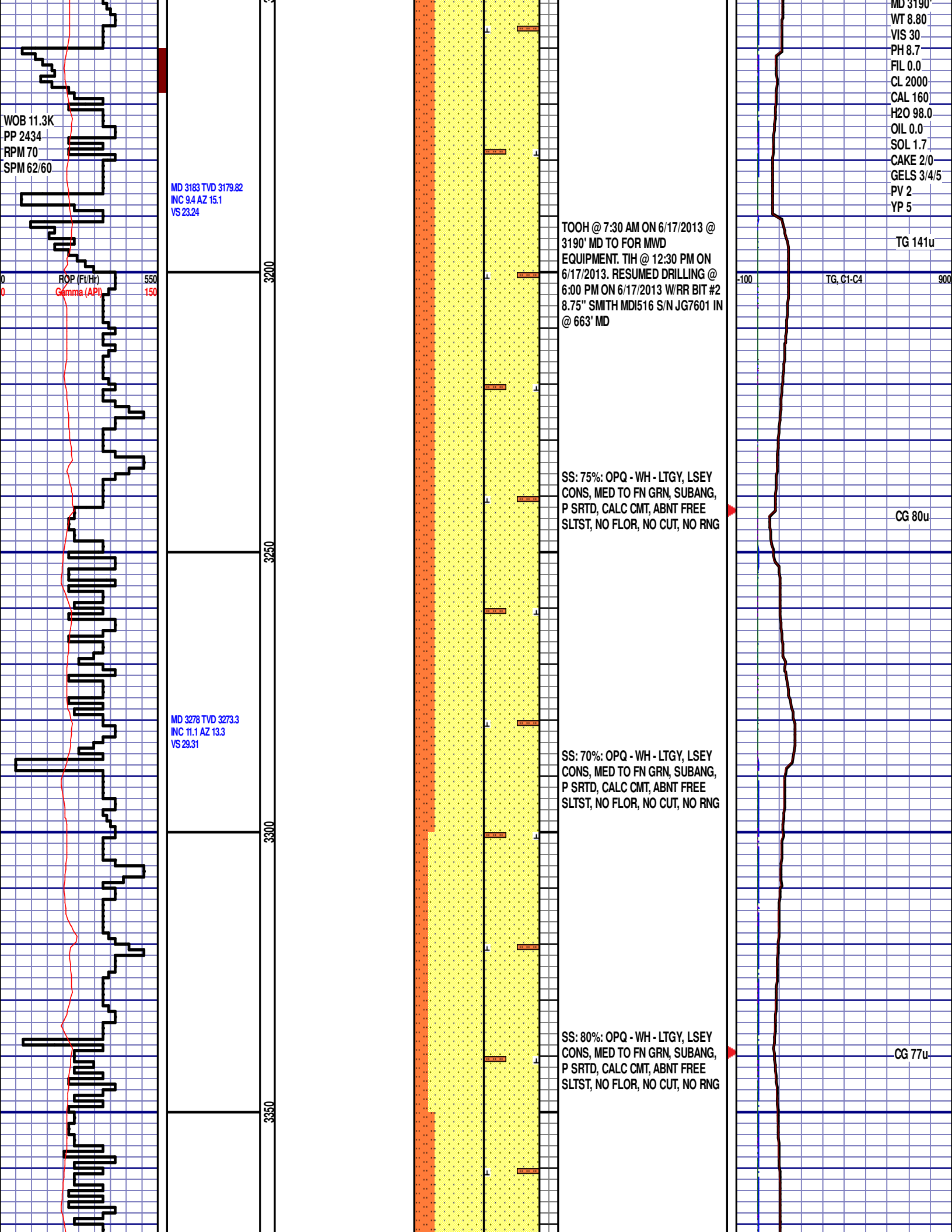
hvycrbsh  
 nosmpl  
 Lsdetrst  
 sltst  
 sdy sh  
 Cement











WOB 11.3K  
PP 2434  
RPM 70  
SPM 62/60

MD 3183 TVD 3179.82  
INC 9.4 AZ 15.1  
VS 23.24

ROP (ft/hr)  
Gamma (API)

TOOH @ 7:30 AM ON 6/17/2013 @  
3190' MD TO FOR MWD  
EQUIPMENT. TJH @ 12:30 PM ON  
6/17/2013. RESUMED DRILLING @  
6:00 PM ON 6/17/2013 W/RR BIT #2  
8.75" SMITH MDI516 S/N JG7601 IN  
@ 663' MD

SS: 75%: OPQ - WH - LTGY, LSEY  
CONS, MED TO FN GRN, SUBANG,  
P SRTD, CALC CMT, ABNT FREE  
SLTST, NO FLOR, NO CUT, NO RNG

SS: 70%: OPQ - WH - LTGY, LSEY  
CONS, MED TO FN GRN, SUBANG,  
P SRTD, CALC CMT, ABNT FREE  
SLTST, NO FLOR, NO CUT, NO RNG

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

MD 3190  
WT 8.80  
VIS 30  
PH 8.7  
FIL 0.0  
CL 2000  
CAL 160  
H2O 98.0  
OIL 0.0  
SOL 1.7  
CAKE 2/0  
GELS 3/4/5  
PV 2  
YP 5

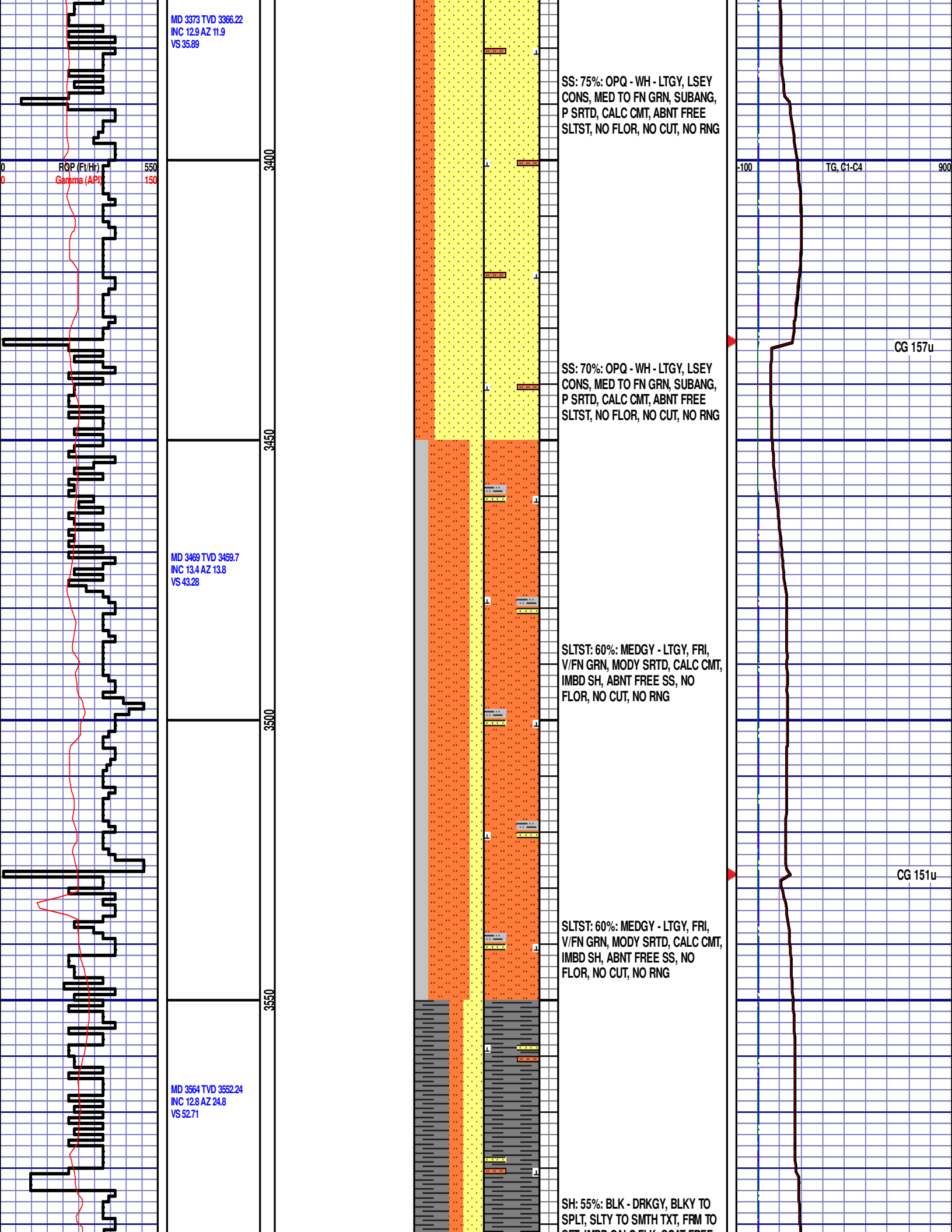
TG 141u

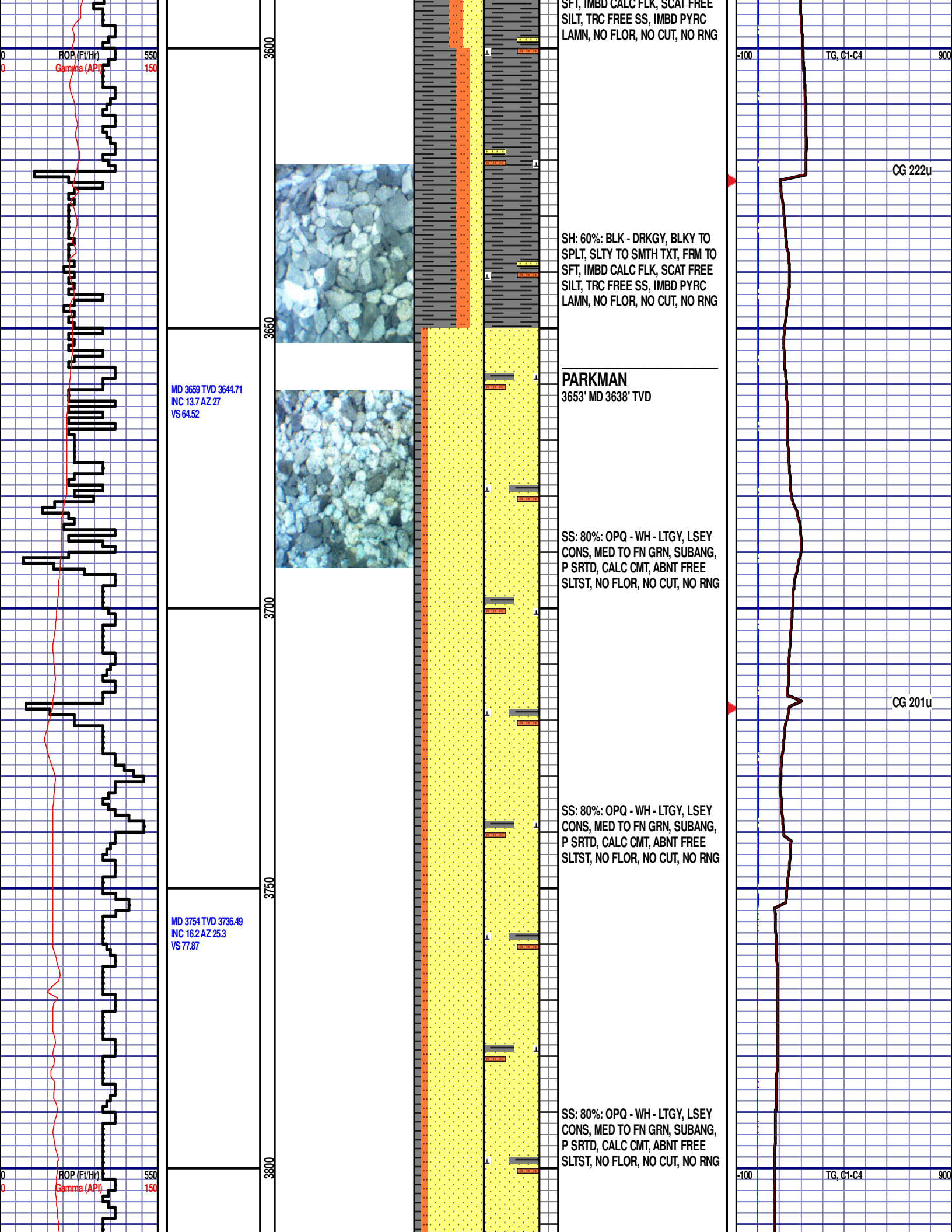
TG, C1-C4

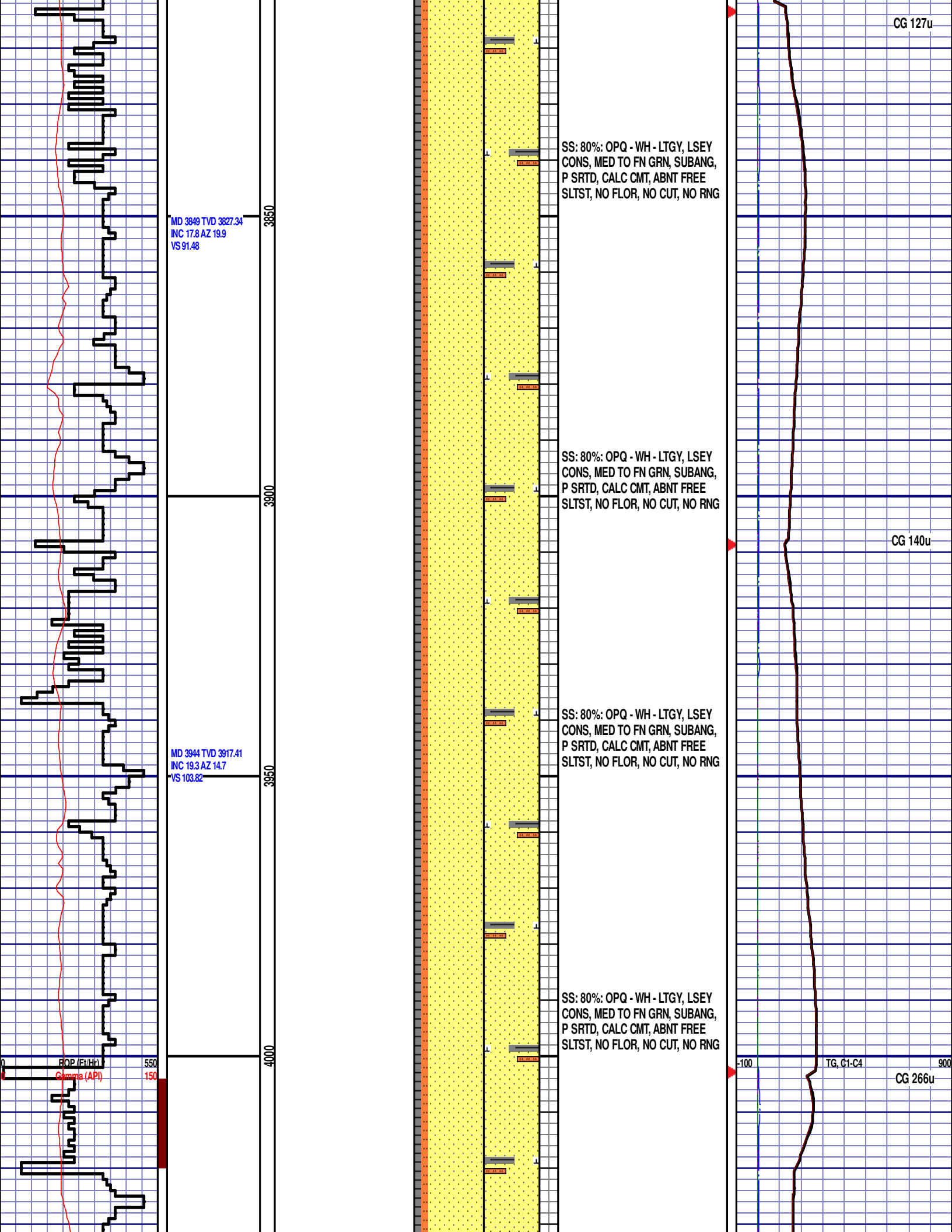
CG 80u

CG 77u

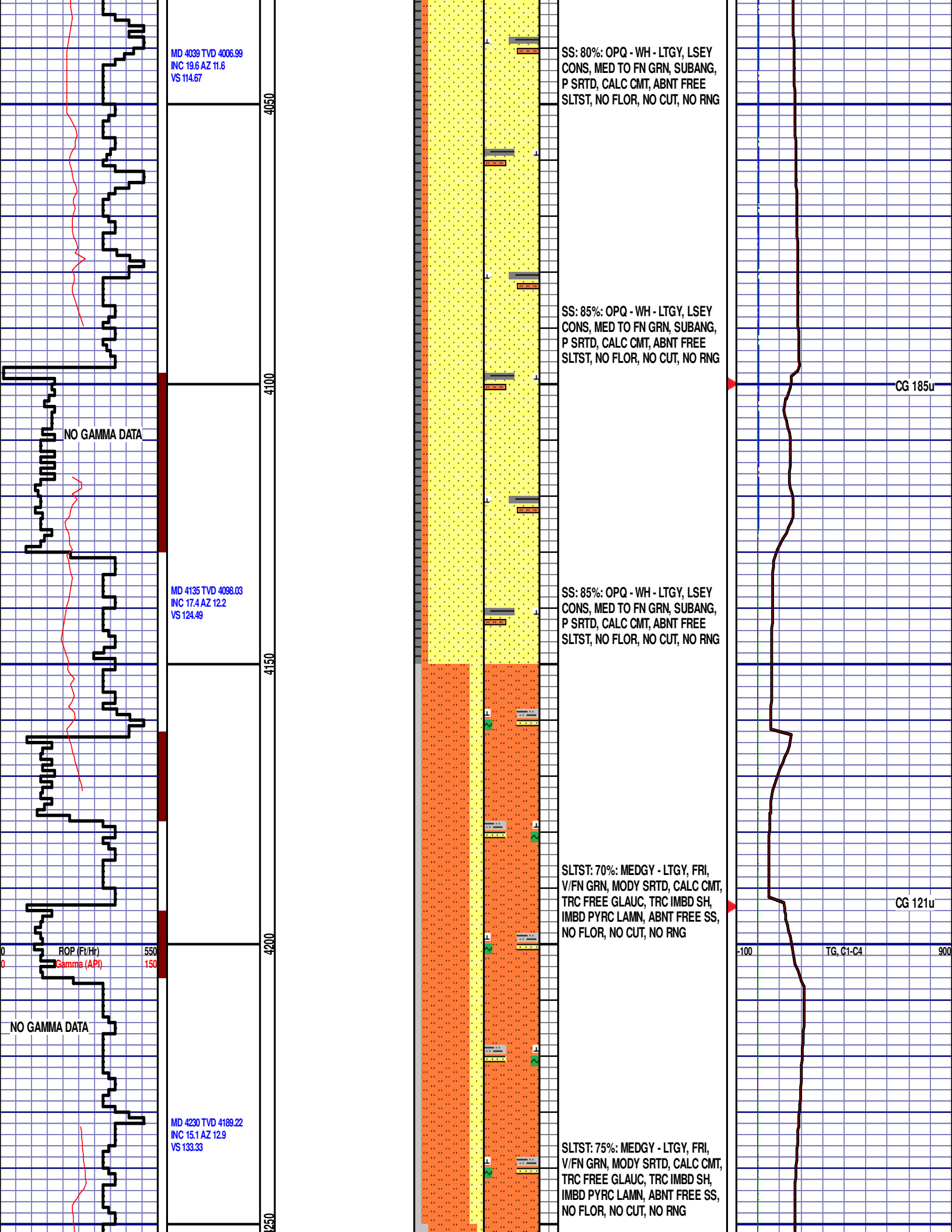


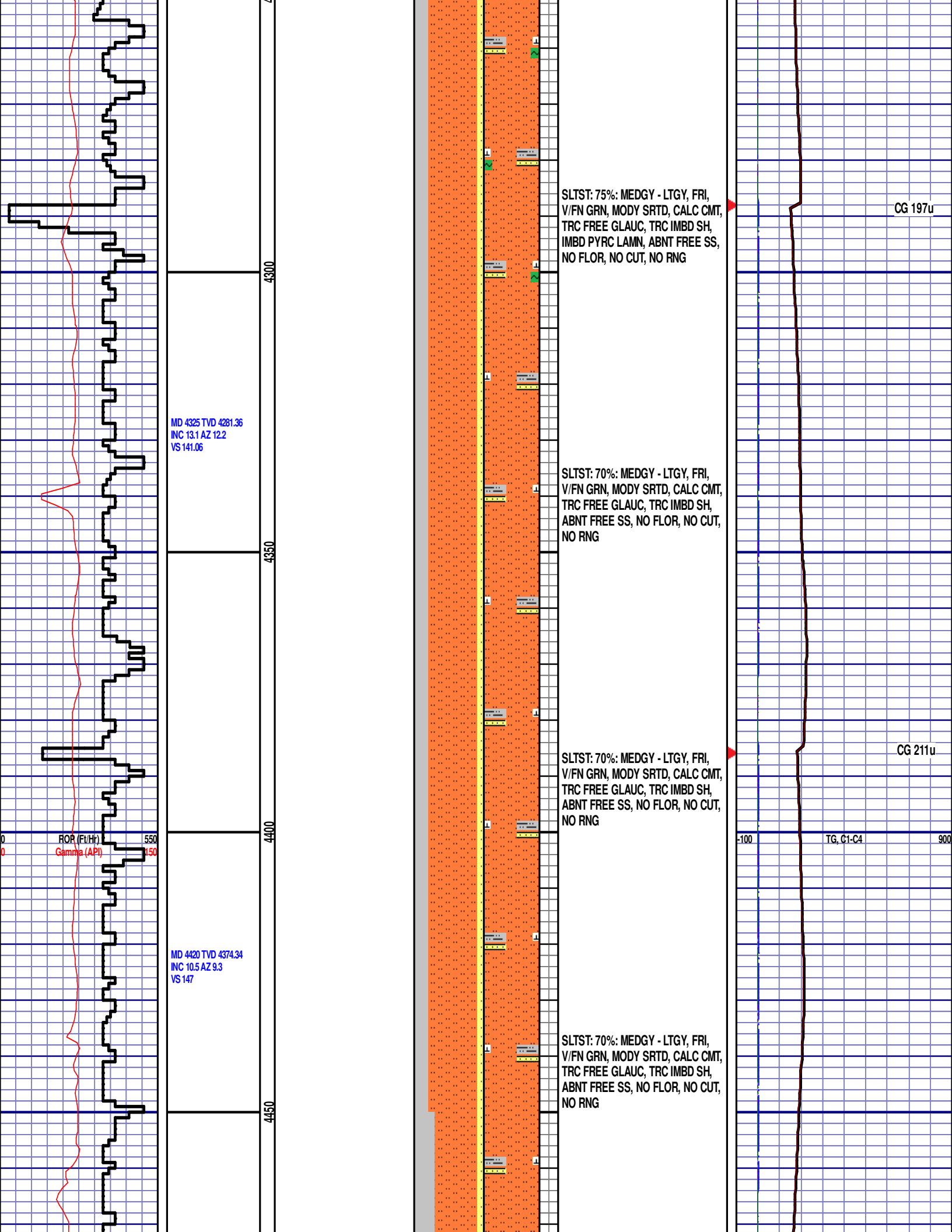


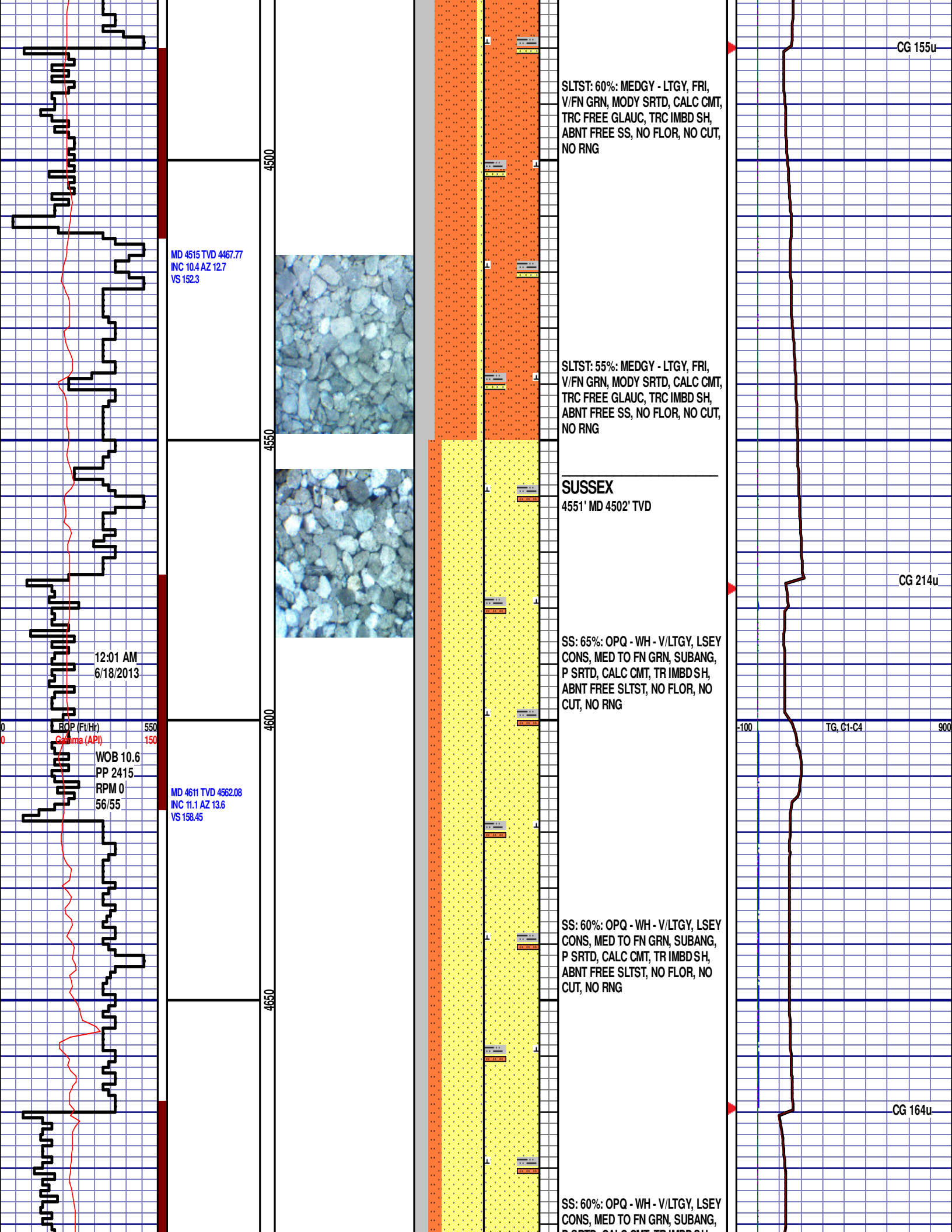


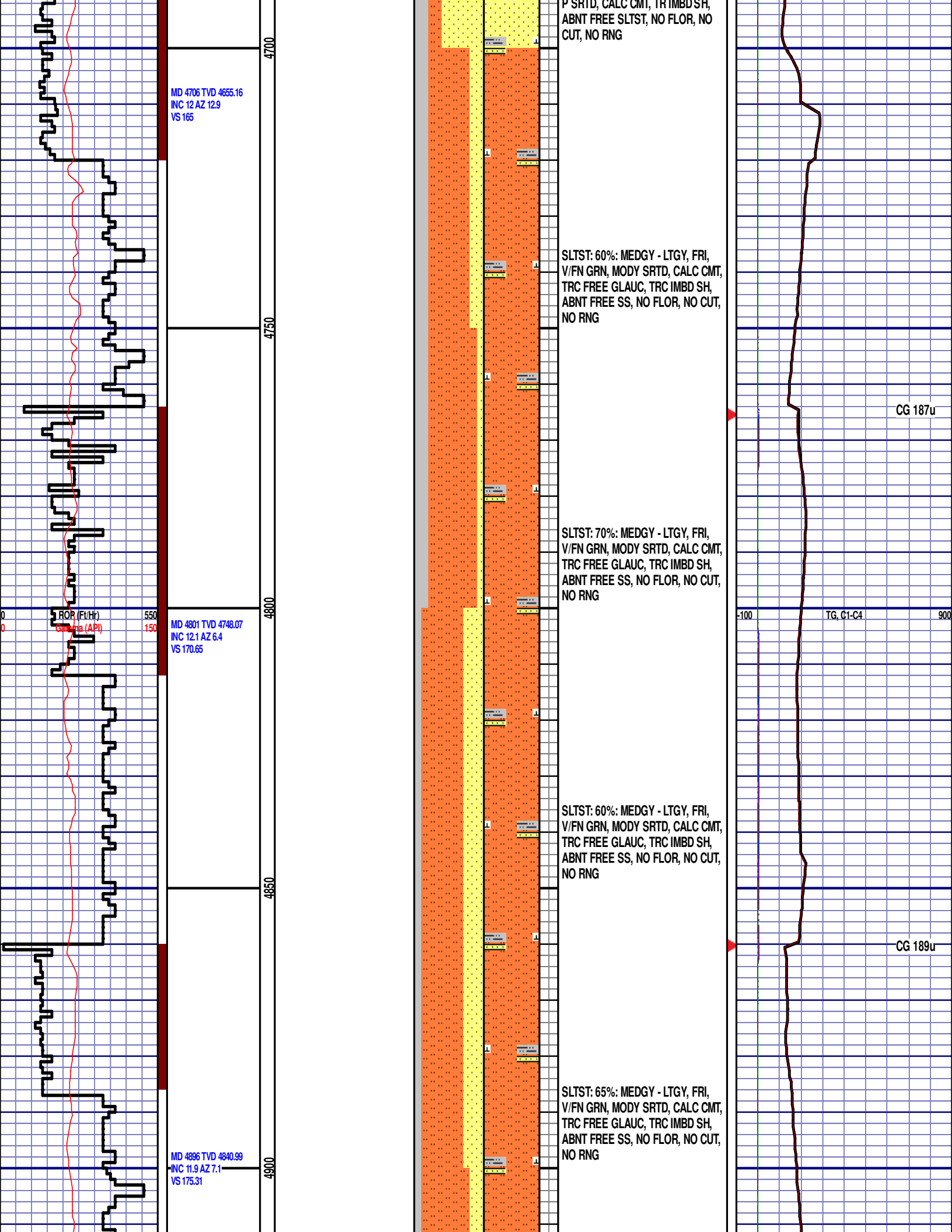


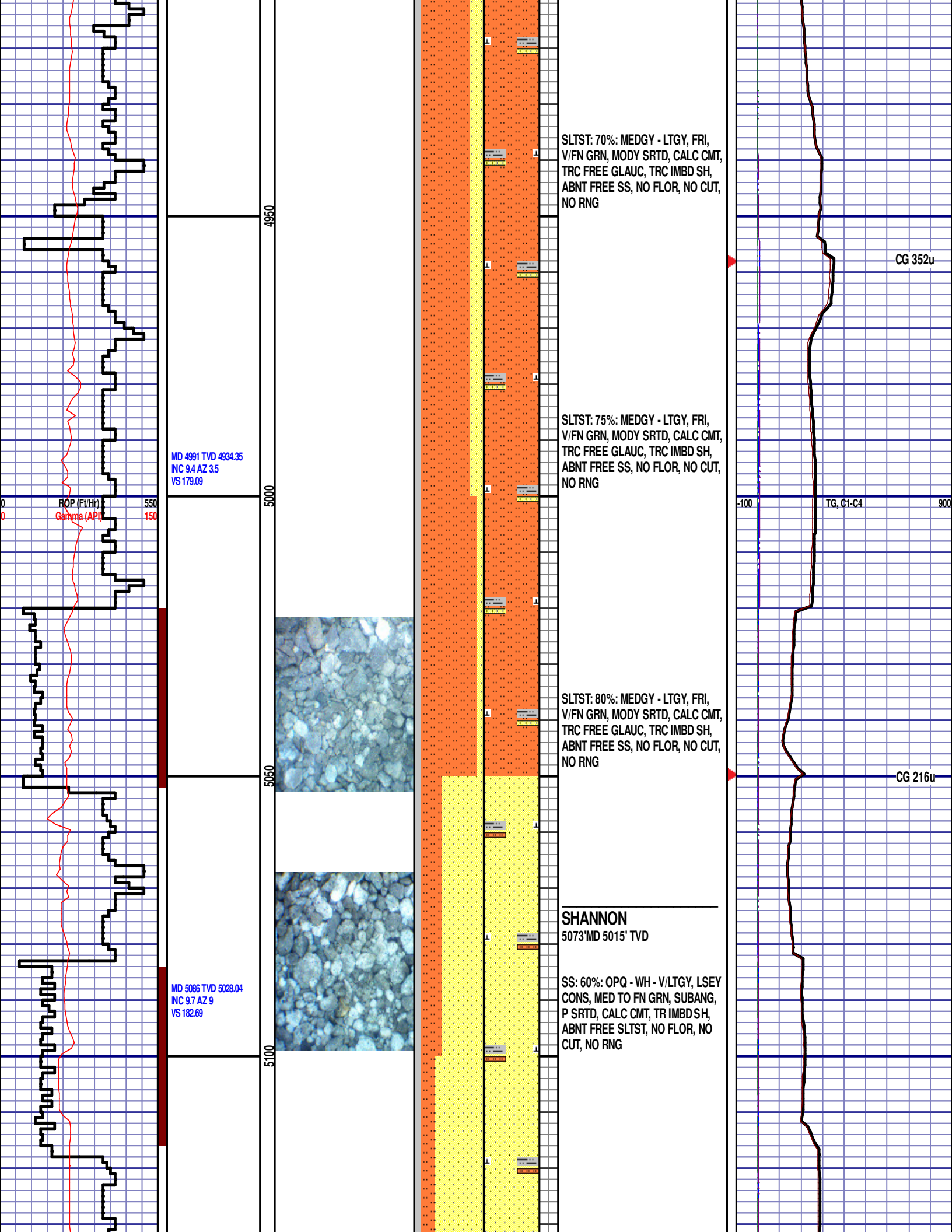












MD 4991 TVD 4934.35  
INC 9.4 AZ 3.5  
VS 179.09

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

CG 352u

SLTST: 75%: MEDGY - LTGY, FRI,  
V/FN GRN, MODY SRTD, CALC CMT,  
TRC FREE GLAUC, TRC IMBD SH,  
ABNT FREE SS, NO FLOR, NO CUT,  
NO RNG

TG, C1-C4

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

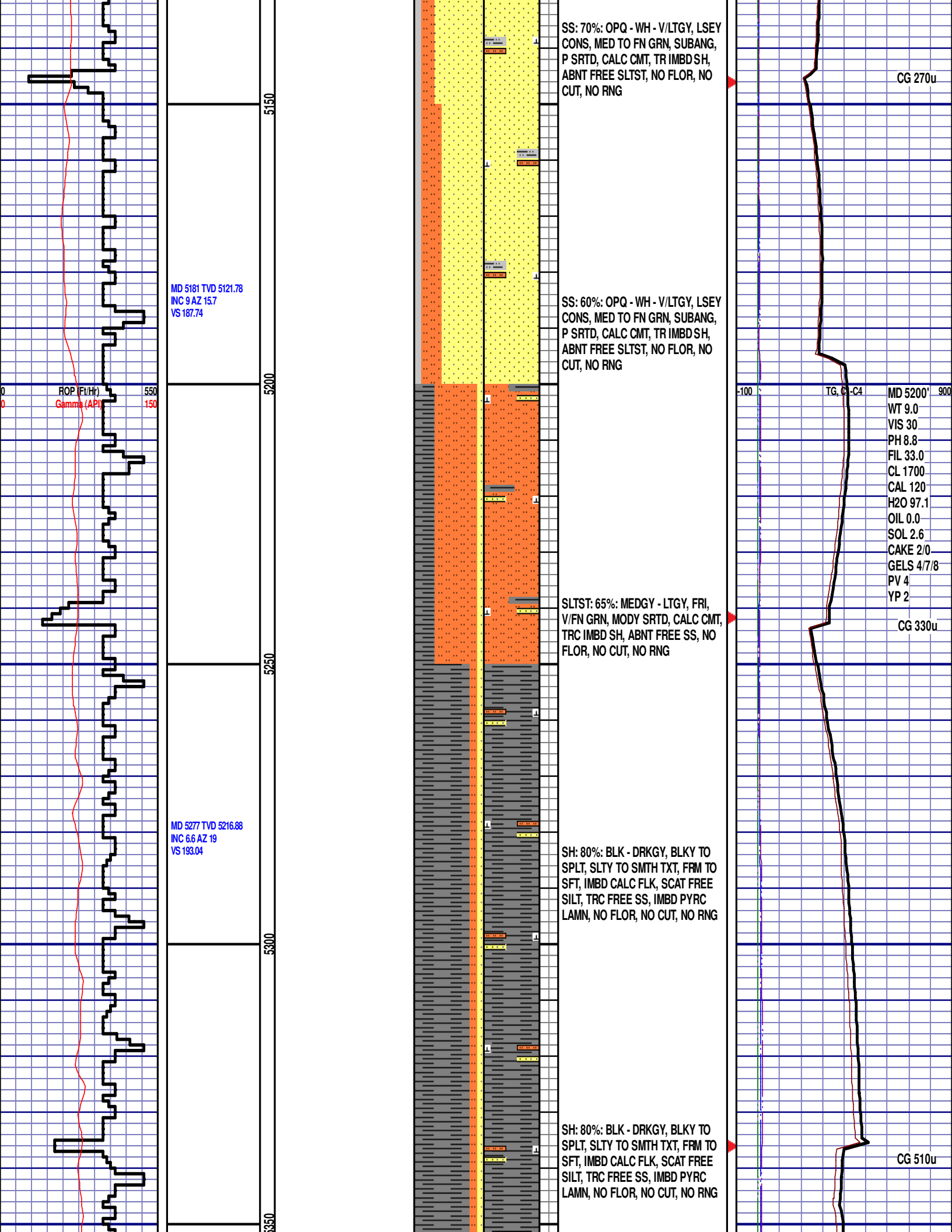
CG 216u

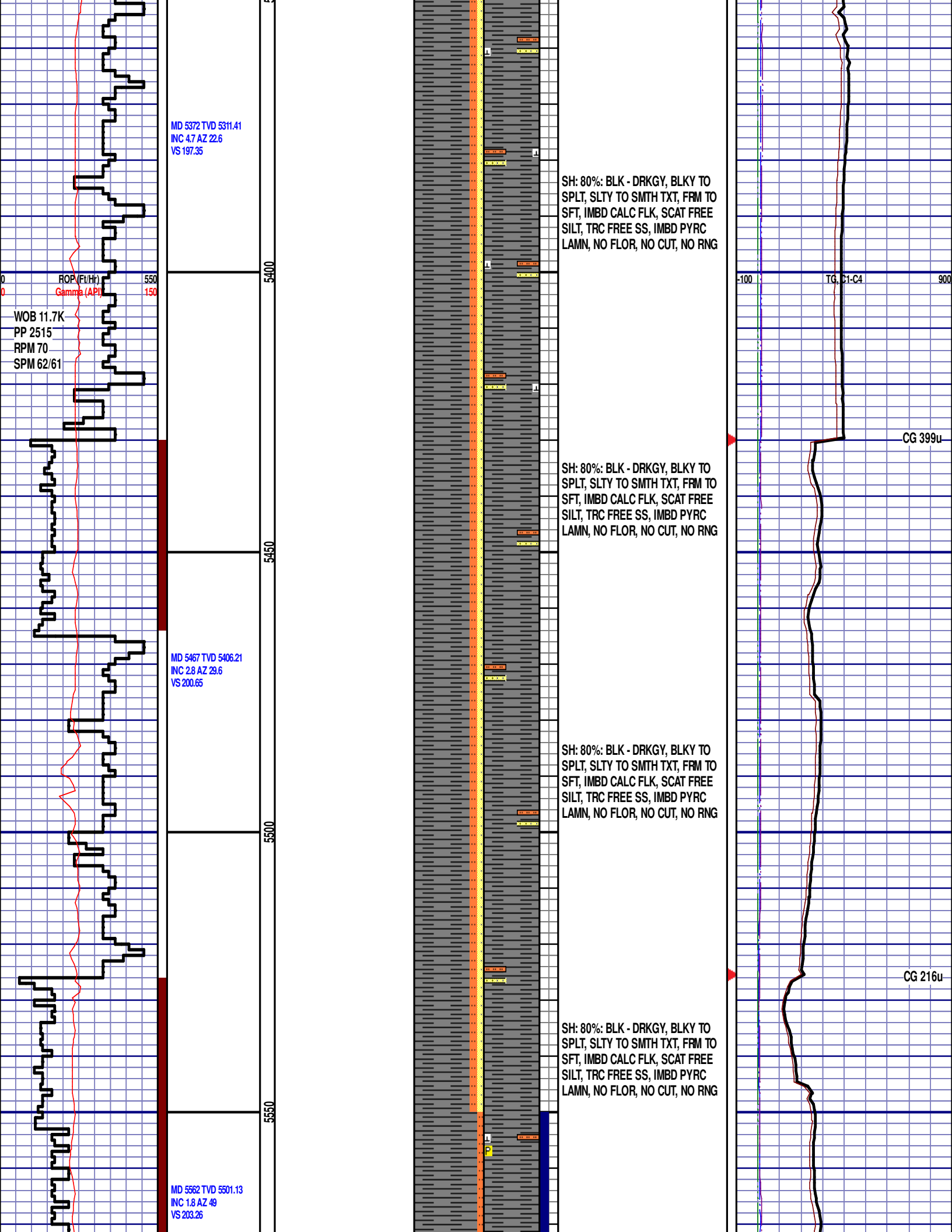
**SHANNON**  
5073' MD 5015' TVD

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

MD 5086 TVD 5028.04  
INC 9.7 AZ 9  
VS 182.69







MD 5372 TVD 5311.41  
INC 4.7 AZ 22.6  
VS 197.35

ROP (Fe/Hr)  
Gamma (API)

WOB 11.7K  
PP 2515  
RPM 70  
SPM 62/61

MD 5467 TVD 5406.21  
INC 2.8 AZ 29.6  
VS 200.65

MD 5562 TVD 5501.13  
INC 1.8 AZ 49  
VS 203.26

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

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

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

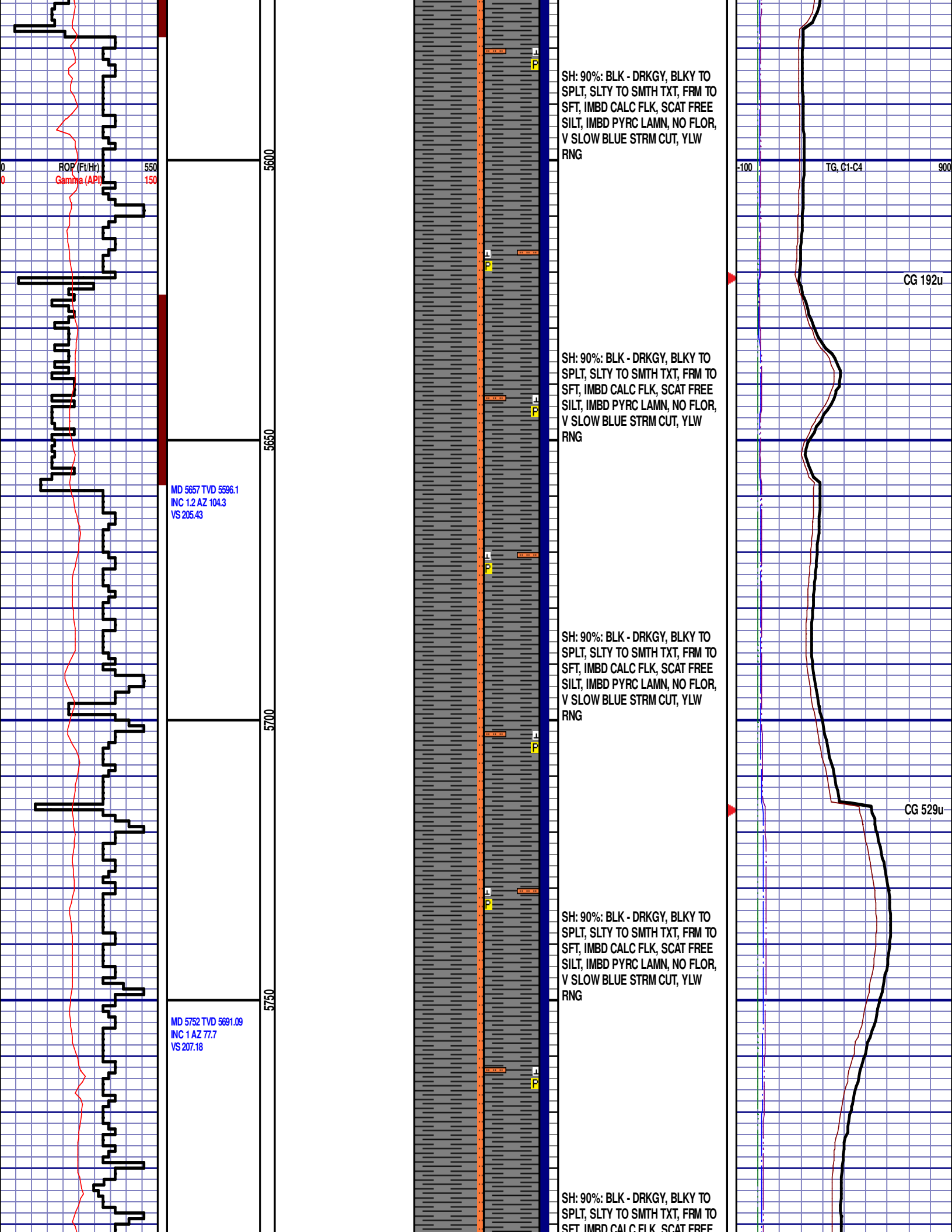
SH: 80%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, IMBD CALC FLK, SCAT FREE  
SILT, TRC FREE SS, IMBD PYRC  
LAMN, NO FLOR, NO CUT, NO RNG

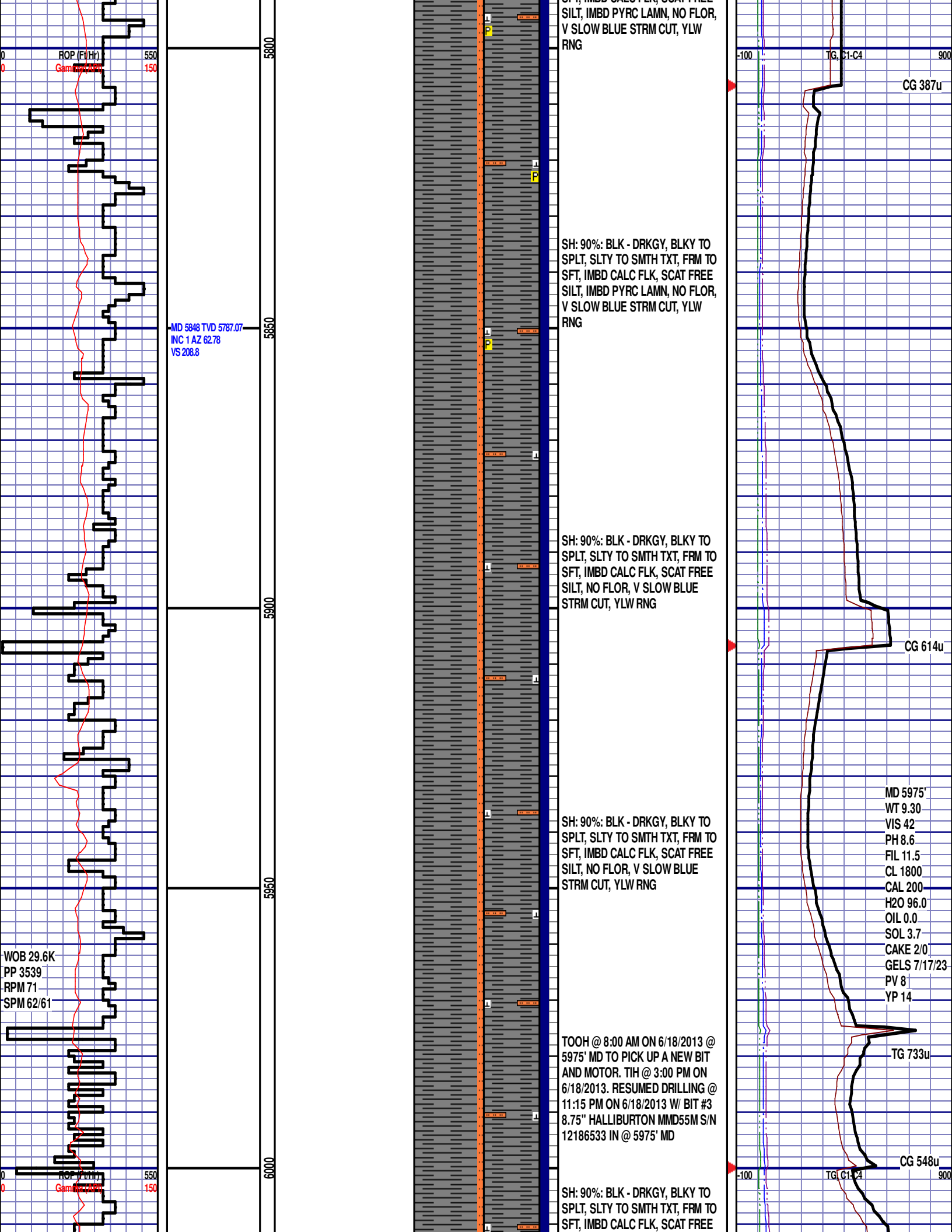
0 100 200 300 400 500 600 700 800 900

TG, C1-C4

CG 399u

CG 216u





ROP (Ft/Hr)  
Gamma Ray

MD 5848 TVD 5787.07  
INC 1 AZ 62.78  
VS 208.8

WOB 29.6K  
PP 3539  
RPM 71  
SPM 62/61

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

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

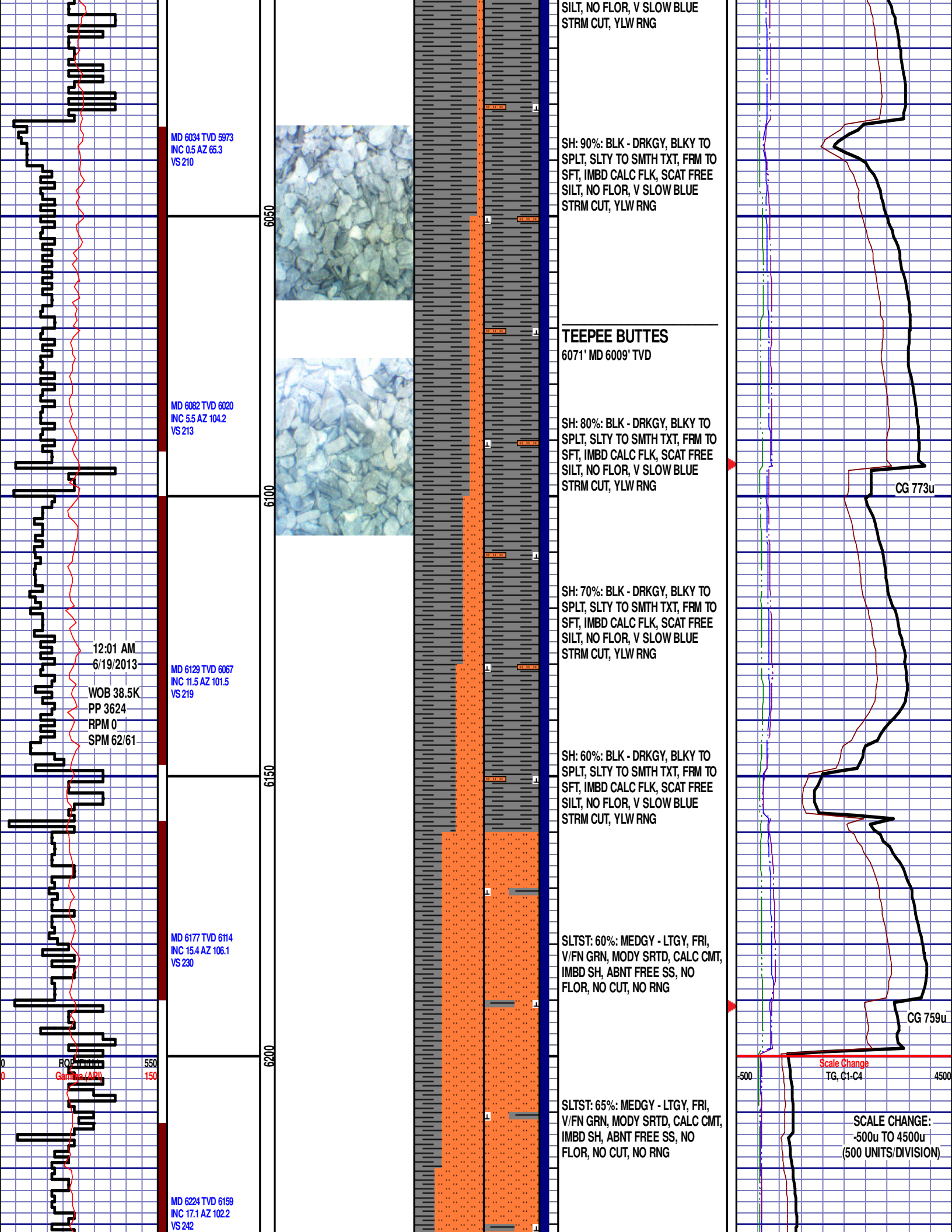
TOOH @ 8:00 AM ON 6/18/2013 @  
5975' MD TO PICK UP A NEW BIT  
AND MOTOR. TIH @ 3:00 PM ON  
6/18/2013. RESUMED DRILLING @  
11:15 PM ON 6/18/2013 W/ BIT #3  
8.75" HALLIBURTON MMD55M S/N  
12186533 IN @ 5975' MD

SH: 90%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, IMBD CALC FLK, SCAT FREE

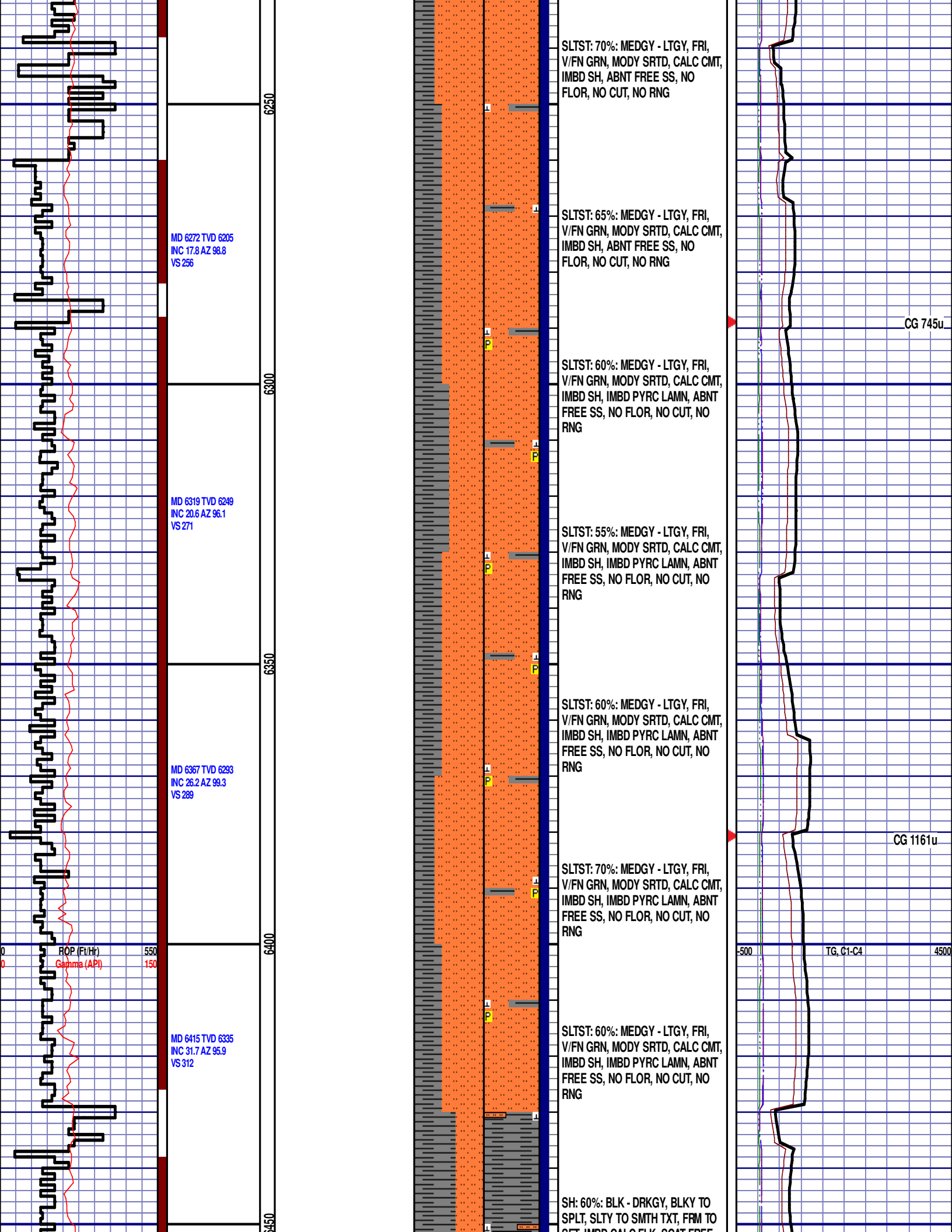
MD 5975'  
WT 9.30  
VIS 42  
PH 8.6  
FIL 11.5  
CL 1800  
CAL 200  
H2O 96.0  
OIL 0.0  
SOL 3.7  
CAKE 2/0  
GELS 7/17/23  
PV 8  
YP 14

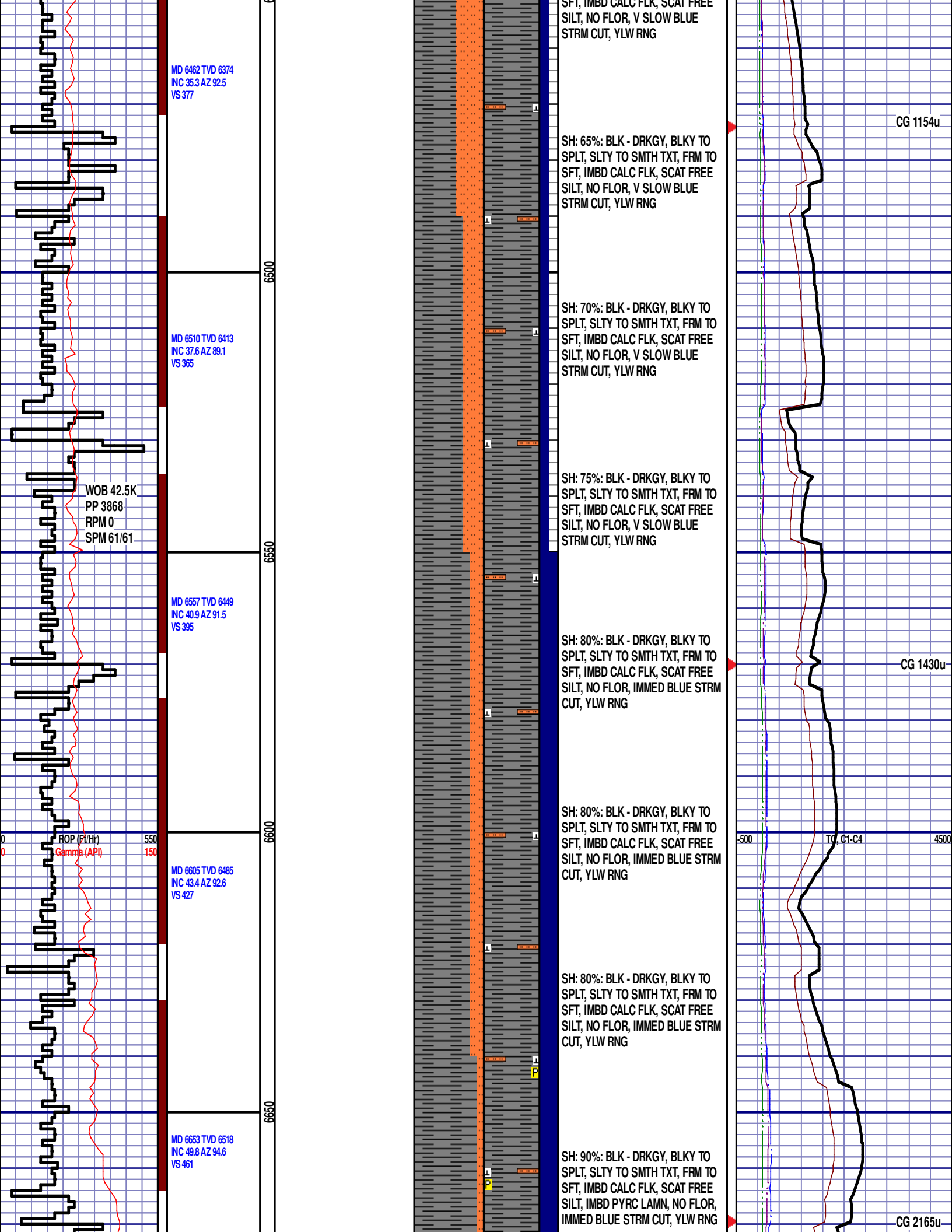
TG 733u

CG 548u









MD 6462 TVD 6374  
INC 35.3 AZ 92.5  
VS 377

MD 6510 TVD 6413  
INC 37.6 AZ 89.1  
VS 365

WOB 42.5K  
PP 3868  
RPM 0  
SPM 61/61

MD 6557 TVD 6449  
INC 40.9 AZ 91.5  
VS 395

ROP (Ft/Hr)  
Gamma (API)

MD 6605 TVD 6485  
INC 43.4 AZ 92.6  
VS 427

MD 6653 TVD 6518  
INC 49.8 AZ 94.6  
VS 461

SH: 65%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, IMBD CALC FLK, SCAT FREE  
SILT, NO FLOR, V SLOW BLUE  
STRM CUT, YLW RNG

SH: 70%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, IMBD CALC FLK, SCAT FREE  
SILT, NO FLOR, V SLOW BLUE  
STRM CUT, YLW RNG

SH: 75%: BLK - DRKGY, BLKY TO  
SPLT, SLTY TO SMTH TXT, FRM TO  
SFT, IMBD CALC FLK, SCAT FREE  
SILT, NO FLOR, V SLOW BLUE  
STRM CUT, YLW RNG

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

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

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

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

CG 1154u

CG 1430u

CG 2165u

