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## Customer Information

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

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

## Mud Logging Details

**Logger:** Casey Sensecqua &  
Ross Apodaca

**Log Interval:** 2500' MD to 6700' MD

**Start Date:** November 22, 2013

**Release Date:** December 02, 2013

## Well Information

**Well Name:** NCLP PC AA04-65-1HN

**Location:** 4-T6N-R63W  
2201' FSL, 250' FWL

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

**Drilling Rig:** H&P 343

**Total Depth:** 16165' MD

**TD Date:** December 02, 2013

**Formation:** Niobrara B Chalk

**KB Elevation:** 4735'

**GR Elevation:** 4711'

**API Number:** 05-123-37174-0000

## ROCK TYPES

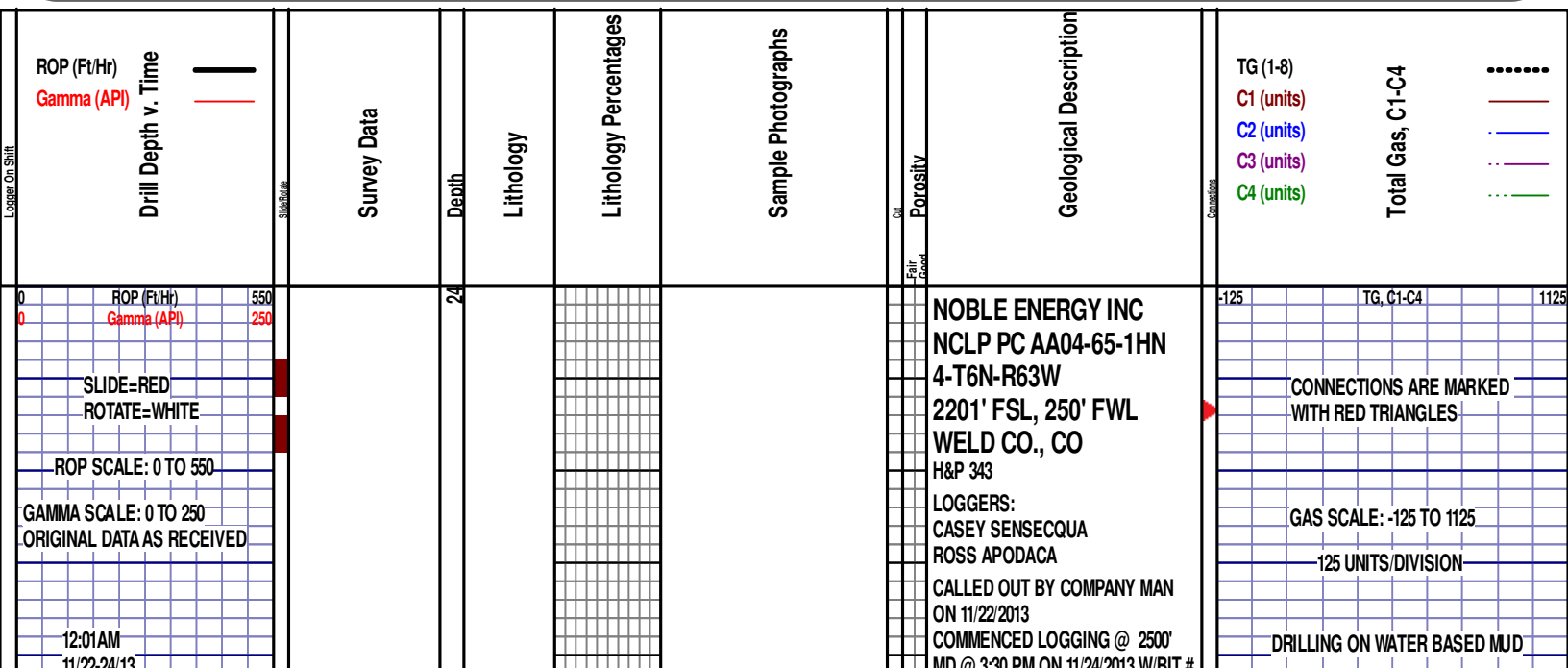
shale  
Anhy  
Bent  
Brec  
Cht  
Clyst  
Coal

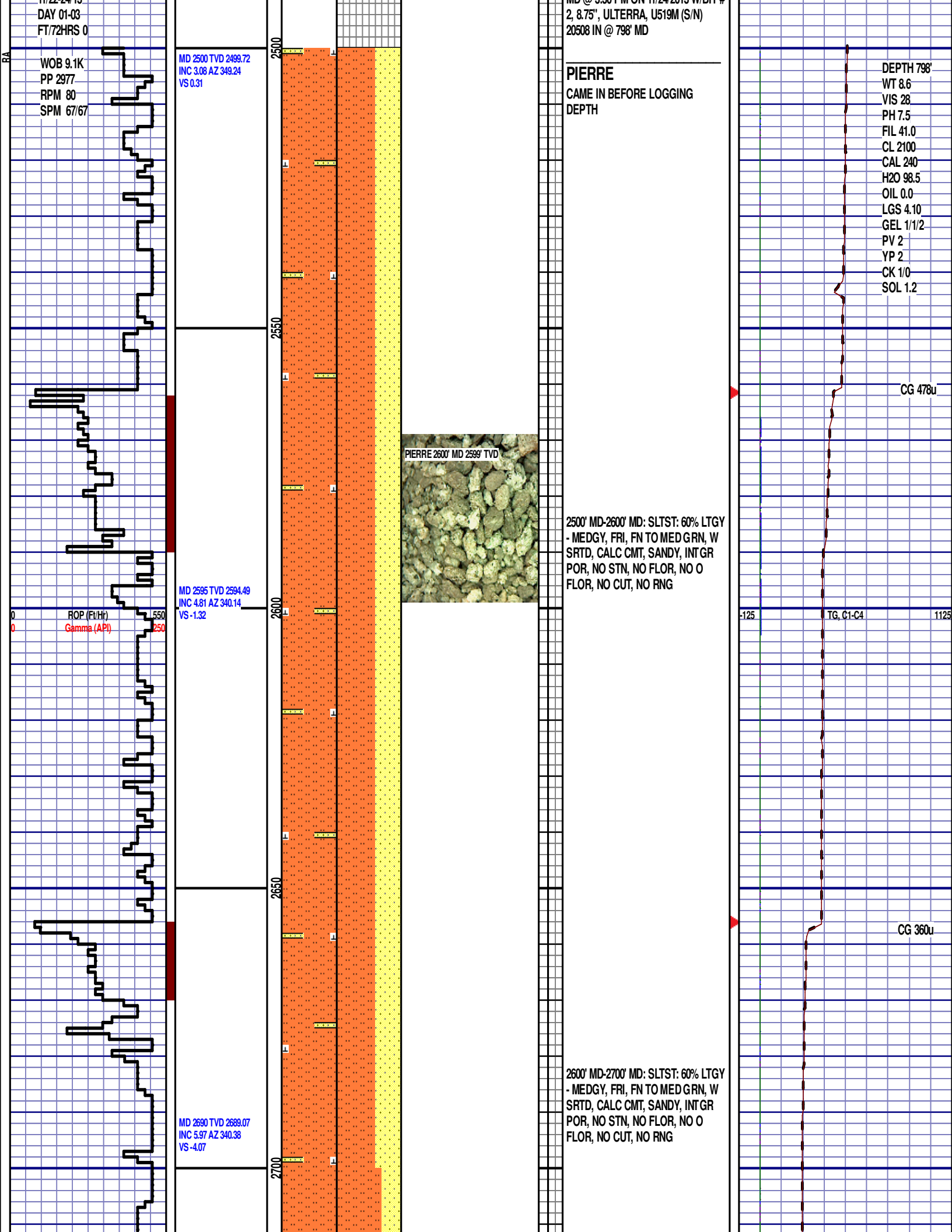
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Dol  
Gyp  
Igne  
Lmst  
Meta  
Mrlist

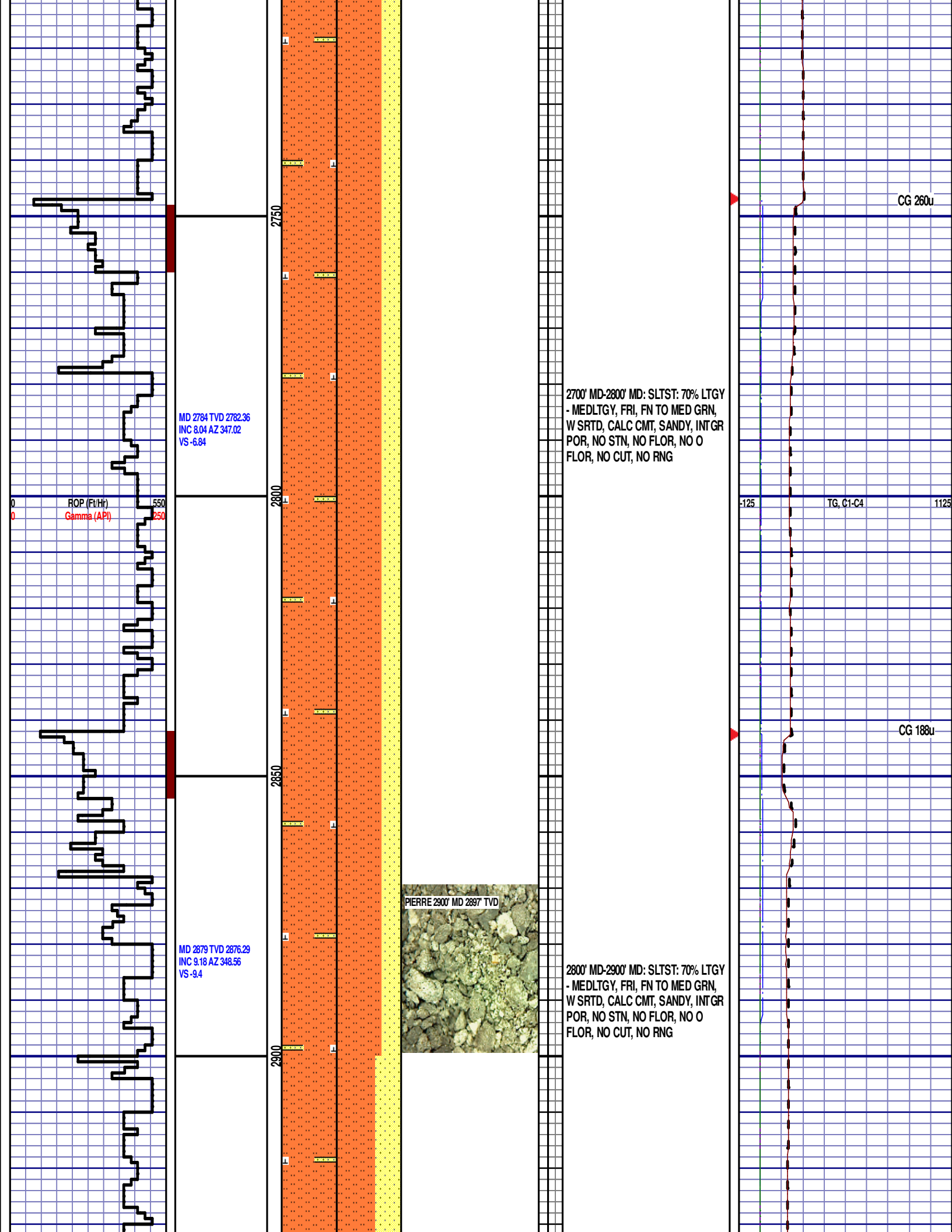
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Shale  
Shcol  
Shgy  
Slstst  
Ss  
Till

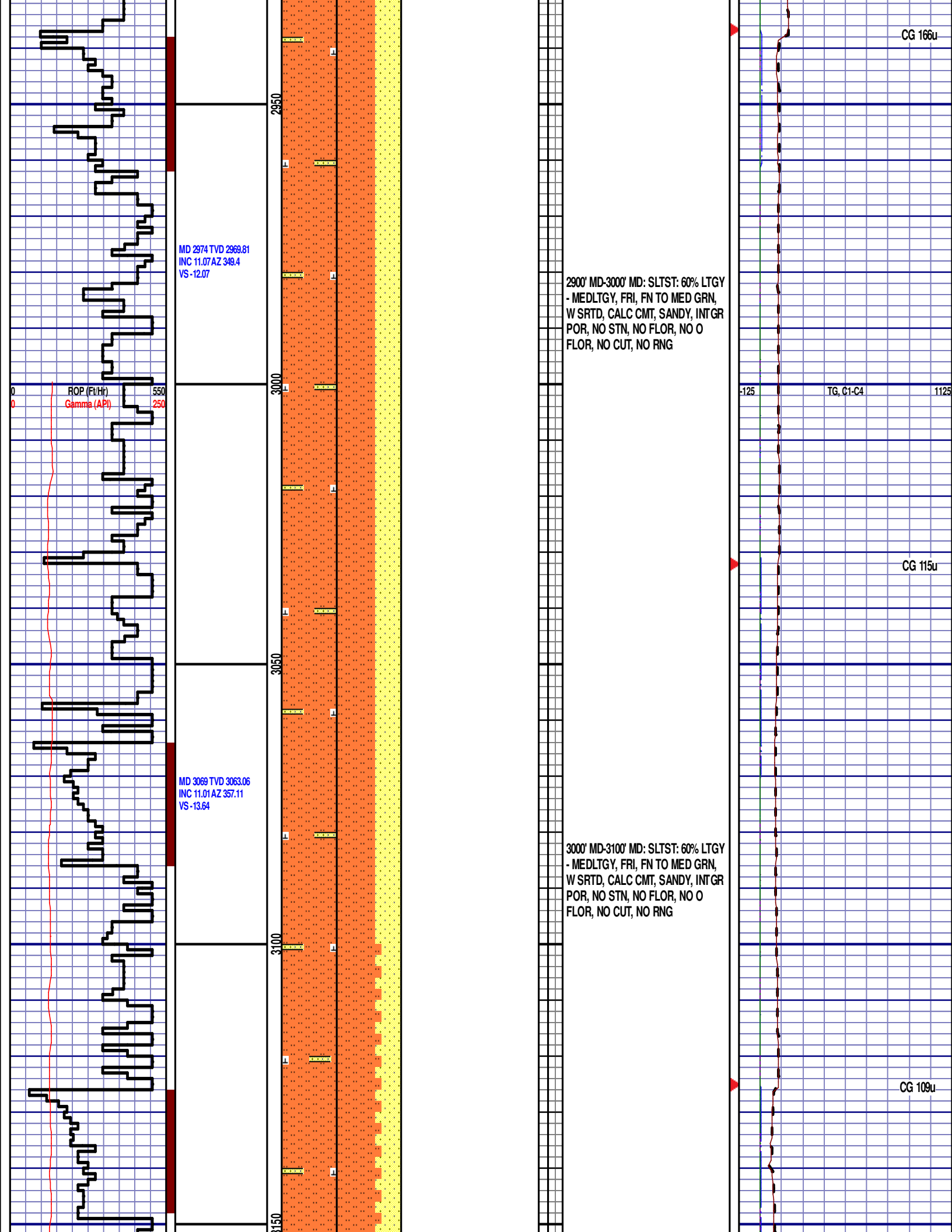
gw  
lmywash  
ogw  
olmywash  
oshly gw  
shly gw  
sdygw

hvyrcrbsh  
nosmpl  
Lsdetrst  
sltst  
sdy sh









MD 3164 TVD 3156.68  
INC 8.47 AZ 1.81  
VS -13.38

ROP (Ft/Hr)  
Gamma (API)

MD 3259 TVD 3250.88  
INC 6.35 AZ 1.67  
VS -12.62

MD 3354 TVD 3345.5  
INC 3.8 AZ 354.72  
VS -12.5



3100' MD-3200' MD: SLTST: 65% LTGY  
- MEDLTGY, FRI, FN TO MED GRN,  
W SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

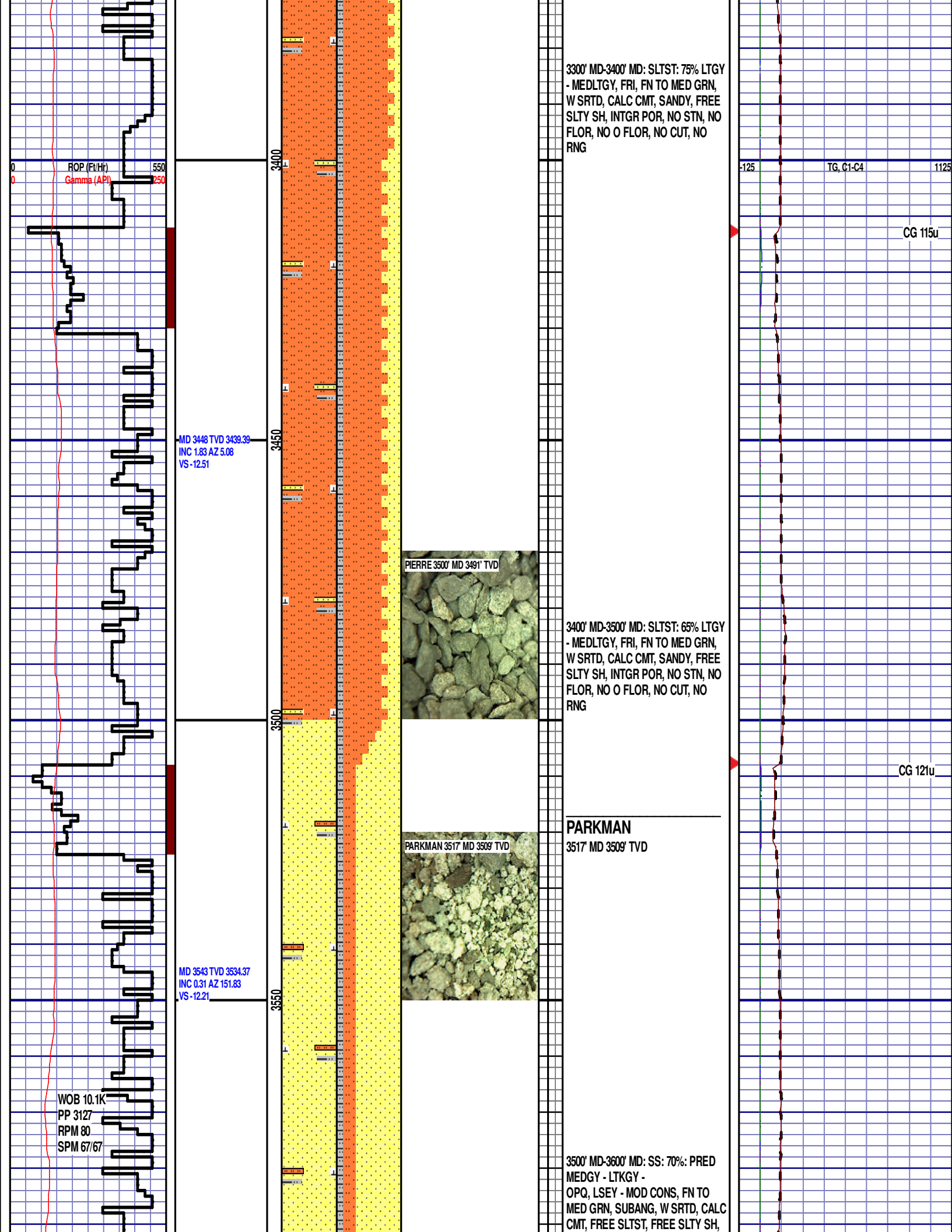
3200' MD-3300' MD: SLTST: 70% LTGY  
- MEDLTGY, FRI, FN TO MED GRN,  
W SRTD, CALC CMT, SANDY, FREE  
SLTY SH, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, NO CUT, NO  
RNG

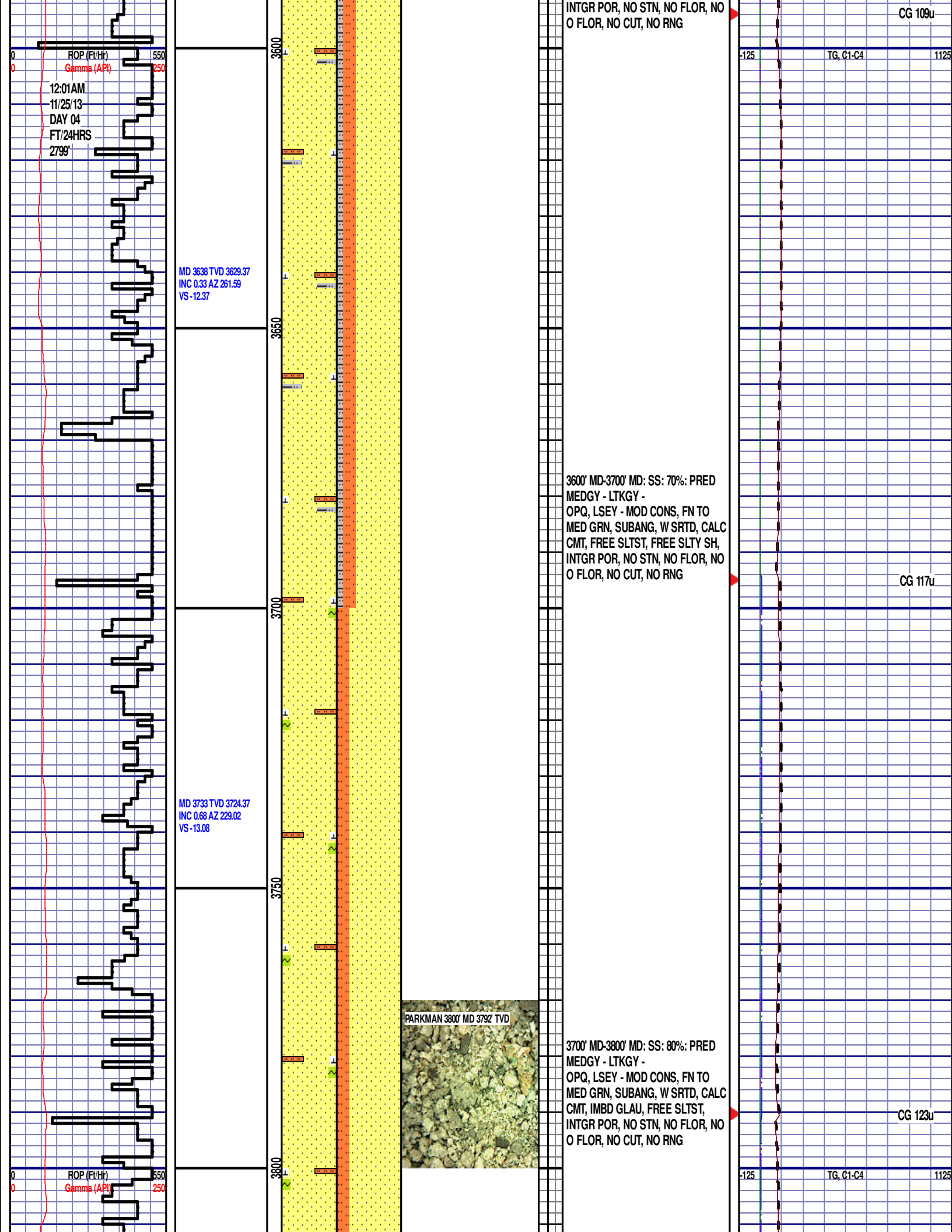
-125 TG, C1-C4 1125

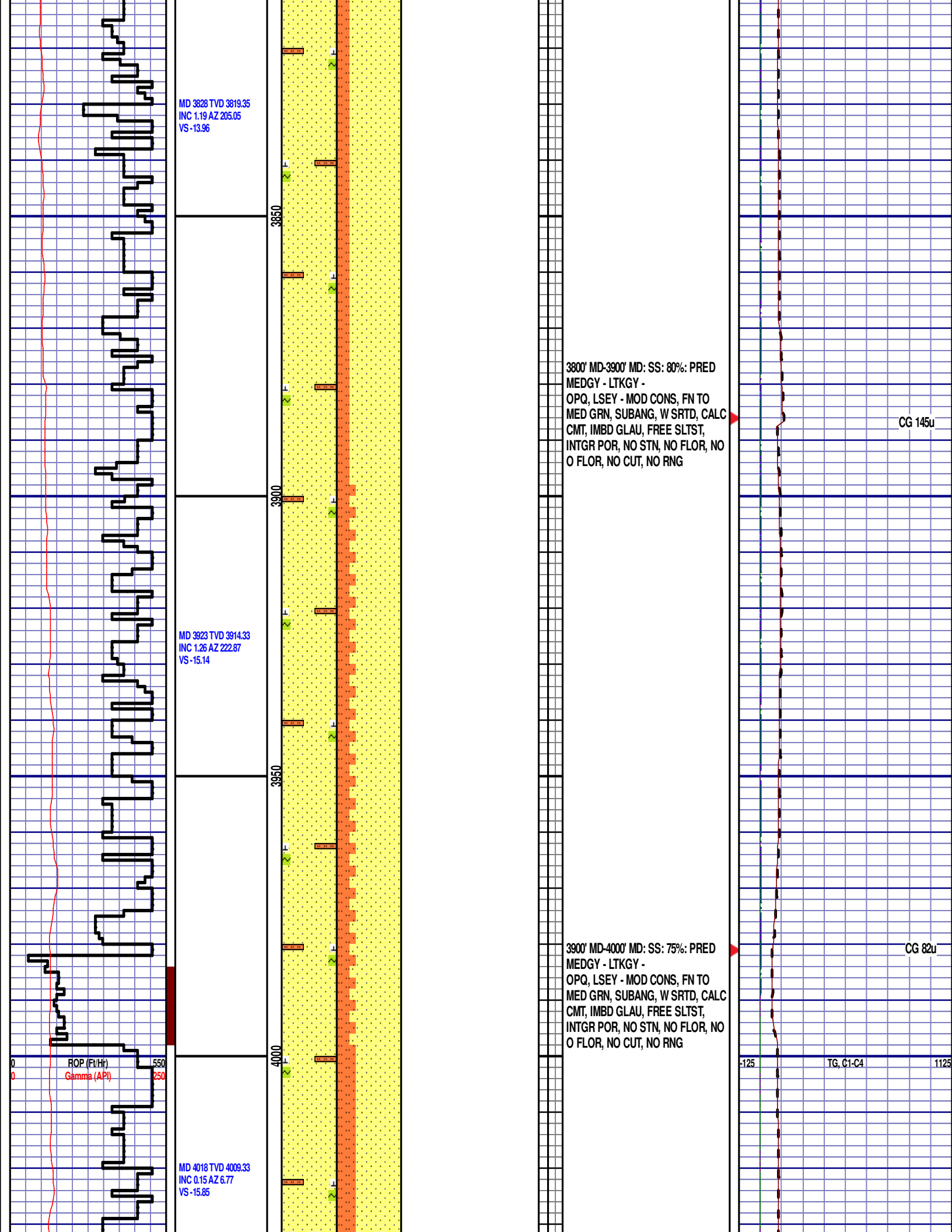
CG 136u

CG 83u

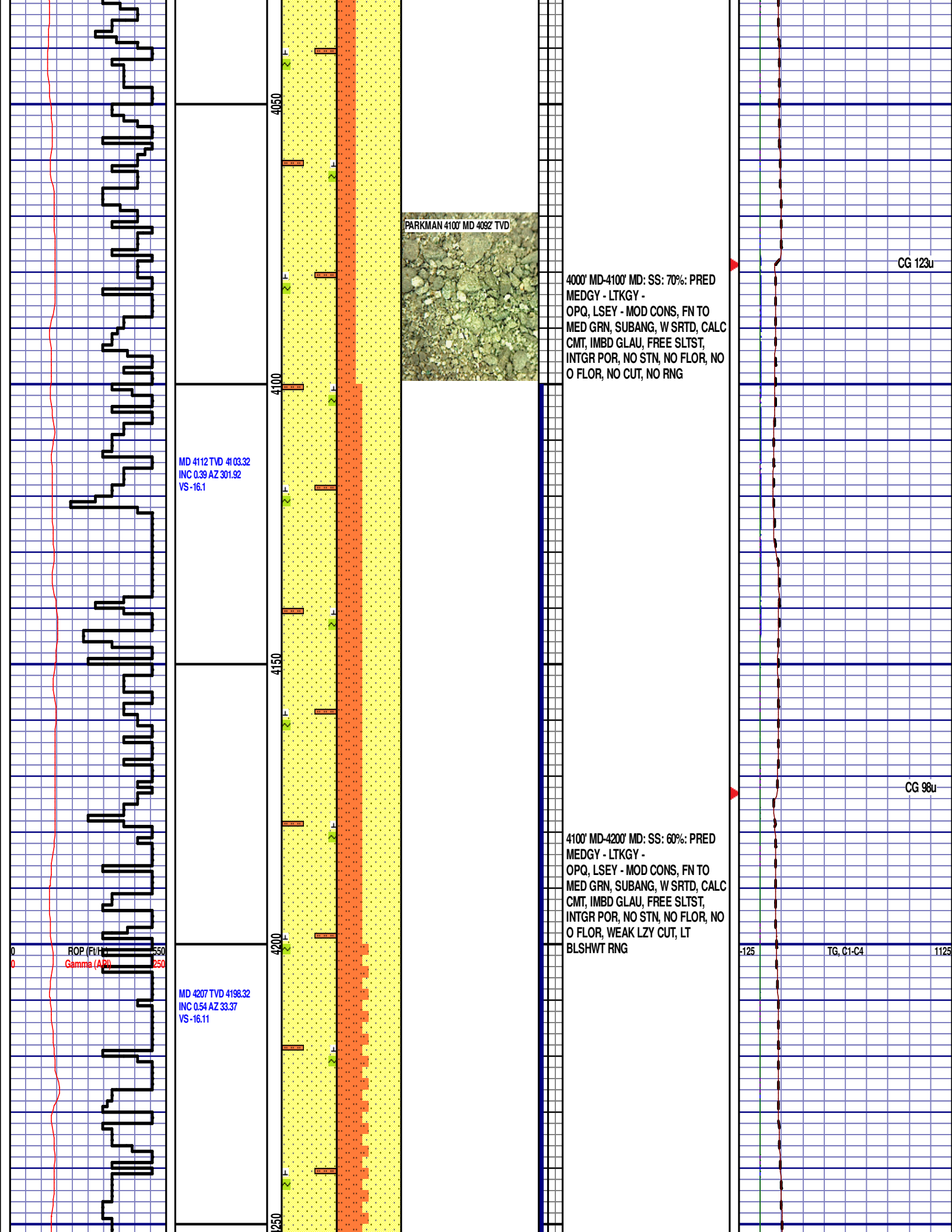


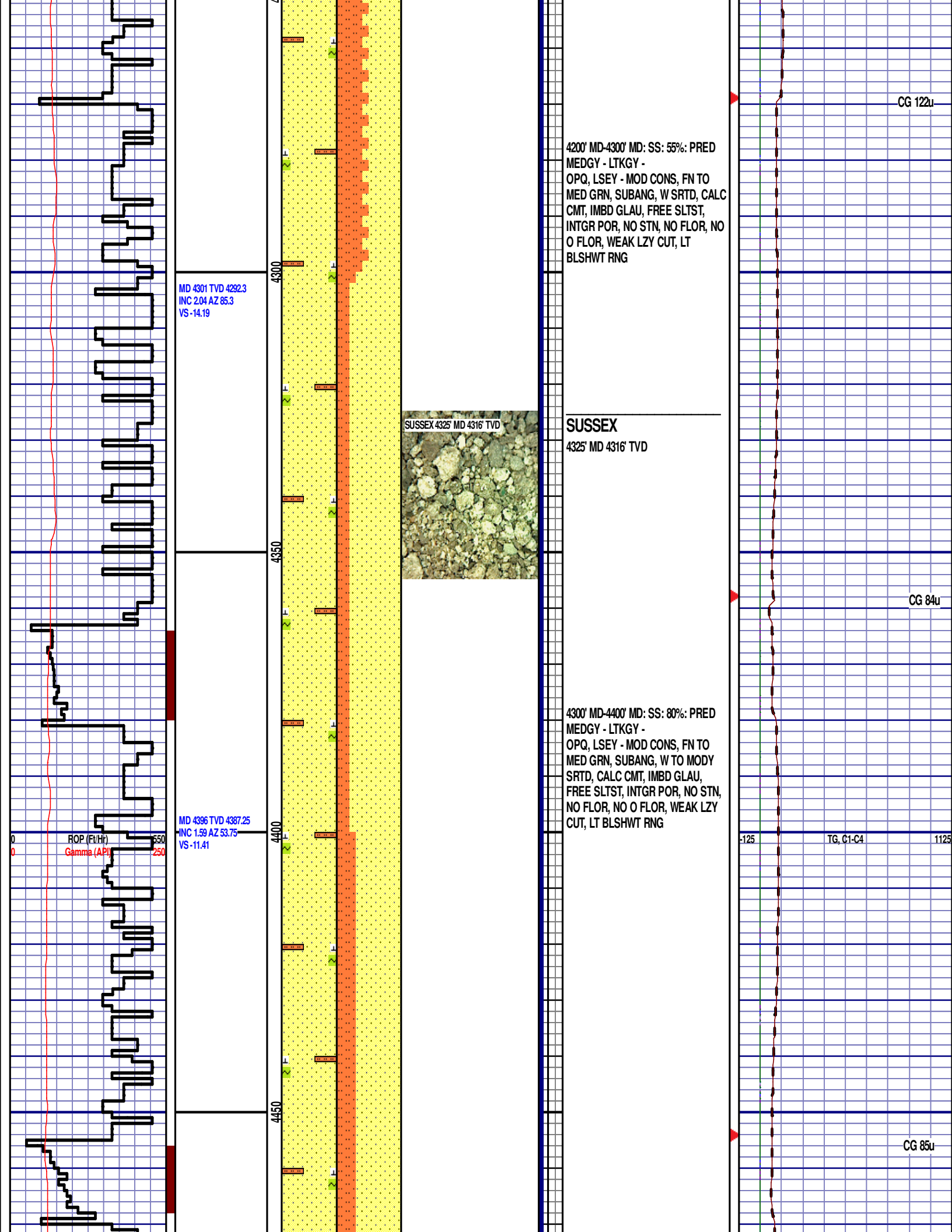


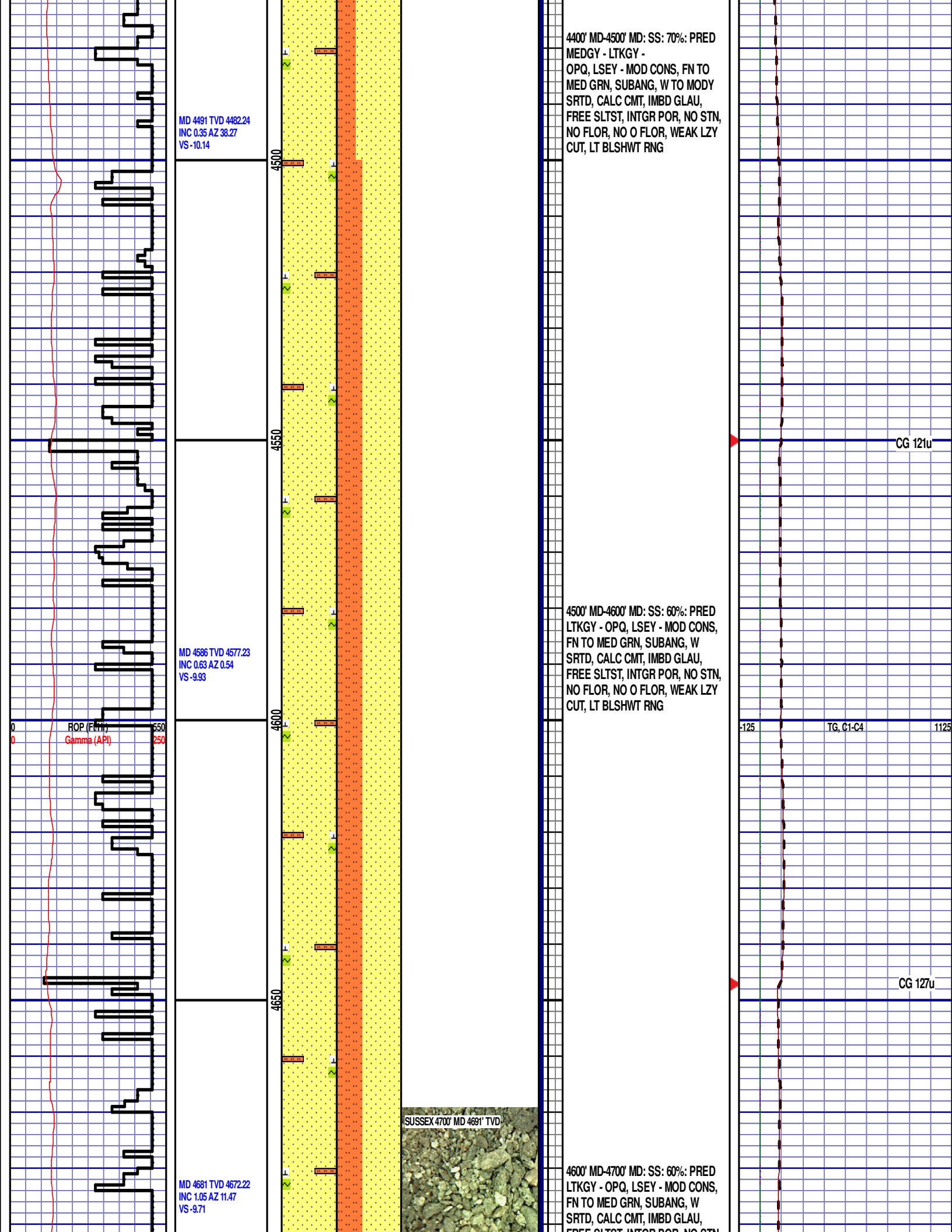












MD 4491 TVD 4482.24  
INC 0.35 AZ 38.27  
VS -10.14

MD 4586 TVD 4577.23  
INC 0.63 AZ 0.54  
VS -9.93

ROP (Fm)  
Gamma (API)

MD 4681 TVD 4672.22  
INC 1.05 AZ 11.47  
VS -9.71

SUSSEX 4700' MD 4691' TVD

4400' MD-4500' MD: SS: 70%: PRED  
MEDGY - LTKGY -  
OPQ, LSEY - MOD CONS, FN TO  
MED GRN, SUBANG, W TO MODY  
SRTD, CALC CMT, IMBD GLAU,  
FREE SLTST, INTGR POR, NO STN,  
NO FLOR, NO O FLOR, WEAK LZ  
CUT, LT BLSHWT RNG

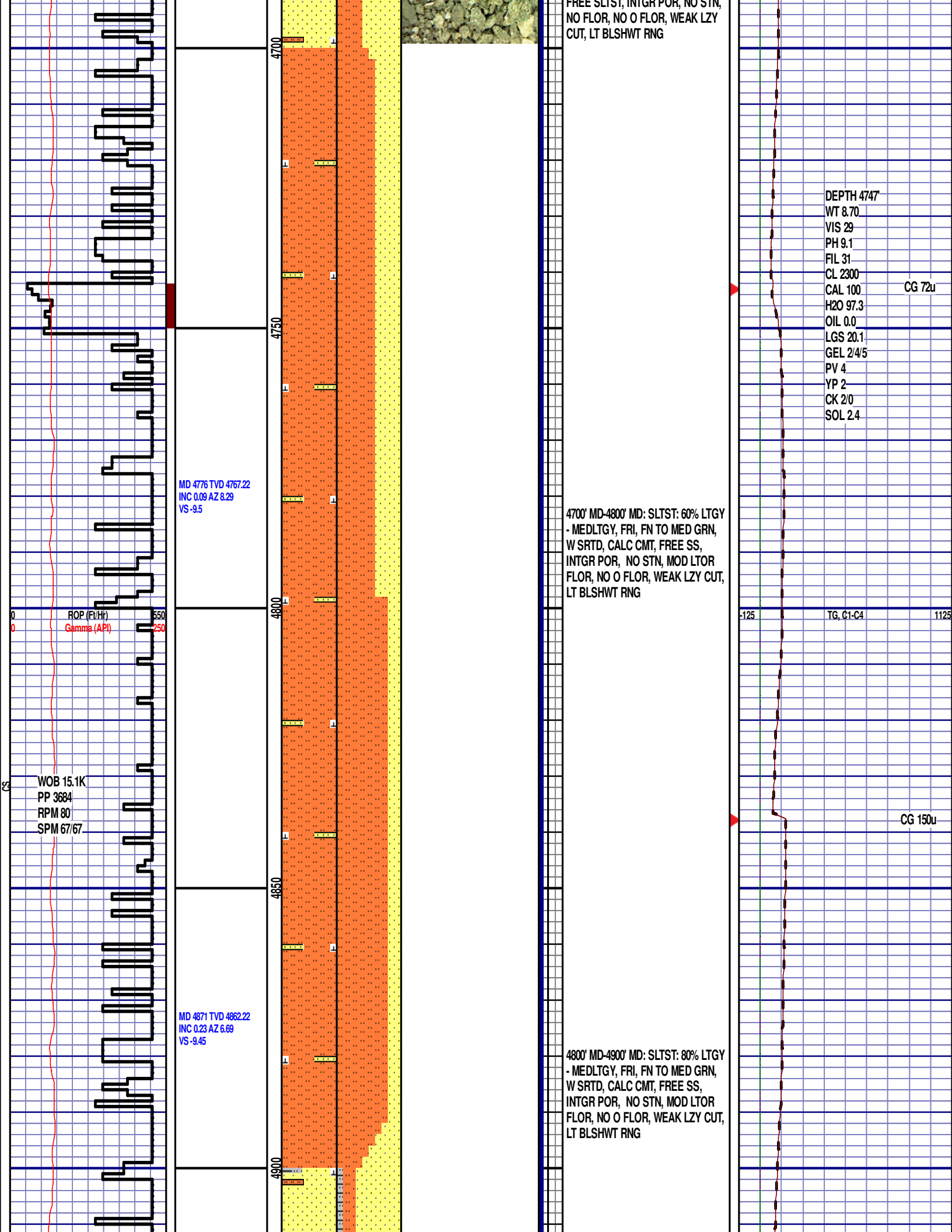
4500' MD-4600' MD: SS: 60%: PRED  
LTKGY - OPQ, LSEY - MOD CONS,  
FN TO MED GRN, SUBANG, W  
SRTD, CALC CMT, IMBD GLAU,  
FREE SLTST, INTGR POR, NO STN,  
NO FLOR, NO O FLOR, WEAK LZ  
CUT, LT BLSHWT RNG

4600' MD-4700' MD: SS: 60%: PRED  
LTKGY - OPQ, LSEY - MOD CONS,  
FN TO MED GRN, SUBANG, W  
SRTD, CALC CMT, IMBD GLAU,  
FREE SLTST, INTGR POR, NO STN,

CG 121u

TG, C1-C4

CG 127u



SHANNON 4914' MD 4905' TVD



## SHANNON

4914' MD 4905' TVD

CG 127u

EQUIPMENT ERROR  
FROM 4956' MD TO  
4967' MD

MD 4966 TVD 4957.22  
INC 0.31 AZ 60.68  
VS -9.2

EQUIPMENT ERROR FROM  
4956' MD TO 4967' MD

4900' MD-5000' MD: SS: 70% WH -  
MEDLTGY, MOD CONS, MED TO  
CRS GRN, ANG, MODY SRTD, CALC  
CMT, IMBD RK FRAGS, FREE  
SLTST, FREE SLTY SH, INTGR POR,  
NO STN, NO O FLOR, WEAK LZY  
CUT, LT BLSHWT RING

ROP (m) 550  
Gamma (API) 250

-125 TG, C1-C4 1125

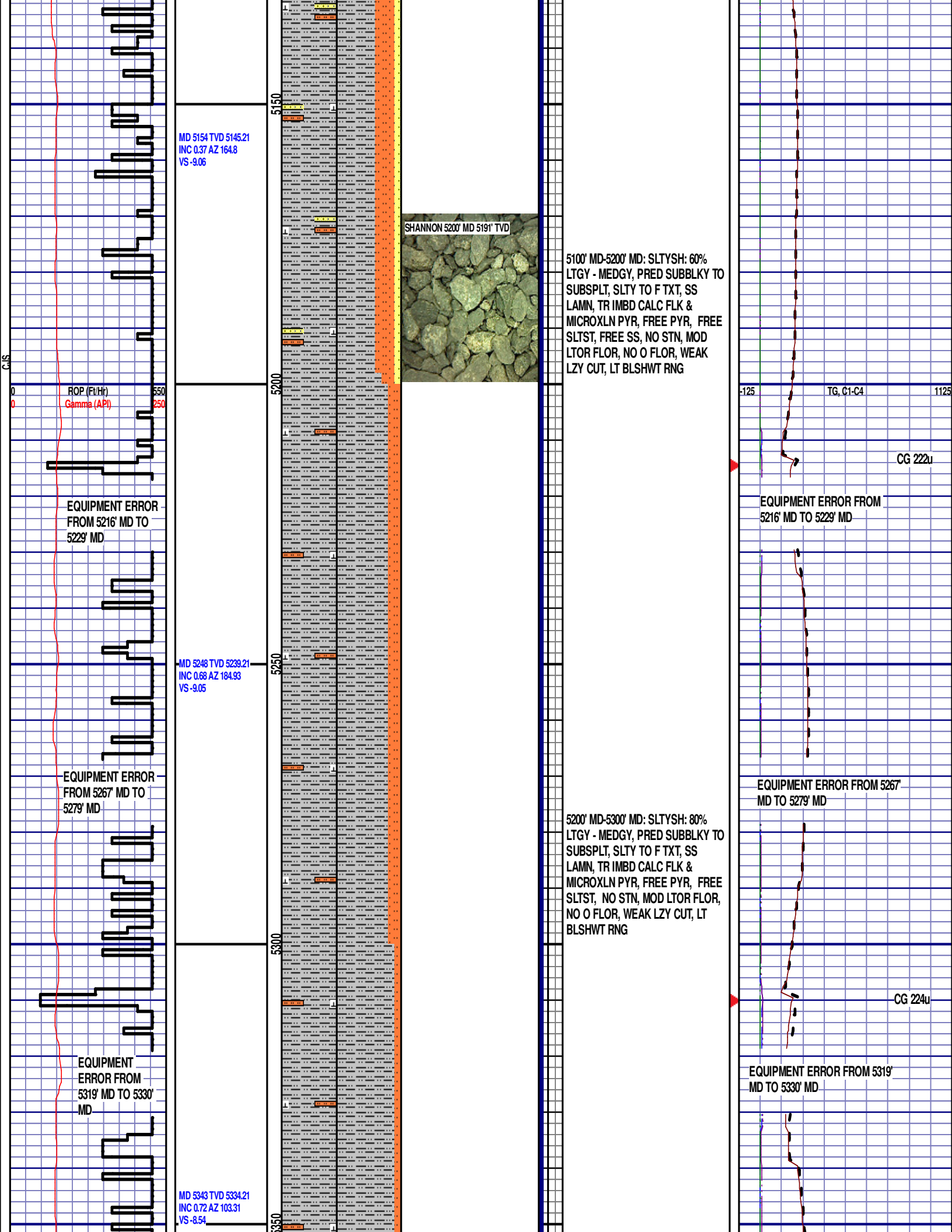
CG 138u

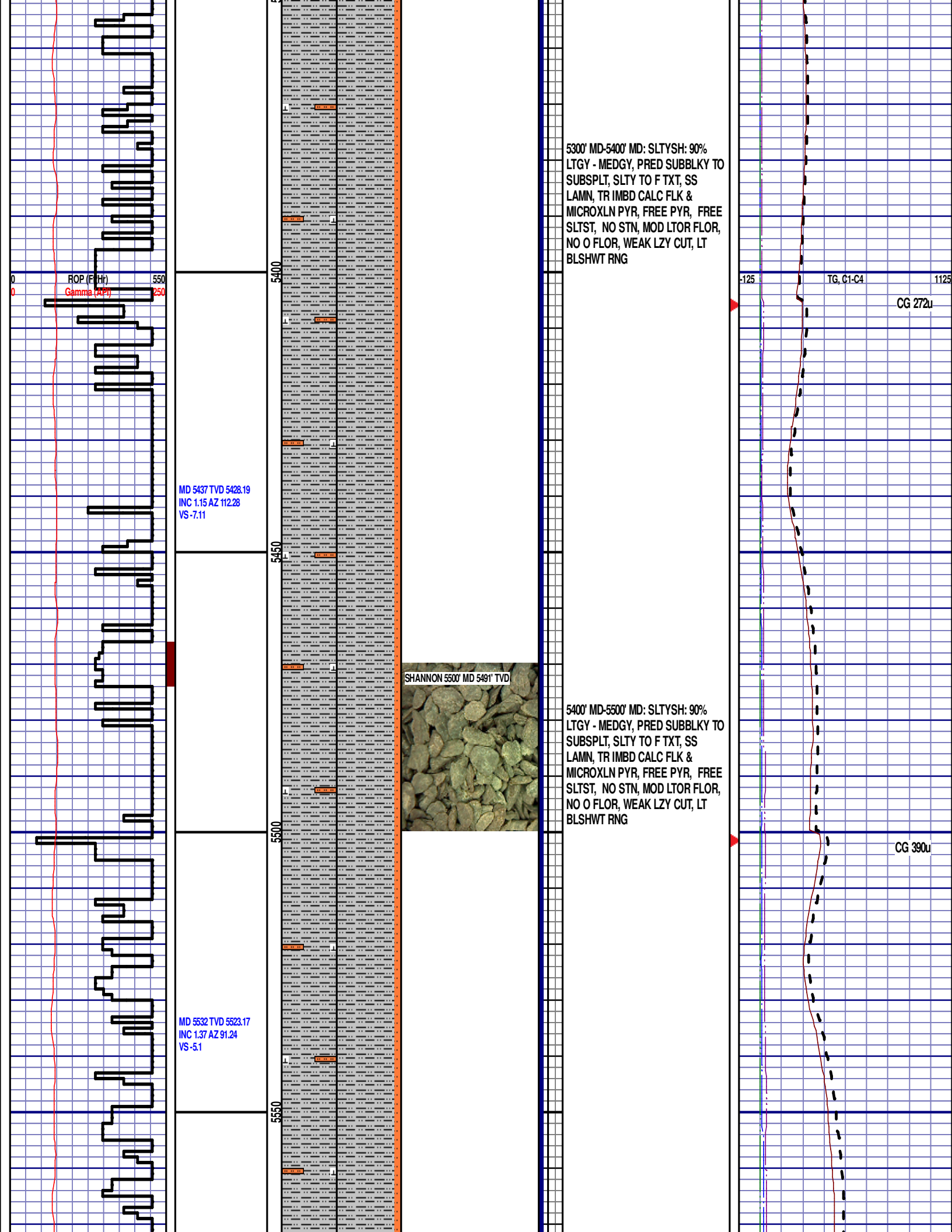
MD 5060 TVD 5051.21  
INC 0.31 AZ 340.67  
VS -9.05

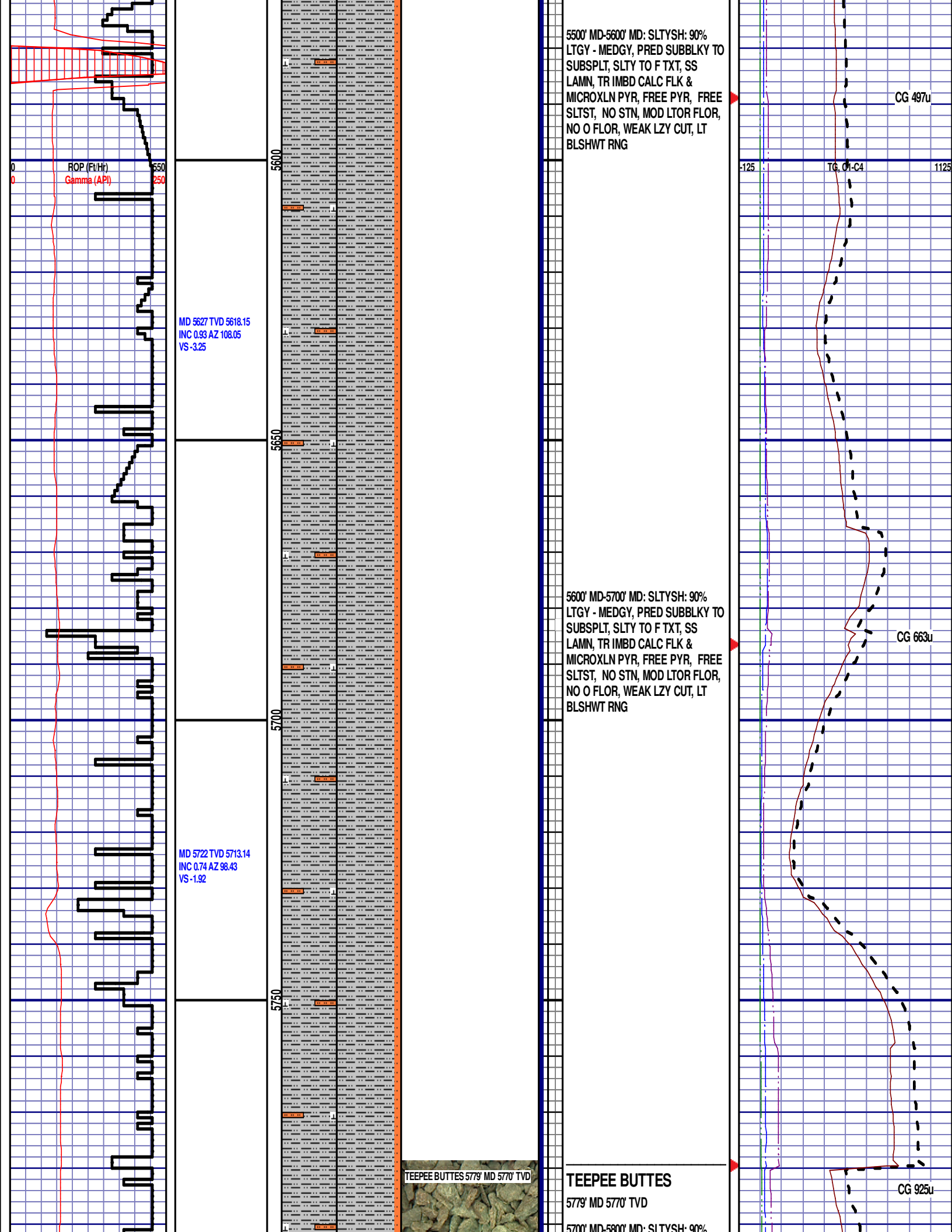
5000' MD-5100' MD: SLTYSH: 60%  
LTGY - MEDGY, PRED SUBBLKY TO  
SUBSPLT, SLTY TO F TXT, SS  
LAMN, TR IMBD CALC FLK &  
MICROXLN PYR, FREE PYR, FREE  
SLTST, FREE SS, NO STN, MOD  
LTOR FLOR, NO O FLOR, WEAK  
LZY CUT, LT BLSHWT RING

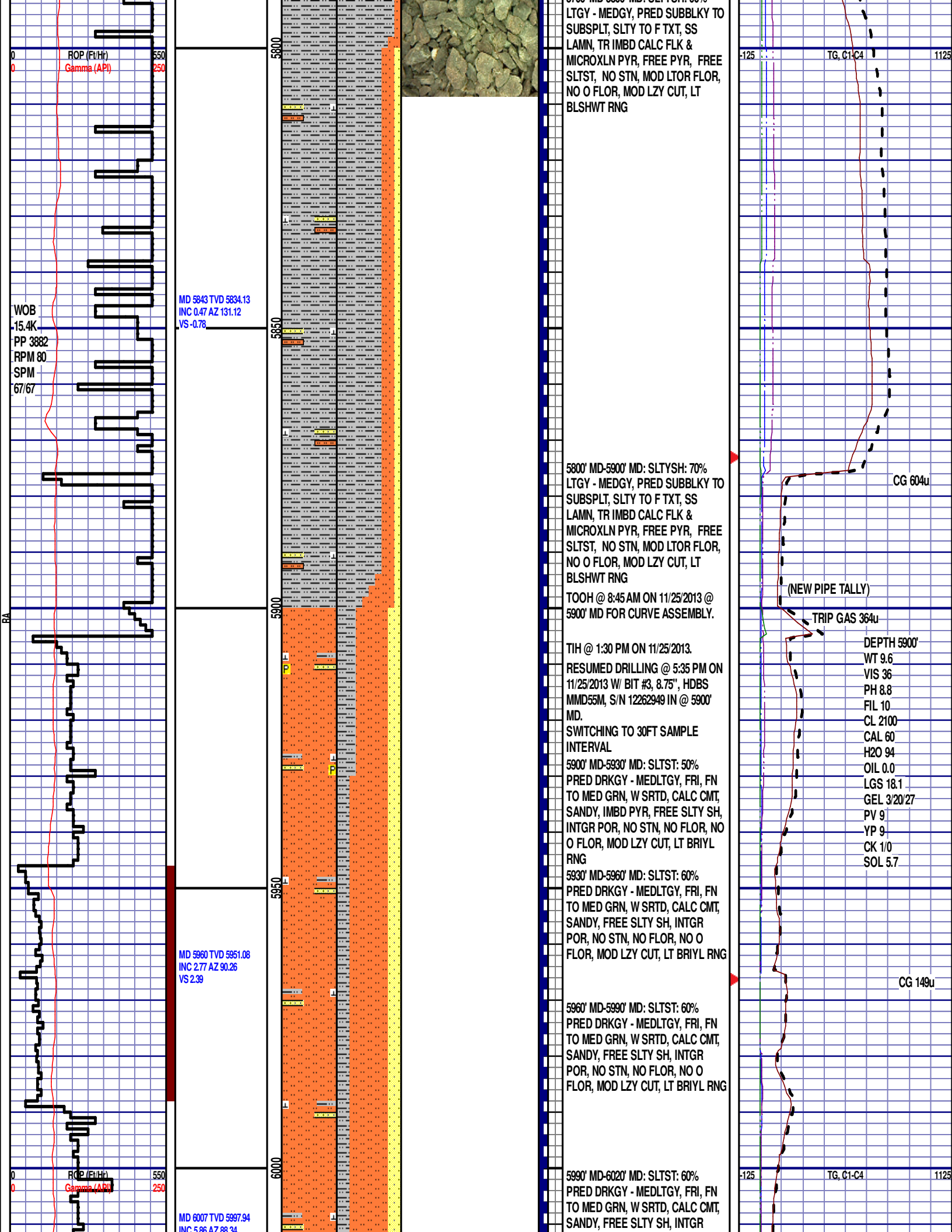
CG 188u

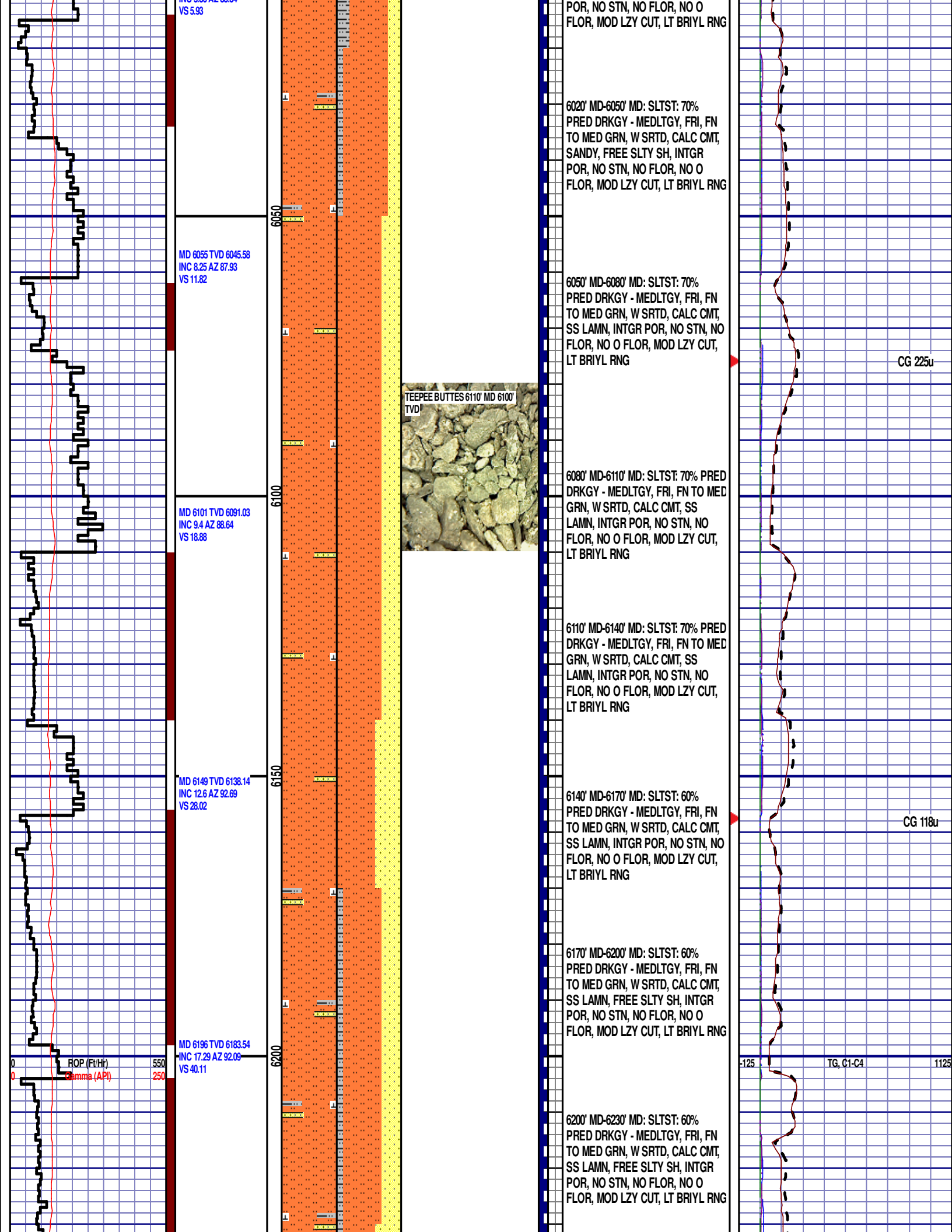














MD 6244 TVD 6228.52  
INC 23.46 AZ 86.6  
VS 56.79

12:01AM  
11/26/13  
DAY 05  
FT/24HRS 2703

MD 6290 TVD 6269.89  
INC 28.31 AZ 85.25  
VS 76.85

WOB 14.7K  
PP 3485  
RPM 0  
SPM 64/64

MD 6338 TVD 6311.78  
INC 30.16 AZ 85.28  
VS 100.26

MD 6384 TVD 6350.8  
INC 33.77 AZ 87.59  
VS 124.6

ROP (Ft/Hr)  
Gamma (API)

MD 6432 TVD 6389.77  
INC 37.62 AZ 89.83  
VS 152.59

6230' MD-6260' MD: SLTST: 55%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, FREE SLTY SH, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, MOD LZ Y CUT, LT BRIYL RNG

CG 191u

6260' MD-6290' MD: SLTST: 70%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, FREE SLTY SH, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, MOD LZ Y CUT, LT BRIYL RNG

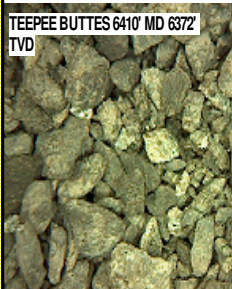
6290' MD-6320' MD: SLTST: 80%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, FREE SLTY SH, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, MOD LZ Y CUT, LT BRIYL RNG

6320' MD-6350' MD: SLTST: 65%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, FREE SLTY SH, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, MOD LZ Y CUT, LT BRIYL RNG

CG 203u

6350' MD-6380' MD: SLTST: 70%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, MOD LZ Y CUT,  
LT BRIYL RNG

TEEPEE BUTTES 6410' MD 6372'  
TVD



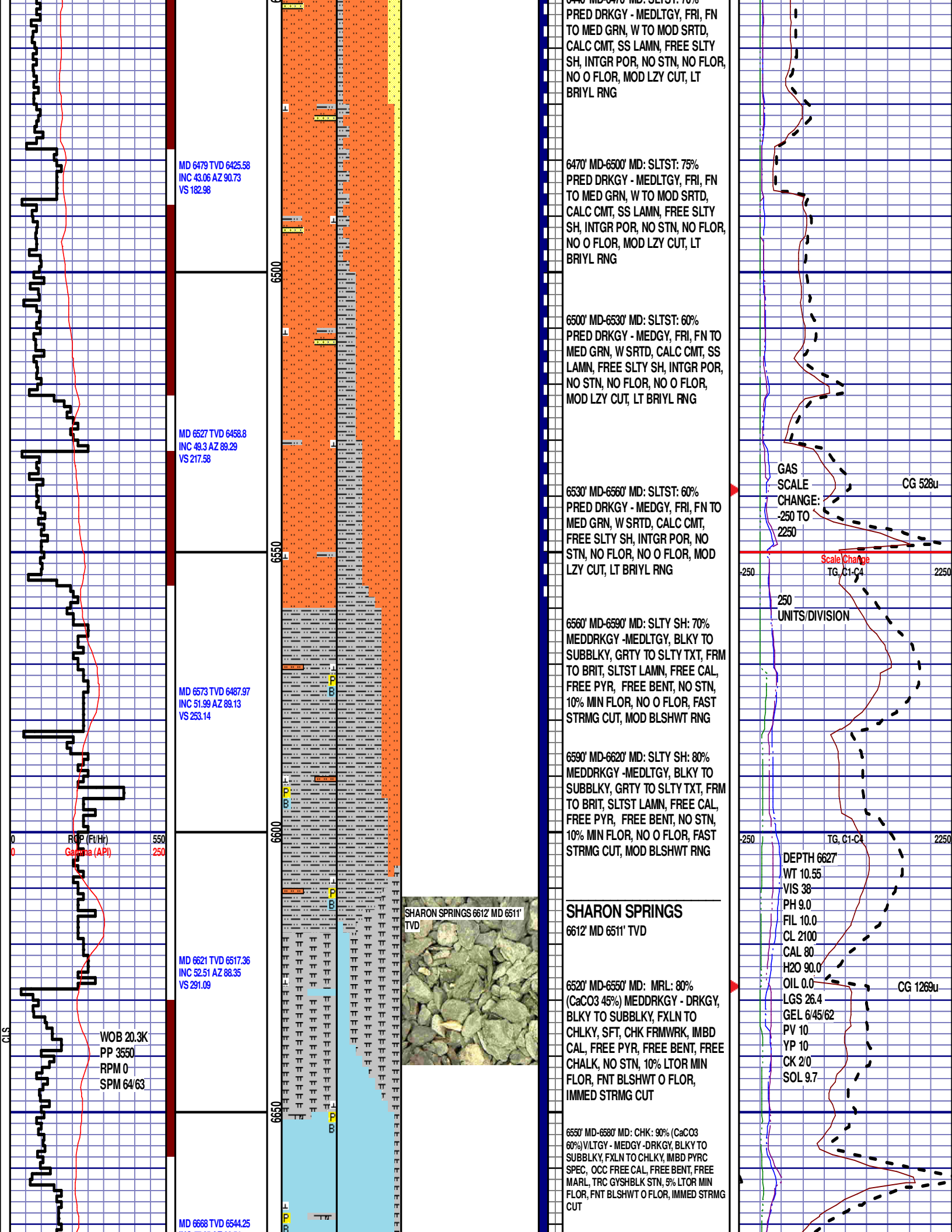
6380' MD-6410' MD: SLTST: 70%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, MOD LZ Y CUT,  
LT BRIYL RNG

-125 TG, C1-C4 1125

6410' MD-6440' MD: SLTST: 80%  
PRED DRKGY - MEDLTGY, FRI, FN  
TO MED GRN, W SRTD, CALC CMT,  
SS LAMN, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, MOD LZ Y CUT,  
LT BRIYL RNG

CG 257u

6440' MD-6470' MD: SLTST: 70%



INC 57.65 AZ 88.54  
VS 329.62



**NIORARA A CHALK**  
6672' MD 6546' TVD

END OF VERTICAL LOG @ 6700' MD  
ON 11/26/2013, CONTINUED ON  
HORIZONTAL LOG

6700

50