



10/6/2014  
0 FT/24HRS  
DAY 02

WOB 18.7K  
PP 3380  
RPM 63  
SPM 78/78

MD 2539 TVD 2532.16  
INC 8.69 AZ 291.68  
VS 67.3

WOB 20.0K  
PP 3565  
RPM 63  
SPM 78/78

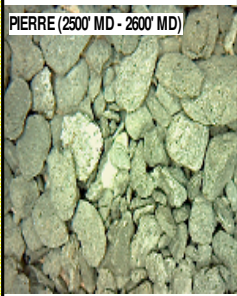
RO (Ft/Hr)  
Gamma (API)

MD 2634 TVD 2626.04  
INC 8.96 AZ 303.19  
VS 74.78

8.75", SMITH SDI519, (S/N) JJ8501 IN  
@ 1191' MD

PIERRE  
BEFORE LOGGING DEPTH

CG 236u DEPTH 1752'  
WT 8.80  
VIS 30  
PH 12.7  
FIL 63.0  
CL 400  
CAL 100  
H2O 97.0  
OIL 0.0  
LGS 17.72  
GELS 2/3/3  
PV 3  
YP 3  
CK 1/0  
SOL 2.7



PIERRE (2500' MD - 2600' MD)

2500'- 2600': SLTST: 80% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

2600'- 2700': SLTST: 85% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

TG, C1-C4 CG 310u 1125

CG 331u

MD 2728 TVD 2718.93  
INC 8.68 AZ 300.69  
VS 83.15

2750

2800

2850

2900

ROP (Ft/Hr)  
Gamma (API)

2000  
300

MD 2823 TVD 2812.86  
INC 8.55 AZ 301.29  
VS 91.22

PIERRE (2800' MD - 2900' MD)



2700'- 2800': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

CG 401u

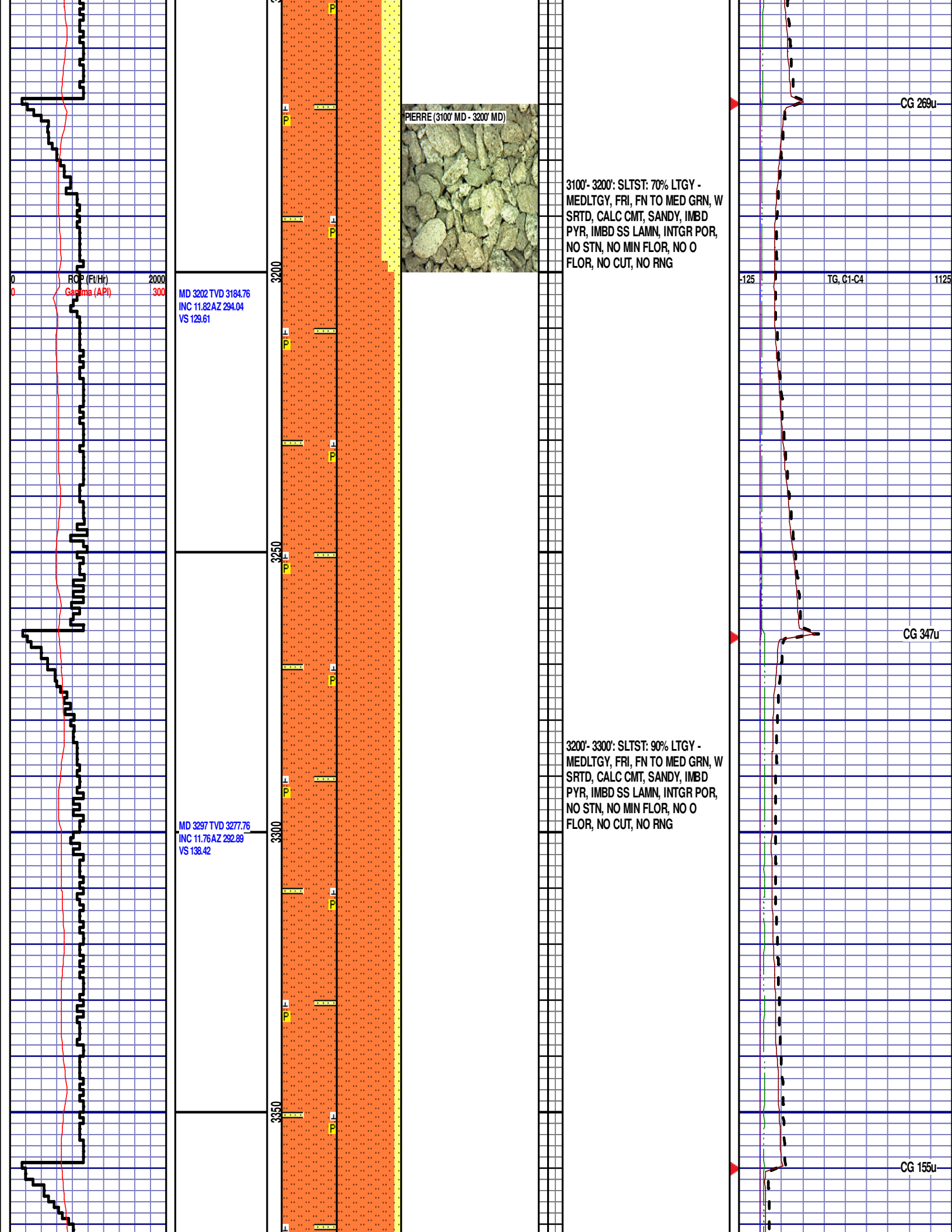
TG, C1-C4

CG 355u

MD 2918 TVD 2906.47  
INC 11.01 AZ 300.6  
VS 100.34

2800'- 2900': SLTST: 85% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG





MD 3392 TVD 3370.84  
INC 11.29 AZ 291.5  
VS 146.66

ROP (Ft/Hr)  
Gamma (API)

2000  
300

3400

3300'- 3400': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

-125

TG, C1-C4

1125

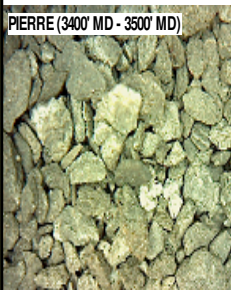
3450

3500

3550

MD 3486 TVD 3462.97  
INC 11.63 AZ 291.59  
VS 154.58

PIERRE (3400' MD - 3500' MD)



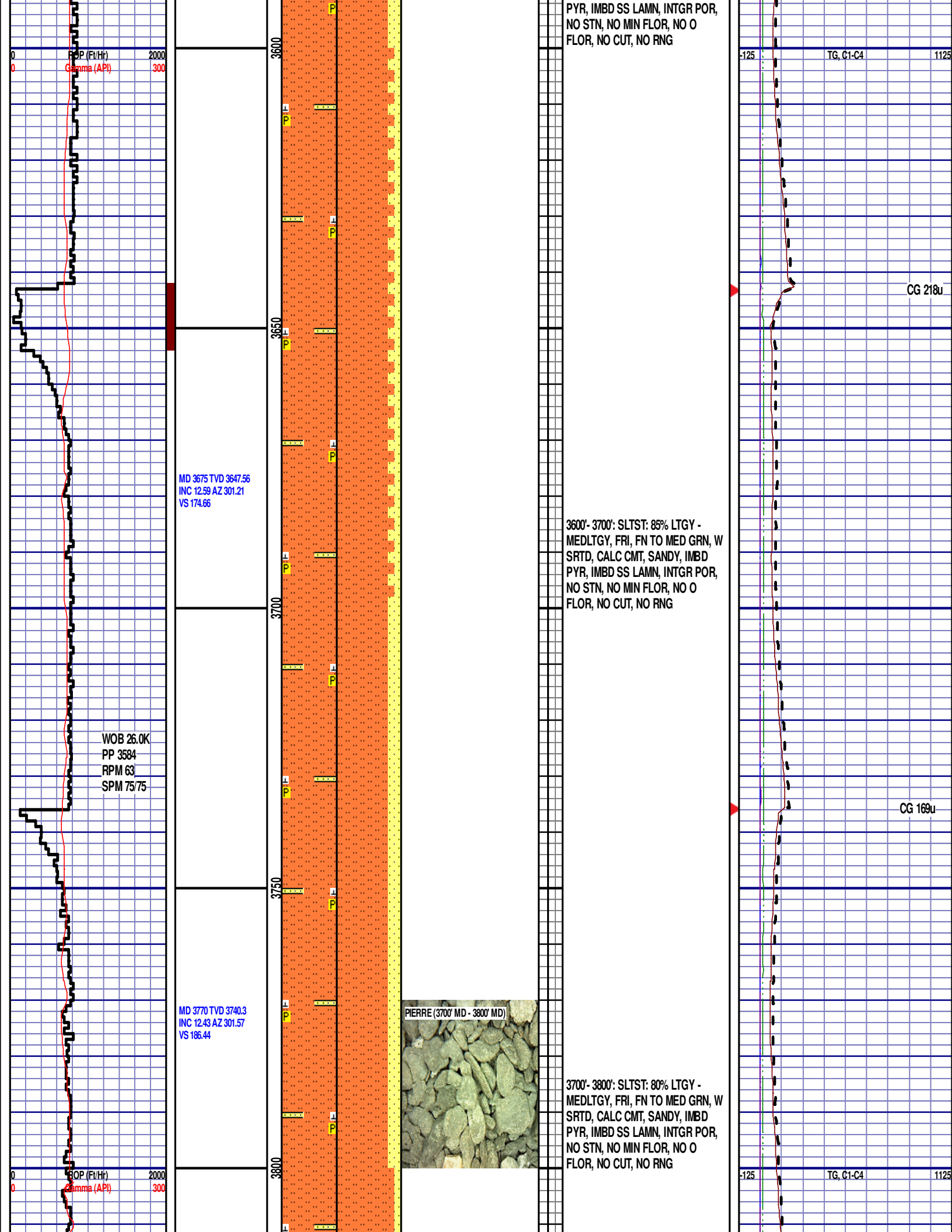
3400'- 3500': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

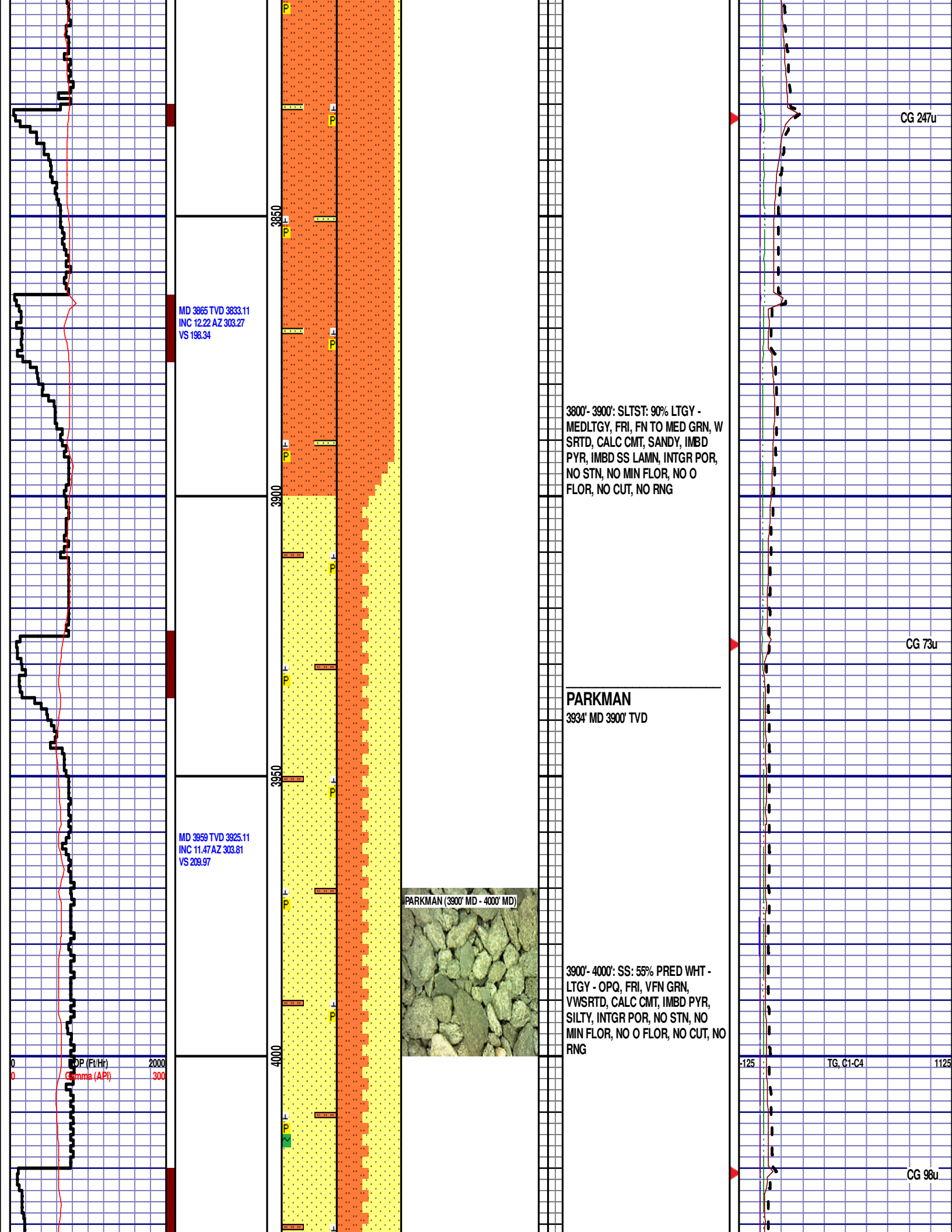
CG 156u

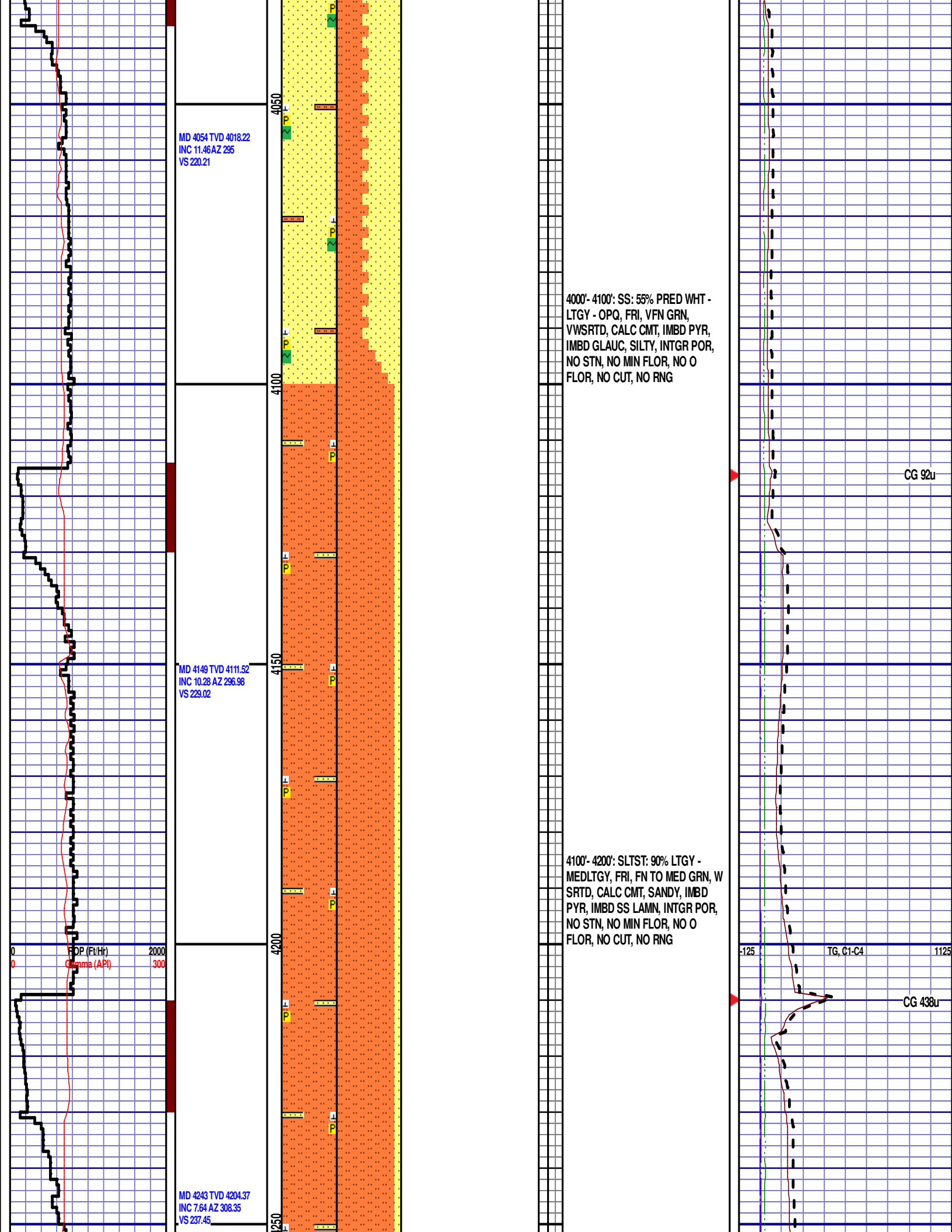
CG 163u

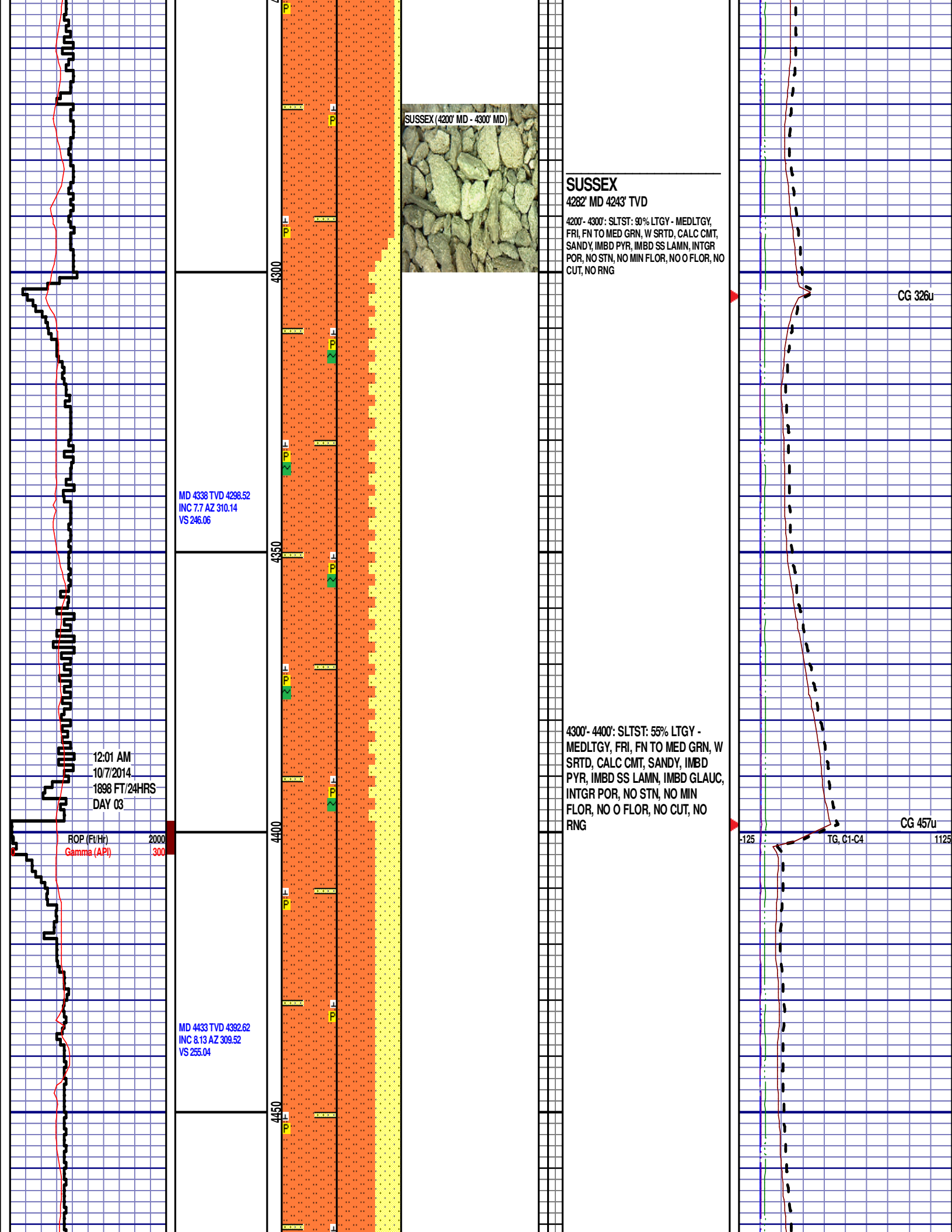
MD 3581 TVD 3555.83  
INC 12.7 AZ 295.78  
VS 163.76

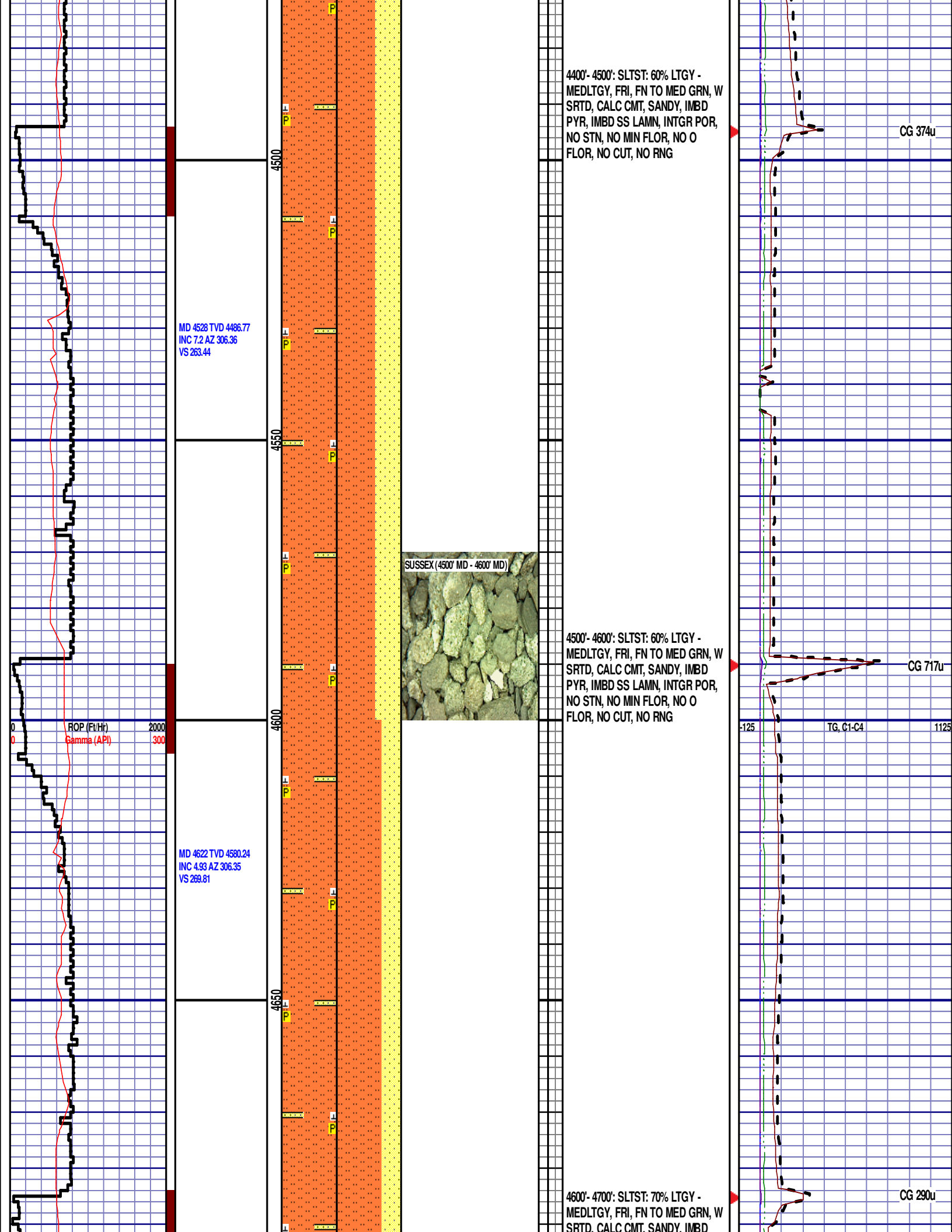
3500'- 3600': SLTST: 80% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD











4700' - 4800': SLTST: 80% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

4800'- 4900': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

CG 290u

DEPTH 4890'  
WT 8.85  
VIS 29  
PH 9.3  
FIL 43.4  
CL 500  
CAL 20  
H2O 97.4

VS 275.91

OIL 0.0  
LGS 7.01  
GELS 1/2/2  
PV 2  
YP 2  
CK 2/0  
SOL 2.3

CG 273u

4900' - 5000': SLTST: 85% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
PYR, IMBD SS LAMN, INTGR POR,  
NO STN, NO MIN FLOR, NO O  
FLOR, NO CUT, NO RNG

-125 TG, C1-C4 1125

CG 349u

SHANNON (5000' MD - 5100' MD)



### SHANNON

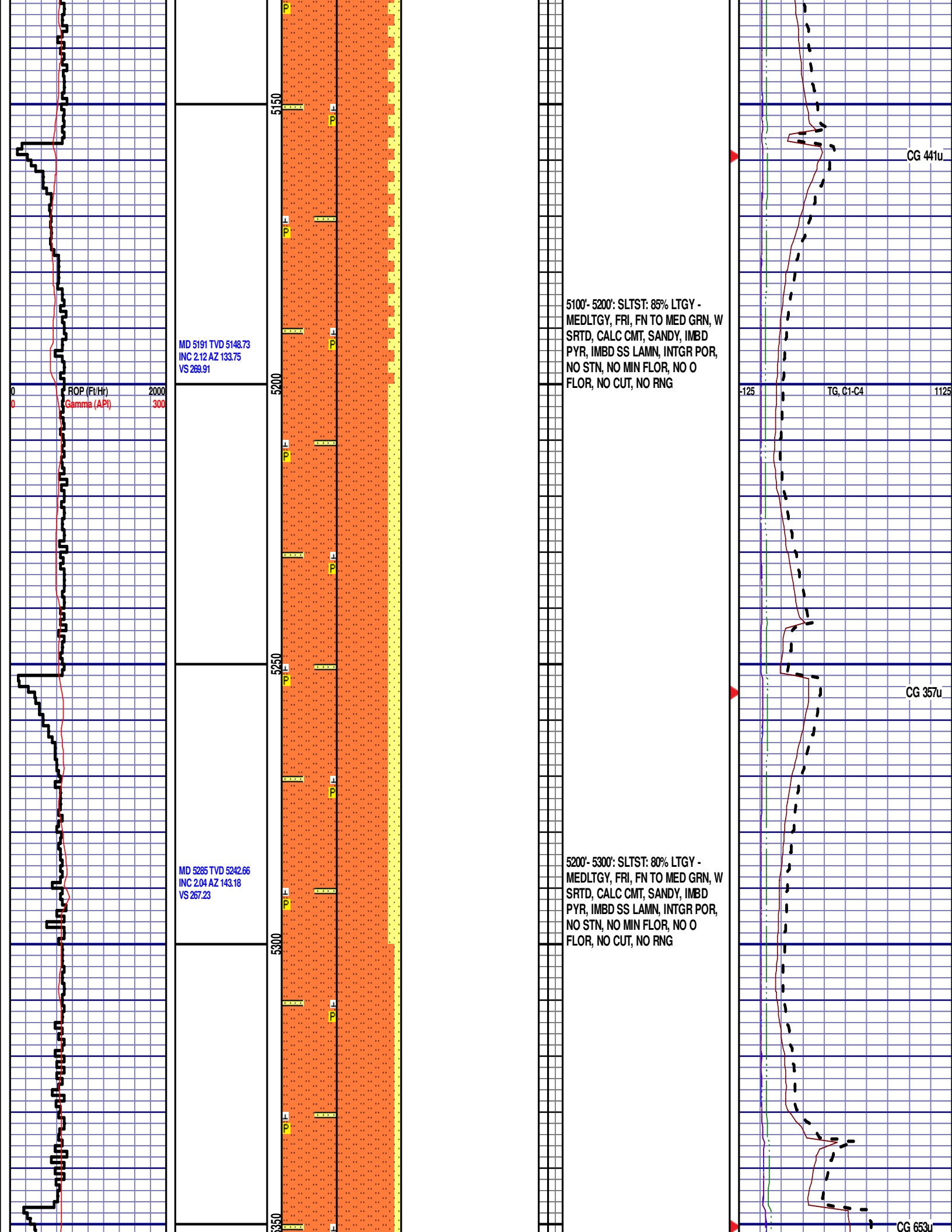
5084' MD 5041' TVD

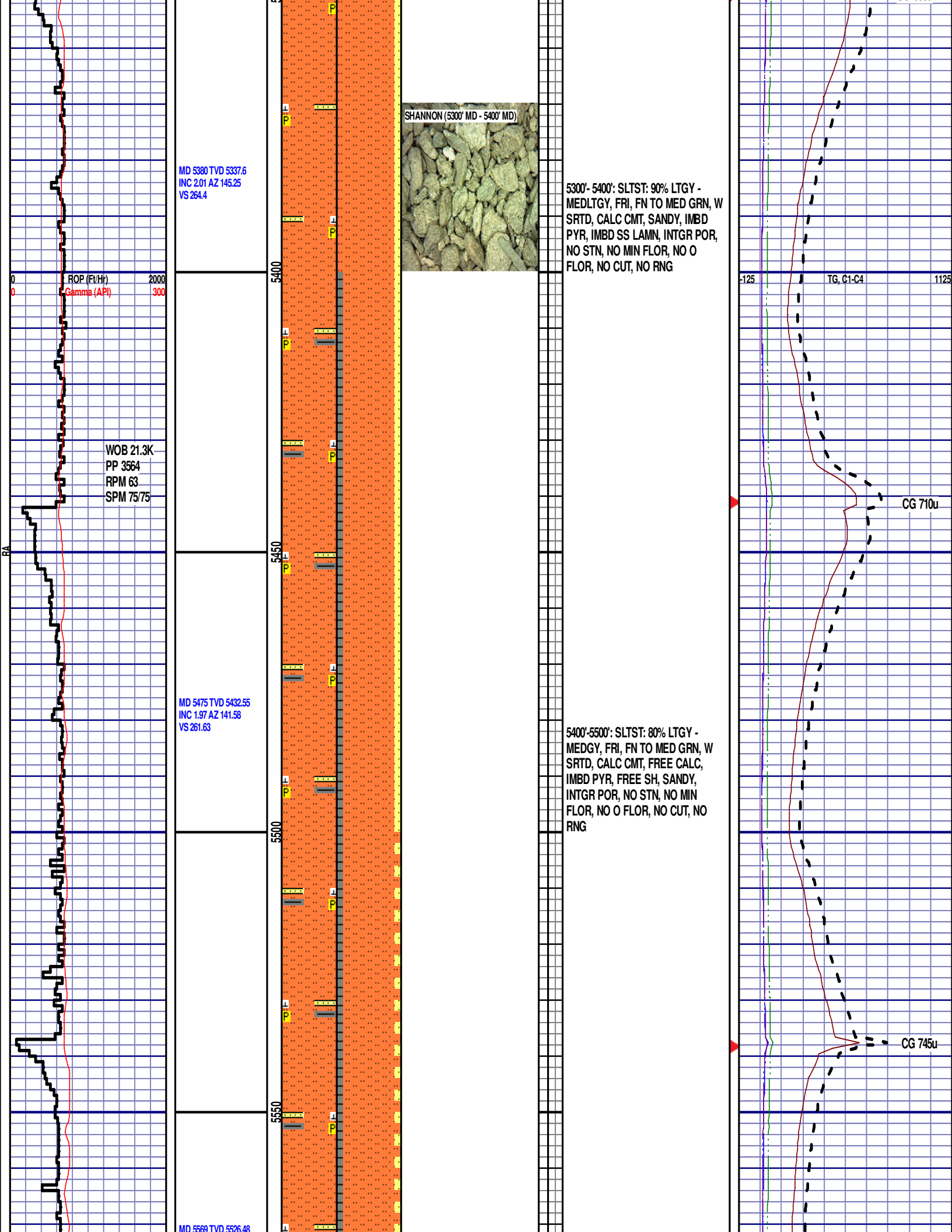
5000' - 5100': SLTST: 90% LTGY - MEDLTGY,  
FRI, FN TO MED GRN, W SRTD, CALC CMT,  
SANDY, IMBD PYR, IMBD SS LAMN, INTGR  
POR, NO STN, NO MIN FLOR, NO O FLOR,  
CUT, NO RNG

MD 5001 TVD 4958.83  
INC 1.72 AZ 129.36  
VS 274.31

MD 5096 TVD 5053.78  
INC 1.82 AZ 132.03  
VS 272.27

ROP (Ft/Hr) 2000  
Gamma (API) 300





INC 2.26 AZ 144.09  
VS 258.74

ROP (Ft/Hr)  
Gamma (API)

2000  
300

MD 5664 TVD 5621.41  
INC 2.37 AZ 147.05  
VS 255.45

MD 5758 TVD 5715.35  
INC 1.6 AZ 185.77  
VS 252.46

5600

5650

5700

5750

SHANNON (5600' MD - 5700' MD)



5500'-5600': SLTST: 85% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

5600'-5700': SLTST: 85% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

5700'-5800': SLTST: 80% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY

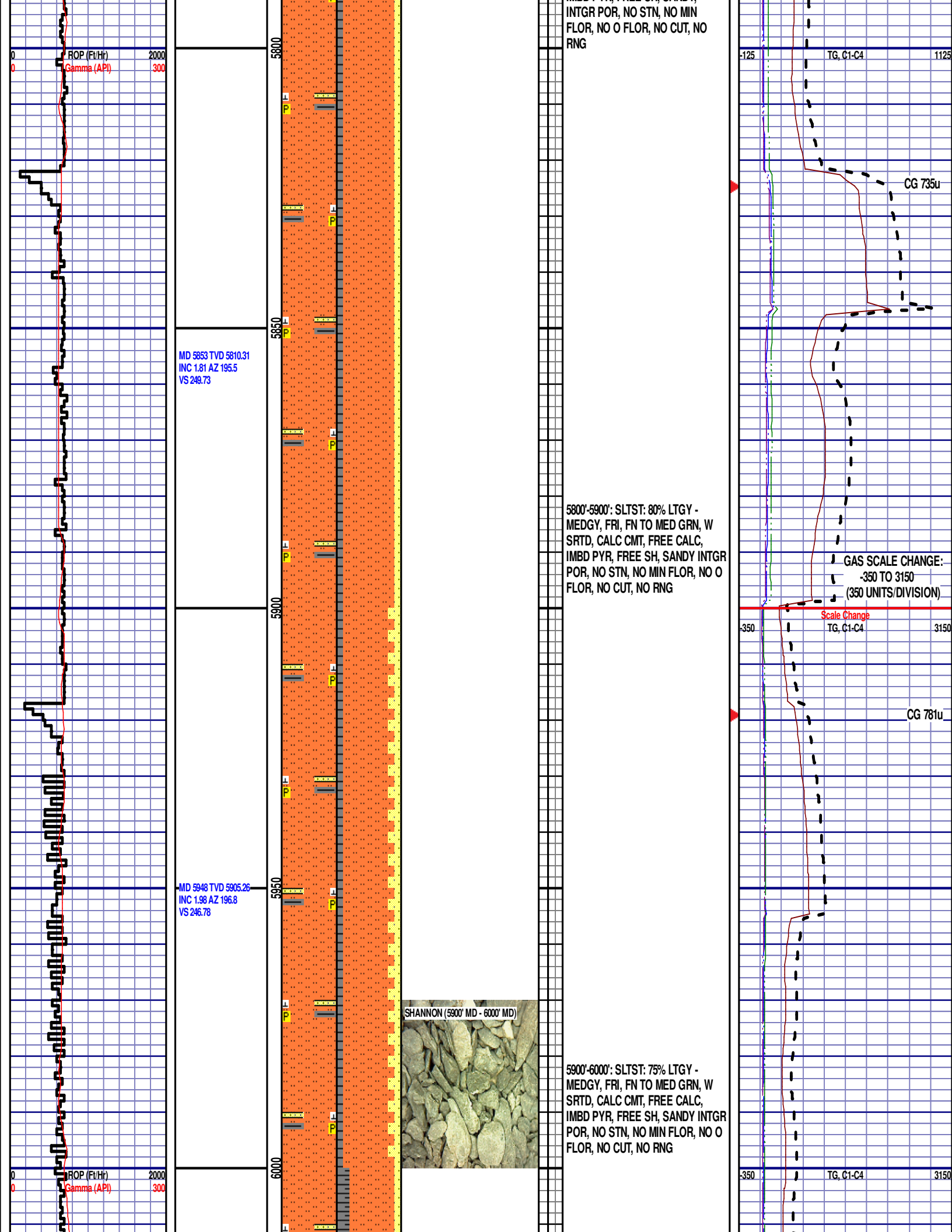
-125

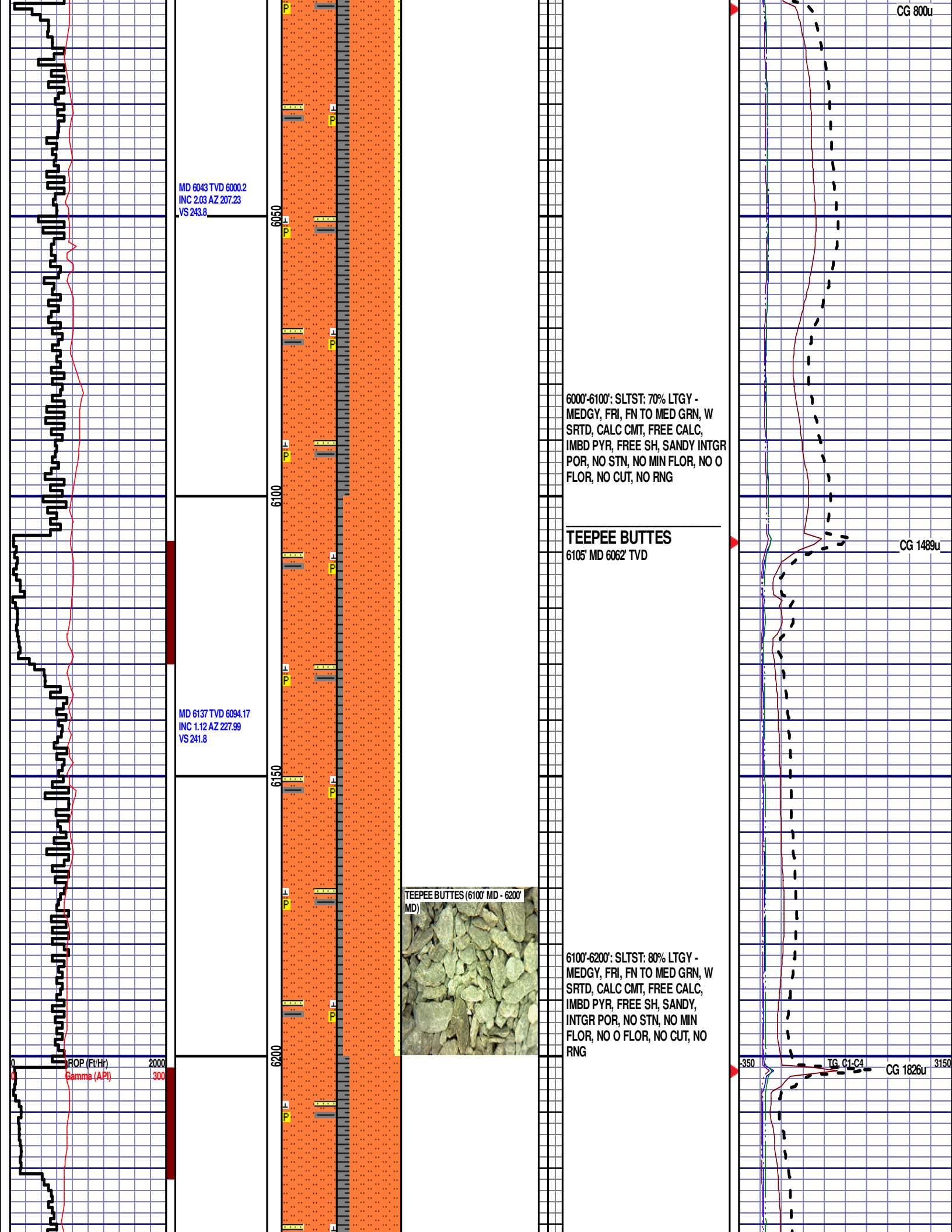
TG, C1-C4

1125

CG 810u

CG 790u





MD 6234 TVD 6191.15  
INC 0.84 AZ 304.74  
VS 241.65

WOB 20.0K  
PP 3050  
RPM 0  
SPM 75/75

MD 6329 TVD 6286.07  
INC 3.92 AZ 356.82  
VS 245.33

ROP (Ft/Hr) 2000  
Gamma (API) 300

MD 6423 TVD 6379.02  
INC 12.5 AZ 359.51  
VS 258.73

6250

6300

6350

6400

6450

6200'-6300': SLTST: 80% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, TRC SS  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

SWITCHING TO 30' SAMPLE  
INTERVAL

6300'-6330': SLTST: 70% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, TRC FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

6330'-6360': SLTST: 70% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, TRC FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

6360'-6390': SLTST: 70% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

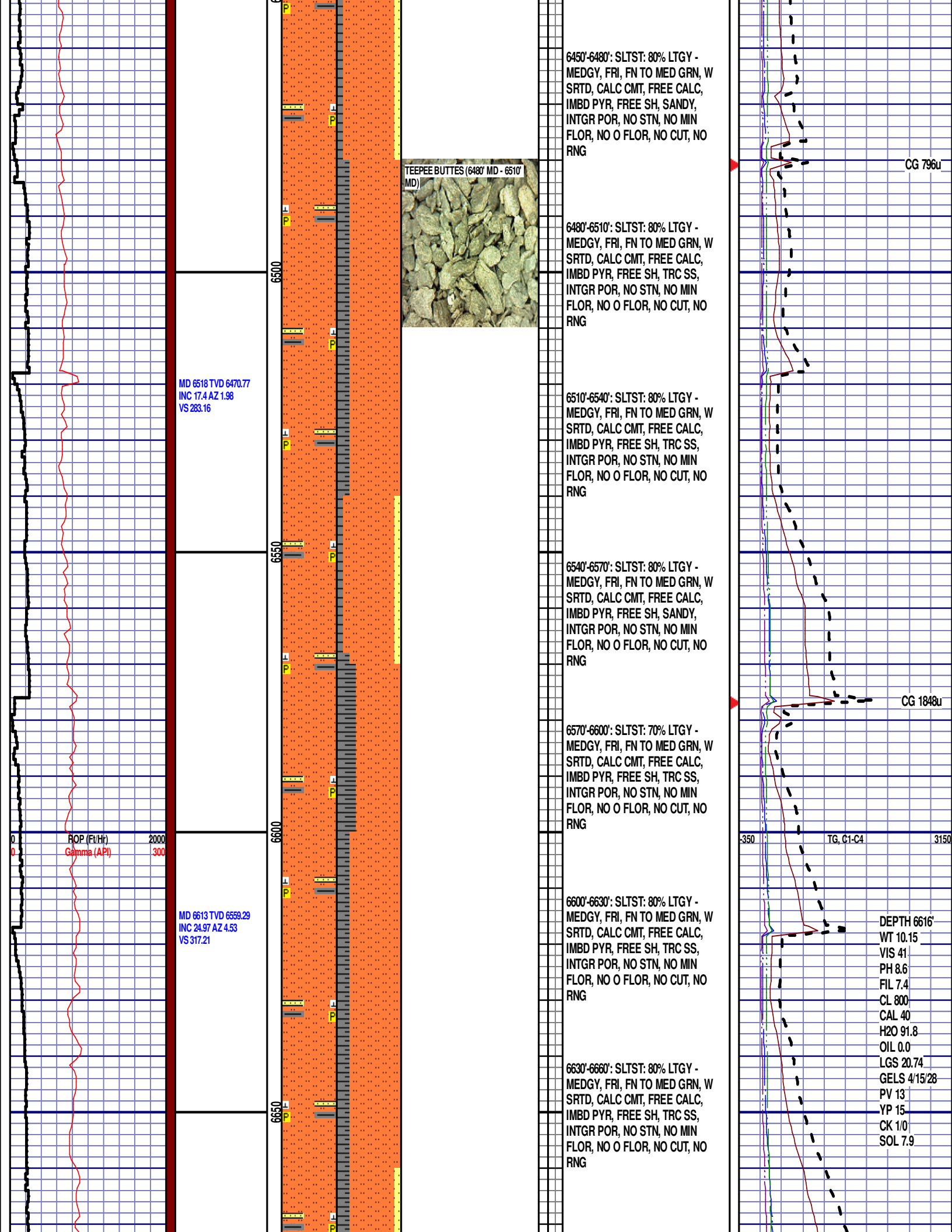
6390'-6420': SLTST: 60% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

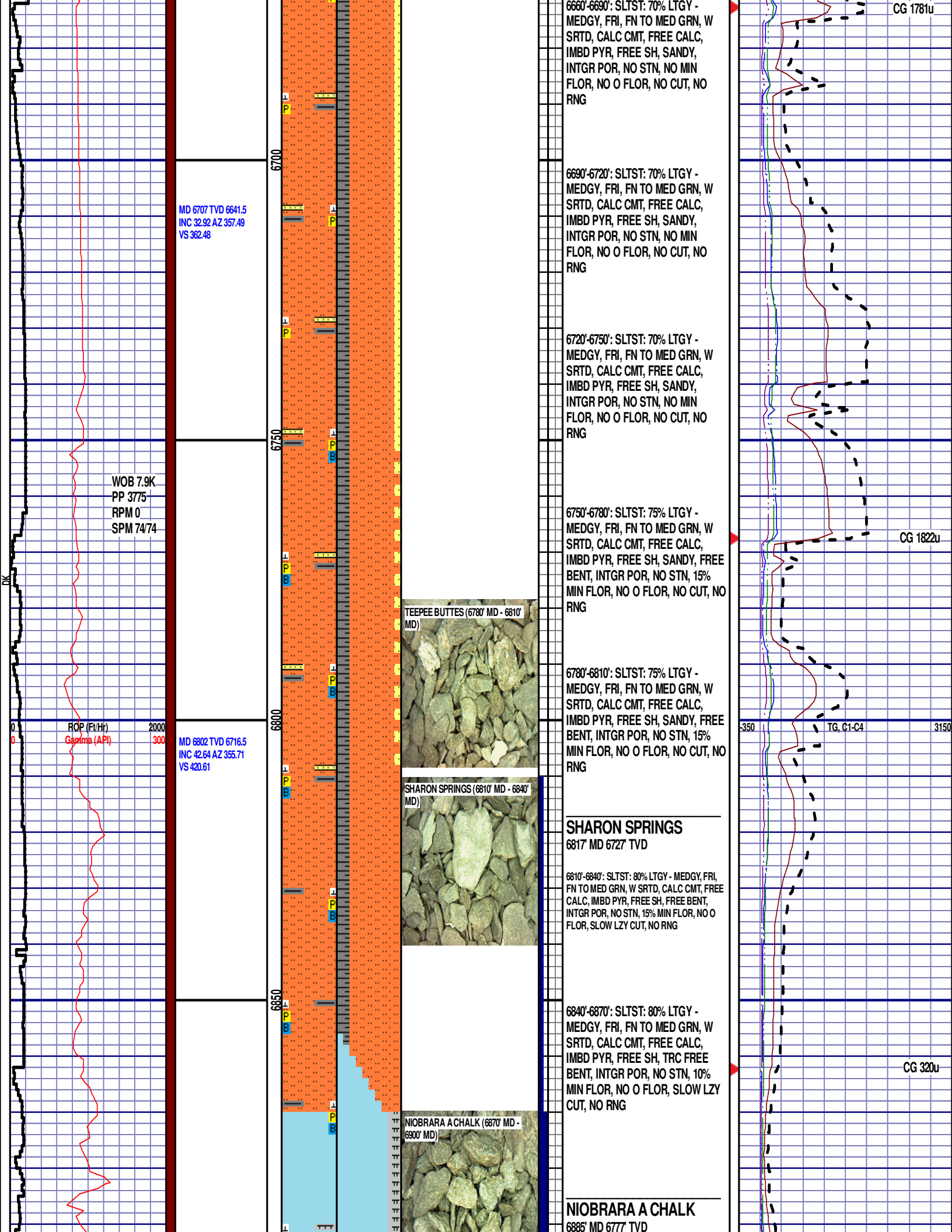
6420'-6450': SLTST: 80% LTGY -  
MEDGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE CALC,  
IMBD PYR, FREE SH, SANDY,  
INTGR POR, NO STN, NO MIN  
FLOR, NO O FLOR, NO CUT, NO  
RNG

CG 1663u

CG 360u

TG, C1-C4





MD 6707 TVD 6641.5  
INC 32.92 AZ 357.49  
VS 362.48

WOB 7.9K  
PP 3775  
RPM 0  
SPM 7474

ROP (Fe/Hr) 2000  
Gamma (API) 300

MD 6802 TVD 6716.5  
INC 42.64 AZ 355.71  
VS 420.61

TEEPEE BUTTES (6780' MD - 6810' MD)

SHARON SPRINGS (6810' MD - 6840' MD)

NIOBRARA A CHALK (6870' MD - 6900' MD)

6660'-6690': SLTST: 70% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, SANDY, INTGR POR, NO STN, NO MIN FLOR, NO O FLOR, NO CUT, NO RNG

6690'-6720': SLTST: 70% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, SANDY, INTGR POR, NO STN, NO MIN FLOR, NO O FLOR, NO CUT, NO RNG

6720'-6750': SLTST: 70% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, SANDY, INTGR POR, NO STN, NO MIN FLOR, NO O FLOR, NO CUT, NO RNG

6750'-6780': SLTST: 75% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, SANDY, FREE BENT, INTGR POR, NO STN, 15% MIN FLOR, NO O FLOR, NO CUT, NO RNG

6780'-6810': SLTST: 75% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, SANDY, FREE BENT, INTGR POR, NO STN, 15% MIN FLOR, NO O FLOR, NO CUT, NO RNG

### SHARON SPRINGS

6817' MD 6727' TVD

6810'-6840': SLTST: 80% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, FREE BENT, INTGR POR, NO STN, 15% MIN FLOR, NO O FLOR, SLOW LZ CUT, NO RNG

6840'-6870': SLTST: 80% LTGY - MEDGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE CALC, IMBD PYR, FREE SH, TRC FREE BENT, INTGR POR, NO STN, 10% MIN FLOR, NO O FLOR, SLOW LZ CUT, NO RNG

### NIOBRARA A CHALK

6885' MD 6777' TVD

CG 1781u

CG 1822u

3150

CG 320u

MD 6897 TVD 6780.83  
INC 52.01 AZ 358.78  
VS 490.35

MD 6991 TVD 6831.4  
INC 62.78 AZ 358.06  
VS 589.37

ROP (Ft/Hr) 2000  
Gamma (API) 300

WOB 15.4K  
PP 3464  
RPM 0  
SPM 69/69

6900

6950

7000

7050

00

NIOBRARA B CHALK (6960' MD -  
6990' MD)

NIOBRARA B MARL (7020' MD - 7050'  
MD)

6870'-6900': CHK: 80% (CaCO3 75%) LTGY -  
MEDGY, BLKY TO SUBBLKY, FXLN TO  
CHLKY, SFT TO FRM, IMBD CALC, SCAT  
FREE PYR, FREE BENT, 20% FREE MARL,  
MOD GYSHBLK STN, 15% MIN FLOR, IMMED  
BLUE STRM CUT, YLW RING

6900'-6930': CHK: 60% (CaCO3 75%) LTGY -  
MEDGY, BLKY TO SUBBLKY, FXLN TO  
CHLKY, SFT TO FRM, IMBD CALC, SCAT  
FREE PYR, 40% FREE MARL, MOD GYSHBLK  
STN, NO MIN FLOR, IMMED BLUE STRM CUT,  
YLW RING

## NIOBRARA B CHALK

6947' MD 6812' TVD

6930'-6960': CHK: 70% (CaCO3 75%) LTGY -  
MEDGY, BLKY TO SUBBLKY, FXLN TO  
CHLKY, SFT TO FRM, IMBD CALC, SCAT  
FREE PYR, FREE BENT, 30% FREE MARL,  
MOD GYSHBLK STN, 15% MIN FLOR, IMMED  
BLUE STRM CUT, YLW RING

6960'-6990': CHK: 90% (CaCO3 75%) LTGY -  
MEDGY, BLKY TO SUBBLKY, FXLN TO  
CHLKY, SFT TO FRM, IMBD CALC, SCAT  
FREE PYR, 10% FREE MARL, MOD GYSHBLK  
STN, NO MIN FLOR, IMMED BLUE STRM CUT,  
YLW RING

6990'-7020': CHK: 80% (CaCO3 75%)  
LTGY - MEDGY, BLKY TO SUBBLKY,  
FXLN TO CHLKY, SFT TO FRM,  
IMBD CALC, SCAT FREE PYR, FREE  
BENT, 20% FREE MARL, MOD  
GYSHBLK STN, 15% MIN FLOR,  
IMMED BLUE STRM CUT, YLW RING

## NIOBRARA B MARL

7031' MD 6850' TVD

7020'-7050': MRL: 60% (CaCO3 45%)  
MEDDRKGY - GYSHBLK, SOFT TO BRITTLE,  
FREE CALC, SCAT PYRC LAMN, IMBD CALC,  
FREE BENT, 40% FREE CHK, PRED LTGY -  
SCAT MEDGY, 15% MIN FLOR, IMMED BLUE  
STRM CUT, YLW RING

END OF VERTICAL LOG @ 7050' MD  
ON 10/7/2014, CONTINUED ON  
HORIZONTAL LOG.

CG 206u

350

TG, C1-C4

3150