

Logger On Shift			ROP (Ft/Hr) Gamma (API)		Drill Depth v. Time		Slide Bar		Survey Data		Depth		Lithology		Lithology Percentages		Sample Photographs		Porosity		Geological Description		Connections		TG (1-8) C1 (units) C2 (units) C3 (units) C4 (units)		Total Gas, C1-C4	
0 0			ROP (Ft/Hr) Gamma (API)		1500 350						24								Oil Fair Good		NOBLE ENERGY WELLS RANCH AE20-69HN 20-T6N-R62W 1098' FNL, 215' FWL WELD COUNTY, CO H&P 321 LOGGERS: ANDREW CHRISTIANO HANNAH BLATCHFORD CALLED OUT BY COMPANY MAN 11/10/13 COMMENCED LOGGING @ 7:15AM		-50 TG, C1-C4		450			
SLIDE=RED ROTATE=WHITE																		CONNECTIONS ARE MARKED WITH RED TRIANGLES										
ROP SCALE: 0 TO 1500 (FT/HR)																		GAS SCALE: -50 TO 450 50 UNITS/DIVISION										
GAMMA SCALE: 0 TO 350																												
(GAMMA DATA AS RECEIVED)																		DRILLING ON WATER-BASED MUD										

@ 2500' MD ON 11/11/13 W/BIT # 1  
8.75 SCHLUMBERGER/SMITH  
MDiZ516 MEPX S/N JH4792 IN @ 990'  
MD

**PIERRE**  
**BEFORE LOGGING DEPTH**

MD 1797	
WT 8.6	
VIS 32.0	
PH 12.6	
FIL 28.2	
CL 1800	
CAL 40	
H2O 98.0	
OIL 0.0	
SOL 1.7	
CAKE 1/0	
GELS 1/2/3	
PV 5.0	
YP 4.0	

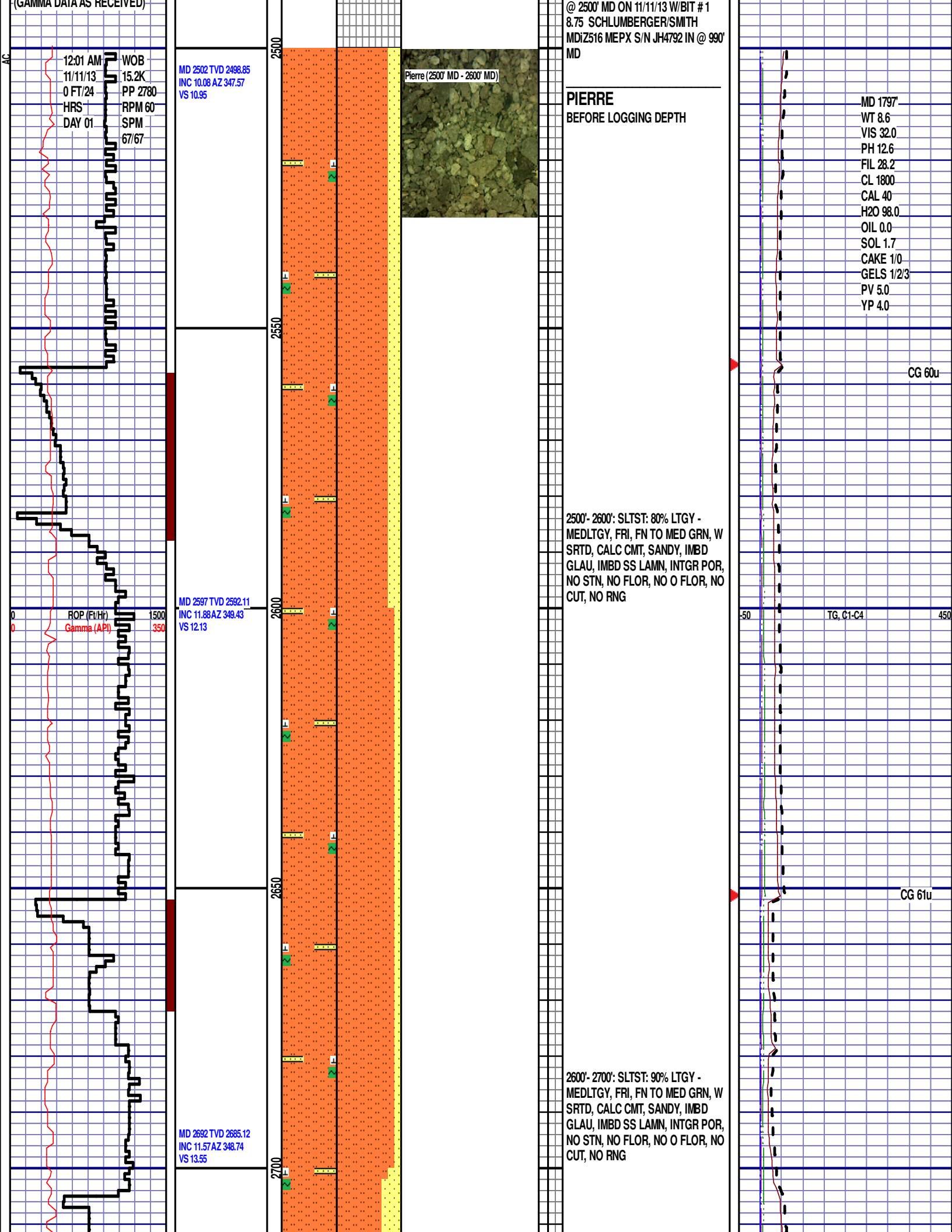
CG 60u

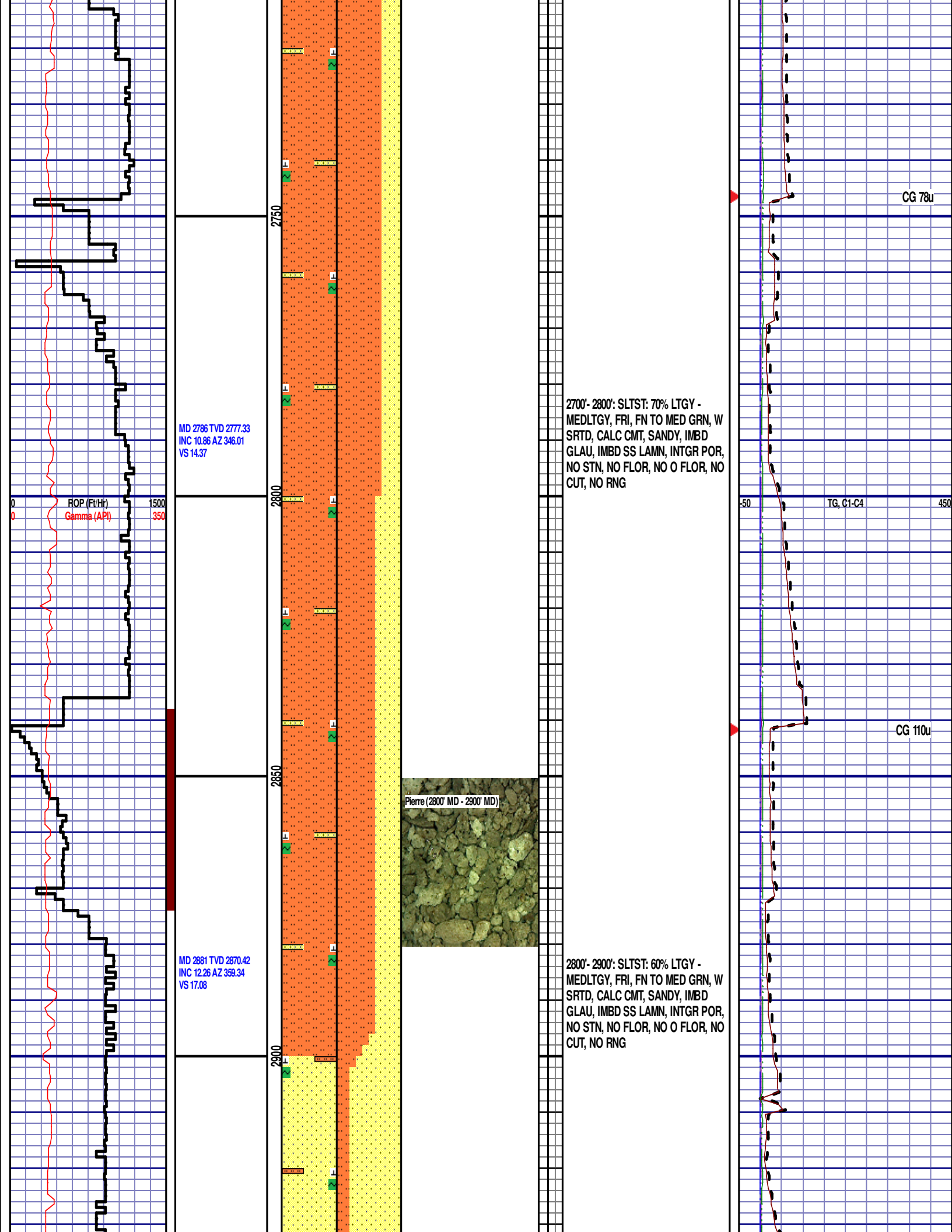
TG, C1-C4			450
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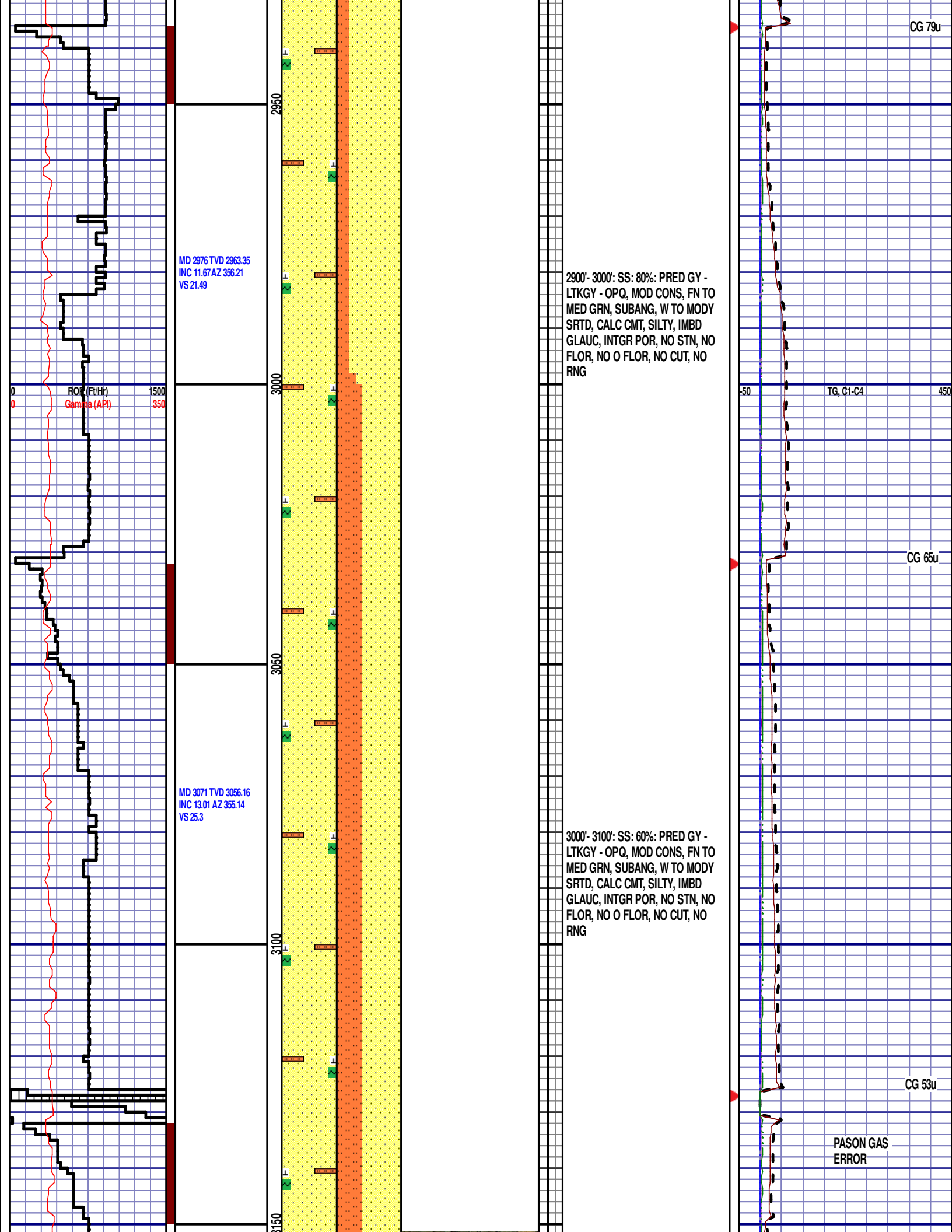
CG 61u

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

2600'- 2700': SLTST: 90% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
GLAU, IMBD SS LAMN, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG







MD 3166 TVD 3148.83  
INC 12.39 AZ 352.54  
VS 28.57

ROP (FTH)  
Gamma (API)

1500  
350

MD 3260 TVD 3240.71  
INC 11.99 AZ 354.61  
VS 31.57

MD 3355 TVD 3333.94  
INC 10.19 AZ 353.93  
VS 34.57

Pierre (3100' MD - 3200' MD)



3100'- 3200': SS: 60%: PRED GY -  
LTKGY - OPQ, MOD CONS, FN TO  
MED GRN, SUBANG, W TO MODY  
SRTD, CALC CMT, SILTY, IMBD  
GLAUC, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, NO CUT, NO  
RNG

-50

TG, C1-C4

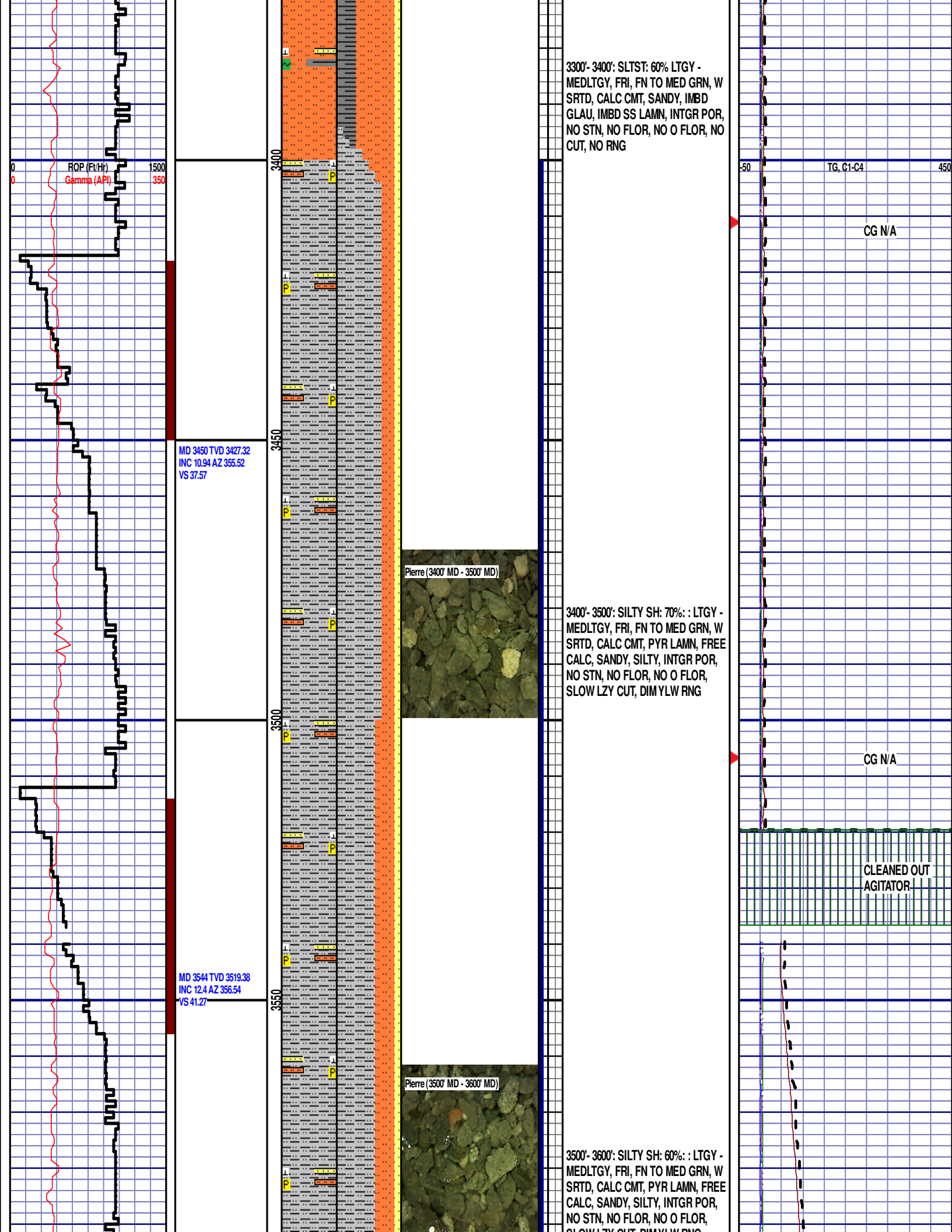
450

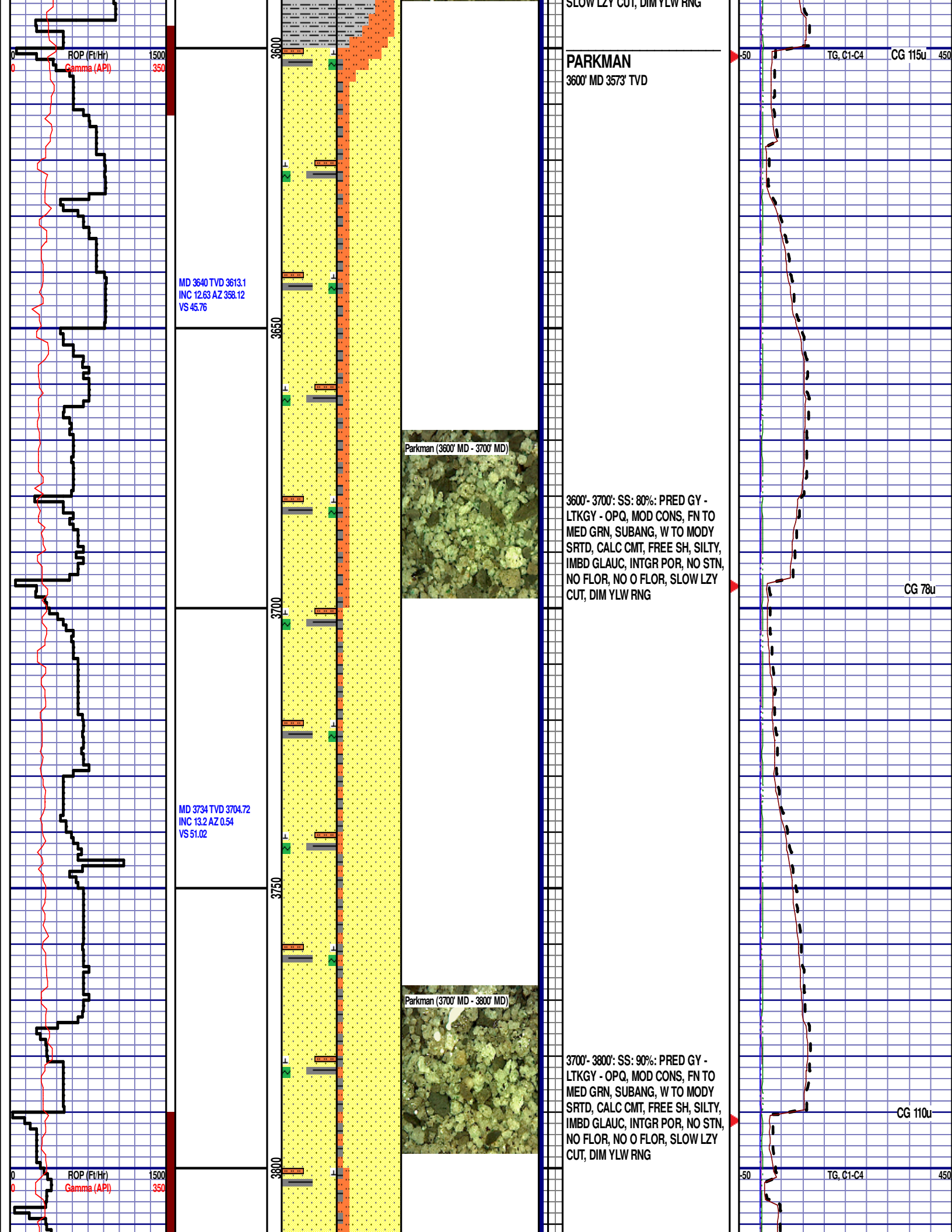
CG N/A

3200'- 3300': SLTST: 60% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, IMBD  
GLAU, IMBD SS LAMN, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

CG N/A







MD 3829 TVD 3797.18  
INC 13.38 AZ 353.94  
VS 55.7

MD 3924 TVD 3889.47  
INC 14.06 AZ 352.97  
VS 59.06

MD 4019 TVD 3981.81  
INC 13.13 AZ 357.02  
VS 62.97

ROP (Ft/Hr)  
Gamma (API)

1500  
350

3850

3900

3950

4000

3800'- 3900': SS: 80%: PRED GY -  
LTKGY - OPQ, MOD CONS, FN TO  
MED GRN, SUBANG, W TO MODY  
SRTD, CALC CMT, FREE SH, SILTY,  
IMBD GLAUC, INTGR POR, NO STN,  
NO FLOR, NO O FLOR, SLOW LZY  
CUT, DIM YLW RNG

CG 114u

3900'- 4000': SS: 80%: PRED GY -  
LTKGY - OPQ, MOD CONS, FN TO  
MED GRN, SUBANG, W TO MODY  
SRTD, CALC CMT, IMBD PYR, FREE  
SH, SILTY, IMBD GLAUC, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, SLOW LZY CUT, DIM YLW  
RNG

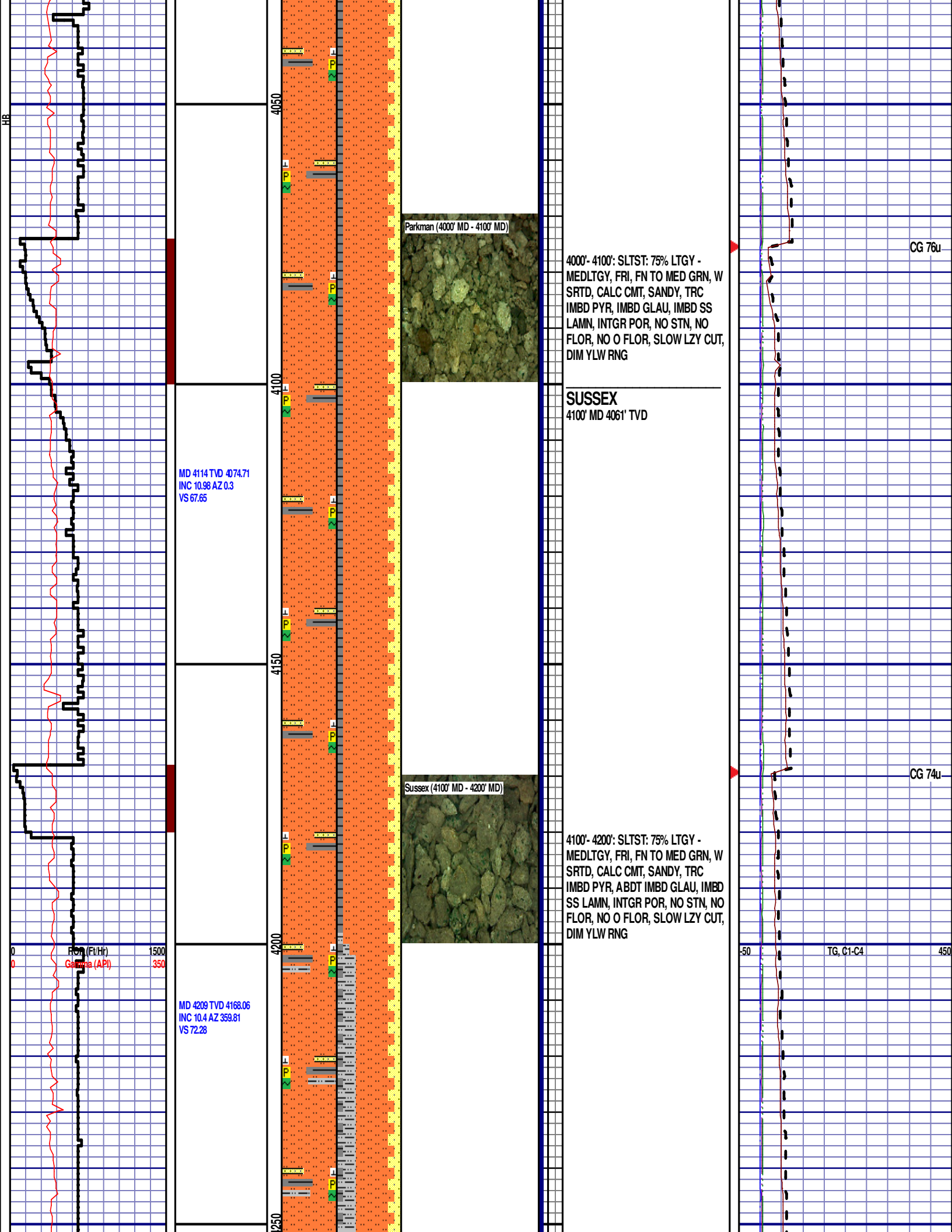
CG 125u

-50

TG, C1-C4

450





Parkman (4000' MD - 4100' MD)

4000'- 4100': SLTST: 75% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, TRC  
IMBD PYR, IMBD GLAU, IMBD SS  
LAMN, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, SLOW LZ CUT,  
DIM YLW RNG

SUSSEX  
4100' MD 4061' TVD

Sussex (4100' MD - 4200' MD)

4100'- 4200': SLTST: 75% LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, TRC  
IMBD PYR, ABTD IMBD GLAU, IMBD  
SS LAMN, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, SLOW LZ CUT,  
DIM YLW RNG

MD 4114 TVD 4074.71  
INC 10.98 AZ 0.3  
VS 67.65

MD 4209 TVD 4168.06  
INC 10.4 AZ 359.81  
VS 72.28

RQ (Ft/Hr)  
Gamma (API)

1500  
350

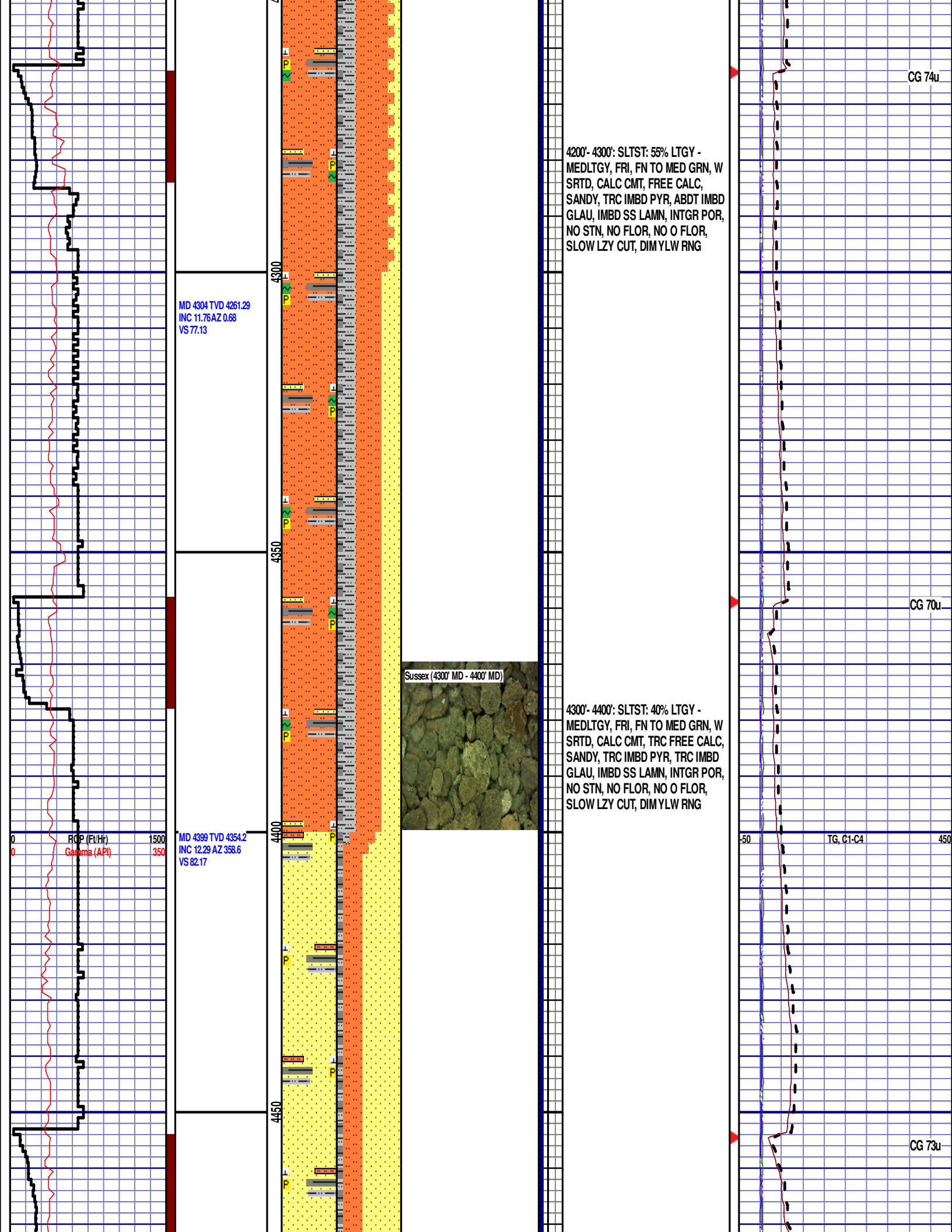
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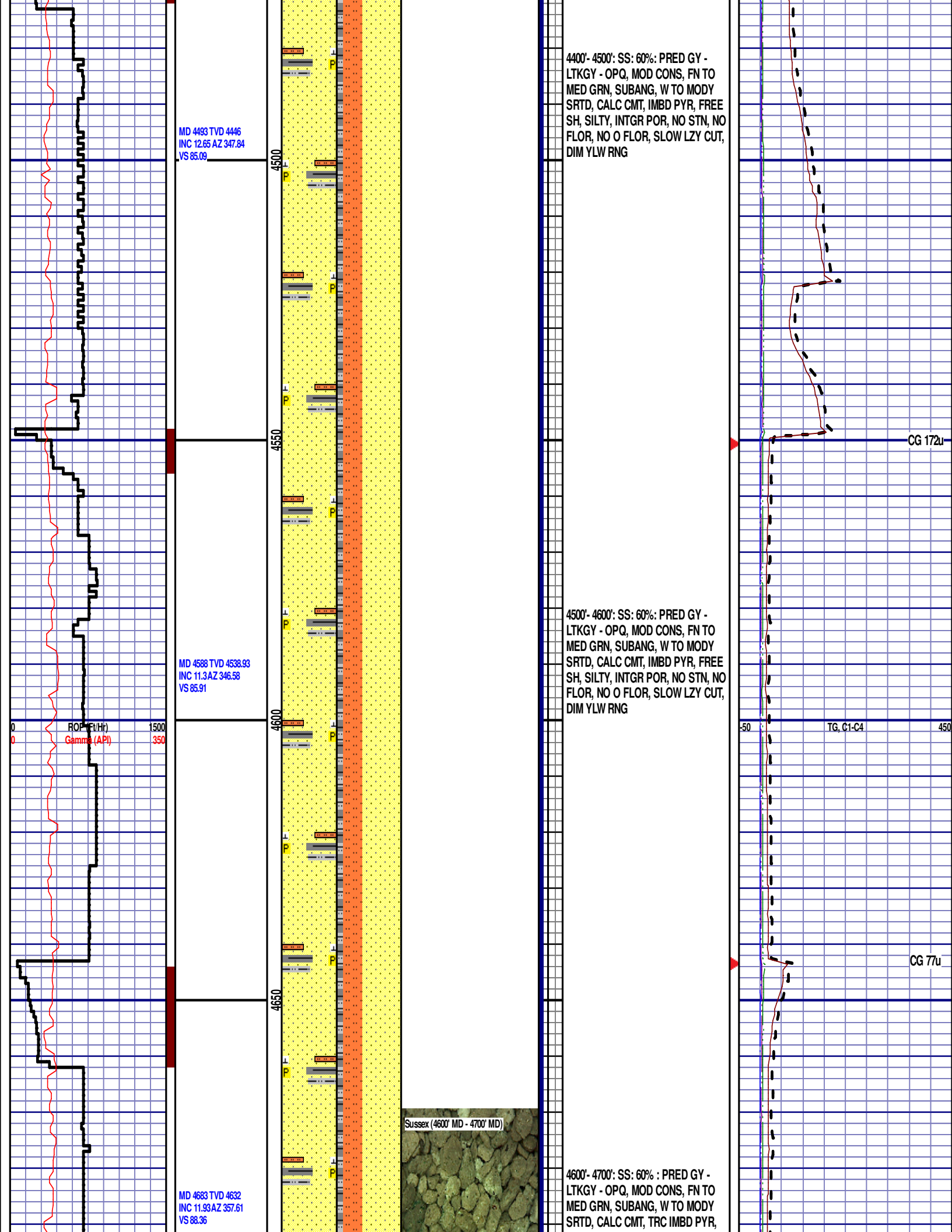
TG, C1-C4

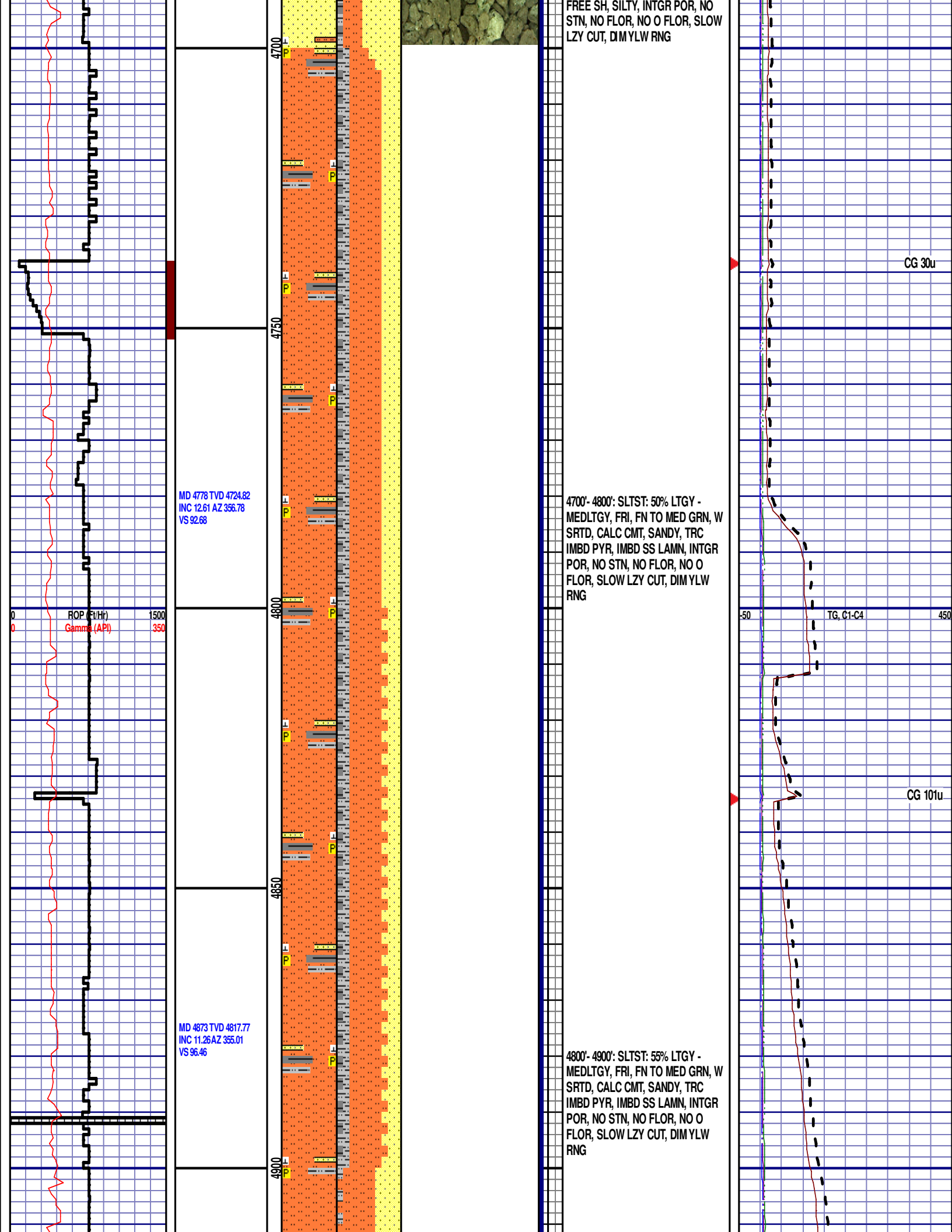
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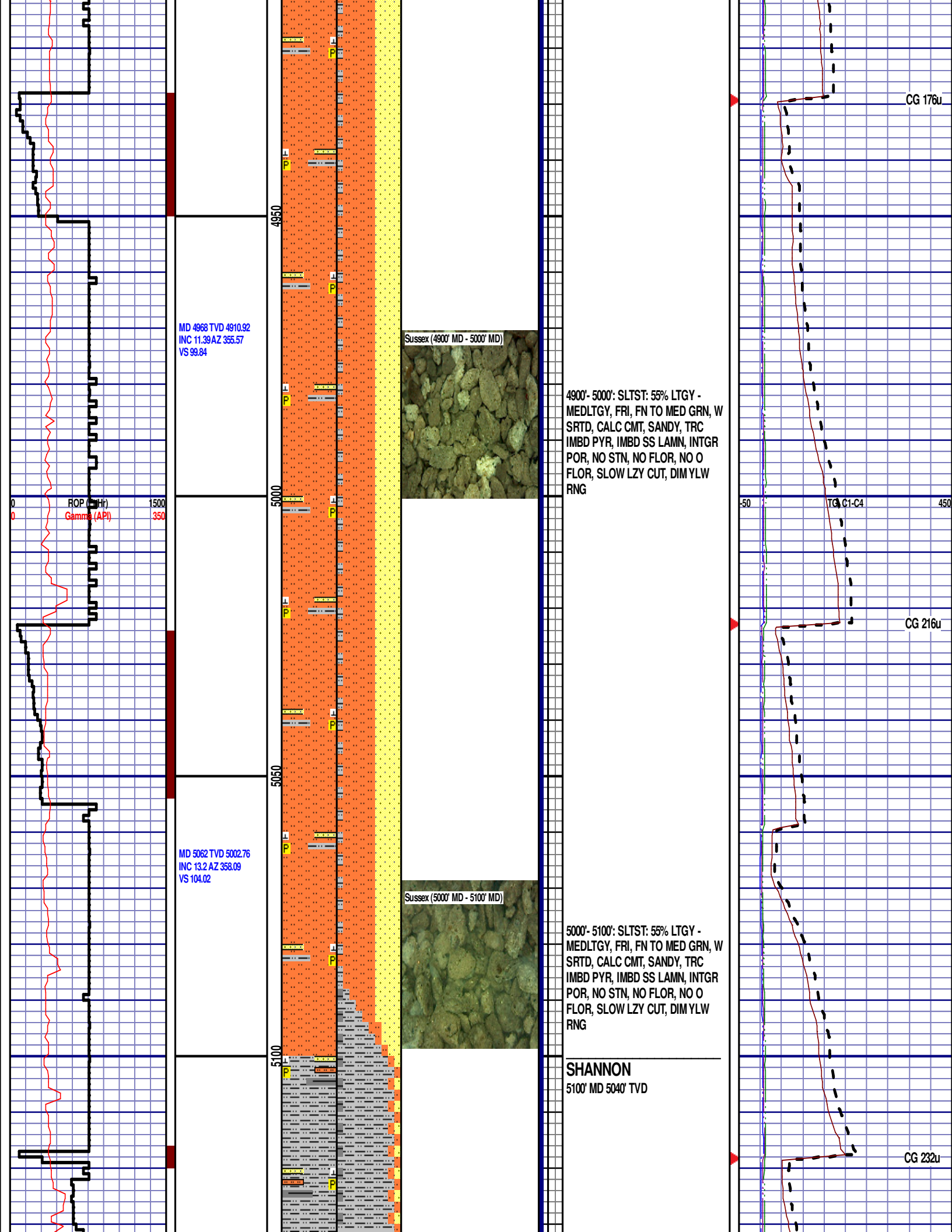
CG 76u

CG 74u











MD 5157 TVD 5095.58  
INC 11.39 AZ 356.55  
VS 108.41

MD 5252 TVD 5188.83  
INC 10.63 AZ 359.95  
VS 112.59

MD 5347 TVD 5282.13  
INC 11.06 AZ 355.21

Shannon (5100' MD - 5200' MD)

Shannon (5200' MD - 5300' MD)

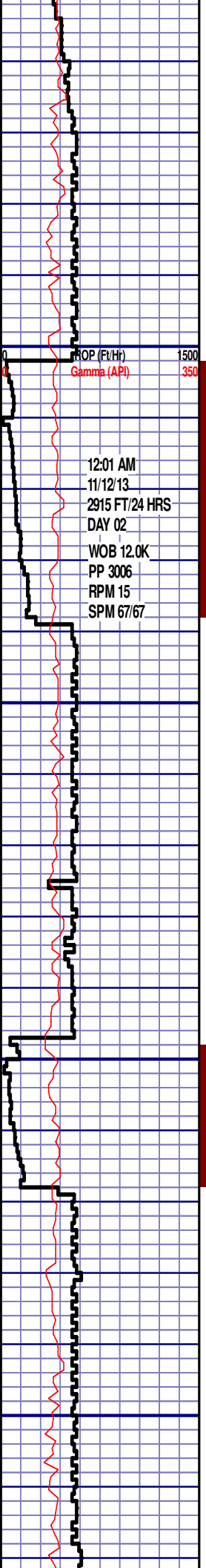
5100'- 5200': SILTY SH: 80%: LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE SH, PYR  
LAMN, SANDY, SILTY, INTGR POR,  
NO STN, NO FLOR, NO O FLOR,  
SLOW LZV CUT, DIM YLW RNG

5200'- 5300': SILTY SH: 80%: LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE SH, PYR  
LAMN, SANDY, SILTY, INTGR POR,  
NO STN, NO FLOR, NO O FLOR,  
SLOW LZV CUT, DIM YLW RNG

CG 343u

CG 333u

VS 116.52

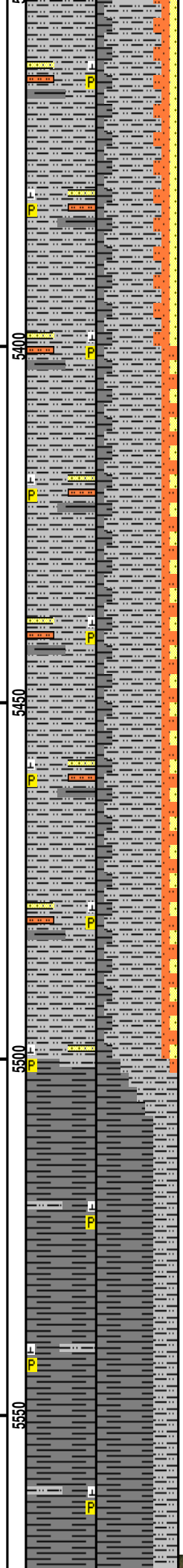


ROP (Ft/Hr)  
Gamma (API)

12:01 AM  
11/12/13  
2915 FT/24 HRS  
DAY 02  
WOB 12.0K  
PP 3006  
RPM 15  
SPM 67/67

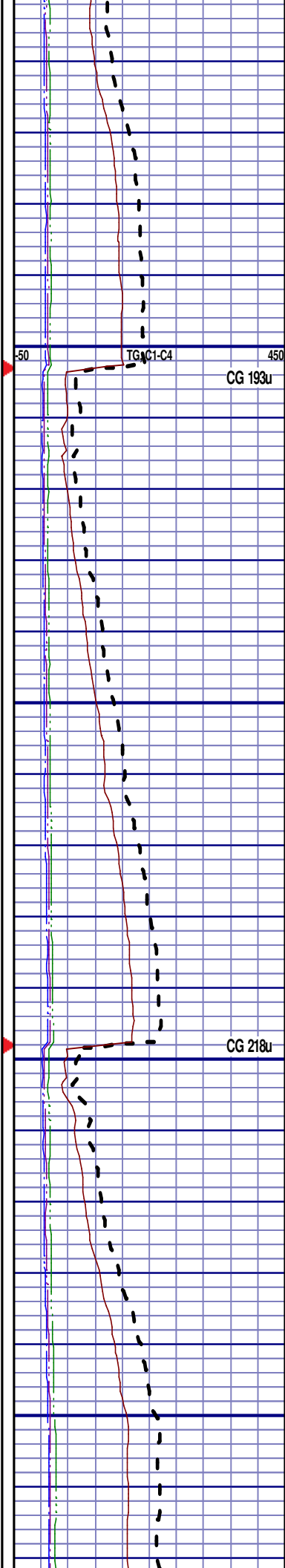
MD 5442 TVD 5375.16  
INC 12.37 AZ 359.59  
VS 120.75

MD 5536 TVD 5467.07  
INC 11.79 AZ 355.71  
VS 125.12



5300'- 5400': SILTY SH: 60%: LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, FREE SH, PYR  
LAMN, SANDY, SILTY, INTGR POR,  
NO STN, NO FLOR, NO O FLOR,  
SLOW LZY CUT, DIM YLW RNG

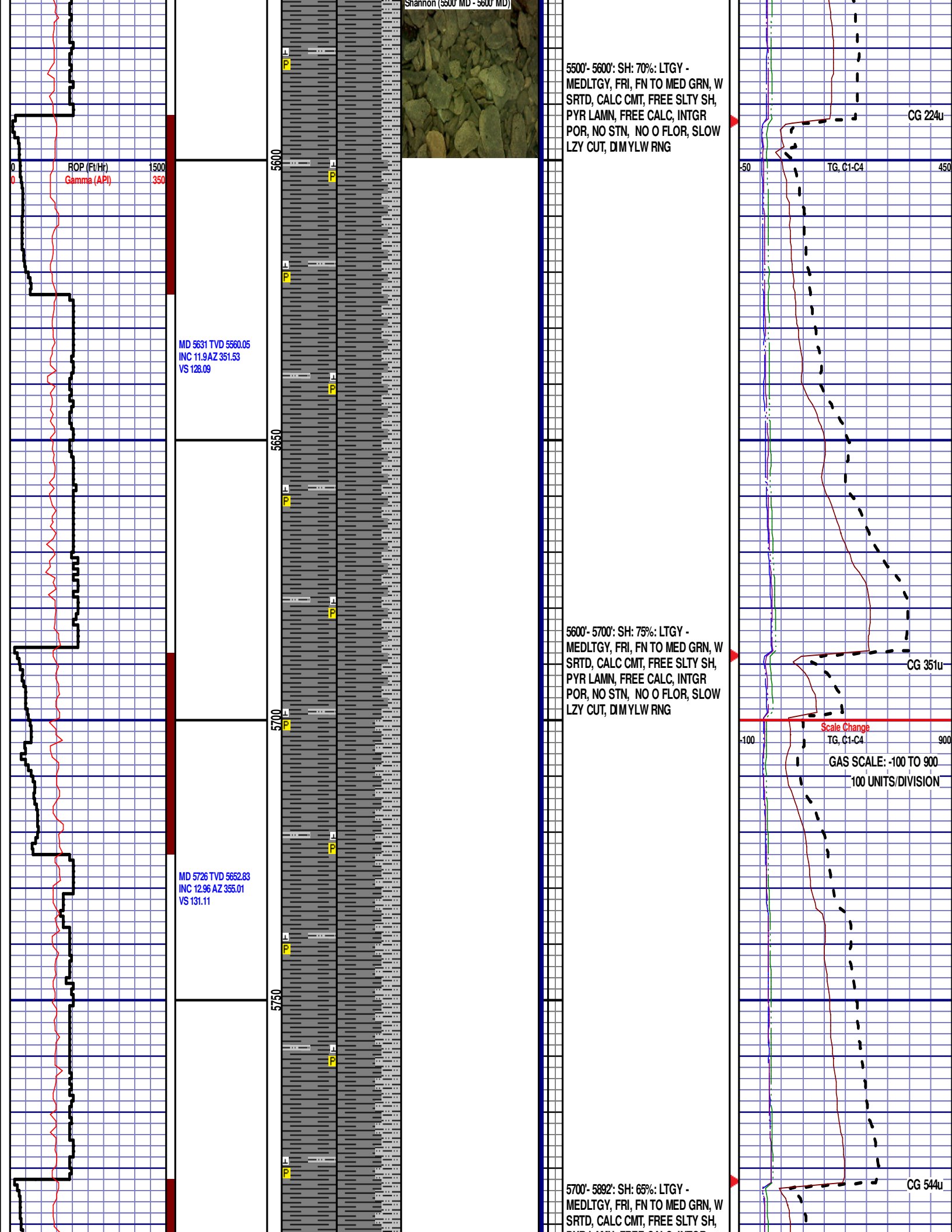
5400'- 5500': SILTY SH: 65%: LTGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, TRC FREE CALC,  
FREE SH, PYR LAMN, SANDY,  
SILTY, INTGR POR, NO STN, NO  
FLOR, NO O FLOR, SLOW LZY CUT,  
DIM YLW RNG

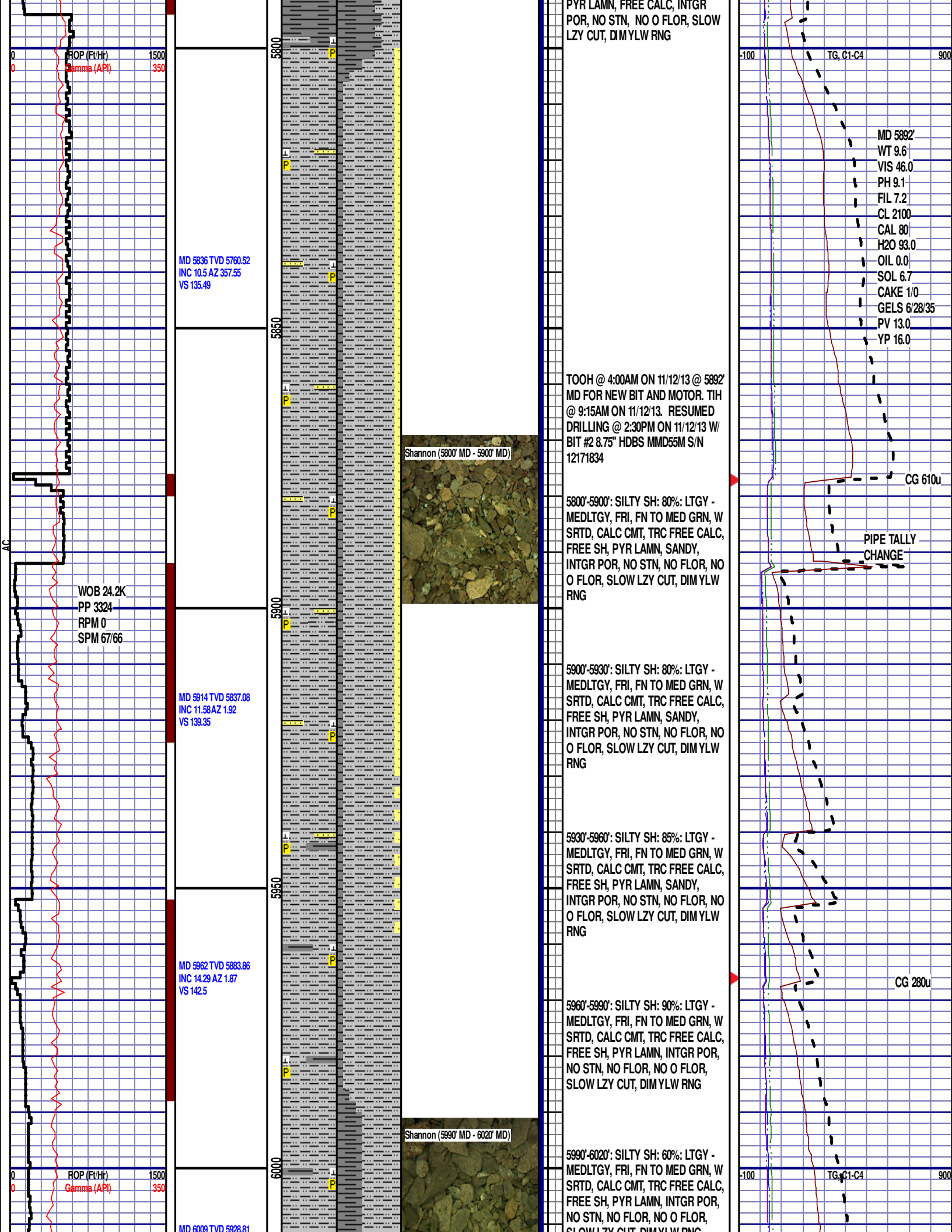


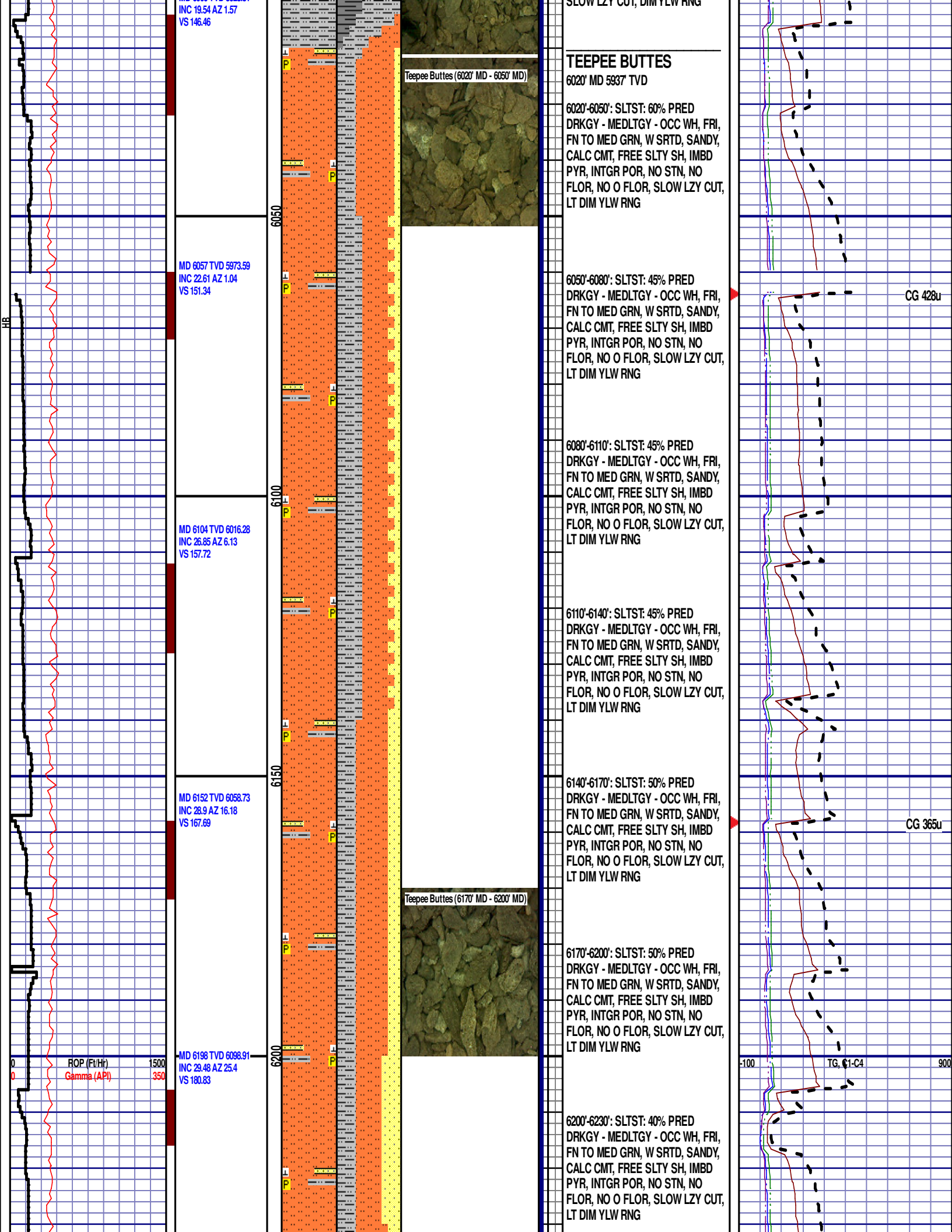
TGAC1-C4

CG 193u

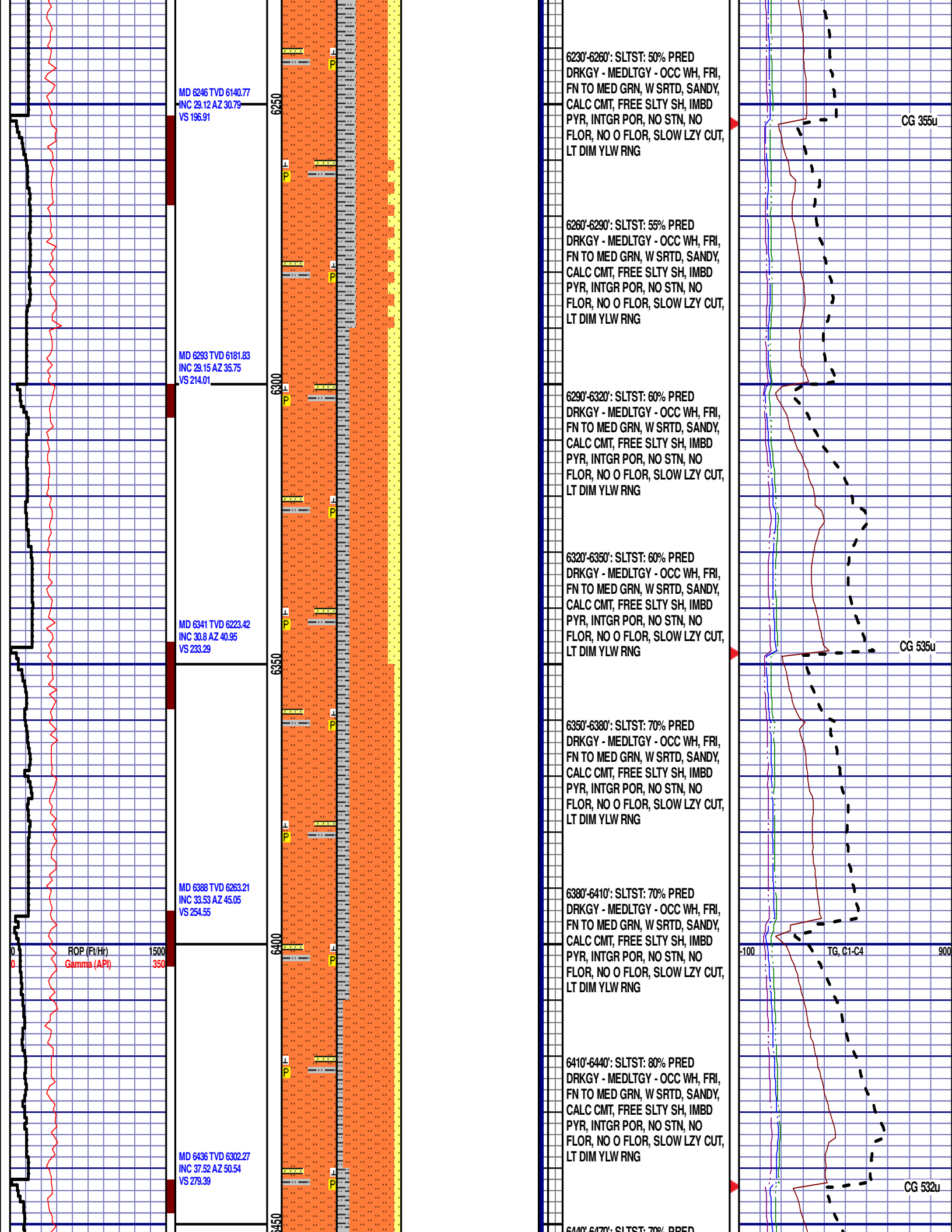
CG 218u

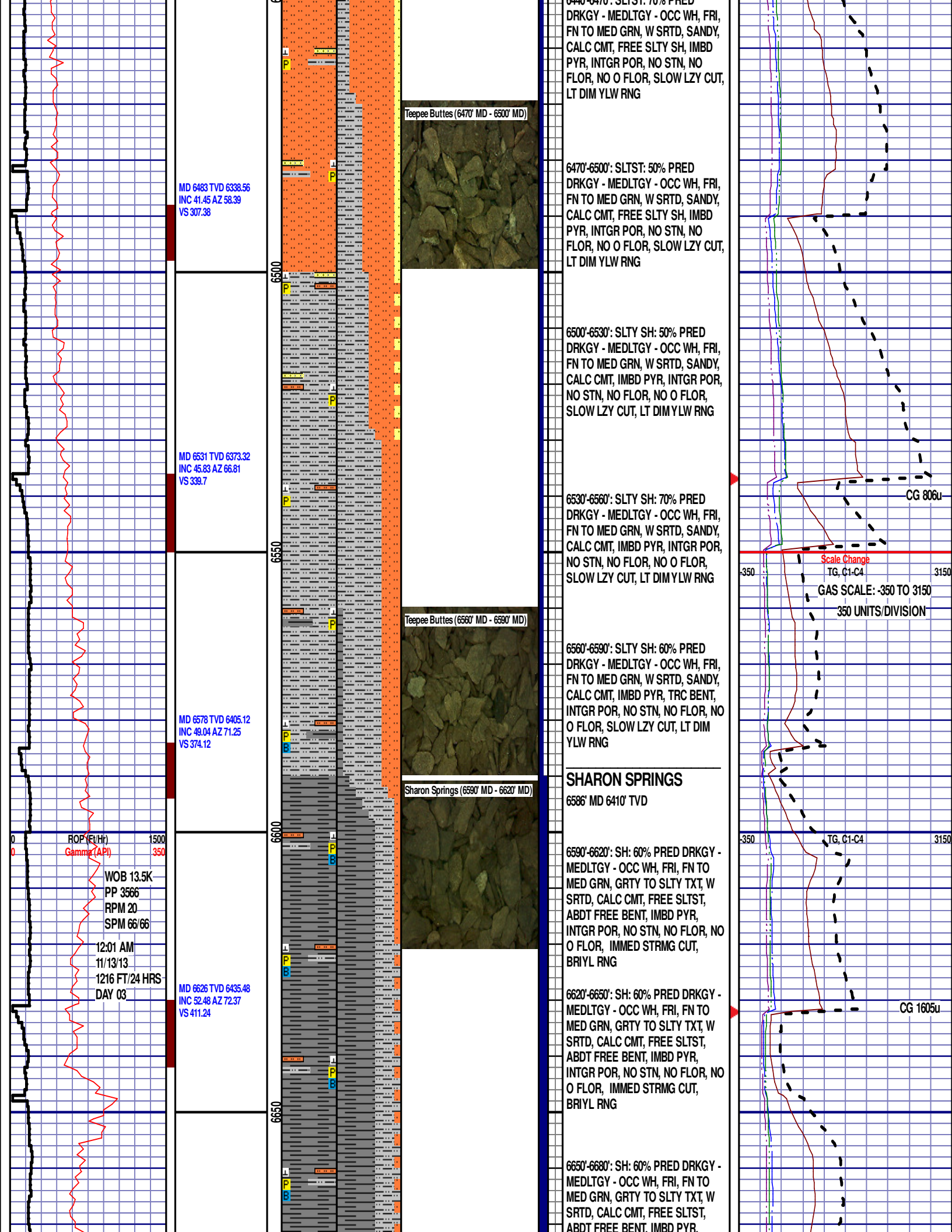












MD 6672 TVD 6462.51  
INC 55.54 AZ 71.96  
VS 448.41

MD 6720 TVD 6488.63  
INC 58.51 AZ 73.5  
VS 488.65

MD 6767 TVD 6512.11  
INC 61.55 AZ 75.62  
VS 529.35

MD 6815 TVD 6533.12  
INC 66.52 AZ 77.98  
VS 572.47

ROP (Ft/Hr)  
Gamma (API)

1500  
350

WOB 34.7K  
PP 3405  
RPM 7  
SPM 62/62

6700

6750

6800

6850

Sharon Springs (6680' MD - 6710' MD)

Niobrara A Chalk (6710' MD - 6740' MD)

Niobrara A Chalk (6740' MD - 6770' MD)

Niobrara A Marl (6770' MD - 6800' MD)

INTGR POR, NO STN, NO FLOR, NO  
O FLOR, IMMED STRMG CUT,  
BRIYL RNG

6680'-6710': SH: 60% PRED DRKGY -  
MEDLTGY - OCC WH, FRI, FN TO  
MED GRN, GRTY TO SLTY TXT, W  
SRTD, CALC CMT, FREE SLTST,  
ABDT FREE BENT, IMBD PYR,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, IMMED STRMG CUT,  
BRIYL RNG

### NIOBRARA A CHALK

6711' MD 6483' TVD

6710'-6740': CHK: 55% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
FREE BENT, TRC IMBD PYR, NO  
STN, 5% FLOR, NO O FLOR, IMMED  
STRMG CUT, BRIYL RNG

6740'-6770': CHK: 60% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
FREE BENT, TRC IMBD PYR, NO  
STN, 5% FLOR, NO O FLOR, IMMED  
STRMG CUT, BRIYL RNG

### NIOBRARA A MARL

6764' MD 6511' TVD

6770'-6800': MRST: 45% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
TRC IMBD PYR, NO STN, 5% FLOR,  
NO O FLOR, IMMED STRMG CUT,  
BRIYL RNG

6800'-6830': MRST: 45% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
FREE BENT, IMBD PYR, NO STN,  
5% FLOR, NO O FLOR, IMMED  
STRMG CUT, BRIYL RNG

6830'-6860': MRST: 45% MEDDRKGY -  
MEDLTGY, BLKY TO SUBBLKY,  
GRTY TO SLTY TXT, FRM TO BRIT,  
FREE BENT, IMBD PYR, NO STN,  
5% FLOR, NO O FLOR, IMMED  
STRMG CUT, BRIYL RNG

CG 2586u

350

TG, C1-C4

3150

CG 1766u

		00					END OF VERTICAL LOG @ 6850' MD ON 11/13/13. CONTINUED ON HORIZONTAL LOG.	
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