

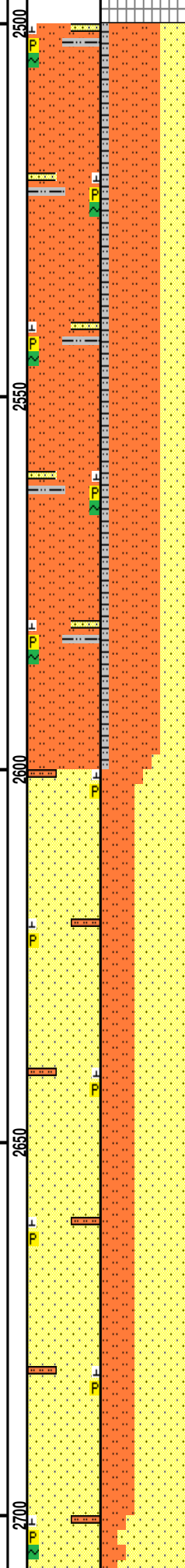
	ROP (Ft/Hr) Gamma (API)	Drill Depth v. Time		Survey Data	Depth	Lithology	Lithology Percentages	Sample Photographs	Porosity <small>Cut Fair Good</small>	Geological Description	TG (1-8) C1 (units) C2 (units) C3 (units) C4 (units) Total Gas, C1-C4
0	ROP (Ft/Hr) Gamma (API)	1500 250			24					NOBLE ENERGY INC. WELLS RANCH AA11-690 10/11-T6N-R63W 650' FNL, 215' FEL WELD CO., CO H&P 321 LOGGERS: SAM STELZER SCOTT HANEY CALLED OUT BY COMPANY MAN @ 5:30 AM ON 05/30/15. COMMENCED LOGGING @ 6:00 PM @ 2500' MD ON	-30 TG, C1-C4 270 CONNECTIONS ARE MARKED WITH RED TRIANGLES GAS SCALE: -30u TO 270u (30 UNITS/DIVISION) DRILLING ON WATER-BASED MUD

WOB 24.9K
PP 2551
RPM 50
SPM 79/79

RO (Ft/Hr)
Gamma (API)

MD 2588 TVD 2578.25
INC 9.57 AZ 19.08
VS -26.92

MD 2680 TVD 2668.94
INC 9.79 AZ 15
VS -30.07

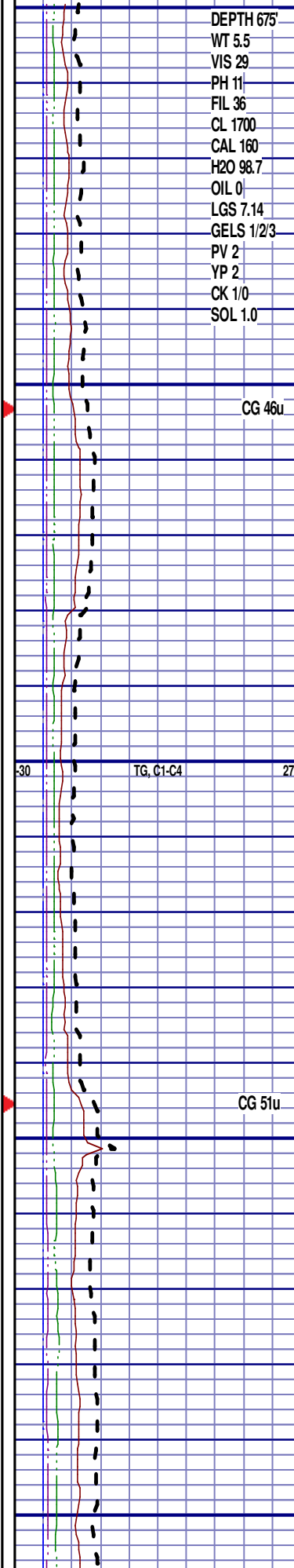


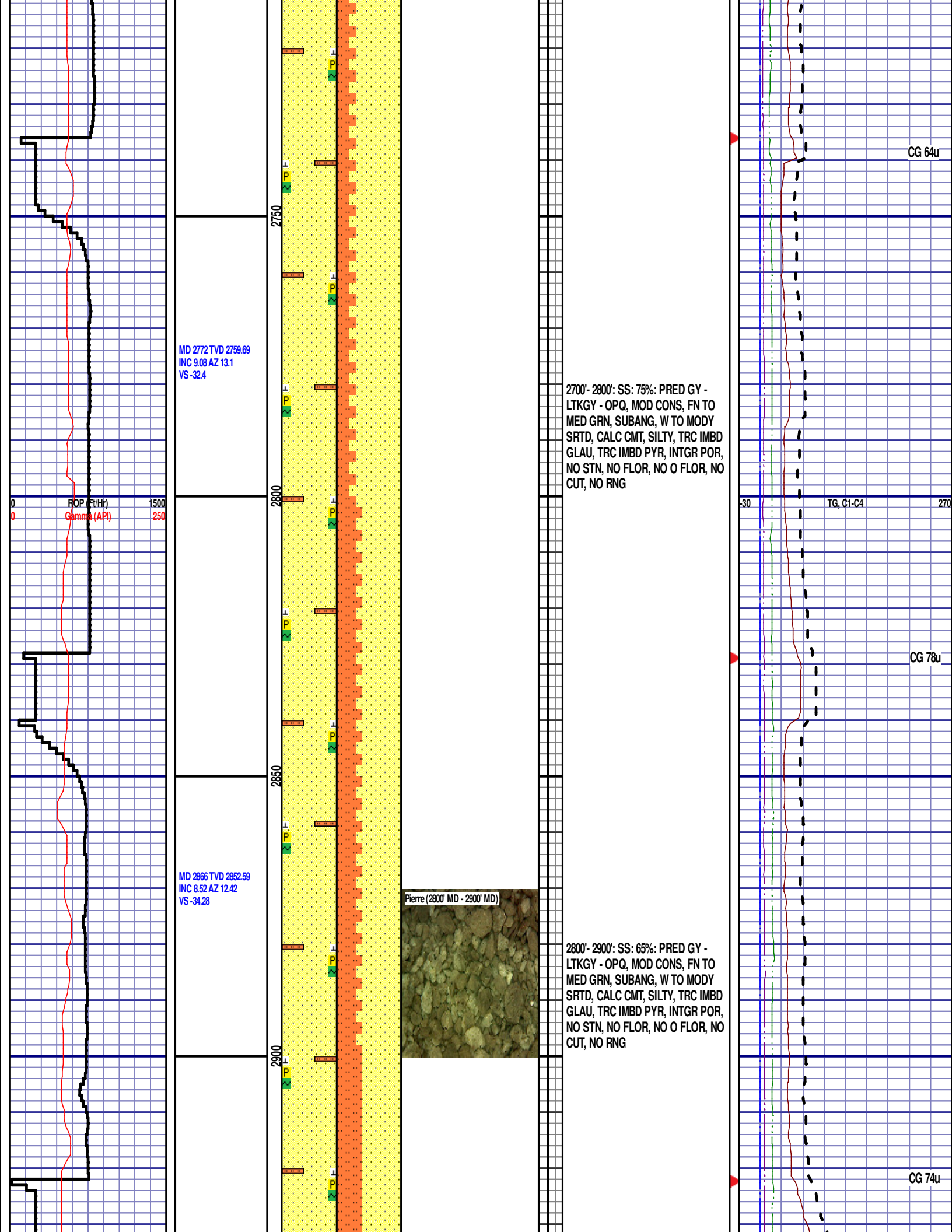
PIERRE

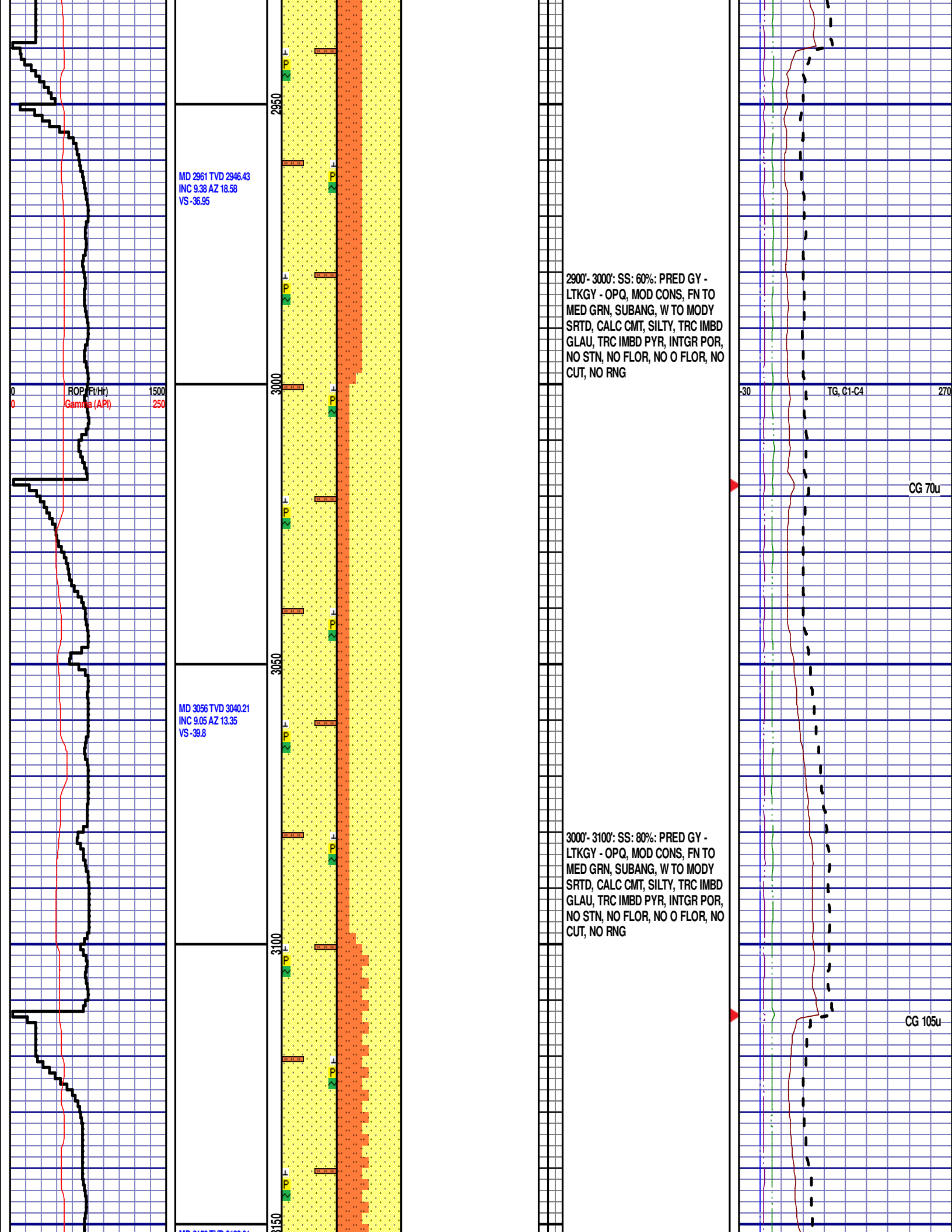
BEFORE LOGGING DEPTH

2500' MD-2600' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, TRC PYR, TRC
IMBD GLAU, SANDY, FREE SLTYSH,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, NO CUT, NO RNG

2600'- 2700': SS: 60%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG







MD 3150 TVD 3133.01
INC 9.27 AZ 13.21
VS -41.89

RCP (Ft/Hr)
Gamma (API)

1500
250

MD 3245 TVD 3226.83
INC 8.81 AZ 12.57
VS -43.89

MD 3340 TVD 3320.74
INC 8.52 AZ 12.06
VS -45.65

3200

3250

3300

3350

Pierre (3100' MD - 3200' MD)



3100'- 3200': SS: 55%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
GLAU, TRC IMBD PYR, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG

3200'- 3300': SS: 60%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

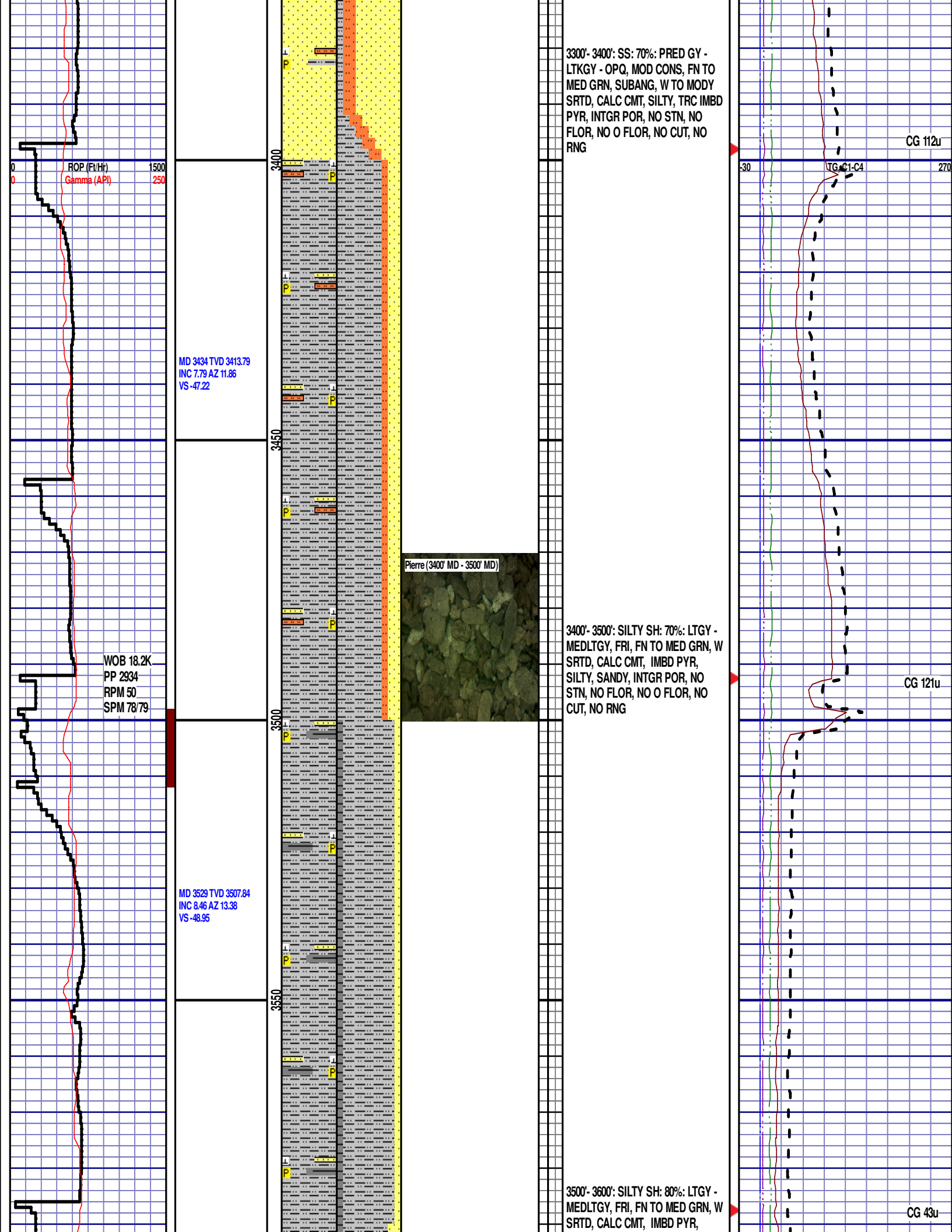
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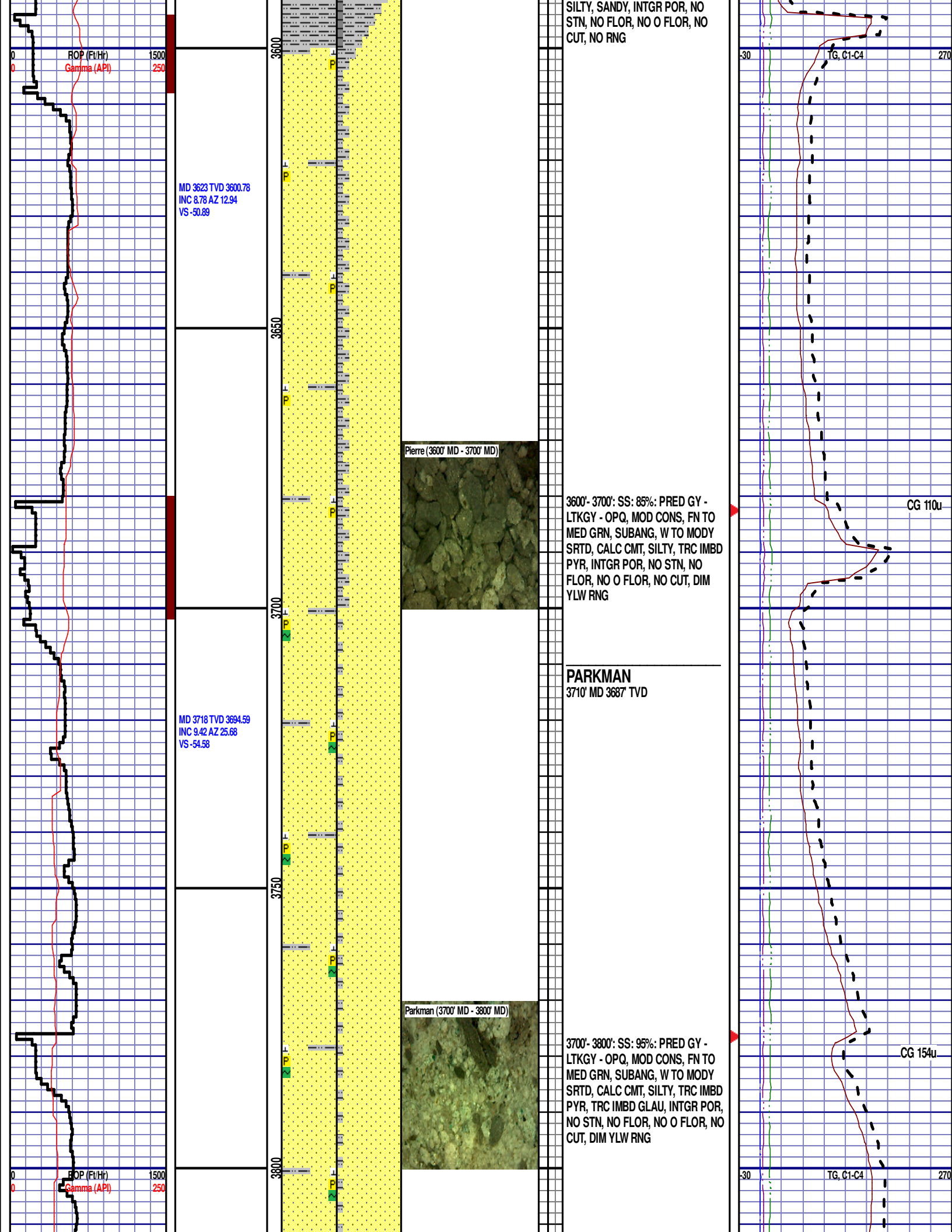
TG, C1-C4

270

CG 105u

CG 111u





ROP (Fe/Hr)
Gamma (API)

1500
250

MD 3623 TVD 3600.78
INC 8.78 AZ 12.94
VS -50.89

Pierre (3600' MD - 3700' MD)

3600'- 3700': SS: 85%; PRED GY - LTKGY - OPQ, MOD CONS, FN TO MED GRN, SUBANG, W TO MODY SRTD, CALC CMT, SILTY, TRC IMBD PYR, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, DIM YLW RNG

PARKMAN
3710' MD 3687 TVD

MD 3718 TVD 3694.59
INC 9.42 AZ 25.68
VS -54.58

Parkman (3700' MD - 3800' MD)

3700'- 3800': SS: 95%; PRED GY - LTKGY - OPQ, MOD CONS, FN TO MED GRN, SUBANG, W TO MODY SRTD, CALC CMT, SILTY, TRC IMBD PYR, TRC IMBD GLAU, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, DIM YLW RNG

ROP (Fe/Hr)
Gamma (API)

1500
250

30

TG, C1-C4

270

CG 110u

CG 154u

30

TG, C1-C4

270

MD 3813 TVD 3788.16
INC 10.47 AZ 28.17
VS -60.66

MD 3907 TVD 3880.4
INC 11.73 AZ 26.67
VS -67.48

MD 4001 TVD 3972.57
INC 10.95 AZ 25
VS -73.99

ROP (Ft/Hr)
Gamma (API)

1500
250

3850

3900

3950

4000

3800'- 3900': SS: 95%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, IMBD GLAU, INTGR POR, NO
STN, NO FLOR, NO O FLOR, NO
CUT, DIM YLW RNG

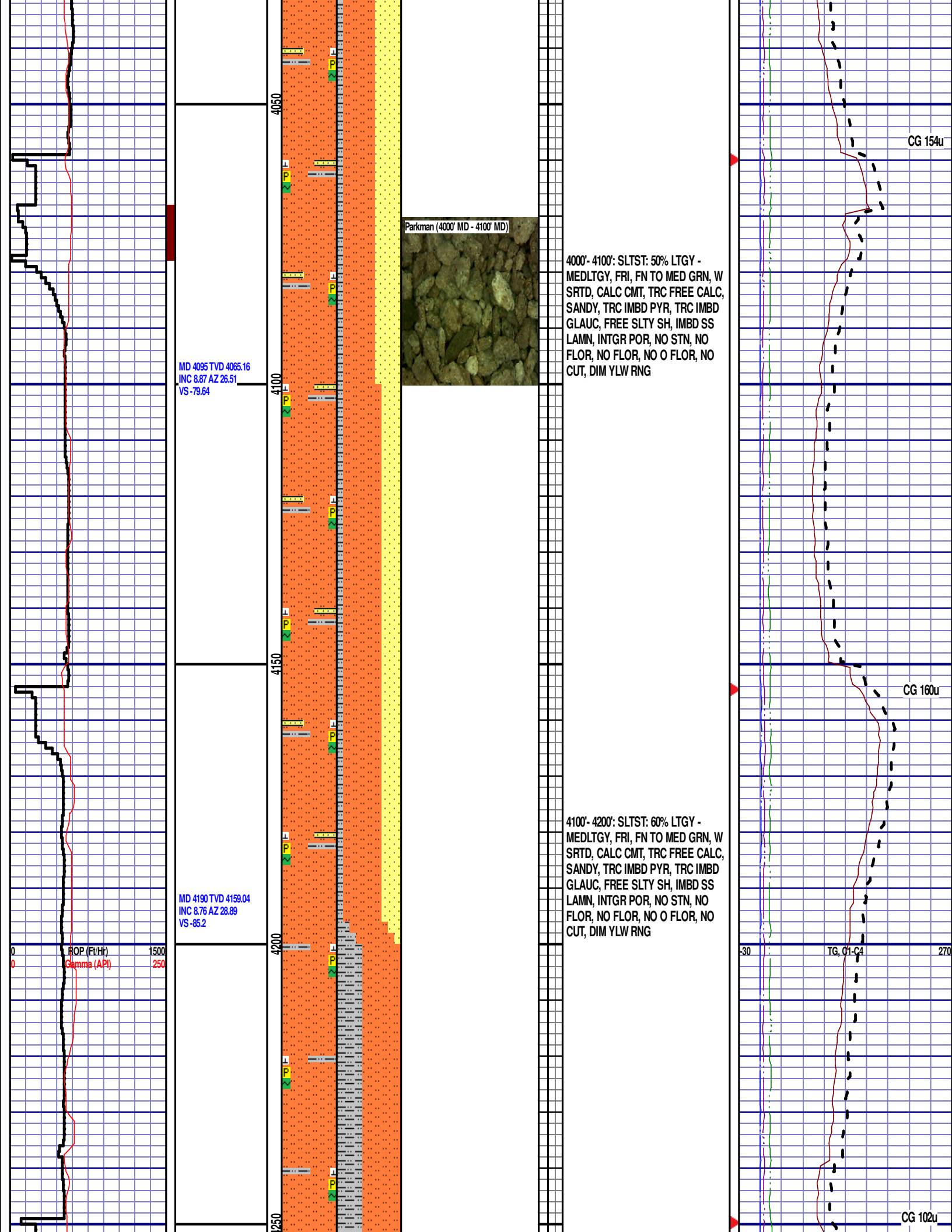
3900'- 4000': SS: 90%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, TRC IMBD GLAU, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, DIM YLW RNG

CG 102u

CG 91u

IG, C1-C4

270



MD 4284 TVD 4252.02
INC 8.15 AZ 29.47
VS -90.81

12:01 AM
5/31/2015
1855 FT/24 HRS
DAY 02

WOB 9.7K
PP 2603
RPM 0
SPM 78/79

MD 4378 TVD 4345.07
INC 8.13 AZ 23.95
VS -95.68

ROP (Ft/Hr) 1500
Gamma (API) 250

Parkman (4200' MD - 4300' MD)



4200'- 4300': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, ABNT FREE
CALC, SANDY, TRC IMBD PYR,
ABNT IMBD GLAUC, FREE SLTY SH,
IMBD SS LAMN, INTGR POR, NO
STN, NO FLOR, NO FLOR, NO O
FLOR, NO CUT, DIM YLW RNG

SUSSEX
4310' MD 4278' TVD

Sussex (4300' MD - 4400' MD)



4300'- 4400': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, FREE CALC,
SANDY, TRC IMBD PYR, ABNT IMBD
GLAUC, FREE SLTY SH, IMBD SS
LAMN, INTGR POR, NO STN, NO
FLOR, NO FLOR, NO O FLOR, NO
CUT, DIM YLW RNG

CG 111u

TG, C1-C4

CG 103u

MD 4473 TVD 4439.07
INC 8.56 AZ 19.73
VS -98.61

MD 4567 TVD 4531.93
INC 9.31 AZ 11.22
VS -102.15

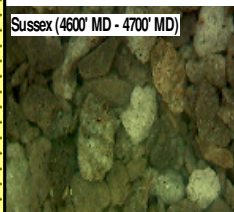
MD 4662 TVD 4625.77
INC 8.62 AZ 7.62
VS -103.25

4400'- 4500': SILTY SH: 40%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, FREE CALC,
IMBD PYR, IMBD GLAUC, SILTY,
SANDY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, DIM
YLW RNG

4500'- 4600': SS: 60%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, TRC IMBD GLAU, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, DIM YLW RNG

4600'- 4700': SILTY SH: 50%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, FREE CALC,
IMBD PYR, TRC IMBD GLAUC,

Sussex (4600' MD - 4700' MD)

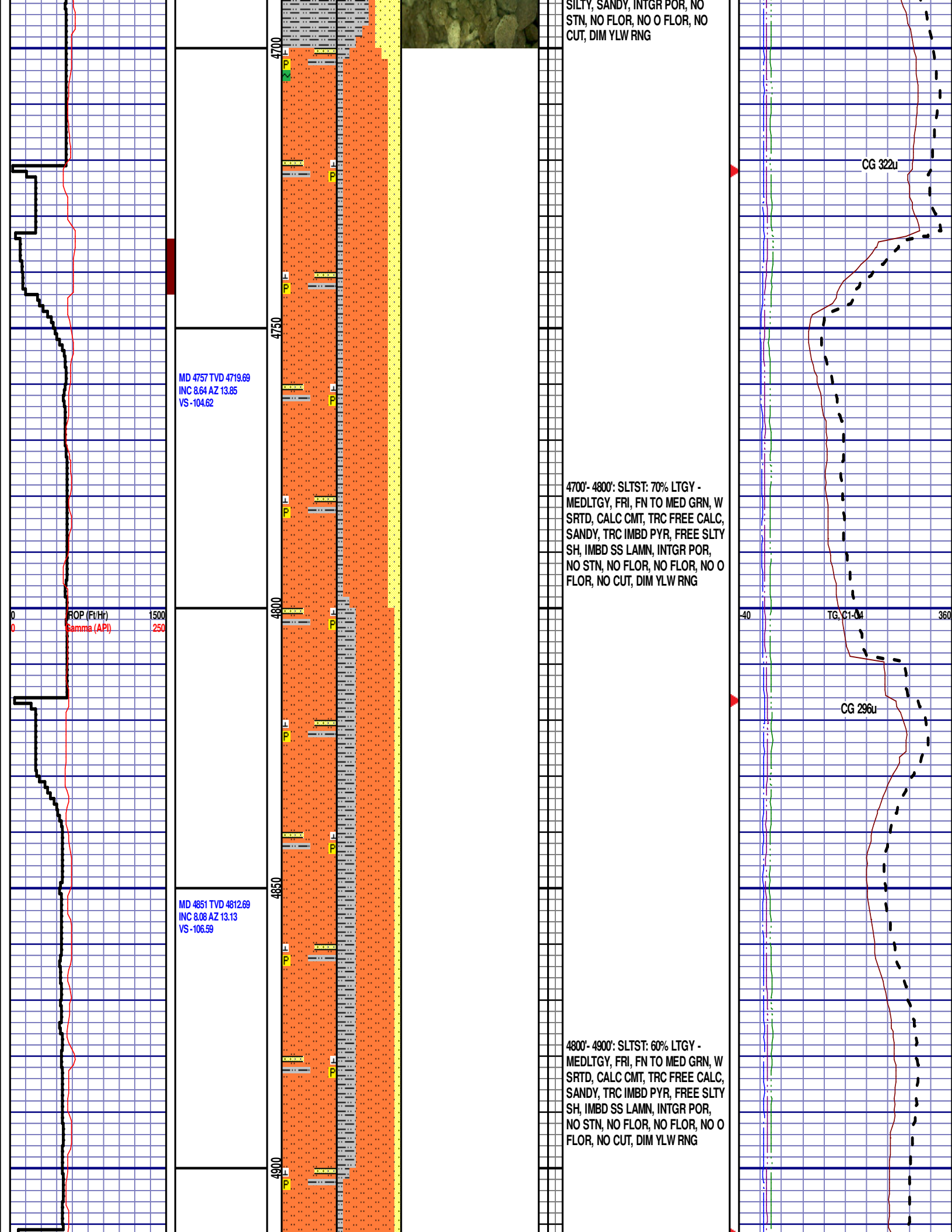


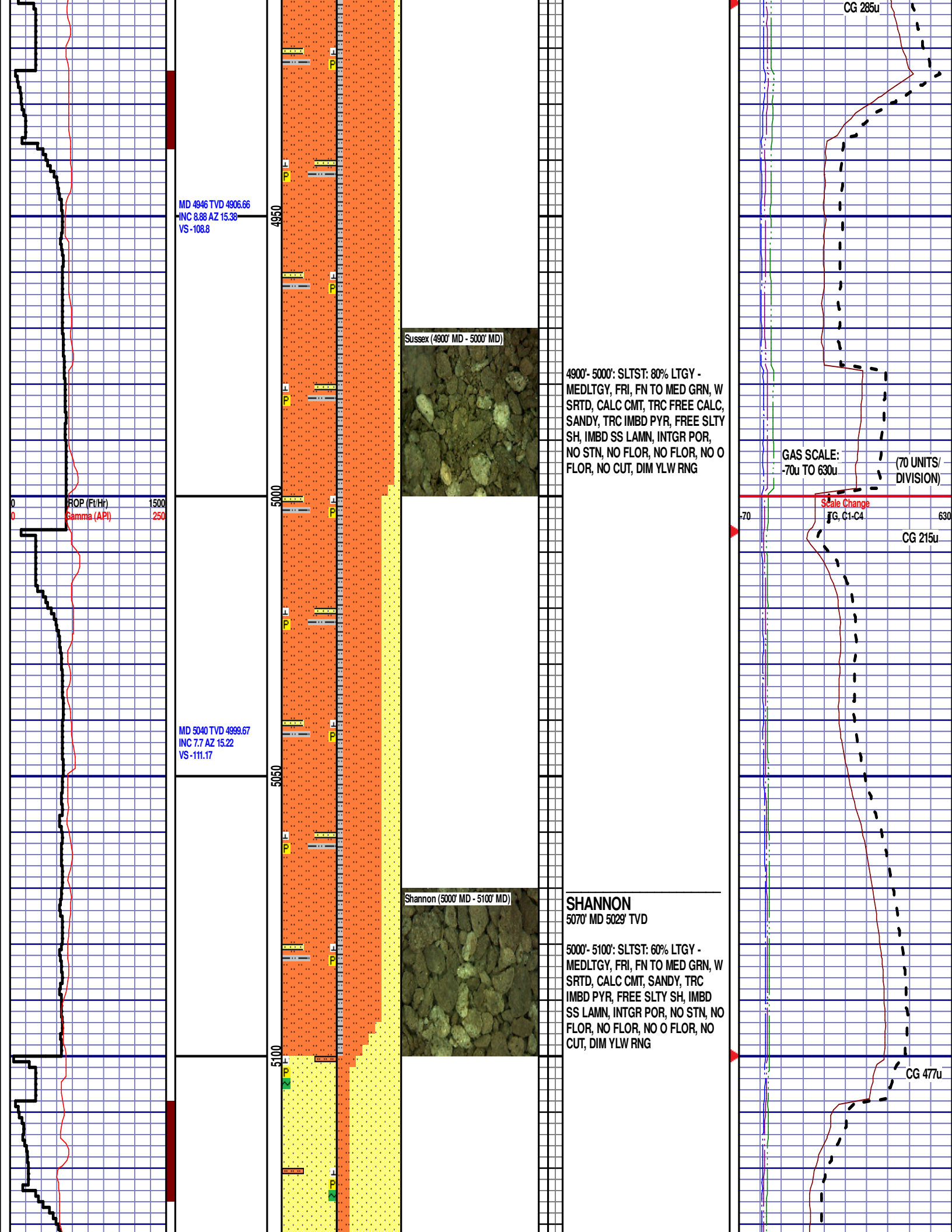
CG 175u

GAS SCALE:
-40u TO 360u

Scale Change
TG C1-C4
(40 UNITS/
DIVISION)

CG 239u





MD 5135 TVD 5093.67
INC 8.97 AZ 19.61
VS -114.11

MD 5229 TVD 5186.56
INC 8.63 AZ 17.93
VS -117.48

MD 5324 TVD 5280.65
INC 7.22 AZ 16.94
VS -120.26

5100'- 5200': SS: 80%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, TRC IMBD GLAU, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, DIM YLW RNG

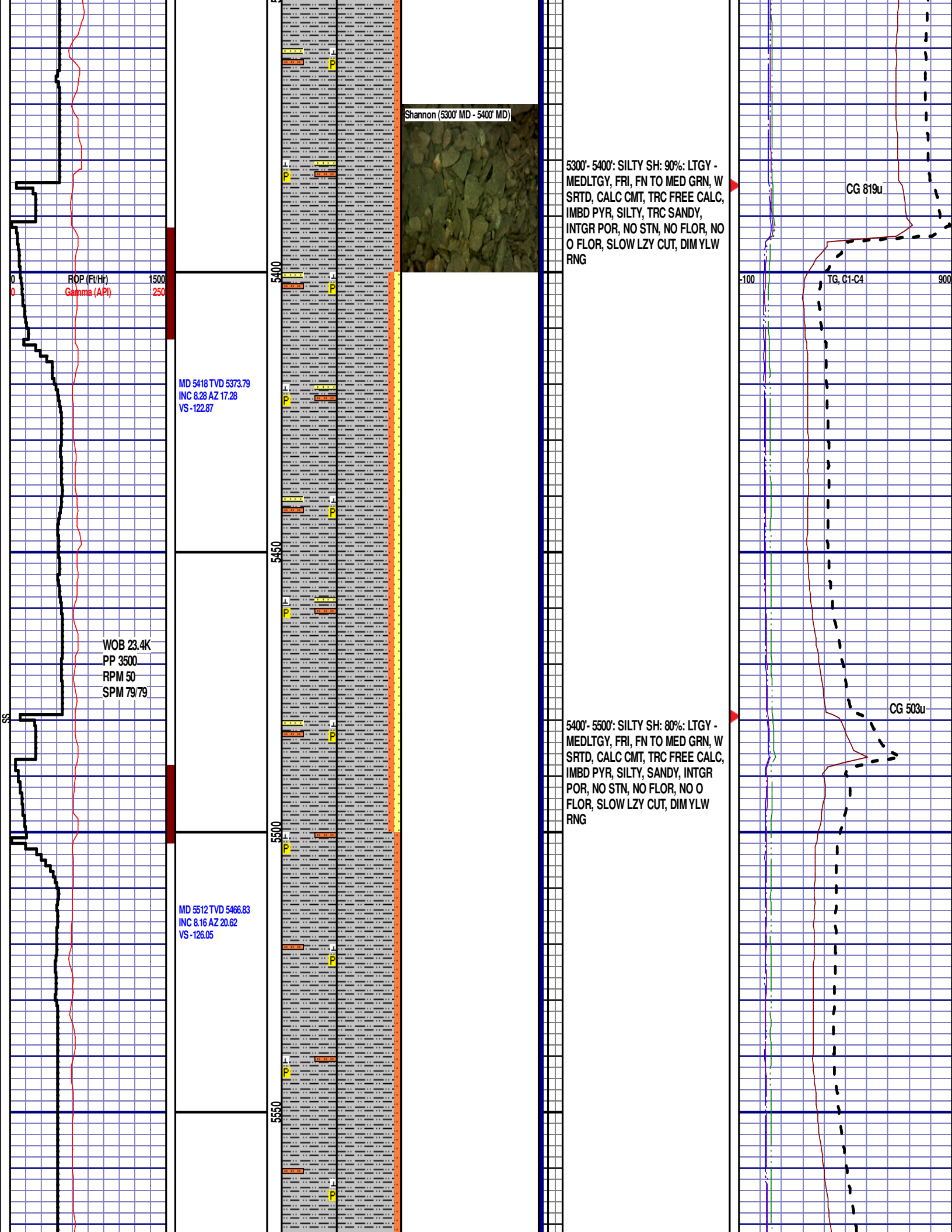
5200'- 5300': SILTY SH: 80%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, SILTY, SANDY, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, DIM YLW RNG

CG 343u

CG 514u

GAS SCALE CHANGE:
-100u TO 900u

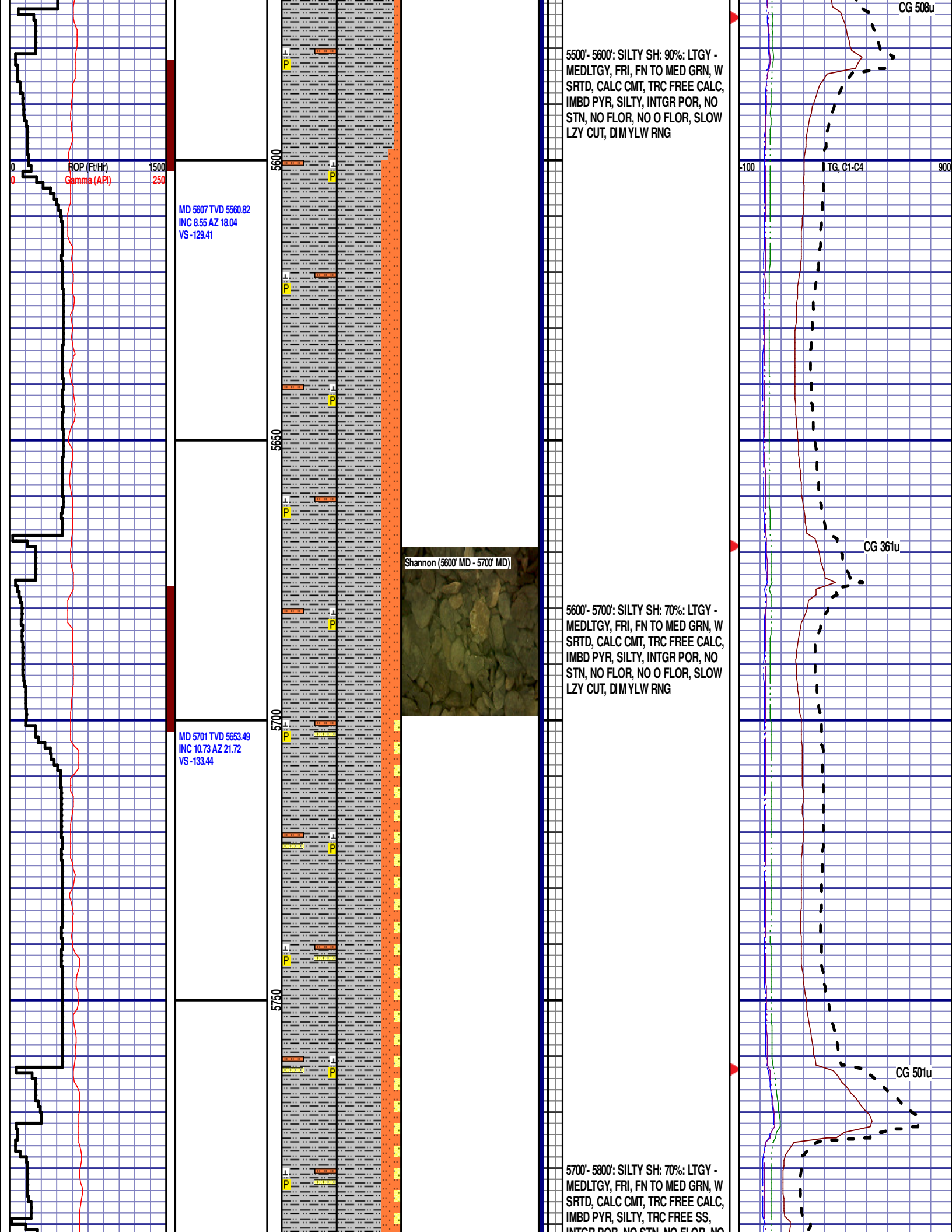
Scale Change
TG, C1-C4
(100 UNITS/
DIVISION)

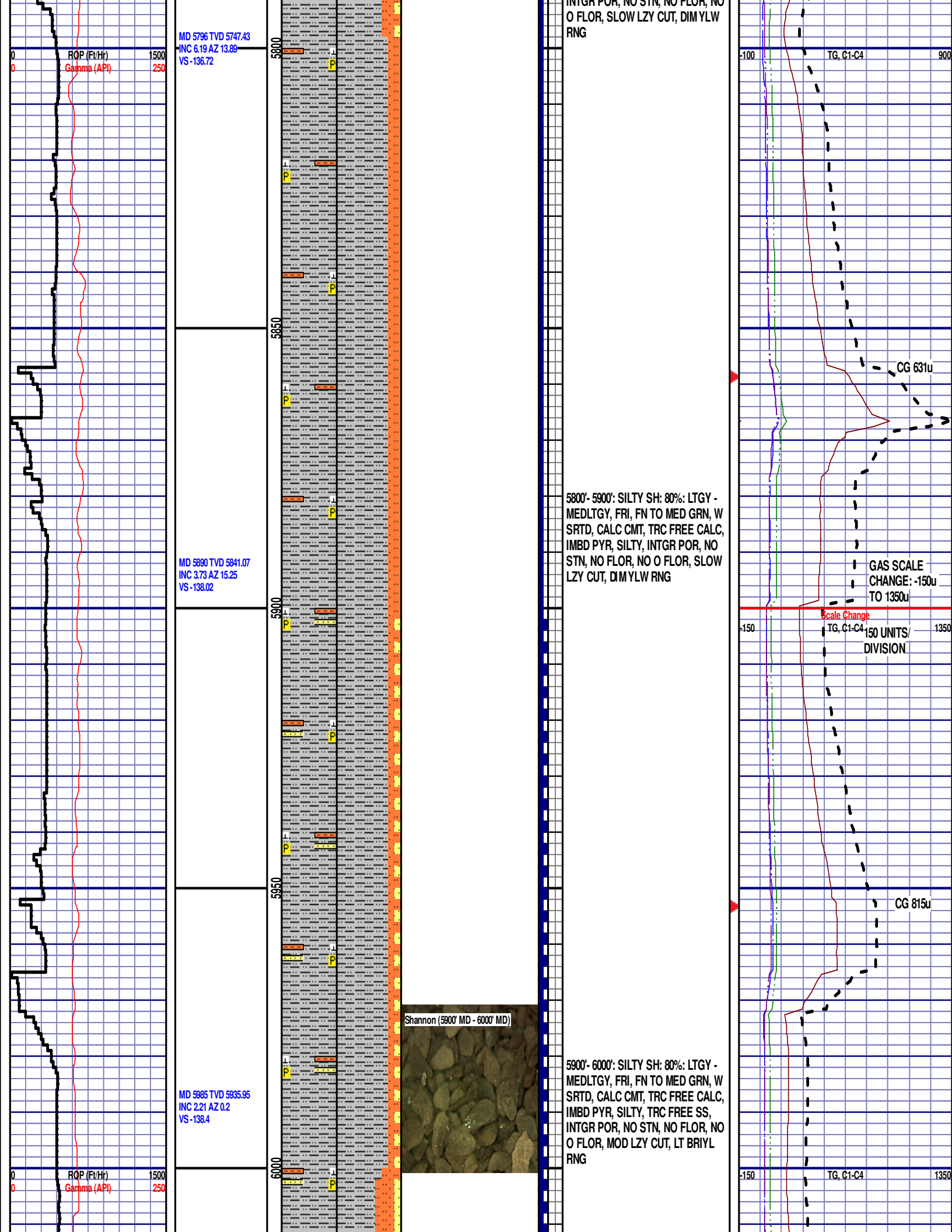


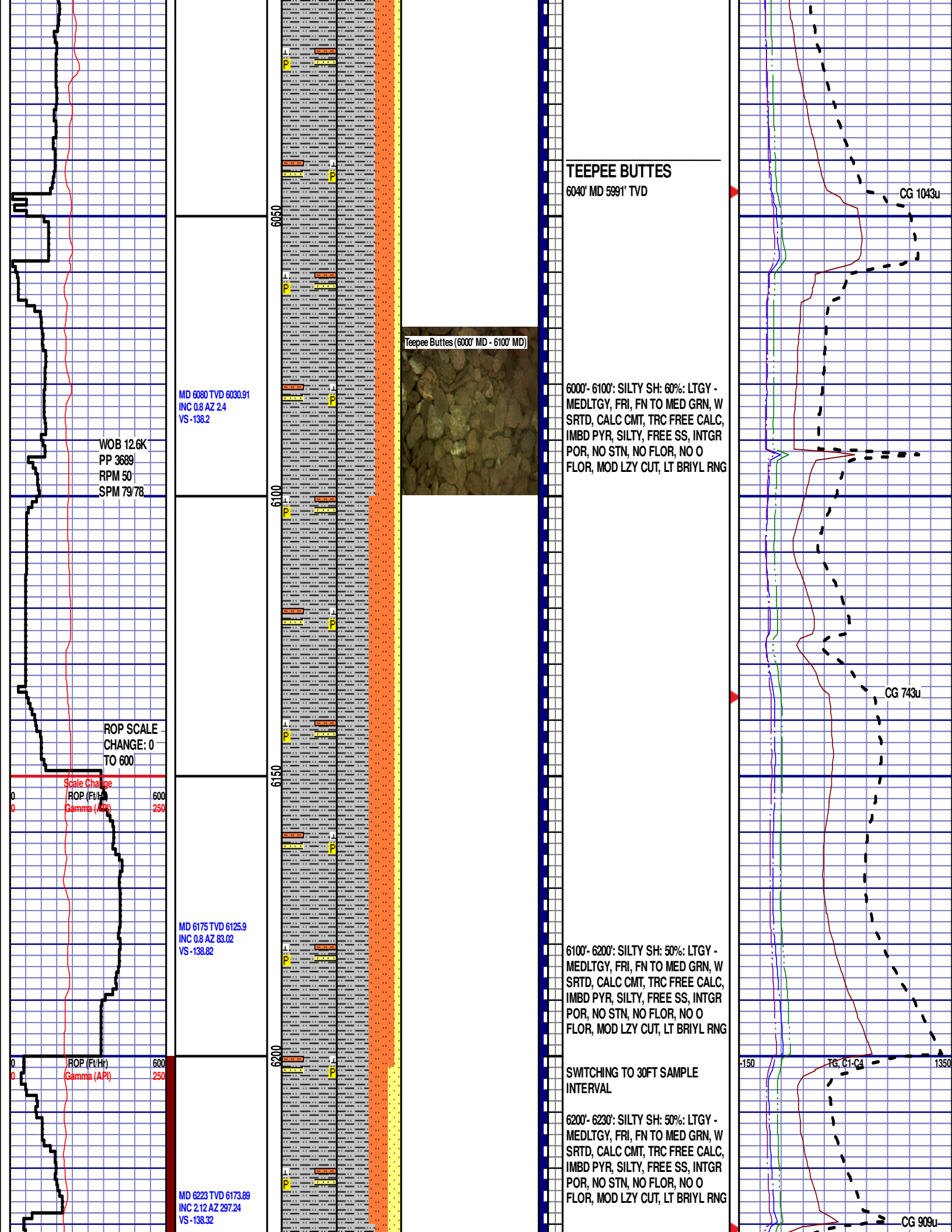
Shannon (5300' MD - 5400' MD)

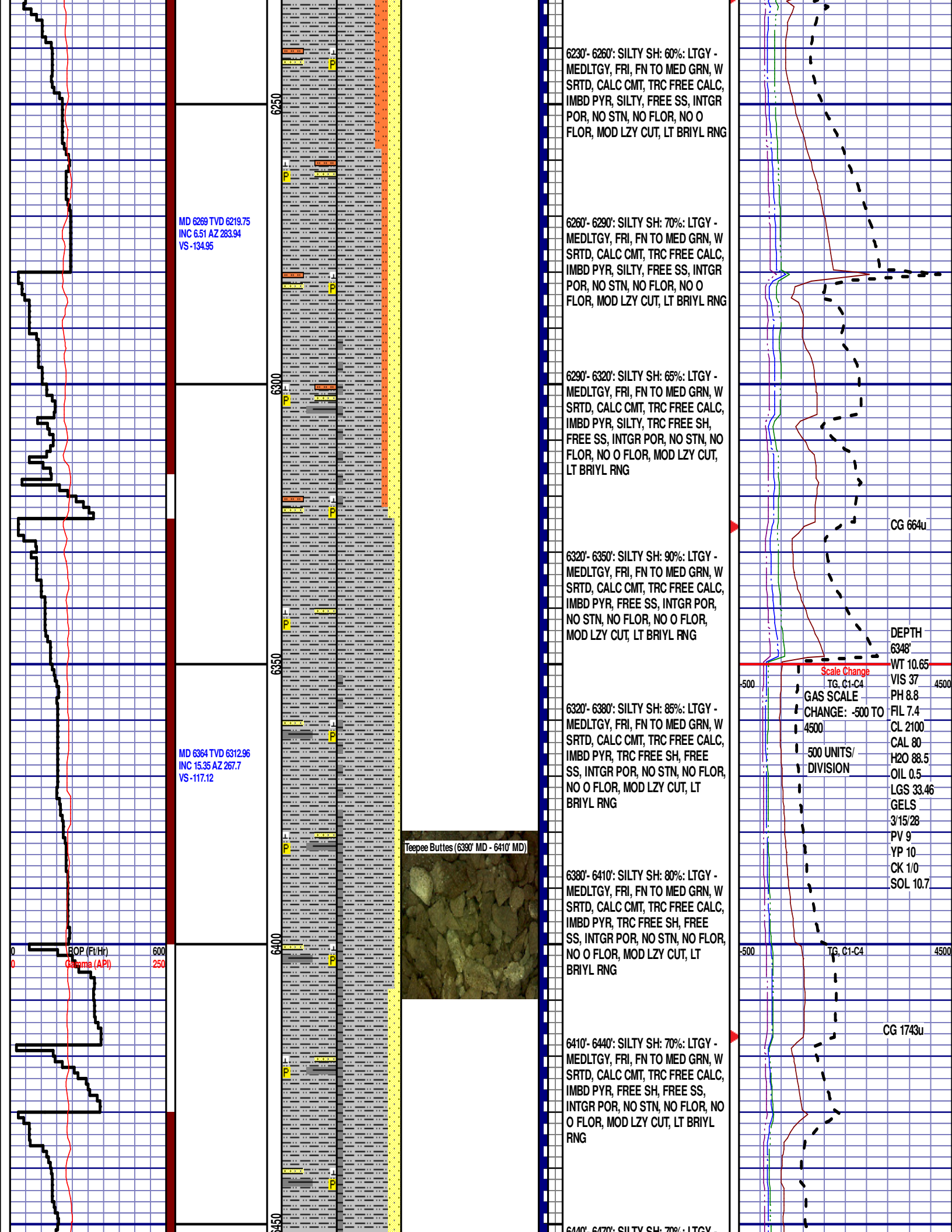
5300'- 5400': SILTY SH: 90%: LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, TRC FREE CALC, IMBD PYR, SILTY, TRC SANDY, INTGR POR, NO STN, NO FLOR, NO O FLOR, SLOW LZY CUT, DIM YLW RNG

5400'- 5500': SILTY SH: 80%: LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, TRC FREE CALC, IMBD PYR, SILTY, SANDY, INTGR POR, NO STN, NO FLOR, NO O FLOR, SLOW LZY CUT, DIM YLW RNG









MD 6459 TVD 6403.24
INC 20.83 AZ 275.75
VS -87.74

MD 6553 TVD 6487.88
INC 30.46 AZ 278.2
VS -47.14

MD 6648 TVD 6565.17
INC 40.55 AZ 269.24
VS 7.8

RO (Ft/Hr)
Gamma (API)

600
250

6500

6550

6600

6650

Sharon Springs (6590' MD - 6620' MD)



6440'-6470': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SH, FREE SS,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, MOD LZY CUT, LT BRIYL
RNG

6470'-6500': SILTY SH: 80%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SH, FREE SS,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, MOD LZY CUT, LT BRIYL
RNG

6500'-6530': SILTY SH: 85%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SH, FREE SS,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, MOD LZY CUT, LT BRIYL
RNG

6530'-6560': SILTY SH: 75%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SH, INTGR POR,
NO STN, NO FLOR, NO O FLOR,
MOD LZY CUT, LT BRIYL RNG

6560'-6590': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SH, INTGR POR,
NO STN, NO FLOR, NO O FLOR,
MOD LZY CUT, LT BRIYL RNG

6590'-6620': SILTY SH: 65%: LTGY - MEDLTGY,
FRI, FN TO MED GRN, W SRTD, CALC CMT,
TRC FREE CALC, IMBD PYR, FREE BENT,
FREE SH, INTGR POR, NO STN, 5% MIN FLOR,
NO O FLOR, IMMED STRMG CUT, BRIYL RNG

SHARON SPRINGS

6610' MD 6535' TVD

6620'-6650': SLTYSH: 60% SUBBLKY
TO SUBSPLT, SLTY TO F TXT, FREE
CALC, IMBD PYR, FREE BENT,
FREE SH, NO STN, 10% MIN FLOR,
FNT BLSHWT O FLOR, IMMED
STRMG CUT, HVY BLSHWT RNG

6650' MD-6680' MD: SLTYSH: 60% SUBBLKY
TO SUBSPLT, SLTY TO F TXT, FREE CALC,
IMBD PYR, FREE BENT, 40% FREE MRLST, NO
STN, TRC MIN FLOR, FNT BLSHWT O FLOR,
IMMED STRMG CUT, HVY BLSHWT RNG

CG 2738u

Scale Change
TG, C1-C4

GAS SCALE CHANGE
CHANGE: -900 TO 8100
900 UNITS/ DIVISION

TG, C1-C4

CG 5619u

