

COMMENCED LOGGING @ 3:30 PM
@ 2500' MD ON 04/10/14 W/BIT # 1
8.75 ULTERRA U516S S/N 18284 IN
@ 668' MD

PIERRE
BEFORE LOGGING DEPTH

MD 2369'
WT 8.60
VIS 30.0
PH 9.9
FIL 23.0
CL 1800
CAL 100.0
H2O 97.9
OIL 0.0
SOL 1.8
CAKE 1/0
GELS 2/3/4
PV 4.0
YP 5.0

CG 164u

Pierre (2500' MD - 2600' MD)

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

-30

TG, C1-C4

270

CG 180u

2600'- 2700': SLTST: 55% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, TRC IMBD
GLAUC, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

WOB 21.0K
PP 2801
RPM 60
SPM 67/66

MD 2587 TVD 2586.91
INC 0.39 AZ 216.14
VS -1.94

MD 2682 TVD 2681.91
INC 0.4 AZ 230.61
VS -1.5

ROP (ft/Hr)
Gamma (API)

1500
350

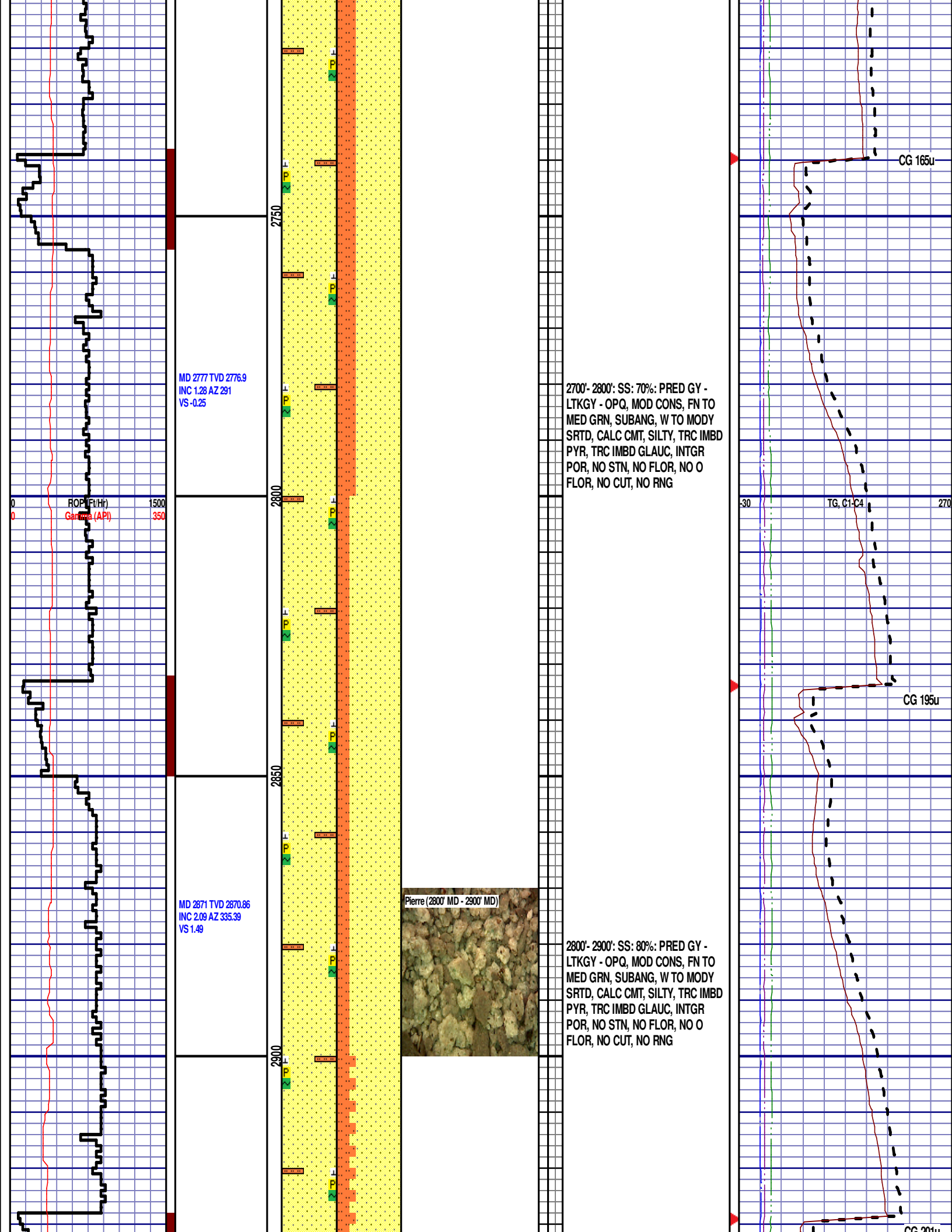
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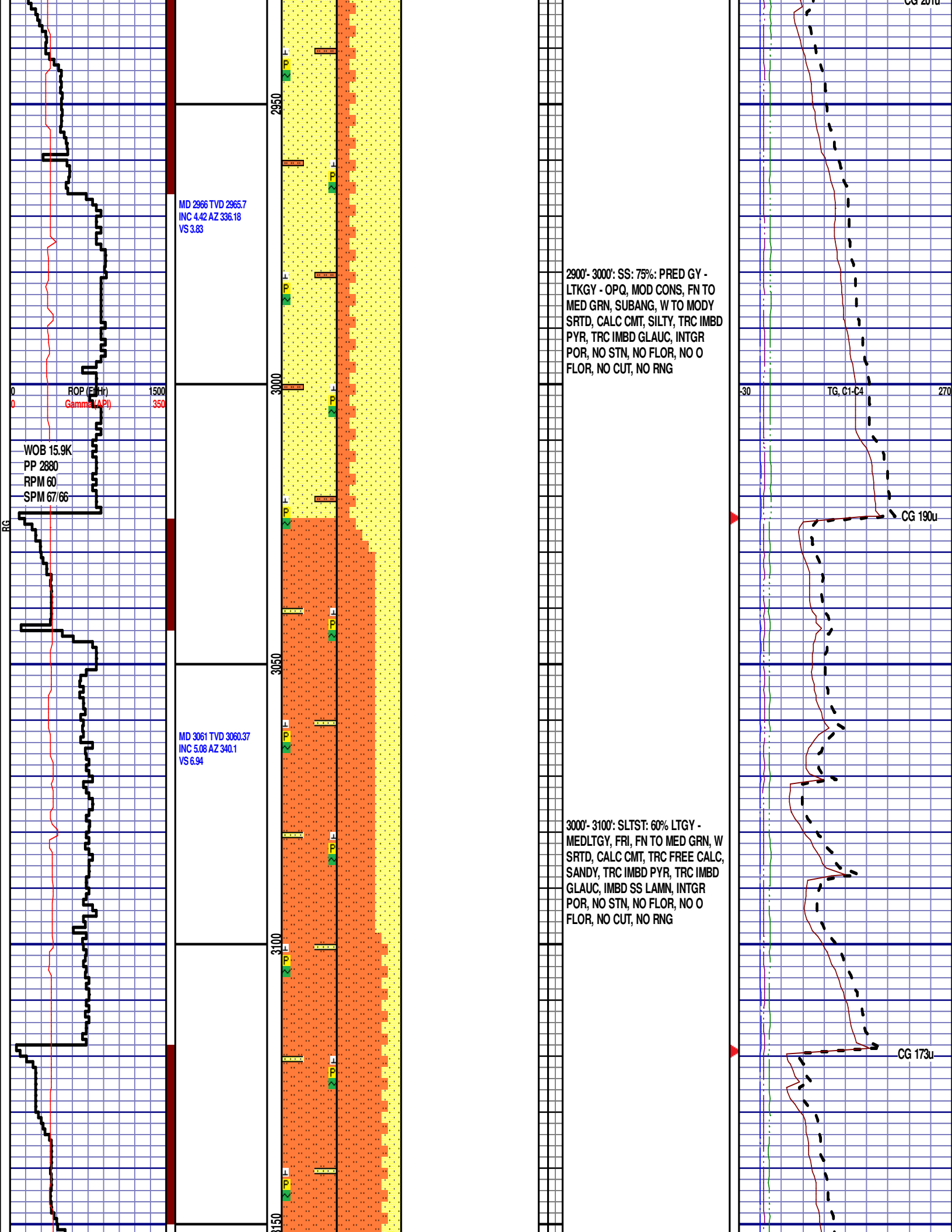
2550

2600

2650

2700





MD 3156 TVD 3154.85
INC 6.89 AZ 332.7
VS 11.24

ROP (Ft/Hr)
Gamma (API)

1500
350

3200

3250

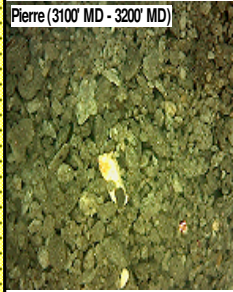
3300

3350

MD 3251 TVD 3248.97
INC 8.73 AZ 336.21
VS 17.09

MD 3346 TVD 3342.69
INC 10.15 AZ 325.42
VS 25.12

Pierre (3100' MD - 3200' MD)



3100'- 3200': SLTST: 75% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, TRC IMBD
GLAUC, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

3200'- 3300': SLTST: 80% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, TRC IMBD
GLAUC, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

-30

TG, C1-C4

270

CG 192u

CG 217u

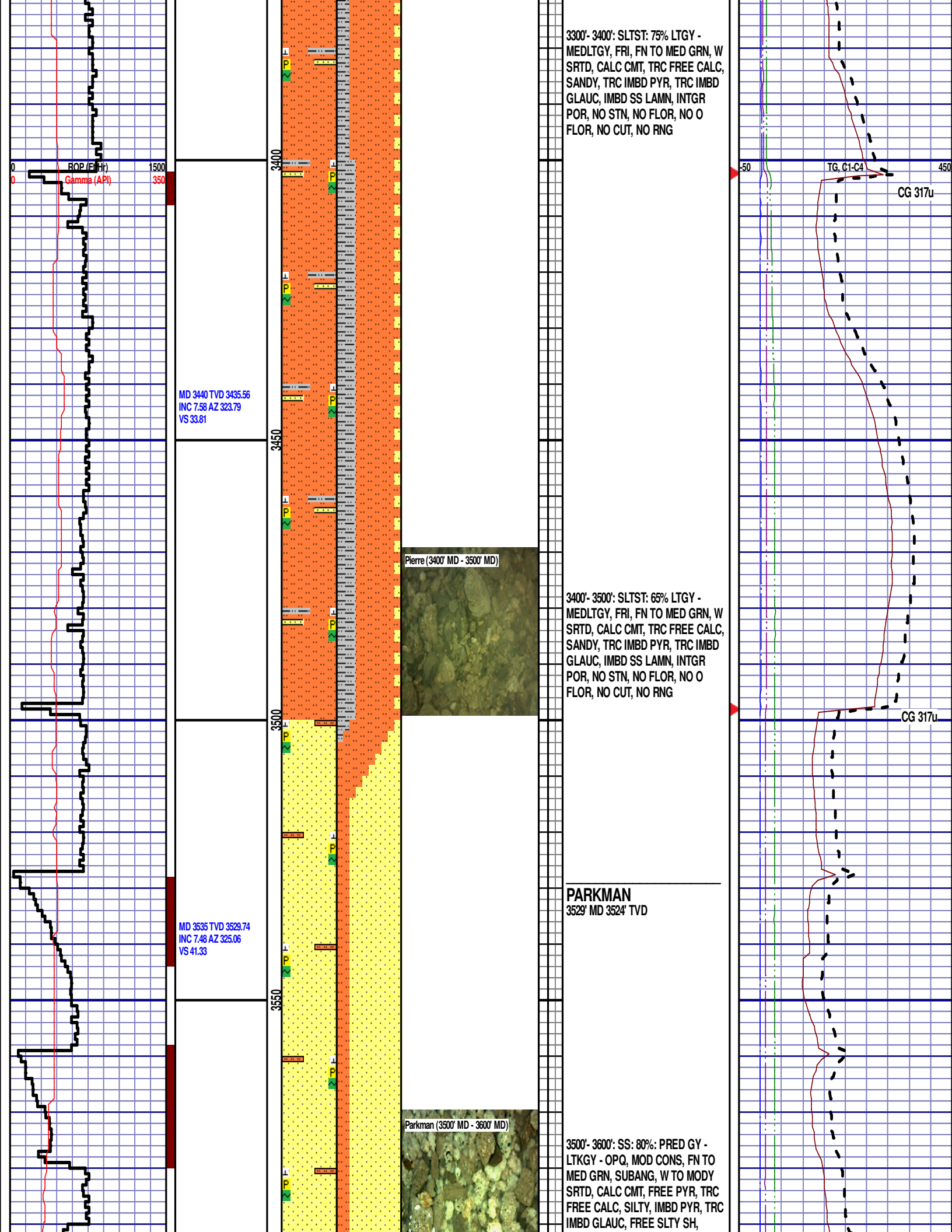
-50

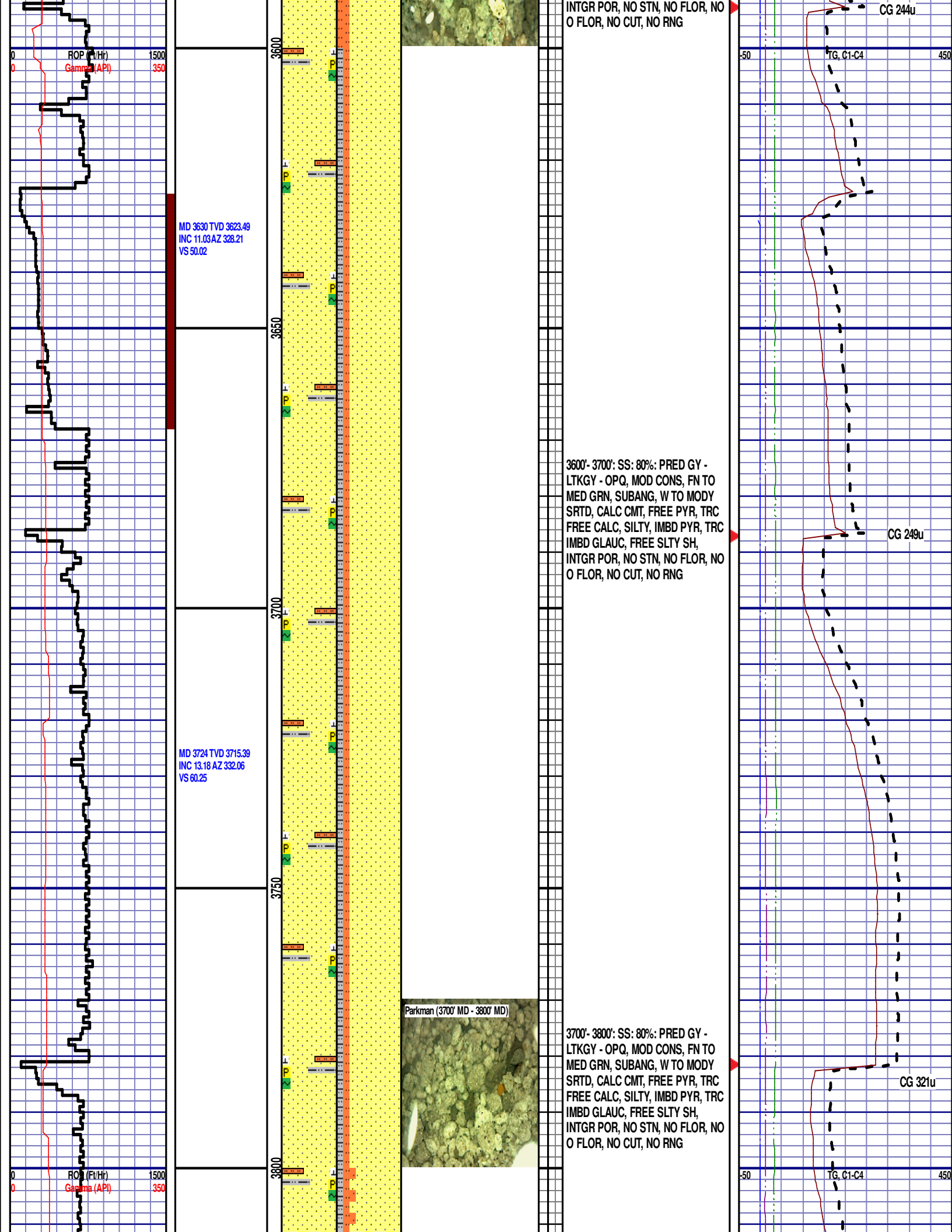
Scale Change
TG, C1-C4

450

GAS SCALE: -50 TO 450

50 UNITS/DIVISION





MD 3818 TVD 3806.75
INC 14.06 AZ 332.58
VS 71.08

WOB 26.9K
PP 3178
RPM 60
SPM 67/67

MD 3913 TVD 3899.09
INC 13.1 AZ 332.2
VS 81.96

MD 4007 TVD 3991.2
INC 9.85 AZ 330.42
VS 91.35

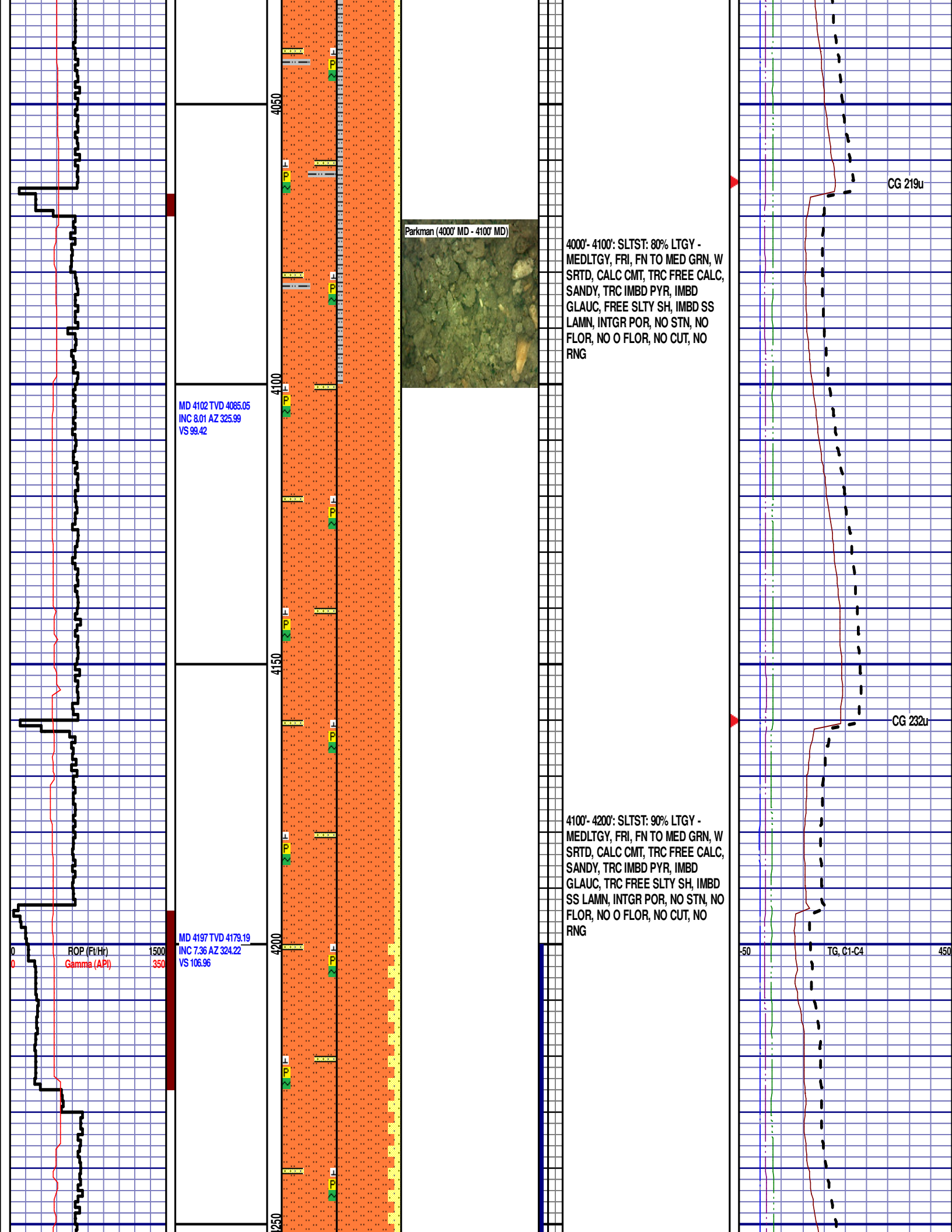
3800'- 3900': SS: 75%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, FREE PYR, TRC
FREE CALC, SILTY, IMBD PYR, TRC
IMBD GLAUC, FREE SLTY SH,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, NO CUT, NO RNG

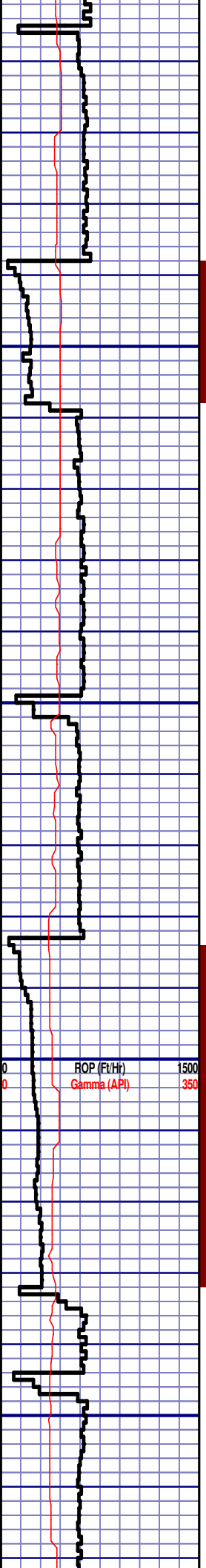
3900'- 4000': SLTST: 70% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, IMBD
GLAUC, FREE SLTY SH, IMBD SS
LAMN, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

CG 262u

CG 212u

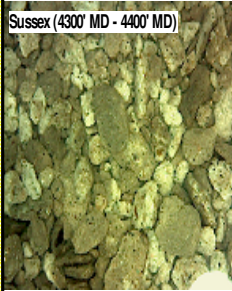
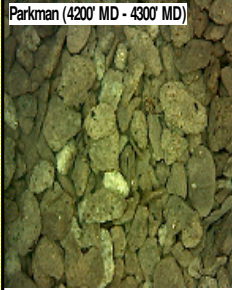
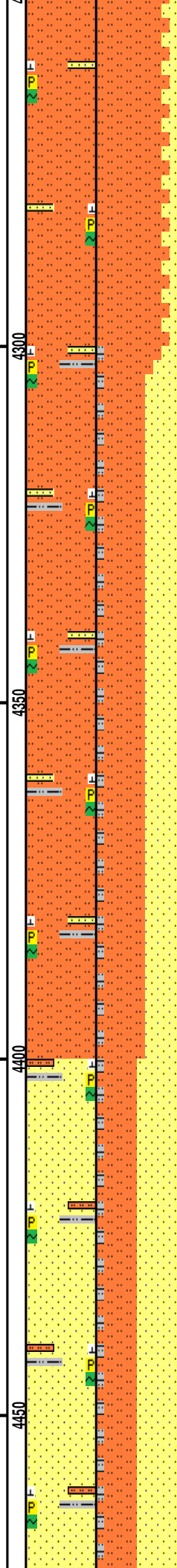
TG, C1-C4





MD 4292 TVD 4273.41
INC 7.35 AZ 320.43
VS 114.66

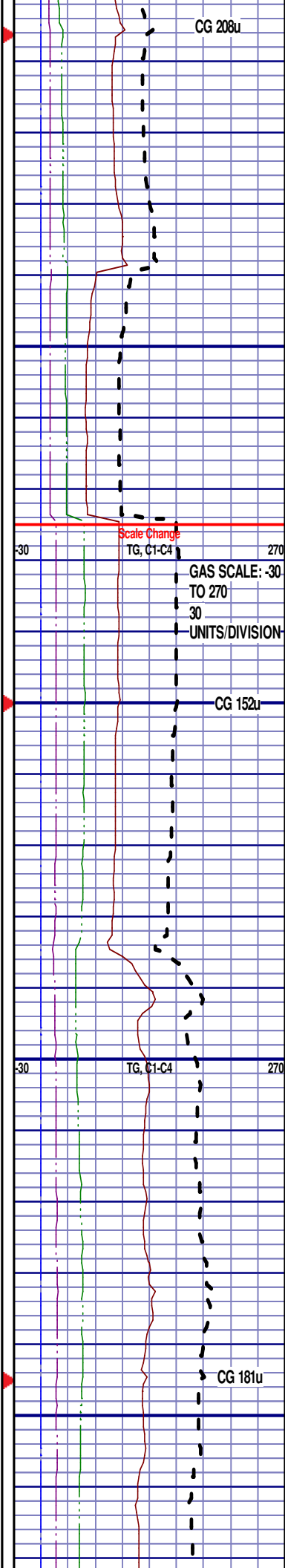
MD 4387 TVD 4367.61
INC 7.55 AZ 319.69
VS 122.83



4200'- 4300': SLTST: 85% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, IMBD
GLAUC, TRC FREE SLTY SH, IMBD
SS LAMN, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW LZ CUT,
DIM YLW RNG

SUSSEX
4301' MD 4282' TVD

4300'- 4400': SLTST: 55% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
SANDY, TRC IMBD PYR, FREE SLTY
SH, IMBD SS LAMN, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG



MD 4481 TVD 4460.67
INC 8.68 AZ 327.92
VS 130.89

MD 4576 TVD 4554.71
INC 7.57 AZ 330.34
VS 138.11

MD 4671 TVD 4648.77
INC 8.57 AZ 331.24
VS 144.93

ROP (Ft/Hr)
Gamma (API)

1500
350

4500

4550

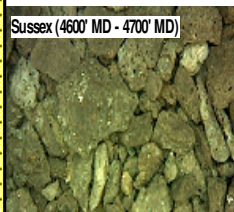
4600

4650

4500'- 4600': SS: 50%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, TRC IMBD
PYR, TRC IMBD GLAUC, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RING

4500'- 4600': SLTST: 75% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, IMBD SS LAMN, FREE
SLTY SH, INTGR POR, NO STN, NO
FLOR, SLOW LZU CUT, DIMYLW
RNG

Sussex (4600' MD - 4700' MD)



4600'- 4700': SLTST: 85% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, IMBD SS LAMN, FREE
SLTY SH, INTGR POR, NO STN, NO
FLOR, SLOW LZU CUT, DIMYLW
RNG

CG 178u

TG, C1-C4

CG 184u

12:01 AM
4/11/2014
4600 FT/24 HRS

4013 F1/24 HRS
DAY 02

WOB 16.7K
PP 3679
RPM 60
SPM 67/67

MD 4766 TVD 4742.6
INC 9.46 AZ 336.19
VS 151.86

ROP (Ft/Hr) 1500
Gamma (API) 350

MD 4861 TVD 4836.42
INC 8.61 AZ 335.93
VS 158.29

Sussex (4700' MD - 4800' MD)

Shannon (4800' MD - 4900' MD)

SLTY SH, INTGR POR, NO STN, NO
FLOR, SLOW LZY CUT, DIMY LW
RNG

4700'- 4800': SLTST: 75% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, IMBD SS LAMN, FREE
SLTY SH, INTGR POR, NO STN, NO
FLOR, SLOW LZY CUT, DIMY LW
RNG

SHANNON
4852' MD 4827' TVD

4800'- 4900': SLTST: 50% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
TRC IMBD GLAUC, SANDY, TRC
IMBD PYR, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, SLOW
LZY CUT, DIMY LW RNG

CG 118u

CG, C1-C4

CG 109u

MD 4956 TVD 4930.48
INC 7.51 AZ 334.2
VS 164.23

Shannon (4900' MD - 5000' MD)

4900'- 5000': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
TRC IMBD GLAUC, SANDY, TRC
IMBD PYR, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, SLOW
LZY CUT, DIMYLW RNG

MD 5050 TVD 5023.9
INC 5.12 AZ 331.41
VS 169.17

5000'- 5100': SILTY SH: 80%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR,
SANDY, SILTY, FREE SLTST, SCT
FREE SS, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW LZY CUT,
DIM YLW RNG

CG 152u

TG, C1-C4

CG 181u

Scale Change

TG, C1-C4

GAS SCALE: -50
TO 450
50
UNITS/DIVISION

CG 304u

MD 5103'

WT 8.80

VIS 30

PH 8.8

FIL 21.3

CL 2100

CAL 80.0

MD 5145 TVD 5118.56
INC 4.68 AZ 331.78
VS 173.23

MD 5239 TVD 5212.15
INC 5.94 AZ 339.4
VS 176.97

MD 5334 TVD 5306.63
INC 6.08 AZ 338.06
VS 180.84

5100'- 5200': SILTY SH: 65%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR,
SANDY, SILTY, FREE SLTST & SH,
SCT FREE SS, INTGR POR, NO
STN, NO FLOR, NO O FLOR, SLOW
LZY CUT, DIM YLW RNG

5200'- 5300': SILTY SH: 50%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR,
SANDY, SILTY, FREE SLTST & SH,
SCT FREE SS, INTGR POR, NO
STN, NO FLOR, NO O FLOR, SLOW
LZY CUT, DIM YLW RNG

Shannon (5200' MD - 5300' MD)

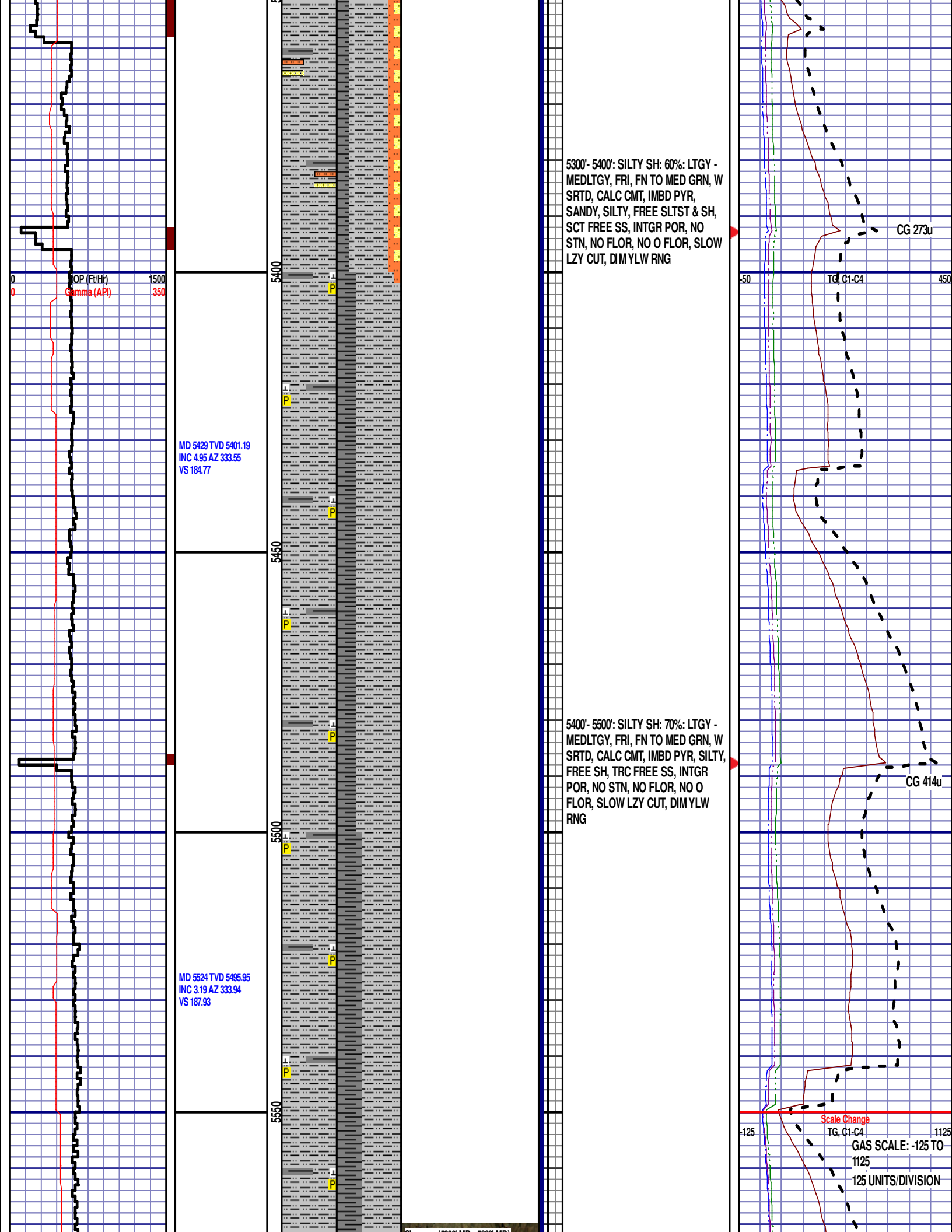


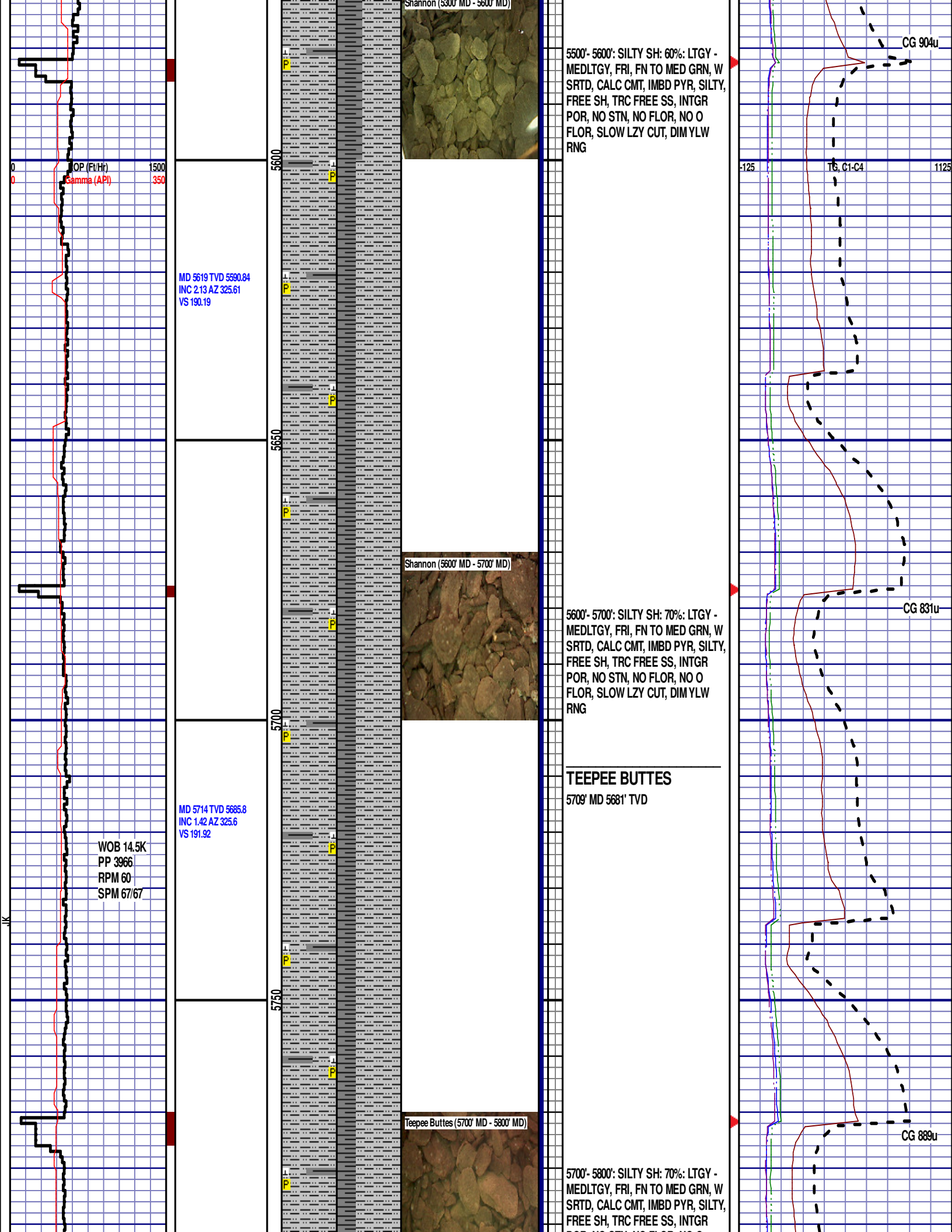
H2O 96.8
OIL 0.0
SOL 2.9
CAKE 2/0
GELS 2/5/6
PV 5.0
YP 4.0

TG, C1-C4
CG 126u

CG 123u

PURGE CONDENSATE





5500'- 5600': SILTY SH: 60%: LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, IMBD PYR, SILTY, FREE SH, TRC FREE SS, INTGR POR, NO STN, NO FLOR, NO O FLOR, SLOW LZY CUT, DIM YLW RNG



5600'- 5700': SILTY SH: 70%: LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, IMBD PYR, SILTY, FREE SH, TRC FREE SS, INTGR POR, NO STN, NO FLOR, NO O FLOR, SLOW LZY CUT, DIM YLW RNG

TEEPEE BUTTES

5709' MD 5681' TVD



5700'- 5800': SILTY SH: 70%: LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, IMBD PYR, SILTY, FREE SH, TRC FREE SS, INTGR

MD 5619 TVD 5590.84
INC 2.13 AZ 325.61
VS 190.19

MD 5714 TVD 5685.8
INC 1.42 AZ 325.6
VS 191.92

WOB 14.5K
PP 3966
RPM 60
SPM 67/67

CG 904u

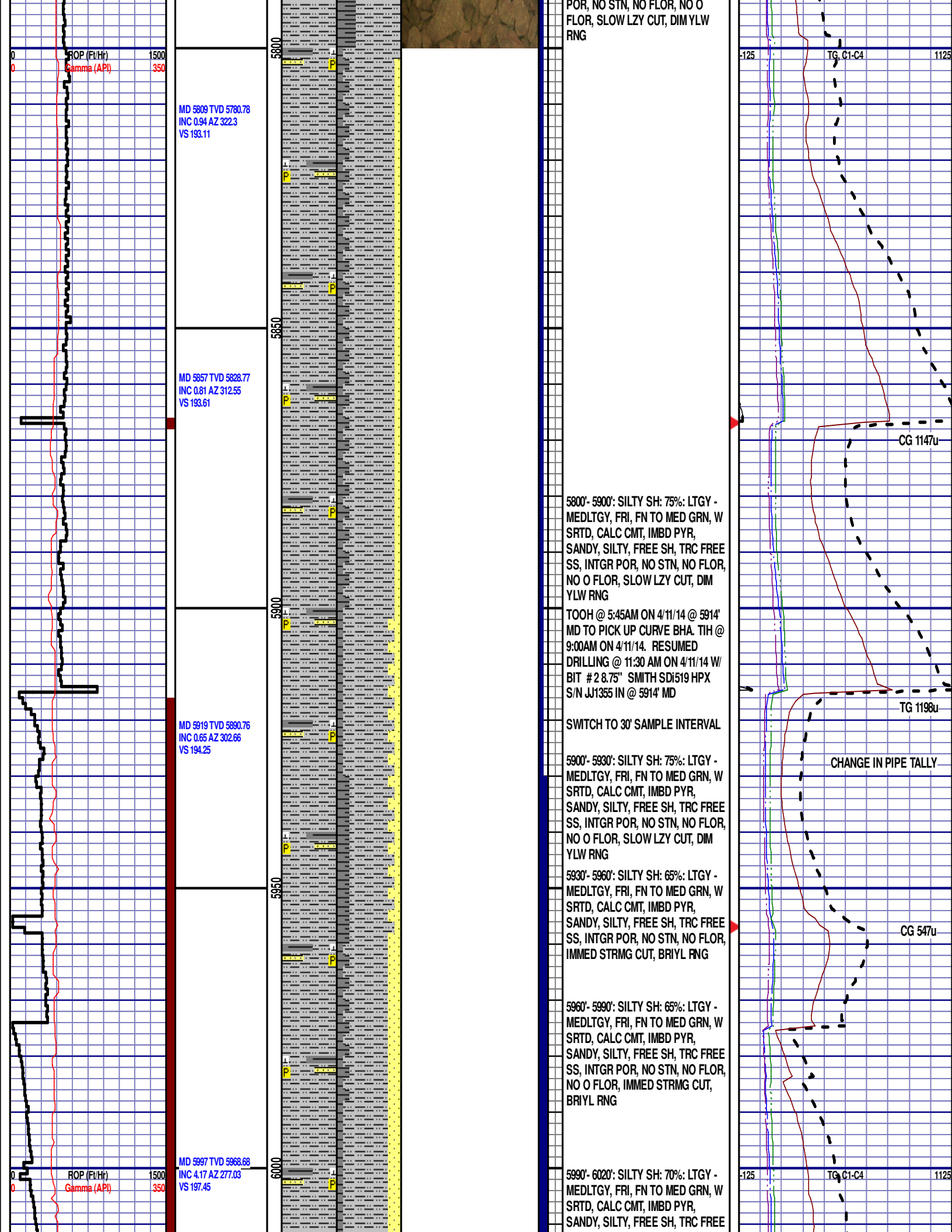
CG 831u

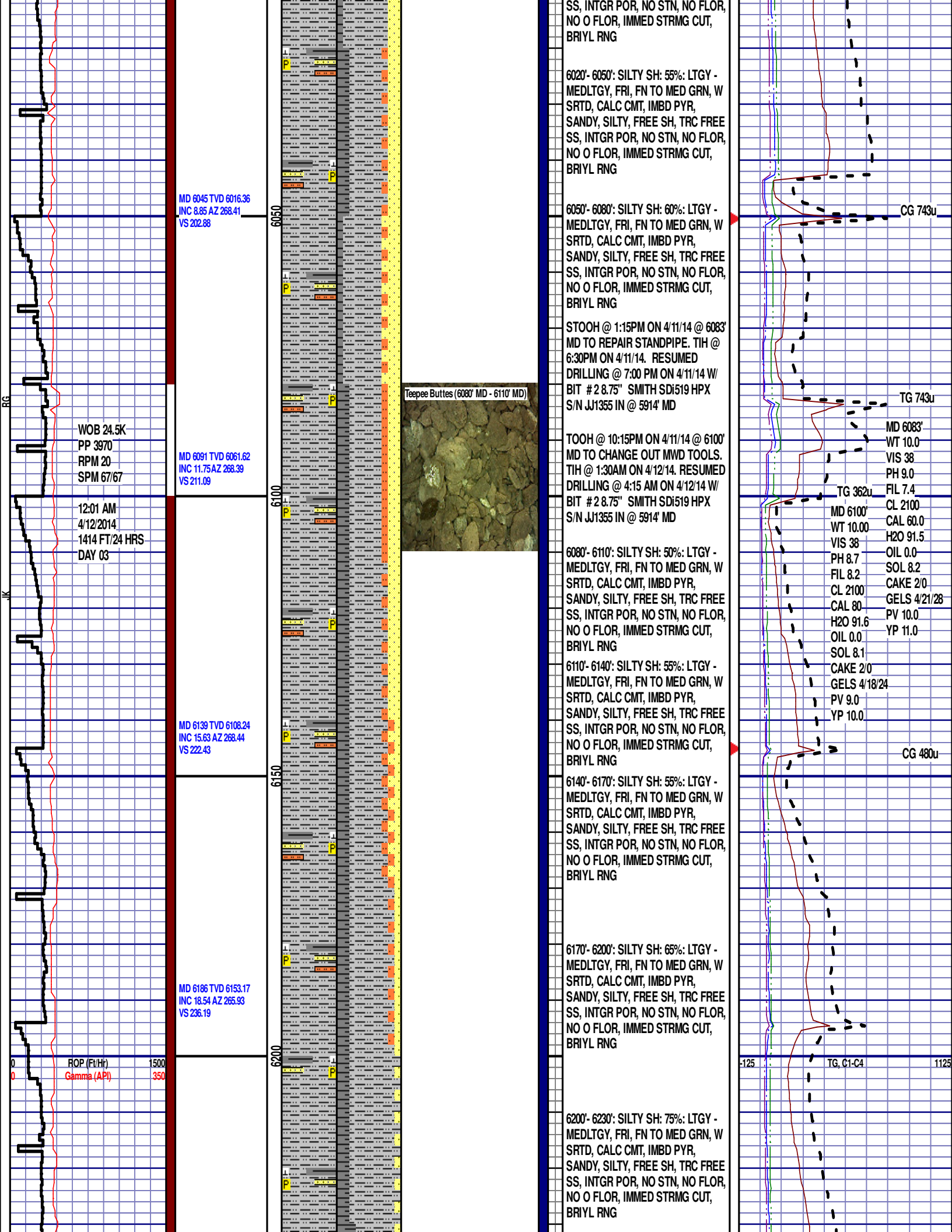
CG 889u

-125

T6, C1-C4

1125





MD 6234 TVD 6198.41
INC 20.49 AZ 266.24
VS 252.15

MD 6281 TVD 6242.13
INC 22.54 AZ 266.89
VS 269.32

MD 6329 TVD 6285.89
INC 25.96 AZ 265.64
VS 288.94

MD 6375 TVD 6326.87
INC 28.05 AZ 268.4
VS 309.76

MD 6423 TVD 6368.34
INC 32.4 AZ 272.57
VS 333.9

ROP (Ft/Hr)
Gamma (API)

6230'- 6260': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR,
SANDY, SILTY, FREE SH, TRC FREE
SS, INTGR POR, NO STN, NO FLOR,
NO O FLOR, IMMED STRMG CUT,
BRIYL RNG

6260'- 6290': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR,
SANDY, SILTY, FREE SH, TRC FREE
SS, INTGR POR, NO STN, NO FLOR,
NO O FLOR, IMMED STRMG CUT,
BRIYL RNG

6290'- 6320': SILTY SH: 65%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, TRC
SANDY, SILTY, FREE SH, TRC FREE
SS, INTGR POR, NO STN, NO FLOR,
NO O FLOR, IMMED STRMG CUT,
BRIYL RNG

6320'- 6350': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, SILTY,
FREE SH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, IMMED STRMG
CUT, BRIYL RNG

6350'- 6380': SILTY SH: 60%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, TRC
FREE BENT, SILTY, FREE SH,
INTGR POR, NO STN, 5% FLOR, NO
O FLOR, IMMED STRMG CUT, BRIYL
RNG

6380'- 6410': SILTY SH: 60%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, TRC
FREE BENT, SILTY, FREE SH,
INTGR POR, NO STN, 10% FLOR,
NO O FLOR, IMMED STRMG CUT,
BRIYL RNG

SHARON SPRINGS

6427' MD 6372' TVD

6410'- 6440': SILTY SH: 55%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, TRC
FREE BENT, SILTY, FREE SH,
INTGR POR, NO STN, 10% FLOR,
NO O FLOR, IMMED STRMG CUT,

CG 659u

CG 768u

Scale Change
TG, C1-C4

GAS SCALE -400
TO 3600
400 UNITS/ DIVISION

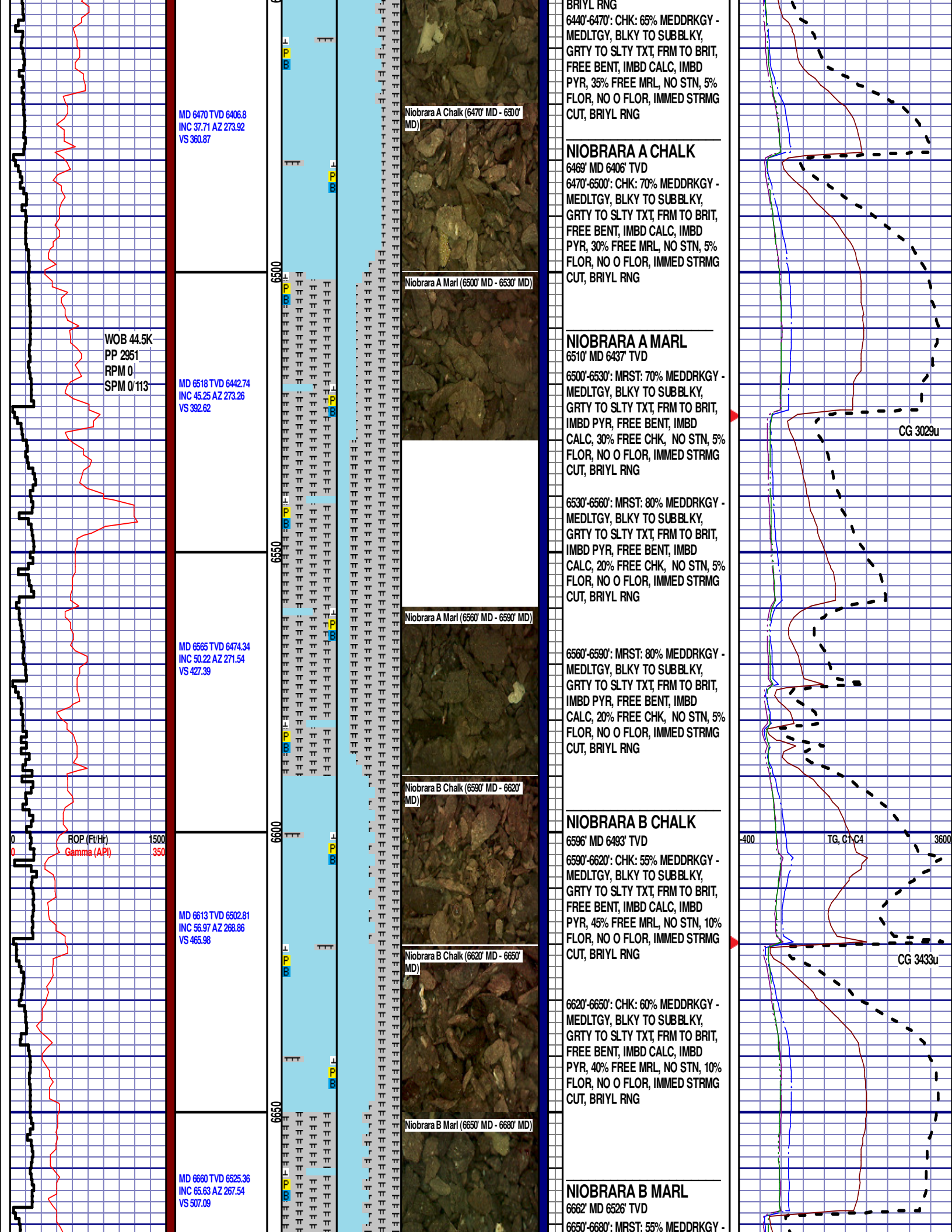
TG, C1-C4

CG 1239u

Teepee Buttes (6380' MD - 6410' MD)

Sharon Springs (6410' MD - 6440' MD)

Niobrara A Chalk (6440' MD - 6470'
MD)



MD 6470 TVD 6406.8
INC 37.71 AZ 273.92
VS 360.87

WOB 44.5K
PP 2951
RPM 0
SPM 0/113

MD 6518 TVD 6442.74
INC 45.25 AZ 273.26
VS 392.62

MD 6565 TVD 6474.34
INC 50.22 AZ 271.54
VS 427.39

MD 6613 TVD 6502.81
INC 56.97 AZ 268.86
VS 465.98

MD 6660 TVD 6525.36
INC 65.63 AZ 267.54
VS 507.09

Niobrara A Chalk (6470' MD - 6500' MD)

Niobrara A Marl (6500' MD - 6530' MD)

Niobrara A Marl (6560' MD - 6590' MD)

Niobrara B Chalk (6590' MD - 6620' MD)

Niobrara B Chalk (6620' MD - 6650' MD)

Niobrara B Marl (6650' MD - 6680' MD)

NIOBRARA A CHALK

6469' MD 6406' TVD
6470'-6500': CHK: 65% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 35% FREE MRL, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

NIOBRARA A MARL

6510' MD 6437' TVD
6500'-6530': MRST: 70% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, IMBD PYR, FREE BENT, IMBD CALC, 30% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

6530'-6560': MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, IMBD PYR, FREE BENT, IMBD CALC, 20% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

6560'-6590': MRST: 80% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, IMBD PYR, FREE BENT, IMBD CALC, 20% FREE CHK, NO STN, 5% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

NIOBRARA B CHALK

6596' MD 6493' TVD
6590'-6620': CHK: 55% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 45% FREE MRL, NO STN, 10% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

6620'-6650': CHK: 60% MEDDRKGY - MEDLTGY, BLKY TO SUBBLKY, GR TY TO SLTY TXT, FRM TO BRIT, FREE BENT, IMBD CALC, IMBD PYR, 40% FREE MRL, NO STN, 10% FLOR, NO O FLOR, IMMED STRMG CUT, BRIYL RNG

NIOBRARA B MARL

6662' MD 6526' TVD
6650'-6680': MRST: 55% MEDDRKGY -

CG 3029u

CG 3433u

