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Customer Information

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

Geologist: Renee Clackler
Noble Energy Inc.

Mud Logging Details

Logger: Tom Denney &
Brian Whitfield

Log Interval: 2500' MD to 6700' MD

Start Date: February 4, 2014

Release Date: February 12, 2014

Well Information

Well Name: Wells Ranch
AA21-67HN

Location: 21-6N-63W
1599' FNL, 419' FEL

County: Weld
State: Colorado

Drilling Rig: H&P 277

Total Depth: 10904' MD

TD Date: February 12, 2014

Formation: Niobrara C Chalk

KB Elevation: 4749'

GR Elevation: 4725'

API Number: 05-123-37741-0000

ROCK TYPES

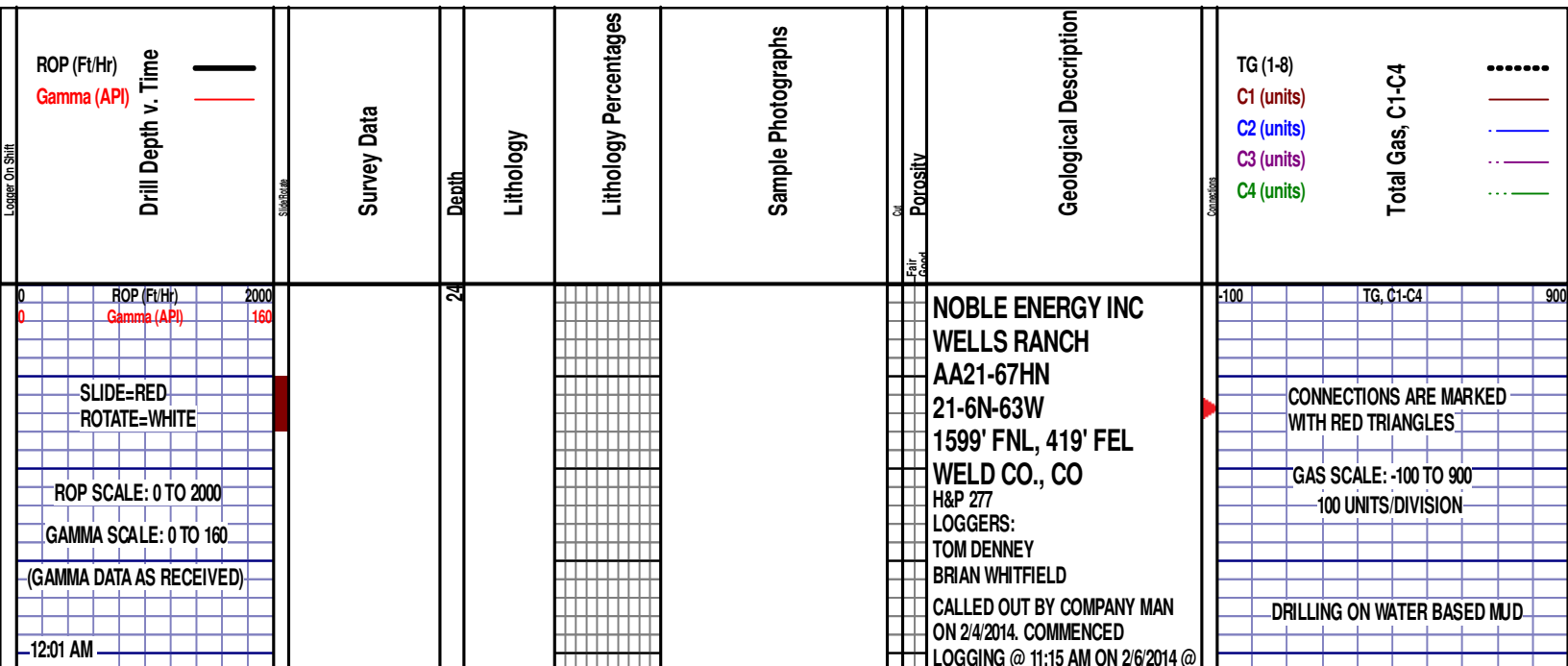
Anhy
Bent
Cht
Clyst
Coal
Congl
Dol

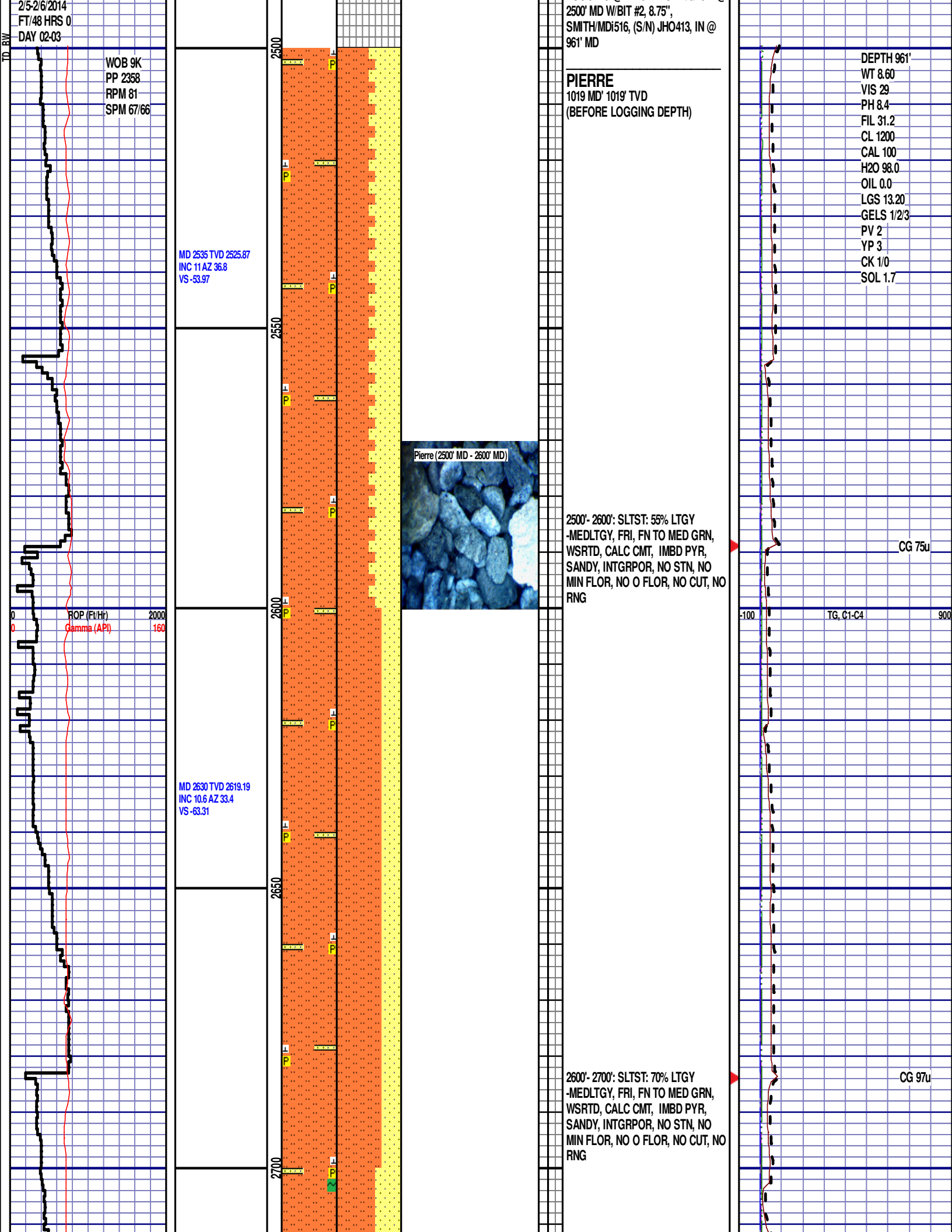
Gyp
Igne
Lmst
Meta
Mrlst
Salt
Shale

Shcol
Chalk
Slst
Ss
Till
gw
lmywash

ogw
olmywash
oshly gw
shly gw
sdygw
hvyrcbsh
nosmpl

Lsdetrit
sltst
sdy sh





MD 2724 TVD 2711.7
INC 9.8 AZ 30
VS -71.2

2750

2800

2850

2900

MD 2819 TVD 2805.11
INC 11.2 AZ 29.2
VS -78.82

MD 2913 TVD 2897.37
INC 10.9 AZ 28.7
VS -86.58

ROP (Ft/Hr)
Gamma (API)

2000
160

2700'- 2800': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

Pierre (2800' MD - 2900' MD)

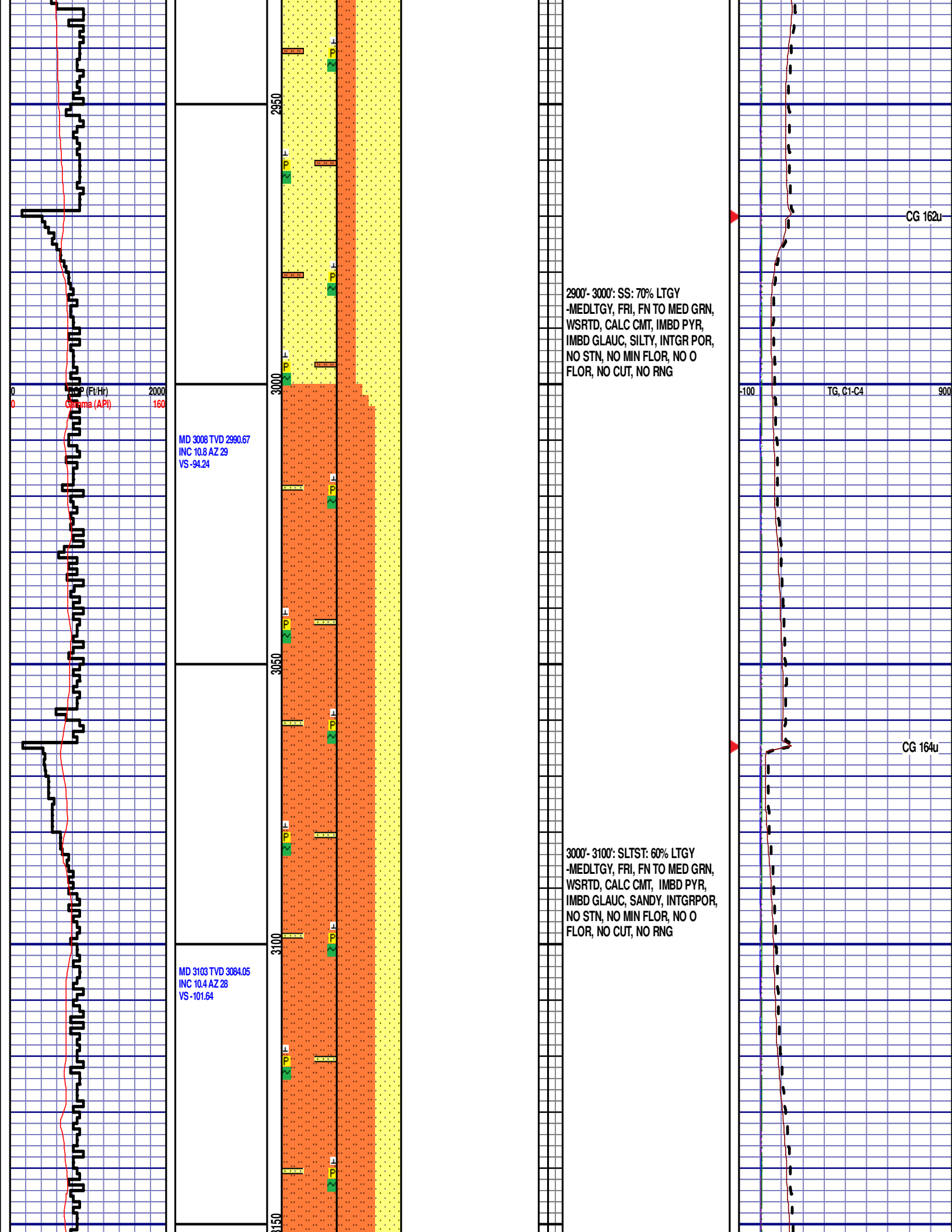


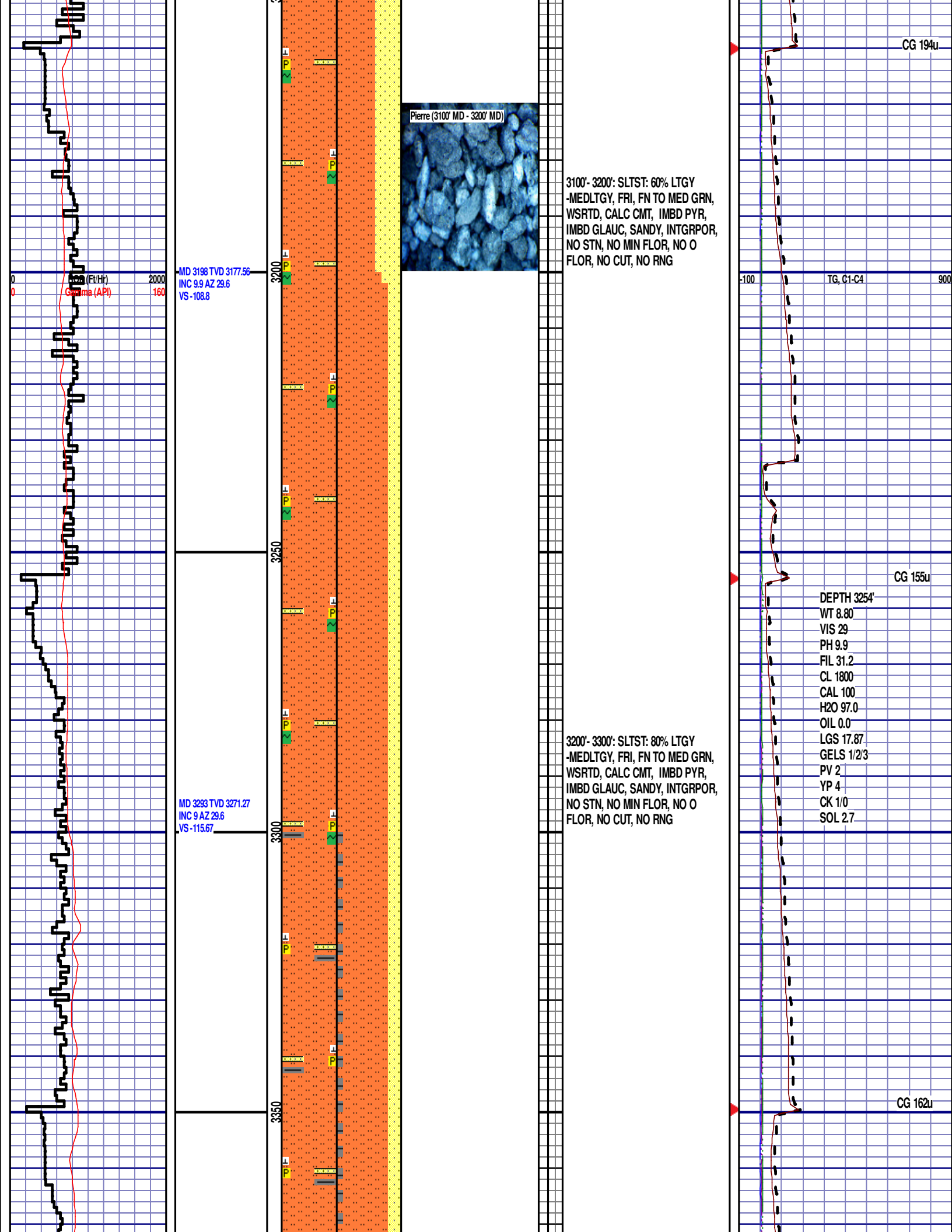
2800'- 2900': SS: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SILTY, INTGR POR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

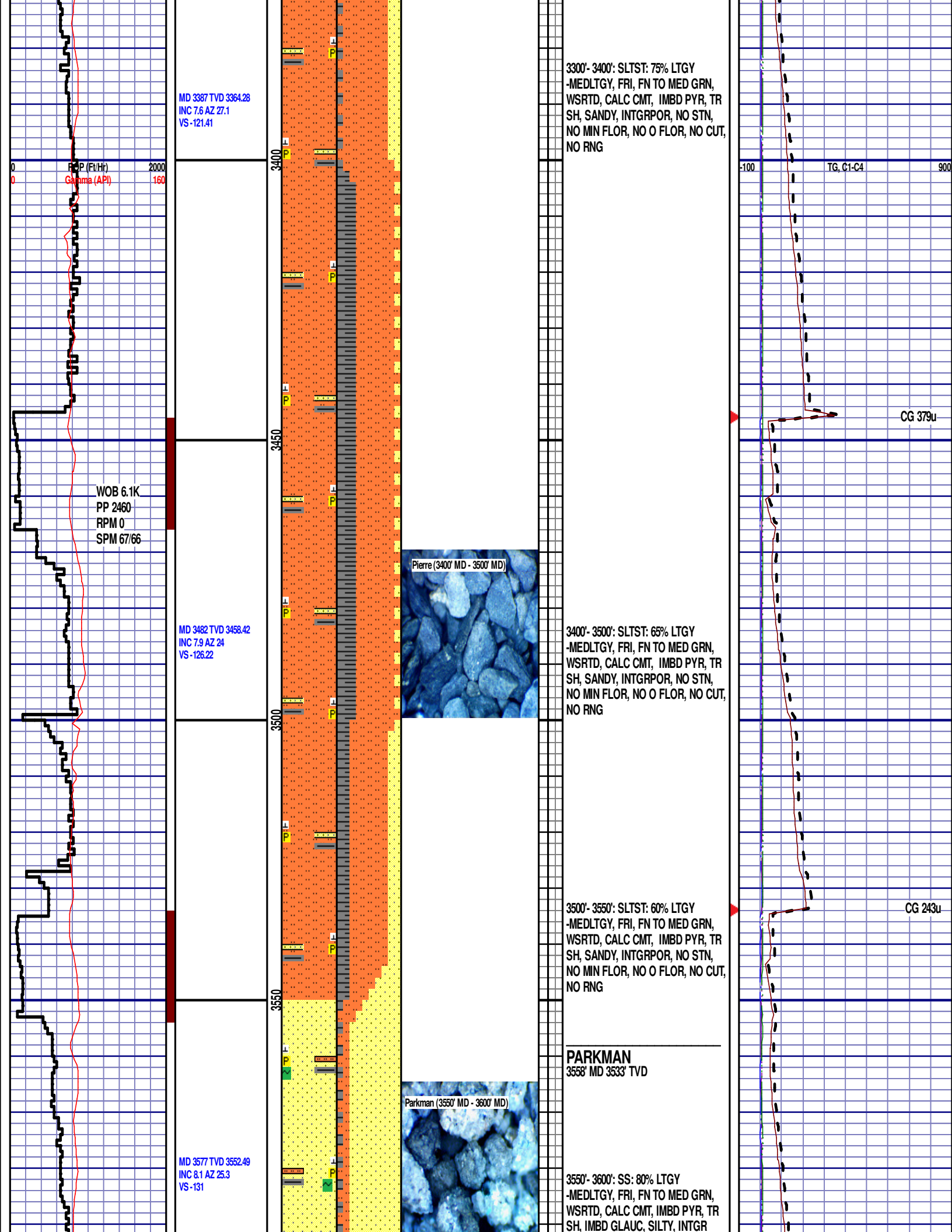
CG 112u

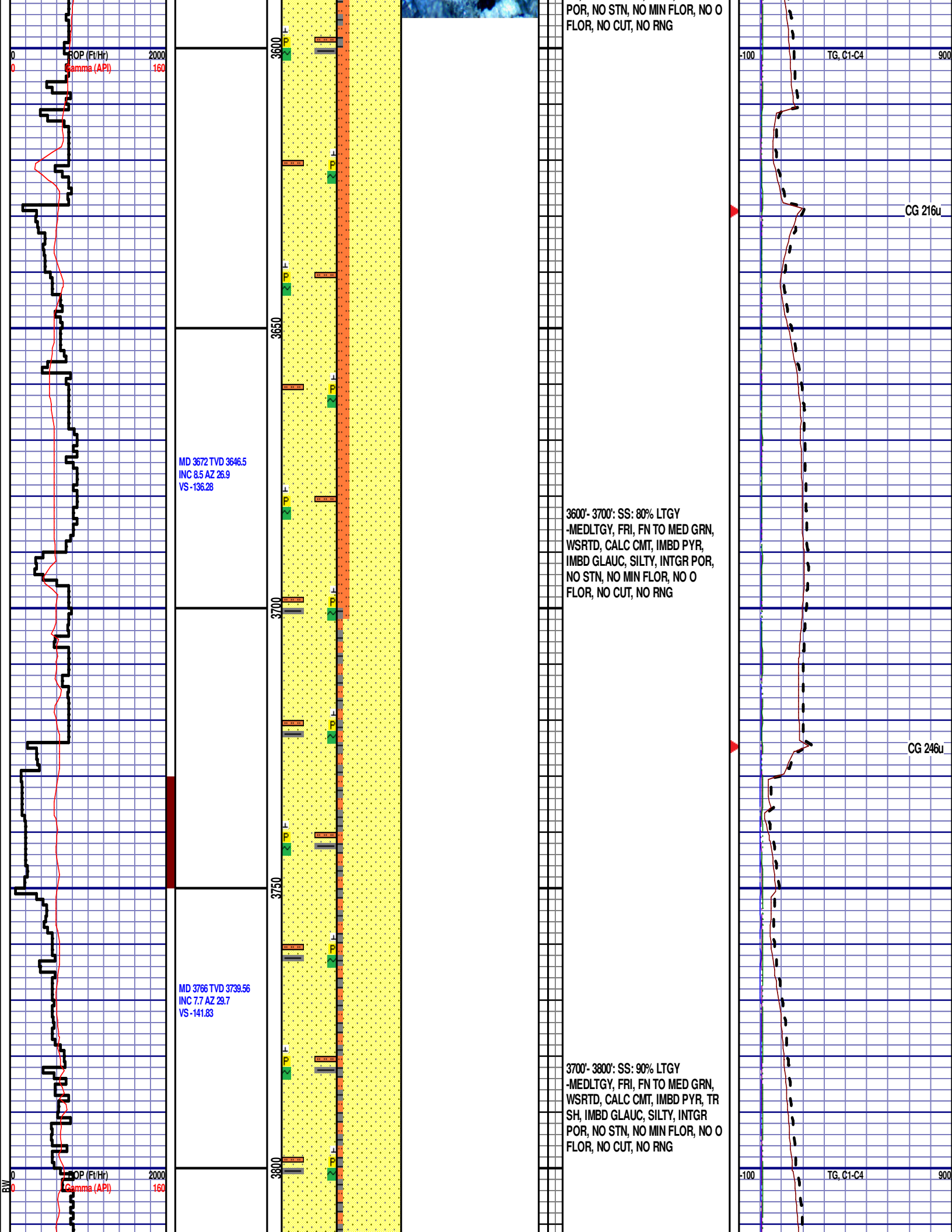
TG, C1-C4

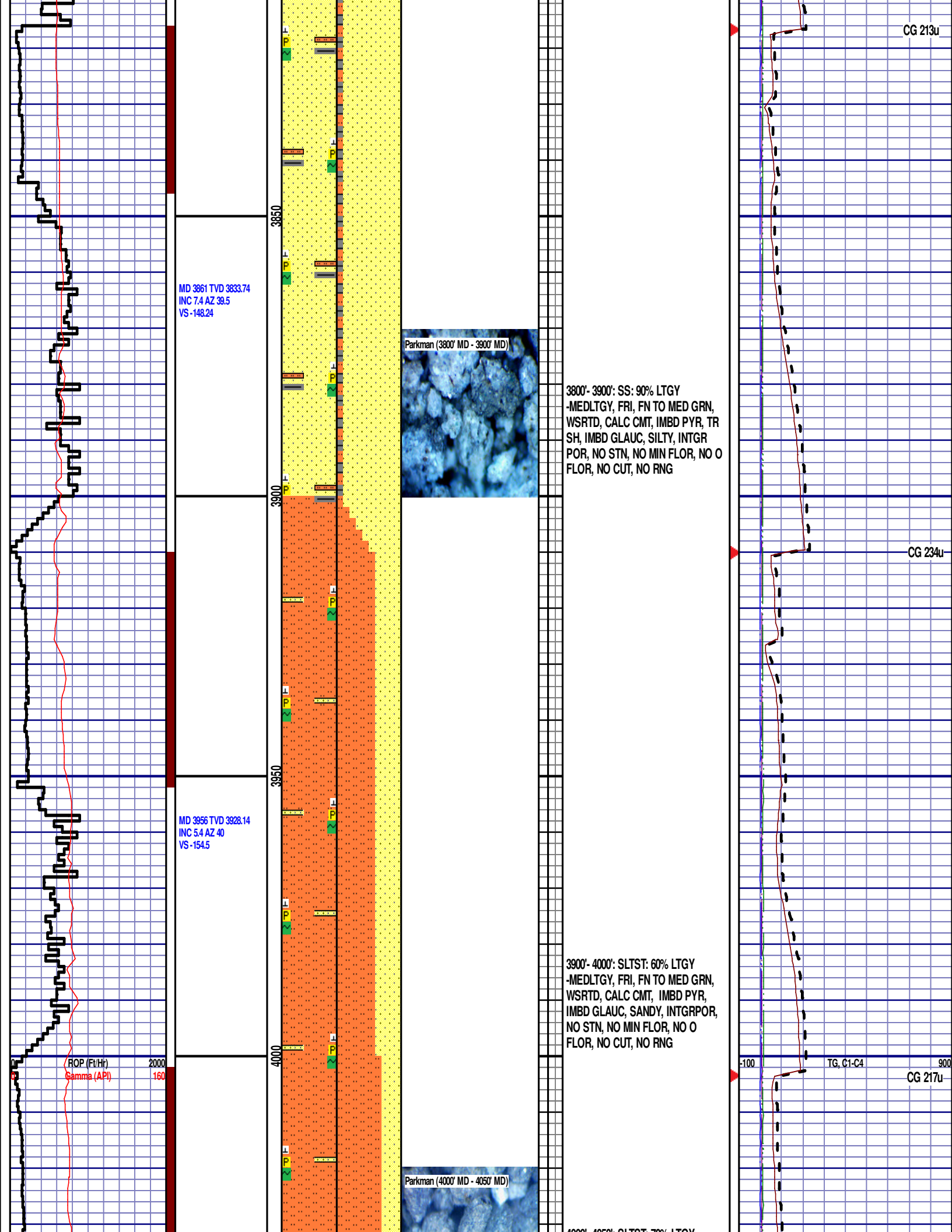
CG 163u











CG 213u

MD 3861 TVD 3833.74
INC 7.4 AZ 39.5
VS -148.24

Parkman (3800' MD - 3900' MD)

3800'- 3900': SS: 90% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, IMBD GLAUC, SILTY, INTGR
POR, NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

CG 234u

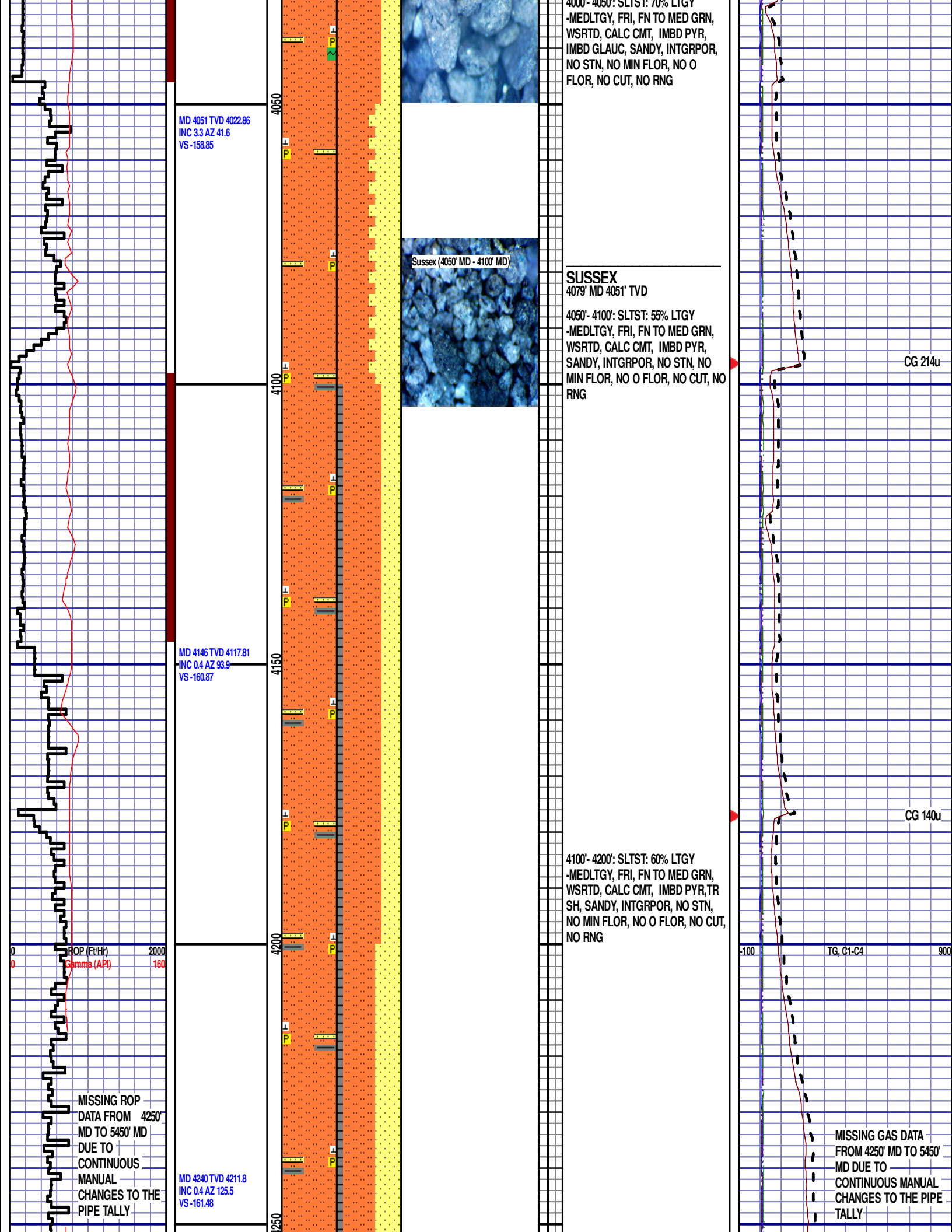
MD 3956 TVD 3928.14
INC 5.4 AZ 40
VS -154.5

3900'- 4000': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR,
IMBD GLAUC, SANDY, INTGRPOR,
NO STN, NO MIN FLOR, NO O
FLOR, NO CUT, NO RNG

Parkman (4000' MD - 4050' MD)

ROP (Fe/Hr) 2000
Gamma (API) 160

-100 TG, C1-C4 900
CG 217u



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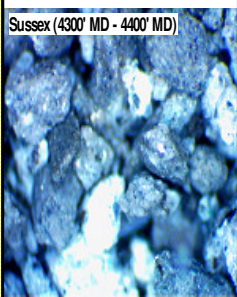
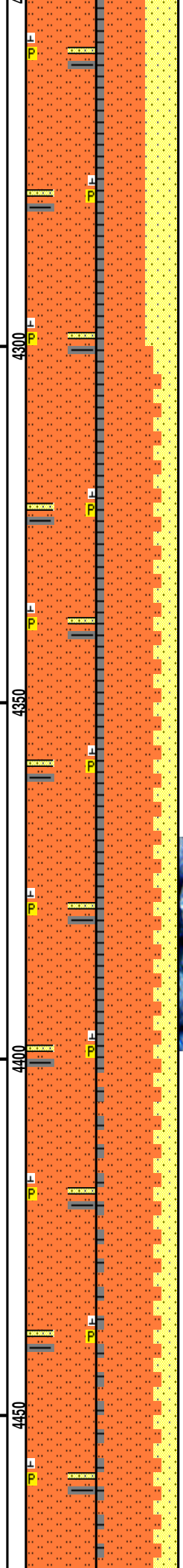
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MD 4335 TVD 4306.8
INC 0.9 AZ 127.9
VS -162.38

MD 4430 TVD 4401.78
INC 1.1 AZ 119
VS -163.81

ROP (Ft/Hr) 2000
Gamma (API) 160



4200'- 4300': SLTST: 50% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTGRPOR, NO STN,
NO MIN FLOR, NO O FLOR, NO CUT,
NO RNG

4300'- 4400': SLTST: 65% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTGRPOR, NO STN,
NO MIN FLOR, NO O FLOR, NO CUT,
NO RNG

(MISSING DATA)

CG N/A

(MISSING DATA)

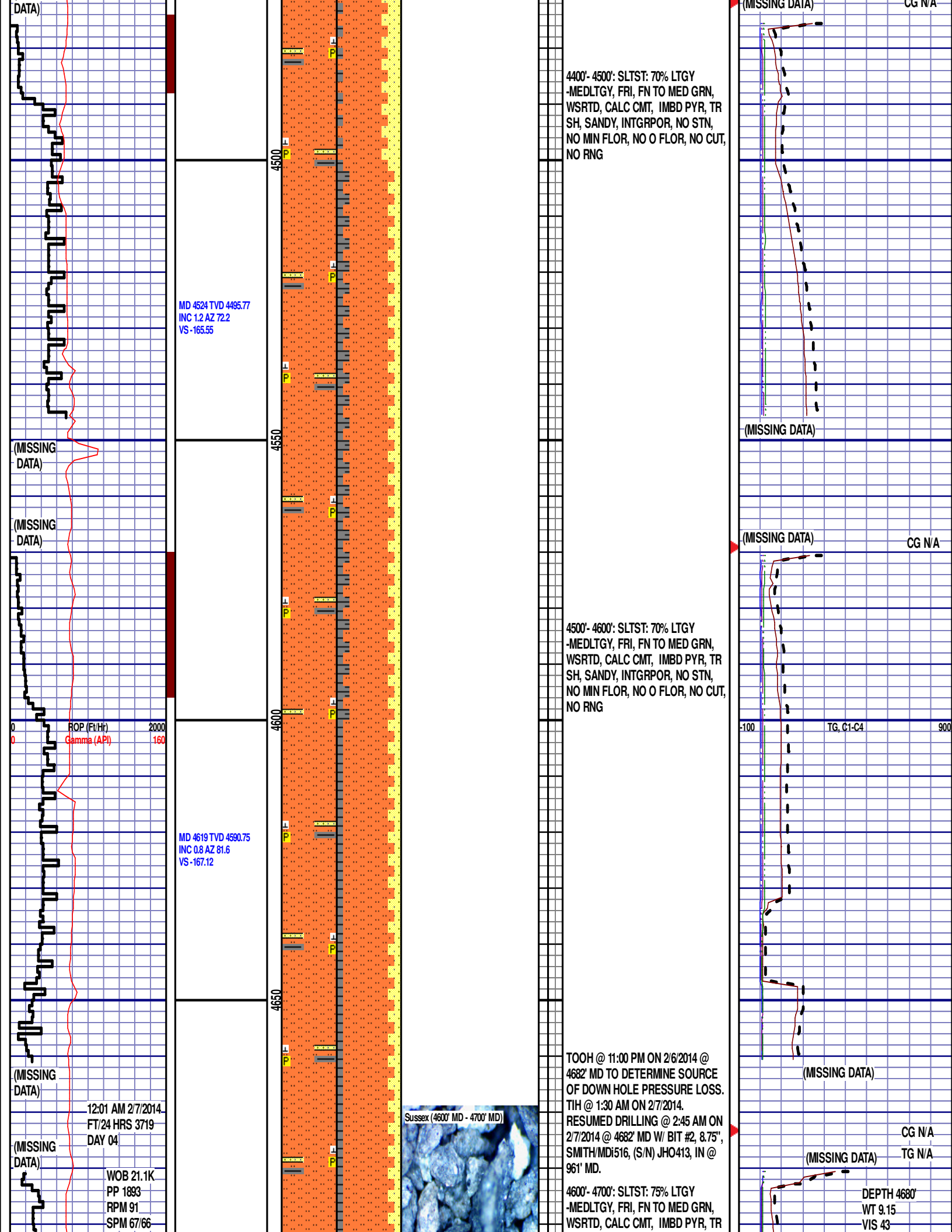
CG 380u

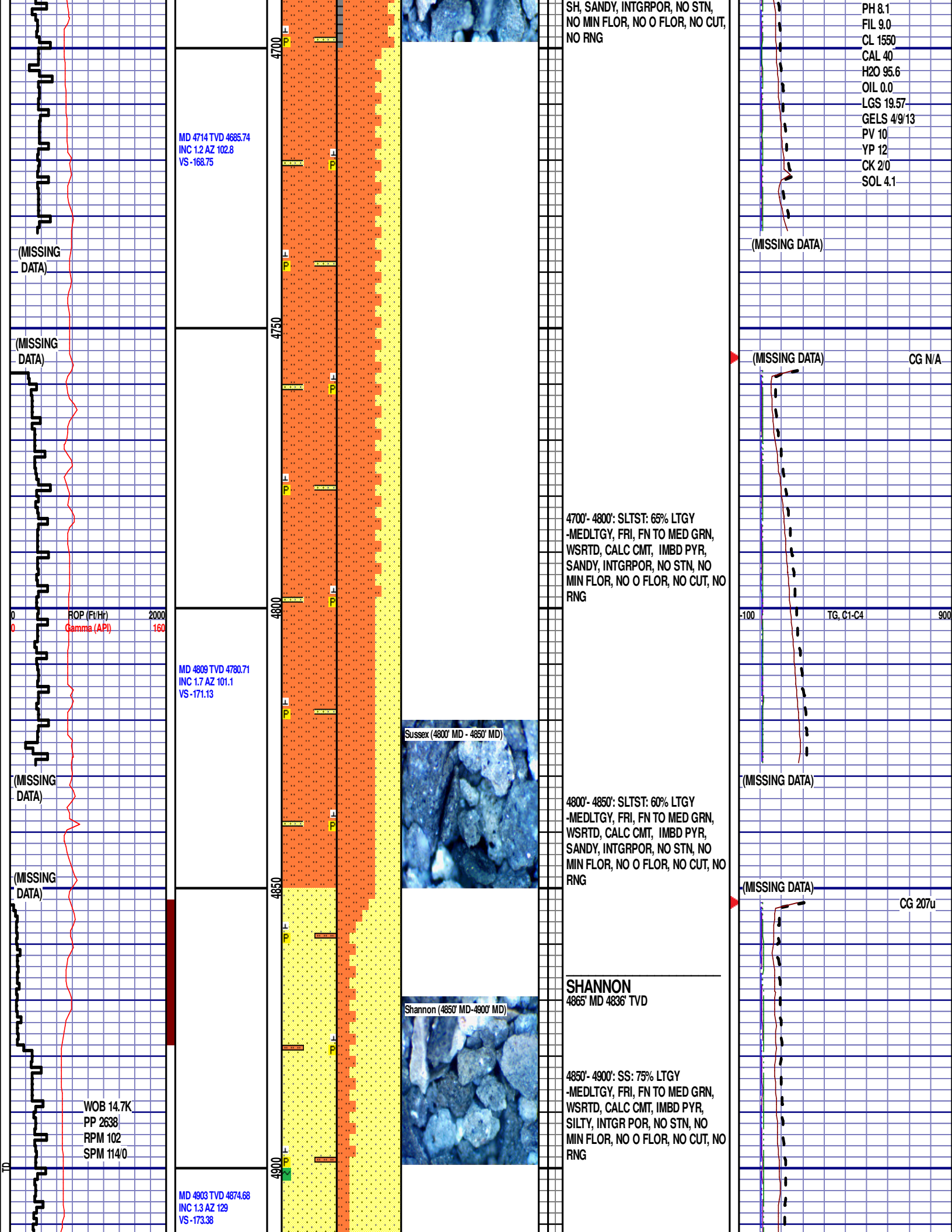
-100 TG, C1-C4 900

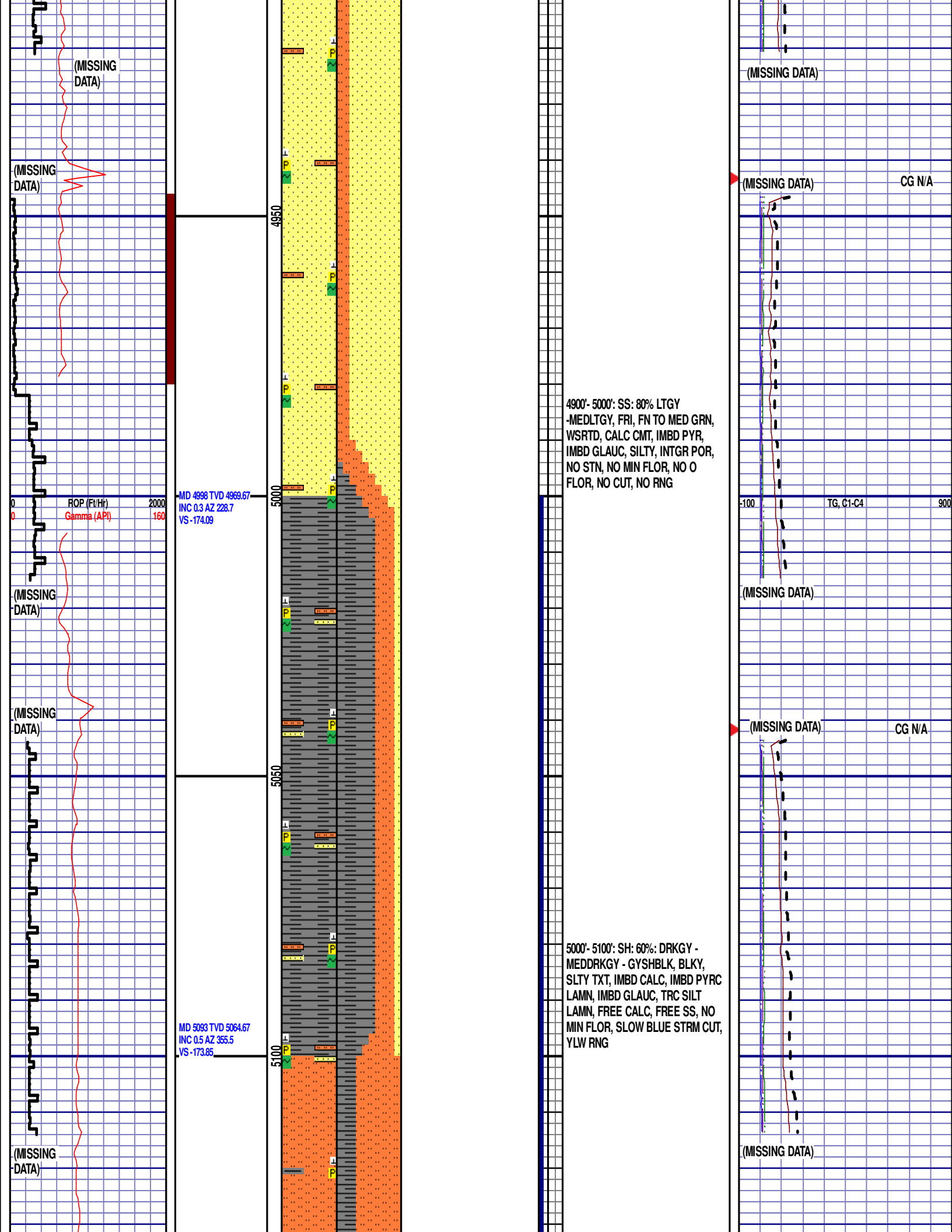
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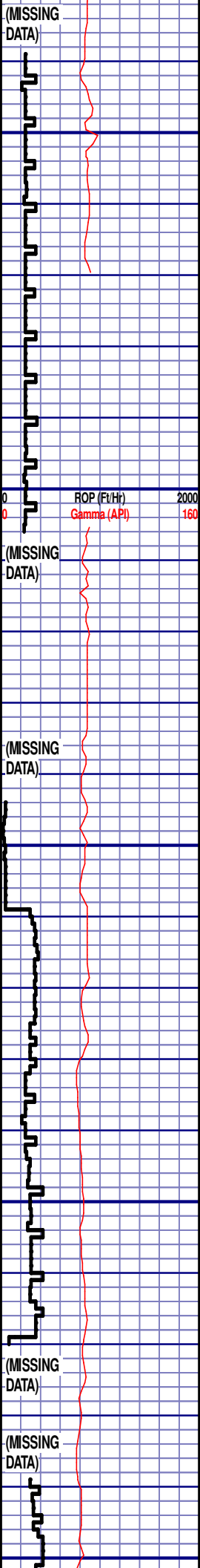
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CG N/A



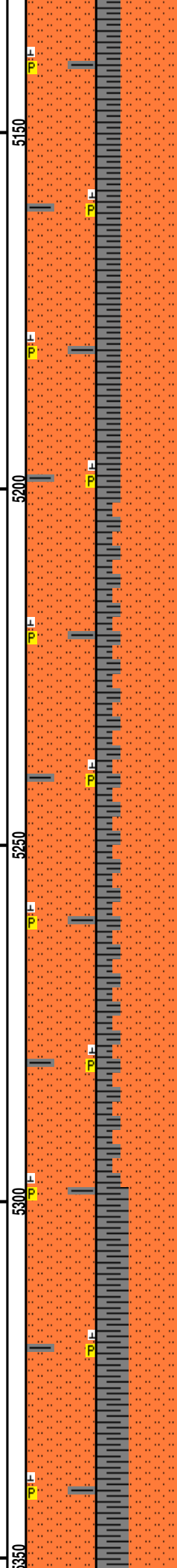






MD 5188 TVD 5159.66
INC 0.4 AZ 16.6
VS -173.87

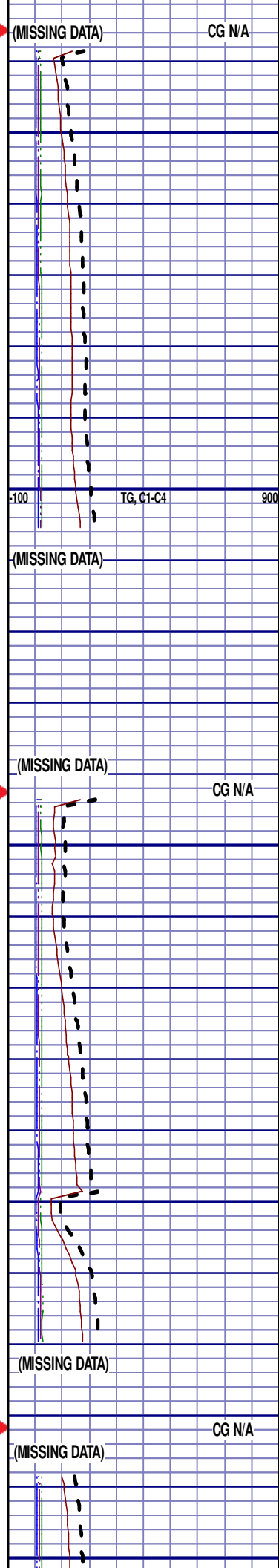
MD 5283 TVD 5254.66
INC 1 AZ 268
VS -173.12



Shannon (5100' MD-5200' MD)

5100'- 5200': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTG POR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, Y LW
RNG

5200'- 5300': SLTST: 75% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTG POR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, Y LW
RNG



MD 5377 TVD 5348.64
INC 1.2 AZ 280
VS -171.33

ROP (Ft/Hr) 2000
Gamma (API) 160

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DATA)

WOB 4.0K
PP 2047
RPM 0
SPM 114/0

MD 5472 TVD 5443.62
INC 1.3 AZ 237.3
VS -169.47

Shannon (5400' MD-5500' MD)



5300'- 5400': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTG POR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, Y LW
RNG

-100 TG, C1-C4 900

(MISSING DATA)

CG N/A

5400'- 5500': SLTST: 80% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTG POR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, Y LW
RNG

CG 329u

MD 5567 TVD 5538.61
INC 0.8 AZ 222.9

VS -168.1

ROP (Ft/Hr)
Gamma (API)

MD 5662 TVD 5633.6
INC 0.4 AZ 253.3
VS -167.28

MD 5756 TVD 5727.6
INC 0.3 AZ 249.4
VS -166.75

Shannon (5700' MD-5800' MD)

5500'- 5600': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTG POR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, YLW
RNG

5600'- 5700': SLTST: 60% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, INTGRPOR, NO STN, NO MIN
FLOR, SLOW BLUE STRM CUT, YLW
RNG

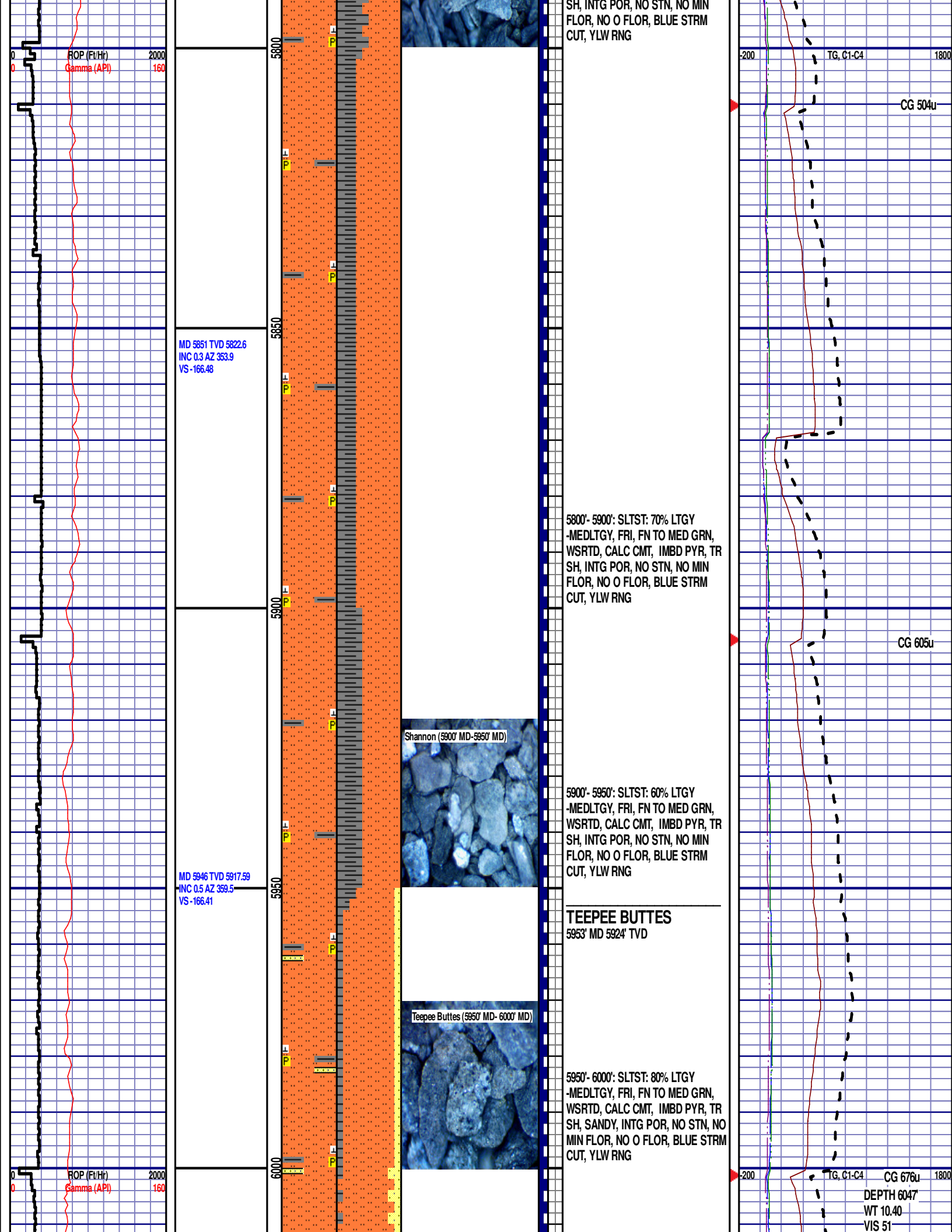
5700'- 5800': SLTST: 55% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR

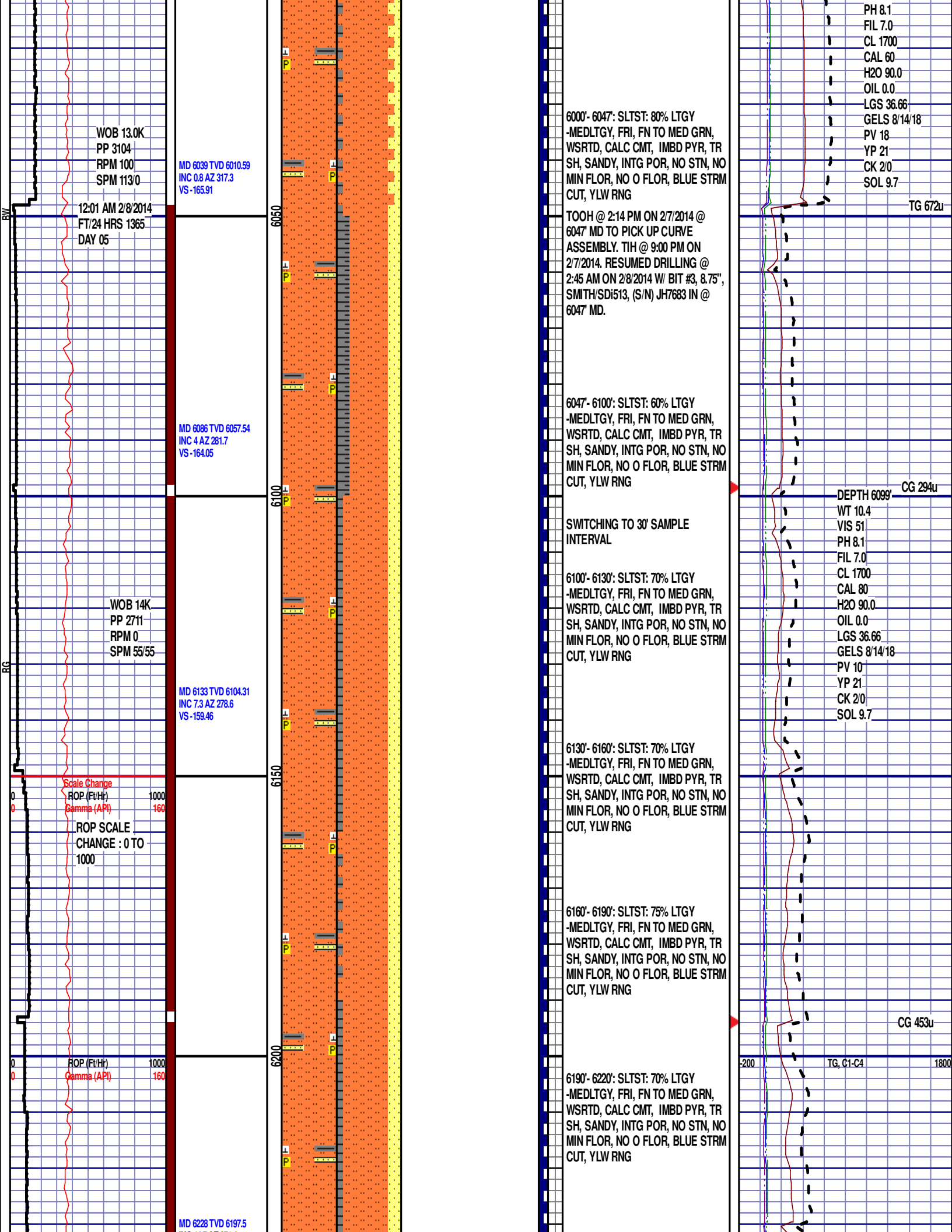
Scale Change
TG, C1-C4

GAS SCALE: -200 TO 1800
200 UNITS/DIVISION

CG 374u

CG 499u





INC 14.7 AZ 271.4
VS -141.37

MD 6323 TVD 6287.44
INC 22.6 AZ 269.7
VS -111.06

MD 6418 TVD 6372.4
INC 30.4 AZ 267
VS -68.9

WOB 28.7K
PP 2729
RPM 0
SPM 51/51

6250

6300

6350

6400

6450

Teepee Buttes (6280' MD- 6310'
MD)



6220'- 6250': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6250'- 6280': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6280'- 6310': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6310'- 6340': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6340'- 6370': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6370'- 6400': SLTST: 70% LTGY
-MEDLTGY, FRI, FN TO MED GRN,
WSRTD, CALC CMT, IMBD PYR, TR
SH, SANDY, INTG POR, NO STN, NO
MIN FLOR, NO O FLOR, BLUE STRM
CUT, YLW RNG

6400'- 6430': SH: 60%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC
LAMN, SANDY, NO MIN FLOR, BLUE
STRM CUT, YLW RING

6430'- 6460': SH: 75%: DRKGY -
MEDDRKGY - GYSHBLK, BLKY,
SLTY TXT, IMBD CALC, IMBD PYRC

CG 626u

CG 732u

-200 TG, C1-C4 1800

