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Customer Information

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

Geologist: Holly Duncan
Noble Energy Inc.

Mud Logging Details

Logger: Sam Stelzer &
Rob Gulliksen

Log Interval: 2500' MD to 7050' MD

Start Date: October 28, 2014

Release Date: November 8, 2014

Well Information

Well Name: Burton K25-69-1HNL

Location: 25-T4N-R66W
341' FNL, 236' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 321

Total Depth: 17008' MD

TD Date: November 8, 2014

Formation: Niobrara C Chalk

KB Elevation: 4782'

GR Elevation: 4752'

API Number: 05-123-38365-0000

ROCK TYPES

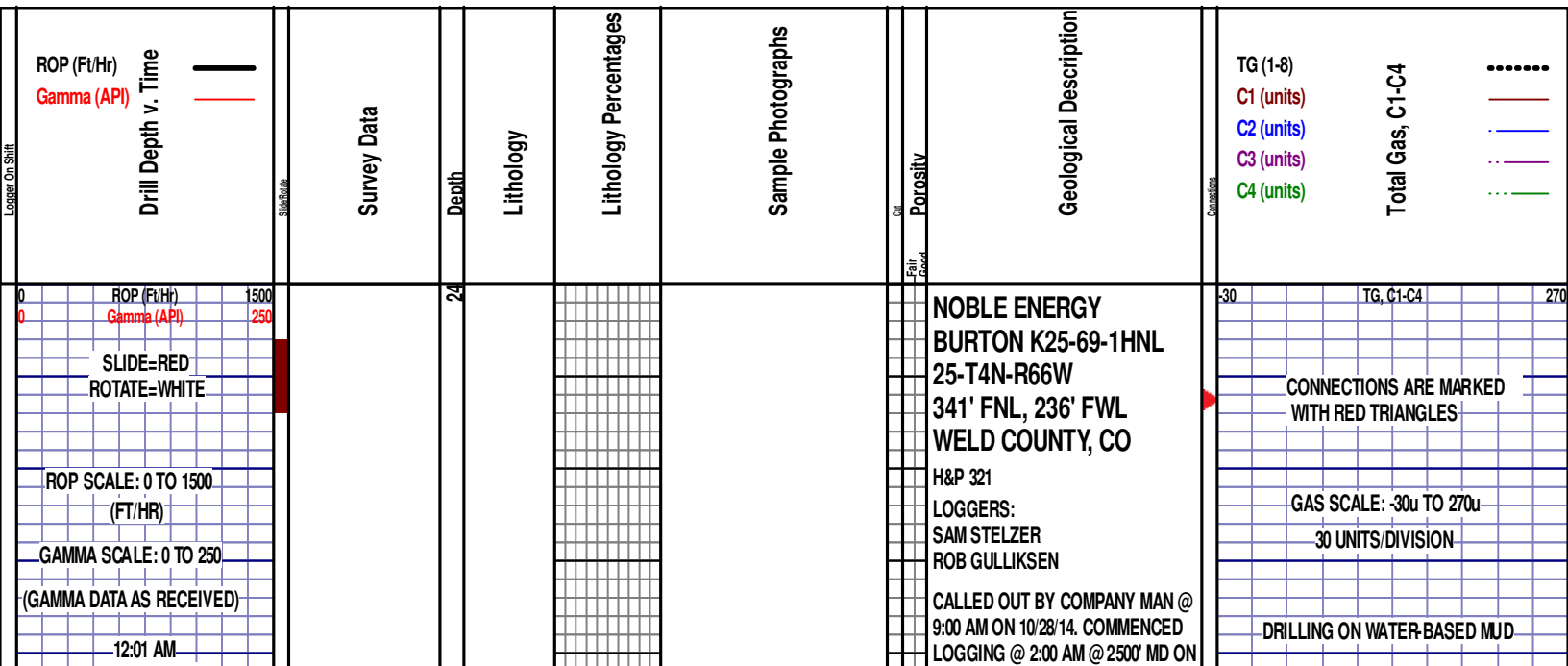
Siltysh
Anhy
Bent
Brec
Cht
Clyst
Coal

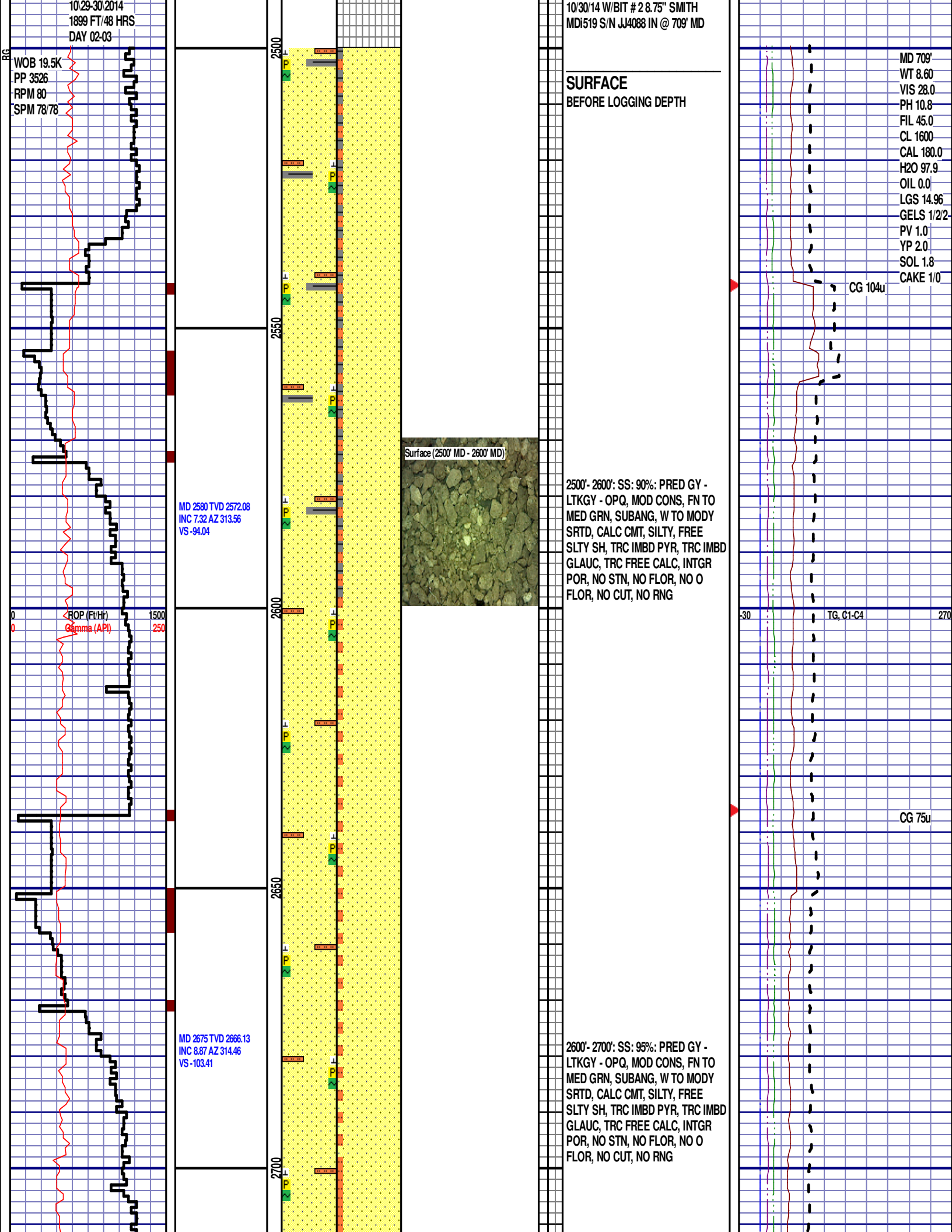
Congl
Dol
Gyp
Igne
Lmst
Meta
Chk

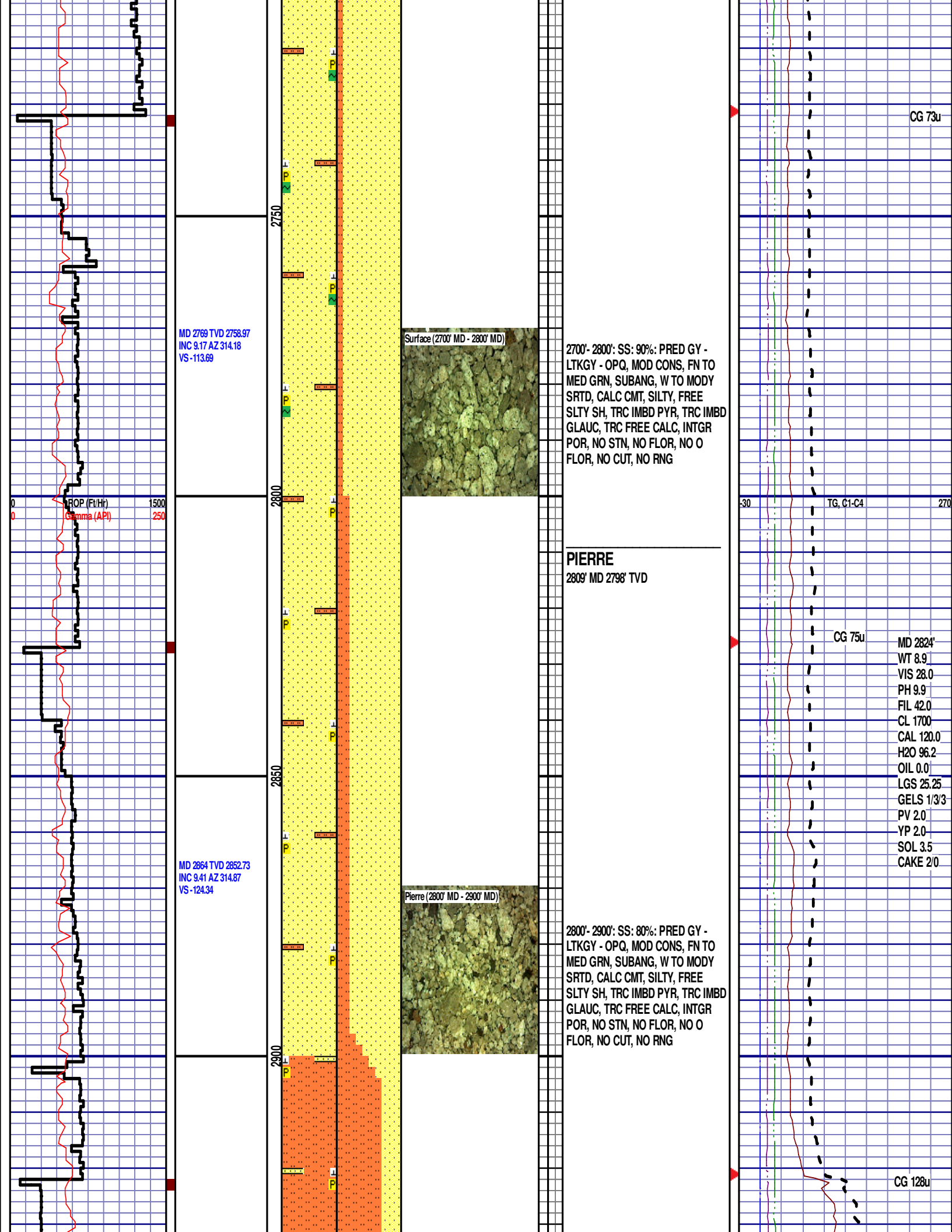
Mrlst
Salt
Shale
Shcol
Shgy
Sltst
Ss

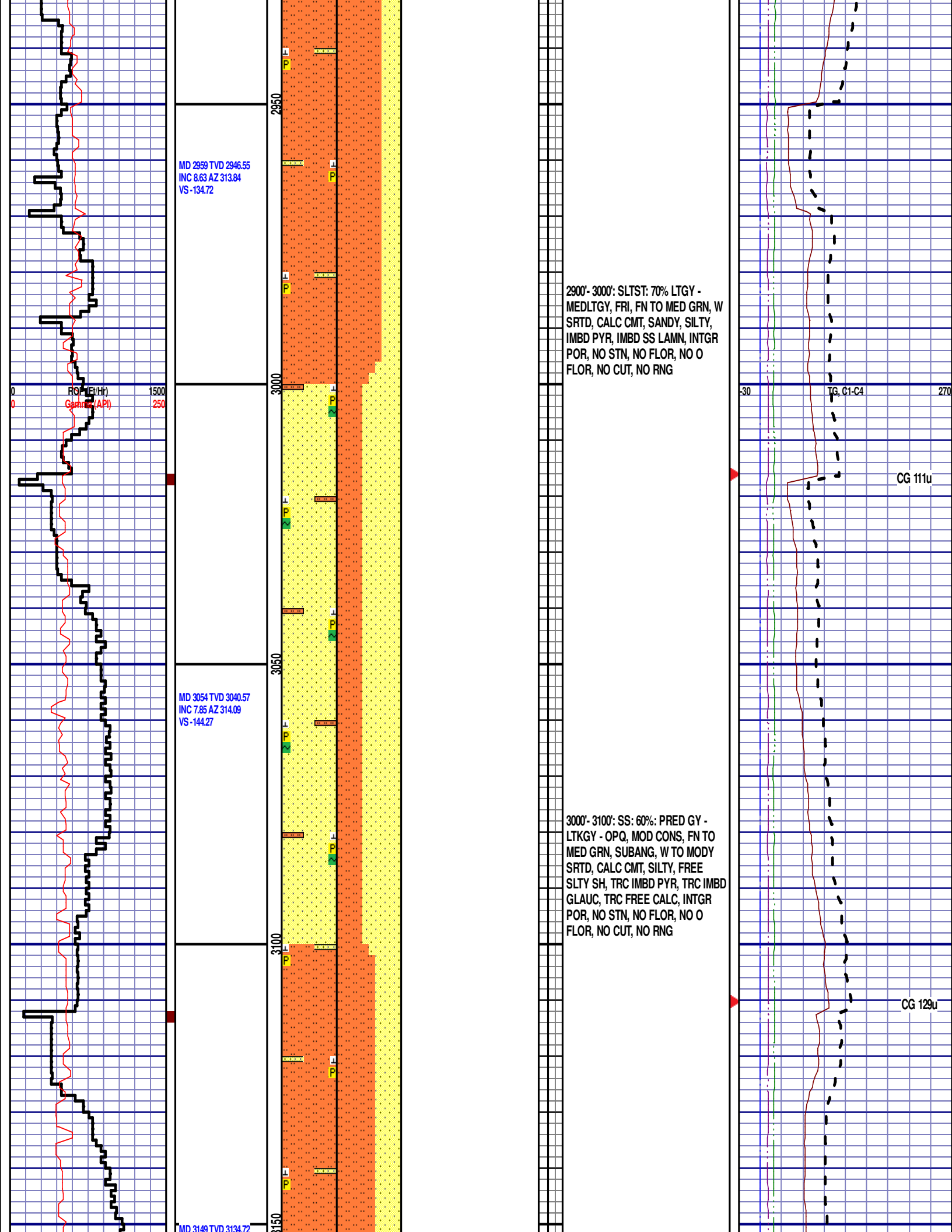
Till
gw
lmywash
ogw
olmywash
oshly gw
shly gw

sdylgw
hvyrcrbsh
nosmpl
Lsdetrst
sltst
sdy sh









INC 7.5 AZ 312.43
VS -153.28

ROP (FTH)
Gamma (GPI)

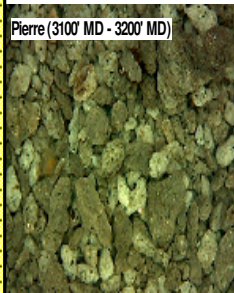
1500
250

MD 3243 TVD 3228.06
INC 6.06 AZ 311.66
VS -161.32

WOB 30.7K
PP 3847
RPM 81
SPM 78/78

MD 3338 TVD 3322.63
INC 4.81 AZ 315.35
VS -167.71

Pierre (3100' MD - 3200' MD)



3100'- 3200': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, SILTY,
IMBD PYR, IMBD SS LAMN, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

3200'- 3300': SLTST: 70% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, SILTY,
IMBD PYR, IMBD GLAUC, IMBD SS
LAMN, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

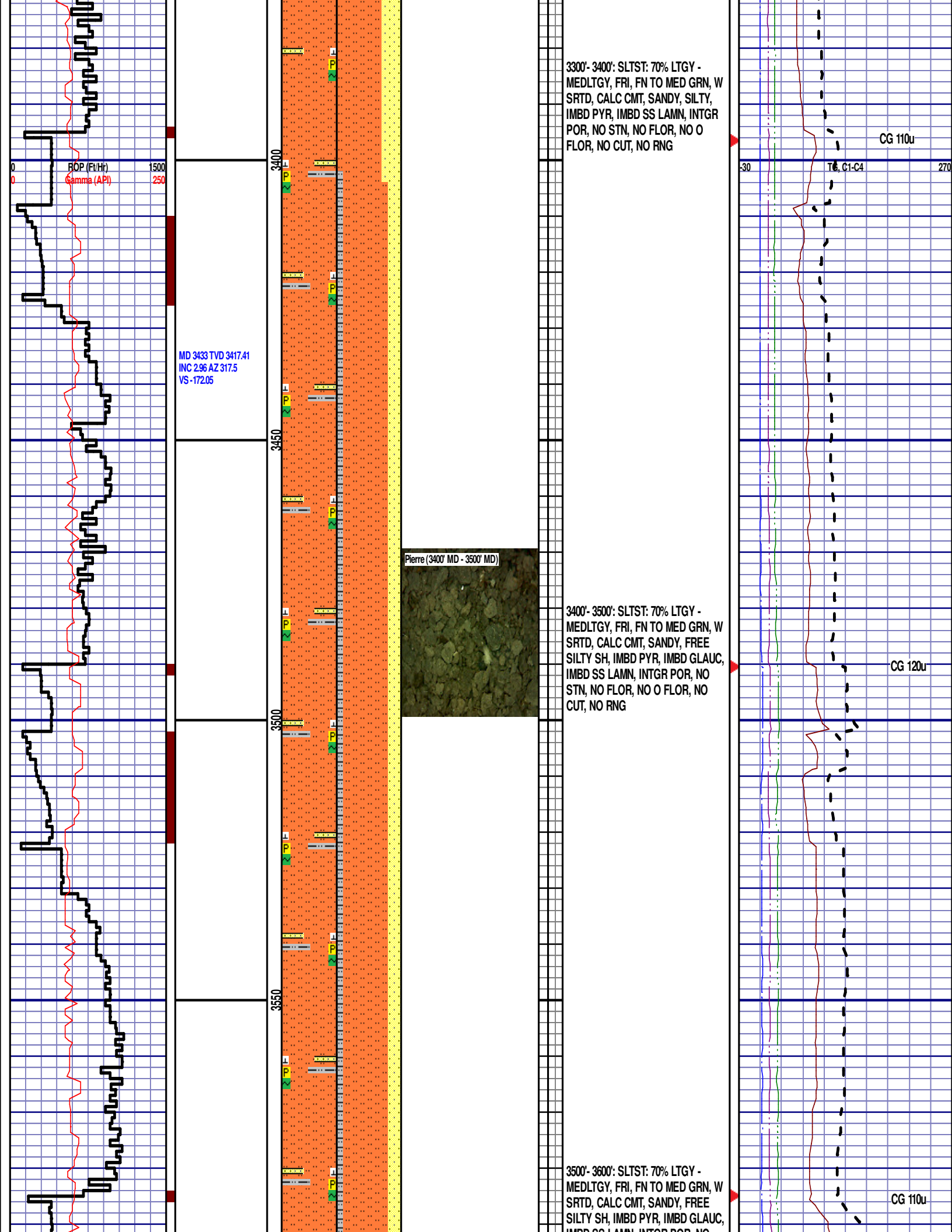
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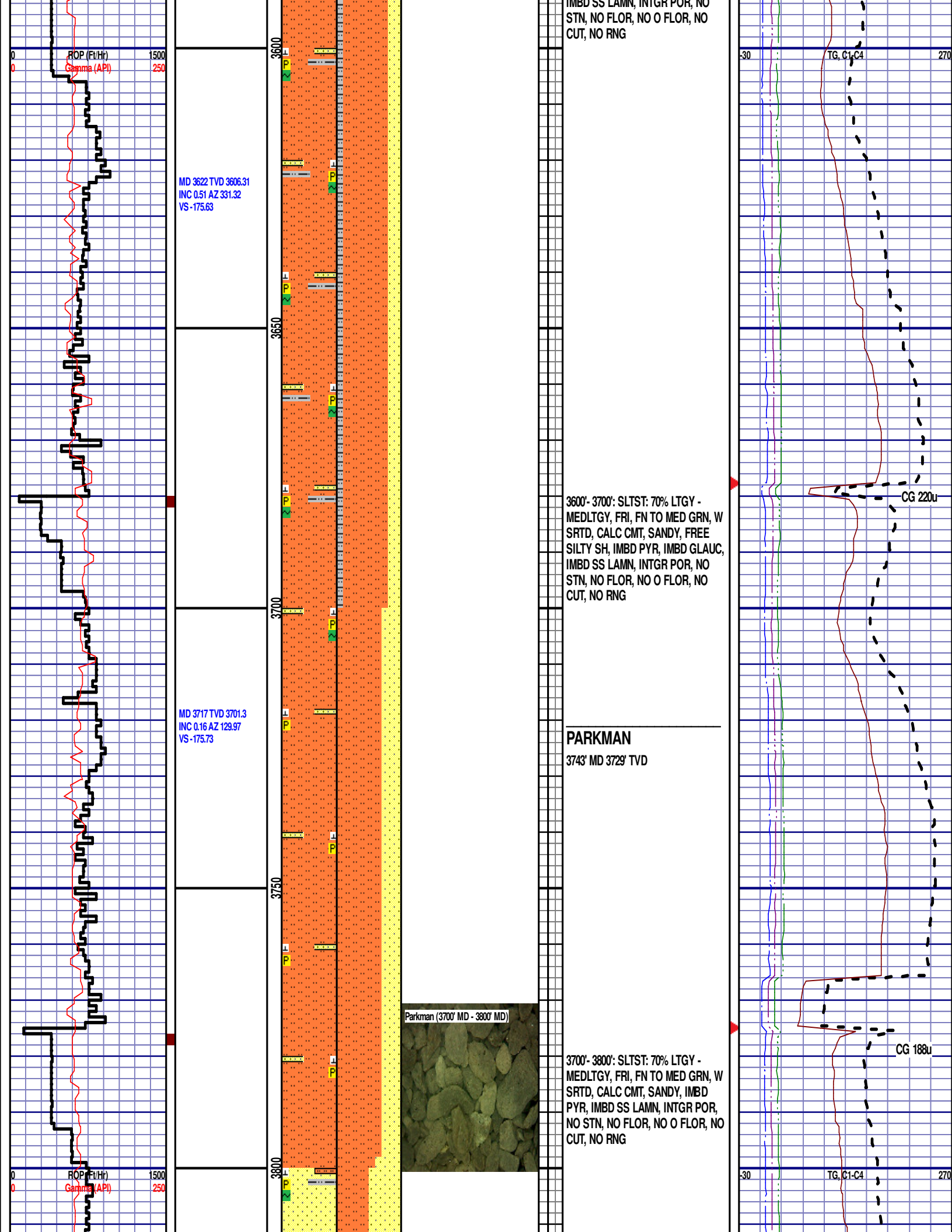
TG, C1-C4

270

CG 148u

CG 100u





MD 3811 TVD 3795.3
INC 0.97 AZ 163.57
VS -175.42

MD 3905 TVD 3889.29
INC 0.9 AZ 167.58
VS -175.08

MD 4000 TVD 3984.28
INC 0.65 AZ 169.27
VS -174.85

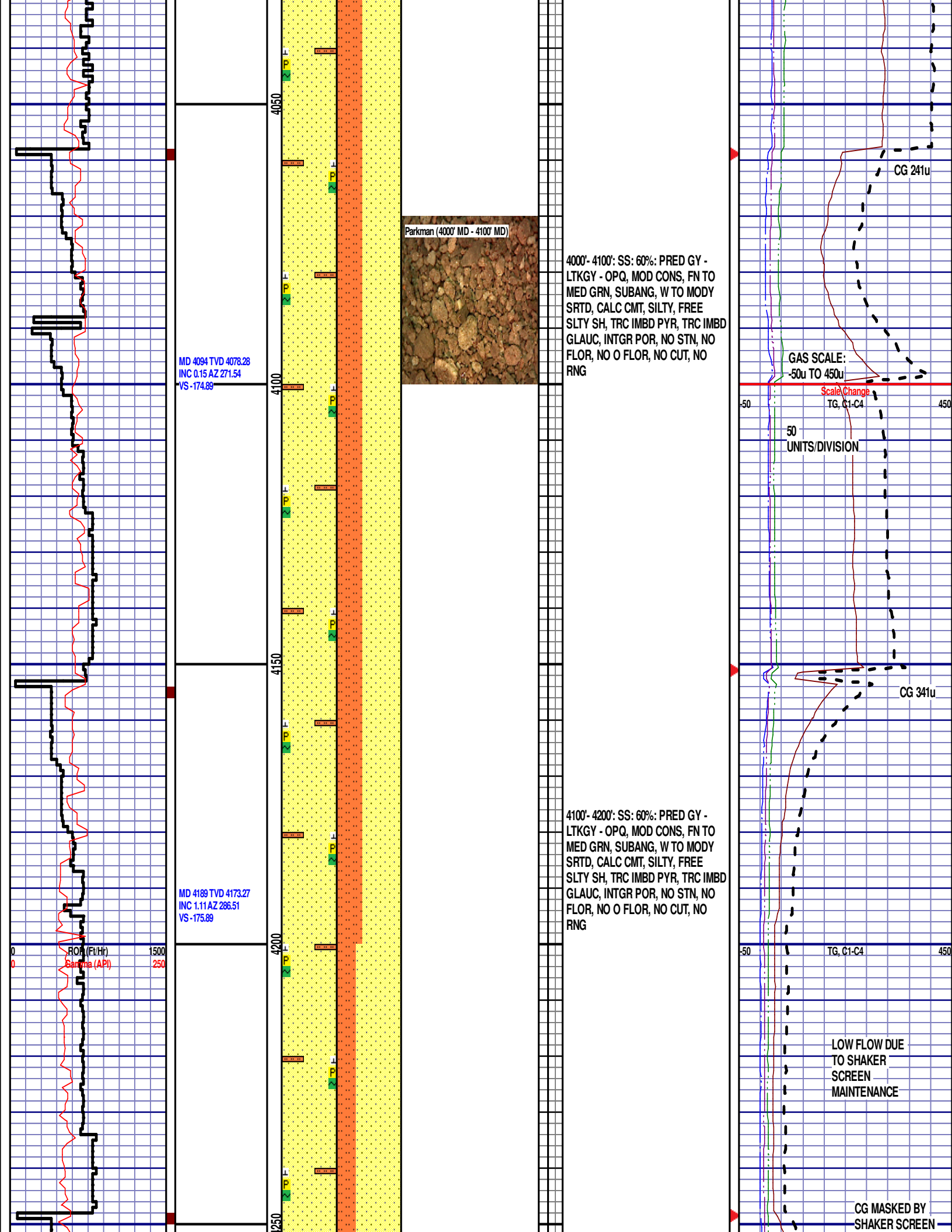
3800'- 3900': SS: 50%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, FREE
SLTY SH, TRC IMBD PYR, TRC IMBD
GLAUC, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

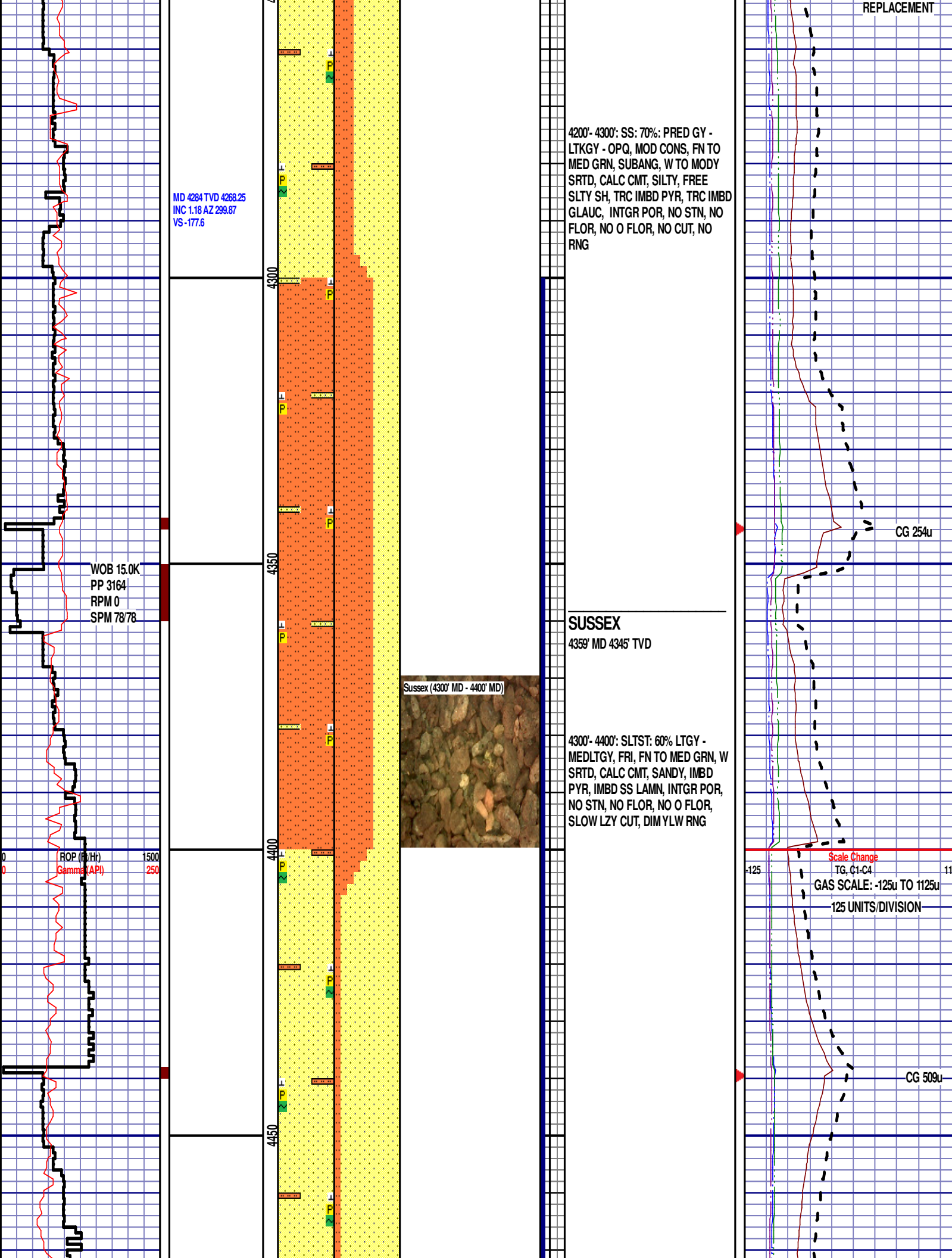
3900'- 4000': SS: 60%: PRED GY -
LTKGY - OPQ, MOD CONS, FN TO
MED GRN, SUBANG, W TO MODY
SRTD, CALC CMT, SILTY, FREE
SLTY SH, TRC IMBD PYR, TRC IMBD
GLAUC, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

CG 139u

CG 208u

TG, C1-C4





MD 4473 TVD 4457.22
INC 0.9 AZ 332.35
VS -179.91

MD 4568 TVD 4552.2
INC 1.34 AZ 330.8
VS -180.76

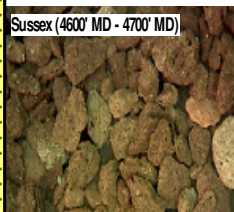
MD 4663 TVD 4647.18
INC 1.38 AZ 290.98
VS -182.33

4400'- 4500': 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 GLAUC, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, SLOW LZY CUT, DIM YLW
RNG

4500'- 4600': SLTST: 70% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, IMBD SS LAMN, INTGR POR,
NO STN, NO FLOR, NO O FLOR,
SLOW LZY CUT, DIM YLW RNG

4600'- 4700': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, IMBD SS LAMN, INTGR POR,
NO STN, NO FLOR, NO O FLOR

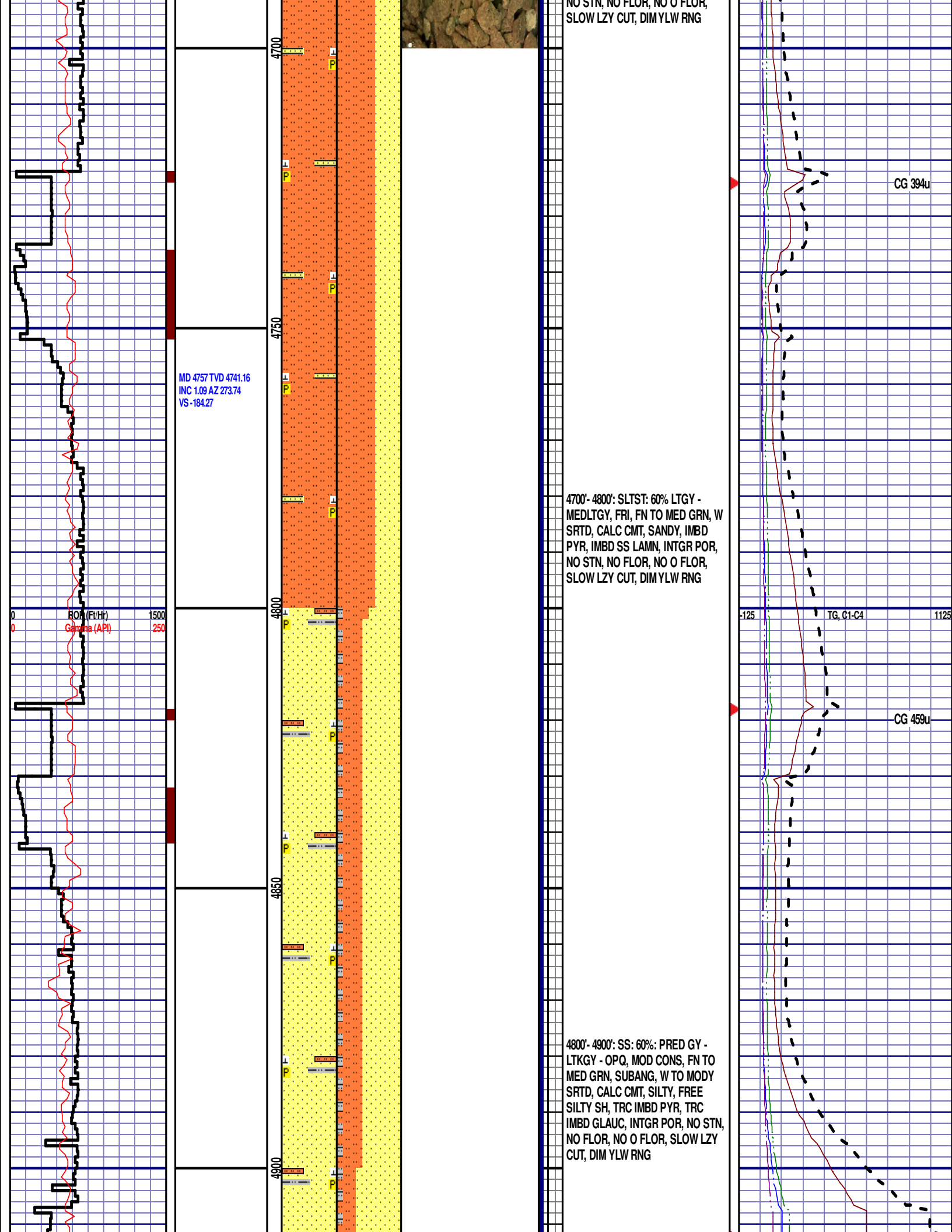
Sussex (4600' MD - 4700' MD)

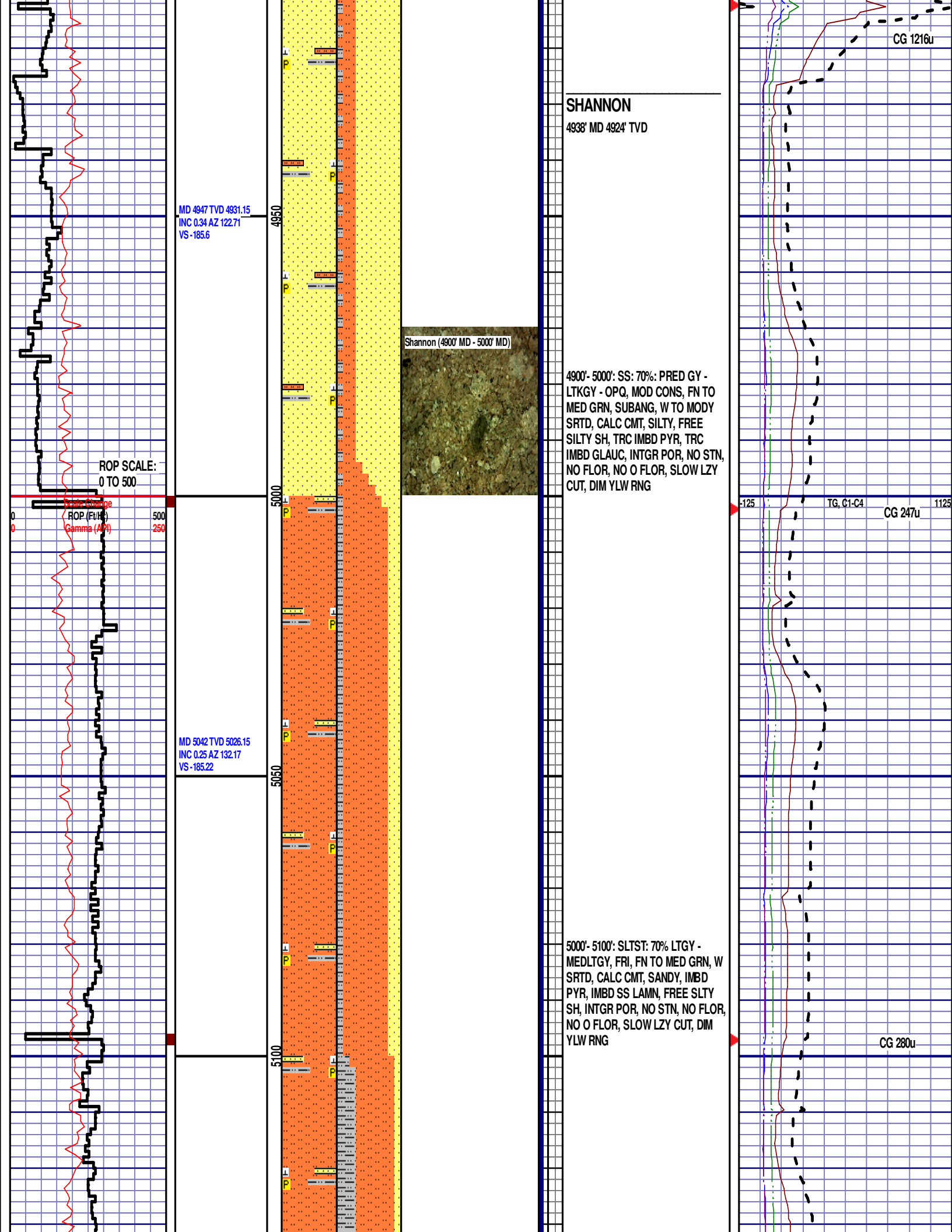


CG 366u

TG, C1-C4

CG 312u





MD 5136 TVD 5120.14
INC 0.22 AZ 185.86
VS -185.1

MD 5231 TVD 5215.14
INC 0.26 AZ 249.99
VS -185.32

MD 5326 TVD 5310.14
INC 0.33 AZ 275.36
VS -185.8

ROP (Ft/H)
Gamma (API)

5150

5200

5250

5300

5350

Shannon (5200' MD - 5300' MD)

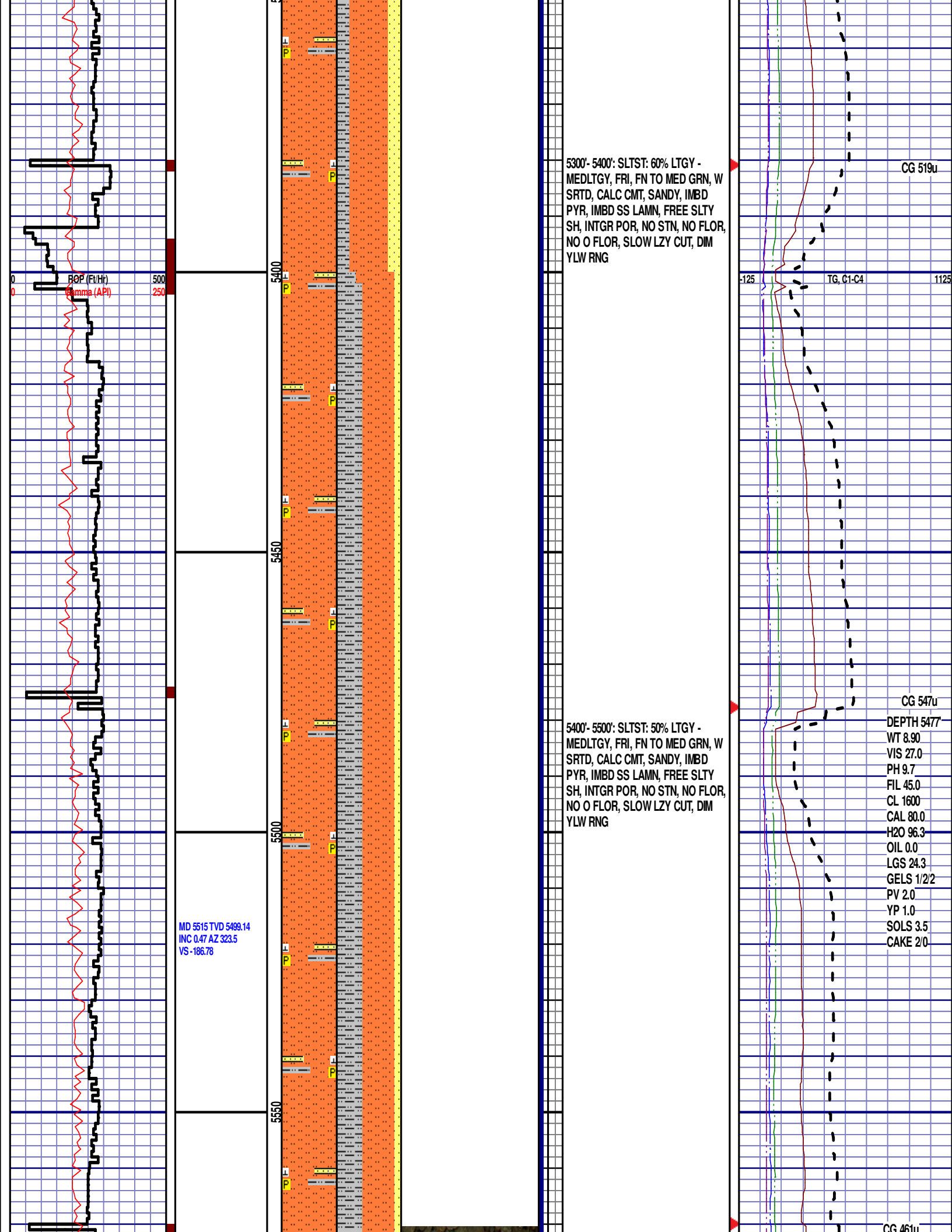
5100'- 5200': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, IMBD SS LAMN, FREE SLTY
SH, INTGR POR, NO STN, NO FLOR,
NO O FLOR, SLOW LZY CUT, DIM
YLW RNG

CG 402u

TG, C1-C4

CG 457u

5200'- 5300': SLTST: 60% LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, IMBD SS LAMN, FREE SLTY
SH, INTGR POR, NO STN, NO FLOR,
NO O FLOR, SLOW LZY CUT, DIM
YLW RNG



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

CG 519u

-125 TG, C1-C4 1125

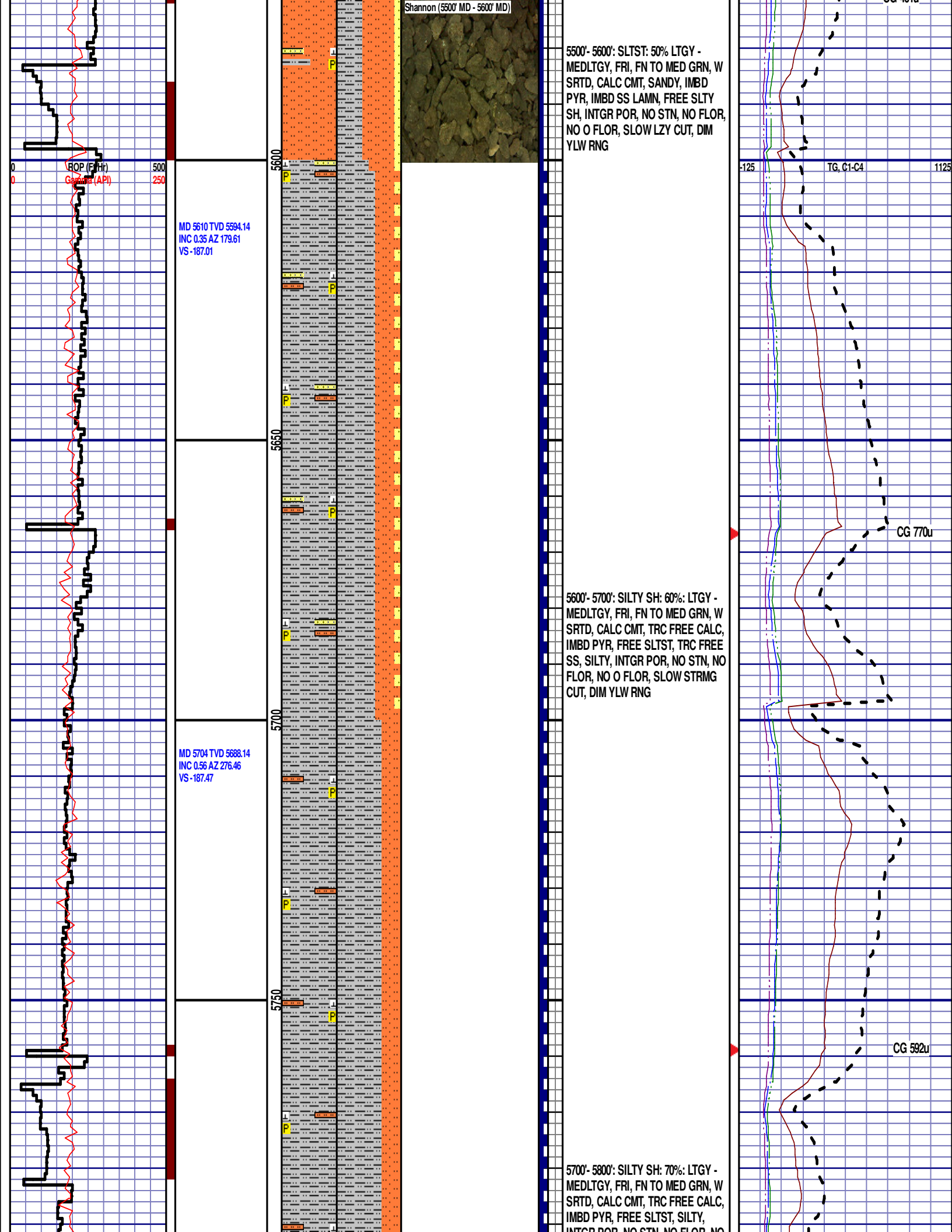
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MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, IMBD SS LAMN, FREE SLTY
SH, INTGR POR, NO STN, NO FLOR,
NO O FLOR, SLOW LZY CUT, DIM
YLW RNG

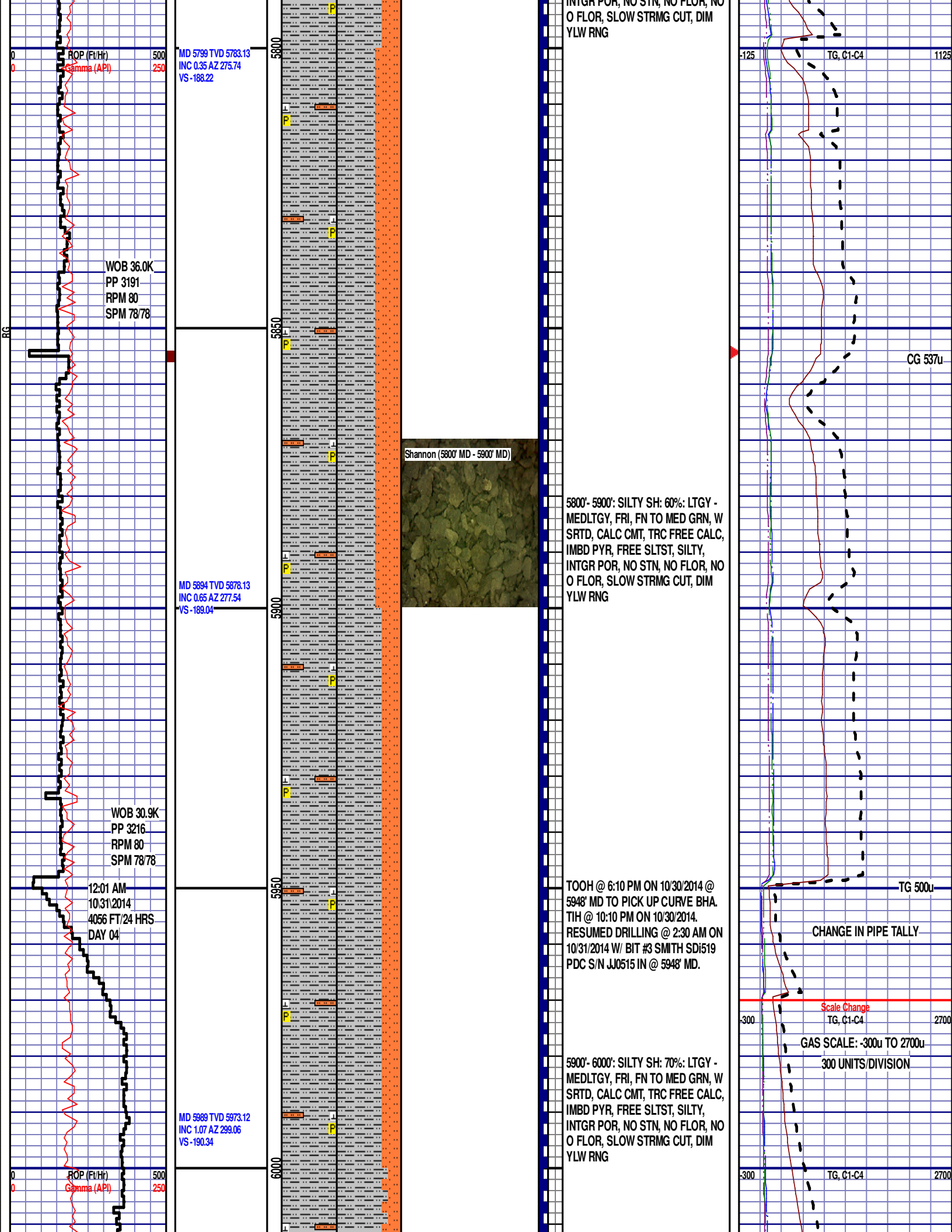
CG 547u

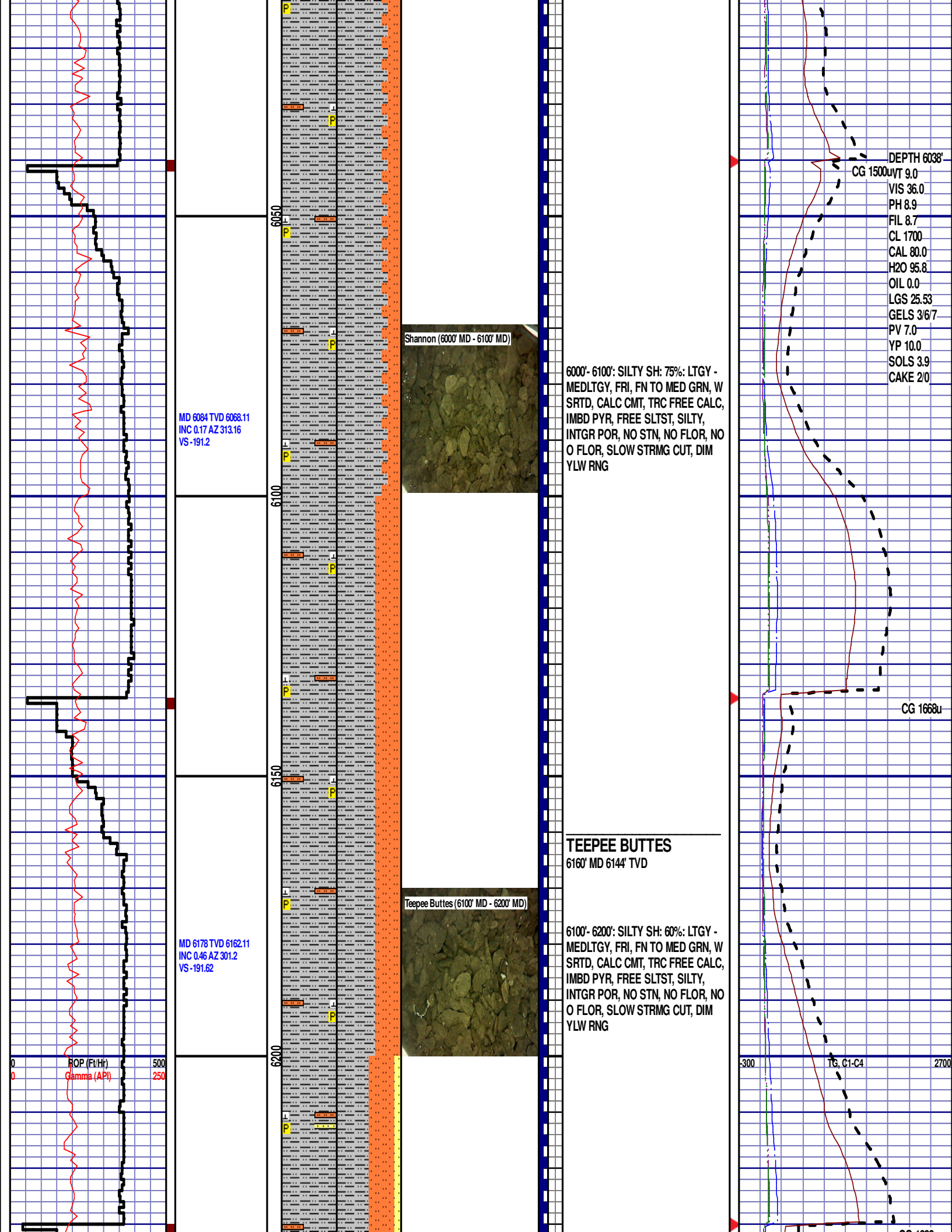
DEPTH 5477
WT 8.90
VIS 27.0
PH 9.7
FIL 45.0
CL 1600
CAL 80.0
H2O 96.3
OIL 0.0
LGS 24.3
GELS 1/2/2
PV 2.0
YP 1.0
SOLS 3.5
CAKE 2/0

MD 5515 TVD 5499.14
INC 0.47 AZ 323.5
VS -186.78

CG 461u







MD 6237 TVD 6221.11
INC 0.15 AZ 292.83
VS -191.89

WOB 25.1K
PP 3399
RPM 25
SPM 7878

SS

ROP (Ft/H)
Gamma (API)

500
250

6250

6300

6350

6400

6450

6200'- 6300': SILTY SH: 50%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6300'- 6400': SILTY SH: 60%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

CG 1888u

CG 2195u

TG, C1-C4

CG 2441u

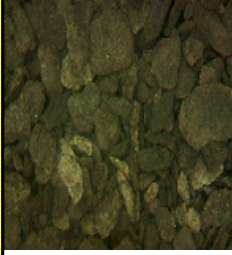
2700

MD 6462 TVD 6446.11
INC 0.18 AZ 240.44
VS -192.47

MD 6557 TVD 6540.86
INC 7.19 AZ 84.56
VS -186.66

MD 6651 TVD 6633.39
INC 12.85 AZ 88.95
VS -170.33

Teepee Buttes (4980' MD - 6510' MD)



6400'- 6480': SILTY SH: 60%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

SWITCHING TO 30FT SAMPLE
INTERVAL

6480'- 6510': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6510'- 6540': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6540'- 6570': SILTY SH: 60%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6570'- 6600': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6600'- 6630': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6630'- 6660': SILTY SH: 70%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, TRC FREE CALC,
IMBD PYR, FREE SLTST, FREE SS,
SILTY, INTGR POR, NO STN, NO
FLOR, NO O FLOR, SLOW STRMG
CUT, DIM YLW RNG

6660'- 6690': SILTY SH: 75%: LTGY -
MEDLTGY, FRI, FN TO MED GRN, W

CG 1367u

TG, C1-C4

CG 1235u

