



7136 South Yale Avenue, Suite 414

Tulsa, Oklahoma 74136-6378

phone 918.925.9739

fax 866.534.4559

WWW.HZMUD.COM

Customer Information

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

Geologist: Cassidy Miller
Noble Energy Inc

Mud Logging Details

Logger: Andrew Christiano & Casey
Sensecqua
Log Interval: 2500' MD to 6800' MD
Start Date: June 29, 2013
Release Date: July 5, 2013

Well Information

Well Name: Wells Ranch USX
AA23-65-1HN

Location: 24-6N 63W
2224' FNL, 74' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 321
Total Depth: 11100' MD
TD Date: July 5, 2013
Formation: Niobrara B Chalk
KB Elevation: 4840'
GR Elevation: 4810'
API Number: 05-123-37023

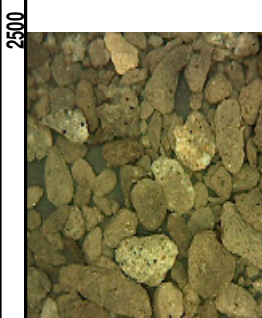
ROCK TYPES

Anhy	Dol	Salt	gw	hvycrbsh
Bent	Gyp	Shale	lmywash	nosmpl
Brec	Igne	Shcol	ogw	Lsdetrit
Cht	Chk	Siltysh	olmywash	sltst
Clyst	Lmst	Sltst	oshly gw	sdy sh
Coal	Meta	Ss	shly gw	Cement
Congl	Mrlst	Till		

Drill Depth v. Time		Survey Data	Photographs	Lithology %	Lithology	Geological Descriptions	Total Gas, C1-C4	
ROP (Ft/Hr)	Gamma (API)						TG (units)	
550	300						-125	1125
NOBLE ENERGY INC WELLS RANCH USX AA23-65-1HN WELD COUNTY, CO 24-6N 63W 2224' FNL 74' FWL H&P 321 LOGGERS: ANDREW CHRISTIANO CASEY SENSECQUA CALLED OUT BY COMPANY MAN ON 6/29/2013 COMMENCED LOGGING @ 2500'							CONNECTIONS MARKED WITH RED TRIANGLES GAS SCALE: -125u TO 1125u (100 UNITS/DIVISION) DRILLING ON WBM	
SLIDE=RED ROTATE=WHITE ROP SCALE: 0 TO 550 GAMMA SCALE: 0 TO 300 (ORIGINAL DATA AS RECEIVED)								

12:01 AM
6/30/2013
WOB 16.4K
PP 2835
RPM 60
SPM 67/67

MD 2506 TVD 2505.82
INC 0.64 AZ 115.42
VS 4.43



MD @ 1:30 PM ON 6/30/2013 W/BIT
#1 8.75" BAKER HUGHES DP51 IN
@ 678' MD

PIERRE
CAME IN BEFORE LOGGING
DEPTH

SLTST: 60% LTGY - MEDLTGY, FRI,
FN TO MED GRN, W SRTD, CALC
CMT, SANDY, INTGR POR, NO STN,
NO FLOR, NO O FLOR, NO CUT, NO
RNG

SLTST: 80% LTGY - MEDLTGY, FRI,
FN TO MED GRN, W SRTD, CALC
CMT, IMBD PYR, SANDY, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

SLTST: 80% LTGY - MEDLTGY, FRI,
FN TO MED GRN, W SRTD, CALC
CMT, IMBD PYR, SANDY, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, NO CUT, NO RNG

SLTST: 60% LTGY - MEDLTGY, FRI,
FN TO MED GRN, W SRTD, CALC
CMT, SANDY, INTGR POR, NO STN,
NO FLOR, NO O FLOR, NO CUT, NO
RNG

MD 678'
WT 8.70
VIS 8.0
PH 8.7
FIL 32.0
CL 1700
CAL 160.0
H2O 97.1
OIL 0.0
SOL 2.6
CAKE 1/0
GELS 1/2/2
PV 2.0
YP 1.0

CG 196u

-125 TG, C1-C4 1125

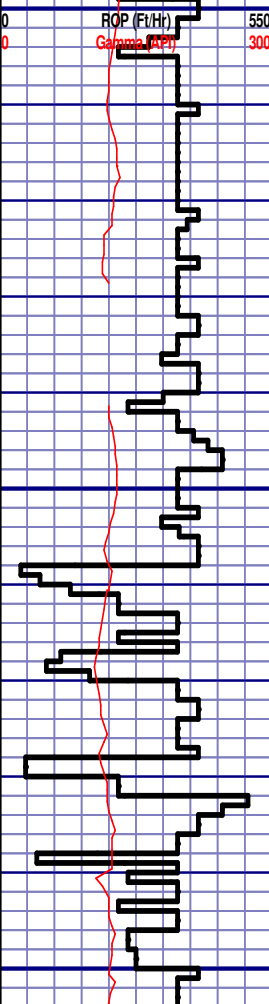
CG 243u

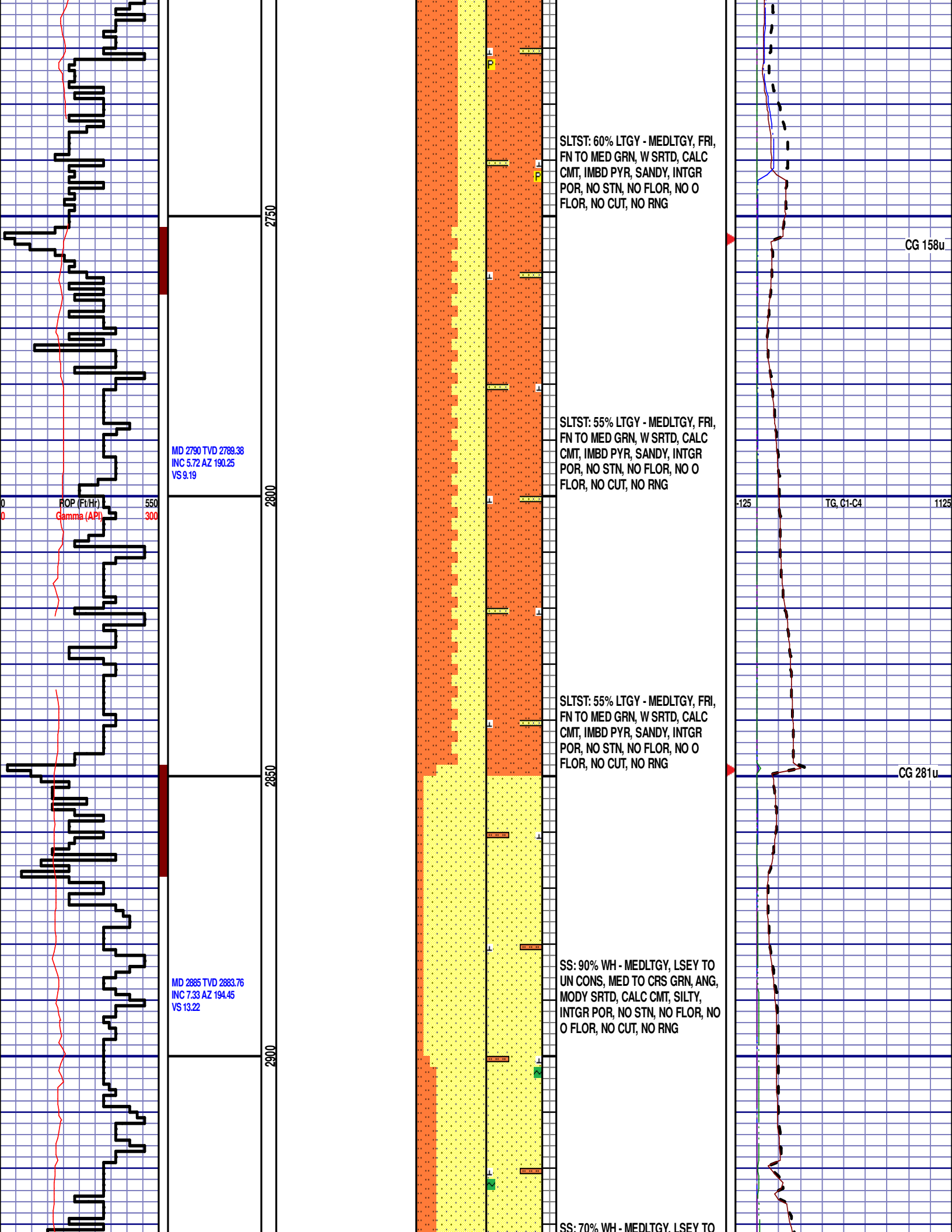
MD 2600 TVD 2599.81
INC 1.45 AZ 193.91
VS 4.47

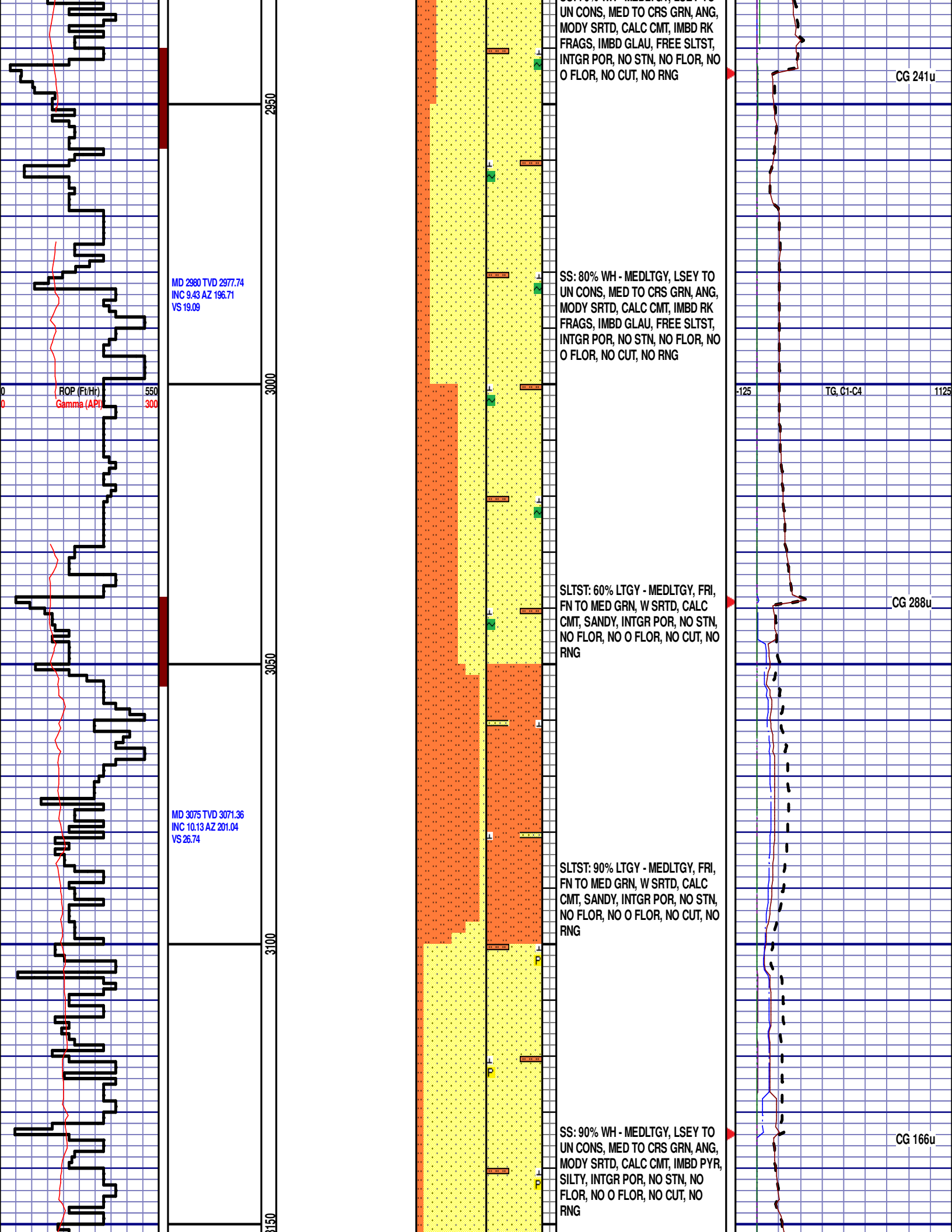
MD 2695 TVD 2694.7
INC 3.74 AZ 195.98
VS 6.27

2500
2550
2600
2650
2700

ROP (Ft/Hr)
Galena (PPH)







MD 3169 TVD 3164
INC 9.38 AZ 198.86
VS 34.55

ROP (Ft/Hr) 550
Gamma (API) 300

MD 3264 TVD 3257.62
INC 10.19 AZ 19.88
VS 42.19

MD 3359 TVD 3351.21
INC 9.55 AZ 203.15
VS 50.4

SS: 60% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD PYR, SILTY, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SLTST: 80% LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, SANDY, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

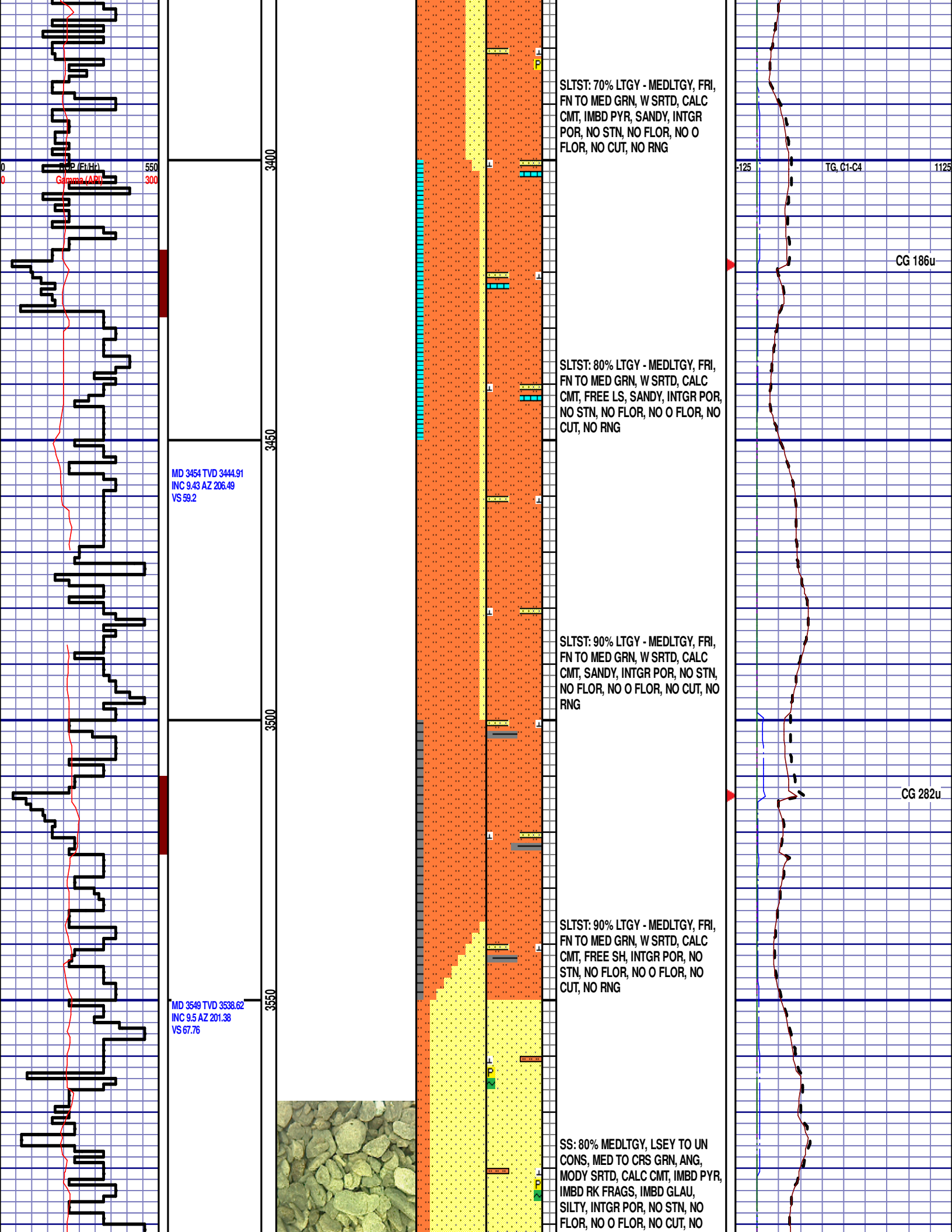
SLTST: 60% LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, SANDY, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

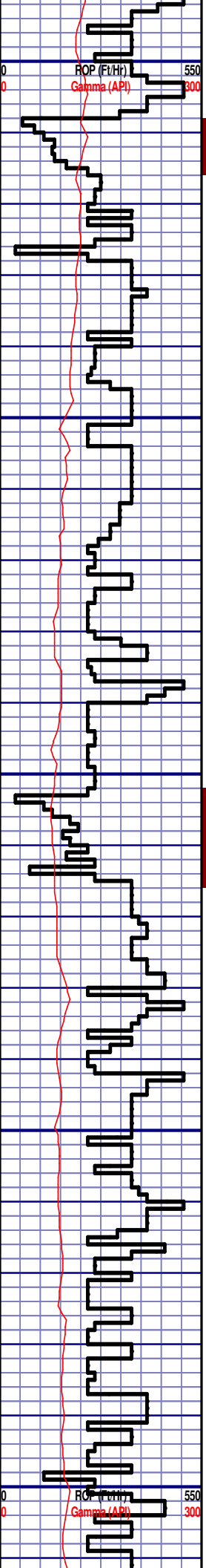
SLTST: 60% LTGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, SANDY, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

-125 TG, C1-C4 1125

CG 242u

CG 161u



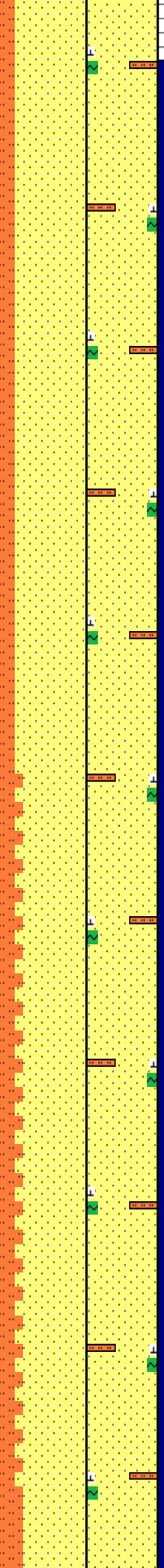


MD 3643 TVD 3631.21
 INC 10.38 AZ 197.59
 VS 75.57

MD 3738 TVD 3724.32
 INC 12.48 AZ 201.87
 VS 84.78



3600
 3650
 3700
 3750
 3800



PARKMAN

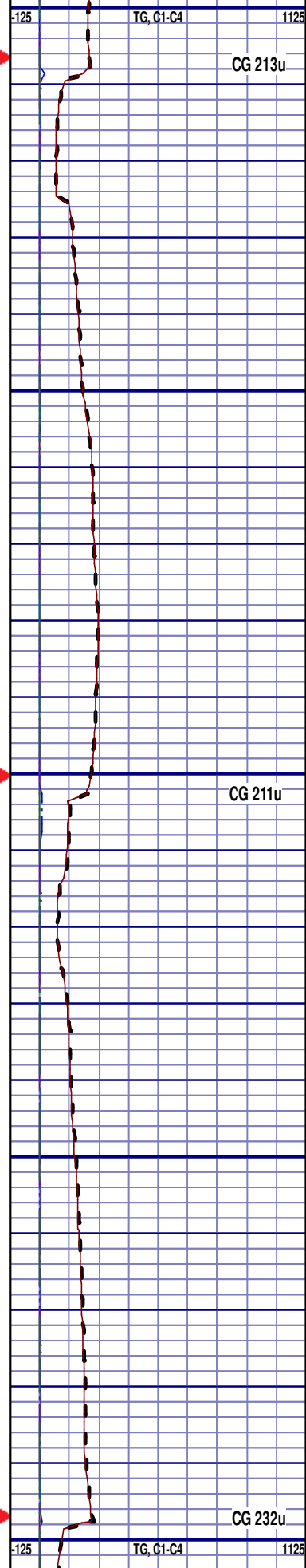
3600' MD 3589' TVD

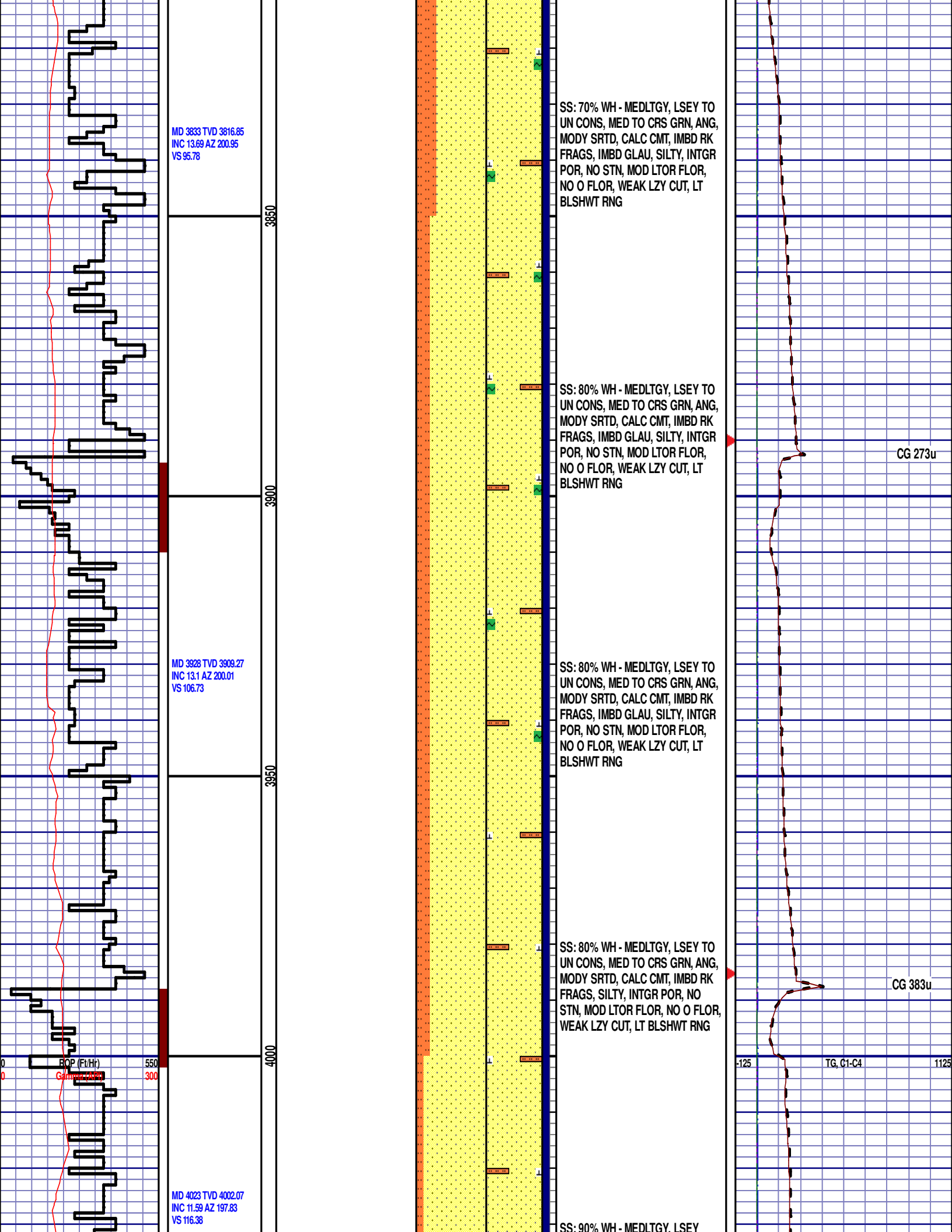
SS: 80% MEDLTGY, LSEY TO UN
 CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SS: 80% MEDLTGY, LSEY TO UN
 CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR, NO
 O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SS: 75% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR, NO
 O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SS: 75% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, MOD LTOR FLOR, NO O
 FLOR, WEAK LZY CUT, LT BLSHWT
 RNG





MD 3833 TVD 3816.85
 INC 13.69 AZ 200.95
 VS 95.78

SS: 70% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

3850

SS: 80% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

3900

CG 273u

MD 3928 TVD 3909.27
 INC 13.1 AZ 200.01
 VS 106.73

SS: 80% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, IMBD GLAU, SILTY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

3950

SS: 80% WH - MEDLTGY, LSEY TO
 UN CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, SILTY, INTGR POR, NO
 STN, MOD LTOR FLOR, NO O FLOR,
 WEAK LZY CUT, LT BLSHWT RNG

4000

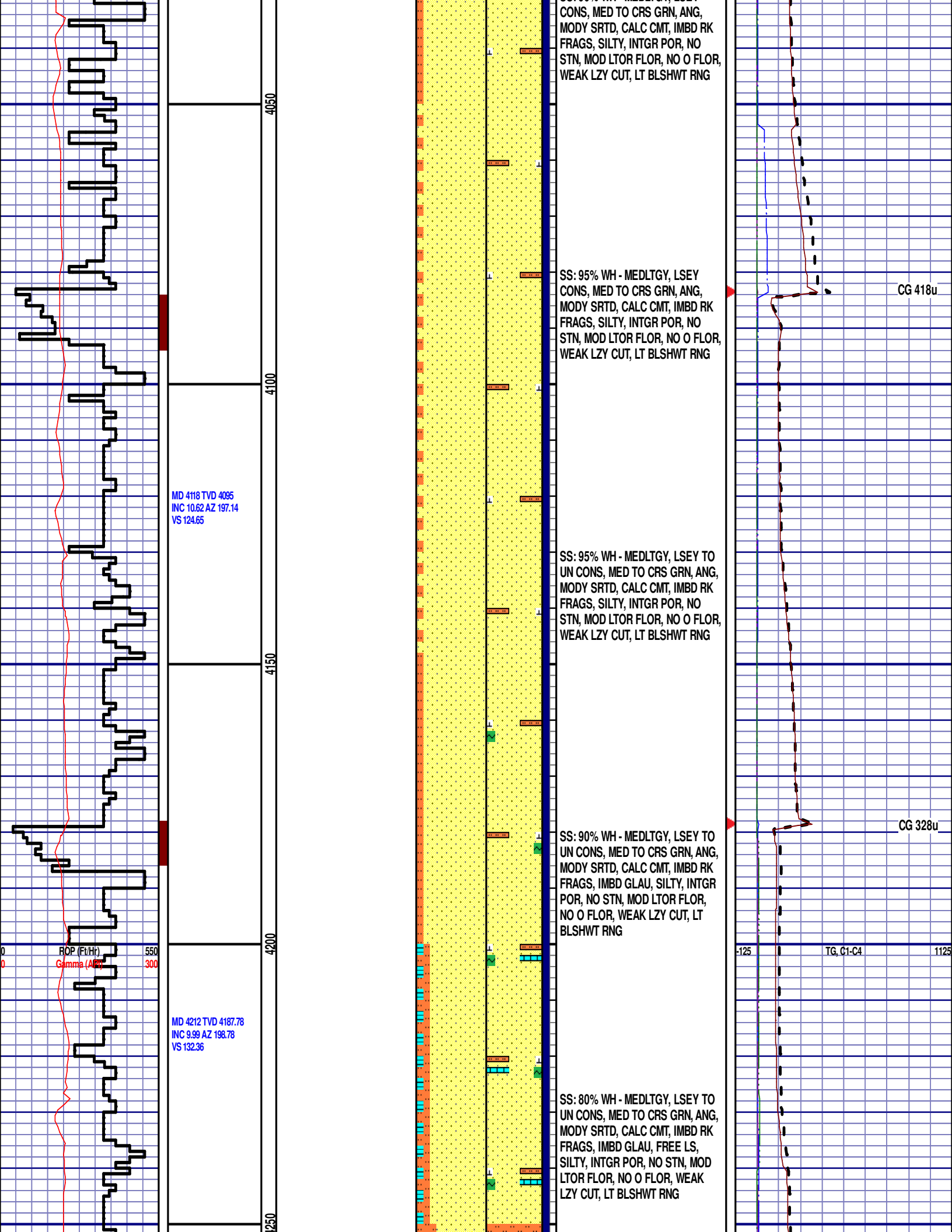
CG 383u

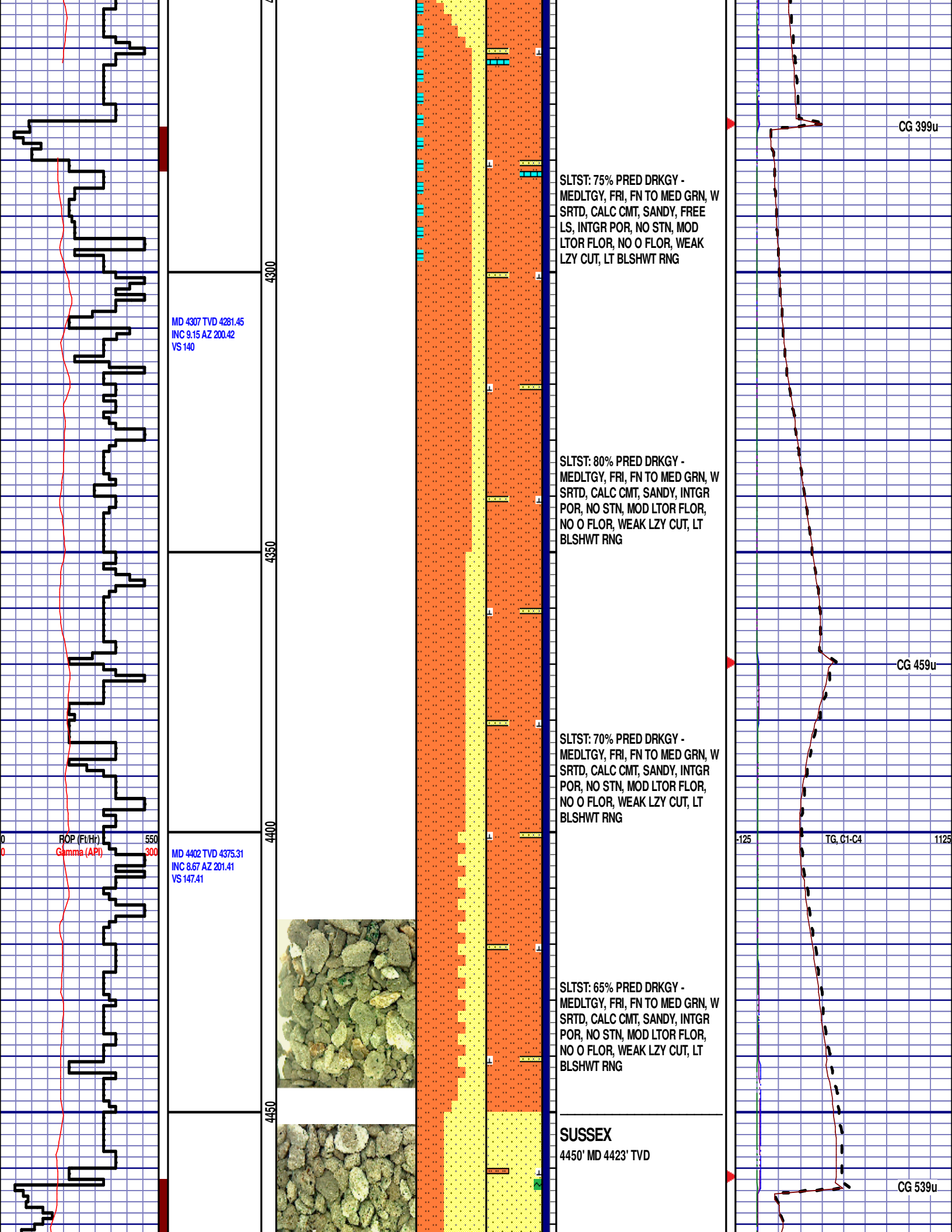
BOP (Ft/Hr)
 550
 300

MD 4023 TVD 4002.07
 INC 11.59 AZ 197.83
 VS 116.38

SS: 90% WH - MEDLTGY, LSEY

-125 TG, C1-C4 1125





MD 4307 TVD 4281.45
 INC 9.15 AZ 200.42
 VS 140

MD 4402 TVD 4375.31
 INC 8.67 AZ 201.41
 VS 147.41

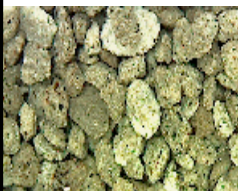
SLTST: 75% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, FREE
 LS, INTGR POR, NO STN, MOD
 LTOR FLOR, NO O FLOR, WEAK
 LZY CUT, LT BLSHWT RNG

SLTST: 80% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SLTST: 70% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SLTST: 65% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, INTGR
 POR, NO STN, MOD LTOR FLOR,
 NO O FLOR, WEAK LZY CUT, LT
 BLSHWT RNG

SUSSEX
 4450' MD 4423' TVD



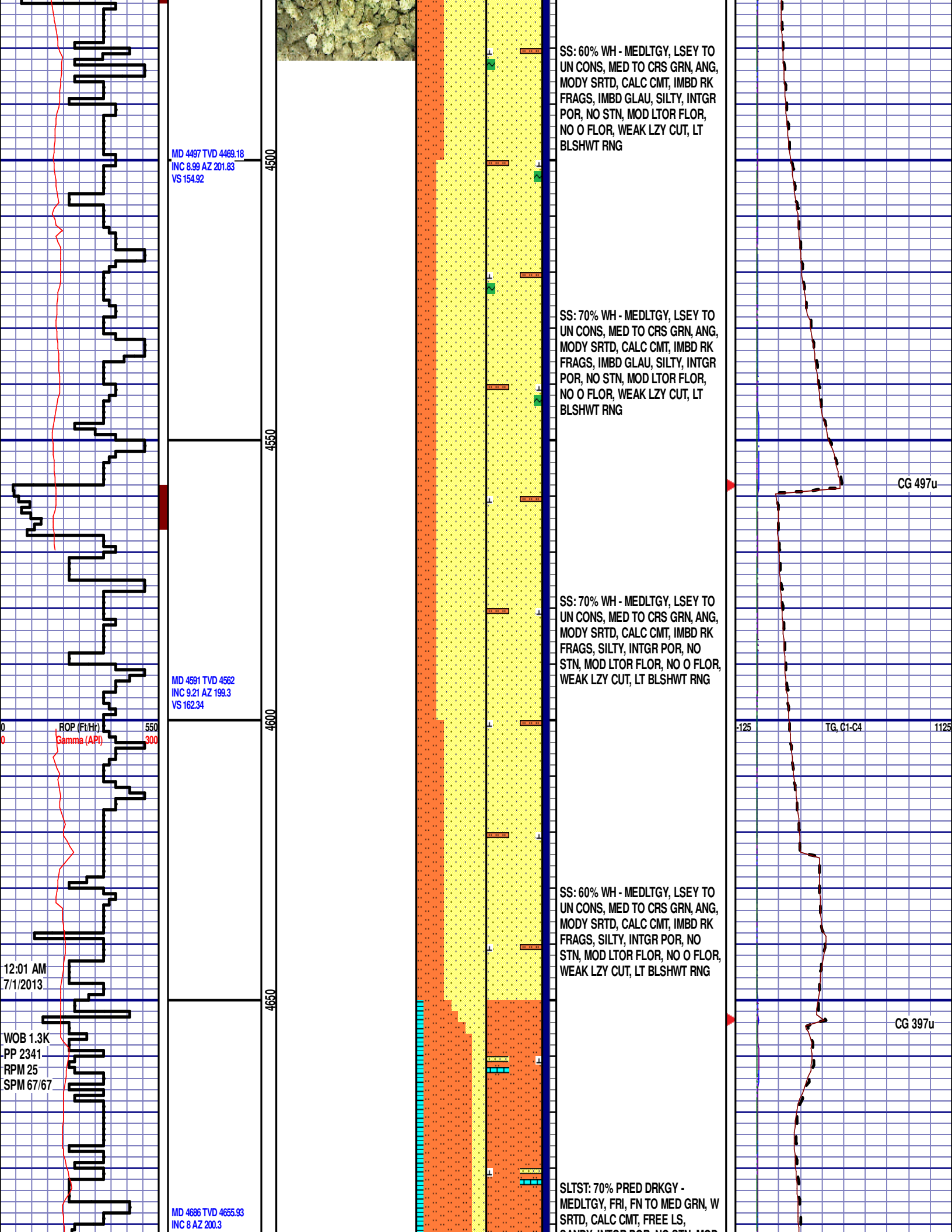
ROP (Ft/Hr) 550
 Gamma (API) 300

-125 TG, C1-C4 1125

CG 399u

CG 459u

CG 539u



MD 4497 TVD 4469.18
 INC 8.99 AZ 201.83
 VS 154.92

4500

SS: 60% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, SILTY, INTGR POR, NO STN, MOD LTOR FLOR, NO O FLOR, WEAK LZY CUT, LT BLSHWT RNG

SS: 70% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, SILTY, INTGR POR, NO STN, MOD LTOR FLOR, NO O FLOR, WEAK LZY CUT, LT BLSHWT RNG

SS: 70% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, SILTY, INTGR POR, NO STN, MOD LTOR FLOR, NO O FLOR, WEAK LZY CUT, LT BLSHWT RNG

SS: 60% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, SILTY, INTGR POR, NO STN, MOD LTOR FLOR, NO O FLOR, WEAK LZY CUT, LT BLSHWT RNG

SLTST: 70% PRED DRKGY - MEDLTGY, FRI, FN TO MED GRN, W SRTD, CALC CMT, FREE LS, SANDY INEOR POR, NO STN, MOD

MD 4591 TVD 4562
 INC 9.21 AZ 199.3
 VS 162.34

4550

ROP (Ft/Hr) 550
 Gamma (API) 300

4600

-125 TG, C1-C4 1125

CG 497u

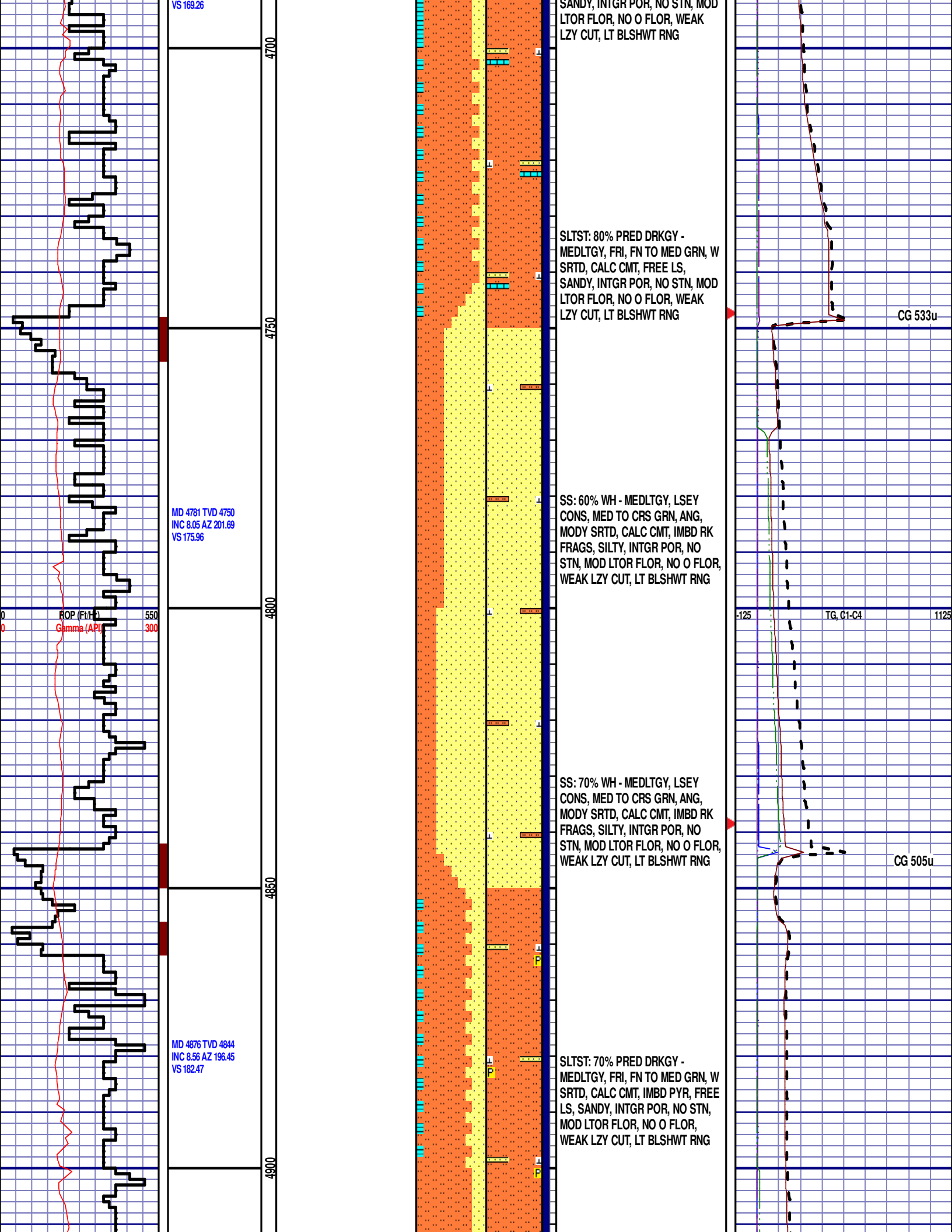
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 7/1/2013

4650

CG 397u

WOB 1.3K
 PP 2341
 RPM 25
 SPM 67/67

MD 4686 TVD 4655.93
 INC 8 AZ 200.3



VS 169.26

4700

SANDY, INTGR POR, NO STN, MOD
L TOR FLOR, NO O FLOR, WEAK
LZY CUT, LT BLSHWT RNG

CG 533u

MD 4781 TVD 4750
INC 8.05 AZ 201.69
VS 175.96

4750

SLTST: 80% PRED DRKGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, FREE LS,
SANDY, INTGR POR, NO STN, MOD
L TOR FLOR, NO O FLOR, WEAK
LZY CUT, LT BLSHWT RNG

SS: 60% WH - MEDLTGY, LSEY
CONS, MED TO CRS GRN, ANG,
MODY SRTD, CALC CMT, IMBD RK
FRAGS, SILTY, INTGR POR, NO
STN, MOD L TOR FLOR, NO O FLOR,
WEAK LZY CUT, LT BLSHWT RNG

SS: 70% WH - MEDLTGY, LSEY
CONS, MED TO CRS GRN, ANG,
MODY SRTD, CALC CMT, IMBD RK
FRAGS, SILTY, INTGR POR, NO
STN, MOD L TOR FLOR, NO O FLOR,
WEAK LZY CUT, LT BLSHWT RNG

CG 505u

ROP (Feet)
Gamma (API)

550
300

4800

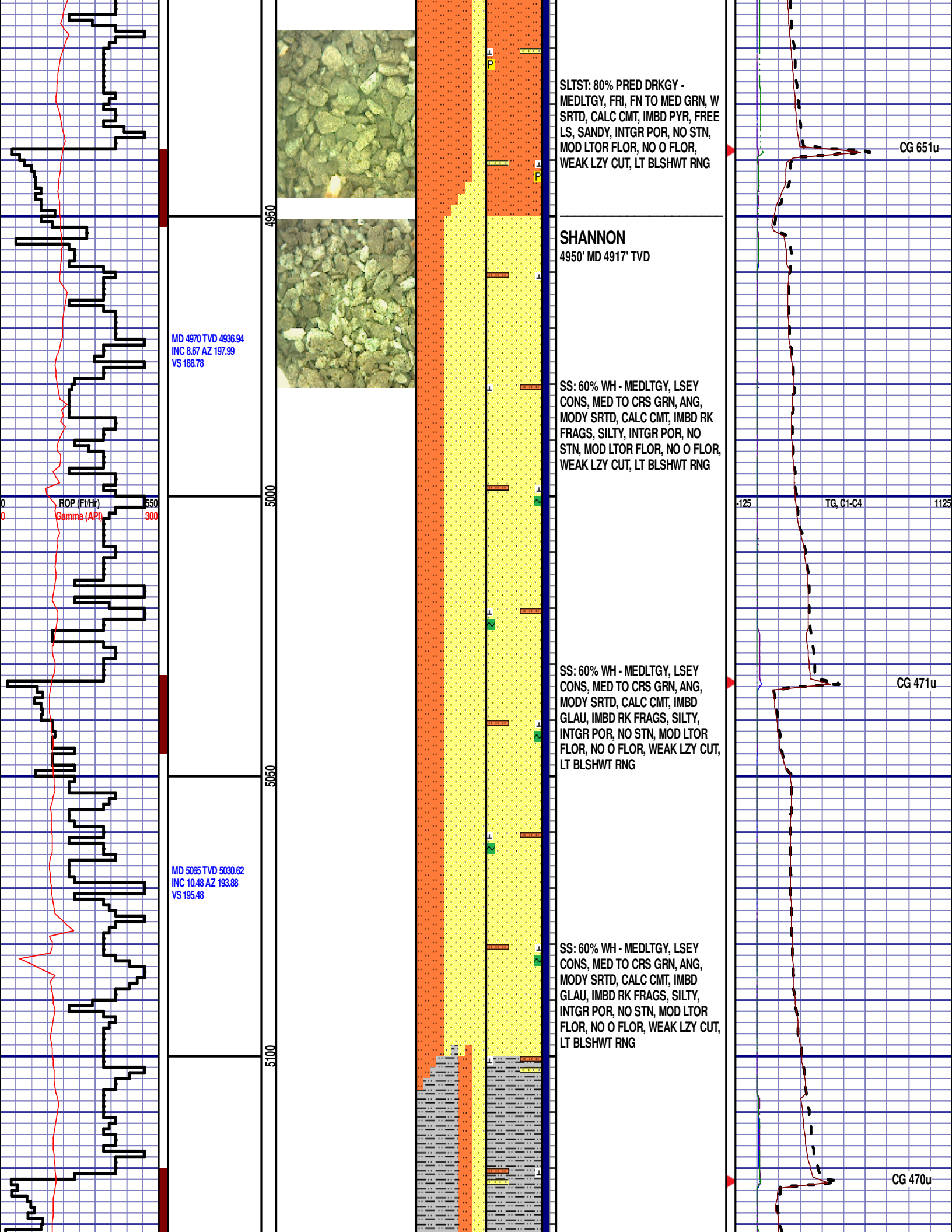
-125 TG, C1-C4 1125

MD 4876 TVD 4844
INC 8.56 AZ 196.45
VS 182.47

4850

SLTST: 70% PRED DRKGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, IMBD PYR, FREE
LS, SANDY, INTGR POR, NO STN,
MOD L TOR FLOR, NO O FLOR,
WEAK LZY CUT, LT BLSHWT RNG

4900



SLTST: 80% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, IMBD PYR, FREE
 LS, SANDY, INTGR POR, NO STN,
 MOD LTOR FLOR, NO O FLOR,
 WEAK LZY CUT, LT BLSHWT RNG

SHANNON
 4950' MD 4917' TVD

SS: 60% WH - MEDLTGY, LSEY
 CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD RK
 FRAGS, SILTY, INTGR POR, NO
 STN, MOD LTOR FLOR, NO O FLOR,
 WEAK LZY CUT, LT BLSHWT RNG

SS: 60% WH - MEDLTGY, LSEY
 CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD
 GLAU, IMBD RK FRAGS, SILTY,
 INTGR POR, NO STN, MOD LTOR
 FLOR, NO O FLOR, WEAK LZY CUT,
 LT BLSHWT RNG

SS: 60% WH - MEDLTGY, LSEY
 CONS, MED TO CRS GRN, ANG,
 MODY SRTD, CALC CMT, IMBD
 GLAU, IMBD RK FRAGS, SILTY,
 INTGR POR, NO STN, MOD LTOR
 FLOR, NO O FLOR, WEAK LZY CUT,
 LT BLSHWT RNG

MD 4970 TVD 4936.94
 INC 8.67 AZ 197.99
 VS 188.78

MD 5065 TVD 5030.62
 INC 10.48 AZ 193.88
 VS 195.48

ROP (Ft/Hr)
 Gamma (API)

CG 651u

CG 471u

CG 470u

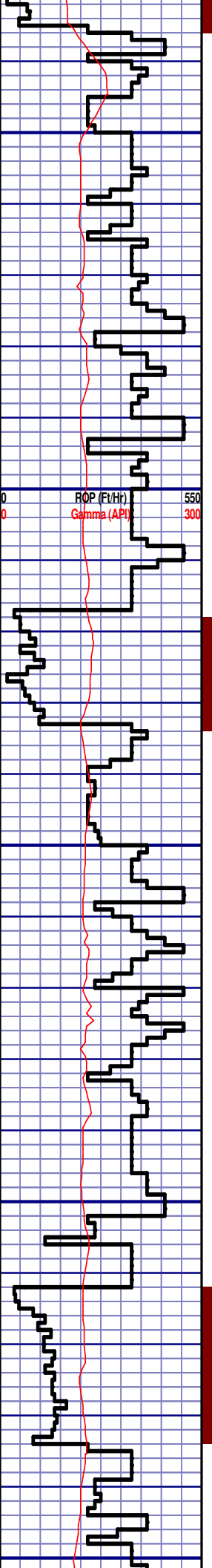
4950

5000

5050

5100

-125 TG, C1-C4 1125



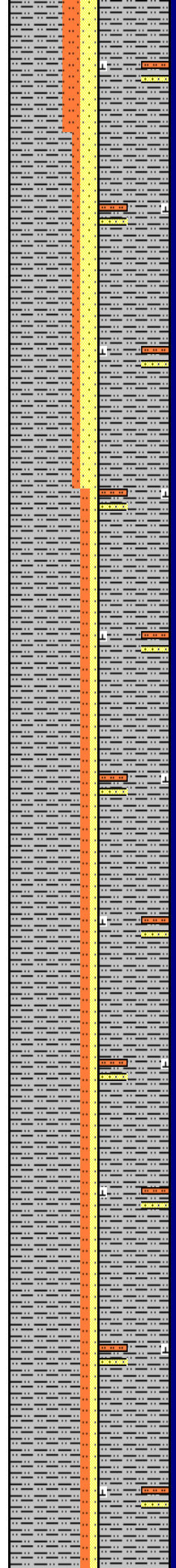
MD 5160 TVD 5124.14
 INC 9.73 AZ 192.72
 VS 201.9

ROP (Ft/H) 550
 Gamma (API) 300

MD 5255 TVD 5217.99
 INC 8.13 AZ 200.07
 VS 208.23

MD 5350 TVD 5317.99
 INC 8.13 AZ 200.07
 VS 208.23

5150
 5200
 5250
 5300
 5350



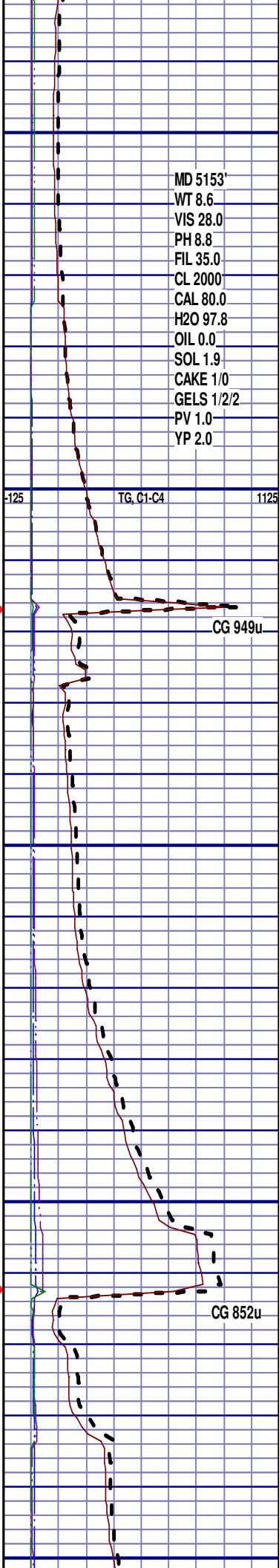
SLTY SH: 60% MEDDRKGY -
 MEDLTGY, BLKY TO SUBBLKY,
 GR TY TO SLTY TXT, FRM TO BRIT,
 IMBD SLTST & SS LAMN, FREE
 CAL, NO STN, NO FLOR, SLOW LZ Y
 CUT, FNT DRKYL RNG

SLTY SH: 70% MEDDRKGY -
 MEDLTGY, BLKY TO SUBBLKY,
 GR TY TO SLTY TXT, FRM TO BRIT,
 IMBD SLTST & SS LAMN, FREE
 CAL, NO STN, NO FLOR, SLOW LZ Y
 CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -
 MEDLTGY, BLKY TO SUBBLKY,
 GR TY TO SLTY TXT, FRM TO BRIT,
 IMBD SLTST & SS LAMN, FREE
 CAL, NO STN, NO FLOR, SLOW LZ Y
 CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -
 MEDLTGY, BLKY TO SUBBLKY,
 GR TY TO SLTY TXT, FRM TO BRIT,
 IMBD SLTST & SS LAMN, FREE
 CAL, NO STN, NO FLOR, SLOW LZ Y
 CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -
 MEDLTGY, BLKY TO SUBBLKY,
 GR TY TO SLTY TXT, FRM TO BRIT,
 IMBD SLTST & SS LAMN, FREE
 CAL, NO STN, NO FLOR, SLOW LZ Y
 CUT, FNT DRKYL RNG



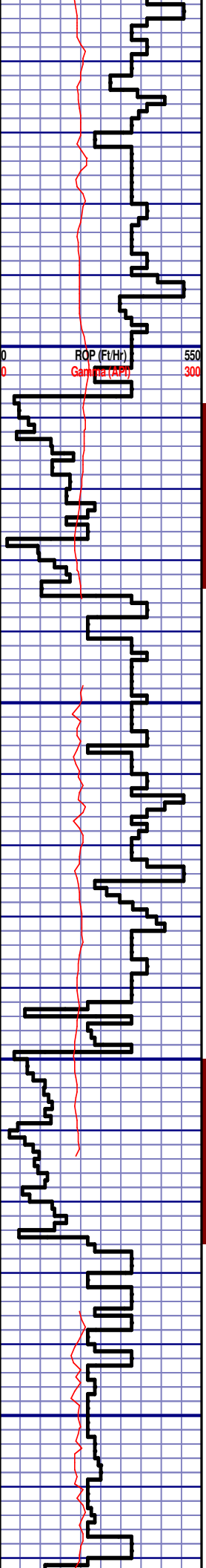
MD 5153'
 WT 8.6
 VIS 28.0
 PH 8.8
 FIL 35.0
 CL 2000
 CAL 80.0
 H2O 97.8
 OIL 0.0
 SOL 1.9
 CAKE 1/0
 GELS 1/2/2
 PV 1.0
 YP 2.0

-125 TG, C1-C4 1125

CG 949u

CG 852u

MD 5350 TVD 5371.96
INC 8.59 AZ 193.18
VS 214.25



MD 5444 TVD 5404.92
INC 8.69 AZ 199.34
VS 220.35

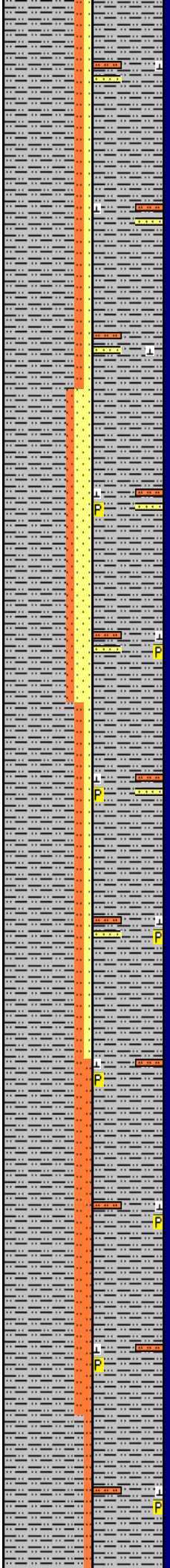
MD 5539 TVD 5498.8
INC 8.93 AZ 202.46
VS 227.69

5400

5450

5500

5550

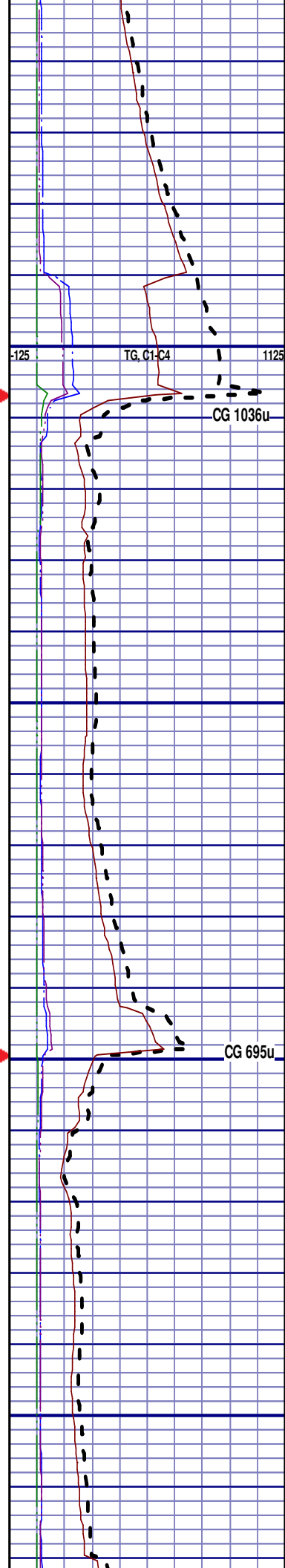


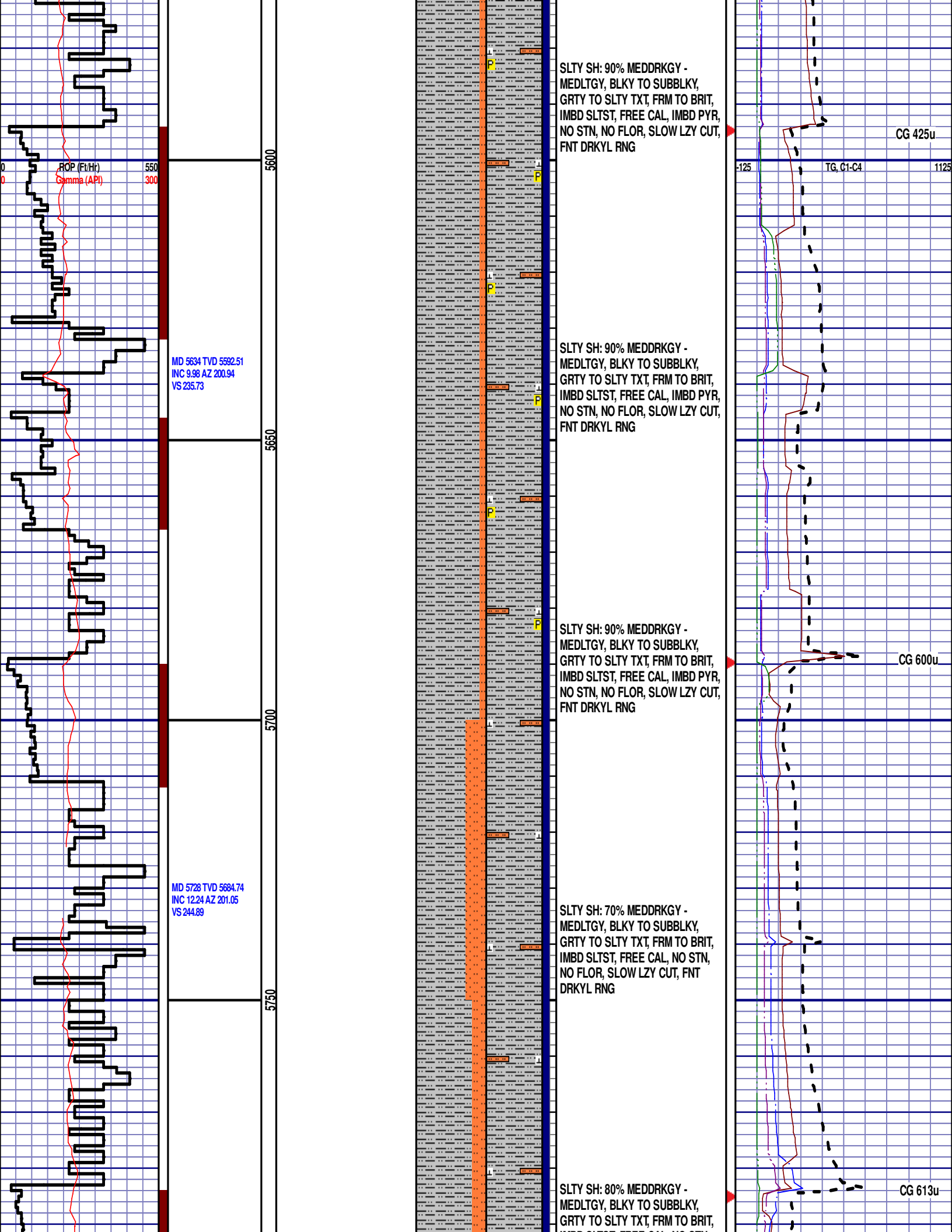
SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST & SS LAMN, FREE
CAL, NO STN, NO FLOR, SLOW LZY
CUT, FNT DRKYL RNG

SLTY SH: 70% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST & SS LAMN, FREE
CAL, IMBD PYR, NO STN, NO FLOR,
SLOW LZY CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST & SS LAMN, FREE
CAL, IMBD PYR, NO STN, NO FLOR,
SLOW LZY CUT, FNT DRKYL RNG

SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, IMBD PYR,
NO STN, NO FLOR, SLOW LZY CUT,
FNT DRKYL RNG





SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, IMBD PYR,
NO STN, NO FLOR, SLOW LZY CUT,
FNT DRKYL RNG

CG 425u

MD 5634 TVD 5592.51
INC 9.98 AZ 200.94
VS 235.73

SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, IMBD PYR,
NO STN, NO FLOR, SLOW LZY CUT,
FNT DRKYL RNG

SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, IMBD PYR,
NO STN, NO FLOR, SLOW LZY CUT,
FNT DRKYL RNG

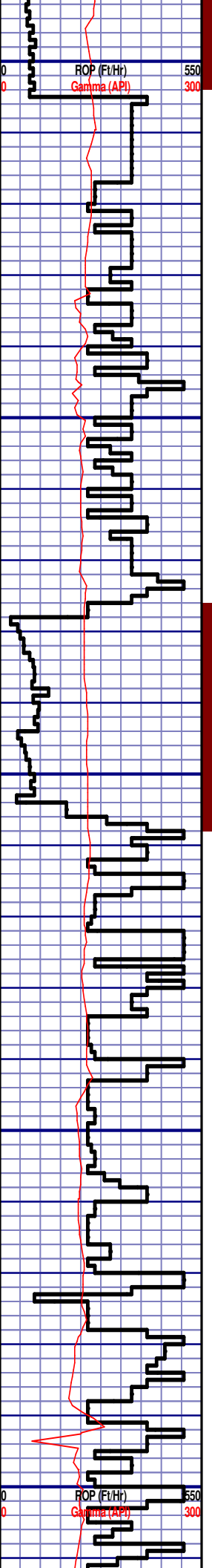
CG 600u

MD 5728 TVD 5684.74
INC 12.24 AZ 201.05
VS 244.89

SLTY SH: 70% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, NO STN,
NO FLOR, SLOW LZY CUT, FNT
DRKYL RNG

SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,

CG 613u

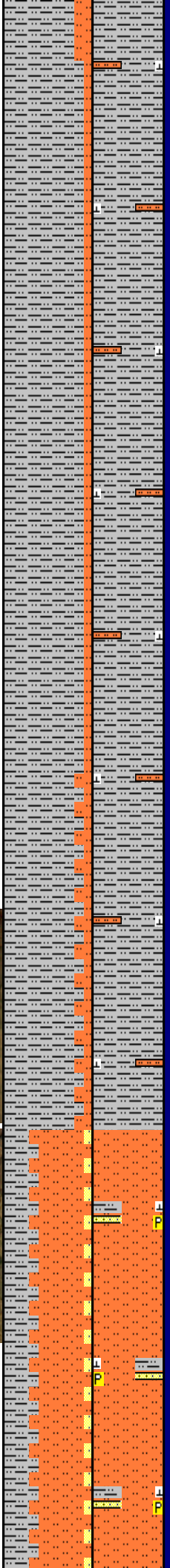
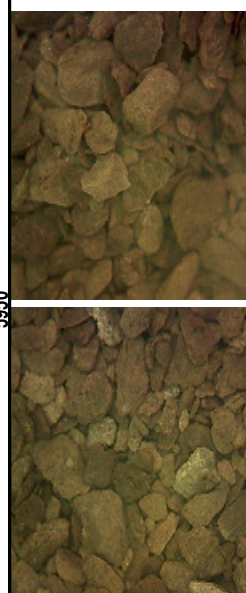


MD 5823 TVD 5777.61
INC 12.08 AZ 204.41
VS 255.52

MD 5918 TVD 5870.52
INC 12.02 AZ 203.89
VS 266.47

MD 5983 TVD 5934.35
INC 9.69 AZ 206.51
VS 273.39

5800
5850
5900
5950
6000



IMBD SLTST, FREE CAL, NO STN,
NO FLOR, SLOW LZY CUT, FNT
DRKYL RNG

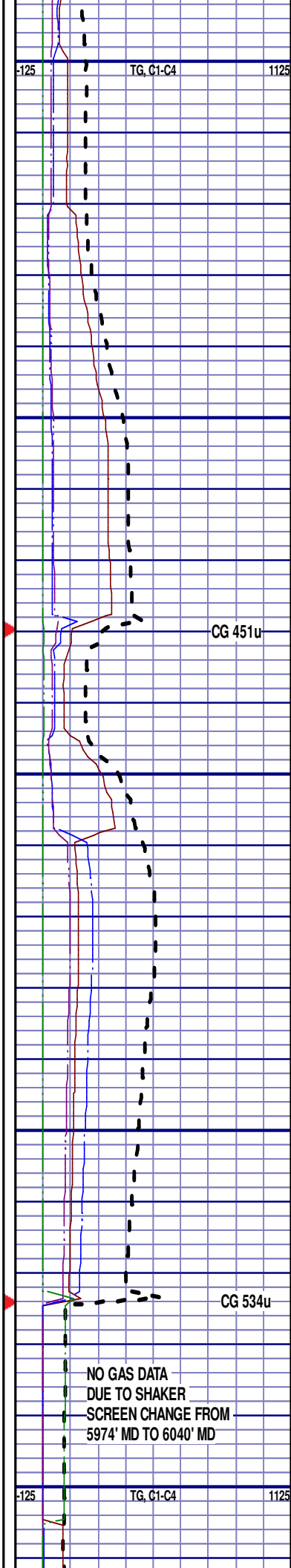
SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, NO STN,
NO FLOR, SLOW LZY CUT, FNT
DRKYL RNG

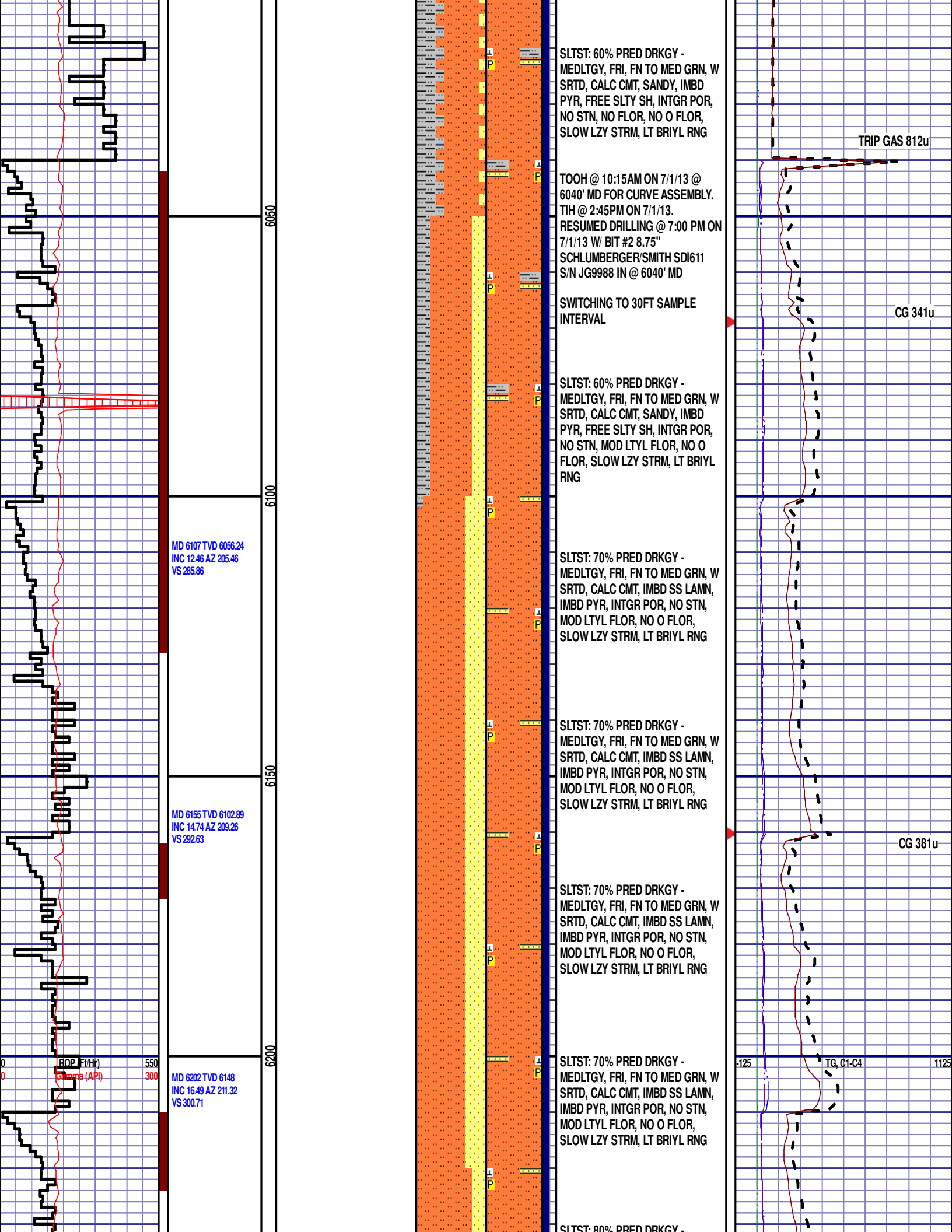
SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, NO STN,
NO FLOR, SLOW LZY CUT, FNT
DRKYL RNG

SLTY SH: 85% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST, FREE CAL, NO STN,
NO FLOR, SLOW LZY CUT, FNT
DRKYL RNG

TEEPEE BUTTES
5950' MD 5902' TVD

SLTST: 60% PRED DRKGY -
MEDLTGY, FRI, FN TO MED GRN, W
SRTD, CALC CMT, SANDY, IMBD
PYR, FREE SLTY SH, INTGR POR,
NO STN, NO FLOR, NO O FLOR,
SLOW LZY STRM, LT BRIYL RNG





SLTST: 60% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, IMBD
 PYR, FREE SLTY SH, INTGR POR,
 NO STN, NO FLOR, NO O FLOR,
 SLOW LZY STRM, LT BRIYL RNG

TOOH @ 10:15AM ON 7/1/13 @
 6040' MD FOR CURVE ASSEMBLY.
 TIH @ 2:45PM ON 7/1/13.
 RESUMED DRILLING @ 7:00 PM ON
 7/1/13 W/ BIT #2 8.75"
 SCHLUMBERGER/SMITH SDI611
 S/N JG9988 IN @ 6040' MD

SWITCHING TO 30FT SAMPLE
 INTERVAL

SLTST: 60% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, SANDY, IMBD
 PYR, FREE SLTY SH, INTGR POR,
 NO STN, MOD LTYL FLOR, NO O
 FLOR, SLOW LZY STRM, LT BRIYL
 RNG

SLTST: 70% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, IMBD SS LAMN,
 IMBD PYR, INTGR POR, NO STN,
 MOD LTYL FLOR, NO O FLOR,
 SLOW LZY STRM, LT BRIYL RNG

SLTST: 70% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, IMBD SS LAMN,
 IMBD PYR, INTGR POR, NO STN,
 MOD LTYL FLOR, NO O FLOR,
 SLOW LZY STRM, LT BRIYL RNG

SLTST: 70% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, IMBD SS LAMN,
 IMBD PYR, INTGR POR, NO STN,
 MOD LTYL FLOR, NO O FLOR,
 SLOW LZY STRM, LT BRIYL RNG

SLTST: 70% PRED DRKGY -
 MEDLTGY, FRI, FN TO MED GRN, W
 SRTD, CALC CMT, IMBD SS LAMN,
 IMBD PYR, INTGR POR, NO STN,
 MOD LTYL FLOR, NO O FLOR,
 SLOW LZY STRM, LT BRIYL RNG

SLTST: 80% PRED DRKGY -

MD 6107 TVD 6056.24
 INC 12.46 AZ 205.46
 VS 285.86

MD 6155 TVD 6102.89
 INC 14.74 AZ 209.26
 VS 292.63

MD 6202 TVD 6148
 INC 16.49 AZ 211.32
 VS 300.71

ROP (ft/hr)
 Gamma (API)

550
 300

6050

6100

6150

6200

TRIP GAS 812u

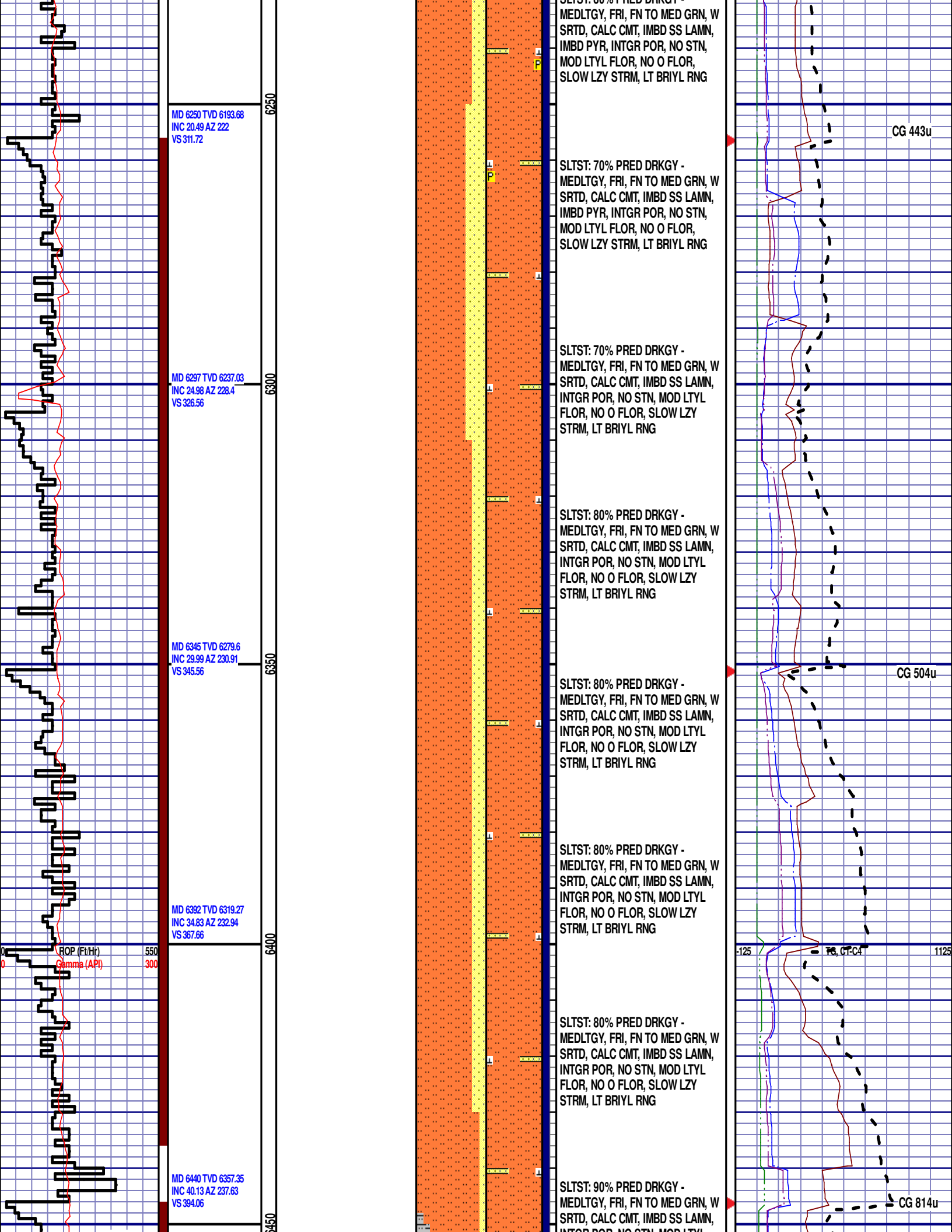
CG 341u

CG 381u

-125

TG, C1-C4

1125



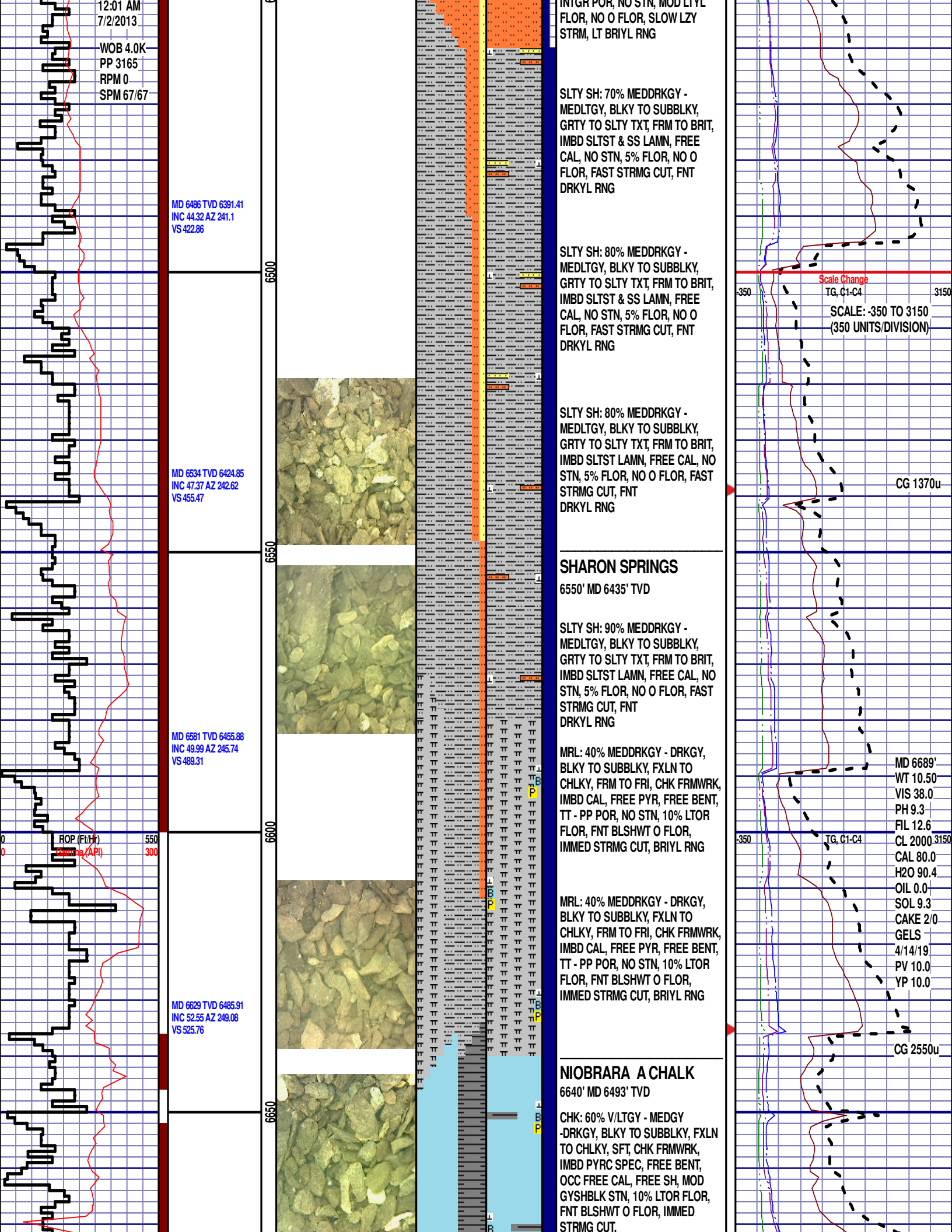
12:01 AM
7/2/2013
WOB 4.0K
PP 3165
RPM 0
SPM 67/67

MD 6486 TVD 6391.41
INC 44.32 AZ 241.1
VS 422.86

MD 6534 TVD 6424.85
INC 47.37 AZ 242.62
VS 455.47

MD 6581 TVD 6455.88
INC 49.99 AZ 245.74
VS 489.31

MD 6629 TVD 6485.91
INC 52.55 AZ 249.08
VS 525.76



SLTY SH: 70% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST & SS LAMN, FREE
CAL, NO STN, 5% FLOR, NO O
FLOR, FAST STRMG CUT, FNT
DRKYL RNG

SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST & SS LAMN, FREE
CAL, NO STN, 5% FLOR, NO O
FLOR, FAST STRMG CUT, FNT
DRKYL RNG

SLTY SH: 80% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST LAMN, FREE CAL, NO
STN, 5% FLOR, NO O FLOR, FAST
STRMG CUT, FNT
DRKYL RNG

SHARON SPRINGS

6550' MD 6435' TVD

SLTY SH: 90% MEDDRKGY -
MEDLTGY, BLKY TO SUBBLKY,
GRTY TO SLTY TXT, FRM TO BRIT,
IMBD SLTST LAMN, FREE CAL, NO
STN, 5% FLOR, NO O FLOR, FAST
STRMG CUT, FNT
DRKYL RNG

MRL: 40% MEDDRKGY - DRKGY,
BLKY TO SUBBLKY, FXLN TO
CHLKY, FRM TO FRI, CHK FRMWRK,
IMBD CAL, FREE PYR, FREE BENT,
TT - PP POR, NO STN, 10% LTOR
FLOR, FNT BLSHW O FLOR,
IMMED STRMG CUT, BRIYL RNG

MRL: 40% MEDDRKGY - DRKGY,
BLKY TO SUBBLKY, FXLN TO
CHLKY, FRM TO FRI, CHK FRMWRK,
IMBD CAL, FREE PYR, FREE BENT,
TT - PP POR, NO STN, 10% LTOR
FLOR, FNT BLSHW O FLOR,
IMMED STRMG CUT, BRIYL RNG

NIORARA A CHALK

6640' MD 6493' TVD

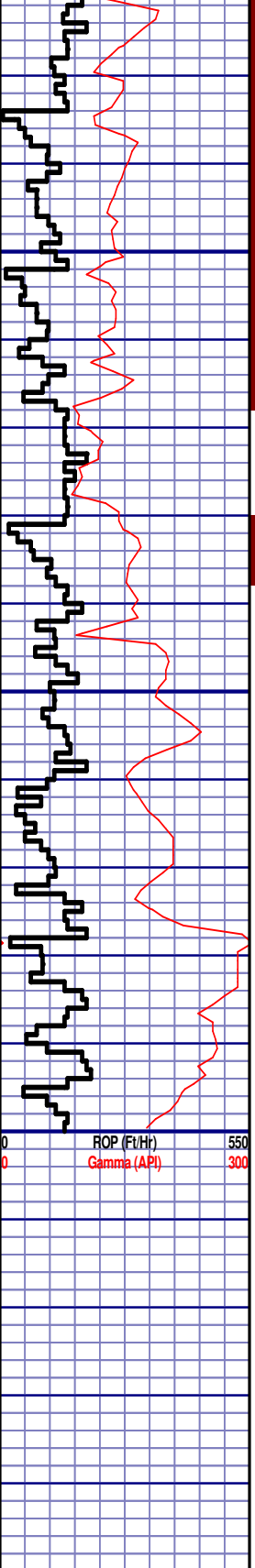
CHK: 60% V/LTGY - MEDGY
-DRKGY, BLKY TO SUBBLKY, FXLN
TO CHLKY, SFT, CHK FRMWRK,
IMBD PYRC SPEC, FREE BENT,
OCC FREE CAL, FREE SH, MOD
GYSHBLK STN, 10% LTOR FLOR,
FNT BLSHW O FLOR, IMMED
STRMG CUT.

Scale Change
TG, C1-C4
SCALE: -350 TO 3150
(350 UNITS/DIVISION)

CG 1370u

MD 6689'
WT 10.50
VIS 38.0
PH 9.3
FIL 12.6
CL 2000.3150
CAL 80.0
H2O 90.4
OIL 0.0
SOL 9.3
CAKE 2/0
GELS
4/14/19
PV 10.0
YP 10.0

CG 2550u



MD 6675 TVD 6512.94
 INC 55.48 AZ 252.33
 VS 562.41

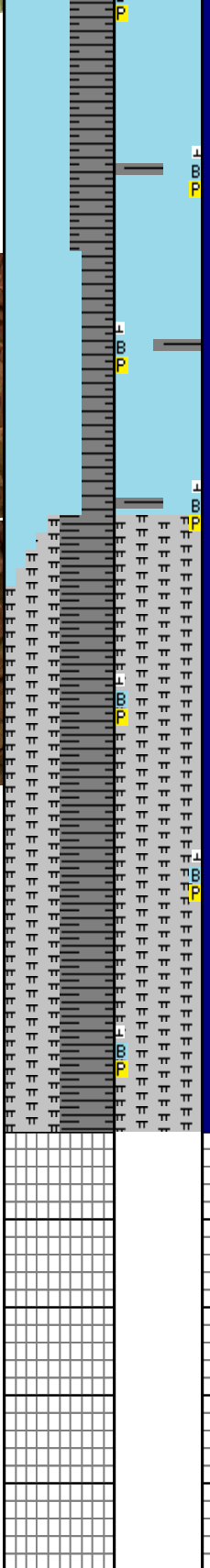
MD 6723 TVD 6539.23
 INC 58.12 AZ 256.77
 VS 602.34

MD 6770 TVD 6562.42
 INC 62.76 AZ 259.01
 VS 643.17

6700

6750

6800



BRIYL RNG
 CHK: 60% V/LTGY - MEDGY
 -DRKGY, BLKY TO SUBBLKY, FXLN
 TO CHLKY, SFT, CHK FRMWRK,
 IMBD PYRC SPEC, FREE PYR,
 FREE BENT, OCC FREE CAL, FREE
 SH, MOD GYSHBLK STN, 10% LTOR
 FLOR, FNT BLSHWT O FLOR,
 IMMED STRMG CUT,
 BRIYL RNG

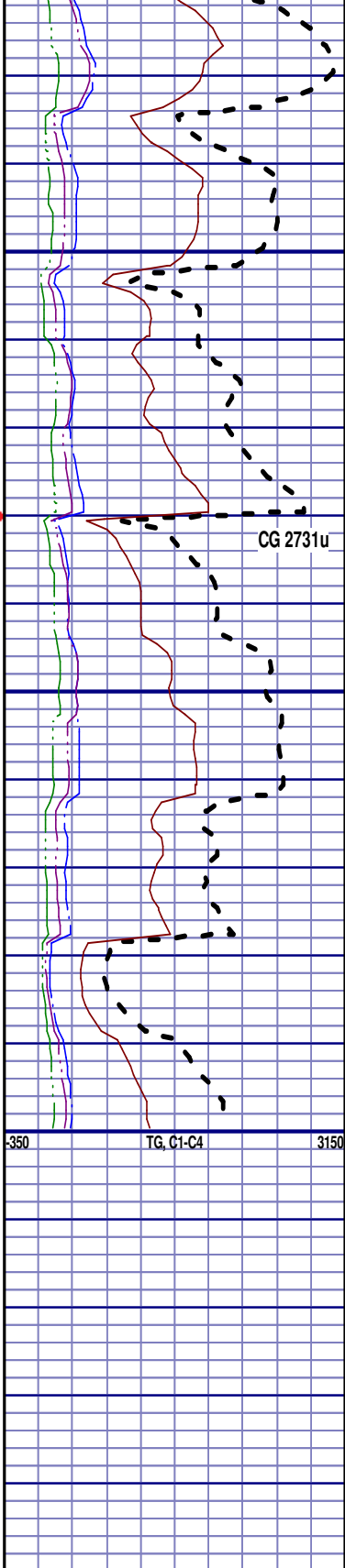
CHK: 65% V/LTGY - MEDGY
 -DRKGY, BLKY TO SUBBLKY, FXLN
 TO CHLKY, SFT, CHK FRMWRK,
 IMBD PYRC SPEC, FREE PYR,
 FREE BENT, OCC FREE CAL, FREE
 SH, MOD GYSHBLK STN, 10% LTOR
 FLOR, FNT BLSHWT O FLOR,
 IMMED STRMG CUT,
 BRIYL RNG

NIOBRARA A MARL
 6730' MD 6548' TVD

MRL: 50% MEDGY - MEDDRKGY,
 BLKY TO SUBBLKY, FXLN TO
 CHLKY, FRM TO FRI, CHK FRMWRK,
 IMBD CAL, FREE PYR, FREE BENT,
 TT - PP POR, NO STN, 10% LTOR
 FLOR, FNT BLSHWT O FLOR,
 IMMED STRMG CUT, BRIYL RNG

MRL: 50% MEDGY - MEDDRKGY,
 BLKY TO SUBBLKY, FXLN TO
 CHLKY, FRM TO FRI, CHK FRMWRK,
 IMBD CAL, FREE PYR, FREE BENT,
 TT - PP POR, NO STN, 10% LTOR
 FLOR, FNT BLSHWT O FLOR,
 IMMED STRMG CUT, BRIYL RNG

END OF VERTICAL LOG @ 6800'
 MD ON 7/2/13, CONTINUED ON
 HORIZONTAL LOG



CG 2731u

3350

TG, C1-C4

3150