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## Customer Information

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

**Geologist:** Cassidy Miller  
Noble Energy Inc

## Mud Logging Details

**Logger:** Ryan Bleess & Casey  
Sensecqua  
**Log Interval:** 2500' MD to 6850' MD  
**Start Date:** June 19, 2013  
**Release Date:** June 24, 2013

## Well Information

**Well Name:** Wells Ranch AE05-67-1HN

**Location:** 6-6N-62W  
1374' FNL, 65' FEL

**County:** Weld  
**State:** Colorado

**Drilling Rig:** H&P 321  
**Total Depth:** 11115' MD  
**TD Date:** June, 24, 2013  
**Formation:** Niobrara B Chalk  
**KB Elevation:** 4963'  
**GR Elevation:** 4933'  
**API Number:** 05-123-36978

## ROCK TYPES

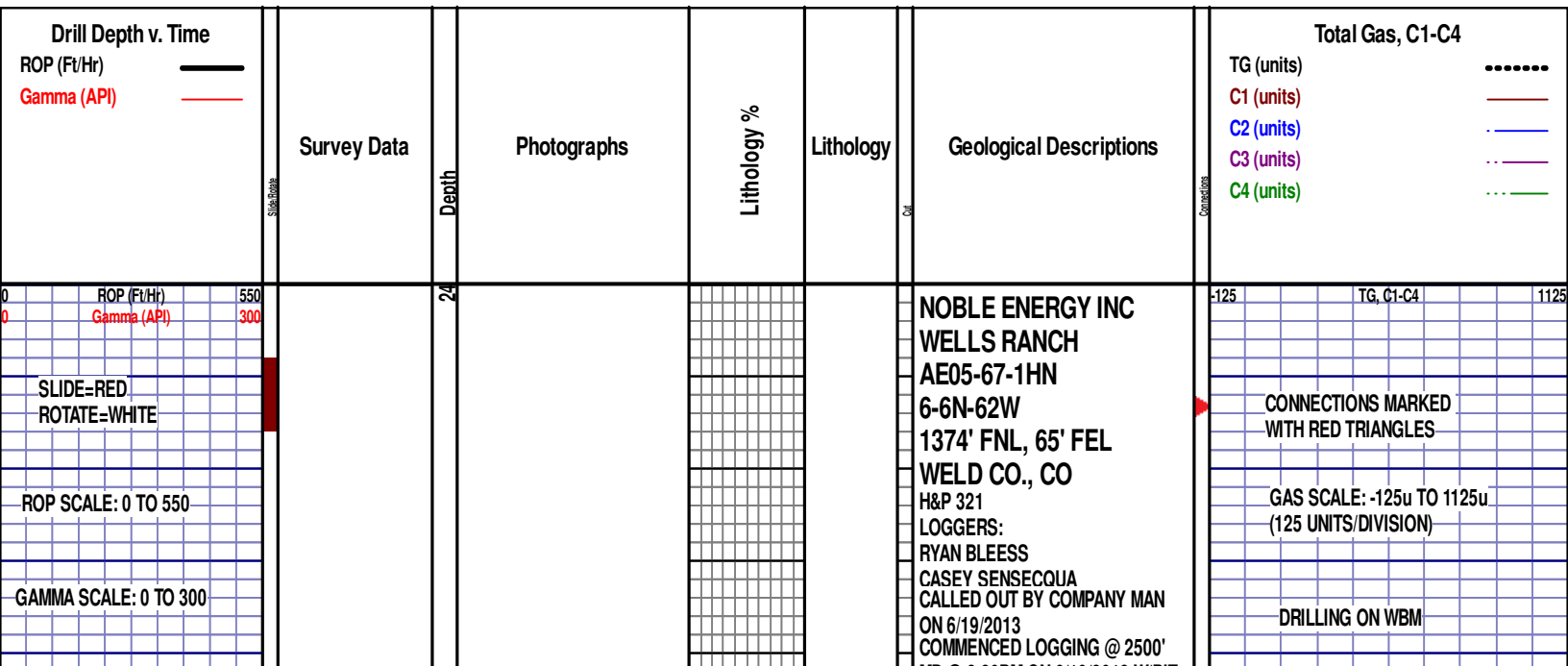
Anhy  
 Bent  
 Brec  
 Cht  
 Clyst  
 Coal  
 Congl

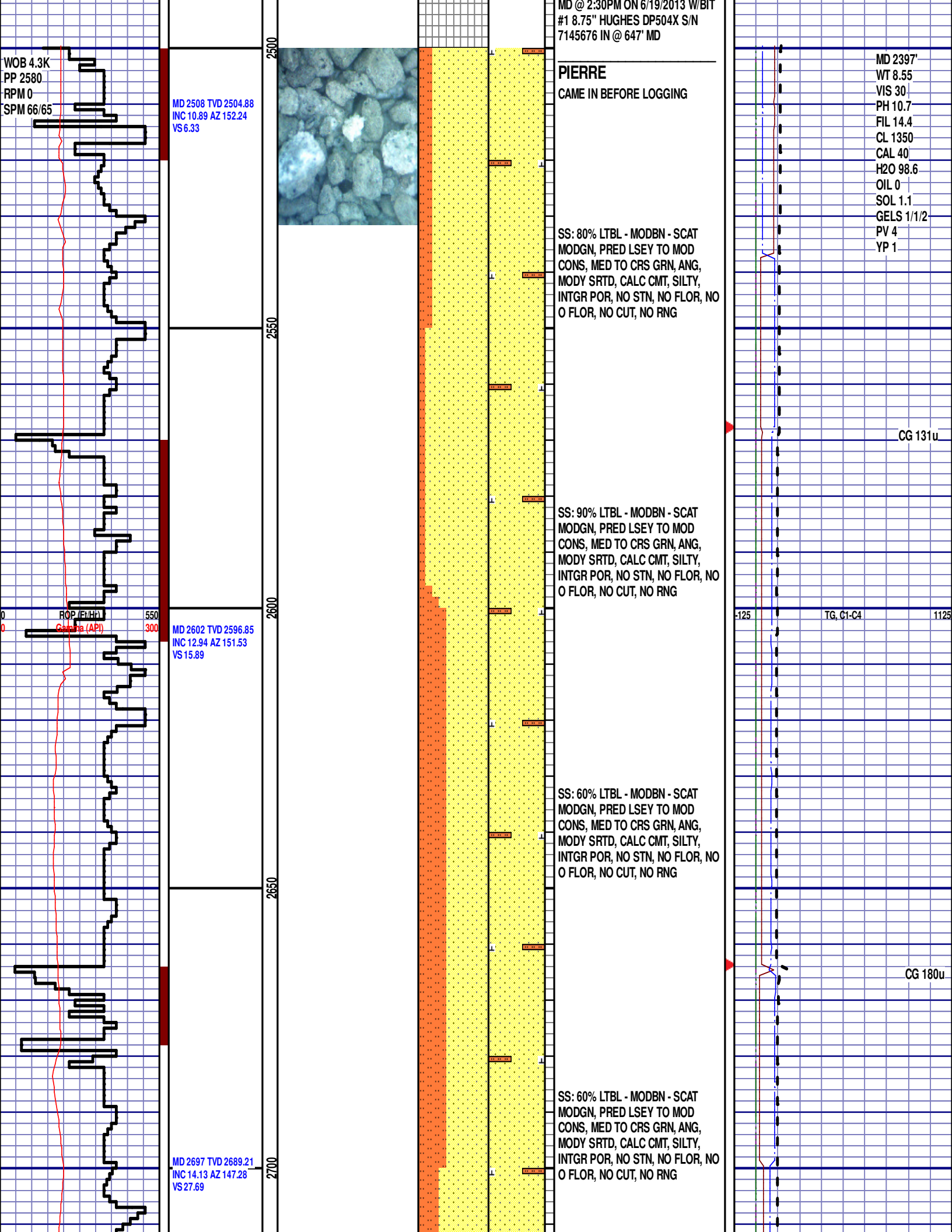
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 Mrlst

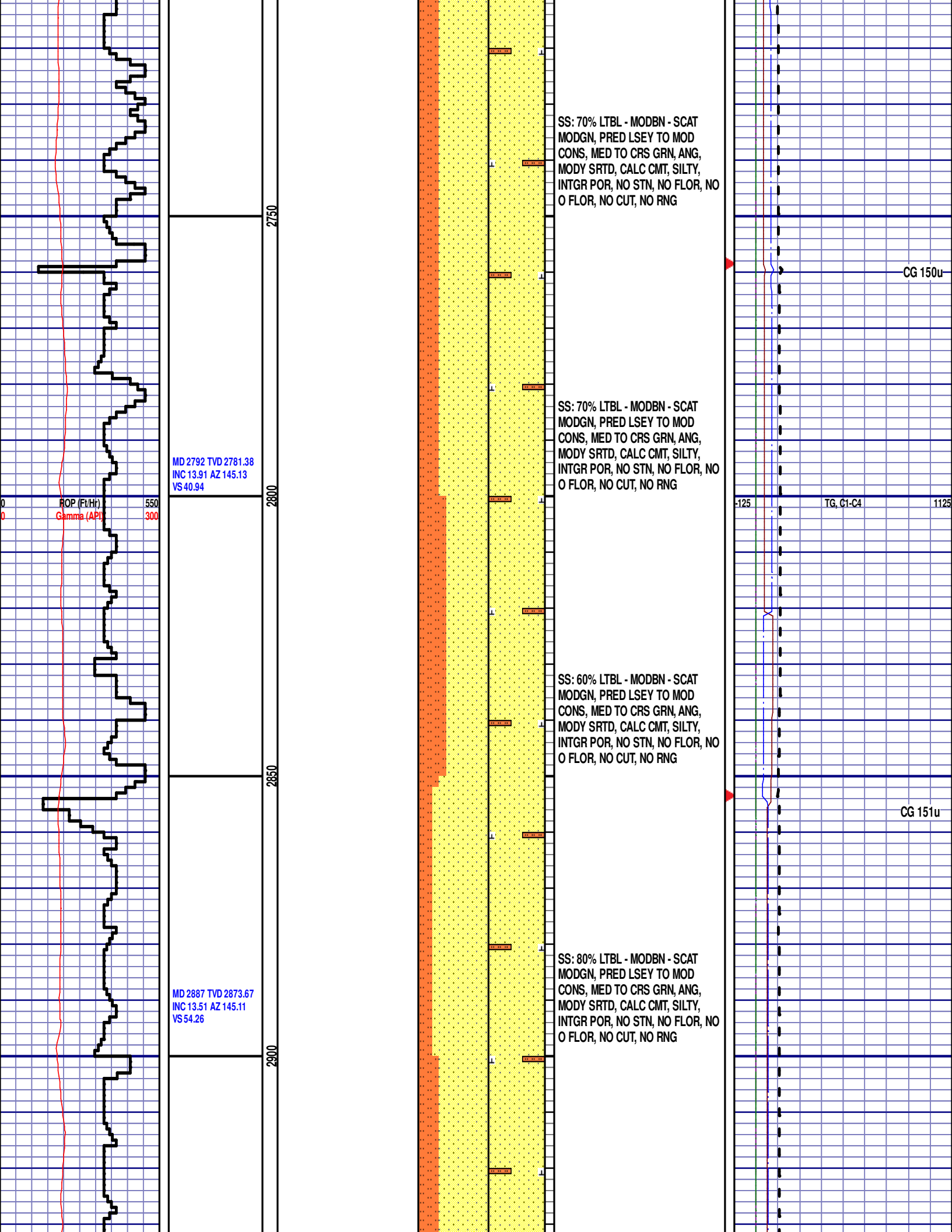
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 Shale  
 Shcol  
 Siltysh  
 Siltst  
 Ss  
 Till

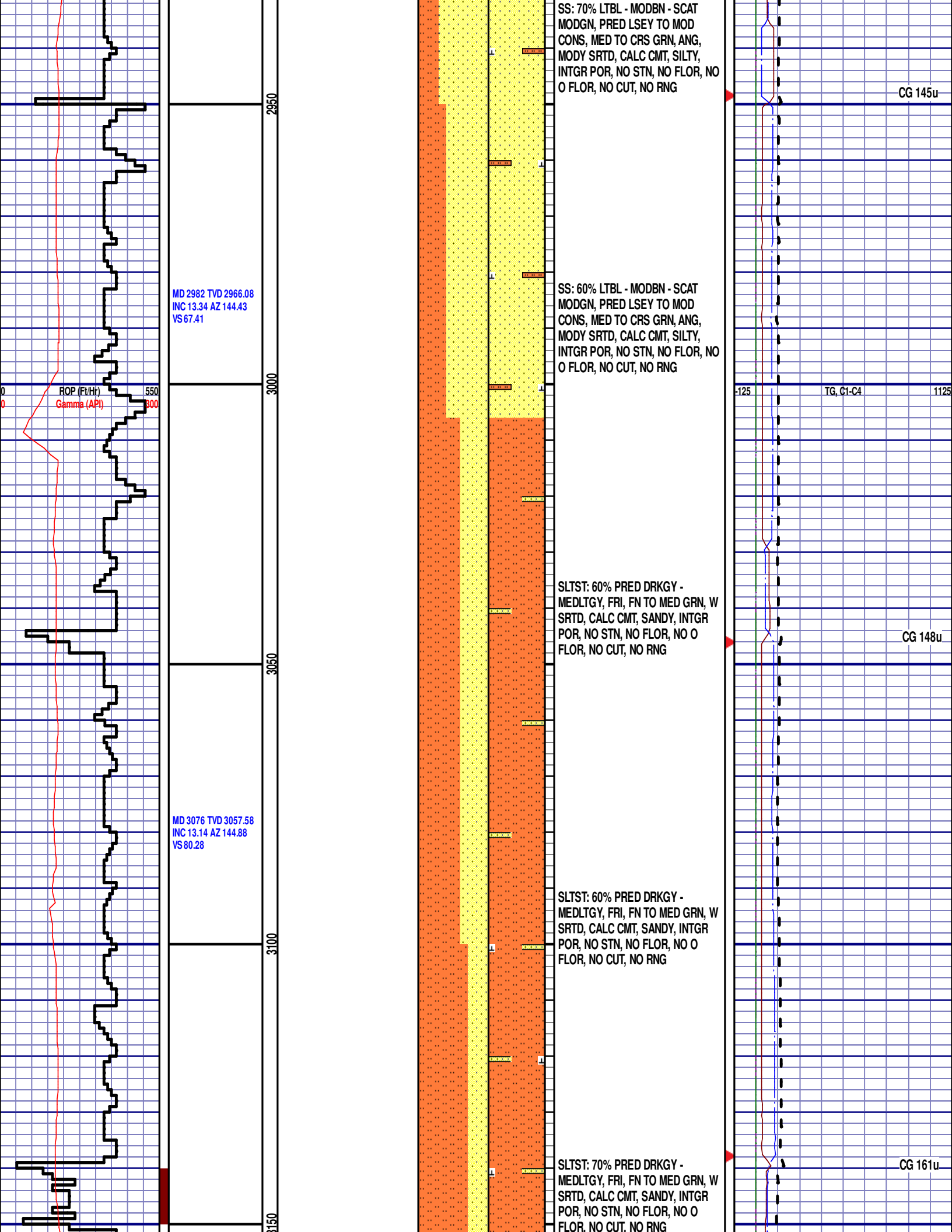
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 sdygw

hvycrbsh  
 nosmpl  
 Lsdetrst  
 sltst  
 sdy sh  
 Cement









MD 2982 TVD 2966.08  
INC 13.34 AZ 144.43  
VS 67.41

SS: 70% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, SILTY,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

CG 145u

SS: 60% LTBL - MODBN - SCAT  
MODGN, PRED LSEY TO MOD  
CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, SILTY,  
INTGR POR, NO STN, NO FLOR, NO  
O FLOR, NO CUT, NO RNG

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

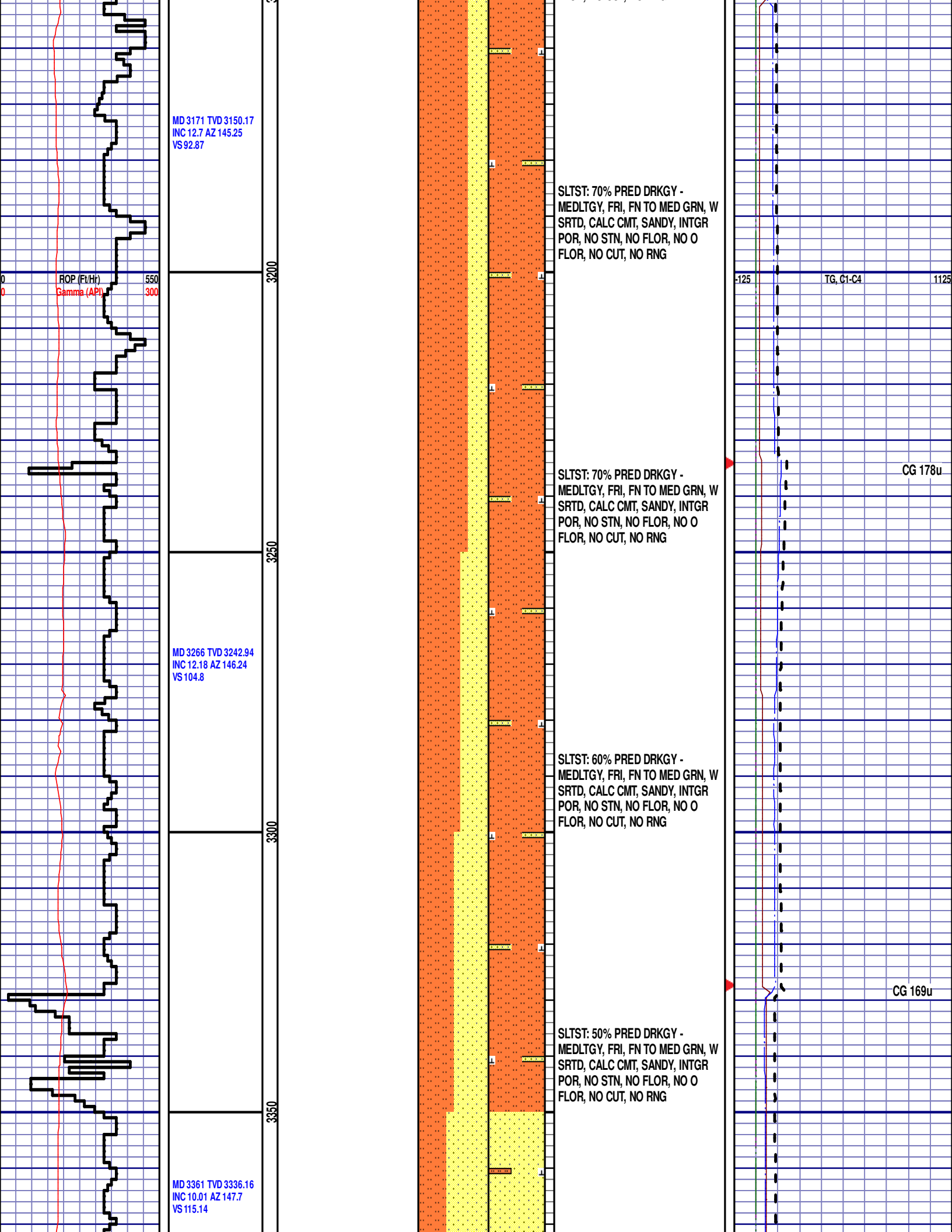
CG 148u

MD 3076 TVD 3057.58  
INC 13.14 AZ 144.88  
VS 80.28

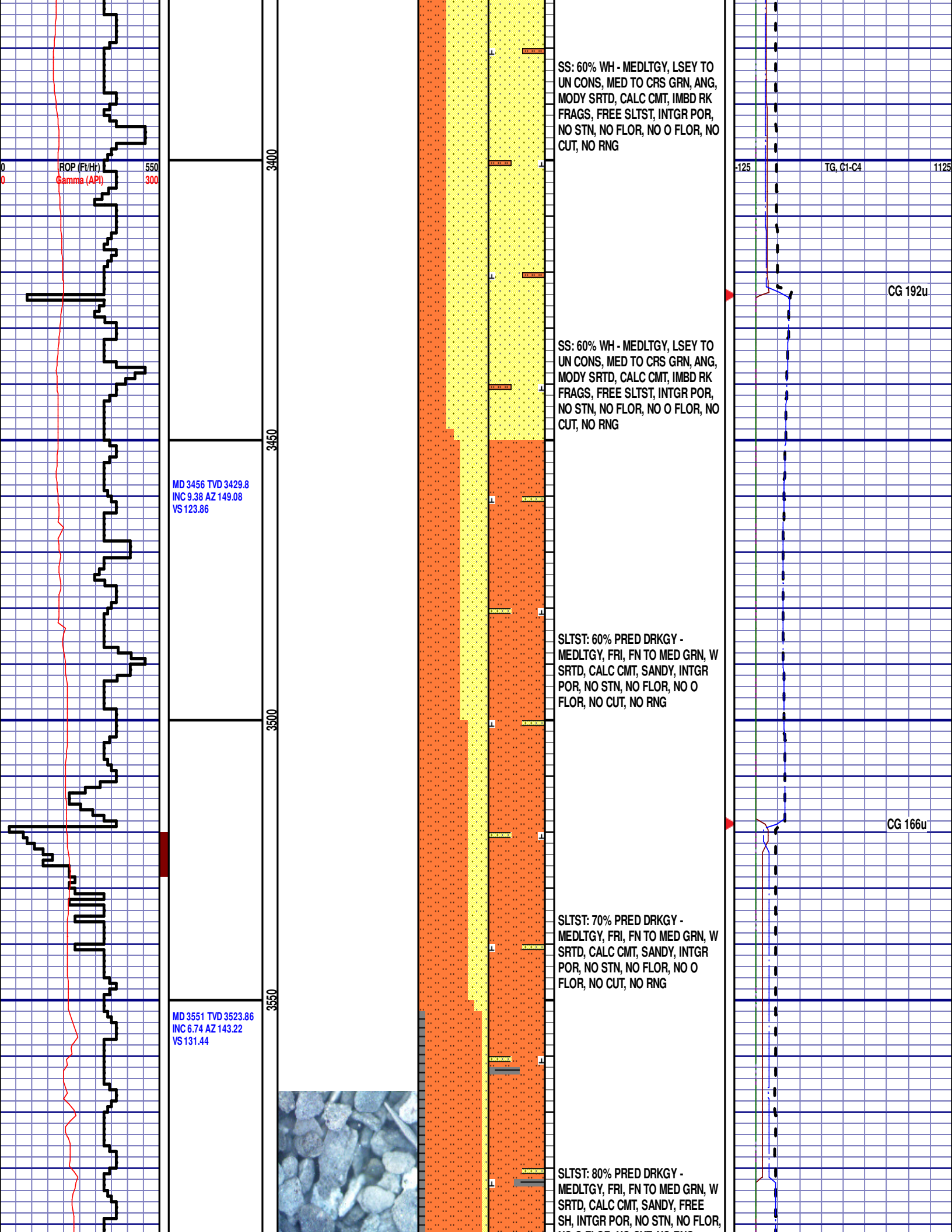
SLTST: 60% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

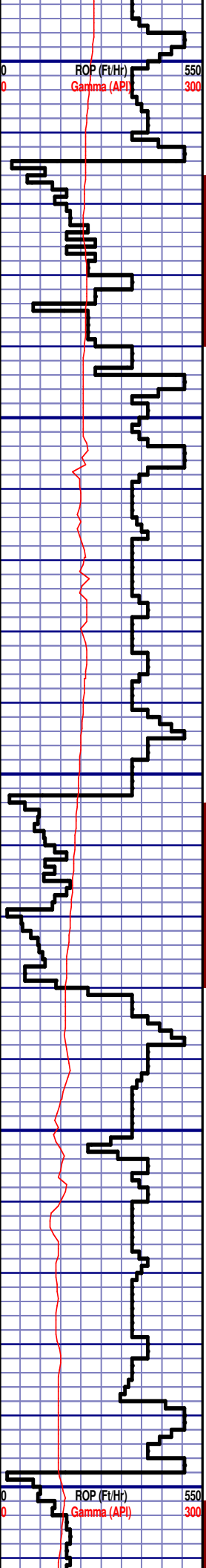
SLTST: 70% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO RNG

CG 161u



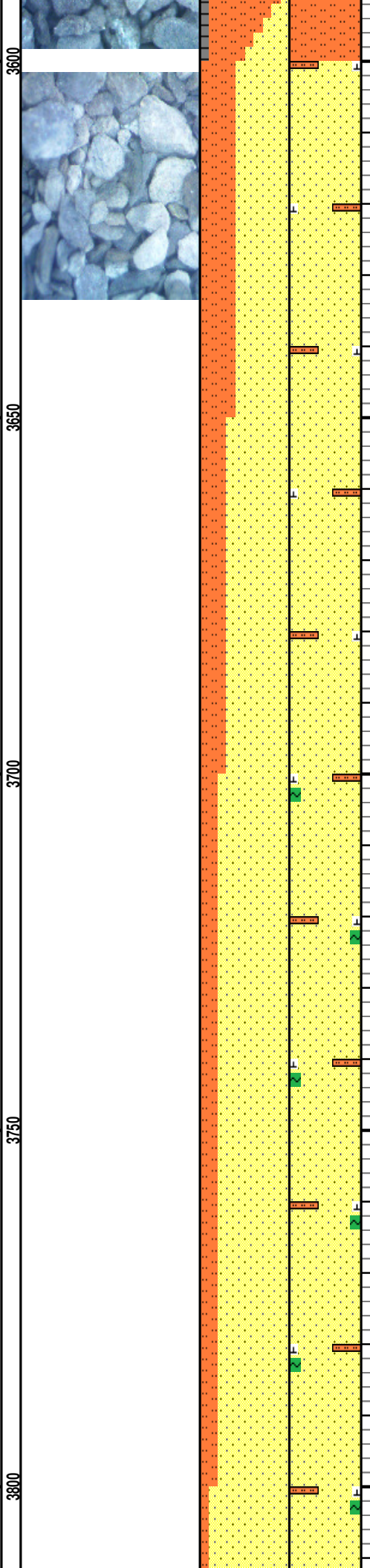






MD 3646 TVD 3618.37  
INC 4.81 AZ 144.3  
VS 137.28

MD 3741 TVD 3713.09  
INC 4.07 AZ 139.49  
VS 141.93



NO O FLOR, NO CUT, NO RNG

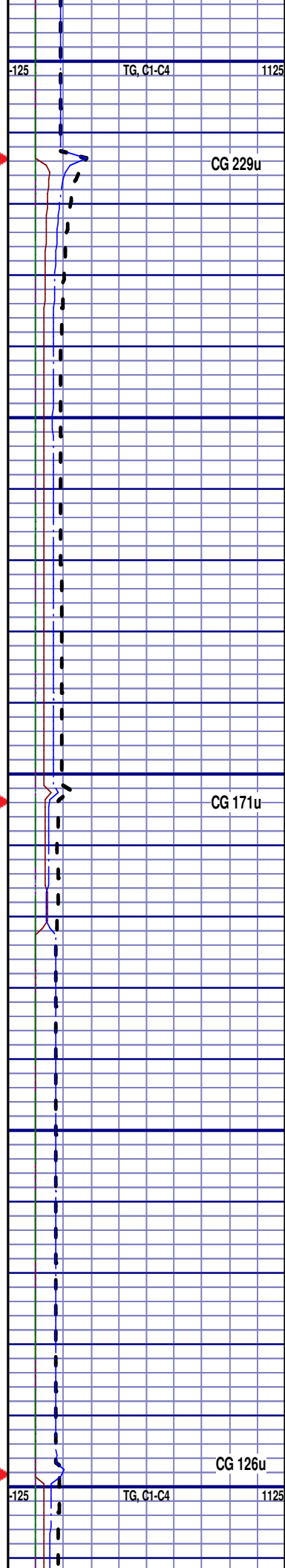
**PARKMAN**  
3600' MD 3573' TVD

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

SS: 70% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 80% WH - MEDLTGY, UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

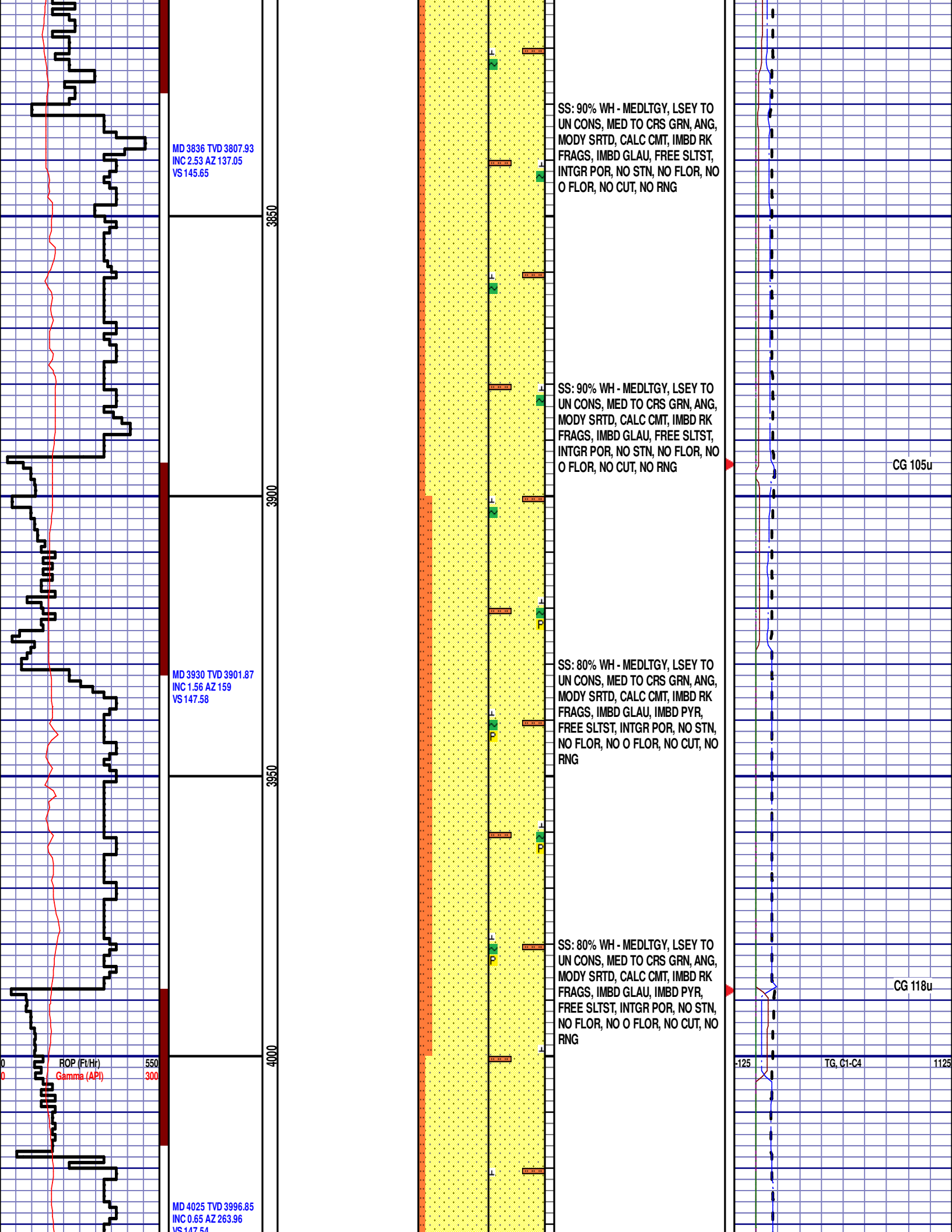
SS: 80% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG



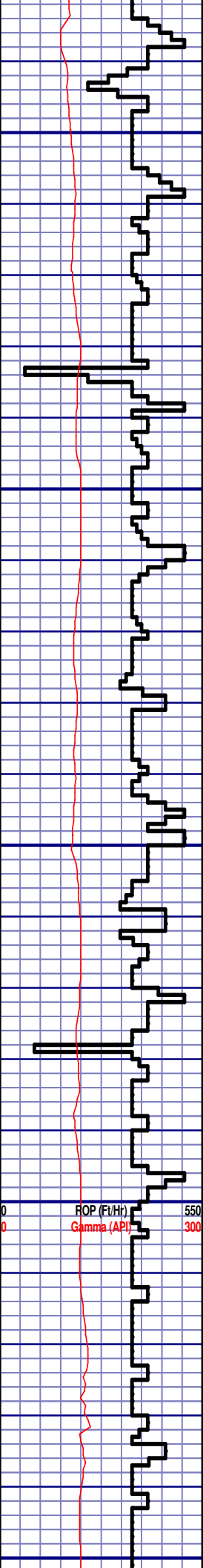
CG 229u

CG 171u

CG 126u





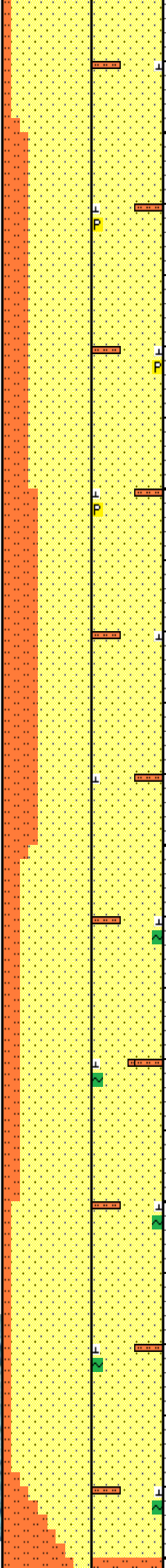
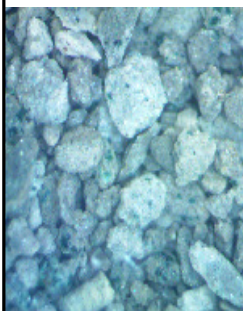


VS 147.54

MD 4120 TVD 4091.85  
INC 0.66 AZ 261.83  
VS 146.48

MD 4215 TVD 4186.84  
INC 0.62 AZ 215.22  
VS 145.65

4050  
4100  
4150  
4200  
4250



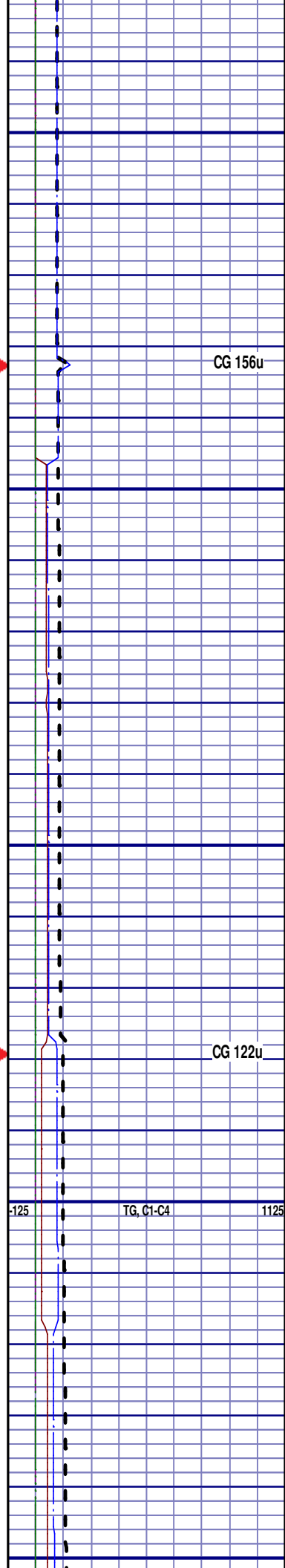
SS: 90% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 70% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD PYR, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

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

SS: 80% MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG

SS: 90% WH - MEDLTGY, LSEY TO UN CONS, MED TO CRS GRN, ANG, MODY SRTD, CALC CMT, IMBD RK FRAGS, IMBD GLAU, FREE SLTST, INTGR POR, NO STN, NO FLOR, NO O FLOR, NO CUT, NO RNG



-125 TG, C1-C4 1125

SUSSEX

4250' MD 4222' TVD

CG 143u

SLTST: 80% PRED DRKGY -  
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 4310 TVD 4281.84  
INC 0.94 AZ 293.98  
VS 144.64

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

CG 128u

SLTST: 70% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO

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

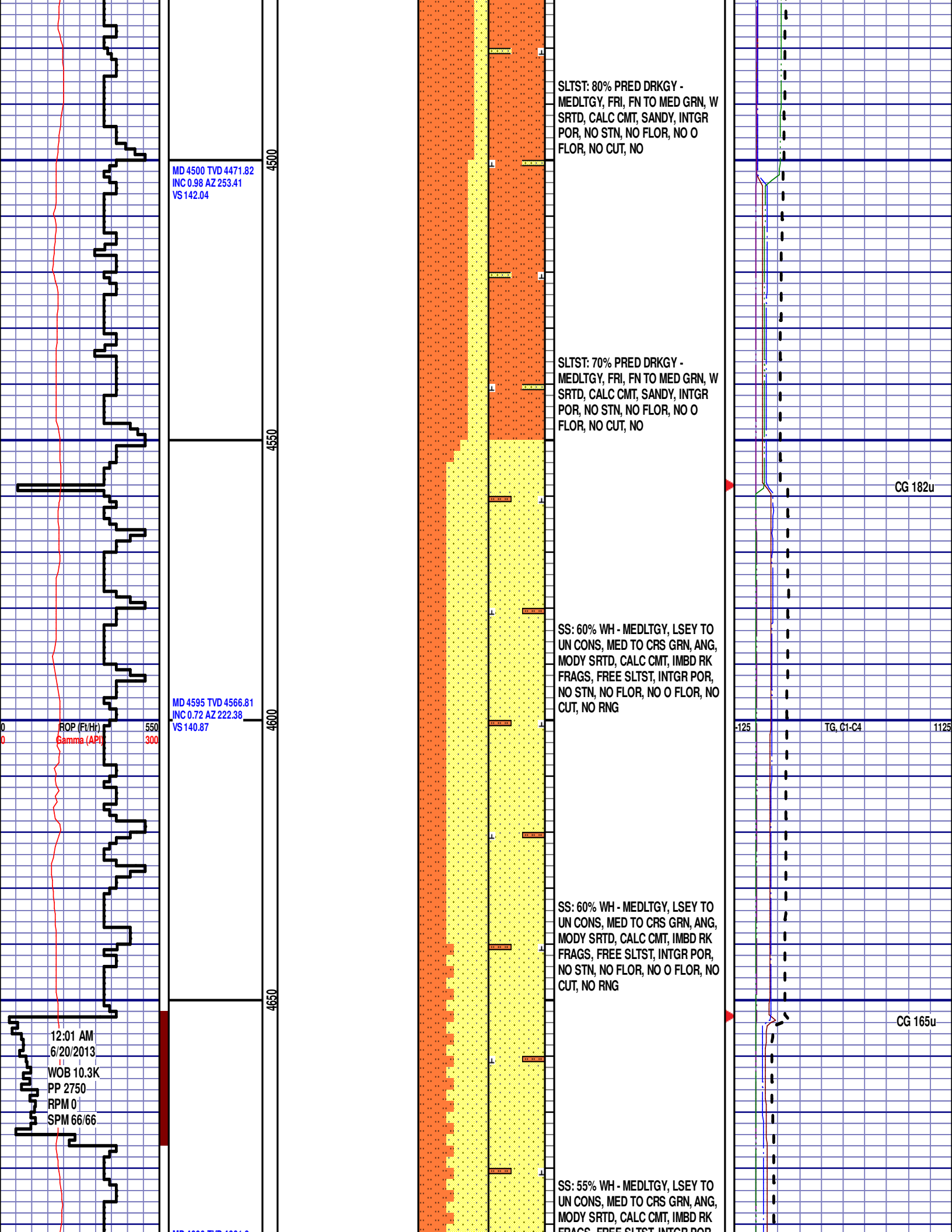
MD 4405 TVD 4376.83  
INC 0.67 AZ 274.12  
VS 143.37

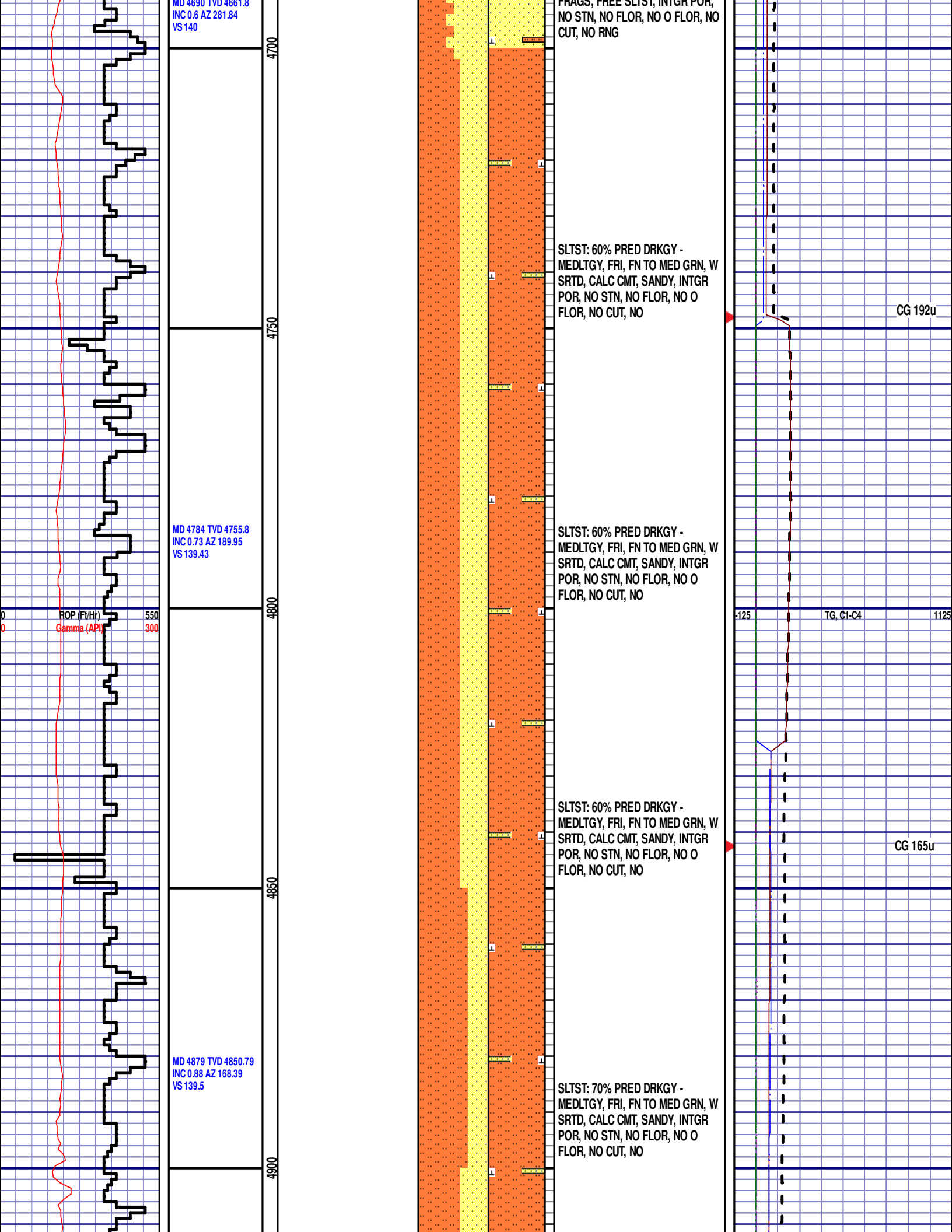
ROP (Ft/Hr) 550  
Gamma (API) 300

-125 TG, C1-C4 1125

CG 395u







MD 4690 TVD 4661.8  
INC 0.6 AZ 281.84  
VS 140

4700

MD 4784 TVD 4755.8  
INC 0.73 AZ 189.95  
VS 139.43

4750

4800

MD 4879 TVD 4850.79  
INC 0.88 AZ 168.39  
VS 139.5

4850

4900

FRAGS, FREE SLTST, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

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

CG 192u

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

-125

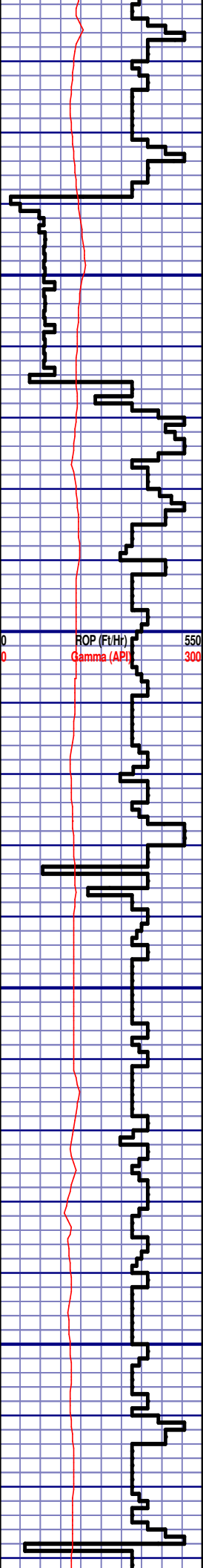
TG, C1-C4

1125

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

CG 165u

SLTST: 70% PRED DRKGY -  
MEDLTGY, FRI, FN TO MED GRN, W  
SRTD, CALC CMT, SANDY, INTGR  
POR, NO STN, NO FLOR, NO O  
FLOR, NO CUT, NO



MD 4974 TVD 4945.78  
INC 0.68 AZ 81.38  
VS 140.22

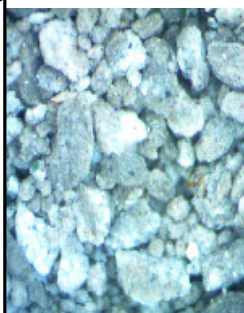
4950

5000

5050

5100

MD 5069 TVD 5040.77  
INC 0.79 AZ 35.22  
VS 141.14



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

SS: 50% WH - MEDLTGY, LSEY TO  
UN CONS, MED TO CRS GRN, ANG,  
MODY SRTD, CALC CMT, IMBD RK  
FRAGS, FREE SLTST, INTGR POR,  
NO STN, NO FLOR, NO O FLOR, NO  
CUT, NO RNG

## SHANNON

5000' MD 4972' TVD

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

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

CG 231u

-125

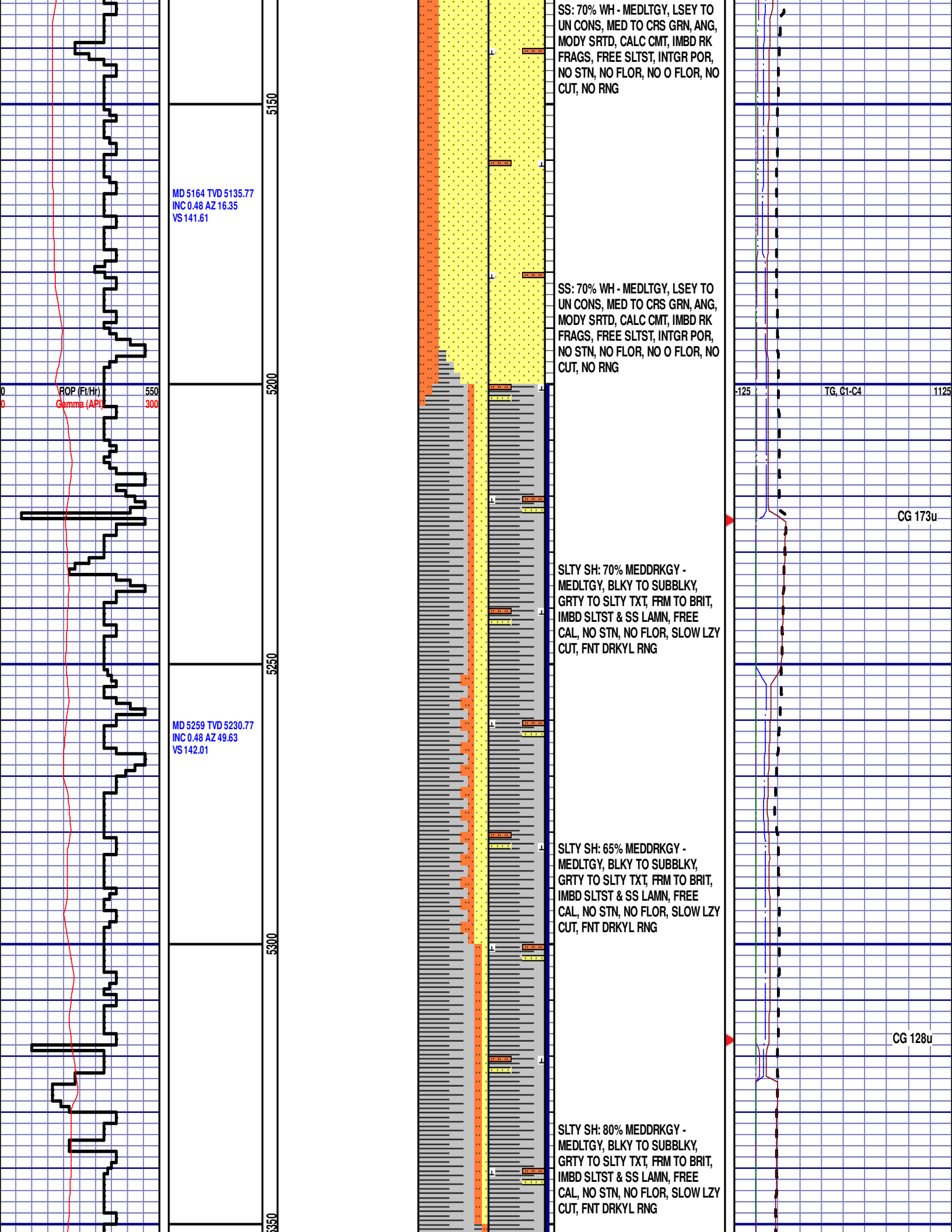
TG, C1-C4

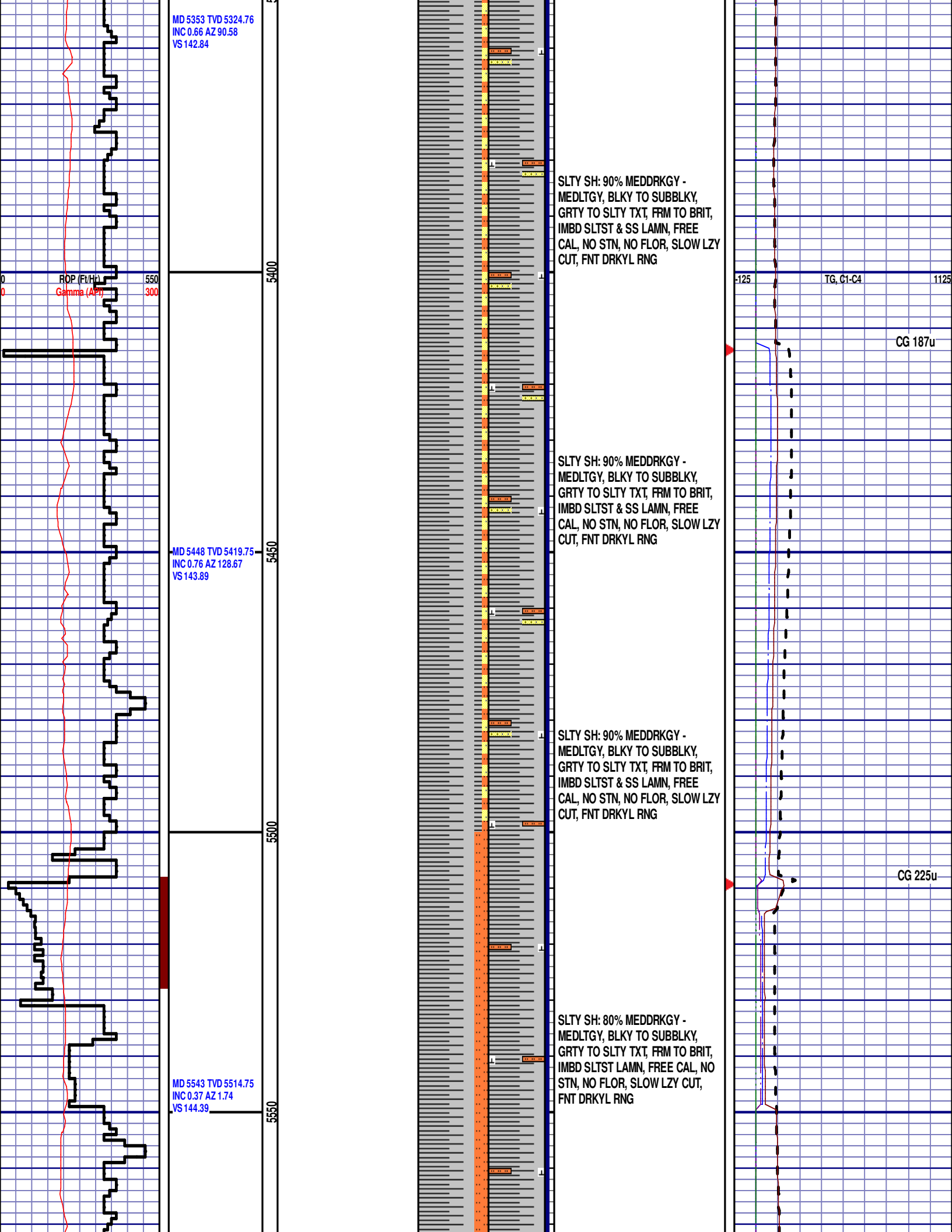
1125

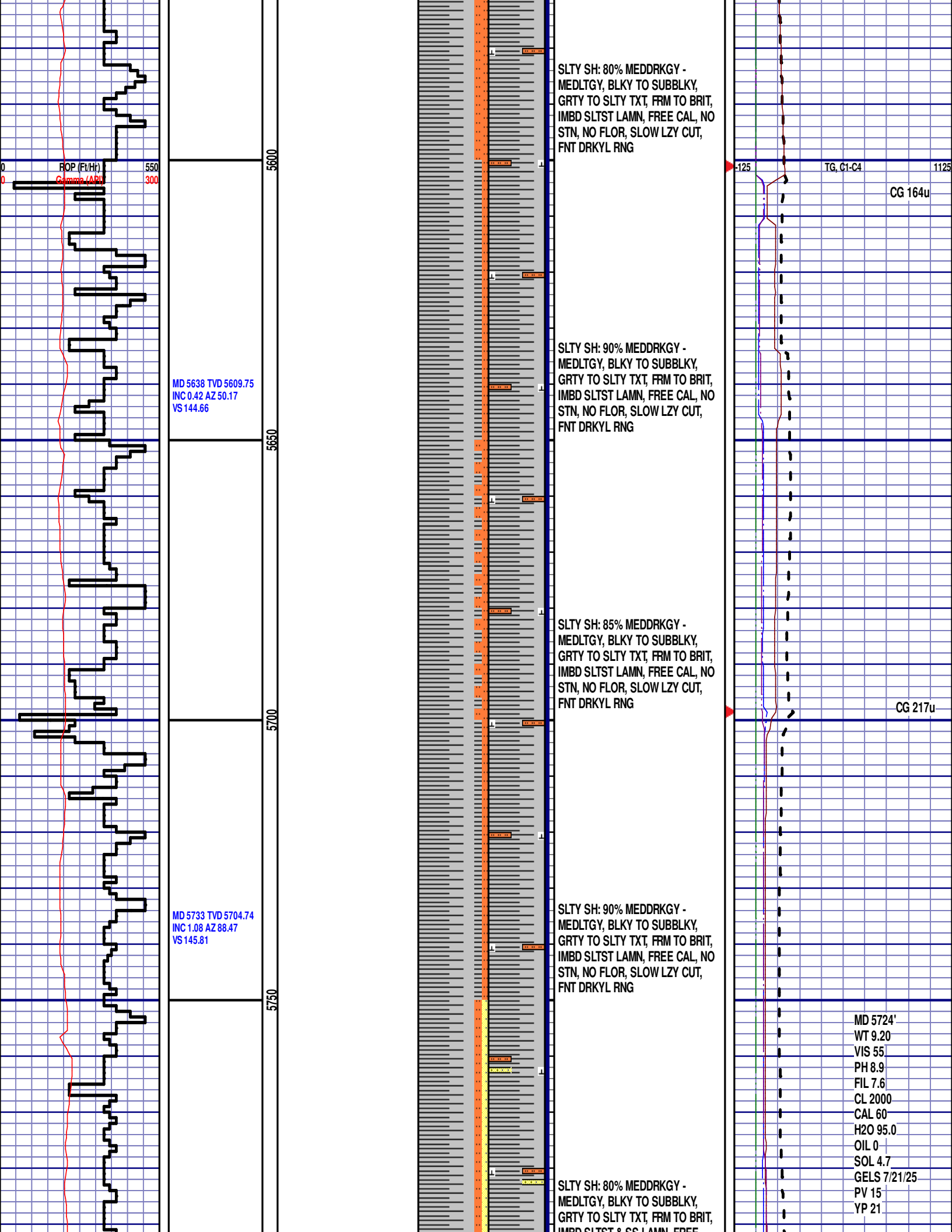
CG 187u

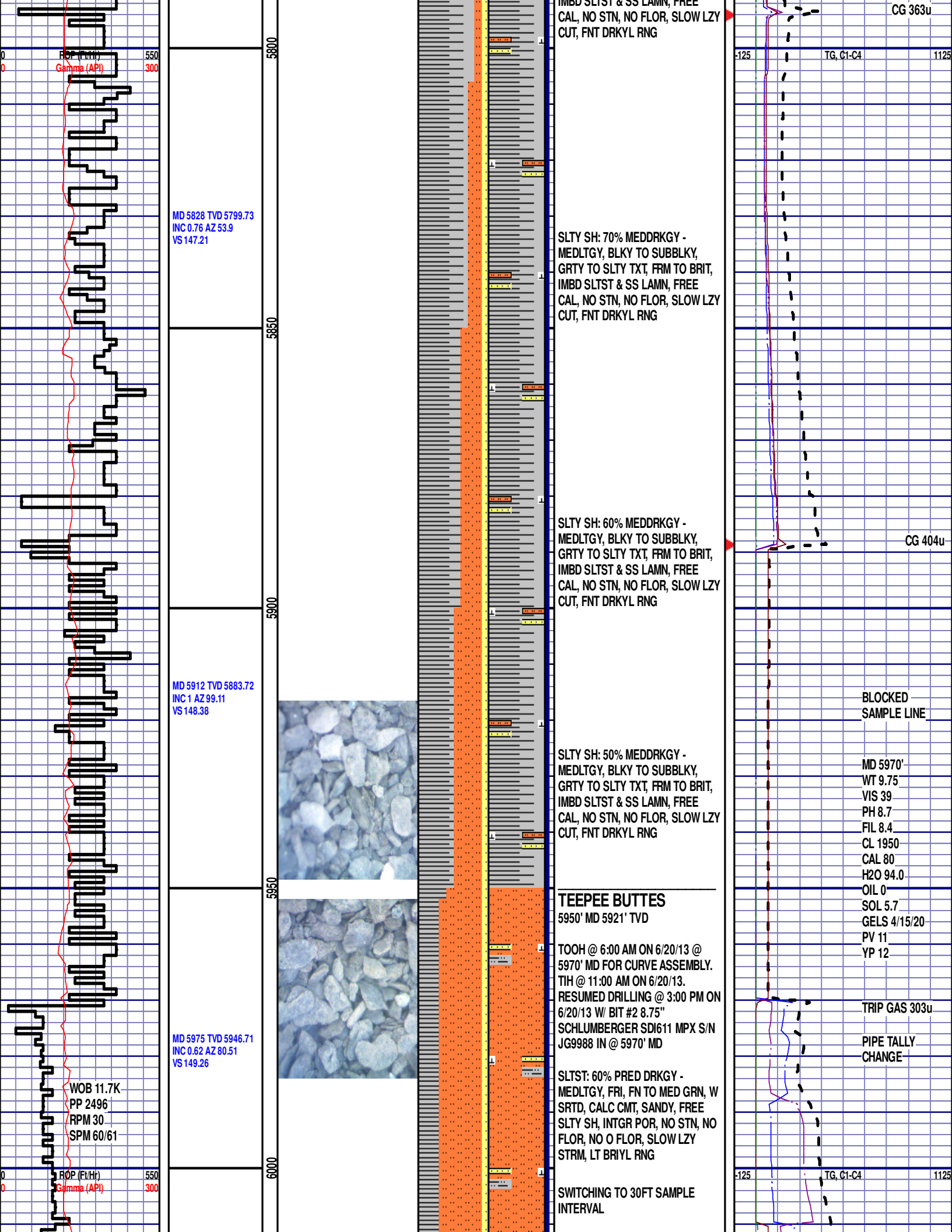
CG 215u

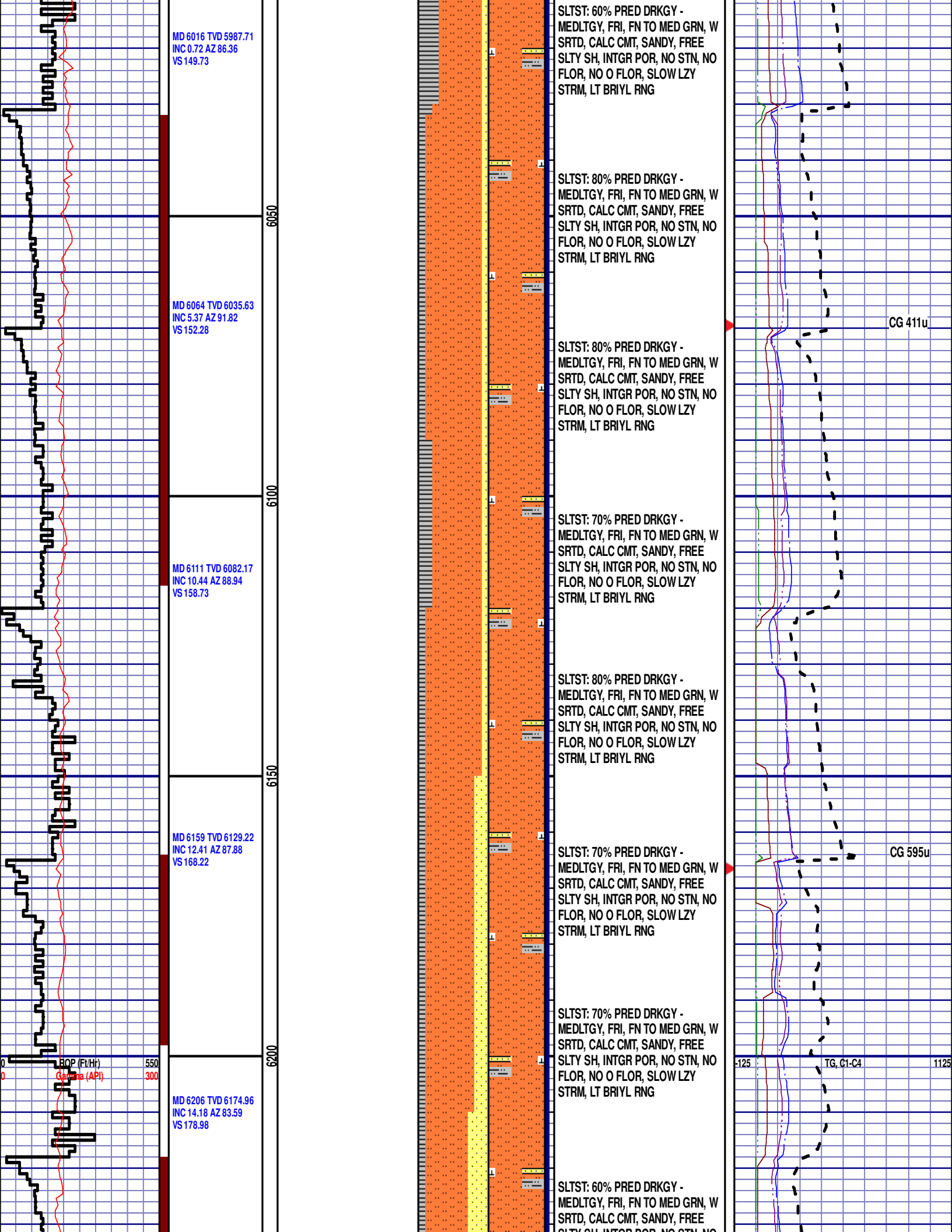




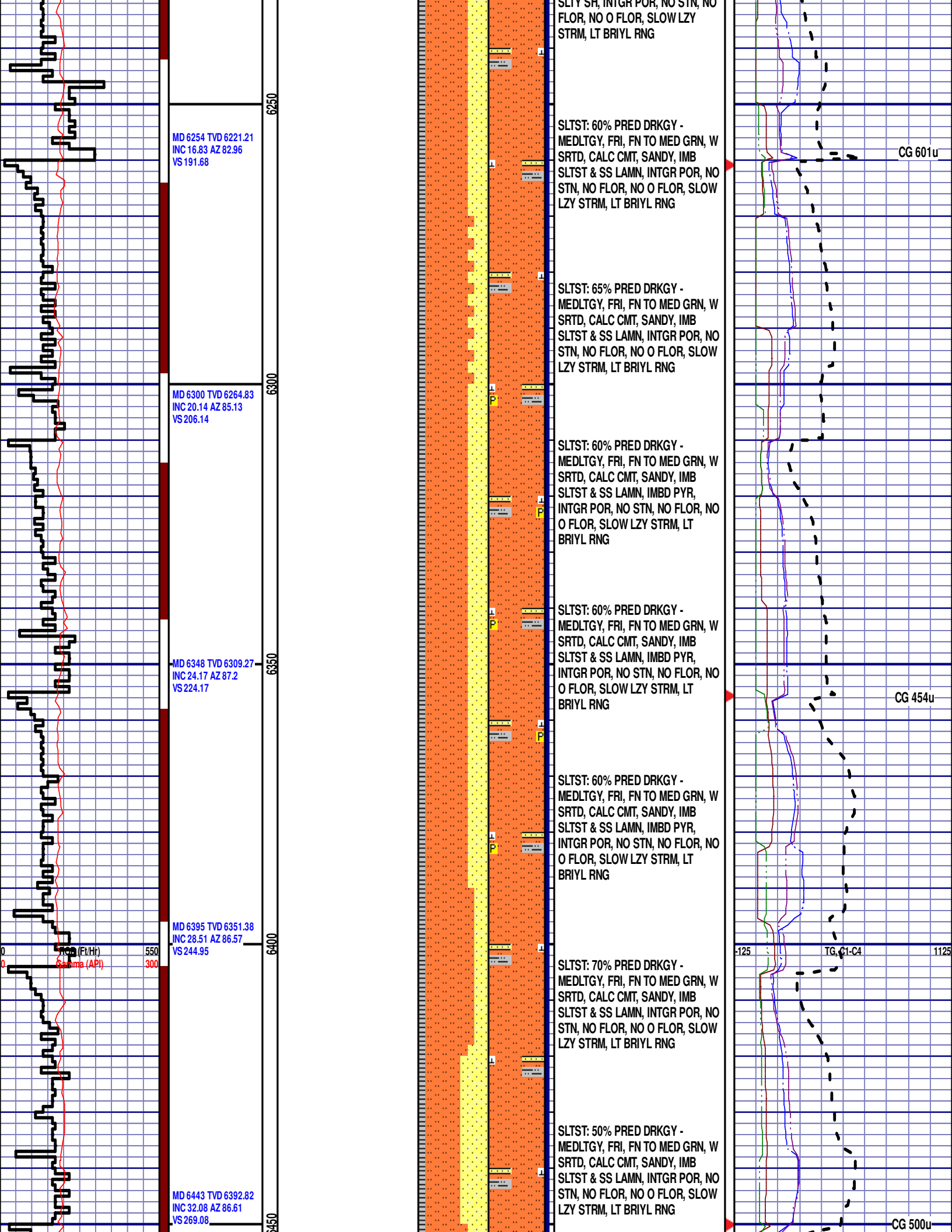


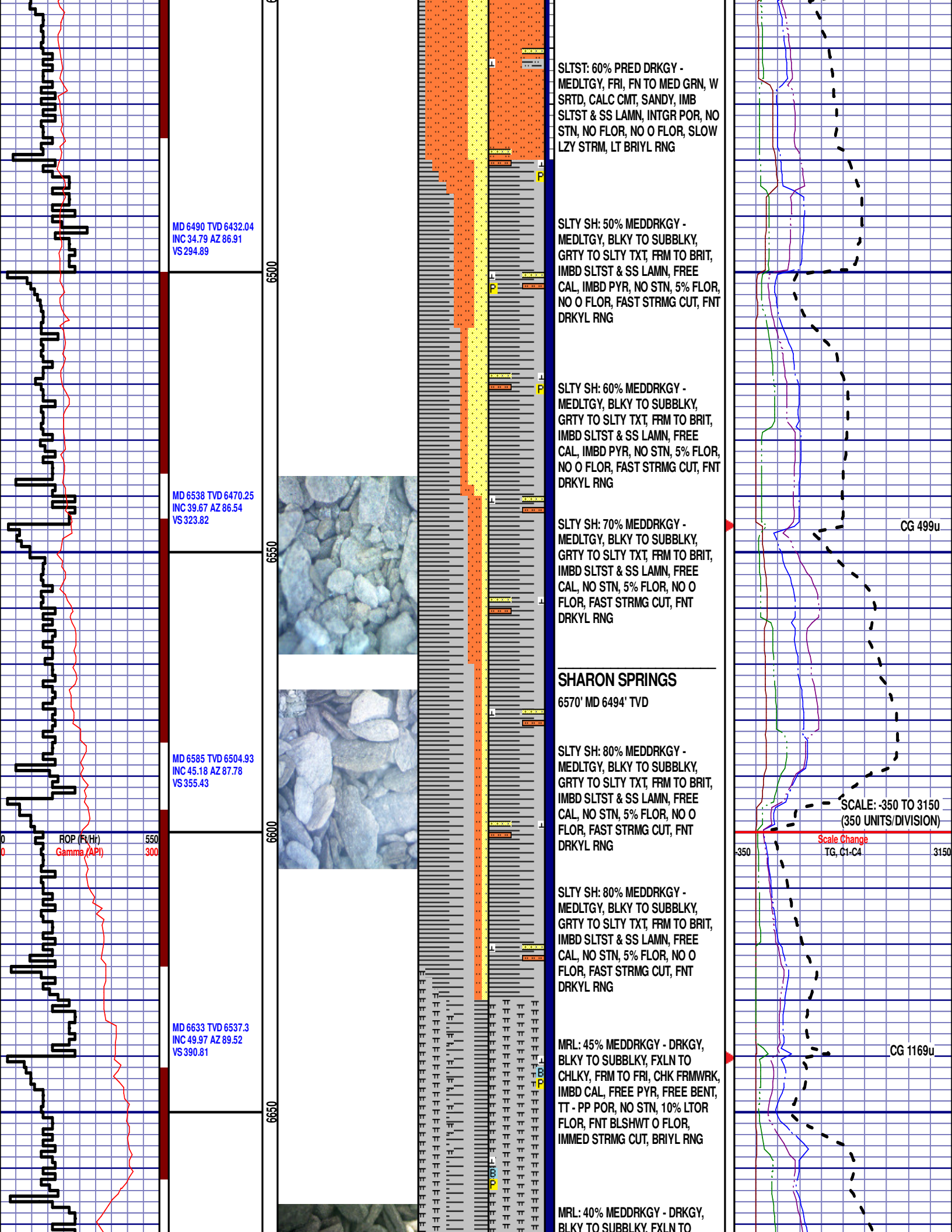


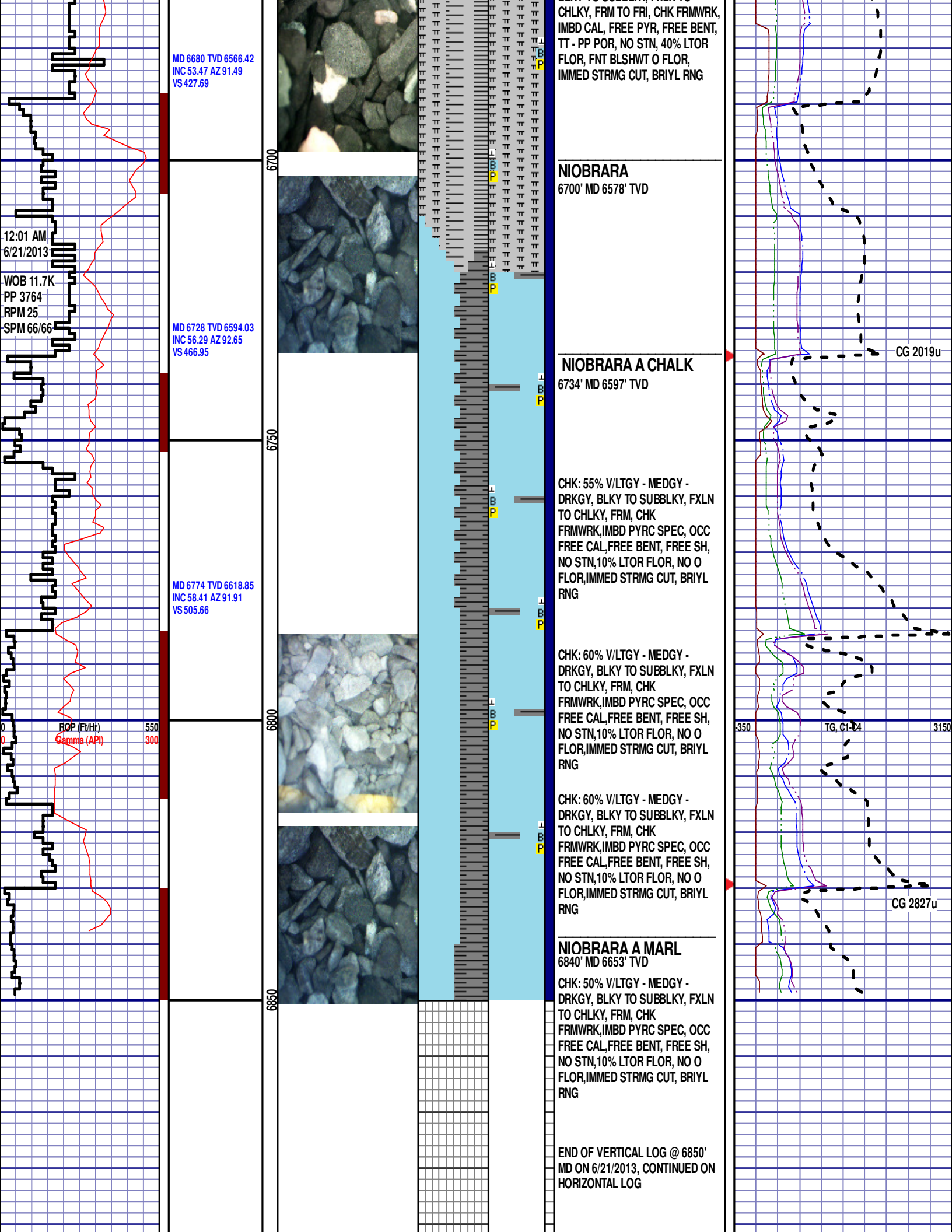



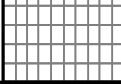

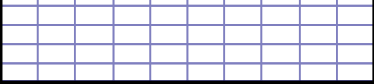










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