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Customer Information

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

Geologist: Holly Duncan
Noble Energy Inc.

Mud Logging Details

Logger: Casey Sensecqua &
Tom Wacholz

Log Interval: 2500' MD to 6700' MD

Start Date: February 14, 2014

Release Date: February 20, 2014

Well Information

Well Name: Wells Ranch AA35-65-1BHNC

Location: 36-T6N-R63W
2041' FSL, 174' FWL

County: Weld
State: Colorado

Drilling Rig: H&P 343

Total Depth: 10946' MD

TD Date: February 20, 2014

Formation: Niobrara C Chalk

KB Elevation: 4798'

GR Elevation: 4774'

API Number: 05-123-38661-0000

ROCK TYPES

shale
Anhy
Bent
Brec
Cht
Clyst
Coal

Congl
Dol
Gyp
Igne
Lmst
Meta
Mrlist

Salt
Shale
Shcol
Shgy
Sltst
Ss
Till

gw
lmywash
ogw
olmywash
oshly gw
shly gw
sdygw

hvyrcrbsh
nosmpl
Lsdetrst
sltst
sdy sh

LOGGING ON SHIFT	ROP (Ft/Hr) Gamma (API)	Drill Depth v. Time	Survey Data	Depth	Lithology	Lithology Percentages	Sample Photographs	Porosity	Geological Description	TG (1-8) C1 (units) C2 (units) C3 (units) C4 (units)	Total Gas, C1-C4	
	ROP (Ft/Hr) Gamma (API)	3000 250		24					NOBLE ENERGY INC WELLS RANCH AA35-65-1BHNC 36-T6N-R63W 2041' FSL, 174' FWL WELD CO., CO H&P 343 LOGGERS: CASEY SENSECQUA TOM WACHOLZ CALLED OUT BY COMPANY MAN ON 2/14/2014 COMMENCED LOGGING @ 2500' MD	75	TG, C1-C4	675
									CONNECTIONS ARE MARKED WITH RED TRIANGLES			
									GAS SCALE: -75u TO 675u (75 UNITS/DIVISION)			
									DRILLING ON WATER BASED MUD			

2/15/2014
DAY 02
0 FT/24HRS

TW

WOB 10.1K
PP 3197
RPM 85
SPM 66/67

ROP (Ft/Hr)
Gamma (API)

MD 2592 TVD 2589.5
INC 7.1 AZ 321.36
VS 40.41

MD 2687 TVD 2683.89
INC 5.84 AZ 321.5
VS 47.31

2500
2550
2600
2650
2700



PIERRE 2500' MD - 2600' MD

@ 2:00AM ON 2/15/2014 W/BIT # 2,
8.75", PDC SMITH, MDi516 (S/N)
JH0251 IN @ 625' MD

PIERRE

CAME IN BEFORE LOGGING
DEPTH

2500' MD-2600' MD: SLTST: 70% 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

2600' MD-2700' MD: 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

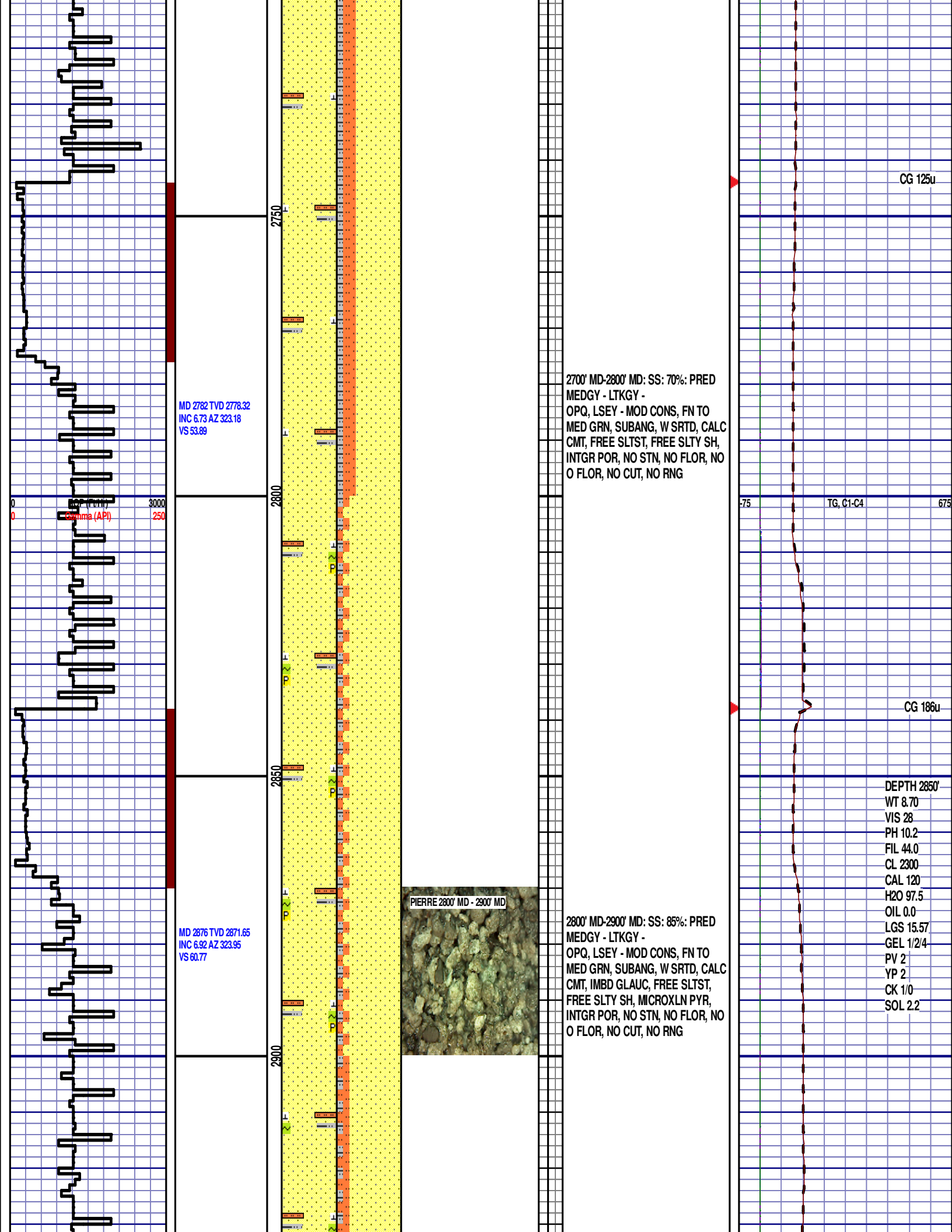
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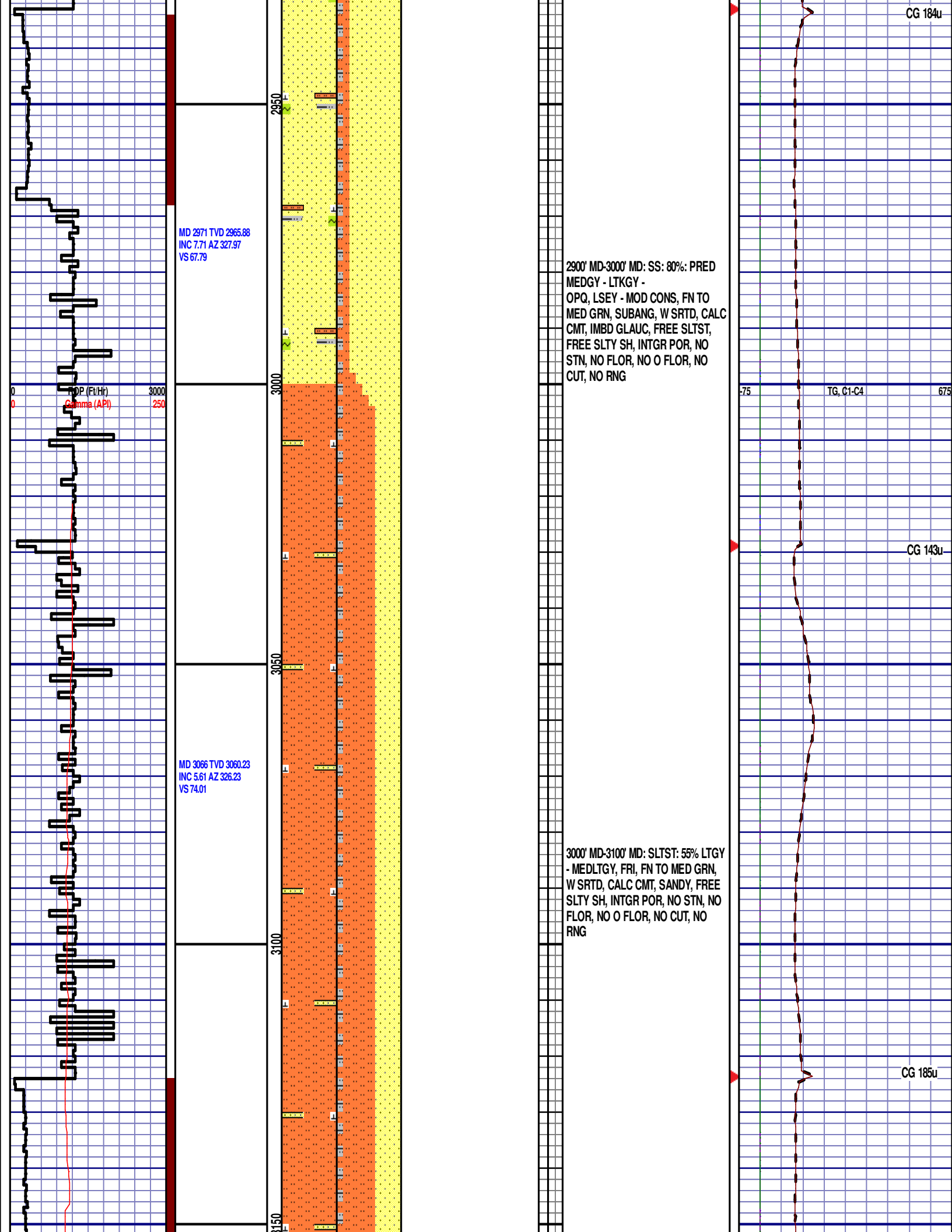
TG, C1-C4

675

CG 120u

CG 167u





MD 3160 TVD 3153.73
INC 6.3 AZ 325.65
VS 79.7

WOB 21.2K
PP 3366
RPM 85
SPM 61/61

ROP (Ft/Hr)
Gamma (API)

3000
250

MD 3254 TVD 3247.13
INC 6.65 AZ 325.98
VS 85.9

MD 3349 TVD 3341.51
INC 6.4 AZ 324.52
VS 92.29

PIERRE 3100' MD - 3200' MD



3100' MD-3200' MD: SLTST: 55% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, SANDY, FREE
SLTY SH, INTGR POR, NO STN, NO
FLOR, NO O FLOR, NO CUT, NO
RNG

3200' MD-3300' MD: SLTYSH: 70%
PRED MEDDRKGY, SUBSPLT, F TXT,
SFT, IMBD CALC, IMBD PYR, FREE
SLTST, TRC FREE SS, INTGR POR,
NO STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG

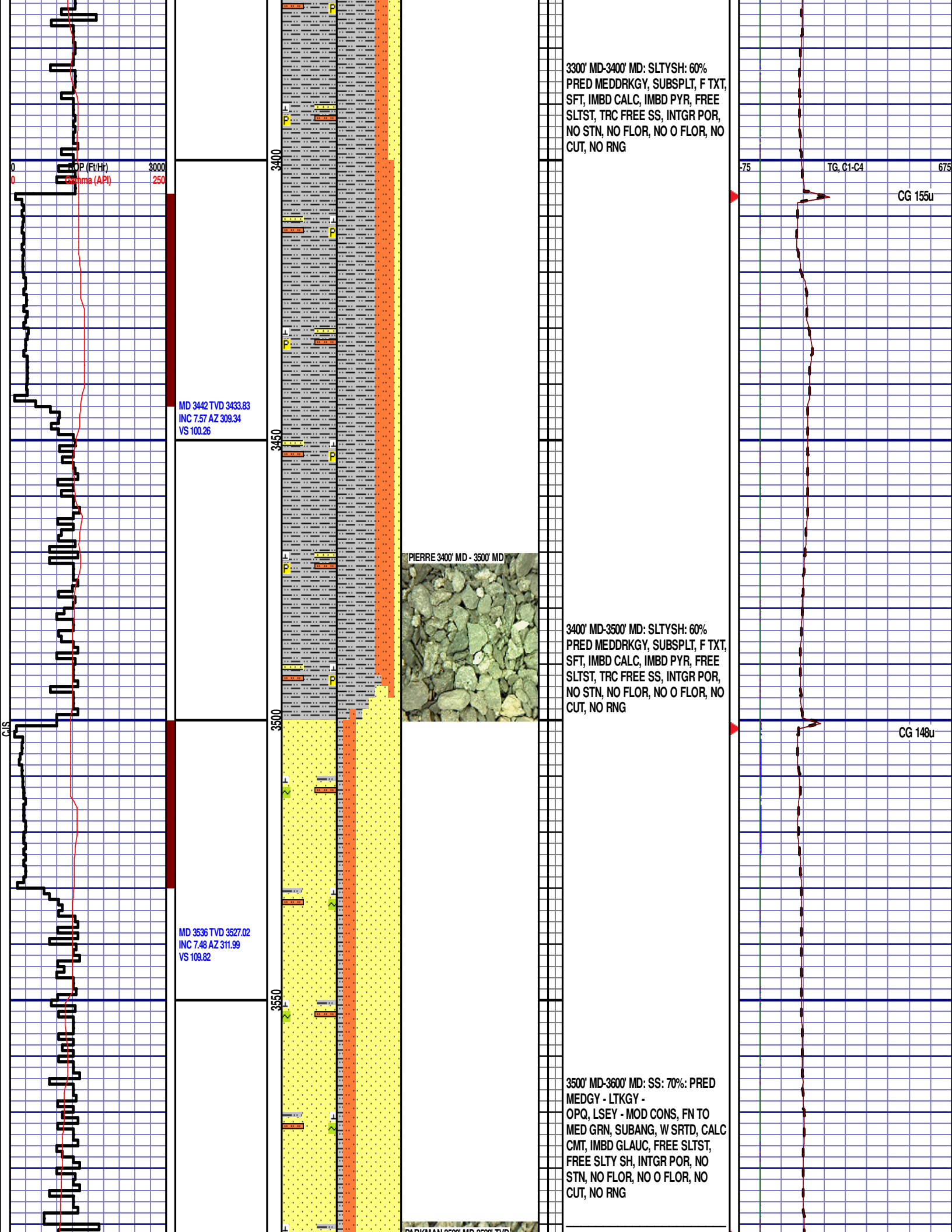
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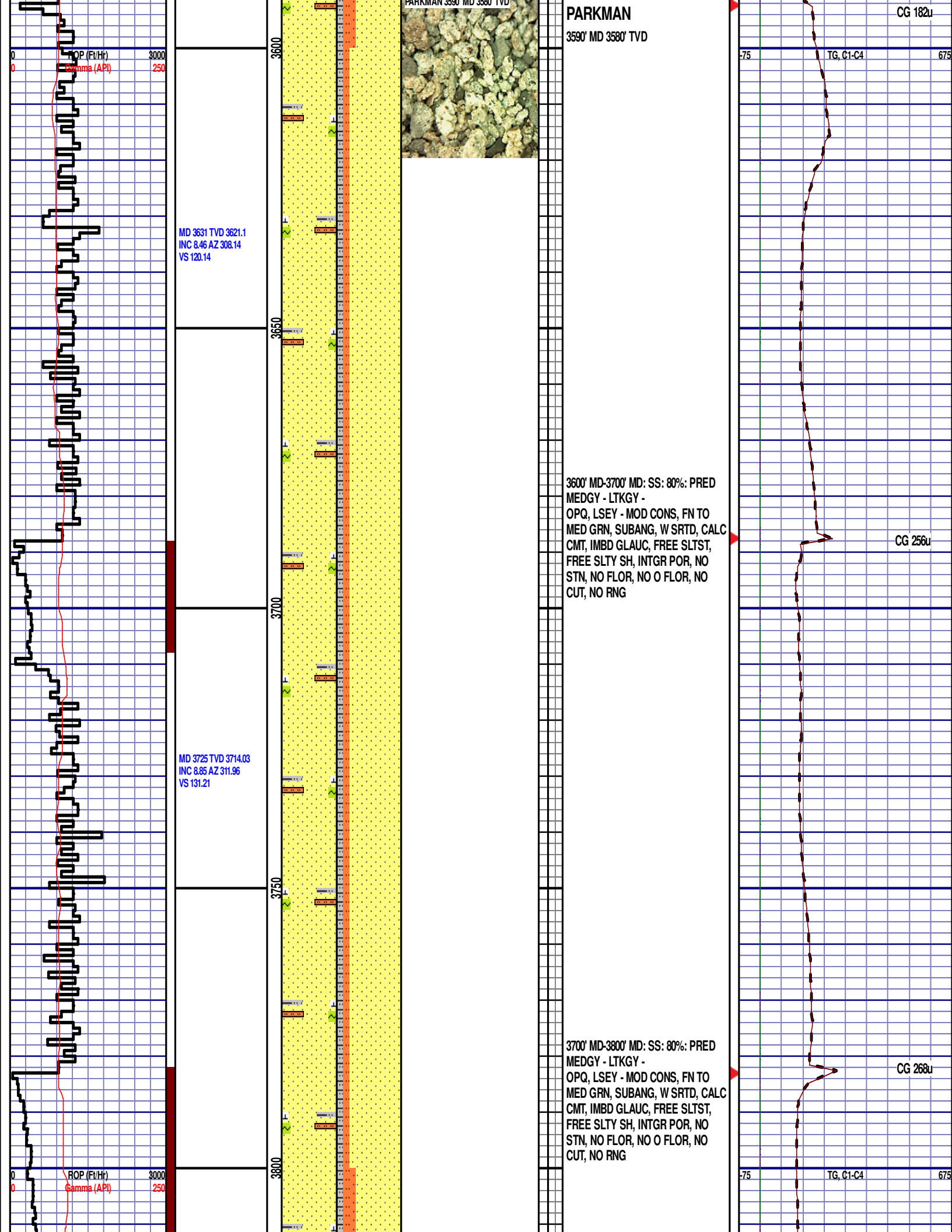
TG, C1-C4

675

CG 176u

CG 140u





MD 3819 TVD 3807.01
INC 8.06 AZ 317.82
VS 141.28

MD 3914 TVD 3901.35
INC 5.41 AZ 327.56
VS 148.4

MD 4007 TVD 3994.17
INC 1.42 AZ 332.12
VS 151.42

ROP (Ft/Hr)
Gamma (API)

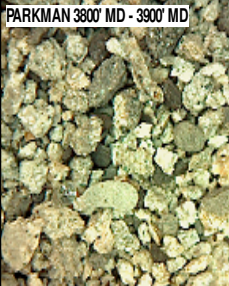
3000
250

3850

3900

3950

4000



PARKMAN 3800' MD - 3900' MD

3800' MD-3900' MD: SS: 70%: PRED
MEDGY - LTKGY -
OPQ, LSEY - MOD CONS, FN TO
MED GRN, SUBANG, W SRTD, CALC
CMT, IMBD GLAUC, FREE SLTST,
FREE SLTY SH, INTGR POR, NO
STN, NO FLOR, NO O FLOR, NO
CUT, NO RNG

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

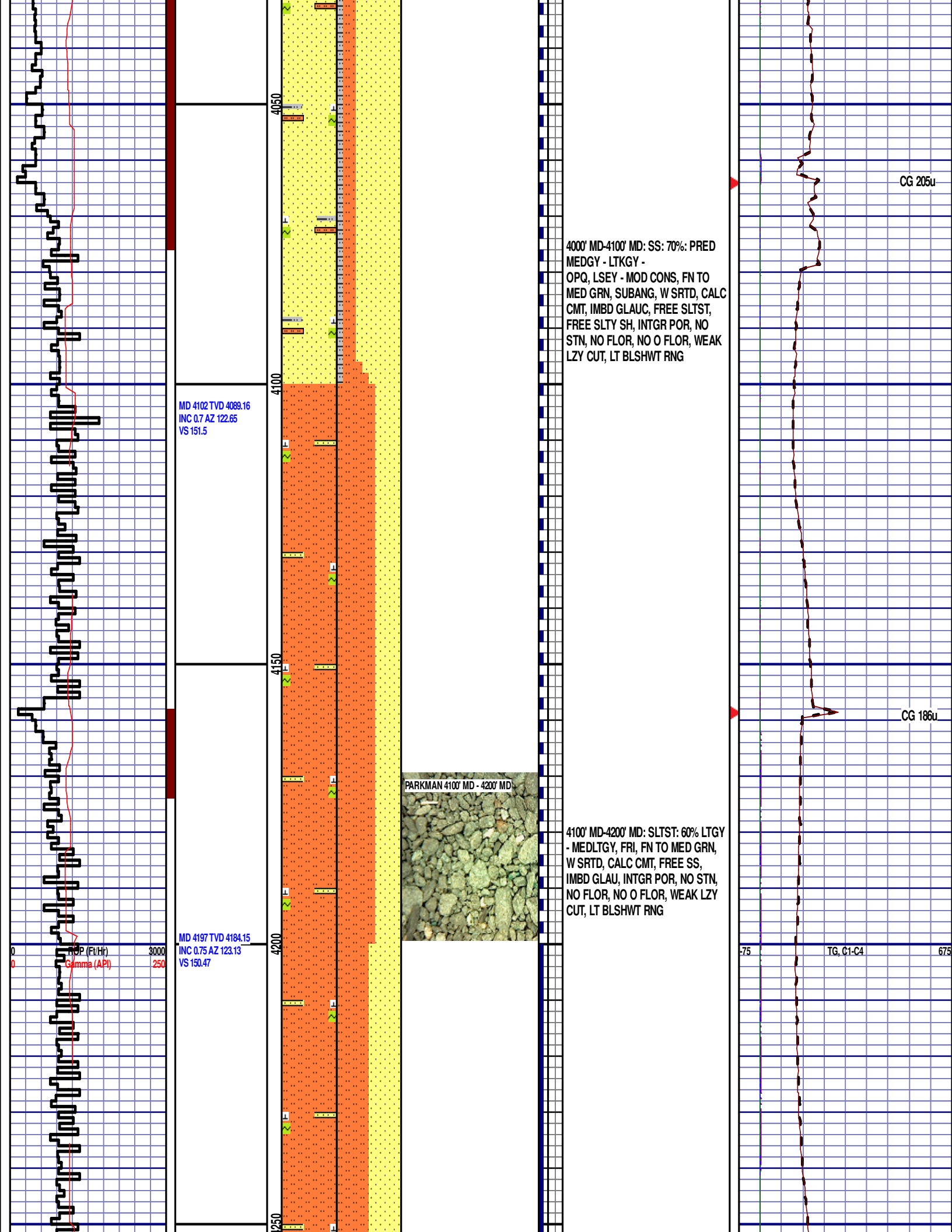
CG 306u

CG 213u

75

TG, C1-C4

675

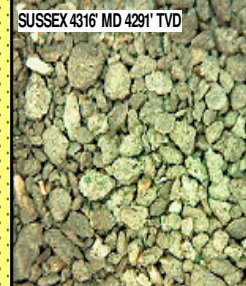


EQUIPMENT ERROR FROM
4270' MD TO 4297' MD

MD 4292 TVD 4279.14
INC 0.68 AZ 108.86
VS 149.41

4200' MD-4300' MD: SLTST: 50% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SS,
IMBD GLAU, INTGR POR, NO STN,
NO FLOR, NO O FLOR, WEAK LZY
CUT, LT BLSHWT RNG

EQUIPMENT ERROR FROM
4270' MD TO 4297' MD



SUSSEX 4316' MD 4291' TVD

SUSSEX
4316' MD 4291' TVD

MD 4387 TVD 4374.14
INC 0.5 AZ 71.13
VS 148.48

4300' MD-4400' MD: SS: 70%: PRED
MEDGY - LTKGY -
OPQ, LSEY - MOD CONS, FN TO
MED GRN, SUBANG, W SRTD, CALC
CMT, IMBD GLAUC, FREE SLTST,
INTGR POR, NO STN, NO FLOR, NO
O FLOR, WEAK LZY CUT, LT
BLSHWT RNG

75 TG, C1-C4 675

BOP (Ft/Hr) 3000
Gamma (API) 250

MD 4482 TVD 4469.13
INC 0.7 AZ 28.84
VS 147.82

MD 4577 TVD 4564.12
INC 1.39 AZ 36.21
VS 146.9

MD 4671 TVD 4658.09
INC 1.47 AZ 43.23
VS 145.46



4400' MD-4500' MD: SS: 80%: PRED
MEDGY - LTKGY -
OPQ, LSEY - MOD CONS, FN TO
MED GRN, SUBANG, W SRTD, CALC
CMT, IMBD GLAUC, FREE SLTST,
FREE SLTY SH, INTGR POR, NO
STN, NO FLOR, NO O FLOR, WEAK
LZY CUT, LT BLSHWT RNG

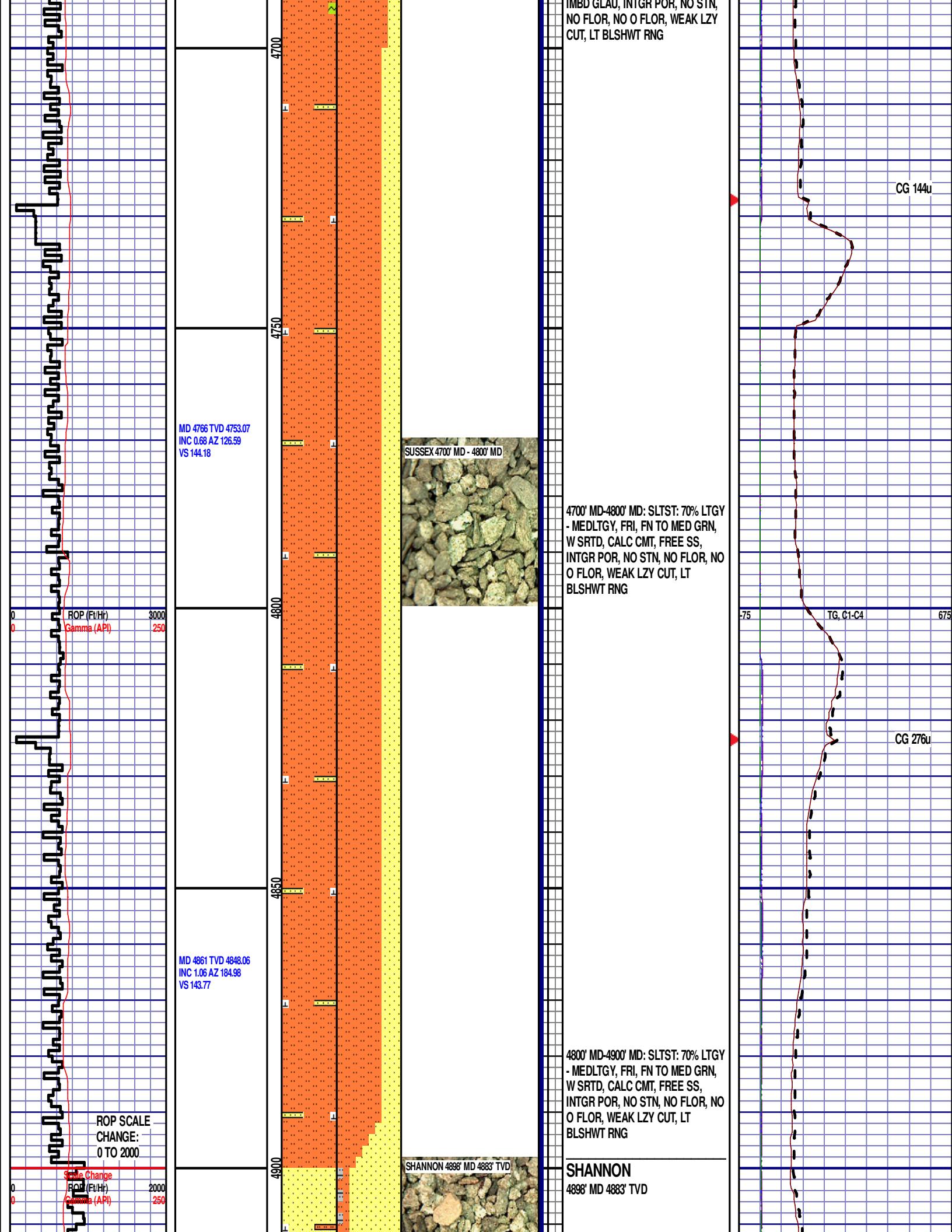
4500' MD-4600' MD: SLTST: 70% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SS,
IMBD GLAU, INTGR POR, NO STN,
NO FLOR, NO O FLOR, WEAK LZY
CUT, LT BLSHWT RNG

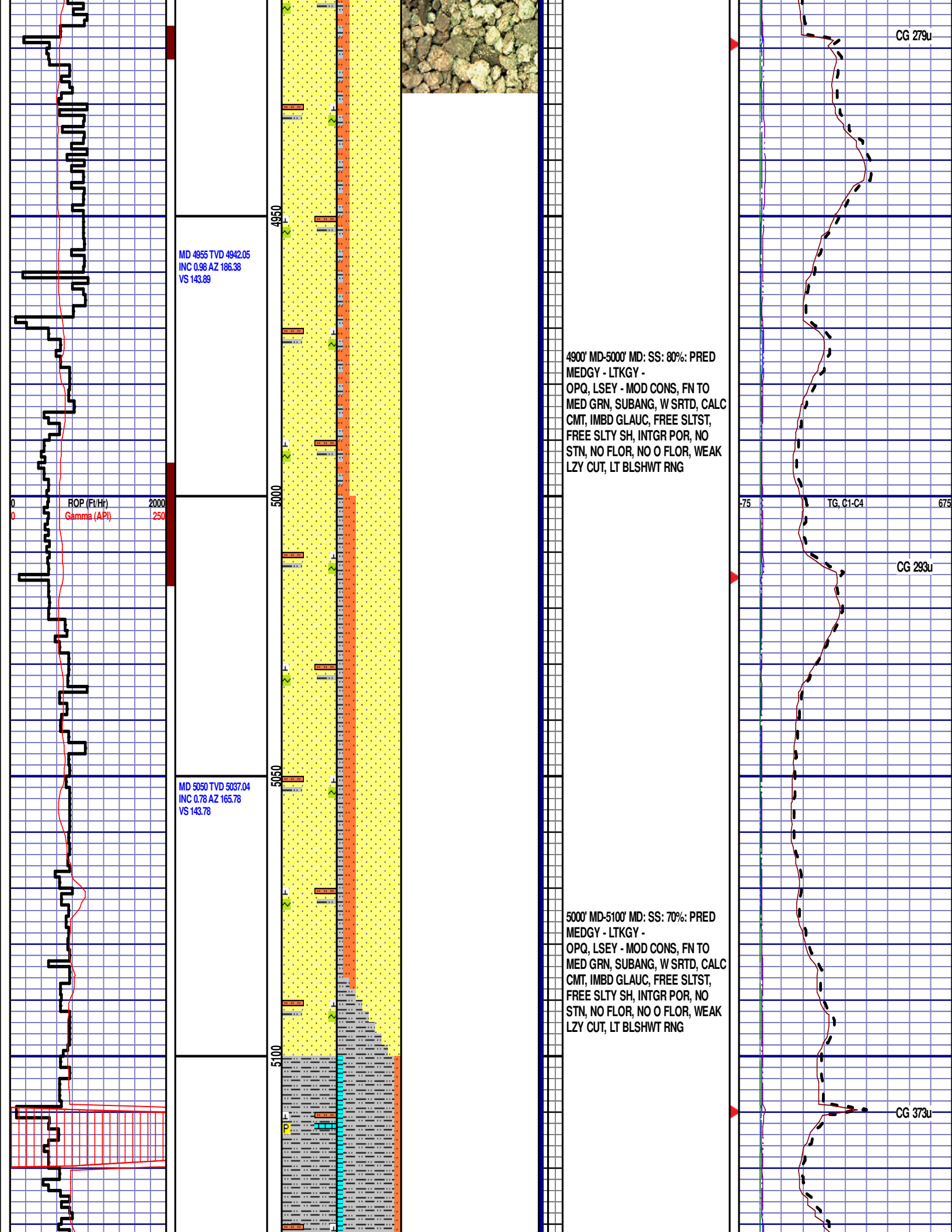
4600' MD-4700' MD: SLTST: 80% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE SS,
IMBD GLAU, INTGR POR, NO STN,
NO FLOR, NO O FLOR, WEAK LZY
CUT, LT BLSHWT RNG

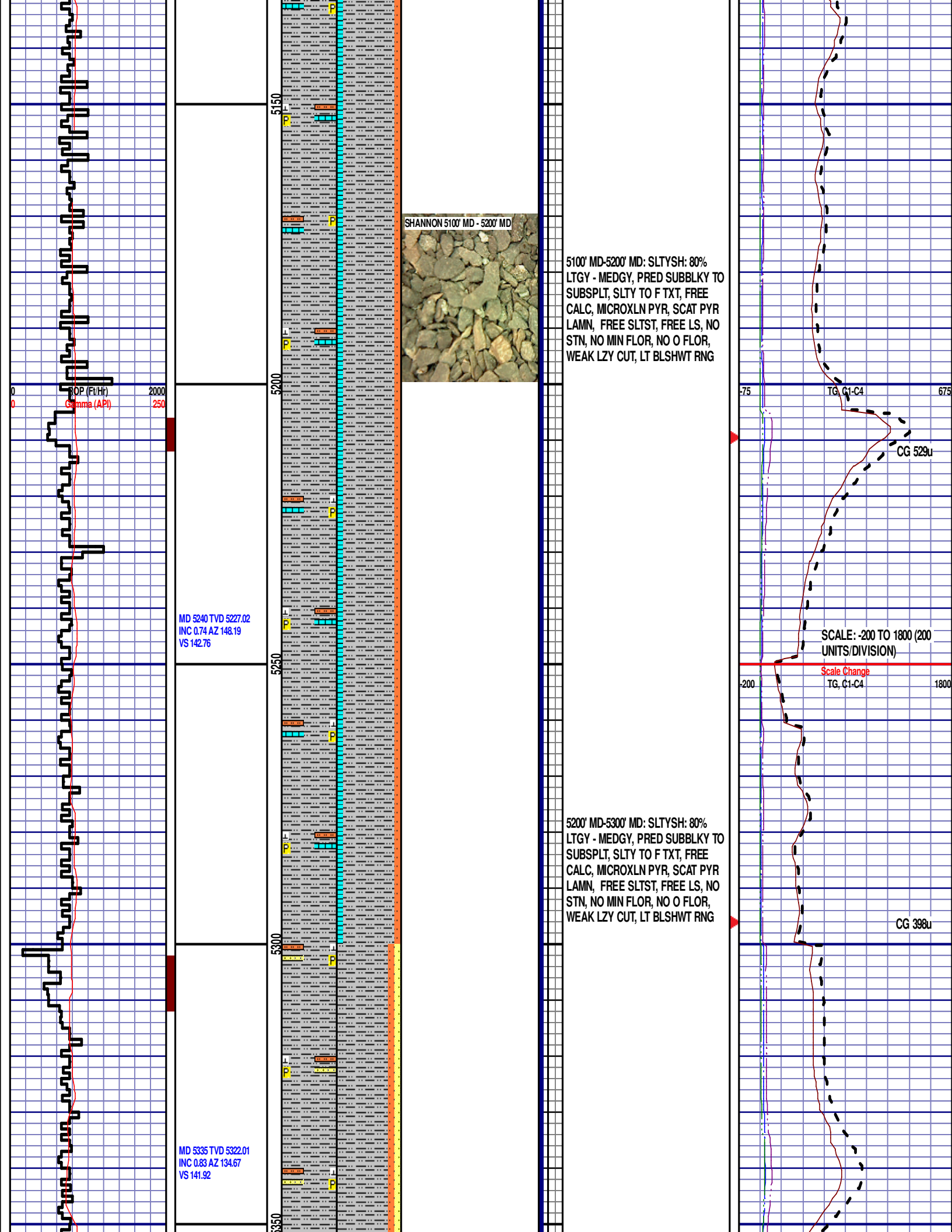
CG 285u

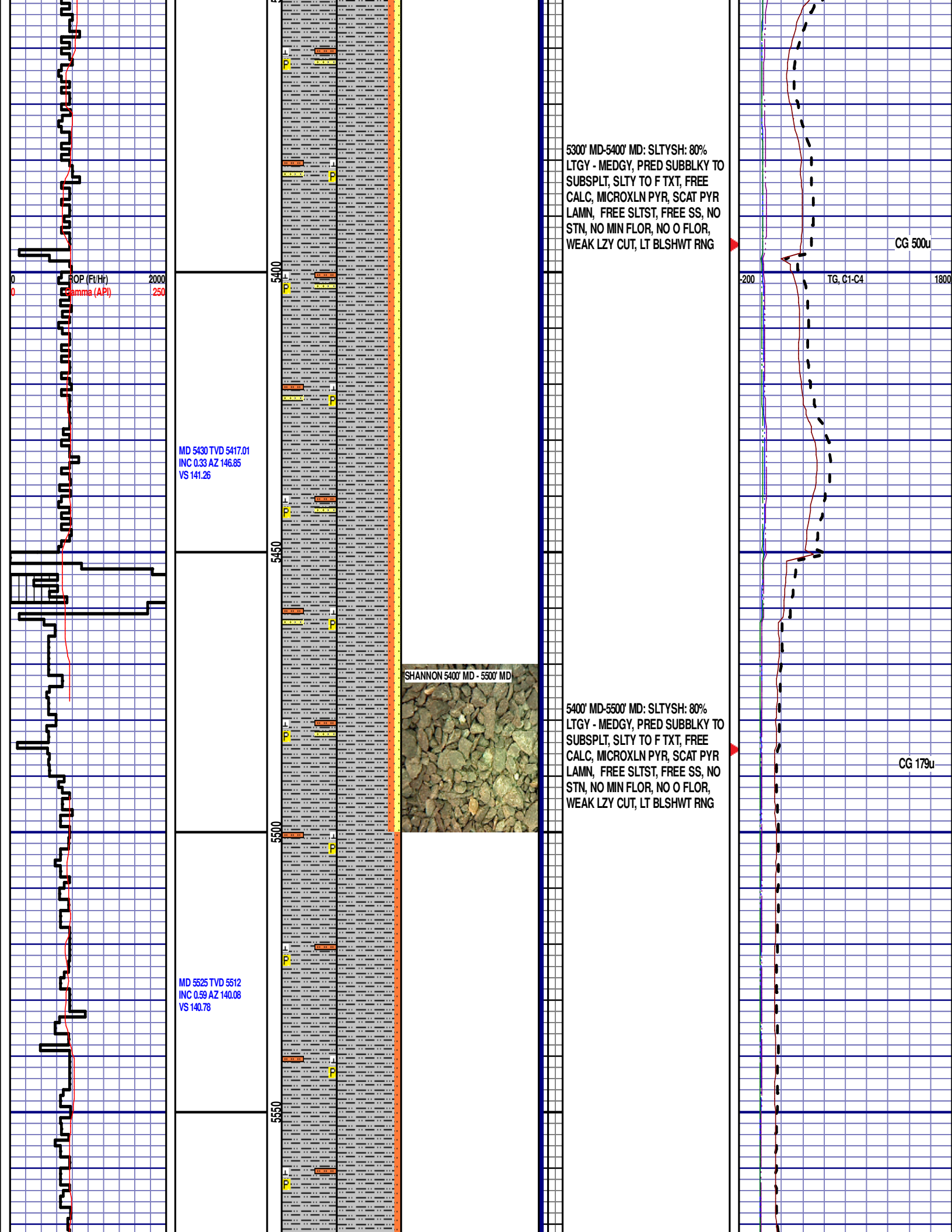
CG 129u

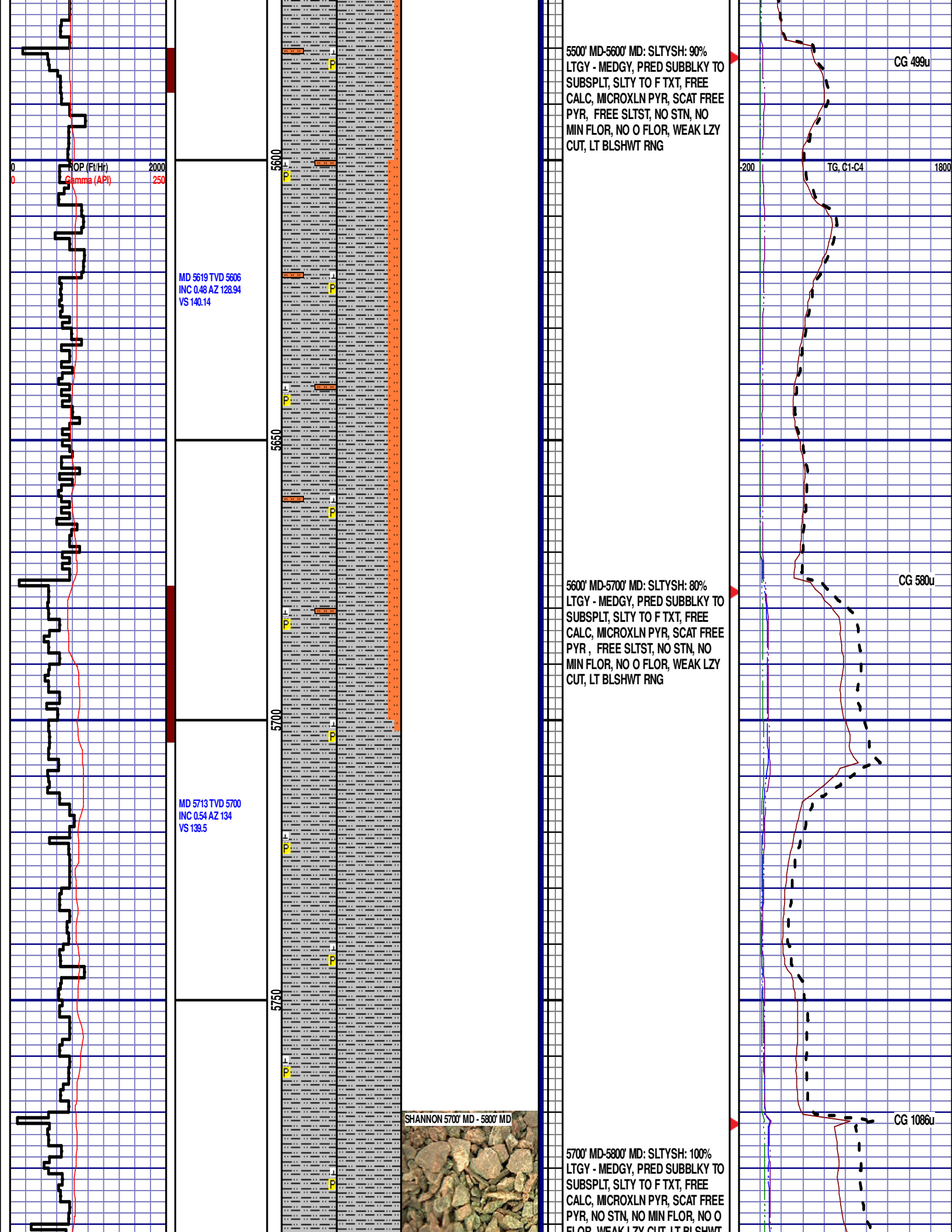
75 TG, C1-C4 675

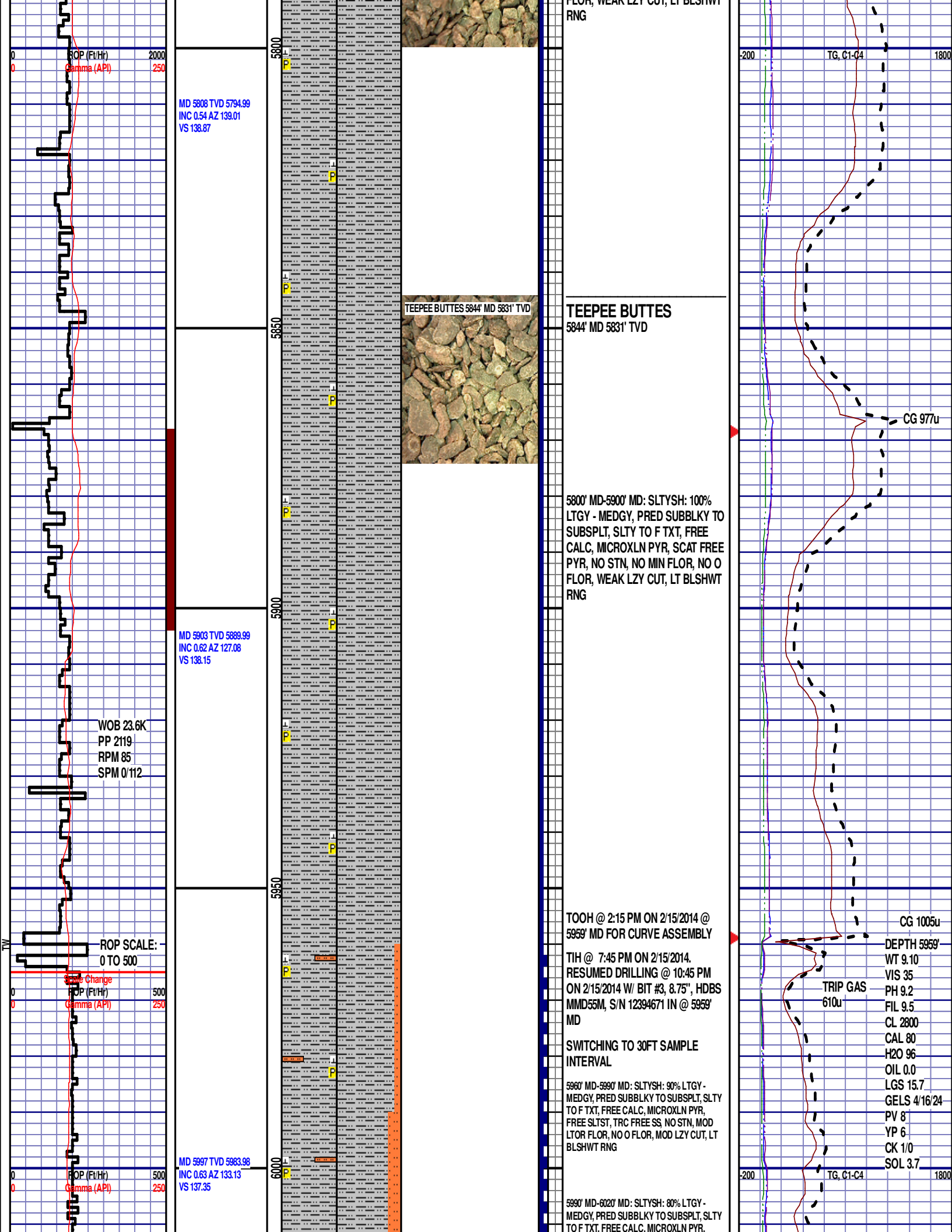


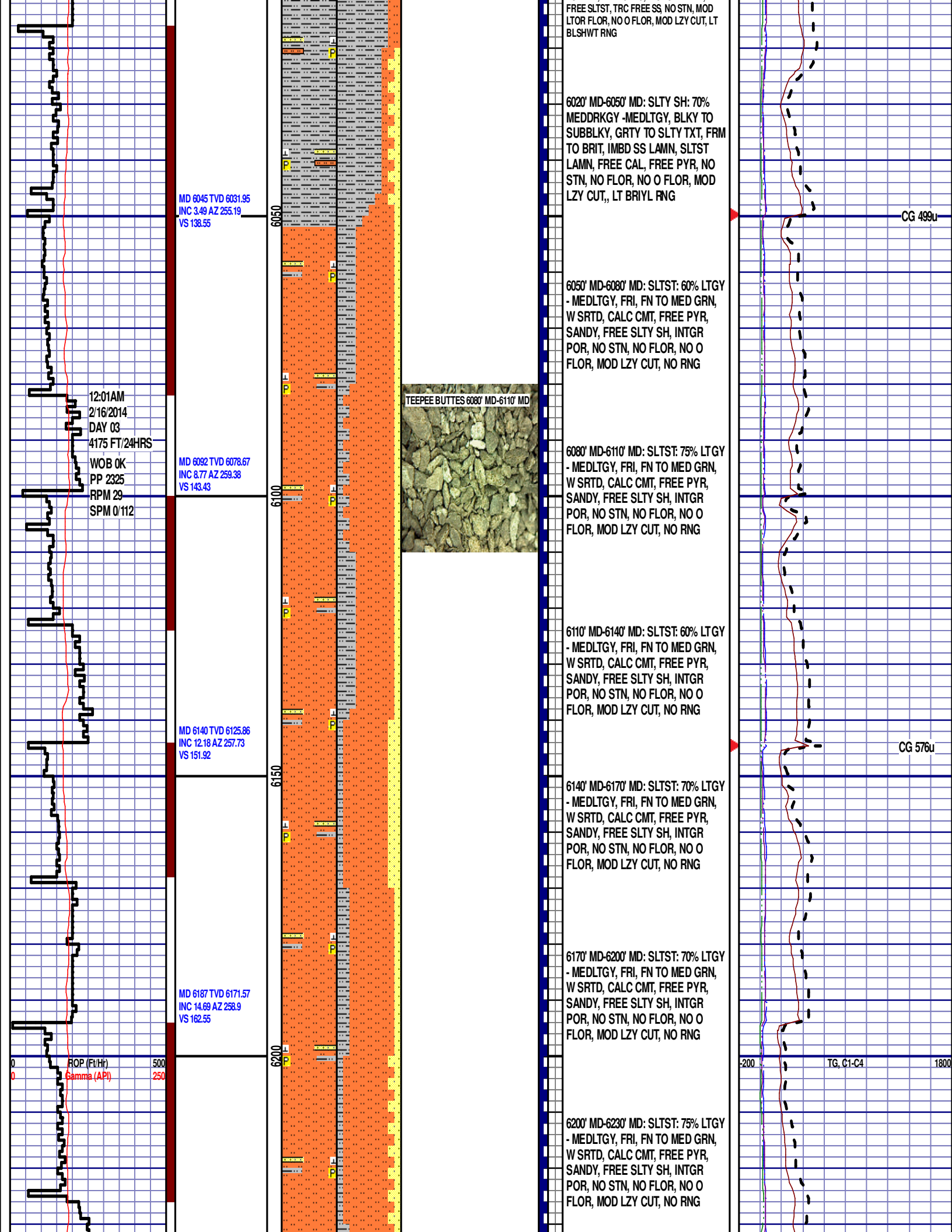












MD 6235 TVD 6217.63
INC 17.97 AZ 263.01
VS 175.82

MD 6282 TVD 6261.57
INC 23.5 AZ 266.77
VS 192.33

MD 6330 TVD 6304.85
INC 27.69 AZ 269.42
VS 213.03

MD 6377 TVD 6345.73
INC 31.44 AZ 270.4
VS 236.2

MD 6425 TVD 6385.38
INC 37.12 AZ 272.93
VS 263.22

6230' MD-6260' MD: SLTST: 70% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE PYR,
SANDY, FREE SLTY SH, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, MOD LZY CUT, NO RNG

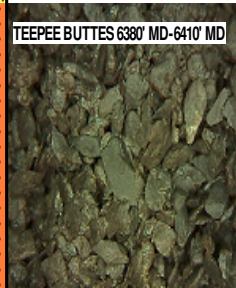
6260' MD-6290' MD: SLTST: 70% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE PYR,
SANDY, FREE SLTY SH, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, MOD LZY CUT, NO RNG

6290' MD-6320' MD: SLTST: 80% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE PYR,
SANDY, FREE SLTY SH, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, MOD LZY CUT, NO RNG

6320' MD-6350' MD: SLTST: 60% LTGY
- MEDLTGY, FRI, FN TO MED GRN,
W SRTD, CALC CMT, FREE PYR,
SANDY, FREE SLTY SH, INTGR
POR, NO STN, NO FLOR, NO O
FLOR, MOD LZY CUT, NO RNG

6350' MD-6380' MD: SLTY SH: 60%
MEDDRKGY -MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM
TO BRIT, SLTST LAMN, FREE CAL,
IMBD SS LAMN, FREE PYR, NO
STN, NO FLOR, NO O FLOR, IMMED
STRMG CUT, LT BRIYL RNG

TEEPEE BUTTES 6380' MD-6410' MD



6380' MD-6410' MD: SLTY SH: 80%
MEDDRKGY -MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM
TO BRIT, SLTST LAMN, FREE CAL,
FREE PYR, NO STN, NO FLOR, NO
O FLOR, IMMED STRMG CUT, LT
BRIYL RNG

6410' MD-6440' MD: SLTY SH: 80%
MEDDRKGY -MEDLTGY, BLKY TO
SUBBLKY, GRTY TO SLTY TXT, FRM
TO BRIT, SLTST LAMN, FREE CAL,
FREE PYR, NO STN, NO FLOR, NO
O FLOR, IMMED STRMG CUT, LT
BRIYL RNG

CG 727u

CG 898u

DEPTH 6350'
WT 10.25
VIS 36
PH 9.4
FIL 8.5
CL 2600
CAL 80
H2O 91.5
OIL 0.0
LGS 19.49
GELS 3/32/54
PV 10
YP 10
CK 1/0
SOL 8.2

Scale Change
TG, C1-C4

GAS SCALE: -350u
TO 3150u
(350 UNITS/DIVISION)

CG 1331u

