eog resources

600 Seventeenth Street
Suite 1000N
Denver, CO 80202

(303) 572-9000

Scale 1:240 (5"=100') Imperial
Measured Depth Log

Well Name:	**Hebron 1-18H**
Location:	**Section 18, T7N, R80W; Jackson County, Colorado**
License Number:	**API # 05-057-06501 AFE# 306497** **Region: North Park Basin**
Spud Date:	**Oct 5, 2010** **Drilling Completed: Oct 2x, 2010**
Surface Coordinates:	**NWNE (308 ft. FNL & 2326 ft. FEL), Section 18, T7N - R80W Jackson County, Colorado**
Bottom Hole Coordinates:	**NENE (620 ft. FNL & 620 ft. FEL), Section 7, T7N - R80W Jackson County, Colorado**
Ground Elevation (ft):	**8,153'** **K.B. Elevation (ft): 8,175'**
Logged Interval (ft):	**1,056'** **To: 11,xxx'** **Total Depth (ft): 11,xxx' MTD 7,408' TVD**
Formation:	**Niobrara (Kn), Kn "D" Chalk**
Type of Drilling Fluid:	**Water & L.S.N.D.**

OPERATOR

Company: **EOG Resources Inc.**
Address: **600 17th St., Ste. 1000**
Denver, CO 80202

GEOLOGISTS

Name:	**John W. Husk**	**Mike Hirsch**
Company:	**Husk Inc.**	**Goolsby Bro. & Assoc, Inc**
Address:	**8229 E. Briarwood Avenue**	**575 Union Blvd, Ste.208**
	Centennial, CO 80112-1306	**Lakewood, CO 80228**

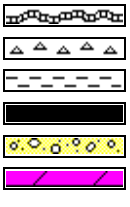
PERSONNEL

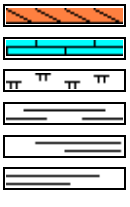
Company Men: Jack Warr, Kit Hatfield
Toolpushers: Tracy Romey, Benny Gonzales
Mud Engineer: Rocky Roberts, Baker Hughes Drilling Fluids
Directional Drillers: Do (Schlumberger); Bayert & Bayert (DDC)
MWD Technicians: Kruzmack/Valles (Schlumberger); Snyder & Reece (DDC)

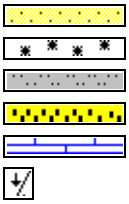
HOLE/CASING

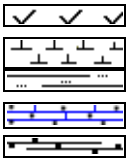
(1) 12 1/4" Surface to 1064' set 9 5/8" to 1054'
(2) 8 3/4" hole from 1054' to xxxx' and set 7" intermediate casing to 7,xxx'.

ROCK TYPES


Bent
Cht
Clyst
Coal
Congl
Dol


Gyp
Ls
Mrlst
Sh
Shcol
Shgy


Ss
Cement
Sltst
Ss
Chlk
Fracture


Anhyd
Mdstn
Slty sh
Carb chalk
Carb sh

ACCESSORIES

MINERAL

Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau
Gyp
Hvymin
Kaol
Marl

Minxl
Nodule
Phos
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff

FOSSIL

Algae
Amph
Belm
Bioclst
Brach
Bryozoa
Cephal
Coral

Crin
Echin
Fish
Foram
Fossil
Gastro
Oolite
Ostra
Pelec
Pellet
Pisolite
Plant
Strom

STRINGER

Anhy
Arg
Bent
Coal
Dol

Gyp
Ls
Mrst
Sltstrg
Ssstrg

TEXTURE

BS Boundst
C Chalky
CX Cryxln
E Earthy
FX Finexln
GS Grainst
L Lithogr
MX Microxln
MS Mudst
PS Packst
WS Wackest

OTHER SYMBOLS

POROSITY TYPE

E Earthy
F Fenest
F Fracture
I Inter
M Moldic
O Organic
P Pinpoint
V Vuggy

SORTING

W Well
M Moderate
P Poor

ROUNDING

R Rounded
r Subrnd
a Subang
A Angular

OIL SHOWS

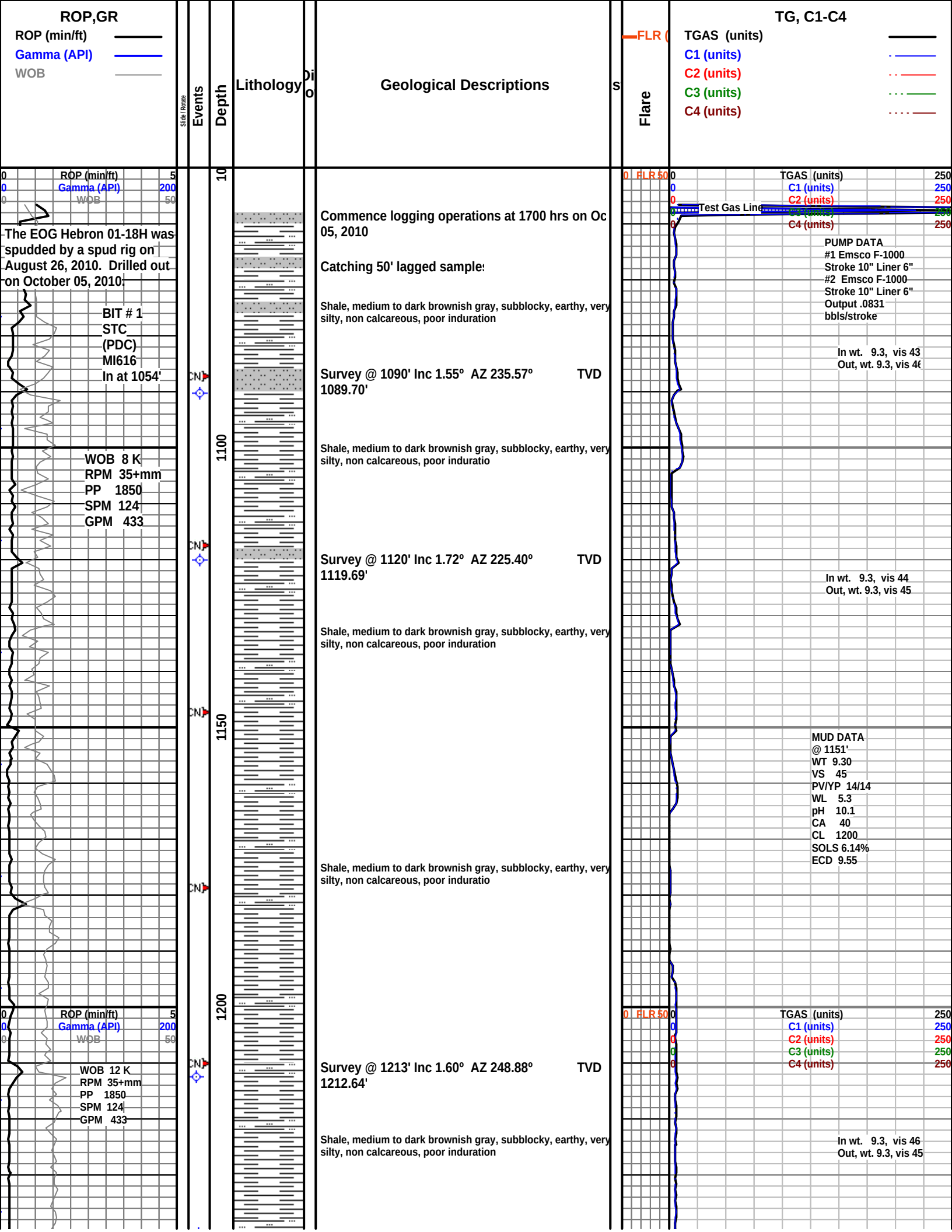
Uniform
Spotted
D Dead
Patchy

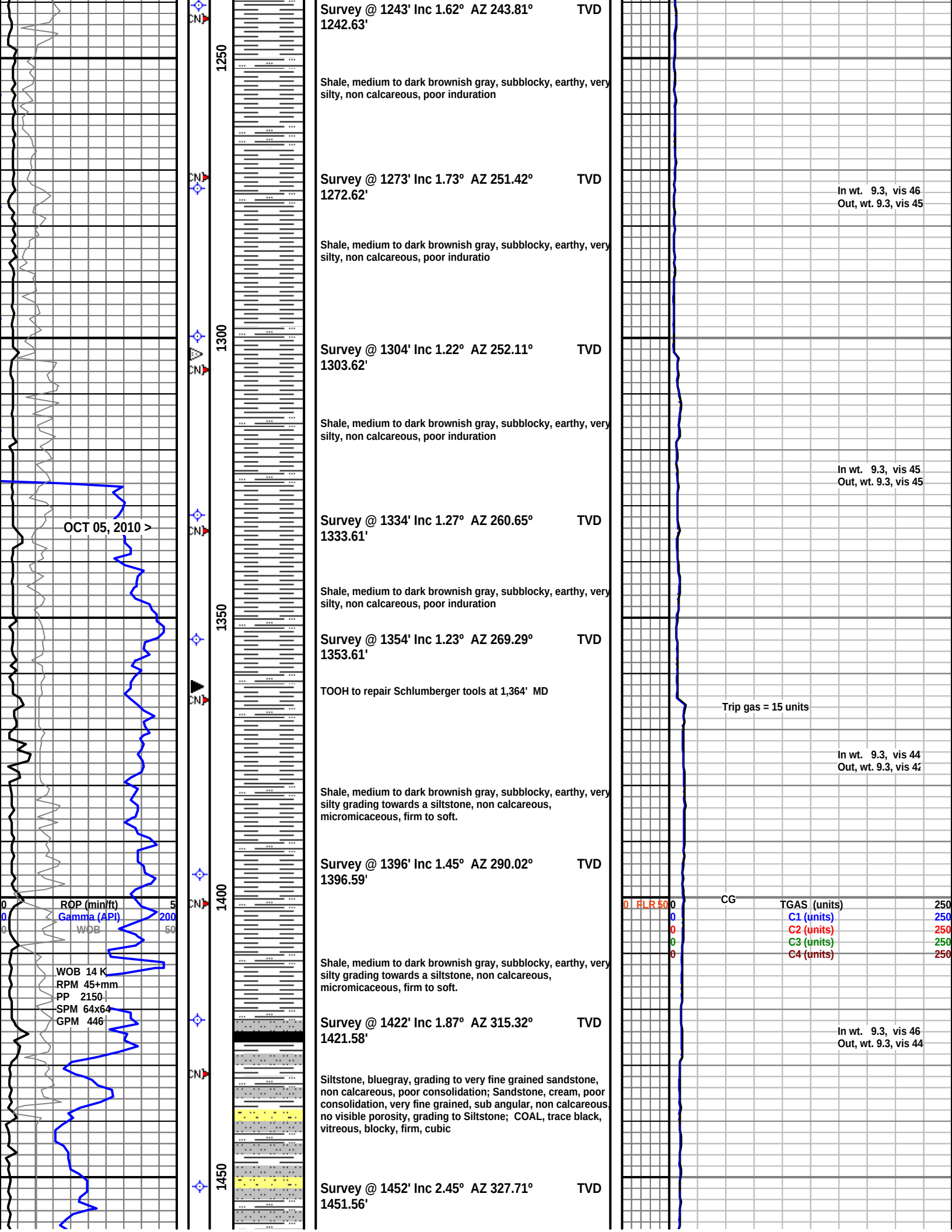
INTERVALS

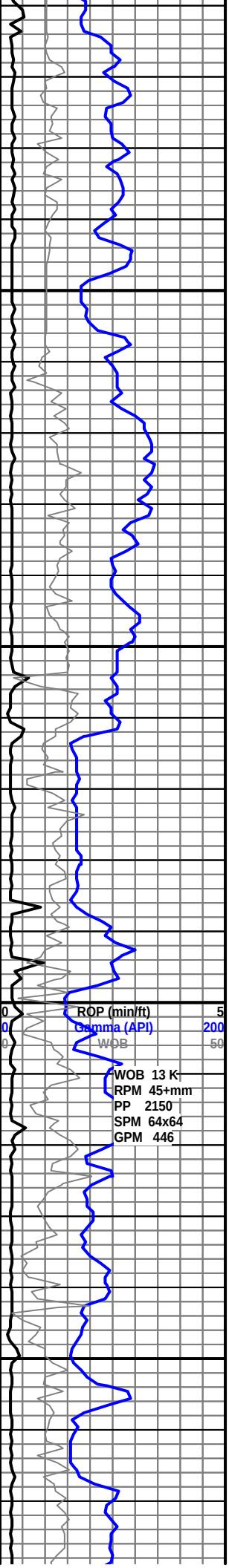
Core
Dst

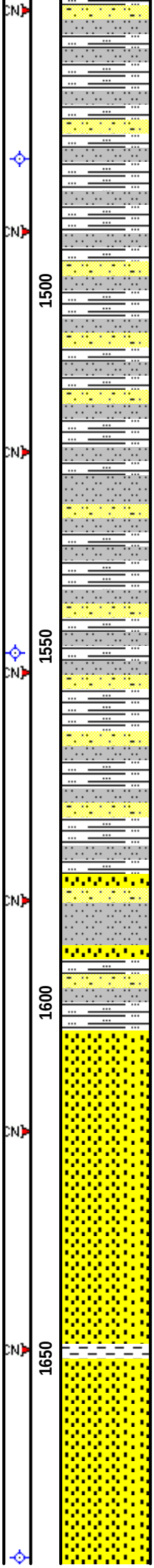
EVENTS

Trip_point
New bit
CN Connection(cn)
Survey(mwd)
Survey(dropped)
Survey(wireline)
Casing_shoe(1)
Off bottom
Sidewall core


ROP,GR
ROP (min/ft)
Gamma (API)
WOB
Slide / Rotate
Events
Depth
Lithology
Geological Descriptions
FLR (
Flare
TG, C1-C4
TGAS (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
The EOG Hebron 01-18H was spudded by a spud rig on August 26, 2010. Drilled out on October 05, 2010.
BIT # 1
STC
(PDC)
MI616
In at 1054'
WOB 8 K
RPM 35+mm
PP 1850
SPM 124
GPM 433
WOB 12 K
RPM 35+mm
PP 1850
SPM 124
GPM 433
1100
1150
1200
Commence logging operations at 1700 hrs on Oc 05, 2010
Catching 50' lagged sample
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
Survey @ 1090' Inc 1.55° AZ 235.57° TVD 1089.70'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induratio
Survey @ 1120' Inc 1.72° AZ 225.40° TVD 1119.69'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induratio
Survey @ 1213' Inc 1.60° AZ 248.88° TVD 1212.64'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
Test Gas Line
PUMP DATA
#1 Emsco F-1000
Stroke 10" Liner 6"
#2 Emsco F-1000
Stroke 10" Liner 6"
Output .0831
bbls/stroke
In wt. 9.3, vis 43
Out, wt. 9.3, vis 46
In wt. 9.3, vis 44
Out, wt. 9.3, vis 45
MUD DATA
@ 1151'
WT 9.30
VS 45
PV/YP 14/14
WL 5.3
pH 10.1
CA 40
CL 1200
SOLS 6.14%
ECD 9.55
In wt. 9.3, vis 46
Out, wt. 9.3, vis 45


Survey @ 1243' Inc 1.62° AZ 243.81° TVD 1242.63'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
Survey @ 1273' Inc 1.73° AZ 251.42° TVD 1272.62'
In wt. 9.3, vis 46
Out, wt. 9.3, vis 45
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induratio
Survey @ 1304' Inc 1.22° AZ 252.11° TVD 1303.62'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
In wt. 9.3, vis 45
Out, wt. 9.3, vis 45
OCT 05, 2010 >
Survey @ 1334' Inc 1.27° AZ 260.65° TVD 1333.61'
Shale, medium to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration
Survey @ 1354' Inc 1.23° AZ 269.29° TVD 1353.61'
TOOH to repair Schlumberger tools at 1,364' MD
Trip gas = 15 units
In wt. 9.3, vis 44
Out, wt. 9.3, vis 42
Shale, medium to dark brownish gray, subblocky, earthy, very silty grading towards a siltstone, non calcareous, micromicaceous, firm to soft.
Survey @ 1396' Inc 1.45° AZ 290.02° TVD 1396.59'
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
CG
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
WOB 14 K
RPM 45+mm
PP 2150
SPM 64x64
GPM 446
Shale, medium to dark brownish gray, subblocky, earthy, very silty grading towards a siltstone, non calcareous, micromicaceous, firm to soft.
Survey @ 1422' Inc 1.87° AZ 315.32° TVD 1421.58'
In wt. 9.3, vis 46
Out, wt. 9.3, vis 44
Siltstone, bluegray, grading to very fine grained sandstone, non calcareous, poor consolidation; Sandstone, cream, poor consolidation, very fine grained, sub angular, non calcareous, no visible porosity, grading to Siltstone; COAL, trace black, vitreous, blocky, firm, cubic
Survey @ 1452' Inc 2.45° AZ 327.71° TVD 1451.56'
1250
1300
1350
1400
1450
CN





Siltstone, bluegray, grading to very fine grained sandstone, non calcareous, poor consolidation; Sandstone, cream, poor consolidation, very fine grained, sub angular, non calcareous, no visible porosity, grading to Siltstone

In wt. 9.3, vis 46
Out, wt. 9.3, vis 44

Survey @ 1482' Inc 2.81° AZ 332.72° TVD 1481.53'

Siltstone, tan to gray, grading to very fine grained sandstone, non calcareous, poor consolidation, mica, grading to Shale; Sandstone, cream, poor consolidation, very fine grained, sub angular, non calcareous, no visible porosity, grading to Siltstone

Siltstone, tan to gray, grading to very fine grained sandstone, non calcareous, poor consolidation, mica; Sandstone, cream, poor consolidation, very fine grained, sub angular, non calcareous, no visible porosity, grading to Siltstone

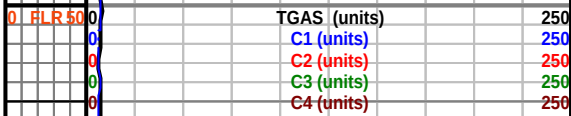
In wt. 9.3, vis 45
Out, wt. 9.3, vis 44

Survey @ 1551' Inc 3.99° AZ 353.82° TVD 1550.41'

MUD DATA
@ 1578'
WT 9.35
VS 45
PV/YP 15/16
WL 5.0
pH 9.2
CA 60
CL 1200
SOLS 6.44%
ECD 9.59

Siltstone, tan to gray, grading to very fine grained sandstone, non calcareous, poor consolidation, mica, grading to earthy gray brown Shale; Sandstone, cream, poor consolidation, very fine grained, sub angular, non calcareous, no visible porosity, grading to Siltstone

Sandstone, translucent, opaque, milky, friable to very poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous cement; Siltstone, gray, S&P, grading to Sandstone in parts; Shale, dark gray to dark brownish gray, subblocky, earthy, very silty, non calcareous, firm to soft.



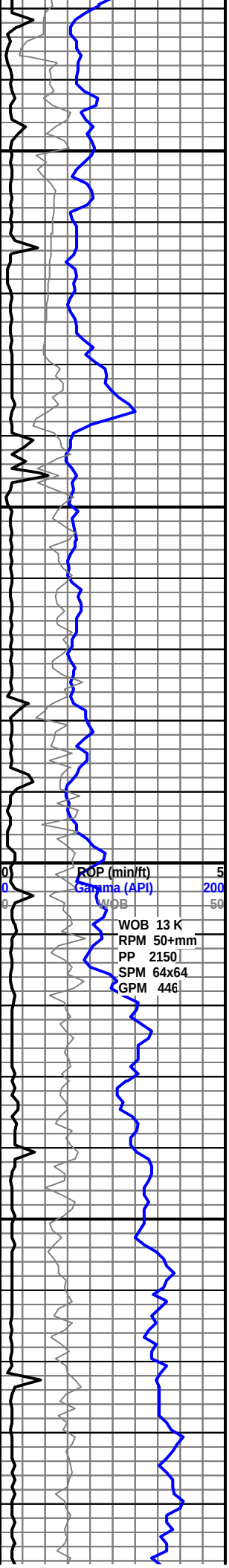
Sandstone, translucent, opaque, milky, unconsolidated to very poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous cement

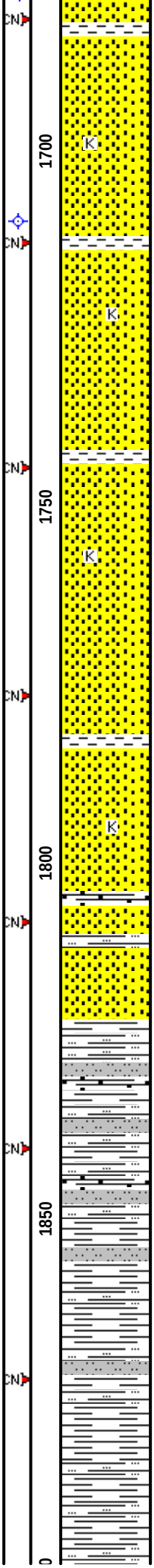
In wt. 9.3, vis 45
Out, wt. 9.3, vis 44

Sandstone, translucent, opaque, milky, unconsolidated to very poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous cement

In wt. 9.3, vis 45
Out, wt. 9.3, vis 44

Survey @ 1678' Inc 4.92° AZ 12.86° TVD 1676.99'





Sandstone, translucent, opaque, milky, unconsolidated to vei poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous and clay(Kaolinite?) cement, mica, rare green mineral inclusions

Survey @ 1710' Inc 4.55° AZ 16.95° TVD 1708.89'

In wt. 9.4, vis 45
Out, wt. 9.4, vis 44

Sandstone, translucent, opaque, milky, unconsolidated to vei poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous and clay(Kaolinite?) cement, mica, rare green mineral inclusions

Survey @ 1773' Inc 3.87° AZ 19.30° TVD 1771.71'

In wt. 9.4, vis 46
Out, wt. 9.4, vis 45

Sandstone, translucent, opaque, milky, unconsolidated to vei poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous and clay(Kaolinite?) cement, mica, rare green mineral inclusions

MIDCOAL - 1804' MD

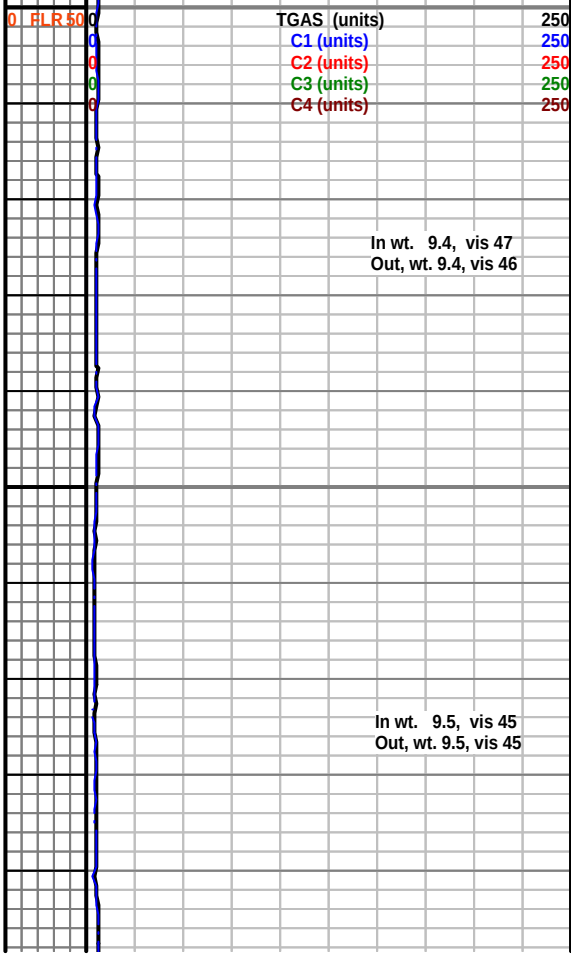
Survey @ 1868' Inc 2.48° AZ 2.30° TVD 1866.57'

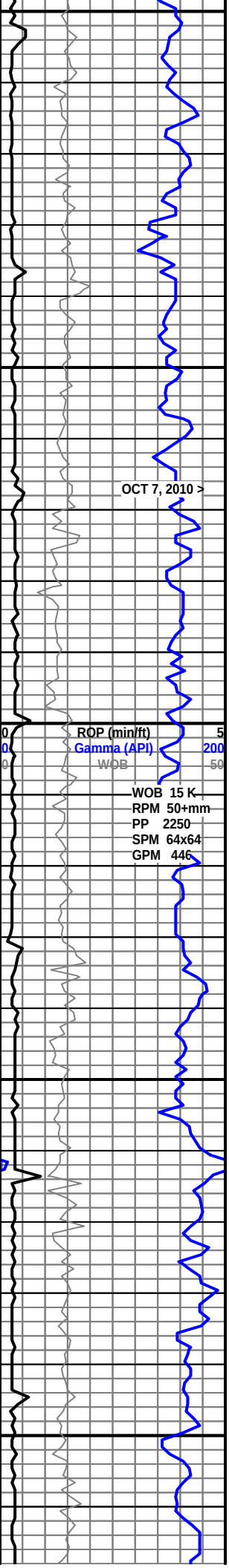
In wt. 9.4, vis 47
Out, wt. 9.4, vis 46

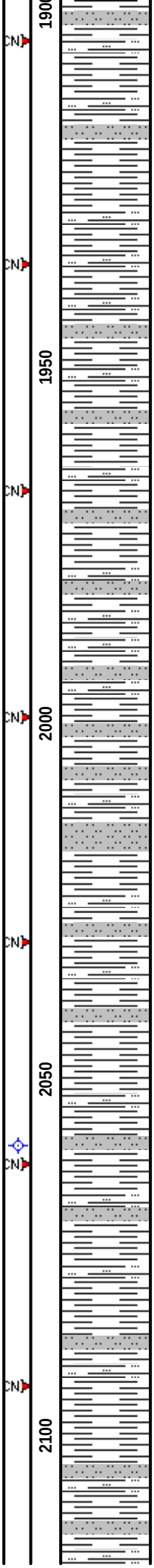
Shale, graybrown, moderate induration, sub blocky, carbonaceous, silty, non calcareous, earthy; Sandstone, translucent, opaque, milky, unconsolidated to very poor consolidation, sub angular, very poor sorting, no visible porosity, siliceous and clay(Kaolinite?) cement, mica, rare green mineral inclusions

Shale, light gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

In wt. 9.5, vis 45
Out, wt. 9.5, vis 45







Shale, light gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

Survey @ 1964' Inc 1.88° AZ 316.68° TVD 1962.51'

Shale, light gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

Shale, light gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

Survey @ 2059' Inc 0.15° AZ 327.98° TVD 2057.49'

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous

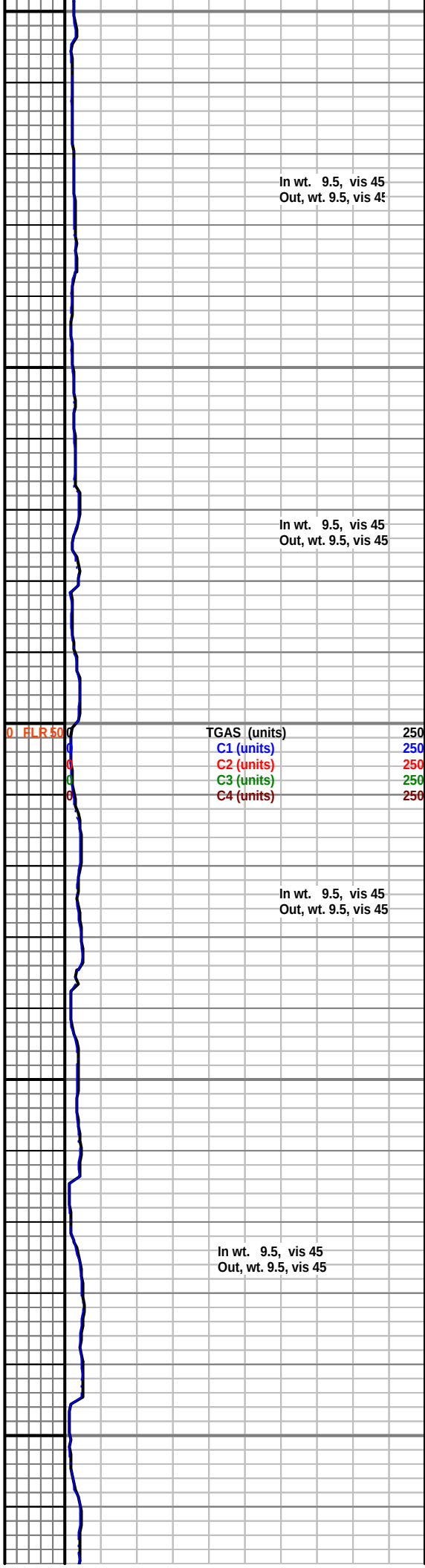
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non

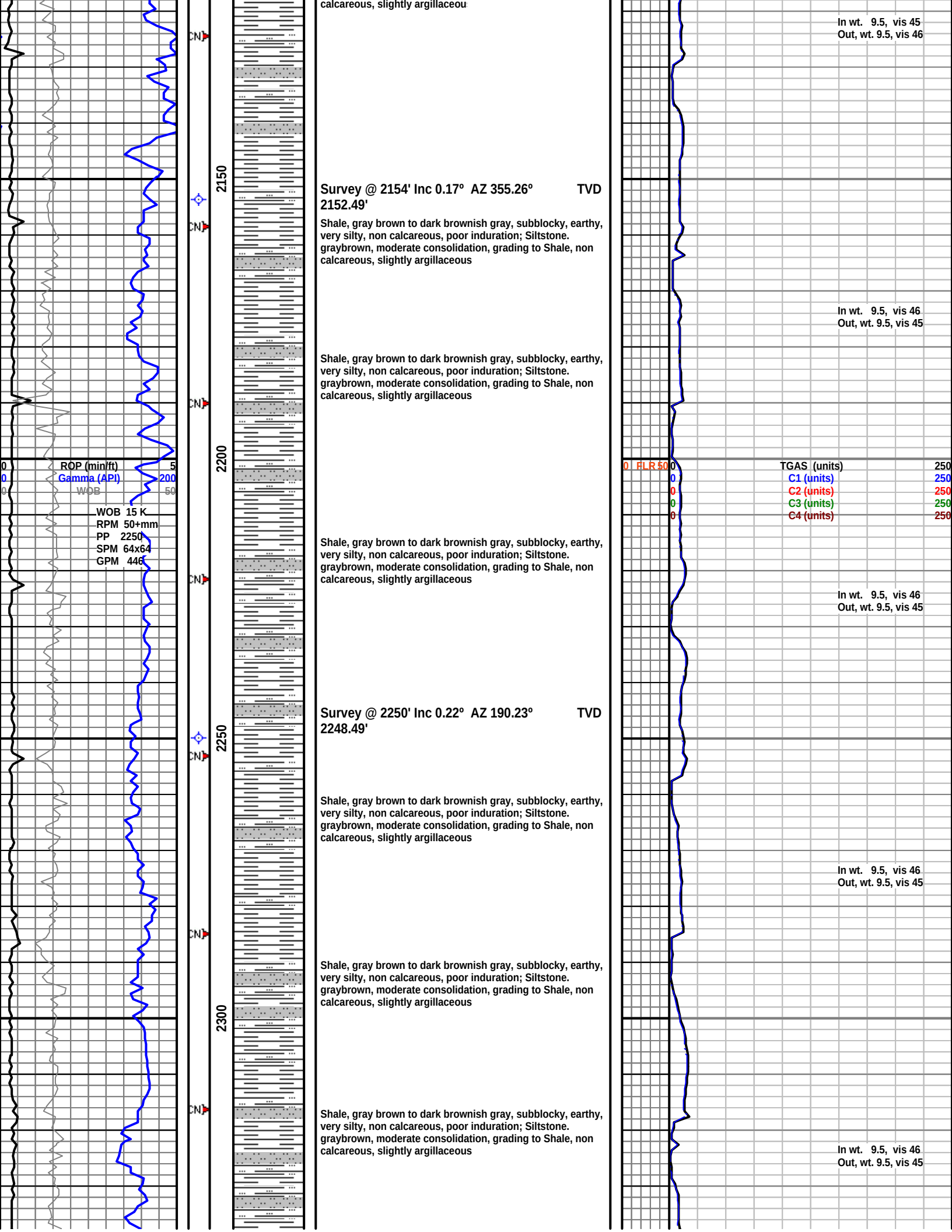
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45

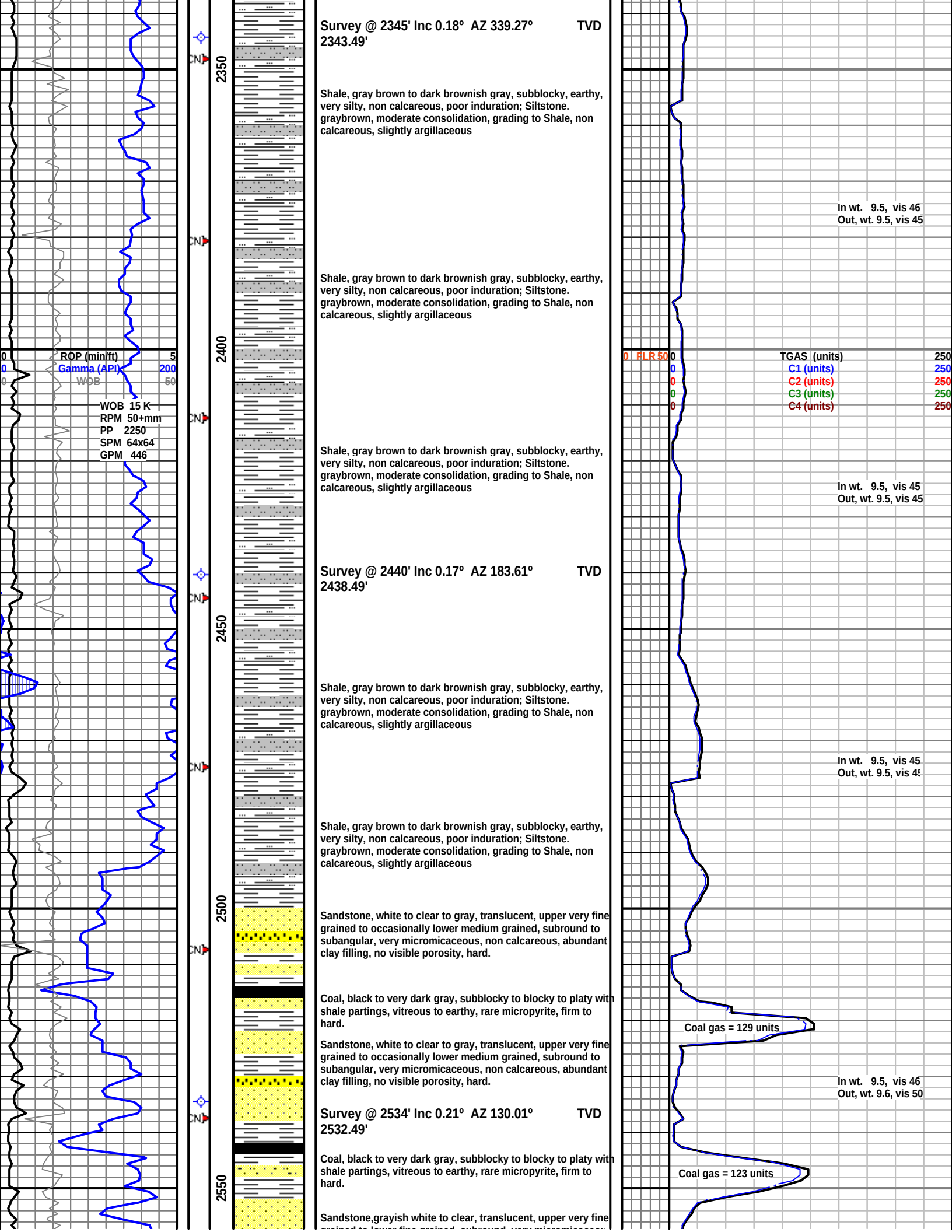
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45

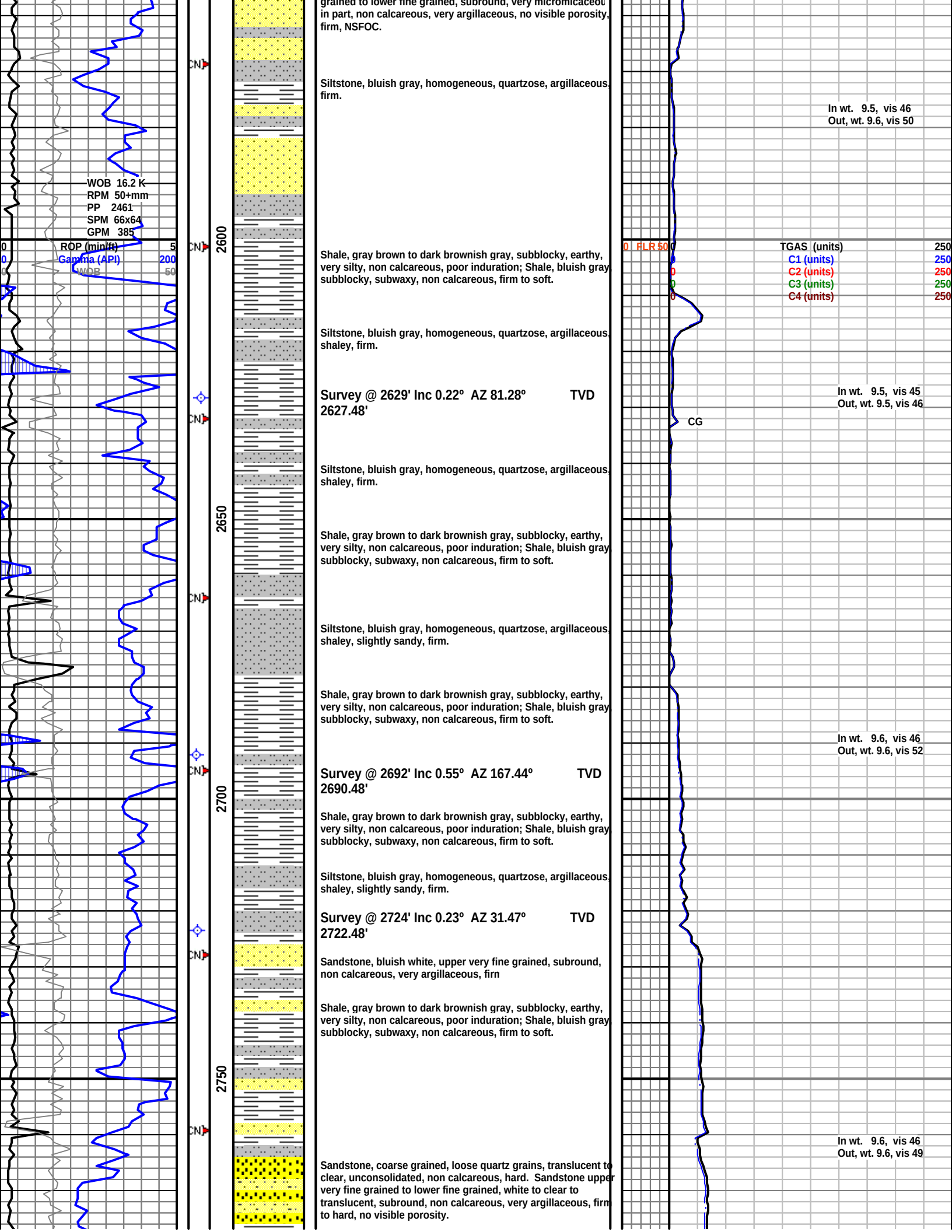
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45

In wt. 9.5, vis 45
Out, wt. 9.5, vis 45




0
ROP (min/ft)
5
0
Gamma (API)
200
0
WOB
50
WOB 15 K
RPM 50+mm
PP 2250
SPM 64x64
GPM 446
2150
2200
2250
2300
CN
0 FLR 50
0
TGAS (units)
250
0
C1 (units)
250
0
C2 (units)
250
0
C3 (units)
250
0
C4 (units)
250
calcareous, slightly argillaceou
In wt. 9.5, vis 45
Out, wt. 9.5, vis 46
Survey @ 2154' Inc 0.17° AZ 355.26° TVD 2152.49'
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Survey @ 2250' Inc 0.22° AZ 190.23° TVD 2248.49'
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45


Survey @ 2345' Inc 0.18° AZ 339.27° TVD 2343.49'
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
WOB 15 K
RPM 50+mm
PP 2250
SPM 64x64
GPM 446
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45
Survey @ 2440' Inc 0.17° AZ 183.61° TVD 2438.49'
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Siltstone. graybrown, moderate consolidation, grading to Shale, non calcareous, slightly argillaceous
Sandstone, white to clear to gray, translucent, upper very fine grained to occasionally lower medium grained, subround to subangular, very micromicaceous, non calcareous, abundant clay filling, no visible porosity, hard.
Coal, black to very dark gray, subblocky to blocky to platy with shale partings, vitreous to earthy, rare micropyrite, firm to hard.
Coal gas = 129 units
Sandstone, white to clear to gray, translucent, upper very fine grained to occasionally lower medium grained, subround to subangular, very micromicaceous, non calcareous, abundant clay filling, no visible porosity, hard.
In wt. 9.5, vis 46
Out, wt. 9.6, vis 50
Survey @ 2534' Inc 0.21° AZ 130.01° TVD 2532.49'
Coal, black to very dark gray, subblocky to blocky to platy with shale partings, vitreous to earthy, rare micropyrite, firm to hard.
Coal gas = 123 units
Sandstone,grayish white to clear, translucent, upper very fine
2350
2400
2450
2500
2550
CN



grained to lower fine grained, subround, very micromicaceou in part, non calcareous, very argillaceous, no visible porosity, firm, NSFOC.

Siltstone, bluish gray, homogeneous, quartzose, argillaceous, firm.

In wt. 9.5, vis 46
Out, wt. 9.6, vis 50

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.

Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, firm.

Survey @ 2629' Inc 0.22° AZ 81.28° TVD 2627.48'

In wt. 9.5, vis 45
Out, wt. 9.5, vis 46

Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, firm.

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.

Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, firm.

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.

In wt. 9.6, vis 46
Out, wt. 9.6, vis 52

Survey @ 2692' Inc 0.55° AZ 167.44° TVD 2690.48'

Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.

Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, firm.

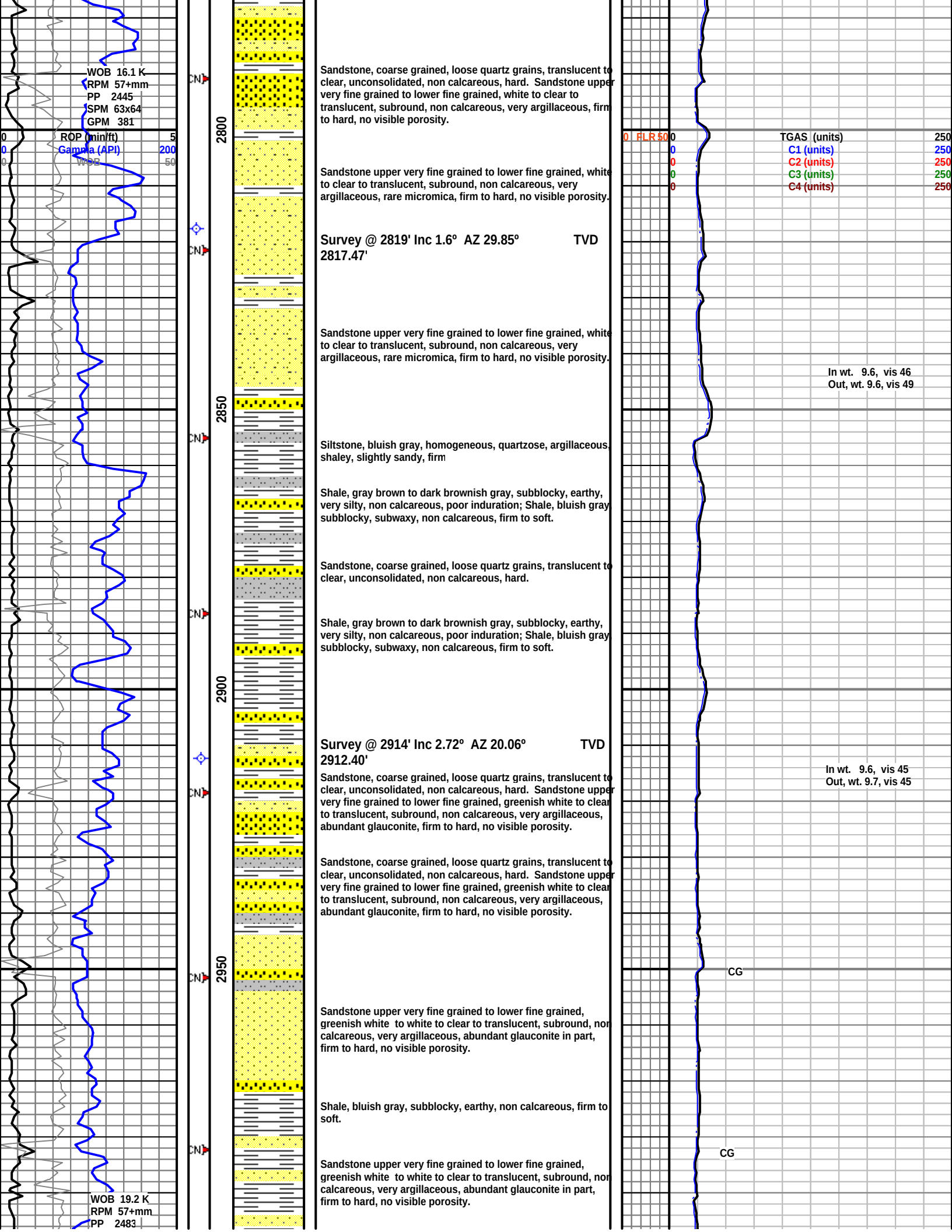
Survey @ 2724' Inc 0.23° AZ 31.47° TVD 2722.48'

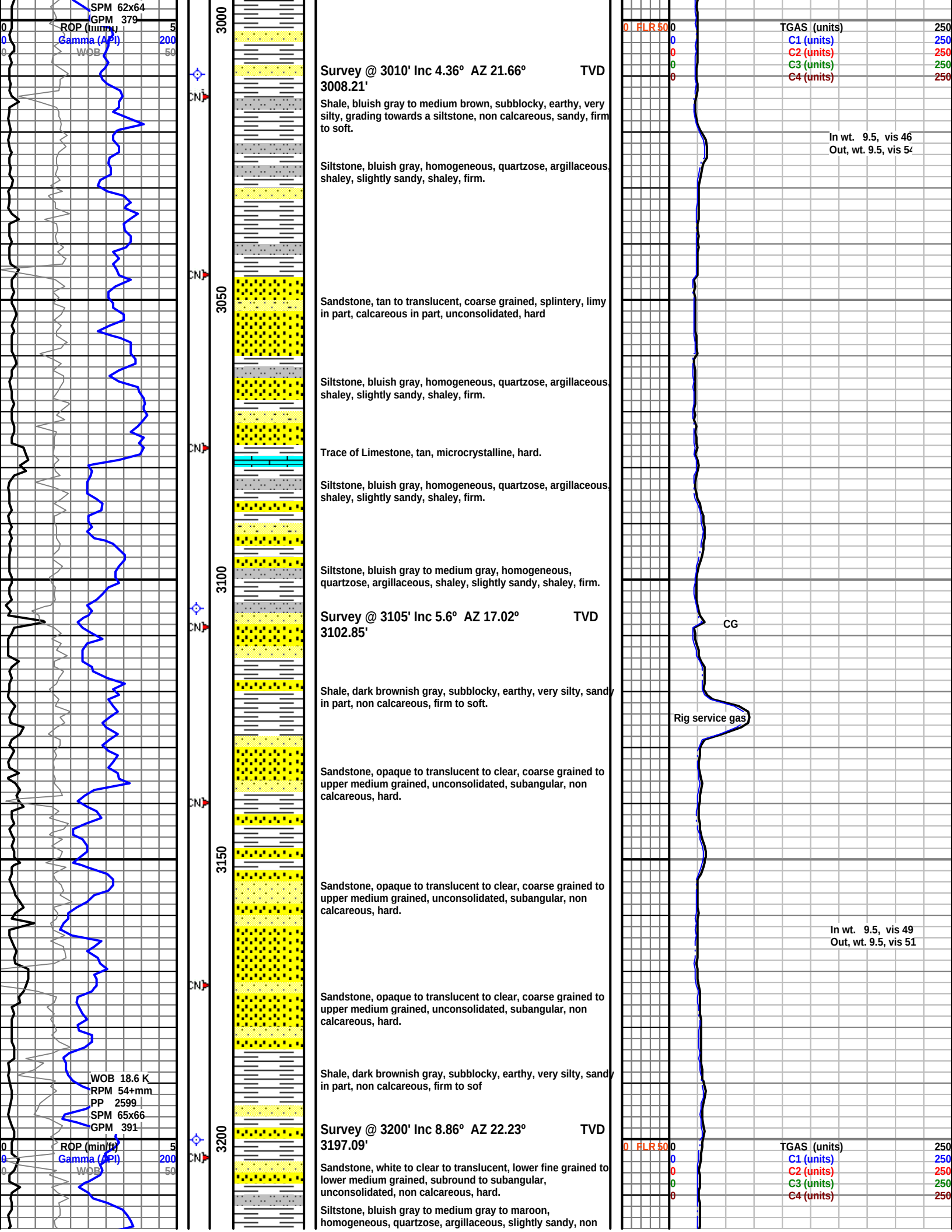
Sandstone, bluish white, upper very fine grained, subround, non calcareous, very argillaceous, firn

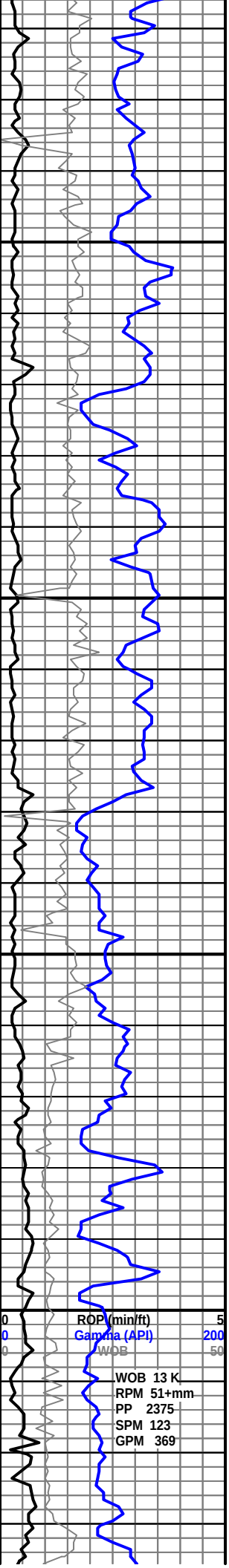
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.

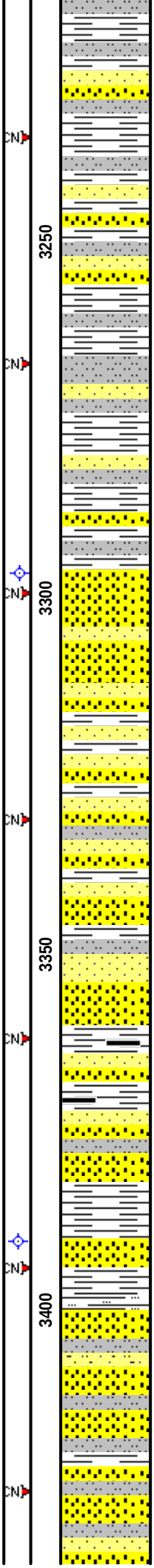
In wt. 9.6, vis 46
Out, wt. 9.6, vis 49

Sandstone, coarse grained, loose quartz grains, translucent to clear, unconsolidated, non calcareous, hard. Sandstone upper very fine grained to lower fine grained, white to clear to translucent, subround, non calcareous, very argillaceous, firm to hard, no visible porosity.


WOB 16.1 K
RPM 57+mm
PP 2445
SPM 63x64
GPM 381
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
2800
2850
2900
2950
CN
Sandstone, coarse grained, loose quartz grains, translucent to clear, unconsolidated, non calcareous, hard. Sandstone upper very fine grained to lower fine grained, white to clear to translucent, subround, non calcareous, very argillaceous, firm to hard, no visible porosity.
Sandstone upper very fine grained to lower fine grained, white to clear to translucent, subround, non calcareous, very argillaceous, rare micromica, firm to hard, no visible porosity.
Survey @ 2819' Inc 1.6° AZ 29.85° TVD 2817.47'
Sandstone upper very fine grained to lower fine grained, white to clear to translucent, subround, non calcareous, very argillaceous, rare micromica, firm to hard, no visible porosity.
Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, firm
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.
Sandstone, coarse grained, loose quartz grains, translucent to clear, unconsolidated, non calcareous, hard.
Shale, gray brown to dark brownish gray, subblocky, earthy, very silty, non calcareous, poor induration; Shale, bluish gray subblocky, subwaxy, non calcareous, firm to soft.
Survey @ 2914' Inc 2.72° AZ 20.06° TVD 2912.40'
Sandstone, coarse grained, loose quartz grains, translucent to clear, unconsolidated, non calcareous, hard. Sandstone upper very fine grained to lower fine grained, greenish white to clear to translucent, subround, non calcareous, very argillaceous, abundant glauconite, firm to hard, no visible porosity.
Sandstone, coarse grained, loose quartz grains, translucent to clear, unconsolidated, non calcareous, hard. Sandstone upper very fine grained to lower fine grained, greenish white to clear to translucent, subround, non calcareous, very argillaceous, abundant glauconite, firm to hard, no visible porosity.
Sandstone upper very fine grained to lower fine grained, greenish white to white to clear to translucent, subround, non calcareous, very argillaceous, abundant glauconite in part, firm to hard, no visible porosity.
Shale, bluish gray, subblocky, earthy, non calcareous, firm to soft.
Sandstone upper very fine grained to lower fine grained, greenish white to white to clear to translucent, subround, non calcareous, very argillaceous, abundant glauconite in part, firm to hard, no visible porosity.
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
In wt. 9.6, vis 46
Out, wt. 9.6, vis 49
In wt. 9.6, vis 45
Out, wt. 9.7, vis 45
CG
CG
WOB 19.2 K
RPM 57+mm
PP 2483


SPM 62x64
GPM 379
ROP (min/ft) 0 5
Gamma (API) 0 200
WOB 0 50
3000
3050
3100
3150
3200
Survey @ 3010' Inc 4.36° AZ 21.66° TVD 3008.21'
Shale, bluish gray to medium brown, subblocky, earthy, very silty, grading towards a siltstone, non calcareous, sandy, firm to soft.
Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, shaley, firm.
Sandstone, tan to translucent, coarse grained, splintery, limy in part, calcareous in part, unconsolidated, hard
Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, shaley, firm.
Trace of Limestone, tan, microcrystalline, hard.
Siltstone, bluish gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, shaley, firm.
Siltstone, bluish gray to medium gray, homogeneous, quartzose, argillaceous, shaley, slightly sandy, shaley, firm.
Survey @ 3105' Inc 5.6° AZ 17.02° TVD 3102.85'
Shale, dark brownish gray, subblocky, earthy, very silty, sandy in part, non calcareous, firm to soft.
Sandstone, opaque to translucent to clear, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.
Sandstone, opaque to translucent to clear, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.
Sandstone, opaque to translucent to clear, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.
Shale, dark brownish gray, subblocky, earthy, very silty, sandy in part, non calcareous, firm to sof
Survey @ 3200' Inc 8.86° AZ 22.23° TVD 3197.09'
Sandstone, white to clear to translucent, lower fine grained to lower medium grained, subround to subangular, unconsolidated, non calcareous, hard.
Siltstone, bluish gray to medium gray to maroon, homogeneous, quartzose, argillaceous, slightly sandy, non
WOB 18.6 K
RPM 54+mm
PP 2599
SPM 65x66
GPM 391
ROP (min/ft) 0 5
Gamma (API) 0 200
WOB 0 50
0 FLR 50
TGAS (units) 0 250
C1 (units) 0 250
C2 (units) 0 250
C3 (units) 0 250
C4 (units) 0 250
In wt. 9.5, vis 46
Out, wt. 9.5, vis 5
CG
Rig service gas
In wt. 9.5, vis 49
Out, wt. 9.5, vis 51
0 FLR 50
TGAS (units) 0 250
C1 (units) 0 250
C2 (units) 0 250
C3 (units) 0 250
C4 (units) 0 250





calcareous, friable.

Shale, dark brownish gray to dark brown to black, subblocky to subplaty, earthy, non calcareous, very silty, firm to soft.

Sandstone, white to clear to translucent, lower fine grained to lower medium grained, subround to subangular, unconsolidated, non calcareous, hard

Sandstone, opaque to translucent to clear, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.

Siltstone, bluish gray to medium gray to maroon, homogeneous, quartzose, argillaceous, slightly sandy, non calcareous, friable.

Shale, dark brownish gray to dark brown to black, subblocky to subplaty, earthy, non calcareous, very silty, firm to soft.

Survey @ 3296' Inc 9.58° AZ 21.37° TVD 3291.85'

In wt. 9.5, vis 47
Out, wt. 9.7, vis 48

Sandstone, opaque to translucent to clear, some white to pale reddish brown, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.

Sandstone, opaque to translucent to clear, some white to pale reddish brown, coarse grained to upper medium grained, unconsolidated, subangular, non calcareous, hard.

MUD DATA
@ 3317'
WT 9.55
VS 47
PV/YP 17/17
WL 5.6
pH 9.3
CA 70
CL 1100
SOLS 7.44%
ECD 9.85

Sandstone, opaque to translucent to clear, some white, coars grained to upper fine grained, unconsolidated, subangular, non calcareous, hard.

CG

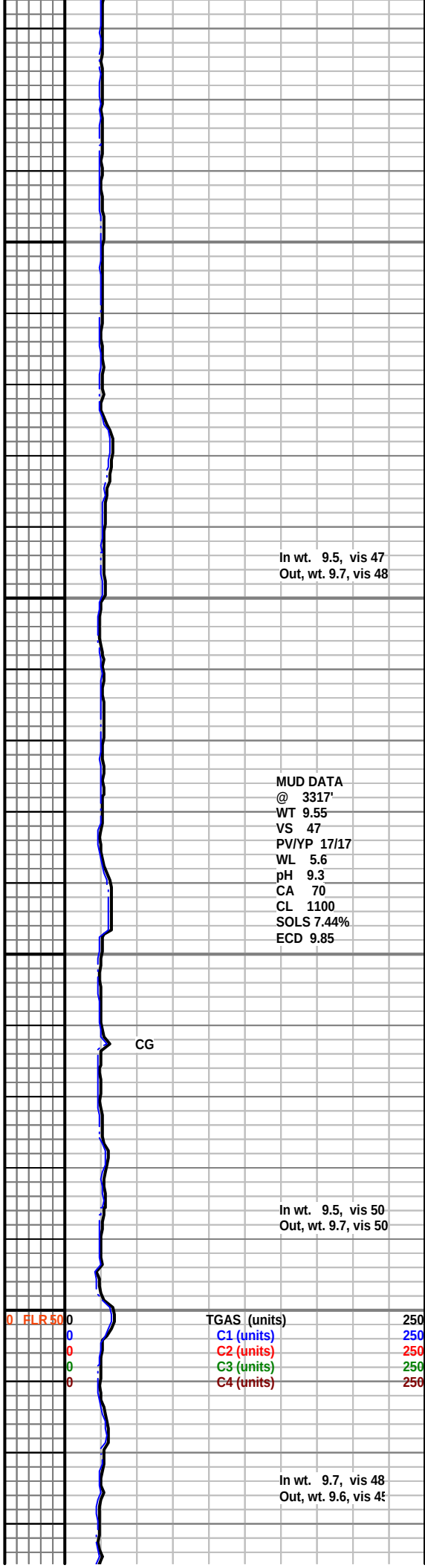
Coal, black to dark brown, subblocky to blocky, vitreous to earthy, shaley in part, firm to hard.

Shale, tan to light brown, subplaty to splintery, subwaxy, non calcareous, soft.

In wt. 9.5, vis 50
Out, wt. 9.7, vis 50

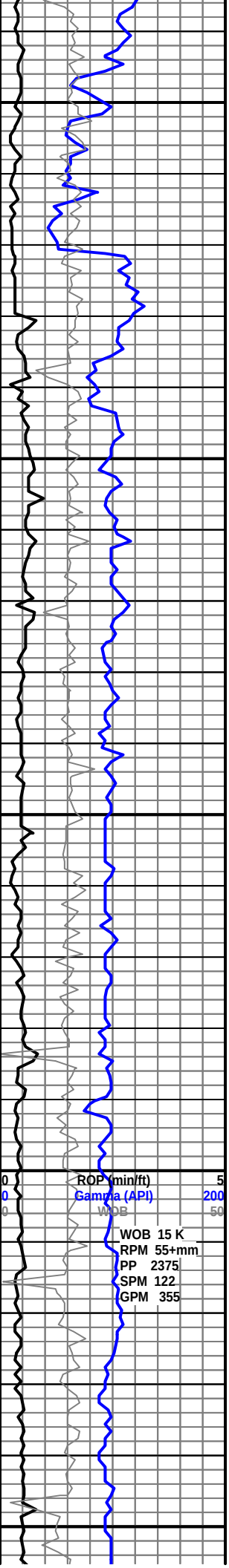
Survey @ 3390' Inc 11.30° AZ 23.26° TVD 3384.29'

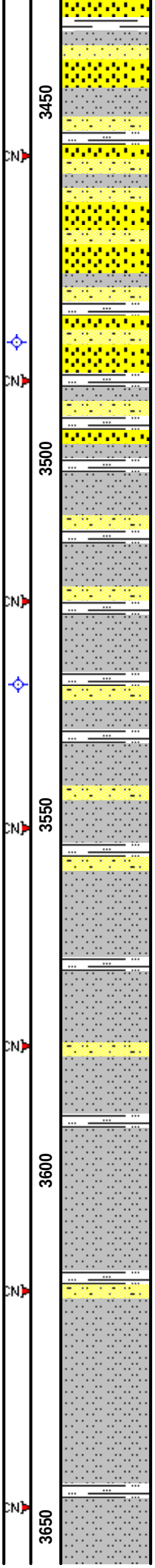
Sandstone, opaque to translucent to clear, some white, coars grained to lower fine grained, unconsolidated, subangular, non calcareous, moderate consolidation; Shale, tan to light brown, subplaty to splintery, subwaxy, non calcareous, poor induration



Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, platey, non calcareous, silty; Sandstone, opaque, gray to light gray, lower very fine grained to upper fine grained, some unconsolidated coarse grains of quartz and feldspar, subangular, very poorly sorted, argillaceous, some cream clay filling in parts, some chlorite, micaceous, non calcareou

In wt. 9.7, vis 48
Out, wt. 9.6, vis 4





moderate consolidation, no visible porosity, NSFOC.

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, platey, non calcareous, silty; Sandstone, translucent, gray to light gray, lower very fine grained to upper fine grained, some unconsolidated coarse grains of quartz and feldspar, subangular, very poorly sorted, argillaceous, some cream clay filling in parts, some chlorite, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.

In wt. 9.7, vis 46
Out, wt. 9.6, vis 45

Survey @ 3485' Inc 11.64° AZ 22.69° TVD 3477.39'

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, platey, non calcareous, silty and sandy in parts

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, platey, non calcareous, silty and sandy in parts

In wt. 9.6, vis 47
Out, wt. 9.6, vis 47

Survey @ 3581' Inc 10.80° AZ 23.45° TVD 3571.55'

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, platey, non calcareous, silty and sandy in parts

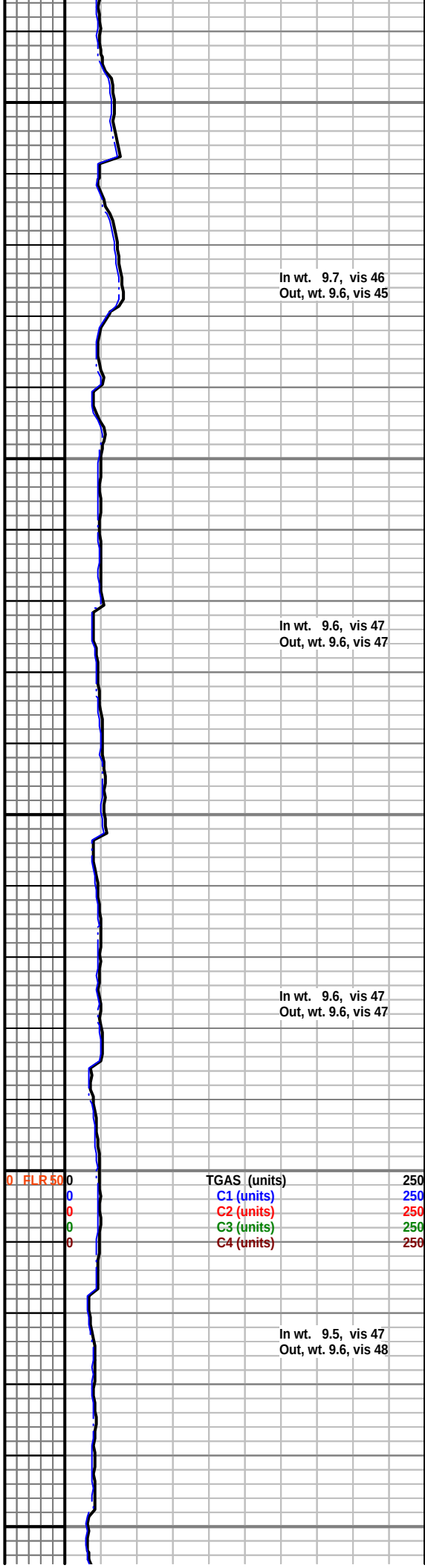
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub platey, non calcareous, silty and sandy in parts

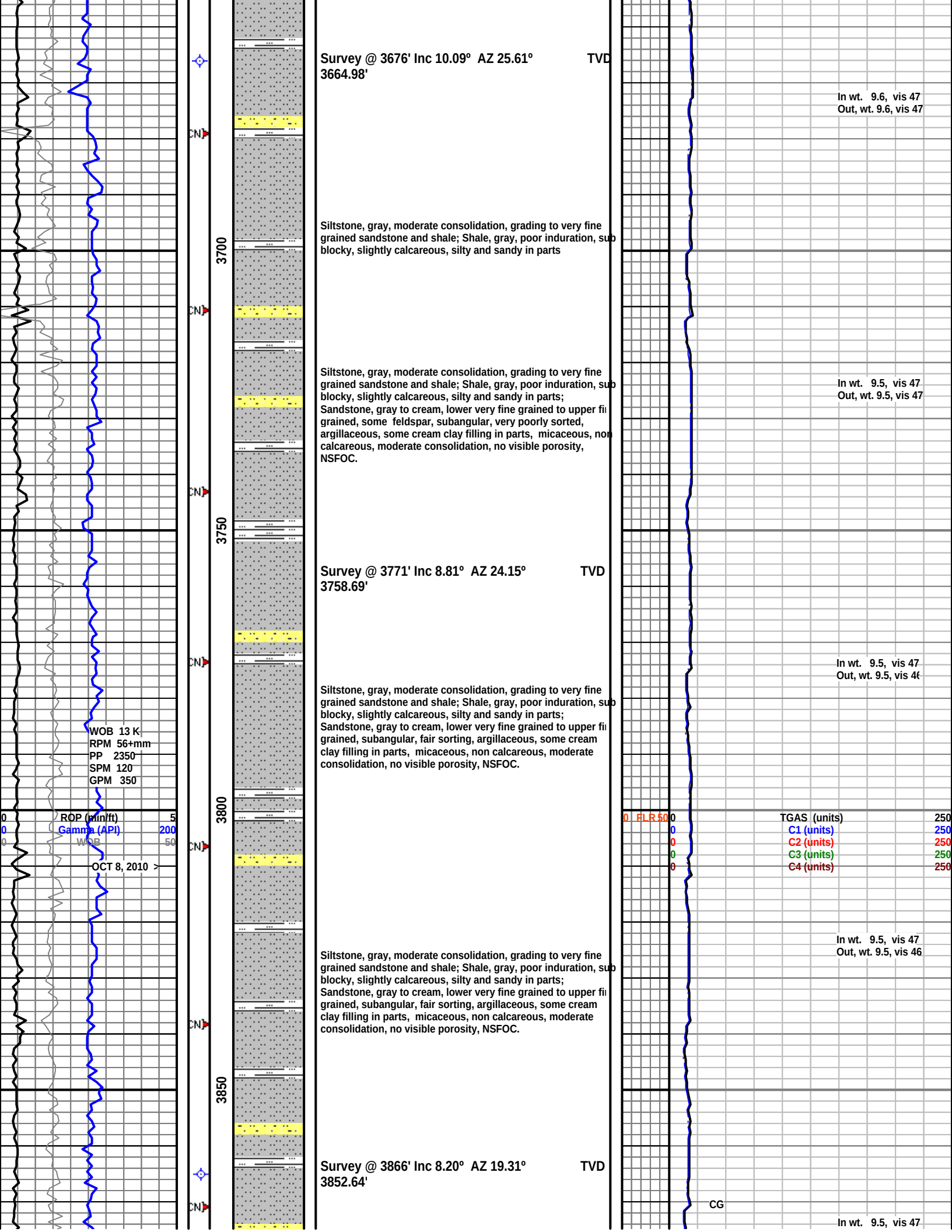
In wt. 9.6, vis 47
Out, wt. 9.6, vis 47

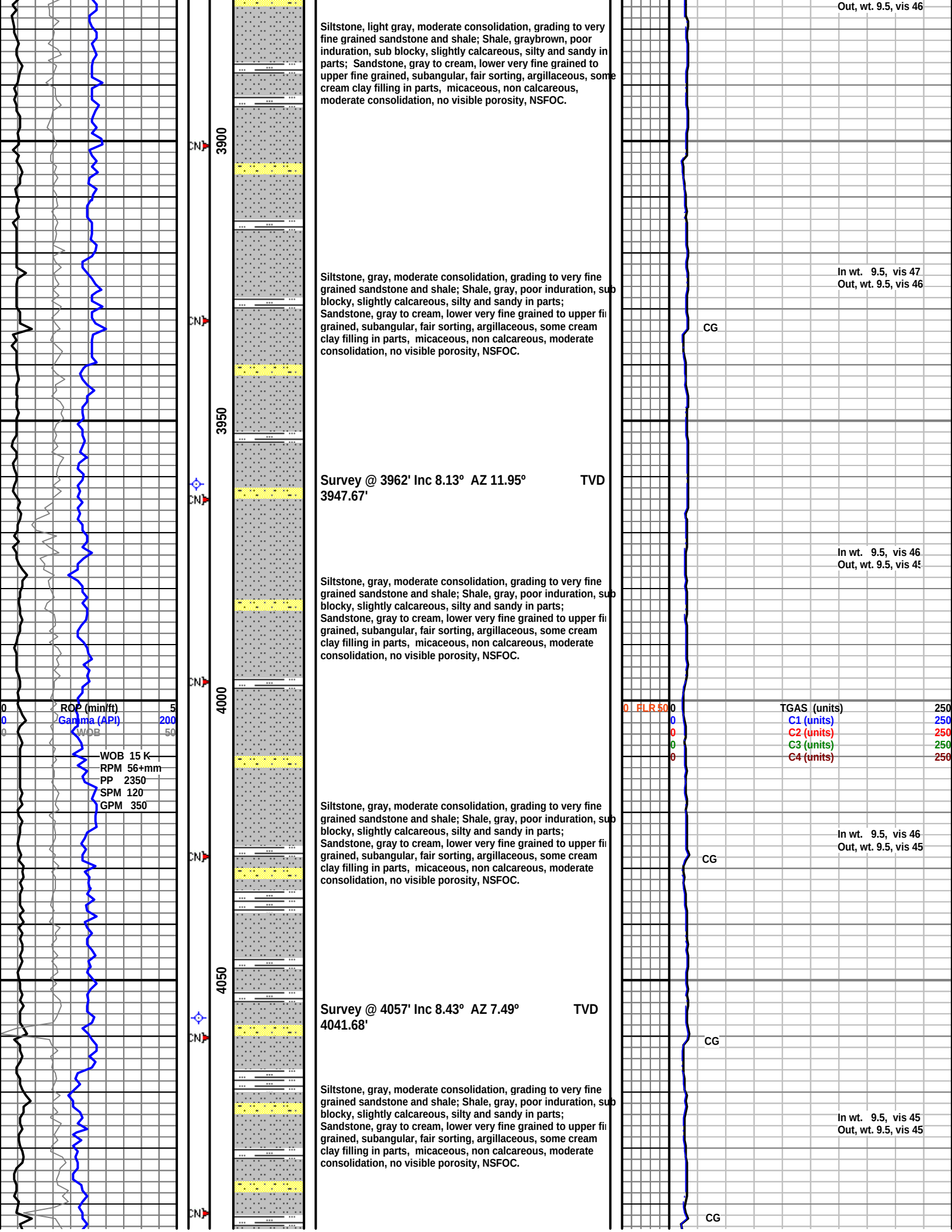
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts

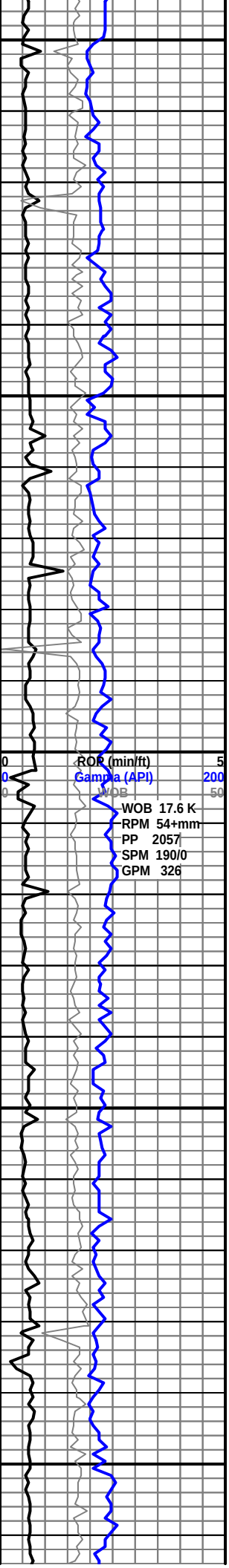
In wt. 9.5, vis 47
Out, wt. 9.6, vis 48

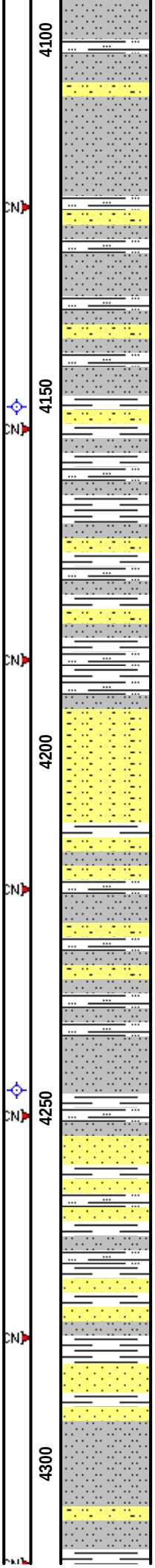
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.




Survey @ 3676' Inc 10.09° AZ 25.61° TVD 3664.98'
In wt. 9.6, vis 47
Out, wt. 9.6, vis 47
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, some feldspar, subangular, very poorly sorted, argillaceous, some cream clay filling in parts, micaceous, no calcareous, moderate consolidation, no visible porosity, NSFOC.
In wt. 9.5, vis 47
Out, wt. 9.5, vis 47
Survey @ 3771' Inc 8.81° AZ 24.15° TVD 3758.69'
In wt. 9.5, vis 47
Out, wt. 9.5, vis 46
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
WOB 13 K
RPM 56+mm
PP 2350
SPM 120
GPM 350
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
OCT 8, 2010 >
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
In wt. 9.5, vis 47
Out, wt. 9.5, vis 46
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
Survey @ 3866' Inc 8.20° AZ 19.31° TVD 3852.64'
CG
In wt. 9.5, vis 47
3700
3750
3800
3850
CN


0
ROP (min/ft)
5
0
Gamma (API)
200
0
WOB
50
WOB 15 K
RPM 56+mm
PP 2350
SPM 120
GPM 350
CN
3900
3950
4000
4050
Siltstone, light gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, graybrown, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fine grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
Out, wt. 9.5, vis 46
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
In wt. 9.5, vis 47
Out, wt. 9.5, vis 46
CG
Survey @ 3962' Inc 8.13° AZ 11.95° TVD 3947.67'
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
CG
Survey @ 4057' Inc 8.43° AZ 7.49° TVD 4041.68'
CG
Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, gray to cream, lower very fine grained to upper fi grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45
CG





Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, light gray to cream, lower very fine grained to upper very fine grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micaceous, non calcareous, moderate consolidation, no visible porosity, NSFOC.

CG

In wt. 9.5, vis 45
Out, wt. 9.5, vis 45

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale.

Survey @ 4152' Inc 7.82° AZ 7.21° TVD 4135.73'

In wt. 9.5+, vis 45
Out, wt. 9.5+, vis 45

Siltstone, gray, moderate consolidation, grading to very fine grained sandstone and shale; Shale, gray, poor induration, sub blocky, slightly calcareous, silty and sandy in parts; Sandstone, light gray to cream, upper very fine grained to lower fine grained, subangular, fair sorting, argillaceous, some cream clay filling in parts, micromicaceous, slightly calcareous, moderate consolidation, no visible porosity, NSFOC.

CG

SUSSEX MARKER
4194 Ft. MD, 4177 Ft. TVD

Sandstone, gray white to clear,upper very fine grained to lower fine grained, subround, calcareous, very argillaceous, very glauconitic, micromicaceous in part, salt and pepper in part, no visible porosity, hard, tight.

0 FLR 50

0	TGAS (units)	250
0	C1 (units)	250
0	C2 (units)	250
0	C3 (units)	250
0	C4 (units)	250

In wt. 9.5, vis 46
Out, wt. 9.5, vis 46

CG

Siltstone, medium gray, homogeneous, very argillaceous, sandy in part, shaley in part, very slightly calcareous, firm.

Survey @ 4247' Inc 8.09° AZ 5.13° TVD 4229.81'

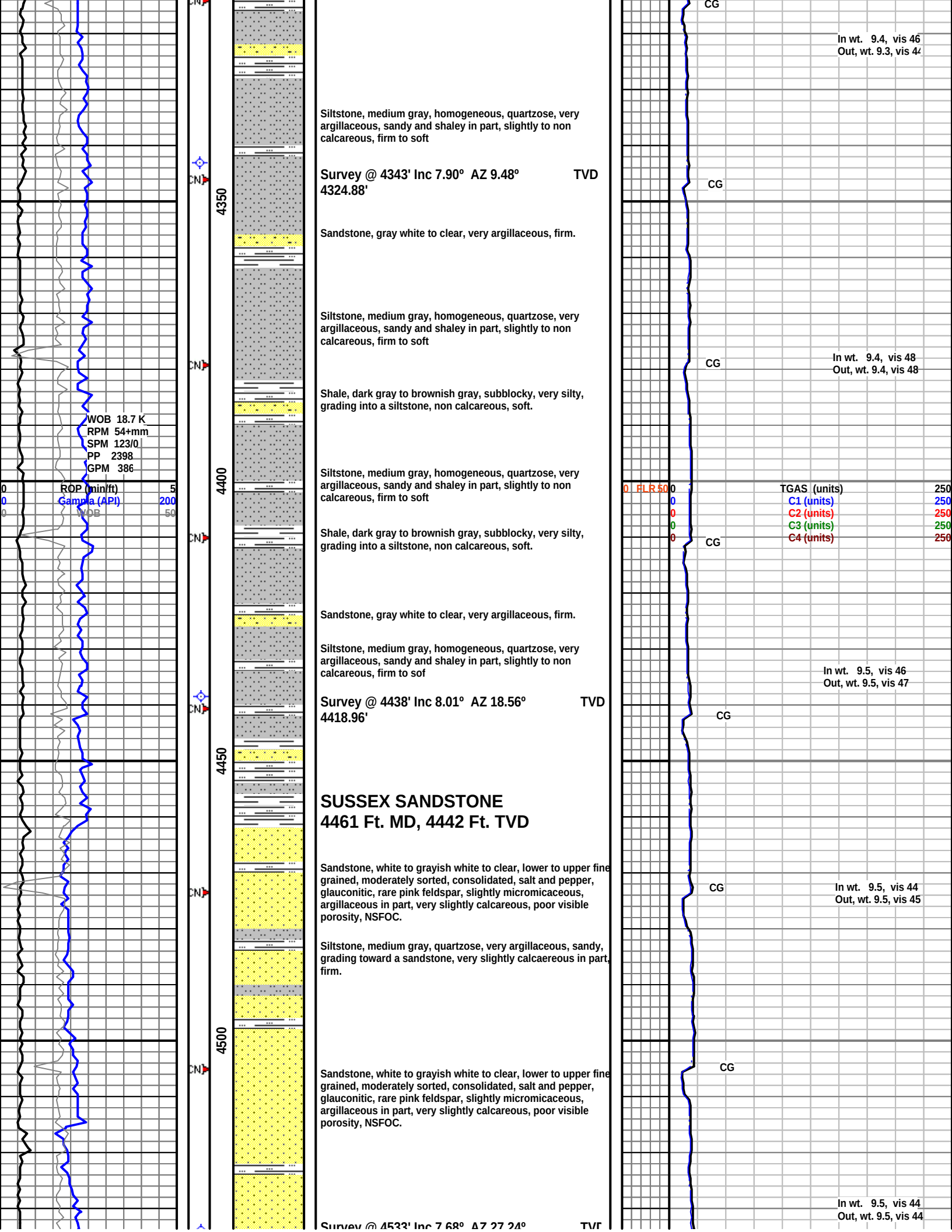
CG

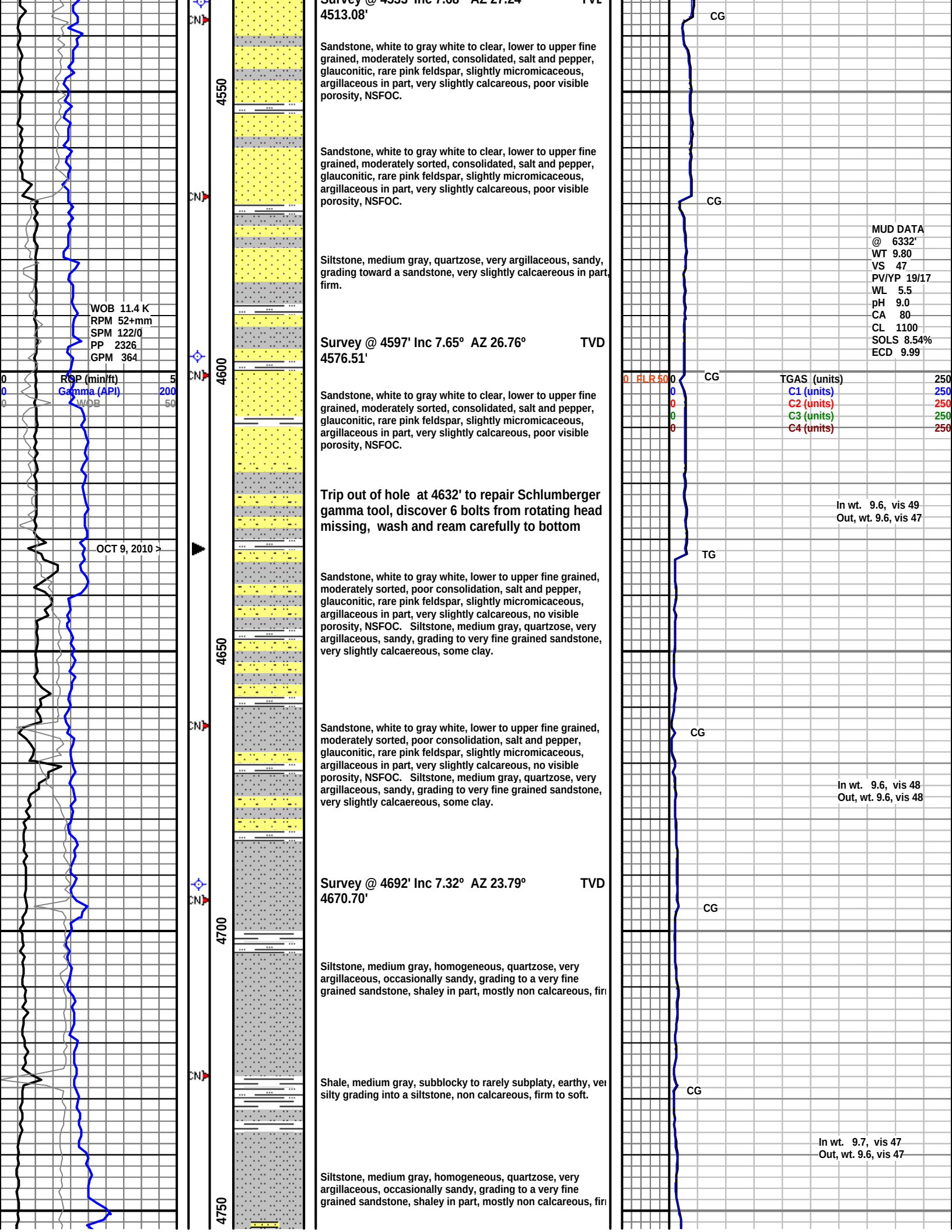
Sandstone, gray white to clear,upper very fine grained to lower fine grained, subround, calcareous, very argillaceous, micromicaceous in part, salt and pepper, poor to no visible porosity, hard, tight.

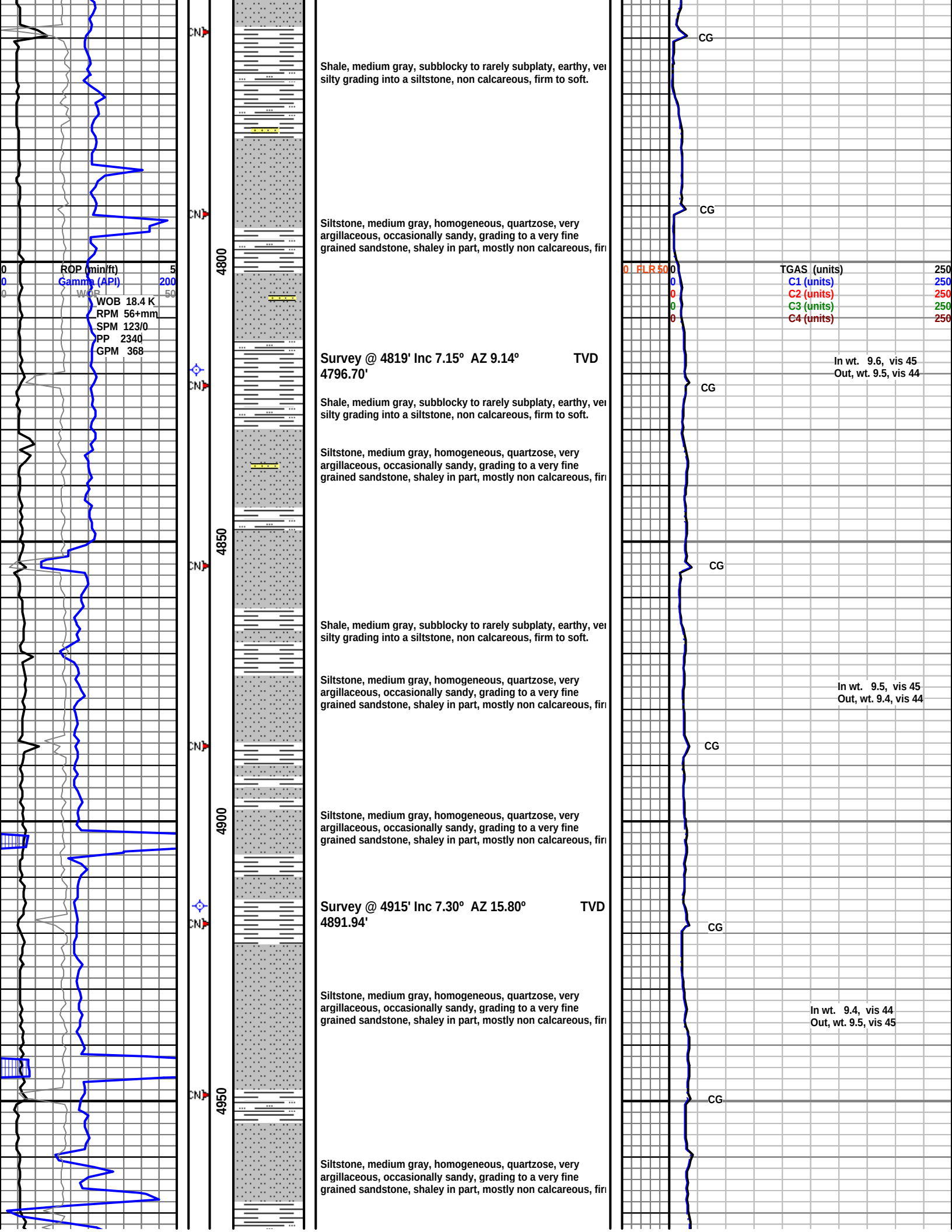
In wt. 9.5, vis 45
Out, wt. 9.5, vis 44

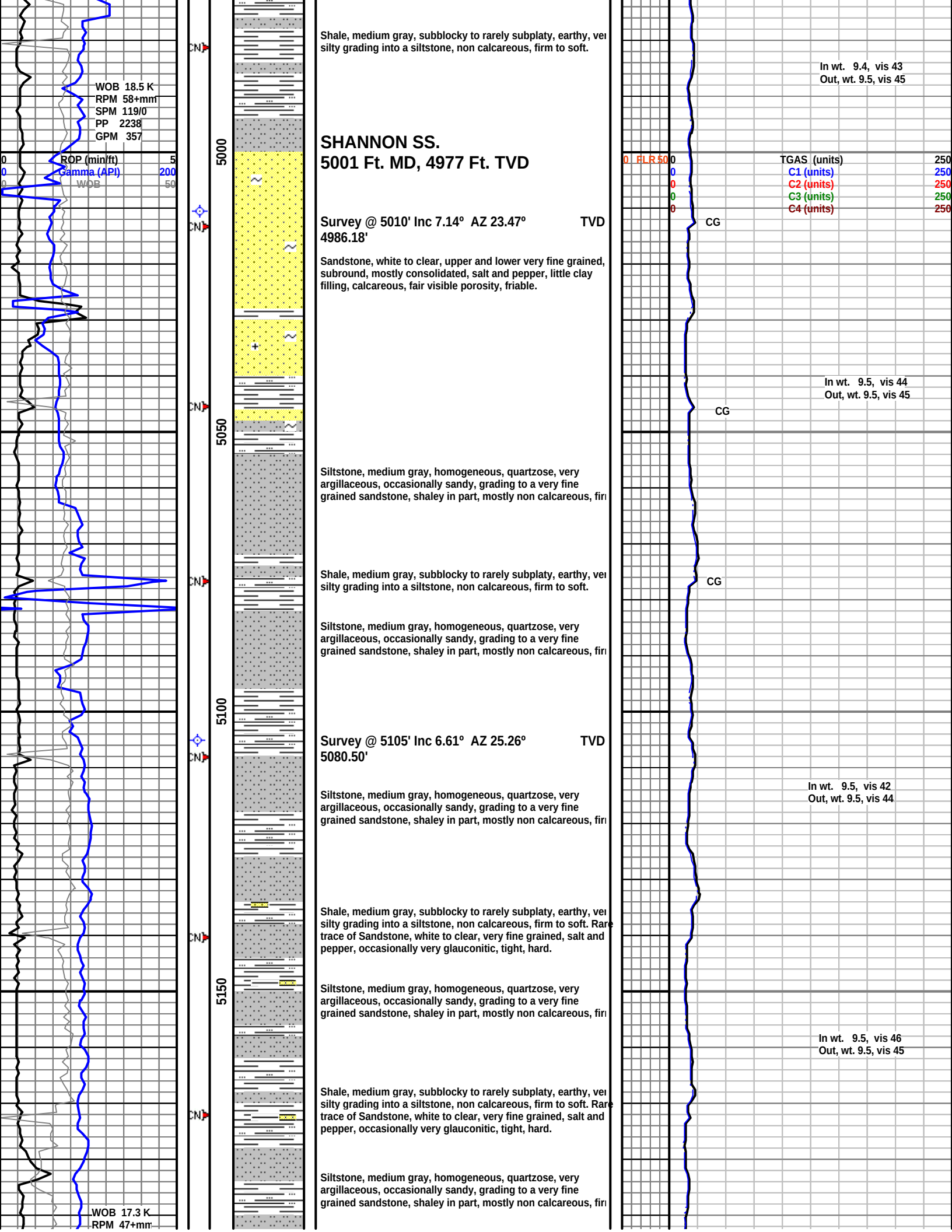
CG

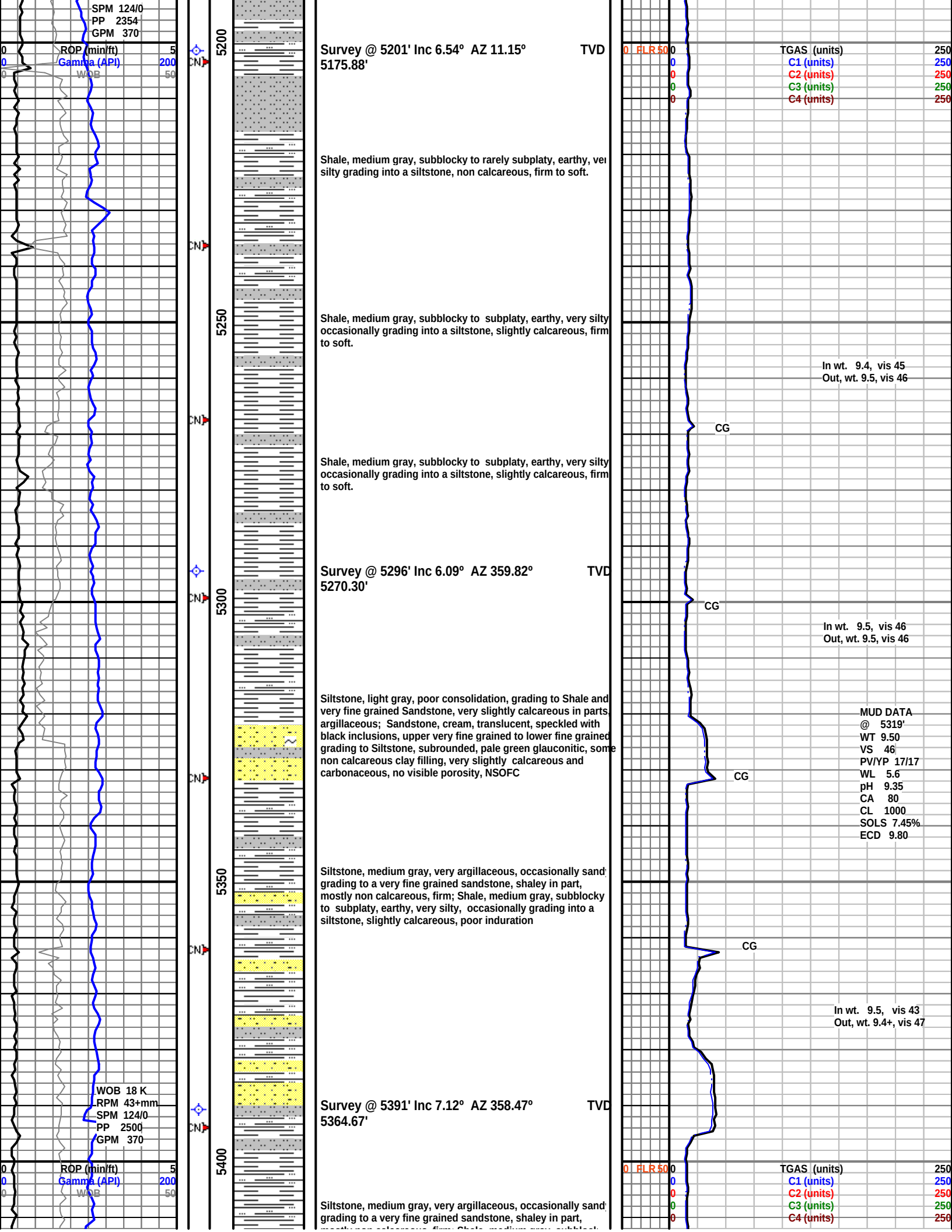
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, sandy and shaley in part, slightly to non calcareous, firm to soft

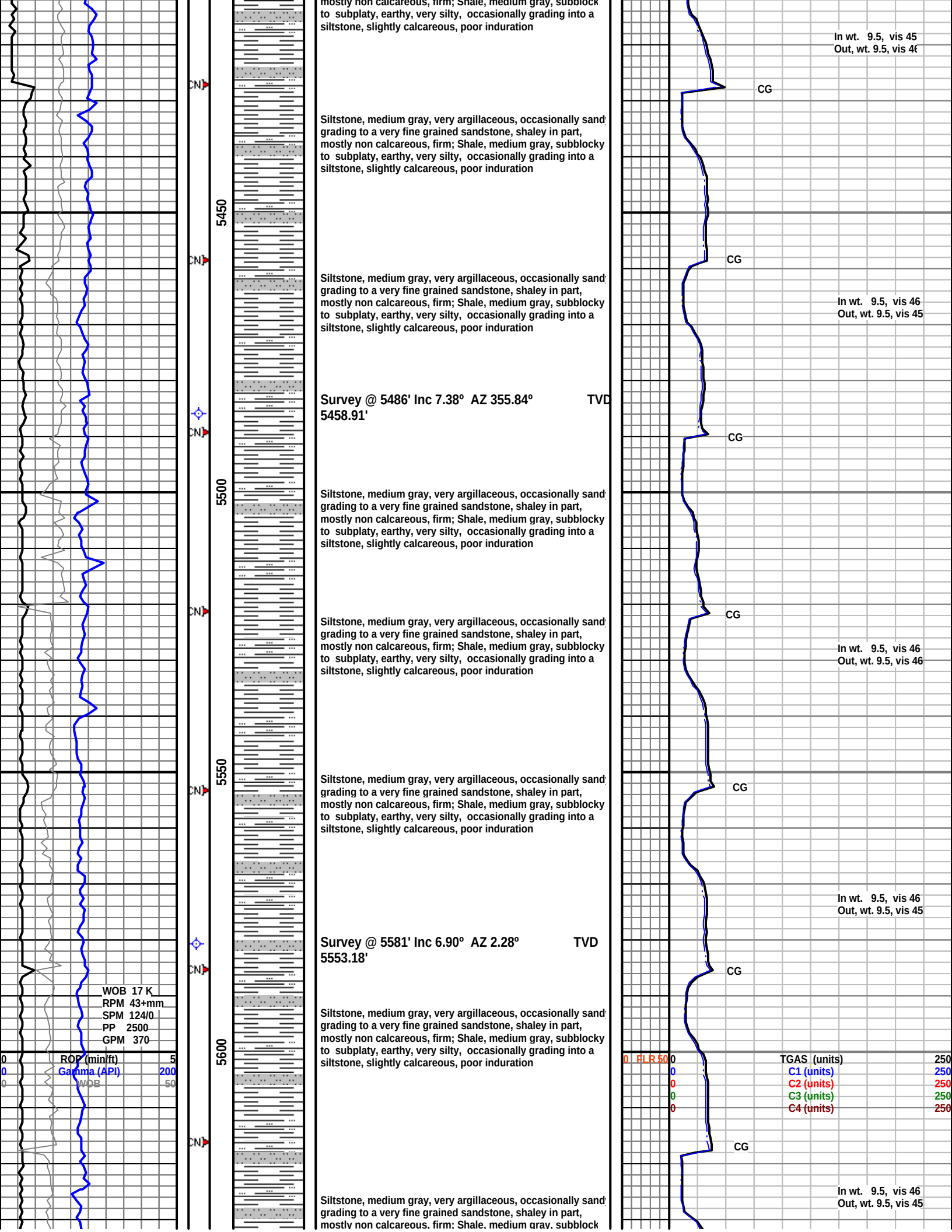

WOB 18.7 K
RPM 54+mm
SPM 123/0
PP 2398
GPM 386
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
4350
4400
4450
4500
CN
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, sandy and shaley in part, slightly to non calcareous, firm to soft
Survey @ 4343' Inc 7.90° AZ 9.48° TVD 4324.88'
Sandstone, gray white to clear, very argillaceous, firm.
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, sandy and shaley in part, slightly to non calcareous, firm to soft
Shale, dark gray to brownish gray, subblocky, very silty, grading into a siltstone, non calcareous, soft.
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, sandy and shaley in part, slightly to non calcareous, firm to soft
Shale, dark gray to brownish gray, subblocky, very silty, grading into a siltstone, non calcareous, soft.
Sandstone, gray white to clear, very argillaceous, firm.
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, sandy and shaley in part, slightly to non calcareous, firm to sof
Survey @ 4438' Inc 8.01° AZ 18.56° TVD 4418.96'
SUSSEX SANDSTONE
4461 Ft. MD, 4442 Ft. TVD
Sandstone, white to grayish white to clear, lower to upper fine grained, moderately sorted, consolidated, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, poor visible porosity, NSFOC.
Siltstone, medium gray, quartzose, very argillaceous, sandy, grading toward a sandstone, very slightly calcaereous in part, firm.
Sandstone, white to grayish white to clear, lower to upper fine grained, moderately sorted, consolidated, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, poor visible porosity, NSFOC.
Survey @ 4533' Inc 7.68° AZ 27.24° TVD
CG
In wt. 9.4, vis 46
Out, wt. 9.3, vis 44
In wt. 9.4, vis 48
Out, wt. 9.4, vis 48
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
In wt. 9.5, vis 46
Out, wt. 9.5, vis 47
In wt. 9.5, vis 44
Out, wt. 9.5, vis 45
In wt. 9.5, vis 44
Out, wt. 9.5, vis 44

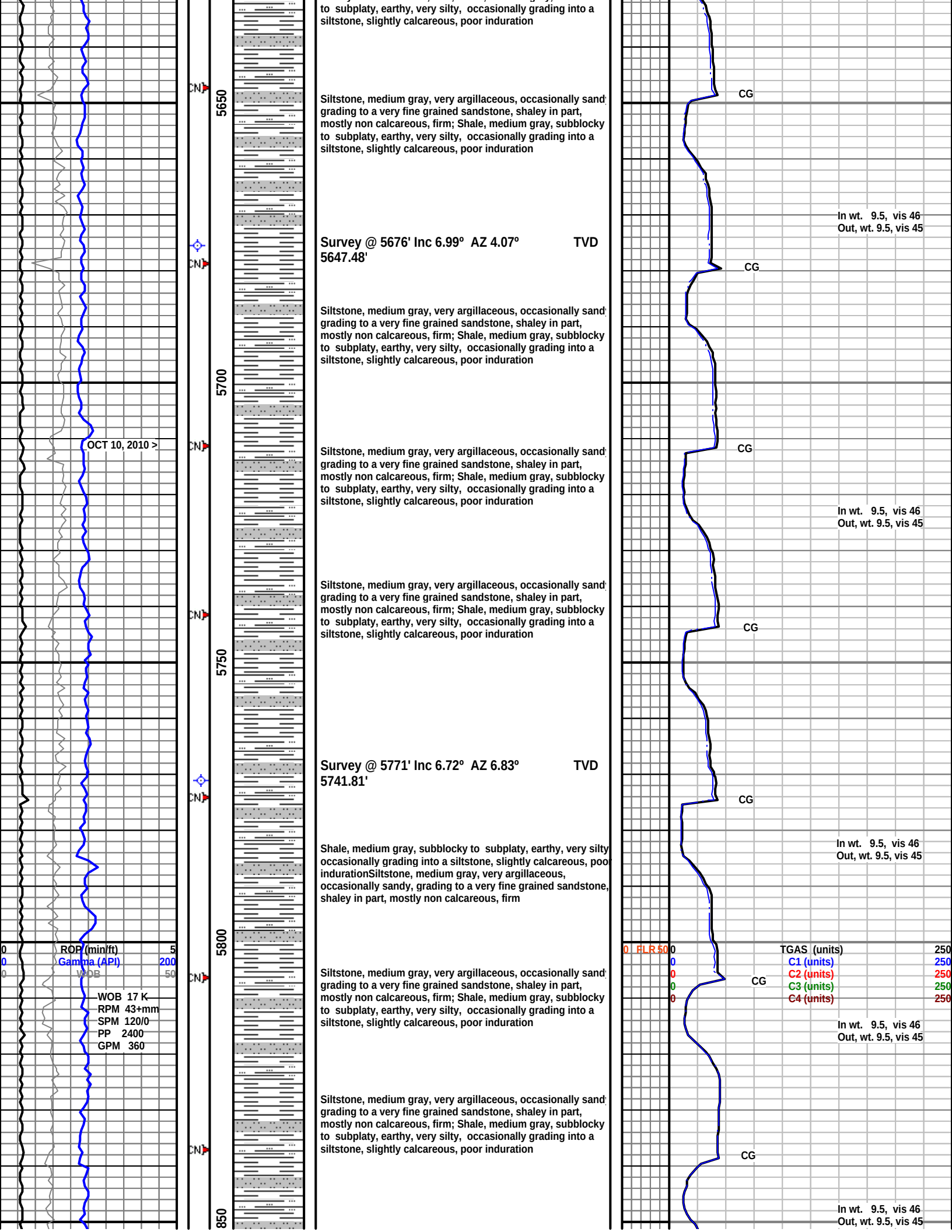

WOB 11.4 K
RPM 52+mm
SPM 122/0
PP 2326
GPM 364
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
OCT 9, 2010 >
4550
4600
4650
4700
4750
CN
CG
TG
0 FLR 50
TGAS (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
250
MUD DATA
@ 6332'
WT 9.80
VS 47
PV/YP 19/17
WL 5.5
pH 9.0
CA 80
CL 1100
SOLS 8.54%
ECD 9.99
In wt. 9.6, vis 49
Out, wt. 9.6, vis 47
In wt. 9.6, vis 48
Out, wt. 9.6, vis 48
In wt. 9.7, vis 47
Out, wt. 9.6, vis 47
4513.08'
Sandstone, white to gray white to clear, lower to upper fine grained, moderately sorted, consolidated, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, poor visible porosity, NSFOC.
Sandstone, white to gray white to clear, lower to upper fine grained, moderately sorted, consolidated, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, poor visible porosity, NSFOC.
Siltstone, medium gray, quartzose, very argillaceous, sandy, grading toward a sandstone, very slightly calcaereous in part, firm.
Survey @ 4597' Inc 7.65° AZ 26.76° TVD 4576.51'
Sandstone, white to gray white to clear, lower to upper fine grained, moderately sorted, consolidated, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, poor visible porosity, NSFOC.
Trip out of hole at 4632' to repair Schlumberger gamma tool, discover 6 bolts from rotating head missing, wash and ream carefully to bottom
Sandstone, white to gray white, lower to upper fine grained, moderately sorted, poor consolidation, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, no visible porosity, NSFOC. Siltstone, medium gray, quartzose, very argillaceous, sandy, grading to very fine grained sandstone, very slightly calcaereous, some clay.
Sandstone, white to gray white, lower to upper fine grained, moderately sorted, poor consolidation, salt and pepper, glauconitic, rare pink feldspar, slightly micromicaceous, argillaceous in part, very slightly calcareous, no visible porosity, NSFOC. Siltstone, medium gray, quartzose, very argillaceous, sandy, grading to very fine grained sandstone, very slightly calcaereous, some clay.
Survey @ 4692' Inc 7.32° AZ 23.79° TVD 4670.70'
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, occasionally sandy, grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firi
Shale, medium gray, subblocky to rarely subplaty, earthy, vei silty grading into a siltstone, non calcareous, firm to soft.
Siltstone, medium gray, homogeneous, quartzose, very argillaceous, occasionally sandy, grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firi

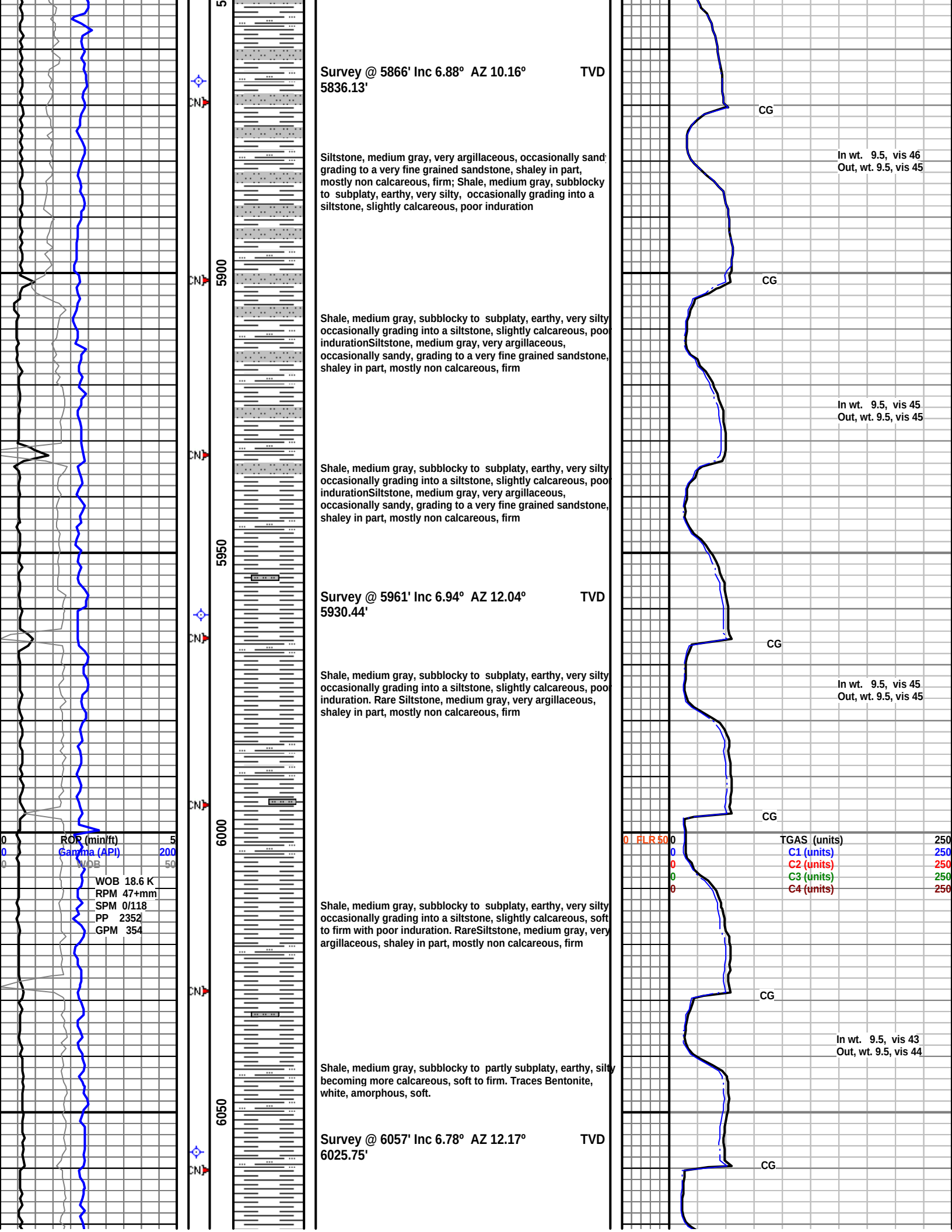

0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
WOB 18.4 K
RPM 56+mm
SPM 123/0
PP 2340
GPM 368
4800
4850
4900
4950
Shale, medium gray, subblocky to rarely subplaty, earthy, ver
silty grading into a siltstone, non calcareous, firm to soft.
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
Survey @ 4819' Inc 7.15° AZ 9.14° TVD
4796.70'
Survey @ 4915' Inc 7.30° AZ 15.80° TVD
4891.94'
CG
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
In wt. 9.6, vis 45
Out, wt. 9.5, vis 44
In wt. 9.5, vis 45
Out, wt. 9.4, vis 44
In wt. 9.4, vis 44
Out, wt. 9.5, vis 45

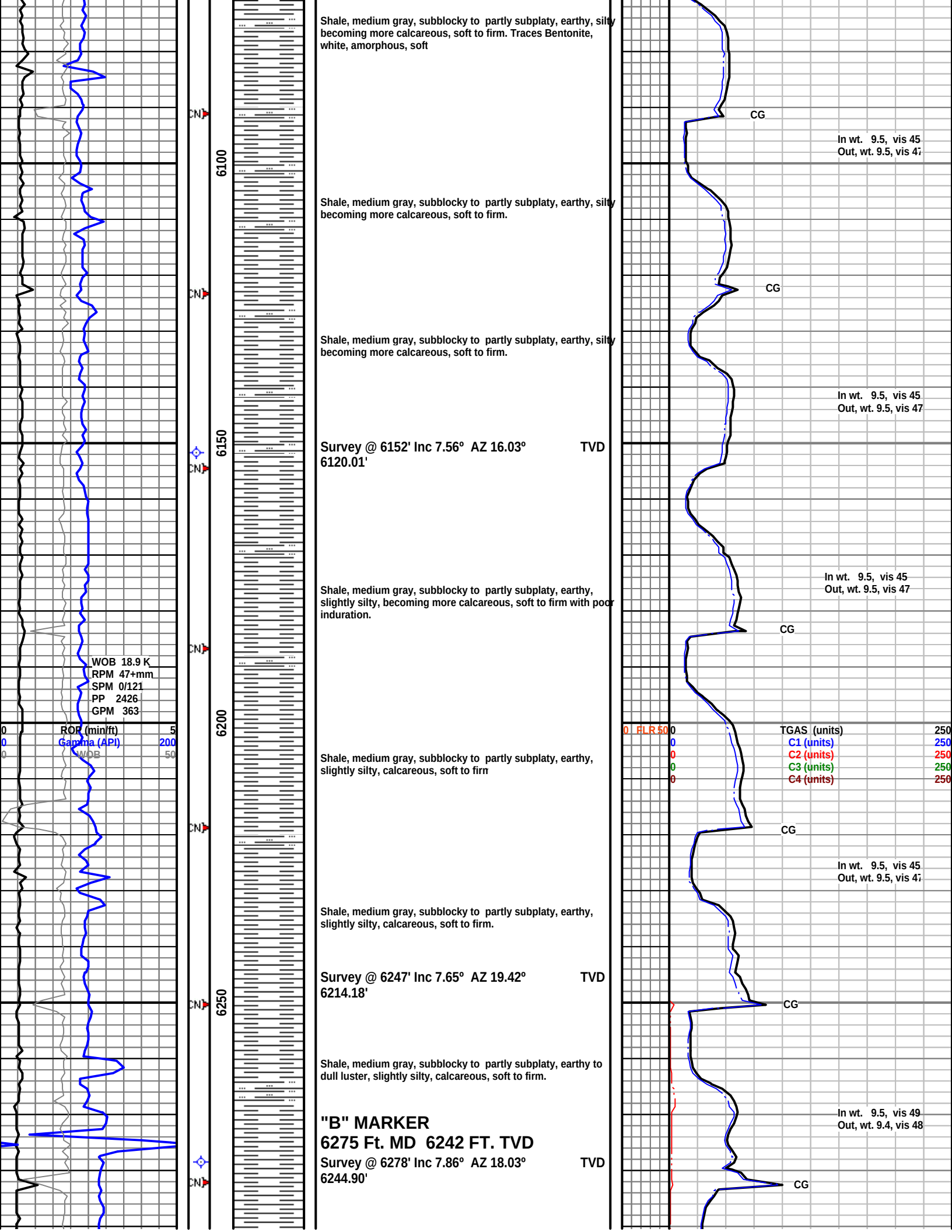

WOB 18.5 K
RPM 58+mm
SPM 119/0
PP 2238
GPM 357
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
5000
5050
5100
5150
WOB 17.3 K
RPM 47+mm
Shale, medium gray, subblocky to rarely subplaty, earthy, vei
silty grading into a siltstone, non calcareous, firm to soft.
SHANNON SS.
5001 Ft. MD, 4977 Ft. TVD
Survey @ 5010' Inc 7.14° AZ 23.47° TVD
4986.18'
Sandstone, white to clear, upper and lower very fine grained,
subround, mostly consolidated, salt and pepper, little clay
filling, calcareous, fair visible porosity, friable.
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
Shale, medium gray, subblocky to rarely subplaty, earthy, vei
silty grading into a siltstone, non calcareous, firm to soft.
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
Survey @ 5105' Inc 6.61° AZ 25.26° TVD
5080.50'
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
Shale, medium gray, subblocky to rarely subplaty, earthy, vei
silty grading into a siltstone, non calcareous, firm to soft. Rare
trace of Sandstone, white to clear, very fine grained, salt and
pepper, occasionally very glauconitic, tight, hard.
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
Shale, medium gray, subblocky to rarely subplaty, earthy, vei
silty grading into a siltstone, non calcareous, firm to soft. Rare
trace of Sandstone, white to clear, very fine grained, salt and
pepper, occasionally very glauconitic, tight, hard.
Siltstone, medium gray, homogeneous, quartzose, very
argillaceous, occasionally sandy, grading to a very fine
grained sandstone, shaley in part, mostly non calcareous, firi
0 BLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
CG
CG
CG
In wt. 9.4, vis 43
Out, wt. 9.5, vis 45
In wt. 9.5, vis 44
Out, wt. 9.5, vis 45
In wt. 9.5, vis 42
Out, wt. 9.5, vis 44
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45

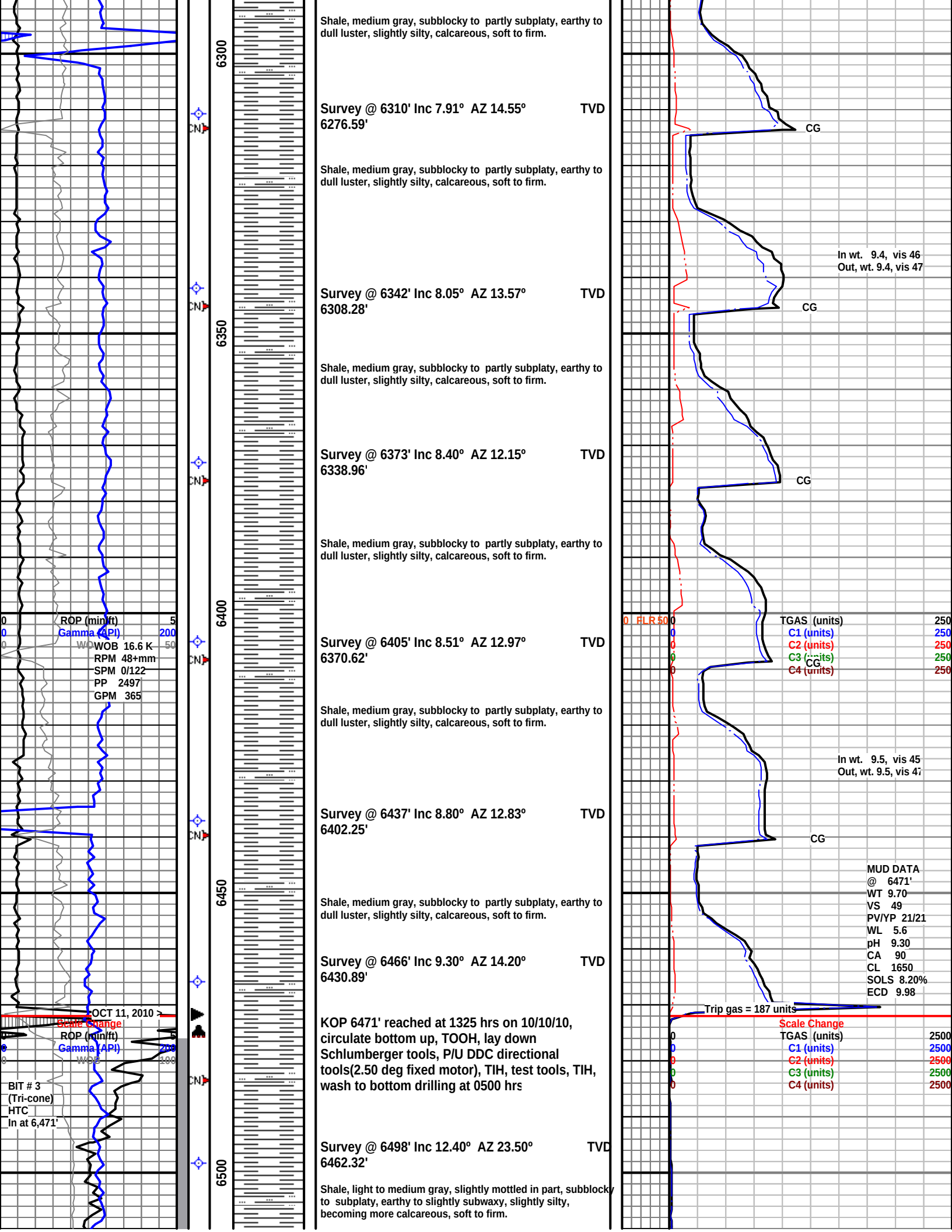

SPM 124/0
PP 2354
GPM 370
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
5200
5250
5300
5350
5400
CN
Survey @ 5201' Inc 6.54° AZ 11.15° TVD 5175.88'
Shale, medium gray, subblocky to rarely subplaty, earthy, ver silty grading into a siltstone, non calcareous, firm to soft.
Shale, medium gray, subblocky to subplaty, earthy, very silty occasionally grading into a siltstone, slightly calcareous, firm to soft.
In wt. 9.4, vis 45
Out, wt. 9.5, vis 46
CG
Shale, medium gray, subblocky to subplaty, earthy, very silty occasionally grading into a siltstone, slightly calcareous, firm to soft.
Survey @ 5296' Inc 6.09° AZ 359.82° TVD 5270.30'
CG
In wt. 9.5, vis 46
Out, wt. 9.5, vis 46
Siltstone, light gray, poor consolidation, grading to Shale and very fine grained Sandstone, very slightly calcareous in parts, argillaceous; Sandstone, cream, translucent, speckled with black inclusions, upper very fine grained to lower fine grained grading to Siltstone, subrounded, pale green glauconitic, some non calcareous clay filling, very slightly calcareous and carbonaceous, no visible porosity, NSOFC
CG
MUD DATA
@ 5319'
WT 9.50
VS 46
PV/YP 17/17
WL 5.6
pH 9.35
CA 80
CL 1000
SOLS 7.45%
ECD 9.80
Siltstone, medium gray, very argillaceous, occasionally sandy grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
CG
In wt. 9.5, vis 43
Out, wt. 9.4+, vis 47
WOB 18 K
RPM 43+mm
SPM 124/0
PP 2500
GPM 370
Survey @ 5391' Inc 7.12° AZ 358.47° TVD 5364.67'
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
Siltstone, medium gray, very argillaceous, occasionally sandy grading to a very fine grained sandstone, shaley in part,

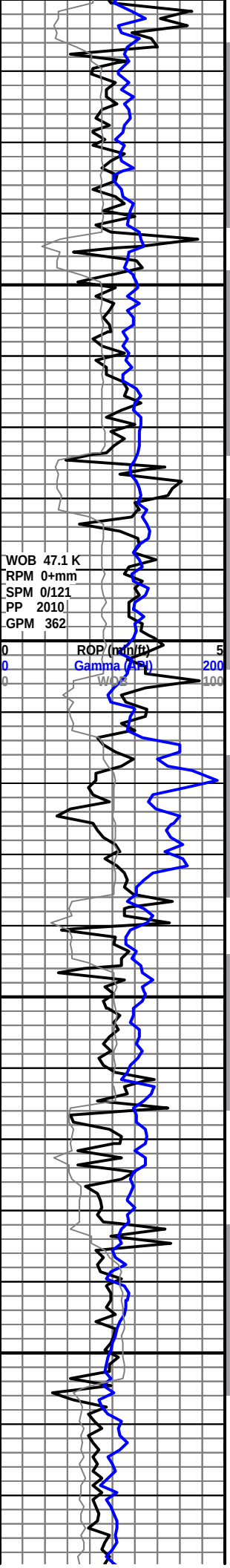

mostly non calcareous, firm; Shale, medium gray, subblock
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
In wt. 9.5, vis 45
Out, wt. 9.5, vis 46
CG
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
5450
CN
CG
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Survey @ 5486' Inc 7.38° AZ 355.84° TVD
5458.91'
CN
CG
5500
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
CN
CG
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
In wt. 9.5, vis 46
Out, wt. 9.5, vis 46
5550
CN
CG
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Survey @ 5581' Inc 6.90° AZ 2.28° TVD
5553.18'
CN
CG
WOB 17 K
RPM 43+mm
SPM 124/0
PP 2500
GPM 370
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
5600
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
CN
CG
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblock


to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
Survey @ 5676' Inc 6.99° AZ 4.07° TVD 5647.48'
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
OCT 10, 2010 >
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
Survey @ 5771' Inc 6.72° AZ 6.83° TVD 5741.81'
Shale, medium gray, subblocky to subplaty, earthy, very silty occasionally grading into a siltstone, slightly calcareous, poo indurationSiltstone, medium gray, very argillaceous, occasionally sandy, grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part, mostly non calcareous, firm; Shale, medium gray, subblocky to subplaty, earthy, very silty, occasionally grading into a siltstone, slightly calcareous, poor induration
5650
5700
5750
5800
5850
CN
CG
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
WOB 17 K
RPM 43+mm
SPM 120/0
PP 2400
GPM 360
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250


Survey @ 5866' Inc 6.88° AZ 10.16° TVD 5836.13'
Siltstone, medium gray, very argillaceous, occasionally sand
grading to a very fine grained sandstone, shaley in part,
mostly non calcareous, firm; Shale, medium gray, subblocky
to subplaty, earthy, very silty, occasionally grading into a
siltstone, slightly calcareous, poor induration
In wt. 9.5, vis 46
Out, wt. 9.5, vis 45
CG
Shale, medium gray, subblocky to subplaty, earthy, very silty
occasionally grading into a siltstone, slightly calcareous, poo
indurationSiltstone, medium gray, very argillaceous,
occasionally sandy, grading to a very fine grained sandstone,
shaley in part, mostly non calcareous, firm
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45
Shale, medium gray, subblocky to subplaty, earthy, very silty
occasionally grading into a siltstone, slightly calcareous, poo
indurationSiltstone, medium gray, very argillaceous,
occasionally sandy, grading to a very fine grained sandstone,
shaley in part, mostly non calcareous, firm
Survey @ 5961' Inc 6.94° AZ 12.04° TVD 5930.44'
Shale, medium gray, subblocky to subplaty, earthy, very silty
occasionally grading into a siltstone, slightly calcareous, poo
induration. Rare Siltstone, medium gray, very argillaceous,
shaley in part, mostly non calcareous, firm
In wt. 9.5, vis 45
Out, wt. 9.5, vis 45
Shale, medium gray, subblocky to subplaty, earthy, very silty
occasionally grading into a siltstone, slightly calcareous, soft
to firm with poor induration. RareSiltstone, medium gray, very
argillaceous, shaley in part, mostly non calcareous, firm
In wt. 9.5, vis 43
Out, wt. 9.5, vis 44
Shale, medium gray, subblocky to partly subplaty, earthy, silty
becoming more calcareous, soft to firm. Traces Bentonite,
white, amorphous, soft.
Survey @ 6057' Inc 6.78° AZ 12.17° TVD 6025.75'
5900
5950
6000
6050
CN
CG
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
WOB 18.6 K
RPM 47+mm
SPM 0/118
PP 2352
GPM 354
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250


Shale, medium gray, subblocky to partly subplaty, earthy, silty becoming more calcareous, soft to firm. Traces Bentonite, white, amorphous, soft
CG
In wt. 9.5, vis 45
Out, wt. 9.5, vis 47
Shale, medium gray, subblocky to partly subplaty, earthy, silty becoming more calcareous, soft to firm.
CG
Shale, medium gray, subblocky to partly subplaty, earthy, silty becoming more calcareous, soft to firm.
In wt. 9.5, vis 45
Out, wt. 9.5, vis 47
Survey @ 6152' Inc 7.56° AZ 16.03° TVD 6120.01'
Shale, medium gray, subblocky to partly subplaty, earthy, slightly silty, becoming more calcareous, soft to firm with poor induration.
In wt. 9.5, vis 45
Out, wt. 9.5, vis 47
CG
WOB 18.9 K
RPM 47+mm
SPM 0/121
PP 2426
GPM 363
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
Shale, medium gray, subblocky to partly subplaty, earthy, slightly silty, calcareous, soft to firm
CG
In wt. 9.5, vis 45
Out, wt. 9.5, vis 47
Shale, medium gray, subblocky to partly subplaty, earthy, slightly silty, calcareous, soft to firm.
Survey @ 6247' Inc 7.65° AZ 19.42° TVD 6214.18'
CG
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
"B" MARKER
6275 Ft. MD 6242 FT. TVD
In wt. 9.5, vis 49
Out, wt. 9.4, vis 48
Survey @ 6278' Inc 7.86° AZ 18.03° TVD 6244.90'
CG
6100
6150
6200
6250
CN


6300
6350
6400
6450
6500
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6310' Inc 7.91° AZ 14.55° TVD 6276.59'
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6342' Inc 8.05° AZ 13.57° TVD 6308.28'
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6373' Inc 8.40° AZ 12.15° TVD 6338.96'
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6405' Inc 8.51° AZ 12.97° TVD 6370.62'
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6437' Inc 8.80° AZ 12.83° TVD 6402.25'
Shale, medium gray, subblocky to partly subplaty, earthy to dull luster, slightly silty, calcareous, soft to firm.
Survey @ 6466' Inc 9.30° AZ 14.20° TVD 6430.89'
KOP 6471' reached at 1325 hrs on 10/10/10, circulate bottom up, TOOH, lay down Schlumberger tools, P/U DDC directional tools(2.50 deg fixed motor), TIH, test tools, TIH, wash to bottom drilling at 0500 hrs
Survey @ 6498' Inc 12.40° AZ 23.50° TVD 6462.32'
Shale, light to medium gray, slightly mottled in part, subblocky to subplaty, earthy to slightly subwaxy, slightly silty, becoming more calcareous, soft to firm.
CN
CG
In wt. 9.4, vis 46
Out, wt. 9.4, vis 47
In wt. 9.5, vis 45
Out, wt. 9.5, vis 47
0 ROP (min/ft) 5
0 Gamma (API) 200
0 WOB 50
WOB 16.6 K
RPM 48+mm
SPM 0/122
PP 2497
GPM 365
0 FLR 50
0 TGAS (units) 250
0 C1 (units) 250
0 C2 (units) 250
0 C3 (units) 250
0 C4 (units) 250
MUD DATA
@ 6471'
WT 9.70
VS 49
PV/YP 21/21
WL 5.6
pH 9.30
CA 90
CL 1650
SOLS 8.20%
ECD 9.98
Trip gas = 187 units
OCT 11, 2010
Scale Change
ROP (min/ft) 5
Gamma (API) 200
WOB 100
0 TGAS (units) 2500
0 C1 (units) 2500
0 C2 (units) 2500
0 C3 (units) 2500
0 C4 (units) 2500
BIT # 3
(Tri-cone)
HTC
In at 6,471'



6550

Survey @ 6530' Inc 16.30° AZ 31.10° TVD 6493.31'

Shale, light to medium gray, slightly mottled in part, subblocky to subplaty, earthy to slightly subwaxy, slightly silty, becoming more calcareous, soft to firm.

In wt. 9.6, vis 44
Out, wt. 9.7, vis 45

CG

Survey @ 6562' Inc 20.20° AZ 34.10° TVD 6523.70'

Shale, medium dark gray (N4) to mostly dark gray (N3), slightly mottled in part, subblocky to subplaty, earthy to slightly subwaxy, slightly silty, becoming more calcareous, soft to hard.

In wt. 9.7, vis 45
Out, wt. 9.7, vis 47

CG

Survey @ 6593' Inc 23.90° AZ 33.70° TVD 6552.43'

NIOBRARA Fm.
6593 Ft. MD, 6552 Ft. TVD

6600

0 FLR 50

0	TGAS (units)	2500
0	C1 (units)	2500
0	C2 (units)	2500
0	C3 (units)	2500
0	C4 (units)	2500

Shale, medium dark gray (N4) to dark gray (N3), very mottled, subblocky to subplaty, earthy to slightly subwaxy, carbonaceous, speckled with calcite inclusions in part, slightly silty, very calcareous, soft to firm.

In wt. 9.6, vis 50
Out, wt. 9.6, vis 49

Survey @ 6625' Inc 27.20° AZ 32.90° TVD 6581.29'

NIOBRARA "A" Marl
6611 Ft. MD, 6572 Ft. TVD

Carbonaceous Shale, medium dark gray (N4) to dark gray (N3), very mottled, subblocky to subplaty, earthy to slightly subwaxy, carbonaceous, some calcite inclusions in part, slightly silty and marly, very calcareous, poor induration.

CG

6650

Survey @ 6657' Inc 30.4° AZ 32.00° TVD 6609.33'

Carbonaceous Shale, medium dark gray (N4) to dark gray (N3), very mottled, subblocky to subplaty, earthy to slightly subwaxy, carbonaceous, some calcite inclusions in part, marlstone, slightly silty, very calcareous, poor induration.

In wt. 9.6, vis 51
Out, wt. 9.6+, vis 48

CG

Survey @ 6688' Inc 33.3° AZ 31.10° TVD 6635.66'

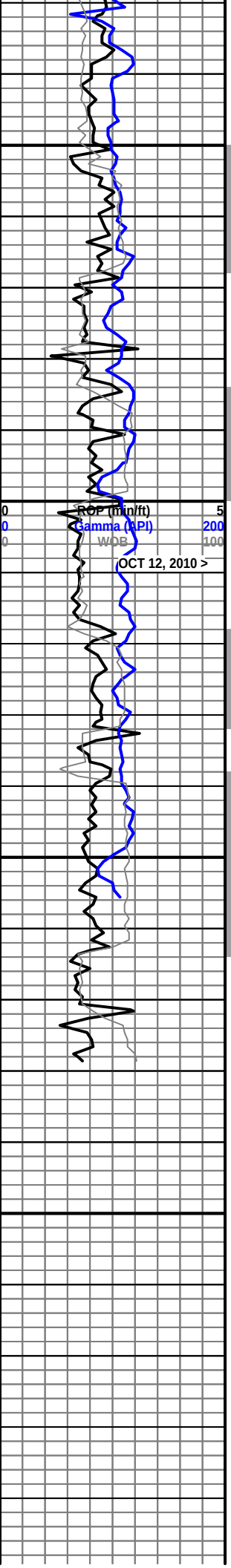
Carbonaceous Shale, light gray (N7) to dark gray (N3) very mottled, subblocky to subplaty, earthy to slightly subwaxy, very carbonaceous, some calcite inclusions in part, slightly silty and marly in parts, becoming increasingly calcareous, poor induration.

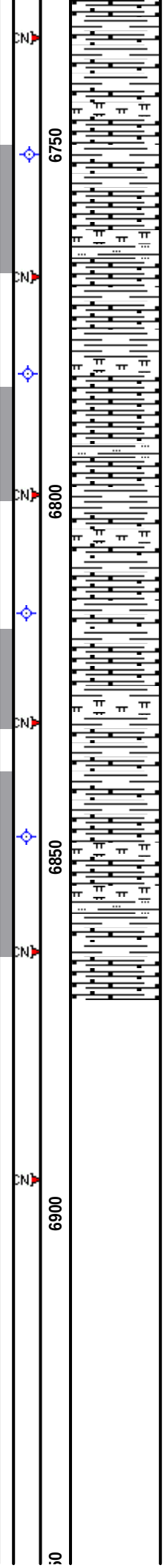
CG

6700

Survey @ 6720' Inc 34.30° AZ 30.20° TVD 6662.25'

MUD DATA
@ 6693'
WT 9.65
VS 47
PV/YP 19/17
WL 6.0
pH 9.0
CA 80
CL 900





Carbonaceous Shale, light gray (N7) to dark gray (N3) very mottled, subblocky to subplaty, earthy to slightly subwaxy, very carbonaceous, some calcite inclusions in part, slightly silty and marly in parts, very calcareous, poor induration.

Survey @ 6752' Inc 35.30° AZ 28.10° TVD 6688.53'

Carbonaceous Shale, light gray (N7) to dark gray (N3) very mottled, subblocky to subplaty, earthy to slightly subwaxy, very carbonaceous, some calcite inclusions in part, slightly silty and marly in parts, rare white calcite filled microfracture calcareous, poor induration, very spotty bright yellow fluorescence in drilling fluid, yellow/gold streaming cut fluorescence.

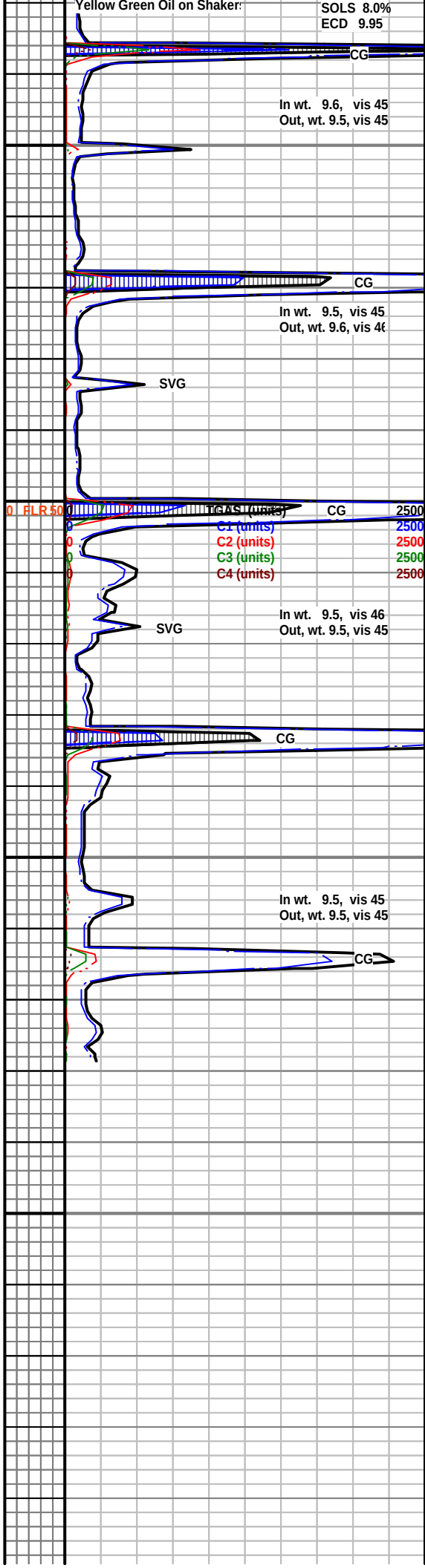
Survey @ 6784' Inc 37.30° AZ 27.40° TVD 6714.32'

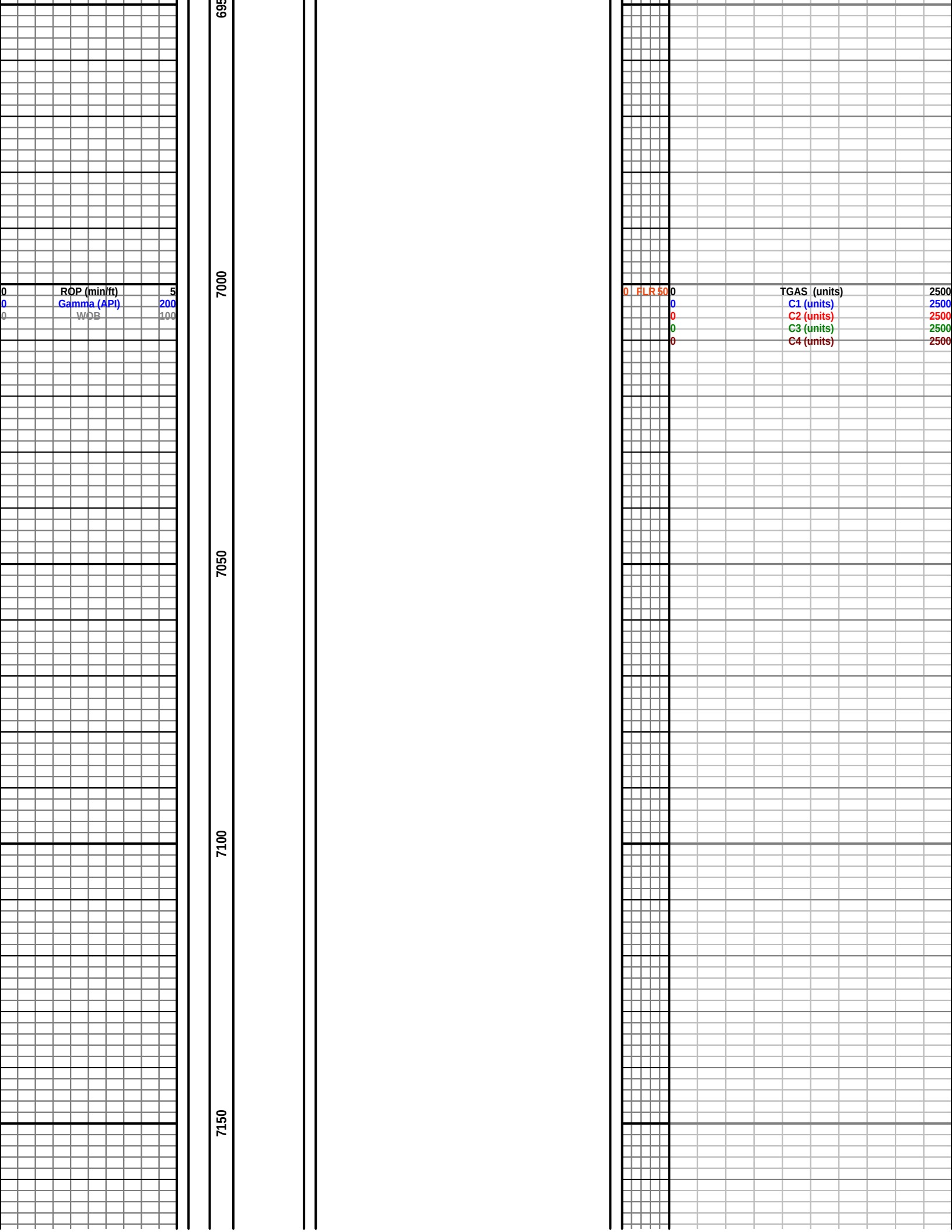
Carbonaceous Shale, light gray (N7) to dark gray (N3) very mottled, subblocky to subplaty, earthy to slightly subwaxy, very carbonaceous, some calcite inclusions in part, slightly silty and marly in parts, rare white calcite filled microfracture rare disseminated pyrite, calcareous, poor induration; very bright yellow/gold spotty mud fluorescence, yellow streaming cut fluorescence.

Survey @ 6815' Inc 39.30° AZ 27.80° TVD 6738.65'

Carbonaceous Shale, light gray (N7) to dark gray (N3) very mottled, subblocky to subplaty, earthy to slightly subwaxy, very carbonaceous, some calcite inclusions in part, slightly silty and marly in parts, rare white calcite filled microfracture rare disseminated pyrite, calcareous, poor induration; very bright yellow/gold spotty mud fluorescence, yellow slow blooming cut fluorescence.

Survey @ 6847' Inc 42.50° AZ 29.0° TVD 6762.83'

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0 WOB 100
0 FLR 500
0 TGAS (units) 2500
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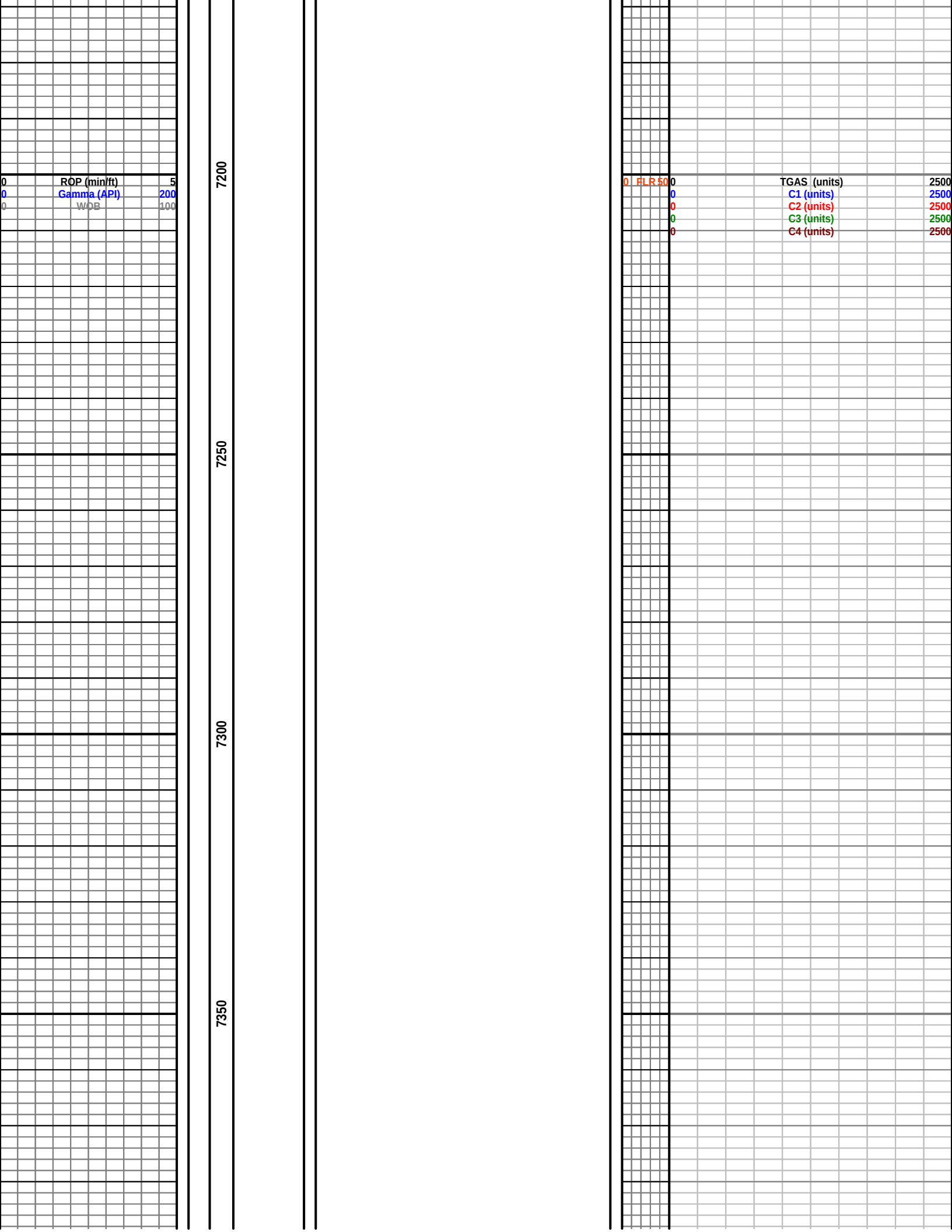
0 C4 (units) 2500
6950
7000
7050
7100
7150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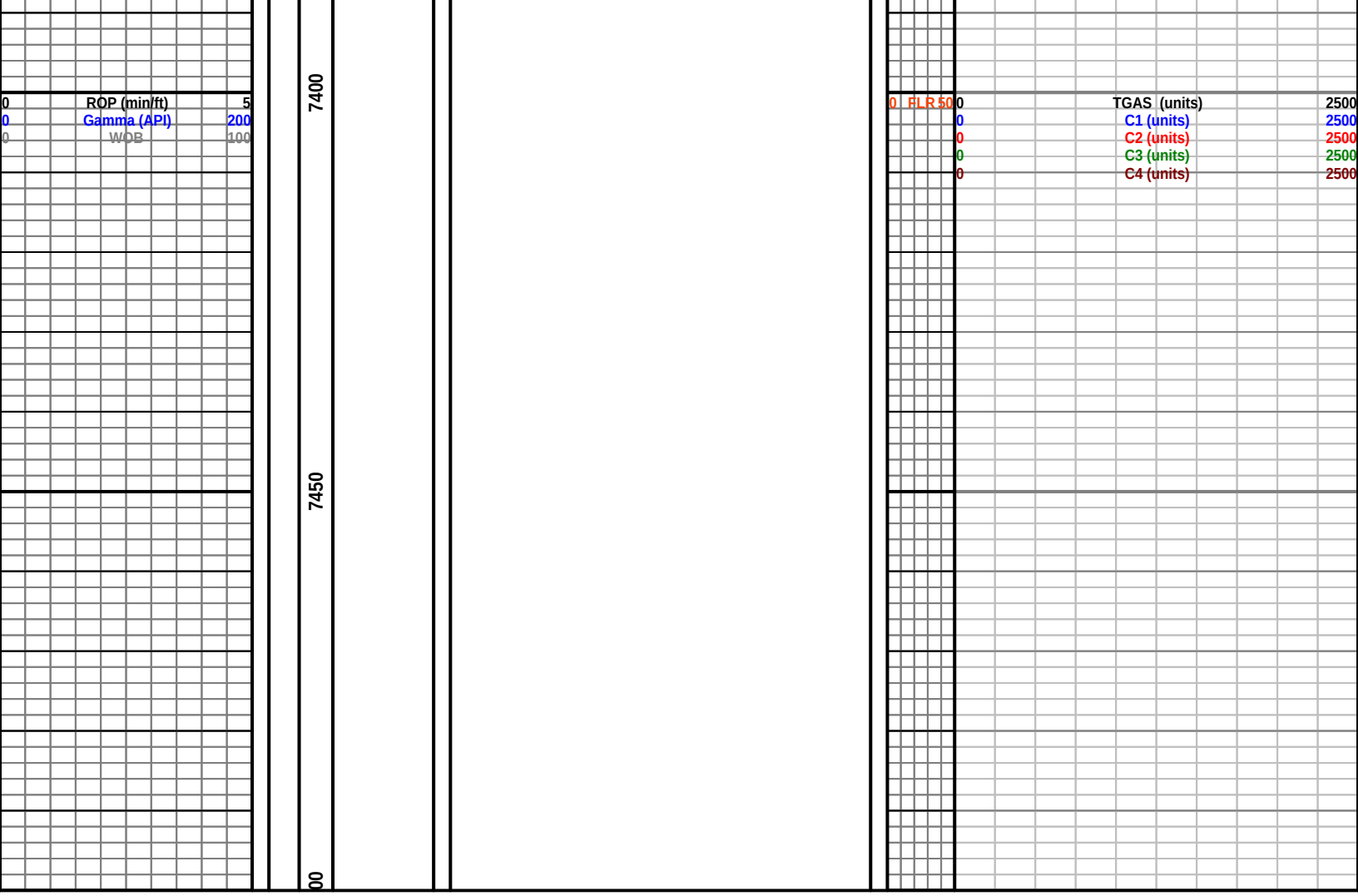
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ROP (min/ft)
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0
Gamma (API)
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0
WOB
100
7400
7450
00
0
FLR
50
0
TGAS (units)
2500
0
C1 (units)
2500
0
C2 (units)
2500
0
C3 (units)
2500
0
C4 (units)
2500