GEOSEARCH LOGGING INC.

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

Well Name:	Windoes 2244H		
Location:	Harrison County, WV		
License Number:	47-033-05406	Region:	Appalachia
Spud Date:	12/18/2010	Drilling Completed:	1/3/2011
Surface Coordinates:	Lat: 39.1273167 Long:-80.2332583		
Bottom Hole Coordinates:	Lat: 39.132838 Long: -80.2393861		
Ground Elevation (ft):	1,324'	K.B. Elevation (ft):	1,340'
Logged Interval (ft):	2,669' To: 10,437'	Total Depth (ft):	10,437
Formation:	Marcellus		
Type of Drilling Fluid:	Air Drilling, Oil Based Mud		

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: XTO Energy
Address: 600 E. Exchange Ave.
Fort Worth, TX 76164

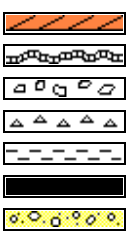
GEOLOGIST

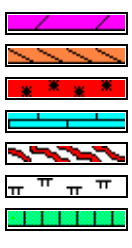
Name: Kelley Hartley, Daniel Blake, & Randy Shuman,
Company: Geosearch Logging, Inc.
Address: P.O. Box 6005
Edmond, OK 73083-6005
(405) 340-5545

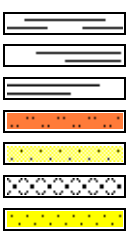
Comments

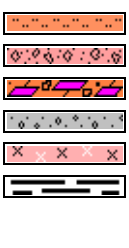
2 Manned Logging Service
Start Logging Date: 12/24/2010
OBM date: 12/29/2010
Released Logging Date: 1/3/2011
Drilling Contractor: UDI #209
PC193,ML126,HASP V-42, H-33

ROCK TYPES


Anhy
Bent
Brec
Cht
Clyst
Coal
Congl


Dol
Gyp
Igne
Lmst
Meta
Mrlst
Salt


Shale
Shcol
Shgy
Sltst
Ss
Till
Sandstn


Siltstn
Granwash
Dolowash
Cement
Granite
Hotshale

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
- Fenest
- F Fracture
- Inter
- Moldic
- Organic
- P Pinpoint
- V Vuggy

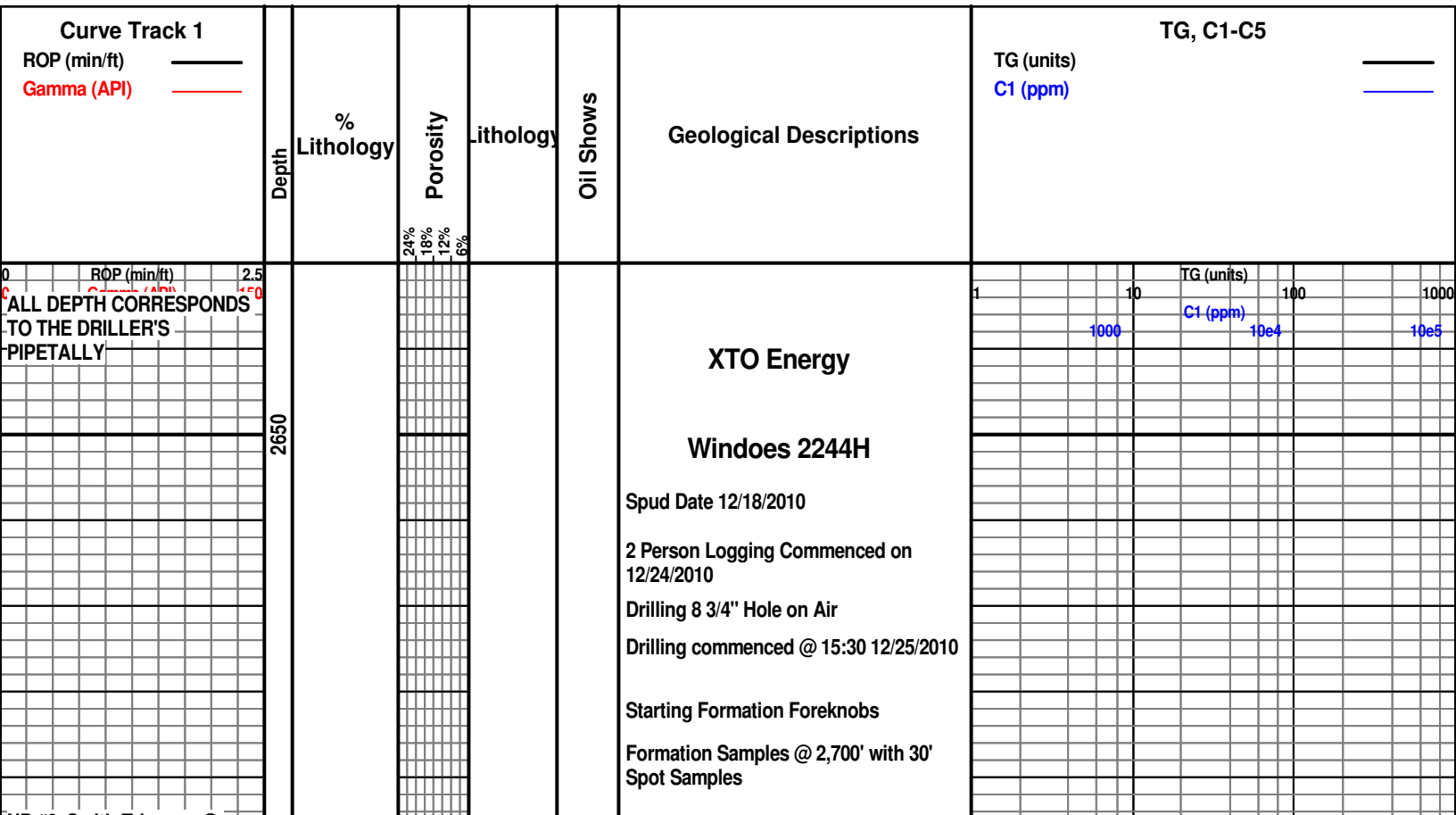
SORTING
- W Well
- M Moderate
- P Poor

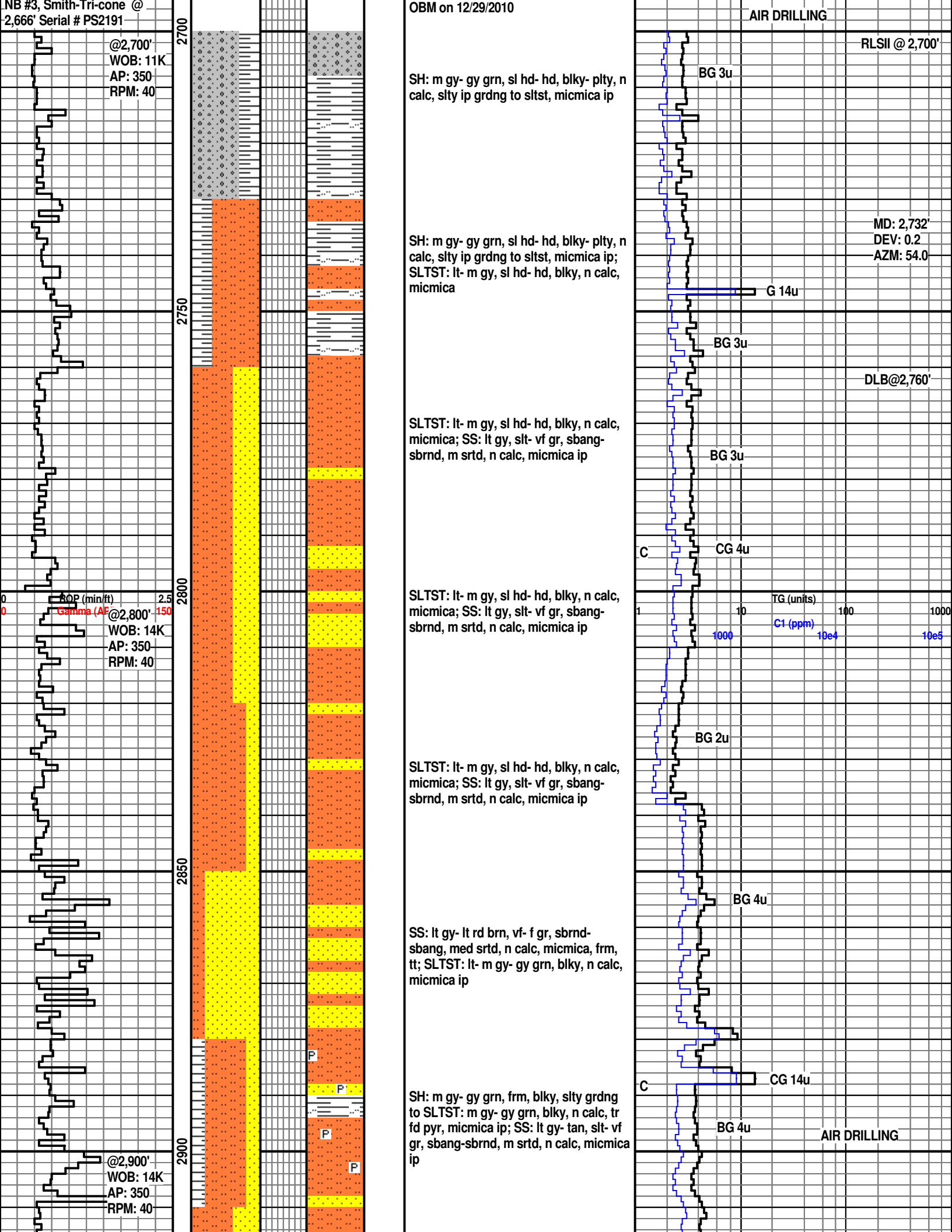
ROUNDING
- R Rounded
- r Subrnd
- a Subang
- A Angular

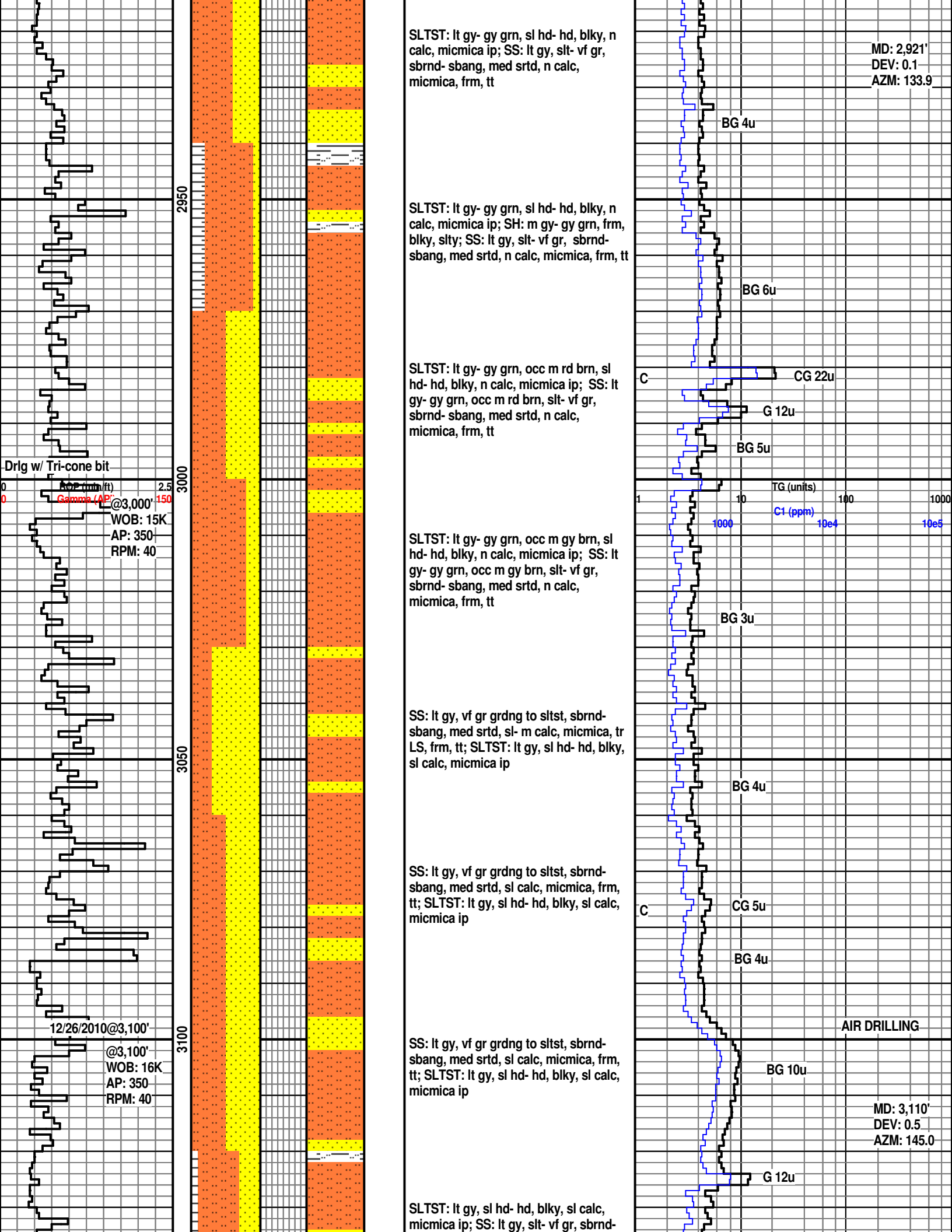
OIL SHOWS
- Even
- Spotted
- Ques
- D Dead
- Poor
- Fair
- Good
- Excelent
- Csgshoe

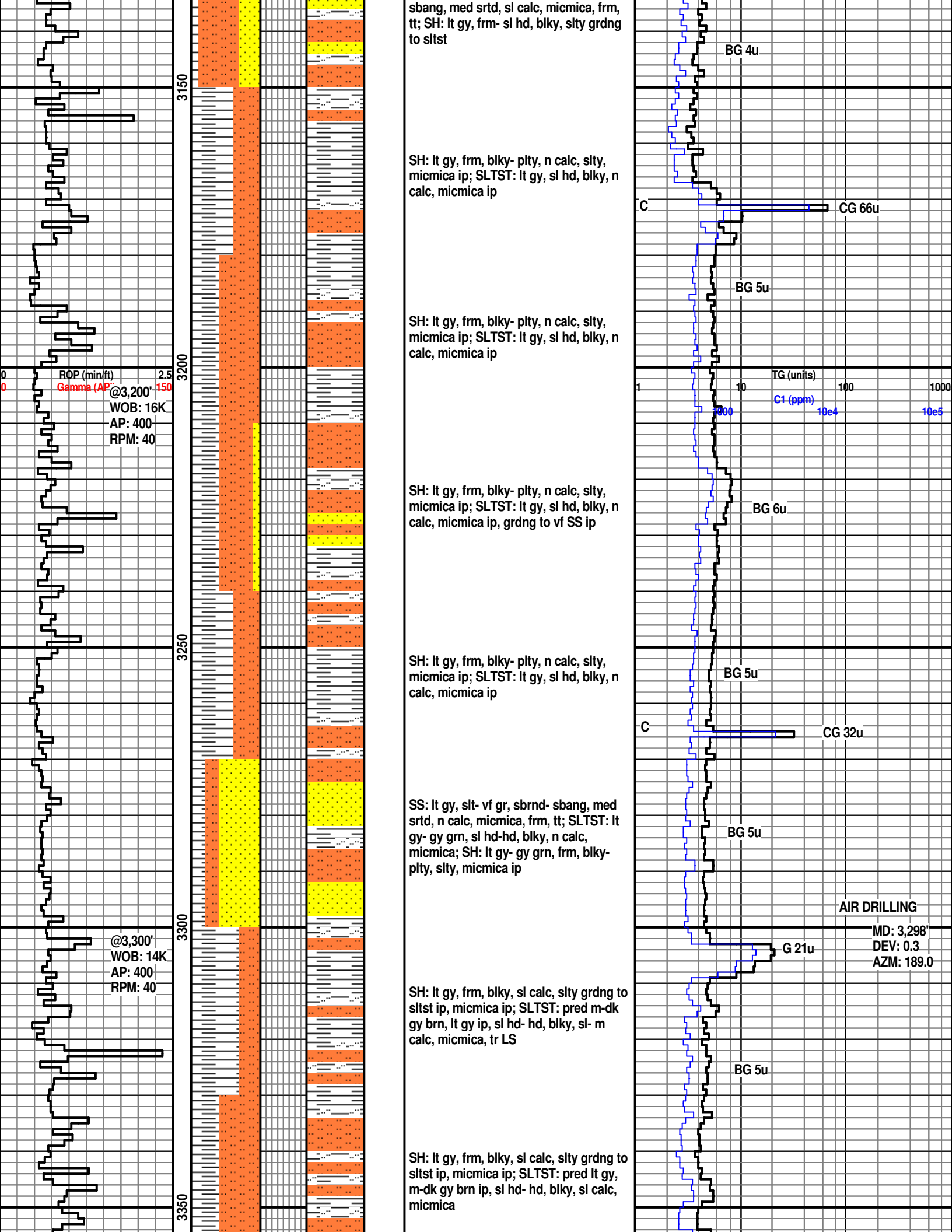
INTERVALS
- Core
- Dst

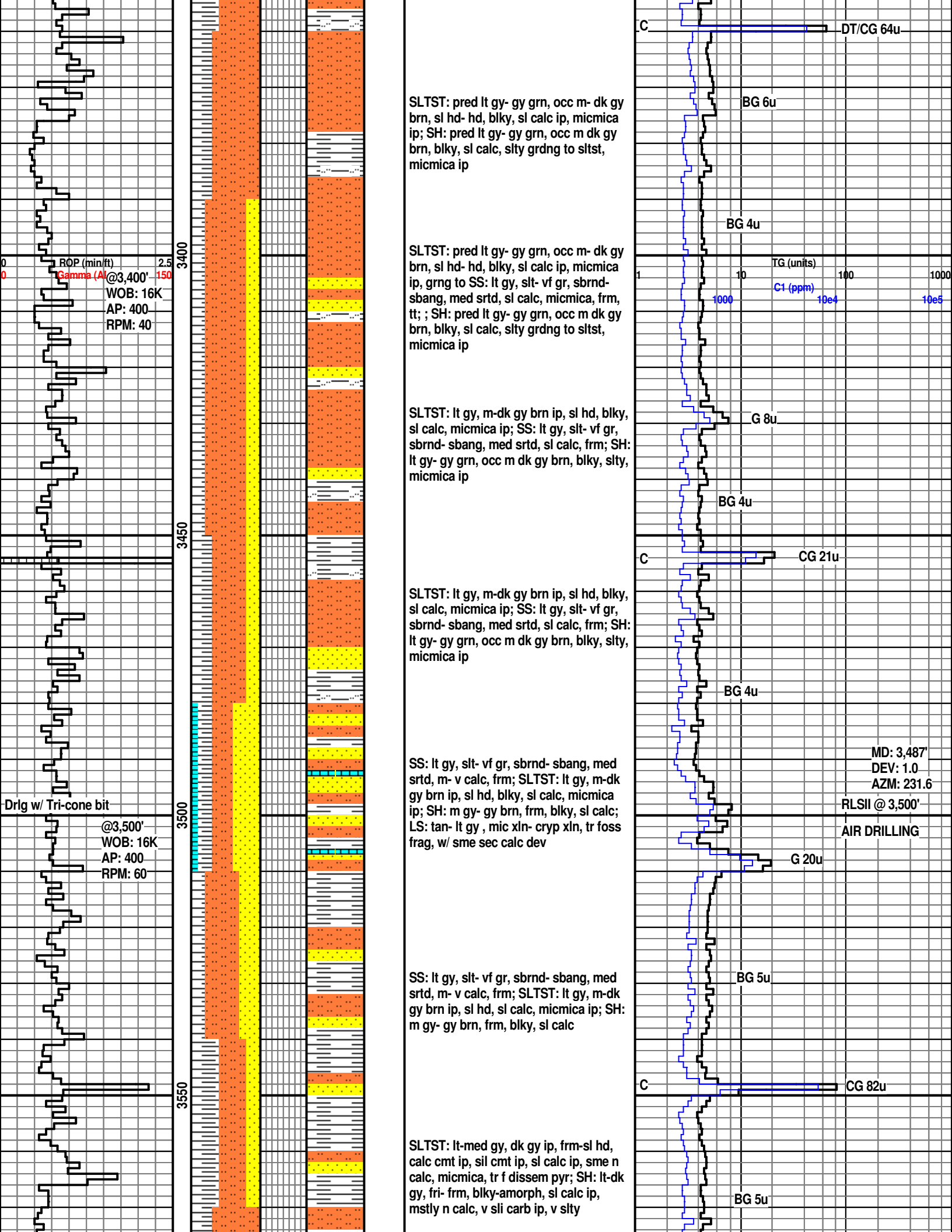
EVENTS
- Rft
- Sidewall



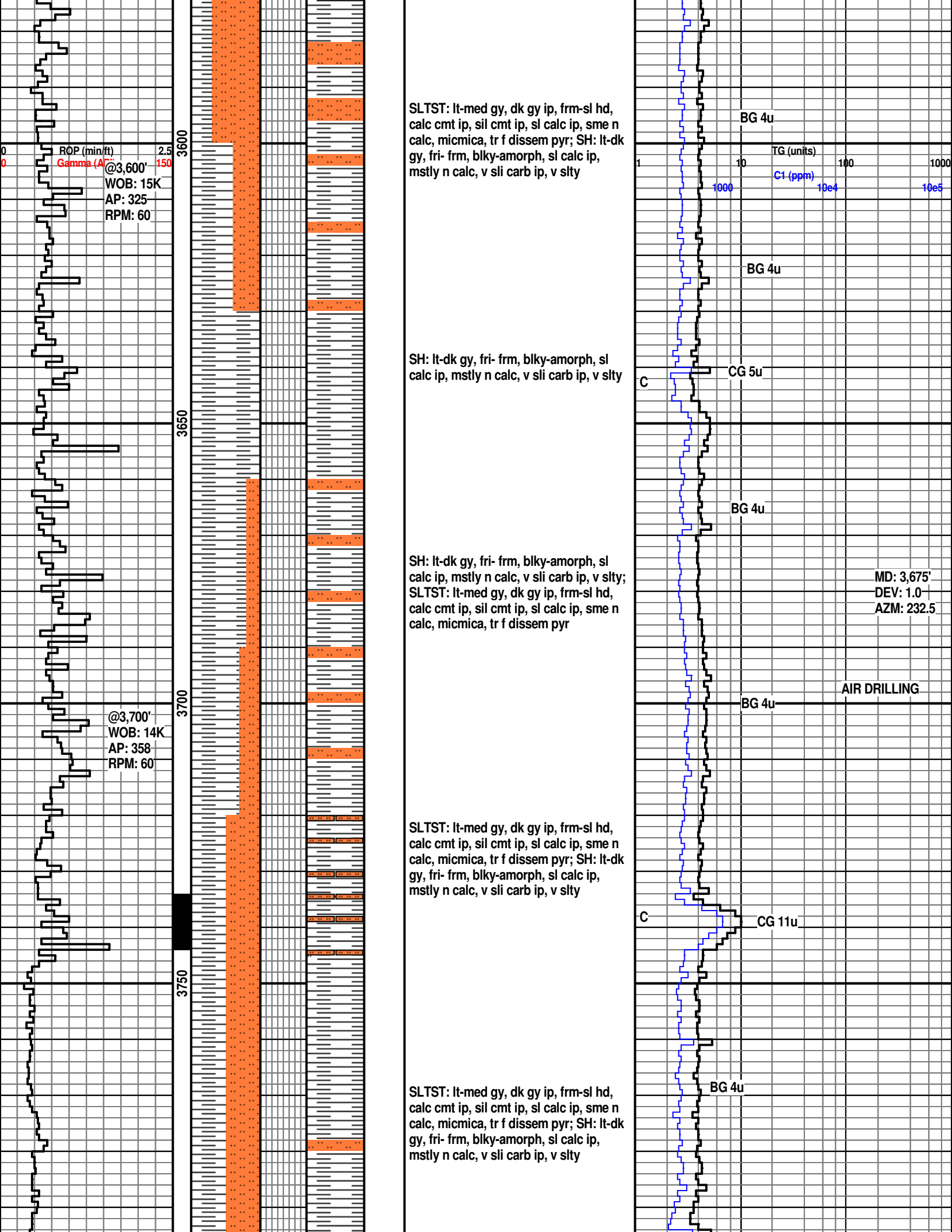

NB #3, Smith-Tri-cone @ 2,666' Serial # PS2191
@2,700'
WOB: 11K
AP: 350
RPM: 40
2700
OBM on 12/29/2010
AIR DRILLING
RLSII @ 2,700'
SH: m gy- gy grn, sl hd- hd, blky- plty, n calc, slty ip grdng to sltst, micmica ip
BG 3u
MD: 2,732'
DEV: 0.2
AZM: 54.0
SH: m gy- gy grn, sl hd- hd, blky- plty, n calc, slty ip grdng to sltst, micmica ip; SLTST: lt- m gy, sl hd- hd, blky, n calc, micmica
G 14u
2750
BG 3u
DLB@2,760'
SLTST: lt- m gy, sl hd- hd, blky, n calc, micmica; SS: lt gy, slt- vf gr, sbang-sbrnd, m srtd, n calc, micmica ip
BG 3u
C
CG 4u
0
ROP (min/ft)
2.5
0
Gamma (AP
150
@2,800'
WOB: 14K
AP: 350
RPM: 40
2800
SLTST: lt- m gy, sl hd- hd, blky, n calc, micmica; SS: lt gy, slt- vf gr, sbang-sbrnd, m srtd, n calc, micmica ip
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
BG 2u
SLTST: lt- m gy, sl hd- hd, blky, n calc, micmica; SS: lt gy, slt- vf gr, sbang-sbrnd, m srtd, n calc, micmica ip
2850
BG 4u
SS: lt gy- lt rd brn, vf- f gr, sbrnd-sbang, med srtd, n calc, micmica, frm, tt; SLTST: lt- m gy- gy grn, blky, n calc, micmica ip
P
P
P
P
C
CG 14u
SH: m gy- gy grn, frm, blky, slty grdng to SLTST: m gy- gy grn, blky, n calc, tr fd pyr, micmica ip; SS: lt gy- tan, slt- vf gr, sbang-sbrnd, m srtd, n calc, micmica ip
BG 4u
AIR DRILLING
2900
@2,900'
WOB: 14K
AP: 350
RPM: 40

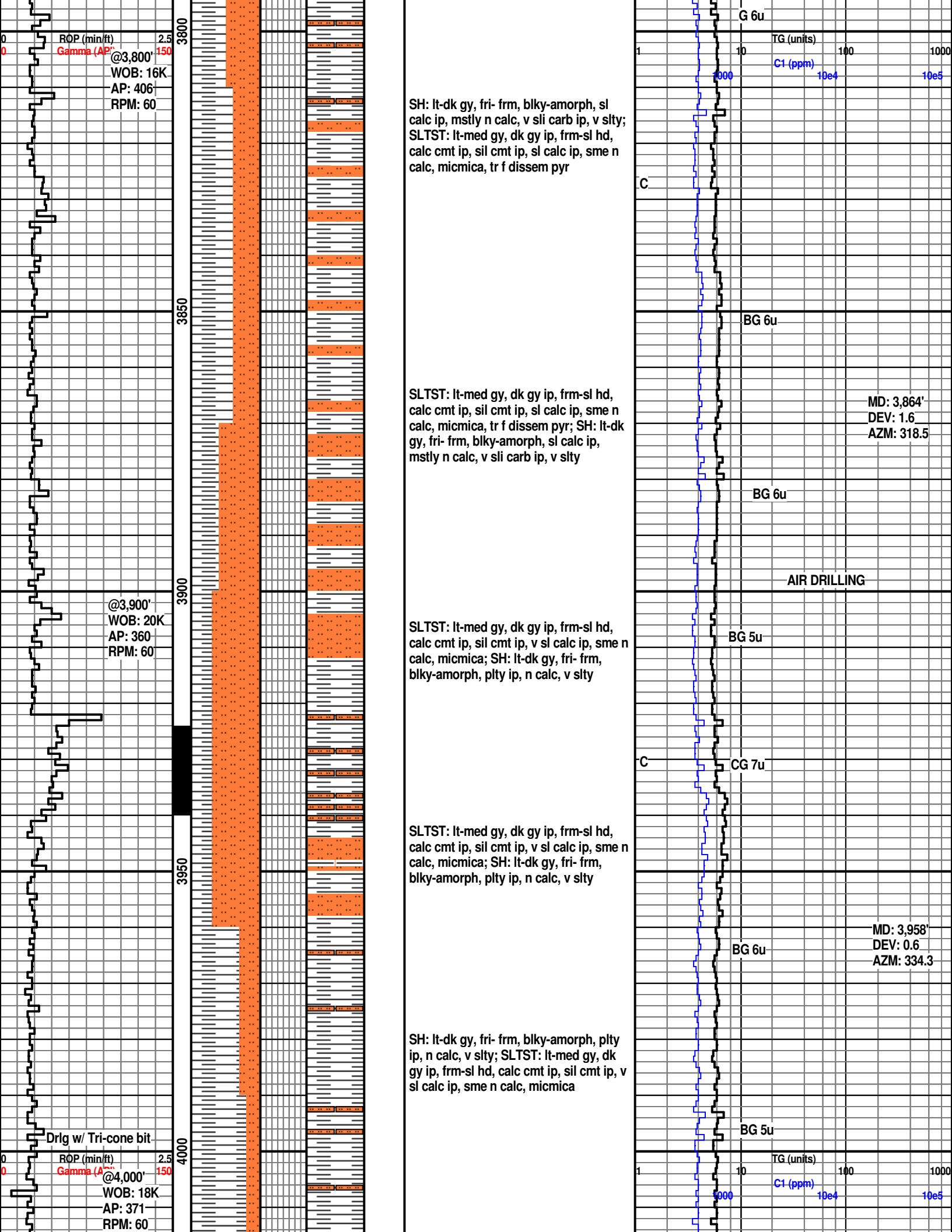

SLTST: lt gy- gy grn, sl hd- hd, blky, n calc, micmica ip; SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, micmica, frm, tt
MD: 2,921'
DEV: 0.1
AZM: 133.9
BG 4u
2950
SLTST: lt gy- gy grn, sl hd- hd, blky, n calc, micmica ip; SH: m gy- gy grn, frm, blky, slty; SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, micmica, frm, tt
BG 6u
SLTST: lt gy- gy grn, occ m rd brn, sl hd- hd, blky, n calc, micmica ip; SS: lt gy- gy grn, occ m rd brn, slt- vf gr, sbrnd- sbang, med srtd, n calc, micmica, frm, tt
C
CG 22u
G 12u
BG 5u
Drlg w/ Tri-cone bit
0
ROP (min/ft)
2.5
0
Gamma (API)
150
@3,000'
WOB: 15K
AP: 350
RPM: 40
3000
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
SLTST: lt gy- gy grn, occ m gy brn, sl hd- hd, blky, n calc, micmica ip; SS: lt gy- gy grn, occ m gy brn, slt- vf gr, sbrnd- sbang, med srtd, n calc, micmica, frm, tt
BG 3u
SS: lt gy, vf gr grdng to sltst, sbrnd- sbang, med srtd, sl- m calc, micmica, tr LS, frm, tt; SLTST: lt gy, sl hd- hd, blky, sl calc, micmica ip
3050
BG 4u
SS: lt gy, vf gr grdng to sltst, sbrnd- sbang, med srtd, sl calc, micmica, frm, tt; SLTST: lt gy, sl hd- hd, blky, sl calc, micmica ip
C
CG 5u
BG 4u
12/26/2010@3,100'
AIR DRILLING
@3,100'
WOB: 16K
AP: 350
RPM: 40
3100
SS: lt gy, vf gr grdng to sltst, sbrnd- sbang, med srtd, sl calc, micmica, frm, tt; SLTST: lt gy, sl hd- hd, blky, sl calc, micmica ip
BG 10u
MD: 3,110'
DEV: 0.5
AZM: 145.0
G 12u
SLTST: lt gy, sl hd- hd, blky, sl calc, micmica ip; SS: lt gy, slt- vf gr, sbrnd-

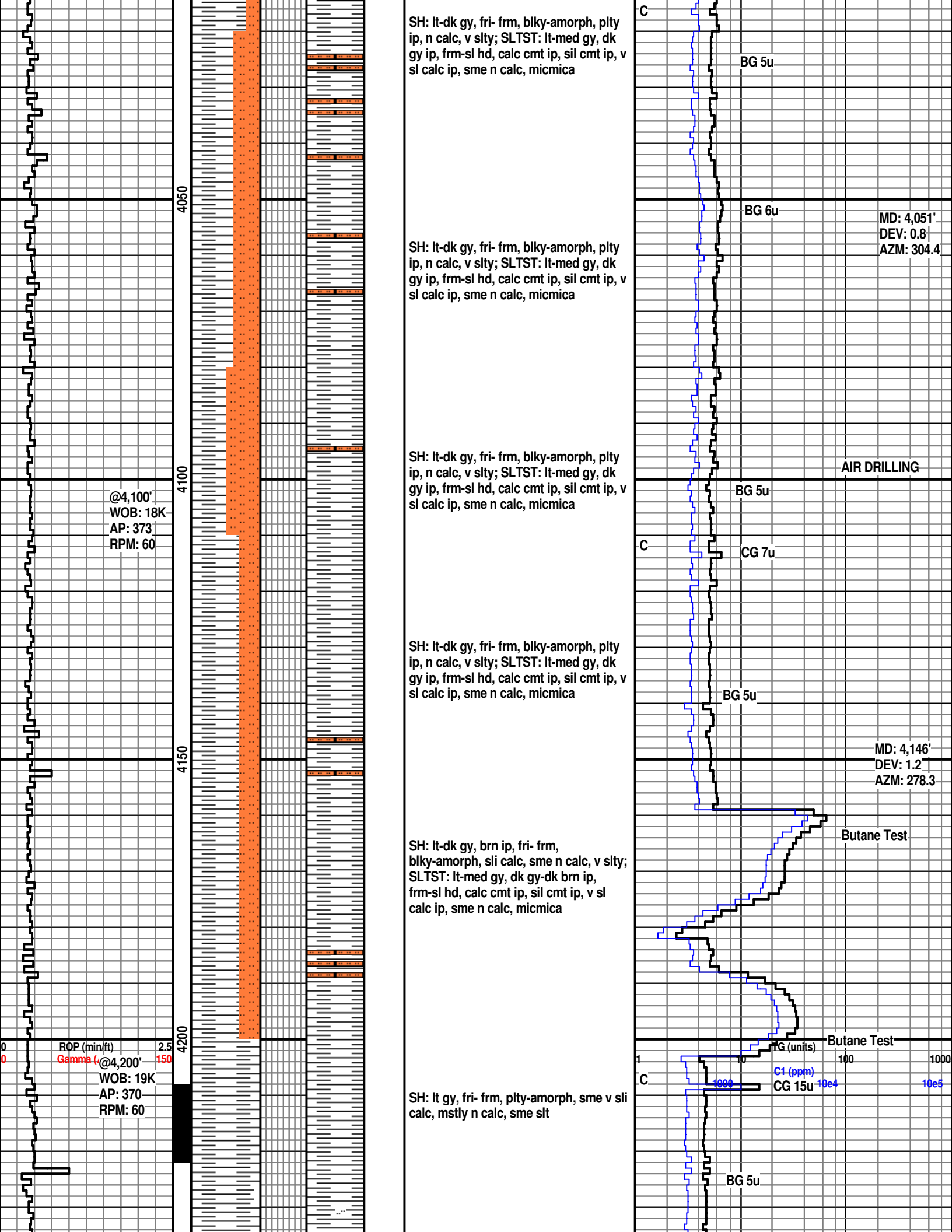

sbang, med srtd, sl calc, micmica, frm, tt; SH: lt gy, frm- sl hd, blky, slty grdng to sltst
BG 4u
3150
SH: lt gy, frm, blky- plty, n calc, slty, micmica ip; SLTST: lt gy, sl hd, blky, n calc, micmica ip
C
CG 66u
BG 5u
SH: lt gy, frm, blky- plty, n calc, slty, micmica ip; SLTST: lt gy, sl hd, blky, n calc, micmica ip
0
ROP (min/ft)
2.5
0
Gamma (AP)
150
3200
@3,200'
WOB: 16K
AP: 400
RPM: 40
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
SH: lt gy, frm, blky- plty, n calc, slty, micmica ip; SLTST: lt gy, sl hd, blky, n calc, micmica ip, grdng to vf SS ip
BG 6u
3250
SH: lt gy, frm, blky- plty, n calc, slty, micmica ip; SLTST: lt gy, sl hd, blky, n calc, micmica ip
BG 5u
C
CG 32u
SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, micmica, frm, tt; SLTST: lt gy- gy grn, sl hd-hd, blky, n calc, micmica; SH: lt gy- gy grn, frm, blky- plty, slty, micmica ip
BG 5u
AIR DRILLING
3300
@3,300'
WOB: 14K
AP: 400
RPM: 40
MD: 3,298'
DEV: 0.3
AZM: 189.0
G 21u
SH: lt gy, frm, blky, sl calc, slty grdng to sltst ip, micmica ip; SLTST: pred m-dk gy brn, lt gy ip, sl hd- hd, blky, sl- m calc, micmica, tr LS
BG 5u
SH: lt gy, frm, blky, sl calc, slty grdng to sltst ip, micmica ip; SLTST: pred lt gy, m-dk gy brn ip, sl hd- hd, blky, sl calc, micmica
3350

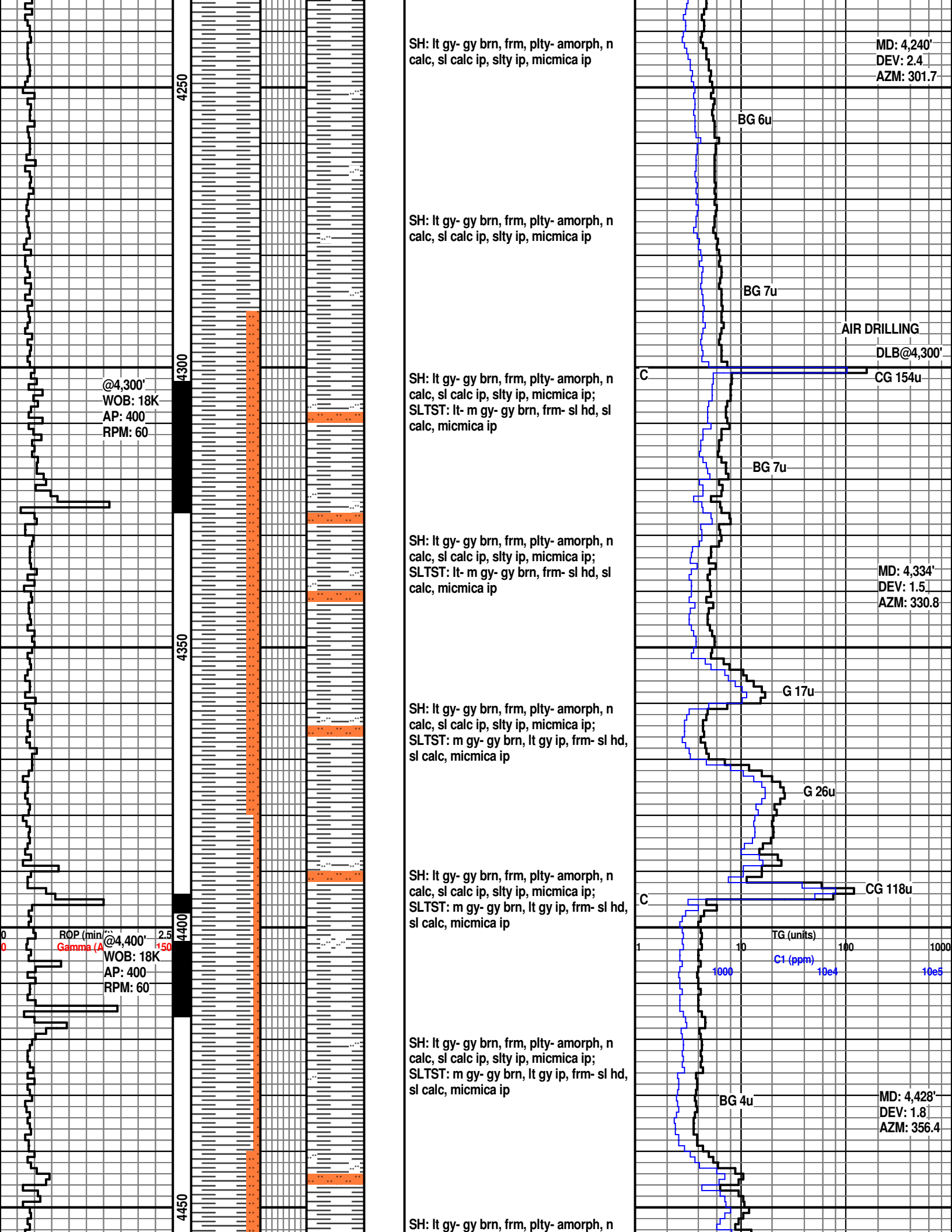


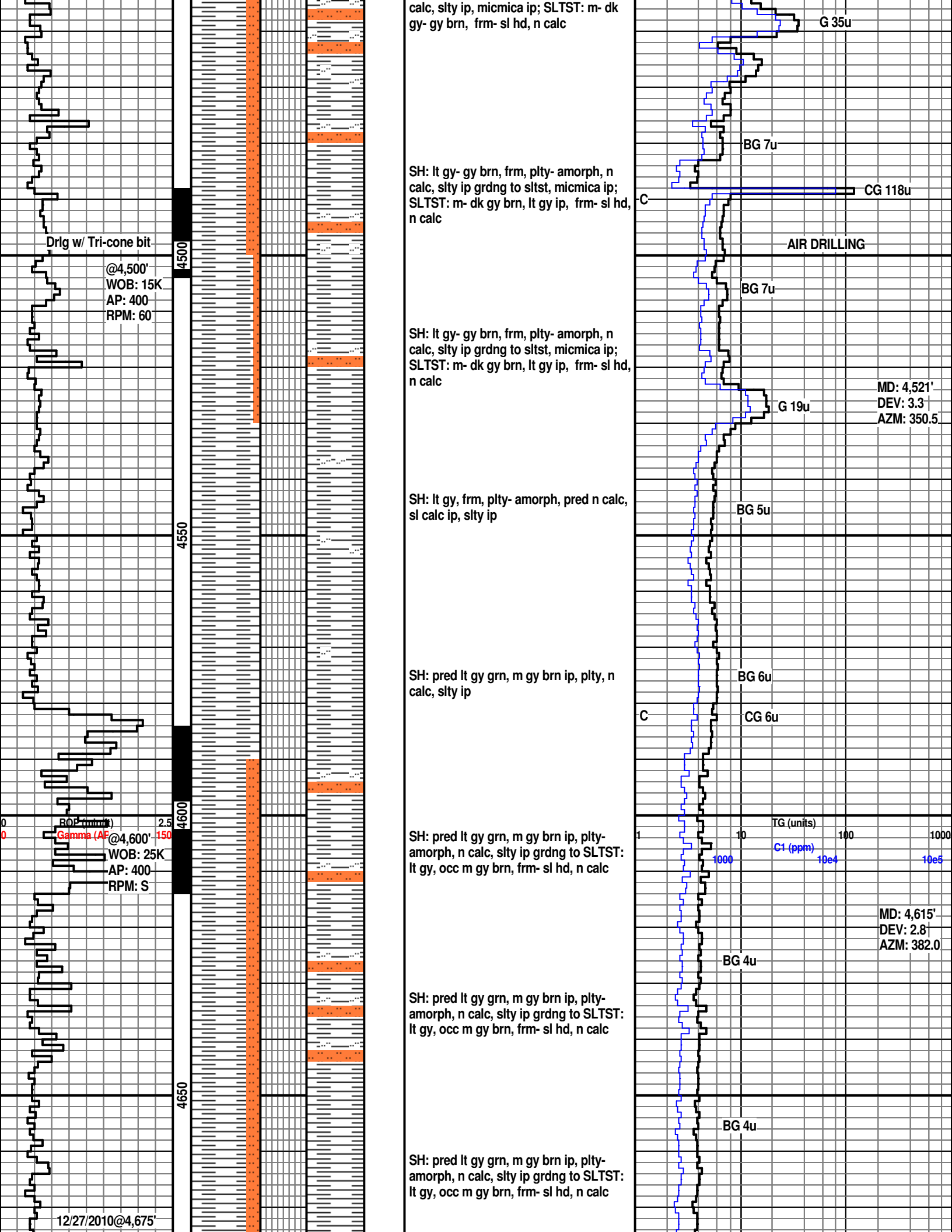
ROP (min/ft)
Gamma (AI
@3,400'
WOB: 16K
AP: 400
RPM: 40
Drlg w/ Tri-cone bit
@3,500'
WOB: 16K
AP: 400
RPM: 60
3400
3450
3500
3550
SLTST: pred lt gy- gy grn, occ m- dk gy brn, sl hd- hd, blky, sl calc ip, micmica ip; SH: pred lt gy- gy grn, occ m dk gy brn, blky, sl calc, slty grdng to sltst, micmica ip
SLTST: pred lt gy- gy grn, occ m- dk gy brn, sl hd- hd, blky, sl calc ip, micmica ip, grng to SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, sl calc, micmica, frm, tt; ; SH: pred lt gy- gy grn, occ m dk gy brn, blky, sl calc, slty grdng to sltst, micmica ip
SLTST: lt gy, m-dk gy brn ip, sl hd, blky, sl calc, micmica ip; SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm; SH: lt gy- gy grn, occ m dk gy brn, blky, slty, micmica ip
SLTST: lt gy, m-dk gy brn ip, sl hd, blky, sl calc, micmica ip; SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm; SH: lt gy- gy grn, occ m dk gy brn, blky, slty, micmica ip
SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, m- v calc, frm; SLTST: lt gy, m-dk gy brn ip, sl hd, blky, sl calc, micmica ip; SH: m gy- gy brn, frm, blky, sl calc; LS: tan- lt gy , mic xln- cryp xln, tr foss frag, w/ sme sec calc dev
SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, m- v calc, frm; SLTST: lt gy, m-dk gy brn ip, sl hd, sl calc, micmica ip; SH: m gy- gy brn, frm, blky, sl calc
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr; SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
C
DT/CG 64u
BG 6u
BG 4u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
G 8u
BG 4u
C
CG 21u
BG 4u
MD: 3,487'
DEV: 1.0
AZM: 231.6
RLSII @ 3,500'
AIR DRILLING
G 20u
BG 5u
C
CG 82u
BG 5u

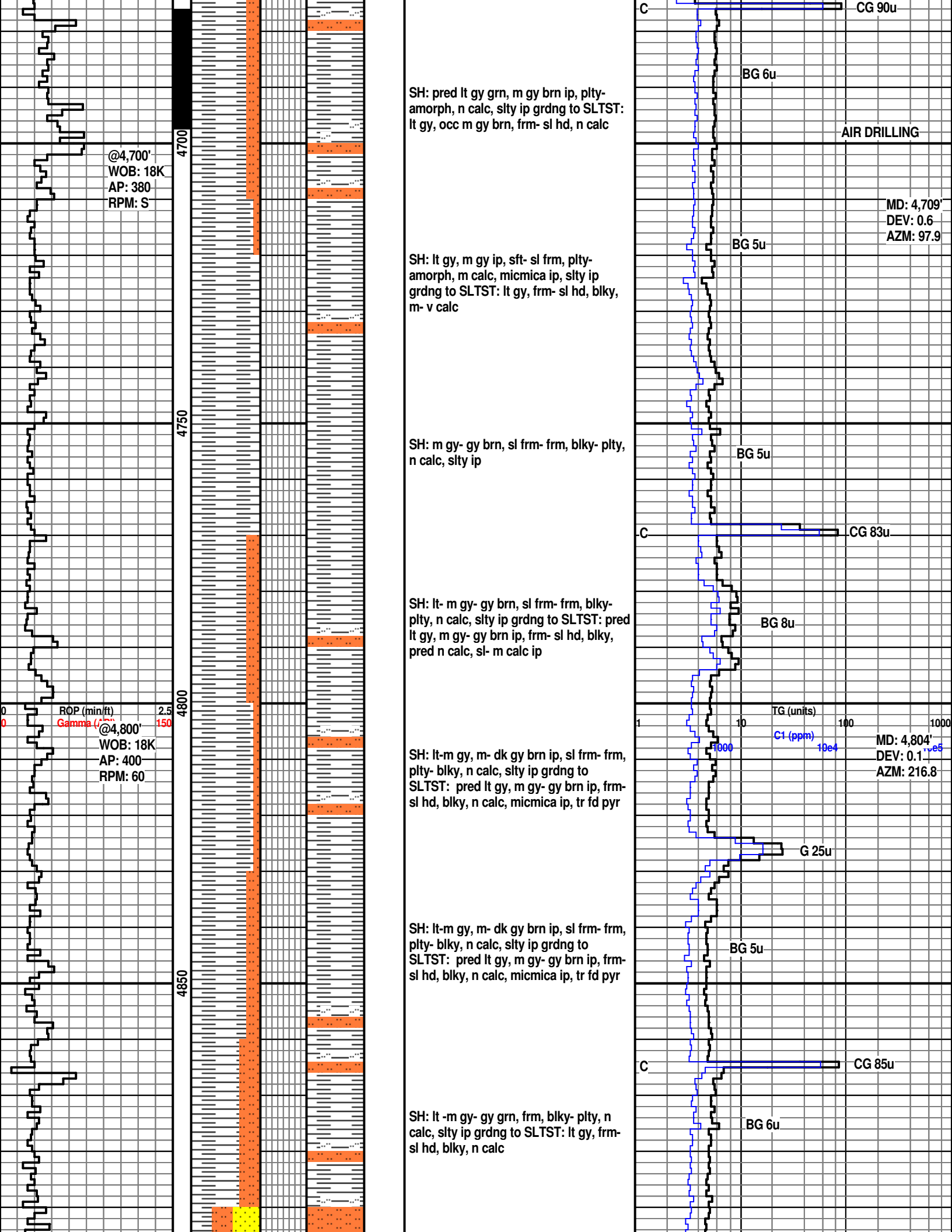

0
ROP (min/ft)
2.5
0
Gamma (API)
150
3600
@3,600'
WOB: 15K
AP: 325
RPM: 60
3650
3700
@3,700'
WOB: 14K
AP: 358
RPM: 60
3750
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr; SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr; SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr; SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
BG 4u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
BG 4u
C
CG 5u
BG 4u
MD: 3,675'
DEV: 1.0
AZM: 232.5
AIR DRILLING
BG 4u
C
CG 11u
BG 4u

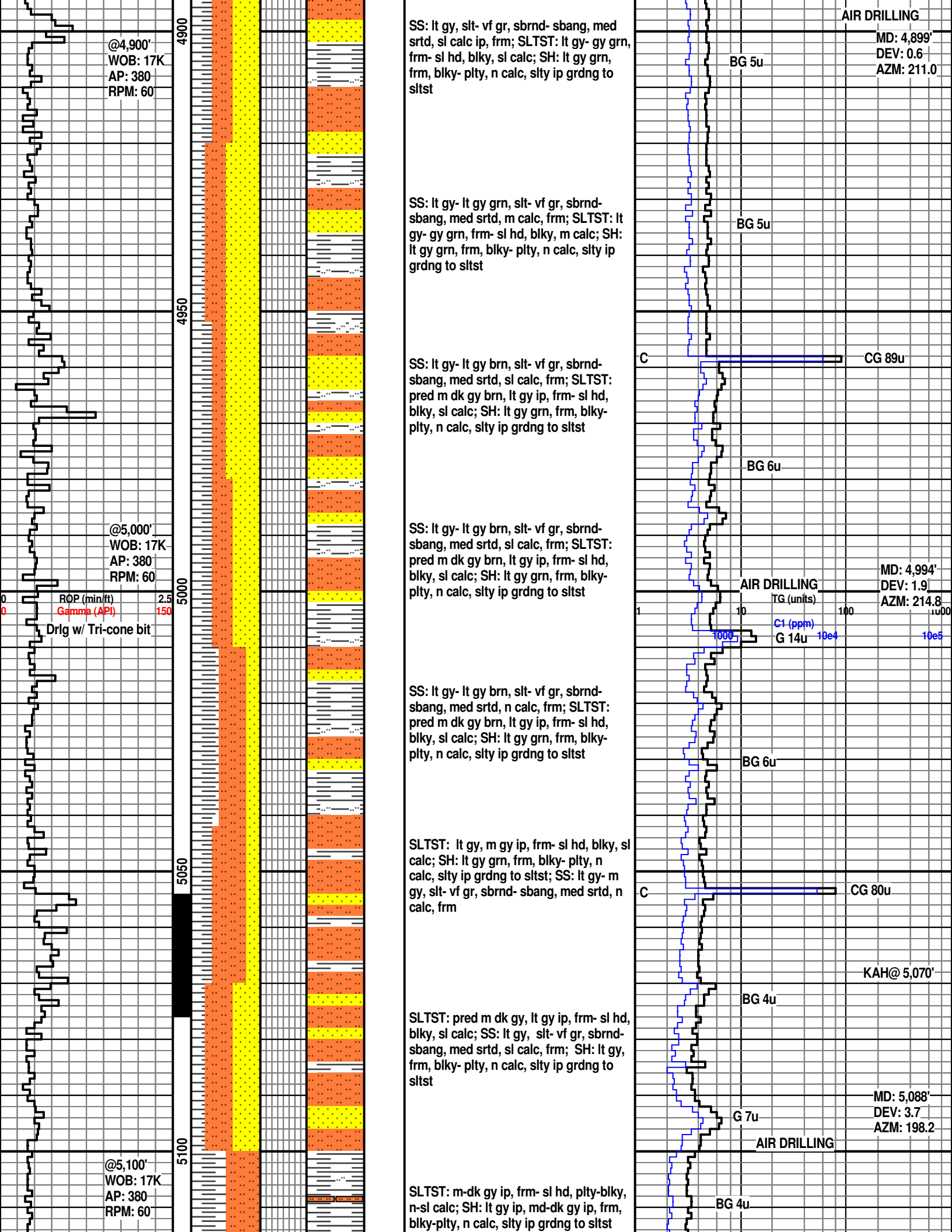

ROP (min/ft)
Gamma (AP)
0
2.5
150
3800
3850
3900
3950
4000
@3,800'
WOB: 16K
AP: 406
RPM: 60
@3,900'
WOB: 20K
AP: 360
RPM: 60
@4,000'
WOB: 18K
AP: 371
RPM: 60
Drlg w/ Tri-cone bit
SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, sl calc ip, sme n calc, micmica, tr f dissem pyr; SH: lt-dk gy, fri- frm, blky-amorph, sl calc ip, mstly n calc, v sli carb ip, v slty
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica; SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty
SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica; SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty
SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
G 6u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
C
BG 6u
MD: 3,864'
DEV: 1.6
AZM: 318.5
BG 6u
AIR DRILLING
BG 5u
C
CG 7u
MD: 3,958'
DEV: 0.6
AZM: 334.3
BG 6u
BG 5u

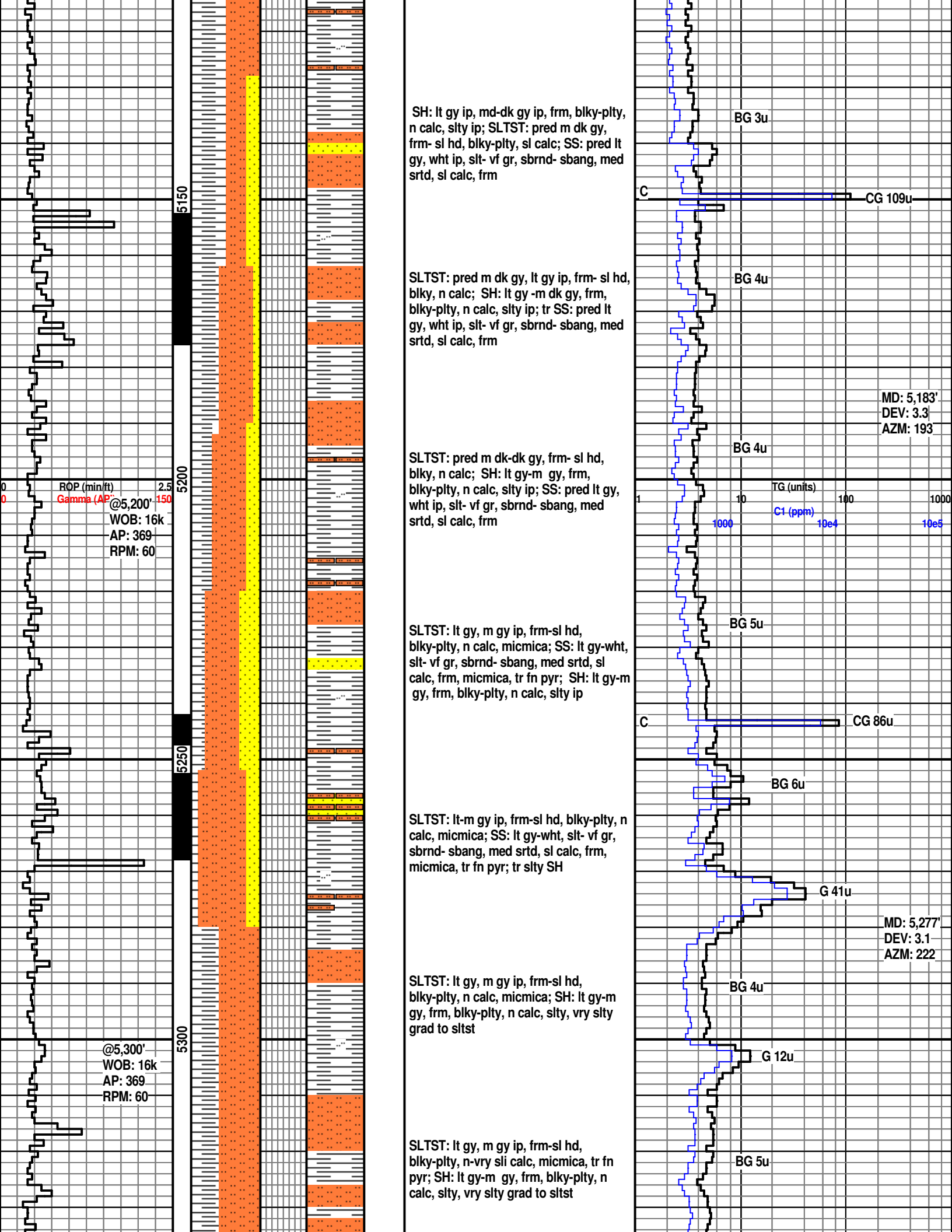

4050
4100
4150
4200
@4,100'
WOB: 18K
AP: 373
RPM: 60
@4,200'
WOB: 19K
AP: 370
RPM: 60
ROP (min/ft)
0
2.5
Gamma (
0
150
SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
SH: lt-dk gy, fri- frm, blky-amorph, plty ip, n calc, v slty; SLTST: lt-med gy, dk gy ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
SH: lt-dk gy, brn ip, fri- frm, blky-amorph, sli calc, sme n calc, v slty; SLTST: lt-med gy, dk gy-dk brn ip, frm-sl hd, calc cmt ip, sil cmt ip, v sl calc ip, sme n calc, micmica
SH: lt gy, fri- frm, plty-amorph, sme v sli calc, mstly n calc, sme slt
C
BG 5u
BG 6u
MD: 4,051'
DEV: 0.8
AZM: 304.4
AIR DRILLING
BG 5u
C
CG 7u
BG 5u
MD: 4,146'
DEV: 1.2
AZM: 278.3
Butane Test
Butane Test
TG (units)
1
10
100
1000
C
C1 (ppm)
1000
CG 15u
10e4
10e5
BG 5u

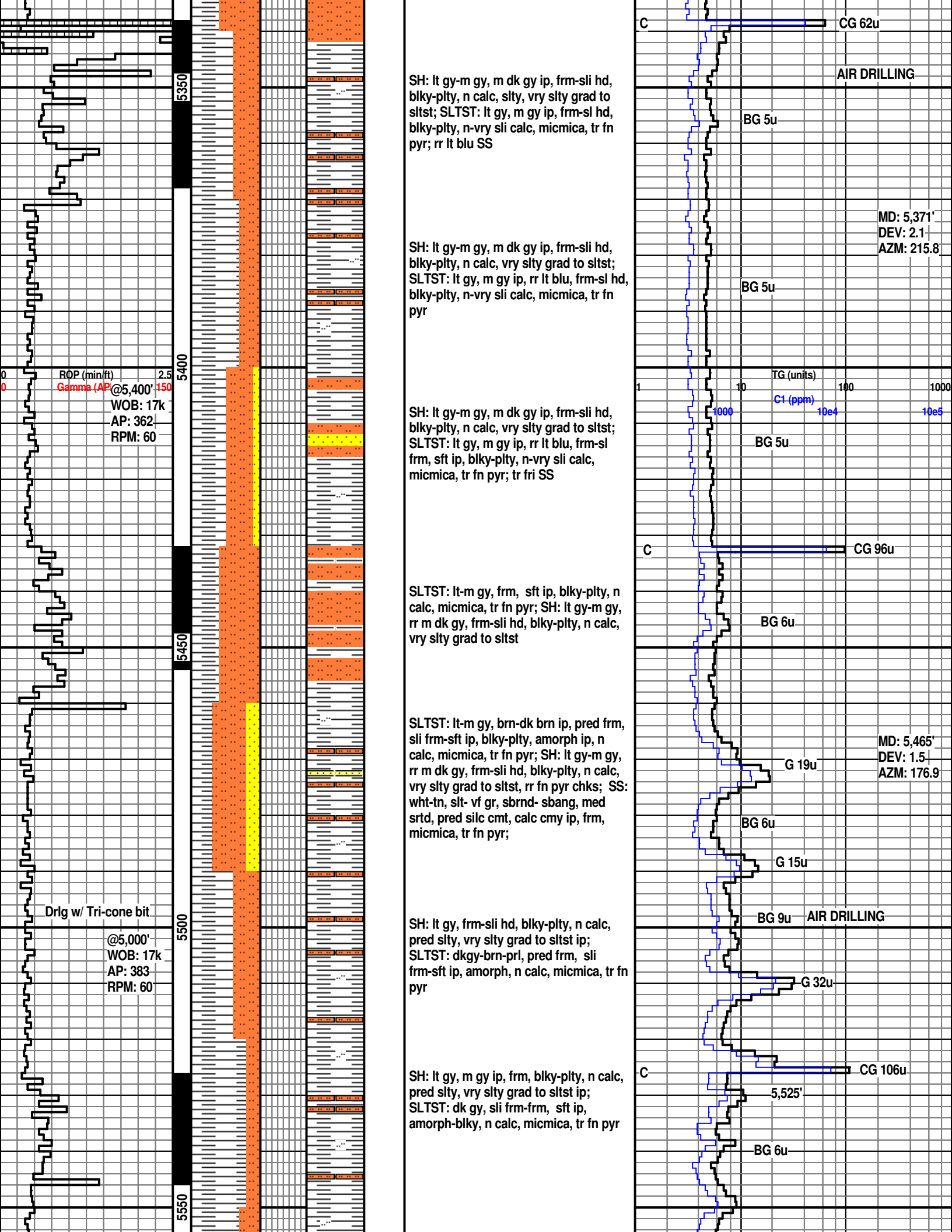

4250
4300
4350
4400
4450
@4,300'
WOB: 18K
AP: 400
RPM: 60
ROP (min/
Gamma (A
2.5
150
@4,400'
WOB: 18K
AP: 400
RPM: 60
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip
MD: 4,240'
DEV: 2.4
AZM: 301.7
BG 6u
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip
BG 7u
AIR DRILLING
DLB@4,300'
C
CG 154u
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip; SLTST: lt- m gy- gy brn, frm- sl hd, sl calc, micmica ip
BG 7u
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip; SLTST: lt- m gy- gy brn, frm- sl hd, sl calc, micmica ip
MD: 4,334'
DEV: 1.5
AZM: 330.8
G 17u
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip; SLTST: m gy- gy brn, lt gy ip, frm- sl hd, sl calc, micmica ip
G 26u
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip; SLTST: m gy- gy brn, lt gy ip, frm- sl hd, sl calc, micmica ip
CG 118u
C
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
SH: lt gy- gy brn, frm, plty- amorph, n calc, sl calc ip, slty ip, micmica ip; SLTST: m gy- gy brn, lt gy ip, frm- sl hd, sl calc, micmica ip
BG 4u
MD: 4,428'
DEV: 1.8
AZM: 356.4
SH: lt gy- gy brn, frm, plty- amorph, n

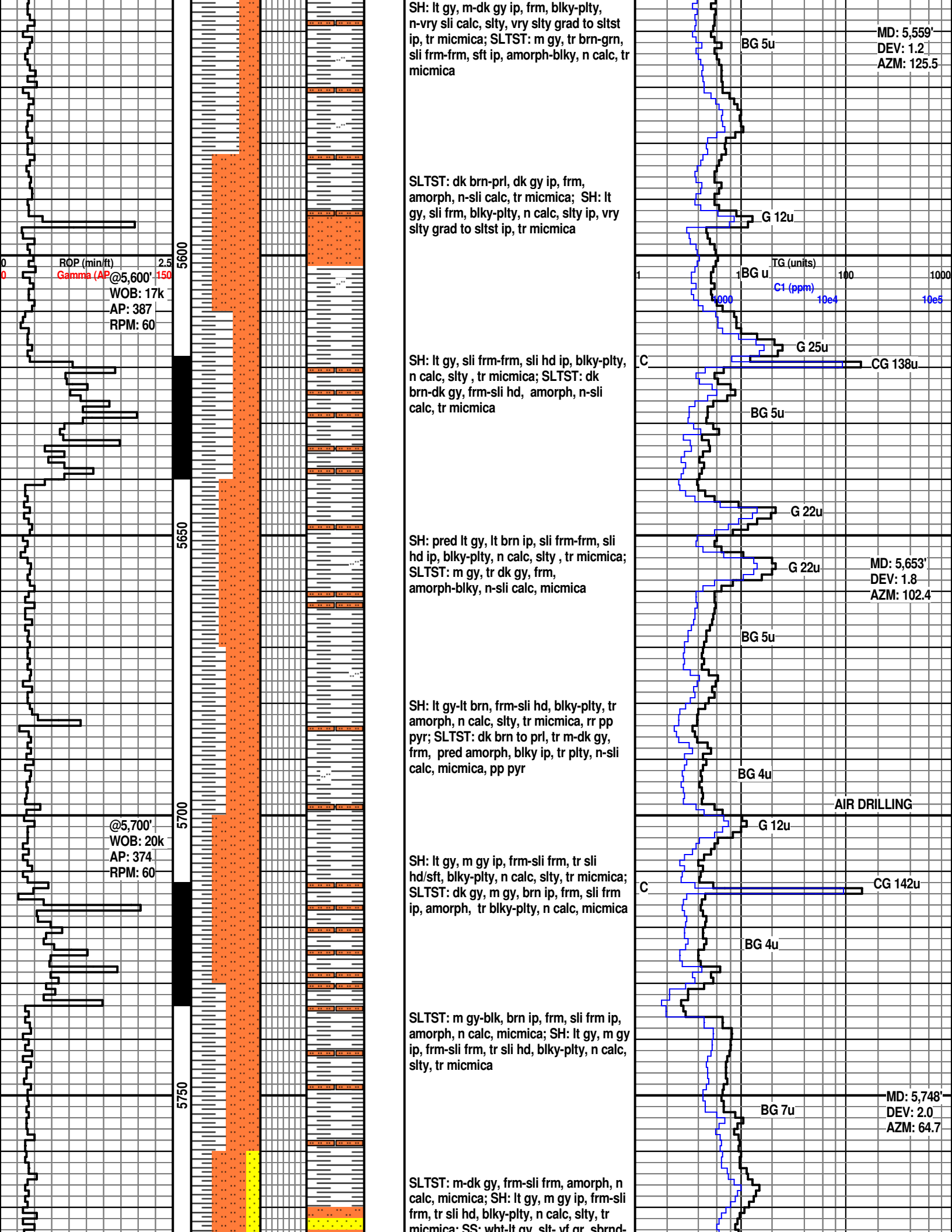

calc, slty ip, micmica ip; SLTST: m- dk gy- gy brn, frm- sl hd, n calc
G 35u
BG 7u
SH: lt gy- gy brn, frm, plty- amorph, n calc, slty ip grdng to sltst, micmica ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, n calc
CG 118u
C
Drlg w/ Tri-cone bit
@4,500'
WOB: 15K
AP: 400
RPM: 60
4500
AIR DRILLING
BG 7u
SH: lt gy- gy brn, frm, plty- amorph, n calc, slty ip grdng to sltst, micmica ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, n calc
MD: 4,521'
DEV: 3.3
AZM: 350.5
G 19u
SH: lt gy, frm, plty- amorph, pred n calc, sl calc ip, slty ip
BG 5u
4550
SH: pred lt gy grn, m gy brn ip, plty, n calc, slty ip
BG 6u
C
CG 6u
4600
BOP (units)
Gamma (AP
@4,600'
WOB: 25K
AP: 400
RPM: S
SH: pred lt gy grn, m gy brn ip, plty- amorph, n calc, slty ip grdng to SLTST: lt gy, occ m gy brn, frm- sl hd, n calc
TG (units)
C1 (ppm)
MD: 4,615'
DEV: 2.8
AZM: 382.0
BG 4u
4650
SH: pred lt gy grn, m gy brn ip, plty- amorph, n calc, slty ip grdng to SLTST: lt gy, occ m gy brn, frm- sl hd, n calc
BG 4u
SH: pred lt gy grn, m gy brn ip, plty- amorph, n calc, slty ip grdng to SLTST: lt gy, occ m gy brn, frm- sl hd, n calc
12/27/2010@4,675'

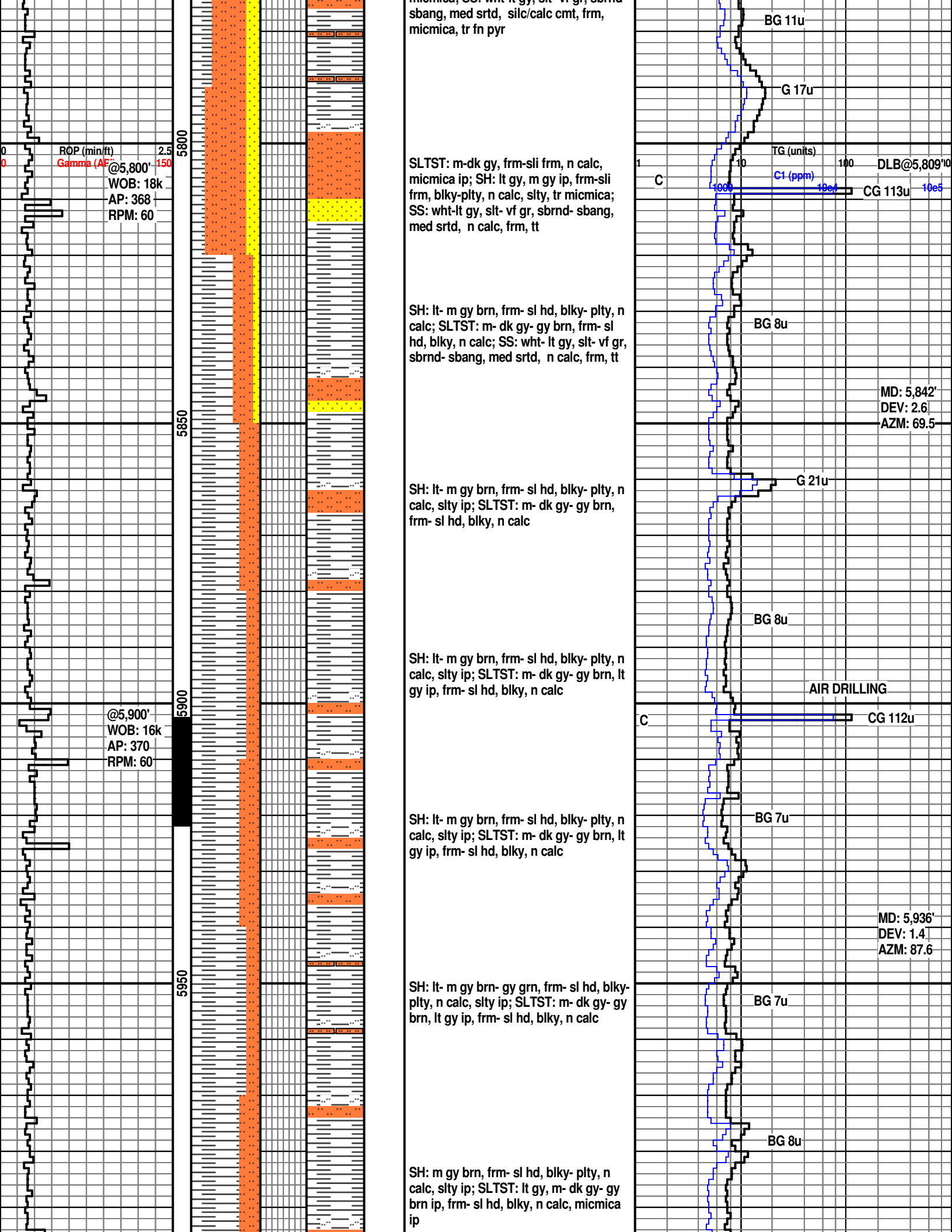

4700
4750
4800
4850
@4,700'
WOB: 18K
AP: 380
RPM: S
@4,800'
WOB: 18K
AP: 400
RPM: 60
ROP (min/ft)
0
2.5
Gamma (
150
SH: pred lt gy grn, m gy brn ip, plty-amorph, n calc, slty ip grdng to SLTST: lt gy, occ m gy brn, frm- sl hd, n calc
SH: lt gy, m gy ip, sft- sl frm, plty-amorph, m calc, micmica ip, slty ip grdng to SLTST: lt gy, frm- sl hd, blky, m- v calc
SH: m gy- gy brn, sl frm- frm, blky- plty, n calc, slty ip
SH: lt- m gy- gy brn, sl frm- frm, blky-plty, n calc, slty ip grdng to SLTST: pred lt gy, m gy- gy brn ip, frm- sl hd, blky, pred n calc, sl- m calc ip
SH: lt-m gy, m- dk gy brn ip, sl frm- frm, plty- blky, n calc, slty ip grdng to SLTST: pred lt gy, m gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip, tr fd pyr
SH: lt-m gy, m- dk gy brn ip, sl frm- frm, plty- blky, n calc, slty ip grdng to SLTST: pred lt gy, m gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip, tr fd pyr
SH: lt -m gy- gy grn, frm, blky- plty, n calc, slty ip grdng to SLTST: lt gy, frm- sl hd, blky, n calc
C
CG 90u
BG 6u
AIR DRILLING
MD: 4,709'
DEV: 0.6
AZM: 97.9
BG 5u
BG 5u
C
CG 83u
BG 8u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
MD: 4,804'
DEV: 0.1
AZM: 216.8
G 25u
BG 5u
C
CG 85u
BG 6u

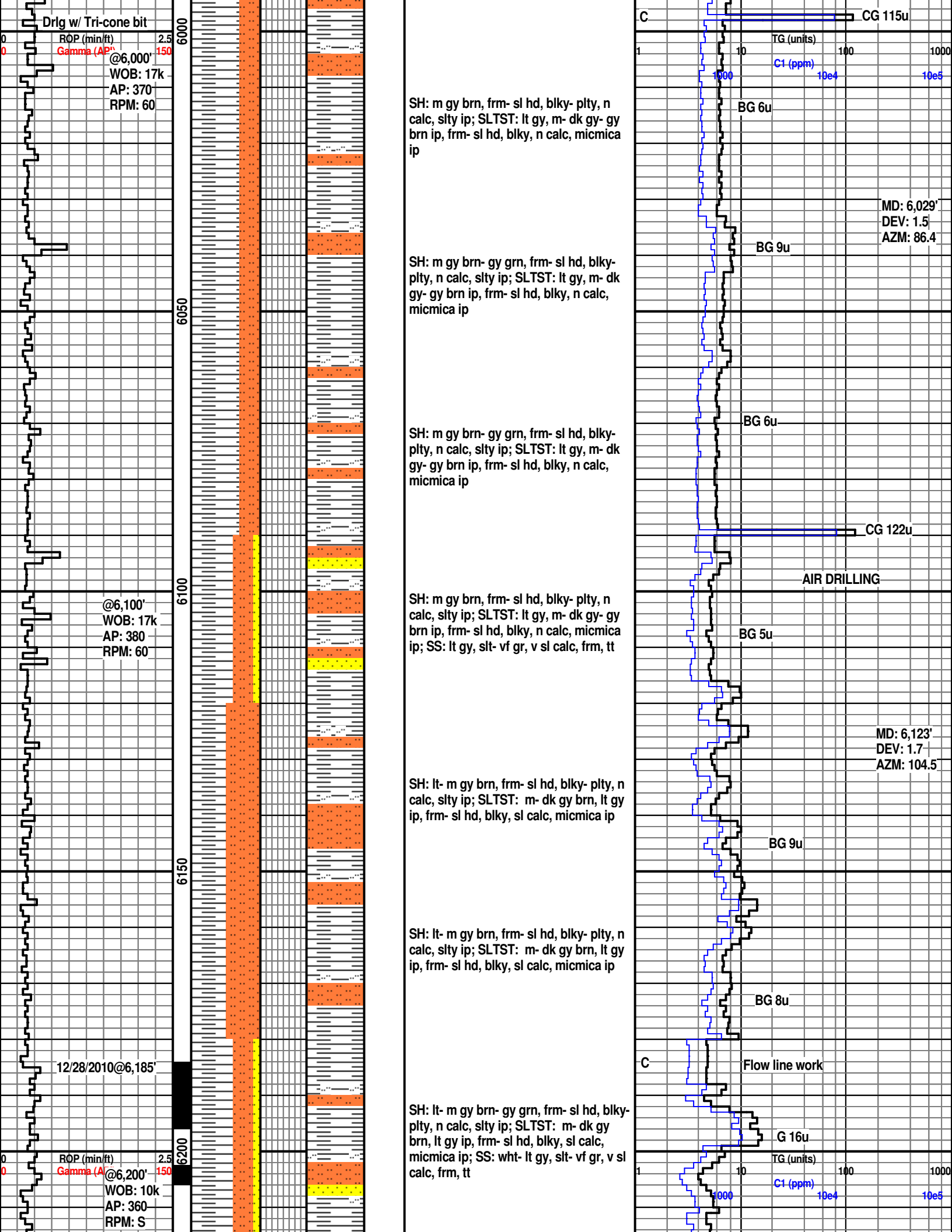

4900
4950
5000
5050
5100
@4,900'
WOB: 17K
AP: 380
RPM: 60
@5,000'
WOB: 17K
AP: 380
RPM: 60
@5,100'
WOB: 17K
AP: 380
RPM: 60
ROP (min/ft)
Gamma (API)
Drlg w/ Tri-cone bit
SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, sl calc ip, frm; SLTST: lt gy- gy grn, frm- sl hd, blky, sl calc; SH: lt gy grn, frm, blky- plty, n calc, slty ip grdng to sltst
SS: lt gy- lt gy grn, slt- vf gr, sbrnd- sbang, med srtd, m calc, frm; SLTST: lt gy- gy grn, frm- sl hd, blky, m calc; SH: lt gy grn, frm, blky- plty, n calc, slty ip grdng to sltst
SS: lt gy- lt gy brn, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm; SLTST: pred m dk gy brn, lt gy ip, frm- sl hd, blky, sl calc; SH: lt gy grn, frm, blky- plty, n calc, slty ip grdng to sltst
SS: lt gy- lt gy brn, slt- vf gr, sbrnd- sbang, med srtd, n calc, frm; SLTST: pred m dk gy brn, lt gy ip, frm- sl hd, blky, sl calc; SH: lt gy grn, frm, blky- plty, n calc, slty ip grdng to sltst
SLTST: lt gy, m gy ip, frm- sl hd, blky, sl calc; SH: lt gy grn, frm, blky- plty, n calc, slty ip grdng to sltst; SS: lt gy- m gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, frm
SLTST: pred m dk gy, lt gy ip, frm- sl hd, blky, sl calc; SS: lt gy, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm; SH: lt gy, frm, blky- plty, n calc, slty ip grdng to sltst
SLTST: m-dk gy ip, frm- sl hd, plty-blky, n-sl calc; SH: lt gy ip, md-dk gy ip, frm, blky-plty, n calc, slty ip grdng to sltst
AIR DRILLING
MD: 4,899'
DEV: 0.6
AZM: 211.0
BG 5u
BG 5u
C
CG 89u
BG 6u
AIR DRILLING
MD: 4,994'
DEV: 1.9
AZM: 214.8
TG (units)
C1 (ppm)
G 14u
BG 6u
C
CG 80u
KAH@ 5,070'
BG 4u
MD: 5,088'
DEV: 3.7
AZM: 198.2
G 7u
AIR DRILLING
BG 4u

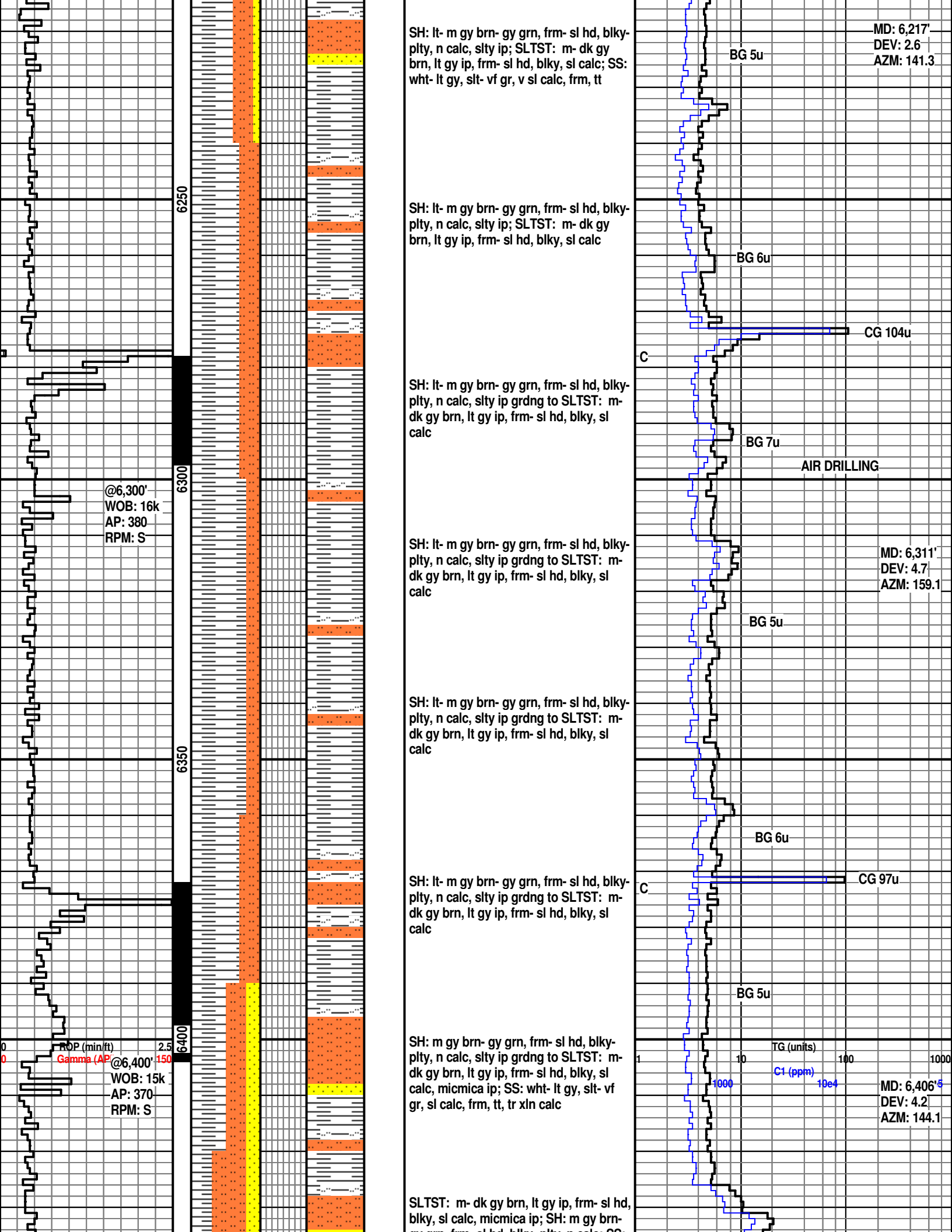

5150
5200
5250
5300
ROP (min/ft)
Gamma (API)
0
2.5
150
@5,200'
WOB: 16k
AP: 369
RPM: 60
@5,300'
WOB: 16k
AP: 369
RPM: 60
SH: lt gy ip, md-dk gy ip, frm, blky-plty, n calc, slty ip; SLTST: pred m dk gy, frm- sl hd, blky-plty, sl calc; SS: pred lt gy, wht ip, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm
SLTST: pred m dk gy, lt gy ip, frm- sl hd, blky, n calc; SH: lt gy -m dk gy, frm, blky-plty, n calc, slty ip; tr SS: pred lt gy, wht ip, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm
SLTST: pred m dk-dk gy, frm- sl hd, blky, n calc; SH: lt gy-m gy, frm, blky-plty, n calc, slty ip; SS: pred lt gy, wht ip, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm
SLTST: lt gy, m gy ip, frm-sl hd, blky-plty, n calc, micmica; SS: lt gy-wht, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm, micmica, tr fn pyr; SH: lt gy-m gy, frm, blky-plty, n calc, slty ip
SLTST: lt-m gy ip, frm-sl hd, blky-plty, n calc, micmica; SS: lt gy-wht, slt- vf gr, sbrnd- sbang, med srtd, sl calc, frm, micmica, tr fn pyr; tr slty SH
SLTST: lt gy, m gy ip, frm-sl hd, blky-plty, n calc, micmica; SH: lt gy-m gy, frm, blky-plty, n calc, slty, vry slty grad to sltst
SLTST: lt gy, m gy ip, frm-sl hd, blky-plty, n-vry sli calc, micmica, tr fn pyr; SH: lt gy-m gy, frm, blky-plty, n calc, slty, vry slty grad to sltst
BG 3u
C
CG 109u
BG 4u
MD: 5,183'
DEV: 3.3
AZM: 193
BG 4u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
BG 5u
C
CG 86u
BG 6u
G 41u
MD: 5,277'
DEV: 3.1
AZM: 222
BG 4u
G 12u
BG 5u

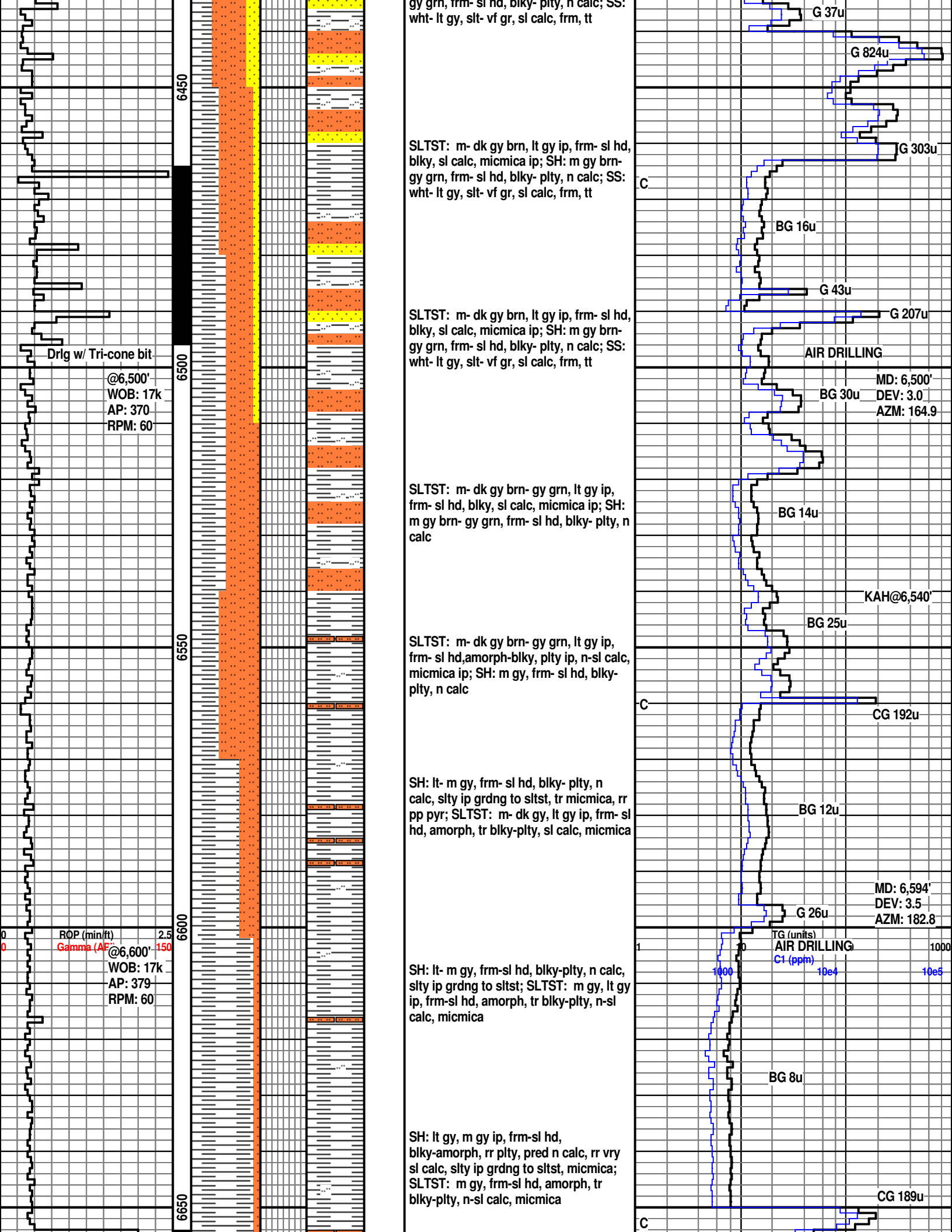

5350
5400
5450
5500
5550
0
ROP (min/ft)
2.5
0
Gamma (AP
150
@5,400'
WOB: 17k
AP: 362
RPM: 60
Drlg w/ Tri-cone bit
@5,000'
WOB: 17k
AP: 383
RPM: 60
SH: lt gy-m gy, m dk gy ip, frm-sli hd, blky-plty, n calc, slty, vry slty grad to sltst; SLTST: lt gy, m gy ip, frm-sl hd, blky-plty, n-vry sli calc, micmica, tr fn pyr; rr lt blu SS
SH: lt gy-m gy, m dk gy ip, frm-sli hd, blky-plty, n calc, vry slty grad to sltst; SLTST: lt gy, m gy ip, rr lt blu, frm-sl hd, blky-plty, n-vry sli calc, micmica, tr fn pyr
SH: lt gy-m gy, m dk gy ip, frm-sli hd, blky-plty, n calc, vry slty grad to sltst; SLTST: lt gy, m gy ip, rr lt blu, frm-sl frm, sft ip, blky-plty, n-vry sli calc, micmica, tr fn pyr; tr fri SS
SLTST: lt-m gy, frm, sft ip, blky-plty, n calc, micmica, tr fn pyr; SH: lt gy-m gy, rr m dk gy, frm-sli hd, blky-plty, n calc, vry slty grad to sltst
SLTST: lt-m gy, brn-dk brn ip, pred frm, sli frm-sft ip, blky-plty, amorph ip, n calc, micmica, tr fn pyr; SH: lt gy-m gy, rr m dk gy, frm-sli hd, blky-plty, n calc, vry slty grad to sltst, rr fn pyr chks; SS: wht-tn, slt- vf gr, sbrnd- sbang, med srtd, pred silc cmt, calc cmy ip, frm, micmica, tr fn pyr;
SH: lt gy, frm-sli hd, blky-plty, n calc, pred slty, vry slty grad to sltst ip; SLTST: dkgy-brn-prl, pred frm, sli frm-sft ip, amorph, n calc, micmica, tr fn pyr
SH: lt gy, m gy ip, frm, blky-plty, n calc, pred slty, vry slty grad to sltst ip; SLTST: dk gy, sli frm-frm, sft ip, amorph-blky, n calc, micmica, tr fn pyr
C
CG 62u
AIR DRILLING
BG 5u
MD: 5,371'
DEV: 2.1
AZM: 215.8
BG 5u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
C
CG 96u
BG 6u
MD: 5,465'
DEV: 1.5
AZM: 176.9
G 19u
BG 6u
G 15u
BG 9u
AIR DRILLING
G 32u
C
CG 106u
5,525'
BG 6u

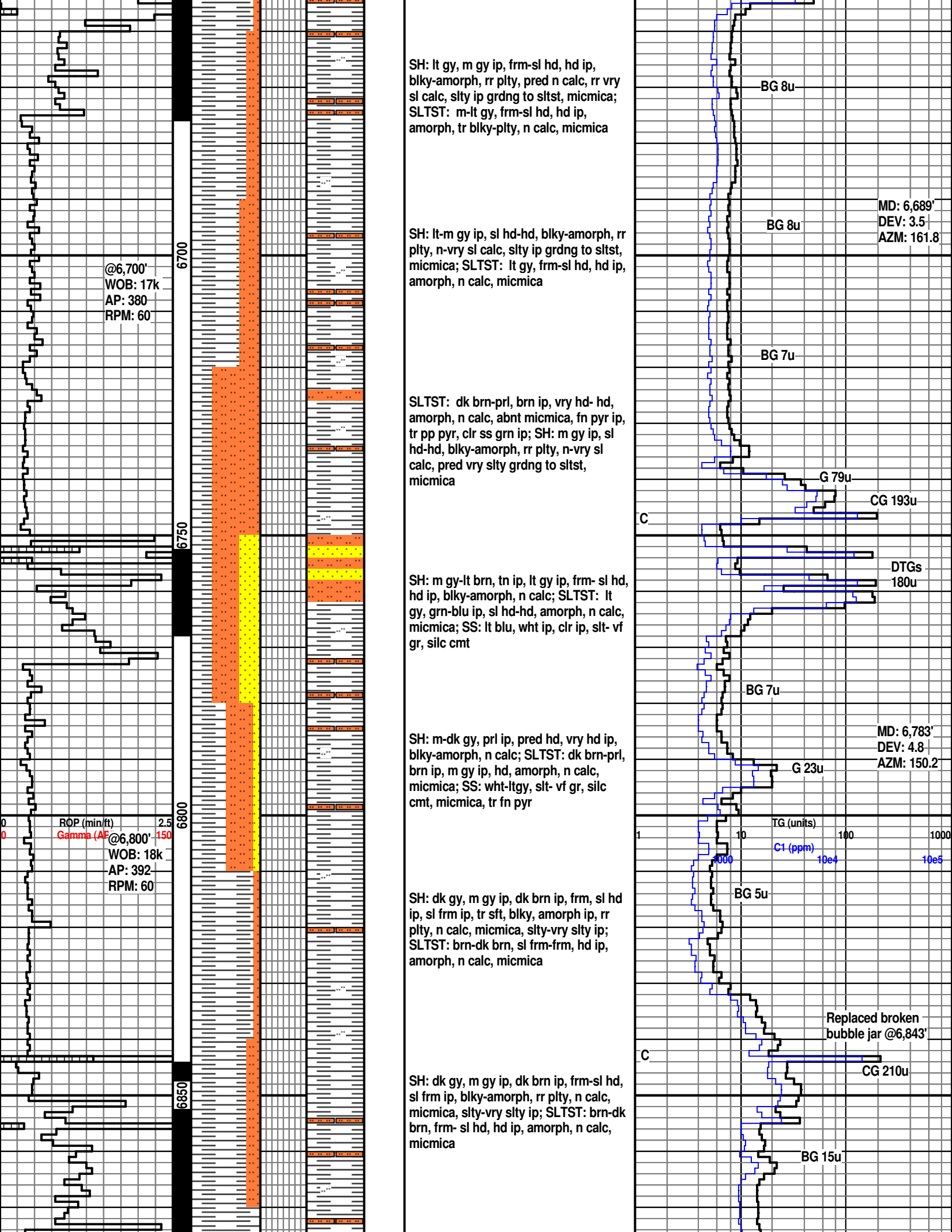

SH: lt gy, m-dk gy ip, frm, blky-plty, n-vry sli calc, slty, vry slty grad to sltst ip, tr micmica; SLTST: m gy, tr brn-grn, sli frm-frm, sft ip, amorph-blky, n calc, tr micmica
BG 5u
MD: 5,559'
DEV: 1.2
AZM: 125.5
SLTST: dk brn-prl, dk gy ip, frm, amorph, n-sli calc, tr micmica; SH: lt gy, sli frm, blky-plty, n calc, slty ip, vry slty grad to sltst ip, tr micmica
G 12u
0
ROP (min/ft)
2.5
0
Gamma (AP
150
@5,600'
WOB: 17k
AP: 387
RPM: 60
5600
TG (units)
1
1
BG u
100
1000
C1 (ppm)
1000
10e4
10e5
G 25u
SH: lt gy, sli frm-frm, sli hd ip, blky-plty, n calc, slty , tr micmica; SLTST: dk brn-dk gy, frm-sli hd, amorph, n-sli calc, tr micmica
C
CG 138u
BG 5u
G 22u
5650
SH: pred lt gy, lt brn ip, sli frm-frm, sli hd ip, blky-plty, n calc, slty , tr micmica; SLTST: m gy, tr dk gy, frm, amorph-blky, n-sli calc, micmica
G 22u
MD: 5,653'
DEV: 1.8
AZM: 102.4
BG 5u
SH: lt gy-lt brn, frm-sli hd, blky-plty, tr amorph, n calc, slty, tr micmica, rr pp pyr; SLTST: dk brn to prl, tr m-dk gy, frm, pred amorph, blky ip, tr plty, n-sli calc, micmica, pp pyr
BG 4u
AIR DRILLING
5700
@5,700'
WOB: 20k
AP: 374
RPM: 60
G 12u
SH: lt gy, m gy ip, frm-sli frm, tr sli hd/sft, blky-plty, n calc, slty, tr micmica; SLTST: dk gy, m gy, brn ip, frm, sli frm ip, amorph, tr blky-plty, n calc, micmica
C
CG 142u
BG 4u
SLTST: m gy-blk, brn ip, frm, sli frm ip, amorph, n calc, micmica; SH: lt gy, m gy ip, frm-sli frm, tr sli hd, blky-plty, n calc, slty, tr micmica
5750
MD: 5,748'
DEV: 2.0
AZM: 64.7
BG 7u
SLTST: m-dk gy, frm-sli frm, amorph, n calc, micmica; SH: lt gy, m gy ip, frm-sli frm, tr sli hd, blky-plty, n calc, slty, tr micmica; SS: wht-lt gy, slt- vf gr, sbrnd-

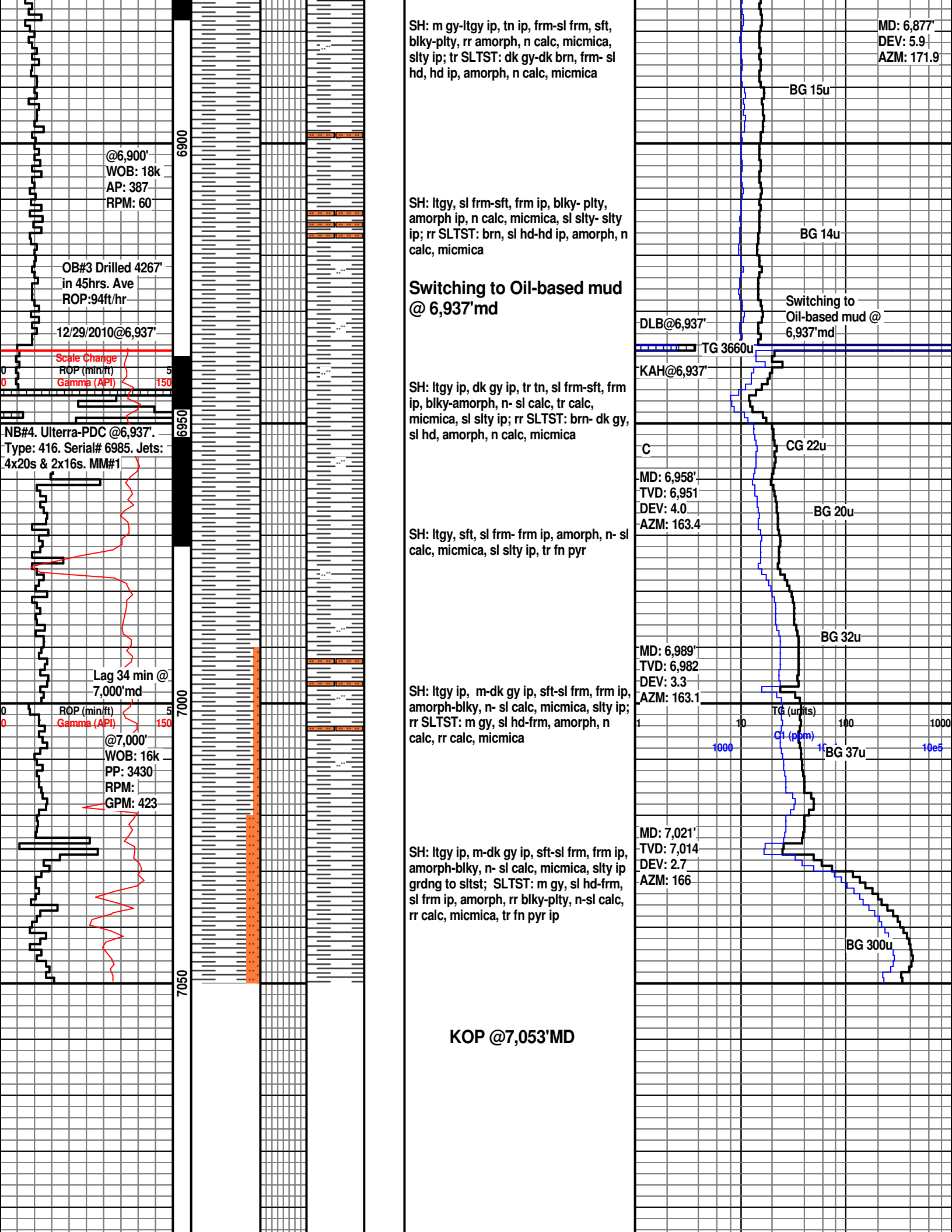

sbang, med srtd, silc/calc cmt, frm, micmica, tr fn pyr
BG 11u
G 17u
0
ROP (min/ft)
2.5
0
Gamma (API)
150
@5,800'
WOB: 18k
AP: 368
RPM: 60
5800
TG (units)
1
10
100
DLB@5,809'
C
C1 (ppm)
1000
10e4
CG 113u
10e5
SLTST: m-dk gy, frm-sli frm, n calc, micmica ip; SH: lt gy, m gy ip, frm-sli frm, blky-plty, n calc, slty, tr micmica; SS: wht-lt gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, frm, tt
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc; SLTST: m- dk gy- gy brn, frm- sl hd, blky, n calc; SS: wht- lt gy, slt- vf gr, sbrnd- sbang, med srtd, n calc, frm, tt
BG 8u
MD: 5,842'
DEV: 2.6
AZM: 69.5
5850
G 21u
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy- gy brn, frm- sl hd, blky, n calc
BG 8u
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy- gy brn, lt gy ip, frm- sl hd, blky, n calc
AIR DRILLING
@5,900'
WOB: 16k
AP: 370
RPM: 60
5900
C
CG 112u
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy- gy brn, lt gy ip, frm- sl hd, blky, n calc
BG 7u
MD: 5,936'
DEV: 1.4
AZM: 87.6
5950
SH: lt- m gy brn- gy grn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy- gy brn, lt gy ip, frm- sl hd, blky, n calc
BG 7u
BG 8u
SH: m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: lt gy, m- dk gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip


Drlg w/ Tri-cone bit
ROP (min/ft)
Gamma (AP')
@6,000'
WOB: 17k
AP: 370
RPM: 60
6000
6050
6100
6150
6200
SH: m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: lt gy, m- dk gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip
SH: m gy brn- gy grn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: lt gy, m- dk gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip
SH: m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: lt gy, m- dk gy- gy brn ip, frm- sl hd, blky, n calc, micmica ip; SS: lt gy, slt- vf gr, v sl calc, frm, tt
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip
SH: lt- m gy brn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip
SH: lt- m gy brn- gy grn, frm- sl hd, blky- plty, n calc, slty ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SS: wht- lt gy, slt- vf gr, v sl calc, frm, tt
12/28/2010@6,185'
@6,200'
WOB: 10k
AP: 360
RPM: S
C
CG 115u
TG (units)
C1 (ppm)
BG 6u
MD: 6,029'
DEV: 1.5
AZM: 86.4
BG 9u
BG 6u
CG 122u
AIR DRILLING
@6,100'
WOB: 17k
AP: 380
RPM: 60
BG 5u
MD: 6,123'
DEV: 1.7
AZM: 104.5
BG 9u
BG 8u
C
Flow line work
G 16u


6250
6300
6350
6400
@6,300'
WOB: 16k
AP: 380
RPM: S
@6,400'
WOB: 15k
AP: 370
RPM: S
ROP (min/ft)
Gamma (AP
SH: lt- m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc; SS: wht- lt gy, slt- vf gr, v sl calc, frm, tt
SH: lt- m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip; SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc
SH: lt- m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip grdng to SLTST: m-dk gy brn, lt gy ip, frm- sl hd, blky, sl calc
SH: lt- m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip grdng to SLTST: m-dk gy brn, lt gy ip, frm- sl hd, blky, sl calc
SH: lt- m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip grdng to SLTST: m-dk gy brn, lt gy ip, frm- sl hd, blky, sl calc
SH: m gy brn- gy grn, frm- sl hd, blky-plty, n calc, slty ip grdng to SLTST: m-dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SS: wht- lt gy, slt- vf gr, sl calc, frm, tt, tr xln calc
SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SH: m gy brn-
BG 5u
BG 6u
CG 104u
C
BG 7u
AIR DRILLING
BG 6u
CG 97u
C
BG 5u
TG (units)
C1 (ppm)
MD: 6,217'
DEV: 2.6
AZM: 141.3
MD: 6,311'
DEV: 4.7
AZM: 159.1
MD: 6,406'
DEV: 4.2
AZM: 144.1


6450
6500
6550
6600
6650
Drlg w/ Tri-cone bit
@6,500'
WOB: 17k
AP: 370
RPM: 60
@6,600'
WOB: 17k
AP: 379
RPM: 60
ROP (min/ft)
Gamma (API)
0
2.5
150
gy grn, frm- sl hd, blky- plty, n calc; SS: wht- lt gy, slt- vf gr, sl calc, frm, tt
SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SH: m gy brn- gy grn, frm- sl hd, blky- plty, n calc; SS: wht- lt gy, slt- vf gr, sl calc, frm, tt
SLTST: m- dk gy brn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SH: m gy brn- gy grn, frm- sl hd, blky- plty, n calc; SS: wht- lt gy, slt- vf gr, sl calc, frm, tt
SLTST: m- dk gy brn- gy grn, lt gy ip, frm- sl hd, blky, sl calc, micmica ip; SH: m gy brn- gy grn, frm- sl hd, blky- plty, n calc
SLTST: m- dk gy brn- gy grn, lt gy ip, frm- sl hd,amorph-blky, plty ip, n-sl calc, micmica ip; SH: m gy, frm- sl hd, blky- plty, n calc
SH: lt- m gy, frm- sl hd, blky- plty, n calc, slty ip grdng to sltst, tr micmica, rr pp pyr; SLTST: m- dk gy, lt gy ip, frm- sl hd, amorph, tr blky-plty, sl calc, micmica
SH: lt- m gy, frm-sl hd, blky-plty, n calc, slty ip grdng to sltst; SLTST: m gy, lt gy ip, frm-sl hd, amorph, tr blky-plty, n-sl calc, micmica
SH: lt gy, m gy ip, frm-sl hd, blky-amorph, rr plty, pred n calc, rr vry sl calc, slty ip grdng to sltst, micmica; SLTST: m gy, frm-sl hd, amorph, tr blky-plty, n-sl calc, micmica
G 37u
G 824u
G 303u
C
BG 16u
G 43u
G 207u
AIR DRILLING
MD: 6,500'
DEV: 3.0
AZM: 164.9
BG 30u
BG 14u
KAH@6,540'
BG 25u
C
CG 192u
BG 12u
MD: 6,594'
DEV: 3.5
AZM: 182.8
G 26u
TG (units)
1
10
1000
AIR DRILLING
C1 (ppm)
1000
10e4
10e5
BG 8u
CG 189u
C


6700
6750
6800
6850
@6,700'
WOB: 17k
AP: 380
RPM: 60
@6,800'
WOB: 18k
AP: 392
RPM: 60
ROP (min/ft)
Gamma (API)
SH: lt gy, m gy ip, frm-sl hd, hd ip, blky-amorph, rr plty, pred n calc, rr vry sl calc, slty ip grdng to sltst, micmica; SLTST: m-lt gy, frm-sl hd, hd ip, amorph, tr blky-plty, n calc, micmica
SH: lt-m gy ip, sl hd-hd, blky-amorph, rr plty, n-vry sl calc, slty ip grdng to sltst, micmica; SLTST: lt gy, frm-sl hd, hd ip, amorph, n calc, micmica
SLTST: dk brn-prl, brn ip, vry hd- hd, amorph, n calc, abnt micmica, fn pyr ip, tr pp pyr, clr ss grn ip; SH: m gy ip, sl hd-hd, blky-amorph, rr plty, n-vry sl calc, pred vry slty grdng to sltst, micmica
SH: m gy-lt brn, tn ip, lt gy ip, frm- sl hd, hd ip, blky-amorph, n calc; SLTST: lt gy, grn-blu ip, sl hd-hd, amorph, n calc, micmica; SS: lt blu, wht ip, clr ip, slt- vf gr, silc cmt
SH: m-dk gy, prl ip, pred hd, vry hd ip, blky-amorph, n calc; SLTST: dk brn-prl, brn ip, m gy ip, hd, amorph, n calc, micmica; SS: wht-ltgy, slt- vf gr, silc cmt, micmica, tr fn pyr
SH: dk gy, m gy ip, dk brn ip, frm, sl hd ip, sl frm ip, tr sft, blky, amorph ip, rr plty, n calc, micmica, slty-vry slty ip; SLTST: brn-dk brn, sl frm-frm, hd ip, amorph, n calc, micmica
SH: dk gy, m gy ip, dk brn ip, frm-sl hd, sl frm ip, blky-amorph, rr plty, n calc, micmica, slty-vry slty ip; SLTST: brn-dk brn, frm- sl hd, hd ip, amorph, n calc, micmica
BG 8u
BG 8u
MD: 6,689'
DEV: 3.5
AZM: 161.8
BG 7u
G 79u
CG 193u
C
DTGs
180u
BG 7u
MD: 6,783'
DEV: 4.8
AZM: 150.2
G 23u
TG (units)
1
10
100
1000
C1 (ppm)
1000
10e4
10e5
BG 5u
Replaced broken bubble jar @6,843'
C
CG 210u
BG 15u


6900
6950
7000
7050
@6,900'
WOB: 18k
AP: 387
RPM: 60
OB#3 Drilled 4267' in 45hrs. Ave ROP:94ft/hr
12/29/2010@6,937'
Scale Change
ROP (min/ft) 0 5
Gamma (API) 0 150
NB#4. Ulterra-PDC @6,937'. Type: 416. Serial# 6985. Jets: 4x20s & 2x16s. MM#1
Lag 34 min @ 7,000'md
ROP (min/ft) 0 5
Gamma (API) 0 150
@7,000'
WOB: 16k
PP: 3430
RPM:
GPM: 423
SH: m gy-ltgy ip, tn ip, frm-sl frm, sft, blky-plty, rr amorph, n calc, micmica, slty ip; tr SLTST: dk gy-dk brn, frm- sl hd, hd ip, amorph, n calc, micmica
SH: ltgy, sl frm-sft, frm ip, blky- plty, amorph ip, n calc, micmica, sl slty- slty ip; rr SLTST: brn, sl hd-hd ip, amorph, n calc, micmica
Switching to Oil-based mud @ 6,937'md
SH: ltgy ip, dk gy ip, tr tn, sl frm-sft, frm ip, blky-amorph, n- sl calc, tr calc, micmica, sl slty ip; rr SLTST: brn- dk gy, sl hd, amorph, n calc, micmica
SH: ltgy, sft, sl frm- frm ip, amorph, n- sl calc, micmica, sl slty ip, tr fn pyr
SH: ltgy ip, m-dk gy ip, sft-sl frm, frm ip, amorph-blky, n- sl calc, micmica, slty ip; rr SLTST: m gy, sl hd-frm, amorph, n calc, rr calc, micmica
SH: ltgy ip, m-dk gy ip, sft-sl frm, frm ip, amorph-blky, n- sl calc, micmica, slty ip grdng to sltst; SLTST: m gy, sl hd-frm, sl frm ip, amorph, rr blky-plty, n-sl calc, rr calc, micmica, tr fn pyr ip
KOP @7,053'MD
MD: 6,877'
DEV: 5.9
AZM: 171.9
BG 15u
BG 14u
Switching to Oil-based mud @ 6,937'md
DLB@6,937'
TG 3660u
KAH@6,937'
C
CG 22u
MD: 6,958'
TVD: 6,951
DEV: 4.0
AZM: 163.4
BG 20u
BG 32u
MD: 6,989'
TVD: 6,982
DEV: 3.3
AZM: 163.1
TG (units)
1 10 100 1000
C1 (ppm)
1000 10e5
BG 37u
MD: 7,021'
TVD: 7,014
DEV: 2.7
AZM: 166
BG 300u

	00					See Windoes 2244H horizontal log	