



Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K07-65-1BHN HORZ

Location SEC 8 T4N R66W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-39477

AFE # 200360

Region DJ BASIN

Field WATTENBERG

Spud Date 8/5/2014

Drilling Completed 8/17/2014

Surface Coordinates NESE SEC 8 T4N R66W

2,234' FSL; 55' FEL

LAT/LON: 40.32505/-104.79277

Bottom Hole Coordinates

SEC 7 T4N R66W
2,475' FSL; 535' FWL

Ground Elevation 4,700'

K.B. Elevation 4,724

Logged Interval 6,312' To 16,291'

Total Depth 16,291'

Formation NIOBRARA A CHALK

Type of Drilling Fluid LSND

Operator

Company Noble Energy Inc

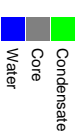
Address 1625 BROADWAY SUITE 2200
DENVER, CO 80202

Geologist

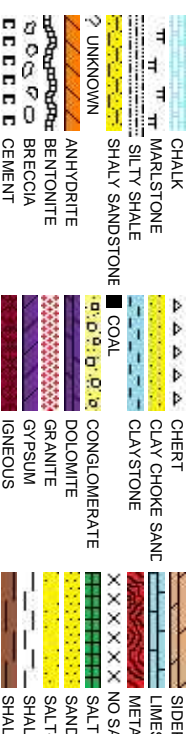
Name NATHAN MURPHY; MARK COLE

Company COLUMBINE LOGGING, INC
Address 2385 S LIPAN ST
DENVER, CO 80223

Zone Color Coding





























































Rock Types



Accessories

Fossils

Fossils	
 FOSSIL	 ARGILLACEOUS
 GASTROPOD	 ARGILLITE GRAIN
 ALGAE	 B BENTONITE
 AMPHIPORA	 BITUMENOUS SUBSTANCE
 BELEMNITE	 BRECCIA FRAGMENTS
 BIOCLASTIC	 CALCAREOUS
 BRACHIOPOD	 CARBONACEOUS FLAKES
 BRYOZOA	 CHERT
 CEPHALOPOD	 CHERT
 CORAL	 COAL - THIN BEDS
 CRINOID	 DOLOMITIC
 ECHINOID	 FELDSPAR
Minerals	
 FISH	 FERRUGINOUS PELLET
 FORAMINIFERA	 FERRUGINOUS
 ANHYDRITIC	 HEAVY MINERAL
 Fossiliferous	 INOCERAMUS
 GLAUCCONITE	 KAOLIN
 GYPSIFEROUS	 MARLSTONE
 HEAVY MINERAL	 MINERAL CRYSTALS
 INOCERAMUS	 NODULES
 KAOLIN	 PHOSPHATE PELLETS
 MARLSTONE	 PYRITE
 MINERAL CRYSTALS	 SALT CAST
 NODULES	 SANDY
 PHOSPHATE PELLETS	 SILTY
 PYRITE	 SUCCACEOUS
 SALT CAST	 SHALE STRINGER
 SANDY	 SILTSTONE STRINGER
 SILTY	 TUFFACEOUS






Other Symbols

Oil Show

- ☐ ORGANIC
- ☐ PINPOINT
- ☒ VULGY

Engine















Engineering

 CORE - RECOVERED
 DST INTERVAL
 FAULT
 FORMATION TOP
 GAS SHOW

Rounding

E EARTHY
F FINELYXLN
G GRAINSTONE
L LITHOGRAPHIC
M MICROXLN







Porosity

	CONNECTION (DOWN)		CONNECTION (DOWN)
	CONNECTION (LEFT)		CONNECTION (LEFT)
	CONNECTION (RIGHT)		CONNECTION (RIGHT)
	CONNECTION GAS		CONNECTION GAS
	CONNECTION GAS UP		CONNECTION GAS UP
	CONNECTION GAS LEFT		CONNECTION GAS LEFT
	CONNECTION GAS DOWN		CONNECTION GAS DOWN

















Textures




PS PACKSTONE
WS WACKSTONE
Sorting
M MODERATE
P POOR
W WELL





Sorting

SHALE GRAY		WHITE or LIMONITE
SHALY SILTSTONE		SILTSTONE
SILTSTONE		ADOPHIC
TILL		SAMPLE
TUFF		SILTSTONE
WELDED TUFF		DEEPER SAND
		COLORLED

Gas	
Pressure	
Seal	

	MN DEPTH		ANGULAR
	NORMAL FAULT		ROUNDED
	OIL SHOW		SUBANG
	OVERTURNED STRATA		SUBRAND
	REVERSE FAULT		
	SIDEWALL CORE (LEFT)		
	SIDEWALL CORE (RIGHT)		BOUNDSTONE
	SLIDE		CHALKY
	SURVEY		CRYPTOXIN

	M5 MUDSTONE
	P3 PACKSTONE
	M5 WACKESTONE

	Sorting
	M MODERATE
	P POOR
	W WELL

Slide/Rotate

ROP

ROP

Curves

GAMMA

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

Depth Labels

% Lith

Well Bore

TVD

Oil Show

Images

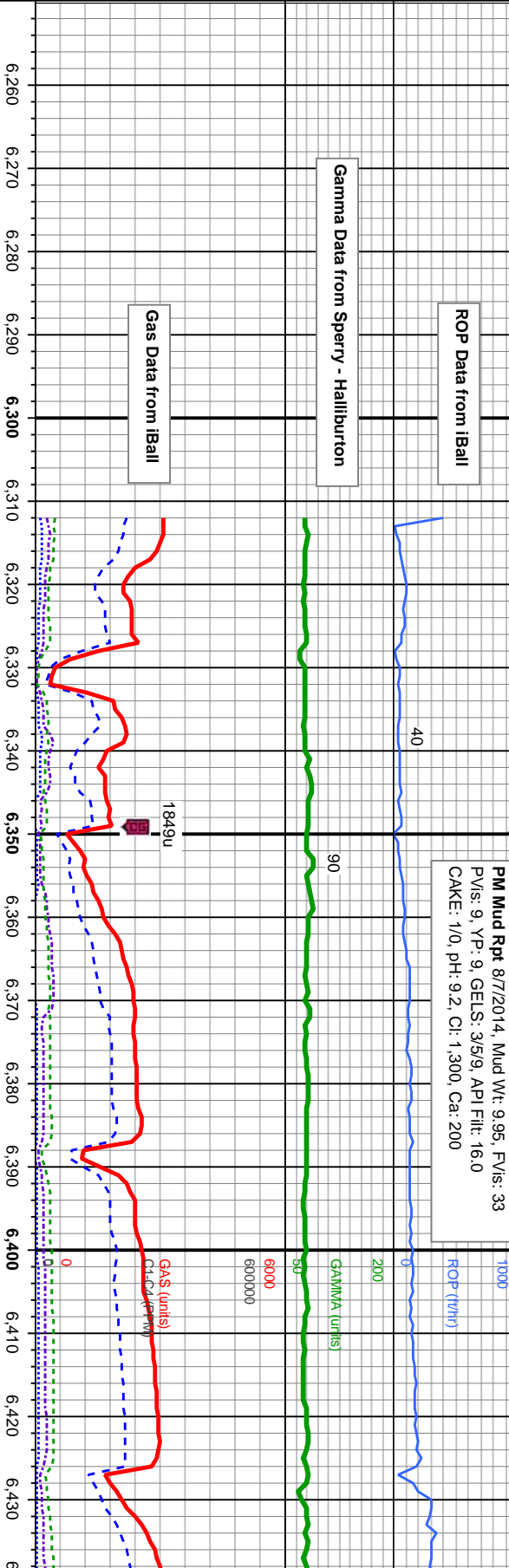
PM Mud Rpt 8/7/2014, Mud Wt: 9.95, FV/s: 33
P/Vs: 9, YP: 9, GELS: 35/9, API Filtr: 16.0
CAKE: 1/0, pH: 9.2, Cl: 1,300, Ca: 200

ROP (ft/hr)

GAMMA (units)

GAS (units)

C1 C2 C3 C4



Columbine Logging began logging with
Bloodhound unit 0687 on 8/7/2014

Bit Data
Bit #: 1
Type: Smith
Model: SD519
Size: 8.75 "
Depth In: 630 '
Jets: 7x14

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, silty - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brt clus, p por, calc cnt, sme glau

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, silty - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brt clus, p por, calc cnt, sme glau

SLTY SH: lt gy - ltgy brn, frm - mod hd,
sb pily, occ sb blkly, silty - grty tex, v sl
SHY SS: lt - medgy, f gr, sb ang - sb rd,
brt clus, p por, calc cnt, sme glau
6700

MD: 6,386 '
TVD: 6,370.68 '
Inclination: 8.2 °
Azimuth: 268.17 °

MD: 6,434 '
TVD: 6,417.85 '
Inclination: 12.9 °
Azimuth: 268.1 °



MUD WT: 10.15/10.25
VIS: 36/37 IN/OUT

MUD WT: 10.20/10.20
VIS: 41/41 IN/OUT

MUD WT: 10.10/9.80
VIS: 41/43 IN/OUT

1000

ROP (ft/hr)

200

GAMMA (units)

6000

6000000

GAS (mols)

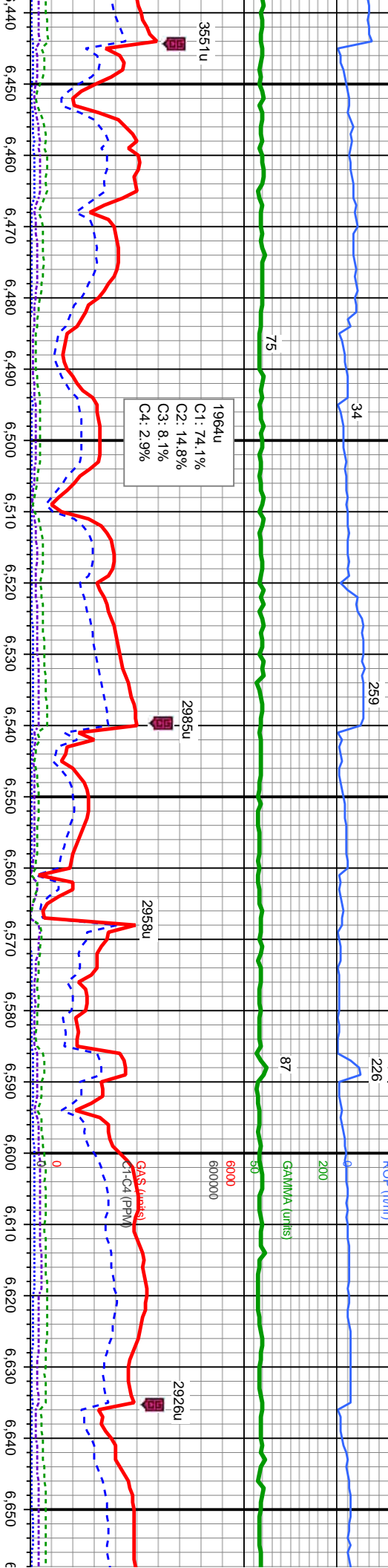
C1 C4 (PPM)

1964u
C1: 74.1%
C2: 14.8%
C3: 8.1%
C4: 2.9%

2985u

2958u

2926u



TVD SCALE CHANGE

6500

MD: 6,481 '
TVD: 6,463.29 '
Inclination: 16.63 °
Azimuth: 270.37 °

MD: 6,529 '
TVD: 6,508.87 '
Inclination: 19.88 °
Azimuth: 271.33 °

MD: 6,576 '
TVD: 6,552.9 '
Inclination: 21.06 °
Azimuth: 272.55 °

MD: 6,624 '
TVD: 6,597 '
Inclination: 25.41 °
Azimuth: 270.55 °

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, stly - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brit clus, p por, calc cnt, sme glau

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, stly - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brit clus, p por, calc cnt, sme glau

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, stly - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brit clus, p por, calc cnt, sme glau

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily -
sb pily, occ sb blkly, stly - grty tex, v sl calc
SHY SS: lt - medgy, f gr, sb ang - sb rd, py srt,
brit clus, p por, calc cnt, sme glau

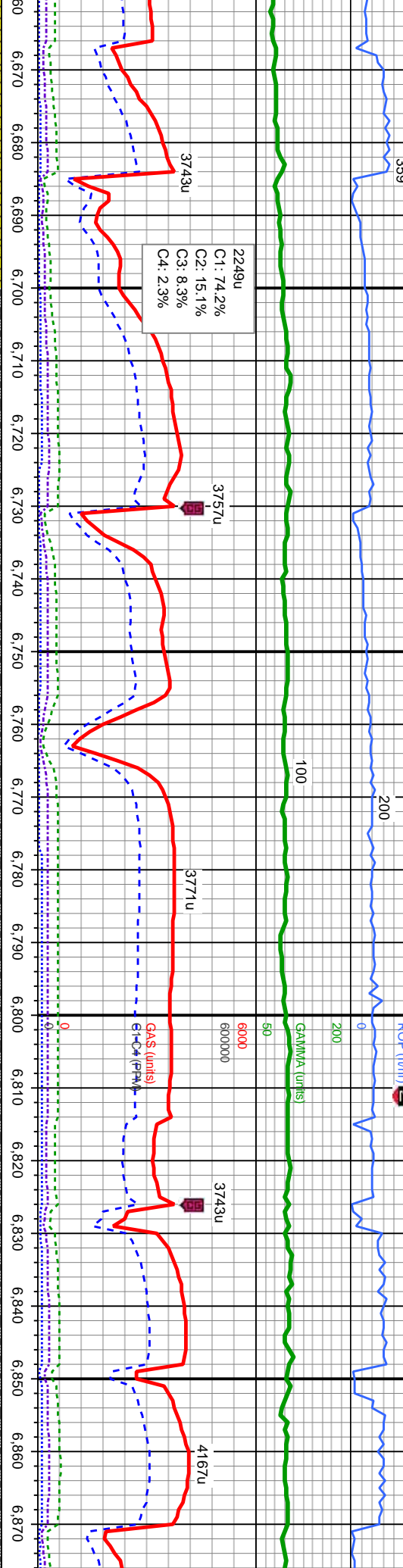
SLTY S
sb pily,
SHY SS
brit clus



MUD WT: 10.60/10.20
VIS: 37/40 IN/OUT

8/7/2014
8/8/2014
8/31/2014

MUD WT: 11.20/10.90
VIS: 34/37 IN/OUT

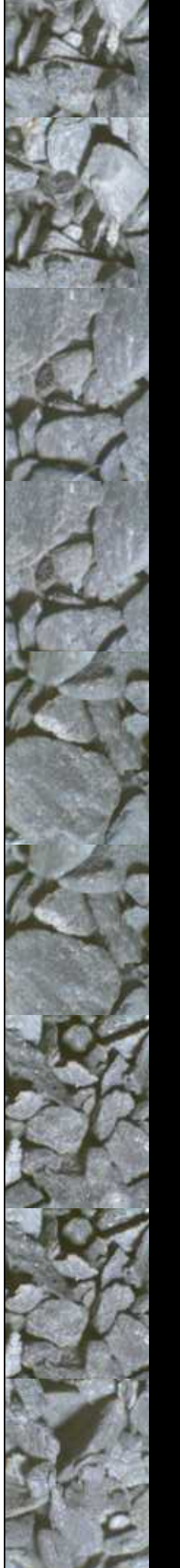


MD: 6,671 '
TVD: 6,638.69 '
Inclination: 29.53 °
Azimuth: 269.36 °

MD: 6,766 '
TVD: 6,715.16 '
Inclination: 42.91 °
Azimuth: 271.54 °

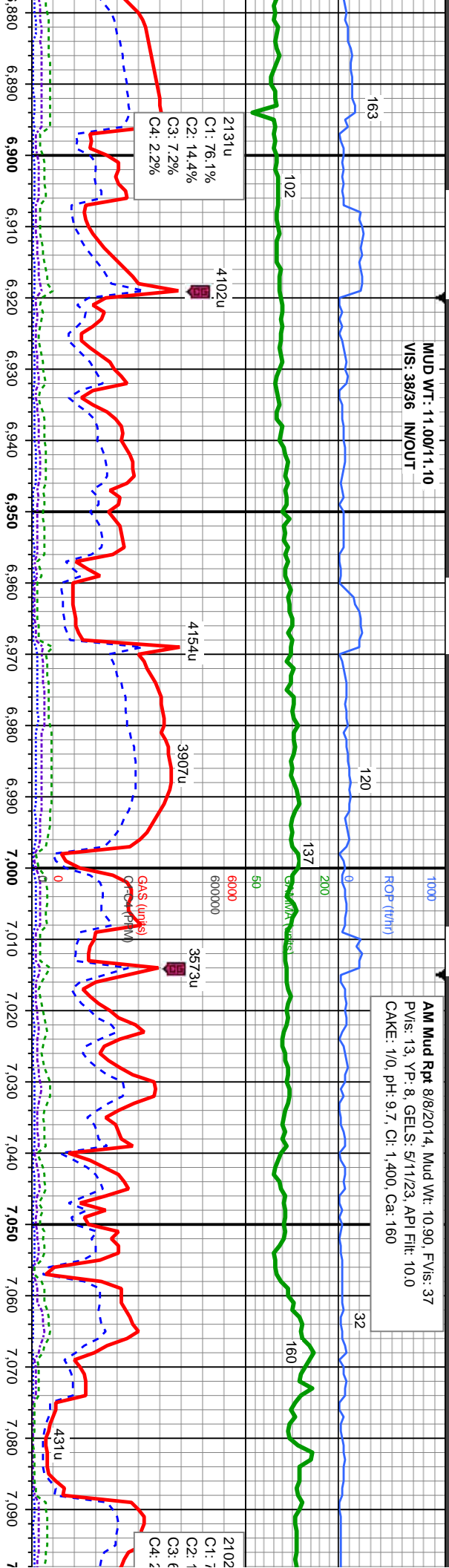
MD: 6,861 '
TVD: 6,779.93 '
Inclination: 51.03 °
Azimuth: 272.69 °

H: lt gy - ltgy brn, frm - mod hd, pred pily - occ sb blkly, slty - grty tex, v sl calc	SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily - sb pily, occ sb blkly, slty - grty tex, v sl calc	SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily - sb pily, occ sb blkly, slty - grty tex, v sl calc	SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pily - sb pily, occ sb blkly, slty - grty tex, v sl calc
6900	6900	6900	6900



MUD WT: 11.00/11.10
VIS: 38/36 IN/OUT

AM Mud Rpt 8/8/2014, Mud Wt: 10.90, FV/s: 37
PVS: 13, YP: 8, GELS: 5/11/23, API Filtr: 10.0
CAKE: 1/0, pH: 9.7, Cl: 1,400, Ca: 160



WELL SCALE CHANGE

MD: 6,909 '
TVD: 6,809.15 '
Inclination: 53.97 °
Azimuth: 273.48 °

MD: 6,956 '
TVD: 6,835.67 '
Inclination: 57.33 °
Azimuth: 272.63 °

MD: 7,004 '
TVD: 6,860.13 '
Inclination: 61.37 °
Azimuth: 271.73 °

MD: 7,051 '
TVD: 6,881.7 '
Inclination: 64 °
Azimuth: 271.18 °

25' Sample Interval @ 7,000 MD

Sharon Springs Mrkr @
7,063' MD; 6,887' TVD

TVD (ft)

TVD (ft)

mod hd, pred pty -
y tex, v sl calc

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pty -
sb pty, occ sb blkly, silty - grty tex, v sl calc

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pty -
sb pty, occ sb blkly, silty - grty tex, v sl calc

SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pty -
sb pty, occ sb blkly, silty - grty tex, v sl calc.

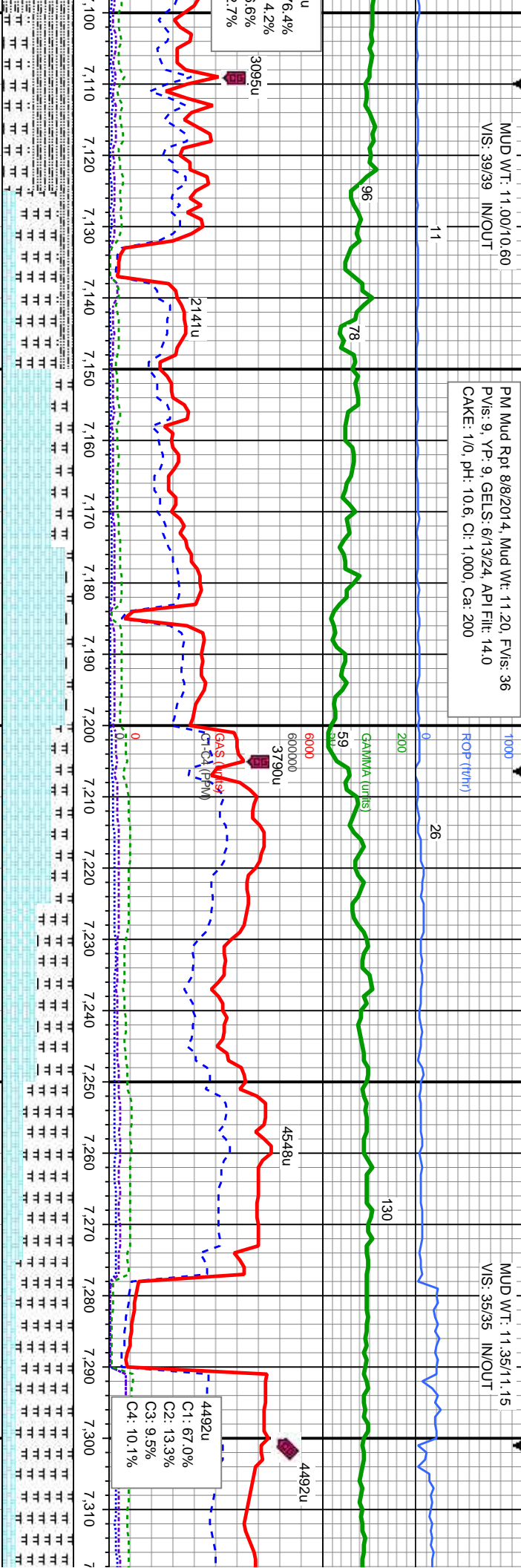
SLTY SH: lt gy - ltgy brn, frm - mod hd, pred pty -
sb pty, occ sb blkly, silty - grty tex, v sl calc.



MUD WT: 11.00/10.60
VIS: 39/39 IN/OUT

PM Mud Rpt 8/8/2014, Mud Wt: 11.20, FV/s: 36
PV/s: 9, YP: 9, GELS: 6/13/24, API Filtr: 14.0
CAKE: 1/0, pH: 10.6, Cl: 1,000, Ca: 200

MUD WT: 11.35/11.15
VIS: 35/35 IN/OUT



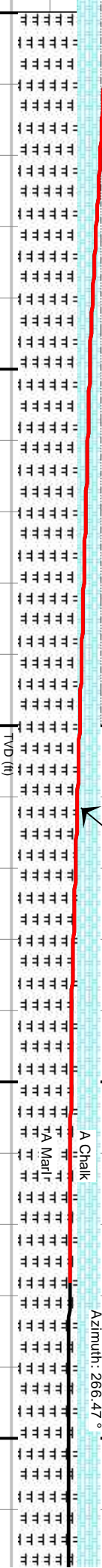
Nio A Chalk Top @
7,123 MD: 6,910' TVD

MD: 7,145'
TVD: 6,917.6'
Inclination: 71.07 °
Azimuth: 269.47 °

Nio A Marl Top @
7,211' MD: 6,934' TVD

MD: 7,240'
TVD: 6,937.72'
Inclination: 84.42 °
Azimuth: 266.36 °

MD: 7,291'
TVD: 6,940.45'
Inclination: 89.45 °
Azimuth: 266.47 °



MRL: lt - med gy, rr blk, sft - frm, sme mod hd,
sb pily - pily, sily - grty tex
CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb
biky, rthy tex, v calc, abnt bent
SLTY SH: lt gy - lt gy brn, blk, frm - mod hd, pily -
sb pily, occ sb biky, sily - grty tex, v sl calc

CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb
biky, rthy tex, v calc, sme bent
MRL: lt - med gy, rr blk, sft - frm, sme mod hd,
sb pily - pily, sily - grty tex

CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb
biky, rthy tex, v calc, sme bent
MRL: lt - med gy, rr blk, sft - frm, sme mod hd,
sb pily - pily, sily - grty tex

MRL: lt - med gy, rr blk, sft - frm, sme mod hd,
sb pily - pily, sily - grty tex
CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb
biky, rthy tex, v calc, sme bent

MRL: lt - med gy,
sb pily - pily, sily
CHK: tan - ltgy, rr
biky, rthy tex, v c



8/8/2014

8/9/2014

8/10/2014

8/11/2014

8/12/2014

PM Mud Rpt 8/12/2014, Mud Wt: 10.45, FVis: 34

PVis: 9, YP: 8, GELS: 3.6/10, API Fil: 13.5

CAKE: 1/0, pH: 8.1, Cl: 600, Ca: 280

ROP (ft/hr)

1000

200

50

GAMMA (units)

600000

600000

GAS (units)

C1-C4 (PPM)

0

2515u

2121u

2294u

C1: 68.0%

C2: 16.4%

C3: 9.5%

C4: 6.2%

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MINDEPTH

180

43

200

50

GAMMA (units)

600000

600000

GAS (units)

C1-C4 (PPM)

0

2515u

2121u

2294u

C1: 68.0%

C2: 16.4%

C3: 9.5%

C4: 6.2%

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

TOOH @ 7.351' MD
TO RUN 7" CASING

Bit #: 2

Type: Security

Model: MMDS4

Size: 6.12"

Depth In: 7.351'

Jets: 5x13

TVD (ft)

6800

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

MD: 7.407'

TVD: 6.941.32'

Inclination: 89.69°

Azimuth: 269.28°

MD: 7.502'

TVD: 6.942.6'

Inclination: 88.77°

Azimuth: 269.15°

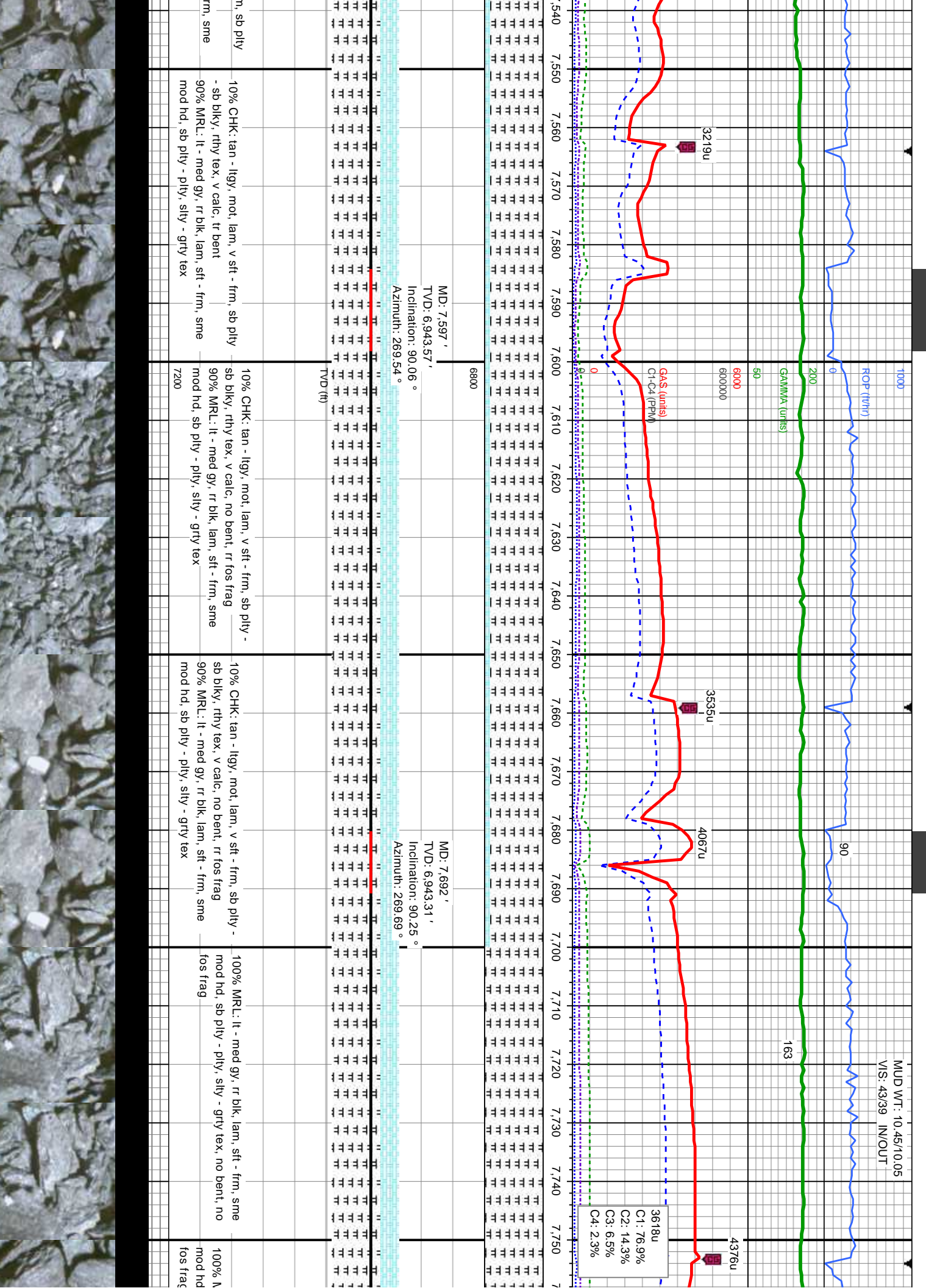
10% CHK: tan - lly, mot, lam, v sft - frm, sb ply
- sb blk, rthy tex, v calc, tr bent
90% MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb ply - ply, silty - grty tex

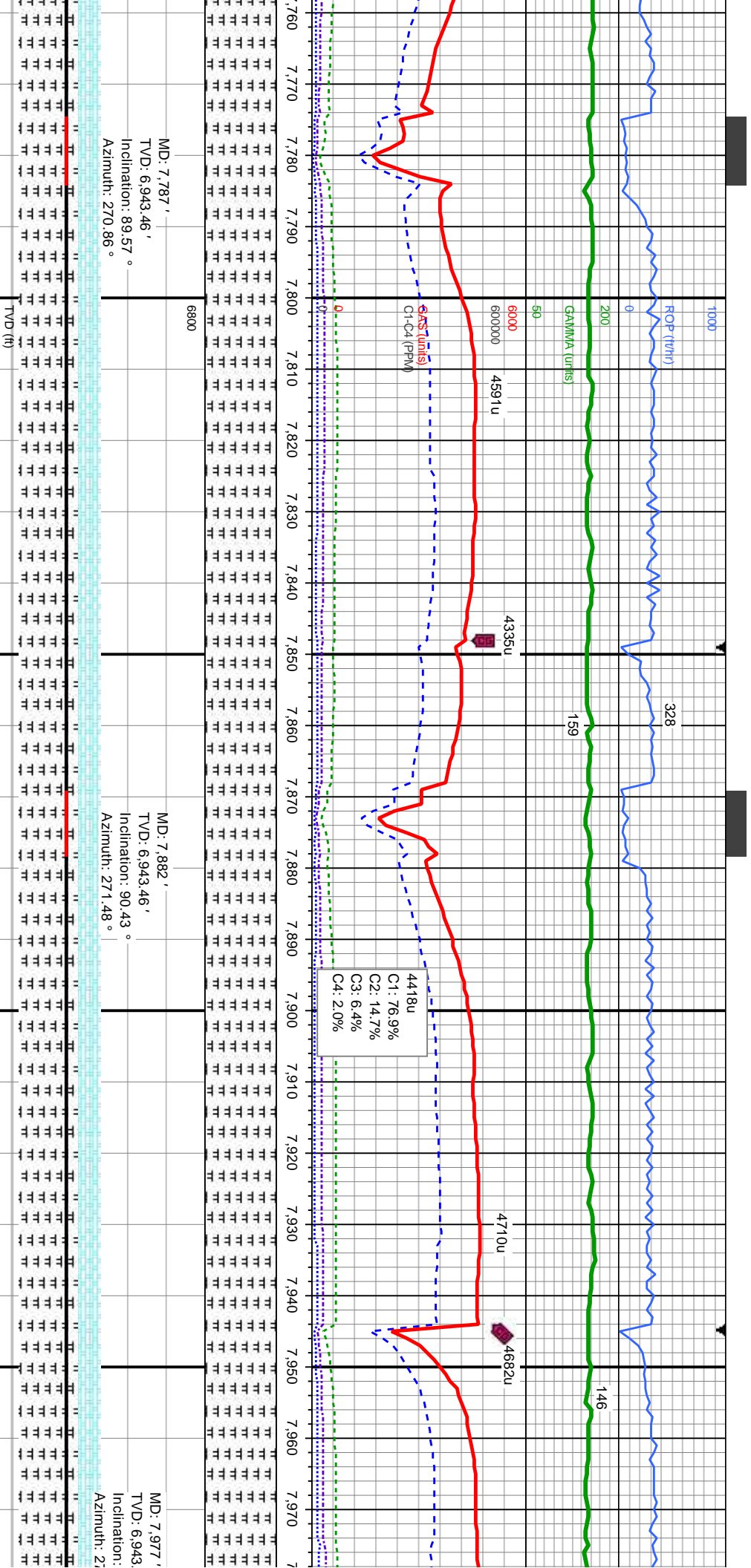
10% CHK: tan - lly, mot, lam, v sft - frm, sb ply
- sb blk, rthy tex, v calc, tr bent
90% MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb ply - ply, silty - grty tex

10% CHK: tan - lly, mot, lam, v sft - frm, sb ply
- sb blk, rthy tex, v calc, tr bent
90% MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb ply - ply, silty - grty tex

10% CHK: tan - lly, mot, lam, v sft - frm, sb ply
- sb blk, rthy tex, v calc, tr bent
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod
hd, sb ply - ply, silty - grty tex







MD: 7.787 '
TV D: 6,943.46 '
Inclination: 89.57 °
Azimuth: 270.86 °

MD: 7,882 '
TVD: 6,943.46 '
Inclination: 90.43 °
Azimuth: 271.48 °

MD: 7,977 '
TVD: 6,943.
Inclination:
Azimuth: 27

MR.: It - med gy, rr blk, lam, sft - frm, sme
 , sb ply - ply, sily - gtry tex, no bent, no

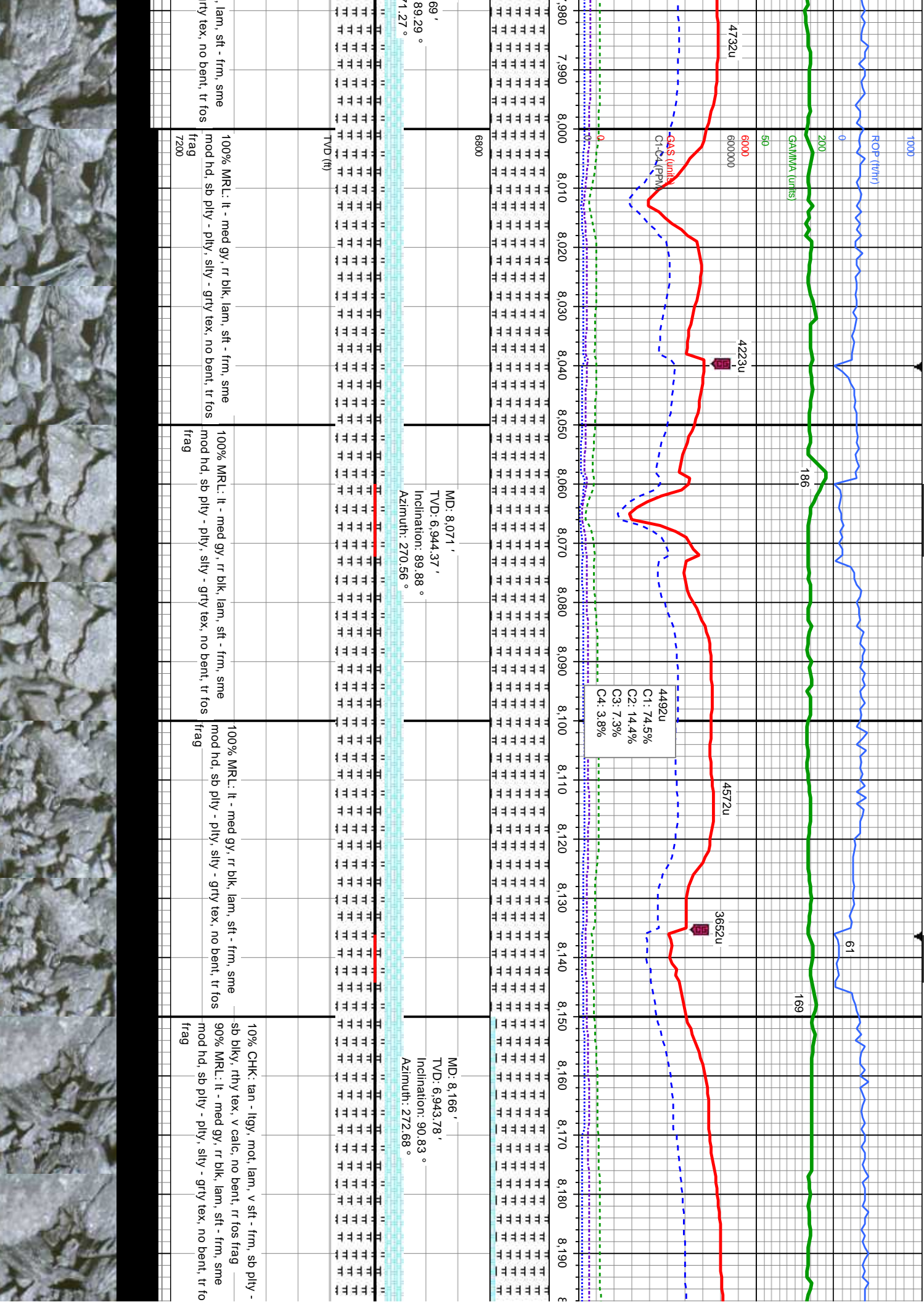
100% MRL: It - med gy, r blk, lam, sft - frm, sme mod hd, sb plty - plty, slty - grty tex, no bent, tr f frag					
7200					

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fosc frag

100% MRL: It - med gy, rr blk, lam, sft - frm, sme					
mod hd, sb plty - plty, slty - grty tex, no bent, tr f					
frag					

100% MR.L: It - med gy, rr blk
-mod hd, sb plty - plty, silty - g
frag

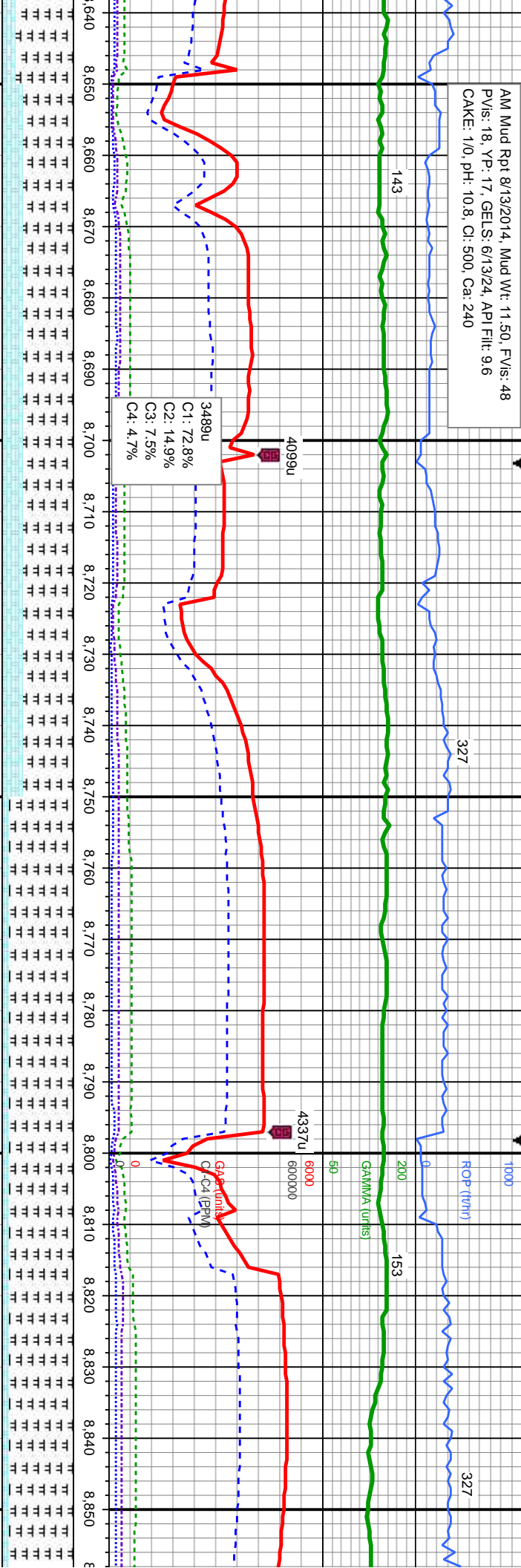




lam, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos frag
7200	7200	7200	7200



AM Mud Rpt 8/13/2014, Mud Wt: 11.50, FV/s: 48
PV/s: 18, YP: 17, GELS: 6/3/24, API Filtr: 9.6
CAKE: 1/0, pH: 10.8, Cl: 500, Ca: 240



MD: 8.735' TVD: 6.936.46' Inclination: 90.12° Azimuth: 269.16°

937.9' Ion: 91.63° Azimuth: 270.48°

30% CHK: tan - llgy, mot, lam, v sft - frm, sb ply - sb blkly, rthy tex, v calc, no bent, rr fos frag	30% CHK: tan - llgy, mot, lam, v sft - frm, sb ply - sb blkly, rthy tex, v calc, no bent, rr fos frag	10% CHK: tan - llgy, mot, lam, v sft - frm, sb ply - sb blkly, rthy tex, v calc, no bent, rr fos frag	10% CHK: tan - llgy, mot, lam, v sft - frm, sb ply - sb blkly, rthy tex, v calc, no bent, rr fos frag	10% CHK: tan - llgy, mot, lam, v sft - frm, sb ply - sb blkly, rthy tex, v calc, no bent, rr fos frag
70% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, slty - grty tex, sme bent, tr fos frag	70% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, slty - grty tex, sme bent, tr fos frag	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, slty - grty tex, sme bent, tr fos frag	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, slty - grty tex, sme bent, tr fos frag	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, slty - grty tex, sme bent, tr fos frag



MUD WT: 11.35/11.00
VIS: 45/40 IN/OUT

4991u
C1: 71.7%
C2: 14.0%
C3: 7.8%
C4: 6.5%

MD: 8.925 '
TVD: 6.932.43 '
Inclination: 91.66 °
Azimuth: 272.15 °

MD: 9.020 '
TVD: 6.931.82 '
Inclination: 89.08 °
Azimuth: 270.15 °

TVD (ft)

tan - llyg, mot, lam, v sft - frm, sb ply -
rthy tex, v calc, no bent, rr fos frag
Rt: lt - med gy, rr blk, lam, sft - frm, sme
sb ply - ply, stly - grty tex, sme bent, tr

10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blk, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, stly - grty tex, abnt bent, tr
fos frag

10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blk, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, stly - grty tex, abnt bent, tr
fos frag

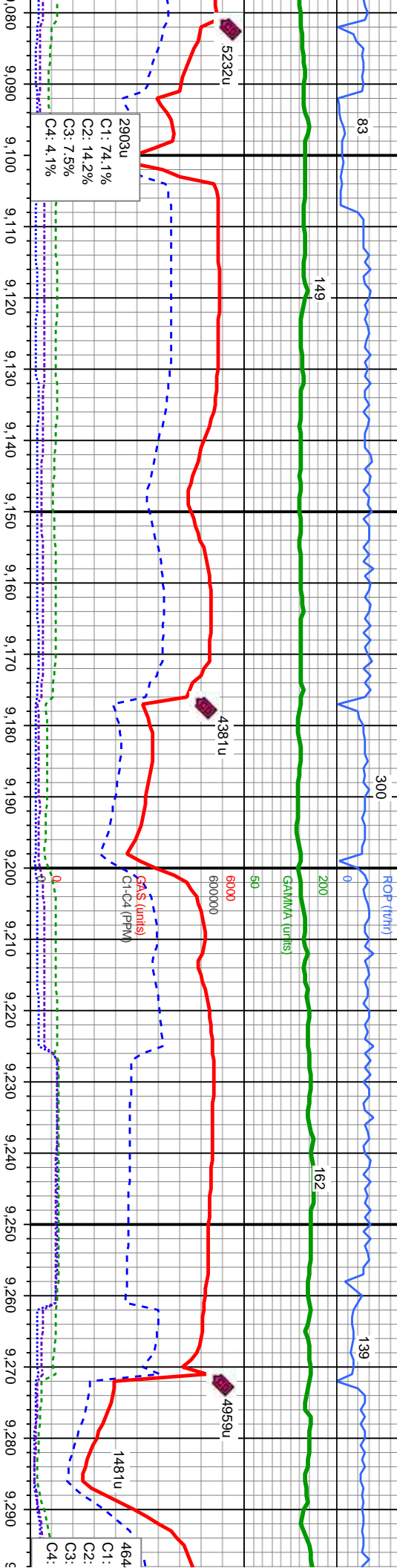
10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blk, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, stly - grty tex, sme bent, tr
fos frag

10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blk, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, stly - grty tex, sme bent, tr
fos frag



MUD WT: 11.35/10.05
VS: 41/41 IN/OUT

MUD WT: 11.35/11.00
VS: 41/41 IN/OUT



MD: 9,115'
TVD: 6,932.2'
Inclination: 90.46 °
Azimuth: 269.43 °

MD: 9,210'
TVD: 6,931.56'
Inclination: 90.31 °
Azimuth: 269.33 °

A Chalk

TVD (ft)

1, v sft - frm, sb ply -	10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -	10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -	10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
ent, rr fos frag	sb blk, rthy tex, v calc, no bent, rr fos frag	sb blk, rthy tex, v calc, no bent, rr fos frag	sb blk, rthy tex, v calc, no bent, rr fos frag
lam, sft - frm, sme	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme	90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply -	mod hd, sb ply -	mod hd, sb ply -	mod hd, sb ply -
tr fos frag	tr fos frag	tr fos frag	tr fos frag



MUD WT: 11.45/10.45
VIS: 41/40 IN/OUT

MUD WT: 11.65/11.15
VIS: 41/41 IN/OUT

ROP (ft/hr)

41

GAMMA (units)

200

159

256

50

6000

6000000

4919u

4448u

4763u

GAS (mls)
C1-C2 (PPM)

4741u

C1: 72.3%

C2: 14.7%

C3: 8.0%

C4: 4.9%

71.3%

15.7%

9.3%

3.7%

MD: 9.400'

TVD: 6,930.84'

Inclination: 91.36°

Azimuth: 269.82°

TVD (ft)

10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blkly, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, sily - grty tex, abnt bent, tr
fos frag

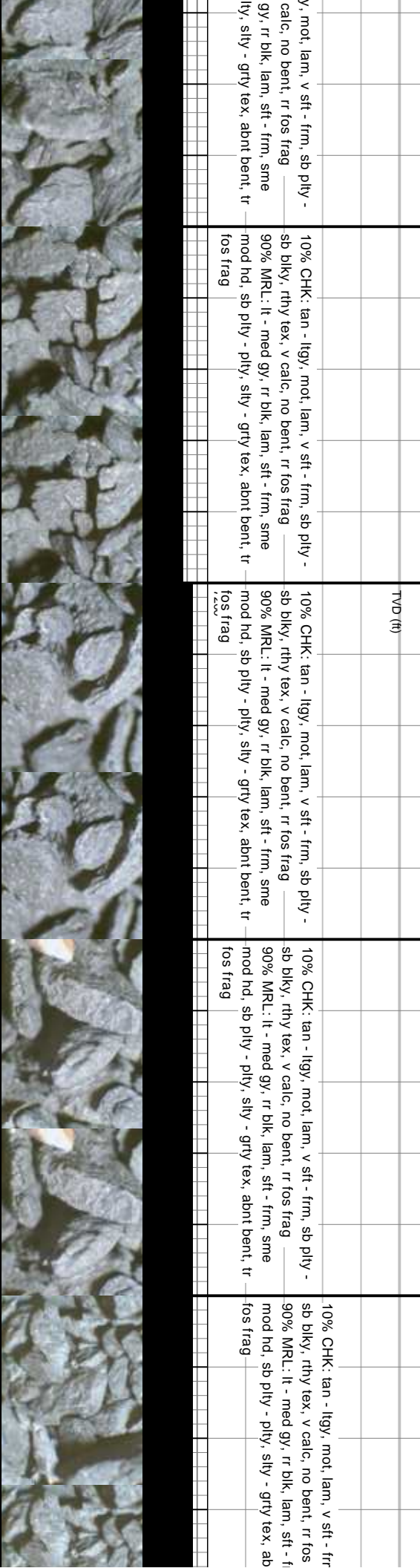
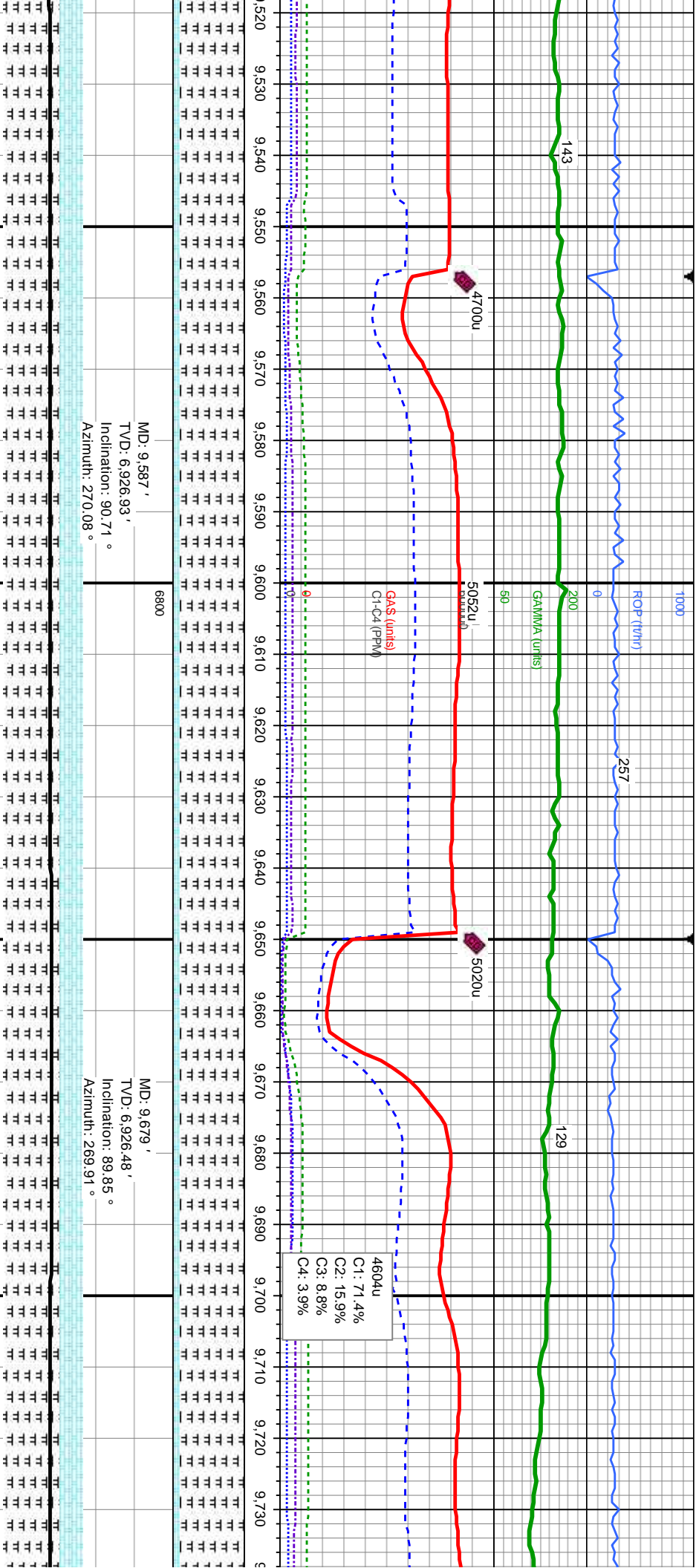
10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blkly, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, sily - grty tex, abnt bent, tr
fos frag

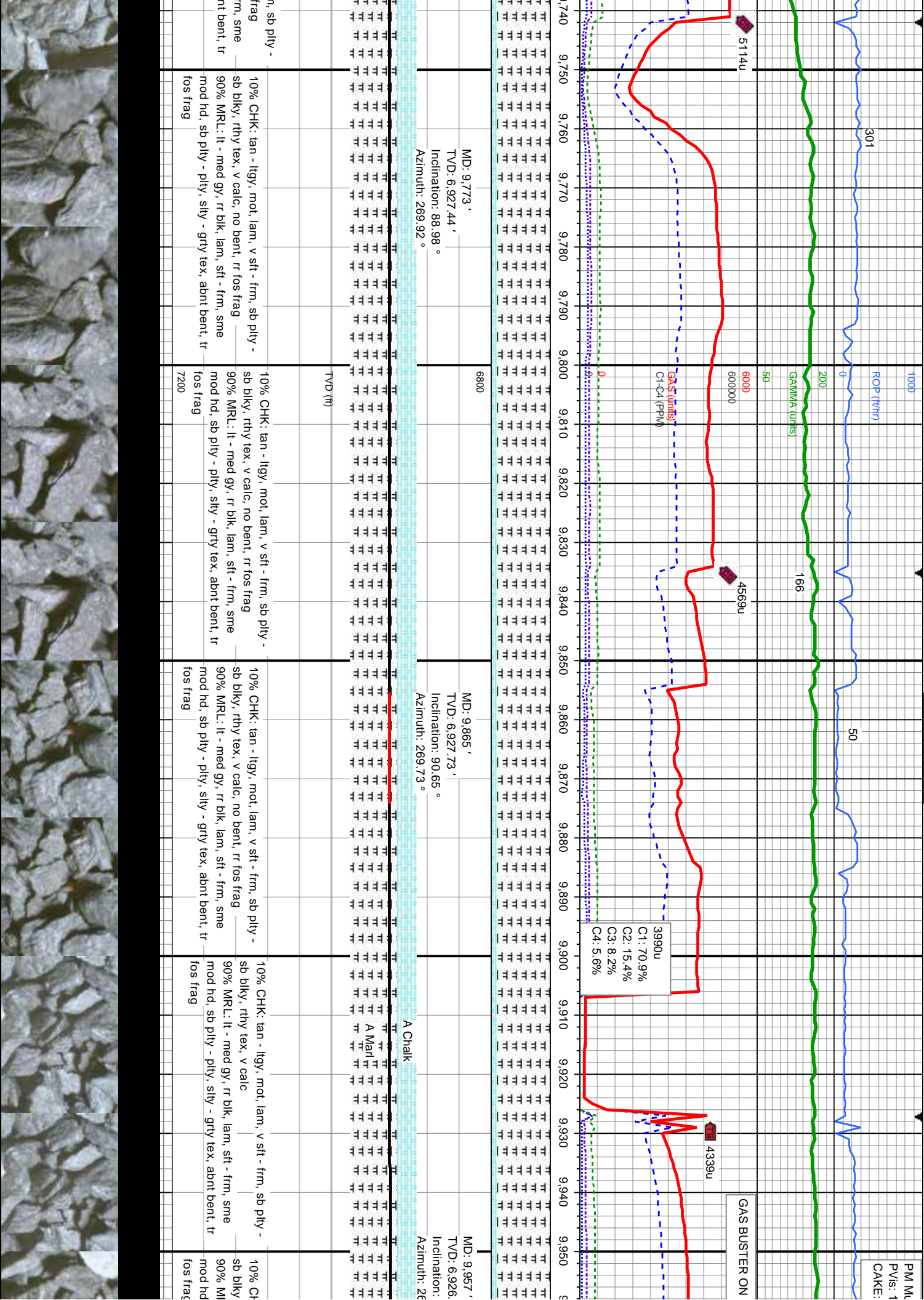
10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blkly, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, sily - grty tex, abnt bent, tr
fos frag

10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blkly, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, sily - grty tex, abnt bent, tr
fos frag

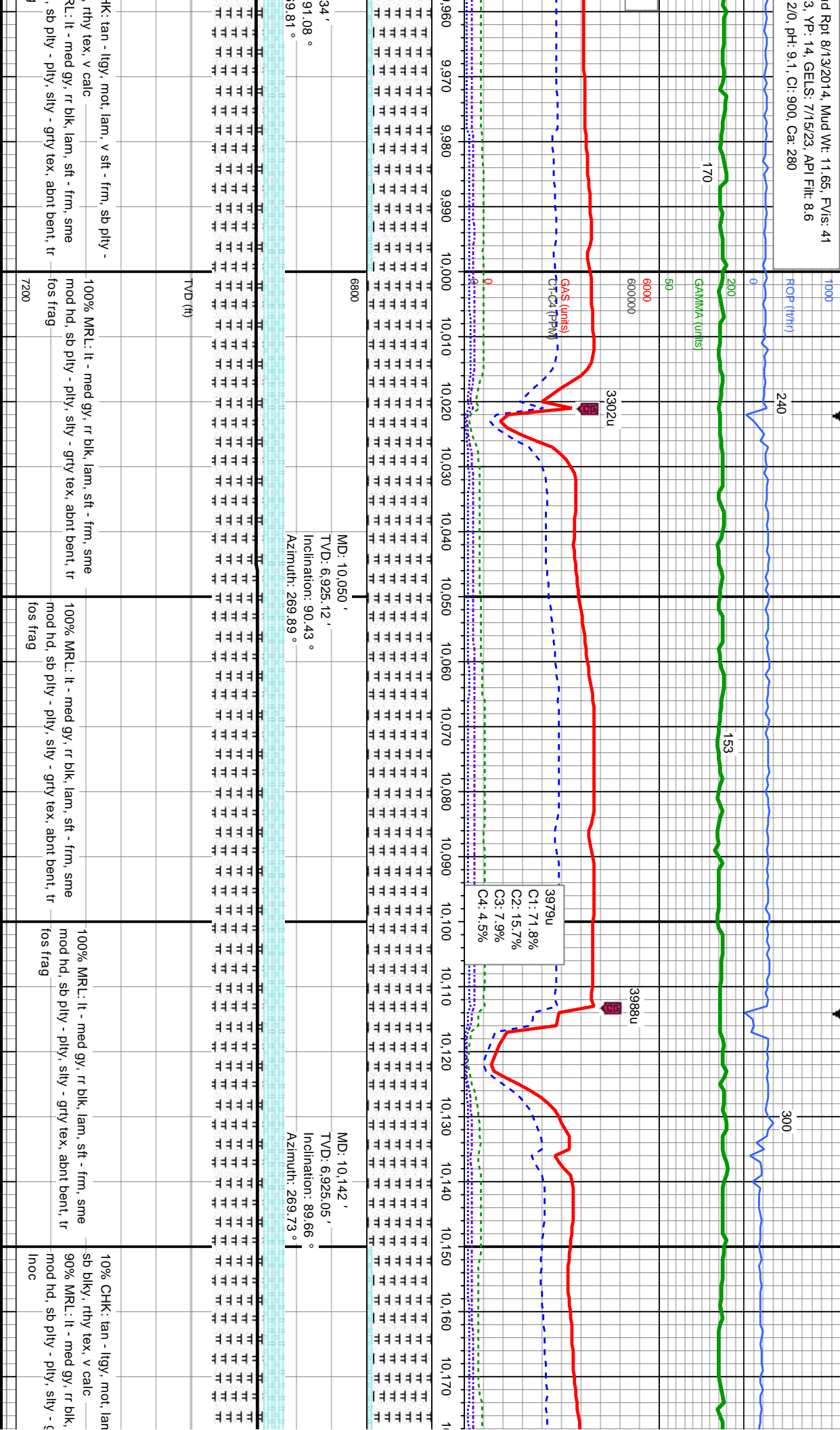
10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply -
sb blkly, rthy tex, v calc, no bent, rr fos frag
90% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, sily - grty tex, abnt bent, tr
fos frag







id Rpt: 8/13/2014, Mud Wt: 11.65, FV/s: 41
3. YP: 14, GELS: 7/15/23, API Filtr: 8.6
2/0, pH: 9.1, Cl: 900, Ca: 280



1000 8/13/2014
8/14/2014

ROP (ft/hr)

MINDEPTH

22

200

153

169

317

50

6000

600000

4025u

3953u

3718u

4217u

3542u

GAS (units)

C4 C4 (PPM)

3440u
C1: 71.1%
C2: 13.9%
C3: 9.1%
C4: 5.9%

0

6800

MD: 10,235 '
TVD: 6,924.24 '
Inclination: 91.33 °
Azimuth: 269.85 °

MD: 10,327 '
TVD: 6,922.01 '
Inclination: 91.45 °
Azimuth: 269.71 °

TVD (ft)

1, v sft - frm, sb ply -

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, silty - grty tex, abnt bent, tr
fos frag

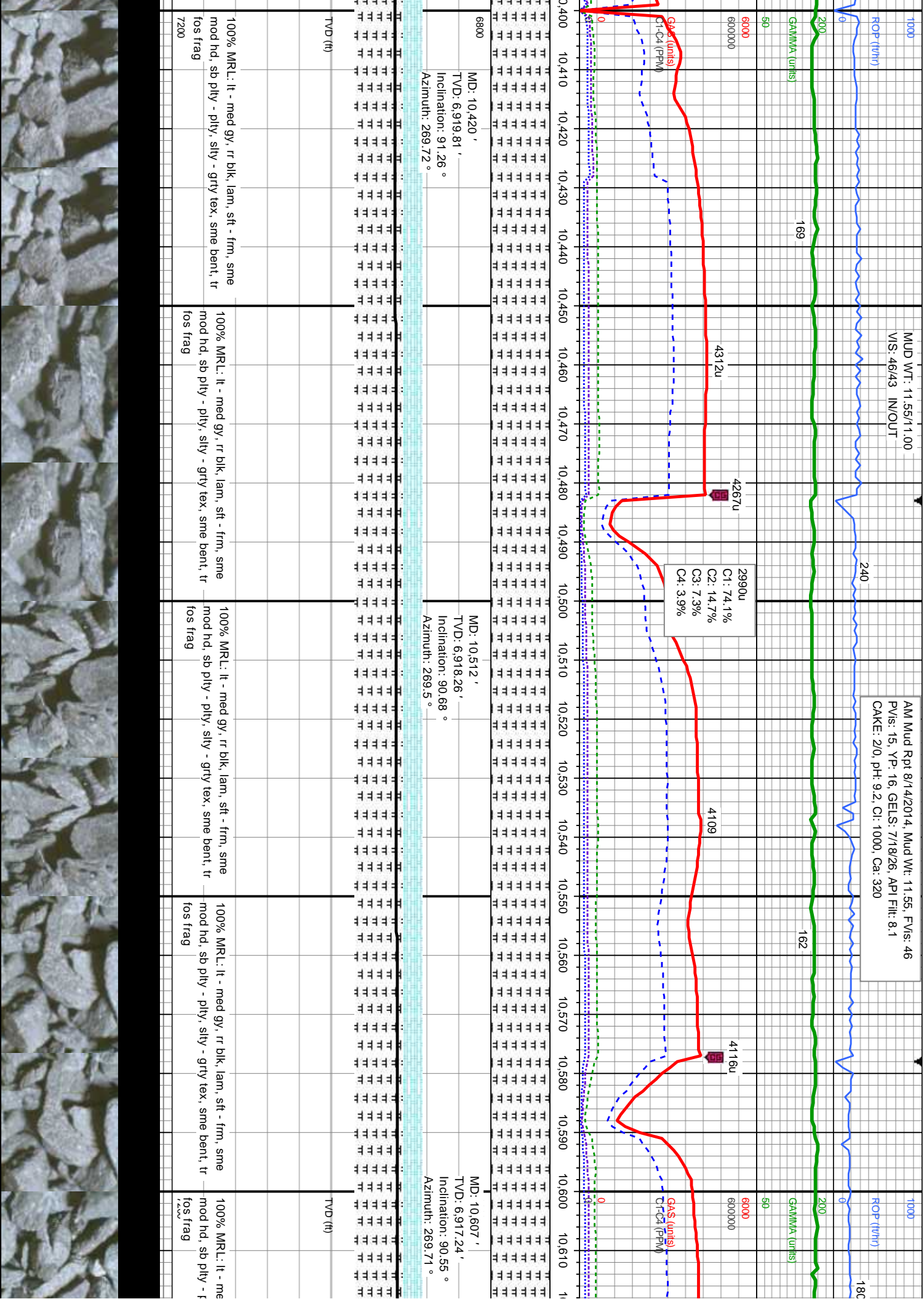
7200

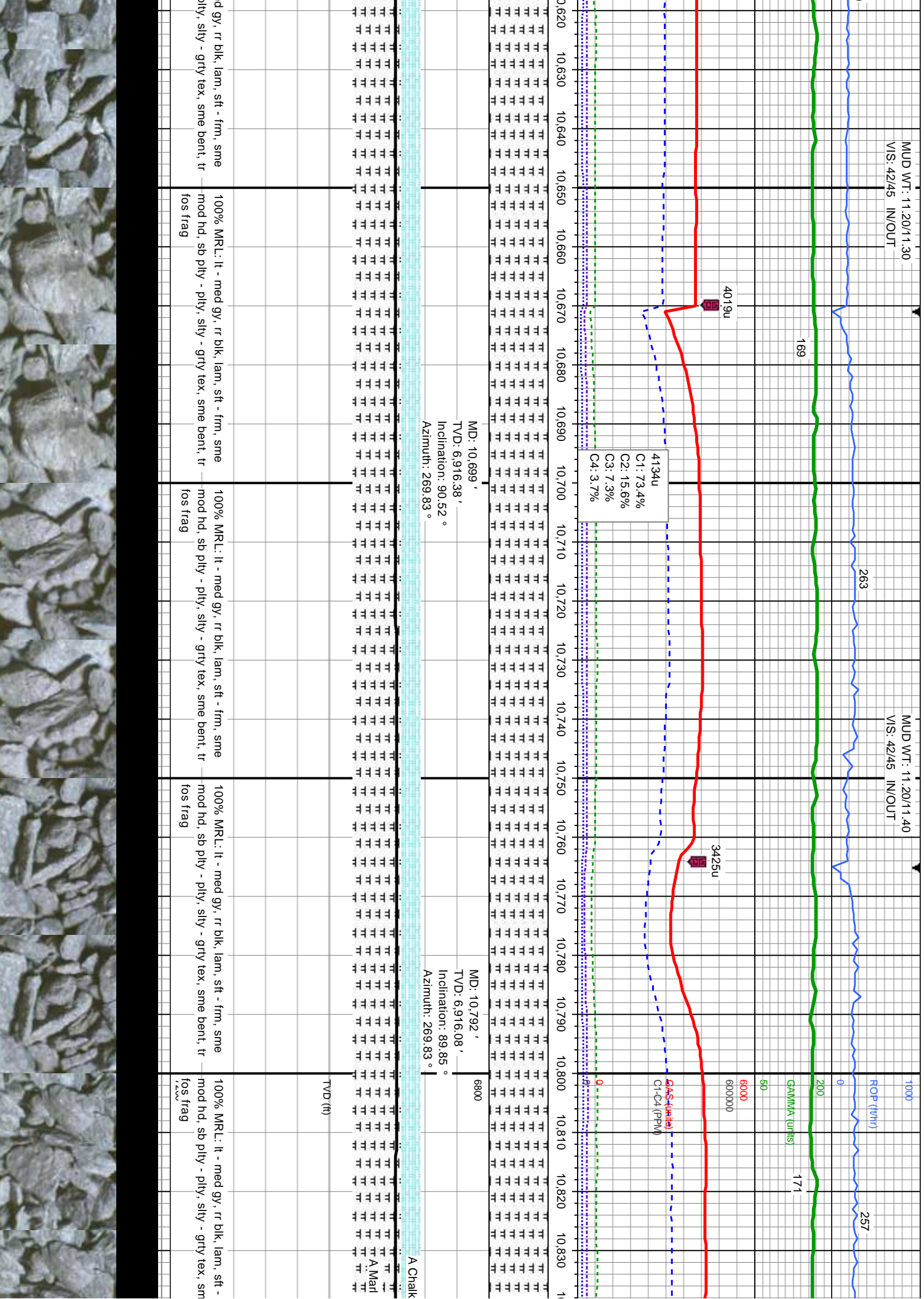
100% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, silty - grty tex, abnt bent, tr
fos frag

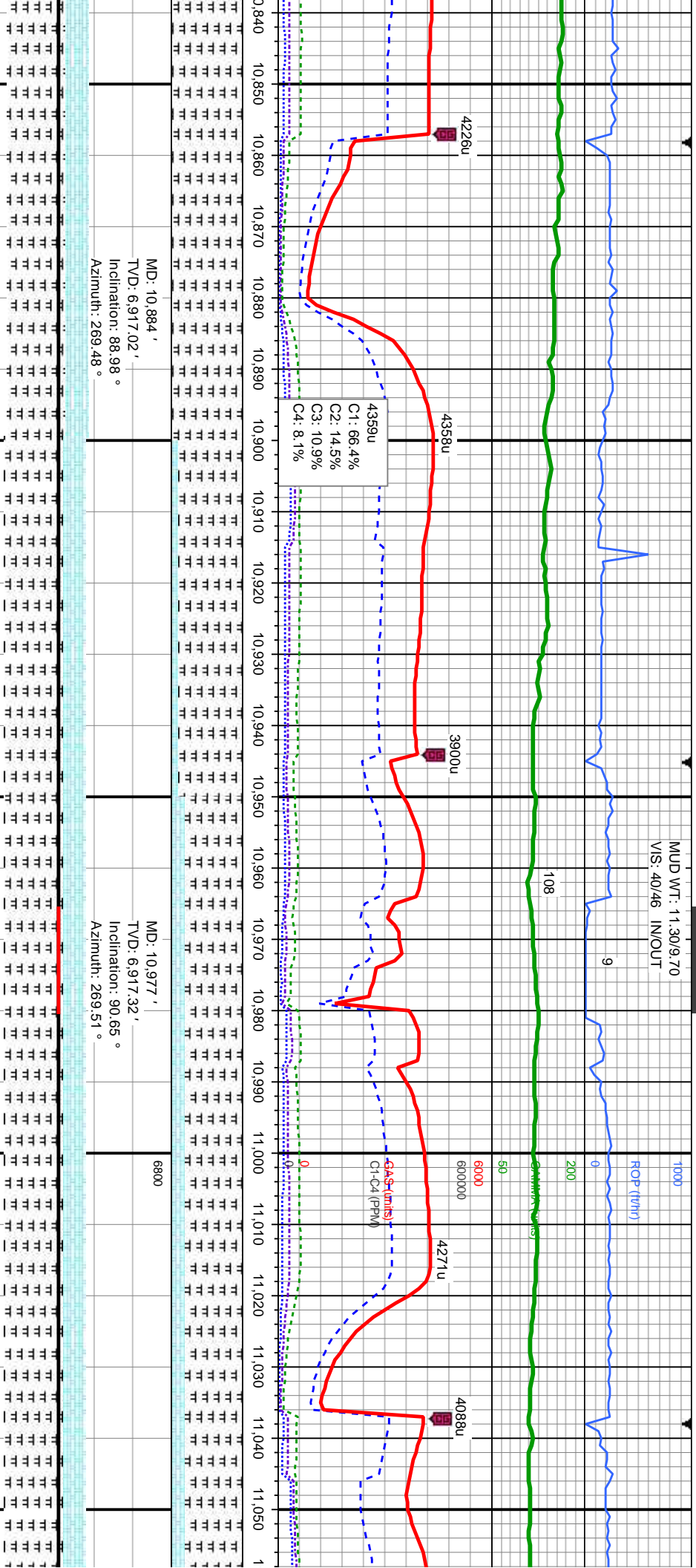
100% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, silty - grty tex, sme bent, tr
fos frag

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb ply - ply, silty - grty tex, sme bent, tr
fos frag









MD: 10,884 '
TVD: 6,917.02 '
Inclination: 88.98 °
Azimuth: 269.48 °

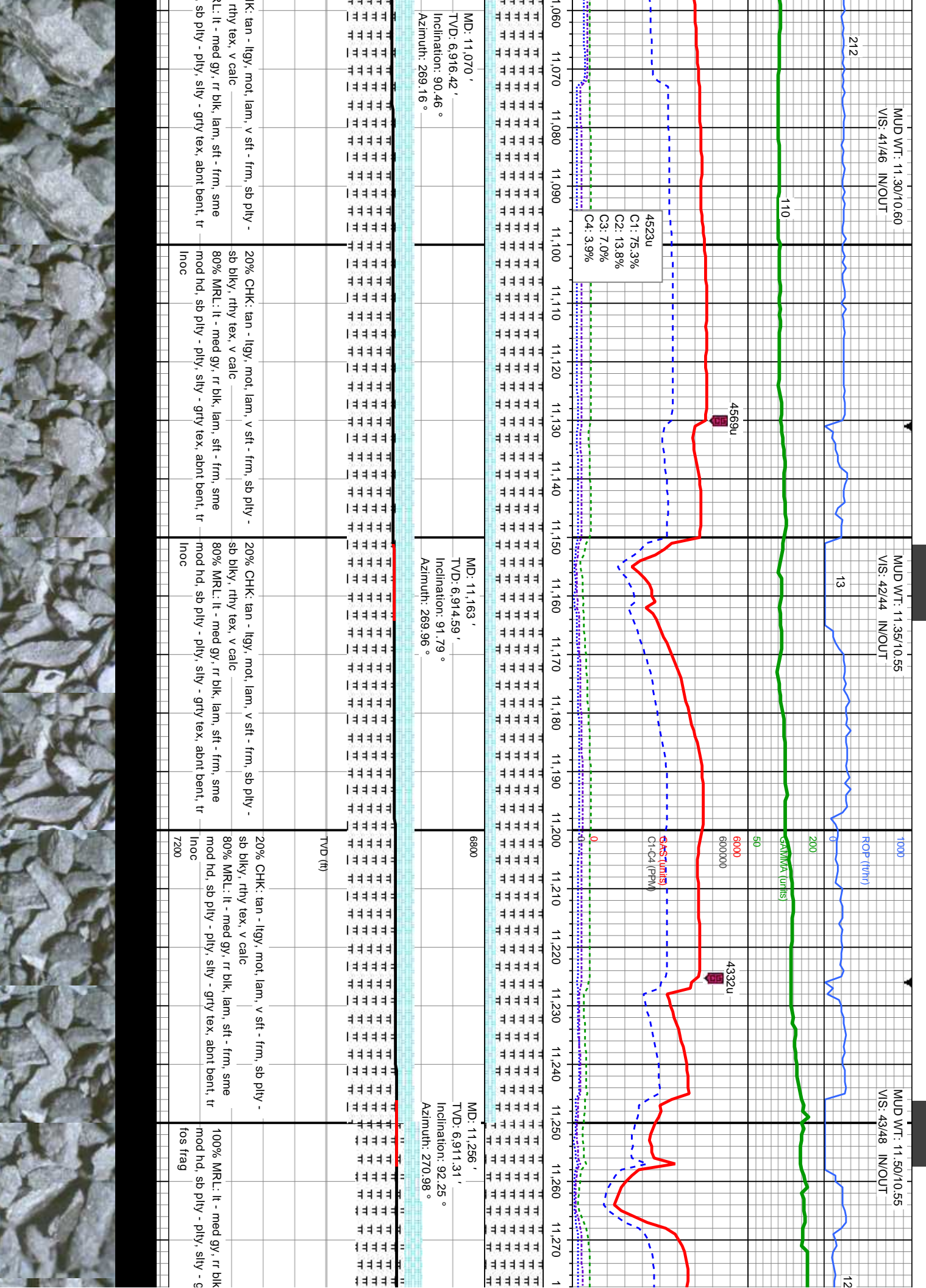
MD: 10,977 '
TVD: 6,917.32 '
Inclination: 90.65 °
Azimuth: 269.51 °

6800

TVD (ft)

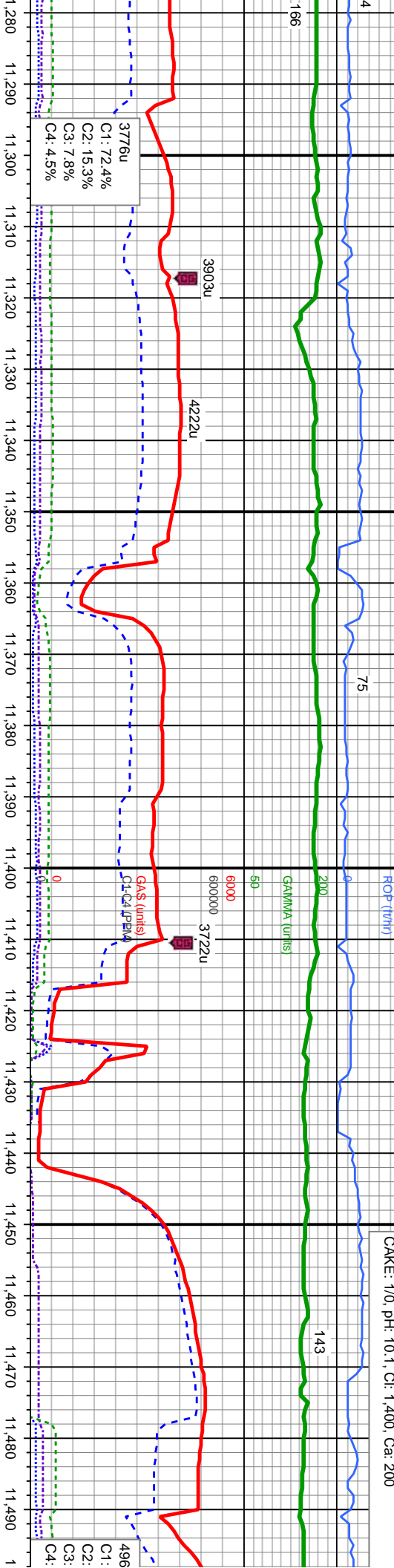
frm, sme e bent, tr	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, sily - grty tex, sme bent, tr fos frag	10% CHK: tan - llyg, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, sily - grty tex, abnt bent, tr Inoc	20% CHK: tan - llyg, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, sily - grty tex, abnt bent, tr Inoc	20% CHK: tan - llyg, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb ply - ply, sily - grty tex, abnt bent, tr Inoc	20% Ch sb blk, 80% Mf mod hd Inoc
------------------------	---	---	---	---	---





MUD WT: 11.50/10.75
VIS: 44/48 IN/OUT

PM Mud Rpt 8/14/2014, Mud Wt: 11.55, FVis: 43
PVs: 17, YP: 18, GELS: 10/24/33, API Filtr: 7.8
CAKE: 1/0, pH: 10.1, Cl: 1,400, Ca: 200

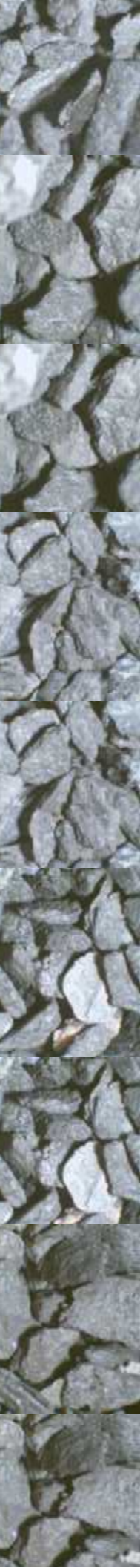


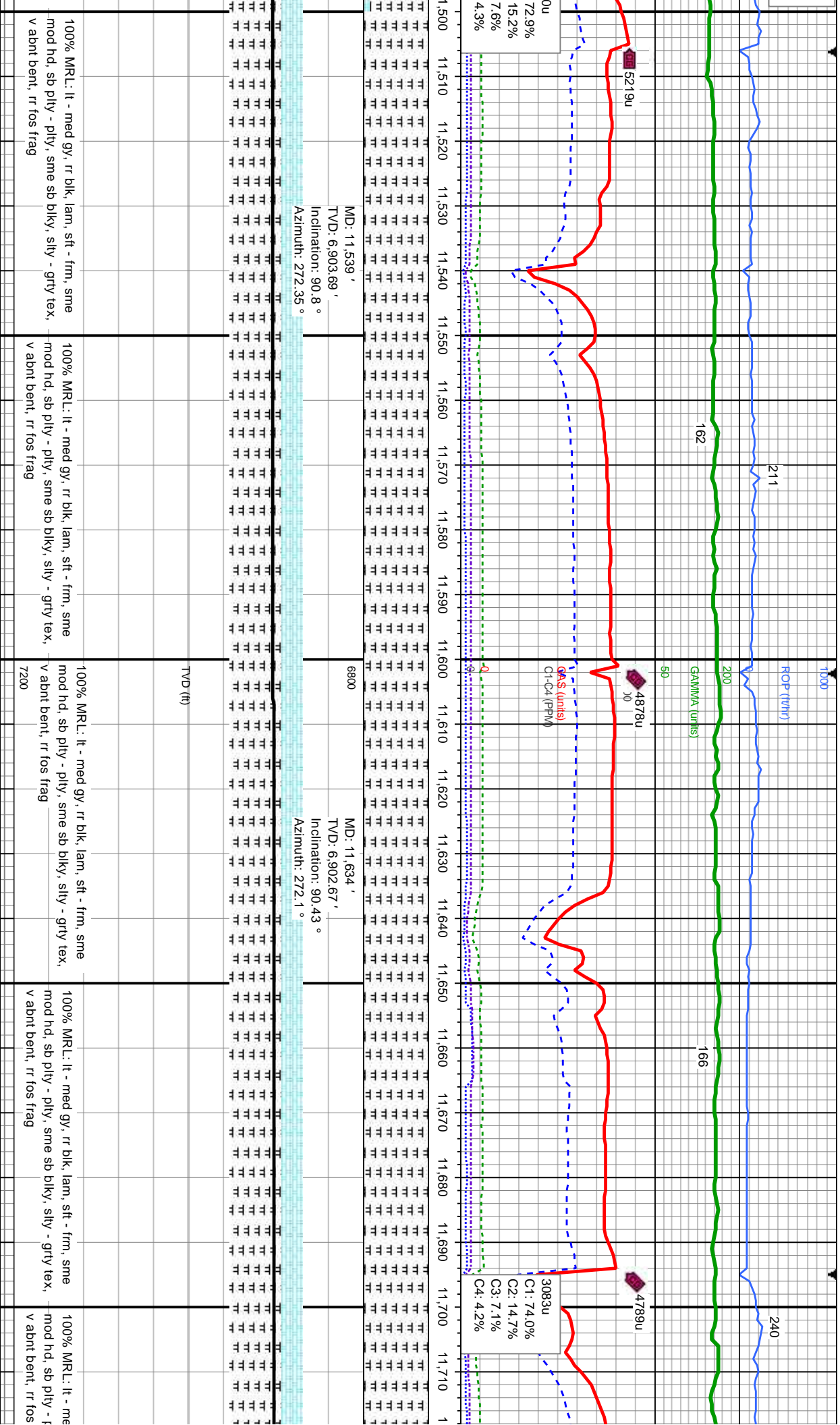
MD: 11,349 '
TVD: 6,907.81 '
Inclination: 92.07 °
Azimuth: 271.95 °

MD: 11,444 '
TVD: 6,905.22 '
Inclination: 91.05 °
Azimuth: 272.57 °

TVD (ft)

lam, sft - frm, sme	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme	100% CHK: tan - lly, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	10% CHK: tan - lly, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
mod hd, sb bent, tr	mod hd, sb ply - ply, silty - grty tex, sme bent, tr	mod hd, sb bent, tr	mod hd, sb ply - ply, sme sb blk, silty - grty tex, abnt bent, tr
fos frag	fos frag	7200	abnt bent, tr fos frag





8/14/2014
8/15/2014

MUD WT: 11.20/
VIS: 45/41 INC

95

175

200
GAMMA (units)

50

4648u

5114u

235
4947u

31

157

600000
600000
C1-C4 (PPM)

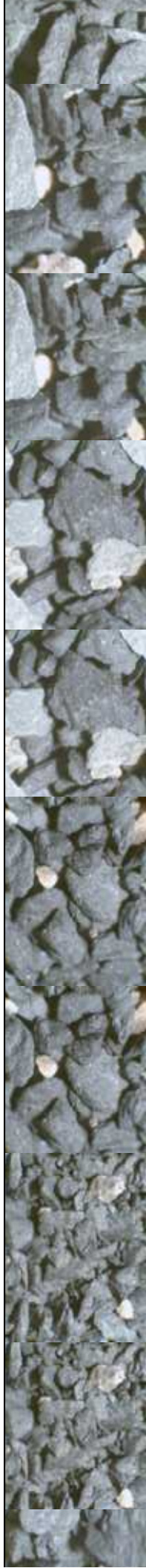
3777u
C1: 75.4%
C2: 14.6%
C3: 6.8%
C4: 3.3%

MD: 12,013 '
TVD: 6,905.27 '
Inclination: 88.83 °
Azimuth: 270.63 °

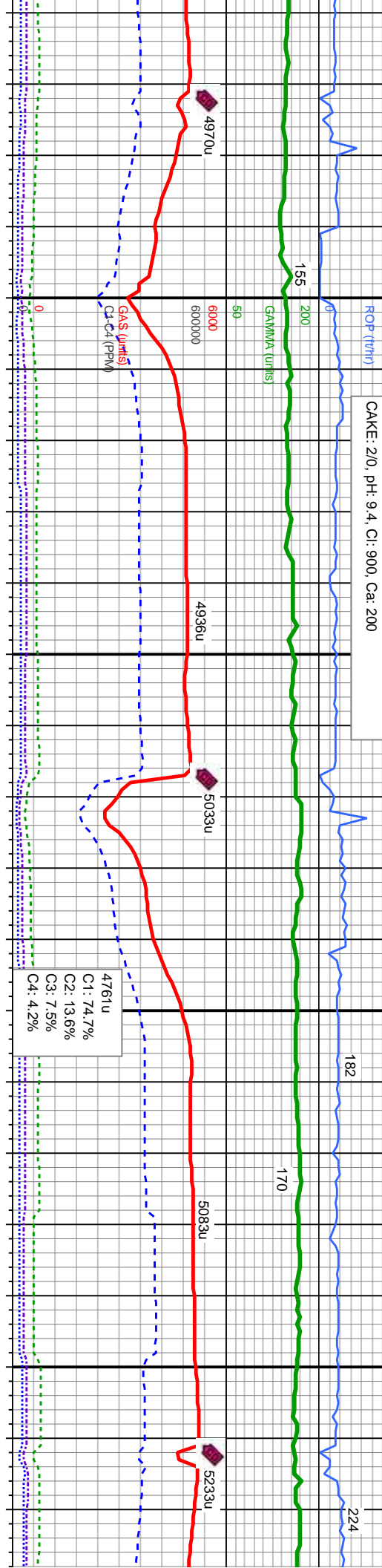
MD: 12,108 '
TVD: 6,907.03 '
Inclination: 89.04 °
Azimuth: 270.17 °

TVD (ft)

frm, sme - grty tex.	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blkly, silty - grty tex, v abnt bent, rr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blkly, silty - grty tex, v abnt bent, rr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blkly, silty - grty tex, v abnt bent, rr fos frag	100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blkly, silty - grty tex, v abnt bent, rr fos frag
-------------------------	---	---	---	---



10.80
UT
AM Mud Rpt 8/15/2014, Mud Wt: 11.10, FV/s: 44
PV/s: 14, YP: 16, GELS: 10/16/26, API Filtr: 7.9
CAKE: 2/0, pH: 9.4, Cl: 900, Ca: 200
MUD WT: 11.10/10.60
V/S: 43/40 IN/OUT



MD: 12,203'
TVD: 6,907.12'
Inclination: 90.86°
Azimuth: 270.29°

MD: 12,298'
TVD: 6,905.81'
Inclination: 90.71°
Azimuth: 269.96°

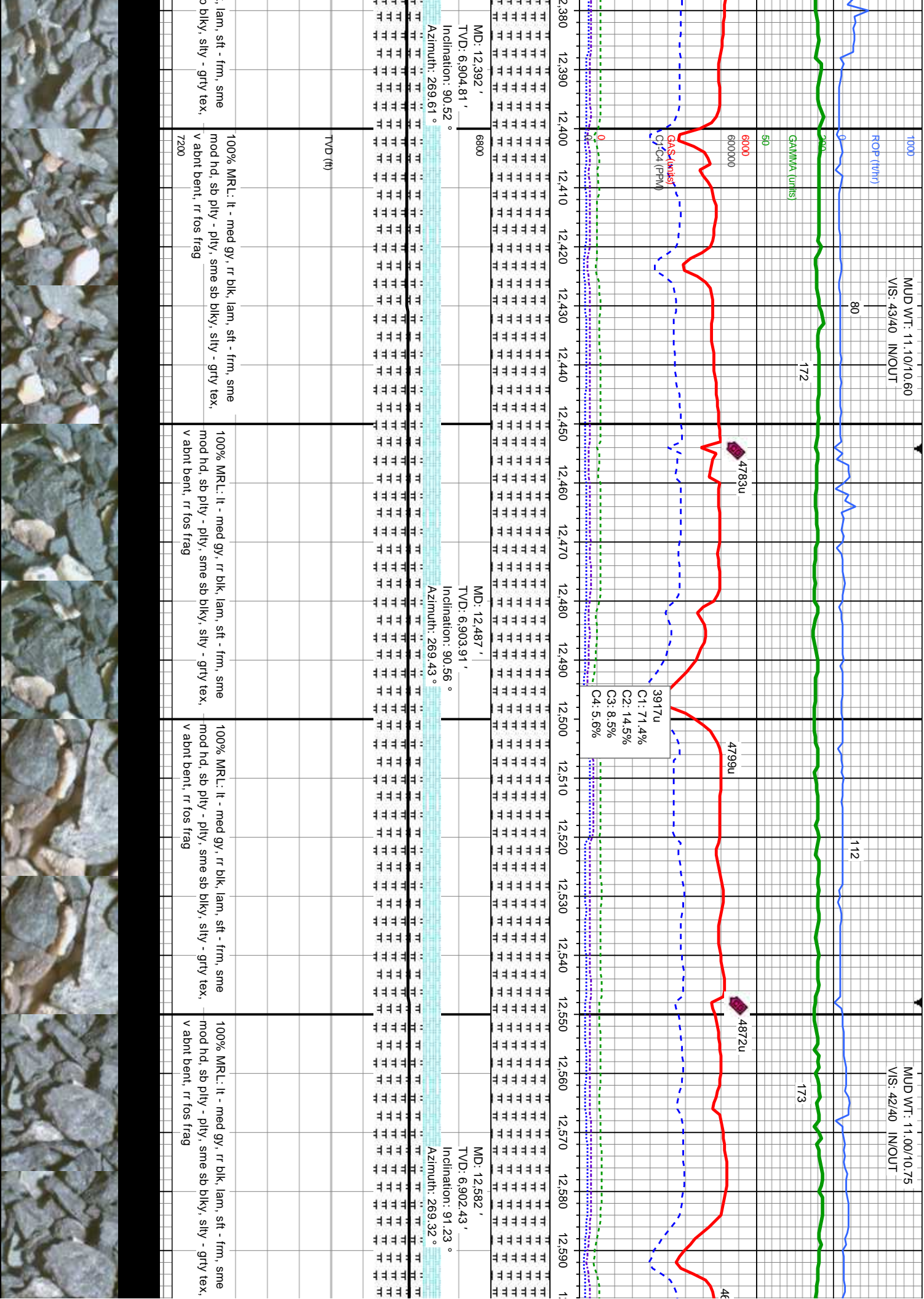
TVD (ft)

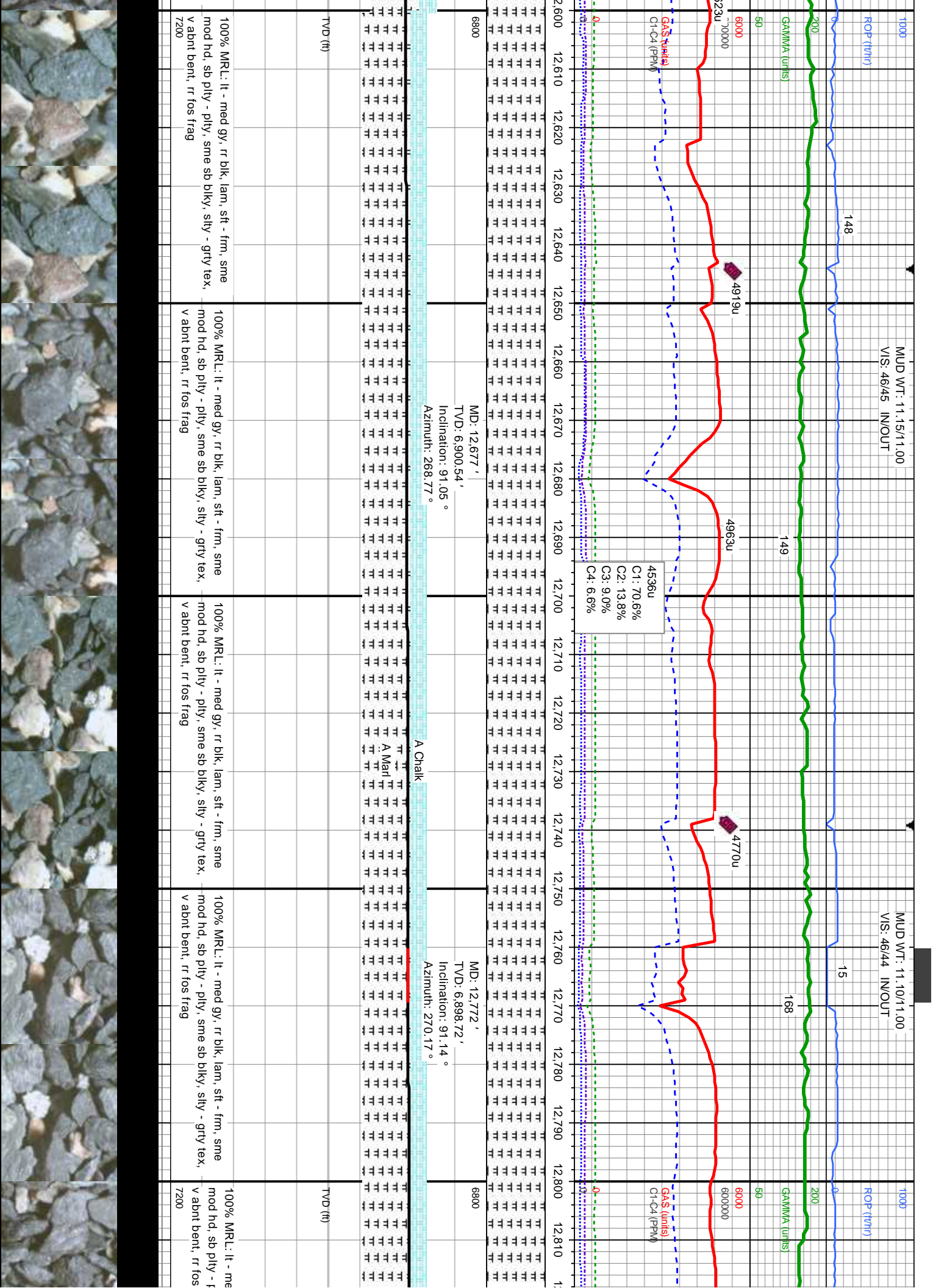
100% MR.L: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb pily - pily, sme sb blkly, silty - gtry tex,
v abnt bent, rr fos frag

100% MR.L: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb pily - pily, sme sb blkly, silty - gtry tex,
v abnt bent, rr fos frag

100% MR.L: lt - med gy, rr blk, lam, sft - frm, sme
mod hd, sb pily - pily, sme sb blkly, silty - gtry tex,
v abnt bent, rr fos frag







MUD WT: 11.15/1.00

V/S: 46/45 IN/OUT

MUD WT: 11.10/1.00

V/S: 46/44 IN/OUT

148

149

15

168

GAS (units)
C1-C4 (PPM)

GAS (units)
C1-C4 (PPM)

C1: 70.6%
C2: 13.8%
C3: 9.0%
C4: 6.6%

MD: 12,677'
TVD: 6,900.54'
Inclination: 91.05°
Azimuth: 268.77°

MD: 12,772'
TVD: 6,898.72'
Inclination: 91.14°
Azimuth: 270.17°

A Chaik

A Marl

TVD (ft)

TVD (ft)

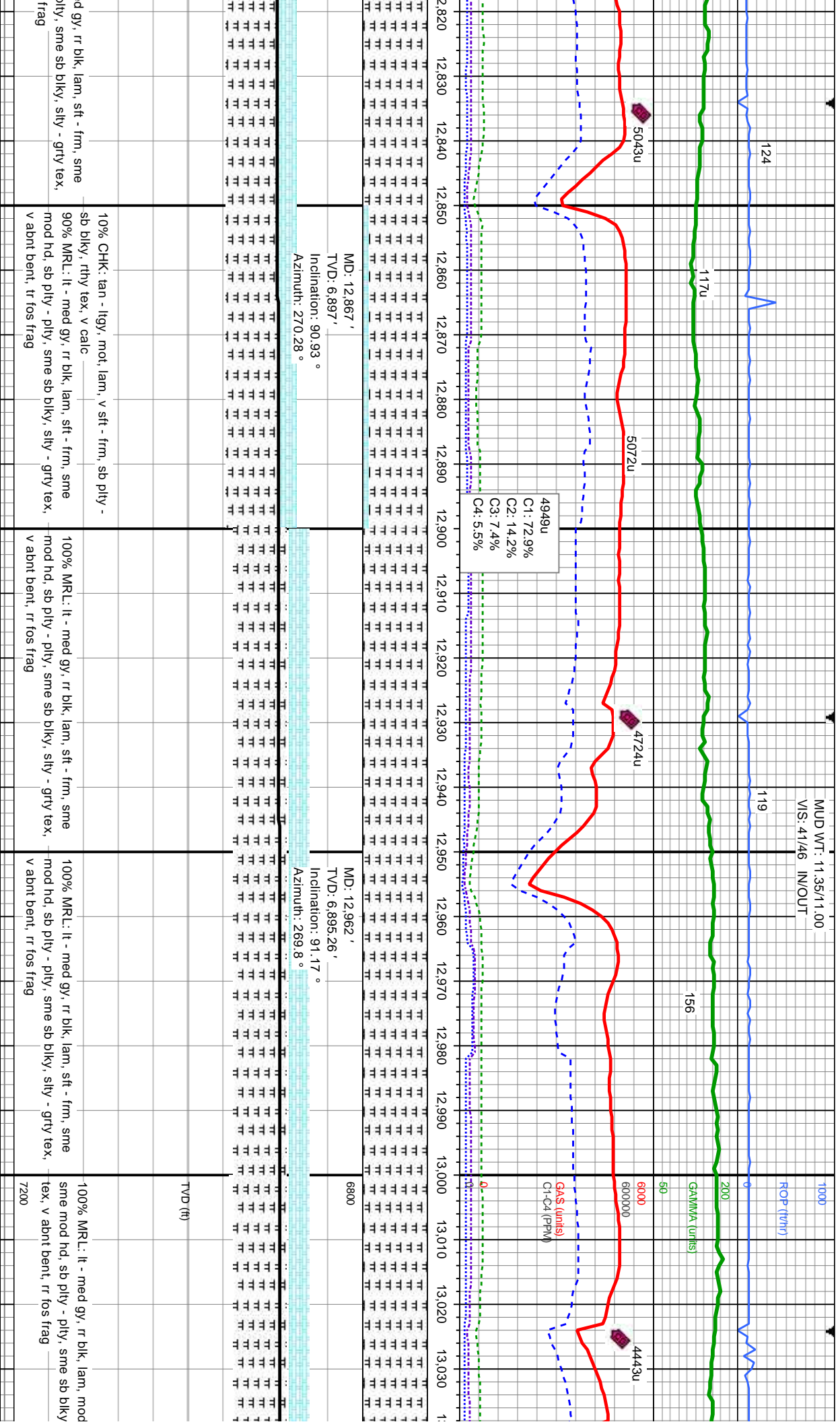
100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blk, sily - grty tex, v abnt bent, rr fos frag

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blk, sily - grty tex, v abnt bent, rr fos frag

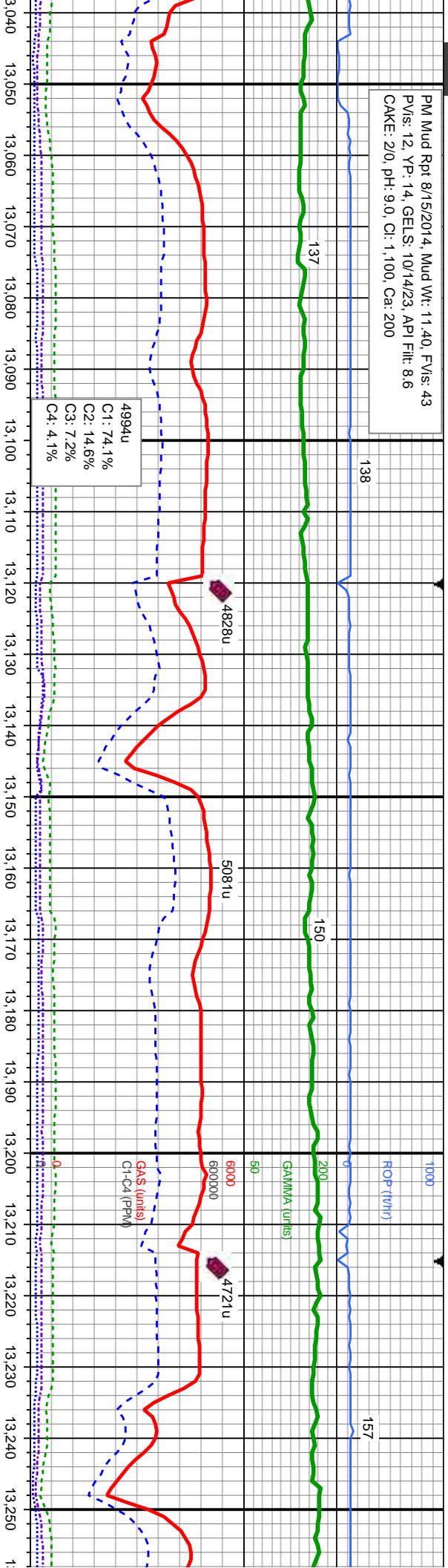
100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blk, sily - grty tex, v abnt bent, rr fos frag

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blk, sily - grty tex, v abnt bent, rr fos frag

100% MRL: lt - med gy, rr blk, lam, sft - frm, sme mod hd, sb pily - pily, sme sb blk, sily - grty tex, v abnt bent, rr fos frag



PM Mud Rpt 8/15/2014, Mud Wt: 11.40, FV/s: 43
PV/s: 12, YP: 14, GELS: 10/14/23, API Filtr: 8.6
CAKE: 2/0, pH: 9.0, Cl: 1,100, Ca: 200



MD: 13,057 '
TVD: 6,894.27 '
Inclination: 90.03 °
Azimuth: 270.39 °

MD: 13,151 '
TVD: 6,894.12 '
Inclination: 90.15 °
Azimuth: 270.58 °

MD: 13,247 '
TVD: 6,893.66 '
Inclination: 90.4 °
Azimuth: 270.38 °

sft - frm,
silty - grty
100% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb pily - pily, sme sb blk, silty - grty
tex, v abnt bent, rr fos frag

100% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb pily - pily, sme sb blk, silty - grty
tex, v abnt bent, rr fos frag

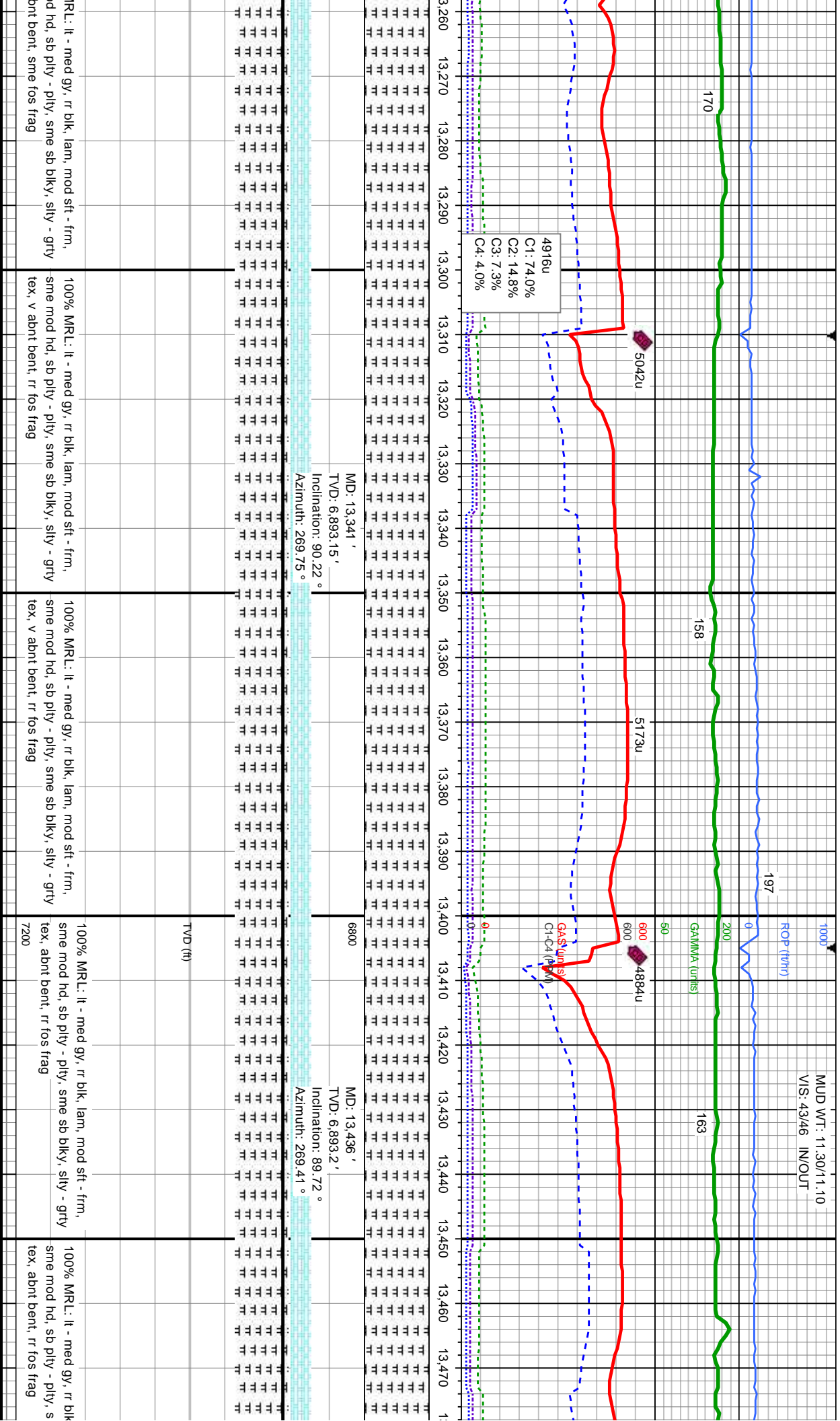
100% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb pily - pily, sme sb blk, silty - grty
tex, v abnt bent, rr fos frag

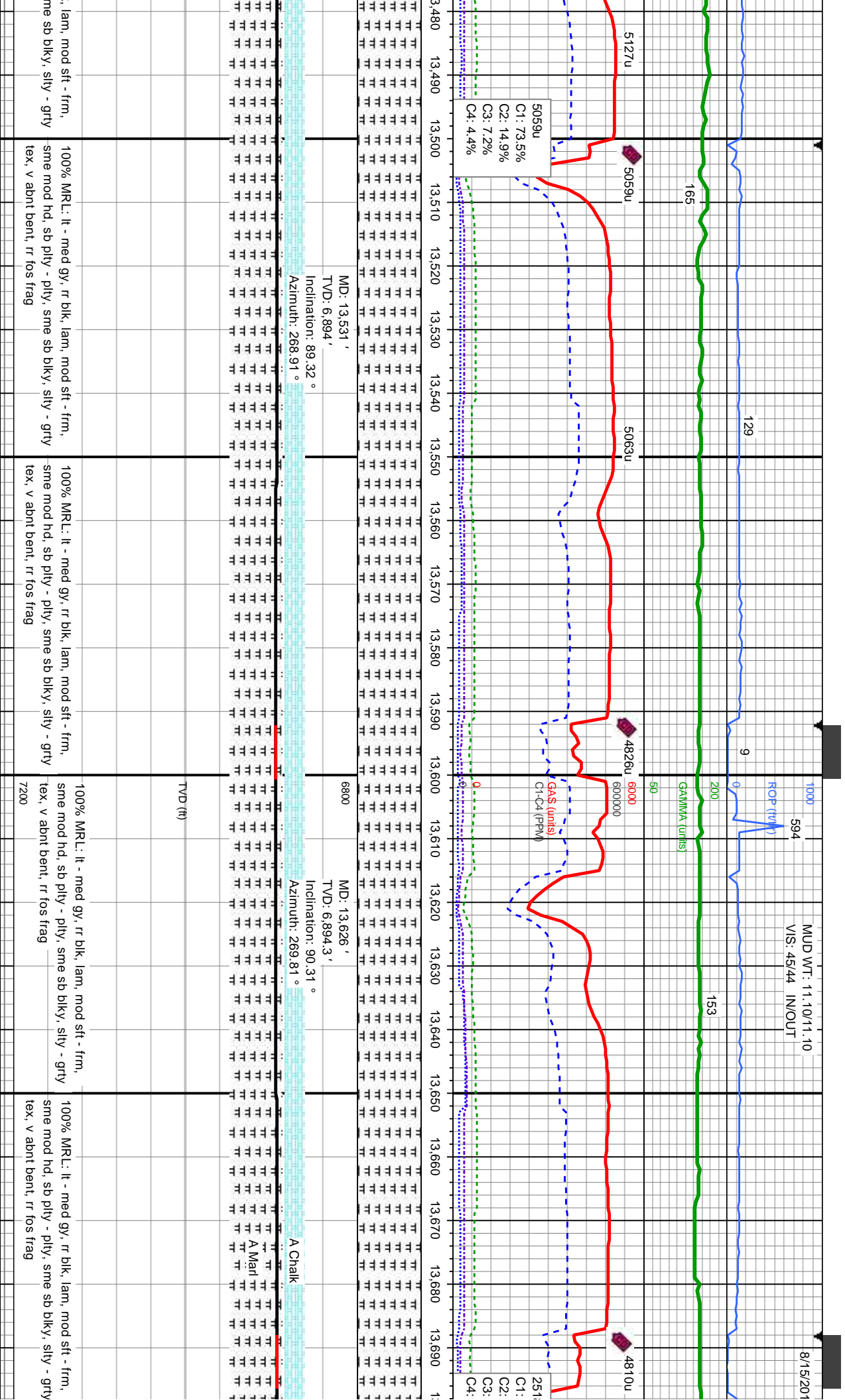
100% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb pily - pily, sme sb blk, silty - grty
tex, v abnt bent, sme fos frag

100% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb pily - pily, sme sb blk, silty - grty
tex, v a

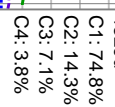
TVD (ft)







MUD WT: 11.0
VIS: 45/43 IN.



↓

6800

Azimuth: 271.47°

TV D (ft)

100% MBI : It - med av rr blk lam mod sft - frm

some mod hd, sb plty - plty, sme sb blkly, slty - grtly, v abnt bent, rr fos frag

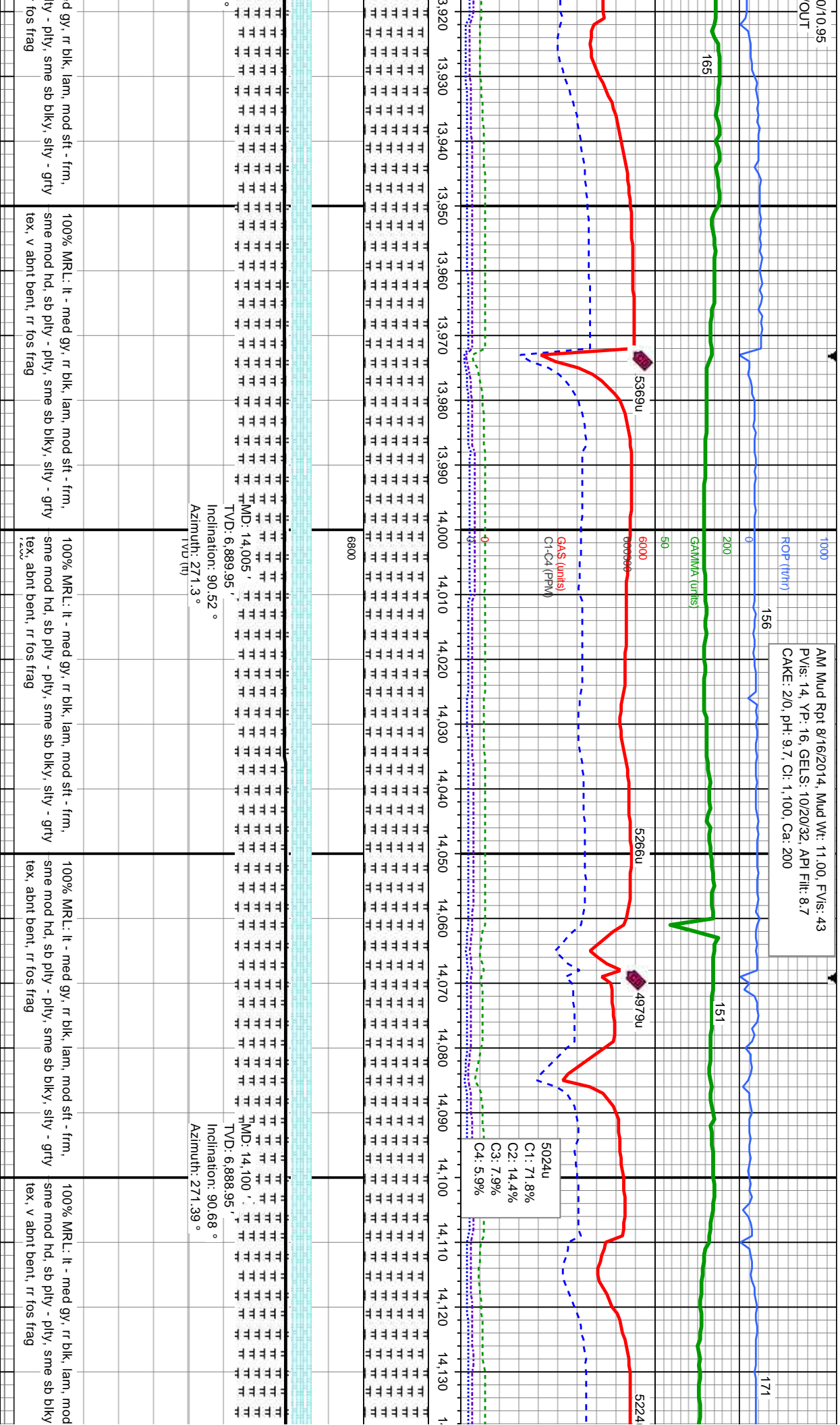
100% MRL: It - me
sme mod hd, sb p
tex, v abnt bent, r

100% MRL: It - me
sme mod hd, sb p
tex, v abnt bent, r



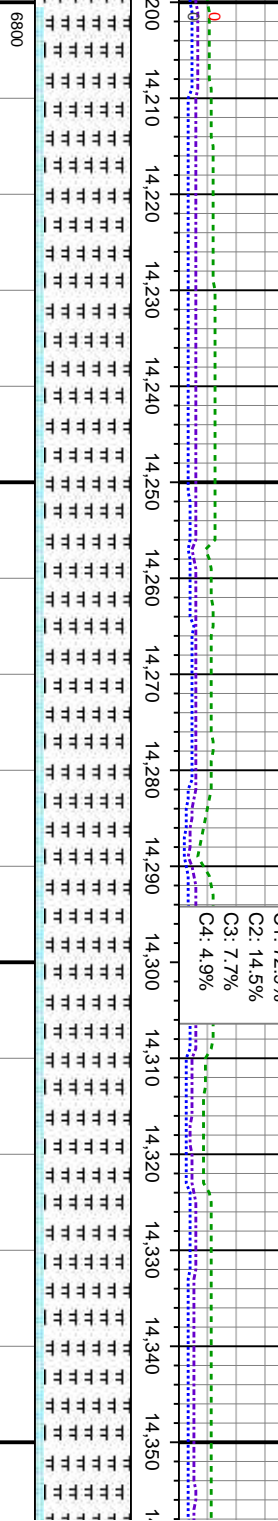
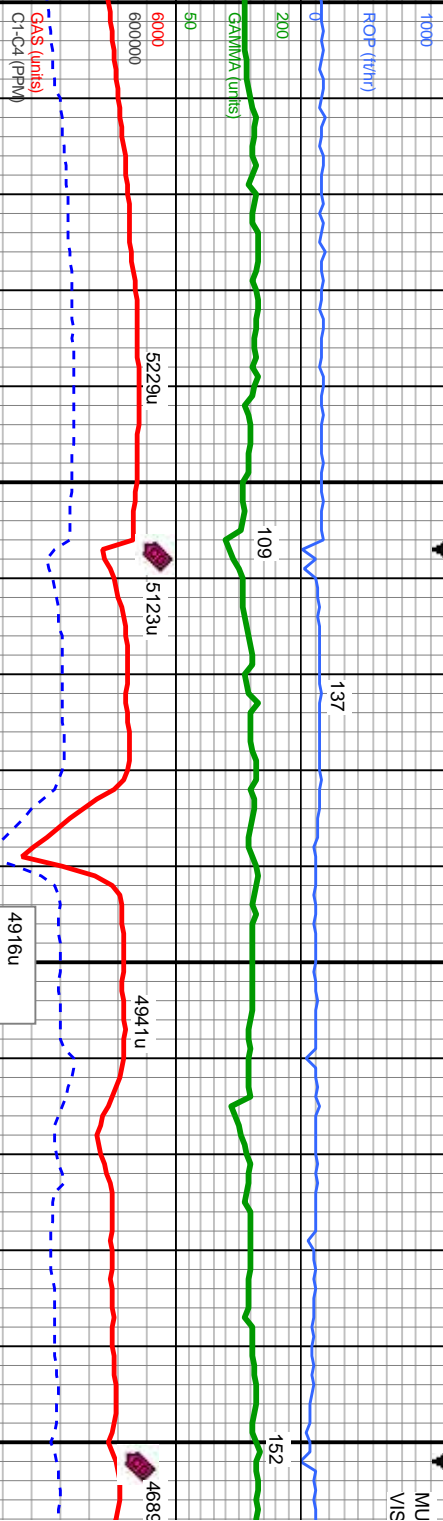
0/10.95
OUT

AM Mud Rpt 8/16/2014, Mud Wt: 11.00, FV/S: 43
PV/S: 14, YP: 16, GELS: 10/20/32, API Filtr: 8.7
CAKE: 2/0, pH: 9.7, Cl: 1,100, Ca: 200



MUD WT: 11.00/11.00
VIS: 45/43 IN/OUT

MU
VIS



MD: 14,195'
TVD: 6,888.93'
Inclination: 89.35°
Azimuth: 271.77°

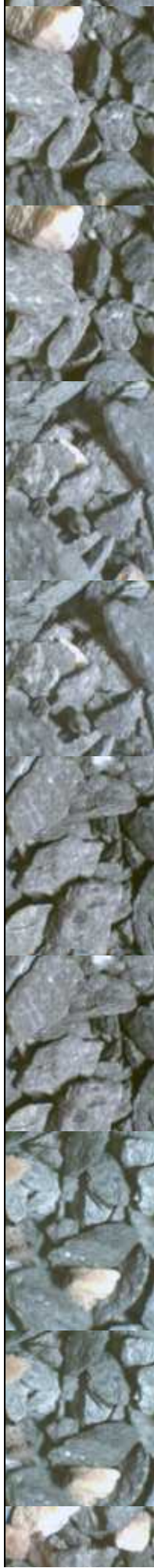
MD: 14,290'
TVD: 6,889.9'
Inclination: 89.48°
Azimuth: 271.55°

TVD (ft)

10% CHK: tan - lly, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sily - grly tex, abnt bent, rr fos frag

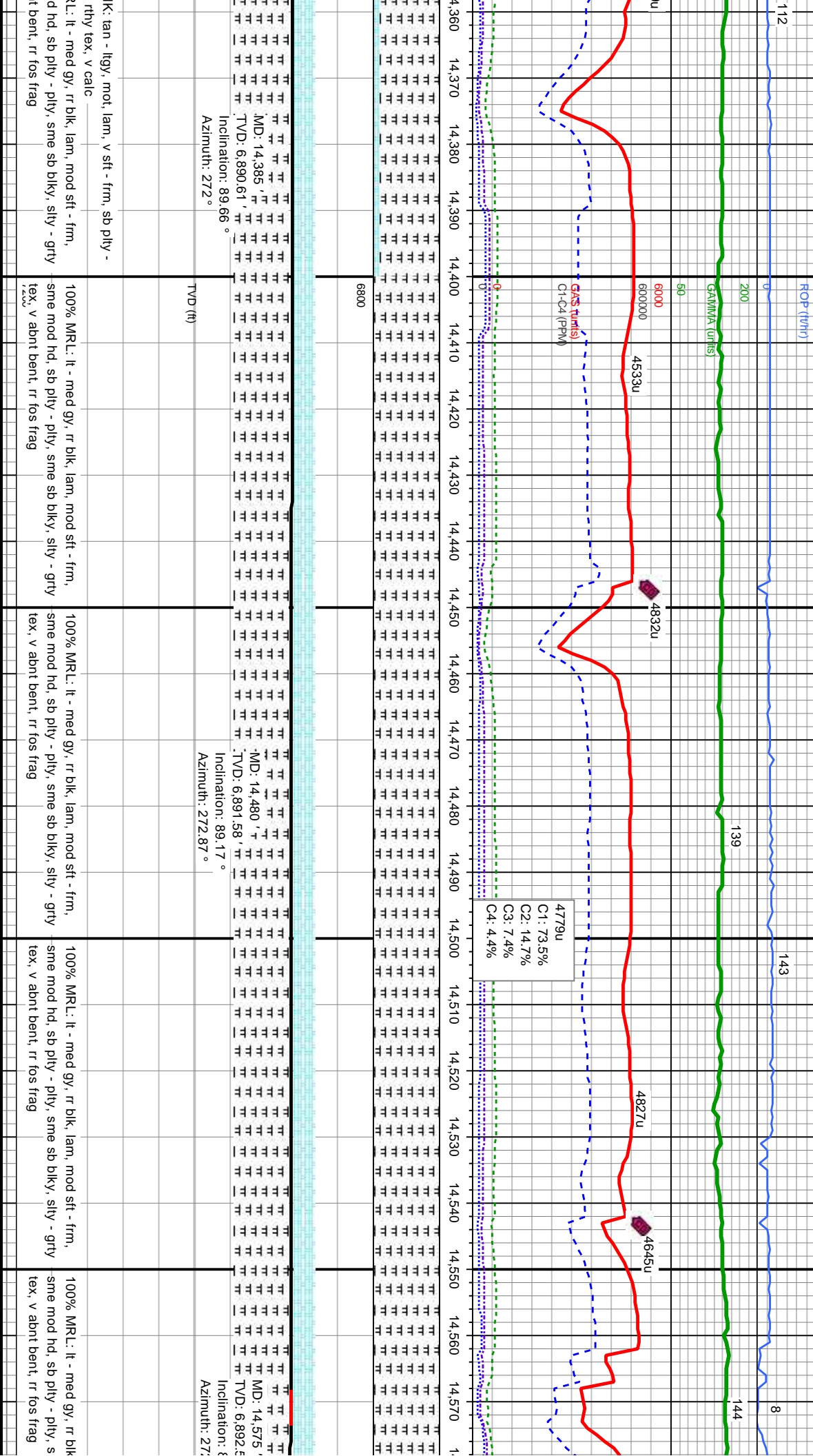
10% CHK: tan - lly, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sily - grly tex, abnt bent, rr fos frag

10% CHK: tan - lly, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sily - grly tex, abnt bent, rr fos frag

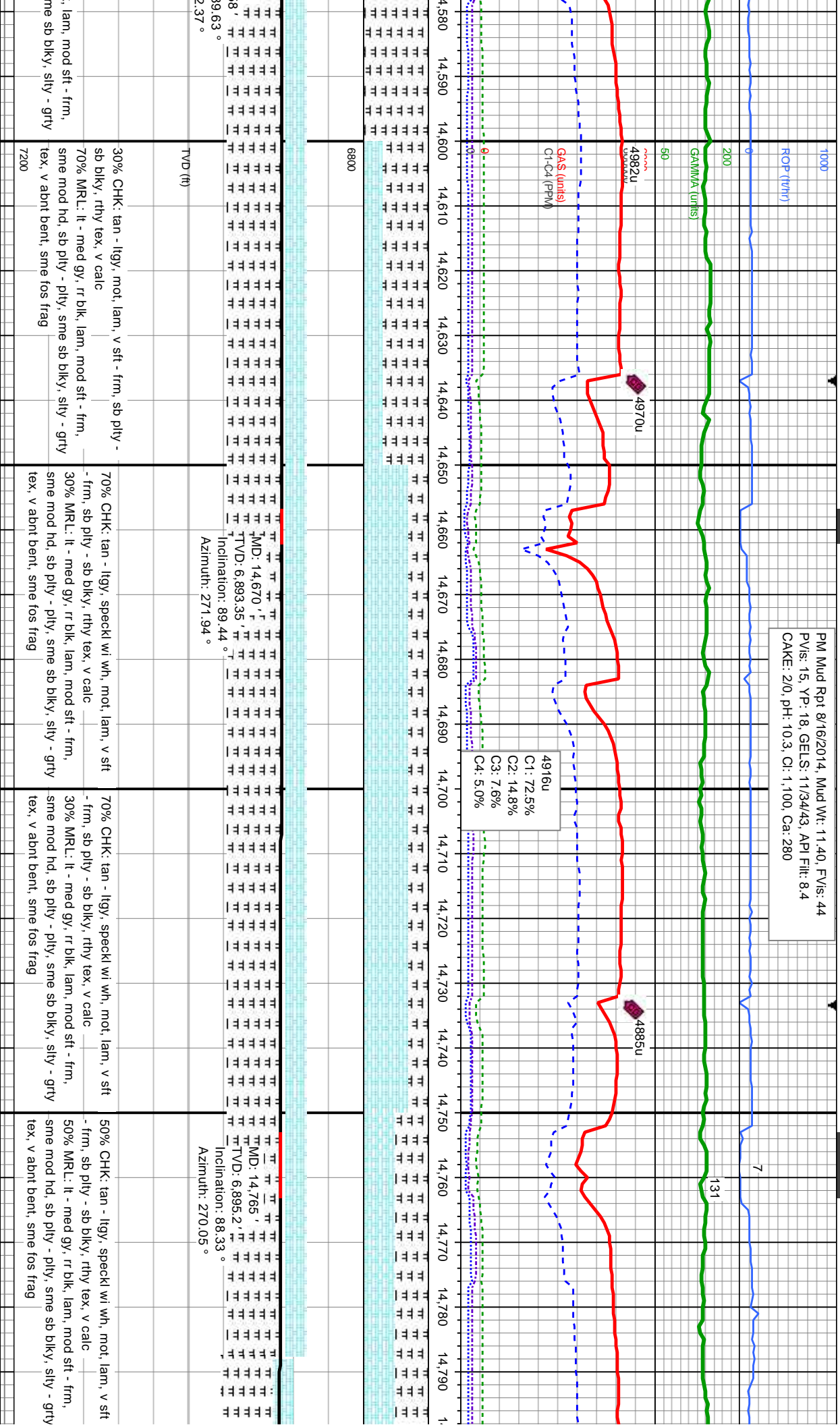


D WT: 11.15/11.00
: 45/43 IN/OUT

MUD WT: 11.10/11.05
VIS: 45/43 IN/OUT

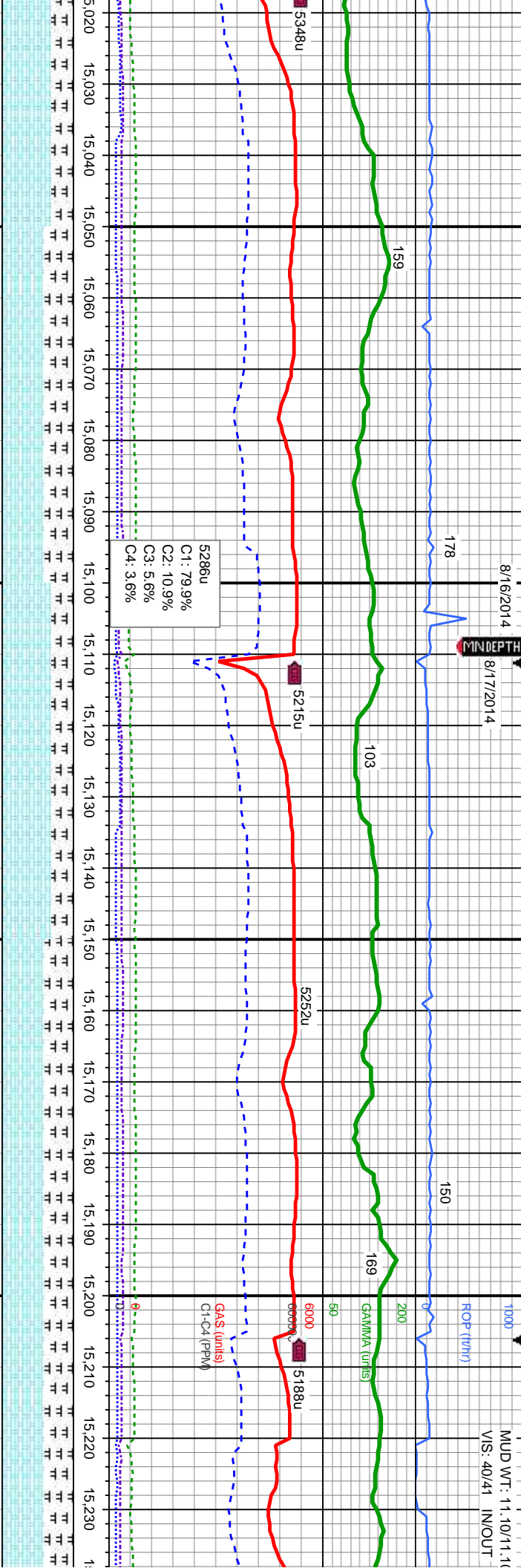


PM Mud Rpt 8/16/2014, Mud Wt: 11.40, FVIs: 44
PVIs: 15, YP: 18, GEELS: 11/34/43, API Filtr: 8.4
CAKE: 2/0, pH: 10.3, CI: 1.100, Ca: 280



8/16/2014
8/17/2014
MWD DEPTH

MUD WT: 11.10/11.11
VIS: 40/41 IN/OUT



15,020	15,030	15,040	15,050	15,060	15,070	15,080	15,090	15,100	15,110	15,120	15,130	15,140	15,150	15,160	15,170	15,180	15,190	15,200	15,210	15,220	15,230
TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
MD: 15,049'	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
TVD: 6,894.27'	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Inclination: 91.02°	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Azimuth: 270.24°	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT

60% CHK: tan - llyg, speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 40% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sly - grly tex, abnt bent, sme tos frag	60% CHK: tan - llyg, speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 30% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sly - grly tex, abnt bent, sme tos frag	60% CHK: tan - llyg, speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 40% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sly - grly tex, abnt bent, sme tos frag	60% CHK: tan - llyg, speckl wi wh, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc 40% MRL: lt - med gy, rr blk, lam, mod sft - frm, sme mod hd, sb ply - ply, sme sb blk, sly - grly tex, abnt bent, sme tos frag
---	---	---	---



AM Mud Rpt 8/17/2014, Mud Wt: 11.00, FV/s: 40
PV/s: 13, YP: 16, GEELS: 8/16/25, API Fil: 8.8
CAKE: 2/0, pH: 9.8, Cl: 1,200, Ca: 160

MUD WT
V/S: 37/4

5324u
C1: 73.4%
C2: 14.4%
C3: 7.4%
C4: 4.9%

GAS (units)
C1-C4 (PPM)

MD: 15,333 '
TVD: 6,888.91 '
Inclination: 89.91 °
Azimuth: 269.39 °

MD: 15,428 '
TVD: 6,889.32 '
Inclination: 89.6 °
Azimuth: 269.72 °

lam, v sft
70% CHK: tan - llyg, speckl wi wh, mot, lam, v sft
- frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb ply - ply, sme sb blk, sily - grly
tex, abnt bent, sme tos frag

70% CHK: tan - llyg, speckl wi wh, mot, lam, v sft
- frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb ply - ply, sme sb blk, sily - grly
tex, abnt bent, sme tos frag

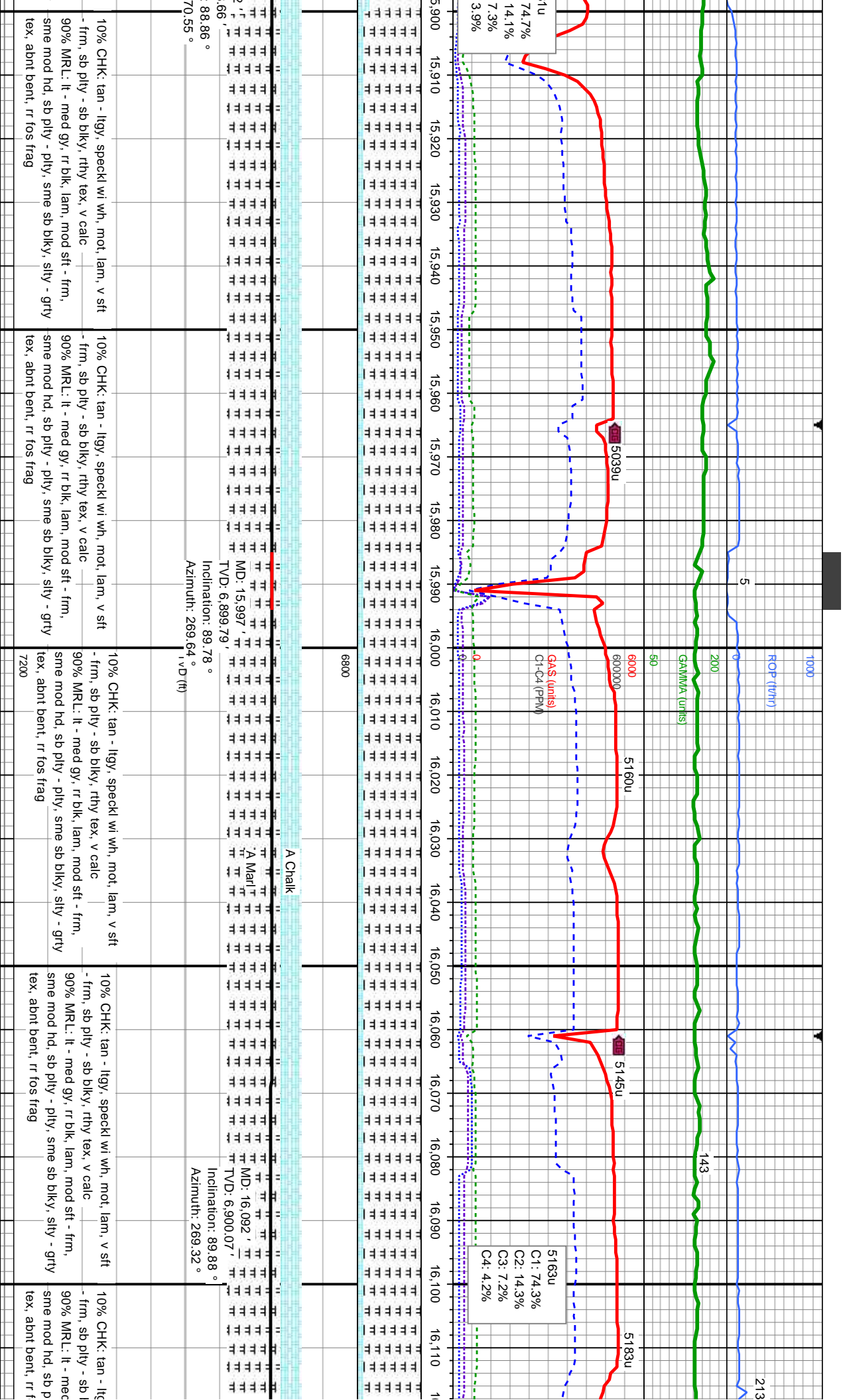
70% CHK: tan - llyg, speckl wi wh, mot, lam, v sft
- frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb ply - ply, sme sb blk, sily - grly
tex, abnt bent, sme tos frag

70% CHK: tan - llyg, speckl wi wh, mot, lam, v sft
- frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, lam, mod sft - frm,
sme mod hd, sb ply - ply, sme sb blk, sily - grly
tex, abnt bent, sme tos frag

60% Ch
- frm, st
40% MRL
sme mnc
tex, abnt



MUD WT: 11.00/10.70
VIS: 45/47 IN/OUT



A blank grid for drawing a diagram, consisting of 10 columns and 10 rows of squares.

[illegible]