



Scale: 5" / 100'
Measured Depth Log

Well Name Five Rivers K07-65-1HN HORZ

Location SEC 8 T4N R66W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-39478

AFE # 200350

Region DJ BASIN

Field WATTENBERG

Spud Date 8/30/2014

Drilling Completed 9/11/2014

Surface Coordinates NESE SEC 8 T4N R66W

2,189' FSL; 58' FEL

LAT/LON: 40.32493/-104.79277

Bottom Hole Coordinates

SEC 7 T4N R66W
2,310' FSL; 535' FWL

Ground Elevation 4,700'

K.B. Elevation 4,724'

Logged Interval 6,467' To 16,510'

Total Depth 16,510'

Formation NIOBRARA C CHALK

Type of Drilling Fluid LSND

Operator

Company Noble Energy Inc

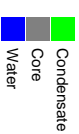
Address 1625 BROADWAY SUITE 2200
DENVER, CO 80202

Geologist

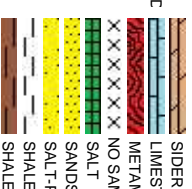
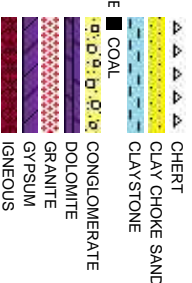
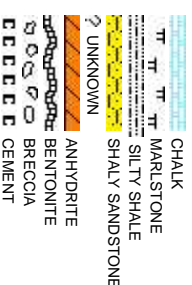
Name NATHAN MURPHY; ZACH UBER

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 PLANT REMAINS
CORAL	COAL - THIN BEDS
CRINOID	DOLOMITIC
ECHINOID	FELDSPAR
FISH	FERRUGINOUS PELLET
FORAMINIFERA	FERRUGINOUS
ANHYDRITIC	HEAVY MINERAL
F	INOCERAMUS
F	KAOLIN
F	MARLSTONE
F	MINERAL CRYSTALS
F	NODULES
F	PHOSPHATE PELLETS
F	PYRITE
F	SALT CAST
F	SANDY
F	SILTY
F	SILTY
F	SILTY
F	SILTY
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F	SILTY
F	SILTY
F	SILTY






Other Symbols

Oil Show

- ☐ ORGANIC
- ☐ PINPOINT
- ☒ VULGY

Engine















Engineering

 CORE - RECOVERED
 DST INTERVAL
 FAULT
 FORMATION TOP
 GAS SHOW














Rounding

E EARTHY
F FINELY XLN
G GRAINSTONE
L LITHOGRAPHIC
M MICROXLN

Porosity

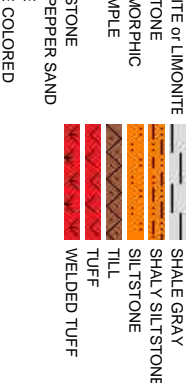
	CONNECTION (DOWN)		CONNECTION (DOWN)
	CONNECTION (LEFT)		CONNECTION (LEFT)
	CONNECTION (RIGHT)		CONNECTION (RIGHT)
	CONNECTION GAS		CONNECTION GAS
	CONNECTION GAS UP		CONNECTION GAS UP
	CONNECTION GAS LEFT		CONNECTION GAS LEFT
	CONNECTION GAS DOWN		CONNECTION GAS DOWN

Textures

	NORMAL FAULT		ROUNDED
	OIL SHOW		SUBANG
	OVERTURNED STRATA		SUBRAND
	REVERSE FAULT	<h2>Textures</h2>	
	SIDEWALL CORE (LEFT)		
	SIDEWALL CORE (RIGHT)		
	SLIDE		
	CRAPTOXLIN		CHALKY
	BOUNDSTONE		

Sorting

PS PACKSTONE
WS WACKSTONE
Sorting
M MODERATE
P POOR
W WELL



Slide/Rotate

ROP
ROP (t/hr)
ROP (t/hr)

ROP Data from Iball

MUD WT: 10.00/9.95
VIS: 58/49 IN/OUT

PM Mud Rpt 8/25/2014 - Mud Wt
PVIS: 14, YP: 16, GELS: 5/13/25.4
CAKE: 1/0, pH: 8.8, CI: 800, Ca: 8

Gamma Data from Sperry - Halliburton

GAMMA (units)
GAMMA (units)
GAMMA (units)

Gamma Data from Sperry - Halliburton

49

88

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

GAS (units)
C1-C4 (PPM)
GAS (units)
C1-C4 (PPM)

Gas Data from Iball

C1: 72.2%
C2: 15.4%
C3: 9.0%
C4: 3.5%

2964u

2906u

3125u

2490u

Depth Labels

5,390 6,400 6,410 6,420 6,430 6,440 6,450 6,460 6,470 6,480 6,490 6,500 6,510 6,520 6,530 6,540 6,550 6,560 6,570

% Lith

Columbine Logging began logging with
BloodHound unit 0687 on 8/31/2014

50' Sample Interval @ 6,500 MD

2,73' ±
1: 0.75°
79.16°

Well Bore
TVD

Bit Data
Bit #: 1
Type: Schlumberger / Smith
Model: SD513
Size: 8.75"
Depth In: 621'
Depth Out: 6,950'
Jets: 8x14

MD: 6,531'
TVD: 6,525.67'
Inclination: 3.2°
Azimuth: 283.61°

MD: 6,57
TVD: 6,5
Inclination:
Azimuth:

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

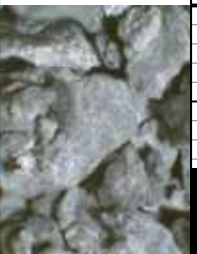
SLTY SH: lt gy - lly brn, frm - mod hd, pred pty -
sb pty, occ sb blkly, silty - grty tex, v sl calc

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

Oil Show

E
G
M
F
T
S

Images



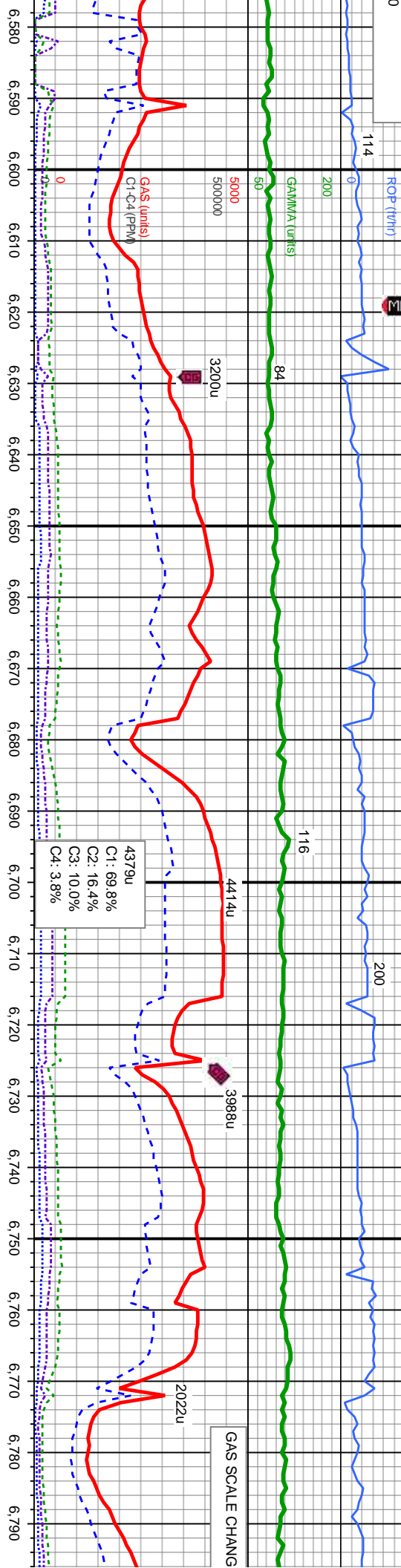
10.20, FV/s: 48
API Filtr: 10.0

800 9/2/2014

9/3/2014

MUD WT: 10.40/10.35
VIS: 43/47 IN/OUT

MUD WT: 10.40/10.45
VIS: 43/47 IN/OUT



6400

TVD SCALE CHANGE

6600

71.51'
MD: 6.625'
TVD: 6.618.94'
Inclination: 11.45°
Azimuth: 270.85°

6400

MD: 6.672'
TVD: 6.664.35'
Inclination: 18.2°
Azimuth: 268.94°

6600

MD: 6.720'
TVD: 6.709.32'
Inclination: 22.65°
Azimuth: 272.47°

MD: 6.768'
TVD: 6.753.07'
Inclination: 25.91°
Azimuth: 273.88°

mod hd, pred pily -
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, tr blk, frm - mod hd,
pred pily - sb pily, occ sb blkly, slty - grty tex, v
sl calc

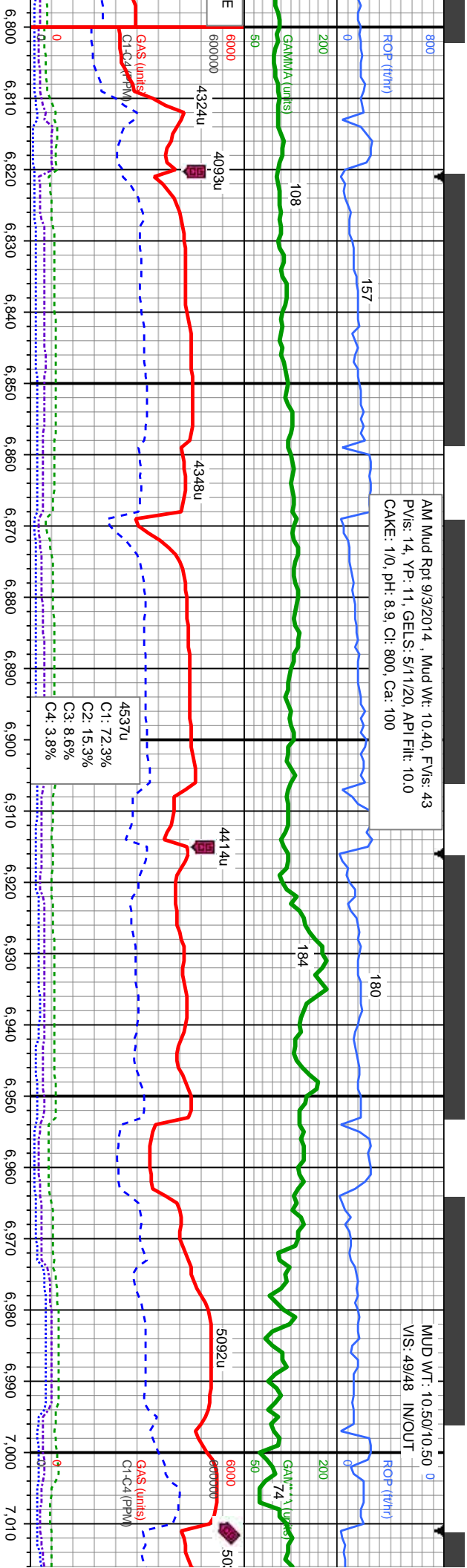
SLTY SH: lt gy - ltgy brn, tr blk, frm - mod
hd, pred pily - sb pily, occ sb blkly, slty -
grty tex, v sl calc

SLTY SH: lt gy - ltgy brn, tr dk gy - blk, frm - mod
hd, pred pily - sb pily, occ sb blkly, slty - grty
tex, sl calc



AM Mud Rpt 9/3/2014 , Mud Wt: 10.40, FVIs: 43
PVIs: 14, YP: 11, GELS: 5/1/20, API Filtr: 10.0
CAKE: 1/0, pH: 8.9, Cl: 800, Ca: 100

MUD WT: 10.50/10.50
V/S: 49/48 IN/OUT



TVD SCALE CHANGE

25' Sample Interval @ 6,900' MD

Sharon Springs Mkr @
6,927' MD: 6,884' TVD

Nio A Chalk Top @
6,971' MD: 6,916' TVD

Nio A Mar
7,011' MD

MD: 6,863'
Inclination: 35.02°
Azimuth: 272.47°

MD: 6,911'
Inclination: 40.48°
Azimuth: 272.51°

MD: 6,958'
Inclination: 45.31°
Azimuth: 271.24°

MD: 7,006'
Inclination: 48.57°
Azimuth: 269.55°

TVD: 6,796.42'
Inclination: 30.21°
Azimuth: 271.88°

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

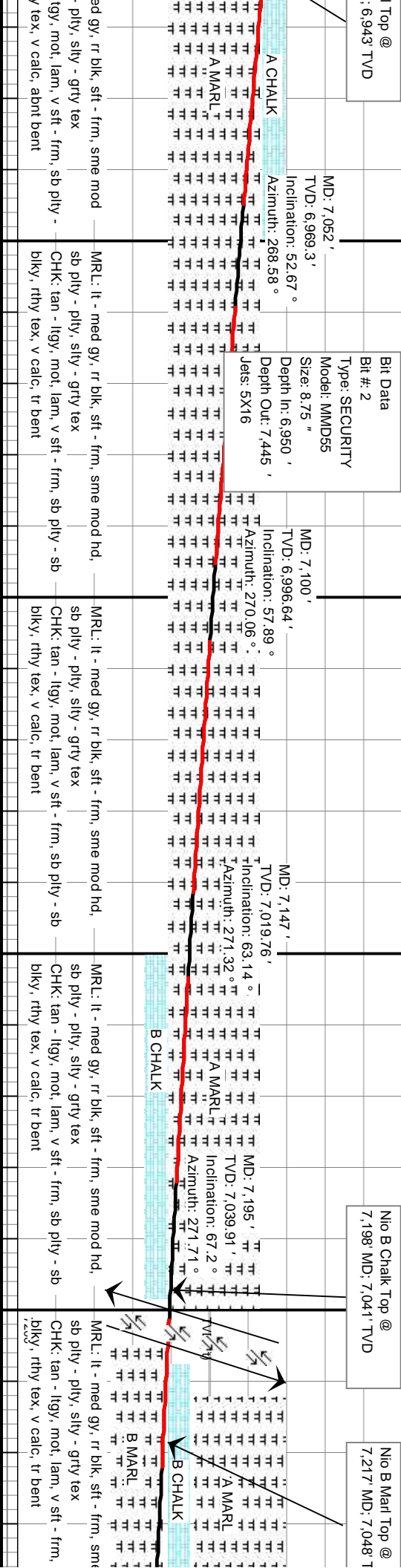
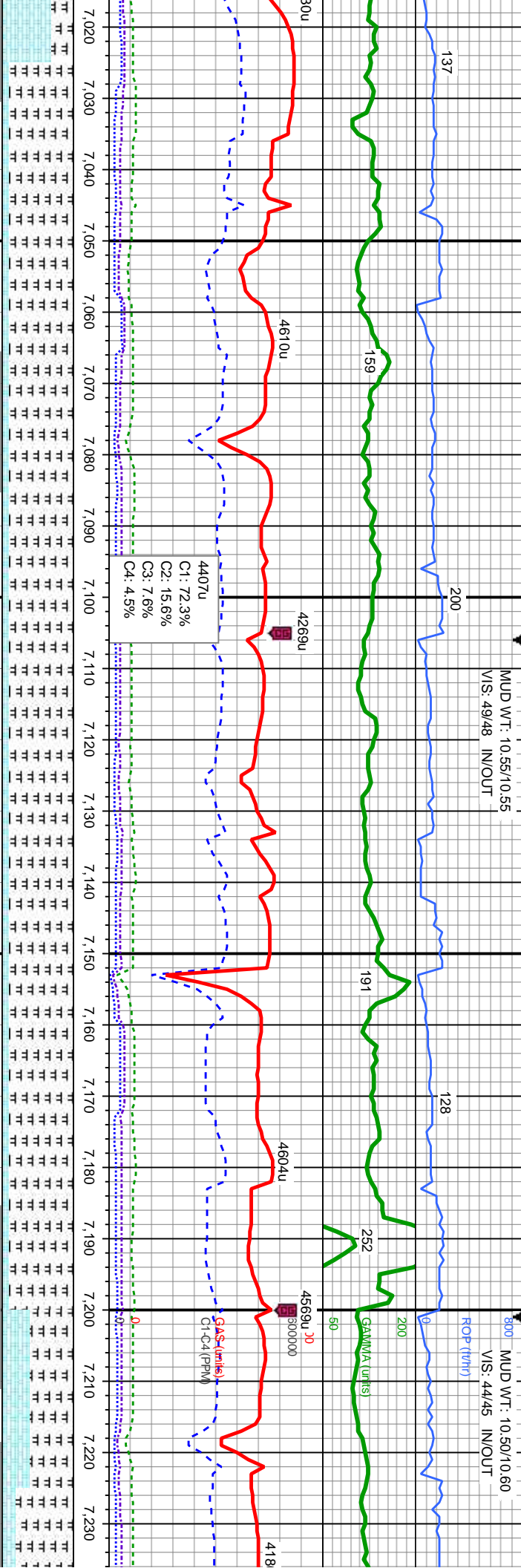
SLTY SH: lt gy - ltgy brn, tr dk gy - blk, frm - mod
hd, pred pty - sb pty, occ sb blkly, slty - grty tex,
v sl calc

MRL: lt - med gy, tr blk, sft - frm, sme mod hd, sb
pty - pty, slty - grty tex
SLTY SH: lt gy - ltgy brn, sme dy gy, frm - mod hd,
pred pty - sb pty, occ sb blkly, slty - grty tex, v sl
calc, sme bent

MRL: lt - med gy, tr blk, sft - frm, sme mod hd, sb
pty - pty, slty - grty tex
CHK: tan - ltgy, mod, lam, v sft - frm, sb pty - sb
blkly, rthy tex, v calc, abnt bent
SLTY SH: lt gy - ltgy brn, sme dy gy, frm - mod hd,
pred pty - sb pty, occ sb blkly, slty - grty tex, v sl
calc

MRL: lt - m
hd, sb pty - l
CHK: tan - l
sb blkly, rth

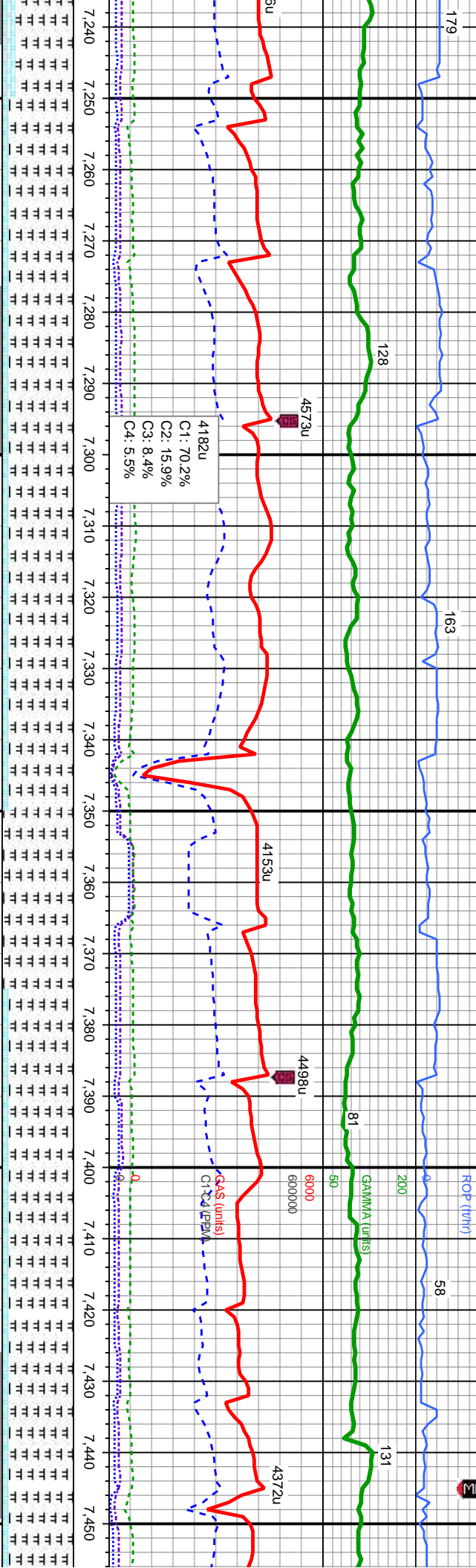




MUD WT: 10.75/10.80
VIS: 46/47 IN/OUT

MUD WT: 10.70/10.80 9/3/2014
VIS: 47/47 IN/OUT

9/4/2014
9/5/2014



TVD SCALE CHANGE

6900

6900

TOOH @ 7.445' MD
TO RUN 7" CASING

C CHALK

MR.L: 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

MR.L: 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

MR.L: 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

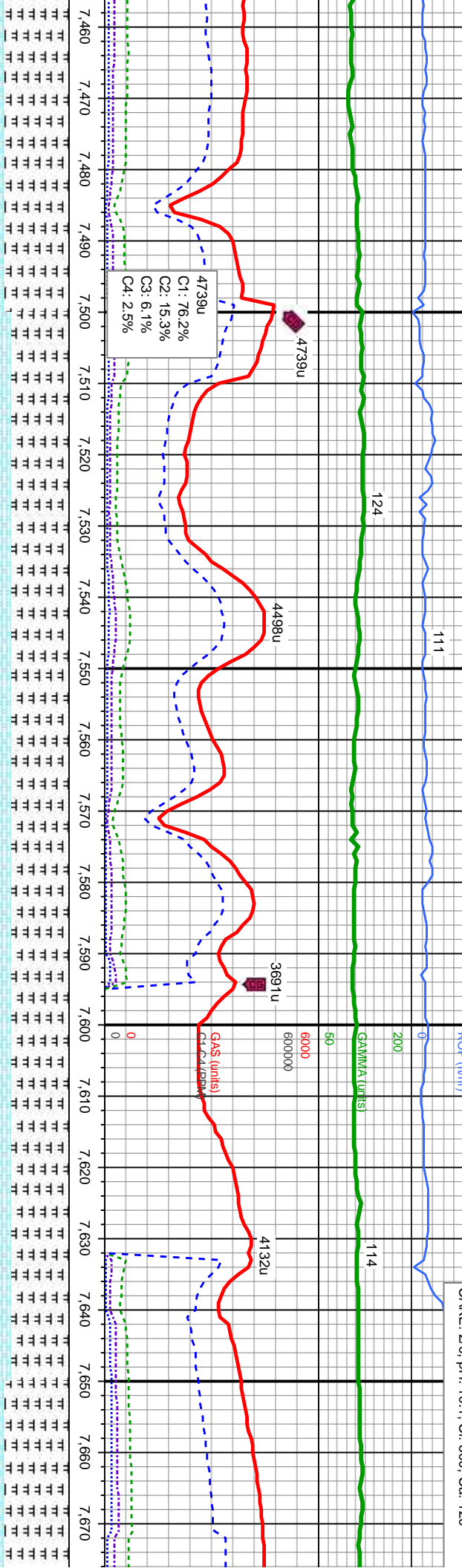
MR.L: lt - med gy, rr blk, sft - frm, sme mod
hd, sb pily - pily, sily - grty tex
CHK: tan - ltgy, mot, lam, v sft - frm, sb pily -
sb biky, rthy tex, v calc, abnt bent

10%
sb bil
90%
hd, si

MUD WT: 10.75/10.25
VIS: 41/44 IN/OUT

MUD WT: 10.35/10.30
VIS: 44/46 IN/OUT

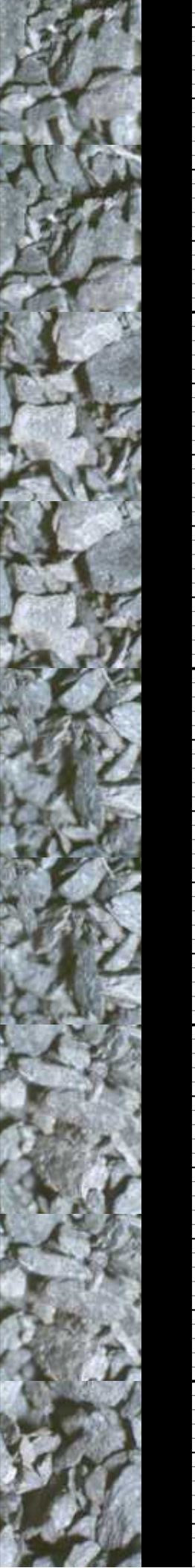
AM Mud Rpt 9/5/2014 , Mud Wt: 10.35, FV/
PVs: 17, YP: 17, GELS: 6/14/31, API Fil: 8,
CAKE: 20, pH: 10.1, Cl: 800, Ca: 120



Bit Data		50' Sample Interval @ 7,500' MD	
Bit #: 3			
Type: REED HVCALOG			
Model: SKH1513M-E1			
Size: 6.12 "			
Depth In: 7,445 '			
Jets: 5X13			

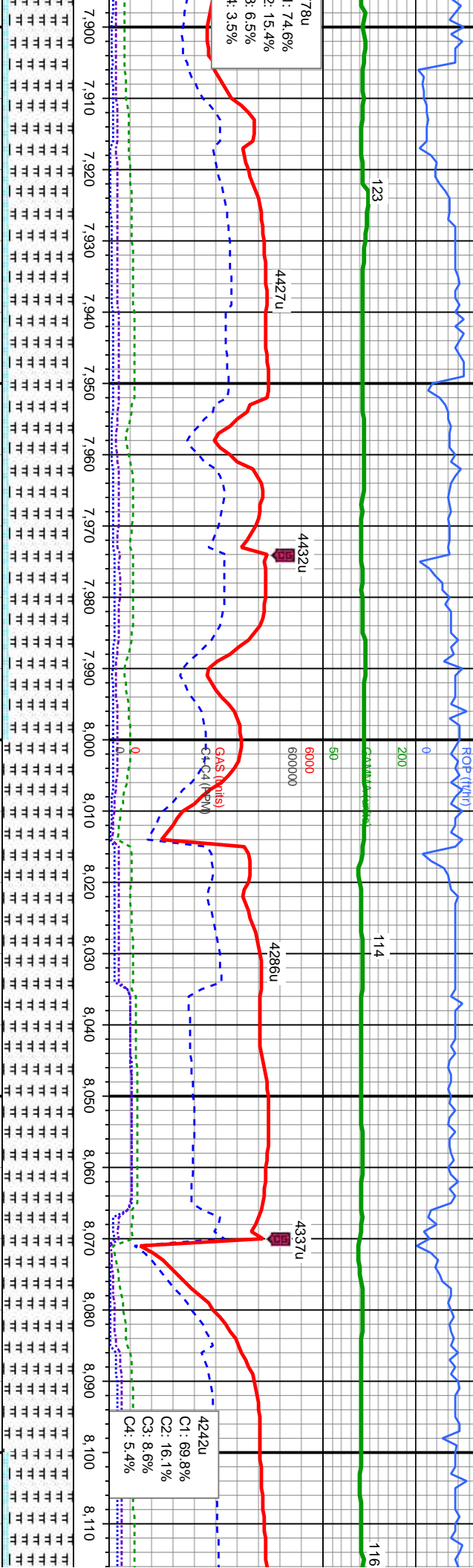
MD: 7,537 ' TVD: 7,102.83 ' Inclination: 88.8 °		MD: 7,632 ' TVD: 7,104.72 ' Inclination: 88.92 °	
Azimuth: 273.64 °		Azimuth: 272.61 °	
TVD(ft)		TVD(ft)	

CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sy, rthy tex, v calc	20% CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex	20% CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex	20% CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 80% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex, no bent, tr tos	10% CHK: tan - ltgy, mot, l sb blk, rthy tex, v calc 90% MRL: lt - med gy, rr bl hd, sb pily - pily, silty - grty
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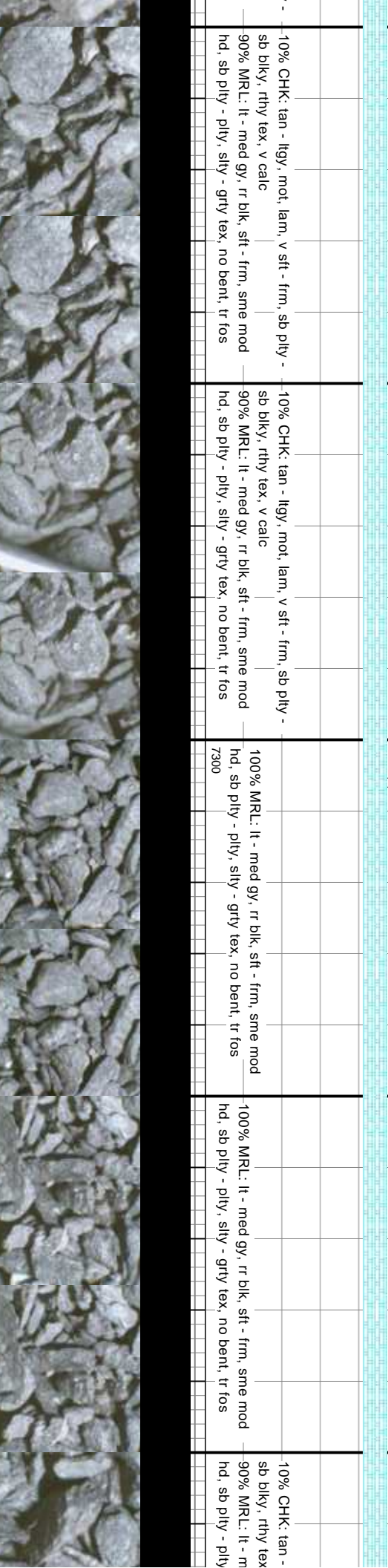


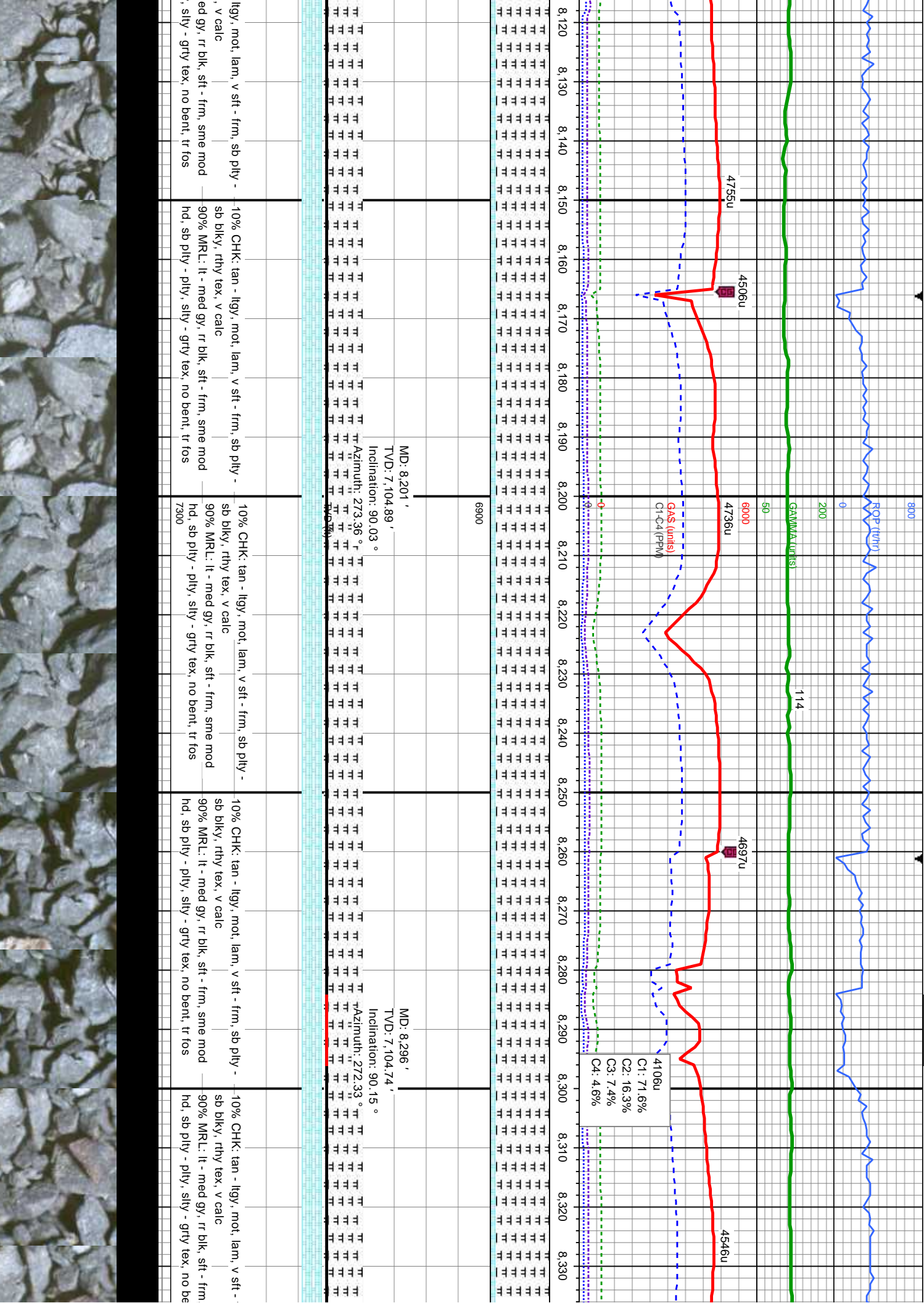
VT: 10.35/10.30
4/46 IN/OUT

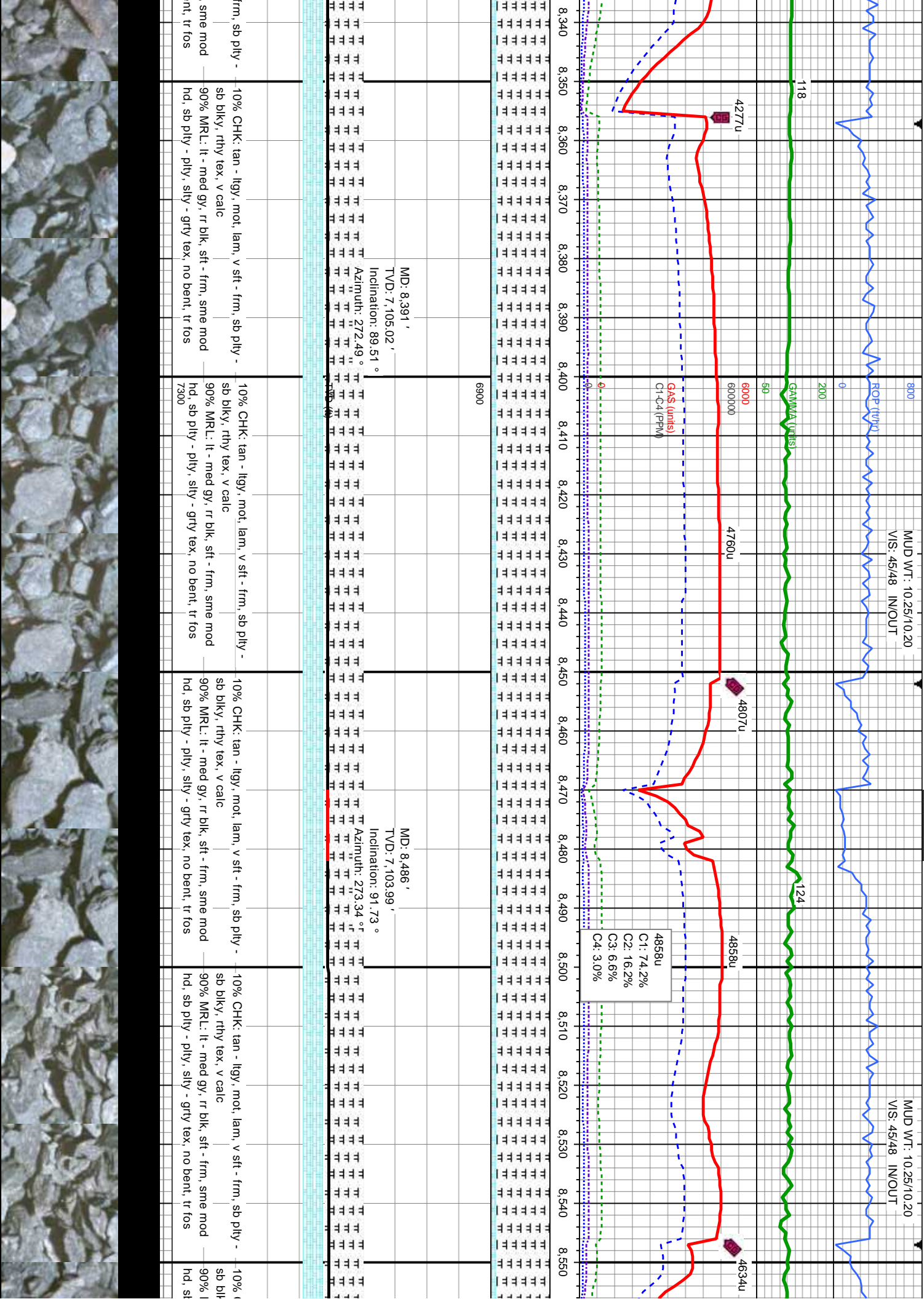
MUD WT: 10.45/10.50
VIS: 51/51 IN/OUT



MD: 7.916'	MD: 8.011'	MD: 8.106'
TVD: 7.103.3'	TVD: 7.103.15'	TVD: 7.103.99'
Inclination: 90.09°	Inclination: 90.09°	Inclination: 88.89°
Azimuth: 272.2°	Azimuth: 272.47°	Azimuth: 271.18°
10% CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc	100% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex, no bent, tr fos	10% CHK: tan - ltgy, mot, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc
90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex, no bent, tr fos	100% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex, no bent, tr fos	90% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb pily - pily, silty - grty tex, no bent, tr fos

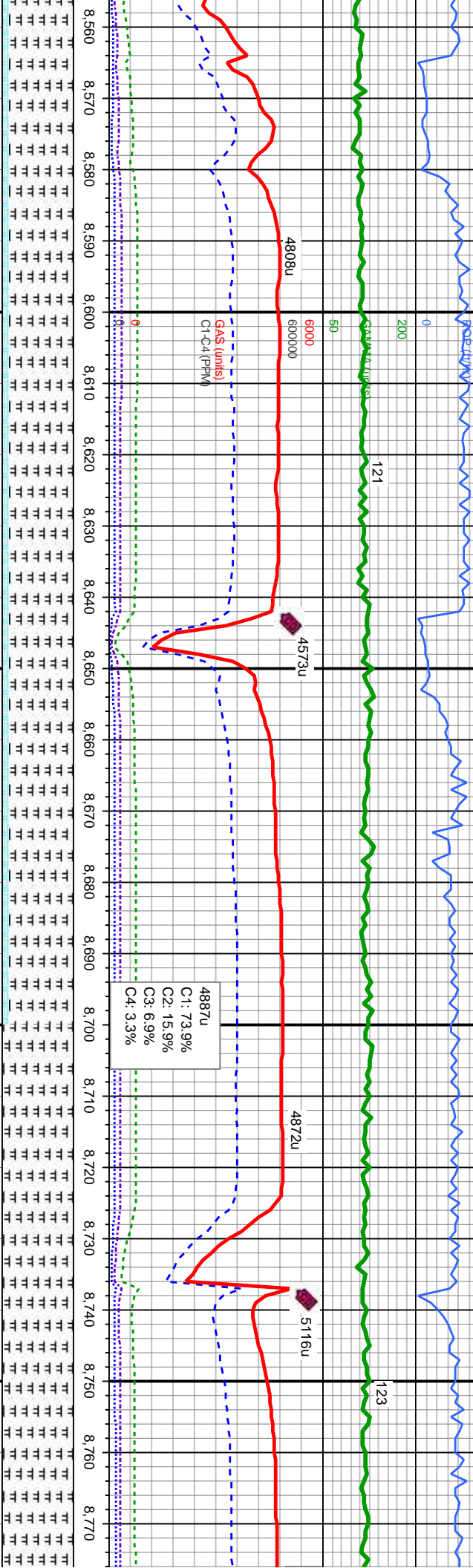






MUD WT: 10.20/10.15
VS: 48/48 IN/OUT

MUD WT: 10.15/10.20
VS: 45/48 IN/OUT



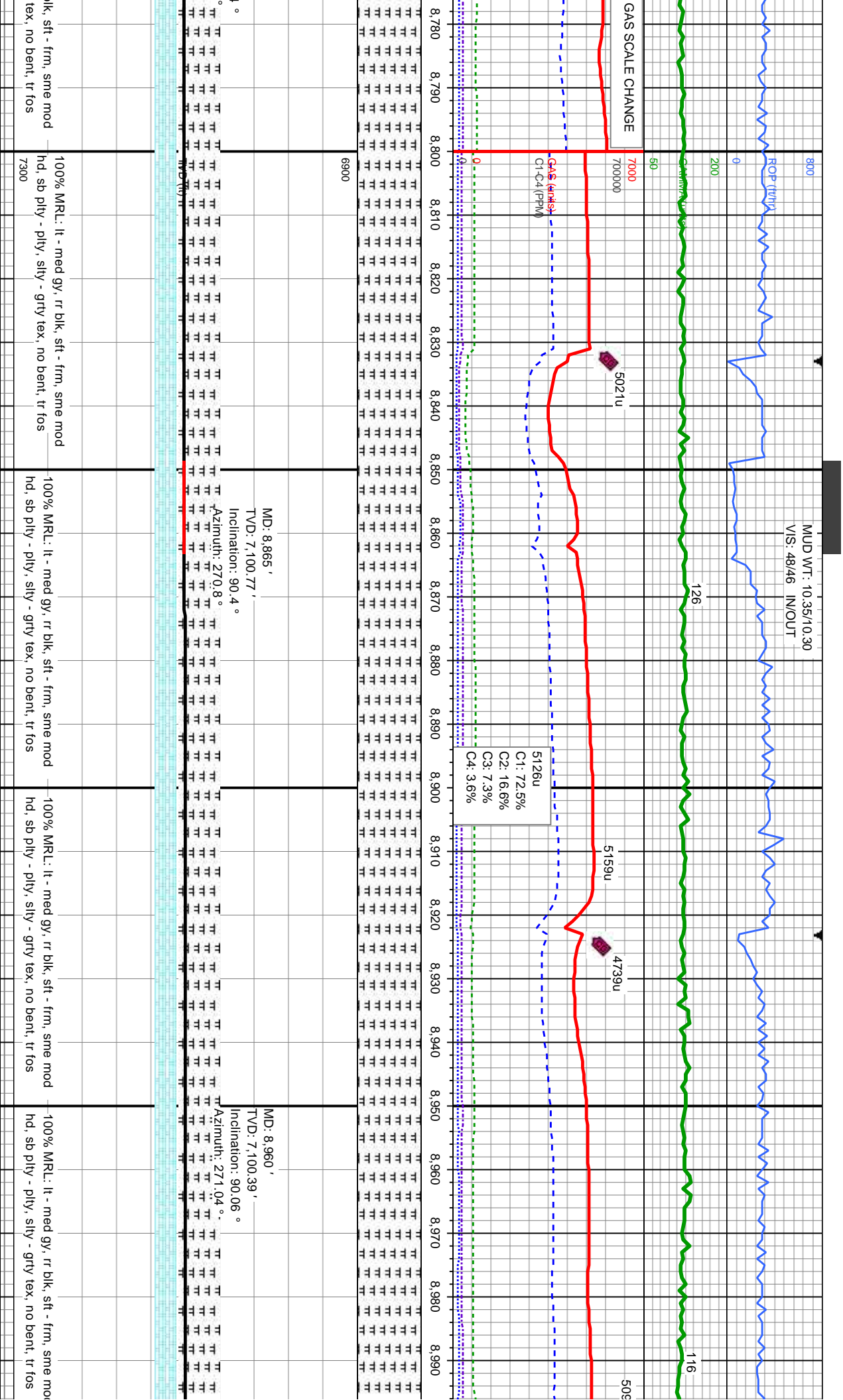
MD: 8,580 '
TVD: 7,102.15 '
Inclination: 90.52 °
Azimuth: 272.03 °

MD: 8,675 '
TVD: 7,101.36 '
Inclination: 90.43 °
Azimuth: 271.04 °

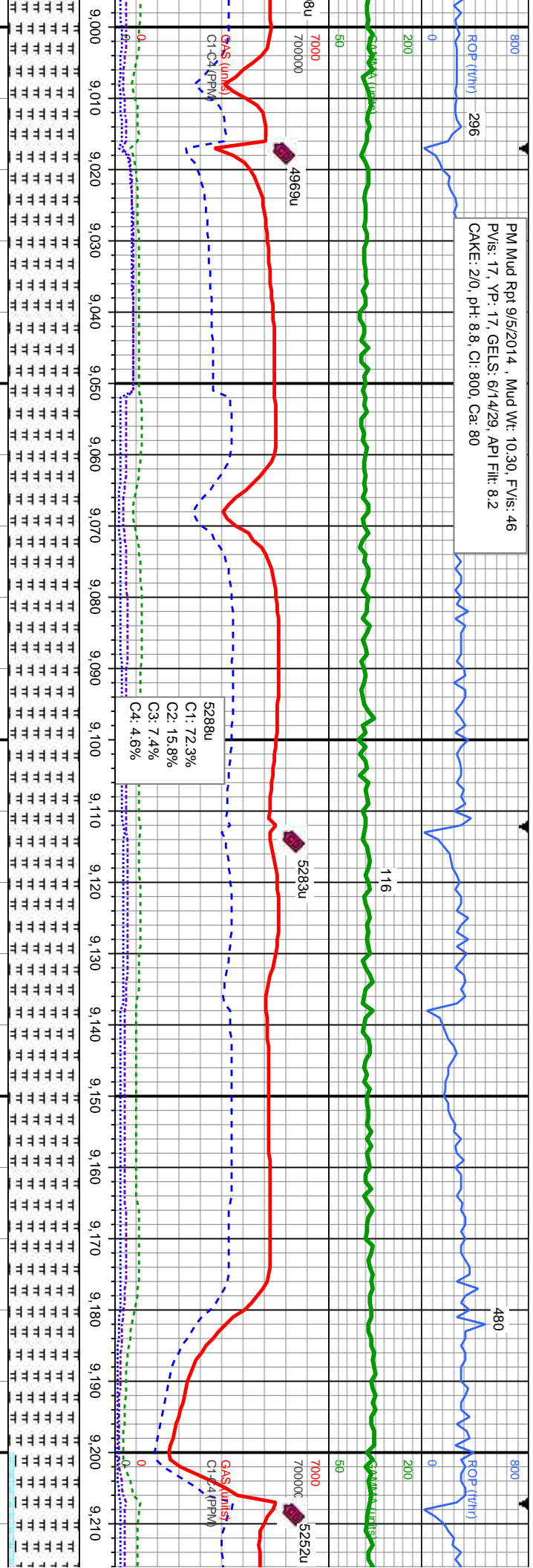
MD: 8,770 '
TVD: 7,101.05 '
Inclination: 89.9 °
Azimuth: 272.16 °

CHK: tan - ltgy, mot, lam, v sft - frm, sb ply - y, rthy tex, v calc	10% CHK: tan - ltgy, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	10% CHK: tan - ltgy, mot, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	100% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos	100% MRL: lt - med gy, rr blk, sft - frm, sme mod hd, sb ply - ply, silty - grty tex, no bent, tr fos
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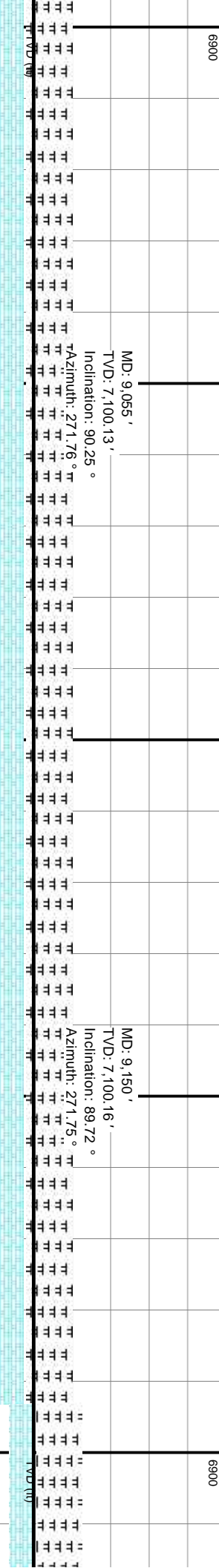


PM Mud Rpt 9/5/2014 , Mud Wt: 10.30, FVis: 46
PVIs: 17, YP: 17, GELS: 6/14/29, API Filtr: 8.2
CAKE: 2/0, pH: 8.8, Cl: 800, Ca: 80



MD: 9,055 '
TVD: 7,100.13 '
Inclination: 90.25 °

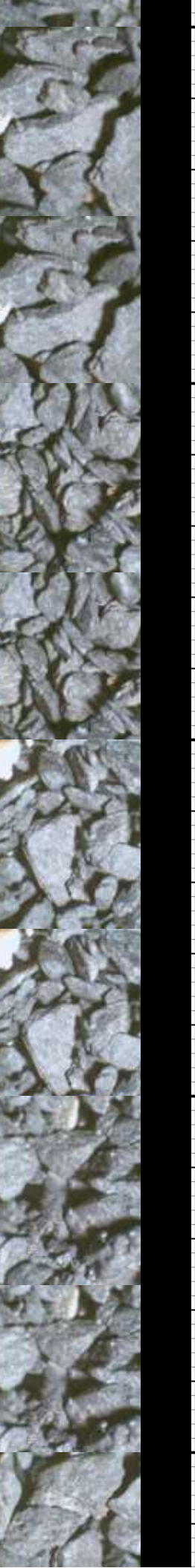
Azimuth: 271.76 °

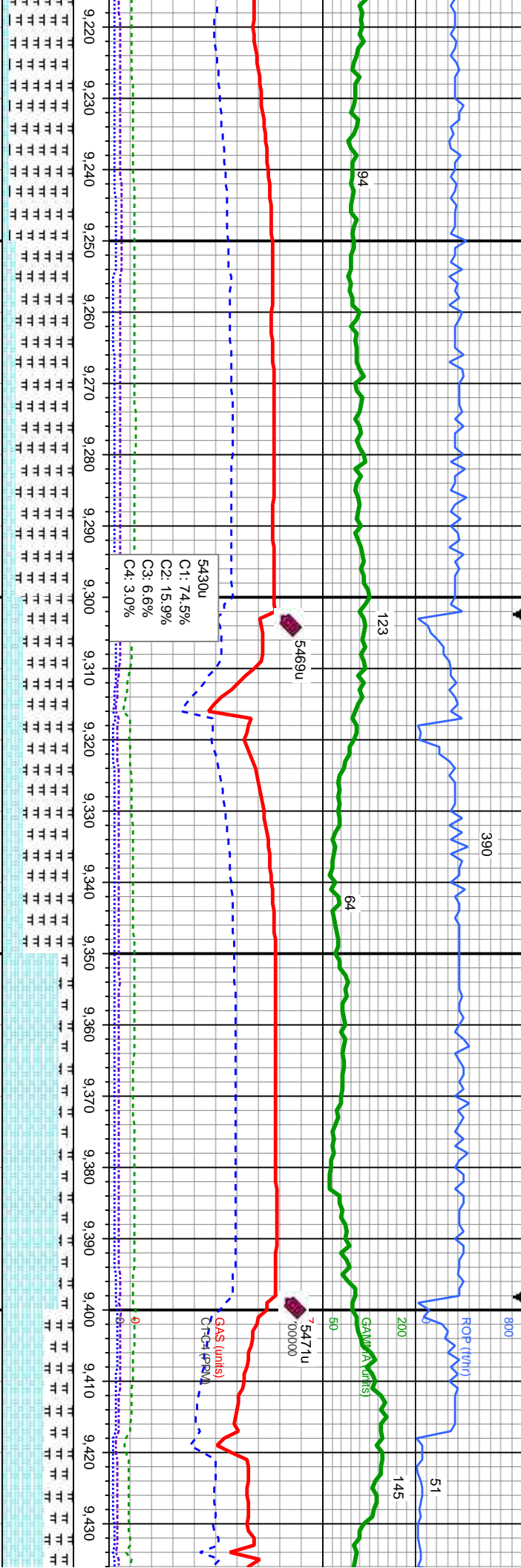


MD: 9,150 '
TVD: 7,100.16 '
Inclination: 89.72 °

Azimuth: 271.75 °

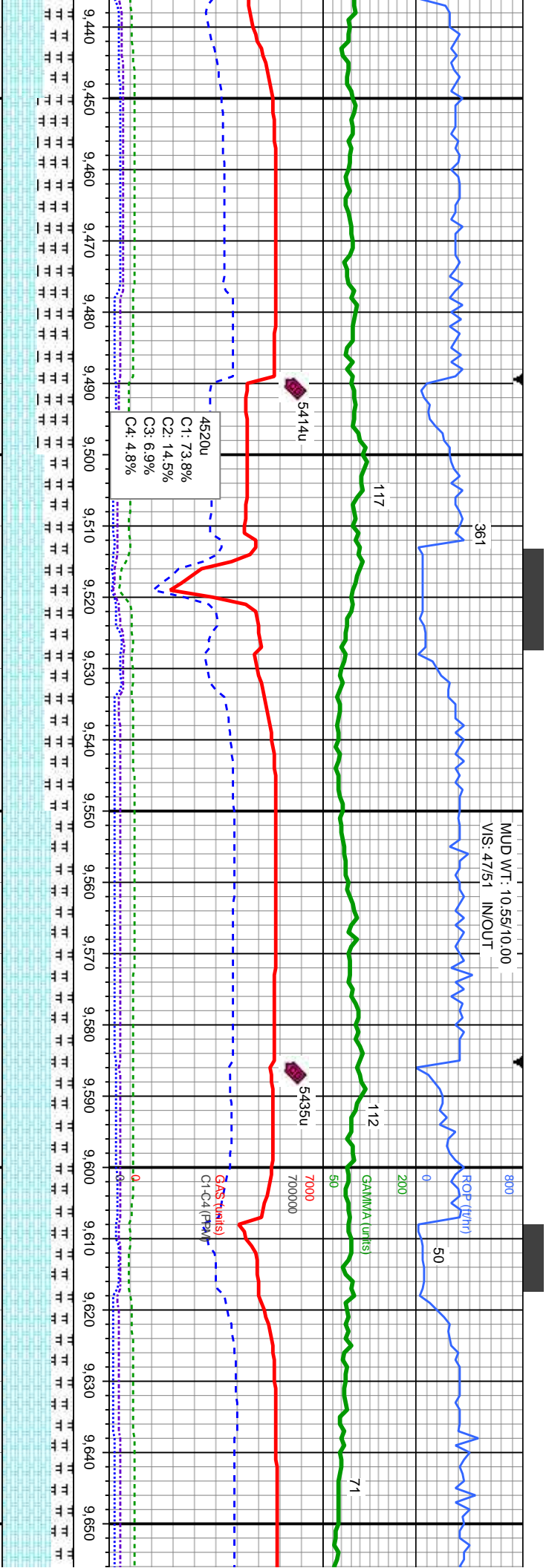
100% MRL: lt - med gy, rr blk, sft - frm, sme mod	100% MRL: lt - med gy, rr blk, sft - frm, sme mod	100% MRL: lt - med gy, rr blk, sft - frm, sme mod	100% MRL: lt - med gy, rr blk, sft - frm, sme mod
hd, sb pily - pily, silty - grty tex, no bent, tr fos	hd, sb pily - pily, silty - grty tex, no bent, tr fos	hd, sb pily - pily, silty - grty tex, no bent, tr fos	hd, sb pily - pily, silty - grty tex, no bent, tr fos
7300	7300	7300	7300





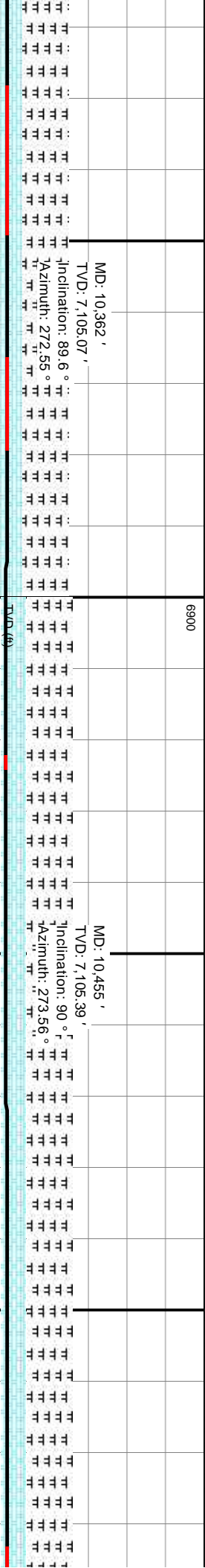
MD: 9,245 ' TVD: 7,100.85 ' Inclination: 89.44 °		MD: 9,339 ' TVD: 7,102.13 ' Inclination: 89.01 °		MD: 9,434 ' TVD: 7,103. ' Inclination: 89.01 °	
Azimuth: 272.17 °		Azimuth: 272.02 °		Azimuth: 272.02 °	
v calc		v calc		v calc	
rly blk, sft - mod hd, sb		rly blk, sft - mod nd, sb		rly blk, sft - mod nd, sb	
grly tex, tr bent, tr inoc		grly tex, no bent, tr inoc		grly tex, tr bent, abnt inoc	
20% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -		30% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -		80% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -	
sb blk, rthy tex, v calc		sb blk, rthy tex, v calc		sb blk, rthy tex, v calc	
80% MRL: lt - med gy, rly blk, sft - mod nd, sb		70% MRL: lt - med gy, rly blk, sft - mod nd, sb		40% MRL: lt - med gy, rly blk, sft - mod nd, sb	
ply - ply, silty - grly tex, no bent, tr inoc		ply - ply, silty - grly tex, no bent, sme inoc		ply - ply, silty - grly tex, tr bent, abnt inoc	
60% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -		60% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -		60% CHK: tan - lgy, mot, lam, v sft - frm, sb ply -	
sb blk, rthy tex, v calc		sb blk, rthy tex, v calc		sb blk, rthy tex, v calc	
20% MRL: lt - med gy, rly blk, sft - mod nd, sb		20% MRL: lt - med gy, rly blk, sft - mod nd, sb		20% MRL: lt - med gy, rly blk, sft - mod nd, sb	
ply - ply, silty - grly tex, no bent, tr inoc		ply - ply, silty - grly tex, no bent, sme inoc		ply - ply, silty - grly tex, tr bent, abnt inoc	
7300		7300		7300	





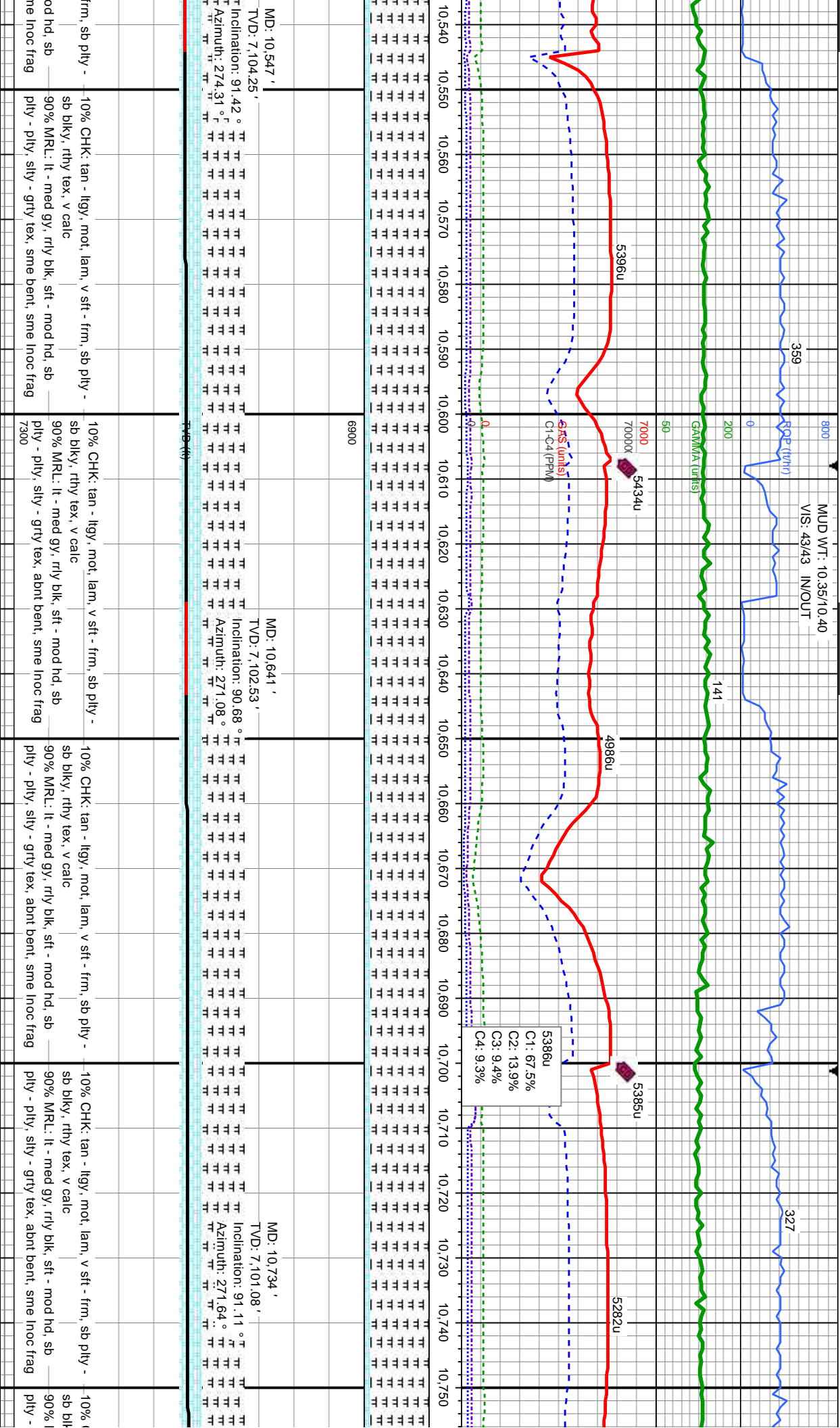
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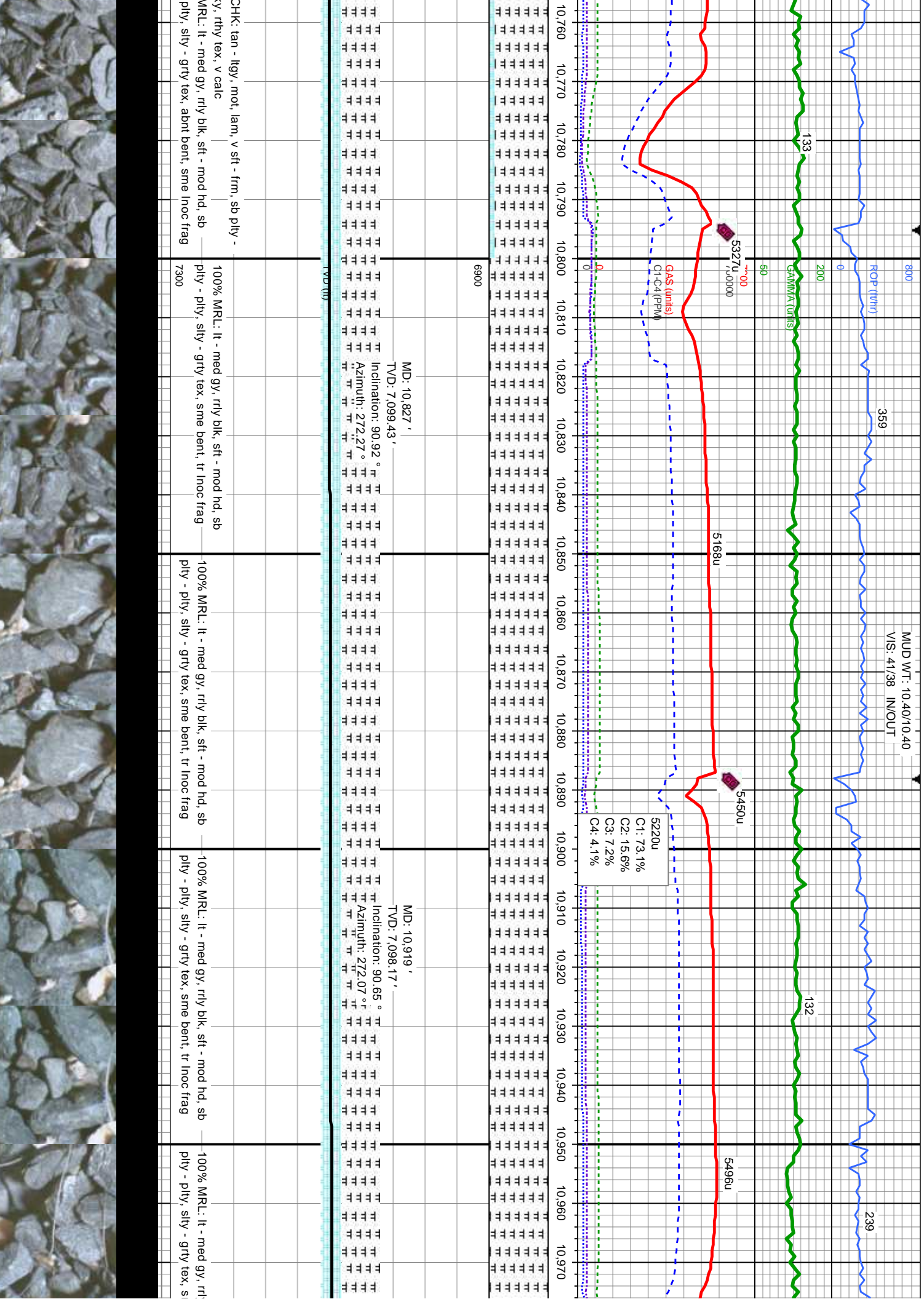
MUD WT: 10.50/10.50
VIS: 45/43 IN/OUT



sb blkly, rthy tex, v calc
90% MRL: lt - med gy, rrlly blk, sft - m
ply - ply, sily - grty tex, sme bent, sr







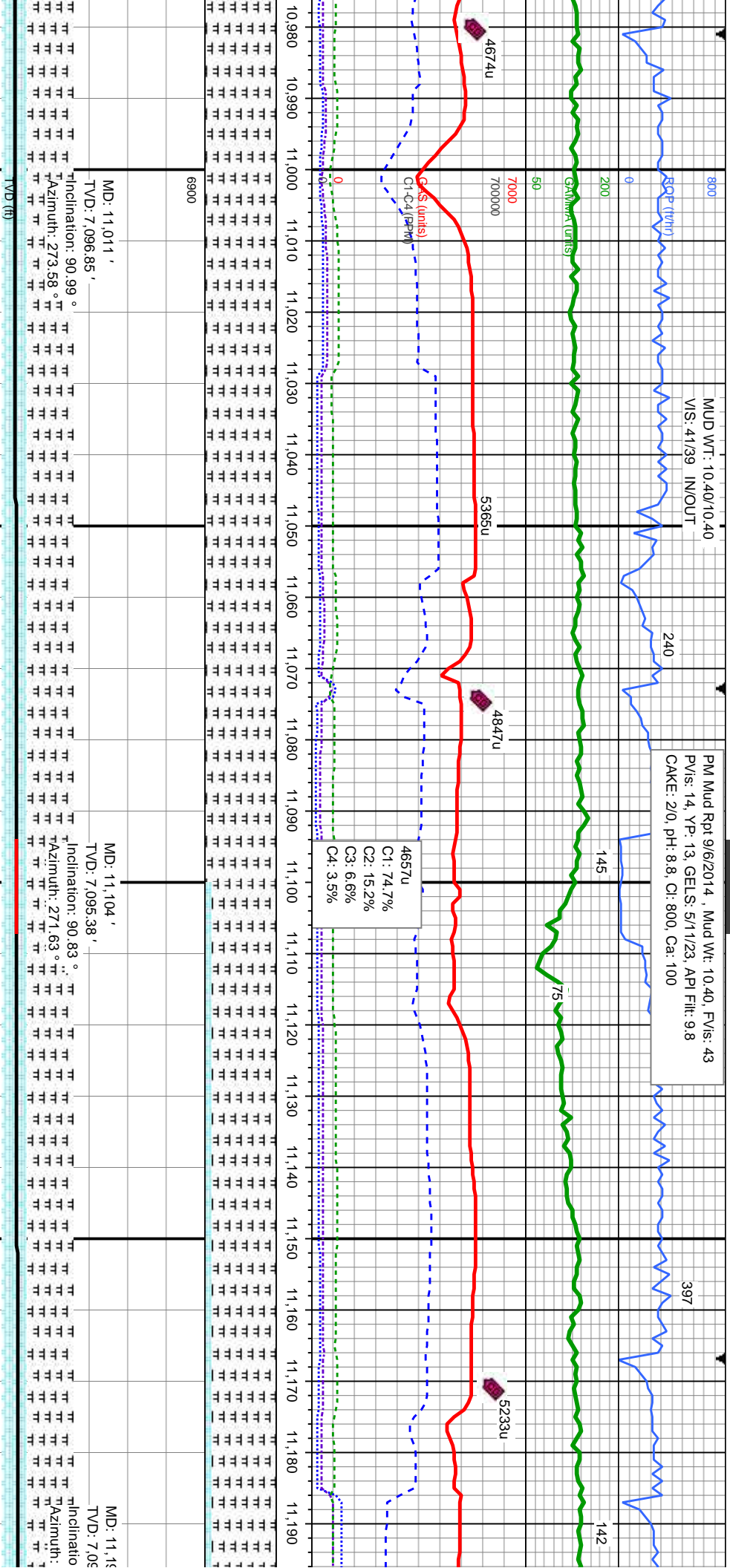
MUD WT: 10.40/10.40
VIS: 41/38 INOUT

5168u
5450u
5496u

5220u
C1: 73.1%
C2: 15.6%
C3: 7.2%
C4: 4.1%

MUD WT: 10.40/10.40
V/S: 41/39 IN/OUT

PM Mud Rpt 9/6/2014 - Mud Wt: 10.40, F/Vs: 43
P/Vs: 14, Y/P: 13, GELS: 5/11/23, API Filtr: 9.8
CAKE: 2/0, pH: 8.8, CI: 800, Ca: 100



MD: 11,011 '
TVD: 7,096.85 '
Inclination: 90.99 °
Azimuth: 273.58 °

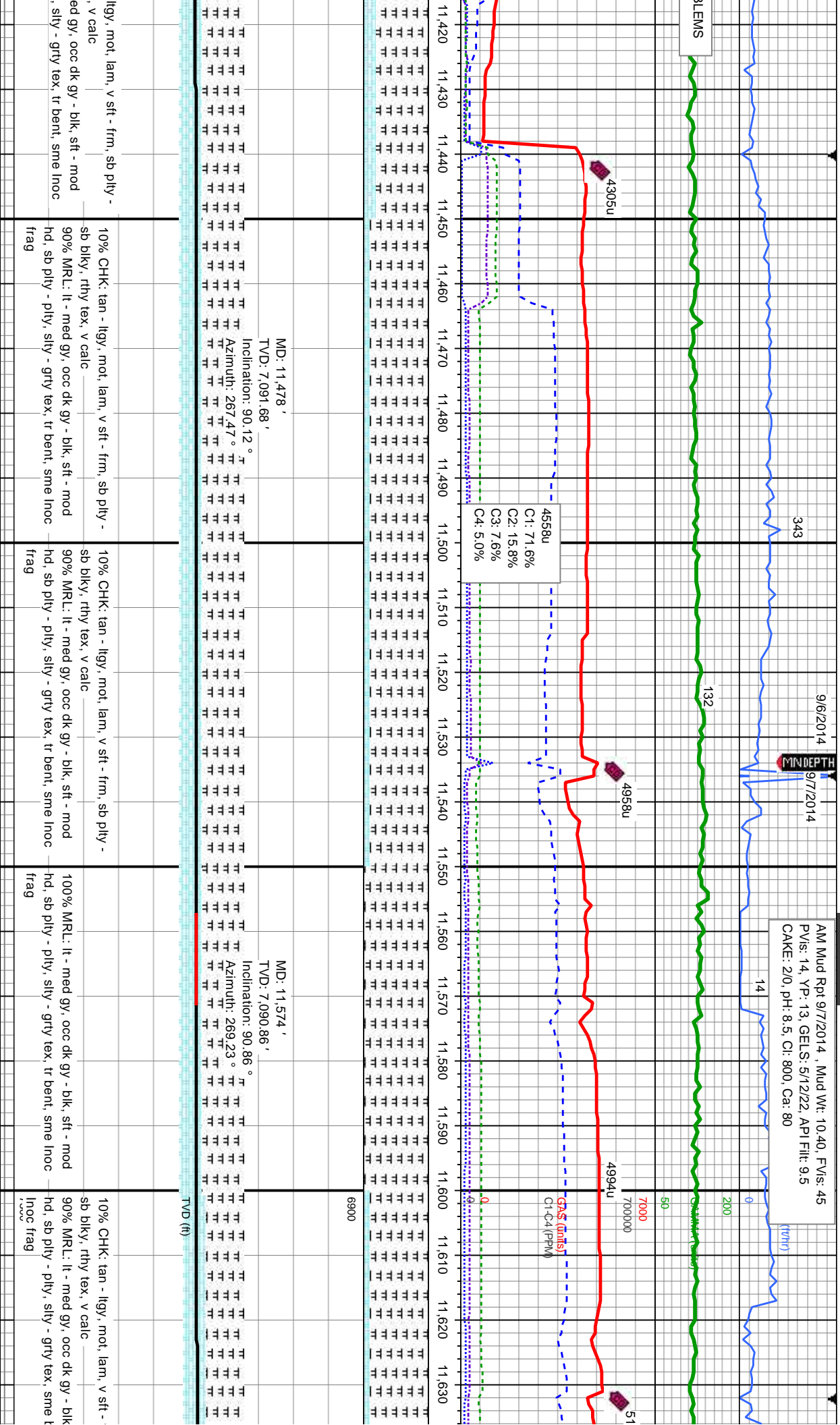
MD: 11,104 '
TVD: 7,095.38 '
Inclination: 90.83 °
Azimuth: 271.63 °

MD: 11,115 '
TVD: 7,095 '
Inclination: 90.83 °
Azimuth: 271.63 °

TVD (ft)

100% MRL: lt - med gy, rthy blk, sft - mod hd, sb ply - ply, silty - grty tex, sme bent, tr inoc frag	100% MRL: lt - med gy, rthy blk, sft - mod hd, sb ply - ply, silty - grty tex, sme bent, tr inoc frag	10% CHK: tan - ltgy, mod, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	10% CHK: tan - ltgy, mod, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
7300		90% MRL: lt - med gy, occ dk gy - blk, sft - mod hd, sb ply - ply, silty - grty tex, sme bent, sme inoc frag	90% MRL: lt - med gy, occ dk gy - blk, sft - mod hd, sb ply - ply, silty - grty tex, sme bent, sme inoc frag





MUD WT: 10.35/10.35
VIS: 40/40 IN/OUT

MUD WT: 10.40/10.40
VIS: 40/40 IN/OUT

MUD WT:
VIS: 43/44

C1: 76.1%
C2: 14.7%
C3: 6.0%
C4: 3.2%

GAS (unit)

C1-C4 (PPM)

6900

MD: 11,668 '
TVD: 7,089.93 '
Inclination: 90.28 °

MD: 11,763 '
TVD: 7,089.65 '
Inclination: 90.06 °

MD: 11,8
TVD: 7,0
Inclination:

Azimuth: 267.81 °

Azimuth: 267.56 °

Azimuth:

TVD (ft)

frm, sb ply -
sft - mod
nd, sme

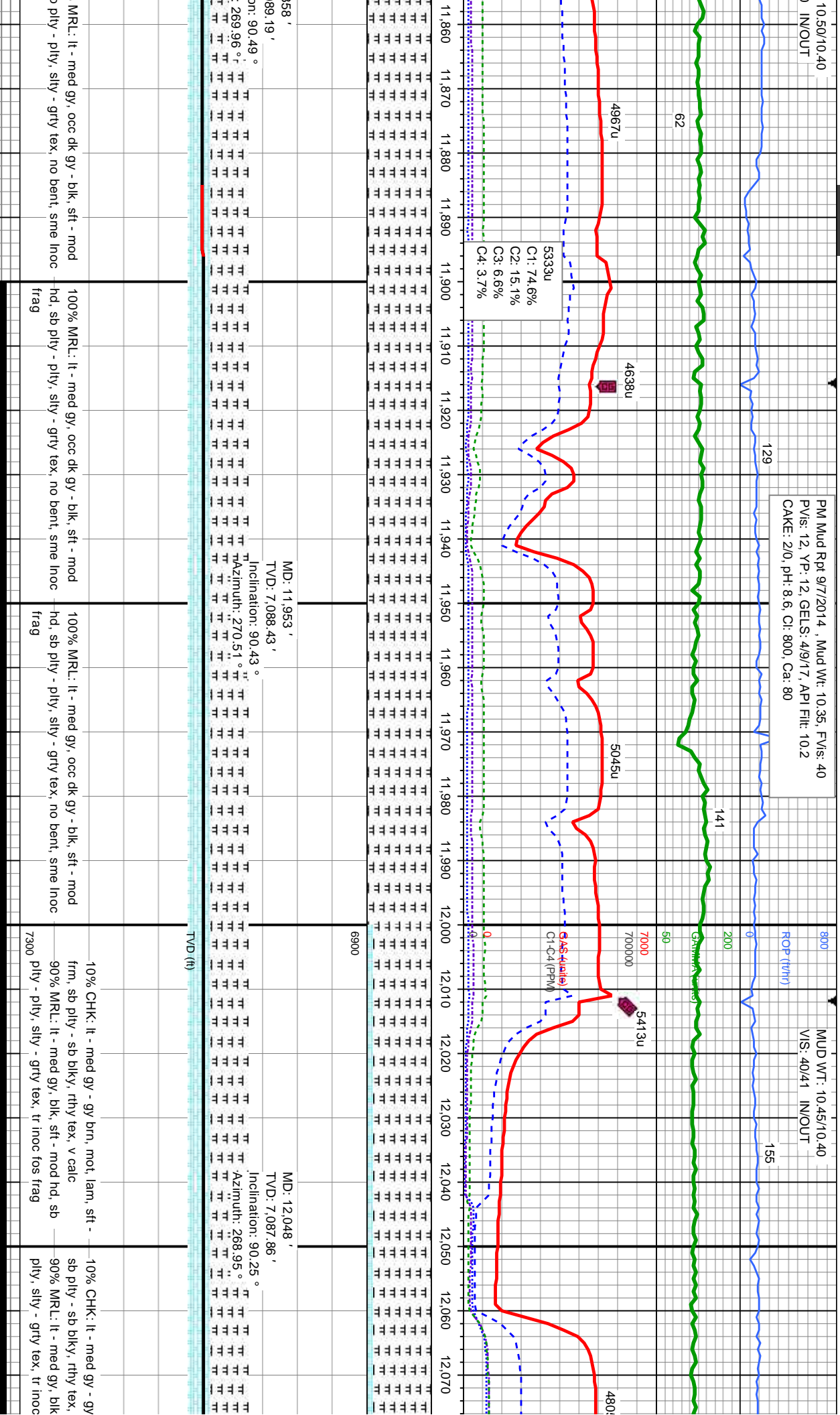
20% CHK: tan - lly, mod, lam, v sft - frm, sb ply -
sb bly, rthy tex, v calc
80% MRL: lt - med gy, occ dk gy - blk, sft - mod
hd, sb ply - ply, sily - grty tex, sme bent, sme
Inoc frag

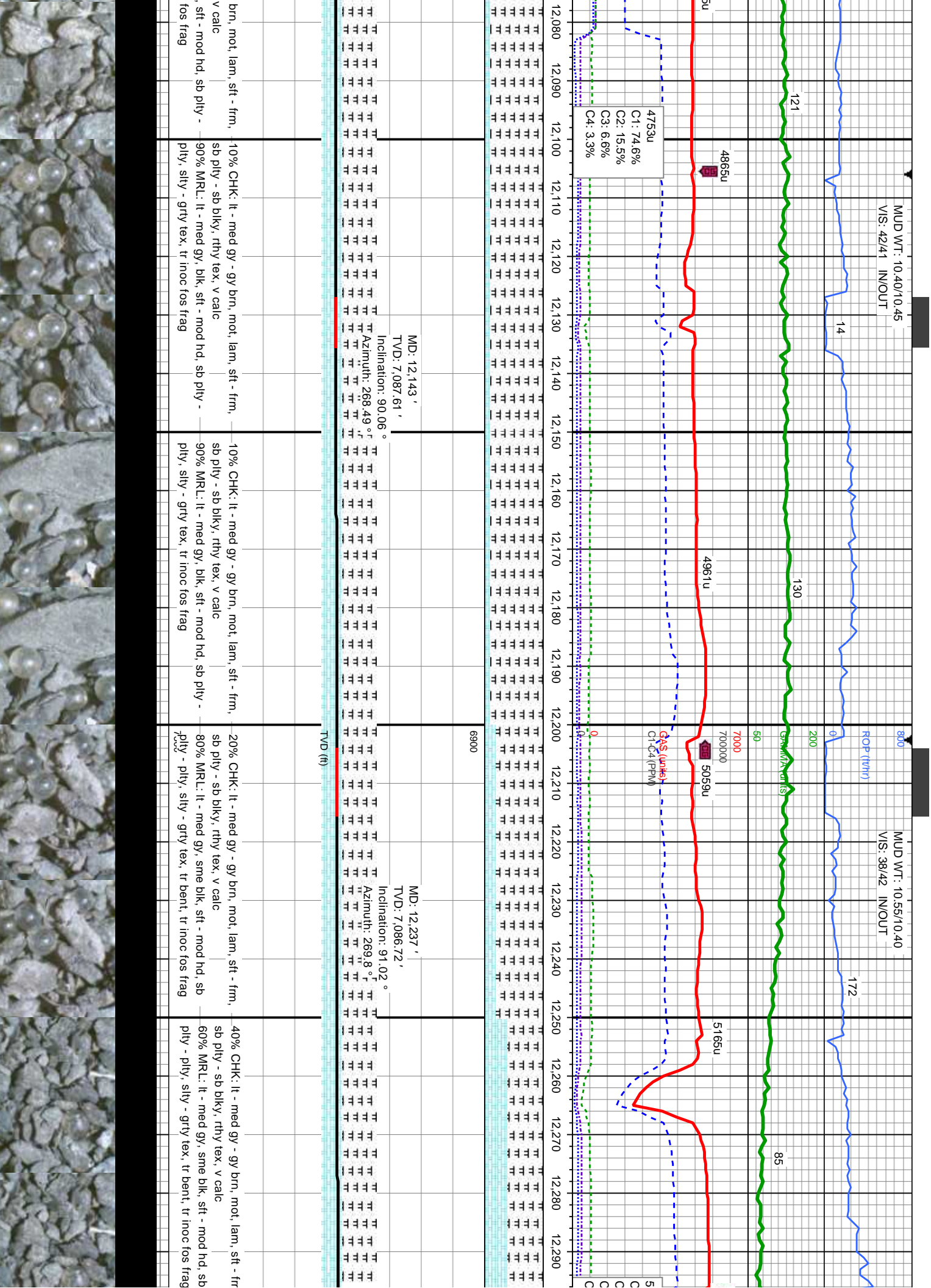
10% CHK: tan - lly, mod, lam, v sft - frm, sb ply -
sb bly, rthy tex, v calc
90% MRL: lt - med gy, occ dk gy - blk, sft - mod
hd, sb ply - ply, sily - grty tex, tr bent, sme inoc
frag

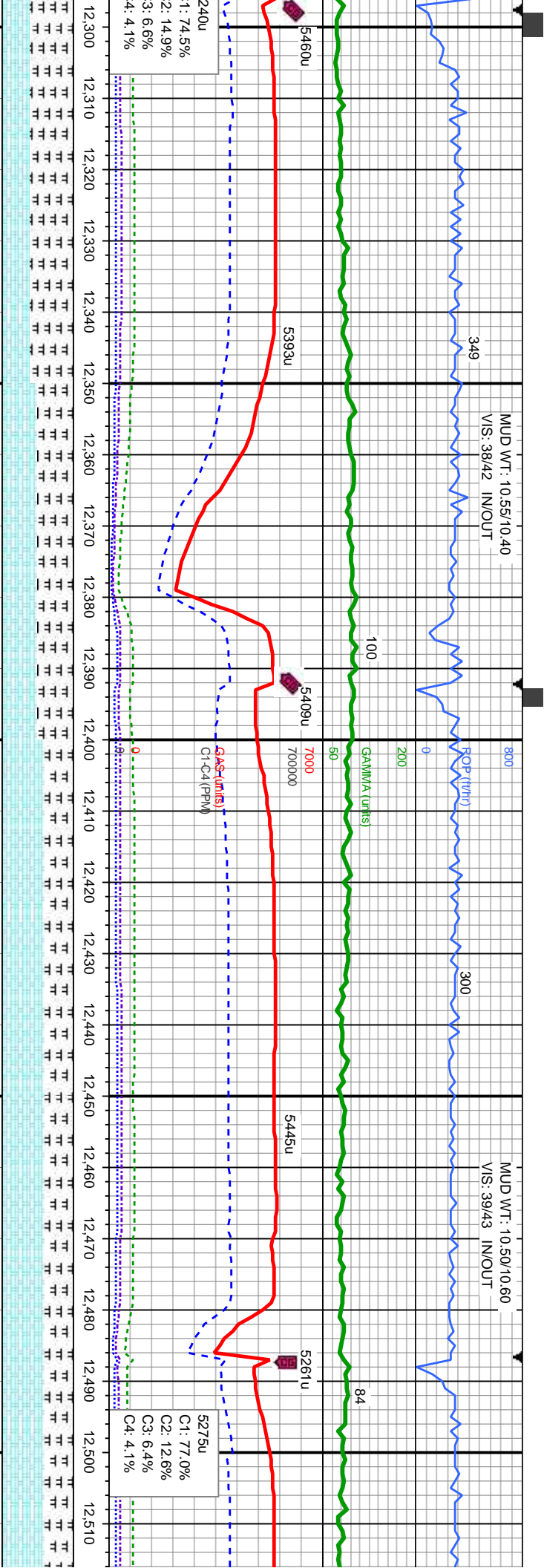
100% MRL: lt - med gy, occ dk gy - blk, sft - mod
hd, sb ply - ply, sily - grty tex, no bent, sme inoc
frag

100% MRL: lt - med gy, occ dk gy - blk, sft - mod
hd, sme
frag



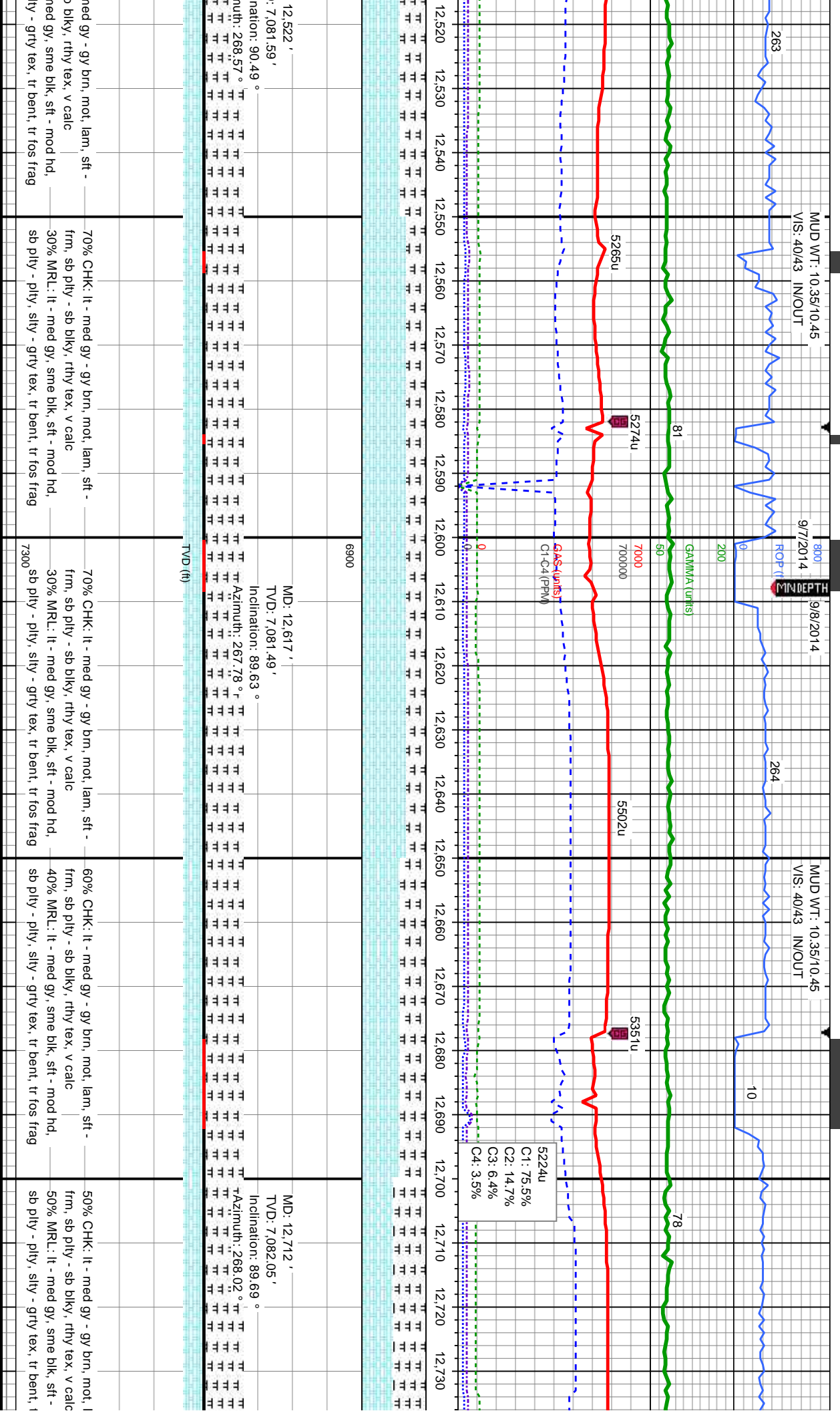






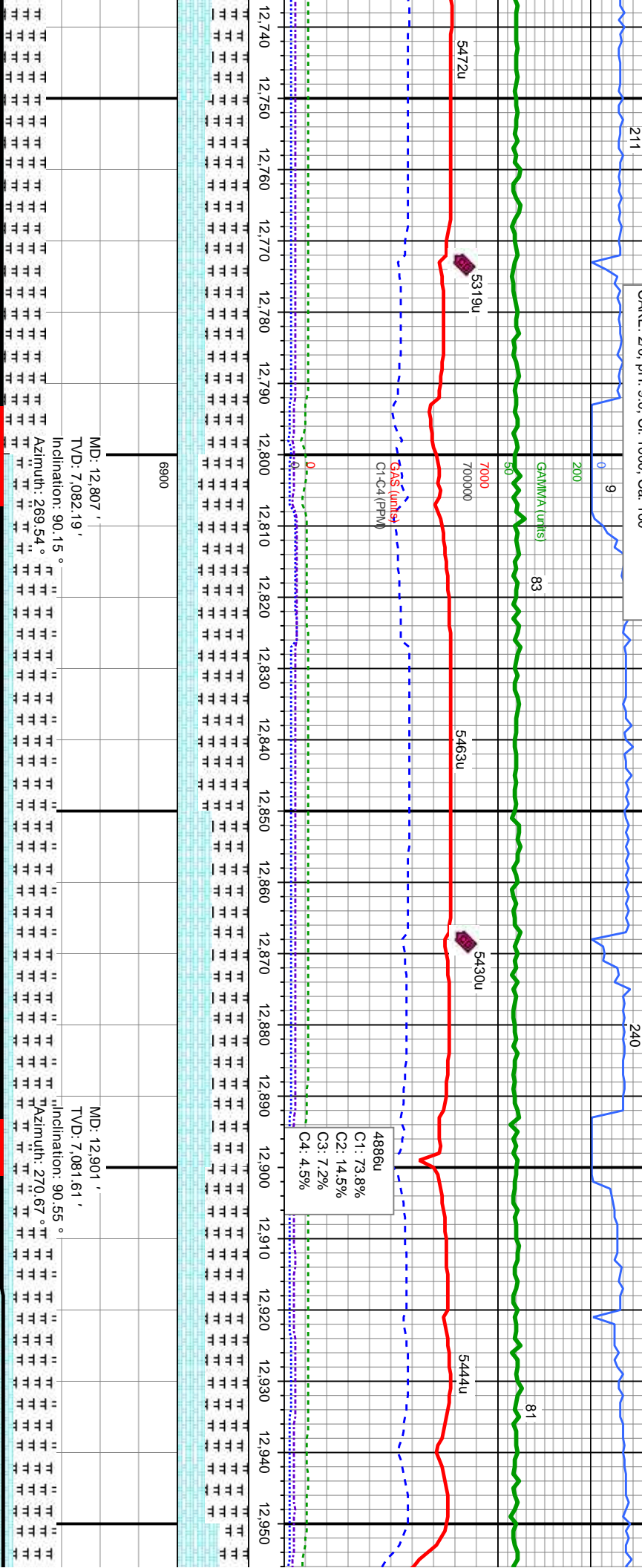
MD: 12,332 ' TVD: 7,084.88 ' Inclination: 91.2 ° Azimuth: 269.61 °		MD: 12,427 ' TVD: 7,082.94 ' Inclination: 91.14 ° Azimuth: 269.3 °		MD: 12,427 ' TVD: 7,082.94 ' Inclination: 91.14 ° Azimuth: 269.3 °		MD: 12,427 ' TVD: 7,082.94 ' Inclination: 91.14 ° Azimuth: 269.3 °		MD: 12,427 ' TVD: 7,082.94 ' Inclination: 91.14 ° Azimuth: 269.3 °	
40% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	50% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag;	60% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag
40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	50% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	60% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	60% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - pily, silty - grty tex, tr bent, tr fos frag
sb pily - pily, silty - grty tex, tr bent, tr fos frag	sb pily - sb blk, rthy tex, v calc	7300	sb pily - pily, silty - grty tex, tr bent, tr fos frag	7300	sb pily - pily, silty - grty tex, tr bent, tr fos frag	7300	sb pily - pily, silty - grty tex, tr bent, tr fos frag	7300	sb pily - pily, silty - grty tex, tr bent, tr fos frag





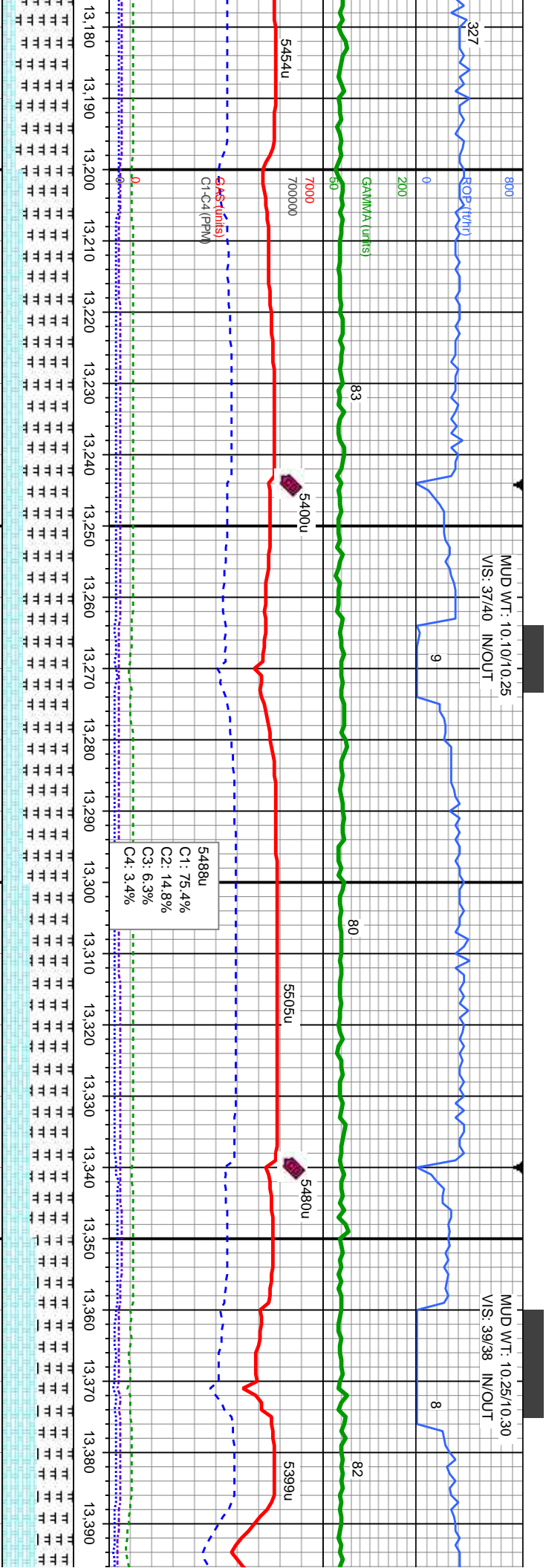
AM Mud Rpt 9/8/2014 , Mud Wt: 10.30, FVis: 38
PVs: 10, YP: 14, GELS: 4/8/15, API Filtr: 9.6
CAKE: 2/0, pH: 9.0, CI: 1000, Car: 160

MUD WT: 10.20/10.20
VIs: 36/41 IN/OUT



am, sft -	40% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	30% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	50% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	40% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	60% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc
mod hd,	60% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gtry tex, tr bent, tr fos frag	70% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gtry tex, tr bent, tr fos frag	50% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gtry tex, tr bent, tr fos frag	60% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gtry tex, tr bent, tr fos frag	40% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gtry tex, tr bent, tr fos frag
tr fos frag					





MD: 13.186 ' TVD: 7.080.8 ' Inclination: 89.75 ° Azimuth: 272.76 °	6900	MD: 13.281 ' TVD: 7.081.47 ' Inclination: 89.44 ° Azimuth: 273.17 °	MD: 13.376 ' TVD: 7.082.32 ' Inclination: 89.54 ° Azimuth: 272.15 °
brn, mot, lam, sft - frm, v calc			
blk, sft - mod hd, sb bent, tr fos frag			

30% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	30% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	40% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	50% CHK: lt - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc
70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gty tex, tr bent, tr fos frag	70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gty tex, tr bent, tr fos frag	60% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gty tex, tr bent, tr fos frag	50% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - pty, silty - gty tex, tr bent, tr fos frag



MUD WT: 10.35/10.40
VIS: 41/44 IN/OUT
9/8/2014 9/9/2014

MINDEPTH

225

72

MUD WT: 10.30/10.40
VIS: 38/48 IN/OUT

151

225

ROP (ft/hr)

0

200

400

600

800

1000

1200

1400

1600

1800

2000

2200

2400

2600

2800

3000

3200

3400

3600

3800

4000

4200

4400

4600

4800

5000

5200

5400

5600

5800

6000

6200

6400

6600

6800

7000

7200

7400

7600

7800

8000

8200

8400

8600

8800

9000

9200

9400

9600

9800

10000

10200

10400

10600

10800

11000

11200

11400

11600

11800

12000

12200

12400

12600

12800

13000

13200

13400

13600

13800

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20200

20400

20600

20800

21000

21200

21400

21600

21800

22000

22200

22400

22600

22800

23000

23200

23400

23600

23800

24000

24200

24400

24600

24800

25000

25200

25400

25600

25800

26000

26200

26400

26600

26800

27000

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29600

29800

30000

30200

30400

30600

30800

31000

31200

31400

31600

31800

32000

32200

32400

32600

32800

33000

33200

33400

33600

33800

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40400

40600

40800

41000

41200

41400

41600

41800

42000

42200

42400

42600

42800

43000

43200

43400

43600

43800

44000

44200

44400

44600

44800

45000

45200

45400

45600

45800

46000

46200

46400

46600

46800

47000

47200

47400

47600

47800

48000

48200

48400

48600

48800

49000

49200

49400

49600

49800

50000

50200

50400

50600

50800

51000

51200

51400

51600

51800

52000

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53600

53800

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54400

54600

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55200

55400

55600

55800

56000

56200

56400

56600

56800

57000

57200

57400

57600

57800

58000

58200

58400

58600

58800

59000

59200

59400

59600

59800

60000

60200

60400

60600

60800

61000

61200

61400

61600

61800

62000

62200

62400

62600

62800

63000

63200

63400

MUD WT: 10.30/10.40
VIS: 38/48 IN/OUT

MUD WT: 10.30/10.20
VIS: 38/41 IN/OUT

5353u
C1: 74.4%
C2: 14.5%
C3: 6.8%
C4: 4.3%

GA5 (units)
C1-C4 (PPM)

6900

MD: 13,851 '
TVD: 7,075.36 '
Inclination: 92.25 °
Azimuth: 268.79 °

MD: 13,945 '
TVD: 7,072.46 '
Inclination: 91.29 °
Azimuth: 268.49 °

MD: 14,040 '
TVD: 7,070.93 '
Inclination: 90.56 °
Azimuth: 268.55 °

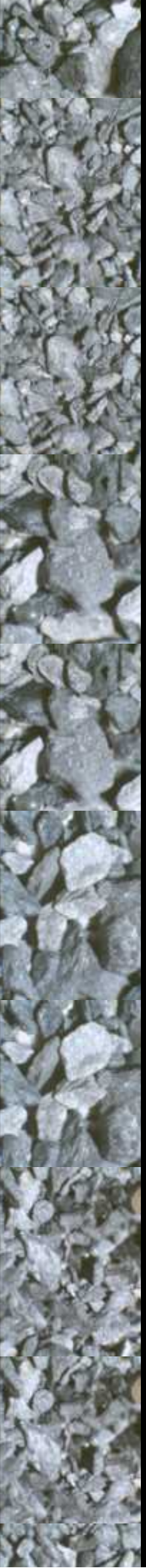
60% CHK: lt - med gy - gy brn, mot, lam, sft -
frm, sb pily - sb blk, rthy tex, v calc
40% MRL: lt - med gy, sme blk, sft - mod hd,
sb pily - pily, sily - grty tex

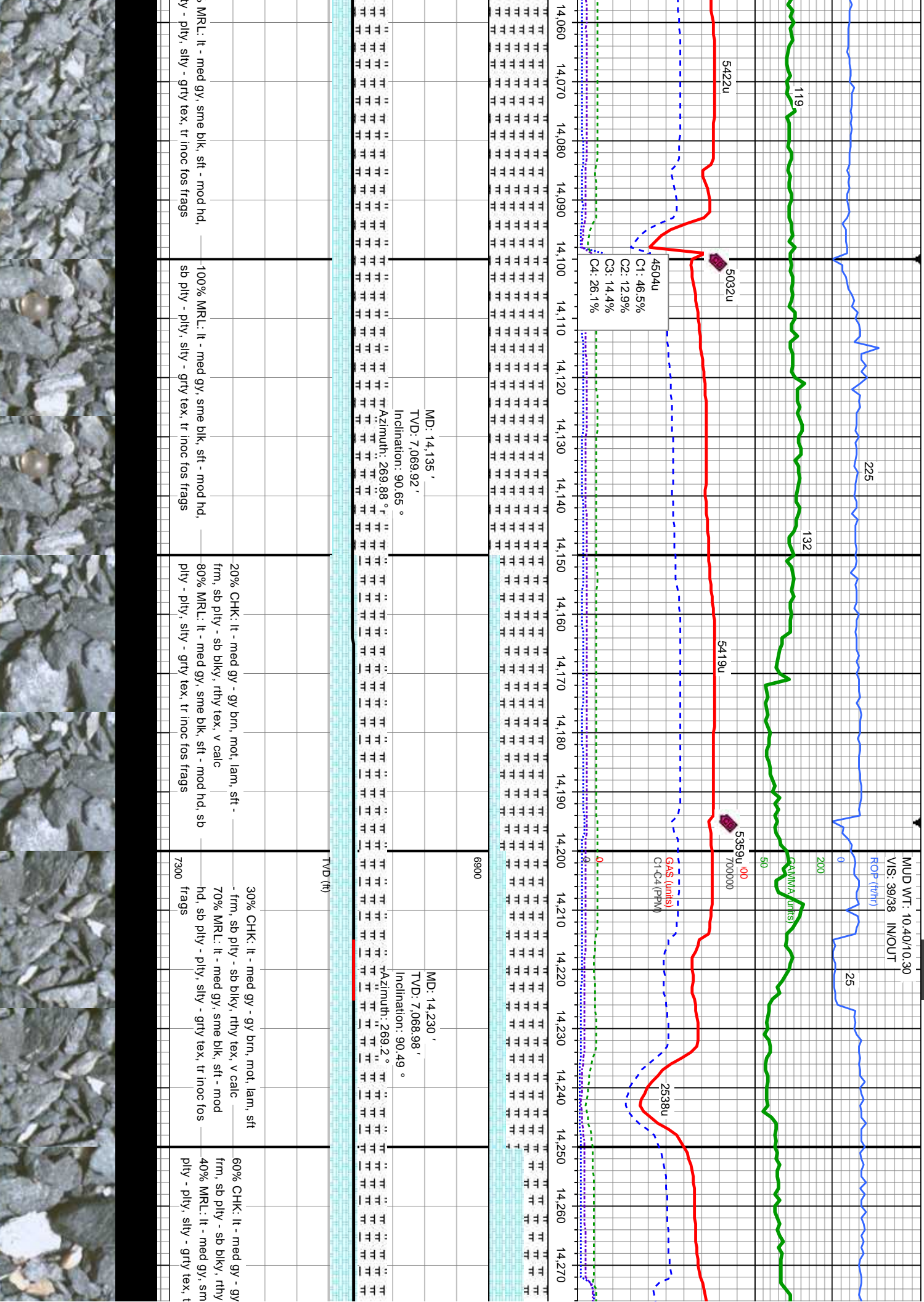
20% CHK: lt - med gy - gy brn, mot, lam, sft -
frm, sb pily - sb blk, rthy tex, v calc
80% MRL: lt - med gy, sme blk, sft - mod hd, sb
pily - pily, sily - grty tex, tr inoc fos frags

100% MRL: lt - med gy, sme blk, sft - mod hd,
sb pily - pily, sily - grty tex, tr inoc fos frags

100% MRL: lt - med gy, sme blk, sft - mod hd,
sb pily - pily, sily - grty tex, tr inoc fos frags

TVD (ft)

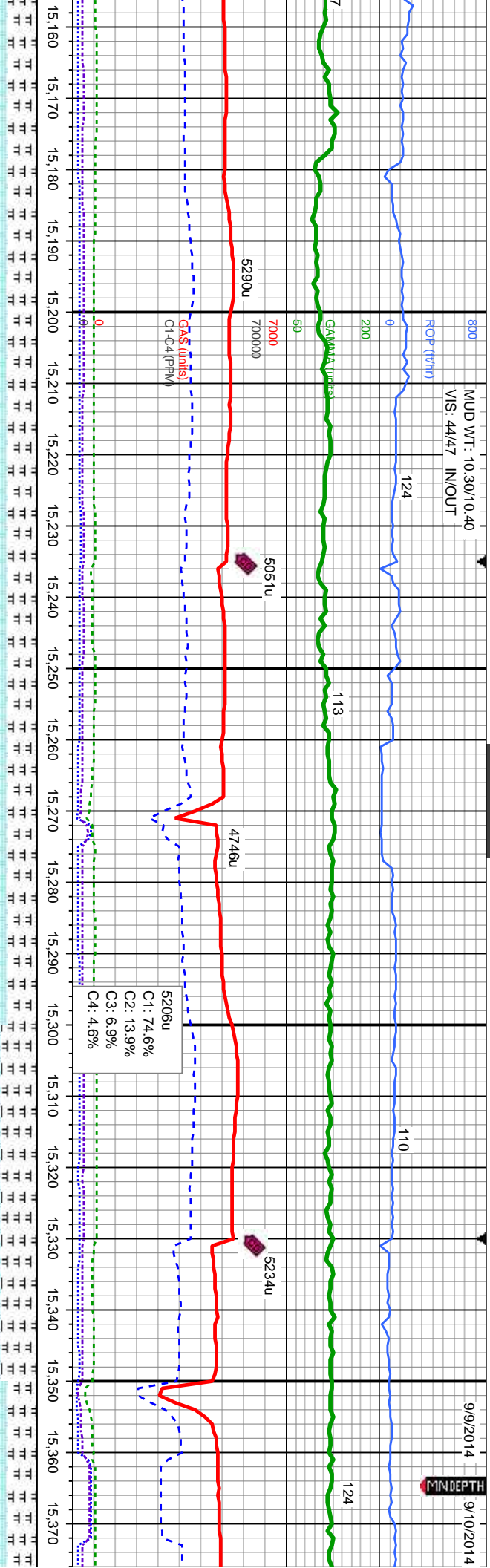




MUD WT: 10.30/10.40
VIS: 44/47 IN/OUT

9/9/2014 9/10/2014

MINDEPTH



MD: 15,178 '
TVD: 7,063.26 '
Inclination: 90.71 °

MD: 15,273 '
TVD: 7,063.1 '
Inclination: 89.48 °

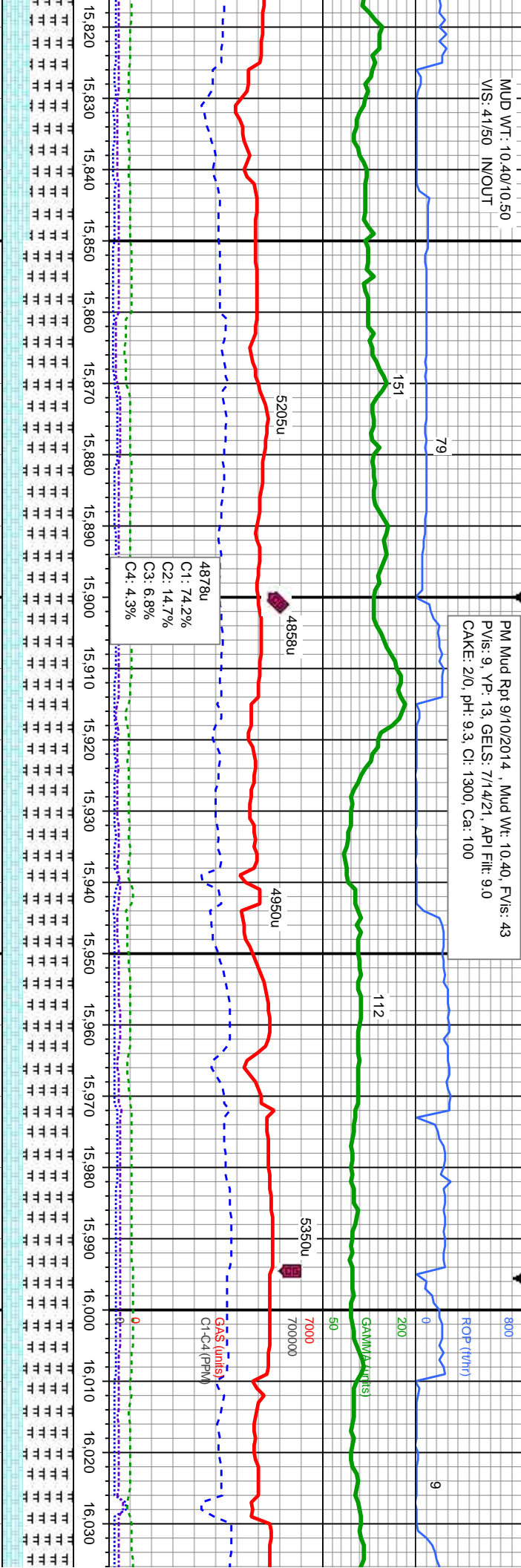
MD: 15,365 '
TVD: 7,063.33 '
Inclination: 89.48 °

60% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	60% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	50% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	60% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc
40% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - grty tex, tr inoc fos frags, pty, silty - grty tex, tr inoc fos frags	40% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - grty tex, tr inoc fos frags, calacte	50% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - grty tex, tr inoc fos frags	40% MRL: It - med gy, sme blk, sft - mod hd, sb pty - pty, silty - grty tex, tr inoc fos frags
7300 tr calacte			



MUD WT: 10.40/10.50
VIS: 41/60 IN/OUT

PM Mud Rpt 9/10/2014 , Mud Wt: 10.40, FV/s: 43
PV/s: 9, YP: 13, GEELS: 7/14/21, API Filtr: 9.0
CAKE: 2.0, pH: 9.3, CI: 1300, Ca: 100



MD: 15,842 '
TVD: 7,076.38 '
Inclination: 87.72 °

MD: 15,937 '
TVD: 7,078.83 '
Inclination: 89.32 °

MD: 16,032 '
TVD: 7,080.14 '
Inclination: 89 °

15,820 15,830 15,840 15,850 15,860 15,870 15,880 15,890 15,900 15,910 15,920 15,930 15,940 15,950 15,960 15,970 15,980 15,990 16,000 16,010 16,020 16,030

It - med gy - gy brn, mot, lam, sft sb blkly, rthy tex, v calc	30% CHK: It - med gy - gy brn, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc 70% MRL: It - med gy, sme blk, sft - mod hd, sb ply - ply, silty - grty tex, tr bent, tr inoc fos frags	30% CHK: It - med gy, sme llygy, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc 70% MRL: It - med gy, tr dk gy - blk, sft - hd, sb ply - ply, silty - grty tex, tr bent, occ inoc frag	30% CHK: It - med gy, sme llygy, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc 70% MRL: It - med gy, tr dk gy - blk, sft - hd, sb ply - ply, silty - grty tex, sme cal	7300 cal
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