



Scale: 5" / 100'  
Measured Depth Log

Well Name Oscar Y10-74HN HORZ

Location SEC 10 T2N R64W

State COLORADO

County WELD

Country USA

Rig Number H&P 315

API Number 05-123-38205

AFE # 200200

Region DJ BASIN

Field WATTENBERG

Spud Date 11/6/2014

Drilling Completed 11/13/2014

Surface Coordinates NWSE SEC 10 T2N R64W  
2,380' FSL; 2,023' FEL

LAT/LON: 40.15223/-104.53534

Bottom Hole Coordinates NWNE SEC 3 T2N R64W  
75' FNL; 1,980' FEL

Ground Elevation 4,923'

K.B. Elevation 4,947'

Logged Interval 6,177' To 12,678'

Total Depth 12,678'

Formation NIOBRARA B CHALK

Type of Drilling Fluid LSND

## Operator

Company Noble Energy Inc

Address 1625 BROADWAY SUITE 2200  
DENVER, CO 80202

## Geologist

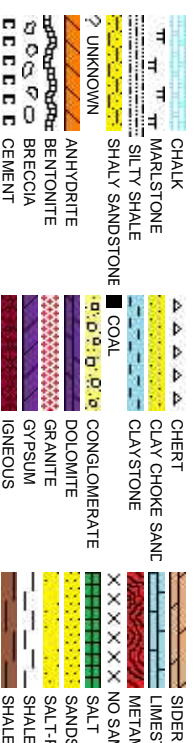
Name NATHAN MURPHY; MARK COLE

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
FISH	FERRUGINOUS PELLET
FORAMINIFERA	FERRUGINOUS
ANHYDRITIC	HEAVY MINERAL
FERRUGINOUS	INOCERAMUS
FERRUGINOUS	KAOLIN
FERRUGINOUS	MARLSTONE
FERRUGINOUS	MINERAL CRYSTALS
FERRUGINOUS	NODULES
FERRUGINOUS	PHOSPHATE PELLETS
FERRUGINOUS	PYRITE
FERRUGINOUS	SALT CAST
FERRUGINOUS	SANDY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
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FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	SILTY
FERRUGINOUS	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

# Porosity

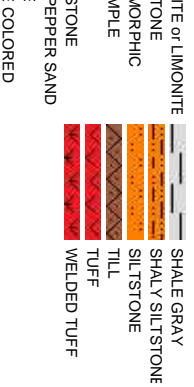
▼	CONNECTION (DOWN)
◀	CONNECTION (LEFT)
▶	CONNECTION (RIGHT)
⬇	CONNECTION GAS
⬆	CONNECTION GAS UP
⬇	CONNECTION GAS LEFT
⬆	CONNECTION GAS DOWN
⬇	INTERCRYSTALLINE
⬆	INTERFRACTURE
⬆	FRACTURE
⬆	FENESTRAL
⬆	E EARTHY
⬆	MOLDIC
⬆	CORE-LOST

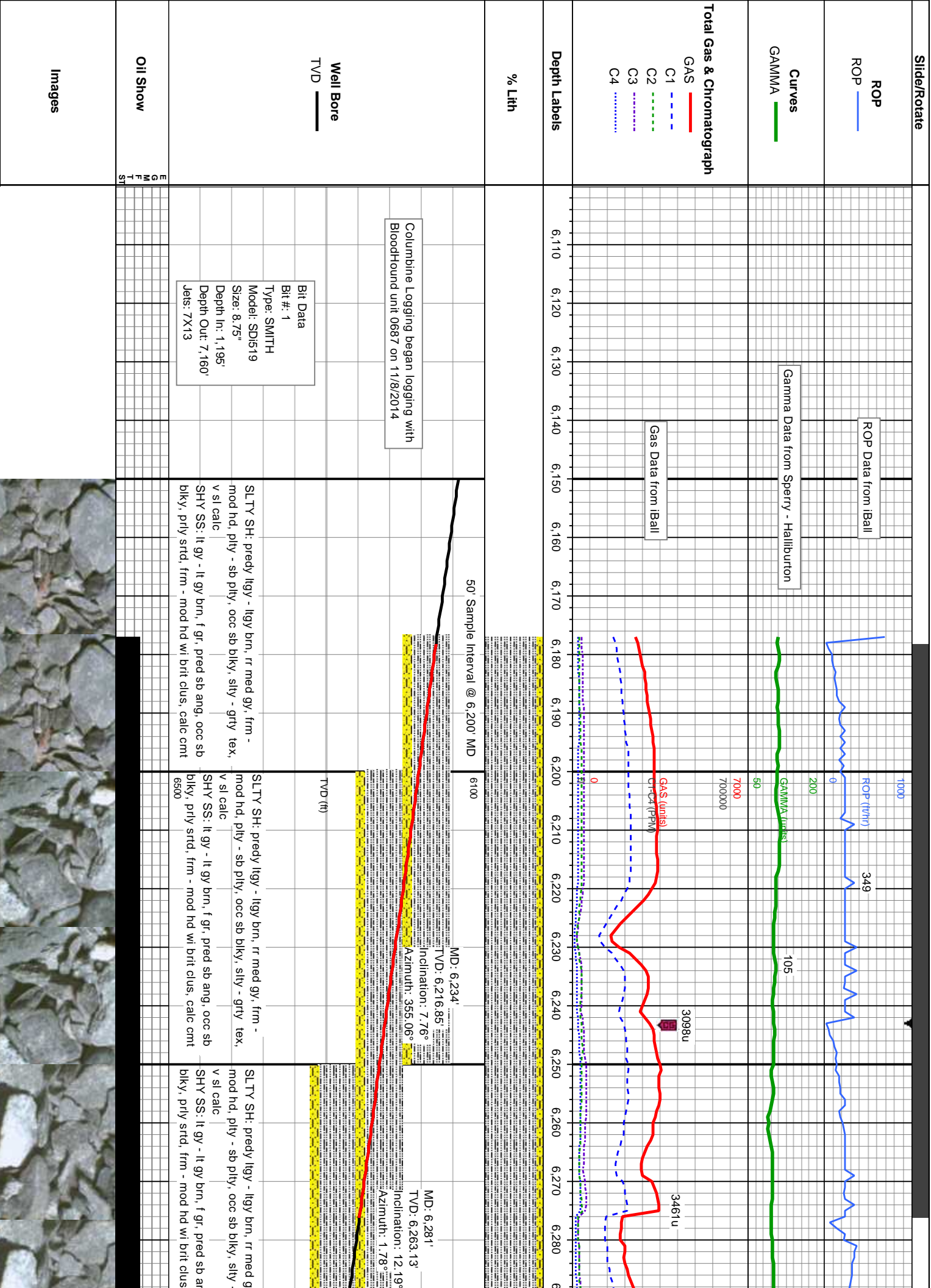
## Textures

☒ BS BOUNDSTONE

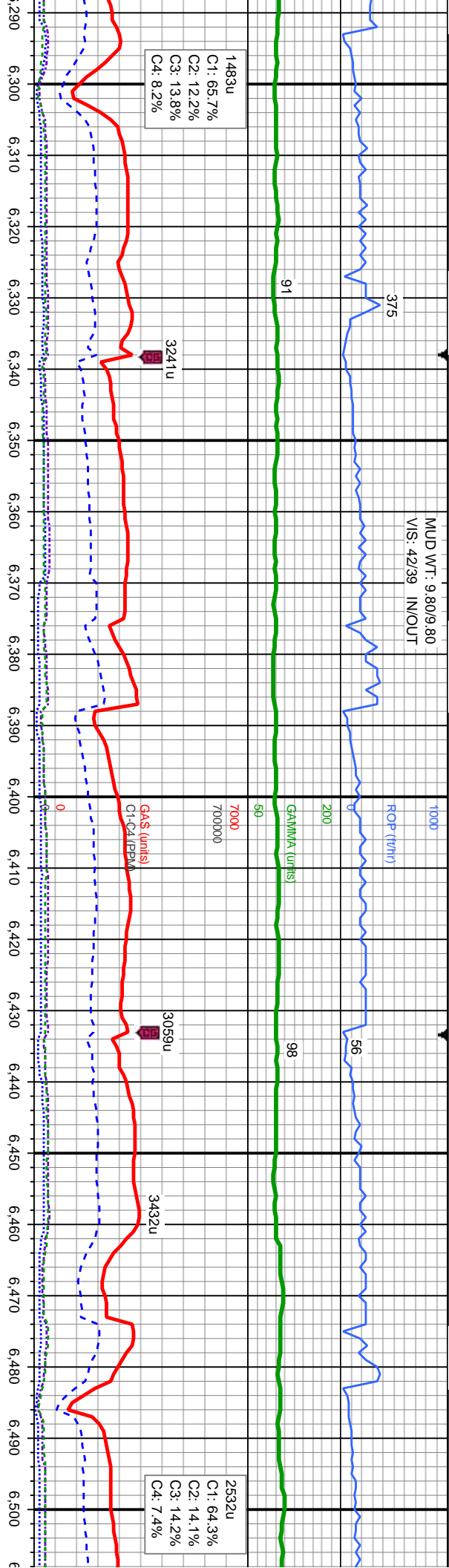
## Sorting

**PS** PACKSTONE  
**MS** WACKSTONE  
**Sorting**  
**M** MODERATE  
**P** POOR  
**W** WELL





MUD WT: 9.80/9.80  
VIS: 42/39 IN/OUT



1483u  
C1: 65.7%  
C2: 12.2%  
C3: 13.8%  
C4: 8.2%

2532u  
C1: 64.3%  
C2: 14.1%  
C3: 14.2%  
C4: 7.4%

SCALE CHANGE

MD: 6,329'  
TVD: 6,309.79'  
Inclination: 14.95°  
Azimuth: 8.92°

MD: 6,376'  
TVD: 6,354.85'  
Inclination: 18.01°  
Azimuth: 7.19°

MD: 6,424'  
TVD: 6,399.91'  
Inclination: 22.24°  
Azimuth: 8.9°

MD: 6,471'  
TVD: 6,442.69'  
Inclination: 26.62°  
Azimuth: 10.53°

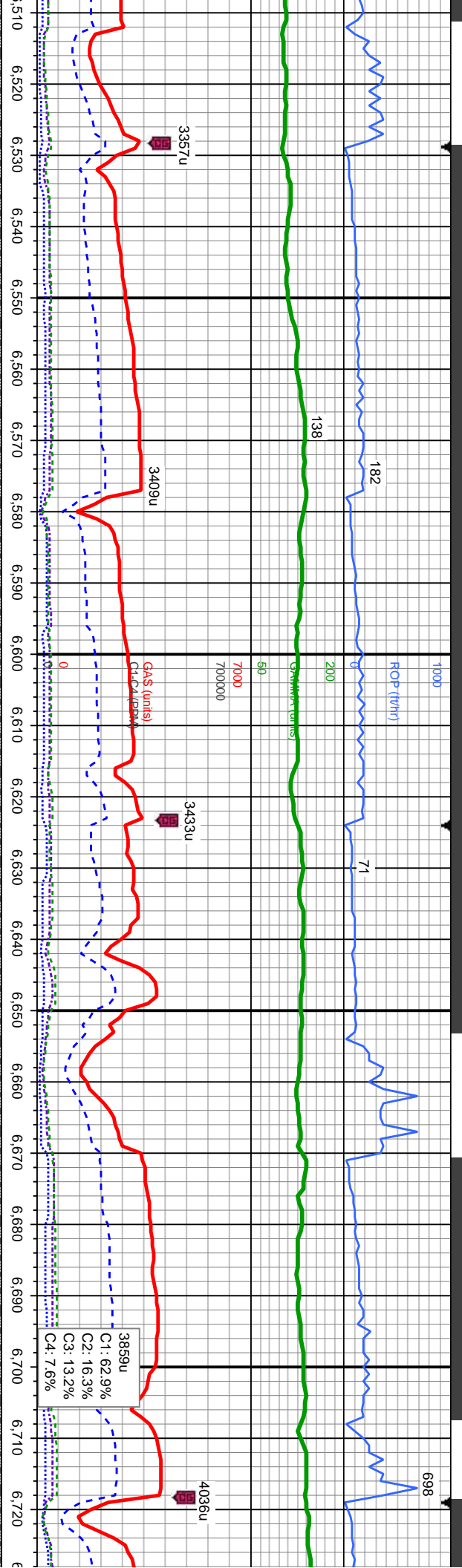
SLTY SH: predy llyg - llyg brn, rr med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, f gr, pred sb ang, occ sb  
blkly, prly strd, frm - mod hd wi brit clus, calc cmt

SLTY SH: predy llyg - llyg brn, occ med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, f gr, pred sb ang, occ sb  
blkly, prly strd, frm - mod hd wi brit clus, calc cmt

SLTY SH: predy llyg - llyg brn, rr med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, f gr, pred sb ang, occ sb  
blkly, prly strd, frm - mod hd wi brit clus, calc cmt

SLTY SH: predy llyg - llyg brn, rr med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc  
SHY SS: lt gy - lt gy brn, f gr, pred sb ang, occ sb  
blkly, prly strd, frm - mod hd wi brit clus, calc cmt

SLTY S  
mod hd  
v sl calc



MD: 6,519'  
TVD: 6,485.37'  
Inclination: 27.87°  
Azimuth: 5.29°

MD: 6,566'  
TVD: 6,526.09'  
Inclination: 32.02°  
Azimuth: 2.2°

MD: 6,661'  
TVD: 6,602.55'  
Inclination: 40.68°  
Azimuth: 357.22°

MD: 6,709'  
TVD: 6,637.79'  
Inclination: 44.81°  
Azimuth: 356.72°

SL TY SH: predy litgy - litgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, sily - grty tex, v sl calc

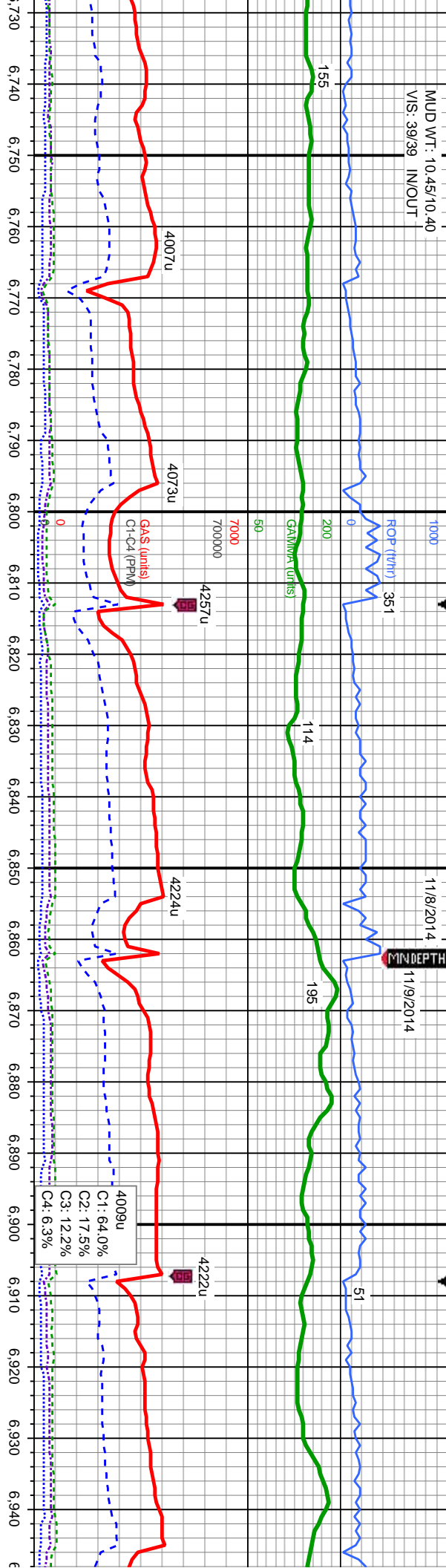
SL TY SH: predy litgy - litgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, sily - grty tex, v sl calc, tr bent

SL TY SH: predy litgy - litgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, sily - grty tex, v sl calc, tr bent

SL TY SH: predy litgy - litgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, sily - grty tex, v sl calc, tr bent



MUD WT: 10.45/10.40  
VIS: 39/39 IN/OUT



MD: 6,804'  
TVD: 6,701.18'  
Inclination: 51.58°  
Azimuth: 359.22°

MD: 6,850'  
TVD: 6,728.21'  
Inclination: 56.42°  
Azimuth: 358.9°

Sharon Springs Mkr @  
6,867 MD: 6,737' TVD

Nibbrara Top @  
6,938 MD: 6,771' TVD

MD: 6,756'  
TVD: 6,670.19'  
Inclination: 48.01°  
Azimuth: 358.04°

MD: 6,898'  
TVD: 6,752.94'  
Inclination: 61.52°  
Azimuth: 358.62°

MD: 6,945'  
TVD: 6,771.18'  
Inclination: 61.52°  
Azimuth: 358.62°

TVD (ft)

SLTY SH: predy litgy - litgy brn, sme med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc, abnt bent

SLTY SH: predy litgy - litgy brn, sme med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc, sme bent

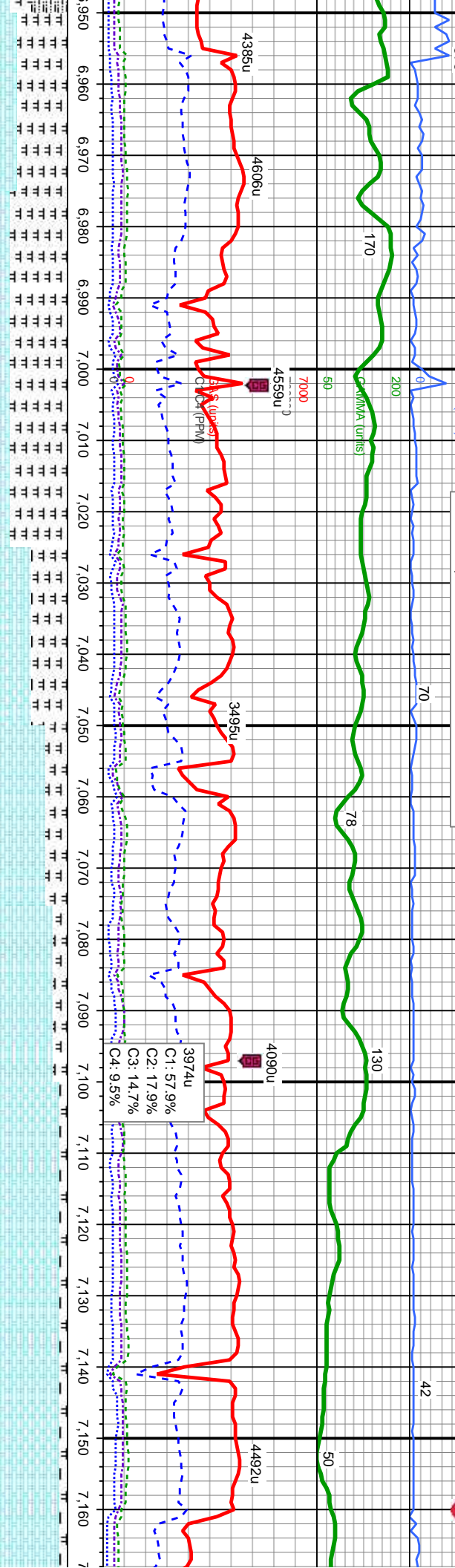
SLTY SH: predy litgy - litgy brn, sme med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc, tr bent

SLTY SH: predy litgy - litgy brn, sme med gy, frm -  
mod hd, pily - sb pily, occ sb blkly, sily - grty tex,  
v sl calc, sme bent  
MR: lt - med gy, rr blk, frm - mod hd, sb pily - sb  
blkly, sily - grty tex  
CHK: tan - litgy, mot wi wh, lam, v sft - frm, sb pily  
- sb blkly, rthy tex, v calc, tr bent, tr tos frag



AM Mud Rpt 11/9/2014 - Mud Wt: 10.50, FV/s: 40  
PV/s: 8, YP: 10, GELS: 5/15/21, API Filtr: 9.5  
CAKE: 2/0, pH: 8.9, CI: 1,700, Ca: 80

11/9/2014  
11/1/0/2  
MINDEPTH



Nio A Marl Top @  
6,958 MD: 6,779 TVD

Nio B Chalk Top @  
7,008 MD: 6,798 TVD

73.89  
n: 65.52°  
358.82°

MD: 7,040'  
TVD: 6,808.67'  
Inclination: 71.51°  
Azimuth: 357.88°

MD: 7,102'  
TVD: 6,825.68'  
Inclination: 76.63°  
Azimuth: 359.37°

TOOH @ 7,160 MD  
to run 7" casing

Bit Dat  
Bit #: 2  
Type: S  
Model: S  
Size: 6  
Depth 1  
Depth 6  
Jets: 5

MRL: lt - med gy, rr blk, frm - mod hd, sb pty -  
sb blkly, silty - grty tex  
CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb  
pty - sb blkly, rthy tex, v calc, sme bent, tr fos  
frag

MRL: lt - med gy, rr blk, frm - mod hd, sb pty -  
sb blkly, silty - grty tex  
CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb  
pty - sb blkly, rthy tex, v calc, abnt bent, tr fos  
frag

CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb  
pty - sb blkly, rthy tex, v calc  
MRL: lt - med gy, rr blk, frm - mod hd, sb pty -  
sb blkly, silty - grty tex, abnt bent, tr fos frag

CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb  
pty - sb blkly, rthy tex, v calc  
MRL: lt - med gy, rr blk, frm - mod hd, sb pty -  
sb blkly, silty - grty tex, abnt bent, tr fos frag

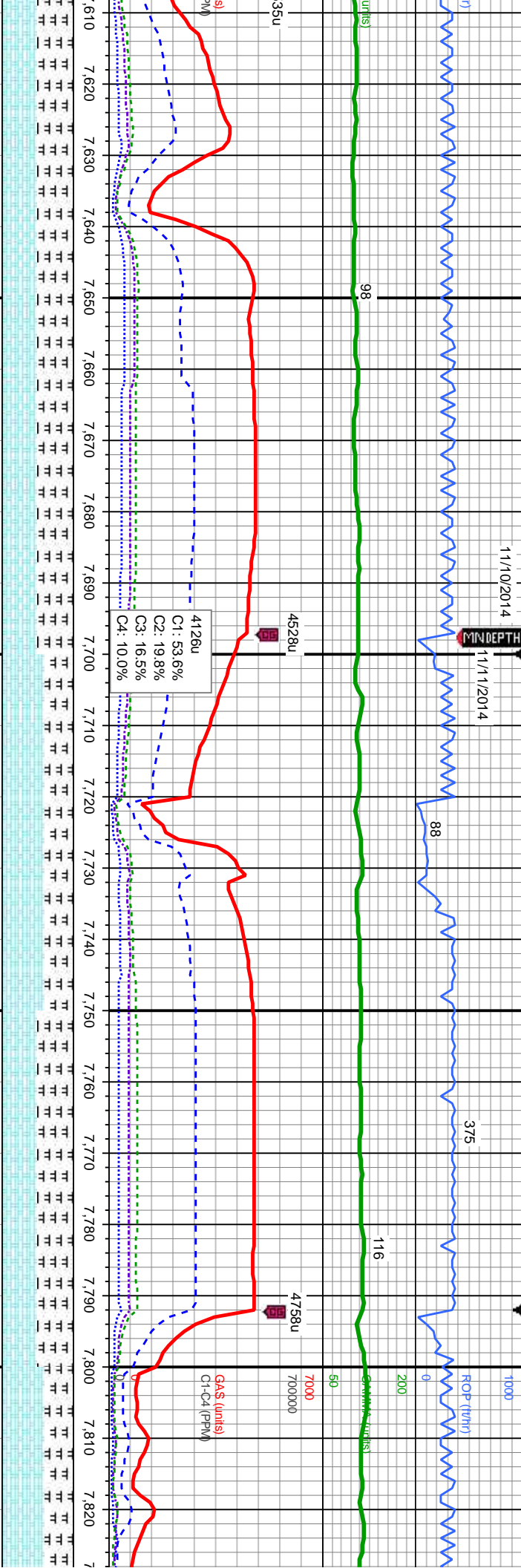
90% CHK: tan - ltgy  
sb pty - sb blkly, r  
10% MRL: lt - med  
- sb blkly, silty - grty



PM Mud Rpt 11/10/2014 , Mud Wt: 9.35, FVis: 34  
PVis: 4, YP: 1, GELS: 1/2/3, API Fil: 13.5

[illegible]



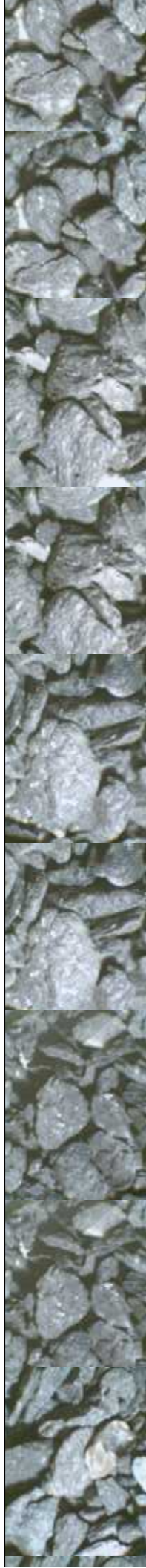


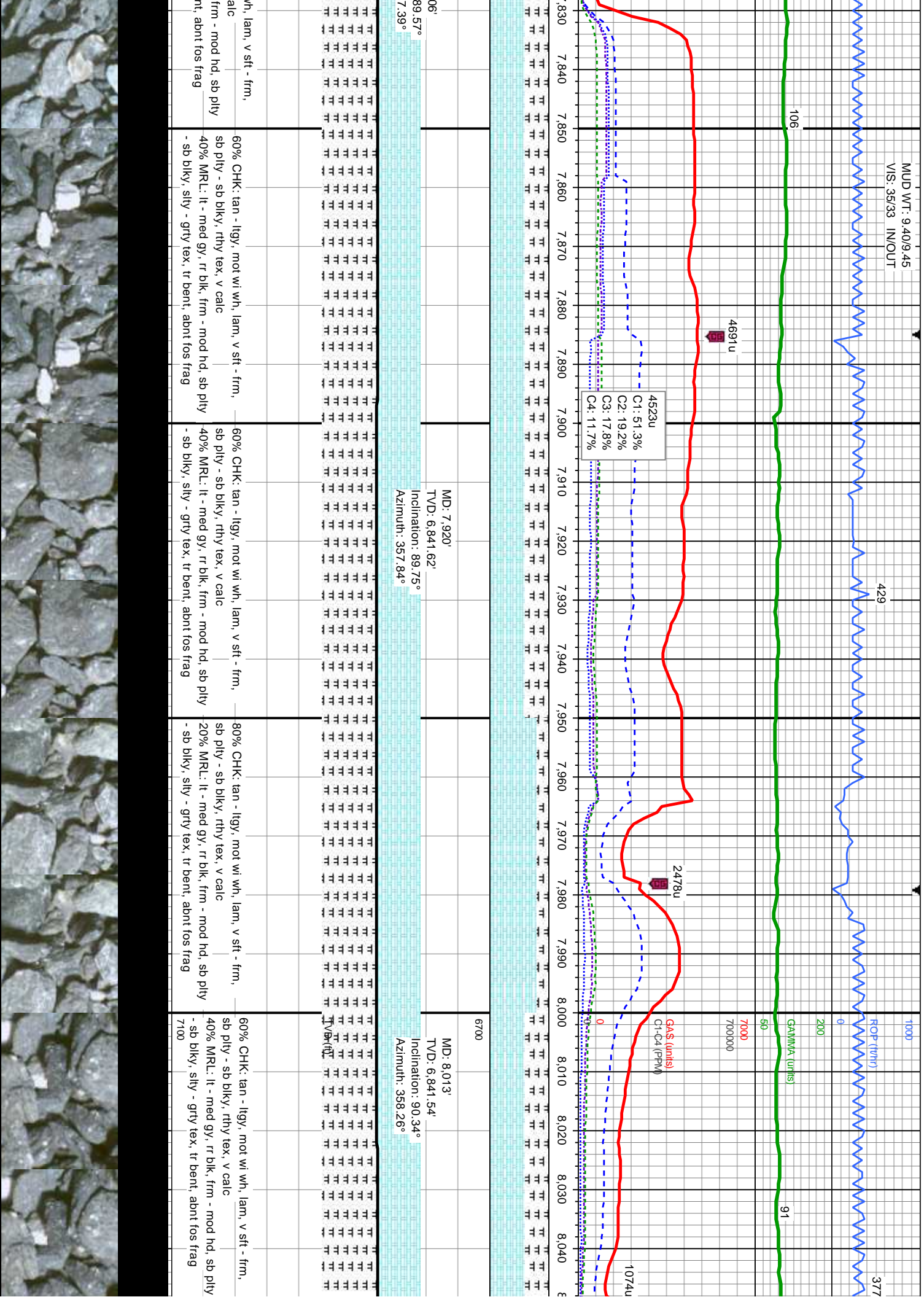
MD: 7.638'  
TVD: 6,840.86'  
Inclination: 90.12°  
Azimuth: 0.03°

MD: 7.733'  
TVD: 6,840.73'  
Inclination: 90.03°  
Azimuth: 358.6°

MD: 7.826'  
TVD: 6,841.1'  
Inclination: 90.03°  
Azimuth: 358.6°

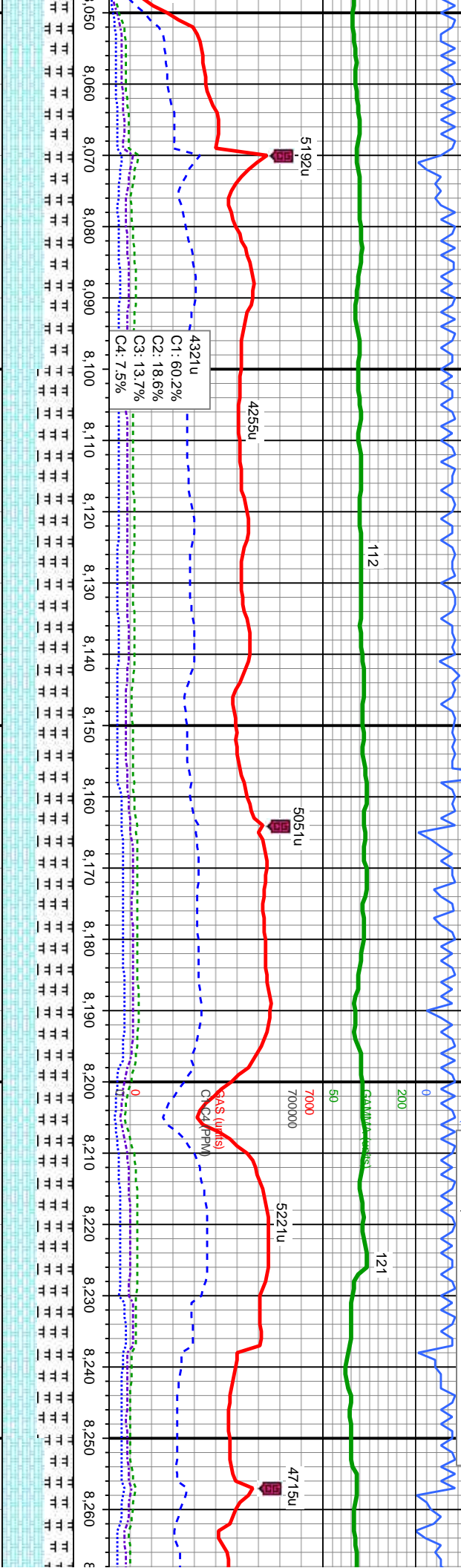
K: tan - lly, mot wi wh, lam, v sft - frm, sb blk, rthy tex, v calc		50% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb blk, rthy tex, v calc	60% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb blk, rthy tex, v calc	50% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb blk, rthy tex, v calc	60% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb blk, rthy tex, v calc
L: it - med gy, rr blk, frm - mod hd, sb ply		50% MRL: it - med gy, rr blk, frm - mod hd, sb ply	40% MRL: it - med gy, rr blk, frm - mod hd, sb ply	50% MRL: it - med gy, rr blk, frm - mod hd, sb ply	40% MRL: it - med gy, rr blk, frm - mod hd, sb ply
/ sly - grty tex, tr bent, abnt fos frag		- sb blk, sly - grty tex, tr bent, abnt fos frag	- sb blk, sly - grty tex, tr bent, abnt fos frag	- sb blk, sly - grty tex, tr bent, abnt fos frag	- sb blk, sly - grty tex, tr bent, abnt fos frag





MUD WT: 9.40/9.45  
VIS: 40/38 IN/OUT

AM Mud Rpt 11/11/2014 , Mud Wt: 9.40, FV/s: 40  
PV/s: 9, YP: 6, GELS: 48/10, API Filtr: 8.6  
ROF Fil: CAKE: 2/0, pH: 10.8, Cl: 1.300, Ca: 80



MD: 8,106'  
TVD: 6,840.94'  
Inclination: 90.4°  
Azimuth: 358.58°

MD: 8,198'  
TVD: 6,840.65'  
Inclination: 89.97°  
Azimuth: 357.98°

60% CHK: tan - ilgy, mot wl wh, lam, v sft - frm, sb pty - sb blk, rthy tex, v calc	50% CHK: tan - ilgy, mot wl wh, lam, v sft - frm, sb pty - sb blk, rthy tex, v calc	50% CHK: tan - ilgy, mot wl wh, lam, v sft - frm, sb pty - sb blk, rthy tex, v calc	60% CHK: tan - ilgy, mot wl wh, lam, v sft - frm, sb pty - sb blk, rthy tex, v calc
40% MRL: lt - med gy, rr blk, frm - mod hd, sb pty	50% MRL: lt - med gy, rr blk, frm - mod hd, sb pty	50% MRL: lt - med gy, rr blk, frm - mod hd, sb pty	40% MRL: lt - med gy, rr blk, frm - mod hd, sb pty
- sb blk, silty - grty tex, tr bent, abnt fos frag	- sb blk, silty - grty tex, tr bent, abnt fos frag	- sb blk, silty - grty tex, tr bent, abnt fos frag	- sb blk, silty - grty tex, tr bent, abnt fos frag







40/9.45  
IN/OUT

350

1000  
ROP (ft/hr)

MUD WT: 9.45/9.40  
VIS: 38/40 IN/OUT

79

200  
GAMMA (units)

7000  
C1-C4 (PPM)

64

ERRATIC GAS DATA FROM ATTEMPT

3580u

4417u

3666u

4722u

GAS LINE FROZEN

2816u

C1: 43.3%

C2: 18.6%

C3: 21.1%

C4: 16.9%

MD: 8,751'  
TVD: 6,838.48'  
Inclination: 89.82°  
Azimuth: 357.48°

MD: 8,844'  
TVD: 6,839.28'  
Inclination: 89.2°  
Azimuth: 358.1°

6700

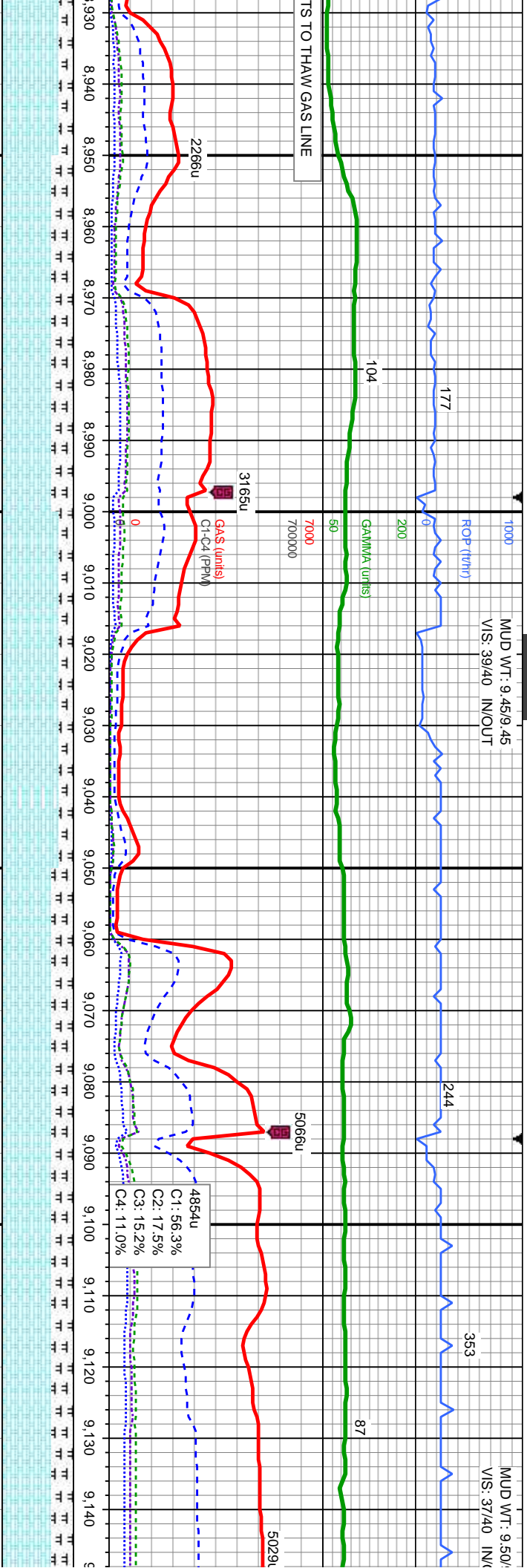
tan - lgy, mot wi wh, lam, v sft - frm,  
sb blk, rthy tex, v calc  
It - med gy, r blk, frm - mod hd, sb ply  
y, silty - grty tex, tr bent, abnt fos frag

90% CHK: tan - lgy, mot wi wh, lam, v sft - frm,  
sb ply - sb blk, rthy tex, v calc  
10% MRL: It - med gy, r blk, frm - mod hd, sb ply  
- sb blk, silty - grty tex, sme bent, abnt fos frag

90% CHK: tan - lgy, mot wi wh, lam, v sft - frm,  
sb ply - sb blk, rthy tex, v calc  
10% MRL: It - med gy, r blk, frm - mod hd, sb ply  
- sb blk, silty - grty tex, sme bent, abnt fos frag

80% CHK: tan - lgy, mot wi wh, lam, v sft - frm,  
sb ply - sb blk, rthy tex, v calc  
20% MRL: It - med gy, r blk, frm - mod hd, sb ply  
- sb blk, silty - grty tex, sme bent, abnt fos frag





MD: 8.936'  
VD: 6.839.99'  
Inclination: 89.91°  
Azimuth: 357.31°

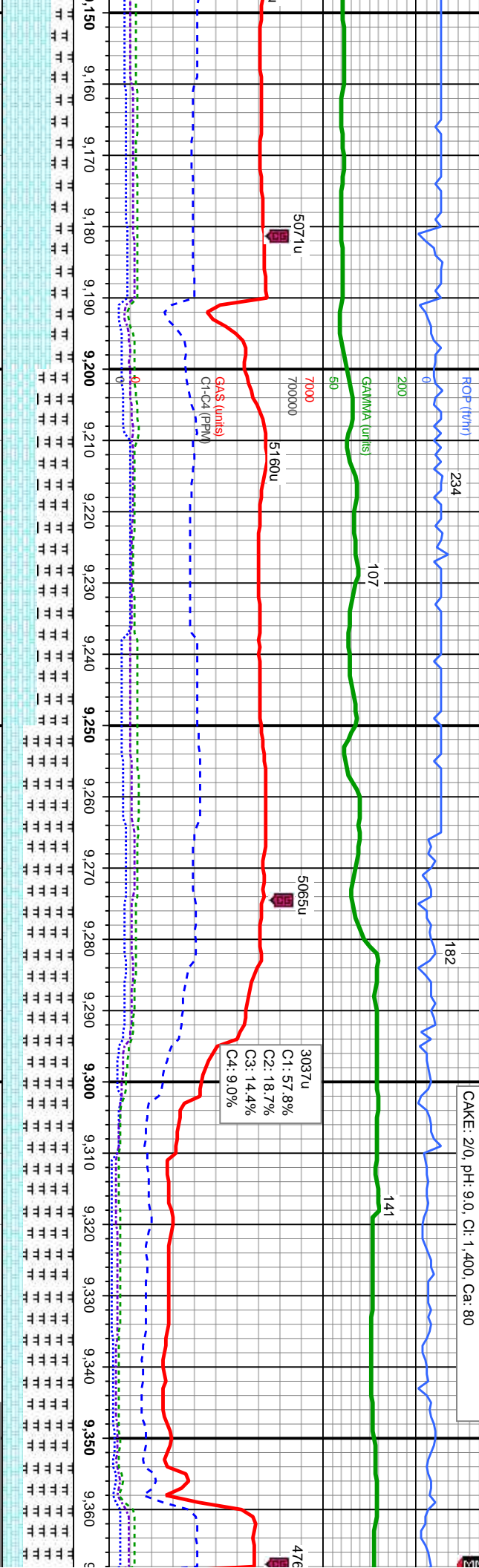
MD: 9.030'  
TVD: 6.840.62'  
Inclination: 89.32°  
Azimuth: 359.1°

MD: 9.123'  
TVD: 6.841.75'  
Inclination: 89.29°  
Azimuth: 359.2°

70% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	80% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	70% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	70% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, silty - grty tex, sme bent, abnt fos frag	20% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, silty - grty tex, sme bent, abnt fos frag	30% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, silty - grty tex, sme bent, abnt fos frag	30% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, silty - grty tex, sme bent, abnt fos frag
7100	7100		



PM Mud Rpt 11/11/2014 , Mud Wt: 9.55, FVis: 41  
PVis: 9, YP: 8, GEIS: 4/8/11, API Filtr: 7.9  
CAKE: 2/0, pH: 9.0, Cl: 1,400, Ca: 80



MD: 9.216'  
TVD: 6,842.77'  
Inclination: 89.45°  
Azimuth: 359.03°

MD: 9.309'  
TVD: 6,843.7'  
Inclination: 89.41°  
Azimuth: 358.74°

TOOH @ 9.368' MD TO  
CHANGE OUT BHA

70% CHK: tan - llyg, mot wi wh, lam, v sft - frm, sb pily - sb blkly, rthy tex, v calc 30% MRL: lt - med gy, rr blk, frm - mod hd, sb pily - sb blkly, silty - grty tex, v tr bent, abnt fos frag	50% CHK: tan - llyg, mot wi wh, lam, v sft - frm, sb pily - sb blkly, rthy tex, v calc 50% MRL: lt - med gy, rr blk, frm - mod hd, sb pily - sb blkly, silty - grty tex, v tr bent, abnt fos frag	30% CHK: tan - llyg, mot wi wh, lam, v sft - frm, sb pily - sb blkly, rthy tex, v calc 70% MRL: lt - med gy, rr blk, frm - mod hd, sb pily - sb blkly, silty - grty tex, tr bent, abnt fos frag	30% CHK: tan - llyg, mot wi wh, lam, v sft - frm, sb pily - sb blkly, rthy tex, v calc 70% MRL: lt - med gy, rr blk, frm - mod hd, sb pily - sb blkly, silty - grty tex, tr bent, abnt fos frag	30% CHK: tan - llyg, mot wi wh, lam, v sft - frm, sb pily - sb blkly, rthy tex, v calc 70% MRL: lt - med gy, rr blk, frm - mod hd, sb pily - sb blkly, silty - grty tex, tr bent, abnt fos frag
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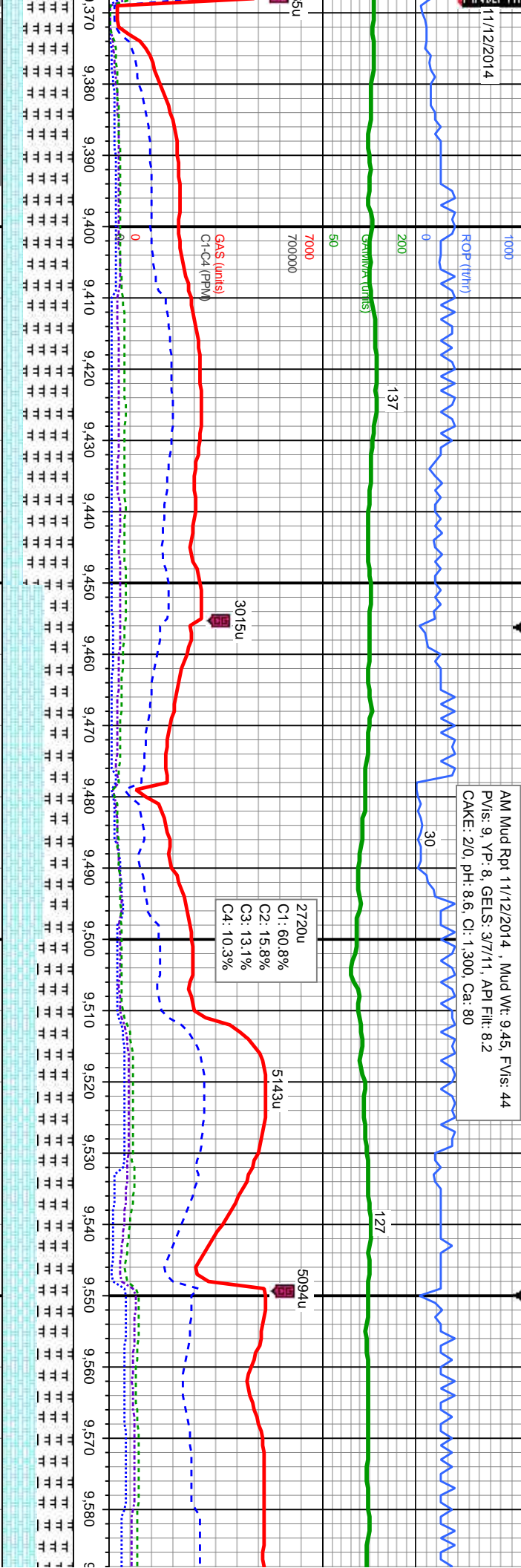


11/12/2014

AM Mud Rpt 11/12/2014 , Mud Wt: 9.45, FV/s: 44

PV/s: 9, YP: 8, GELS: 3.7/11, API Filtr: 8.2

CAKE: 2/0, pH: 8.6, CI: 1.300, Ca: 80



Bit Data  
Type: REED/HYCALOG  
Model: SKH1513M  
Size: 6.12"  
Depth In: 9.368'  
Jets: 5X14

MD: 9.401'  
TVD: 6.844.62  
Inclination: 89.45°  
Azimuth: 358.53°

MD: 9.493'  
TVD: 6.844.86  
Inclination: 90.25°  
Azimuth: 359.33°

MD: 9.585'  
TVD: 6.844.3  
Inclination: 90.25°  
Azimuth: 355.33°

30% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
70% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag  
7100

30% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
70% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag  
7100

60% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

60% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

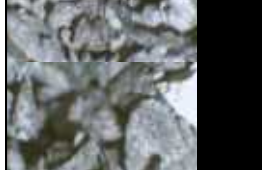
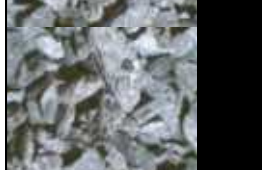
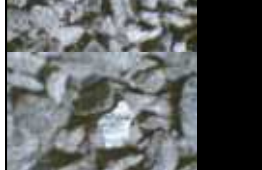
50% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
50% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

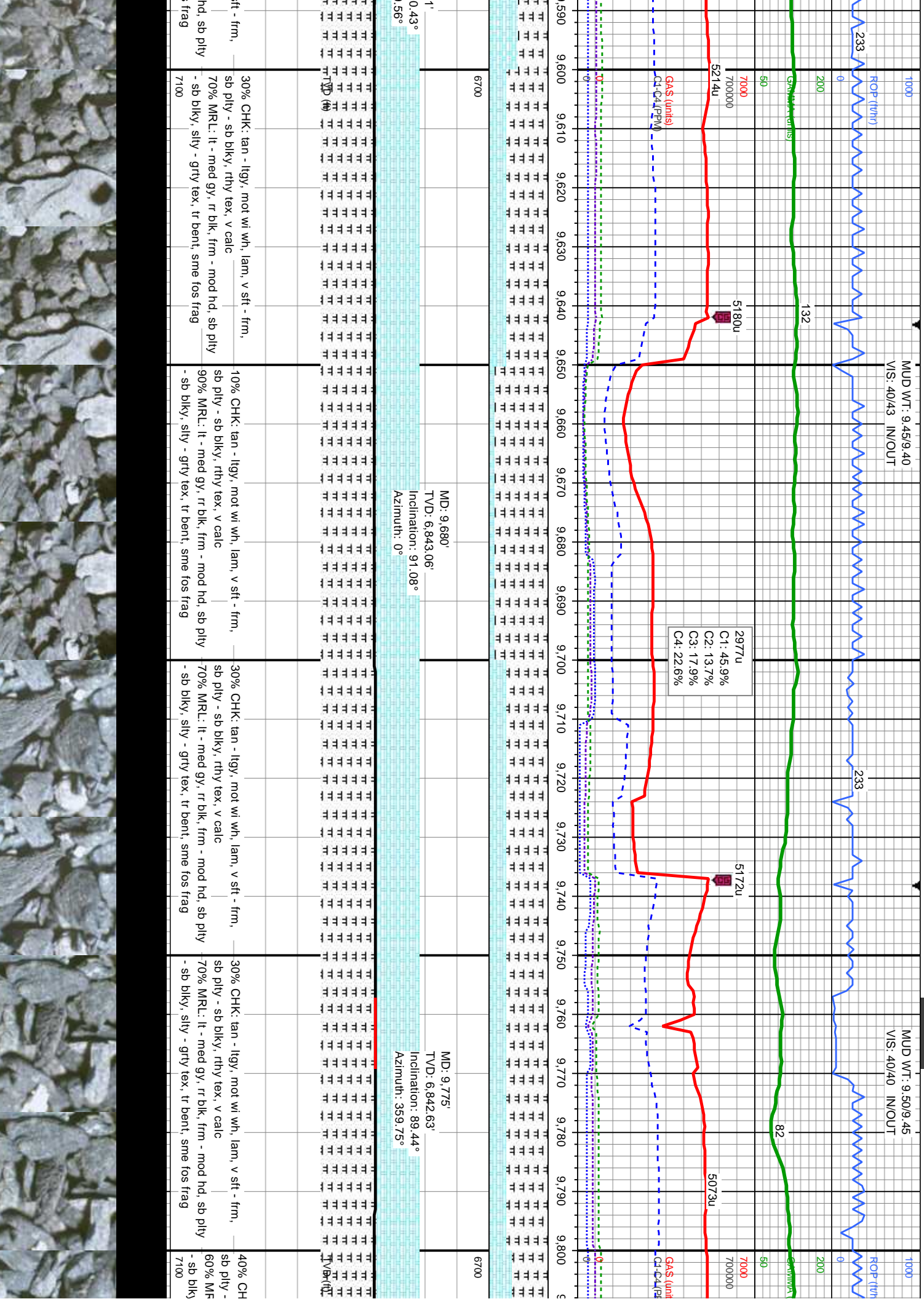
50% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
50% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

50% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
50% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

50% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
50% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag

50% CHK: tan - llgy, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc  
50% MRL: lt - med gy, rr blk, frm - mod hd, sb ply - sb blk, sily - grty tex, tr bent, sme fos frag



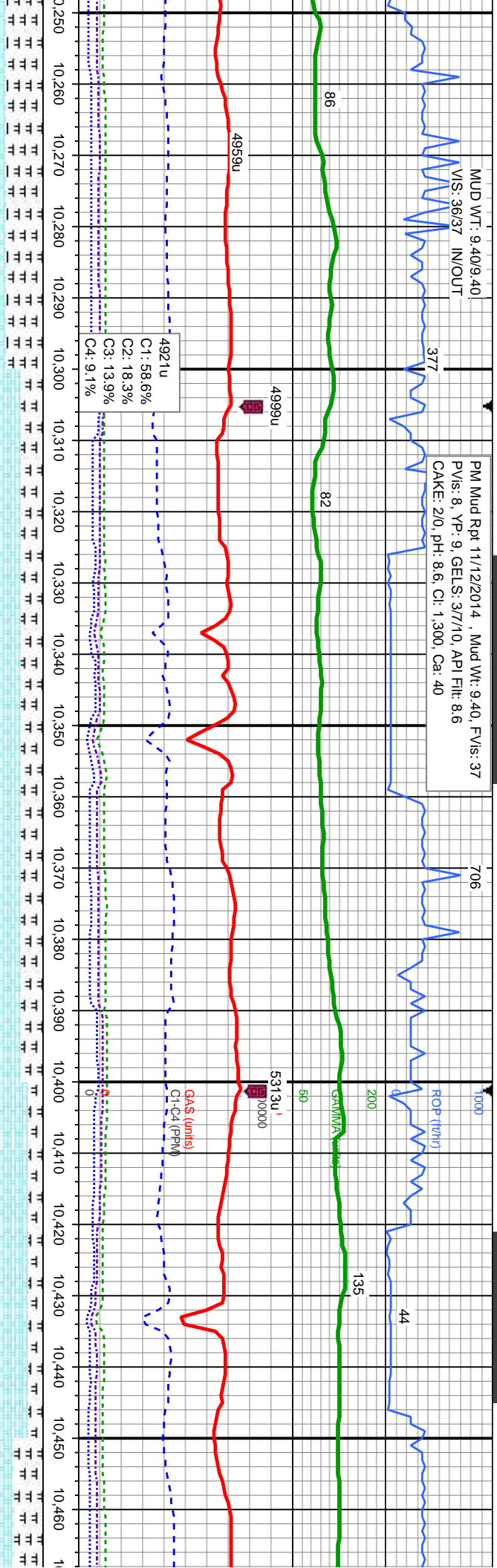






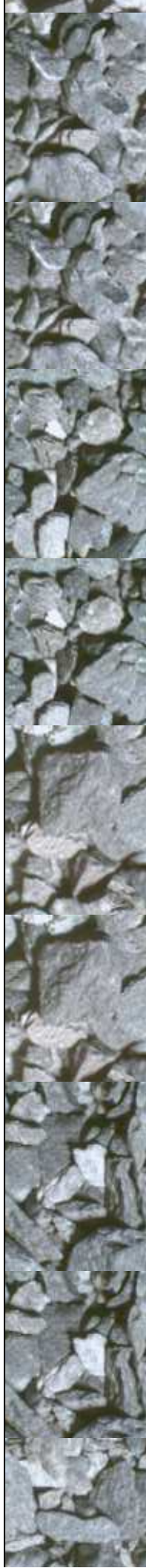
MUD WT: 9.40/9.40  
VS: 36/37 IN/OUT

PM Mud Rpt 11/12/2014 , Mud Wt: 9.40, FV/s: 37  
PV/s: 8, YP: 9, GELS: 3.7/10, API Filtr: 8.6  
CAKE: 2/0, pH: 8.6, CI: 1,300, Ca: 40



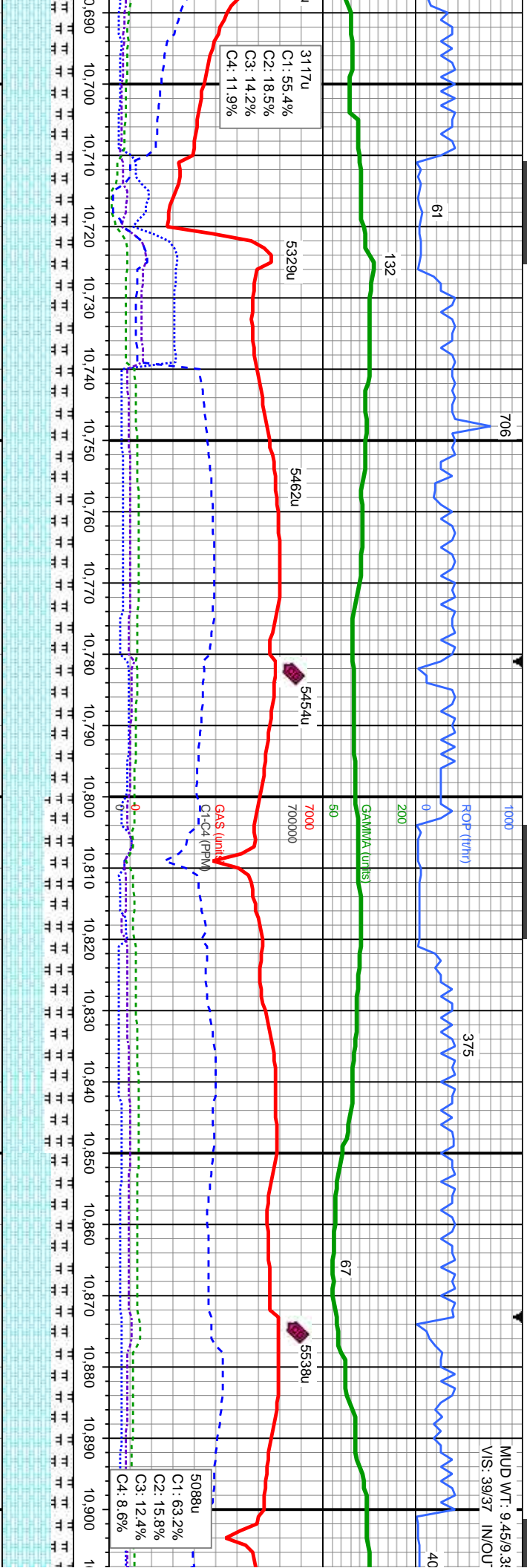
149' 39'	MD: 10.344' TVD: 6,834.76' Inclination: 91.91° Azimuth: 359.91°	6700	MD: 10.439' TVD: 6,832.77' Inclination: 90.49° Azimuth: 0.7°
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50% CHK: tan - lgy, mot w/ wh, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 50% MRL: lt - med gy, r blk, frm - mod hd, sb pily - sb blk, silty - grty tex, tr bent, sme fos frag	70% CHK: tan - lgy, mot w/ wh, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 30% MRL: lt - med gy, r blk, frm - mod hd, sb pily - sb blk, silty - grty tex, tr bent, sme fos frag	70% CHK: tan - lgy, mot w/ wh, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 30% MRL: lt - med gy, r blk, frm - mod hd, sb pily - sb blk, silty - grty tex, tr bent, sme fos frag	80% CHK: tan - lgy, mot w/ wh, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 20% MRL: lt - med gy, r blk, frm - mod hd, sb pily - sb blk, silty - grty tex, sme bent, sme fos frag	60% CHK: tan - lgy, mot w/ wh, lam, v sft - frm, sb pily - sb blk, rthy tex, v calc 40% MRL: lt - med gy, r blk, frm - mod hd, sb pily - sb blk, silty - grty tex, sme bent, sme fos frag
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MUD WT: 9.45/9.34  
VIS: 39/37 IN/OUT

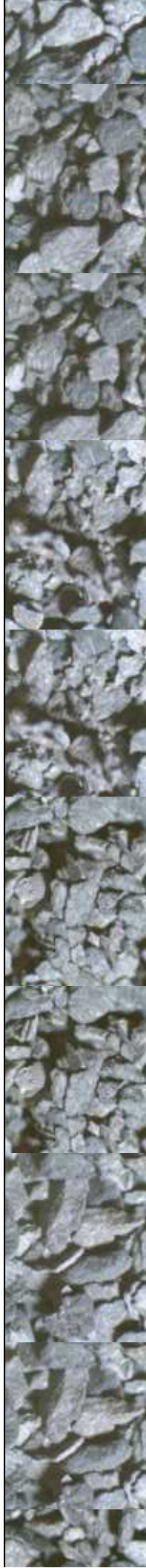


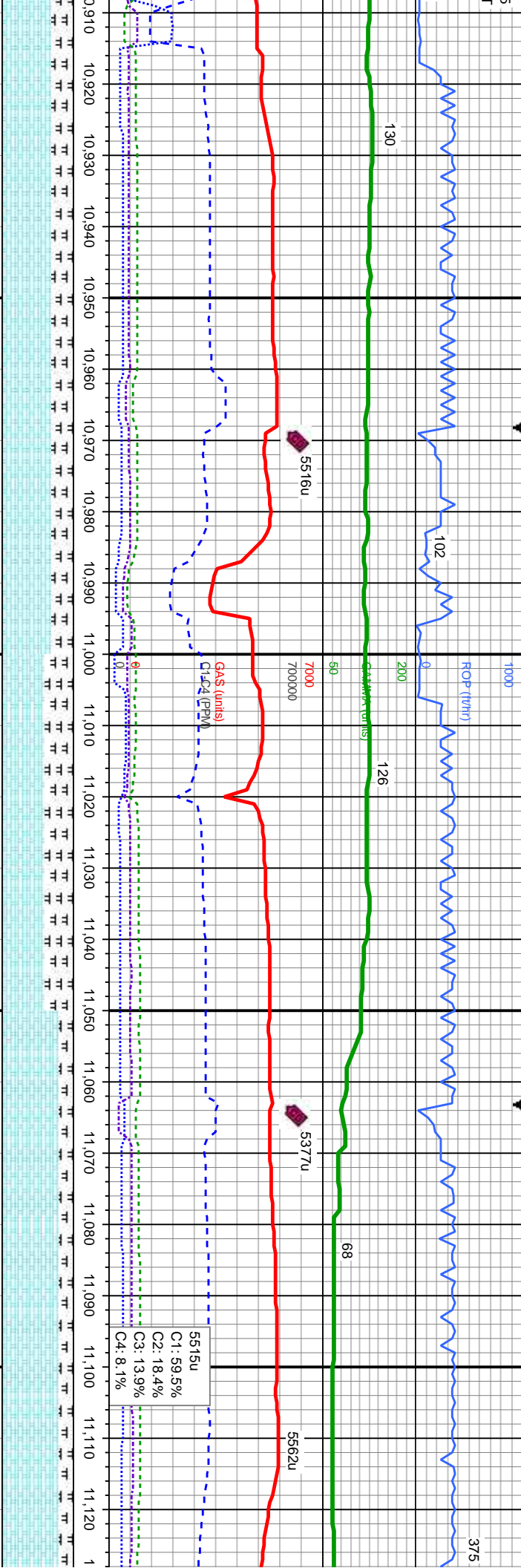
MD: 10.724'  
TVD: 6,832.98'  
Inclination: 90.34°  
Azimuth: 0.56°

MD: 10.818'  
TVD: 6,832.86'  
Inclination: 89.81°  
Azimuth: 0.12°

MD: 10.818'  
TVD: 6,832.86'  
Inclination: 89.81°  
Azimuth: 0.12°

ft - frm,	70% CHK: tan - lgy, mot wi wh, lam, v sft - frm,	60% CHK: tan - lgy, mot wi wh, lam, v sft - frm,	70% CHK: tan - lgy, mot wi wh, lam, v sft - frm,	70% Ch
sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply -
30% MRL: lt - med gy, r blk, frm - mod hd, sb ply	30% MRL: lt - med gy, r blk, frm - mod hd, sb ply	40% MRL: lt - med gy, r blk, frm - mod hd, sb ply	30% MRL: lt - med gy, r blk, frm - mod hd, sb ply	30% Mf
- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk,

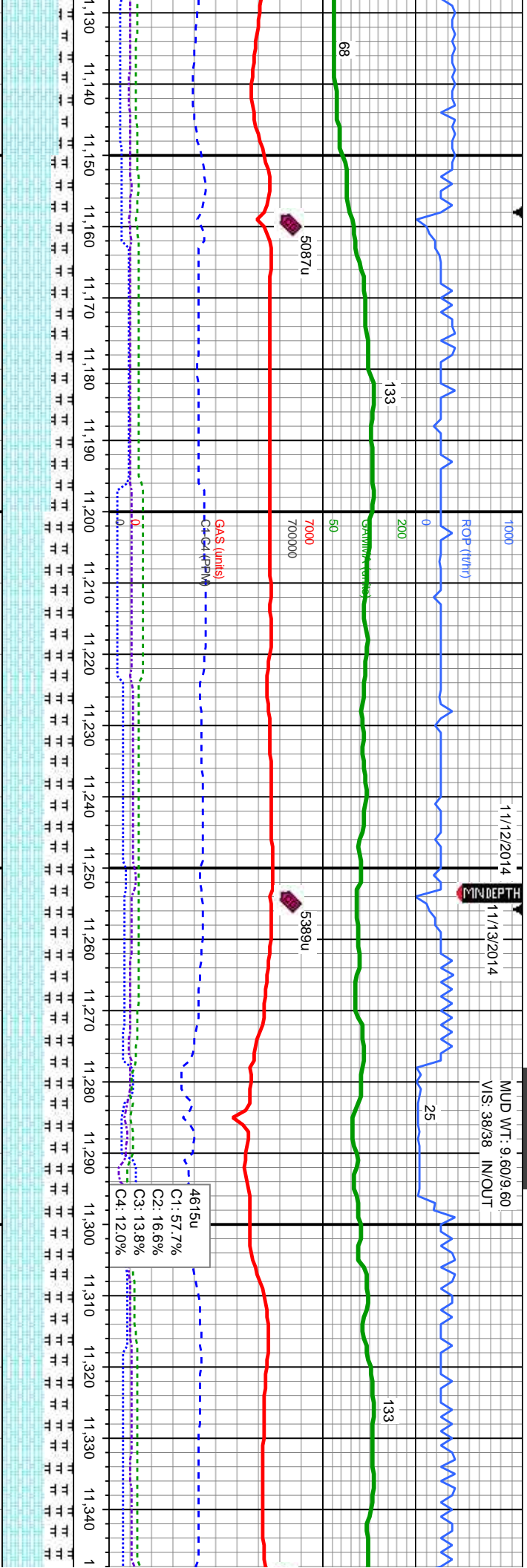




10,913'	MD: 11,008'	MD: 11,103'
6,833.73'	TVD: 6,835.24'	TVD: 6,837.08'
Inclination: 89.14°	Inclination: 89.04°	Inclination: 88.74°
uth: 359.88°	Azimuth: 359.65°	Azimuth: 359.04°

tan - lly, mot wi wh, lam, v sft - frm,	70% CHK: tan - lly, mot wi wh, lam, v sft - frm,	60% CHK: tan - lly, mot wi wh, lam, v sft - frm,	80% CHK: tan - lly, mot wi wh, lam, v sft - frm,	80% CHK: tan - lly, mot wi wh, lam, v sft - frm,
sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc	sb ply - sb blk, rhy tex, v calc
lt: lt - med gy, rr blk, frm - mod hd, sb ply	30% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	20% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	20% MRL: lt - med gy, rr blk, frm - mod hd, sb ply
stly - grty tex, sme bent, tr fos frag	- sb blk, stly - grty tex, sme bent, tr fos frag	- sb blk, stly - grty tex, tr bent, tr fos frag	- sb blk, stly - grty tex, tr bent, tr fos frag	- sb blk, stly - grty tex, tr bent, tr fos frag





MD: 11,198'  
TVD: 6,837.87  
Inclination: 90.31°  
Azimuth: 358.42°

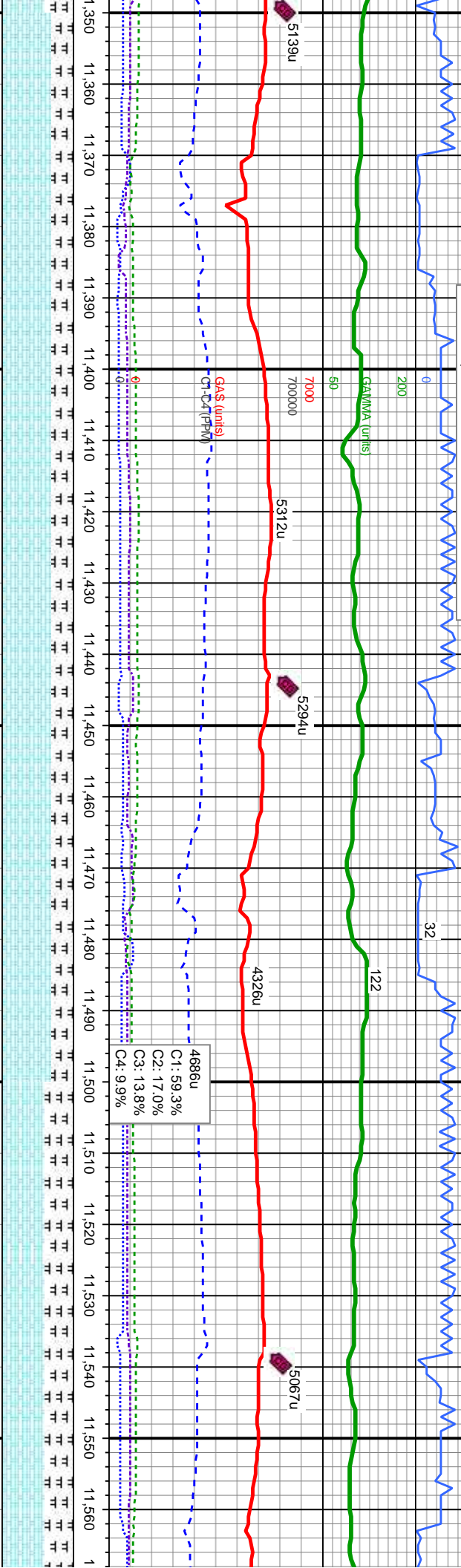
MD: 11,293'  
TVD: 6,838.02  
Inclination: 89.51°  
Azimuth: 358.15°

70% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	60% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	60% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc	60% CHK: tan - lly, mot wi wh, lam, v sft - frm, sb ply - sb blk, rthy tex, v calc
30% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply	40% MRL: lt - med gy, rr blk, frm - mod hd, sb ply
- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag	- sb blk, sily - grty tex, tr bent, tr fos frag
7100	7100	7100	7100



AM Mud Rpt: 11/13/2014 , Mud Wt: 9.60, FV/s: 38  
PV/s: 9, YP: 8, GELS: 4/7/9, API Fil: 8.1  
CAKE: 2/0, pH: 10.3, Cl: 1.300, Ca: 80

MUD WT: 9.60/9.6  
V/S: 36/36 IN/OU



MD: 11,388'  
TVD: 6,839.6'  
Inclination: 88.58°  
Azimuth: 358.97°

MD: 11,483'  
TVD: 6,841.98'  
Inclination: 88.55°  
Azimuth: 357.99°

70% CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb pty - sb blkly, rthy tex, v calc 30% MRL: lt - med gy, rr blk, frm - mod hd, sb pty - sb blkly, slty - grty tex, tr bent, tr fos frag	70% CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb pty - sb blkly, rthy tex, v calc 30% MRL: lt - med gy, rr blk, frm - mod hd, sb pty - sb blkly, slty - grty tex, tr bent, tr fos frag	70% CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb pty - sb blkly, rthy tex, v calc 30% MRL: lt - med gy, rr blk, frm - mod hd, sb pty - sb blkly, slty - grty tex, tr bent, tr fos frag	60% CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb pty - sb blkly, rthy tex, v calc 40% MRL: lt - med gy, rr blk, frm - mod hd, sb pty - sb blkly, slty - grty tex, tr bent, tr fos frag	60% CHK: tan - ltgy, mot wi wh, lam, v sft - frm, sb pty - sb blkly, rthy tex, v calc 40% MRL: lt - med gy, rr blk, frm - mod hd, sb pty - sb blkly, slty - grty tex, tr bent, tr fos frag
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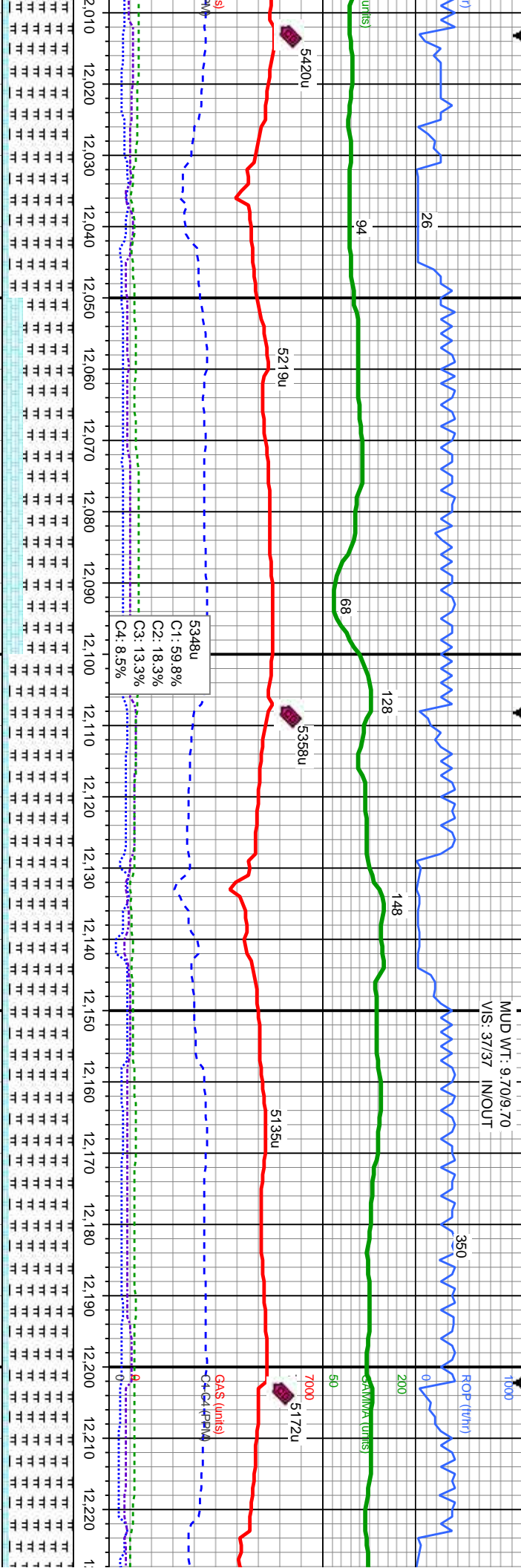






MUD WT: 9.70/9.70  
VIS: 37/37 IN/OUT

ROP (ft/hr)



MD: 12,052'  
TVD: 6,841.48'  
Inclination: 90.62°  
Azimuth: 359.35°

B CHALK

MD: 12,147'  
TVD: 6,839.77'  
Inclination: 91.45°  
Azimuth: 0.16°

SHARON SPRINGS

NIO TOP

A MARL

B CHALK

TVD (ft)

tan - llygy, mot wi wh, lam, v sft - frm,  
sb blkly, rthy tex, v calc  
lt - med gy, rr blk, frm - mod hd, sb ply  
sily - grty tex, tr bent, tr fos frag

30% CHK: tan - llygy, mot wi wh, lam, v sft - frm,  
sb ply - sb blkly, rthy tex, v calc  
70% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blkly, sily - grty tex, abnt bent, tr fos frag

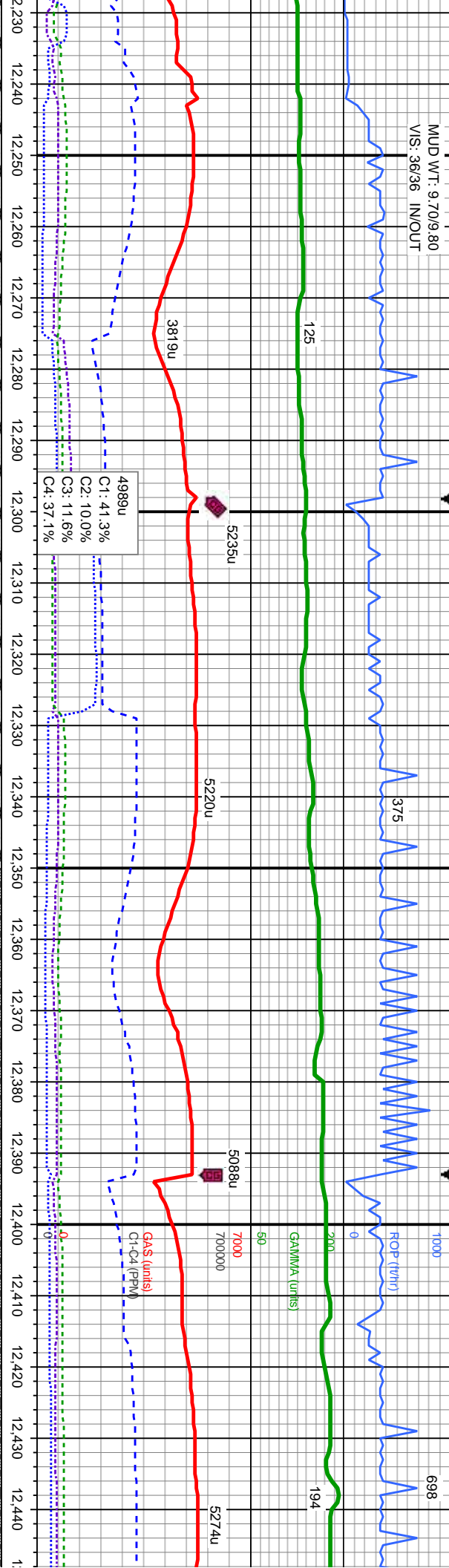
10% CHK: tan - llygy, mot wi wh, lam, v sft - frm,  
sb ply - sb blkly, rthy tex, v calc  
90% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blkly, sily - grty tex, abnt bent, tr fos frag

10% CHK: tan - llygy, mot wi wh, lam, v sft - frm,  
sb ply - sb blkly, rthy tex, v calc  
90% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blkly, sily - grty tex, abnt bent, tr fos frag

10% CHK: tan - llygy, mot wi wh, lam, v sft - frm,  
sb ply - sb blkly, rthy tex, v calc  
90% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blkly, sily - grty tex, abnt bent, tr fos frag



MUD WT: 9.70/9.80  
VIS: 36/36 IN/OUT



MD: 12,242'

TVD: 6,838.26'  
Inclination: 90.37°  
Azimuth: 0.66°

MD: 12,337'

TVD: 6,837.9'  
Inclination: 90.06°  
Azimuth: 359.75°

MD: 12,431'

TVD: 6,838.11'  
Inclination: 89.69°  
Azimuth: 359.7°

NIO TOP  
A MARL

B CHALK

TVD (ft)

B CHALK

Wh, lam, v sft - frm,  
calc  
frm - mod hd, sb ply  
bent, tr fos frag

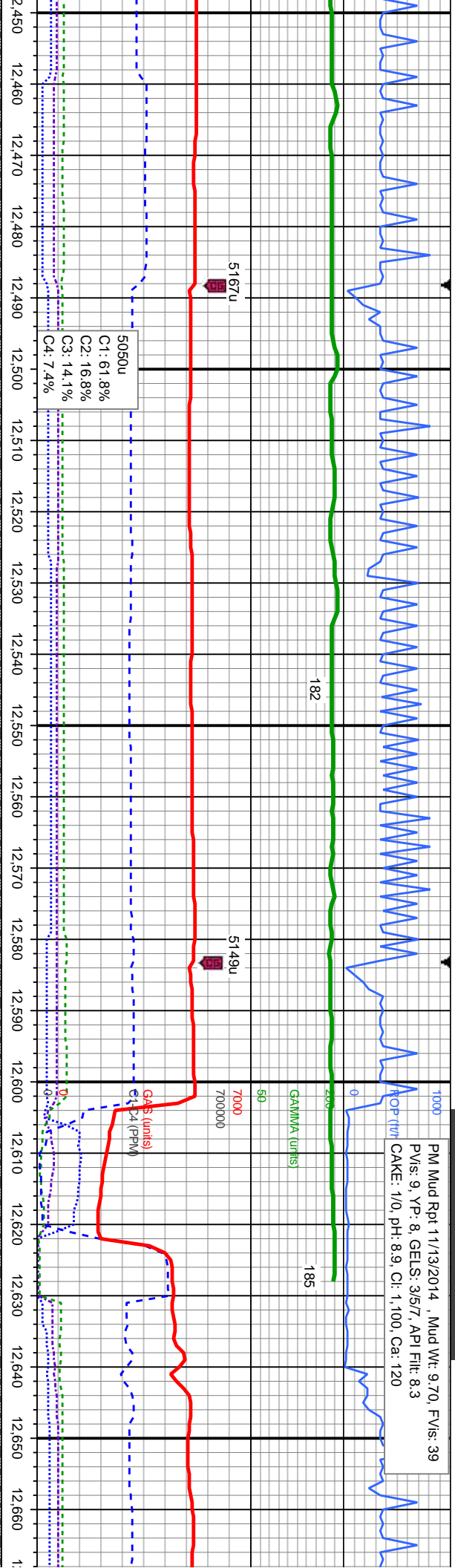
10% CHK: lan - llyg, mot w/ wh, lam, v sft - frm,  
sb ply - sb blk, rthy tex, v calc  
90% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blk, sily - grty tex, abnt bent, tr fos frag

10% CHK: lan - llyg, mot w/ wh, lam, v sft - frm,  
sb ply - sb blk, rthy tex, v calc  
90% MRL: lt - med gy, rr blk, frm - mod hd, sb ply  
- sb blk, sily - grty tex, abnt bent, tr fos frag

100% SLTY SH: predy llyg - llyg brn, sme med gy,  
frm - mod hd, ply - sb ply, occ sb blk, sily - grty  
tex, v sl calc, abnt bent

100% SLTY SH: predy llyg - llyg brn, sme med gy,  
frm - mod hd, ply - sb ply, occ sb blk, sily - grty  
tex, v sl calc, abnt bent





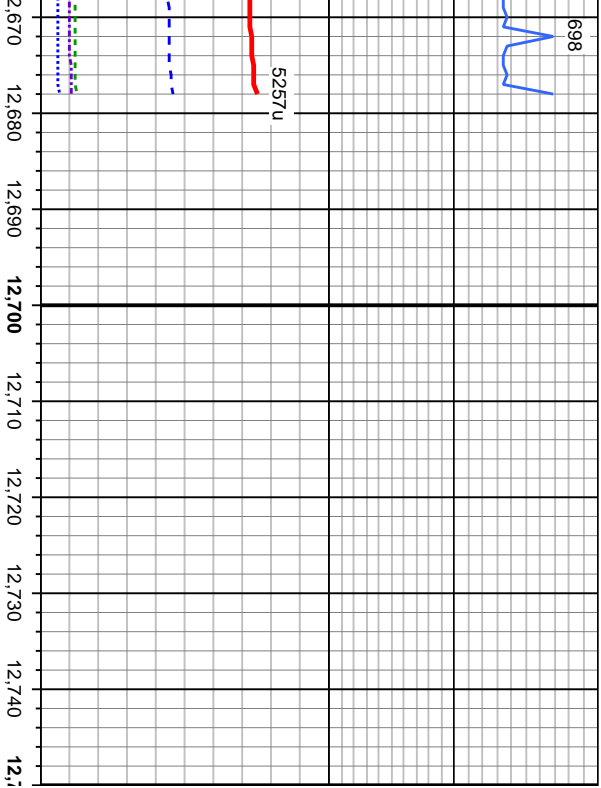
MD: 12,526'  
TVD: 6,839.16'  
Inclination: 89.04°  
Azimuth: 357.09°

MD: 12,621'  
TVD: 6,841.29'  
Inclination: 88.39°  
Azimuth: 357°

TVD (ft)

100% SLTY SH: predy lgy - lgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, slty - grly tex, v sl calc, abnt bent	100% SLTY SH: predy lgy - lgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, slty - grly tex, v sl calc, abnt bent	100% SLTY SH: predy lgy - lgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, slty - grly tex, v sl calc, abnt bent	100% SLTY SH: predy lgy - lgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, slty - grly tex, v sl calc, abnt bent	100% SLTY SH: predy lgy - lgy brn, sme med gy, frm - mod hd, pily - sb pily, occ sb blkly, slty - grly tex, v sl calc, abnt bent
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12,670 12,680 12,690 12,700 12,710 12,720 12,730 12,740 12,750

Projection to Bit:

MD: 12,678'

TVD: 6,842.89'

Inclination: 88.39°

Azimuth: 357°

TD @ 12,678' MD @ 16:17 hrs MST  
on 11/13/2014

See Corresponding Vertical  
Log Oscar Y10-74HN VERT

Wellsite Geological Services  
Provided By Columbine Logging

redy lgy - lgy brn, sme med gy.  
- sb pily, occ sb blk, silty - grty  
bent

