



Scale: 5" / 100'  
Measured Depth Log

<b>Well Name</b>	SEYLER B10-62-1HN HORZ	
<b>Location</b>	SEC 10 T5N R64W	
<b>State</b>	COLORADO	<b>County</b> WELD
<b>Country</b>	USA	<b>Rig Number</b> H&P 315
<b>API Number</b>	05-123-37727	<b>A/E #</b> 139200
<b>Region</b>	DJ BASIN	<b>Field</b> WATTENBERG
<b>Spud Date</b>	12/23/2013	<b>Drilling Completed</b> 12/31/2013
<b>Surface Coordinates</b>	SWSW SEC 10 T5N R64W 1,176' FSL; 245' FWL LAT/LON 40.409810/-104.544730	
<b>Bottom Hole Coordinates</b>	SESE SEC 10 T5N R64W 330' FSL; 700' FEL	
<b>Ground Elevation</b>	4,582'	<b>K.B. Elevation</b> 4,606'
<b>Logged Interval</b>	5,970' To 10,738'	<b>Total Depth</b> 10,738'
<b>Formation</b>	NIOBRARA B CHALK	
<b>Type of Drilling Fluid</b>	LSND	

**Company** Noble Energy Inc  
**Address** 1625 BROADWAY  
DENVER, CO 80202

**Name** MARK COLE, NIOBRARA  
**Company** COLUMBINE LOGGING  
**Address** 2385 S LIPAN ST  
DENVER, CO 80229



Operator

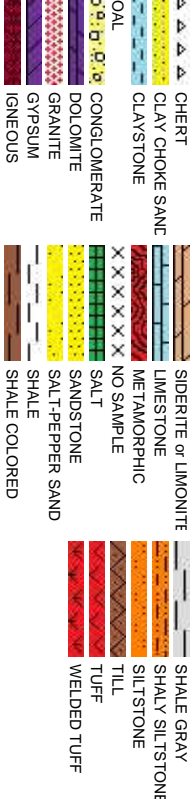
AY SUITE 2200  
0202

Geologist

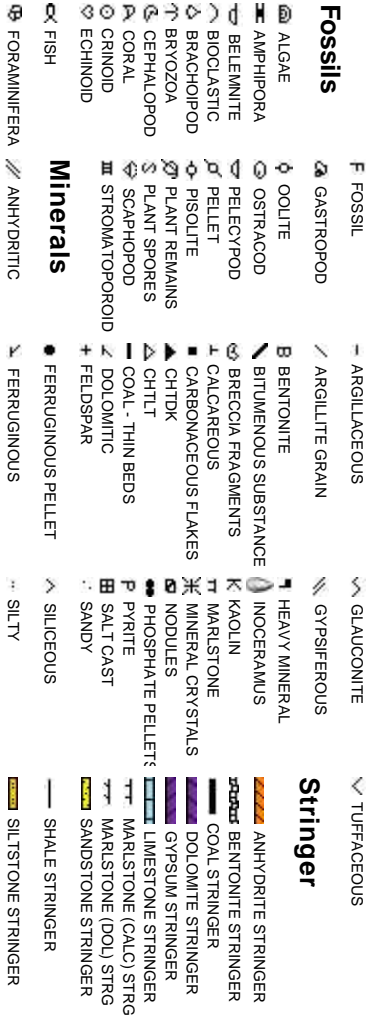
MOHAMMED ALMUBARAK  
OGGING, INC

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0223

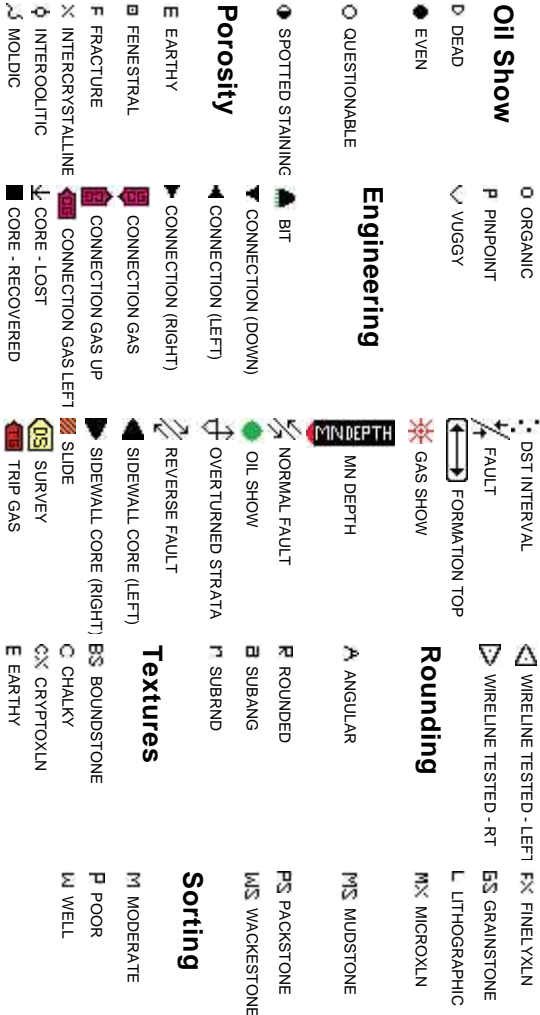
Rock Types



Accessories



Other Symbols



Slide/Rotate

ROP

ROP

Curves  
GAMMA

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Depth Labels

% Lith

Well Bore  
TVD

Images

ROP data from iBall

12/26/2013, Mud Wt: 9.85, FV/s: 35  
PV/s: 10, YP: 10, GELS: 4/13/19, API Filt: 10.0  
CAKE: 1/0, pH: 8.3, Cl: 1,000, Ca: 320

Gamma data from Sperry - Halliburton

Gas data from iBall

50' Sample Interval @ 6,000' MD

Columbine Logging began logging with  
Bloodhound unit 624 on 12/26/2013

Bit Data

Bit #: 2  
Type: Smith  
Model: SDi513  
Size: 8.75"  
Depth In: 5,970'  
Jets: 3x13 & 5x12

MD: 5,954'  
TVD: 5,869.22'  
Inclination: 14.85 °  
Azimuth: 187.64 °  
VS: -45.17'

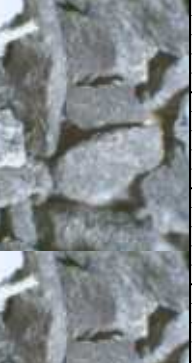
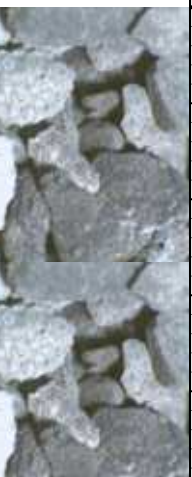
SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, slty - grty tex, v sl calc  
SHY SS: lt gy, s&p, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, slty - grty tex, v sl calc  
SHY SS: lt gy, s&p, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, slty - grty tex, v sl calc  
SHY SS: lt gy, s&p, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

Oil Show

20  
40  
60  
80





MUD WT: 10.30/10.20  
VIS: 35/35 IN/OUT

MUD WT: 10.65/10.40  
VIS: 36/36 IN/OUT

167

300

60

400

165

189

50

6000

6000000

GAMMA (units)

GA\$ (units)

C1-C4 (PPM)

2070u

C1: 59.8%

C2: 19.9%

C3: 14.4%

C4: 6.0%

3317u

2800u

C1: 60.4%

C2: 21.0%

C3: 14.2%

C4: 4.4%

3099u

2506u

3549u

<<Scale Change>>

MD: 6.101'

TVD: 6.009.68'

Inclination: 20.5°

Azimuth: 149.54°

VS: -26.74'

MD: 6.149'

TVD: 6.054.38'

Inclination: 22.42°

Azimuth: 134.14°

VS: -13.43'

MD: 6.196'

TVD: 6.098'

Inclination: 21.36°

Azimuth: 126.96°

VS: 1.82'

MD: 6.244'

TVD: 6.142.67'

Inclination: 21.66°

Azimuth: 119.14°

VS: 18.13'

MD: 6.290'

TVD: 6.185.19'

Inclination: 23.17°

Azimuth: 115.64°

VS: 34.99'

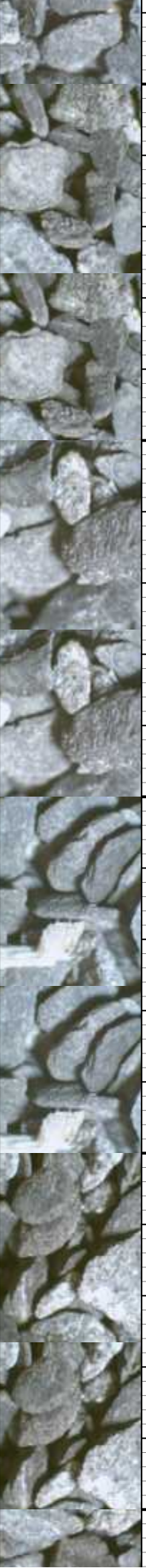
SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, silty - grty tex, v sl calc  
SHY SS: lt gy, s&g, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, silty - grty tex, v sl calc  
SHY SS: lt gy, s&g, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, silty - grty tex, v sl calc  
SHY SS: lt gy, s&g, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, silty - grty tex, v sl calc  
SHY SS: lt gy, s&g, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt

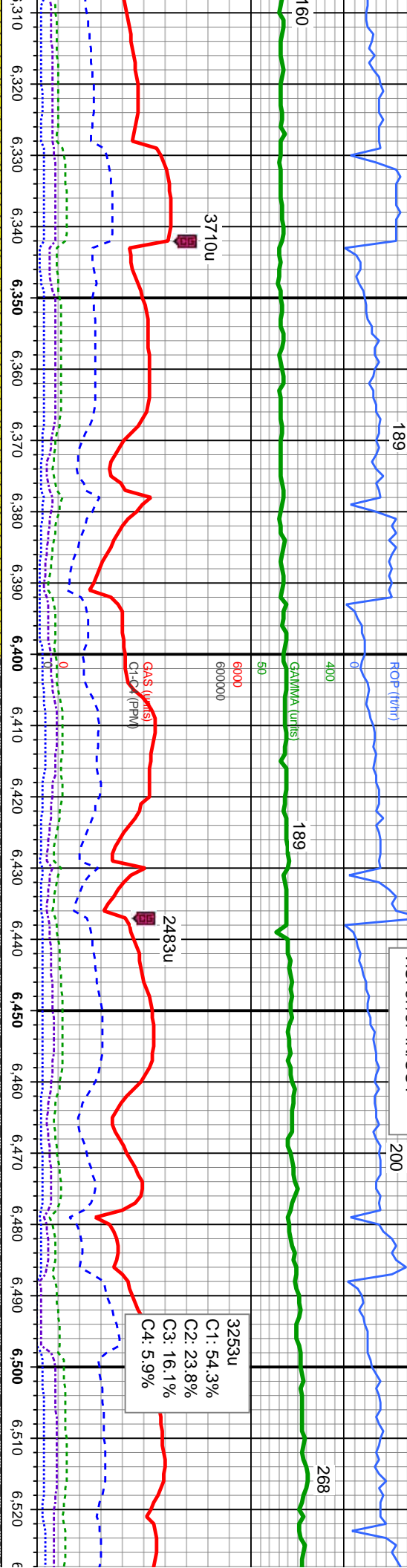
SLTY SH: lt - med gy, occ dk gy, hd, pty - sb  
pty, occ sb blk, silty - grty tex, v sl calc  
SHY SS: lt gy, s&g, vfg, mod hd wi brit clus,  
sb ang - sb rd, sl calc cmt





12/26/2013

MUD WT: 10.80/10.80  
VIS: 37/37 IN/OUT



25' Sample Interval @ 6,500' MD

MD: 6,338' TVD: 6,228.75' Inclination: 26.5° Azimuth: 112.02° VS: 54.67'	MD: 6,385' TVD: 6,270.36' Inclination: 28.97° Azimuth: 106.68° VS: 76.31'	MD: 6,433' TVD: 6,311.55' Inclination: 32.75° Azimuth: 106.5° VS: 100.82'	MD: 6,480' TVD: 6,349.66' Inclination: 38.81° Azimuth: 105.45° VS: 128.2'	MD: 6,528' TVD: 6,38 Inclination Azimuth: 1 VS: 159.8
SH: It - med gy, occ dk gy, hd, pily - sb c sb blkly, silty - grty tex, v sl calc S: It gy, s&g, vfg, mod hd wí brit clus, - sb rd, sl calc cnt	SLTY SH: It - med gy, occ dk gy, hd, pily - sb pily, occ sb blkly, silty - grty tex, v sl calc SHY SS: It gy, s&g, vfg, mod hd wí brit clus, sb ang - sb rd, sl calc cnt	SLTY SH: It - med gy, occ dk gy, hd, pily - sb pily, occ sb blkly, silty - grty tex, v sl calc	SLTY SH: It - med gy, occ dk gy, hd, pily - sb pily, occ sb blkly, silty - grty tex, v sl calc	SLTY SH: It - med gy, occ pily, occ sb blkly, silty - gr

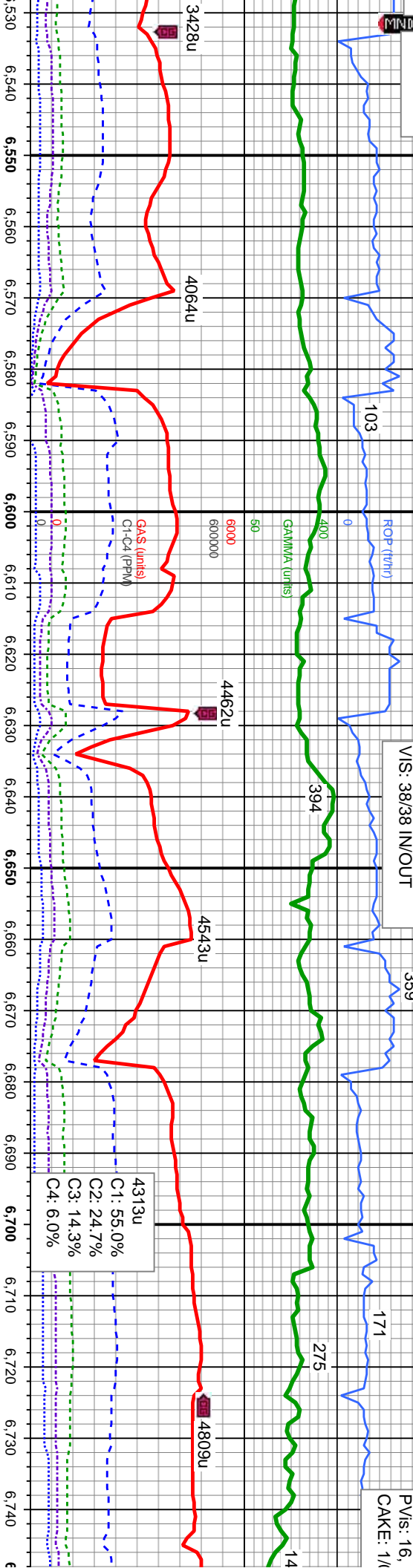




12/27/2013

MUD WT: 10.85/10.85  
VIS: 38/38 IN/OUT

12/27/201  
PV's: 16,  
CAKE: 1/6



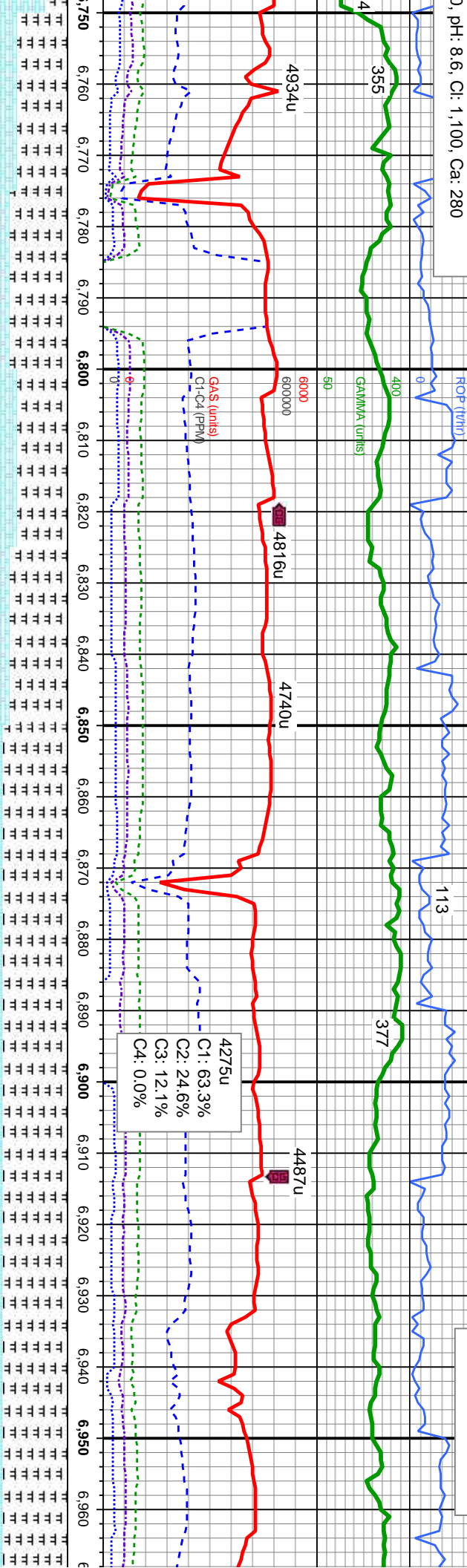
<Scale Change>>

MD: 6.575' TVD: 6,418.01' Inclination: 49.08 ° Azimuth: 101.97 ° VS: 193.94'	MD: 6.623' TVD: 6,447.71' Inclination: 54.45 ° Azimuth: 99.72 ° VS: 231.62'	MD: 6.670' TVD: 6,473.27' Inclination: 59.65 ° Azimuth: 96.99 ° VS: 270.99'	MD: 6.718' TVD: 6,496.54' Inclination: 62.33 ° Azimuth: 94.72 ° VS: 312.76'
SLTY SH: lt - med gy, sme dk gy - blk, firm -hd, pty - sb pty, occ sb blk, sily - grty tex, sl calc, abnt bent	SLTY SH: lt - med gy, sme dk gy - blk, firm -hd, pty - sb pty, occ sb blk, sily - grty tex, sl calc, abnt bent	SLTY SH: lt - med gy, sme dk gy - blk, firm -hd, pty - sb pty, occ sb blk, sily - grty tex, sl calc, abnt bent	CHK: pred tan wi wh, sme lgy, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc MRL: lt - med gy, occ blk, sft - mod hd, sb pty - pty, sily - grty tex, sme bent CHK: pred tan wi wh, sme lgy, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc
6750	6750	6750	6750



3. Mud Wt: 11.00, FVis: 38  
YP: 14, GELS: 5/15/24, API Filtr: 8.0  
pH: 8.6, CI: 1,100, Ca: 280

MUD WT: 11.10/10.95  
VIS: 40/40 IN/OUT



2) TVD

MD: 6,765'  
TVD: 6,517.6'  
Inclination: 64.43°  
Azimuth: 93.86°  
VS: 354.46'

MD: 6,813'  
TVD: 6,536.46'  
Inclination: 69.29°  
Azimuth: 93.15°  
VS: 398.18'

MD: 6,860'  
TVD: 6,551.58'  
Inclination: 73.18°  
Azimuth: 92.42°  
VS: 442.18'

MD: 6,908'  
TVD: 6,564.14'  
Inclination: 76.47°  
Azimuth: 90.23°  
VS: 487.79'

MD: 6,954'  
TVD: 6,597.44'  
Inclination: 76.47°  
Azimuth: 90.23°  
VS: 547.44'

MRL: lt - med gy, sme blk, sft - mod hd, sb  
ply - ply, silty - grty tex, sme bent wi dissim  
pyr  
CHK: pred tan wi wh, sme lgy, mot, lam,  
sft - frm, sb ply - sb blk, rthy tex, v calc

MRL: lt - med gy, sme blk, sft - mod hd, sb  
ply - ply, silty - grty tex, sme bent wi dissim  
pyr  
CHK: pred tan wi wh, sme lgy, mot, lam,  
sft - frm, sb ply - sb blk, rthy tex, v calc

MRL: lt - med gy, rr blk, sft - mod hd, sb ply  
- ply, silty - grty tex, sme bent wi dissim pyr,  
tr inoc  
CHK: pred tan wi wh, sme lgy, mot, lam,  
sft - frm, sb ply - sb blk, rthy tex, v calc

MRL: lt - med gy, rr blk, sft - mod hd, sb ply -  
ply, silty - grty tex, sme bent wi dissim pyr, tr  
inoc  
CHK: pred tan wi wh, sme lgy, mot, lam, sft  
- frm, sb ply - sb blk, rthy tex, v calc

MRL: lt - med gy  
ply - ply, silty -  
CHK: pred tan w  
- frm, sb ply - sl

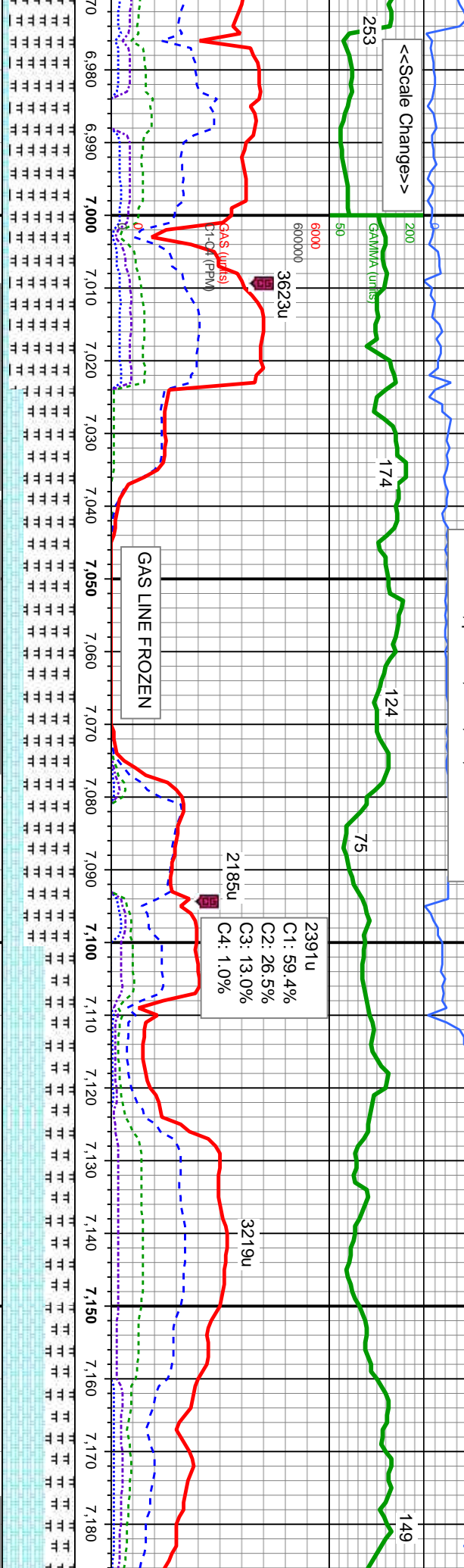




12/27/2013 12/28/2013 12/28/2013 12/29/2013

12/28/2013, Mud Wt: 10.55, FV/s: 36  
PV/s: 12, YP: 9, GELS: 4/8/14, API Filtr: 11.0  
CAKE: 1/0, pH: 9.1, Cl: 1.000, Ca: 320

MUD WT: 9.50/9.45  
VIS: 33/33 IN/OUT



MD: 7,024'	MD: 7,126'
TVD: 6,581.38'	TVD: 6,591.72'
Inclination: 87.13°	Inclination: 86.99°
Azimuth: 90°	Azimuth: 88.81°
VS: 599.99'	VS: 699'
Jets: 5x13	
Depth In: 7,024'	

30% CHK: pred tan wi wh, sme lgy, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, silty - grty tex.

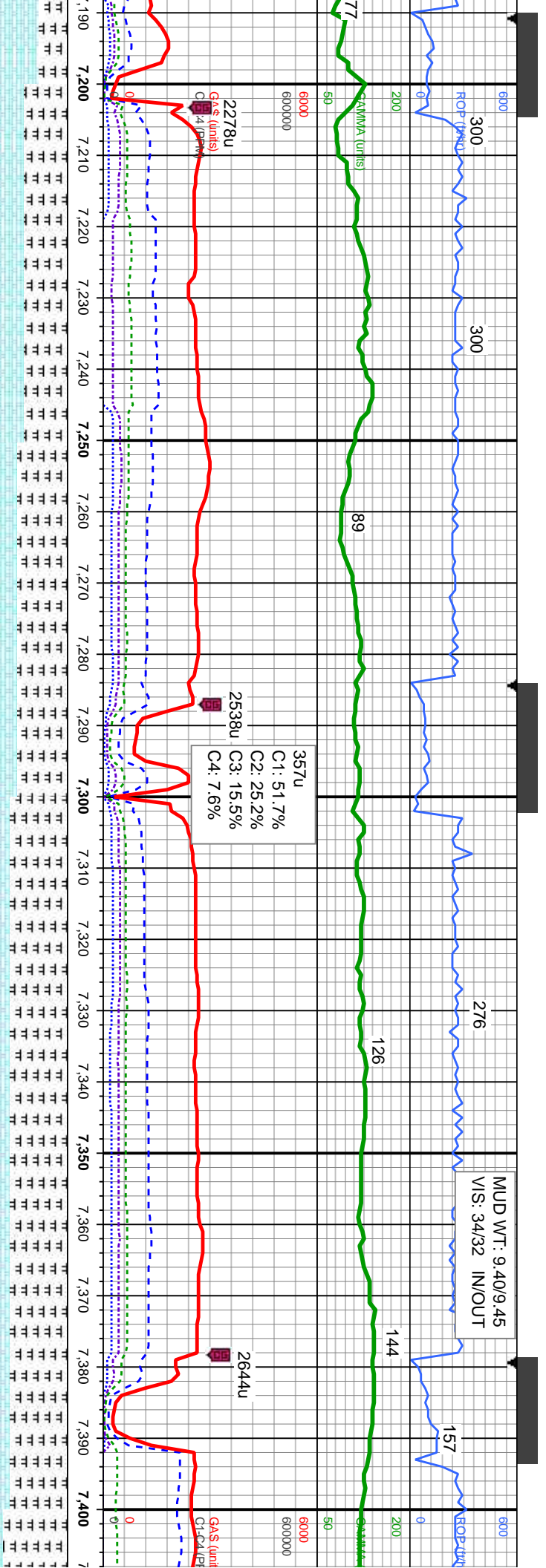
30% CHK: pred tan wi wh, sme lgy, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, silty - grty tex, tr fos frag

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

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





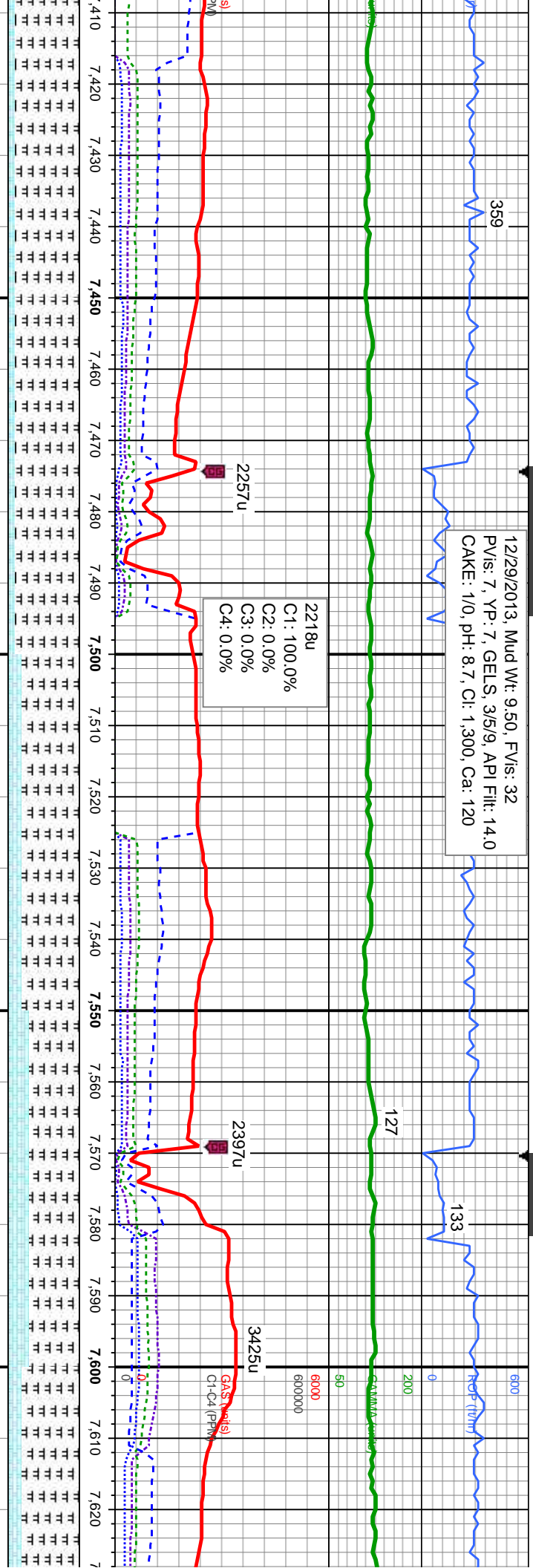


changes>>		6400	MD: 7,221'	TV: 6,596.26'	Inclination: 87.53°	Azimuth: 89.87°	VS: 791.82	B Chalk	40% CHK: pred tan wi wh, sme ltyg, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 60% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, tr bent, tr fos frag 6800
			MD: 7,315'	TV: 6,598.64'	Inclination: 89.57°	Azimuth: 90.07°	VS: 883.95		30% CHK: pred tan wi wh, sme ltyg, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, tr bent, tr fos frag
			MD: 7,4	TV: 6,5	Inclination:	Azimuth:	VS: 977		20% CHK: pred tan wi wh, sme ltyg, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 80% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, tr fos frag
			MD: 7,4	TV: 6,5	Inclination:	Azimuth:	VS: 977		10% C lam, sft 90% M sb ply frag 6800



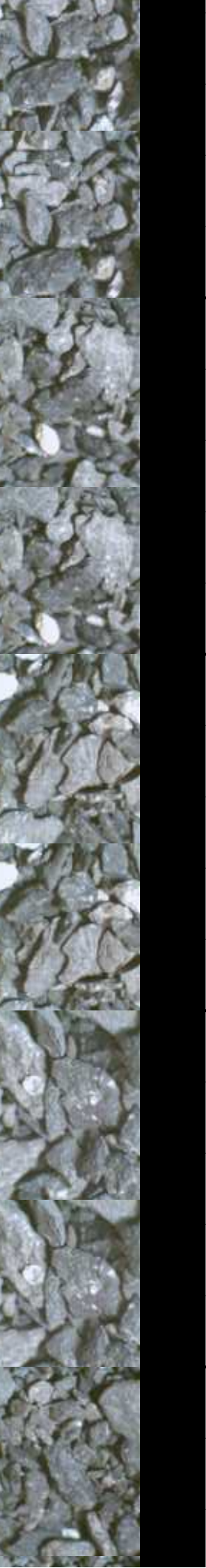


12/29/2013, Mud Wt: 9.50, FV/s: 32  
PV/s: 7, YP: 7, GELS: 3/5/9, API Filtr: 14.0  
CAKE: 1/0, pH: 8.7, Cl: 1,300, Ca: 120

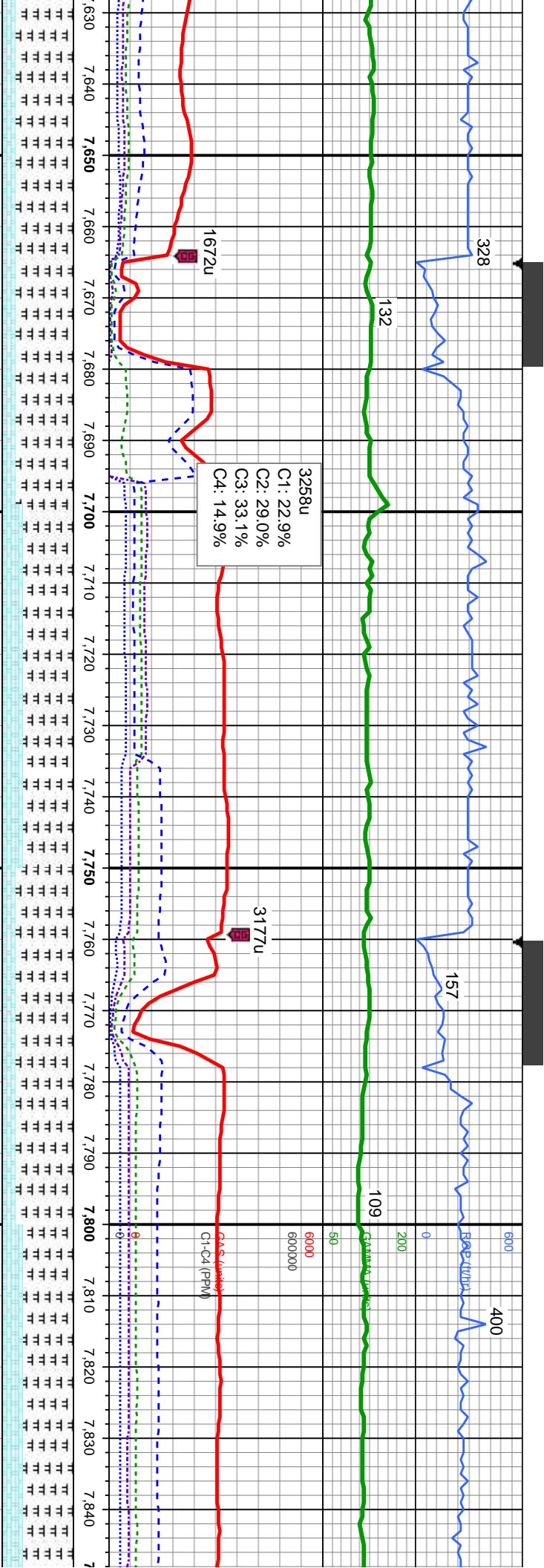


10'	MD: 7,505'	TVD: 6,598.89'	Inclination: 90.86°	Azimuth: 89.81°	VS: 1,070.32'
99.3'	MD: 7,505'	TVD: 6,598.89'	Inclination: 90.86°	Azimuth: 89.81°	VS: 1,070.32'
90.29°	MD: 7,505'	TVD: 6,598.89'	Inclination: 90.86°	Azimuth: 89.81°	VS: 1,070.32'
15'	MD: 7,505'	TVD: 6,598.89'	Inclination: 90.86°	Azimuth: 89.81°	VS: 1,070.32'

CHK: pred tan wi wh, sme ltyg, mot,	10% CHK: pred tan wi wh, sme ltyg, mot,	20% CHK: pred tan wi wh, sme ltyg, mot,	30% CHK: pred tan wi wh, sme ltyg, mot,	20% CHK: pred tan wi wh,
- frm, sb ply - sb blk, rthy tex, v calc	lam, sft - frm, sb ply - sb blk, rthy tex, v calc	lam, sft - frm, sb ply - sb blk, rthy tex, v calc	lam, sft - frm, sb ply - sb blk, rthy tex, v calc	lam, sft - frm, sb ply - sb
RL: lt - med gy, sme blk, sft - mod hd,	90% MRL: lt - med gy, sme blk, sft - mod hd,	80% MRL: lt - med gy, sme blk, sft - mod hd,	70% MRL: lt - med gy, sme blk, sft - mod hd,	80% MRL: lt - med gy, sme
- sb blk, silty - grty tex, tr bent, tr fos	sb ply - sb blk, silty - grty tex, tr bent, tr fos	sb ply - sb blk, silty - grty tex, abnt bent,	sb ply - sb blk, silty - grty tex, abnt bent, sme	sb ply - sb blk, silty - grty
	frag	frag	frag	frag





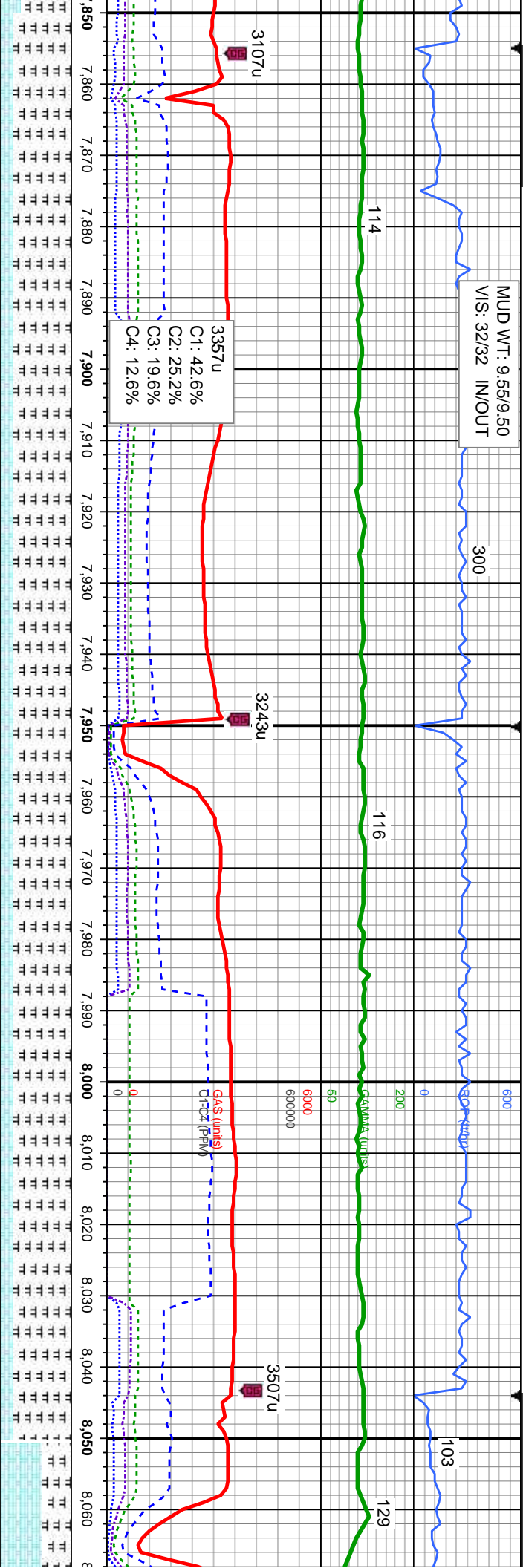


MD: 7.695'		MD: 7.790'	6400
TV/D: 6,596.14'		TV/D: 6,593.69'	
Inclination: 90.74°		Inclination: 92.22°	
Azimuth: 89.01°		Azimuth: 88.8°	
VS: 1,256.16'		VS: 1,348.9'	
20% CHK: pred tan wi wh, sme ltyg, mot, blk, rthy tex, v calc	30% CHK: tan - ltyg brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	20% CHK: tan - ltyg brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc	30% CHK: tan - ltyg brn, mot, lam, sft - frm, sb pty - sb blk, rthy tex, v calc
80% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, slty - grty tex, abnt bent, abnt fos frag	70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, slty - grty tex, abnt bent, abnt fos frag	80% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, slty - grty tex, abnt bent, abnt fos frag	70% MRL: lt - med gy, sme blk, sft - mod hd, sb pty - sb blk, slty - grty tex, abnt bent, abnt fos frag





MUD WT: 9.55/9.50  
VIS: 32/32 IN/OUT



MD: 7,885'

TVD: 6,590.39'  
Inclination: 91.76°  
Azimuth: 90.7°  
VS: 1,441.91'

MD: 7,980'

TVD: 6,588.24'  
Inclination: 90.83°  
Azimuth: 89.47°  
VS: 1,535.06'

6400

MD: 8,000'

TVD: 6,586.00'  
Inclination: 90.83°  
Azimuth: 89.47°  
VS: 1,535.06'

20% CHK: tan - ltgy 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 - sb blk, silty - grty tex, abnt bent,  
abnt fos frag

20% CHK: tan - ltgy 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 - sb blk, silty - grty tex, v abnt  
bent, abnt fos frag

20% CHK: tan - ltgy 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 - sb blk, silty - grty tex, v abnt  
bent, abnt fos frag

20% CHK: tan - ltgy 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 - sb blk, silty - grty tex, v abnt  
bent, abnt fos frag

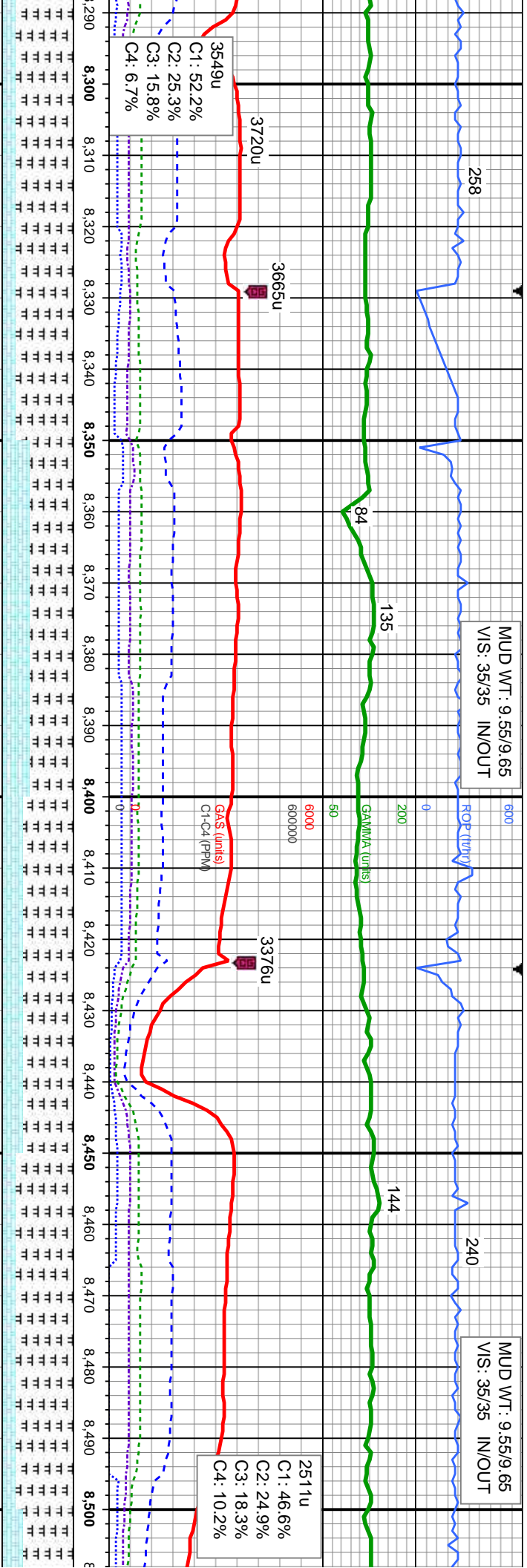
60% CHK: tan -  
sb pily - sb blk  
40% MRL: lt - n  
hd, sb pily - sb  
abnt fos frag







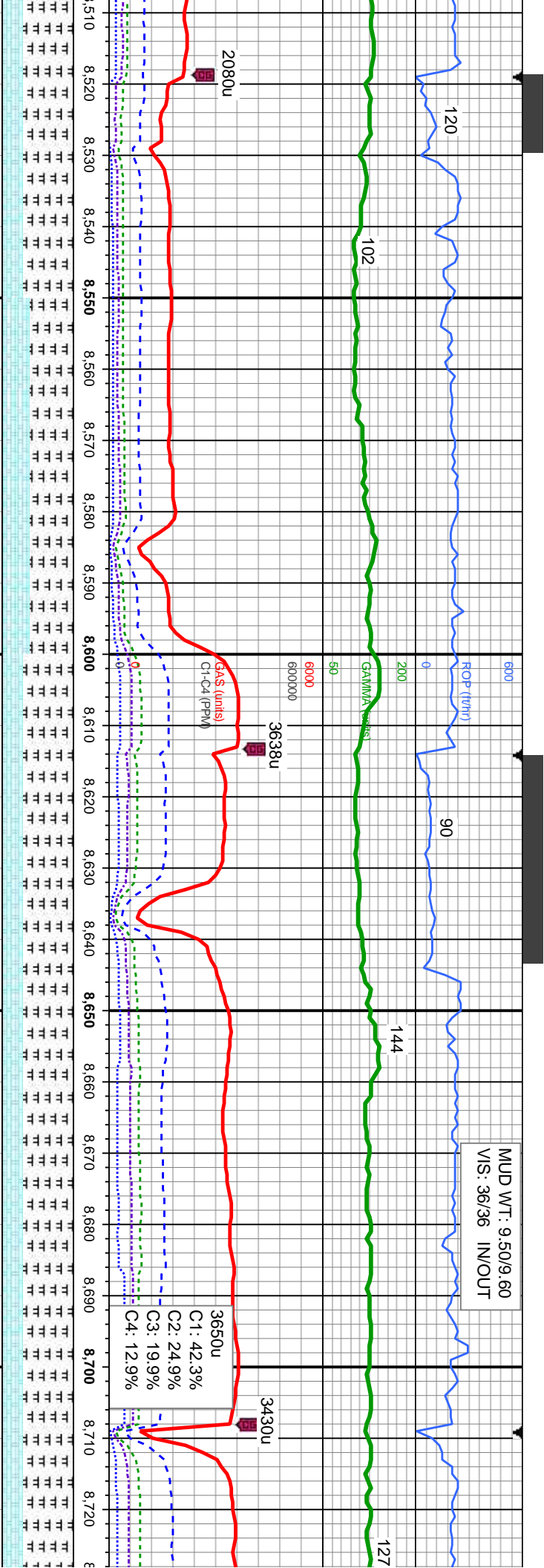




MD: 8,359'		TVD: 6,581.11'	Inclination: 91.51°	Azimuth: 92.34°	VS: 1,908.42'
ft - frm,	20% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	40% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	60% MRL: lt - med gy, sme blk, sft - mod
mod hd,	80% MRL: lt - med gy, sme blk, sft - mod	hd, sb ply - sb blk, sily - grty tex, abnt bent,	hd, sb ply - sb blk, sily - grty tex, v abnt bent,	abnt fos frag	bent, abnt fos frag
bent,	about fos frag				
MD: 8,454'		TVD: 6,579.73'	Inclination: 90.15°	Azimuth: 90.53°	VS: 2,002.1'
ft - frm,	20% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	30% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	70% MRL: lt - med gy, sme blk, sft - mod
mod hd,	80% MRL: lt - med gy, sme blk, sft - mod	hd, sb ply - sb blk, sily - grty tex, v abnt bent,	hd, sb ply - sb blk, sily - grty tex, v abnt bent,	abnt fos frag	bent, abnt fos frag
bent,	about fos frag				
MD: 8,454'		TVD: 6,579.73'	Inclination: 90.15°	Azimuth: 90.53°	VS: 2,002.1'
ft - frm,	20% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	30% CHK: tan - lly brn, mot, lam, sft - frm,	sb ply - sb blk, rthy tex, v calc	70% MRL: lt - med gy, sme blk, sft - mod
mod hd,	80% MRL: lt - med gy, sme blk, sft - mod	hd, sb ply - sb blk, sily - grty tex, v abnt bent,	hd, sb ply - sb blk, sily - grty tex, v abnt bent,	abnt fos frag	bent, abnt fos frag
bent,	about fos frag				





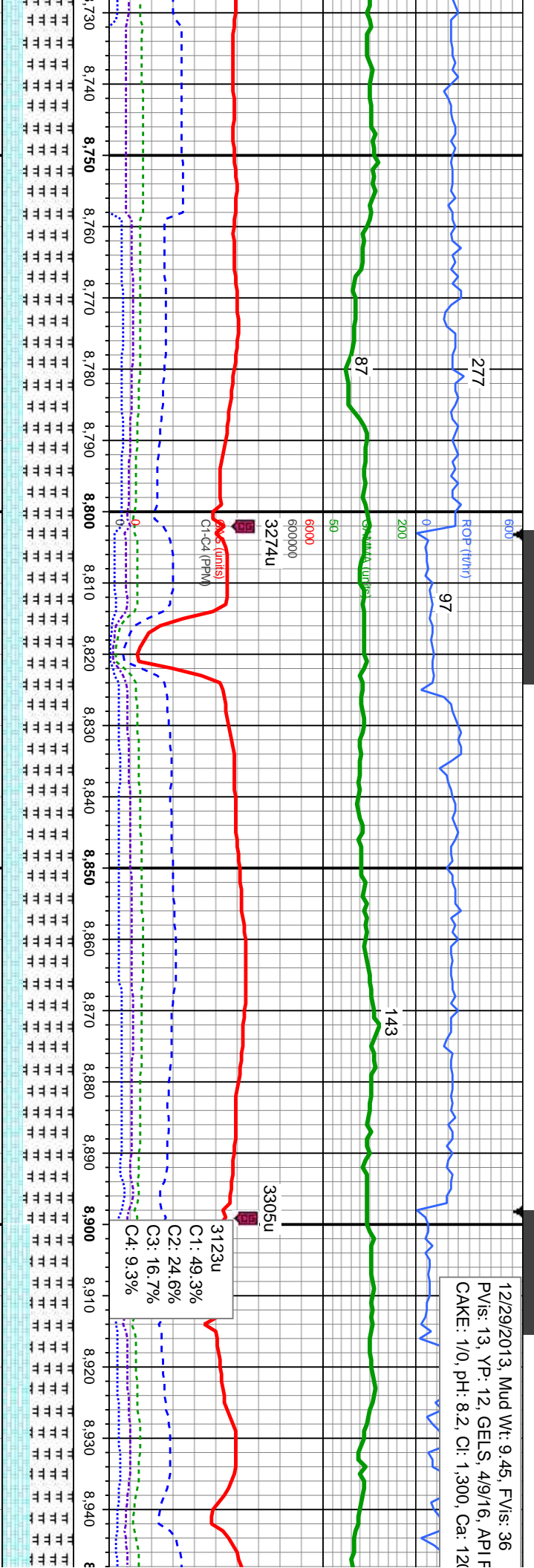


MD: 8,549'		MD: 8,644'	
TVD: 6,579.79'		TVD: 6,579.18'	
Inclination: 89.78°		Inclination: 90.95°	
Azimuth: 89.68°		Azimuth: 90.27°	
VS: 2,095.18'		VS: 2,188.32'	
CHK: tan - llyy brn, mot, lam, sft - frm,	40% CHK: tan - llyy brn, mot, lam, sft - frm,	CHK: tan - llyy brn, mot, lam, sft - frm,	30% CHK: tan - llyy brn, mot, lam, sft - frm,
- / - sb blkly, rthy tex, v calc	sb ply - sb blkly, rthy tex, v calc	sb ply - sb blkly, rthy tex, v calc	sb ply - sb blkly, rthy tex, v calc
MRL: lt - med gy, sme blk, sft - mod	60% MRL: lt - med gy, sme blk, sft - mod	70% MRL: lt - med gy, sme blk, sft - mod	70% MRL: lt - med gy, sme blk, sft - mod
ply - sb blkly, slty - grty tex, v abnt	hd, sb ply - sb blkly, slty - grty tex, v abnt	hd, sb ply - sb blkly, slty - grty tex, v abnt	hd, sb ply - sb blkly, slty - grty tex, v abnt
abnt fos frag	bent, abnt fos frag	bent, abnt fos frag	bent, abnt fos frag

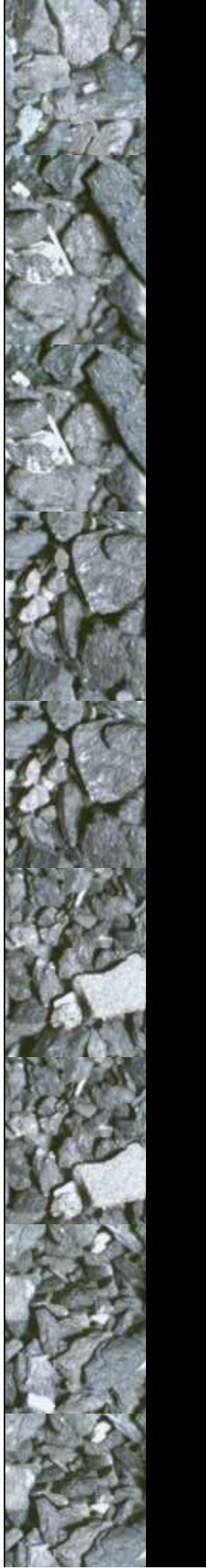




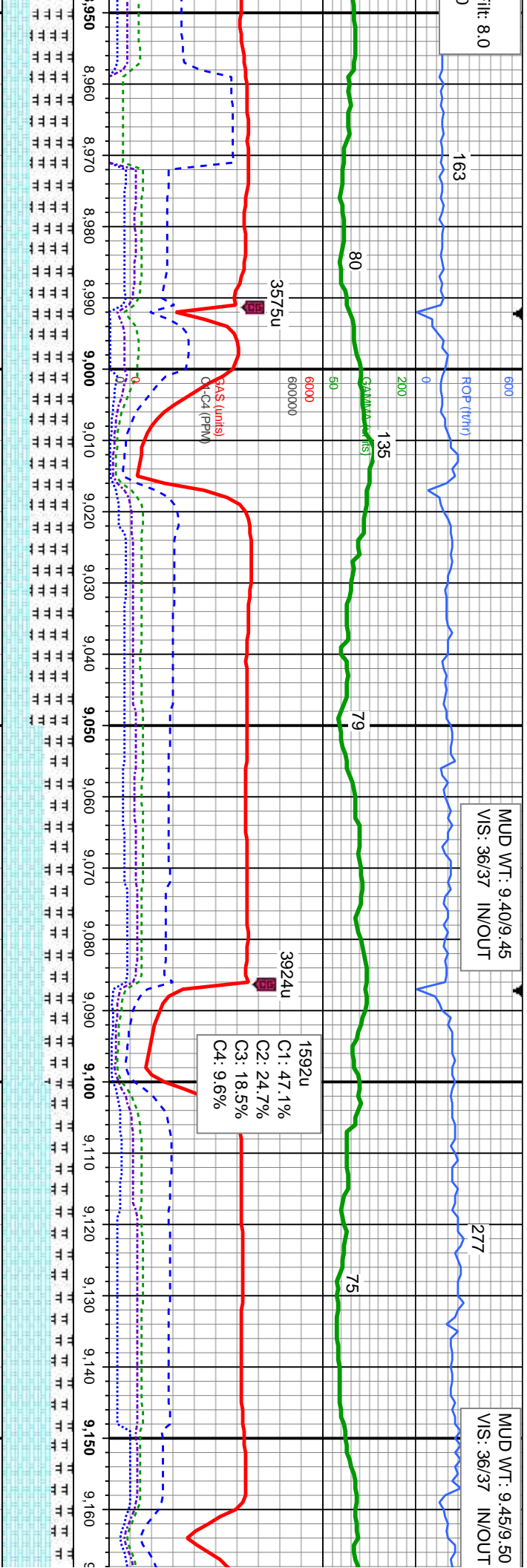
12/29/2013, Mud Wt: 9.45, FV/s: 36  
PV/s: 13, YP: 12, GELS: 4/9/16, API F  
CAKE: 1/0, pH: 8.2, Cl: 1.300, Ca: 12



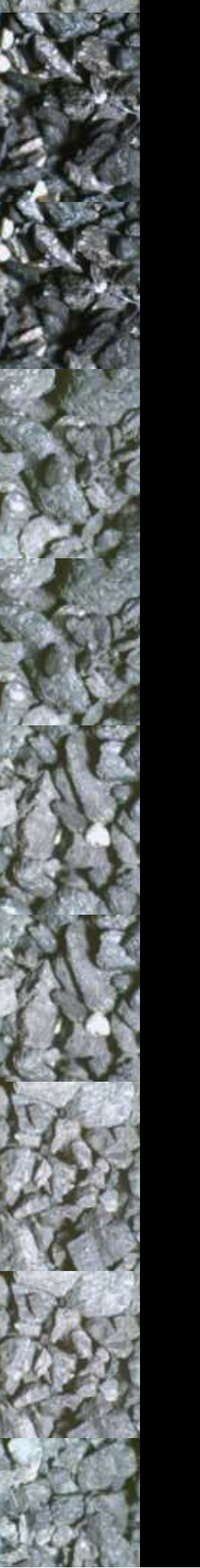
MD: 8,739'		MD: 8,833'		MD: 8,928'	
TVD: 6,577.45'		TVD: 6,576.87'		TVD: 6,576'	
Inclination: 91.14°		Inclination: 89.57°		Inclination: 91.48°	
Azimuth: 89.35°		Azimuth: 91.05°		Azimuth: 91.09°	
VS: 2,281.39'		VS: 2,373.62'		VS: 2,467.1'	
mot, lam, sft - frm,		mot, lam, sft - frm,		mot, lam, sft - frm,	
v calc		sb ply - sb blk, rthy tex, v calc		sb ply - sb blk, rthy tex, v calc	
e blk, sft - mod hd,		70% MRL: lt - med gy, sme blk, sft - mod		60% MRL: lt - med gy, sme blk, sft - mod	
tex, abnt bent, abnt		hd, sb ply - sb blk, sily - grty tex, abnt bent,		hd, sb ply - sb blk, sily - grty tex, abnt bent,	
abnt fos frag		abnt fos frag		abnt fos frag	







MD: 9.023'	MD: 9.118'	MD: 9.118'
TVD: 6,573.96'	TVD: 6,571.56'	TVD: 6,571.56'
Inclination: 90.98°	Inclination: 91.91°	Inclination: 91.91°
Azimuth: 91.1°	Azimuth: 91.34°	Azimuth: 91.34°
VS: 2,560.57'	VS: 2,654.06'	VS: 2,654.06'
40% CHK: tan - ltgy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	60% CHK: tan - ltgy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	70% CHK: tan - ltgy 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 - sb blk, silty - grty tex, abnt bent, abnt fos frag	40% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - sb blk, silty - grty tex, abnt bent, abnt fos frag	30% MRL: lt - med gy, sme blk, sft - mod hd, sb pily - sb blk, silty - grty tex, abnt bent, abnt fos frag





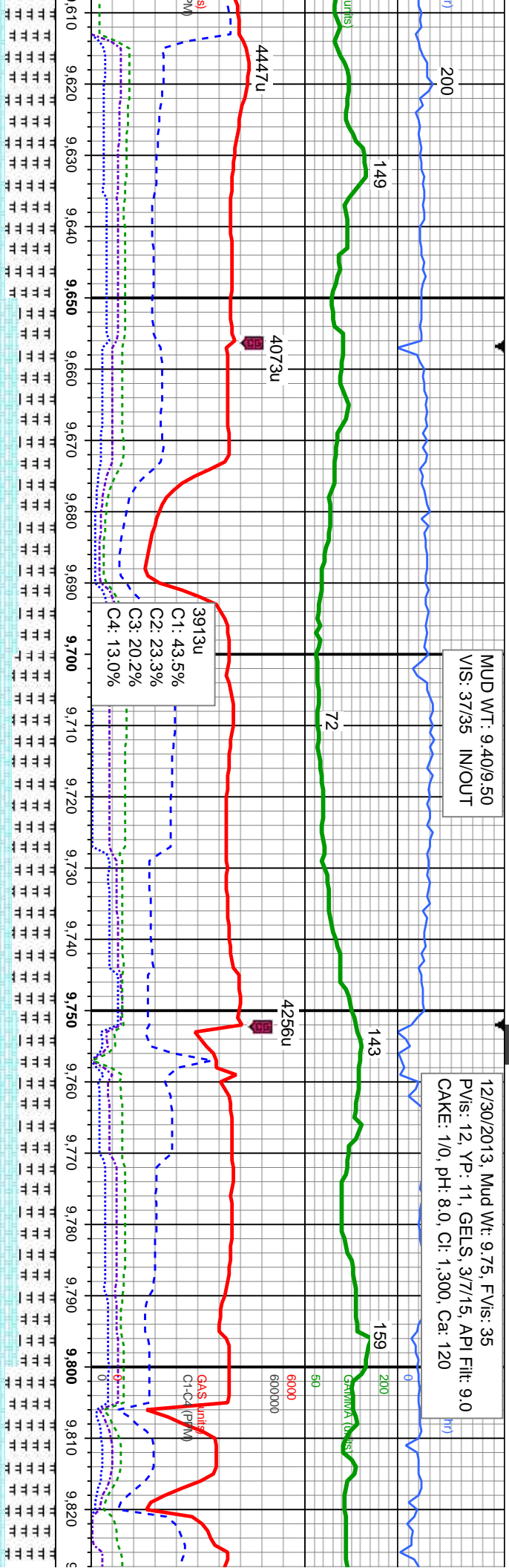






MUD WT: 9.40/9.50  
VIS: 37/35 IN/OUT

12/30/2013, Mud Wt: 9.75, FVs: 35  
PVs: 12, YP: 11, GELS: 3/7/15, API Filtr: 9.0  
CAKE: 1/0, pH: 8.0, CI: 1,300, Ca: 120



MD: 9,688'  
TVD: 6,565.99'

Inclination: 90.31 °  
Azimuth: 90.08 °  
VS: 3,213.09'

MD: 9,783'  
TVD: 6,565.15'

Inclination: 90.71 °  
Azimuth: 88.85 °  
VS: 3,306.05'

Bit Data  
Type: Security  
Model: MMD54  
Size: 6.12"  
Depth In: 9,857'  
Jets: 5x13

HK: tan - ltgy brn, mot, lam, sft - frm, - sb blkly, rthy tex, v calc	50% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc	40% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc	50% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blkly, rthy tex, v calc	30% CHK: tan - ltgy brn, sb ply - sb blkly, rthy tex, 70% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blkly, sily - grfy tex, abnt bent, abnt fos frag
RL: lt - med gy, sme blk, sft - mod ply - sb blkly, sily - grfy tex, abnt bent, s frag	50% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blkly, sily - grfy tex, abnt bent, abnt fos frag	60% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blkly, sily - grfy tex, abnt bent, abnt fos frag	50% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blkly, sily - grfy tex, abnt bent, abnt fos frag	50% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blkly, sily - grfy tex, abnt bent, abnt fos frag

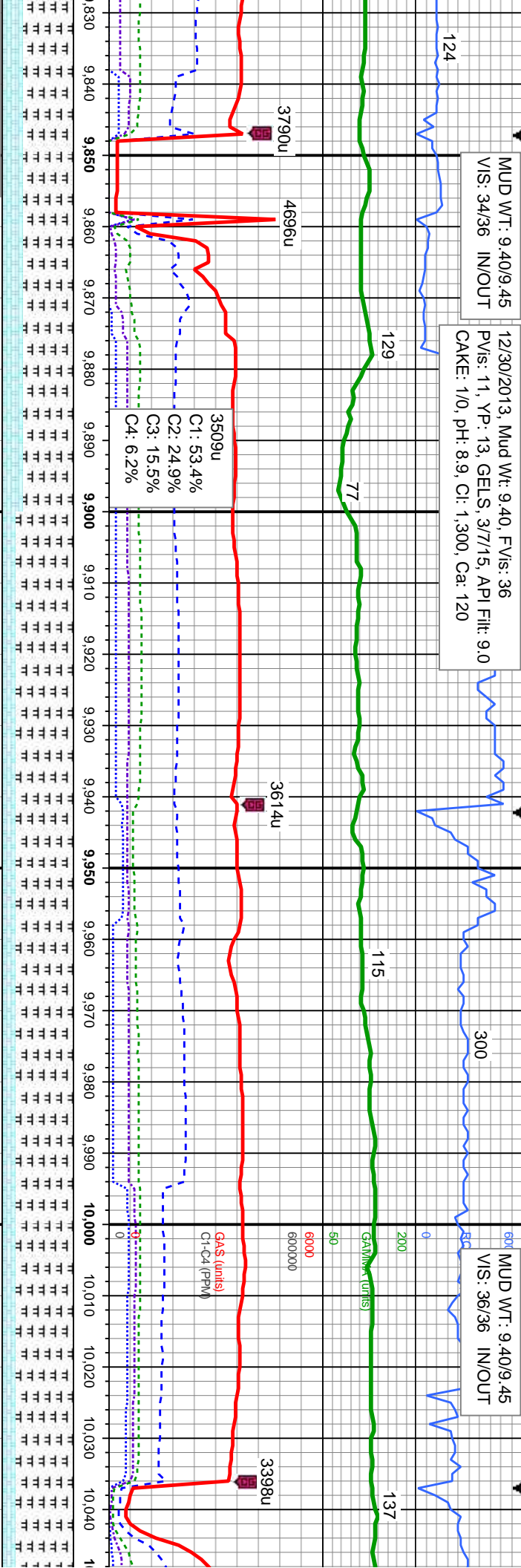




MUD WT: 9.40/9.45  
VIS: 34/36 IN/OUT

12/30/2013, Mud Wt: 9.40, FV/s: 36  
PV/s: 11, YP: 13, GELS: 3/7/15, API Filtr: 9.0  
CAKE: 1/0, pH: 8.9, CI: 1,300, Ca: 120

MUD WT: 9.40/9.45  
VIS: 36/36 IN/OUT



OOH @ 9,857' MD  
change out mud motor

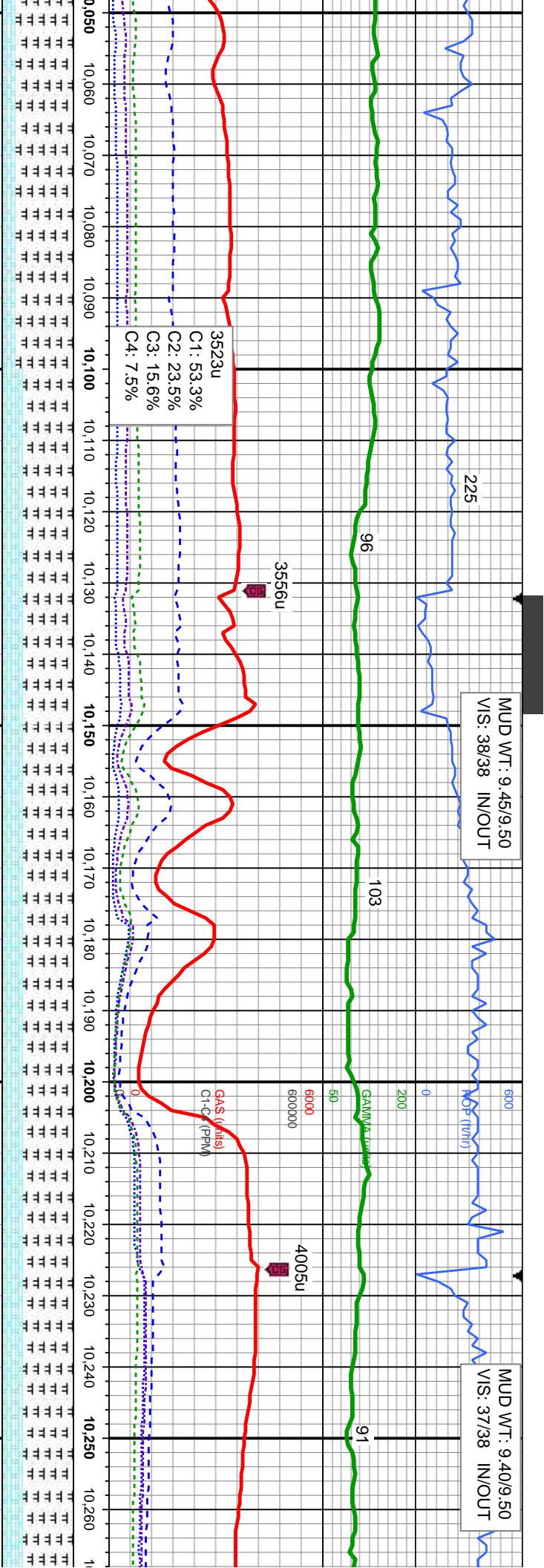
MD: 9,878'  
TVD: 6,565.22'

MD: 9,973'  
TVD: 6,566.96'

6400

mot, lam, sft - frm, v calc	30% CHK: tan - ltgy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	20% CHK: tan - ltgy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc	20% CHK: tan - ltgy brn, mot, lam, sft - frm, sb pily - sb blk, rthy tex, v calc
blk, sft - mod	70% MRL: lt - med gy, sme blk, sft - mod	80% MRL: lt - med gy, sme blk, sft - mod	80% MRL: lt - med gy, sme blk, sft - mod
grfy tex, abnt bent,	hd, sb pily - sb blk, silty - grfy tex, abnt bent, abnt fos frag	hd, sb pily - sb blk, silty - grfy tex, abnt bent, abnt fos frag	hd, sb pily - sb blk, silty - grfy tex, abnt bent, abnt fos frag





MD: 10,068'  
TVD: 6,569.81'

Inclination: 87.84°  
Azimuth: 87.33°  
VS: 3,584.02'

MD: 10,163'  
TVD: 6,572.09'

Inclination: 89.41°  
Azimuth: 88.42°  
VS: 3,676.38'

6400

MD: 10,258'  
TVD: 6,574.45'

Inclination: 87.75°  
Azimuth: 85.84°  
VS: 3,768.44'

20% CHK: tan - ltgy brn, mot, lam, sft - frm,  
sb ply - sb blk, rthy tex, v calc  
80% MRL: lt - med gy, sme blk, sft - mod  
hd, sb ply - sb blk, silty - grty tex, abnt bent,  
abnt fos frag

30% CHK: tan - ltgy brn, mot, lam, sft - frm,  
sb ply - sb blk, rthy tex, v calc  
70% MRL: lt - med gy, sme blk, sft - mod  
hd, sb ply - sb blk, silty - grty tex, abnt bent,  
abnt fos frag

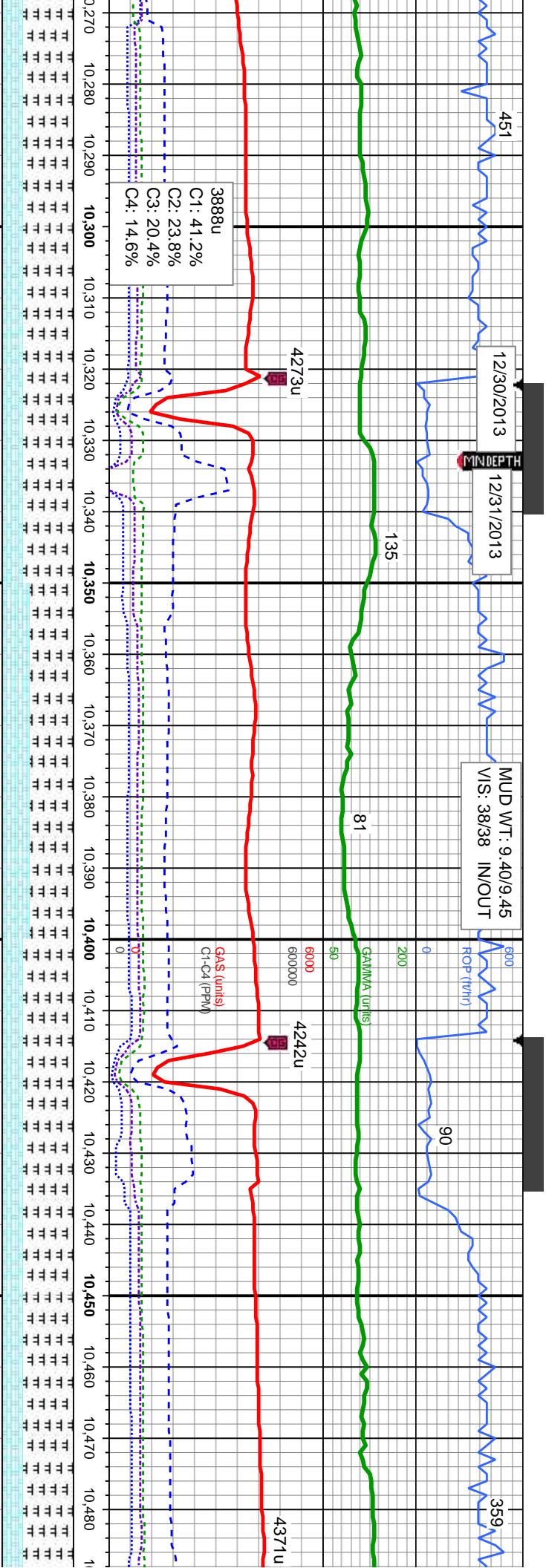
30% CHK: tan - ltgy brn, mot, lam, sft - frm,  
sb ply - sb blk, rthy tex, v calc  
70% MRL: lt - med gy, sme blk, sft - mod  
hd, sb ply - sb blk, silty - grty tex, abnt bent,  
abnt fos frag

30% CHK: tan - ltgy brn, mot, lam, sft - frm,  
sb ply - sb blk, rthy tex, v calc  
70% MRL: lt - med gy, sme blk, sft - mod  
hd, sb ply - sb blk, silty - grty tex, abnt bent,  
abnt fos frag

30% CHK: tan -  
sb ply - sb blk,  
70% MRL: lt - m  
hd, sb ply - sb b  
abnt fos frag







MD: 10,353'	MD: 10,448'
TVD: 6,577.03'	TVD: 6,577.62'
Inclination: 89.14 °	Inclination: 90.15 °
Azimuth: 85.91 °	Azimuth: 87.69 °
VS: 3,859.98'	VS: 3,951.94'

30% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, abnt bent, abnt fos frag	30% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, abnt bent, abnt fos frag	30% CHK: tan - ltgy brn, mot, lam, sft - frm, sb ply - sb blk, rthy tex, v calc 70% MRL: lt - med gy, sme blk, sft - mod hd, sb ply - sb blk, silty - grty tex, abnt bent, abnt fos frag
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