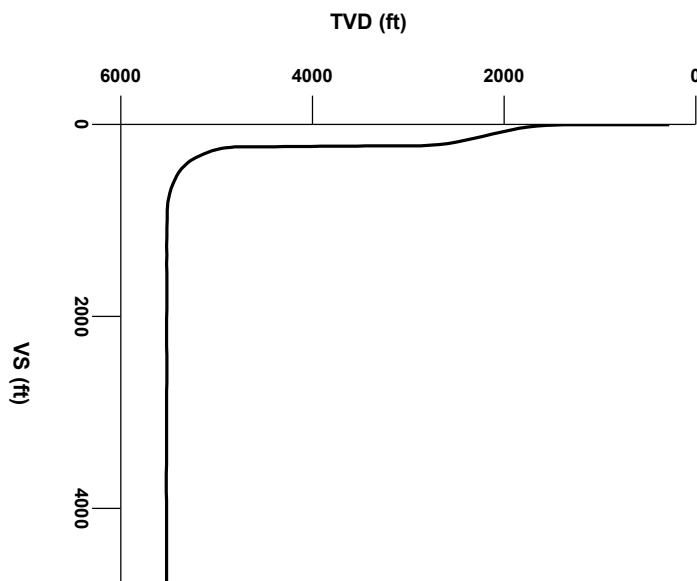


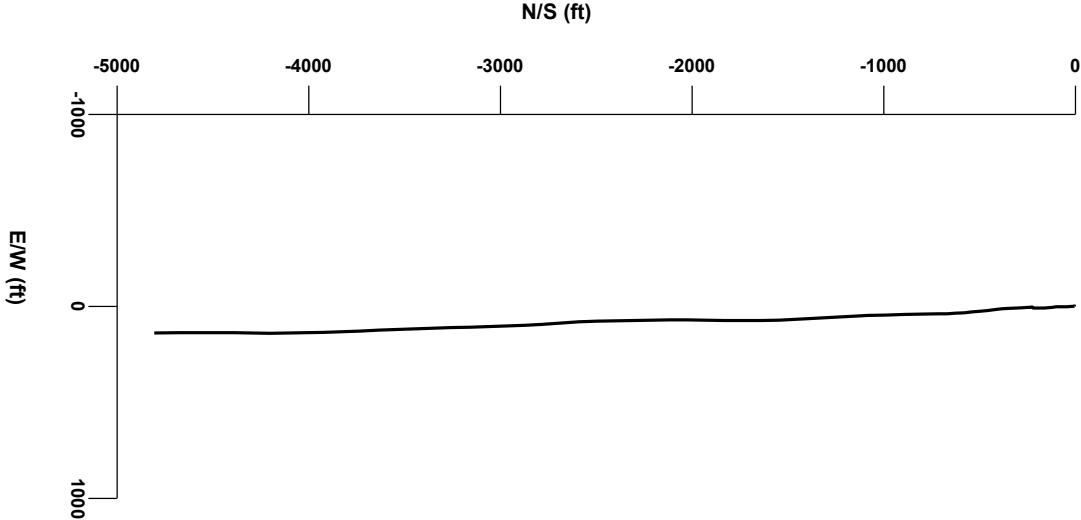
LOG created using LPLOT VH Version 3.0, May 29, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** NOBLE ENERGY INC.  
**WELL:** CASTOR FEDERAL LD13-78HN  
**LOCATION:** SEC 12, T9N, R58W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 250 FSL, 660 FWL  
**ELEVATION:** 4628' GL, 4652' KB  
**FIELD:** WILDCAT  
**SPUD DATE:** 5/23/2013  
**TD DATE:** 5/28/2013  
**DATES LOGGED:** 5/23/2013 - 5/29/2013  
**DEPTHS LOGGED:** 1242' - 9888'  
**LOGGERS:** JOHN T. READY, JEFF LACY  
**DRILLING FLUID:** WATER, MUD, POLY  
**DRILLING RIG:** H&P 322  
**API:** 05-123-37097  
**LOG TYPE:** HORIZONTAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.



Survey Elevation

Survey Plan



6000

Chalk

Marl

Silty Shale

ENGINEERING SYMBOLS

▲

Casing

▲

Casing

◻

Connection

⊗

Connection Gas

↙

Arrow

▣

Midnight Depth

➔

Arrow

GAS

0

UNITS

2000

C1

0

PPM

200000

C2

0

PPM

200000

C3

0

PPM

200000

C4

0

PPM

200000

DEPTH  
(FEET)

4740

50

60

70

80

90

4800

10

20

30

40

50

60

ROP

0

FT/HR

400

246

250

Log Continued From:  
Castor Federal LD13-78HN(VERT).iplot

Resumed Drilling @: 4748' MD  
07:37 hrs 5/25/2013

1166u

862u

UNITS

2000

0

PPM

200000

FT/HR

400

CUTTINGS LITHOLOGY

107

113

GAMMA

50

API

250

MD

4781'

INC

0.49°

AZM

141.20°

TVD

4760.80'

MD

4828'

INC

2.87°

AZM

171.02°

TVD

4807.78'

6000

ft

4700

50

API

250

COLUMBINE LOGGING INC.

RIGGED UP ON 5/23/2013

MANNED 2-PERSON LOGGING

WITH BLOODHOUND GAS

CHROMATOGRAPH UNIT #0160

BHA #2

Bit: 8.750"

Manufacturer: NOV/Reedhyalog

Model: E1202

Serial Number: A174695

Nozzles: 5x15

Motor: 6.75"

Manufacturer: Sperry Drilling

Model: SperryDrill

Serial Number: 675-1226

Bend: 1.75

100% SILTY SH: m gy-mgypm occ v dk gy, firm -stf, sbdky - sbply, rthy sl silty tex; tr ss

100% SILTY SH: m gy-mgypm occ v dk gy, firm -stf, sbdky - sbply, rthy sl silty tex; tr ss

100% SILTY SH: m gy-mgypm occ v dk gy, firm -stf, sbdky - sbply, rthy sl silty tex; tr ss

OIL SHOWS




TFG

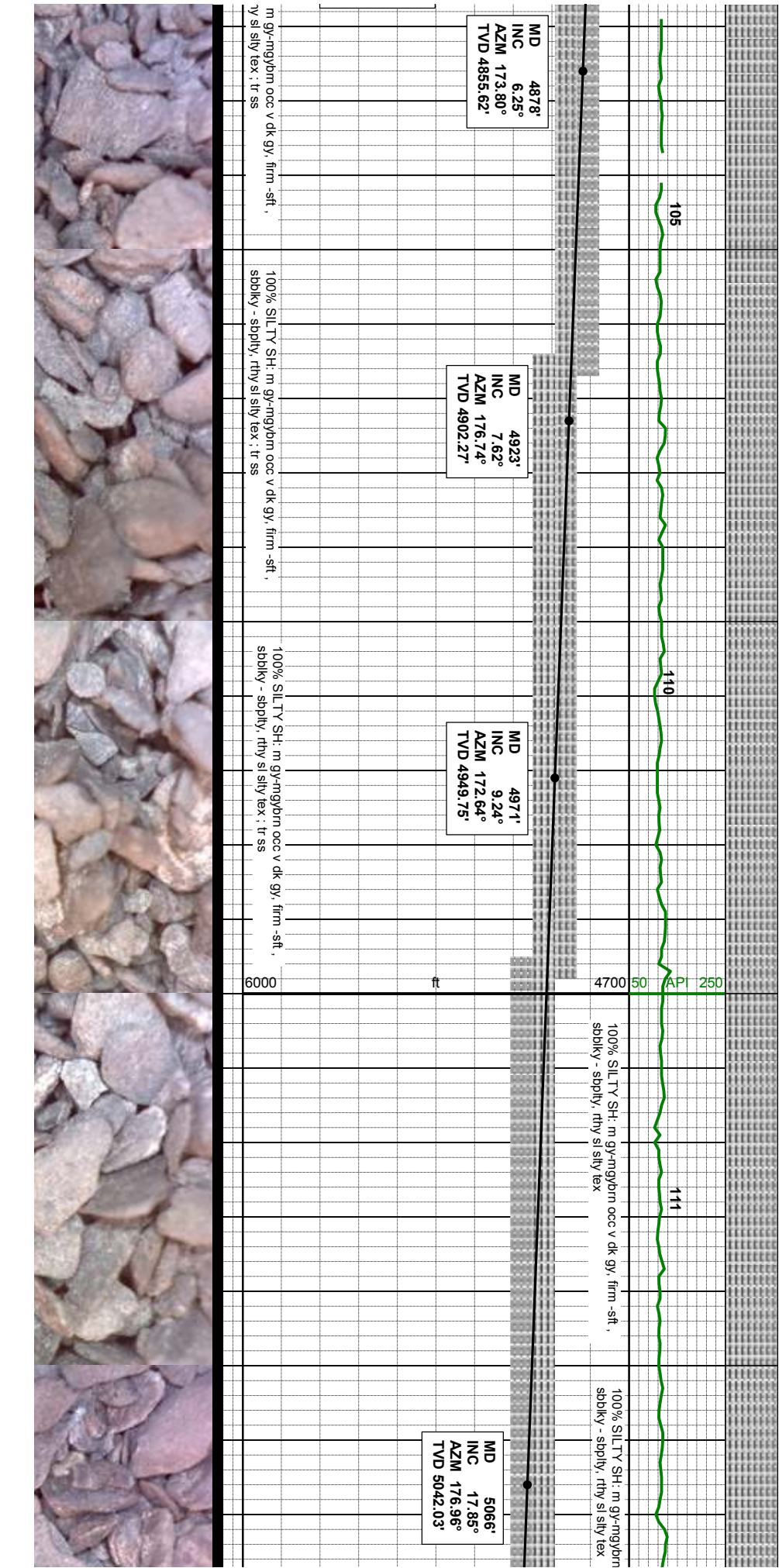
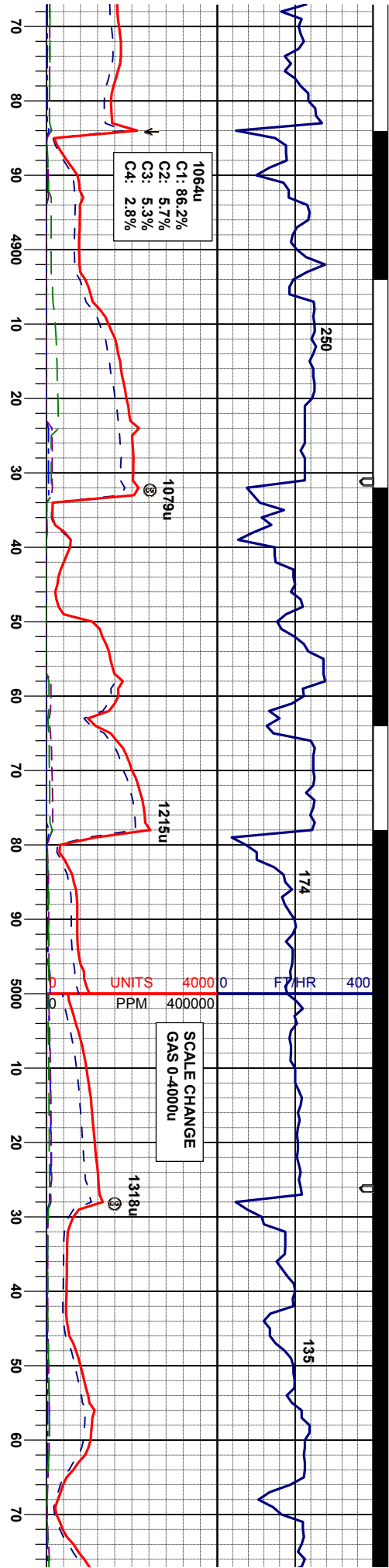
6000

ft

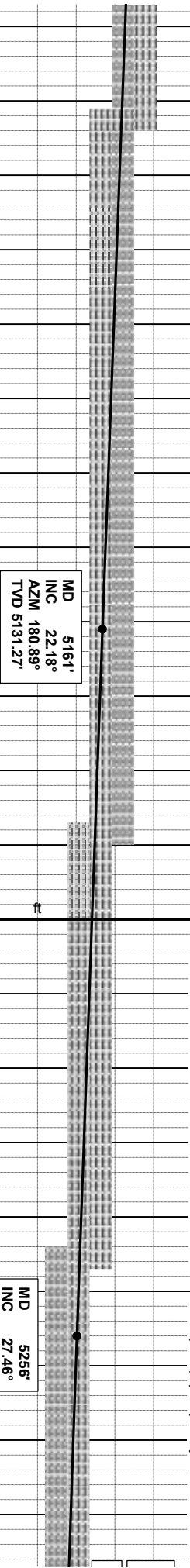
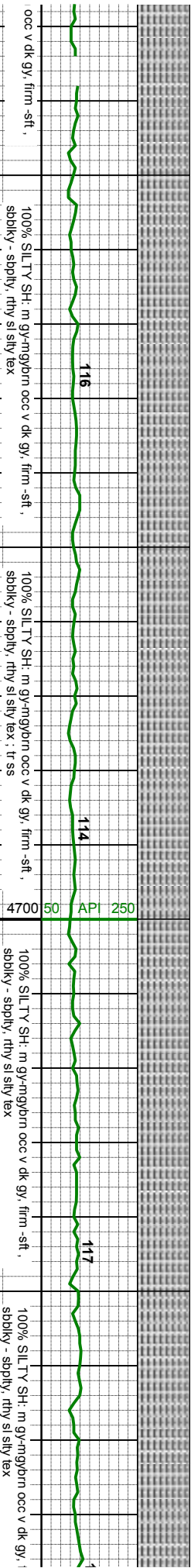
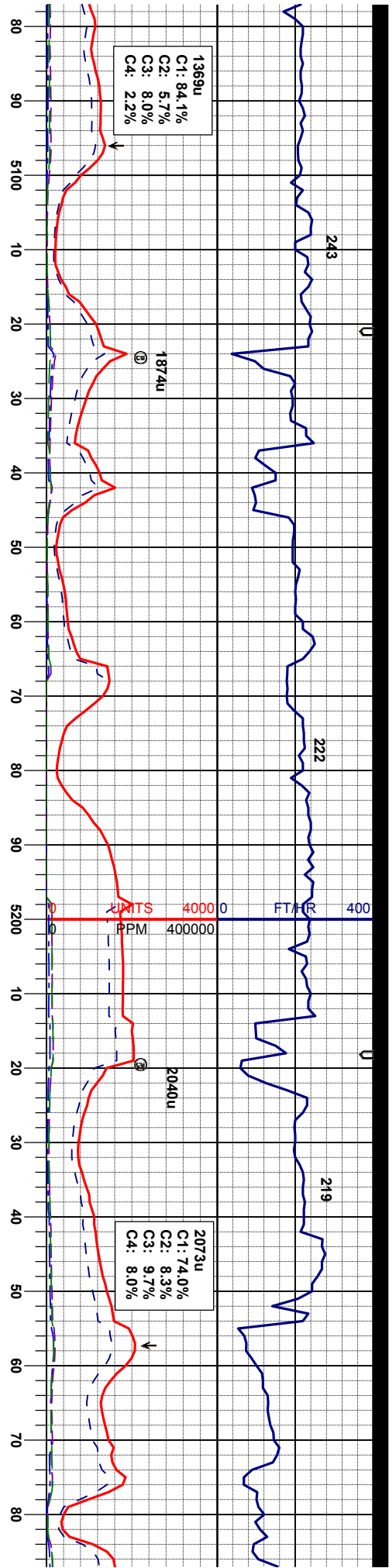
6000

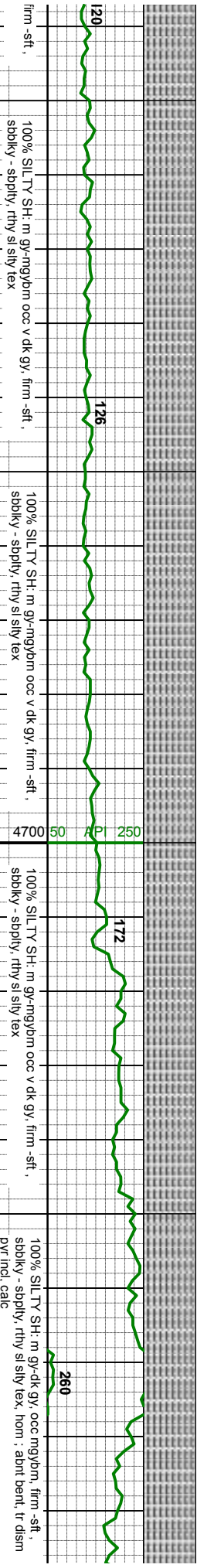
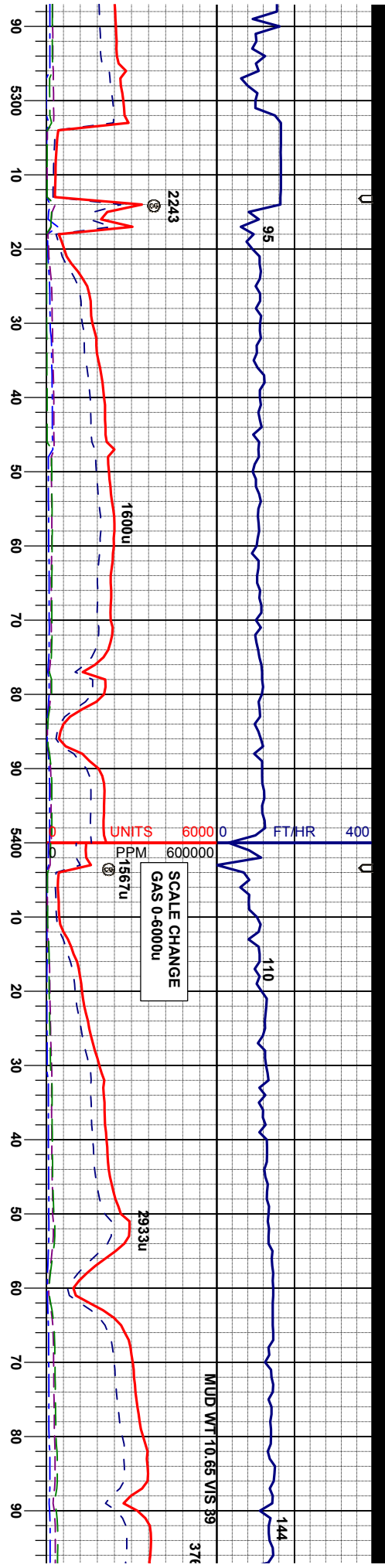
SAMPLE PHOTOS











TOOH for more aggressive motor  
@5316 MD 13.45 hrs 5/25/2013

Resumed Drilling @: 21:40, 5/25/2013

MD 5351'  
INC 37.62°  
AZM 173.22°  
TVD 5297.42'

MD 5316'  
INC 33.97°  
AZM 174.63°  
TVD 5269.03'

BHA #3  
Bit: 8.750"  
Manufacturer: NOV/ReedHycalog  
Model: E1202  
Serial Number: A174695  
Nozzles: 5x15

Motor: 6.75"  
Manufacturer: Sperry Drilling  
Model: SperryDrill  
Serial Number: 675-820  
Bend: 2.25

MD 5445'  
INC 49.89°  
AZM 174.26°  
TVD 5365.19'

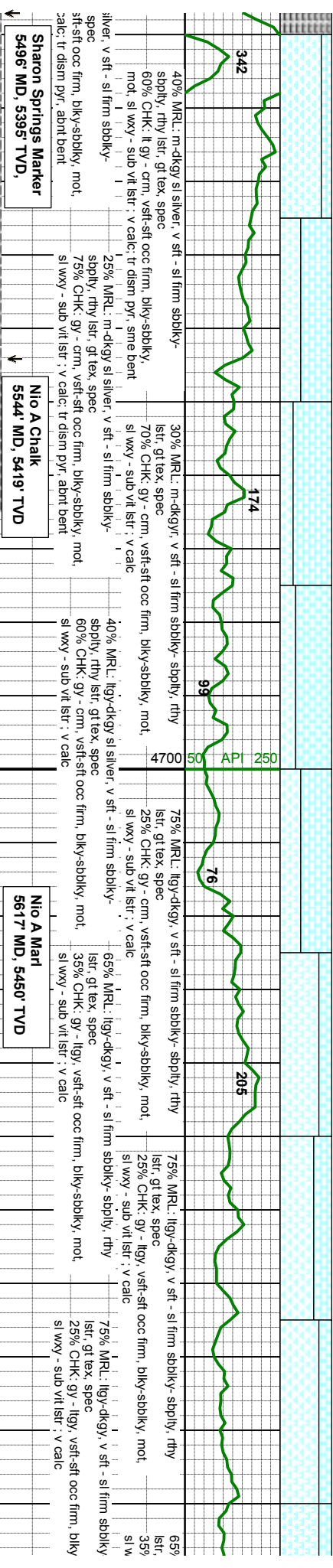
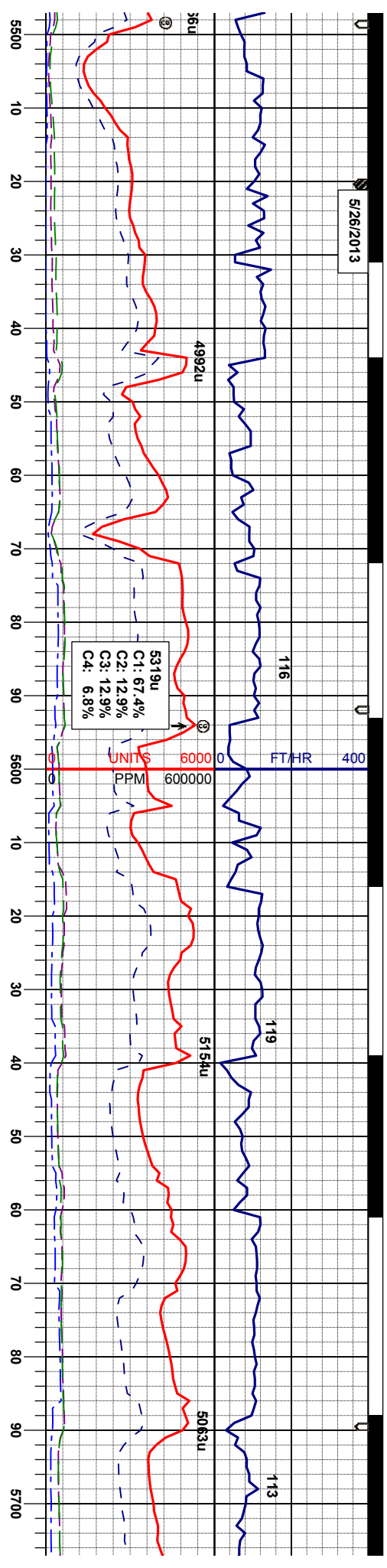
MD 5492'  
INC 56.61°  
AZM 174.51°  
TVD 5393.29'

80% MRL: m-dkgy sl s  
sbdky, rthy slsr, gr tex,  
20% CHK: gy - cm, vt  
sl wxy - sub vit slsr ; v t





5/26/2013



Sharon Springs Marker  
5496' MD, 5396' TVD,

Nio A Chaik  
5544' MD, 5419' TVD

Nio A Marl  
5617' MD, 5450' TVD

MD 5540'  
INC 62.38°  
AZM 174.23°  
TVD 5417.64'

MD 5587'  
INC 65.59°  
AZM 175.11°  
TVD 5438.25'

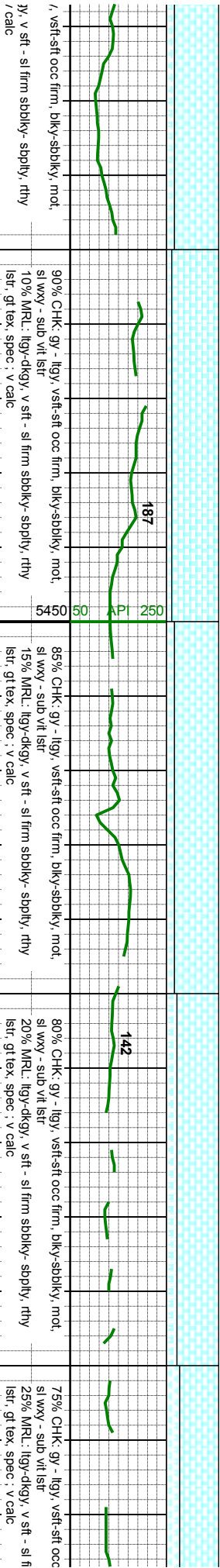
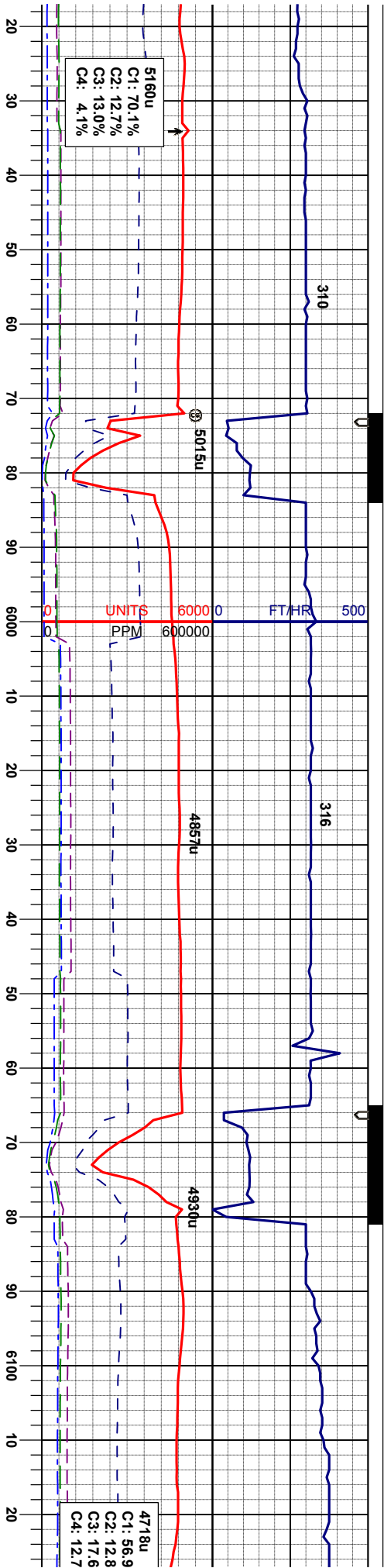
MD 5635'  
INC 68.83°  
AZM 176.69°  
TVD 5456.84'

MD 5682'  
INC 71.17°  
AZM 178.50°  
TVD 5472.92'









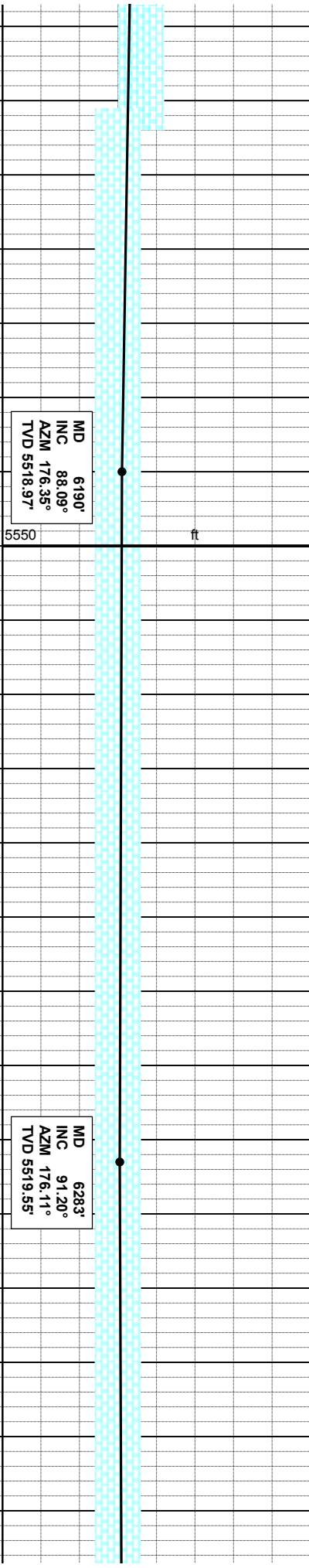
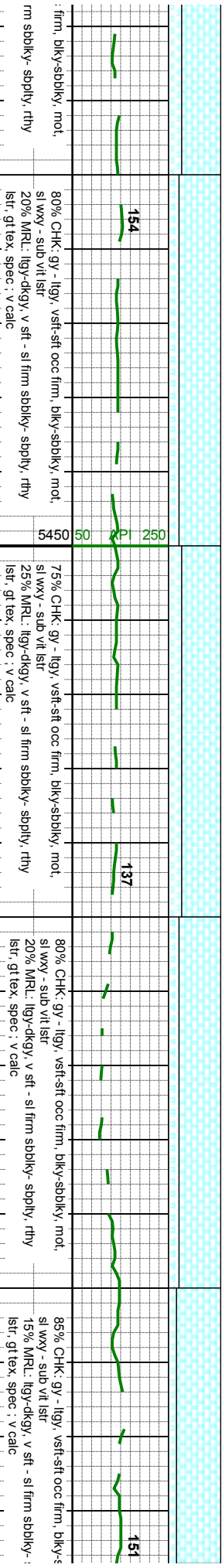
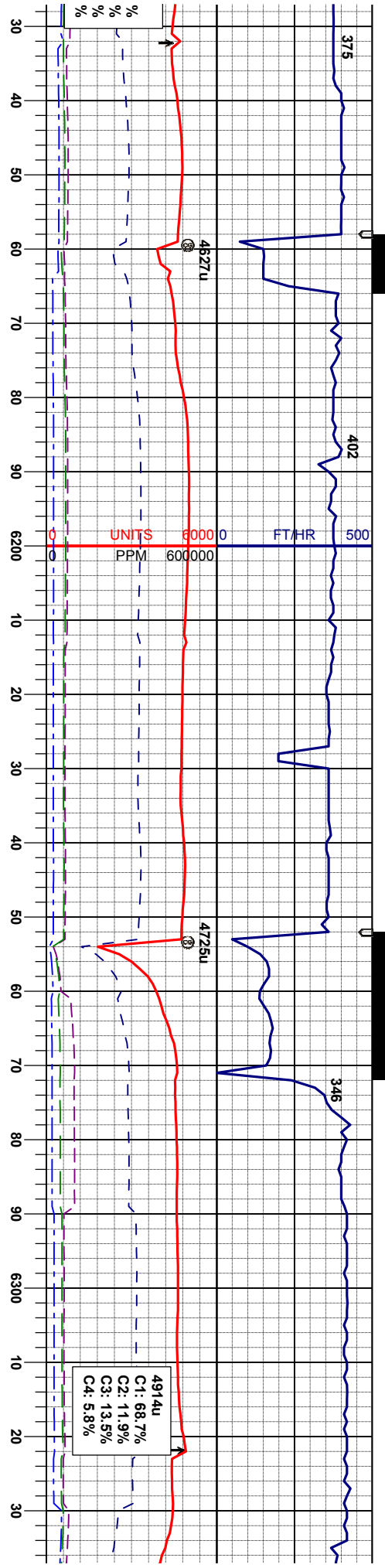
**BHA #4**  
**Bit: 6.125"**  
**Manufacturer: SlumbergerSmith**  
**Model: SD1513**  
**Serial Number: JG3363**  
**Nozzles: 5x11**

**Motor: 4.750"**  
**Manufacturer: SperryDrilling**  
**Model: 475-476**  
**Serial Number: 475-476**  
**Bend: 1.50**

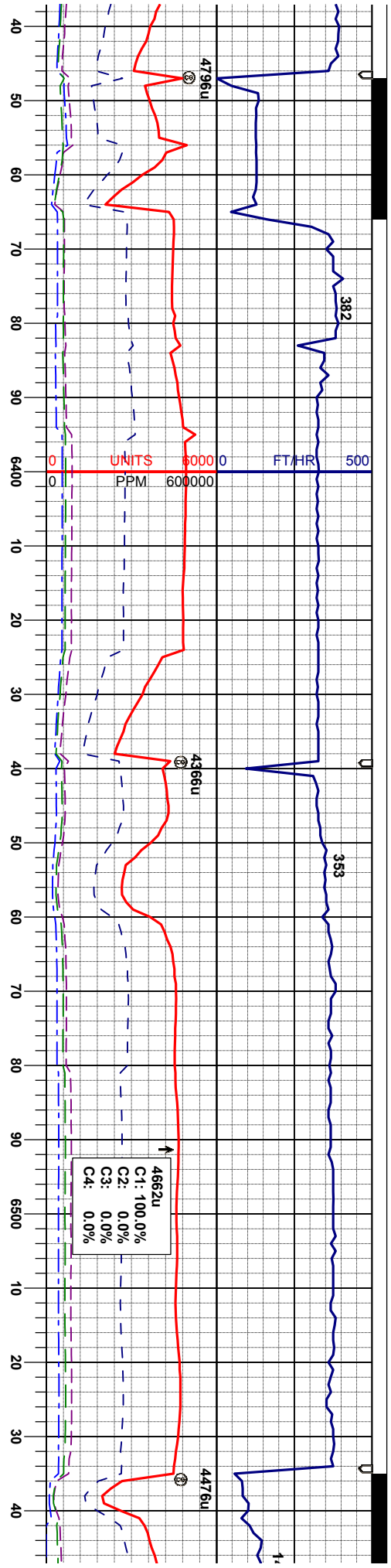
MD 6002.1  
INC 89.51°  
AZM 178.83°  
TVD 5514.27'

MD 6097.1  
INC 88.30°  
AZM 178.34°  
TVD 5516.04'



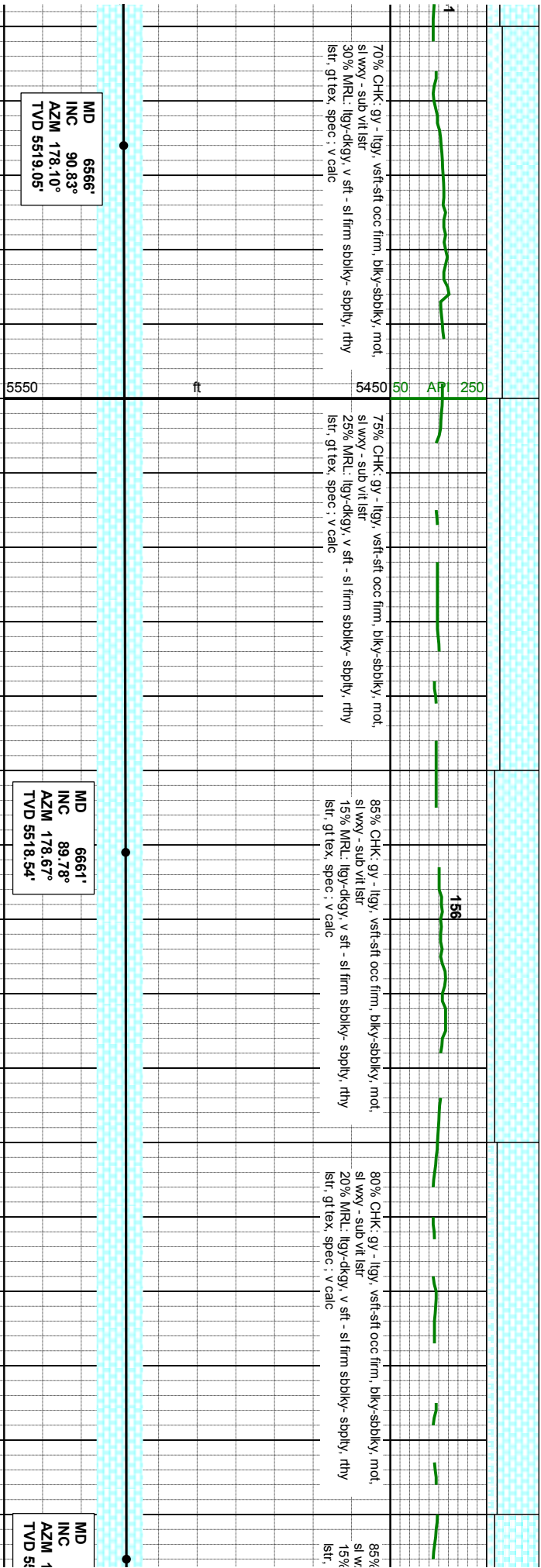
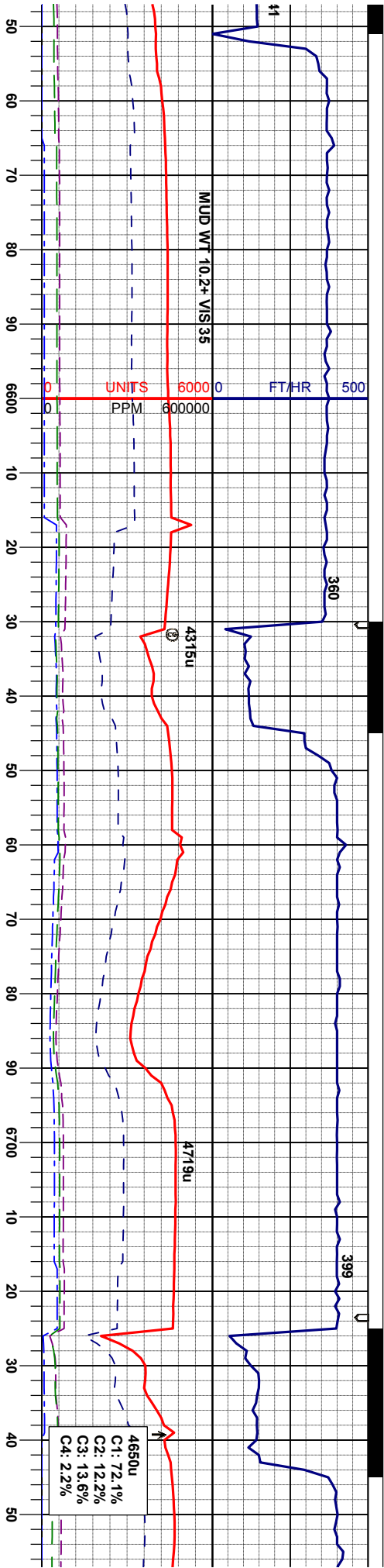




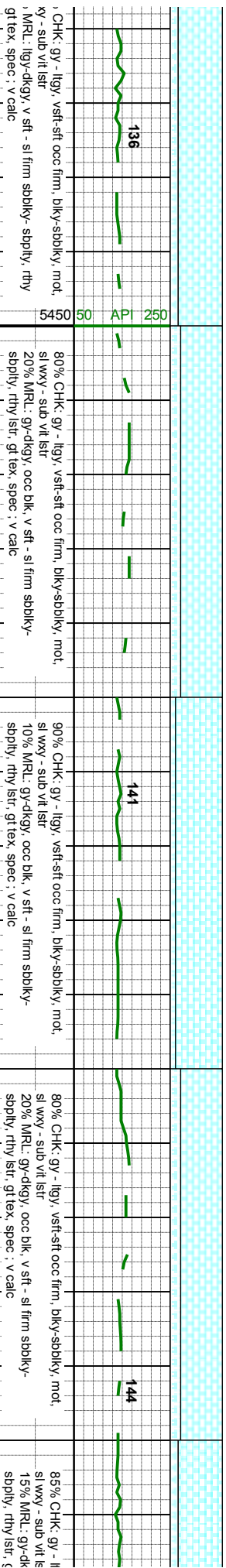
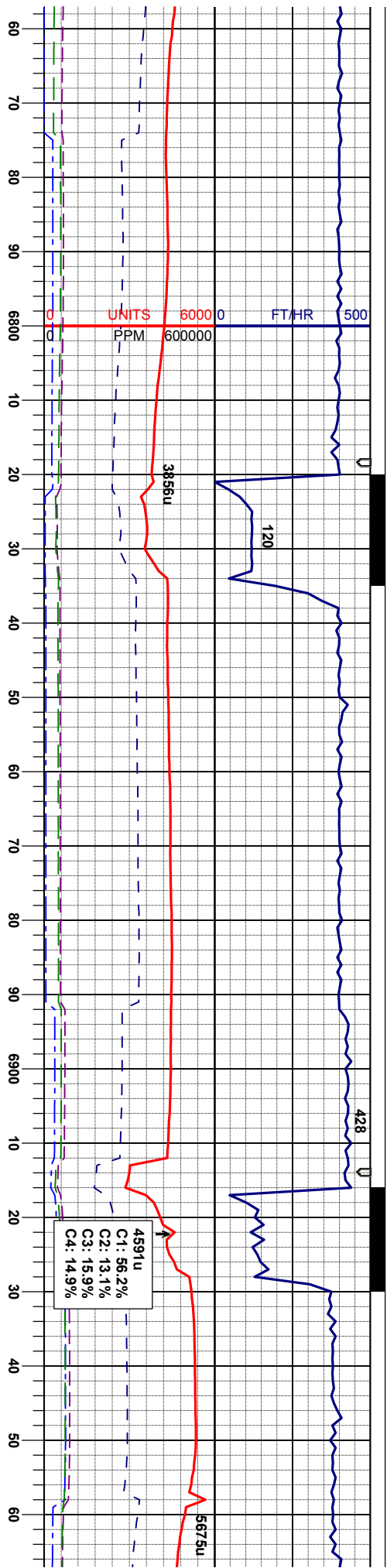


MD 6376' INC 89.66° AZM 177.78° TVD 5518.85'		MD 6471' INC 89.63° AZM 176.40° TVD 5519.44'	
5550		5550	
ft		ft	
85% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr		80% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr	
15% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc		20% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc	
sbdky, mot,		sbdky, mot,	
sbply, rthy		sbply, rthy	
5450		5450	
API 250		API 250	
164		164	
75% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr		75% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr	
25% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc		25% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc	
75% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr		75% CHK: gy - lgy, vsft-sft occ firm, biky-sbdky, mot, sl wxy - sub vit lstr	
25% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc		25% MRL: lgy-dkgy, v sft - sl firm sbdky- sbply, rthy lstr, gt lex, spec, v calc	
14		14	





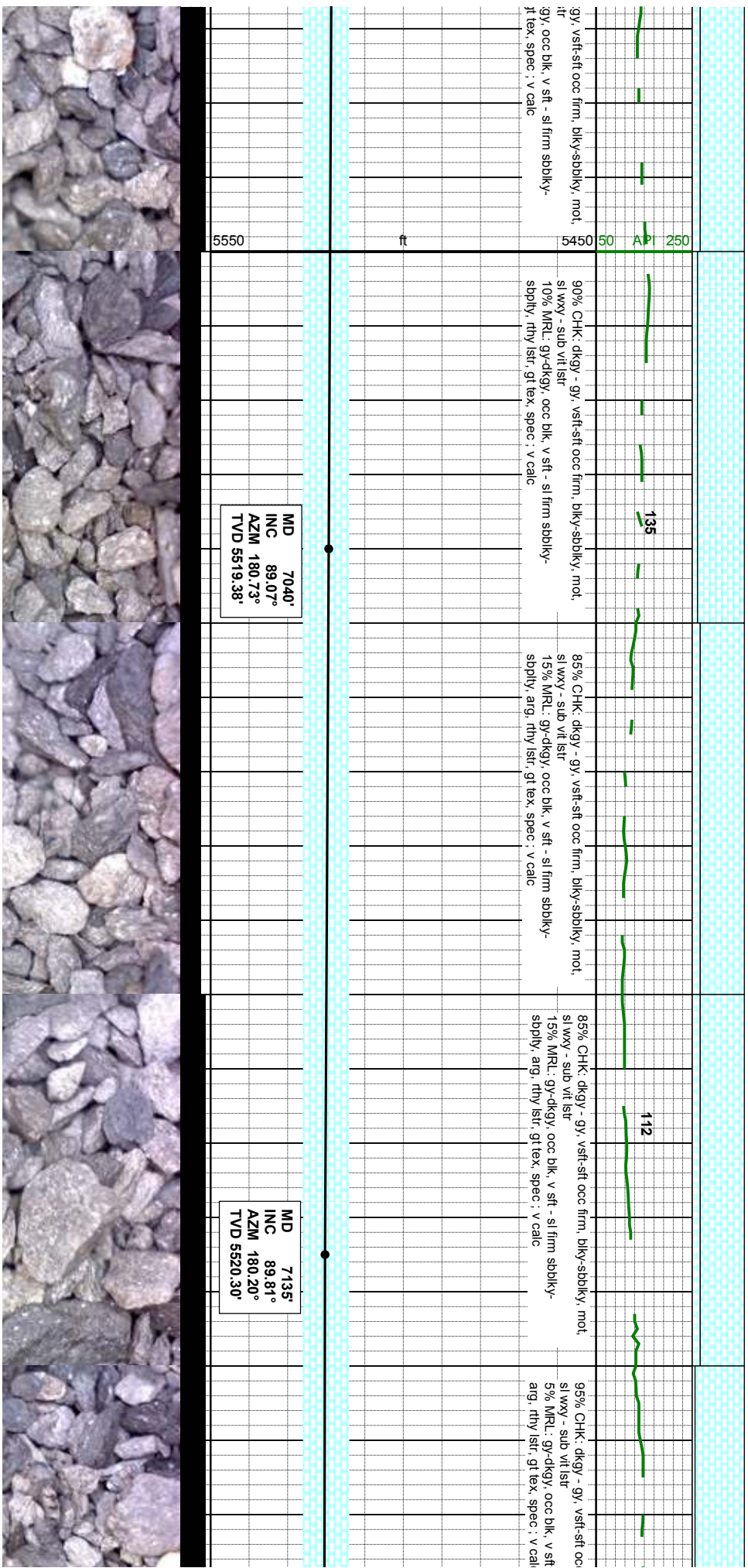
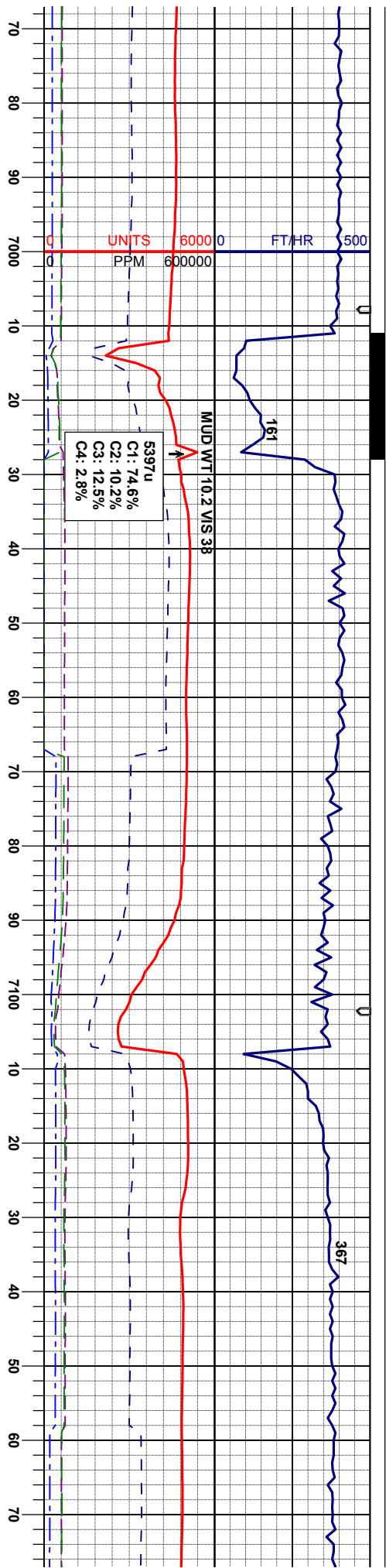




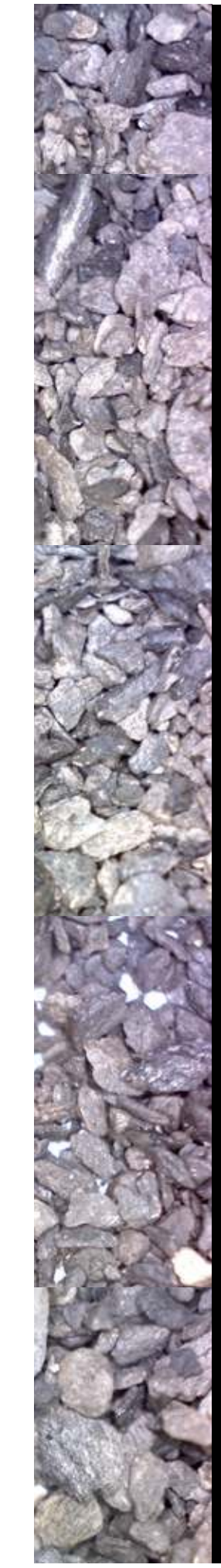
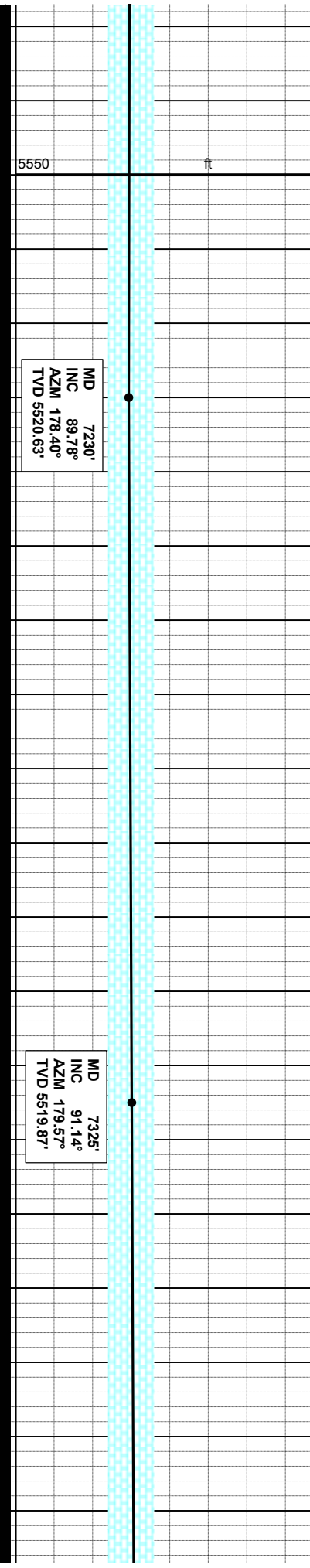
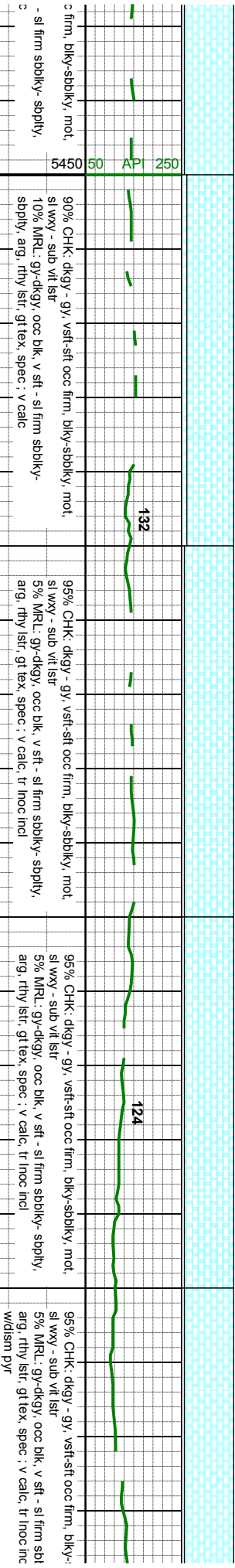
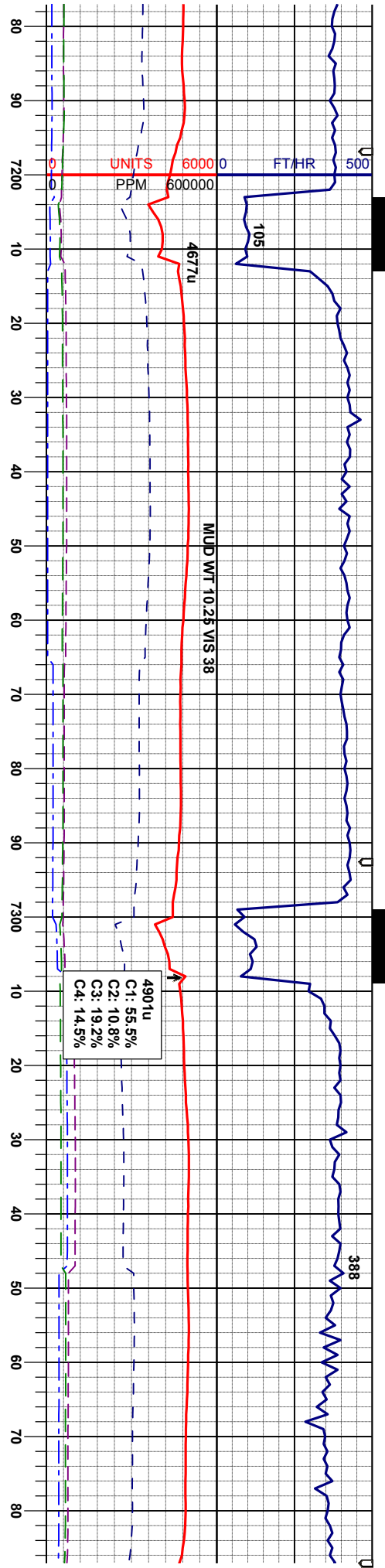
6756'  
90.46°  
81.27°  
518.34'

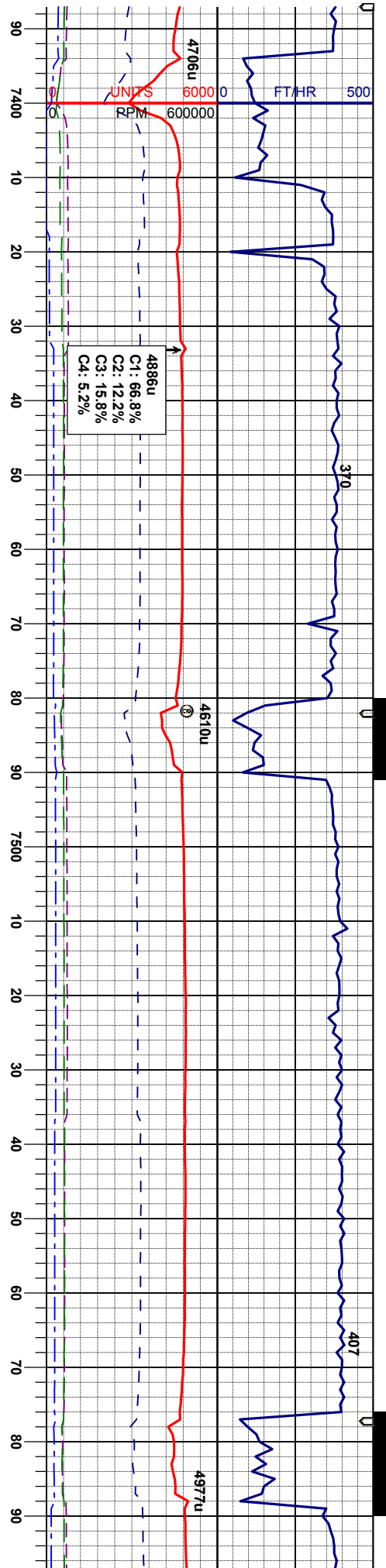
MD	6851'
INC	89.69°
AZM	180.13°
TVD	5518.21'

MD	6946'
INC	89.91°
AZM	181.02°
TVD	5518.54'







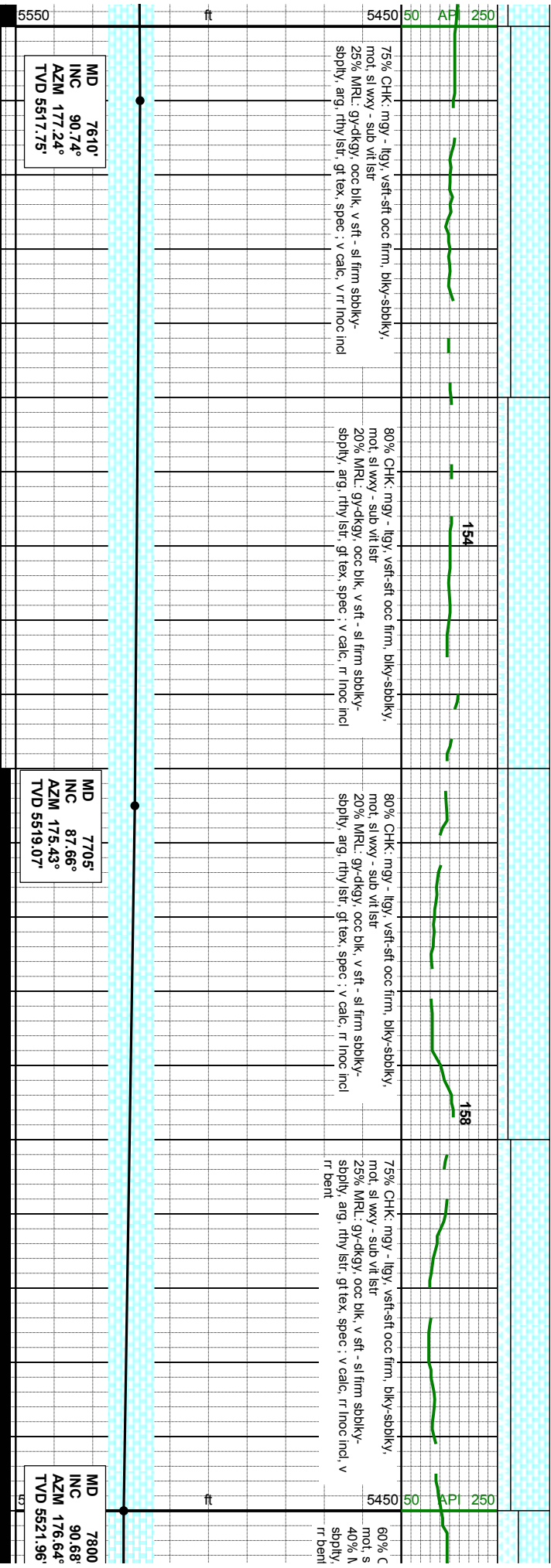
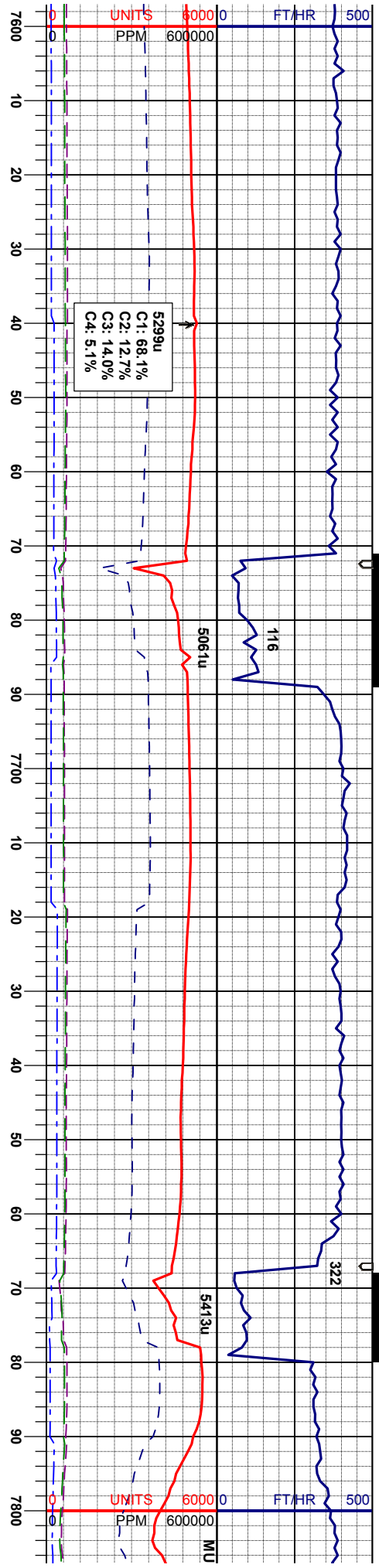


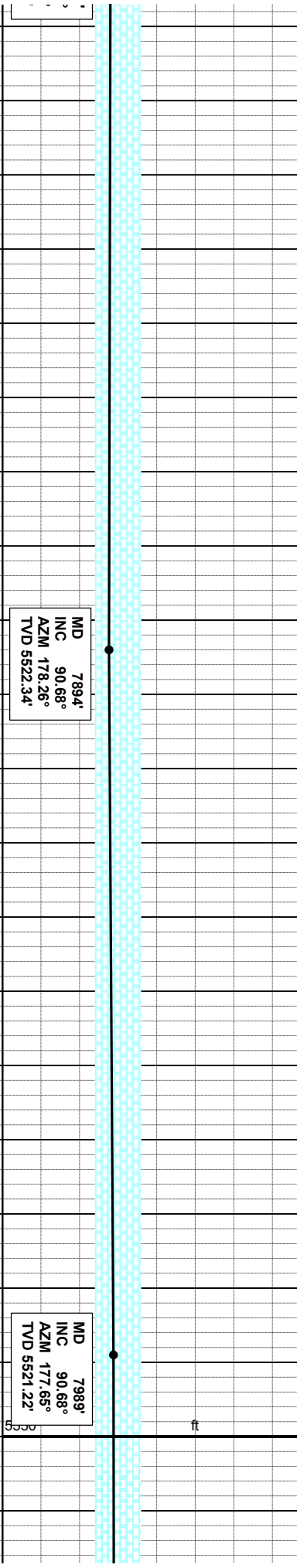
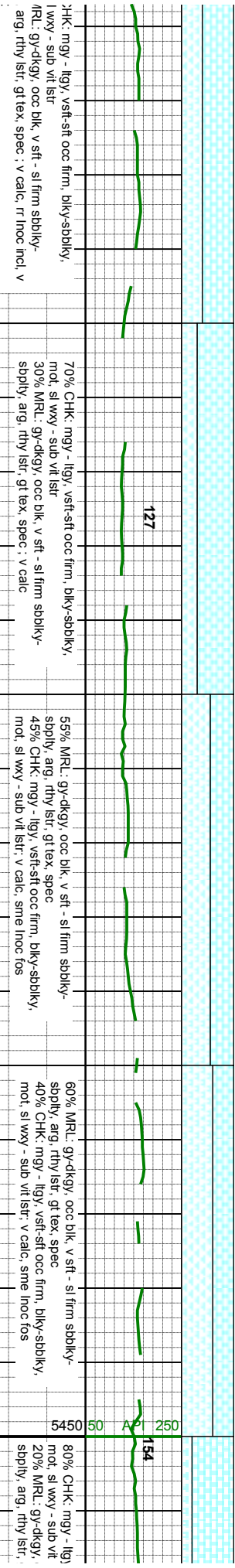
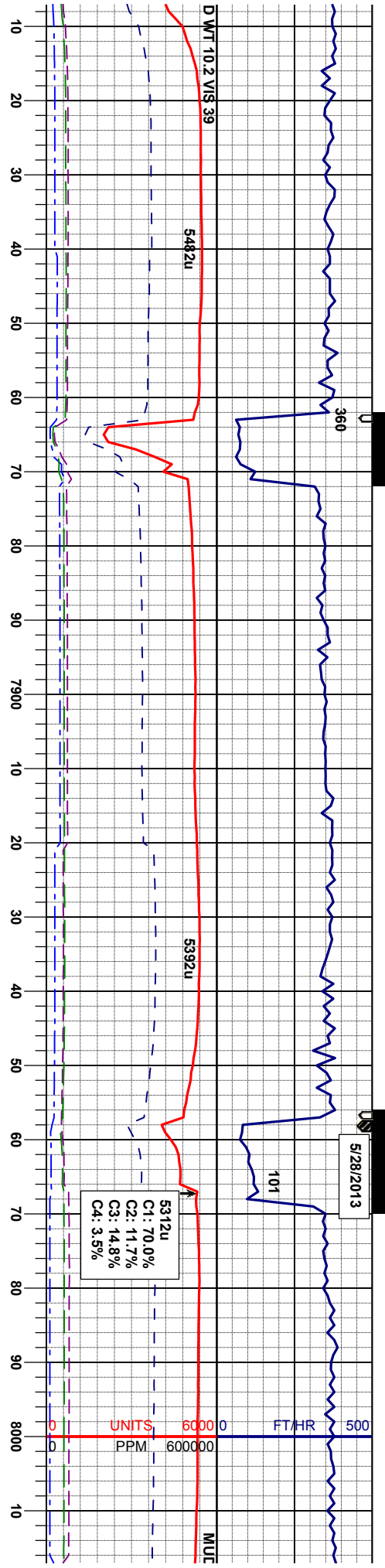
API	250	50	135	138	150
sbblky, mot.	85% CHK: dkgy - gy, vsft-sft occ firm, biky-sbblky, mot.	75% CHK: dkgy - gy, vsft-sft occ firm, biky-sbblky, mot.	85% CHK: mgy - lgy, vsft-sft occ firm, biky-sbblky, mot.	80% CHK: mgy - lgy, vsft-sft occ firm, biky-sbblky, mot.	80% CHK: mgy - lgy, vsft-sft occ firm, biky-sbblky, mot.
sl wxy - sub vit lstr	15% MRU: gy-dkgy, occ blk, v sft - sl firm sbblky-sbply, arg, rthy lstr, gt tex, spec : v calc	25% MRU: gy-dkgy, occ blk, v sft - sl firm sbblky-sbply, arg, rthy lstr, gt tex, spec : v calc	15% MRU: gy-dkgy, occ blk, v sft - sl firm sbblky-sbply, arg, rthy lstr, gt tex, spec : v calc	20% MRU: gy-dkgy, occ blk, v sft - sl firm sbblky-sbply, arg, rthy lstr, gt tex, spec : v calc	20% MRU: gy-dkgy, occ blk, v sft - sl firm sbblky-sbply, arg, rthy lstr, gt tex, spec : v calc

5550	ft	MD 7420° INC 89.82° AZM 178.29° TVD 5519.07°	MD 7515° INC 90.74° AZM 178.42° TVD 5518.79°
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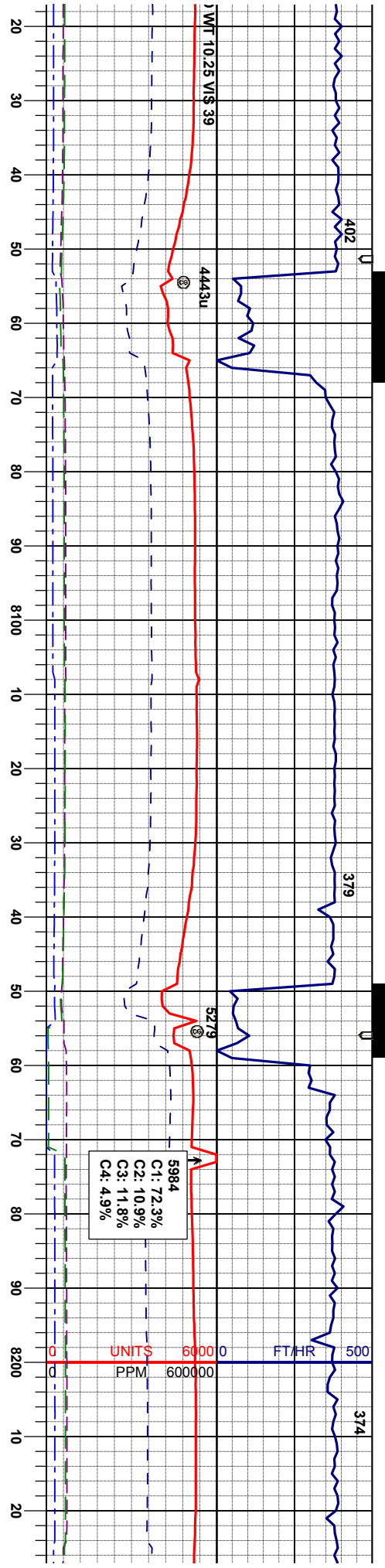




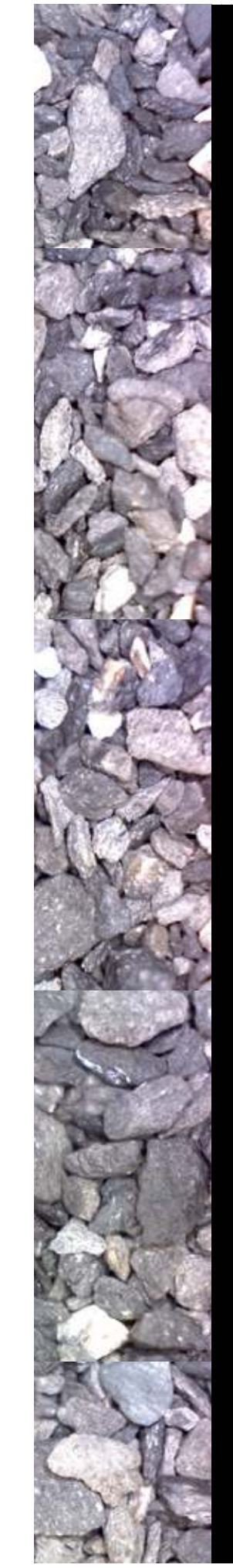
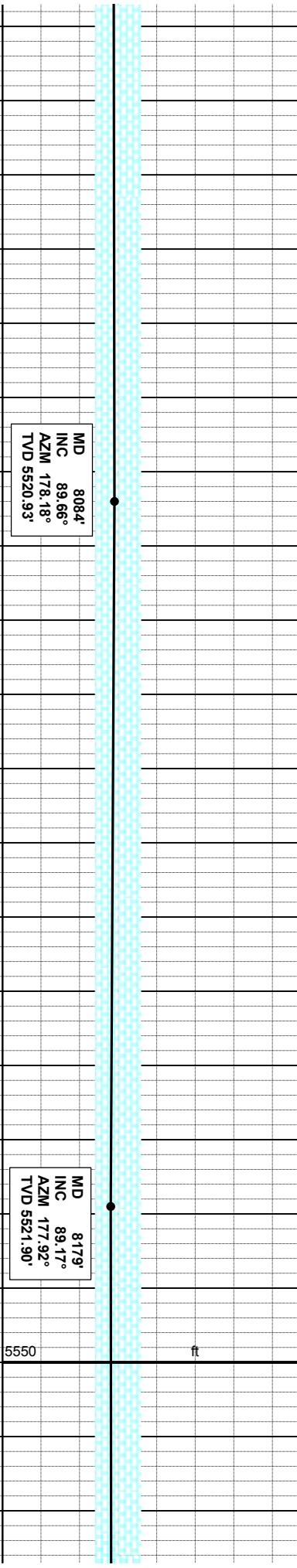


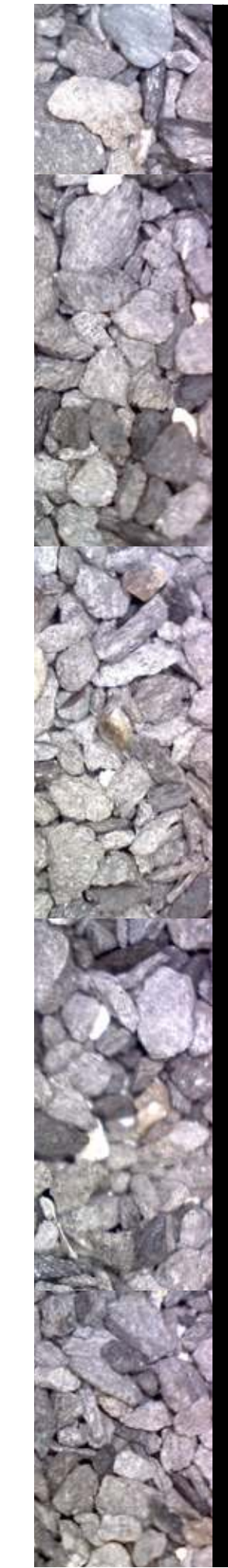
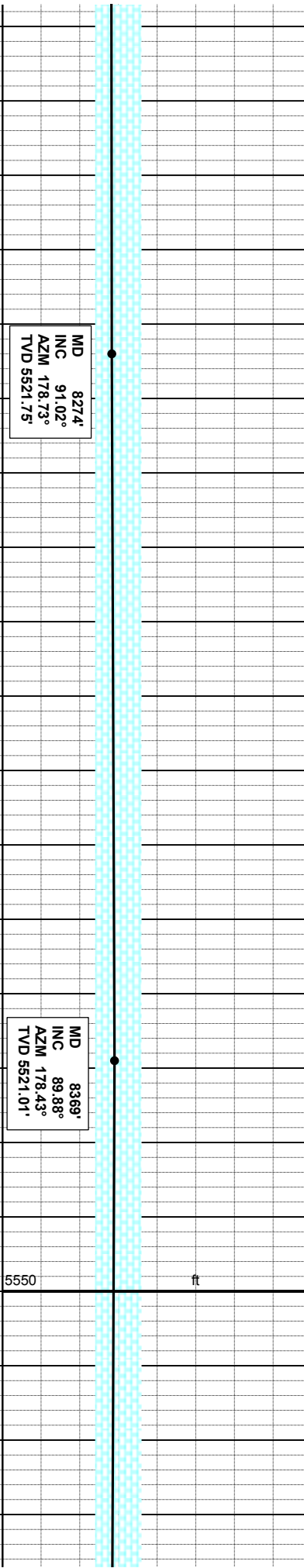
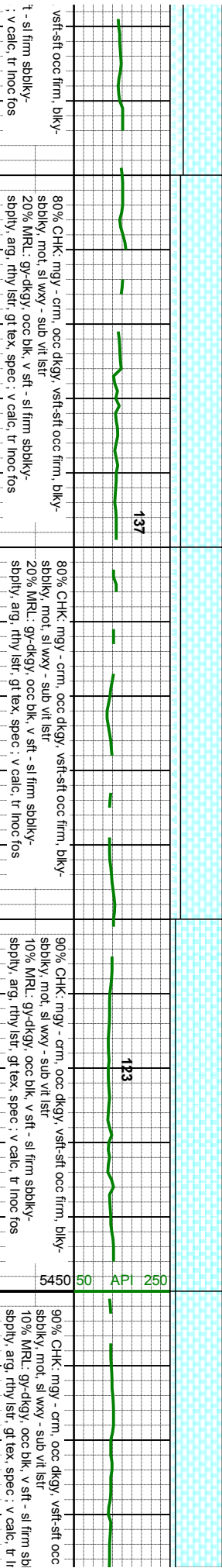
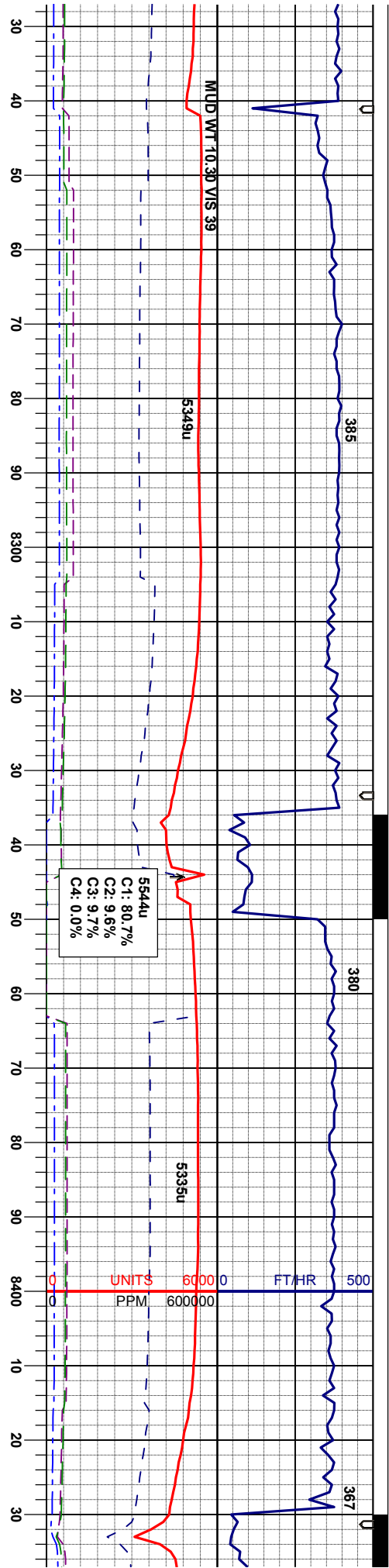




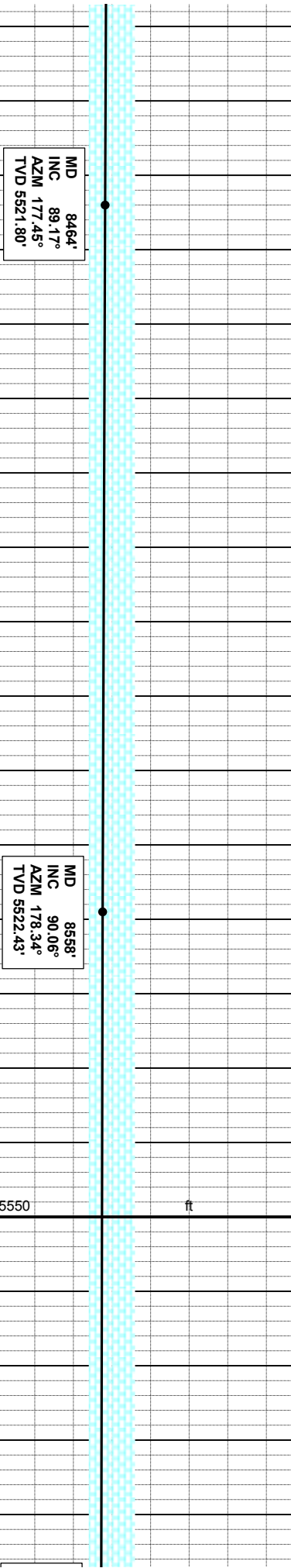
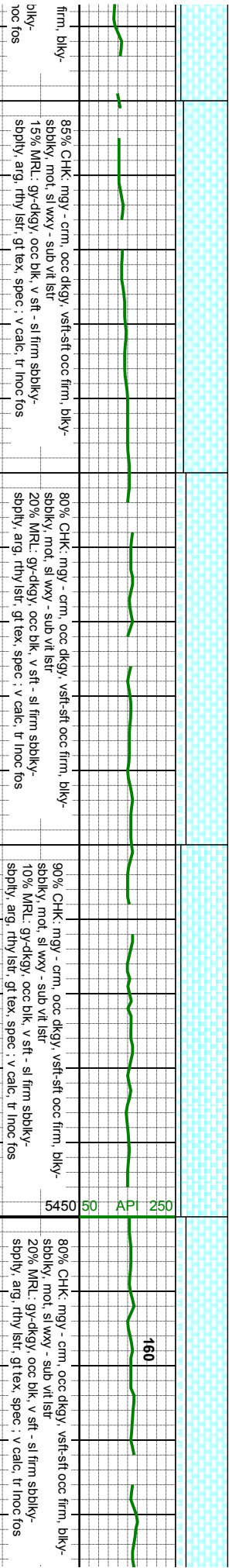
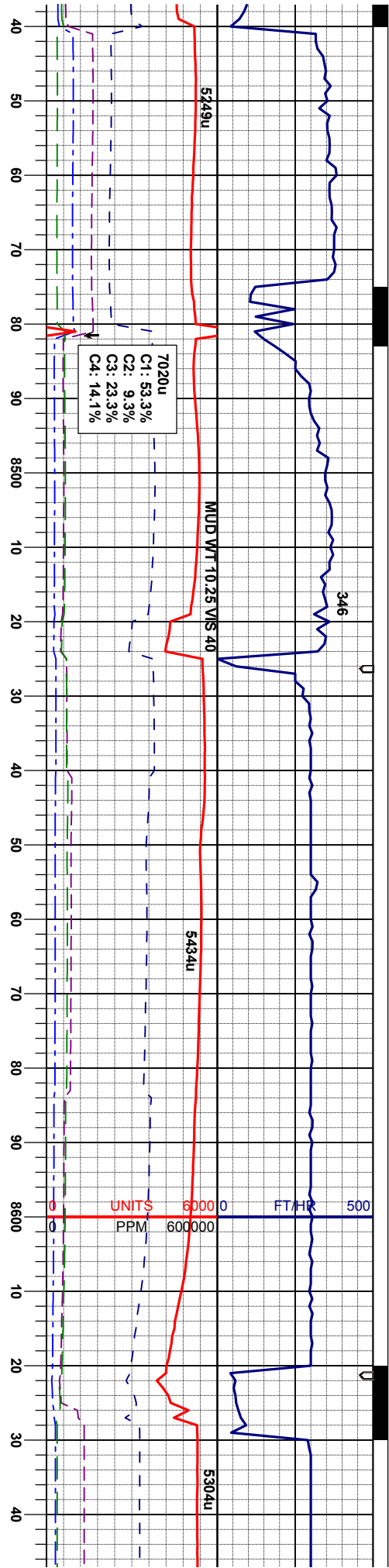


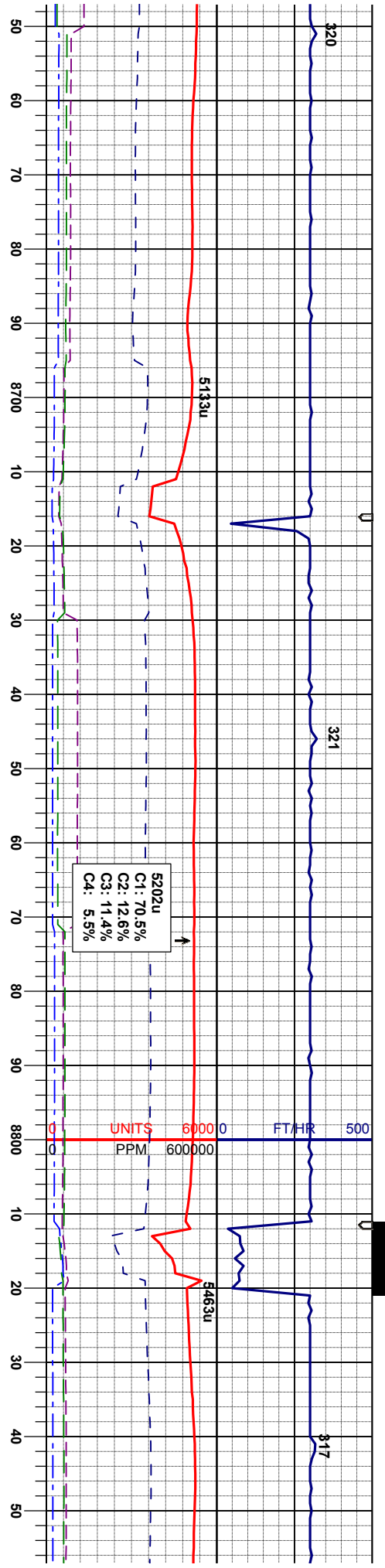
75% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mot, sl wxy - sub vit lstr	75% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mot, sl wxy - sub vit lstr	80% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mot, sl wxy - sub vit lstr	80% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mot, sl wxy - sub vit lstr	75% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mot, sl wxy - sub vit lstr
25% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt tex, spec; v calc, tr inoc fos, v tr bent	25% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt tex, spec; v calc, tr inoc fos, v tr bent	20% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt tex, spec; v calc, tr inoc fos, v tr bent	20% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt tex, spec; v calc, tr inoc fos, v tr bent	25% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt tex, spec; v calc, tr inoc fos, v tr bent









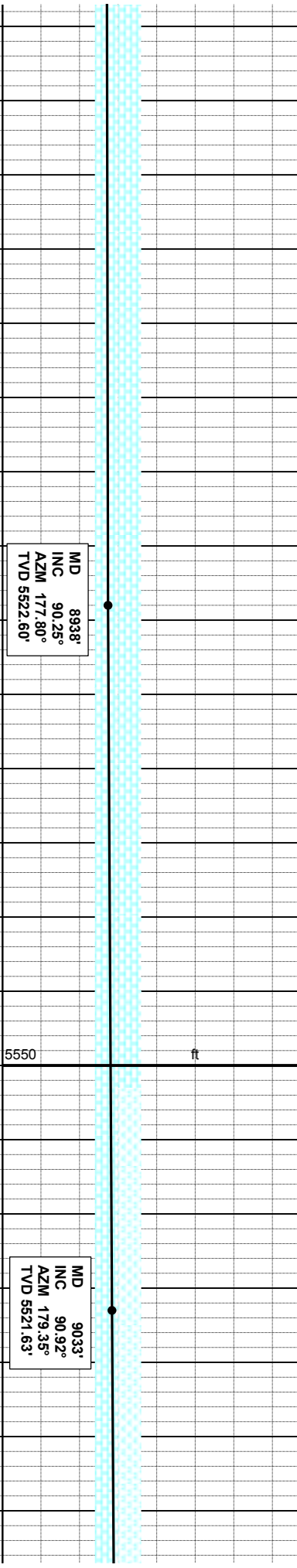
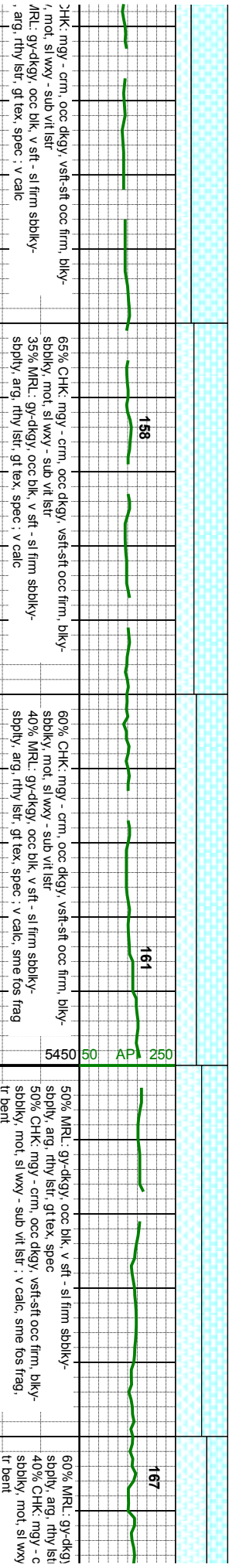
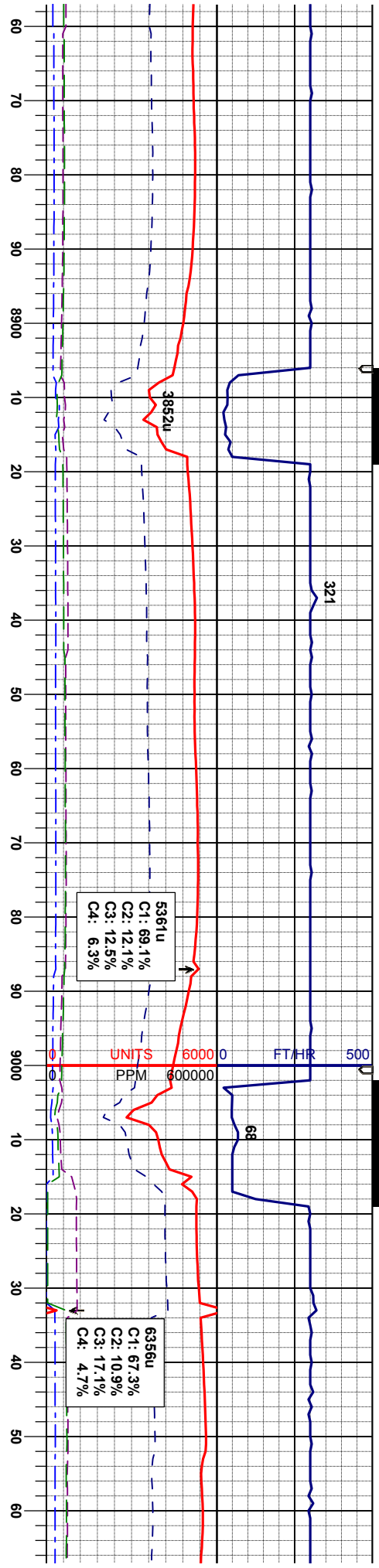


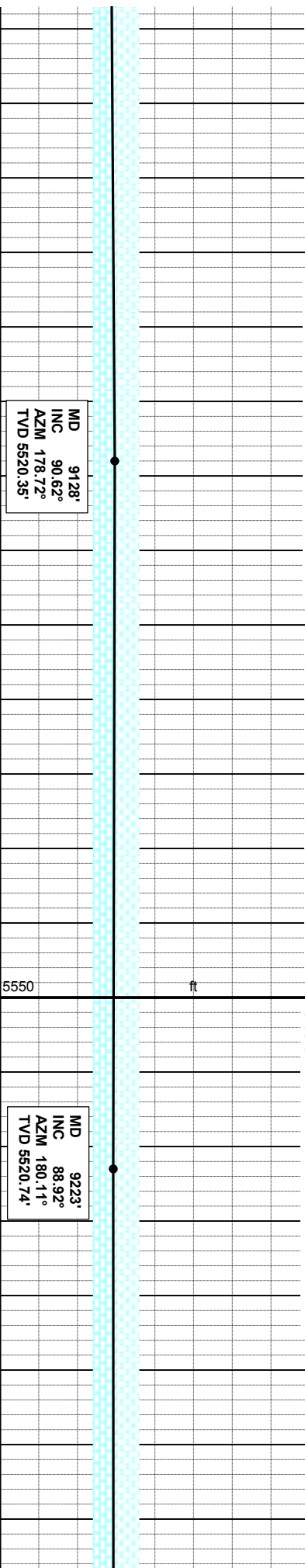
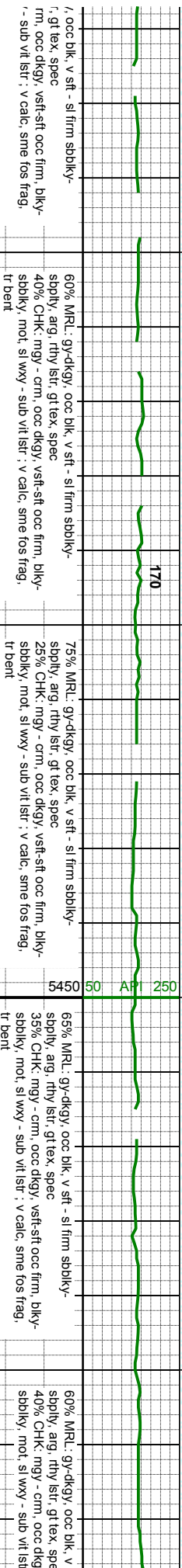
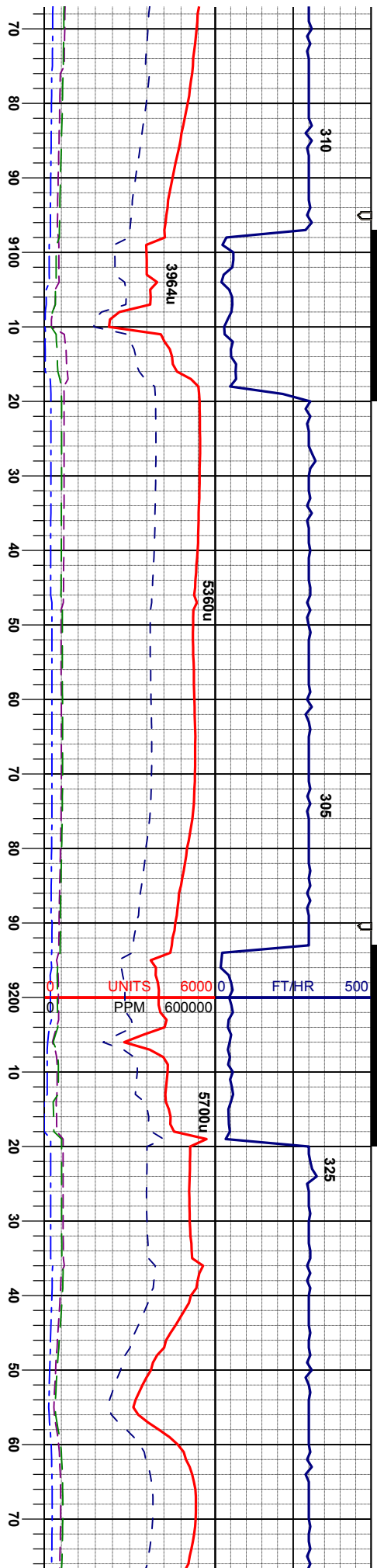
85% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mod, sl wxy - sub vit lstr	80% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mod, sl wxy - sub vit lstr	90% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mod, sl wxy - sub vit lstr	80% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky-sbbiky, mod, sl wxy - sub vit lstr	70% (sbbiky, 30% h
15% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt lex, spec: v calc, tr inoc tos	20% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt lex, spec: v calc	10% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt lex, spec: v calc	20% MRL: gy-dkgy, occ blk, v sft - sl firm sbbiky-sbply, arg, rthy lstr, gt lex, spec: v calc	

MD 8653° INC 89.51° AZM 177.57° TVD 5522.79'	MD 8749° INC 90.08° AZM 177.02° TVD 5523.13'	MD 8844° INC 90.15° AZM 178.18° TVD 5522.93'
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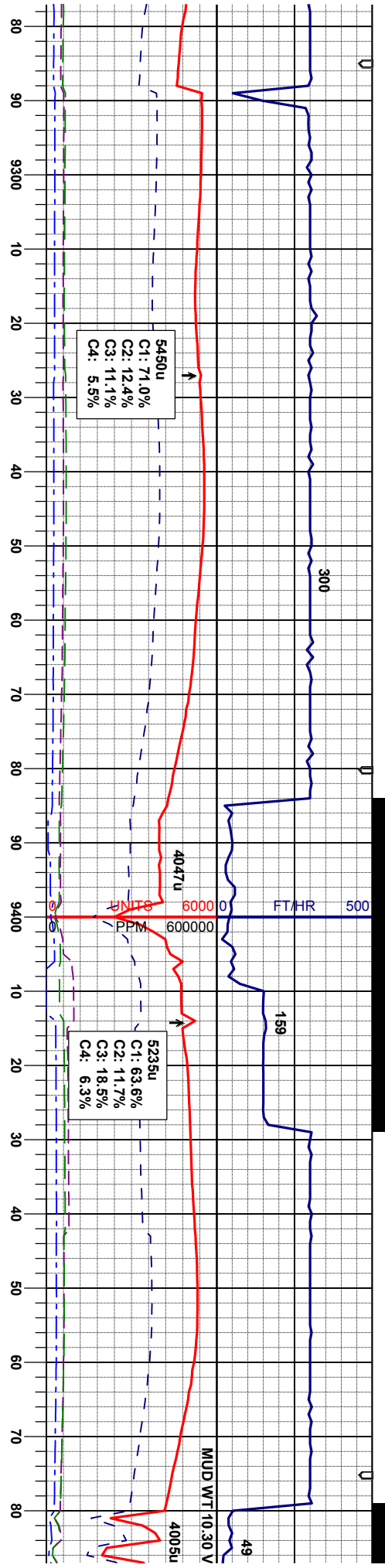










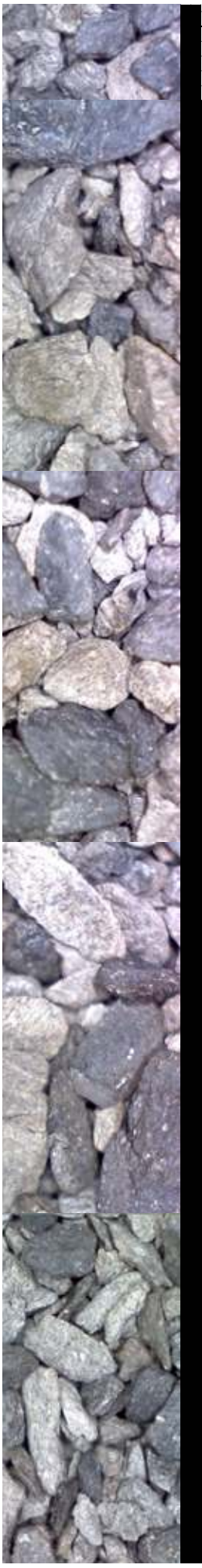
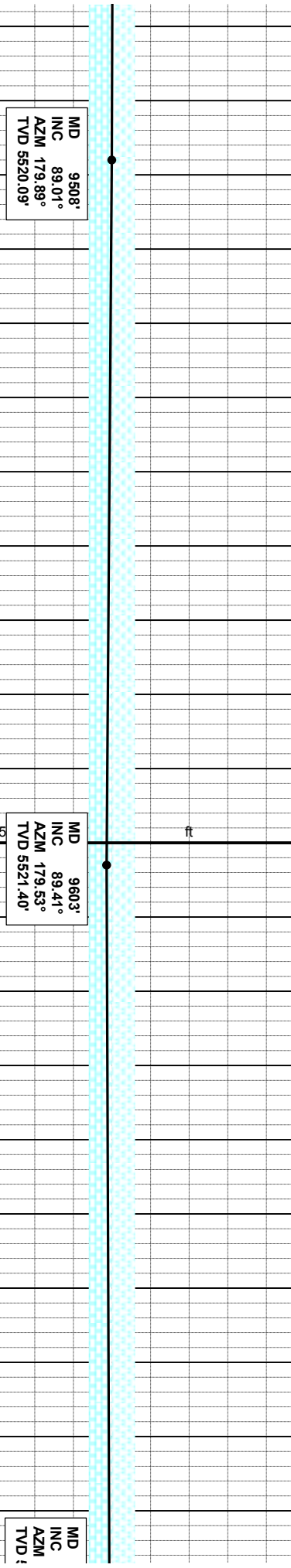
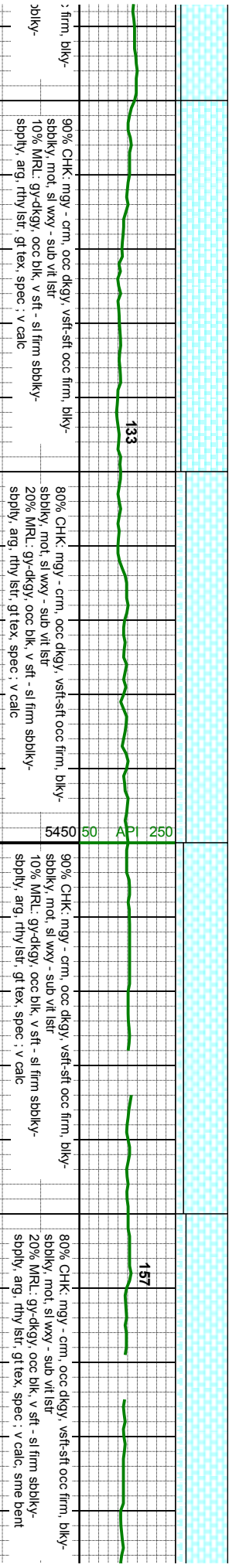
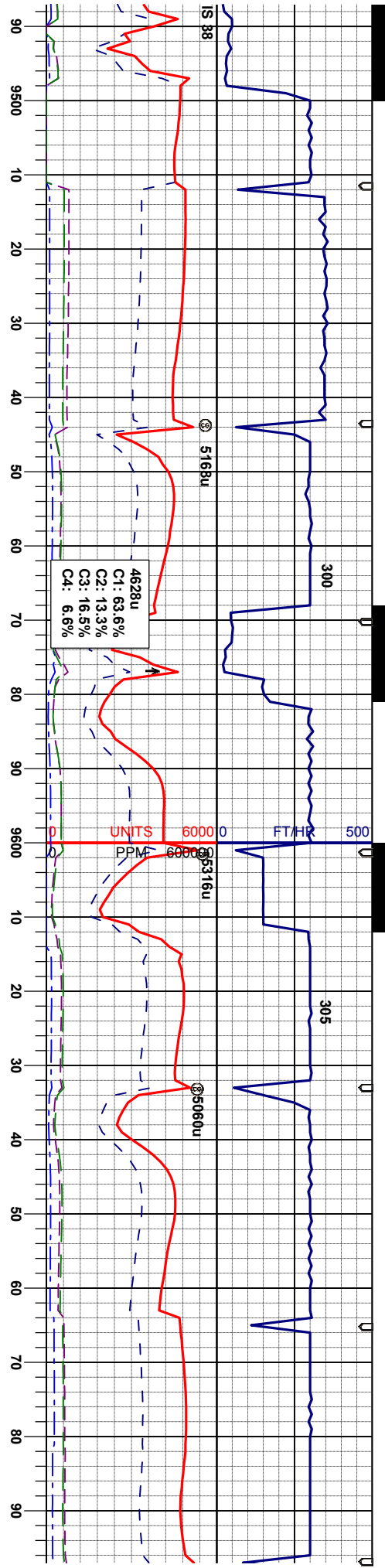


179	165	140
ft - si firm sbblky-	50% MRL: gy-dkgy, occ blk, v sft - si firm sbblky- sbply, arg, rthy istr, gt tex, spec	90% CHK: mgy - crm, occ dkgy, vsft-sft occ sbblky, mot, sl wxy - sub vit istr
50% MRL: gy-dkgy, occ blk, v sft - si firm sbblky- sbply, arg, rthy istr, gt tex, spec	75% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky- sbblky, mot, sl wxy - sub vit istr	10% MRL: gy-dkgy, occ blk, v sft - si firm st sbply, arg, rthy istr, gt tex, spec ; v calc
50% CHK: mgy - crm, occ dkgy, vsft-sft occ firm, biky- sbblky, mot, sl wxy - sub vit istr ; v calc, sme los frag	25% MRL: gy-dkgy, occ blk, v sft - si firm sbblky- sbply, arg, rthy istr, gt tex, spec ; v calc	

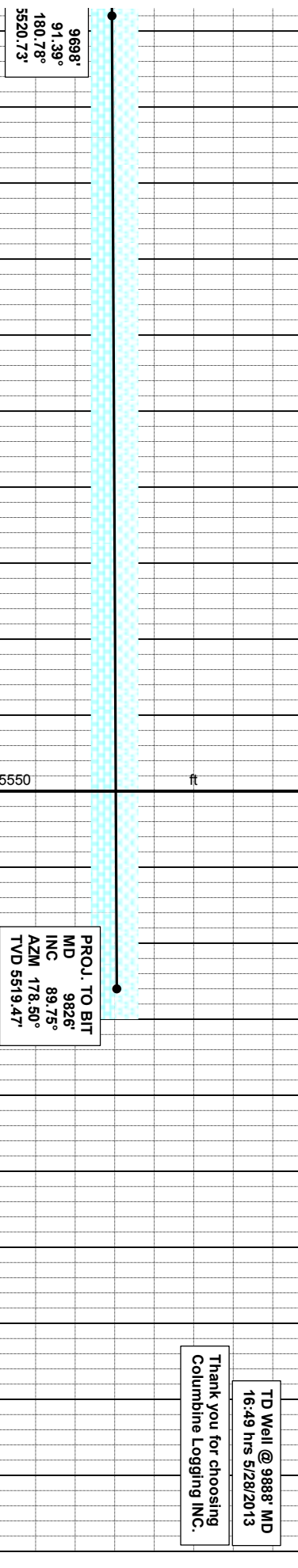
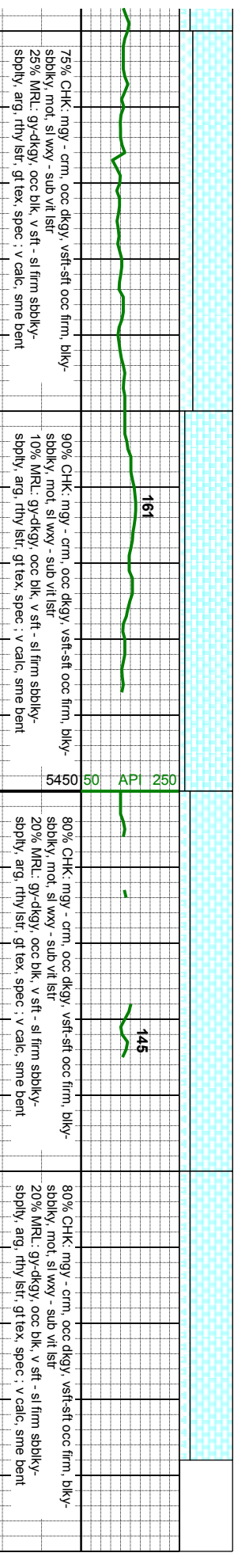
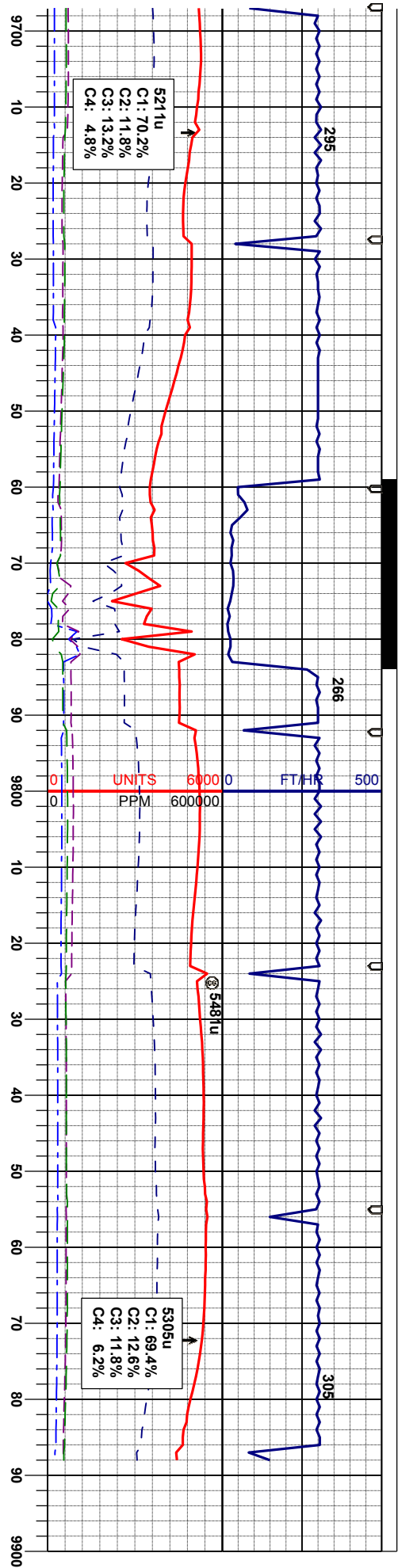
MD 9318'  
INC 91.14°  
AZM 181.30°  
TVD 5520.69'

MD 9413'  
INC 90.28°  
AZM 180.50°  
TVD 5519.51'









TD Well @ 9888' MD  
16:49 hrs 5/28/2013

Thank you for choosing  
Columbine Logging INC.

