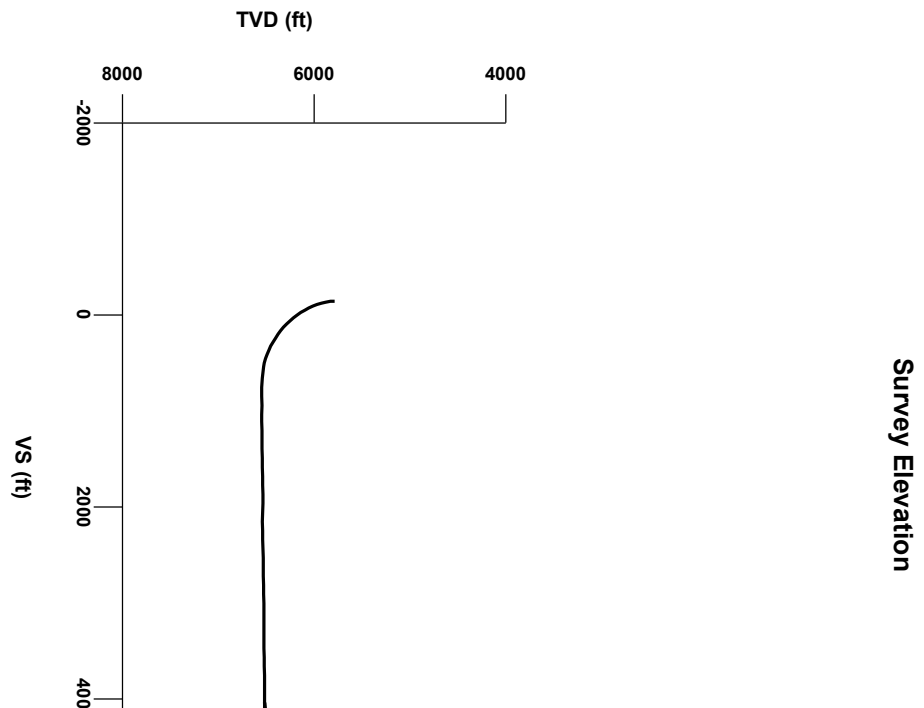
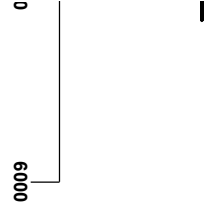
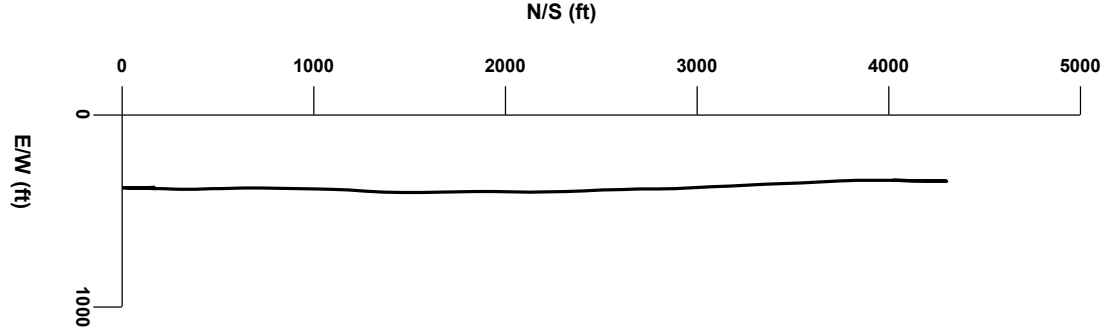


LOG created using LPLOT VH Version 3.0, April 16, 2012, Copyright (C) 1999-2009 Pason Systems Corp.

**OPERATOR:** NOBLE ENERGY, INC.  
**WELL:** WASHBURN LE22-78HN  
**LOCATION:** SEC 22, T8N, R16W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 250' FNL 280' FWL  
**ELEVATION:** GE 4985' KB 5014'  
**FIELD:** WATTENBERG  
**SPUD DATE:** APRIL 9, 2012  
**TD DATE:** APRIL 16, 2012  
**DATES LOGGED:** 4/12/12 - 4/16/12  
**DEPTHS LOGGED:** 5817 - 10777  
**LOGGERS:** MIKE KERSCHEN / MIKE SULLIVAN  
**DRILLING FLUID:** WATER, MUD, POLY  
**DRILLING RIG:** H&P 326  
**API:** 05-123-35060  
**LOG TYPE:** HORIZONTAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:**



Survey Plan



Chalk

Marl

No Sample

Silty Shale

Connection

Connection Gas

Arrow

Midnight Depth

Arrow

LITHOLOGIES

ENGINEERING SYMBOLS

0

UNITS

3000

C1

PPM

300000

C2

PPM

300000

C3

PPM

300000

C4

PPM

300000

C5

PPM

300000

CO2

PPM

300000

ROP

FT/HR

500

DEPTH (FEET)

5780

90

5800

10

20

30

40

50

60

70

80

90

212

1170u

5600

50

API

80

GAMMA RAY

50

API

80

TVD

ft

6500

5600

Logging by Columbine Logging Inc.

began at 5817' MD on 04/12/2012

SURVEY

MD 5837'

TVD 5784.88'

INC 0.6°

AZI 135.1°

SURVEY

MD 5882'

TVD 5829.79'

INC 5.8°

AZI 169.0°


100% SLTYSH: lly-mgybrn, sl firm - modst, sbply-sbply, slty-slsdy, occ intbds, vsicalc, occ lam ip carb flk

100% SLTYSH: lly-mgybrn, sl firm - modst, sbply-sbply, slty-slsdy, occ intbds, vsicalc, occ lam ip carb flk

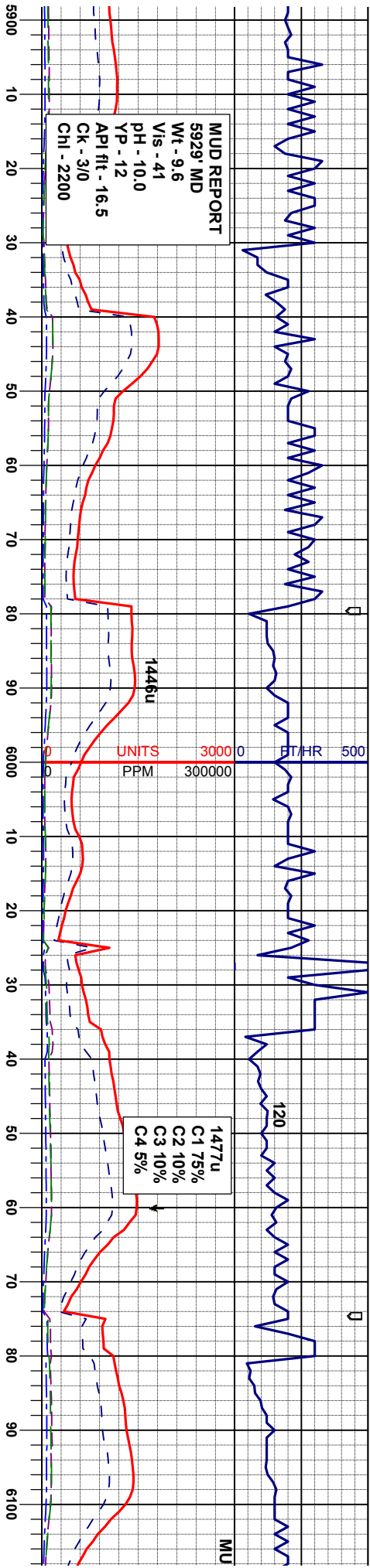
OIL SHOWS

TFG

CUTTINGS LITHOLOGY



SAMPLE PHOTOS



100% SLTYSH: ltgy-mgybrn, sl firm -  
modstf, sbply-sbblky, slty-slsdy, occ  
intbdss, vsicalc, occ lam ip carb flk

100% SLTYSH: ltgy-mgybrn, sl firm -  
modstf, sbply-sbblky, slty-slsdy, occ  
intbdss, vsicalc, occ lam ip carb flk

100% SLTYSH: ltgy-mgybrn, sl firm -  
modstf, sbply-sbblky, slty, vsicalc, occ lam  
ip carb flk

100% SLTYSH: ltgy-mgybrn, sl firm -  
modstf, sbply-sbblky, slty, vsicalc, occ lam  
ip carb flk

100% SLTYSH: ltgy-mgybr  
modstf, sbply-sbblky, slty,  
ip carb flk

**SURVEY**  
MD 5932'  
TVD 5879.23'  
INC 11.2°  
AZI 178.8°

**SURVEY**  
MD 5977'  
TVD 5922.97'  
INC 15.8°  
AZI 178.3°

**SURVEY**  
MD 6027'  
TVD 5970.63'  
INC 19.4°  
AZI 176.2°

**SURVEY**  
MD 6072'  
TVD 6012.62'  
INC 22.7°  
AZI 177.3°

6500

ft

5600

50

API

80

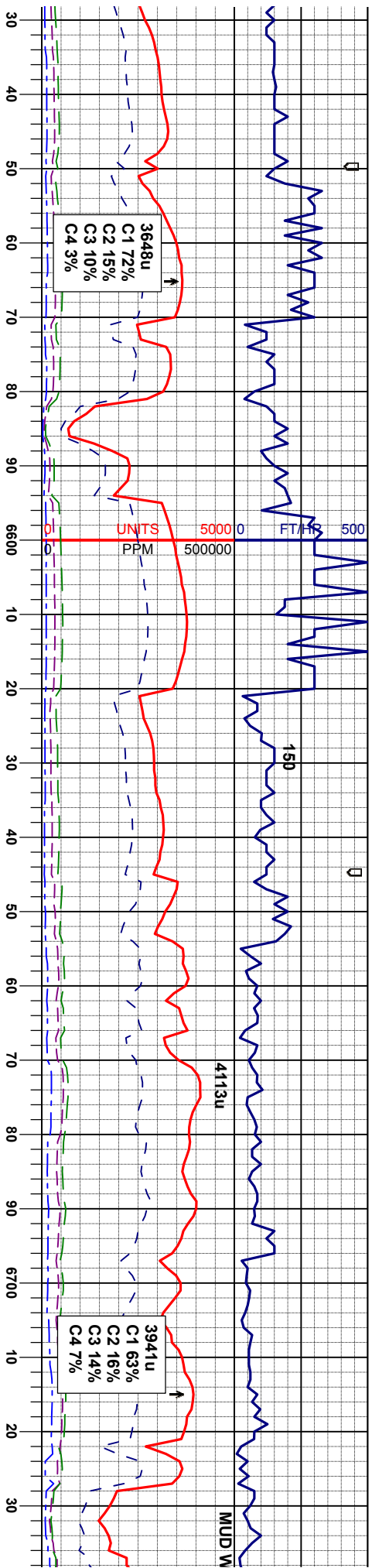












Sharon Spr. Mtk Bd 6565' MD

Nio Top 6625' MD

A Chalk 6660' MD

A Marl 6725' MD

100% SLTYSH: lly-mgy, sl firm -modstf, sbply-sbply, slty, gt, vsicalc, occ bent, firm -modstf,

100% SLTYSH: lly-mgy, sl firm -modstf, sbply-sbply, slty, gt, vsicalc, abnt bent, tr mrl

40% SLTYSH: mdkmgy, sl firm, pty-sbply, sl slty, noncalc 60% MRL:m-dkgybm, gybkl, sbply-sbply, firm-sl brt, occ sft, slty, calc

90% CHK: llybm-crm, bnd lly, sbply, fls, mot-wxy sft, occ brt, vcalc 10% MRL:gy -dkgybm, sbply-sbply, firm-sl brt, mot, occ sft, slty, calc, tr bent

85% MRL:gy -dkgybm, sbply-sbply, mot, occ sft, slty, calc, 15% CHK: llybm-crm, bnd mot-wxy sft, occ brt, vcalc,

SURVEY MD 6547' TVD 6377.76' INC 55.0° AZI 178.7°

SURVEY MD 6597' TVD 6405.54' INC 57.5° AZI 177.4°

SURVEY MD 6642' TVD 6429.01' INC 59.6° AZI 178.8°

SURVEY MD 6692' TVD 6452.56' INC 64.2° AZI 179.5°

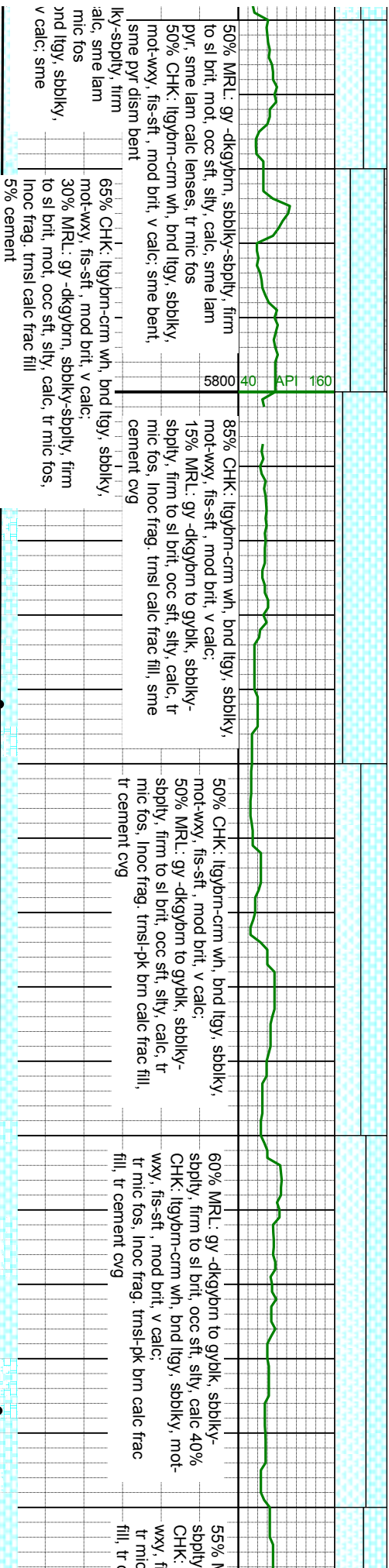
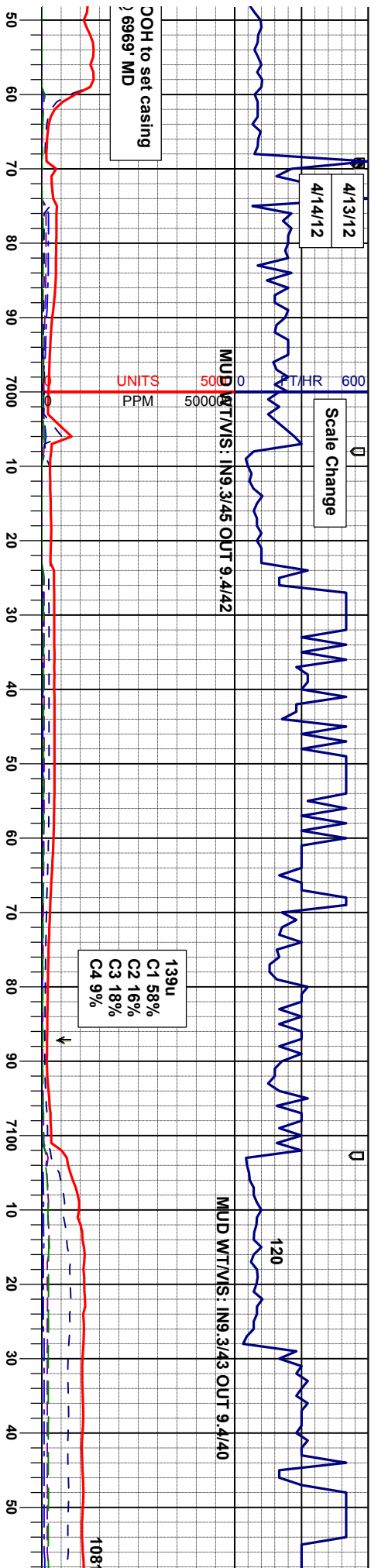
SURVEY MD 6737' TVD 647' INC 65.8° AZI 179.1°

7000





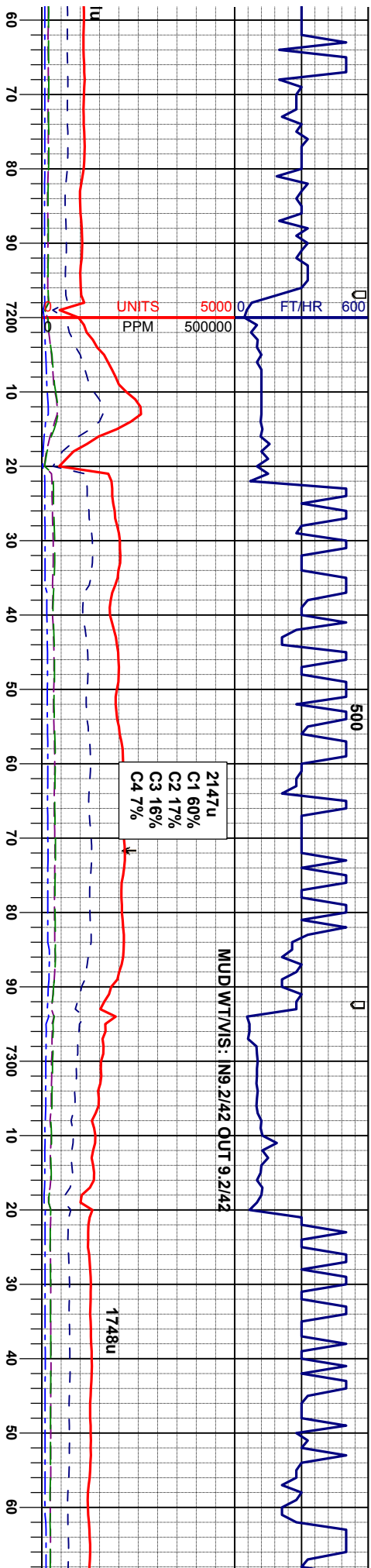




SURVEY  
MD 7042'  
TVD 6542.31'  
INC 86.7°  
AZI 180.6°

SURVEY  
MD 7143'  
TVD 6547.03'  
INC 88.4°  
AZI 179.5°





APL: gy -dkgybm to gybik, sbblky-  
firm to sl brt, occ sft, silty, calc 45%  
lgybm-crm wh, bnd lgy, sbblky, mot-  
s-sft, mod brt, v calc:  
fos, inoc frag, trnsl-pk brn calc frac  
cement cvg

70% MRL: gy -dkgybm to gybik, sbblky-  
sbply, firm to sl brt, occ sft, silty, calc, sme  
mic fos 30% CHK: lgybm-crm wh, bnd lgy,  
sbblky, mot-wxy, fis-sft, mod brt, v calc,  
inoc frag, trnsl-pk brn calc frac fill, tr  
cement cvg

65% MRL: gy -dkgybm to gybik, sbblky-  
sbply, firm to sl brt, occ sft, silty, calc, abnt  
mic fos 35% CHK: lgybm-crm wh, bnd lgy,  
sbblky, mot-wxy, fis-sft, mod brt, v calc:  
inoc frags, sme trnsl-pk brn calc frac fill, tr  
cement cvg

55% CHK: lgybm-crm wh, bnd lgy, sbblky,  
mot-wxy, fis-sft, mod brt, v calc: inoc  
frags, 45% MRL: gy -dkgybm to gybik,  
sbblky-sbply, firm to sl brt, occ sft, silty,  
calc, sme mic fos, sme trnsl-pk brn calc  
frac fill

80% CHK: lgy  
mot-wxy, fis-sft  
frags, 20% MR  
sbblky-sbply, 1  
calc, sme mic  
frac fill

7000  
ft

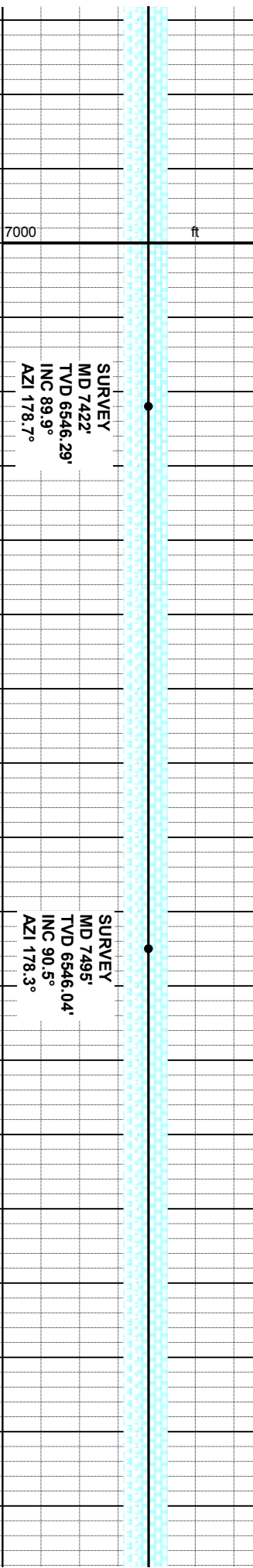
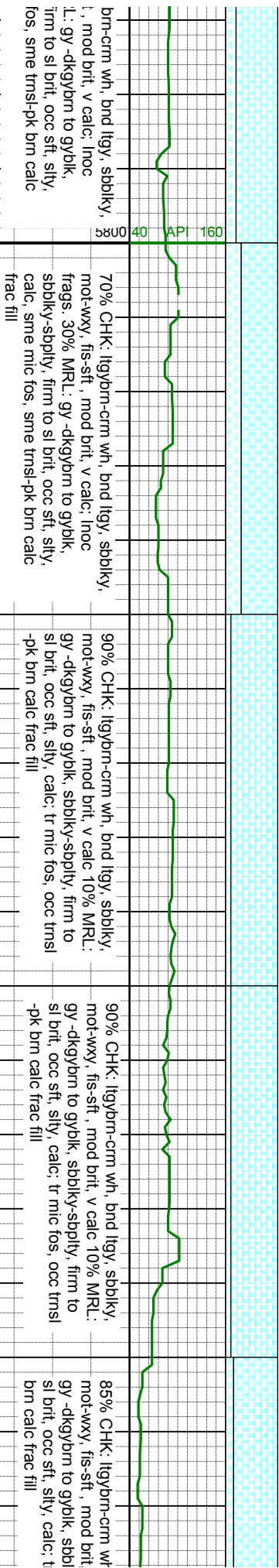
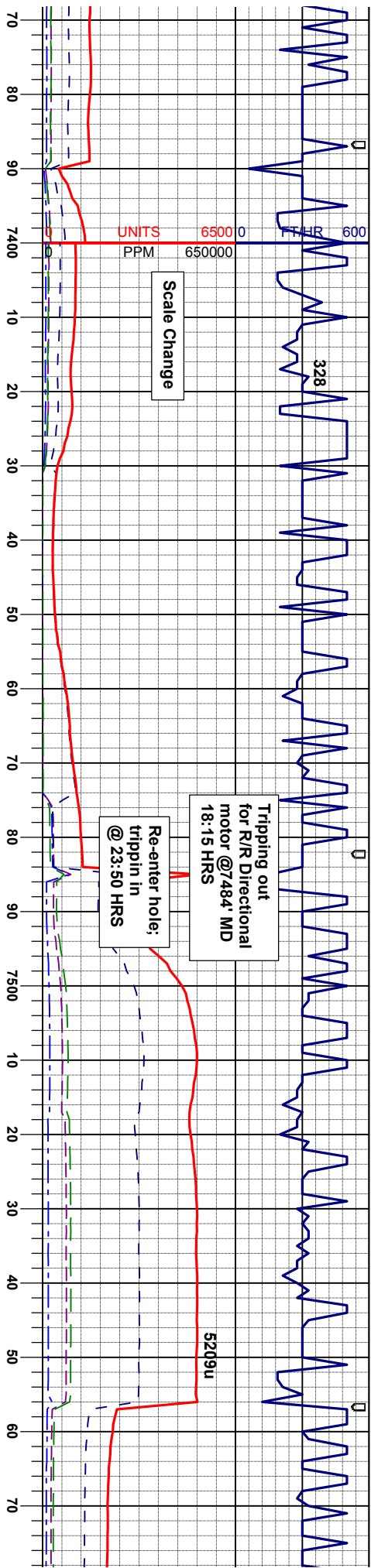
API 160  
40

SURVEY  
MD 7238'  
TVD 6547.2'  
INC 91.4°  
AZI 178.5°

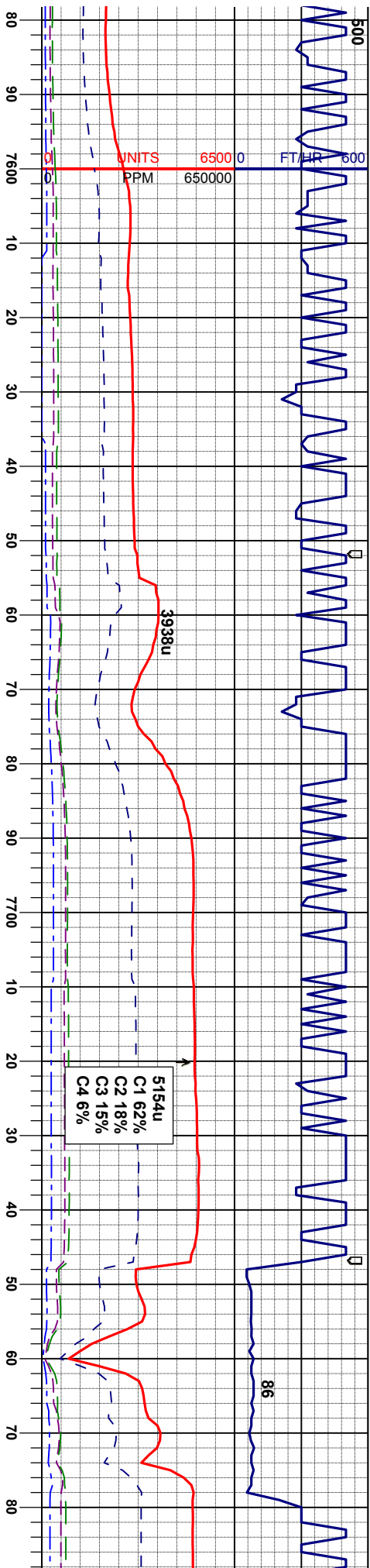
SURVEY  
MD 7333'  
TVD 6546.45'  
INC 89.5°  
AZI 179.9°











1, bnd lgy, sbblky, v calc 15% MRL: r mic fos, tmsl-pk

85% CHK: lgybrn-crm wh, bnd lgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 15% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos, tmsl-pk brn calc frac fill

60% CHK: lgybrn-crm wh, bnd lgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 40% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos

90% CHK: lgybrn-crm wh, bnd lgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 10% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos, sme tmsl brn-wh calc frac fill, inoc frag

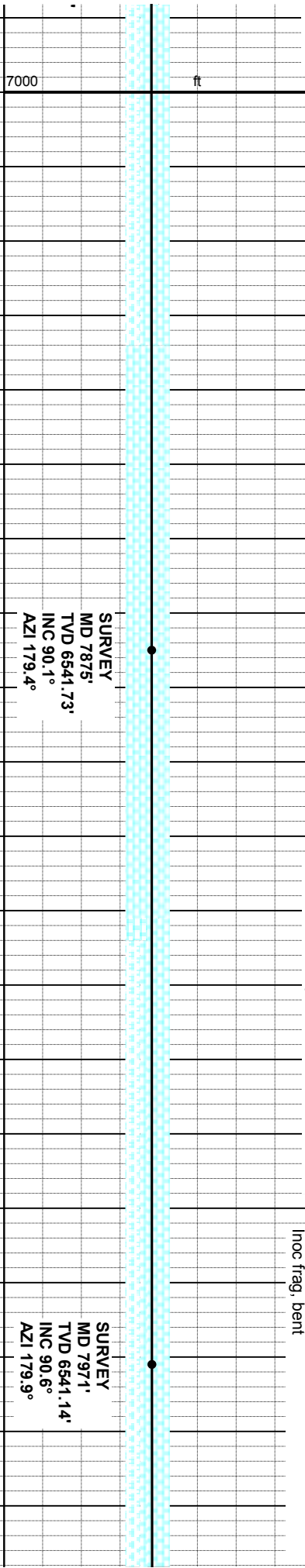
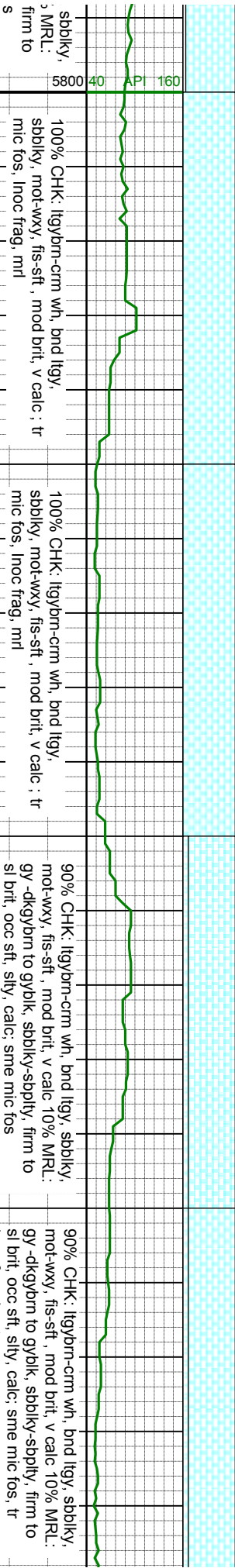
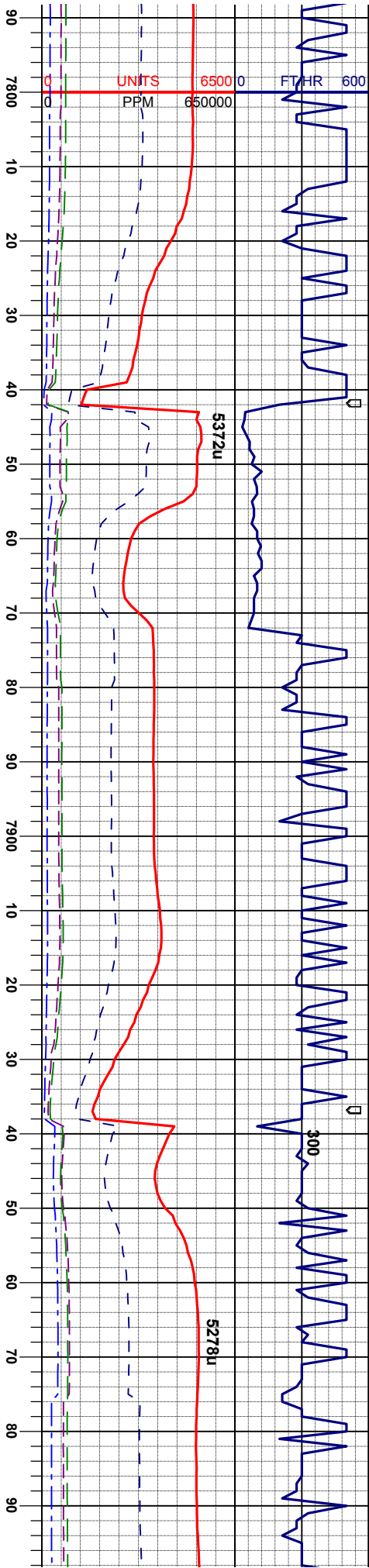
95% CHK: lgybrn-crm wh, bnd lgy, mot-wxy, fis-sft, mod brt, v calc 5% gy -dkgybrn to gyblk, sbblky-sbply, sl brt, occ sft, silty, calc; sme mic to

SURVEY  
MD 7590'  
TVD 6545.29'  
INC 90.4°  
AZI 177.1°

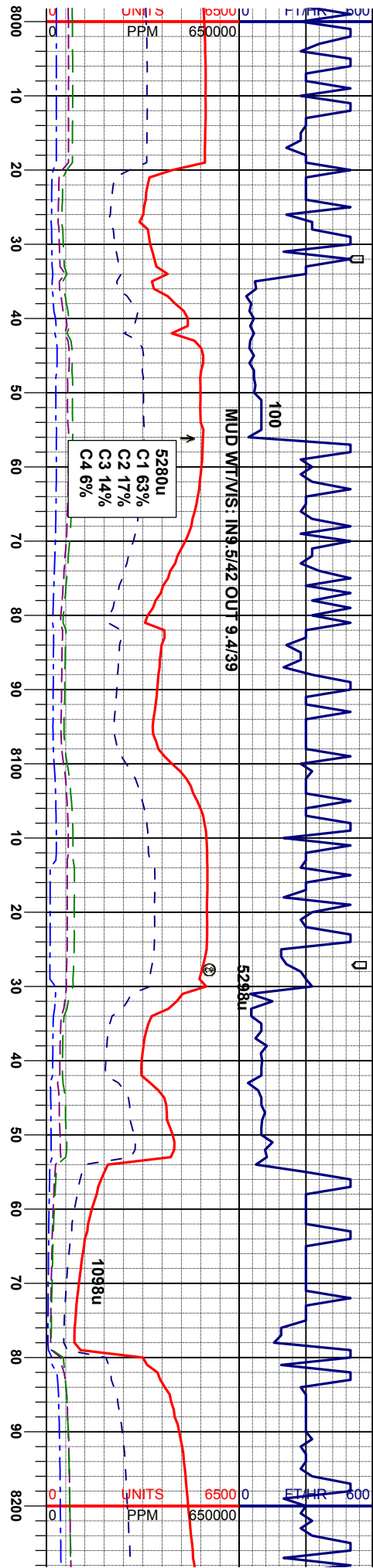
SURVEY  
MD 7685'  
TVD 6544.55'  
INC 90.5°  
AZI 176.0°

SURVEY  
MD 7780'  
TVD 6542.97'  
INC 91.4°  
AZI 178.0°









80% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 20% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos, tr Inoc frag, bent

90% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 5% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos, tr Inoc frag, bent

50% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 50% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme mic fos, tr Inoc frag

70% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 30% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme trnsl brn-wh calc frac fill

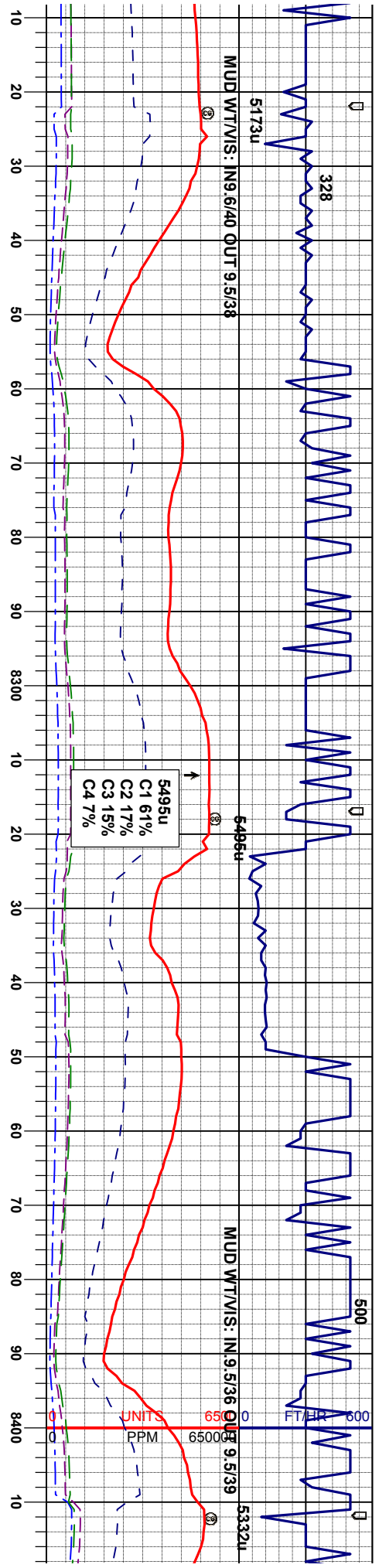
70% C mot-w gy -dk sl brt, calc tr

SURVEY  
MD 8066'  
TVD 6538.82'  
INC 92.2°  
AZI 182.0°

SURVEY  
MD 8161'  
TVD 6536.58'  
INC 90.5°  
AZI 181.1°







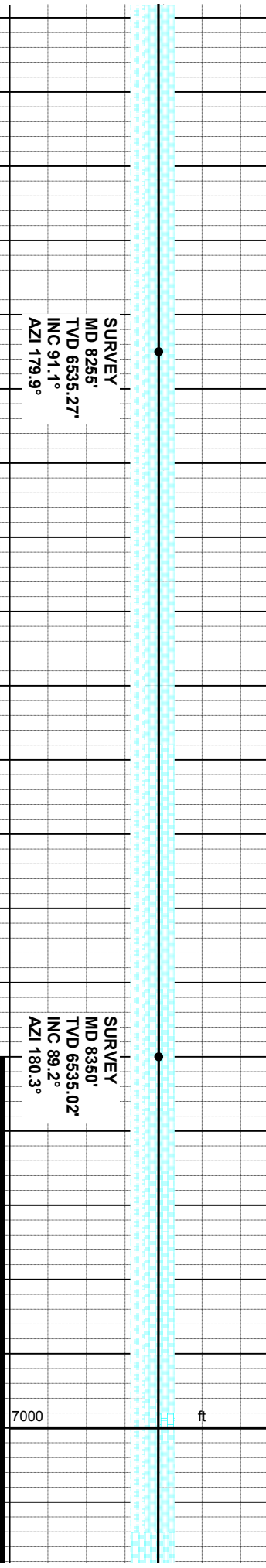
HK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fts-sft, mod brt, v calc 30% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to occ sft, silty, calc, sme trnsl brn-wh 3c fill

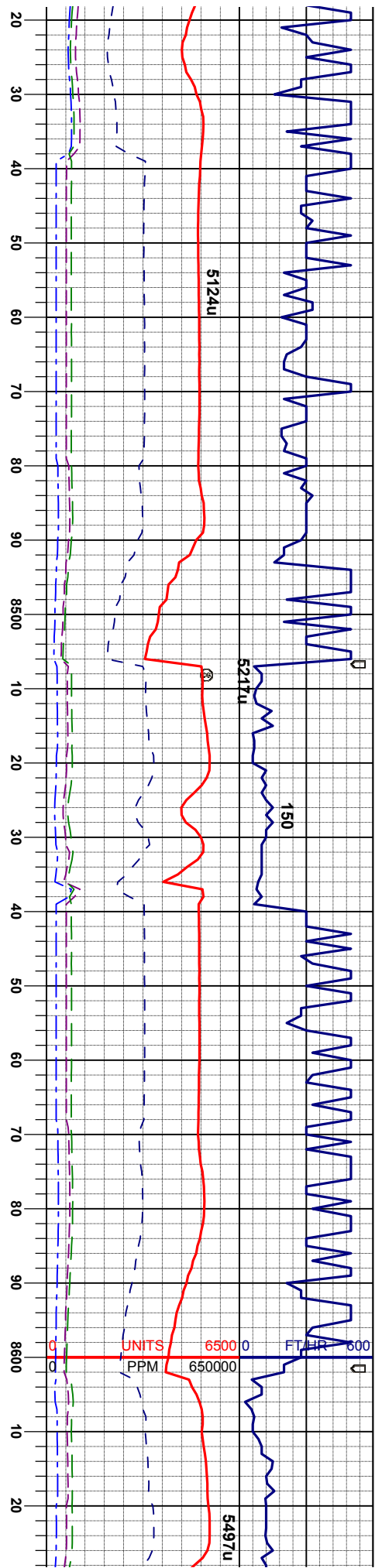
60% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fts-sft, mod brt, v calc 40% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc

70% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fts-sft, mod brt, v calc 30% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; sme trnsl brn-wh calc frac fill

90% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fts-sft, mod brt, v calc 10% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, bent, pyr

100% CHK: ltgy sbblky, mot-wx inoc, mtl



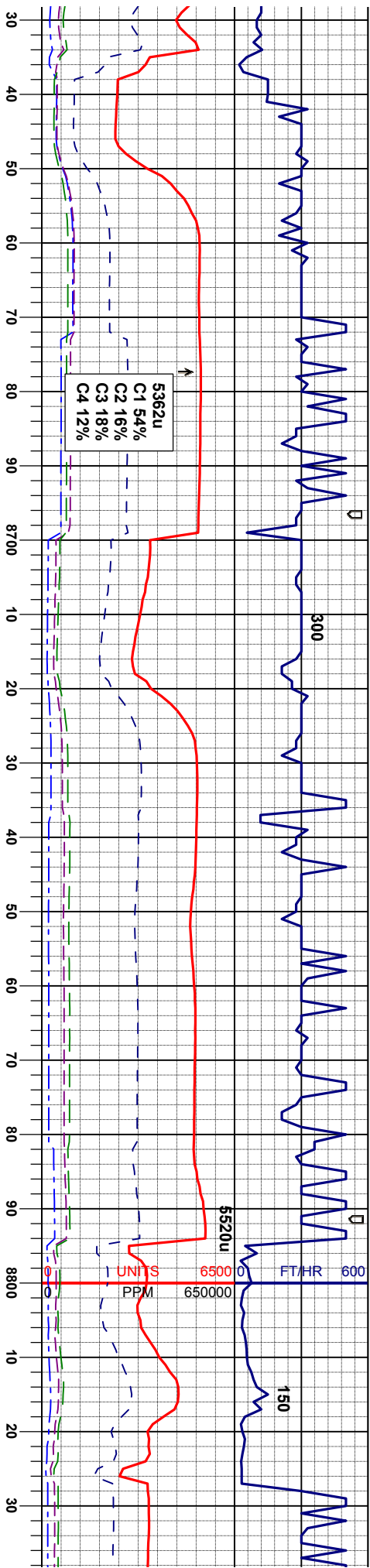


SURVEY  
MD 8445'  
TVD 6537.67'  
INC 87.6°  
AZI 178.3°

SURVEY  
MD 8540'  
TVD 6539.66'  
INC 90.0°  
AZI 179.7°







90% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 10% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, trnsl brn-wh calc frac fill

90% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 10% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc

90% CHK: ltgybrn-crm wh, bnd ltgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 10% MRL: gy -dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, tr microfos

80% CHK: ltgybrn-crm wh, bnd ltgy, s mot-wxy, fis-sft, mod brt, v calc 20% gy -dkgybrn to gyblk, sbblky-sbply, ft sl brt, occ sft, silty, calc; tr inoc, tr mi

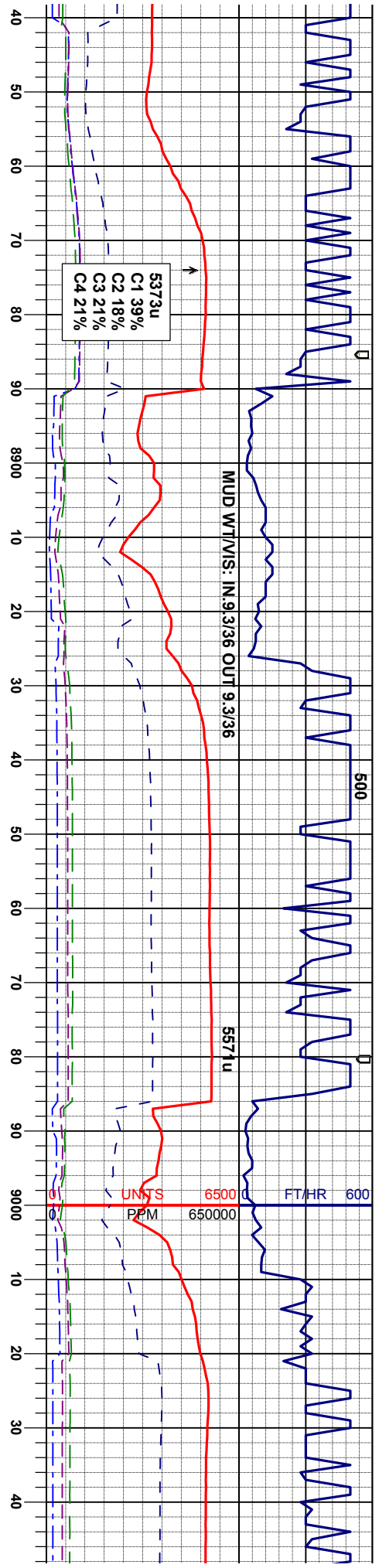
SURVEY  
MD 8635'  
TVD 6639.00'  
INC 90.8°  
AZI 181.8°

SURVEY  
MD 8730'  
TVD 6636.60'  
INC 92.1°  
AZI 180.9°

SURVEY  
MD 8825'  
TVD 6632.95'  
INC 92.3°  
AZI 182.9°







70% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 30% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, tr microfoss

50% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, v calc 50% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, tr microfoss

50% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, m-v calc 50% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, tr microfoss

80% CHK: Itgybrn-crm wh, bnd Itgy, sbblky, mot-wxy, fis-sft, mod brt, m-v calc 20% MRL: gy-dkgybrn to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; tr inoc, tr microfoss

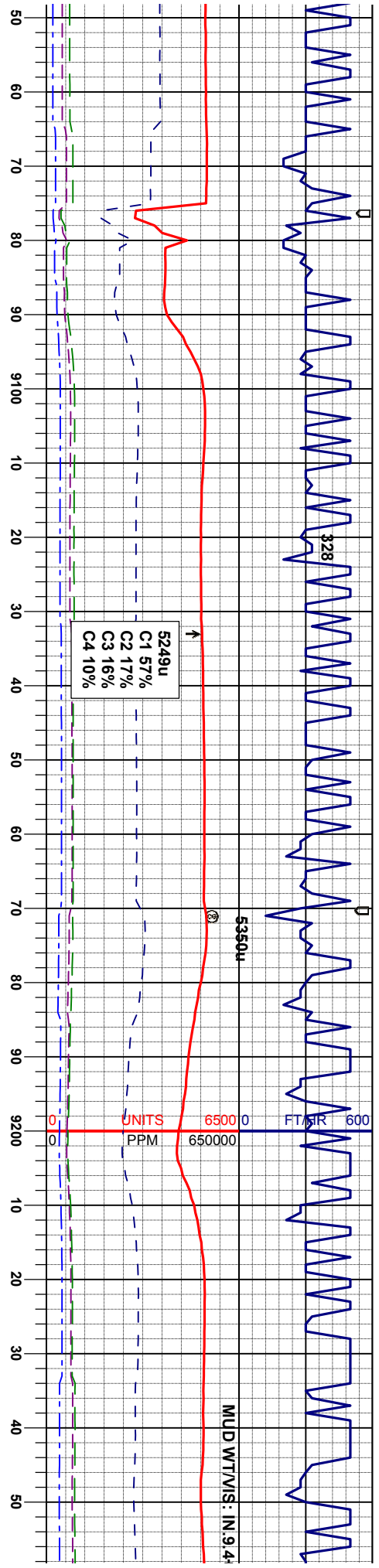
SURVEY  
MD 8920'  
TVD 6530.38'  
INC 90.8°  
AZI 181.8°

ft

7000

SURVEY  
MD 9015'  
TVD 6530.38'  
INC 89.5°  
AZI 181.5°





70% CHK: ltgybrn-crm wh, bnd ltgy, blk-  
sbbkly, mot-wxy, fis-sft, mod brt, m-v calc  
30% MRL: gy-dkgybrn to gyblk, sbbkly-  
sbbply, firm to sl brt, occ sft, silty, calc; tr  
Inoc, tr microfoss

55% CHK: ltgybrn-crm wh, bnd ltgy, blk-  
sbbkly, mot-wxy, fis-sft, mod brt, m-v calc  
45% MRL: gy-dkgybrn to gyblk, sbbkly-  
sbbply, firm to sl brt, occ sft, silty, calc; tr  
Inoc, tr microfoss

65% CHK: ltgybrn-crm wh, bnd ltgy, blk-  
sbbkly, mot-wxy, fis-sft, mod brt, m-v calc  
35% MRL: gy-dkgybrn to gyblk, sbbkly-  
sbbply, firm to sl brt, occ sft, silty, calc; tr  
Inoc, tr microfoss

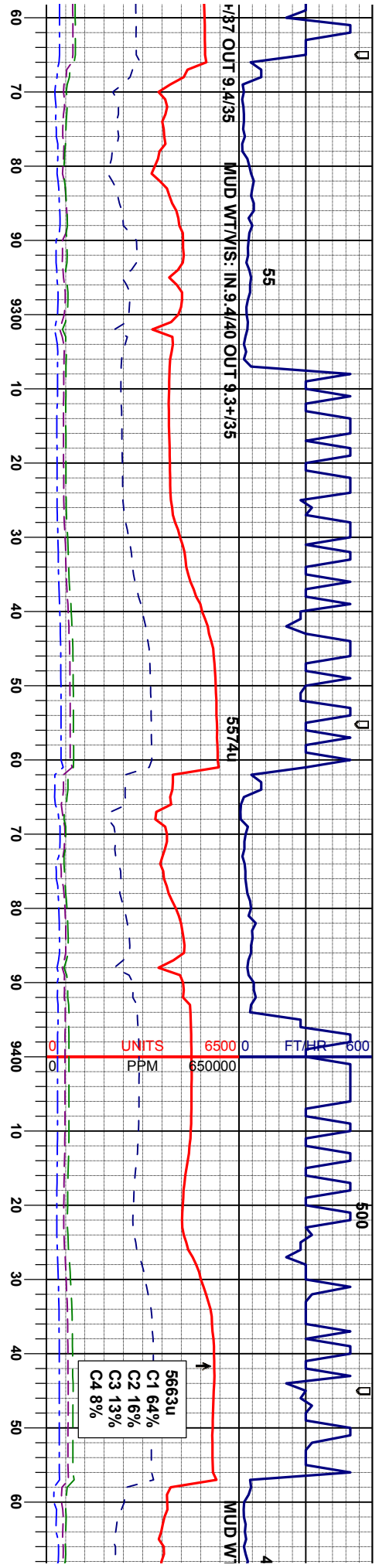
60% CHK: ltgybrn-crm wh, bnd ltgy, blk-  
sbbkly, mot-wxy, fis-sft, mod brt, m-v calc  
40% MRL: gy-dkgybrn to gyblk, sbbkly-  
sbbply, firm to sl brt, occ sft, silty, calc; tr  
Inoc, tr microfoss

50%  
sbbkly  
50%  
sbbply  
Inoc,

SURVEY		SURVEY	
MD 9110'	TVD 6530.38'	MD 9205'	TVD 6528.97'
INC 90.2°		INC 91.5°	
AZI 181.5°		AZI 180.3°	







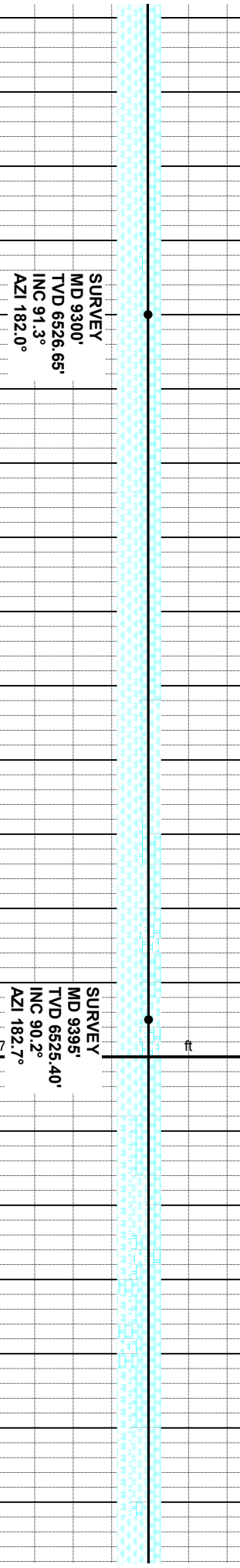
CHK: ltgybrn-crm wh, bnd ltgy, blk-y, mot-wxy, fis-sft, mod brt, m-v calc  
MRL: gy-dkgybrn to gyblk, sbblky-  
/, firm to sl brt, occ sft, silty, calc; tr  
tr microfoss

65% CHK: ltgybrn-crm wh, bnd ltgy, blk-y  
sbblky, mot-wxy, fis-sft, mod brt, m-v calc  
35% MRL: gy-dkgybrn to gyblk, sbblky-  
sbply, firm to sl brt, occ sft, silty, calc; tr  
Inoc, tr microfoss

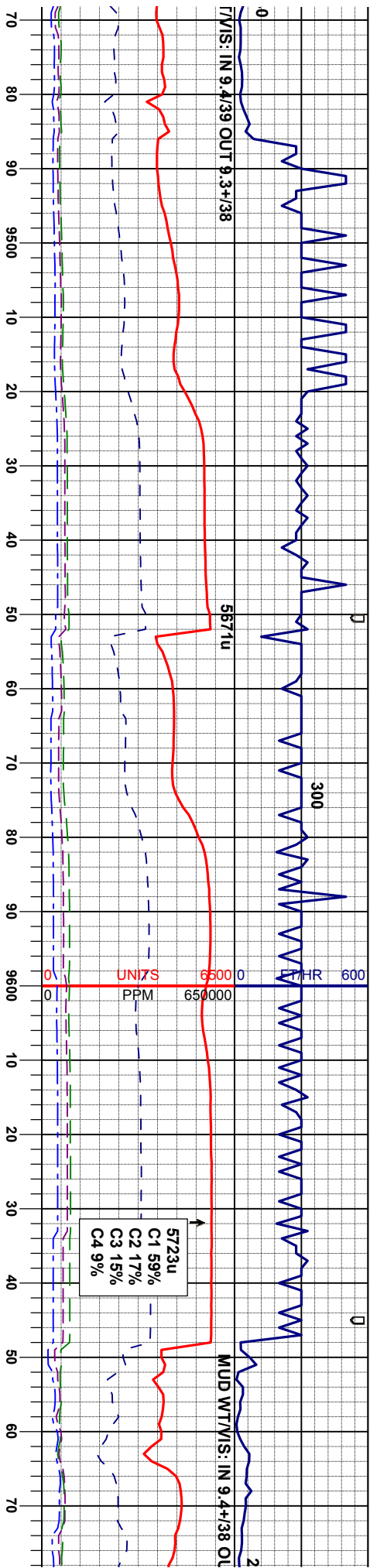
55% MRL: gy-dkgybrn to gyblk, sbblky-  
sbply, firm to sl brt, occ sft, silty, calc; 45%  
CHK: ltgybrn-crm wh, bnd ltgy, blk-y-sbblky,  
mot-wxy, fis-sft, mod brt, m-v calc, sme  
Inoc, tr microfoss

55% MRL: gy-dkgybrn to gyblk, sbblky-  
sbply, firm to sl brt, occ sft, silty, calc; 45%  
CHK: ltgybrn-crm wh, bnd ltgy, blk-y-sbblky,  
mot-wxy, fis-sft, mod brt, m-v calc, sme  
Inoc, tr microfoss

60% MRL: gy-dk  
sbply, firm to sl  
CHK: ltgybrn-crm  
mot-wxy, fis-sft,  
Inoc, tr microfoss,







gy/bm to gy/bk, sb/bky-  
brt, occ sft, silty, calc; 40%  
1 wh, bnd lgy, bky-sb/bky,  
mod brt, m-v calc, sme  
sme slick mrl and chalk

65% MRL: gy-dkgy/bm to gy/bk, sb/bky-  
sbpty, firm to sl brt, occ sft, silty, calc; 35%  
CHK: lgy/bm-crm wh, bnd lgy, bky-sb/bky,  
mot-wxy, fis-sft, mod brt, m-v calc, sme  
Inoc, tr microfoss

75% MRL: gy-dkgy/bm to gy/bk, sb/bky-  
sbpty, firm to sl brt, occ sft, silty, calc; 25%  
CHK: lgy/bm-crm wh, bnd lgy, bky-sb/bky,  
mot-wxy, fis-sft, mod brt, m-v calc, sme  
Inoc, tr microfoss, sme slick mrl and chalk

80% MRL: gy-dkgy/bm to gy/bk, sb/bky-  
sbpty, firm to sl brt, occ sft, silty, calc; 20%  
CHK: lgy/bm-crm wh, bnd lgy, bky-sb/bky,  
mot-wxy, fis-sft, mod brt, m-v calc, sme  
Inoc, tr microfoss, sme slick mrl and chalk

60% MRL: gy-dkgy/bm to  
sbpty, firm to sl brt, occ s  
CHK: lgy/bm-crm wh, bnd  
mot-wxy, fis-sft, mod brt,  
Inoc, tr microfoss, sme slic

SURVEY  
MD 9490'  
TVD 6525.49'  
INC 89.7°  
AZI 182.9°

SURVEY  
MD 9584'  
TVD 6524.83'  
INC 91.1°  
AZI 182.0°

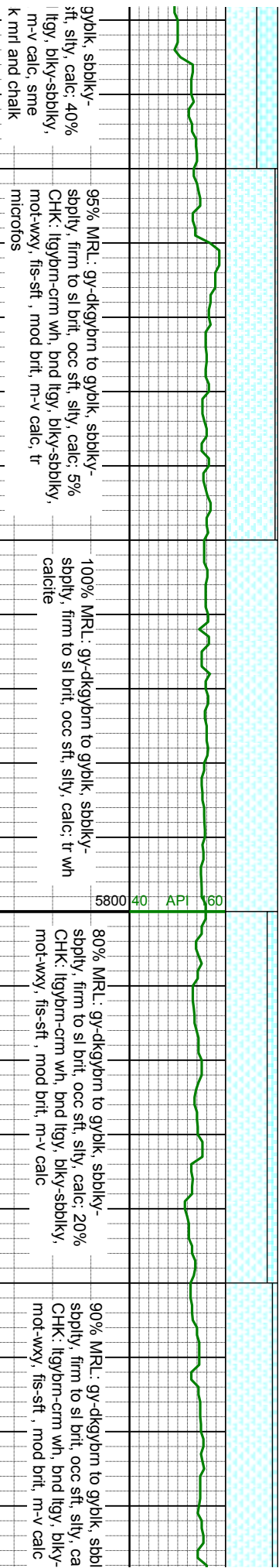
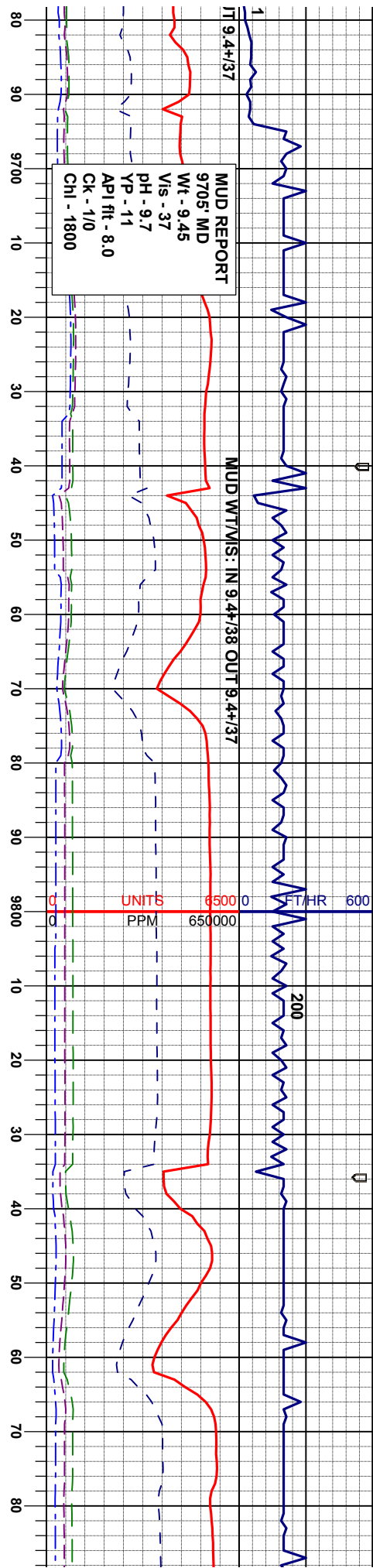
7000

ft

5800 40 API 160

SUF  
MD  
TVC  
INC  
AZI



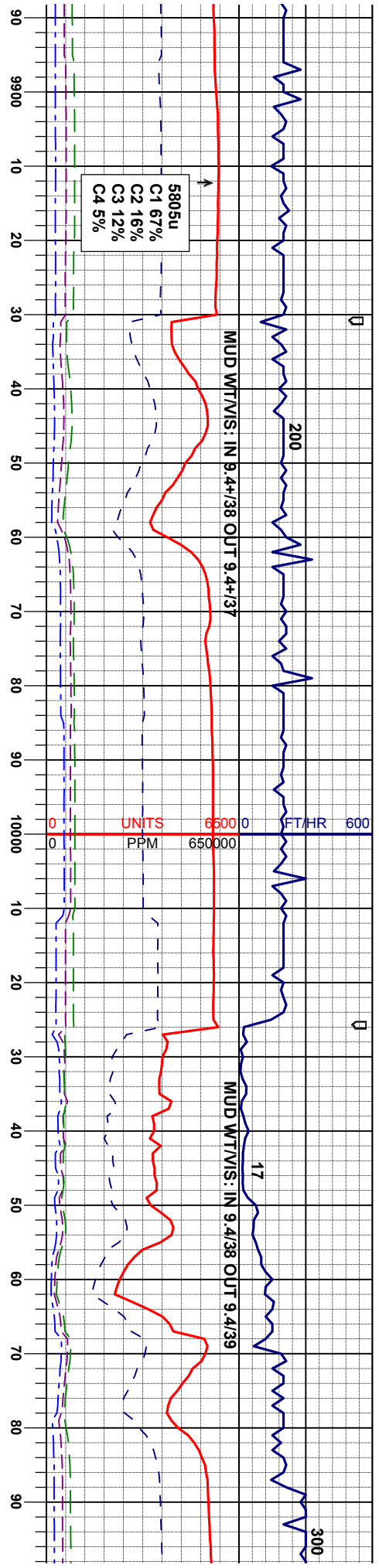


**SURVEY**  
MD 9774'  
TVD 6525.25'  
INC 89.8°  
AZI 182.7°

**SURVEY**  
MD 9869'  
TVD 6524.75'  
INC 90.8°  
AZI 182.4°







95% MRL: gy-dkgybrn to gyblk, sbdky-sbdky, firm to sl brt, occ sft, silty, calc; 5% CHK: ltgybrn-crm wh, bnd ltgy, blkY-sbdky, mot-wxy, fis-sft, mod brt, m-v calc; tr brn-wh calc

95% MRL: gy-dkgybrn to gyblk, sbdky-sbdky, firm to sl brt, occ sft, silty, calc; 5% CHK: ltgybrn-crm wh, bnd ltgy, blkY-sbdky, mot-wxy, fis-sft, mod brt, m-v calc; tr brn-wh calc

80% MRL: gy-dkgybrn to gyblk, sbdky-sbdky, firm to sl brt, occ sft, silty, calc; 20% CHK: ltgybrn-crm wh, bnd ltgy, blkY-sbdky, mot-wxy, fis-sft, mod brt, m-v calc

90% MRL: gy-dkgybrn to gyblk, sbdky-sbdky, firm to sl brt, occ sft, silty, calc; 10% CHK: ltgybrn-crm wh, bnd ltgy, blkY-sbdky, mot-wxy, fis-sft, mod brt, m-v calc

ft

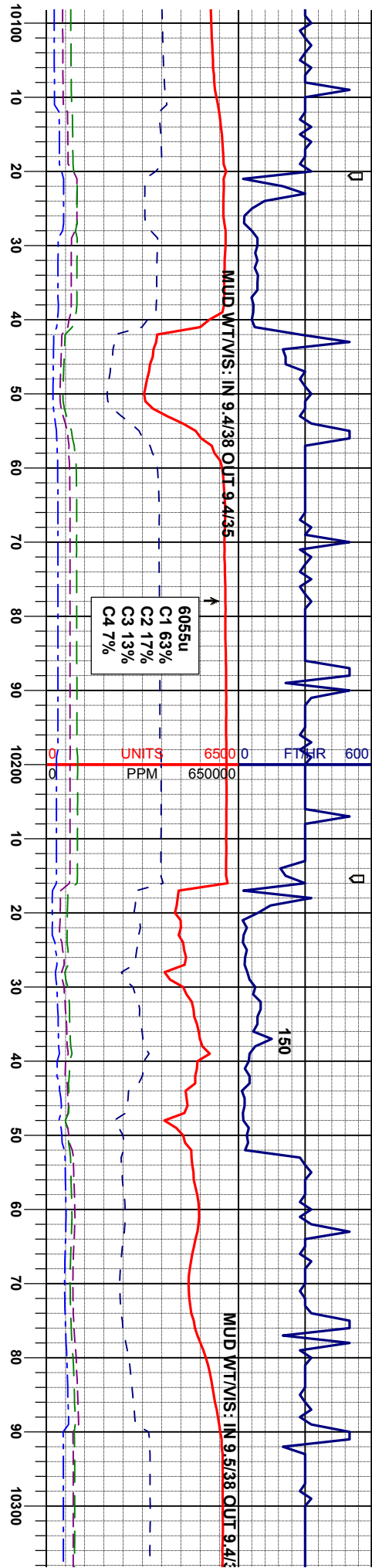
5800 40 API 160

7000

SURVEY  
MD 9964'  
TVD 6522.34'  
INC 92.1°  
AZI 182.0°

SURVEY  
MD 10059'  
TVD 6519.61'  
INC 91.2°  
AZI 183.6°





95% MRL: gy-dkgybm to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; 5% CHK: ltgybm-crm wh, bnd ltgy, blkly-sbblky, mot-wxy, fls-sft, mod brt, m-v calc

80% MRL: gy-dkgybm to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; 20% CHK: ltgybm-crm wh, bnd ltgy, blkly-sbblky, mot-wxy, fls-sft, mod brt, m-v calc

80% MRL: gy-dkgybm to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, calc; 20% CHK: ltgybm-crm wh, bnd ltgy, blkly-sbblky, mot-wxy, fls-sft, mod brt, m-v calc; tr mic fos

100% MRL: gy-dkgybm to gyblk, sbblky-sbply, firm to sl brt, occ sft, silty, mot, calc; tr chk

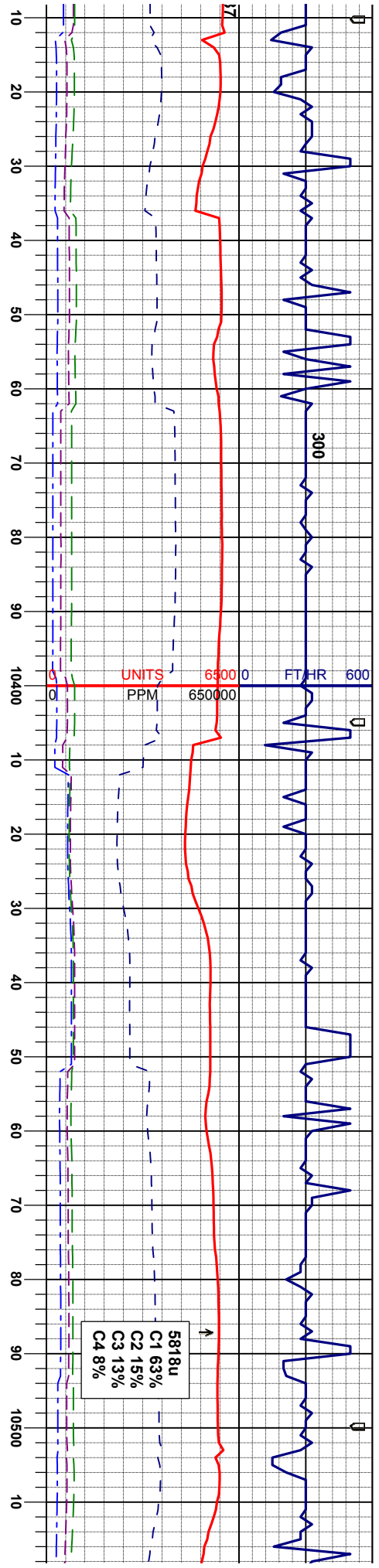
100% spolt tr chk

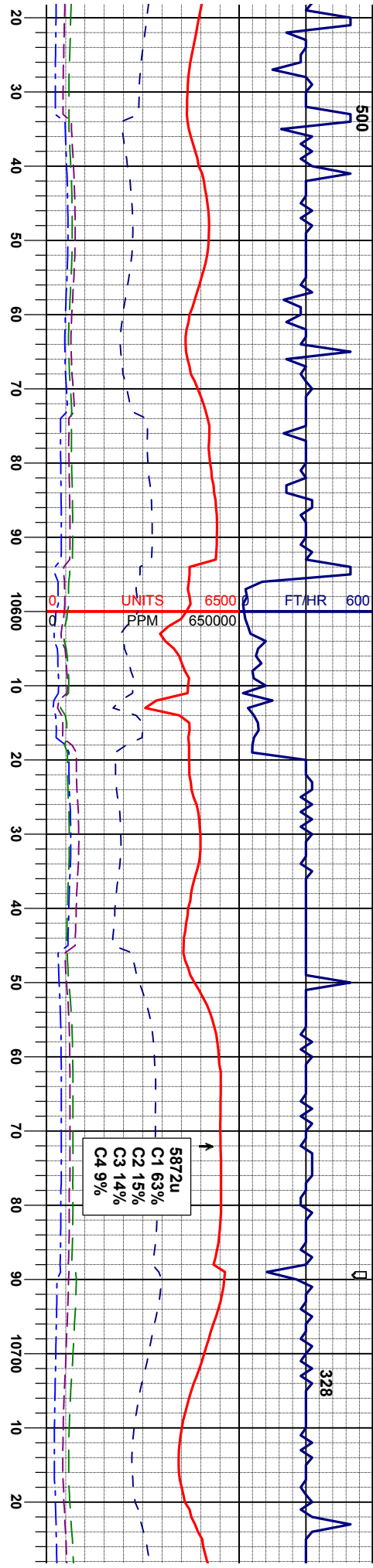
SURVEY  
MD 10154'  
TVD 6517.78'  
INC 91.0°  
AZI 182.7°

SURVEY  
MD 10249'  
TVD 6516.96'  
INC 90.0°  
AZI 180.6°









100% MRL: gy-dkgybm to gyblk, sbbly-  
brt, occ sft, stly, mot, calc

100% MRL: gy-dkgybm to gyblk, sbbly-  
sbbly, firm to sl brt, occ sft, stly, mot, calc

100% MRL: gy-dkgybm to gyblk, sbbly-  
sbbly, firm to sl brt, occ sft, stly, mot, calc

100% MRL: gy-dkgybm to gyblk, sbbly-  
sbbly, firm to sl brt, occ sft, stly, mot, calc

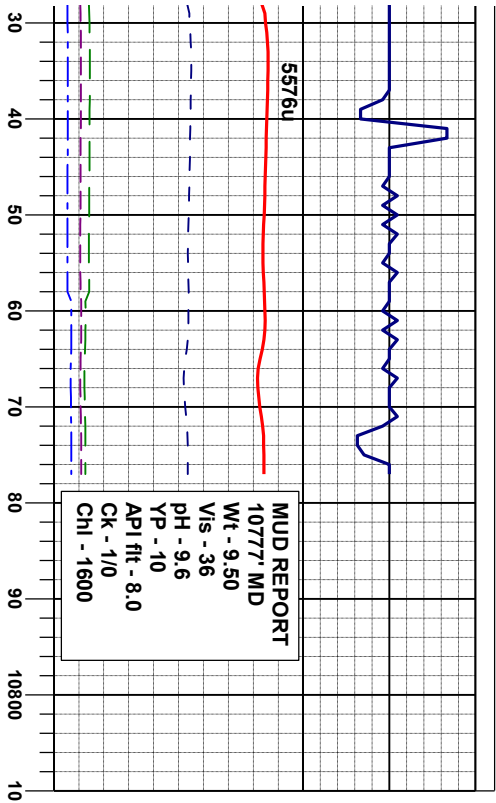
SURVEY  
MD 10533'  
TVD 6515.05'  
INC 91.3°  
AZI 179.5°

SURVEY  
MD 10622'  
TVD 6513.58'  
INC 90.6°  
AZI 179.0°

SURVEY  
MD 10717'  
TVD 6513.08'  
INC 90.0°  
AZI 177.1°







gyblk, sbbly-  
ft, stly, mot, calc

TD @ 10777' MD  
14:01 hrs 4/16/2012

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