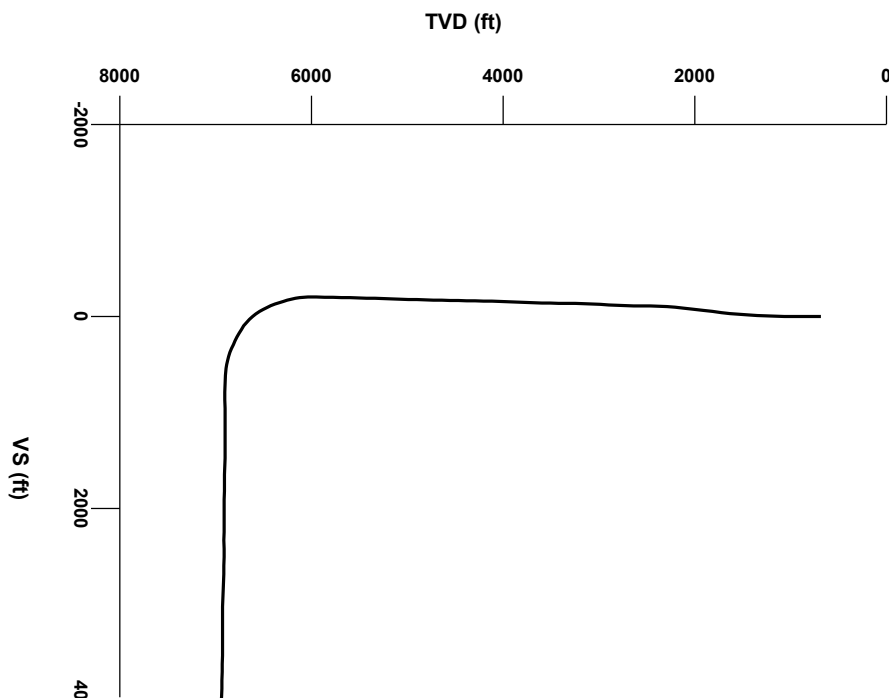


LOG created using LPLOT VH Version 3.0, March 07, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

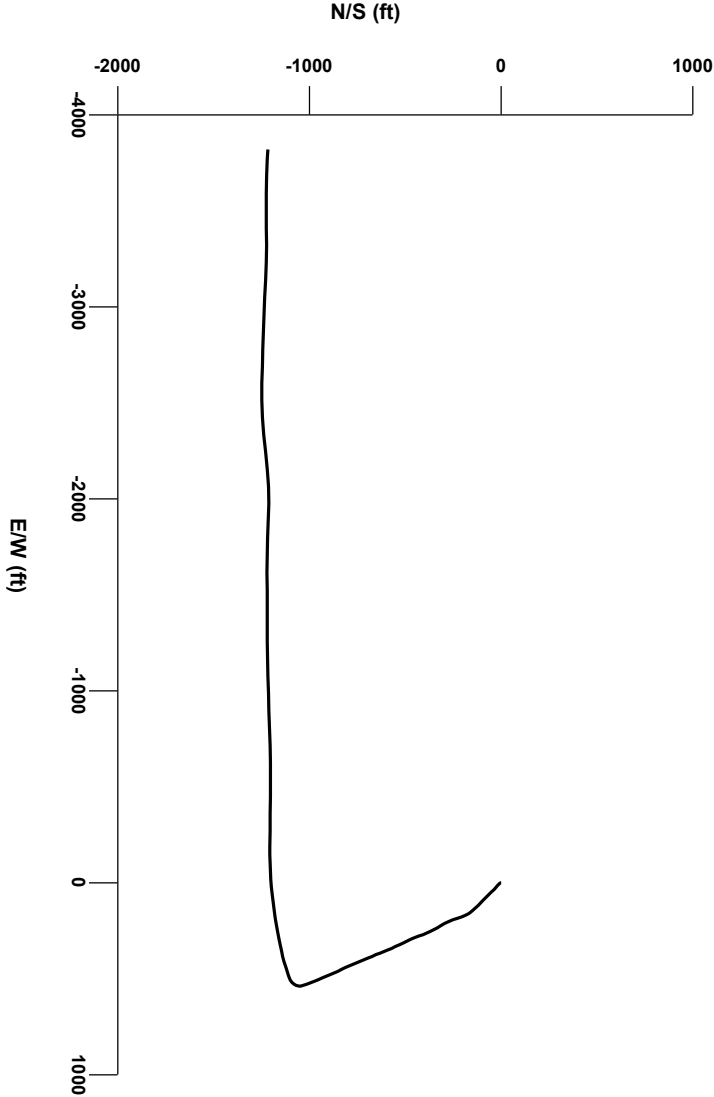
OPERATOR: NOBLE ENERGY INC
WELL: THISTLE DOWN STATE PC F36-69HN
LOCATION: SEC25 T5N R65W
COUNTY: WELD
STATE: COLORADO
SPOT: 1136' FSL, 860' FEL
ELEVATION: 4723 ' GL, 4739' KB
FIELD: WATTENBERG
SPUD DATE: 2/26/13
TD DATE: 3/7/13
DATES LOGGED: 2/28/13 - 3/7/13
DEPTHS LOGGED: 684' - 11126'
GEOLOGISTS: GARY MYERS, TED STOCKWELL
DRILLING FLUID: LSND
DRILLING RIG: PRECISION 828
API: 05-123-36391
LOG TYPE: HORIZONTAL
SCALE: 1:240 (5 inches per 100 feet)
REMARKS: WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.

LOG CONTINUES FROM FILE: Thistle Down State PC F36-69HN Vert.lplot



Survey Elevation

Survey Plan

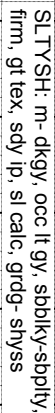


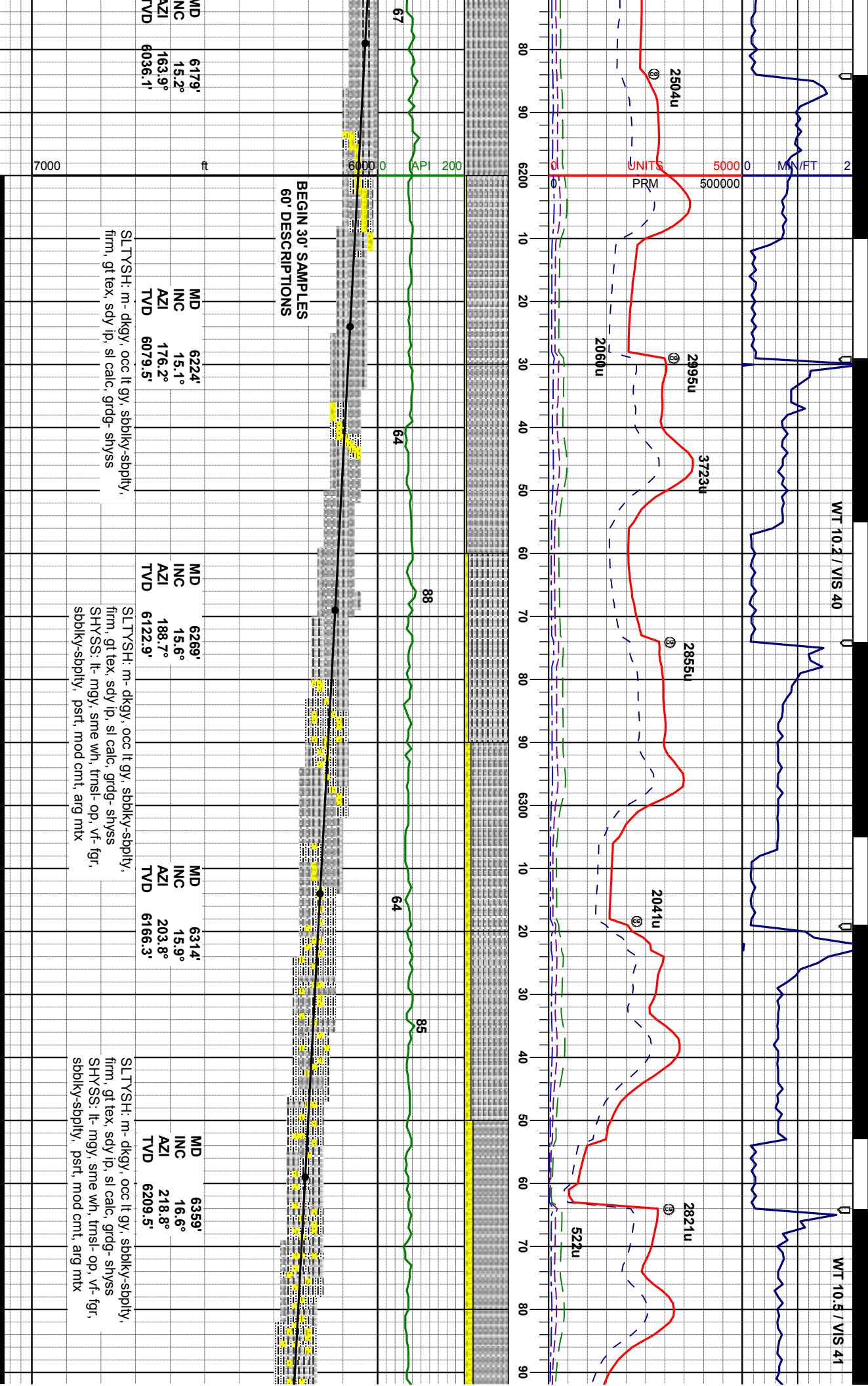
6000

Silty Shale

B Bentonite

Normal Fault

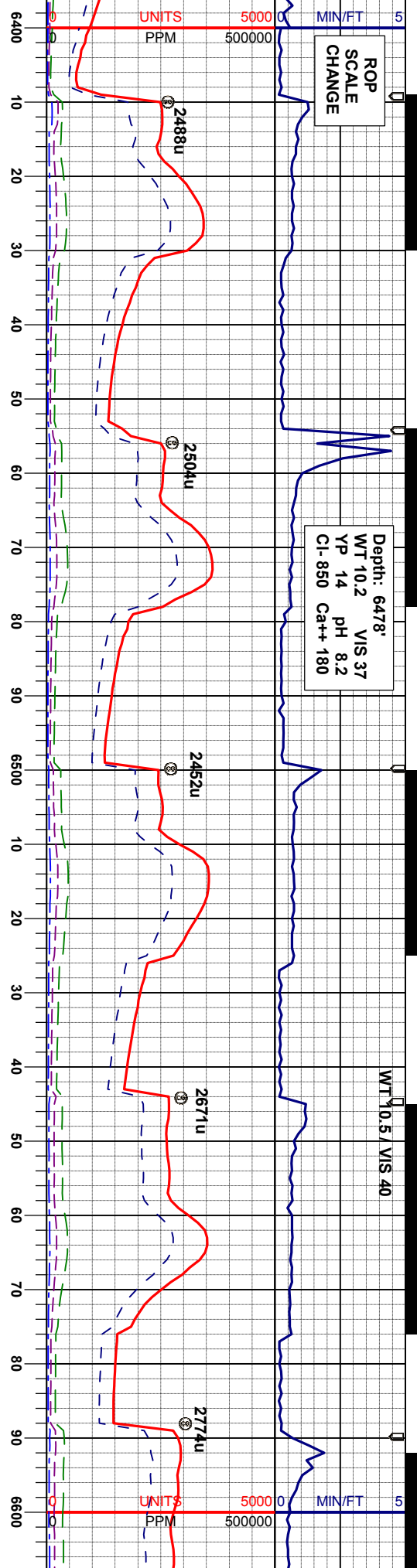




ROP
SCALE
CHANGE

Depth: 6478'
WT 10.2 VIS 37
YP 14 pH 8.2
Cl- 850 Ca++ 180

WT 10.5 / VIS 40



MD 6404'
INC 17.4°
AZI 230.9°
TVD 6252.5'

MD 6449'
INC 17.5°
AZI 239.3°
TVD 6295.5'

MD 6494'
INC 17.5°
AZI 248.5°
TVD 6338.4'

MD 6539'
INC 20.0°
AZI 250.9°
TVD 6381.0'

MD 6584'
INC 22.4°
AZI 253.6°
TVD 6423.0'

SLTYSH: m-dkgy, occ lt gy, sbblky-sbply,
firm, gt tex, sdy ip, sl calc, grdg- shys
SHYSS: lt- mgy, sme wh, tmsl- op, vf- fgr,
sbblky-sbply, psrt, mod cnt, arg mt

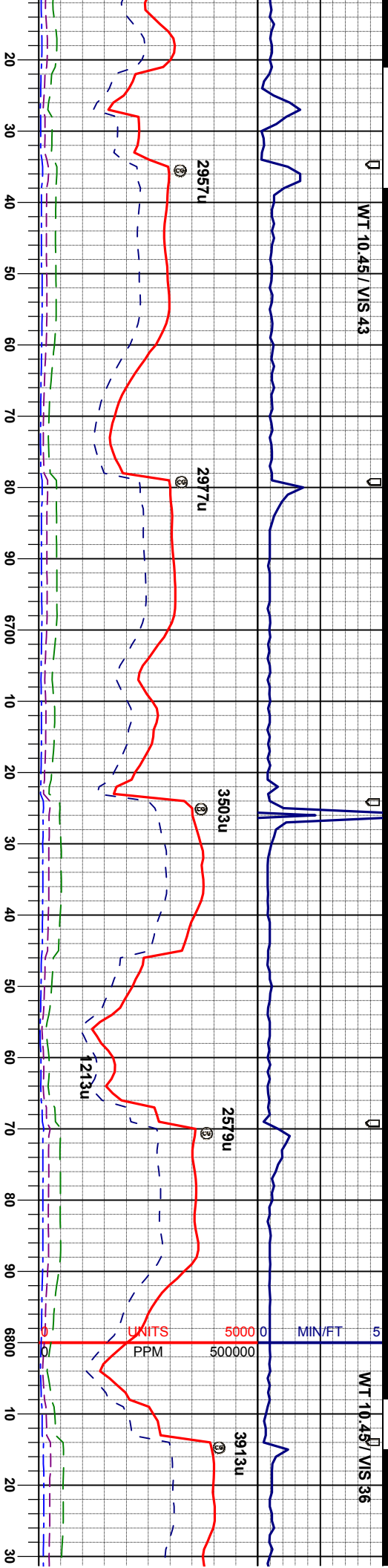
SLTYSH: m-dkgy, occ lt gy, sbblky-sbply,
firm, gt tex, sdy ip, sl calc, grdg- shys
SHYSS: lt- mgy, sme wh, tmsl- op, vf- fgr,
sbblky-sbply, psrt, mod cnt, arg mt

SLTYSH: m-dkgy, occ lt gy, sbblky-sbply,
firm, gt tex, sdy ip, sl calc, grdg- shys
SHYSS: lt- mgy, sme wh, tmsl- op, vf- fgr,
sbblky-sbply, psrt, mod cnt, arg mt

SLTYSH: m-d
firm, gt tex, sdy
SHYSS: lt- mgy
sbblky-sbply,

WT 10.45 / VIS 43

WT 10.45 / VIS 36



MD 6629'
INC 25.0°
AZI 252.5°
TVD 6464.2'

MD 6674'
INC 28.4°
AZI 252.5°
TVD 6504.4'

MD 6718'
INC 32.2°
AZI 253.2°
TVD 6542.3'

MD 6763'
INC 36.1°
AZI 256.4°
TVD 6579.6'

TVD
SCALE
CHANGE

MD 6808'
INC 39.7°
AZI 257.4°
TVD 6615.1'

kggy, occ lt gy, sbbky-sbply,
v ip, sl calc, tr shys, tr fos
y, sme wh, trnsi-op, vf- fgr,
psrt, mod cnt, arg mtz

SLTYSH: m- dkgy, occ lt gy, sbbky-sbply,
firm, gt tex, sdy ip, sl calc, tr shys, tr fos
SHYSS: lt- mgy, sme wh, trnsi-op, vf- fgr,
sbbky-sbply, psrt, mod cnt, arg mtz

SLTYSH: m- dkgy, occ lt gy, sbbky-sbply,
occ pily, firm, gt tex, sdy ip, sl calc, tr
shys, tr fos

SLTYSH: m- dkgy, occ lt gy, sbbky-sbply,
occ pily, firm, gt tex, sdy ip, sl calc, tr
shys, tr fos

SLTYSH: m- dkgy, .
occ pily, firm, gt tex
shys, tr fos, tr bent

7200

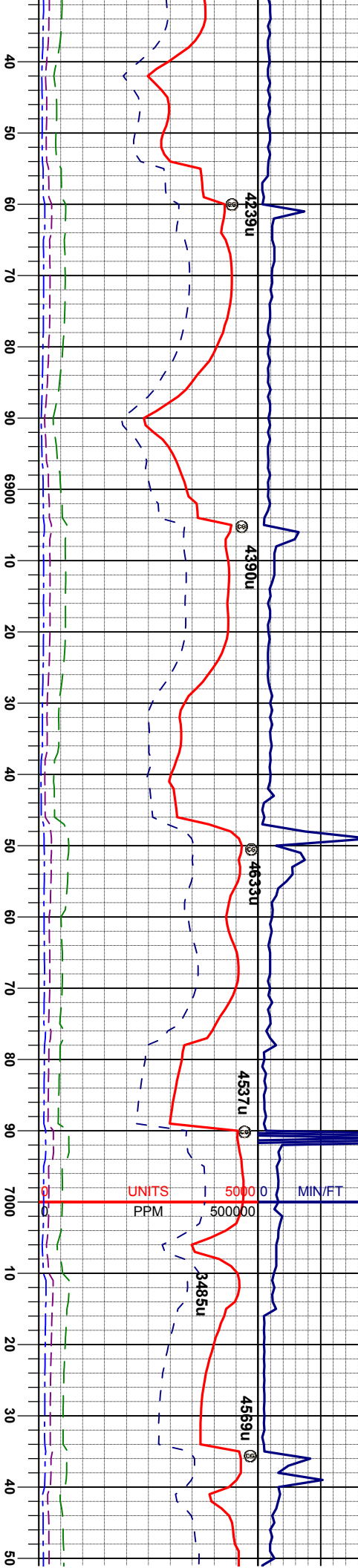
6600 0 API 200



WT 10.45 / VIS 45

WT 10.40 / VIS 44

3/3/20



SHARON SPRINGS
MARKER
6892 MD, 6675' TVD

NIORARA A CHALK
LOGGER TOP
6969' MD, 6729' TVD

MD 6853'
INC 44.0°
AZI 258.3°
TVD 6648.6'

MD 6898'
INC 49.1°
AZI 258.7°
TVD 6679.5'

MD 6943'
INC 53.9°
AZI 259.7°
TVD 6707.5'

MD 6988'
INC 57.9°
AZI 260.6°
TVD 6732.8'

MD 7033'
INC 61.4°
AZI 260.6°
TVD 6755.5'

occ lt gy, sbblky-sbply,
sdy ip, sl calc, tr

SLTYSH: m- dkgy, occ lt gy, sbblky-sbply,
occ pily, firm, gt tex, sdy ip, sl calc, tr
slyss, tr fos, tr bent
MRL: m- dkgy, sft- mfirm, sbply-pily, rthy
lstr, silty tex, org/calc mtx, calc, scat bent

CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, mod calc, tr pyr
MRL: m- dkgy, sft- mfirm, sbply-pily, rthy
lstr, silty tex, org/calc mtx, calc, scat bent
SLTYSH: m- dkgy, occ lt gy, sbblky-sbply,
occ pily, firm, gt tex, sdy ip, sl calc

MRL: m- dkgy, sft- mfirm, sbblky-sbply, tr
pily, rthy lstr, silty tex, org/calc mtx, calc,
scat bent
CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, mod calc, tr pyr

7200

6600

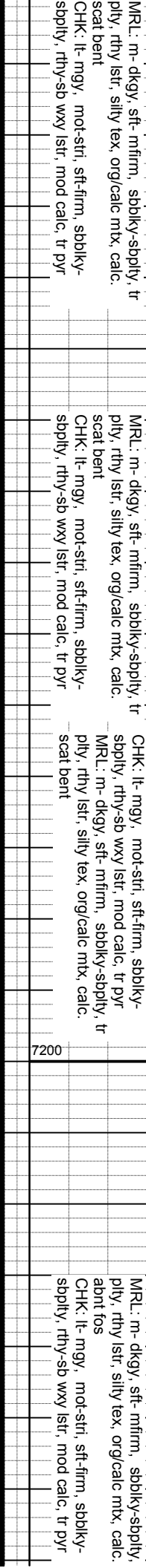
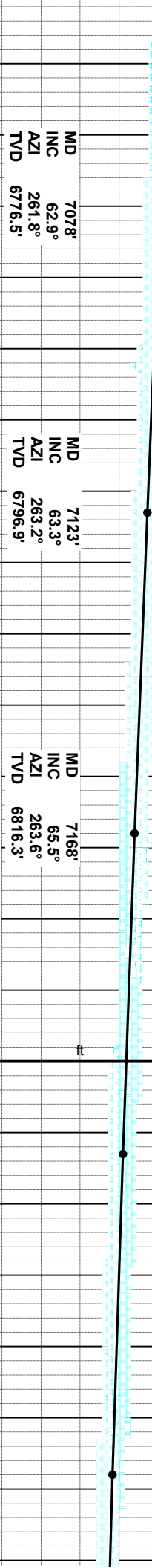
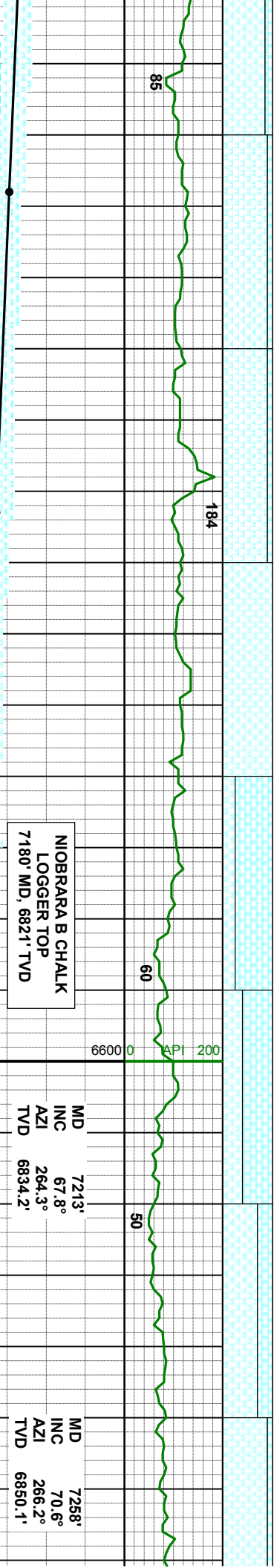
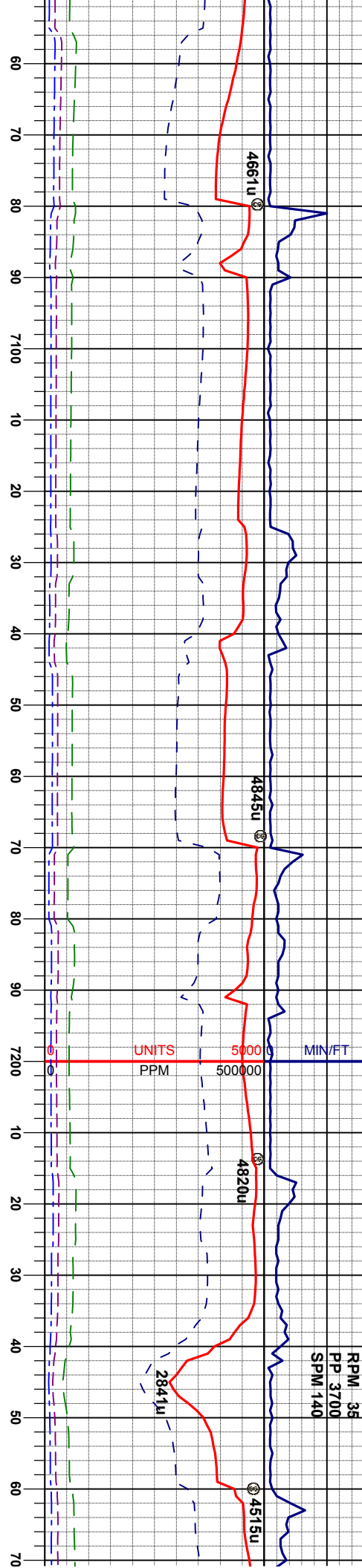
57

200

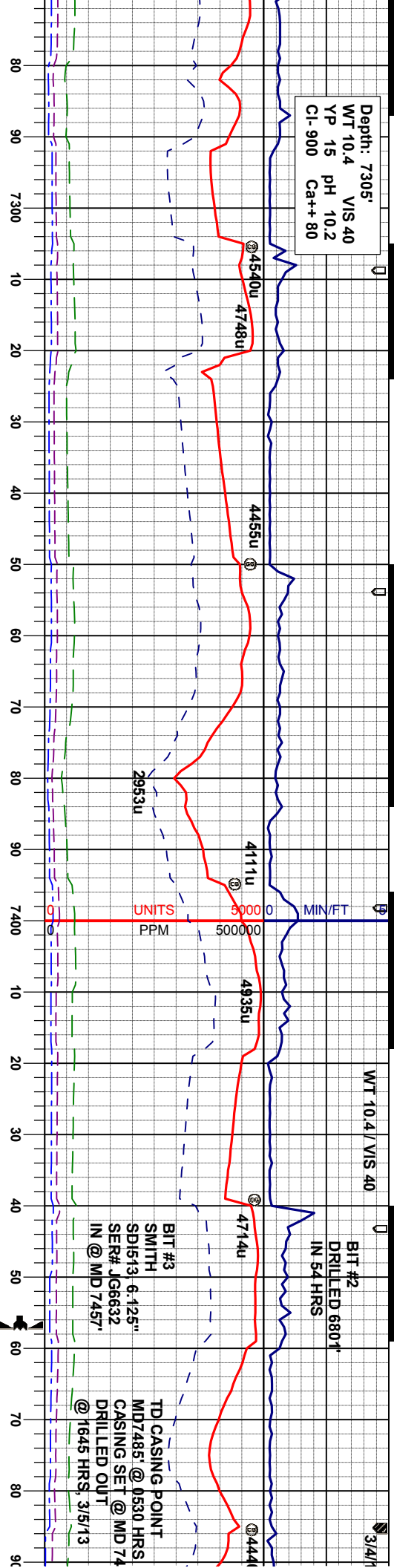
142

166





Depth: 7305'
WT 10.4 VIS 40
YP 15 pH 10.2
Cl- 900 Ca++ 80



MD 7303'
INC 73.3°
AZI 268.1°
TVD 6864.1'

MD 7348'
INC 75.9°
AZI 268.3°
TVD 6876.0'

NIOBRARA C CHALK
LOGGER TOP
7371' MD, 6881' TVD

MD 7393'
INC 80.5°
AZI 269.7°
TVD 6885.2'

MD 7435'
INC 83.8°
AZI 269.9°
TVD 6891.0'

MRL: m- dkgy, sft- mfirm, sbbiky-sbply,
rthy istr, silty tex, org/calc mtx, occ fos frag
CHK: lt- mgy, mot-str, sft-sfirm, sbbiky-
sbply, rthy-sb wxy istr, calc

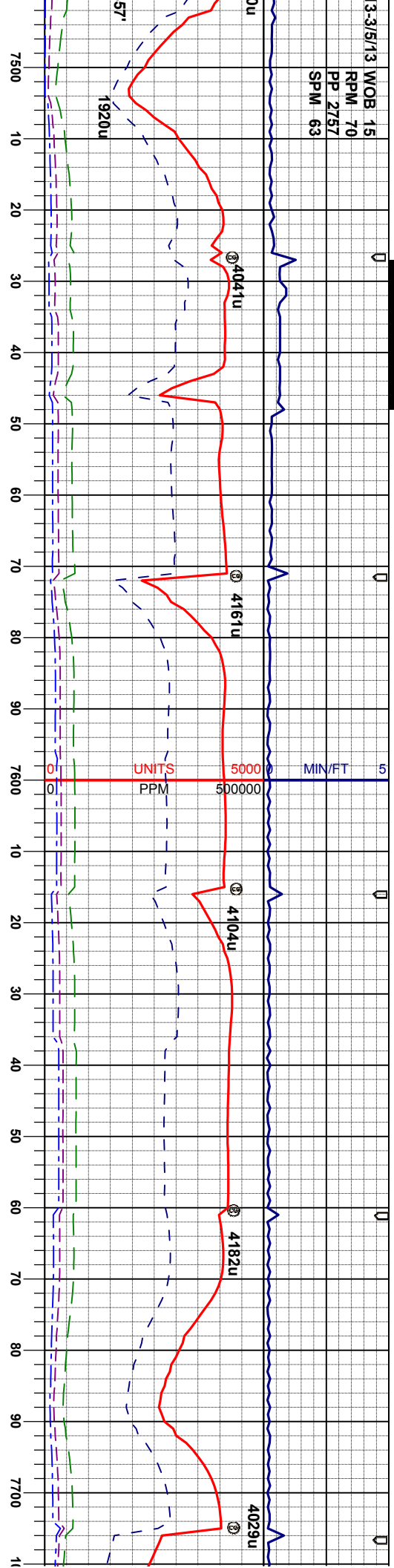
MRL: m- dkgy, sft- mfirm, sbbiky-sbply,
rthy istr, silty tex, org/calc mtx, occ fos frag
CHK: lt- mgy, mot-str, sft-sfirm, sbbiky-
sbply, rthy-sb wxy istr, calc

CHK: lt- mgy, mot-str, sft-firm, sbbiky-
sbply, rthy-sb wxy istr, vcalc
MRL: m- dkgy, sft- mfirm, sbbiky-sbply, tr
ply, rthy istr, silty tex, org/calc mtx, occ fos
frag, tr bent

CHK: lt- m
sbply, rthy
MRL: m- d
ply, rthy is
frag



WOB	15
RPM	70
PP	2757
SPM	63



MD	7515'
INC	86.0°
AZI	270.6°
TVD	6898.1'

BEGIN 50' SAMPLES

TVD
SCALE
CHANGE

MD	7605'
INC	88.8°
AZI	270.6°
TVD	6902.2'

MD	7695'
INC	89.3°
AZI	270.6°
TVD	6903.6'

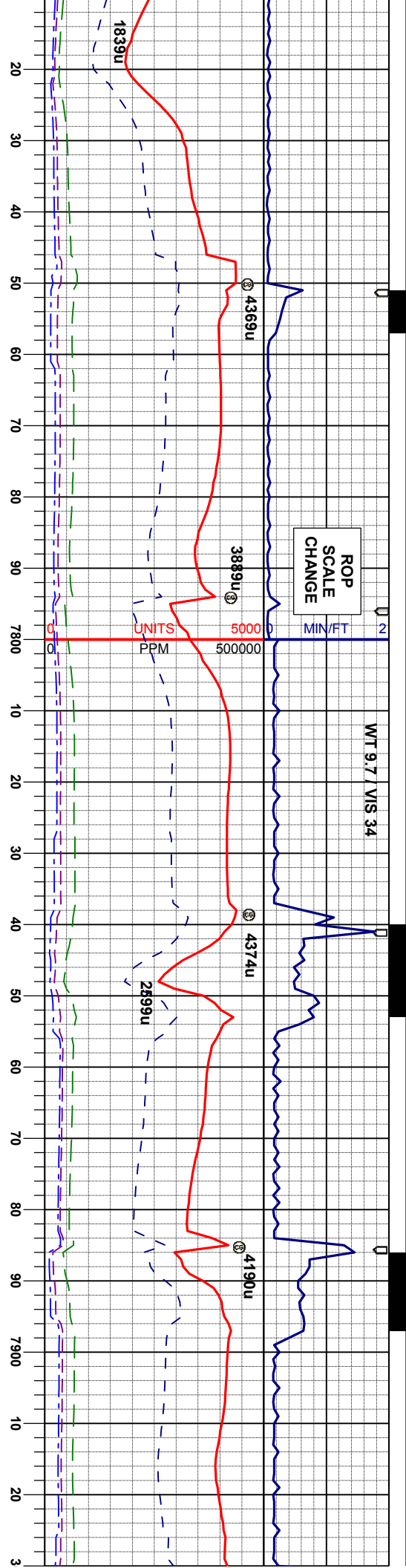
gy, mot-stri, sft-firm, sbblky-
-sb way lstr, vcalc
kgy, sft-mfirm, sbblky-sbply, tr
tr, slty tex, org/calc mtx, occ fos

MR.: m-dkgy, sft-firm, sbblky-sply, t
ply, tthy lstr, slty tex, org/calc mrx, occ fos
frag
CHK: lt-mgy, mot-strl, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc

MRL: m-dkgy, firm-hd, sbblky-sbply, tr
ply, rthy lstr, sily tex, orgcalc mix, abnt fos
frag, tr bent, tr pyr, tr chk

M/R: m-dkgy, firm-hd, sdblk-sply, tr
ply, rthy lstr, stly tex, org/calc mtx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: n
pity, rth
frag, tr



MD 7784'
INC 90.7°
AZI 270.4°
TVD 6903.6'

MD 7874'
INC 90.7°
AZI 269.4°
TVD 6902.5'

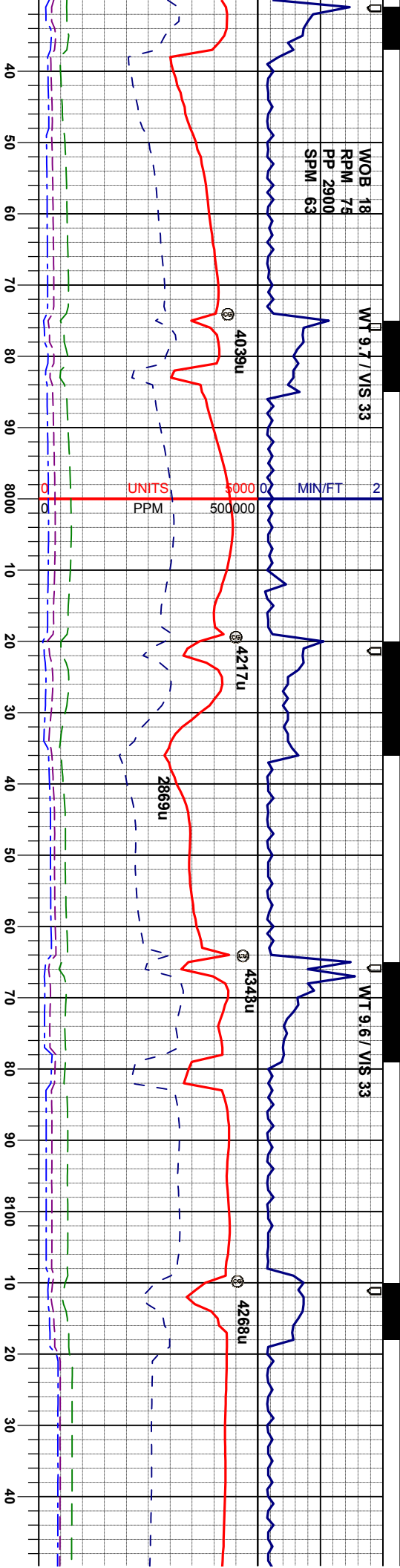
MRL: m- dkgy, firm-hd, sbbiky-sbpily, tr
ply, rthy lst, silty tex, org/calc mt, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbiky-sbpily, tr
ply, rthy lst, silty tex, org/calc mt, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbiky-sbpily, tr
ply, rthy lst, silty tex, org/calc mt, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbiky-sbpily, tr
ply, rthy lst, silty tex, org/calc mt, abnt fos
frag, tr bent, tr pyr, tr chk





MD 7964'
INC 90.6°
AZI 267.8°
TVD 6901.5'

MRL: m- dkgy, firm-hd, sbbkly-sbpily, tr
pily, rthy lstr, silty tex, org/calac mtx, abnt fos
frag, tr bent, tr pyr, tr chk

MD 8054'
INC 90.1°
AZI 268.5°
TVD 6901.0'

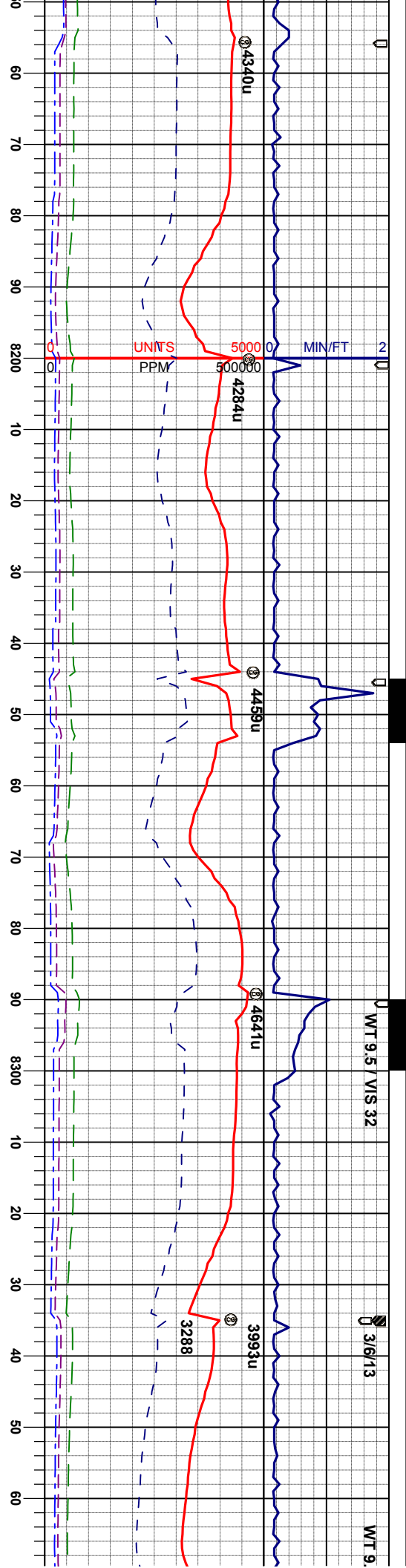
MRL: m- dkgy, firm-hd, sbbkly-sbpily, tr
pily, rthy lstr, silty tex, org/calac mtx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbkly-sbpily, tr
pily, rthy lstr, silty tex, org/calac mtx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbkly-sbpily, tr
pily, rthy lstr, silty tex, org/calac mtx, abnt fos
frag, tr bent, tr pyr, tr chk

MD 8144'
INC 89.3°
AZI 268.0°
TVD 6901.5'





MD 8234'
INC 90.3°
AZI 268.1°
TVD 6901.8'

MD 8324'
INC 90.0°
AZI 269.0°
TVD 6901.5'

MRL: m- dkgy, firm-hd, sbbiky-sbply, tr
ply, rthy lstr, silty tex, orgcalc mx, abnt fos
frag, tr bent, tr pyr, tr chk

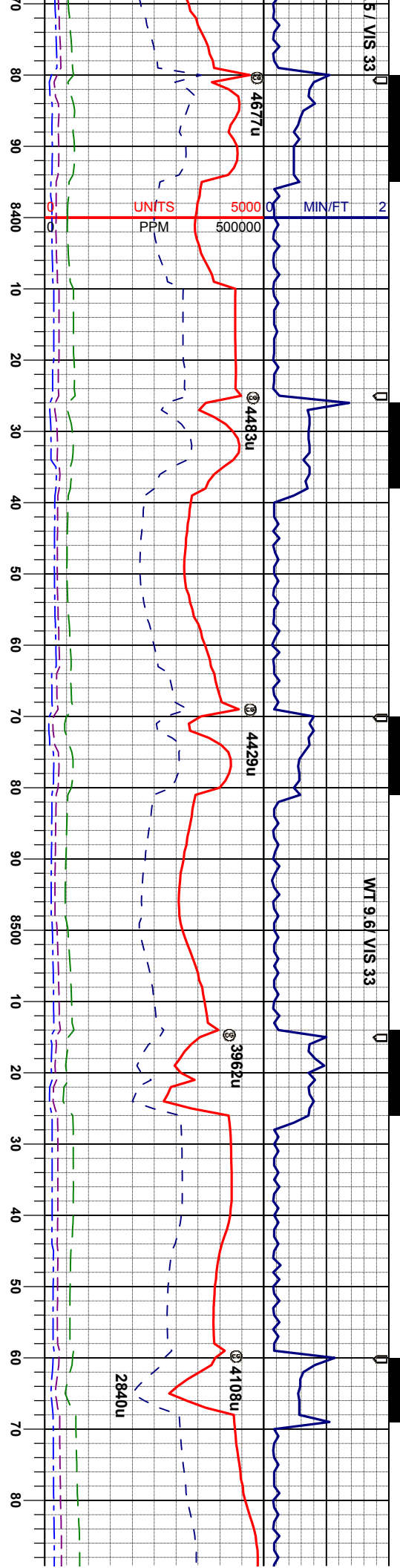
MRL: m- dkgy, sft- mfirm, sbbiky-sbply, tr
ply, rthy lstr, silty tex, orgcalc mx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbiky-sbply, tr
ply, rthy lstr, silty tex, orgcalc mx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, firm-hd, sbbiky-sbply, tr
ply, rthy lstr, silty tex, orgcalc mx, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m- dkgy, fir
ply, rthy lstr, silty
frag, tr bent, tr py





MD 8414'
INC 89.1°
AZI 269.0°
TVD 6902.2'

MD 8504'
INC 88.2°
AZI 268.8°
TVD 6904.4'

MD
INC
AZI
TVD

m-hd, sbblky-sbply, tr
pty, rthy lstr, silty tex, org/calc mtz, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m-dkgy, firm-hd, sbblky-sbply, tr
pty, rthy lstr, silty tex, org/calc mtz, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m-dkgy, firm-hd, sbblky-sbply, tr
pty, rthy lstr, silty tex, org/calc mtz, abnt fos
frag, tr bent, tr pyr, tr chk

MRL: m-dkgy, firm-hd, sbblky-sbply, tr
pty, rthy lstr, silty tex, org/calc mtz, abnt fos
frag, tr bent, tr pyr, tr chk

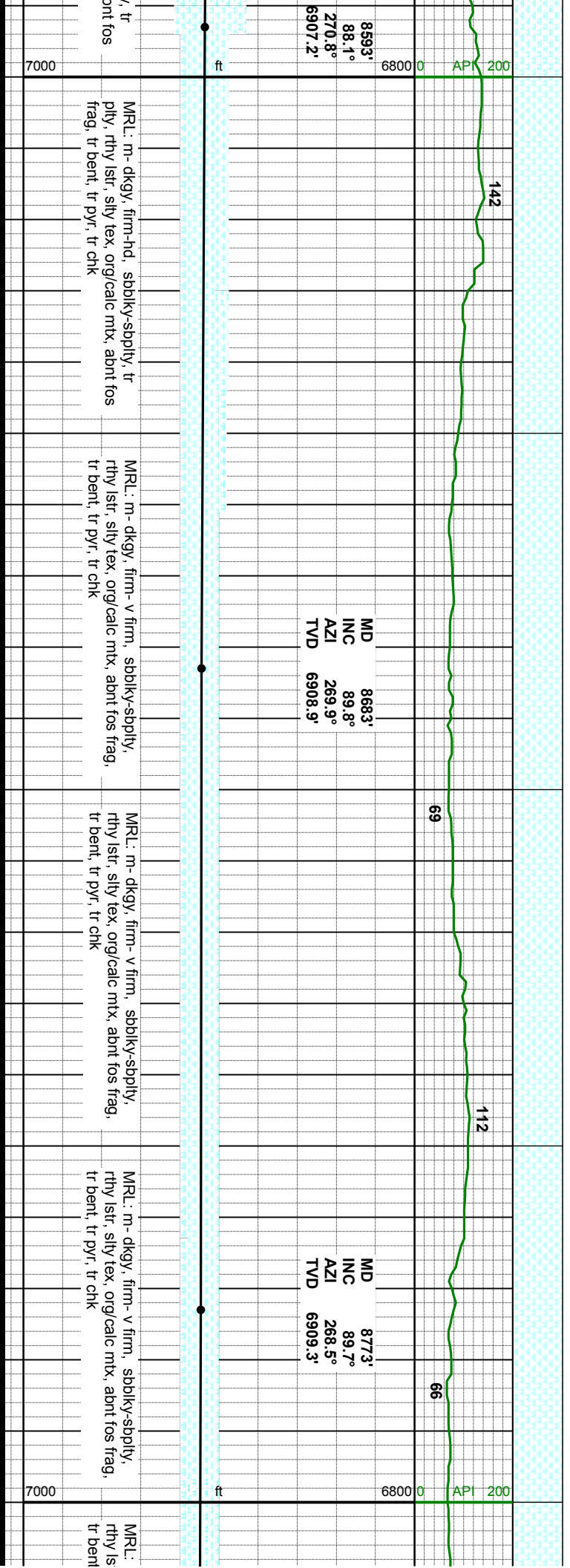
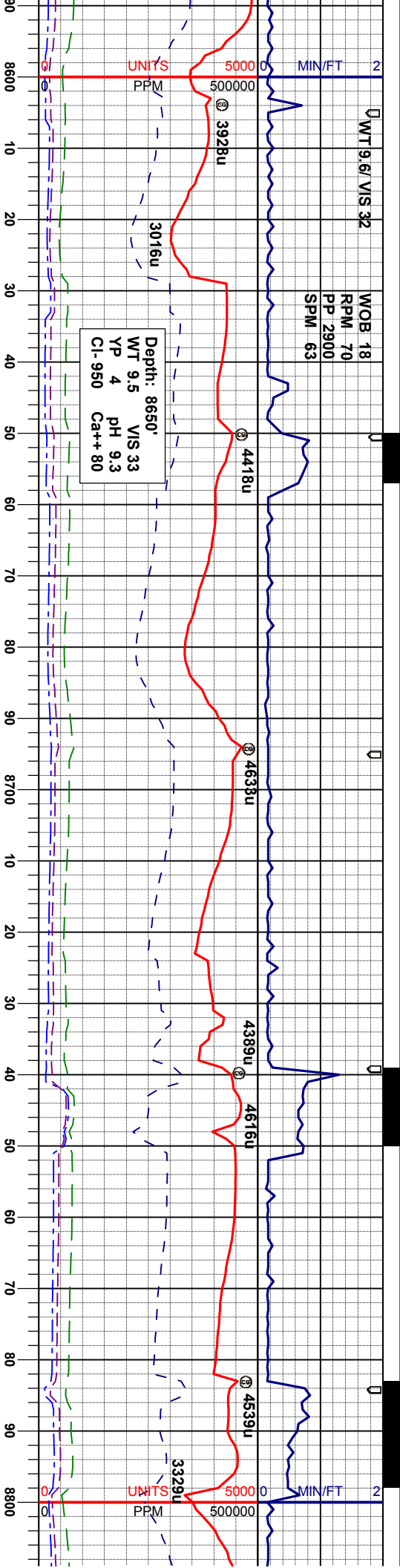
MRL: m-dkgy, firm-hd, sbblky-sbply
pty, rthy lstr, silty tex, org/calc mtz, al
frag, tr bent, tr pyr, tr chk

7000

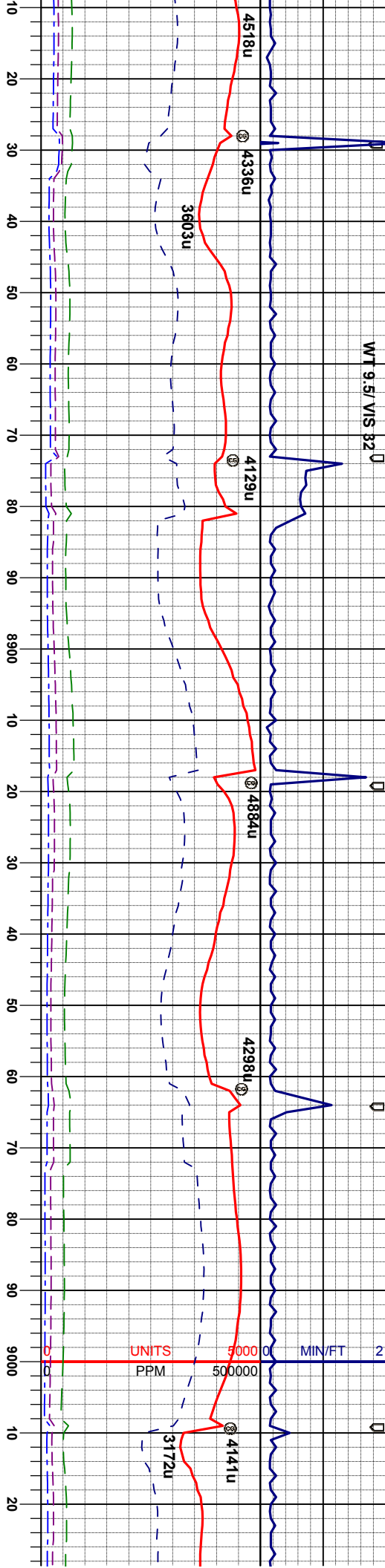
ft

6800 0 AP 200





WT 9.5/ VIS 32



MD 8863'
INC 89.0°
AZI 270.3°
TVD 6910.3'

MD 8653'
INC 89.7°
AZI 271.0°
TVD 6911.3'

m - dkgy, firm- v firm, sbblky-sbply,
tr silty tex, org/calci mix, abnt fos frag,
tr bent, tr pyr, occ chk

MRL: m - dkgy, firm- v firm, sbblky-sbply,
rthy lst, silty tex, org/calci mix, abnt fos frag,
tr bent, tr pyr, occ chk

MRL: m - dkgy, firm- v firm, sbblky-sbply,
rthy lst, silty tex, org/calci mix, abnt fos frag,
tr bent, tr pyr, tr chk

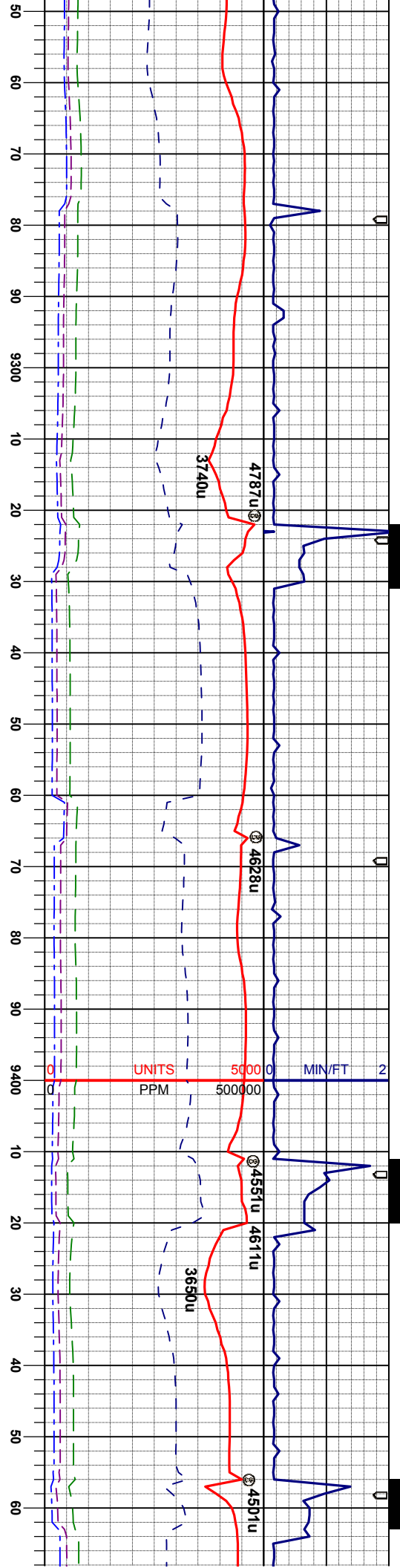
MRL: m - dkgy, firm- v firm, sbblky-sbply,
rthy lst, silty tex, org/calci mix, abnt fos frag,
tr bent, tr pyr, tr chk

MRL: m - dkgy, firm- v firm, sbblky-sbply,
rthy lst, silty tex, org/calci mix, abnt fos frag,
tr bent, tr pyr, tr chk

7000

6800 0 API 200





MD 9312'
INC 90.4°
AZI 267.8°
TVD 6913.4'

MD 9402'
INC 90.1°
AZI 264.3°
TVD 6913.0'

MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtz, abnt fos frag,
tr pyr
CHK: lt- mgy, mot-slti, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc

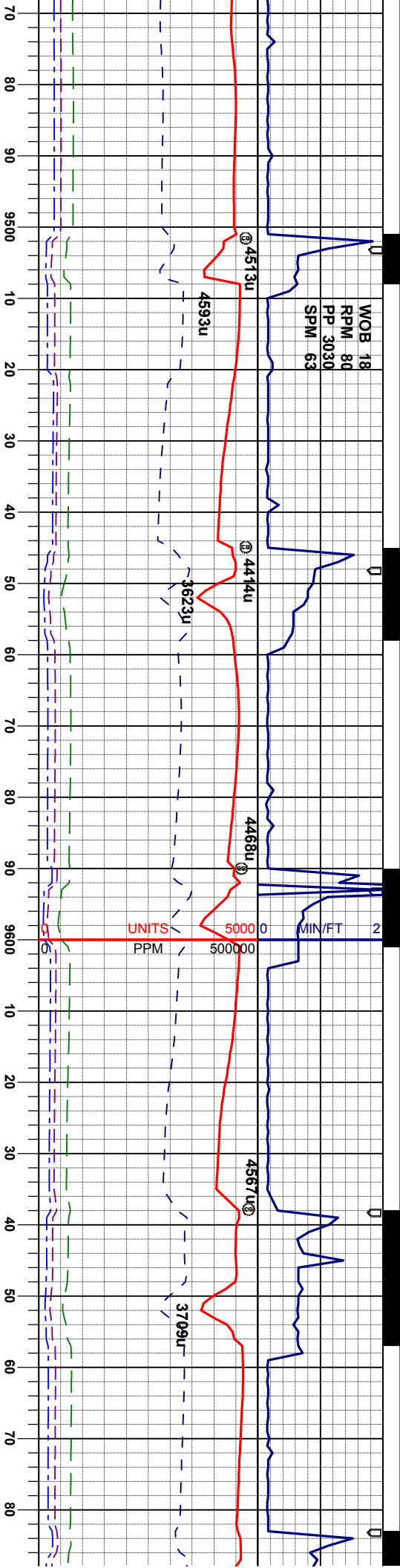
MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtz, abnt fos frag,
tr pyr, occ chk

MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtz, abnt fos frag,
tr pyr, occ chk

MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, org/calc mtz, abnt fos frag,
tr pyr, occ chk

MRL: m- dkgy,
rthy lstr, silty tex,
tr pyr, occ chk





MD 9492'
INC 89.6°
AZI 264.6°
TVD 6913.3'

MD 9582'
INC 89.9°
AZI 264.1°
TVD 6913.7'

MD 9672'
INC 89.3°
AZI 266.2°
TVD 6914.3'

firm - v firm, sbbkly-sbbply,
x, org/calc mt, abnt fos frag,

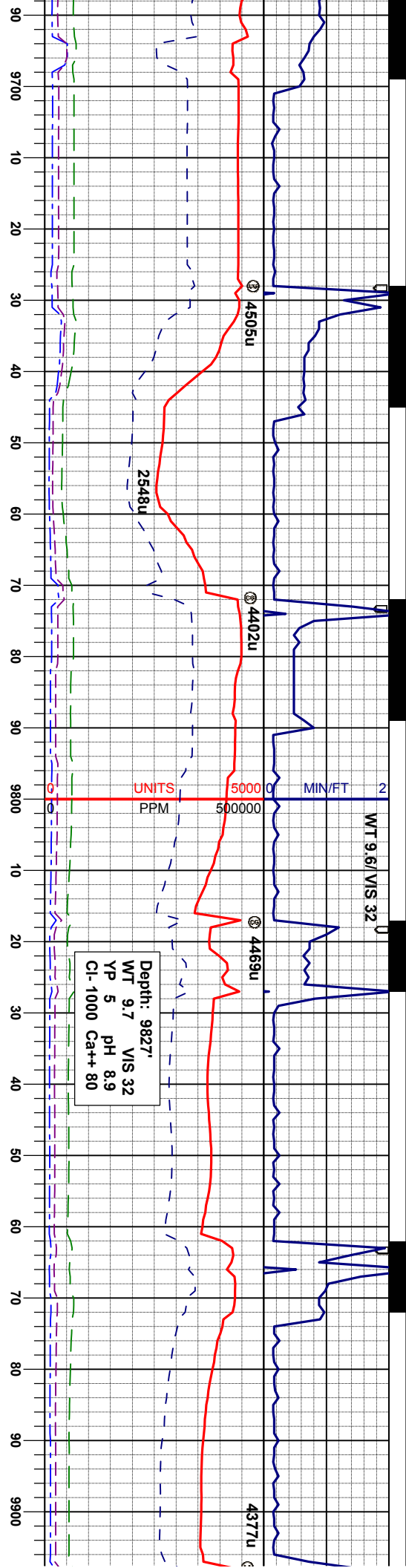
MR: m- dkgy, firm- v firm, sbbkly-sbbply,
rthy lstr, silty tex, org/calc mt, abnt fos frag,
tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbbply, rthy-sb wxy lstr, vcalc

MR: m- dkgy, firm- v firm, sbbkly-sbbply,
rthy lstr, silty tex, org/calc mt, abnt fos frag,
tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbbply, rthy-sb wxy lstr, vcalc

CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbbply, rthy-sb wxy lstr, vcalc
MR: m- dkgy, firm- v firm, sbbkly-sbbply,
rthy lstr, silty tex, org/calc mt, abnt fos frag,
tr pyr

CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbbply, rthy-sb wxy lstr, vcalc
MR: m- dkgy, firm- v firm, sbbkly-sbbply,
rthy lstr, silty tex, org/calc mt, abnt
tr pyr





MD 9762'
INC 89.4°
AZI 269.0°
TVD 6916.9'

MD 9852'
INC 87.0°
AZI 271.5°
TVD 6921.3'

CHK: lt- mgy, mot-str, sft-firm, sbbkly-spply, rthy-sb wxy lstr, vcalc MRL: m- dkgv, firm- v firm, sbbkly-spply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

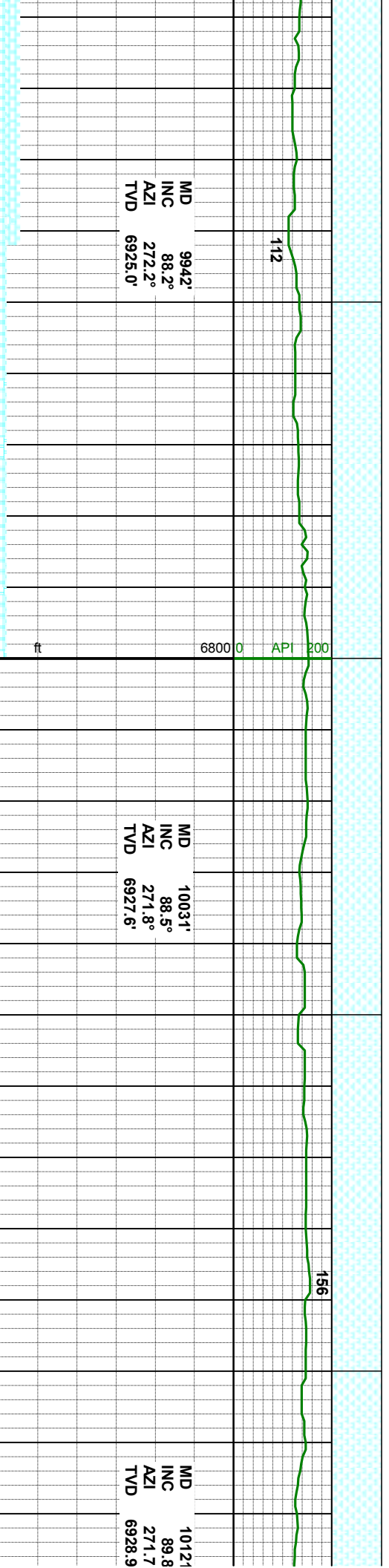
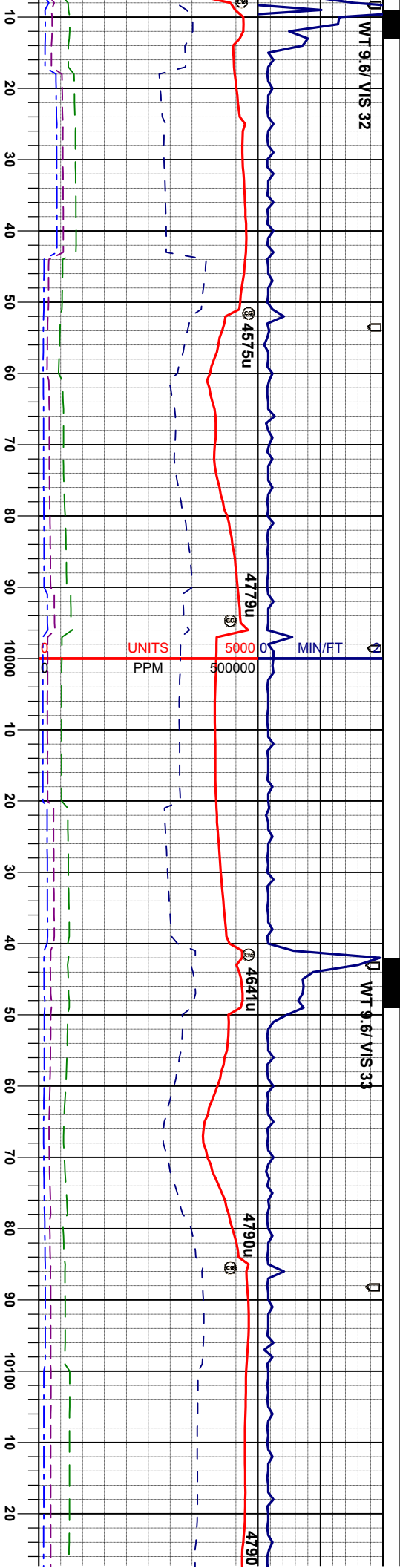
CHK: lt- mgy, mot-str, sft-firm, sbbkly-spply, rthy-sb wxy lstr, vcalc MRL: m- dkgv, firm- v firm, sbbkly-spply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

CHK: lt- mgy, mot-str, sft-firm, sbbkly-spply, rthy-sb wxy lstr, vcalc MRL: m- dkgv, firm- v firm, sbbkly-spply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

CHK: lt- mgy, mot-str, sft-firm, sbbkly-spply, rthy-sb wxy lstr, vcalc MRL: m- dkgv, firm- v firm, sbbkly-spply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

CHK: lt- mgy, mot-str, sft-firm, sbbkly-spply, rthy-sb wxy lstr, vcalc MRL: m- dkgv, firm- v firm, sbbkly-spply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr





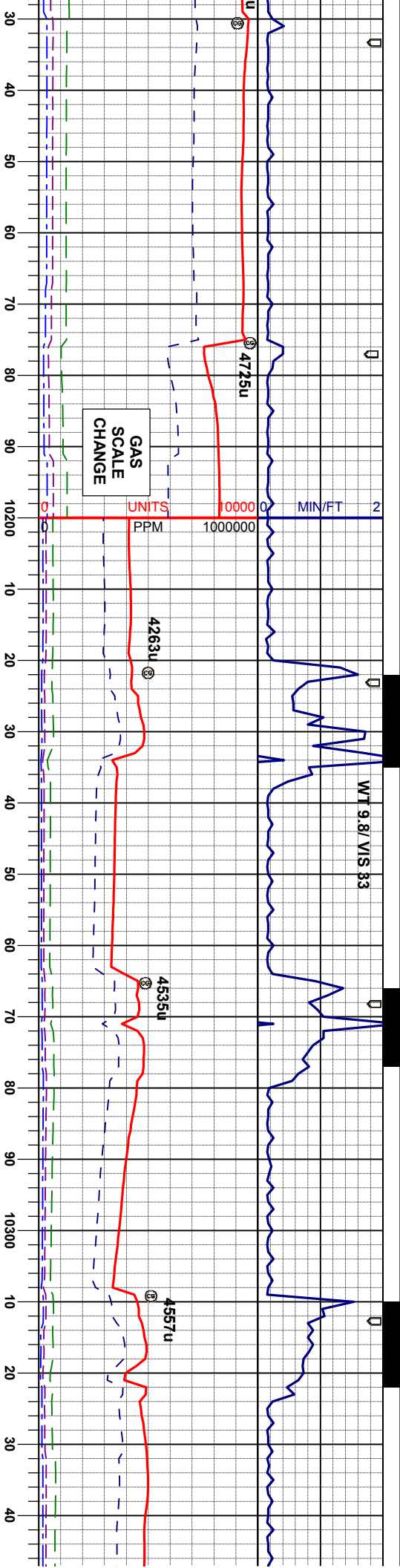
CHK: lt-mgy, mol-str, sft-firm, sbblky-sbply, rthy-sb wxy lstr, vcalc
MR: m-dkgy, firm-v firm, sbblky-sbply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

CHK: lt-mgy, mol-str, sft-firm, sbblky-sbply, rthy-sb wxy lstr, vcalc
MR: m-dkgy, firm-v firm, sbblky-sbply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

MR: m-dkgy, firm-v firm, sbblky-sbply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr

MR: m-dkgy, firm-v firm, sbblky-sbply, rthy lstr, silty tex, org/calc mt, abnt fos frag, tr pyr





MD 10211'
INC 91.4°
AZI 271.5°
TVD 6928.0'

MD 10301'
INC 89.6°
AZI 273.6°
TVD 6927.2'

Possible Fault

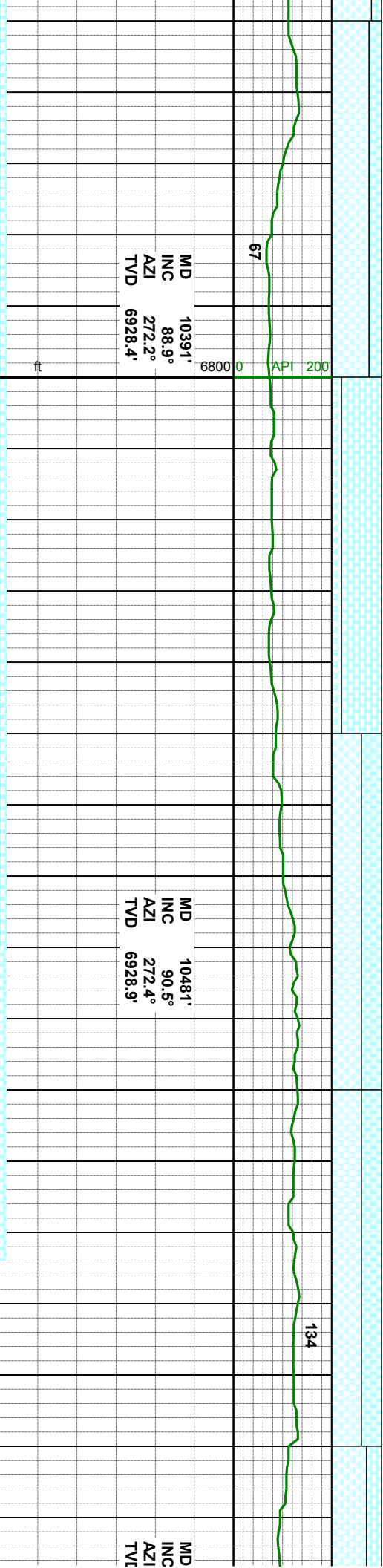
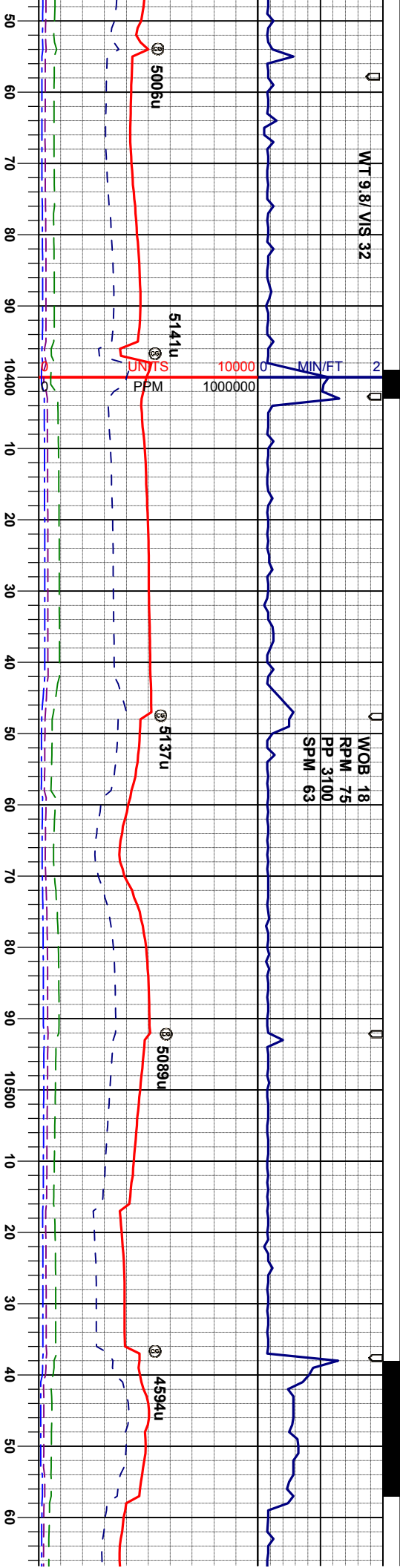
m, sbbkly-sbply,
mtx, abnt fos frag,
tr pyr, occ chk

MRL: m- dkgy, firm- v firm, sbbkly-sbply,
rthy lstr, silty tex, org/calc mtx, abnt fos frag,
tr pyr, tr inbd chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbply, rthy-sb wxy lstr, vcalc

MRL: m- dkgy, firm- v firm, sbbkly-sbply,
rthy lstr, silty tex, org/calc mtx, tr fos frag, tr
chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbply, rthy-sb wxy lstr, vcalc

MRL: m- dkgy, firm- v firm, sbbkly-sbply,
rthy lstr, silty tex, org/calc mtx, abnt fos frag,
tr pyr, tr inbd chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbbkly-
sbply, rthy-sb wxy lstr, vcalc





MD 10391'
INC 88.9°
AZI 272.2°
TVD 6928.4'

MD 10481'
INC 90.5°
AZI 272.4°
TVD 6928.9'

MD
INC
AZI
TVD

MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, orgcalc mt, abnt fos frag,
tr pyr, tr intbd chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc

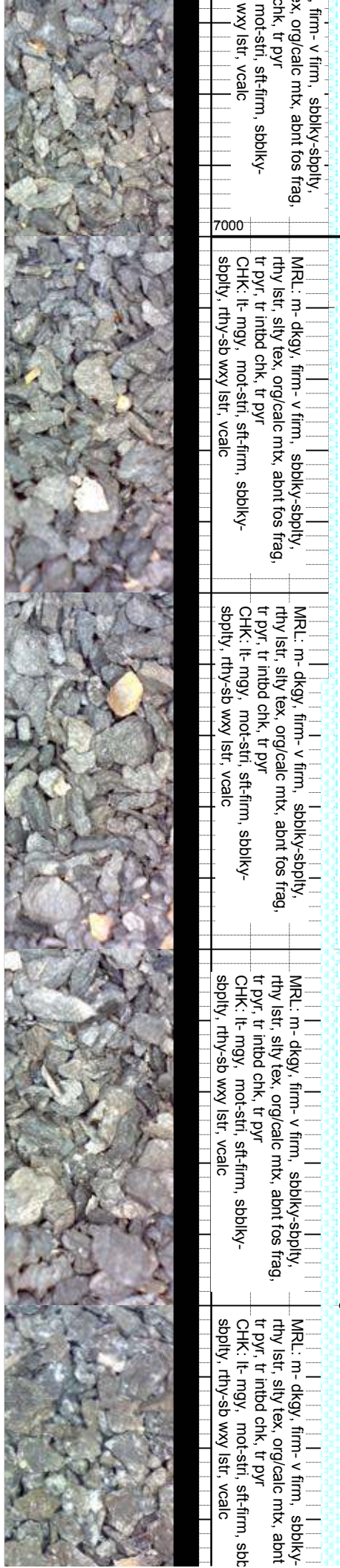
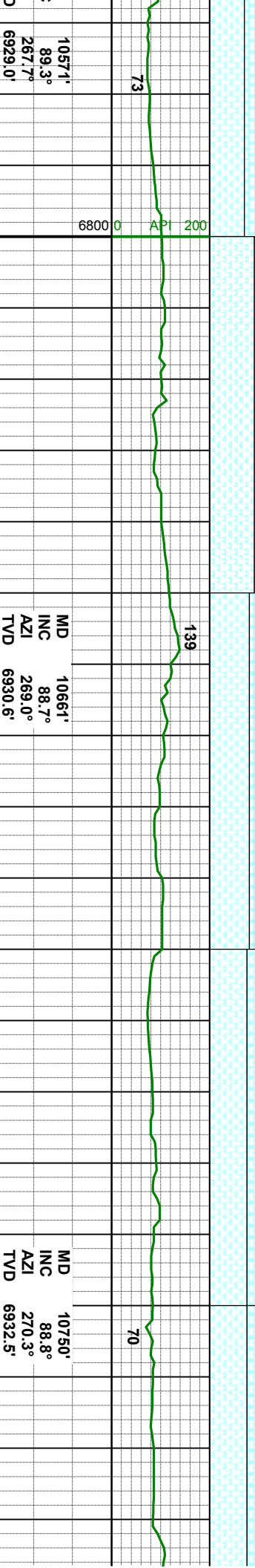
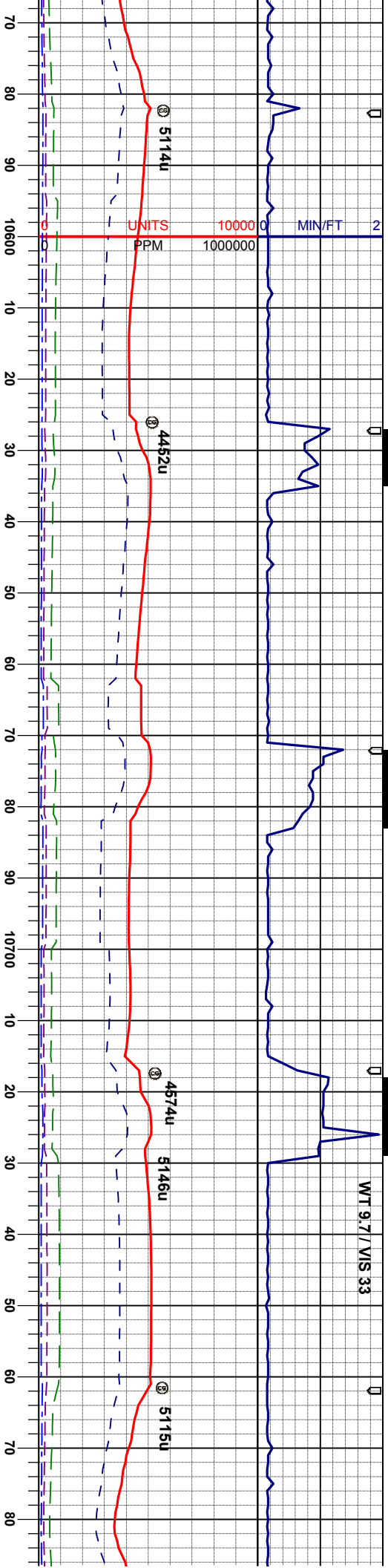
CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc
MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, orgcalc mt, abnt fos frag,
tr pyr, tr intbd chk, tr pyr

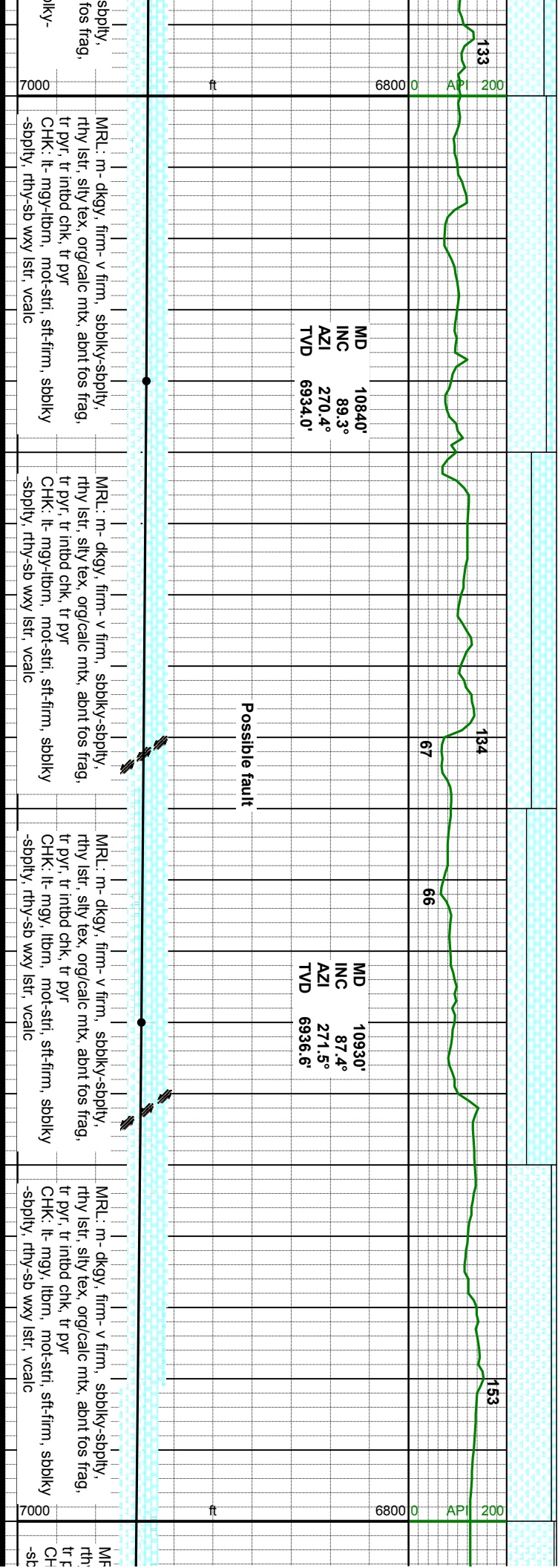
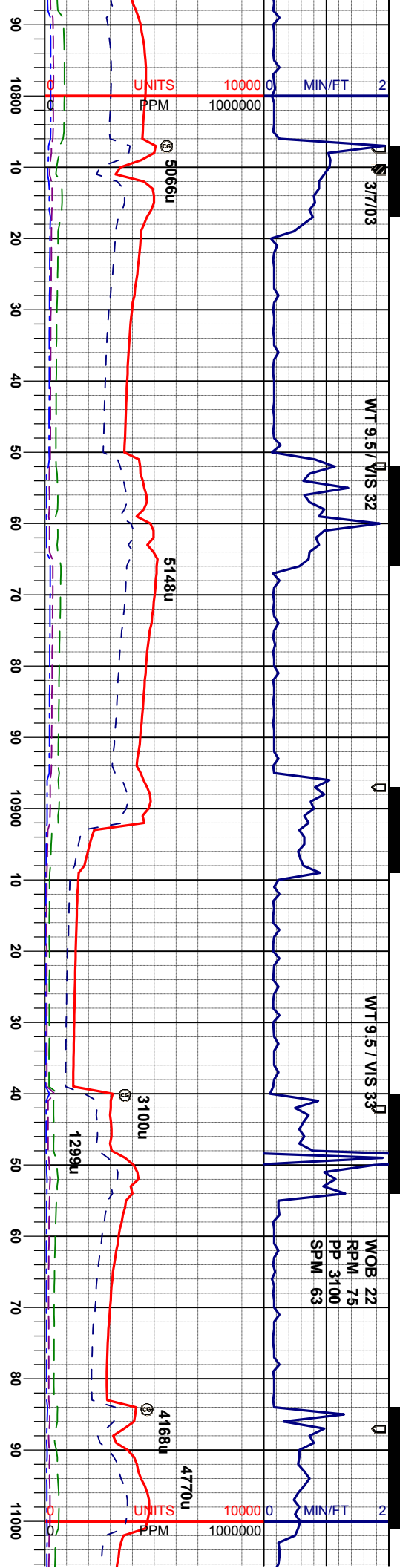
MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, orgcalc mt, abnt fos frag,
tr pyr, tr intbd chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc

MRL: m- dkgy, firm- v firm, sbblky-sbply,
rthy lstr, silty tex, orgcalc mt, abnt fos frag,
tr pyr, tr intbd chk, tr pyr
CHK: lt- mgy, mot-str, sft-firm, sbblky-
sbply, rthy-sb wxy lstr, vcalc

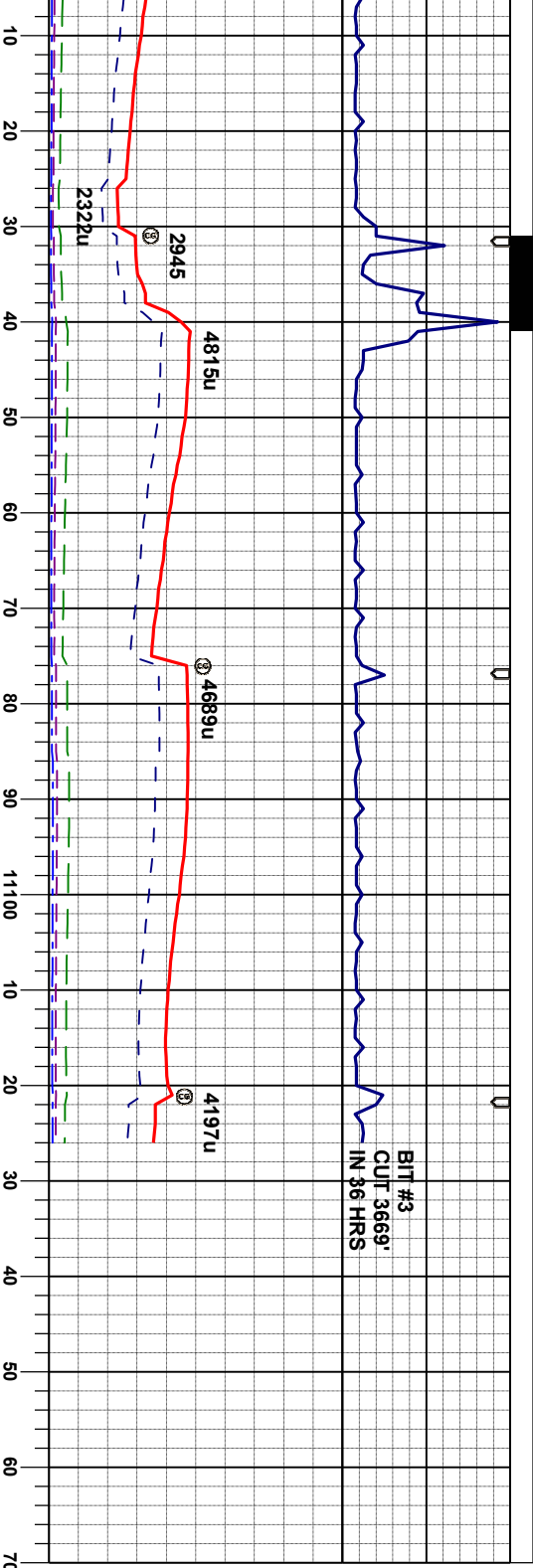
MRL: m- dkgy
rthy lstr, silty tex
tr pyr, tr intbd
CHK: lt- mgy,
sbply, rthy-sb







BIT #3
CUT 3669'
IN 36 HRS



THANK YOU FOR CHOOSING
COLUMBINE LOGGING, INC.

MD 11020'
INC 88.5°
AZI 273.1°
TVD 6939.8'

MD 11070'
INC 89.3°
AZI 272.7°
TVD 6940.8'

MD 11126'
INC 89.3°
AZI 272.7°
TVD 6941.5'

STRAIGHT LINE PROJECTION TO BIT

TD 11126'MD
@ 0352 HRS, 3/7/13

RL: m-dkgy, firm- v firm, sbblky-sbply,
vlystr, slty tex, org/calc mtx, abnt fos frag,
pyr, tr intbd chk, tr pyr
K: lt-mgy, lbmn, mot-srti, sft-firm, sbblky
ply, rthy-sb wxy istr, vcalc

MRL: m-dkgy, firm- v firm, sbblky-sbply,
rthy istr, slty tex, org/calc mtx, abnt fos frag,
tr pyr, tr intbd chk

