

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Merritt 6-66-9-0857CH HZ

Location NW/NE S9-T6N-R66W

State Colorado

Country USA

API Number 05-123-37706

Region DJ Basin

Surface Coordinates NW/NE S9-T6N-R66W

Bottom Hole Coordinates SE/SE Sec 09-T6N-R66W

County Weld

Rig Number Nabors M22

Field Wattenberg

Drilling Completed 12/26/2013

Ground Elevation 4,822

Logged Interval 6,800' **To** 11,988'

Formation Niobrara C

Type of Drilling Fluid LSND

K.B. Elevation 4,844

Total Depth 11,988'

Company Bill Barrett Corp
Address 1099 18th Street
Denver, CO 802

Name John Roesink
Company Bill Barrett Corp
Address 1099 18th Street
Denver, CO 802

Kevi

Oil
Note
Error

Operator

1.
Suite 2300
202

Geologist

2.
Suite 2300
202

Other

3.
Chris Cook Wellsite Geologist / Geosteering Specialist Columbine Logging Inc.
Chris Cook Wellsite Geologist Columbine Logging Inc.

Zone Color Coding



Rock Types

| | | | |
|-----------------|----------------------|------------------|-----------|
| UNKNOWN | COAL | MARLSTONE | SHALE |
| ANHYDRITE | CONGLOMERATE | METAMORPHIC | SHALY |
| BENTONITE | DOLOMITE | NO SAMPLE | SILTY |
| BRECCIA | DOLOMITIC LIMESTONE | SALT | SILTSTONE |
| CHALK | GRANITE | SANDSTONE | TILL |
| CEMENT | GYPSUM | SALT-PEPPER SANC | TUFF |
| CHERT | IGNEOUS | SHALE | WELD |
| CLAY CHOKE SANC | SIDERITE or LIMONITE | SHALE COLORED | |
| CLAYSTONE | LIMESTONE | SHALE GRAY | |

Accessories

| | | | |
|--------------|----------------------|---------------------|----------------|
| GASTROPOD | ARGILLITE GRAIN | HEAVY MINERAL | ANHYDRITE STR |
| INOCERAMUS | B BENTONITE | K KAOLIN | BENTONITE STR |
| ALGAE | BITUMENOUS SUBSTANCE | M MARLSTONE | COAL STRINGER |
| AMPHIPORA | BRECCIA FRAGMENTS | M MICACEOUS | DOLOMITE STR |
| BELEMNITE | C CALCAREOUS | M MINERAL CRYSTALS | GYPSUM STR |
| BIOCLASTIC | CARBONACEOUS FLAKES | N NODULES | LIMESTONE STR |
| BRACHIOPOD | C CHERT | P PHOSPHATE PELLETS | MARLSTONE STR |
| BRYOZOA | CHTLT | P PYRITE | MARLSTONE STR |
| CEPHALOPOD | COAL - THIN BEDS | S SALT CAST | SANDSTONE STR |
| CORAL | D DOLOMITIC | S SANDY | SHALE STRINGER |
| GRINOID | F FELDSPAR | S SILTACEOUS | SILTSTONE STR |
| ECHINOID | F FERRUGINOUS PELLET | S SILTY | |
| FISH | F FERRUGINOUS | T TUFFACEOUS | |
| FORAMINIFERA | A ANHYDRITIC | G GLAUCONITIC | |
| F FOSSIL | A ARGILLACEOUS | G GYPSIFEROUS | |

Stringer

Slide/Rotate

ROP
ROF
GAMMA

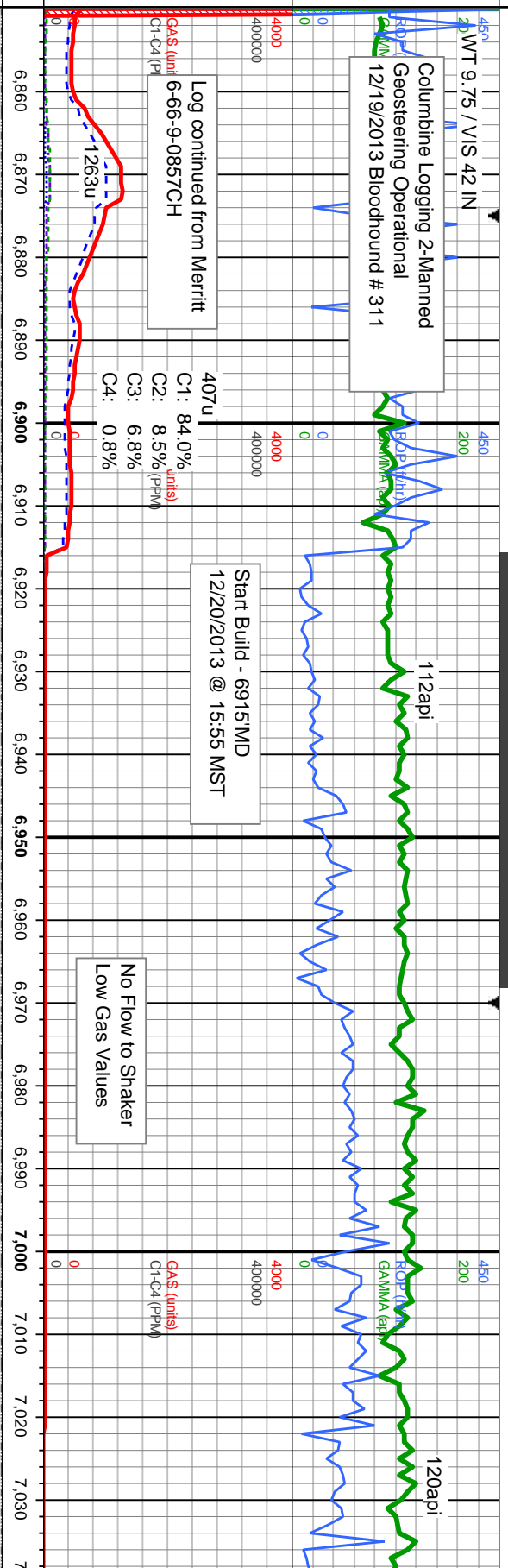
Columbine Logging 2-Manned
Geosteering Operational
12/19/2013 Bloodhound # 311

112api

120api

Total Gas & Chromatograph

GAS
C1
C2
C3
C4



Log continued from Merritt
GAS (units)
C1-C4 (ppm)

Start Build - 6915' MD
12/20/2013 @ 15:55 MST

No Flow to Shaker
Low Gas Values

% Lith

SLTYSH: med-dk gy, mod frm-sl britt, sb
blky-sb pty, v grt-rthy, non calc, silty; SLST: lt
gy-dk gy, sft-frm, sb blky - pty, sl aren, arg,
non calc, grdg to sh

SLTYSH: med-dk gy, mod frm-sl britt, sb
blky-sb pty, v grt-rthy, non calc, silty; SLST: lt
gy-dk gy, sft-frm, sb blky - pty, sl aren, arg,
non calc, grdg to sh

SLTYSH: med-dk gy, mod frm-sl britt, sb
blky-sb pty, v grt-rthy, non calc, silty

SLTYSH: med-dk gy, mod frm-sl br
blky-sb pty, v grt-rthy, non calc, silt

Well Bore
TVD

MD: 6,869'
TVD: 6,605.83'
Inclination: 0.6°
Azimuth: 4.4°
VS: 243.27'

TVD (ft)

MD: 6,926'
TVD: 6,662.82'
Inclination: 1.5°
Azimuth: 159.2°
VS: 242.87'

MD: 6,957'
TVD: 6,693.75'
Inclination: 5.9°
Azimuth: 171.4°
VS: 240.92'

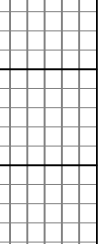
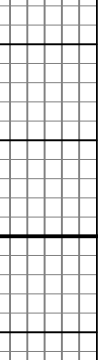
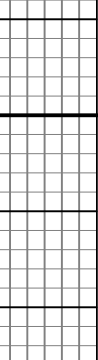
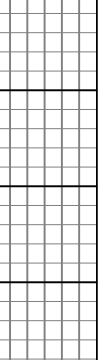
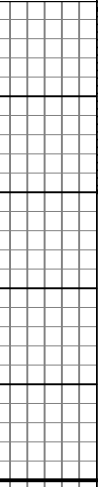
MD: 6,989'
TVD: 6,725.42'
Inclination: 10.4°
Azimuth: 179.7°
VS: 236.4'

TVD (ft)

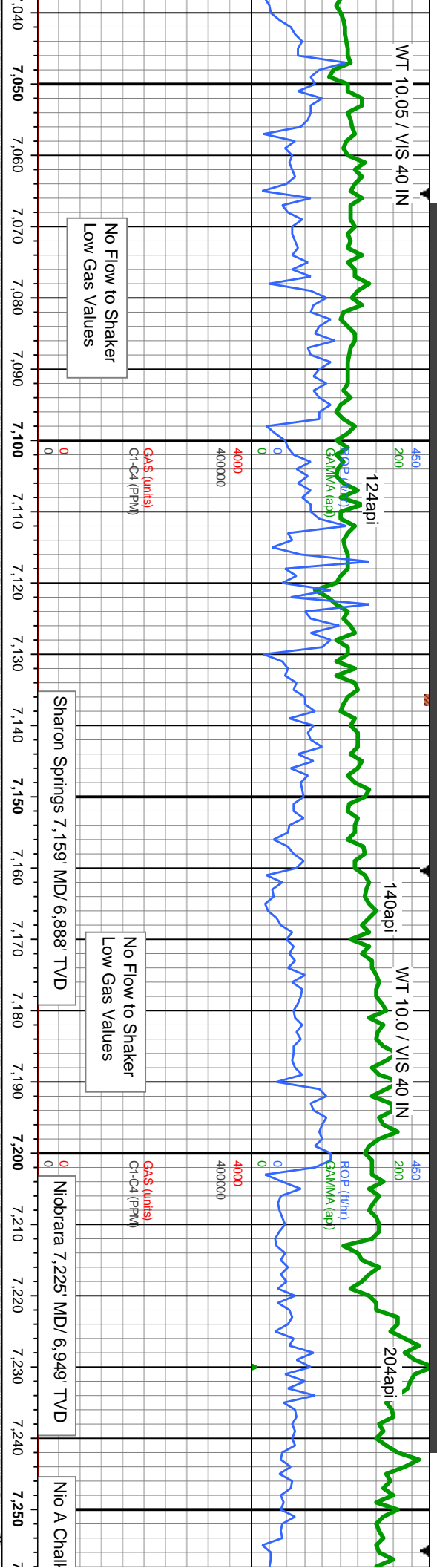
MD: 7,021'
TVD: 6,756.73'
Inclination: 13.5°
Azimuth: 183.1°
VS: 229.78'

Oil Show

68
66
64
62
60
58
56
54
52
50
48



Images



| | | | | | | | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 7,040 | 7,050 | 7,060 | 7,070 | 7,080 | 7,090 | 7,100 | 7,110 | 7,120 | 7,130 | 7,140 | 7,150 | 7,160 | 7,170 | 7,180 | 7,190 | 7,200 | 7,210 | 7,220 | 7,230 | 7,240 | 7,250 |
| <p>SLTYSH: med-dk gy, mod frm-sl britt, sb</p> <p>bilky-sb ply, v grt-rthy, non calc, silty</p> <p>SLTYSH: med-dk gy, mod frm-sl britt, sb</p> <p>bilky-sb ply, v grt-rthy, non calc, silty</p> <p>SLTYSH: m gy-m gy brn, mod fri-sl, sb</p> <p>bilky-sb ply, gy-rthy, grdg - SH, MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri-brit, sil, vf grn, CHK: lt-med gy, sm brn, lam, mot, v sft-sft, sb ply-bilky, v calc, crpxl, intbd w/ mrl, scat bent: v bri bl mod fast mky-stimg cut, sl od, fnt vel bl fior res, v fnt tan vis light ring-</p> <p>SLTYSH: m gy-m gy brn, mod fri-sl, sb</p> <p>bilky-sb ply, gy-rthy, grdg - SH, MARL: lt-dk gy, stri, sft-v sft, sb ply-ply, fri-brit, sil, vf grn, CHK: lt-med gy, sm brn, lam, mot, v sft-sft, sb ply-bilky, v calc, crpxl, intbd w/ mrl, scat bent: v bri bl mod fast mky-stimg cut, sl od, fnt vel bl fior res, v fnt tan vis light ring-</p> <p>MARL: brit, sil sme br calc, ci mod fa res, v f</p> | | | | | | | | | | | | | | | | | | | | | |

MD: 7,053'
 TVD: 6,787.64'
 Inclination: 16.4°
 Azimuth: 179.1°
 VS: 221.53'

MD: 7,085'
 TVD: 6,818.23'
 Inclination: 17.7°
 Azimuth: 177°
 VS: 212.16'

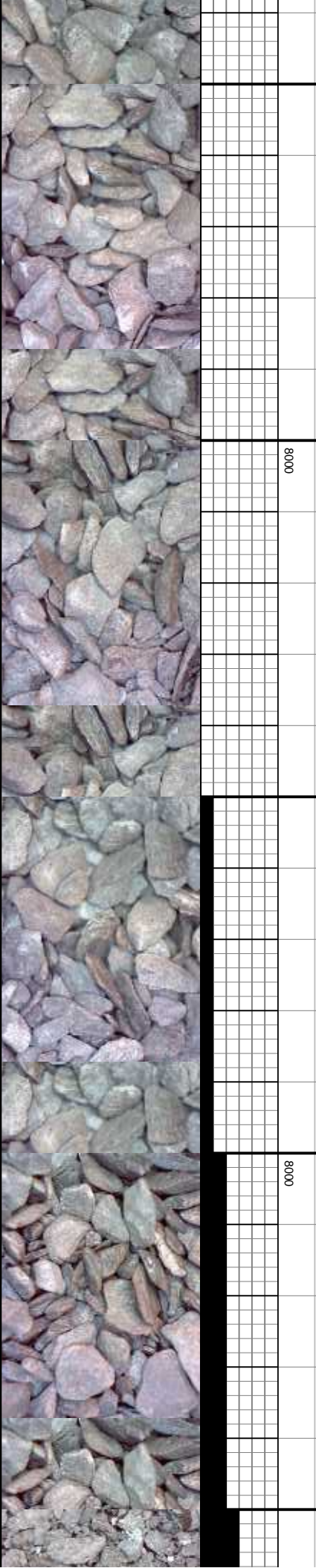
MD: 7,116'
 TVD: 6,847.76'
 Inclination: 17.8°
 Azimuth: 176.3°
 VS: 202.72'

MD: 7,148'
 TVD: 6,878.05'
 Inclination: 19.8°
 Azimuth: 175.6°
 VS: 192.44'

MD: 7,180'
 TVD: 6,907.93'
 Inclination: 22.1°
 Azimuth: 176.4°
 VS: 181.02'

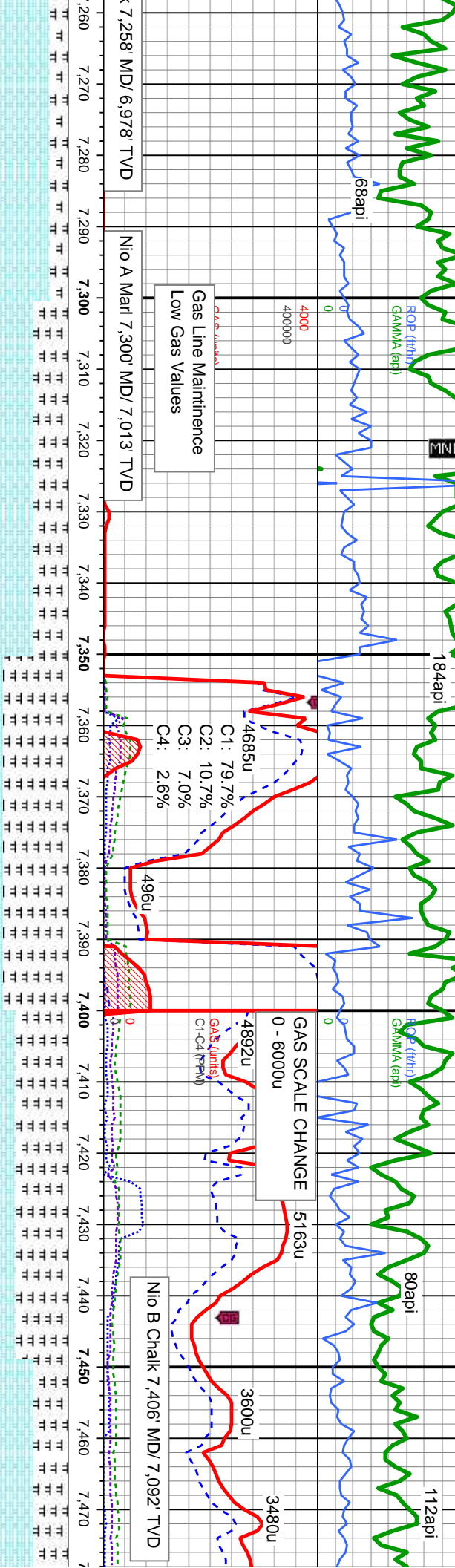
MD: 7,211'
 TVD: 6,936.39'
 Inclination: 24.6°
 Azimuth: 177.2°
 VS: 168.76'

MD: 7,244'
 TVD: 6,965.92'
 Inclination: 28.4°
 Azimuth: 177.9°
 VS: 154.05'



WT 10.0 / VIS 43 IN

WT 10.0 /



It-dk gy, stri, sft-v sft, sbply-plty, fri-
 brit, sil, vf grn, rr vf dism pyr; CHK: It-med gy,
 sme brn, lam, mot, vsft-sft, sbply-dlky, v
 calc, crptxl, intbd w/ mrl, scat bent; v bri bl
 mod fast mky-stmg cut, sl od, fnt yel bl flor
 res, v fnt tan vis light ring

MARL: It-dk gy, stri, sft-v sft, sbply-plty, fri-
 brit, sil, vf grn, rr vf dism pyr; CHK: It-med gy,
 sme brn, lam, mot, vsft-sft, sbply-dlky, v
 calc, crptxl, intbd w/ mrl, scat bent; v bri bl
 mod fast mky-stmg cut, sl od, fnt yel bl flor
 res, v fnt tan vis light ring

MARL: med-dk gy, stri, sft-v sft, sbply-plty,
 fri- brit, vf grn, rr vf dism pyr; CHK: It-med gy,
 sme brn, lam, mot, vsft-sft, sbply-dlky, v
 calc, crptxl, intbd w/ mrl, scat bent; v bri bl
 mod fast mky-stmg cut, sl od, fnt yel bl flor
 res, v fnt tan vis light ring

MARL: med-dk gy, stri, sft-v sft, sbply-plty,
 fri- brit, vf grn, rr vf dism pyr; CHK: It-med gy,
 sme brn, lam, mot, vsft-sft, sbply-dlky, v
 calc, crptxl, intbd w/ mrl, scat bent; v bri bl
 mod fast mky-stmg cut, sl od, fnt yel bl flor
 res, v fnt tan vis light ring

MARL: med-dk gy, stri, sft-v sft, sbply-plty,
 fri- brit, vf grn, rr vf dism pyr; CHK: It-med gy,
 sme brn, lam, mot, vsft-sft, sbply-dlky, v
 calc, crptxl, intbd w/ mrl, scat bent; v bri bl
 mod fast mky-stmg cut, sl od, fnt yel bl flor
 res, v fnt tan vis light ring

MD: 7,275'
 TVD: 6,992.65'
 Inclination: 32.4°
 Azimuth: 178.4°
 VS: 138.37'

MD: 7,307'
 TVD: 7,019.03'
 Inclination: 36.5°
 Azimuth: 178.1°
 VS: 120.28'

MD: 7,339'
 TVD: 7,044.09'
 Inclination: 40.4°
 Azimuth: 177.7°
 VS: 100.4'

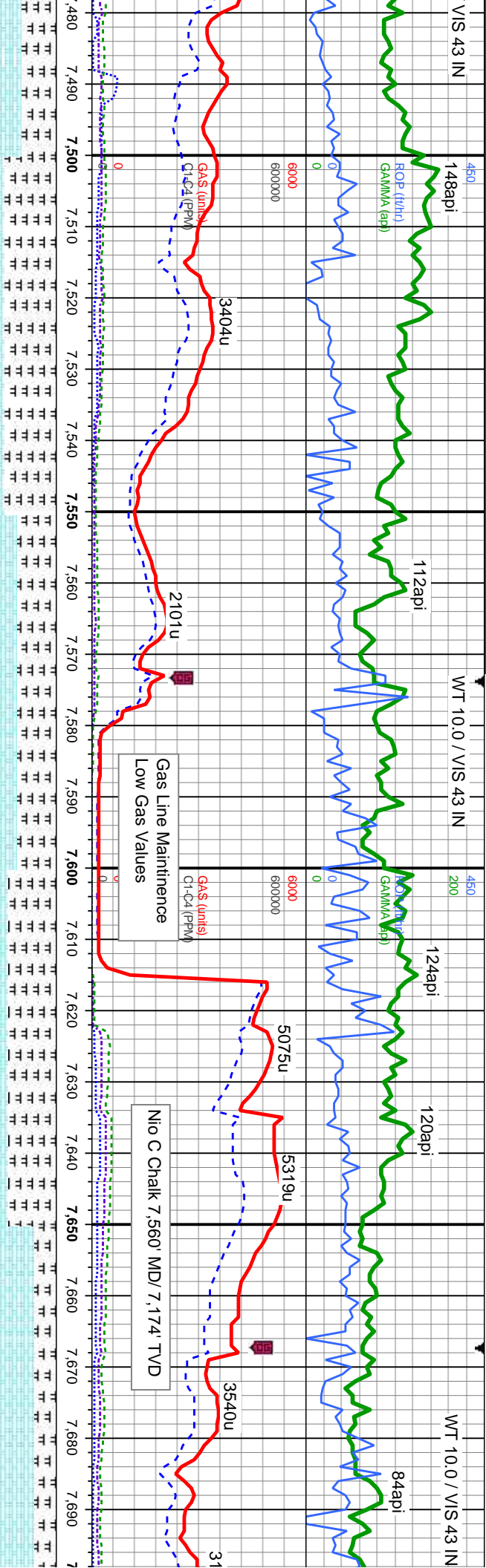
MD: 7,371'
 TVD: 7,067.81'
 Inclination: 43.9°
 Azimuth: 177.7°
 VS: 78.95'

MD: 7,402'
 TVD: 7,089.46'
 Inclination: 47.5°
 Azimuth: 178.3°
 VS: 56.78'

MD: 7,433'
 TVD: 7,109.79'
 Inclination: 50.5°
 Azimuth: 178.8°
 VS: 33.39'

MD: 7,465'
 TVD: 7,129.27'
 Inclination: 54.5°
 Azimuth: 178.5°
 VS: 8.02'





-t-v sft, sbply-pity, fri-brit, vf grn, rr vf dism pyr; CHK: lt-med gy, some brn, lam, mot, vsft-sft, sbply-biky, v calc, crptxl, intbd w/ mri, scat bent; v bri bl mod fast mky-stmg cut, sl od, fnt yel bl flor res, v fnt tan vis light ring
 MARL: med-dk gy, stri, sft-v sft, sbply-pity, fri-brit, vf grn, rr vf dism pyr; CHK: lt-med gy, some brn, lam, mot, vsft-sft, sbply-biky, v calc, crptxl, intbd w/ mri, scat bent; v bri bl mod fast mky-stmg cut, sl od, fnt yel bl flor res, v fnt tan vis light ring
 MARL: med-dk gy, stri, sft-v sft, sbply-pity, fri-brit, vf grn, rr vf dism pyr; CHK: lt-med gy, some brn, lam, mot, vsft-sft, sbply-biky, v calc, crptxl, intbd w/ mri, scat bent; v bri bl mod fast mky-stmg cut, sl od, fnt yel bl flor res, v fnt tan vis light ring
 MARL: lt-dk gy, stri, sft-v sft, sbply-pity, fri-brit, sil, vf grn, rr vf dism pyr; CHK: lt-med gy, some brn, lam, mot, vsft-sft, sbply-biky, v calc, crptxl, intbd w/ mri, scat bent; v bri bl mod fast mky-stmg cut, sl od, fnt yel bl flor res, v fnt tan vis light ring
 CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-biky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pity, fri-brit, vf grn, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, fnt yel bl flor res, v fnt tan vis light ring

MD: 7,497'
 TVD: 7,146.76'
 Inclination: 59.2 °
 Azimuth: 178.6 °
 VS: -18.76'

MD: 7,529'
 TVD: 7,161.93'
 Inclination: 64.2 °
 Azimuth: 179.2 °
 VS: -46.92'

MD: 7,560'
 TVD: 7,174.06'
 Inclination: 69.7 °
 Azimuth: 179.2 °
 VS: -75.43'

MD: 7,592'
 TVD: 7,183.71'
 Inclination: 75.2 °
 Azimuth: 179.3 °
 VS: -105.93'

MD: 7,623'
 TVD: 7,190.76'
 Inclination: 78.5 °
 Azimuth: 179.8 °
 VS: -136.11'

MD: 7,654'
 TVD: 7,196.67'
 Inclination: 79.5 °
 Azimuth: 179.2 °
 VS: -166.54'

MD: 7,686'
 TVD: 7,201.46'
 Inclination: 83.3 °
 Azimuth: 179.3 °
 VS: -198.17'

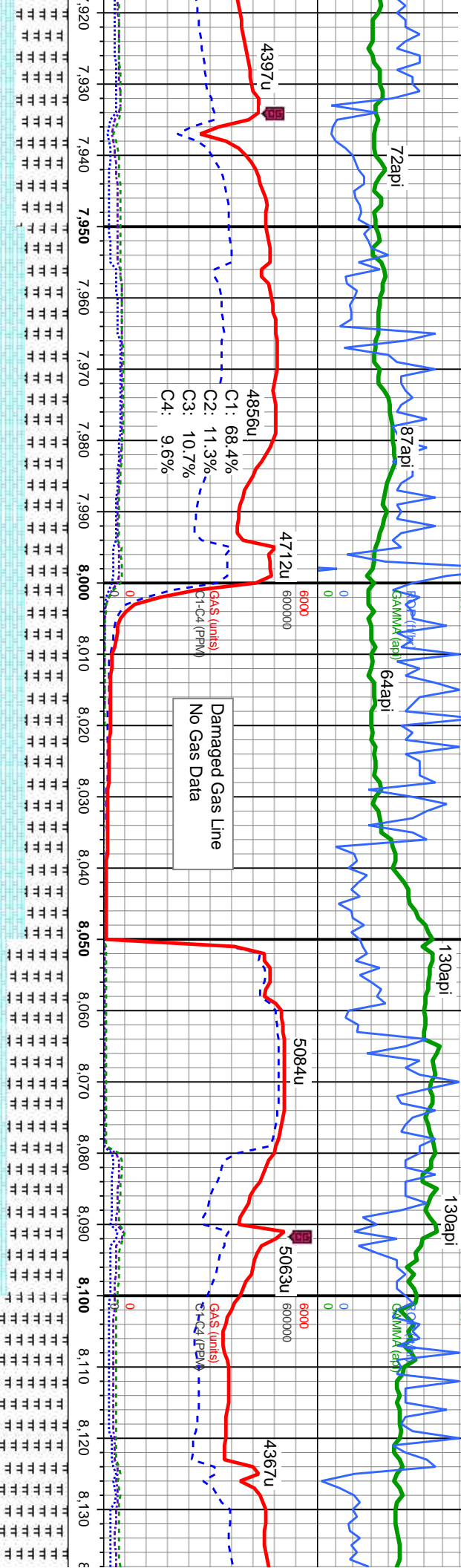
Reached TD to



WT 9.40 / VIS 34 IN

WT 9.40 / VIS 34 IN

WT 9.40 / VIS 34 IN



gy, stri, sft-v sft, sbply-pty, sec calc, rr vf dism pyr; inthd w/, MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/, MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt tan vis light ring

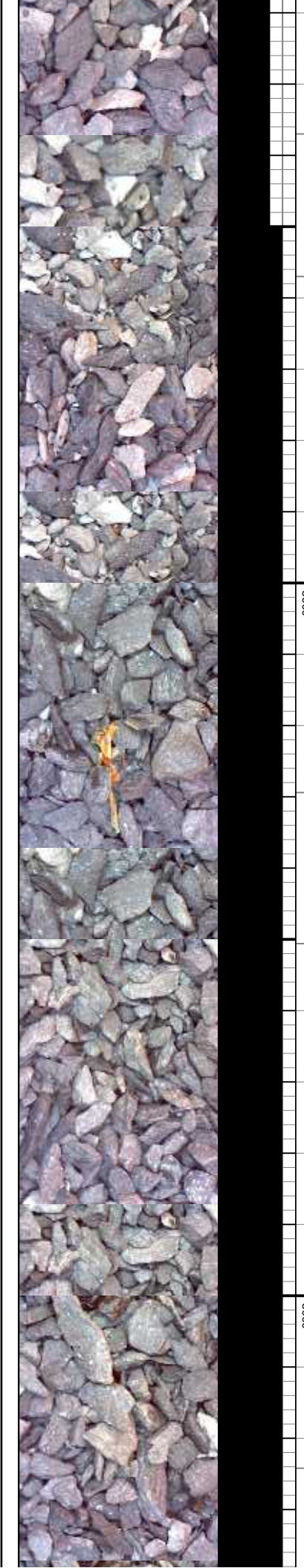
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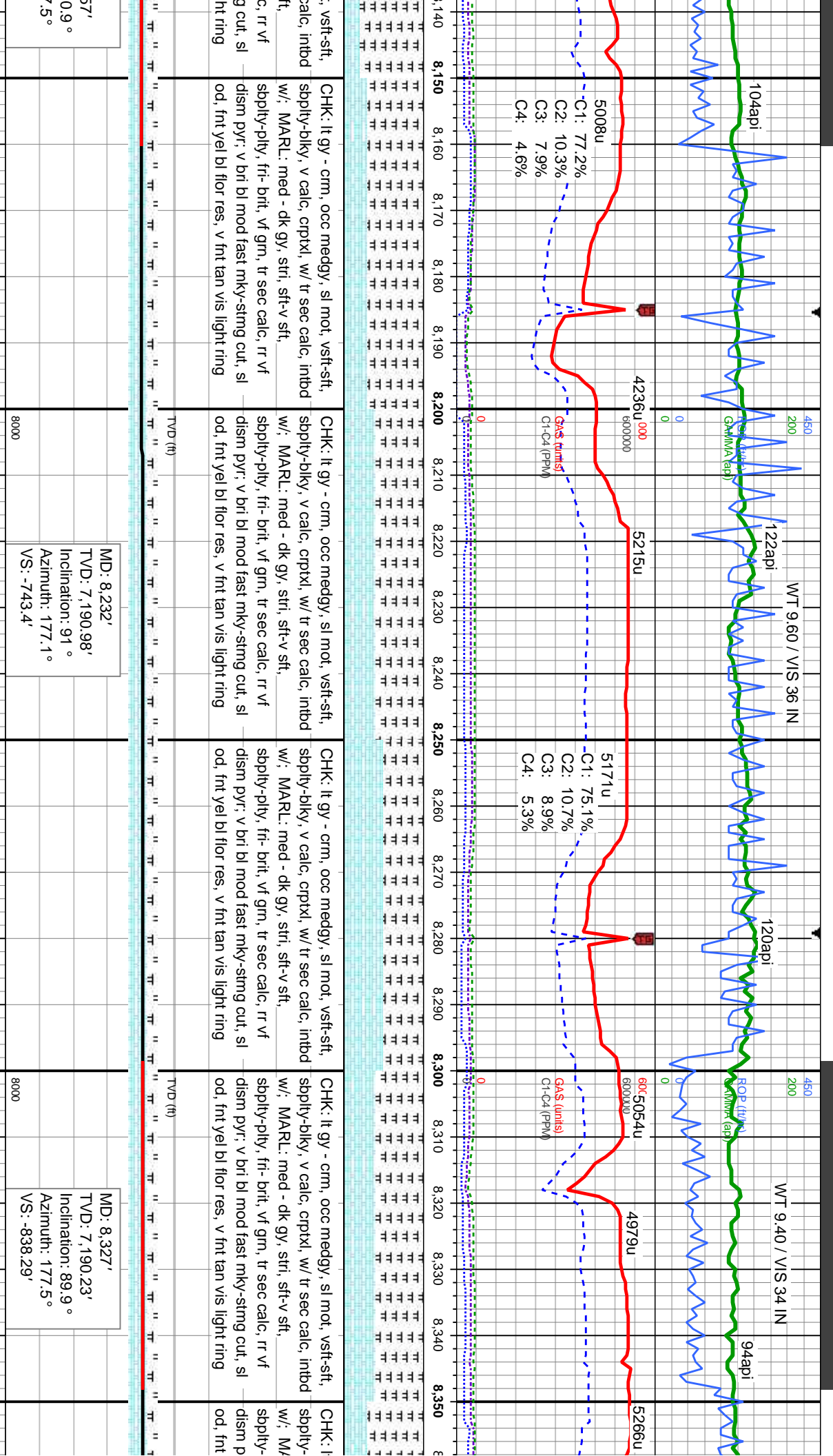
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MD: 7,947'
 TVD: 7,199.24'
 Inclination: 93°
 Azimuth: 177.7°
 VS: -458.85'

MD: 8,041'
 TVD: 7,195.06'
 Inclination: 92.1°
 Azimuth: 177.2°
 VS: -552.66'

MD: 8,136'
 TVD: 7,192.4'
 Inclination: 9
 Azimuth: 177
 VS: -647.52'





CHK: It gy - crm, occ medgy, sl mot, vsft-sft, sbply-blky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft, sbply-blky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft, sbply-blky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

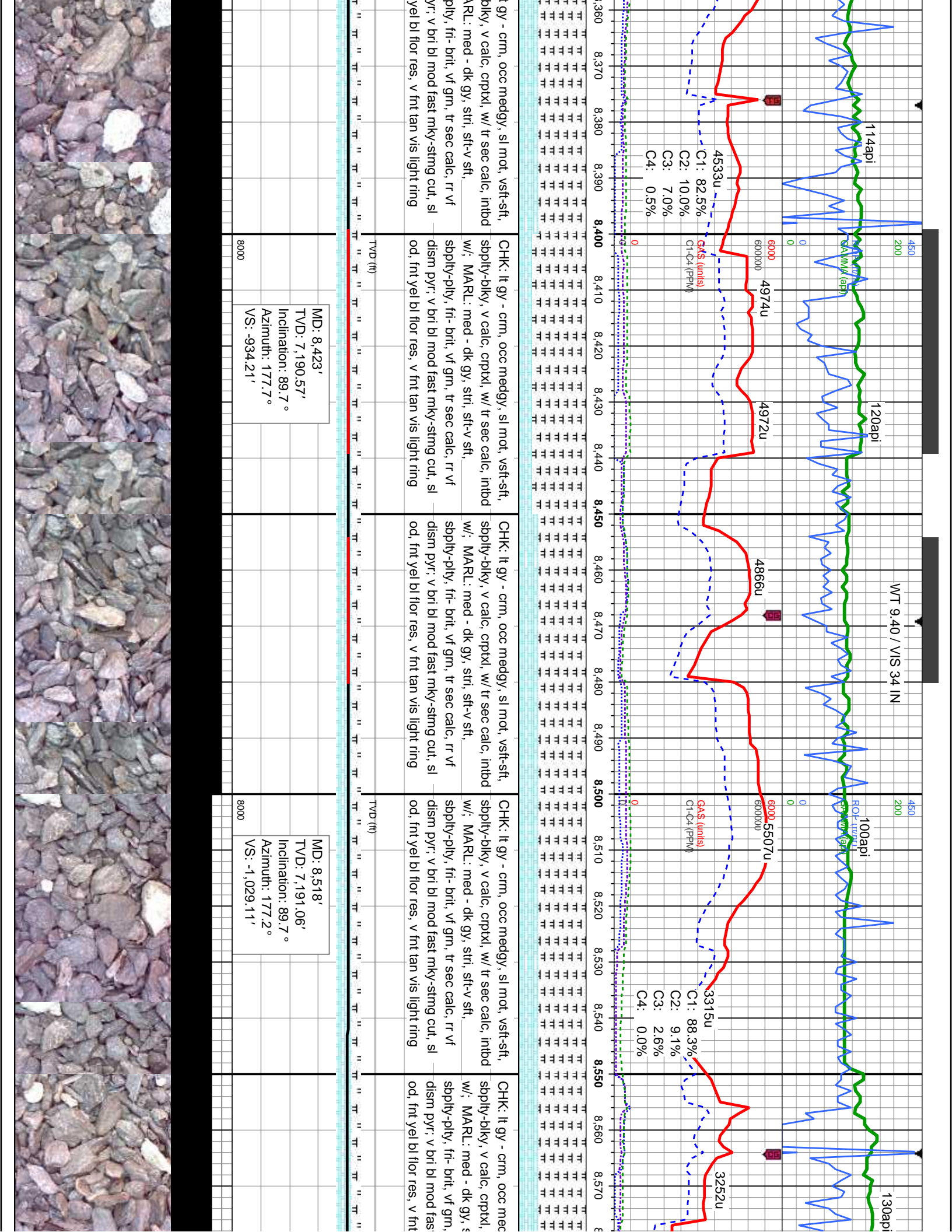
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CHK: It gy - crm, occ medgy, sl mot, vsft-sft, sbply-blky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stimg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

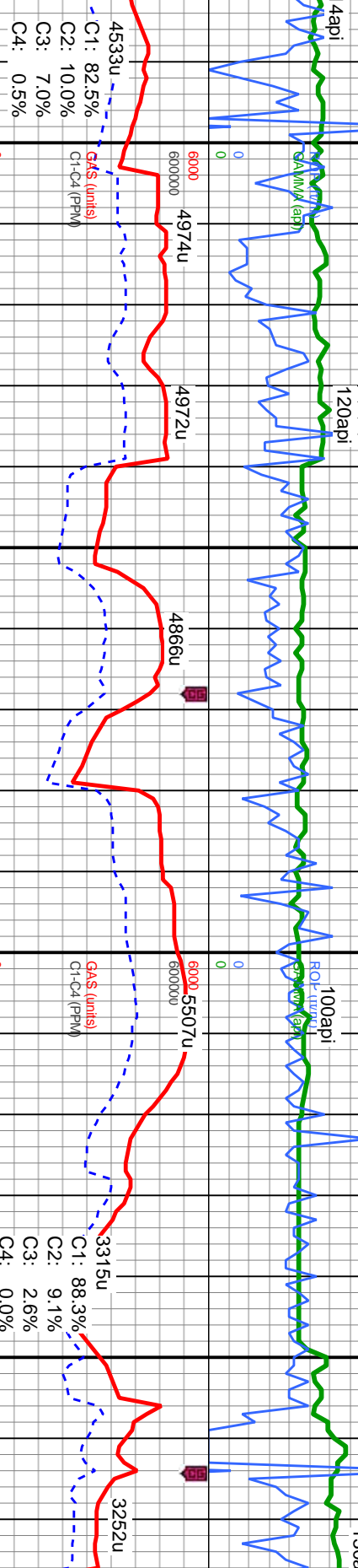
MD: 8,232'
TVD: 7,190.98'
Inclination: 91°
Azimuth: 177.1°
VS: -743.4'

MD: 8,327'
TVD: 7,190.23'
Inclination: 89.9°
Azimuth: 177.5°
VS: -838.29'





WT 9.40 / VIS 34 IN



gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, cprtl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ppty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring

gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, cprtl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ppty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring

gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, cprtl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ppty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring

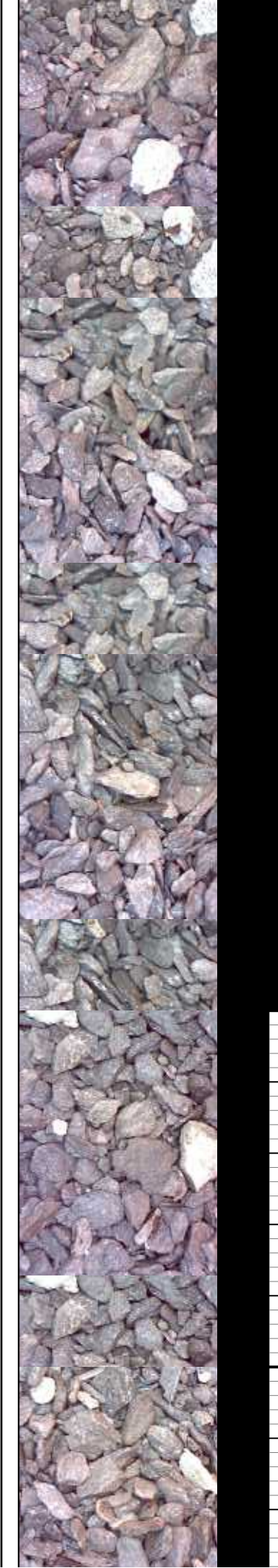
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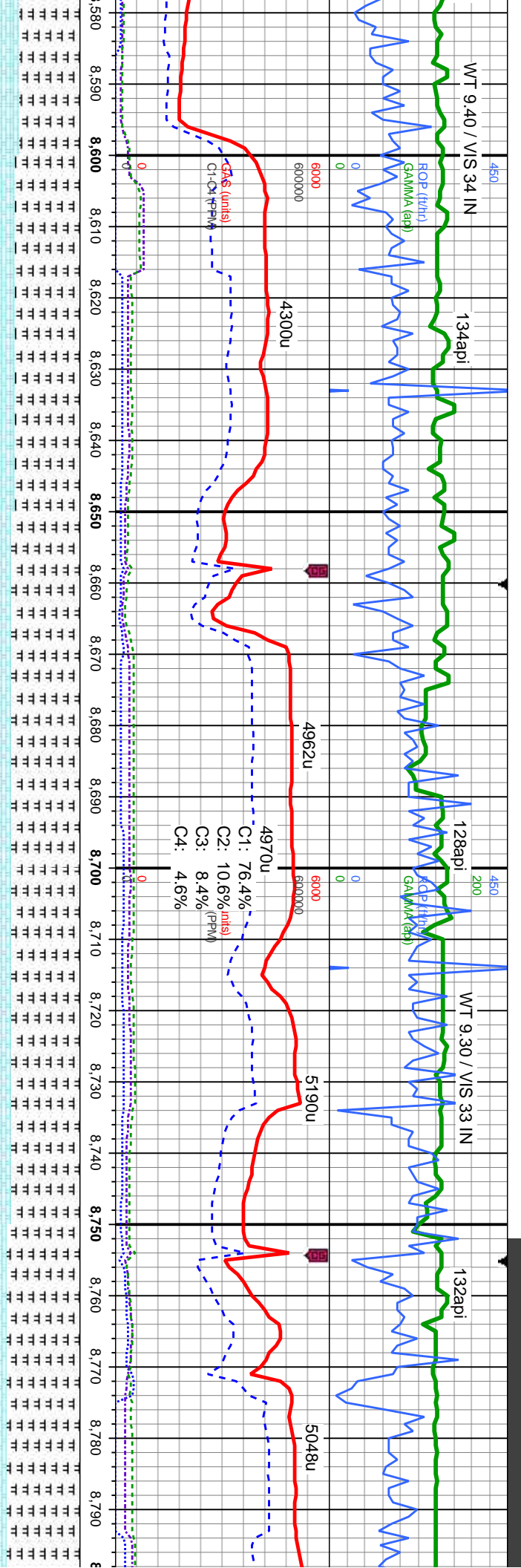
TVD (ft)

MD: 8,423'
TVD: 7,190.57'
Inclination: 89.7°
Azimuth: 177.7°
VS: -934.21'

TVD (ft)

MD: 8,518'
TVD: 7,191.06'
Inclination: 89.7°
Azimuth: 177.2°
VS: -1,029.11'





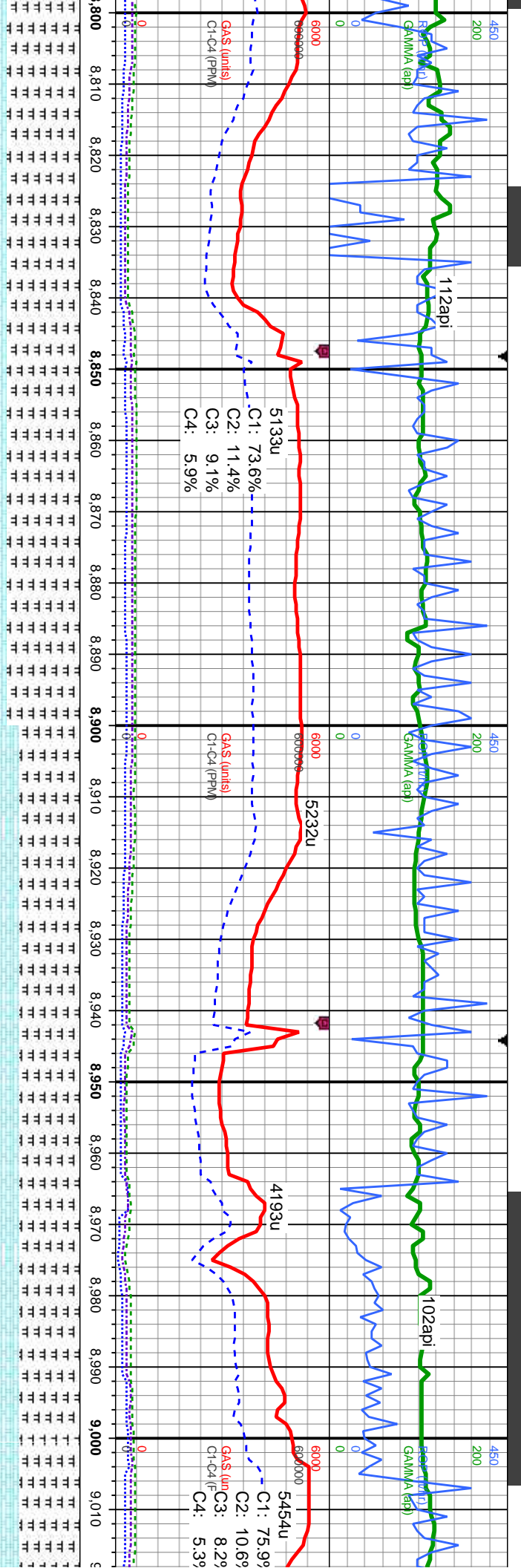
| WT 9.40 / VIS 34 IN | WT 9.30 / VIS 33 IN |
|---------------------|---------------------|
| 134api | 128api |
| 4300u | 4962u |
| 4970u | 5190u |
| 5048u | |
| 132api | |
| 8,580 | 8,580 |
| 8,590 | 8,590 |
| 8,600 | 8,600 |
| 8,610 | 8,610 |
| 8,620 | 8,620 |
| 8,630 | 8,630 |
| 8,640 | 8,640 |
| 8,650 | 8,650 |
| 8,660 | 8,660 |
| 8,670 | 8,670 |
| 8,680 | 8,680 |
| 8,690 | 8,690 |
| 8,700 | 8,700 |
| 8,710 | 8,710 |
| 8,720 | 8,720 |
| 8,730 | 8,730 |
| 8,740 | 8,740 |
| 8,750 | 8,750 |
| 8,760 | 8,760 |
| 8,770 | 8,770 |
| 8,780 | 8,780 |
| 8,790 | 8,790 |

MD: 8,614'
 TVD: 7,192.4'
 Inclination: 88.7°
 Azimuth: 178.2°
 VS: -1,125.02'

MD: 8,709'
 TVD: 7,193.4'
 Inclination: 90.1°
 Azimuth: 178°
 VS: -1,219.96'

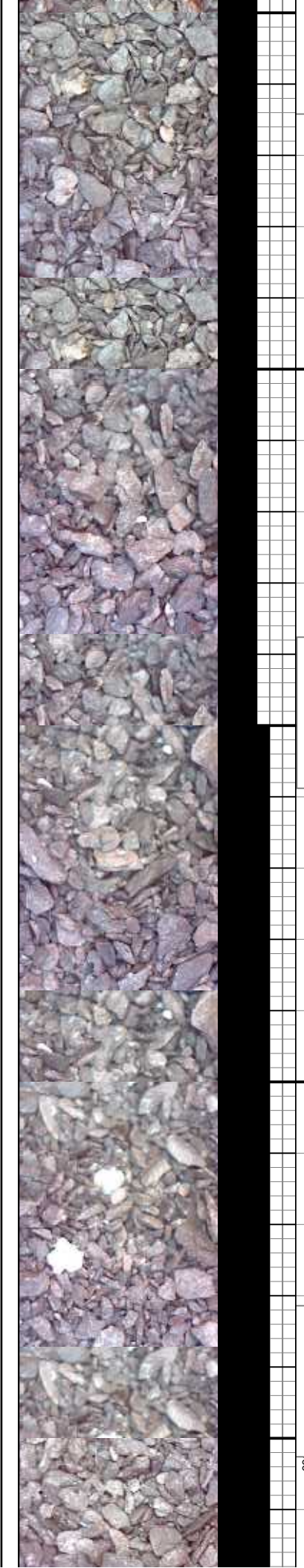
MD:
 TVD
 Incl
 Azim
 VS:

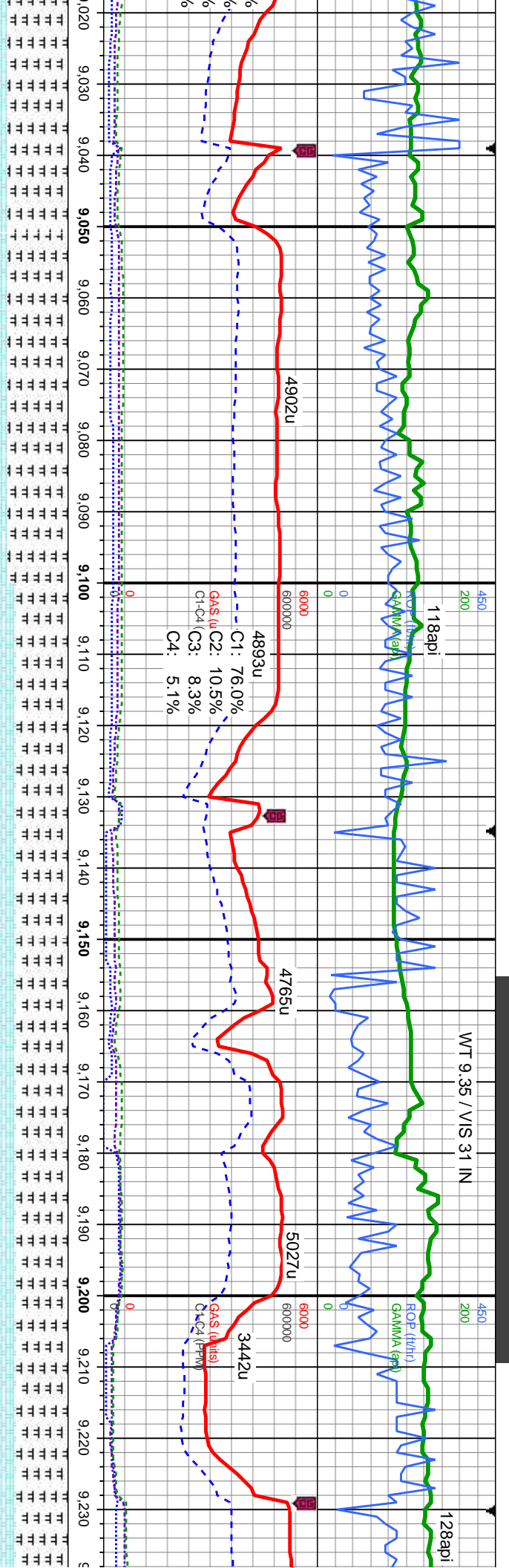




| | | | | | | | | | |
|--------|---|--------|---|--------|---|--------|---|--------|---|
| 8,800' | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ply, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | 8,850' | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ply, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | 8,900' | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ply, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | 8,950' | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ply, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | 9,000' | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v-sft, sbply-ply, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring |
|--------|---|--------|---|--------|---|--------|---|--------|---|

| | | | |
|--------------------|----------------|--------------------|----------------|
| 8,803' | MD: 8,803' | MD: 8,898' | MD: 8,993' |
| Inclination: 89.1° | TVD: 7,194.06' | Inclination: 90.8° | TVD: 7,194.14' |
| Azimuth: 177.8° | VS: -1,313.9' | VS: -1,408.82' | VS: -1,503.77' |





occ medgy, sl mot, vsft-sft, crptxl, w/ tr sec calc, intbd
 - dk gy, stri, sft-v sft, l mod fast mky-stmg cut, sl res, v frt tan vis light ring

CHK: ll gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

CHK: ll gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

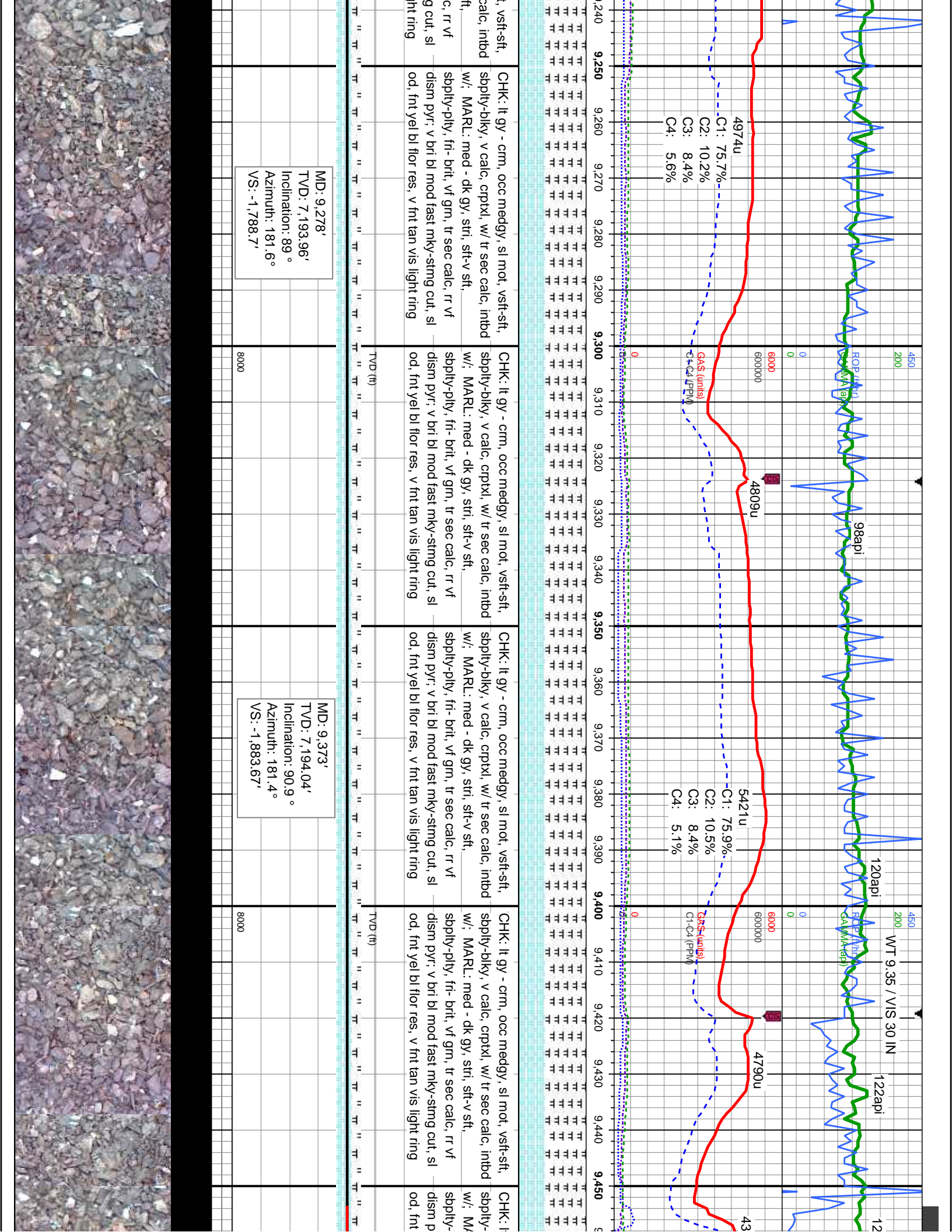
CHK: ll gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

CHK: ll gy - crm, occ medgy, sl mot, vsft-sft, sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

MD: 9,088'
 TVD: 7,192.9'
 Inclination: 90.9°
 Azimuth: 179°
 VS: -1,598.76'

MD: 9,184'
 TVD: 7,192.64'
 Inclination: 89.4°
 Azimuth: 181.4°
 VS: -1,694.75'





C1: 75.7%
 C2: 10.2%
 C3: 8.4%
 C4: 5.6%

C1: 75.9%
 C2: 10.5%
 C3: 8.4%
 C4: 5.1%

MD: 9,278'
 TVD: 7,193.96'
 Inclination: 89 °
 Azimuth: 181.6 °
 VS: -1,788.7'

MD: 9,373'
 TVD: 7,194.04'
 Inclination: 90.9 °
 Azimuth: 181.4 °
 VS: -1,883.67'

CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
 sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd
 w/: MARL: med - dk gy, stri, sft-v sft,
 sbply-pity, fri- brit, vf gm, tr sec calc, rr vf
 dism pyr; v bri bl mod fast mky-stimg cut, sl
 od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
 sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd
 w/: MARL: med - dk gy, stri, sft-v sft,
 sbply-pity, fri- brit, vf gm, tr sec calc, rr vf
 dism pyr; v bri bl mod fast mky-stimg cut, sl
 od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
 sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd
 w/: MARL: med - dk gy, stri, sft-v sft,
 sbply-pity, fri- brit, vf gm, tr sec calc, rr vf
 dism pyr; v bri bl mod fast mky-stimg cut, sl
 od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
 sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd
 w/: MARL: med - dk gy, stri, sft-v sft,
 sbply-pity, fri- brit, vf gm, tr sec calc, rr vf
 dism pyr; v bri bl mod fast mky-stimg cut, sl
 od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
 sbply-dlky, v calc, crptxl, w/ tr sec calc, intbd
 w/: MARL: med - dk gy, stri, sft-v sft,
 sbply-pity, fri- brit, vf gm, tr sec calc, rr vf
 dism pyr; v bri bl mod fast mky-stimg cut, sl
 od, frnt yel bl flor res, v frnt tan vis light ring

WT 9.35 / VIS 30 IN

ROP (ft)

GAS (units)

4974u

4809u

5421u

4790u

43

120api

122api

98api

12

430

200

60000

600000

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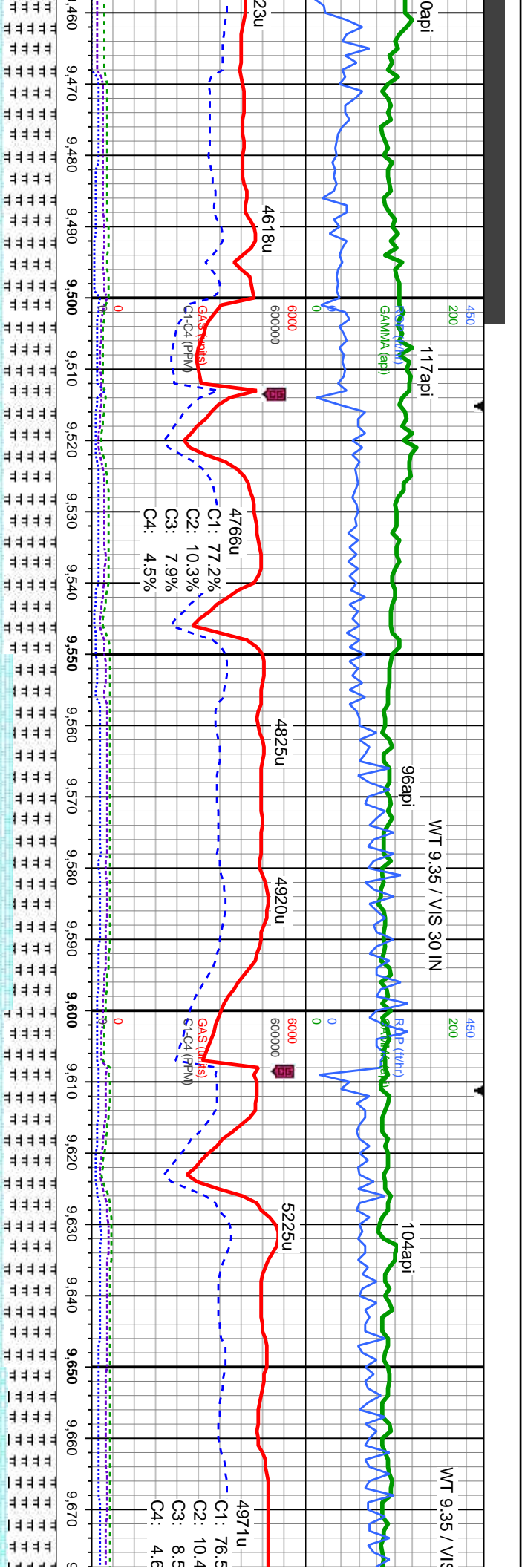
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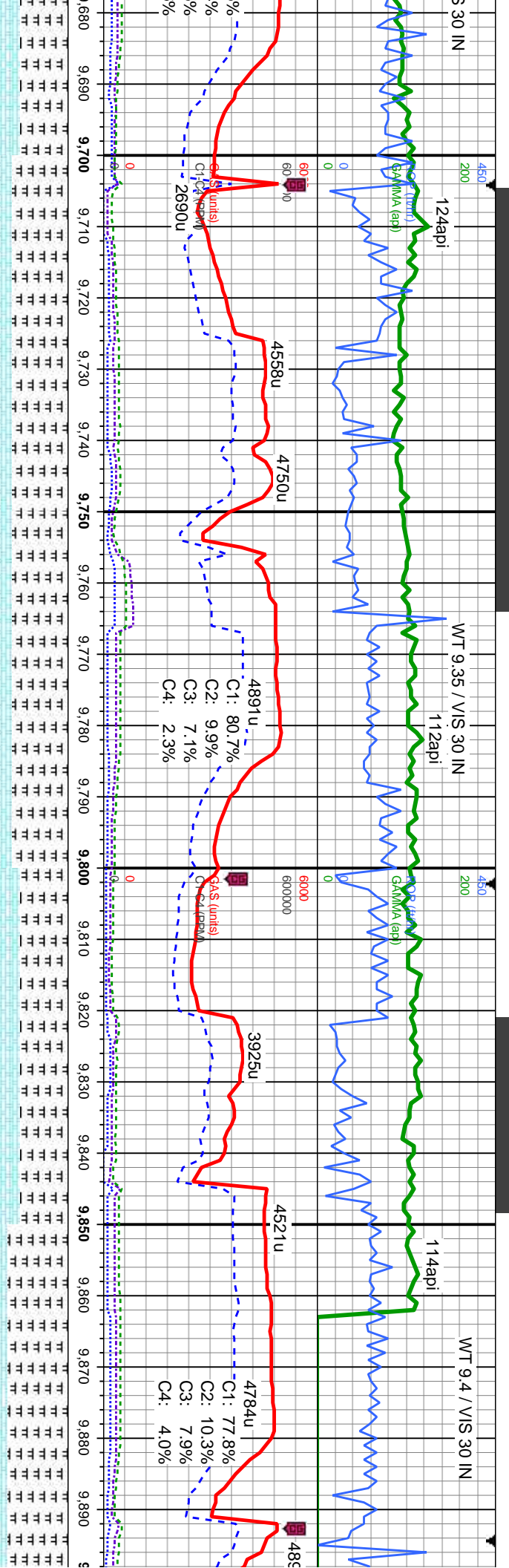
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0api
 117api
 96api
 104api
 WT 9.35 / VIS 30 IN
 WT 9.35 / VIS 30 IN
 23u
 4618u
 4766u
 4825u
 4920u
 5225u
 4971u
 GAS (vol%)
 C1: 77.2%
 C2: 10.39%
 C3: 7.99%
 C4: 4.5%

| Depth (ft) | Log Description | MD | TVD | Inclination | Azimuth | VS |
|-------------|---|--------|-----------|-------------|---------|------------|
| 9460 - 9500 | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | 9.469' | 7.192.2' | 91.3° | 181° | -1.979.63' |
| 9500 - 9550 | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | 9.565' | 7.191.19' | 89.9° | 180.7° | -2.075.61' |
| 9550 - 9600 | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | 9.660' | 7.190.2' | 91.3° | 180.6° | -2.170.6' |
| 9600 - 9670 | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, intbd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | 9.660' | 7.190.2' | 91.3° | 180.6° | -2.170.6' |





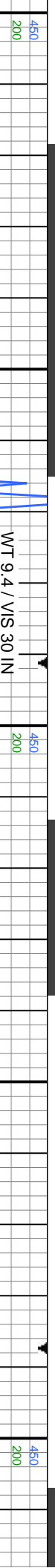
| | | | | |
|---|--|--|--|--|
| gy, sl mot, vsft-sft, w/ tr sec calc, inthd | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd | MARL: dk gy, occ med gy, stri, sft-v sft, sbply-pty, fri- brit, sl aren, tr sec calc; CHK: lt gy - crm, occ medgy, sl mot & lam, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd | MARL: dk gy, occ med gy, stri, sft-v sft, sbply-pty, fri- brit, sl aren, tr sec calc; CHK: lt gy - crm, occ medgy, sl mot & lam, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd |
| stri, sft-v sft, tr sec calc, rr vf mky-stmg cut, sl tan vis light ring | w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | w/; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring | w/; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring |

| | | | | | | | |
|----------|------|----------|------|----------|------|----------|------|
| TVD (ft) | 8000 | TVD (ft) | 8000 | TVD (ft) | 8000 | TVD (ft) | 8000 |
|----------|------|----------|------|----------|------|----------|------|

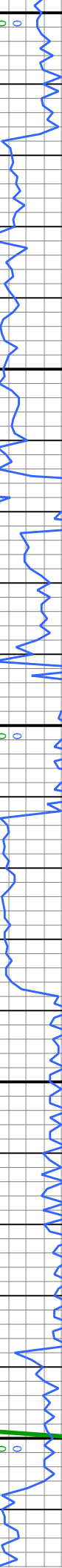
MD: 9,755'
 TVD: 7,188.46'
 Inclination: 90.8°
 Azimuth: 178.9°
 VS: -2,265.58'

MD: 9,850'
 TVD: 7,187.05'
 Inclination: 90.9°
 Azimuth: 178.7°
 VS: -2,360.54'





WT 9.4 / VIS 30 IN



C1: 77.6%
C2: 10.4%
C3: 8.0%
C4: 4.0%



MARL: dk gy, occ med gy, stri, sft-v sft,
sbply-pty, fri- brit, sl aren, tr sec calc; CHK:
It gy - crm, occ medgy, sl mot & lam, vsft-sft,
sbply-blky, v calc, crptxl, w/ tr sec calc, inthd
w/; v bri bl mod fast mky-stimg cut, sl od, frnt
yel bl flor res, v frnt tan vis light ring

MARL: dk gy, occ med gy, stri, sft-v sft,
sbply-pty, fri- brit, sl aren, tr sec calc; CHK:
It gy - crm, occ medgy, sl mot & lam, vsft-sft,
sbply-blky, v calc, crptxl, w/ tr sec calc, inthd
w/; v bri bl mod fast mky-stimg cut, sl od, frnt
yel bl flor res, v frnt tan vis light ring

MARL: dk gy, occ med gy, stri, sft-v sft,
sbply-pty, fri- brit, sl aren, tr sec calc; CHK:
medgy - med gy brn, occ dk gy brn, sl mot &
lam, vsft-sft, sbply-blky, v calc, crptxl, w/ tr
sec calc, inthd w/; v bri bl mod fast
mky-stimg cut, sl od, frnt yel bl flor res, v frnt
tan vis light ring

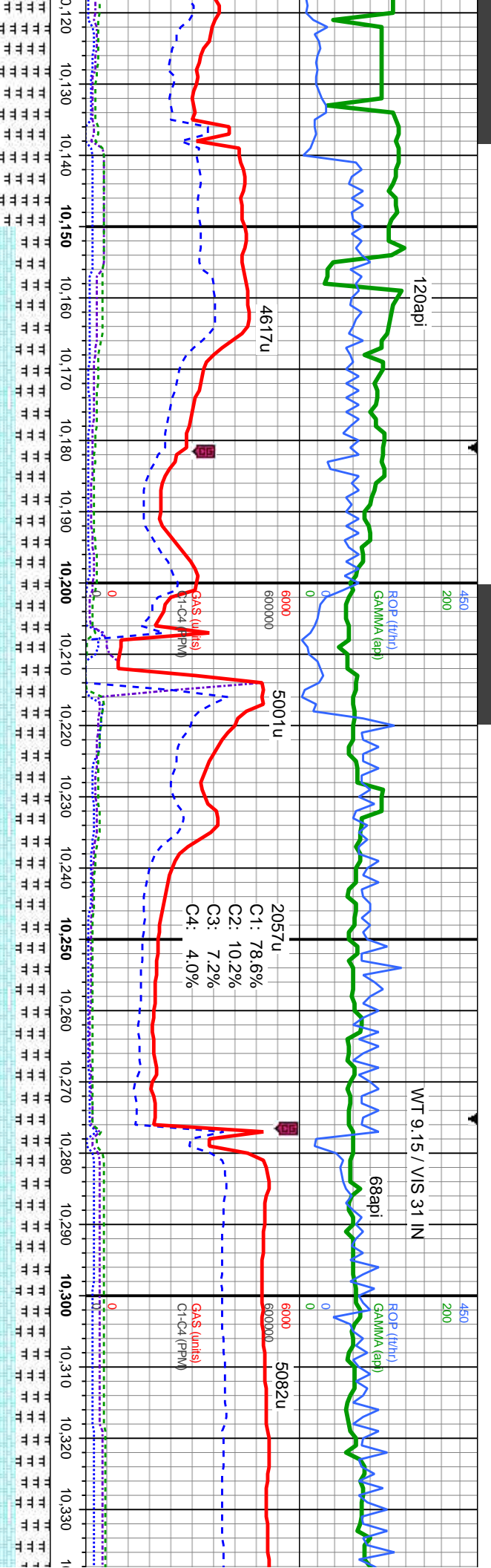
CHK: It gy - crm, occ medgy, sl mot, vsft-sft,
sbply-blky, v calc, crptxl, w/ tr sec calc, inthd
w/; MARL: med - dk gy, stri, sft-v sft,
sbply-pty, fri- brit, vf gm, tr sec calc, r r vf
dism pyr; v bri bl mod fast mky-stimg cut, sl
od, frnt yel bl flor res, v frnt tan vis light ring

CHK: It gy - crm,
sbply-blky, v calc
w/; MARL: med
sbply-pty, fri- br
dism pyr; v bri bl
od, frnt yel bl flor

MD: 9.945'
TVD: 7,185.64'
Inclination: 90.8°
Azimuth: 178.3°
VS: -2,455.5'

MD: 10.040'
TVD: 7,185.06'
Inclination: 89.9°
Azimuth: 179.5°
VS: -2,550.48'





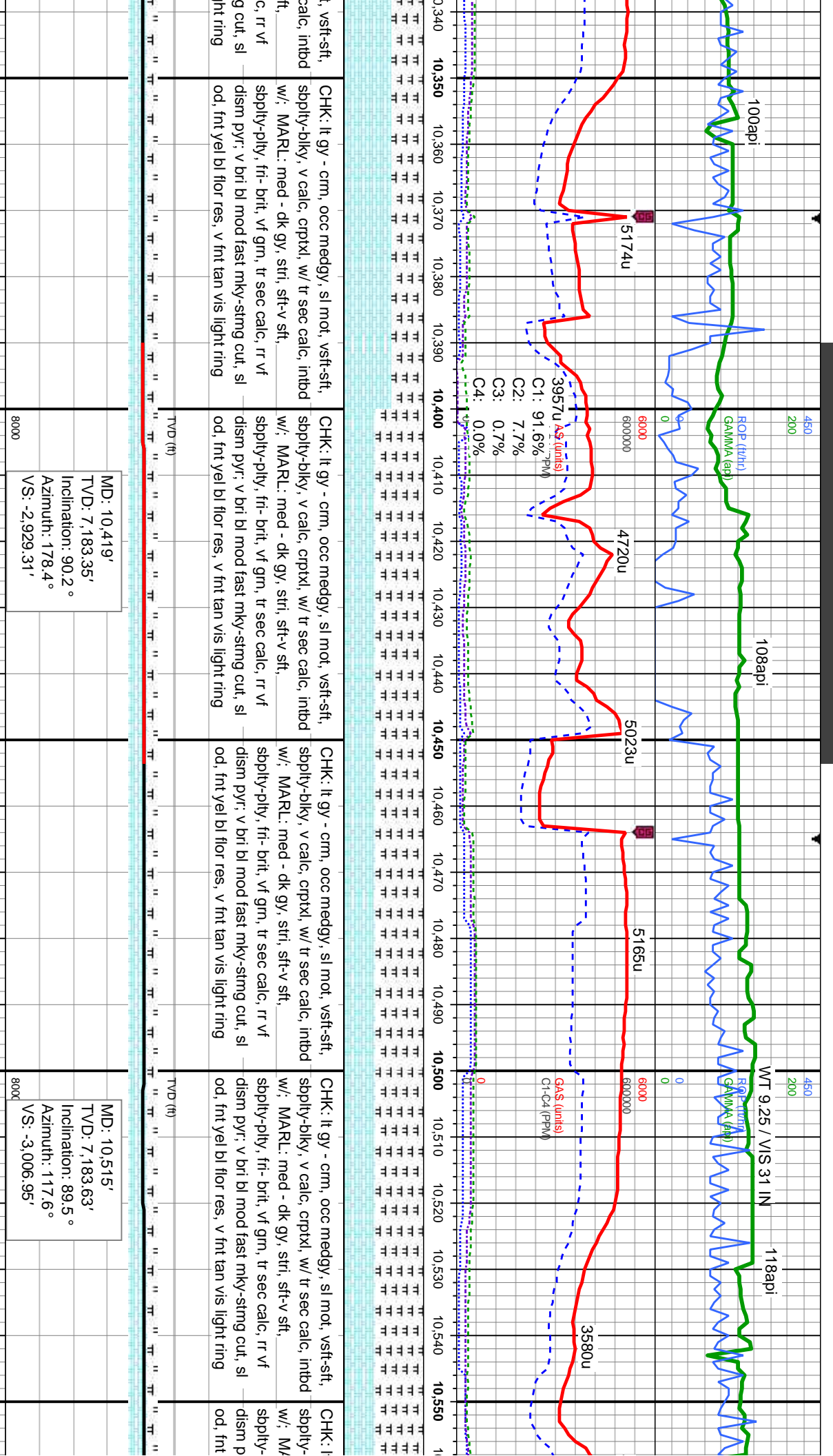
| | | | | | | | | | | | | | | | | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| 10,120 | 10,130 | 10,140 | 10,150 | 10,160 | 10,170 | 10,180 | 10,190 | 10,200 | 10,210 | 10,220 | 10,230 | 10,240 | 10,250 | 10,260 | 10,270 | 10,280 | 10,290 | 10,300 | 10,310 | 10,320 | 10,330 | |
| TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |

MD: 10,135'
 TVD: 7,185.55'
 Inclination: 89.5°
 Azimuth: 178.8°
 VS: -2,645.47'

MD: 10,231'
 TVD: 7,186.31'
 Inclination: 89.6°
 Azimuth: 177.9°
 VS: -2,741.42'

MD: 10,325'
 TVD: 7,185.08'
 Inclination: 91.9°
 Azimuth: 178.5°
 VS: -2,835.36'

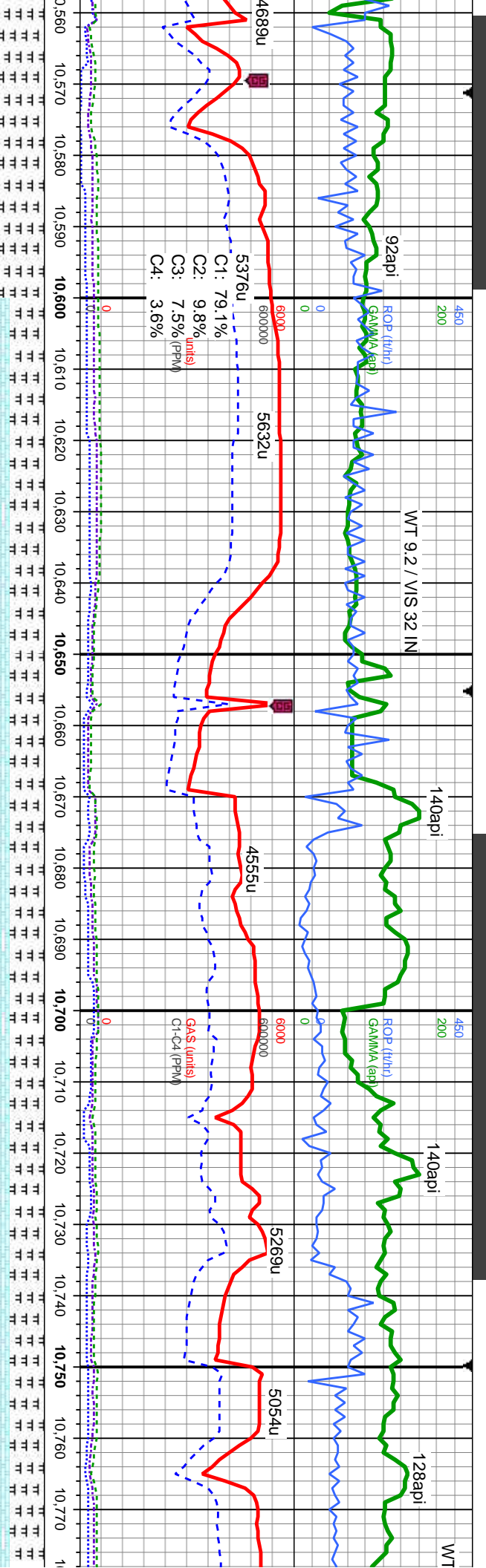




MD: 10,419'
 TVD: 7,183.35'
 Inclination: 90.2°
 Azimuth: 178.4°
 VS: -2,929.31'

MD: 10,515'
 TVD: 7,183.63'
 Inclination: 89.5°
 Azimuth: 117.6°
 VS: -3,006.95'





4689u
 5376u
 5632u
 4555u
 5269u
 5054u

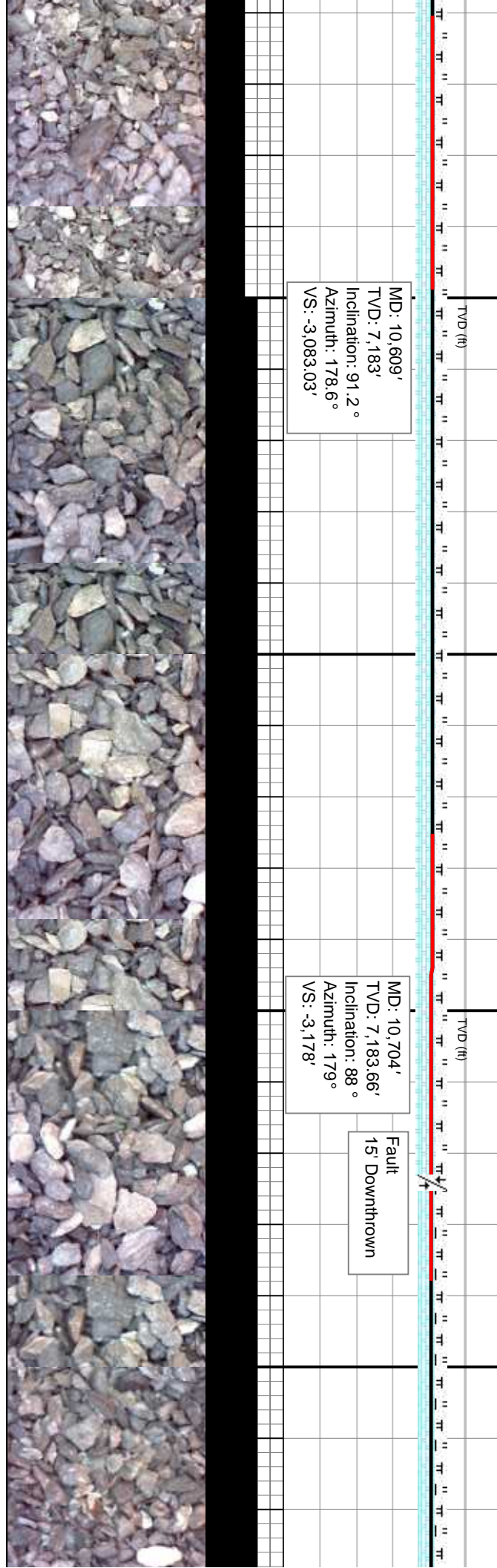
C1: 79.1%
 C2: 9.8% (units)
 C3: 7.5% (PPM)
 C4: 3.6%

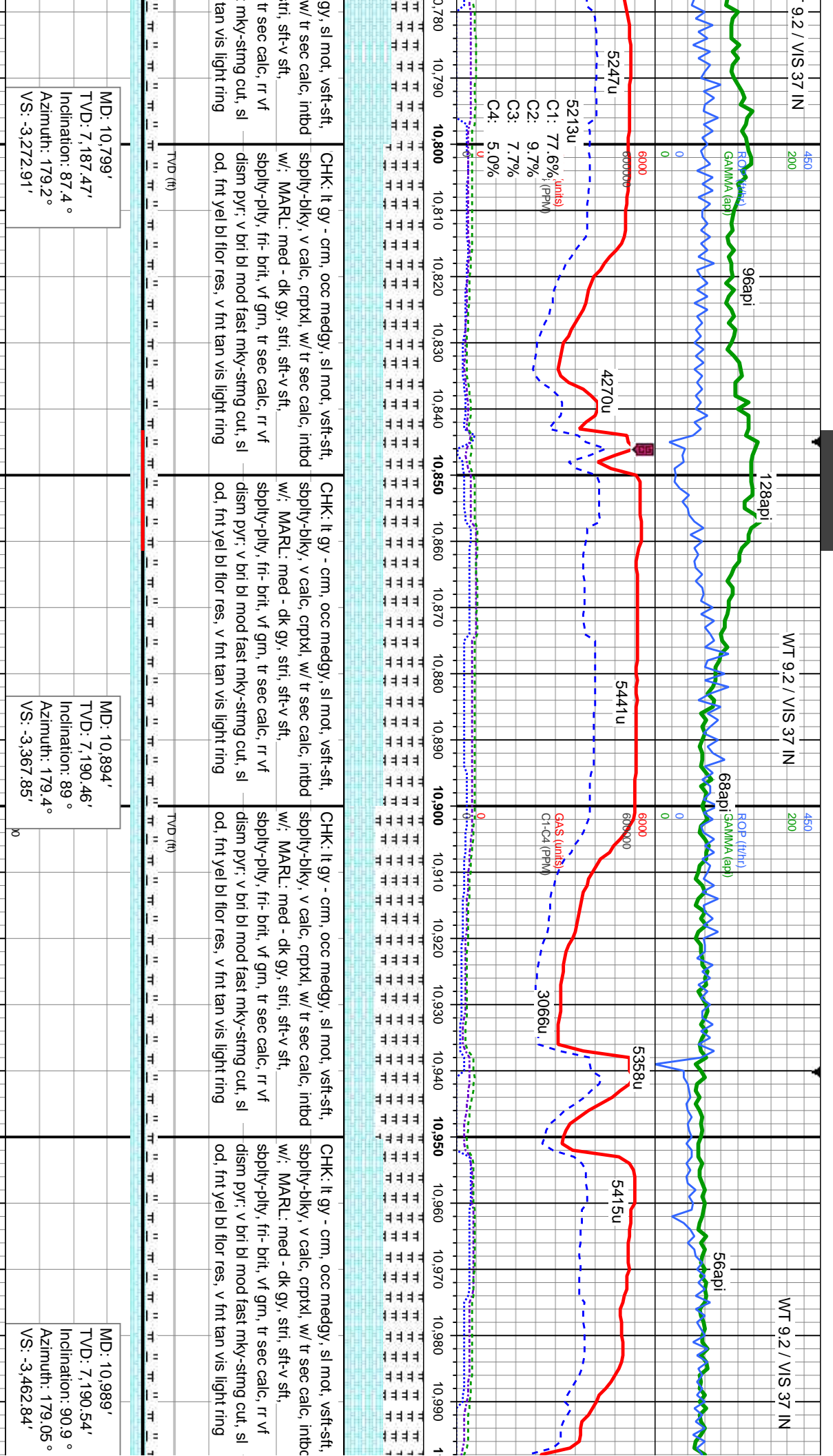
ROP (ft/hr)
 GAMMA (api)
 GAS (units)
 CH-C4 (PPM)

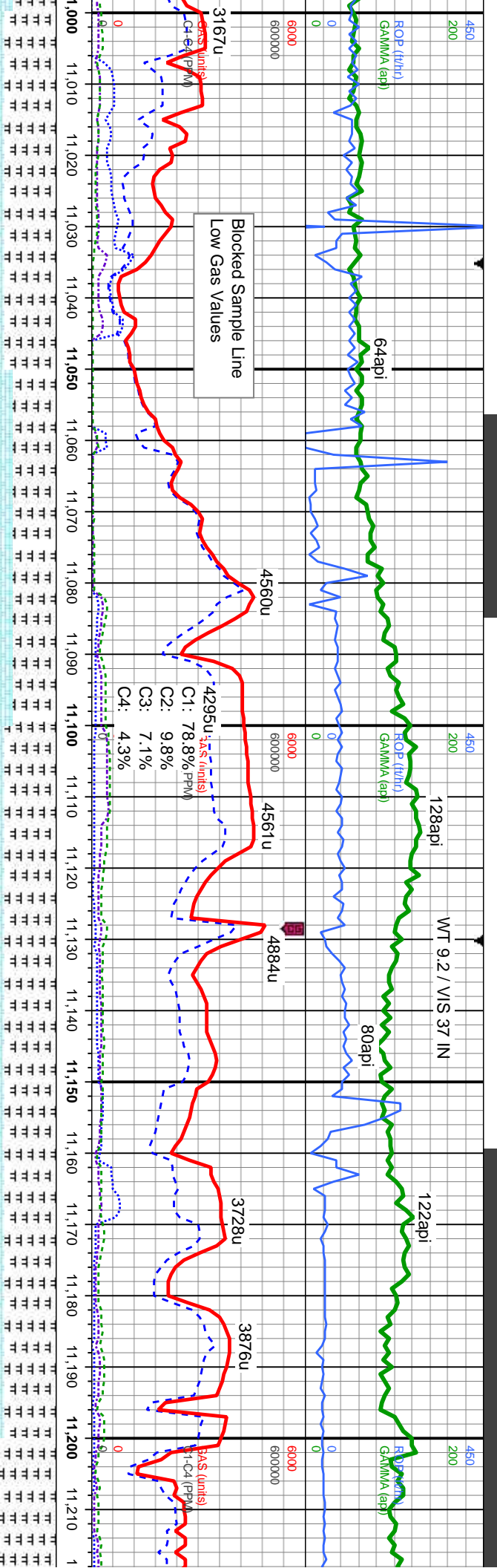
MD: 10,609'
 TVD: 7,183'
 Inclination: 91.2°
 Azimuth: 178.6°
 VS: -3,083.03'

MD: 10,704'
 TVD: 7,183.66'
 Inclination: 88°
 Azimuth: 179°
 VS: -3,178'

Fault
 15' Downthrown







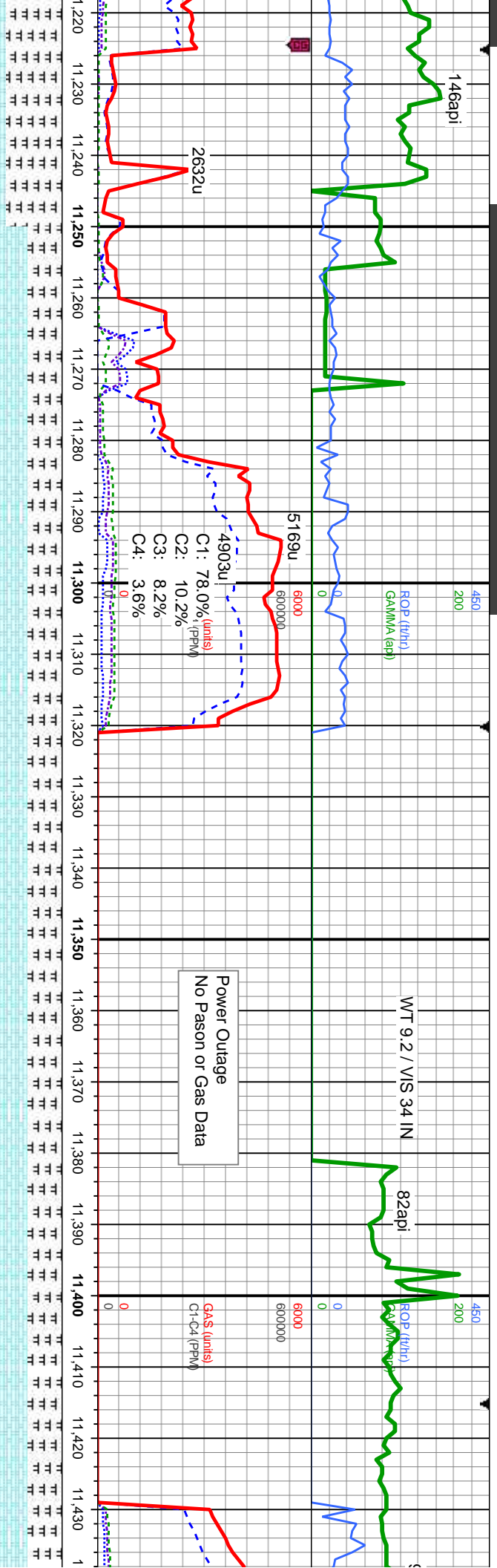
| | | | | | | | | | | | | | | | | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| 11,000 | 11,010 | 11,020 | 11,030 | 11,040 | 11,050 | 11,060 | 11,070 | 11,080 | 11,090 | 11,100 | 11,110 | 11,120 | 11,130 | 11,140 | 11,150 | 11,160 | 11,170 | 11,180 | 11,190 | 11,200 | 11,210 | |
| TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT | TT |

| | | | | |
|---|---|---|---|---|
| CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MAARL: med - dk gy, stri, sft-v sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MAARL: med - dk gy, stri, sft-v sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MAARL: med - dk gy, stri, sft-v sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MAARL: med - dk gy, stri, sft-v sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring | CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MAARL: med - dk gy, stri, sft-v sft, sbply-pily, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frt yel bl flor res, v frt tan vis light ring |
|---|---|---|---|---|

MD: 11,085'
 TVD: 7,188.45'
 Inclination: 91.6°
 Azimuth: 178.5°
 VS: -3,558.79'

MD: 11,179'
 TVD: 7,184.59'
 Inclination: 93.1°
 Azimuth: 177.9°
 VS: -3,652.67'





occ medgy, sl mot, vsft-sft,
- dk gy, stri, sft-v sft,
mod fast mky-stmg cut, sl
res, v frt tan vis light ring

CHK: lt gy - crm, occ medgy, sl mot, vsft-sft,
sbply-dlky, v calc, crptxl, w/ tr sec calc, inthd
w/; MARL: med - dk gy, stri, sft-v sft,
sbply-pty, fri- brit, vf gm, tr sec calc, rr vf
dism pyr; v bri bl mod fast mky-stmg cut, sl
od, frnt yel bl flor res, v frnt tan vis light ring

CHK: lt gy - crm, occ medgy, sl mot, vsft-sft,
sbply-dlky, v calc, crptxl, w/ tr sec calc, inthd
w/; MARL: med - dk gy, stri, sft-v sft,
sbply-pty, fri- brit, vf gm, tr sec calc, rr vf
dism pyr; v bri bl mod fast mky-stmg cut, sl
od, frnt yel bl flor res, v frnt tan vis light ring

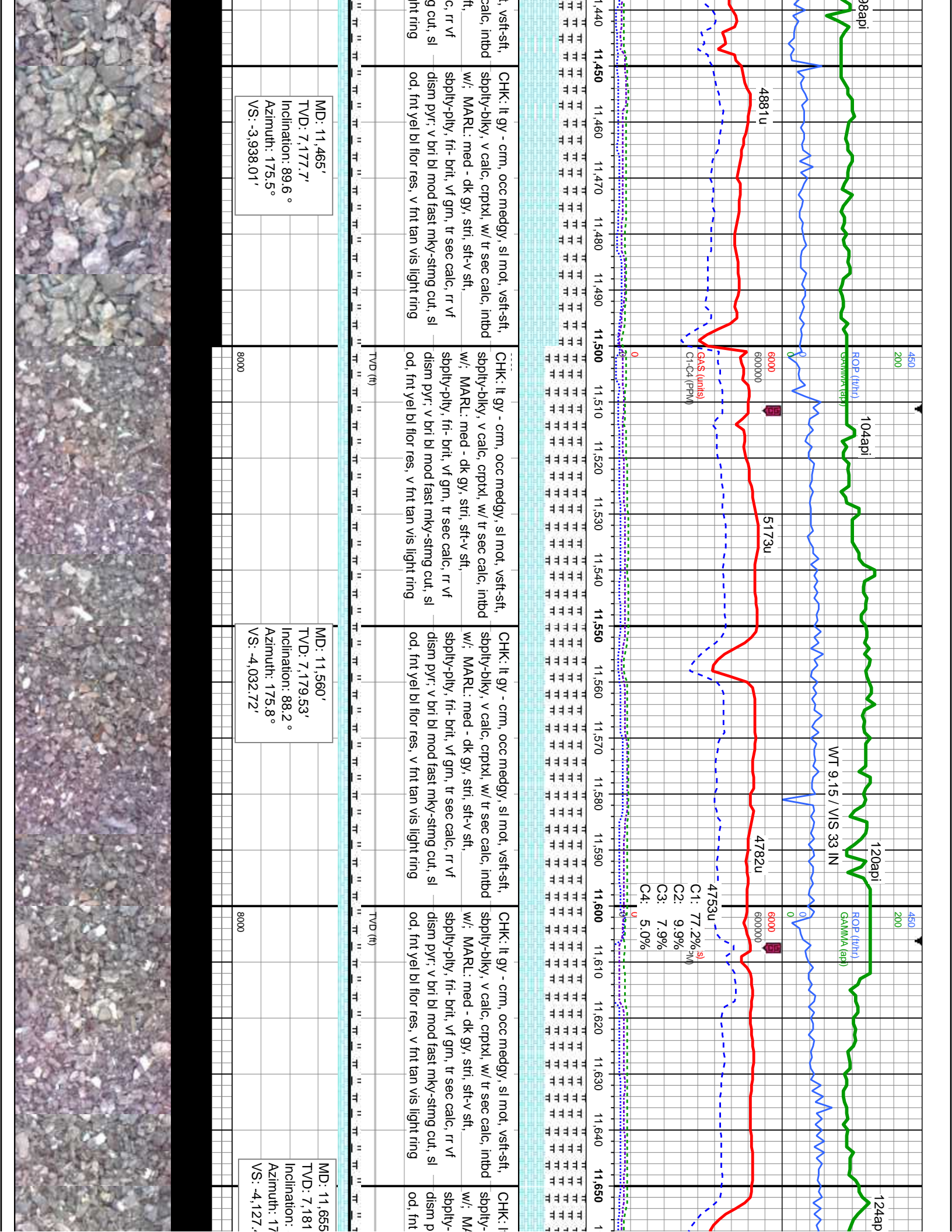
CHK: lt gy - crm, occ medgy, sl mot, vsft-sft,
sbply-dlky, v calc, crptxl, w/ tr sec calc, inthd
w/; MARL: med - dk gy, stri, sft-v sft,
sbply-pty, fri- brit, vf gm, tr sec calc, rr vf
dism pyr; v bri bl mod fast mky-stmg cut, sl
od, frnt yel bl flor res, v frnt tan vis light ring

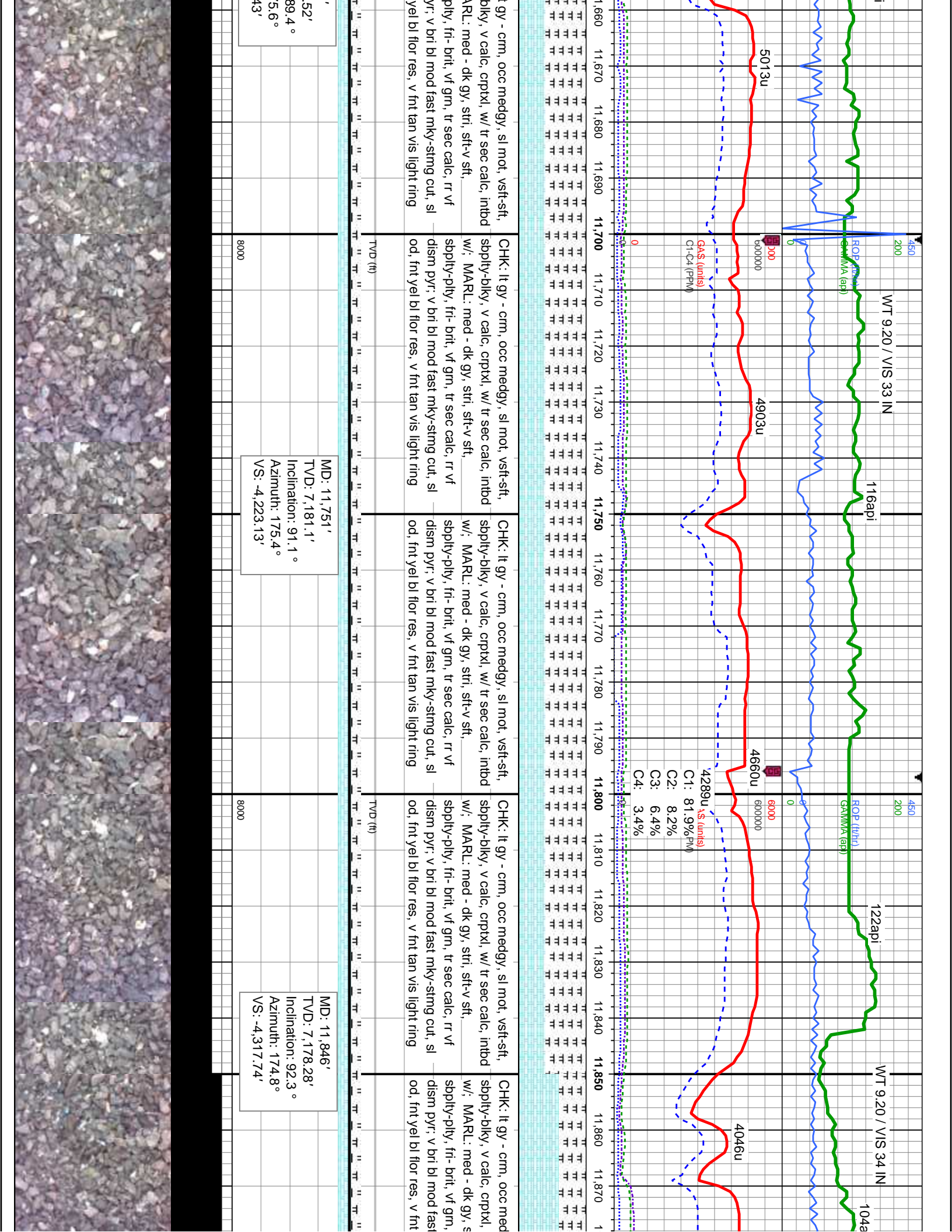
CHK: lt gy - crm, occ medgy, sl mot, vsft-sft,
sbply-dlky, v calc, crptxl, w/ tr sec
w/; MARL: med - dk gy, stri, sft-v s
sbply-pty, fri- brit, vf gm, tr sec cal
dism pyr; v bri bl mod fast mky-stm
od, frnt yel bl flor res, v frnt tan vis lig

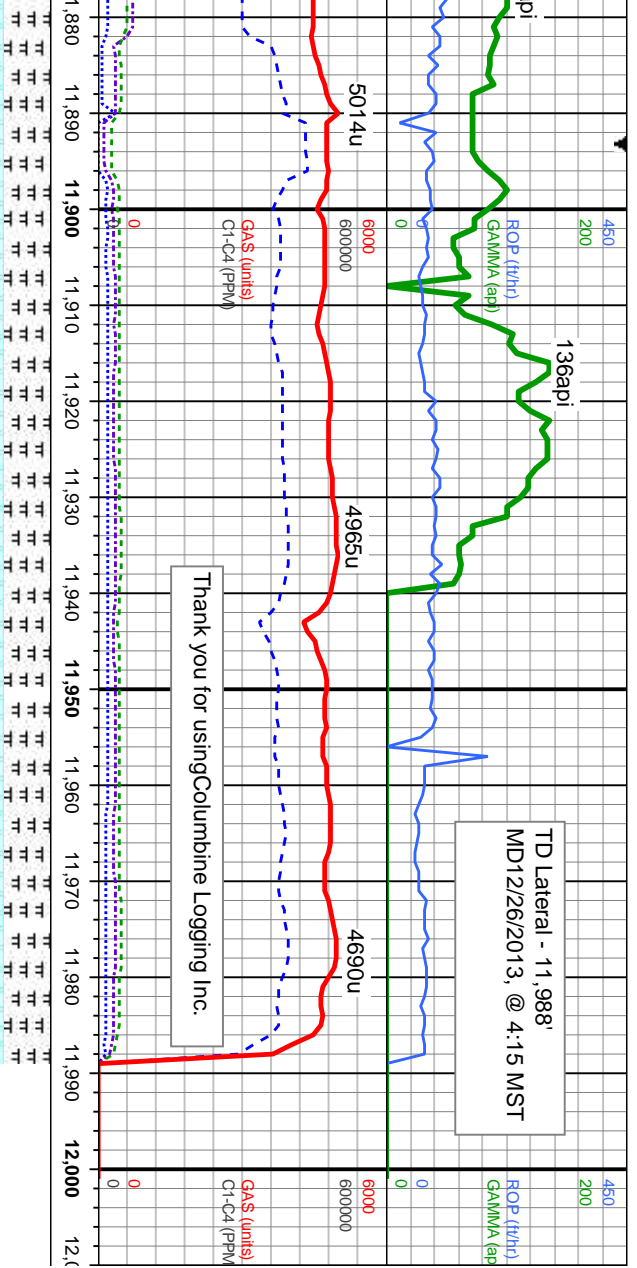
MD: 11,274'
TVD: 7,180.78'
Inclination: 91.5°
Azimuth: 176.3°
VS: -3,747.46'

MD: 11,369'
TVD: 7,178.46'
Inclination: 91.3°
Azimuth: 176.6°
VS: -3,842.25'

| Depth (ft) | ROP (ft/hr) | GAMMA (api) | GAS (units) | C1-C4 (PPM) |
|------------|-------------|-------------|-------------|-------------|
| 11,220 | 0 | 0 | 0 | 0 |
| 11,230 | 0 | 0 | 0 | 0 |
| 11,240 | 0 | 0 | 0 | 0 |
| 11,250 | 0 | 0 | 0 | 0 |
| 11,260 | 0 | 0 | 0 | 0 |
| 11,270 | 0 | 0 | 0 | 0 |
| 11,280 | 0 | 0 | 0 | 0 |
| 11,290 | 0 | 0 | 0 | 0 |
| 11,300 | 0 | 0 | 0 | 0 |
| 11,310 | 0 | 0 | 0 | 0 |
| 11,320 | 0 | 0 | 0 | 0 |
| 11,330 | 0 | 0 | 0 | 0 |
| 11,340 | 0 | 0 | 0 | 0 |
| 11,350 | 0 | 0 | 0 | 0 |
| 11,360 | 0 | 0 | 0 | 0 |
| 11,370 | 0 | 0 | 0 | 0 |
| 11,380 | 0 | 0 | 0 | 0 |
| 11,390 | 0 | 0 | 0 | 0 |
| 11,400 | 0 | 0 | 0 | 0 |
| 11,410 | 0 | 0 | 0 | 0 |
| 11,420 | 0 | 0 | 0 | 0 |
| 11,430 | 0 | 0 | 0 | 0 |







TD Lateral - '11,988'
 MD12/26/2013, @ 4:15 MST

Thank you for using Columbine Logging Inc.

| | | | | | | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 11,880 | 11,890 | 11,900 | 11,910 | 11,920 | 11,930 | 11,940 | 11,950 | 11,960 | 11,970 | 11,980 | 11,990 | 12,000 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|

gy, sl mot, vsft-sft, w/ tr sec calc, inthd
 sft, sft-v sft, tr sec calc, rr vf mky-stmg cut, sl tan vis light ring

CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

CHK: lt gy - crm, occ medgy, sl mot, vsft-sft, sbply-bkly, v calc, crptxl, w/ tr sec calc, inthd w/; MARL: med - dk gy, stri, sft-v sft, sbply-pty, fri- brit, vf gm, tr sec calc, rr vf dism pyr; v bri bl mod fast mky-stmg cut, sl od, frnt yel bl flor res, v frnt tan vis light ring

MD: 11,942'
 TVD: 7,173.51'
 Inclination: 93.4°
 Azimuth: 173.8°
 VS: -4,413.14'

| | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 | 8000 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|

