



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Janssen #11

Location Sec.8-T06N-R65W

State Colorado

Country USA

API Number 05-123-42363-00

Geographic Region DJ Basin

Spud Date 11/29/2015

Surface Coordinates SHL: 2371' FNL, 2396' FWL Sec. 8 T6N R65W

Lat: 40 30' 9.734 N

Long: 104 41' 17.794 W

Bottom Hole Coordinates PBHL:

Lat: 40 30'13.694 N

Long: 104 42'17.064 W

Ground Elevation 4,777'

K.B. Elevation 4,801.5'

Logged Interval 6,500' To 11,290'

Total Depth 11,290'

Formation Codell

Type of Drilling Fluid Oil Based - invert

County Weld

Rig Number Patterson UTI 346

AFE # NA

Field Wattenberg

Drilling Completed 12/1/2015

Operator

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203

Geologist

Name Vivian Spiess / Jared Rouse

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203



Other

Equipment ML-113

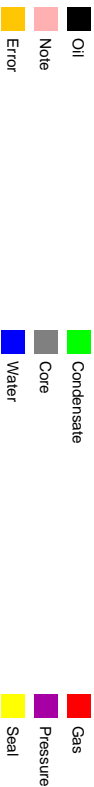
Comments Start: 11-29-15
TD: 12-01-15

Services Provided 2-man Logging
On Site Geosteering

Logger Names Dominic Pitre / Nicholas V

Address Empirica, LLC.
6360 W Sam Houston Pk
Suite 100
Houston, TX 77041

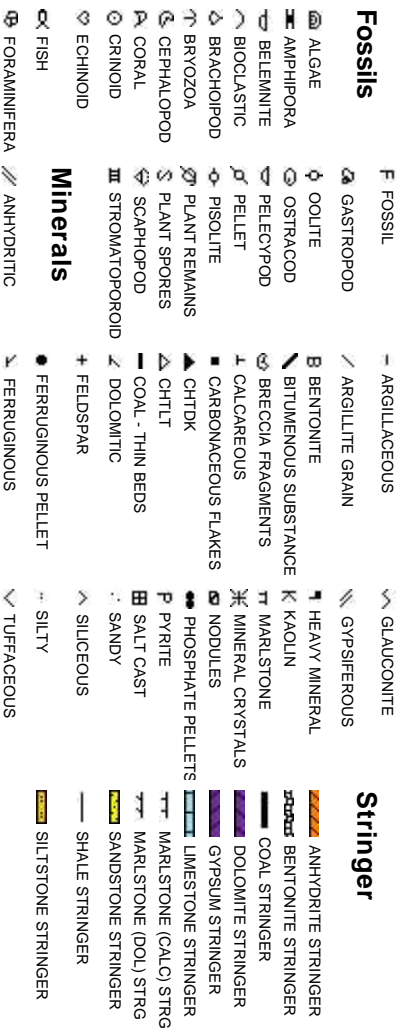
Zone Color Coding



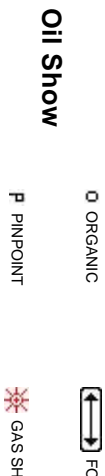
Rock Types



Accessories



Other Sy



Engineering



Porosity



Symbols

FORMATION TOP L LITHOGRAPHIC

Rounding

LOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW B SUBANG WS WACKESTONE

TURNED STRATA N SUBRND

Sorting

DEFAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

C CHALKY W WELL

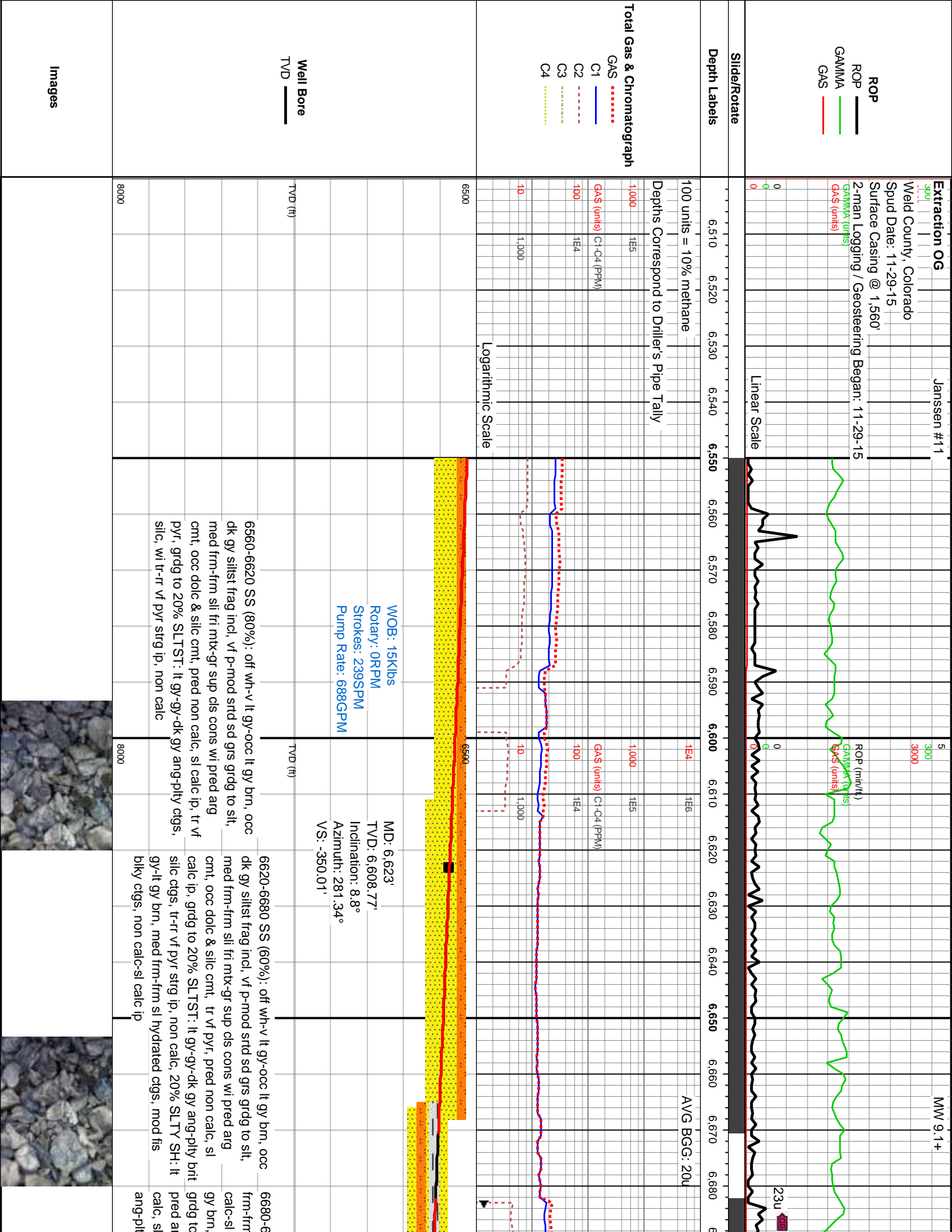
CRY CX CRYPTOXLN

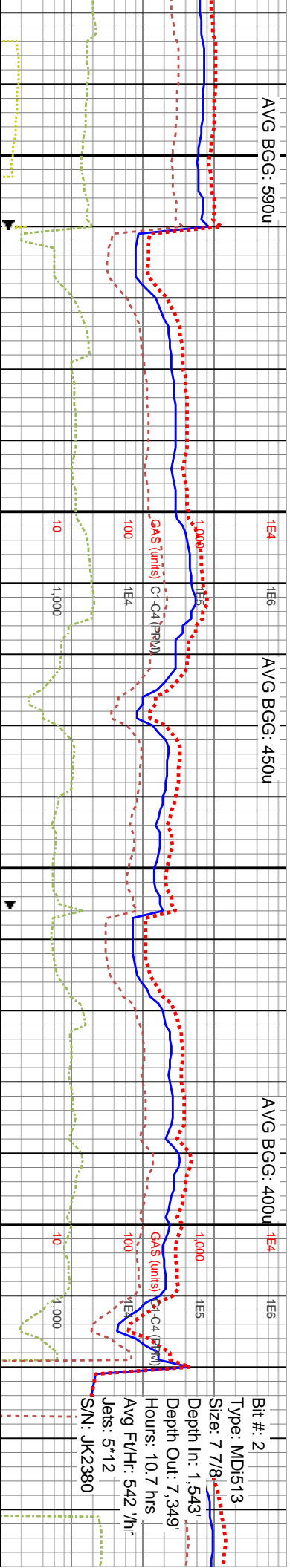
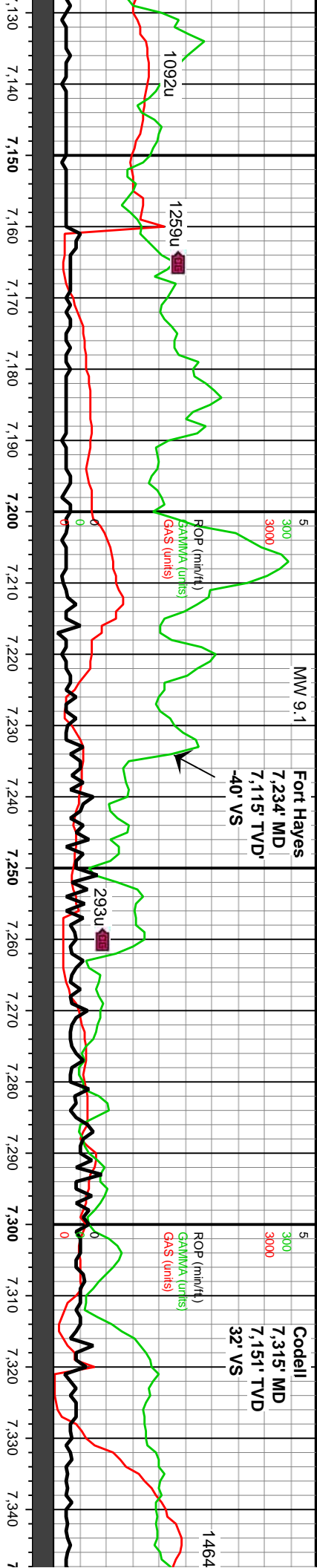
E EARTHY

SAS

IE TESTED - LEFT FX FINELYXLN

IE TESTED - RT GS GRAINSTONE



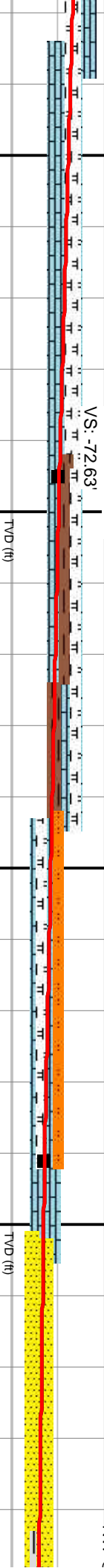


WOB: 39Klbs
Rotary: 0RPM
Strokes: 240SPM
Pump Rate: 689GPM

DP @ 7,250'

MD: 7,195'
TVD: 7,094'
Inclination: 54.26°
Azimuth: 280.24°
VS: -72.63'

MD: 7,291'
TVD: 7,141.8'
Inclination: 65.9°
Azimuth: 279°
VS: 9.8'



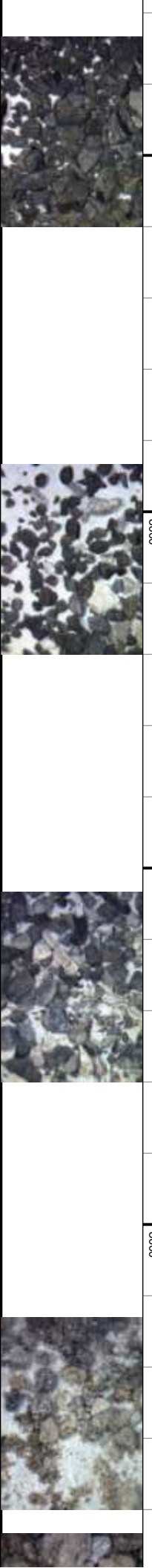
gy-dk gy-blk, dk wi OBM
rd occ sb ang cigs, mot wi
v pyr & v pyr strg, sl silty-sm
CHK (40%): lt gy-gy, frm,
LS cigs, com u f-med
mn, tr v pyr, tr c free chk, tr
clin HCL rxn,

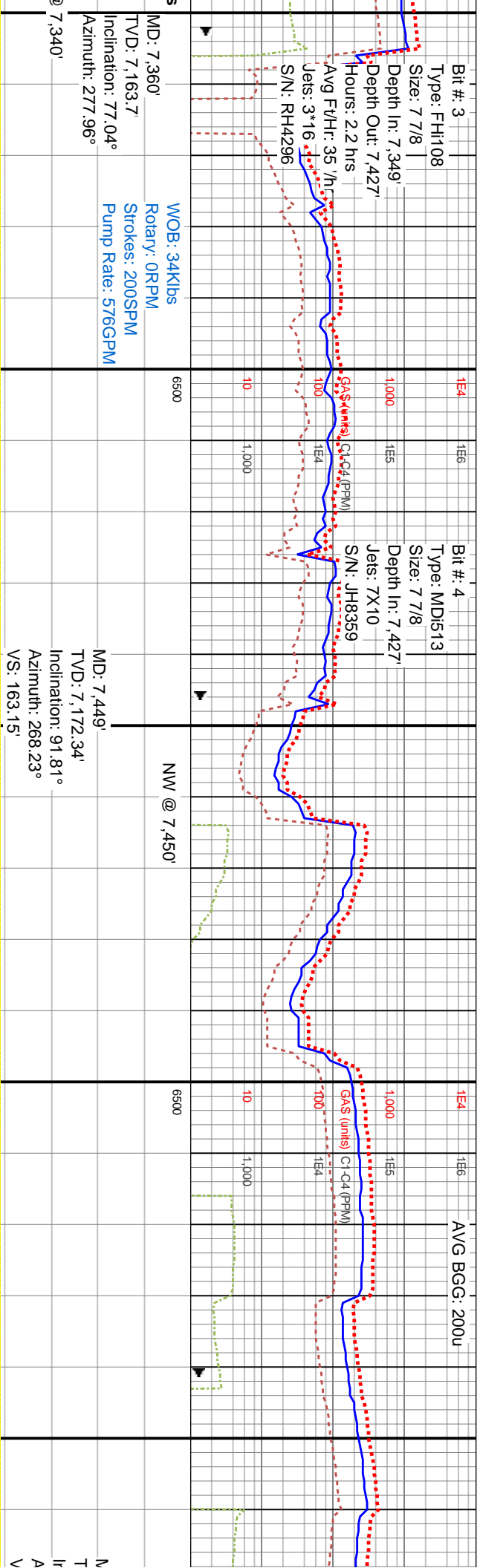
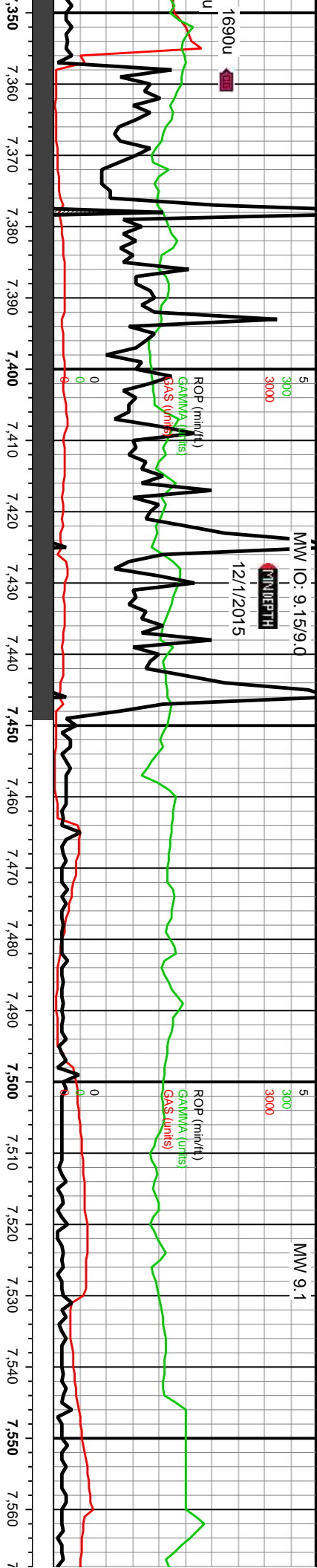
7160-7220: 40% SLTST: med gy, ip gy, sb blk, sl
frm-hd, calc, sme sh intbds; 40% MRLST: dk gy-
blk, sl frm, sb blk, sb ply, ip sm txt, tr frac fl cal,
occ f lam, mod - v carb; 20% LS: ofwht-bf, ip sl in-
med gy mot, occ wht, pred blk, ip sb ply,
frm, pred mudst wi sme intbd carb grs, tr pyr

7220-7280: 60% LS: ofwht-bf, ip sl in-med
gy mot, occ wht, pred blk, sb blk, ip sb ply,
frm, pred mudst wi sme intbd carb grs, tr
pyr; 40% SLTST: med gy, ip gy, sb blk, sl
frm-hd, calc, sme dk mly intbds

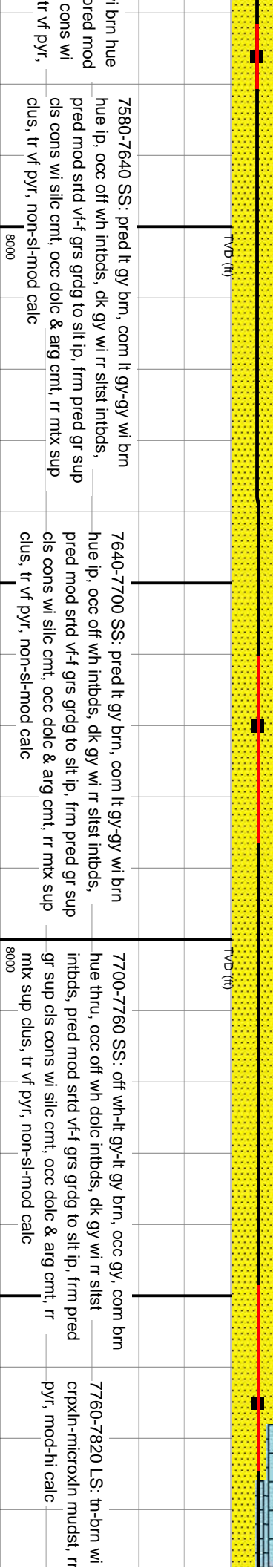
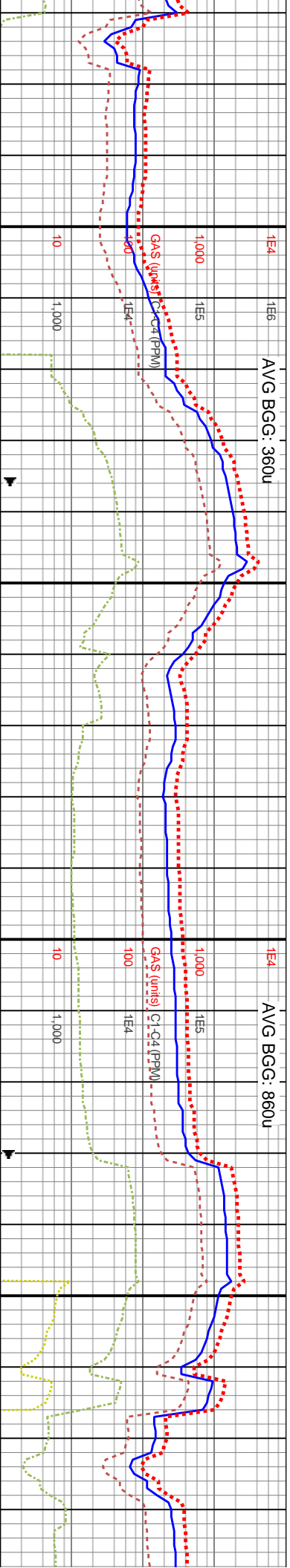
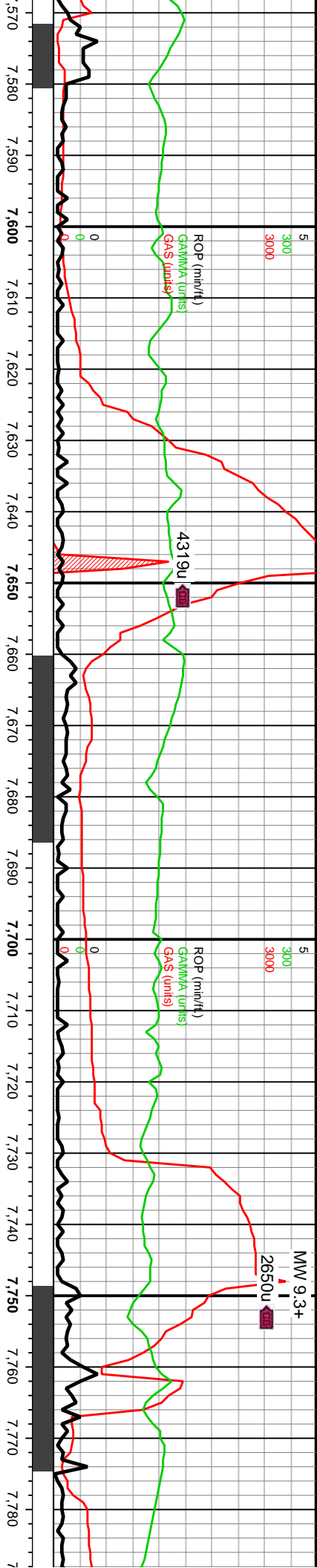
7280-7340 SD: pred gy- lt gy, ip med gy- amb
trns, pred sl trns- v trns grs, sb blk, frm- tr
clus, pred v f- f grd, sb rnd- ang grs, pred grn
sup clus, calc- sil cmt, sme mod calc, sme
lse sil- calc cmt, tr glau, sme pyr

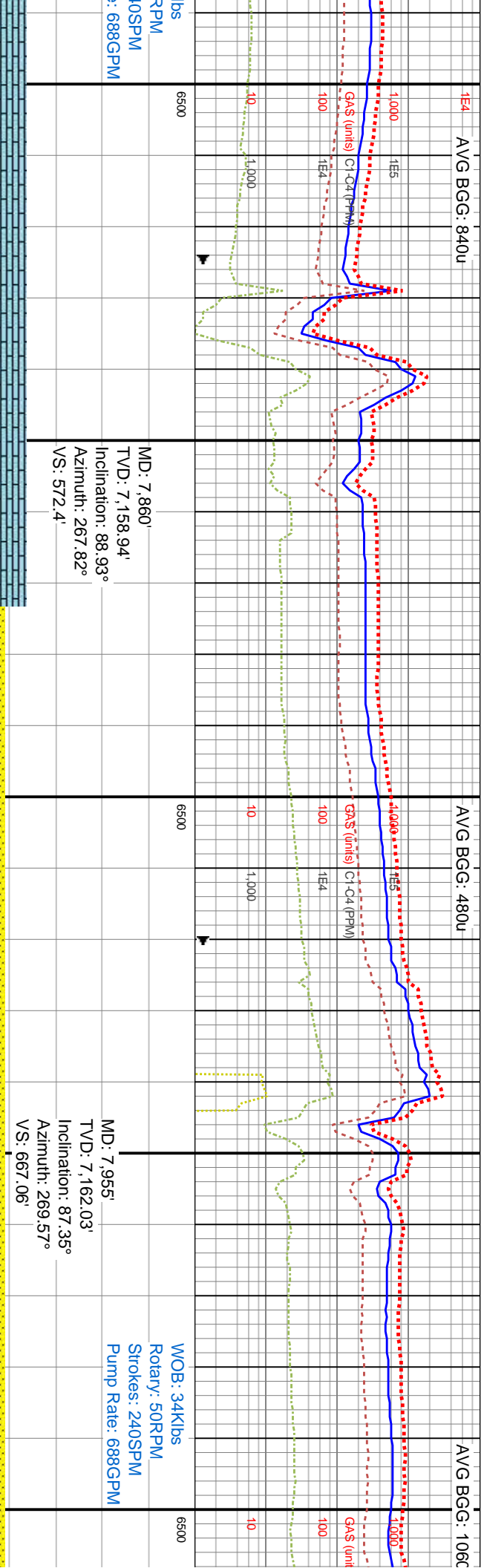
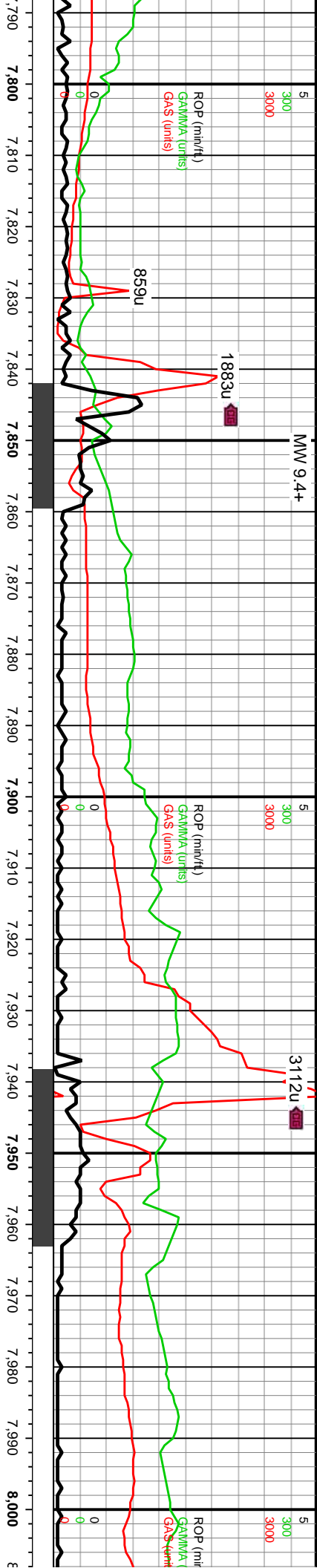
7340-: ip, sb t
cons v
tr gn g



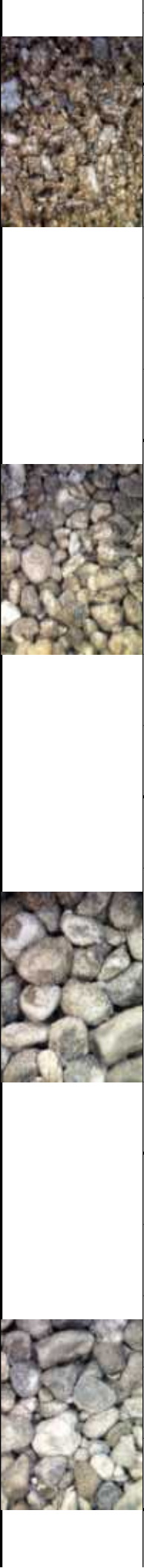


7400 SS: pred lt gy brn, com lt gy-gy wi brn hue ip, p-mod strd vf-f grs, frm pred gr sup cls wi silic cnt, occ dolc & arg cnt, rr mtx sup clus, glau, tr vf pyr, non-si-mod calc	7400-7460 SS: pred lt gy brn, com lt gy-gy wi brn hue ip, occ off wh intbds, dk gy wi rr slist intbds, pred mod strd vf-f grs grdg to silt ip, frm pred gr sup cls cons wi silic cnt, occ dolc & arg cnt, rr mtx sup clus, tr vf pyr, non-si-mod calc	7460-7520 SS: pred lt gy brn, com lt gy-gy, com brn hue thru, mod strd vf-f grs, frm pred gr sup cls cons wi silic cnt, occ dolc & arg cnt, rr mtx sup clus, tr gn glau, tr vf pyr, non-si-mod calc	7520-7580 SS: pred lt gy brn, com lt gy-gy w ip, occ off wh intbds, dk gy wi rr slist intbds, l strd vf-f grs grdg to silt ip, frm pred gr sup cls silic cnt, occ dolc & arg cnt, rr mtx sup clus, non-si-mod calc
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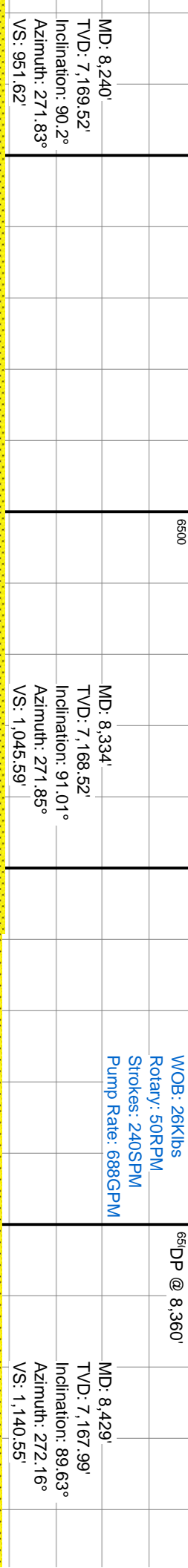
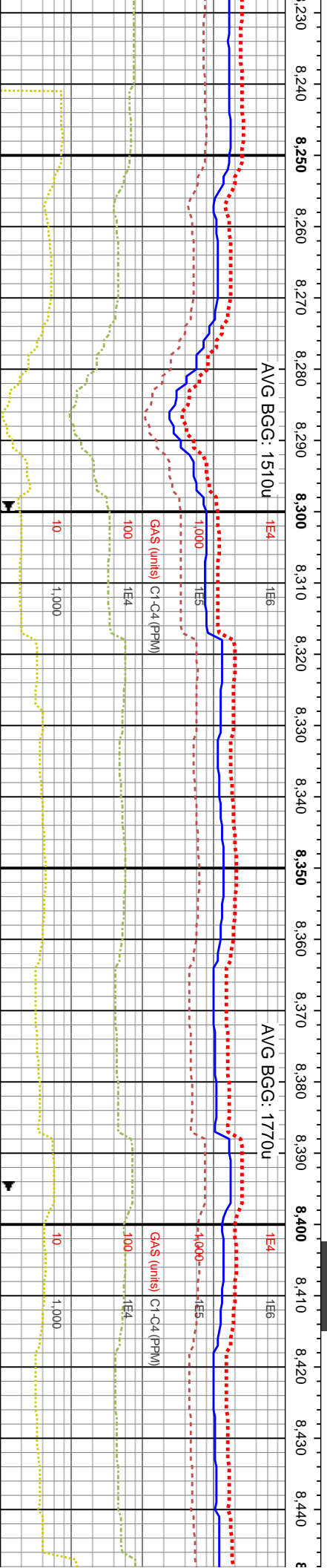
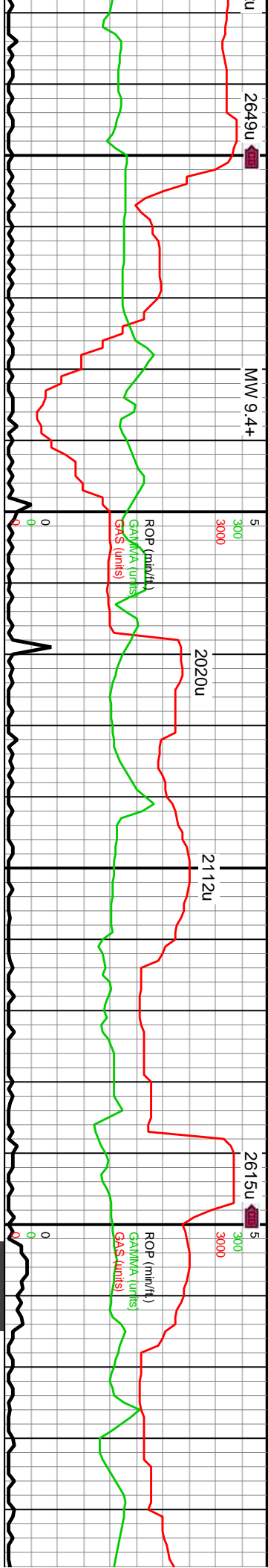
TVD (ft)		TVD (ft)		TVD (ft)		TVD (ft)	
8000		8000		8000		8000	
occ dk gy lamn, pkst-wkst, sm way lstr, tr f		7820-7880 SS: off wh-lt gy-lt gy brn, occ gy, com brn hue thru, occ off wh dolc intbds, dk gy wi rr siltst intbds, pred mod strd vf-f grs grdg to silt ip, frm pred gr sup cls cons wi silc cnt, occ dolc & arg cnt, rr mtx sup clus, tr vf pyr, non-sl-mod calc		7880-7940 SS: off wh-lt gy-lt gy brn, occ gy, com brn hue thru, pred mod strd vf-f grs grdg to silt ip, frm pred gr sup cls cons wi silc cnt, dk gy wi rr siltst intbds, occ off wh dolc intbds, rr mtx sup clus, tr vf pyr, non-sl-mod calc		7940-8000 SS: pred off wh-lt gy, occ gy-lt gy brn, mod strd sb rd-rd gr-mtx sup clus, vf-f grs grdg to silt ip, frm pred gr sup cls cons wi silc cnt, dk gy wi rr siltst intbds, occ off wh dolc intbds, tr vf pyr, non-sl-mod calc	



MD: 7,860'
TVD: 7,158.94'
Inclination: 88.93°
Azimuth: 267.82°
VS: 572.4'

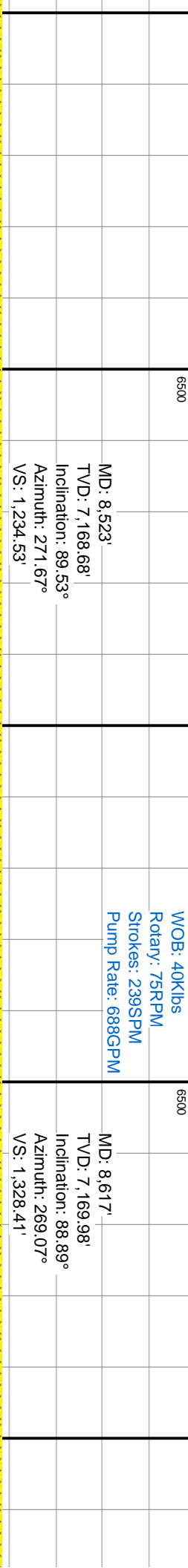
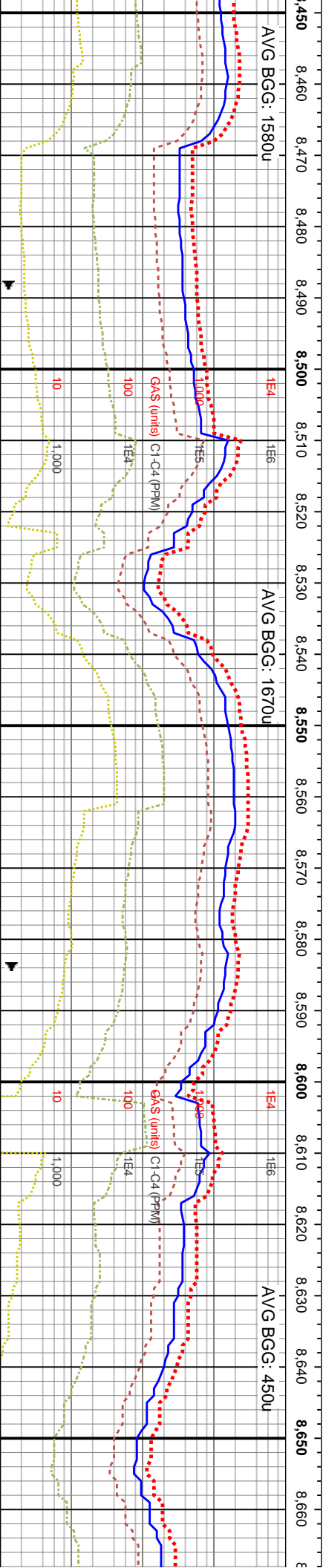
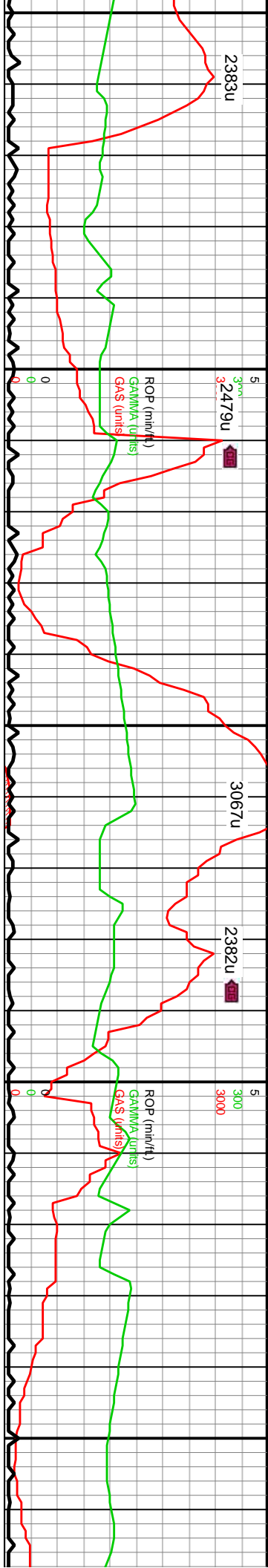
MD: 7,955'
TVD: 7,162.03'
Inclination: 87.35°
Azimuth: 269.57°
VS: 667.06'

WOB: 34Klbs
Rotary: 50RPM
Strokes: 240SPM
Pump Rate: 688GPM



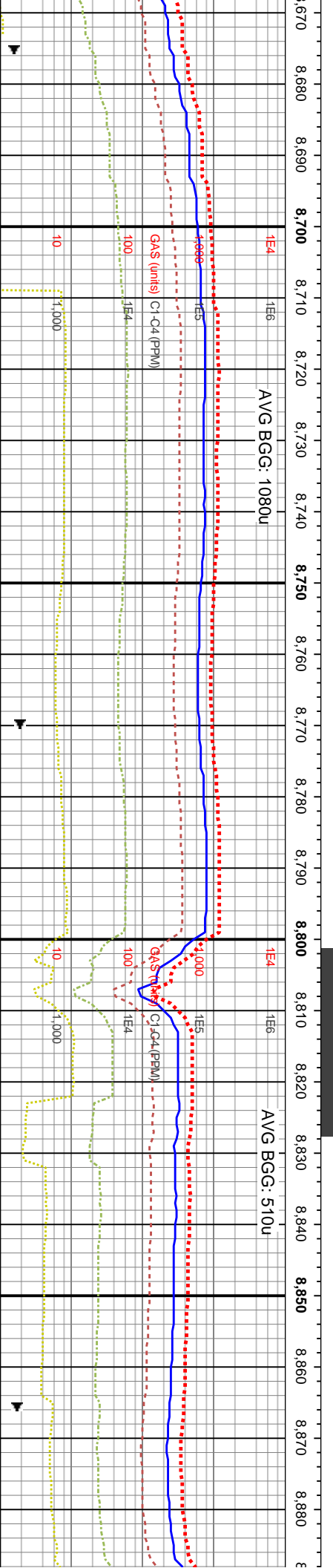
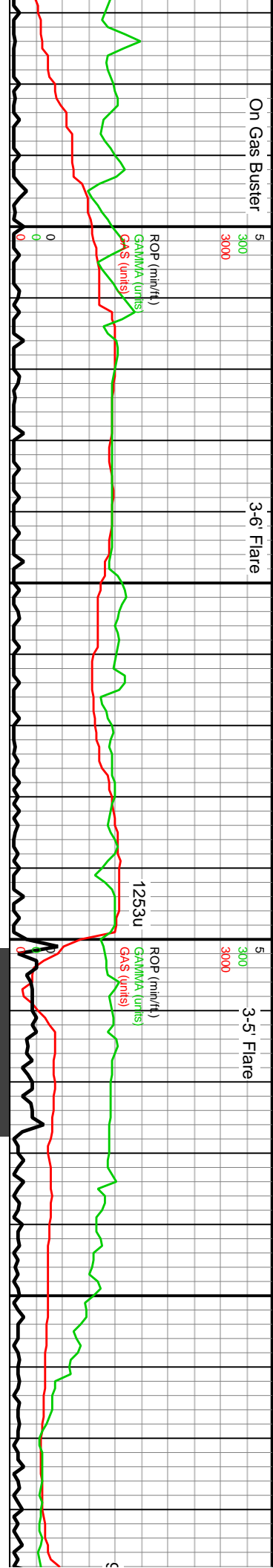
8240-8300 SS: pred off wh-lt gy, wi sl brn hue ip, occ gy, mod strd sb rd-rd gr-mtx sup clus, vf-f grs grdg to slt ip, frm pred gr sup cls cons wi silc cnt, dk gy wi rr slst intbds, occ off wh dolc intbds, tr vf pyr, non-sl-mod calc	8300-8360 SS: pred off wh-lt gy, sl lt brn hue up, pred mod strd vf-f grs grdg to slt ip, frm pred gr sup cls cons wi silc cnt, sl arg ip, rr wh dolc intbds ip, rr dk gy slst intbds, rr mtx sup clus, tr vf pyr, non-sl-mod calc	8360-8420 SD: pred gy- brn gy, ip med gy- amb tnsl, pred sl trnsi grs, sb blk, frm- fri clus, ip sft clus, pred v f- f grd, sb rnd- ang grs, ip u f- l med grs, pred grn sup clus, ip unconc, arg- sil cnt, sme mod calc, sme lse sil- calc cnt, intbd w silty sh, tr glau, sme pyr	8420-8480 SD: pred i tnsl, pred sl trnsi grs, clus, pred v f- f grd, sl grs, pred grn sup clus sme mod calc, sme lse sh, tr glau, sme pyr
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MD: 8.523' TVD: 7,168.68' Inclination: 89.53° Azimuth: 271.67° VS: 1,234.53'		MD: 8.617' TVD: 7,169.98' Inclination: 88.89° Azimuth: 269.07° VS: 1,328.41'	
8480-8540 SD: pred gy- brn gy, ip med gy- amb trns, pred sl trnsl grs, sb blk, frm- fri clus, ip sft clus, pred v f- l grd, sb rnd- ang grs, ip u f- l med grs, pred grn sup clus, ip uncon, arg- sil cnt, sme mod calc, sme lse sil- calc cnt, intbd w slty sh, tr glau, sme pyr		8540-8600 SD: pred med gy- brn gy, ip med gy- amb trns, pred sl trnsl grs, sb blk, frm- fri clus, ip sft clus, pred f- l grd, sb rnd- ang grs, ip u f- l med grs, grn sup clus- uncon, arg- sil cnt, sme mod calc, sme lse sil- calc cnt, intbd w slty sh- blk sh, sme ls, tr glau, tr pyr	
8600-8660 SD: pred med gy- brn gy, ip med gy- amb trns, pred sl trnsl grs, sb blk, frm- fri clus, ip sft clus, pred f- l grd, sb rnd- ang grs, ip u f- l med grs, grn sup clus- uncon, arg- sil cnt, sme mod calc, sme lse sil- calc cnt, intbd w slty sh- blk sh, sme ls, tr glau, tr pyr		8660-8720 SD: pred med gy- brn gy, ip med gy- amb trns, pred sl trnsl grs, sb blk, frm- fri clus, ip sft clus, pred f- l grd, sb rnd- ang grs, ip u f- l med grs, grn sup clus- uncon, arg- sil cnt, sme mod calc, sme lse sil- calc cnt, intbd w slty sh- blk sh, sme ls, tr glau, tr pyr	





MD: 8,712'
TVD: 7,172.76'
Inclination: 87.75°
Azimuth: 266.03°
VS: 1,422.93'

WOB: 55klbs
Rotary: 15RPM
Strokes: 240SPM
Pump Rate: 688GPM

MD: 8,807'
TVD: 7,176.43'
Inclination: 87.82°
Azimuth: 265.46°
VS: 1,517.1'

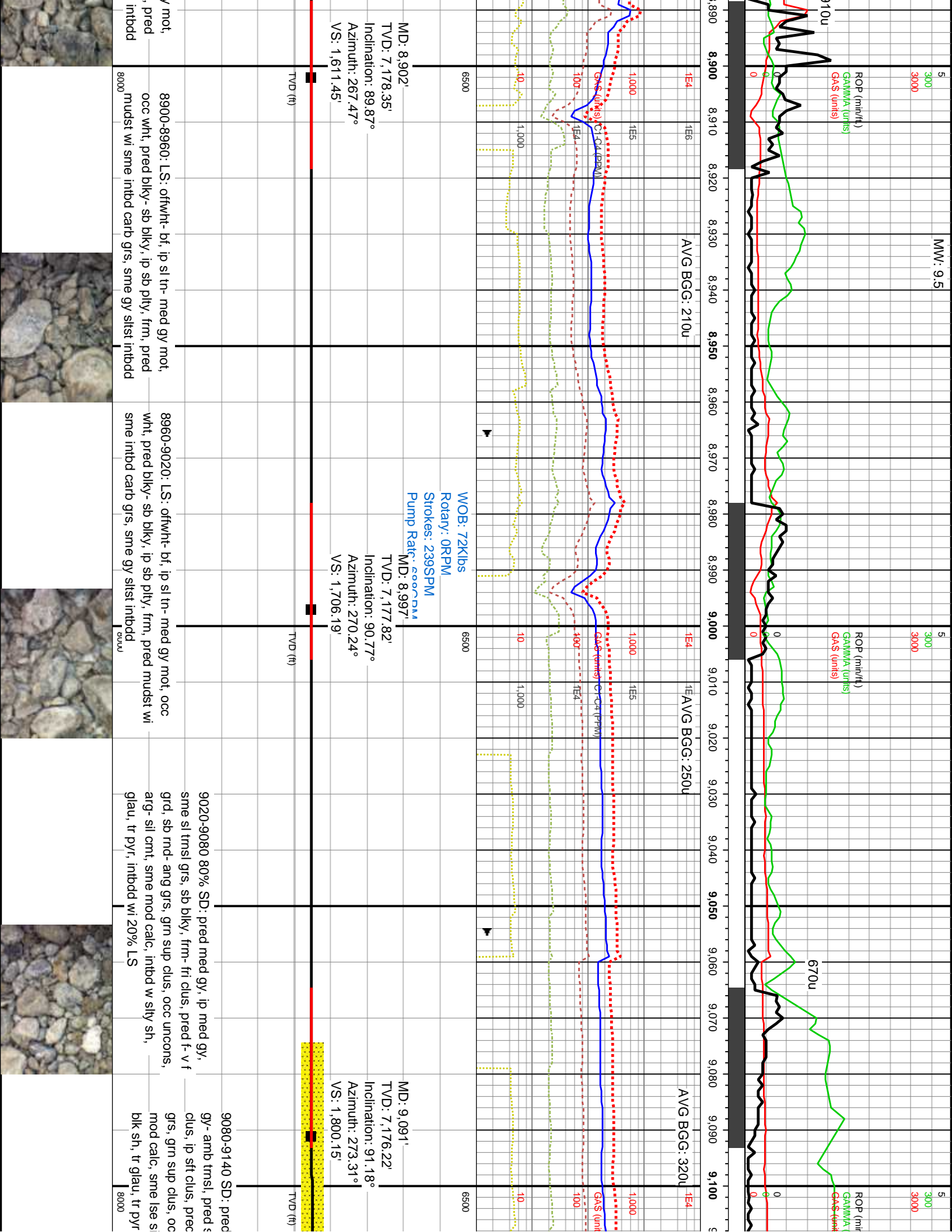
8720 SD: pred med gy- brn gy, ip med gy- amb
pred sl tmsl grs, sb blkly, frm- fri clus, ip sft
pred f grd, sb rnd- ang grs, ip u f- l med grs, gm
us- uncongs, arg- sil cnt, sme mod calc, sme
calc cnt, intbd w silty sh- blk sh, sme ls, tr
tr pyr

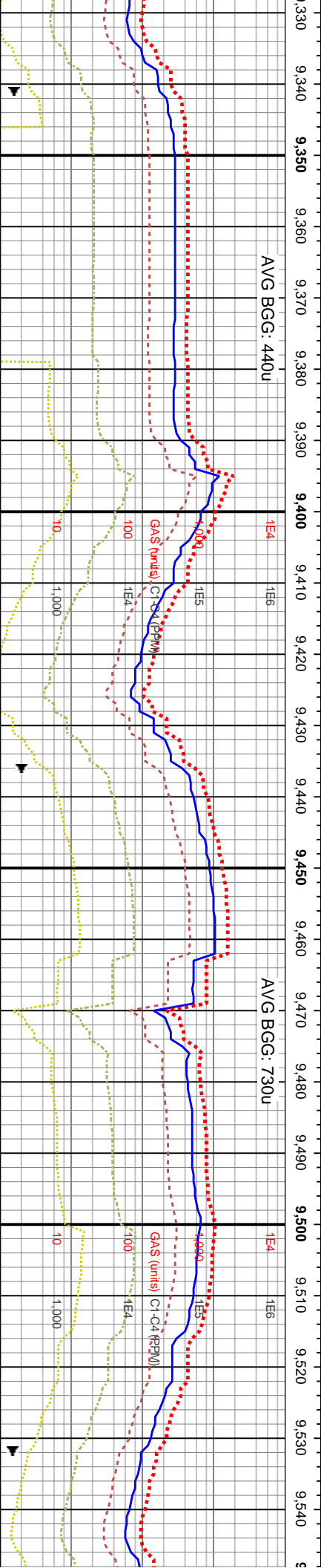
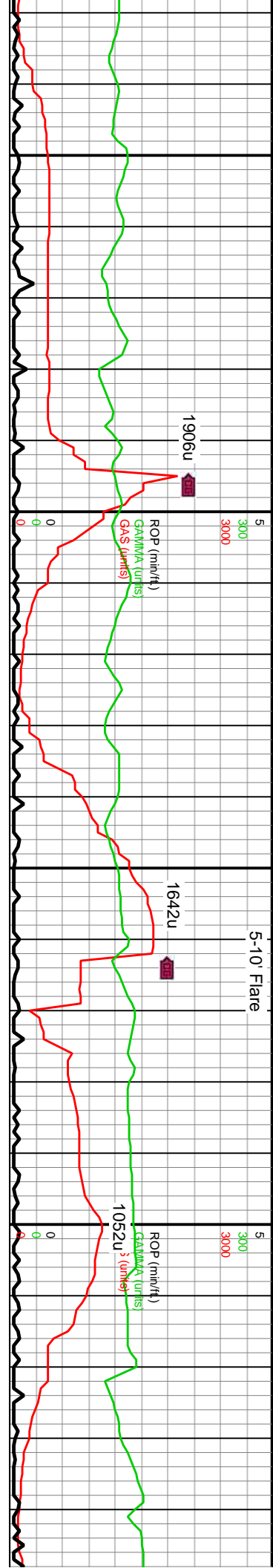
8720-8780 SD: pred brn- med gy, ip med gy- amb
tmsl, pred sl tmsl grs, sb blkly, sme frm- fri clus, ip
sft clus, pred f- u f grd, sb rnd- ang grs, ip l med
grs, pred uncongs, sme clus wi arg- sil cnt, sme
mod calc, sme lse sil- calc cnt, intbd w silty sh-
blk sh, sme ls, tr glau, tr pyr

8780-8840 70% SD: pred med gy, ip med gy,
sme sl tmsl grs, sb blkly, frm- fri clus, pred f- v f
grd, sb rnd- ang grs, gm sup clus, occ uncongs,
arg- sil cnt, sme mod calc, intbd w silty sh,
glau, tr pyr, intbdd wi 30% LS

8840-8900: LS: oftwht- bf, ip sl tn- med gy
occ wht, pred blkly- sb blkly, ip sb pfly, frm
mudst wi sme intbd carb grs, sme gy stst



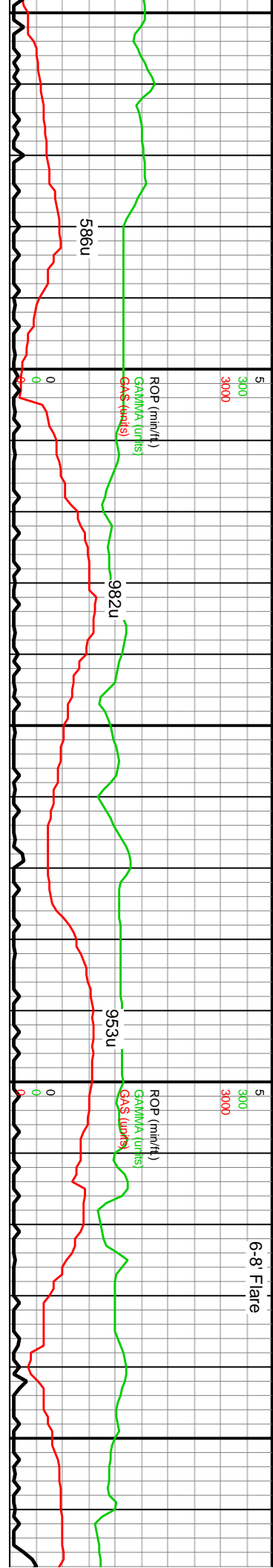




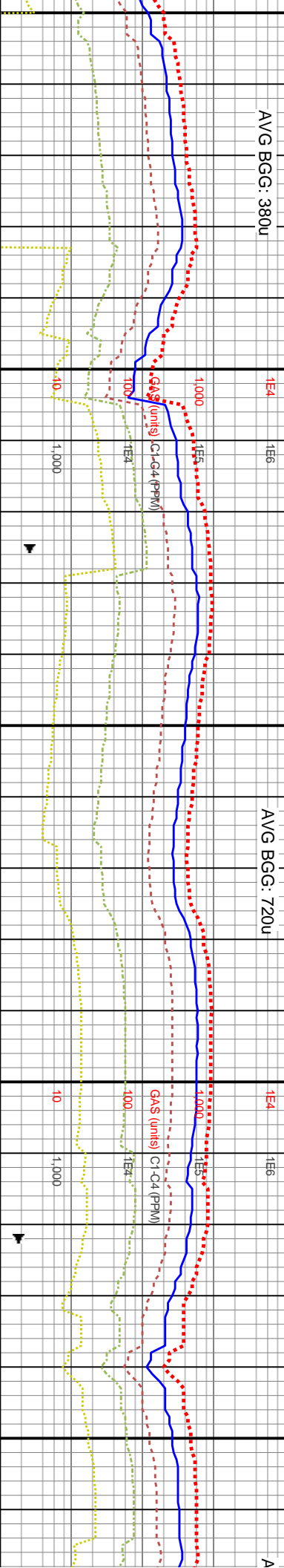
WOB: 40Klbs
Rotary: 75RPM
Strokes: 240SPM
Pump Rate: 688GPM
MD: 9,377'
TVD: 7,176.18'
Inclination: 89.93°
Azimuth: 273.88°
VS: 2.086.1'

0-9380 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred sl trnsi grs, sb blk, sl frm- fri clus, t clus, pred f- v f grd, sb md- ang grs, ip u f pred grn sup clus, occ uncons grs, arg- sil thru, sme mod calc, sme lse sil- calc cnt, d w silty sh- blk sh, tr glau, tr pyr	9380-9440 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred sl trnsi grs, sb blk, sl frm- fri clus, ip sft clus, pred f- v f grd, sb md- ang grs, ip u f grs, pred grn sup clus, occ uncons grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, intbd w silty sh- blk sh, tr glau, tr pyr	9440-9500 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred sl trnsi grs, sb blk, sl frm- fri clus, ip sft clus, pred f- v f grd, sb md- ang grs, ip u f grs, pred grn sup clus, occ uncons grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr silty sh- blk sh intbds, tr glau, tr pyr	9500-9560 SD: pred med gy- lt gy brn, ip m amb trnsi, pred sl trnsi grs, sb blk, sl frm- fri sft clus, pred f- v f grd, sb md- ang grs, occ pred grn sup clus, occ uncons grs, arg- sil c sme mod calc, sme lse sil- calc cnt, tr glau
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9,550 9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630 9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730 9,740 9,750 9,760

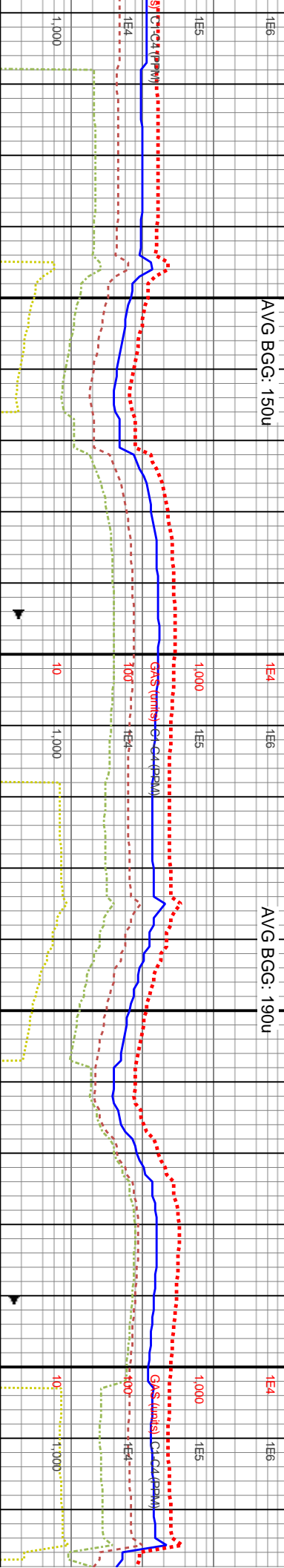
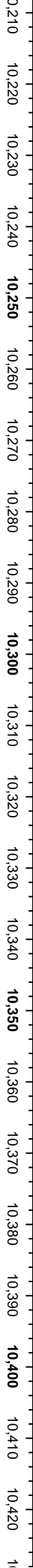
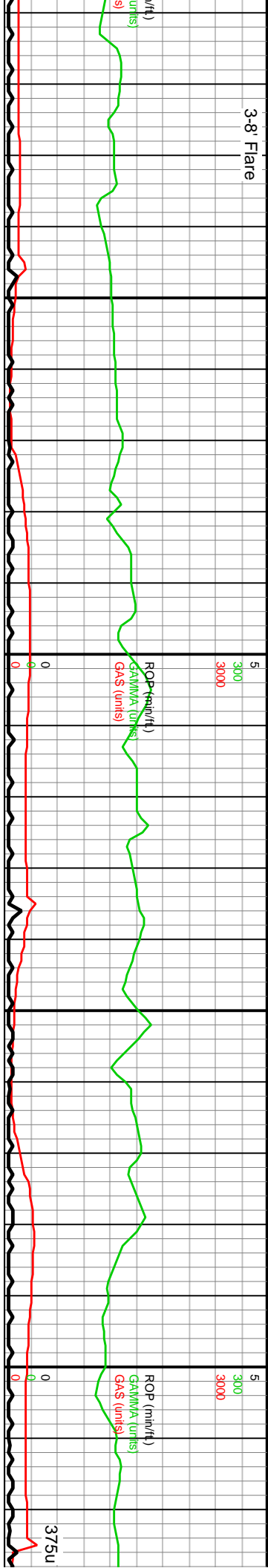


WOB: 36Klbs Rotary: 75RPM Strokes: 240SPM Pump Rate: 688GPM	MD: 9,568' TVD: 7,175.45' Inclination: 90.27° Azimuth: 274.15° VS: 2,277.07'	MD: 9,663' TVD: 7,174.39' Inclination: 91.01° Azimuth: 274.52° VS: 2,372.04'	MD: 9,759' TVD: 7,172.87' Inclination: 90.81° Azimuth: 274.18° VS: 2,468'
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9560-9620 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred si trnsi grs, sb blkly, si frm- fri clus, ip sft clus, pred f- v f grd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau	9620-9680 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred si trnsi grs, sb blkly, si frm- fri clus, ip sft clus, pred f- v f grd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau	9680-9740 SD: pred med gy- lt gy brn, ip med gy- amb trnsi, pred si trnsi grs, sb blkly, si frm- fri clus, ip sft clus, pred f- v f grd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau	9740-9800 SD: pred me trnsi, sme offwht, pred s sft clus, pred f- v f grd s grs, pred grn sup clus, med qtz grs, arg- sil cm lse sil- calc cnt, tr glau
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3-8' Flare



MD: 10,236'
TVD: 7,183.43'
Inclination: 88.79°
Azimuth: 274.06°
VS: 2,944.81'

MD: 10,331'
TVD: 7,184.65'
Inclination: 89.73°
Azimuth: 275.14°
VS: 3,039.76'

WOB: 41Klbs
Rotary: 8,029,688RPM
Strokes: 239SPM
Pump Rate: 688GPM

MD: 10,426'
TVD: 7,184
Inclination:
Azimuth: 27
VS: 3,134.6

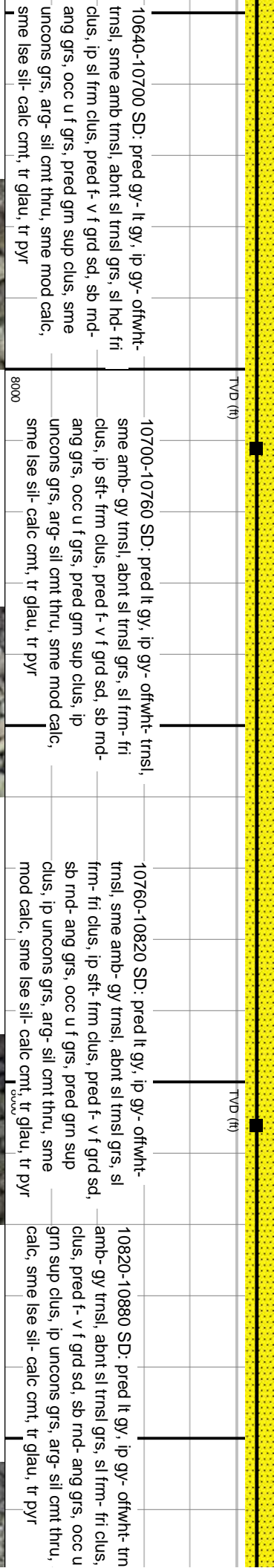
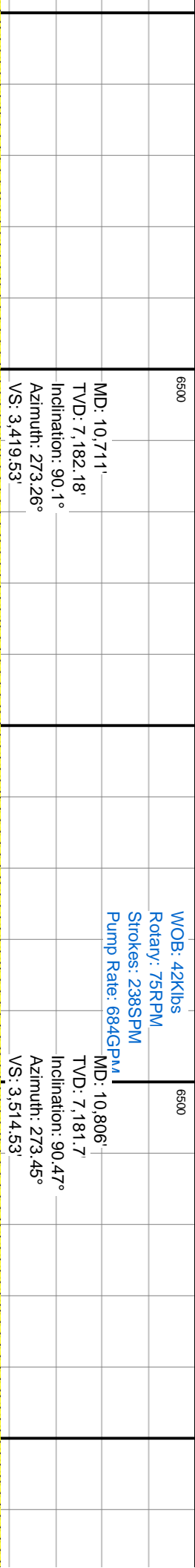
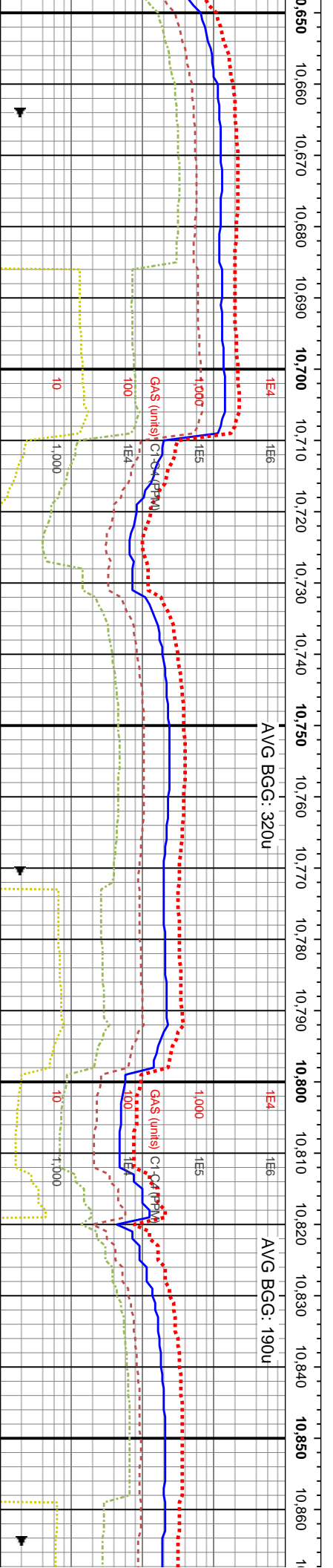
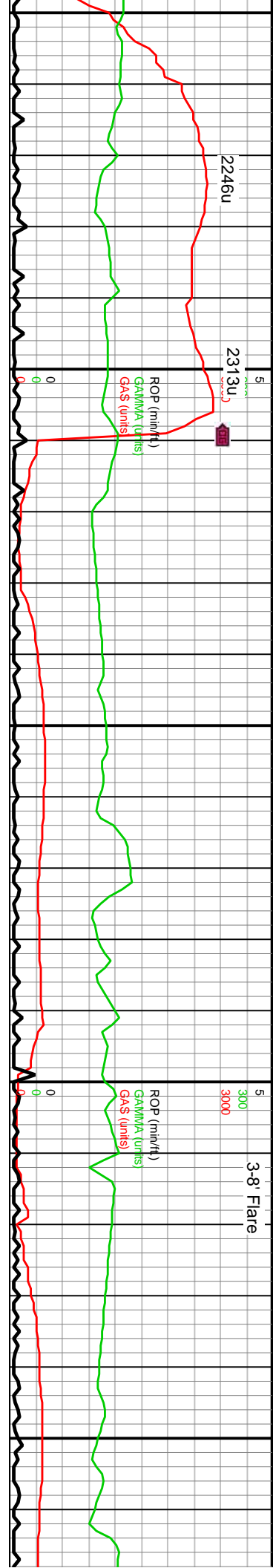
10220-10280 SD: pred med gy- lt gy brn, ip lt gy- amb trnsi, sme ofwht, abnt sl trnsi grs, sl frm- fri clus, ip sft clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau, rr pyr

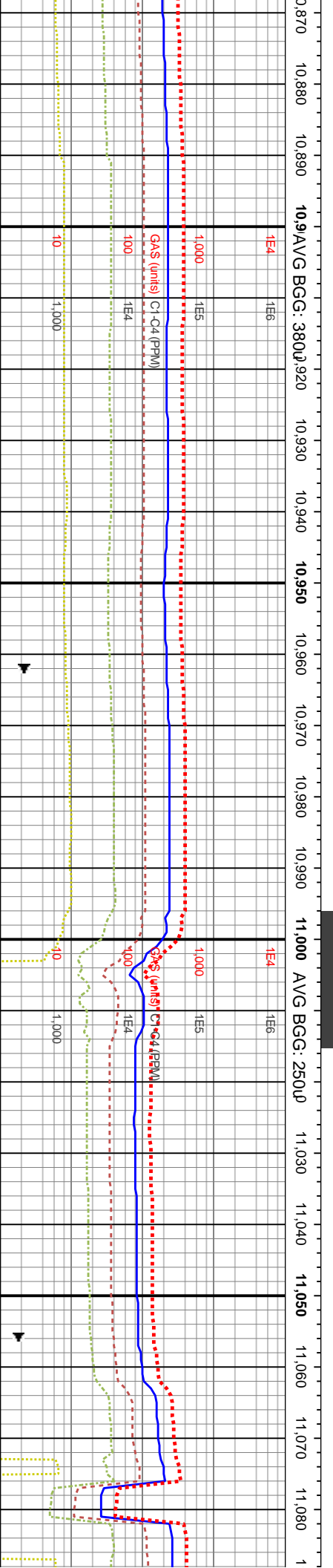
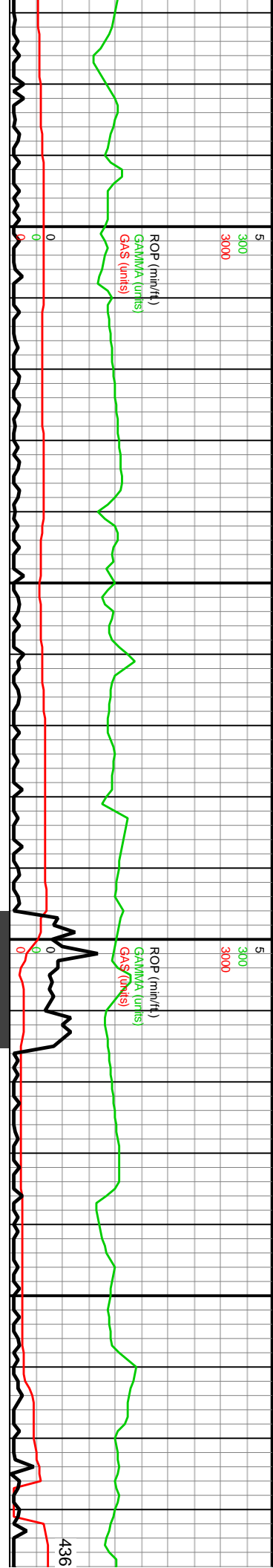
10280-10340 SD: pred med gy- lt gy brn, ip lt gy- amb trnsi, sme ofwht, abnt sl trnsi grs, sl frm- fri clus, ip sft clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau, rr pyr

10340-10400 SD: pred gy- lt gy, ip lt gy- ofwht trnsi, sme amb trnsi, abnt sl trnsi grs, sl hd- fri clus, ip sl frm clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau, rr pyr

10400-10460 SD: pred med gy- lt gy brn, ip lt gy- amb trnsi, sme ofwht, abnt sl trnsi grs, sl frm- fri clus, ip sft clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, occ uncongs grs, arg- sil cnt thru, sme mod calc, sme lse sil- calc cnt, tr glau, rr pyr







MD: 10,901'
TVD: 7,180.95'
Inclination: 90.44°
Azimuth: 272.71°
VS: 3,609.52'

WOB: 44Klbs
Rotary: 30RPM
Strokes: 240SPM
Pump Rate: 689GPM

MD: 10,997'
TVD: 7,180.35'
Inclination: 90.27°
Azimuth: 272.23°
VS: 3,705.52'

10880-10940 SD: pred lt gy, ip gy- offwht- trnsl, sme amb- gy trnsl, abnt sl trnsl grs, sl frm- fri clus, ip sft- frm clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, ip uncongs grs, arg- sil cnt thru, tr sh strg, sme mod calc, sme lse sil- calc cnt, tr glau, tr pyr	10940-11000 SD: pred lt gy, ip gy- offwht- trnsl, sme amb- gy trnsl, abnt sl trnsl grs, sl frm- fri clus, ip sft- frm clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, ip uncongs grs, arg- sil cnt thru, tr sh strg, sme mod calc, sme lse sil- calc cnt, tr glau, tr pyr	11000-11060 SD: pred lt gy, ip gy- offwht- trnsl, sme amb- gy trnsl, abnt sl trnsl grs, sl frm- fri clus, ip sft- frm clus, pred f- v f grd sd, sb rnd- ang grs, occ u f grs, pred grn sup clus, ip uncongs grs, arg- sil cnt thru, tr sh strg, sme mod calc, sme lse sil- calc cnt, tr glau, tr pyr	11060-11120 SD: p sme amb- gy trnsl, & clus, ip sft- frm clus, ang grs, occ u f grs, arg- sil mod calc, sme lse s
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