



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Johnson Trust 9_HZ

Location Sec. 13-T2N-R68W

State Colorado

Country USA

API Number 05-123-42313-00

Geographic Region DJ Basin

Spud Date 2/7/2016

County Weld

Rig Number Patterson UTI 346

Field Wattenberg

Drilling Completed 2/11/2016

Surface Coordinates SHL: 2041' FSL, 388' FWL Sec. 13 T2N R68W

Lat: 40° 8' 13.315 N

Long: 104° 57' 34.632 W

Bottom Hole Coordinates PBHL:

Lat: 40° 7' 31.210 N

Long: 104° 57' 35.611 W

Ground Elevation 4,923'

K.B. Elevation 4,947.5'

Logged Interval 5,000' **To** 12,343'

Total Depth 12,343'

Formation Codell

Type of Drilling Fluid Oil Based - invert

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: 02-08-16
Standby: 02-07-16
TD: 02-11-16

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

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Accessories

F FOSSIL

GASTROPOD

OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHERT

COAL - THIN BEDS

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLETS

PYRITE

SALT CAST

SANDY

SILICEOUS

SILTY

TUFFACEOUS

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

Other Sy

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

CORE - RECOVERED

TRIP

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

FAULT

WIRELIN

Engineering

NORMA

MINDEPTH

VUGGY

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

OVERTU

REVERS

CASING

CONNECTION (LEFT)

CONNECTION (RIGHT)

SIDEWA

SLIDE

SURVI

FRACTURE

FENESTRAL

E EARTHY

Porosity

CONNECTION (LEFT)

CONNECTION (RIGHT)

SIDEWA

SLIDE

SURVI

FRACTURE

FENESTRAL

E EARTHY

CONNECTION (LEFT)

CONNECTION (RIGHT)

SIDEWA

SLIDE

SURVI

FRACTURE

FENESTRAL

E EARTHY

CONNECTION (LEFT)

CONNECTION (RIGHT)

Symbols

FORMATION TOP L LITHOGRAPHIC

Rounding

LOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW SB SUBANG WS WACKESTONE

TURNED STRATA SN SUBRND

Sorting

SE FAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

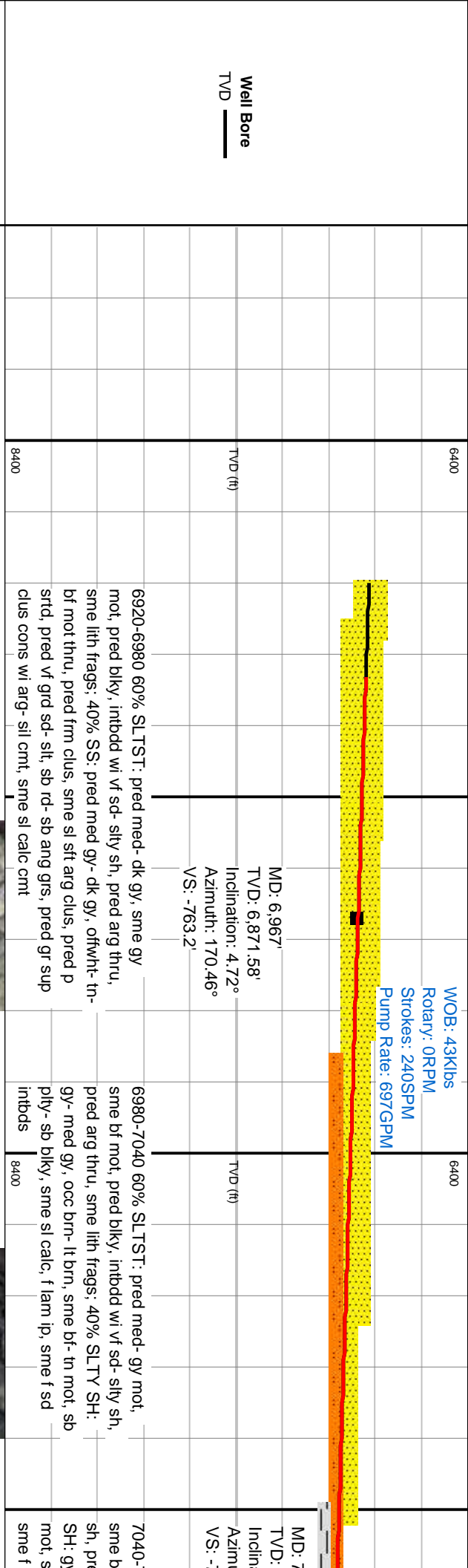
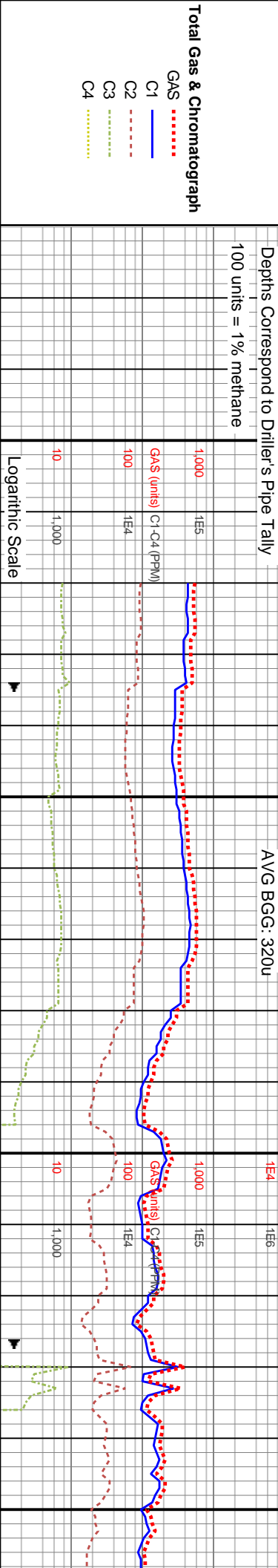
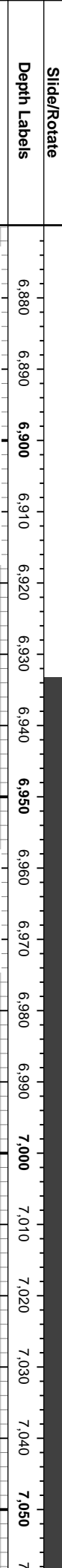
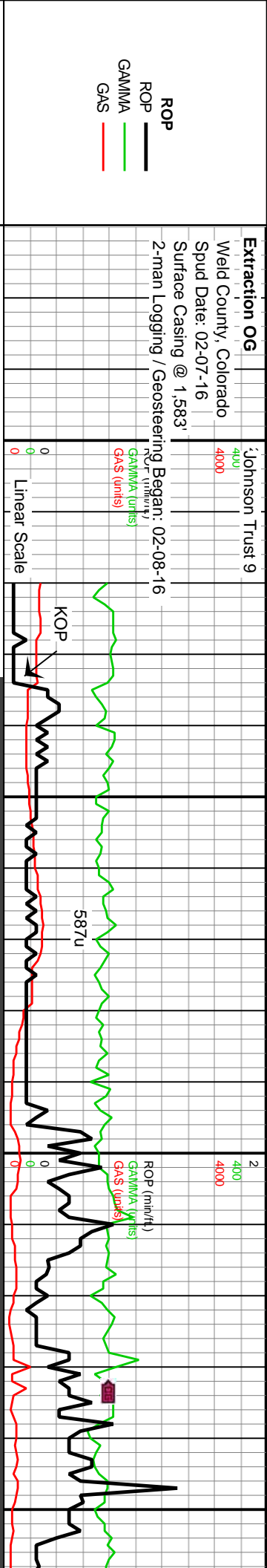
C CHALKY W WELL

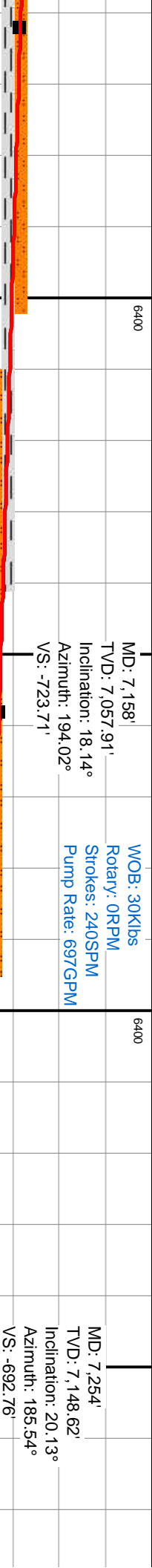
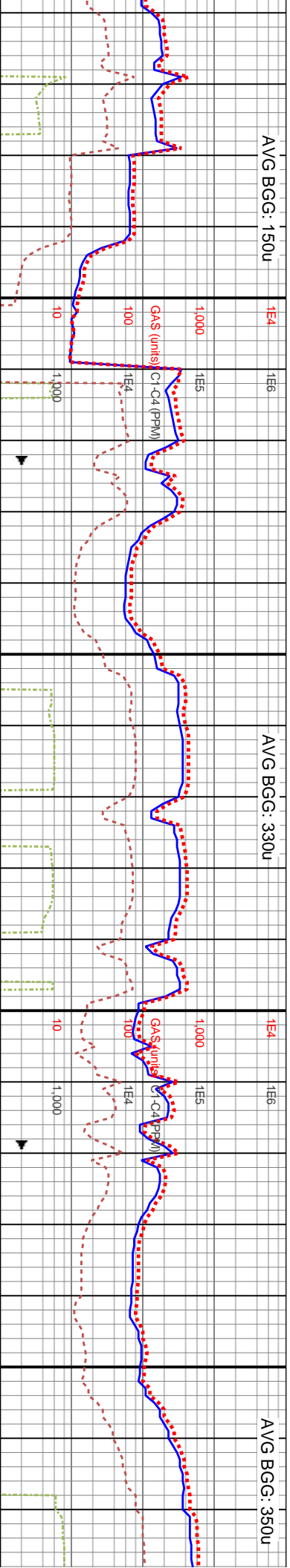
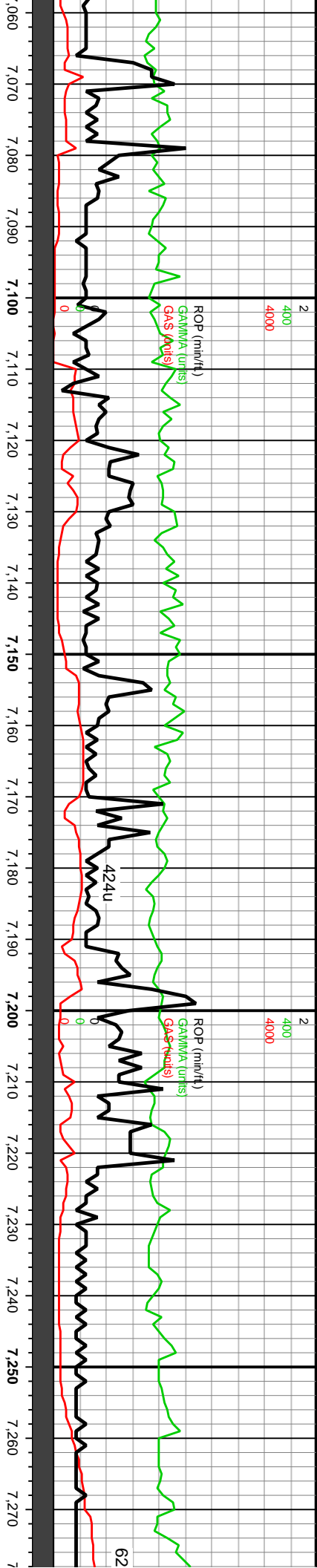
CRY CRYPTOXLN

SAS E EARTHY

IE TESTED - LEFT FX FINELYXLN

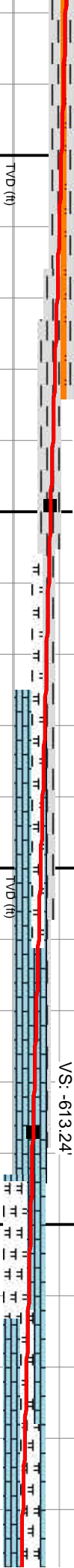
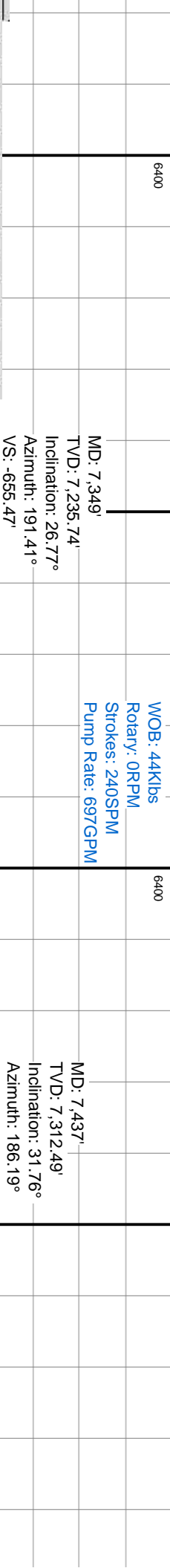
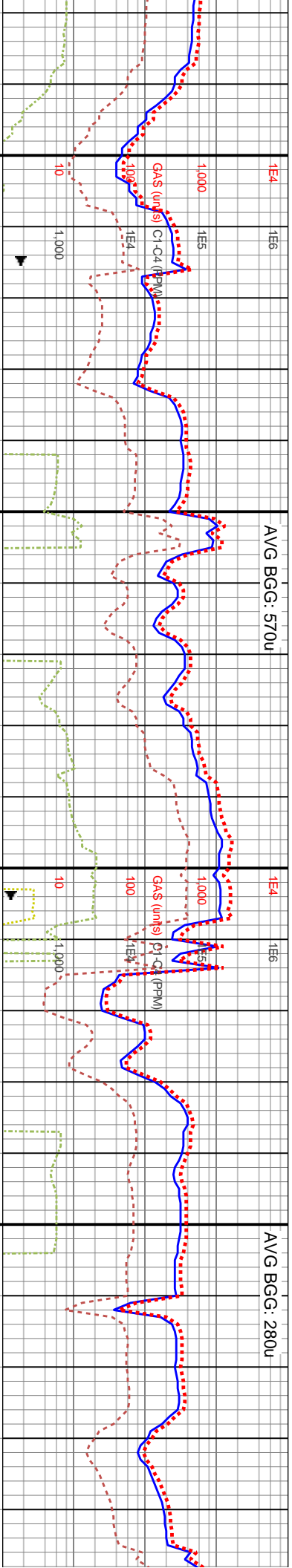
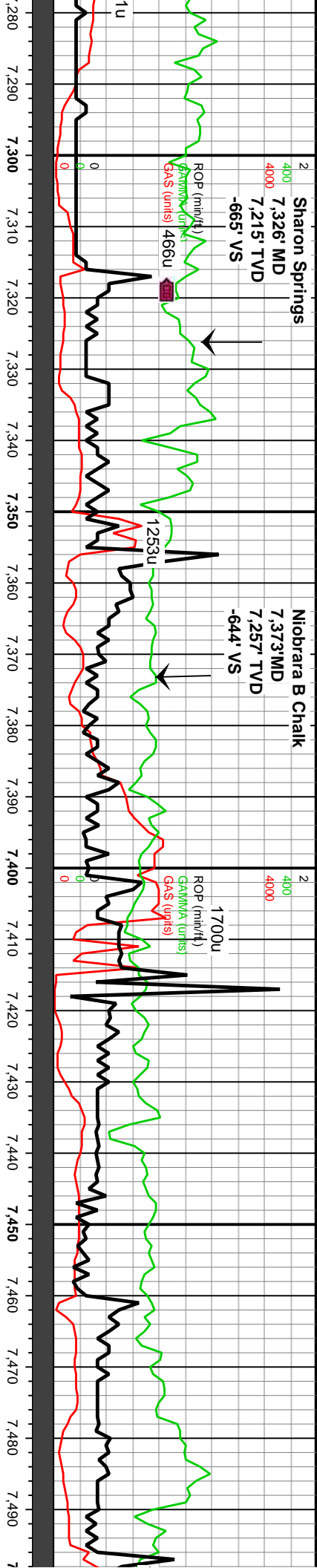
IE TESTED - RT GS GRAINSTONE





7,062' 6,965.41' ation: 12.8° uth: 184.63° 748.83'	7100-7100 60% SLTST: pred med- gy mot, f mot, pred blkly, intbdd wi vf sd- silty med arg thru, sme lith frags; 40% SLTY	7100-7160 50% SLTY SH: gy- med gy, occ brn- lt brn, sme bf- tn mot, sb ply- sb blkly, sme sl calc, f lam ip, tr f sd intbds; 50% SLTST: pred med- gy mot, sme bf mot, pred blkly, intbdd wi vf sd- silty sh, pred arg thru, sme sl sdy, sme lith frags	7160-7220 50% SLTY SH: gy- med gy, occ brn- lt brn, sme bf- tn mot, sb ply- sb blkly, sme sl calc, f lam ip, tr f sd intbds; 50% SLTST: pred med- gy mot, sme bf mot, pred blkly, intbdd wi vf sd- silty sh, pred arg thru, sme sl sdy, sme lith frags	7220-7280 70% SLTY SH: gy- med gy, occ brn- lt brn, sme bf- tn mot, sb ply- sb blkly, sme sl calc, f lam ip, tr f sd intbds; 30% SLTST: pred med- gy mot, sme bf mot, pred blkly, intbdd wi vf sd- silty sh, pred arg thru, sme sl sdy, sme lith frags
8400	8400	8400	8400	8400





7280-7340 80% SLTY SH: med- dk gy, occ brn- lt brn, sme bf- in mot, sb ply- sb blk, sme sl calc, sme ise cal, sme mrly intbds, f lam ip, 20% SLTST: pred med gy, offwht- bf mot, pred blk, intbodd wi vf sd- silty sh, pred arg thru, lith frags

7360-7400 60% CHK: pred medgy- gy, tr dk gy, lt gy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ split, rthy- chky txt, sme cln- sl cln chk, sl arg thru, tr bent, tr pyr, mod- abnt calc incl, sme carb mrly intbds, 40% SLTY SH: med gy- blk, sme brn, occ offwht mot, pred sl frm, sb ply- ply, occ sb blk, sme sm- silty tex, sme f lam, sl- mod calc

7400-7460 70% CHK: pred medgy- gy, tr dk gy, lt gy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ split, rthy- chky txt, sme cln- sl cln chk, sl arg thru, tr bent, tr pyr, mod- abnt calc incl, sme carb mrly intbds: 30% MRLST: dk gy- blk, blk- sb ply, frm- sl frm, sl silty, sl carb

7400-7460 70% CHK: pred medgy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ split, rthy- chky txt, sme cln- sl cln chk, sl arg thru, tr bent, tr pyr, mod- abnt calc incl, sme carb mrly intbds: 30% MRLST: dk gy- blk, blk- sb ply, frm- sl silty, sl carb



Niobrara C

7,506 MD

7,370' TVD

-575' VS

29/16

Bit #:

2

Type: MD516

Size: 7 7/8

Depth In: 1,585'

Depth Out: 7,530'

Hours: 16 hrs

Jets: 8*10

S/N: JK9898

3

Bit #:

1

Type: FH08

Size: 7 7/8

Depth In: 7,530'

Depth Out: 7,688'

Hours: 5 hrs

Avg Ft/Hr: 32 /h

Jets: 3*20

S/N: RH4296

Fort Hayes

7,680' MD

7,779' TVD

-442' VS

4

Bit #:

4

Type: SK513D

Size: 7 7/8

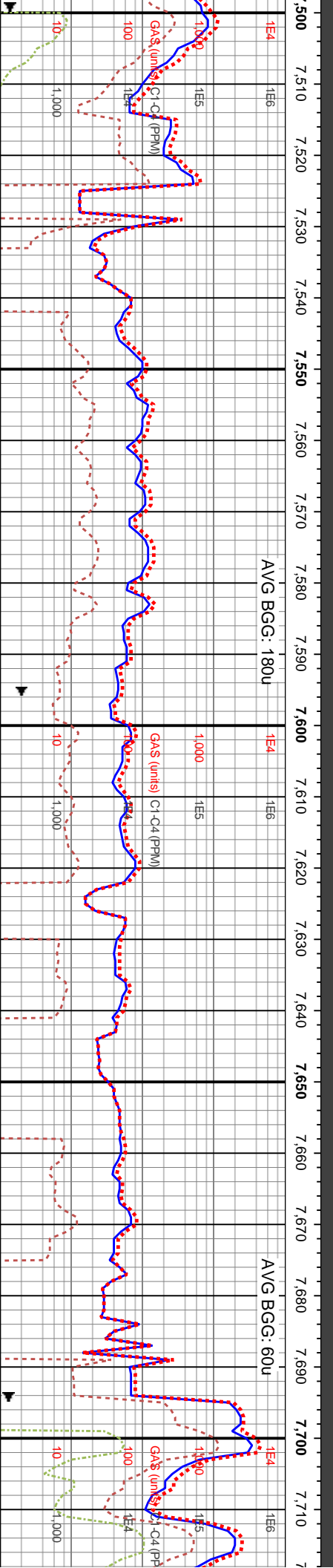
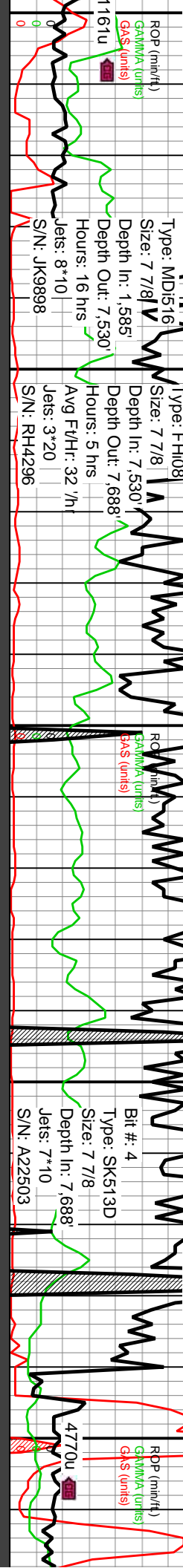
Depth In: 7,688'

Depth Out: 7,710'

Hours: 7*10

Jets: 7*10

S/N: A22503



6400

DP @ 7,520'

MD: 7,532'

TVD: 7,390.67'

Inclination: 37.39°

Azimuth: 182.93°

VS: -559.28'

WOB: 46klbs

Rotary: 0RPM

Strokes: 206SPM

Pump Rate: 598GPM

6400

MD: 7,626'

TVD: 7,453.56'

Inclination: 58.09°

Azimuth: 181.1°

VS: -490.13'

NW @ 7,640'

MD: 7,760

TVD: 7,640

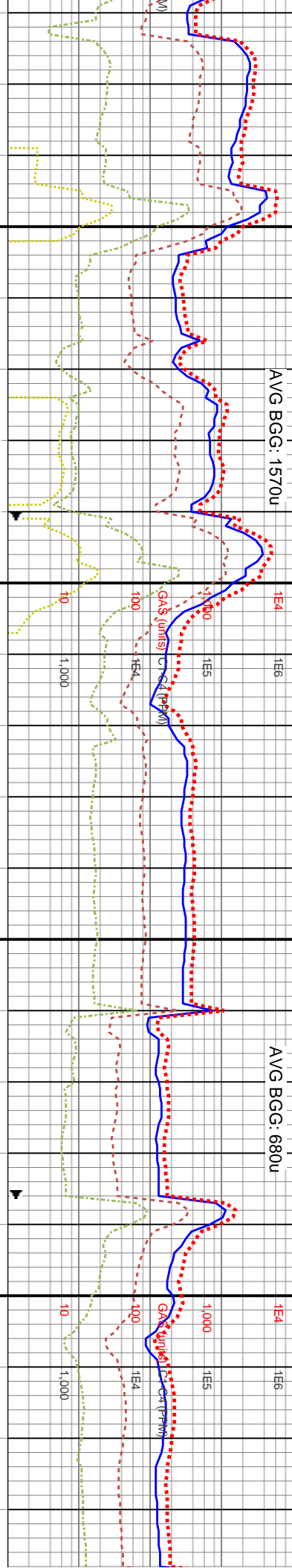
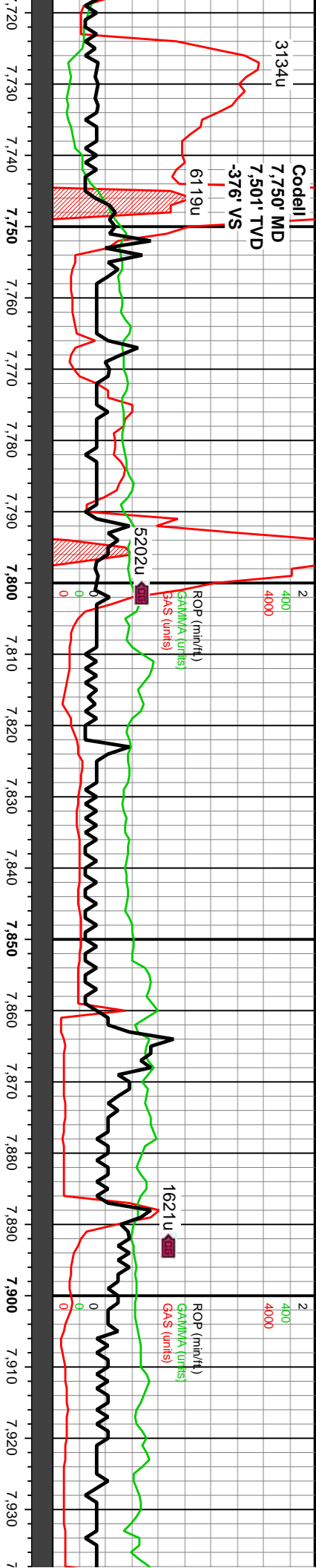
Inclination: 58.09°

Azimuth: 181.1°

VS: -490.13'

gy, tr dk gy, lt gy- m, pred blkly- sb n- sl cin chk, sl arg incl, sme carb mrlly y- sb ply, frm- sl	7520-7580 60% CHK: pred med gy- gy, sme lt brn- gy, gy- bf- tn mot, pred frm, ip sl frm- sft, pred blkly- sb blkly, occ splt, rthy- chky txt, sl- mod arg thru, tr pyr, sme lse cal, calc incl wi 40% mrlly- stly intbds, tr LS	7580-7640 40% CHK: pred med gy- gy, sme lt brn- gy, gy- bf- tn mot, pred frm, ip sl frm- sft, pred blkly- sb blkly, occ splt, rthy- chky txt, sl- mod arg thru, tr pyr, sme lse cal, calc incl wi 40% mrlly- stly intbds; 20% LS: lt brn- brn, sme bf- tn, ip med gy mot, sme offwht, pred blkly- sb blkly, ip sb ply, pred frm- hd, ip sl frm, pred mudst wi sme intbd carb grs	7640-7700 LS: gy brn-brn-bf-tn, occ v lt gy, hd sb blkly-ply ctgs, pred mudst, occ wkst, occ carb incl, tr vf pyr, hi calc	7700-7760 LS (7 sb blkly-ply ctgs, carb incl, tr vf pyr gy brn-dk gy brn grs, gr sup clus c lamm, non-sl calc
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WOB: 26Klbs
Rotary: 10RPM
Strokes: 200SPM
Pump Rate: 581GPM

MD: 7,818'
TVD: 7,517.48'
Inclination: 78.01°
Azimuth: 177.51°
VS: -310.62'

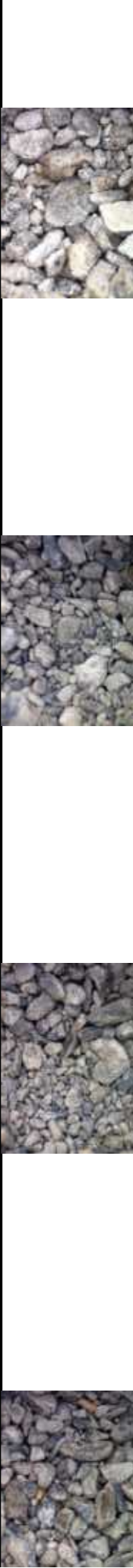
MD: 7,913'
TVD: 7,529.82'
Inclination: 87.05°
Azimuth: 177.51°
VS: -216.6'

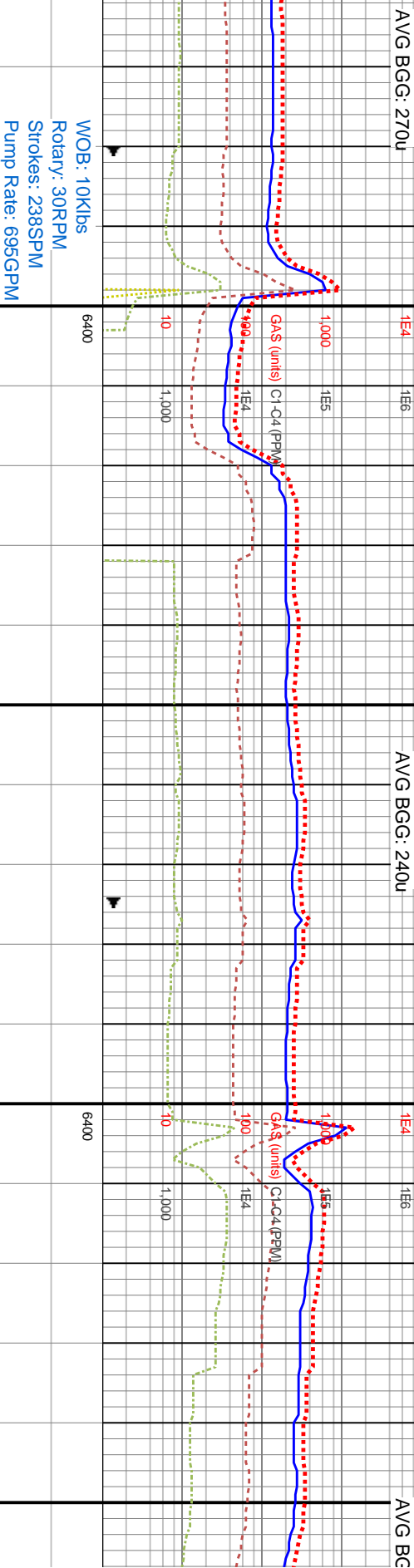
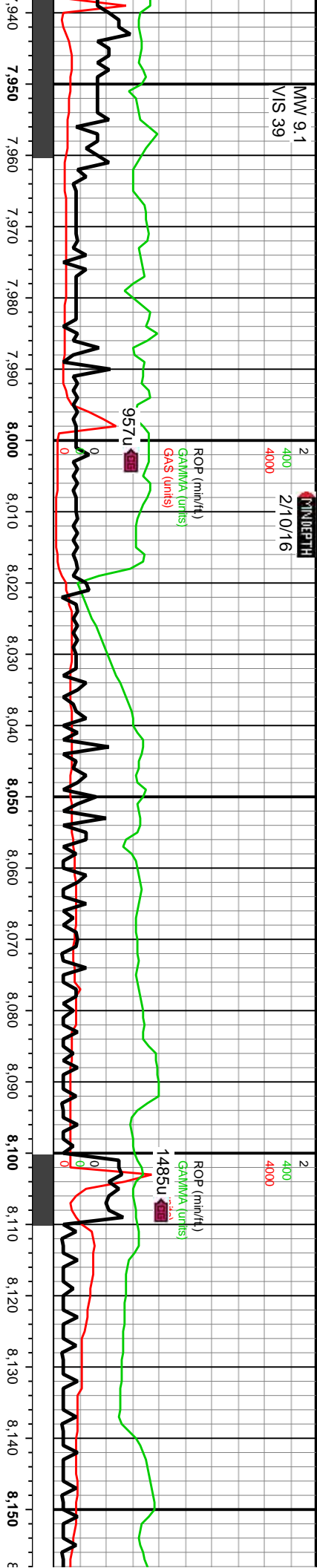
7760-7820 SS (50%): gy-gy brn, occ off wh-lt gy
brn-dk gy brn wi o stn ip, mod strd vf-u f sb rd-rd grs,
gr sup clus cons wi arg cmt, silic ip, rr brn-blk lamn,
non-sl calc-l calc ip, LS (50%): gy brn-brn-bf-tn, occ v
lt gy, hd sb blk-y-pty ctgs, mudst-wkst, incr pkst grdg
to SS, occ carb incl, tr vf pyr, ht calc

7820-7880 SS: gy-gy brn, occ off wh-lt gy brn-dk
gy brn wi o stn ip, mod strd vf-u f sb rd-rd grs, gr
sup clus cons wi arg cmt, silic ip, rr brn-blk lamn,
non-sl calc-l calc ip

7880-7940 SS (80%): lt gy-gy-gy brn, occ off wh-lt gy
brn-bf, frm-slt fri gr sup clus cons wi arg & silic cmt,
vf-f sd grs grdg down to silt ip, tr vf pyr, non-sl-mod
calc, grdg down to SLTST: pred gy-dk gy, occ tn, frm
ply ctgs, sily tex, tr vf pyr, non calc

8400



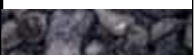


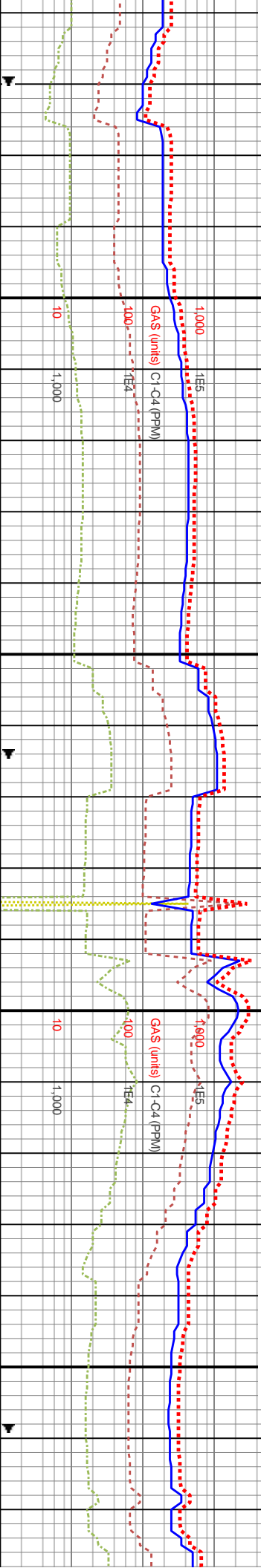
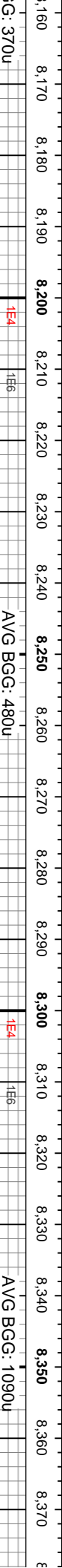
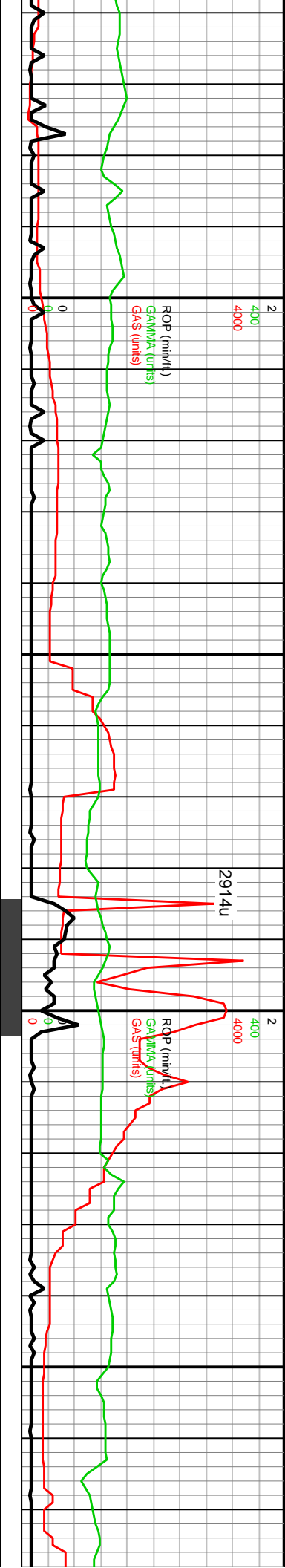
7940-8000 SS (80%): lt gy-gy-gy brn, occ off wh-lt gy
brn-bf, pred p strd vf-f sd grs grdg down to silt ip,
frm-sil fri gr sup clus cons wi arg & silc cnt, tr vf pyr,
non-sl-mod calc, grdg down to SLTST: pred gy-dk gy,
occ tn, frm pily ctgs, silty tex, tr vf pyr, non calc

8000-8060 SS (75%): lt gy-gy-gy brn, occ off wh-lt gy
brn-bf, frm-sil fri gr sup clus cons wi arg & silc cnt,
vf-f sd grs grdg down to silt ip, tr vf pyr, non-sl-mod
calc, grdg down to 25% SLTST: pred gy-dk gy, occ
tn, frm pily ctgs, silty tex, tr vf pyr, non calc

8060-8120 SS (75%): lt gy-gy-gy brn, occ off wh-lt
gy brn-bf, pred p strd vf-f sd grs grdg down to silt ip,
frm-sil fri gr sup clus cons wi arg & silc cnt, tr vf
pyr, non-sl-mod calc, grdg down to SLTST (25%):
pred gy-dk gy, occ tn, frm pily ctgs, silty tex, tr vf pyr,
non calc

8120-8180 SS (75%): lt gy-gy-gy t
gy brn-bf, pred p strd vf-f sd grs gr
frm-sil fri gr sup clus cons wi arg &
pyr, non-sl-mod calc, grdg down to
pred gy-dk gy, occ tn, frm pily ctgs,
non calc





WOB: 44Klbs
Rotary: 65RPM
Strokes: 238SPM
Pump Rate: 695GPM

MD: 8,196'
TVD: 7,526.79'
Inclination: 92.88°
Azimuth: 178.88°
VS: 66.21' TVD (ft)

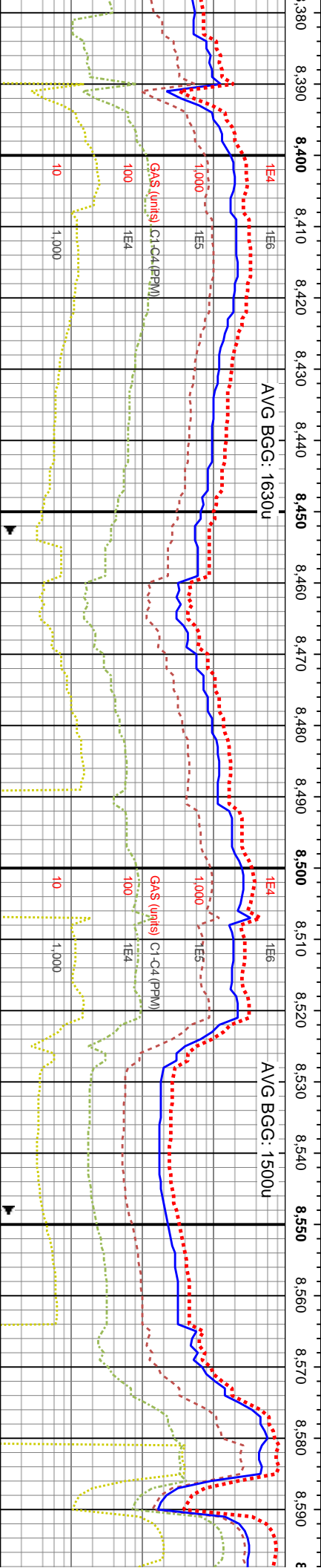
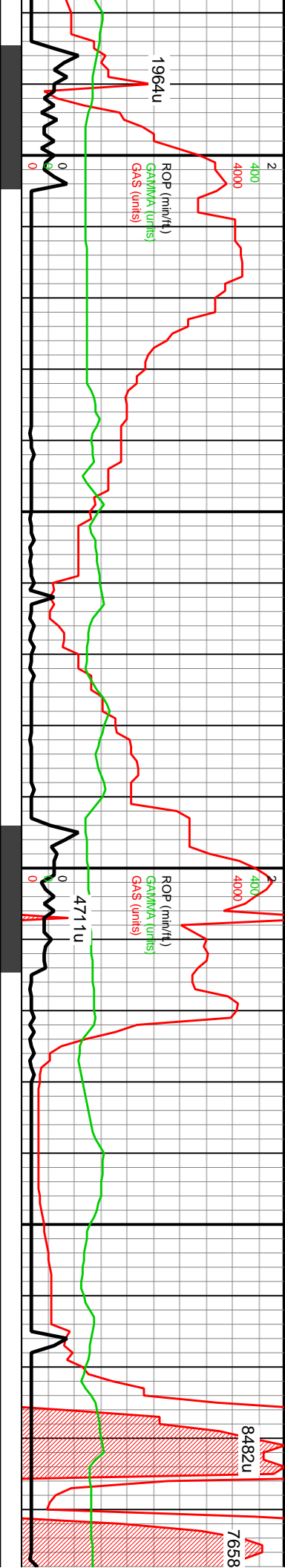
8180-8240 SS (75%): lt gy-gy brn, occ off wh-it gy
brn-bf, frm-sil fri gr sup clus cons wi arg & silic cnt,
vf-f sd grs grdg down to silt ip, tr vf pyr, non-si-mod
calc, grdg down to 25% SLTST: pred gy-dk gy, occ tn,
frm pily ctgs, silty tex, tr vf pyr, non calc

8240-8300 SS (80%): pred lt gy-gy, occ off wh-gy
brn, frm-sil fri gr sup clus cons wi arg & silic cnt, vf-f
sd grs grdg down to silt ip, tr vf pyr, non-si-mod calc,
grdg down to 20% SLTST: gy-dk gy, frm-brit, med hi
fis pily ctgs, silty tex, tr vf pyr, non calc

8300-8360 SS (80%): off wh-it gy-occ gy brn,
pred p srtf vf-f sd grs grdg down to silt ip, frm-sil
fri gr sup clus cons wi arg & silic cnt, tr vf pyr,
non-si-mod calc, grdg down to SLTST (20%):
gy-dk gy, frm pily ctgs, silty tex, tr vf pyr, non calc

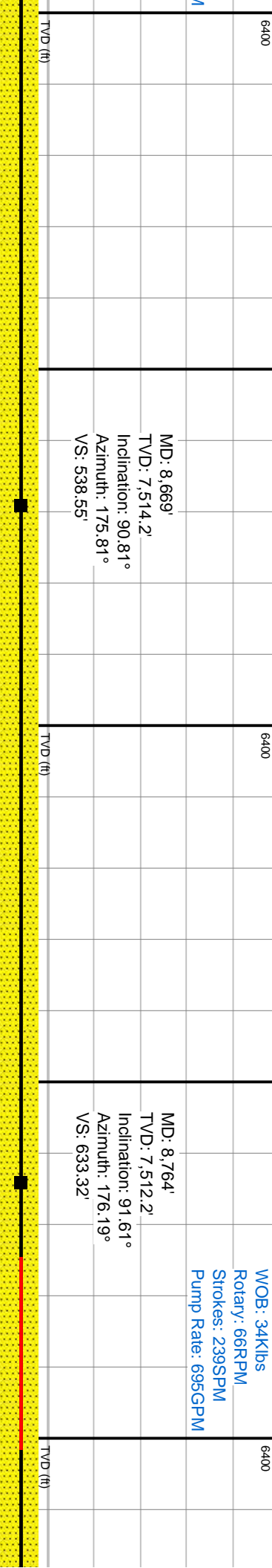
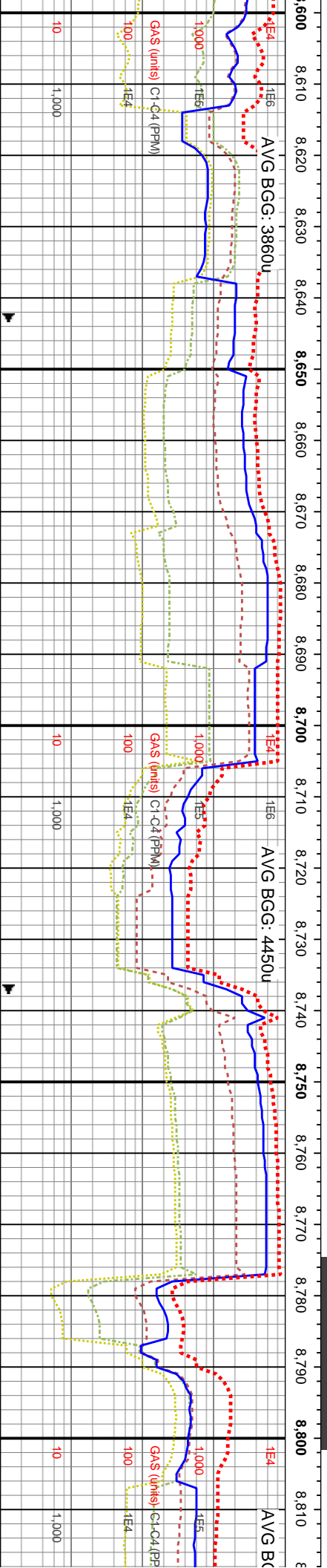
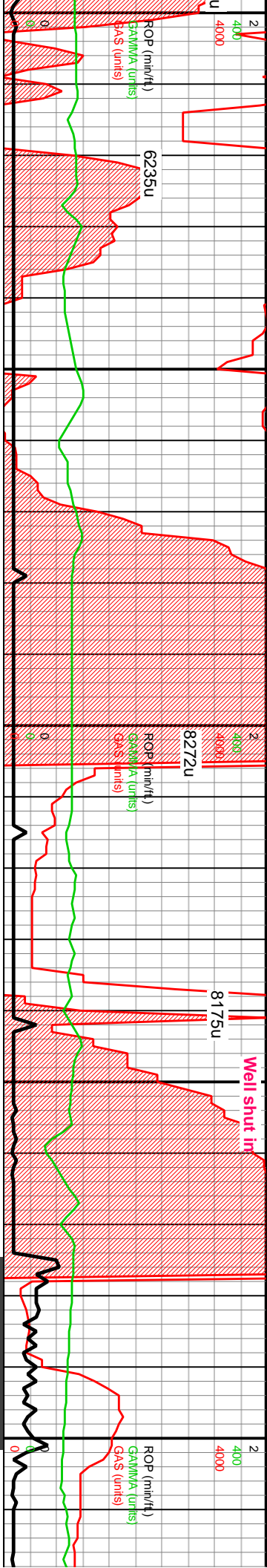
8360-8420 SS
brn, frm-sil fri g
vf-f sd grs grdg
calc, grdg down
med hi fis pily c





OIB: 42Klbs Rotary: 65RPM Strokes: 240SPM Pump Rate: 697GPM		6400			6400			WOB: 46Klbs Rotary: 65RPM Strokes: 238SPM Pump Rate: 695GPM		
MD: 8,385' TVD: 7,519.12' Inclination: 91.64° Azimuth: 177.48° VS: 254.97'		TVD (ft)	8420-8480 SS (80%): off wh-lt gy-occ gy brn, pred p srtf vf-f sd grs grdg down to silt ip, frm-sil fri gr sup clus cons wi arg & silic cnt, tr vf pyr, non-sl-mod calc, grdg down to SLTST (20%): gy-dk gy, frm ply cigs, silty tex, tr vf pyr, non calc		8400	8480-8540 SS (80%): lt gy-gy-gy brn, occ off wh-lt gy brn-bf, pred p srtf vf-f sd grs grdg down to silt ip, frm-sil fri gr sup clus cons wi arg & silic cnt, tr vf pyr, non-sl-mod calc, grdg down to SLTST (20%): pred gy-dk gy frm ply cigs, silty tex, tr vf pyr, tr sil vn, non calc		8400	MD: 8,575' TVD: 7,514.8' Inclination: 89.93° Azimuth: 176.65° VS: 444.74'	
(80%): pred lt gy-gy, occ off wh-gy r sup clus cons wi arg & silic cnt, down to silt ip, tr vf pyr, non-sl-mod clg, sily tex, tr vf pyr, non calc		8400			8400					





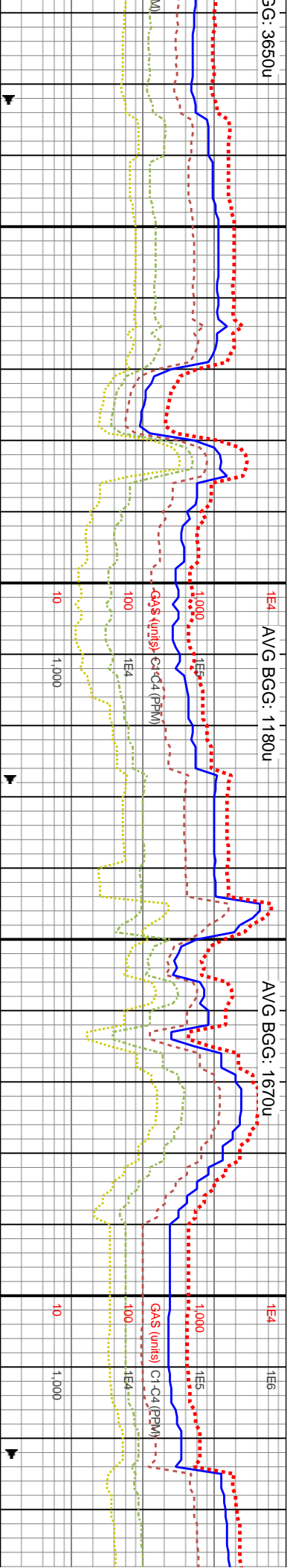
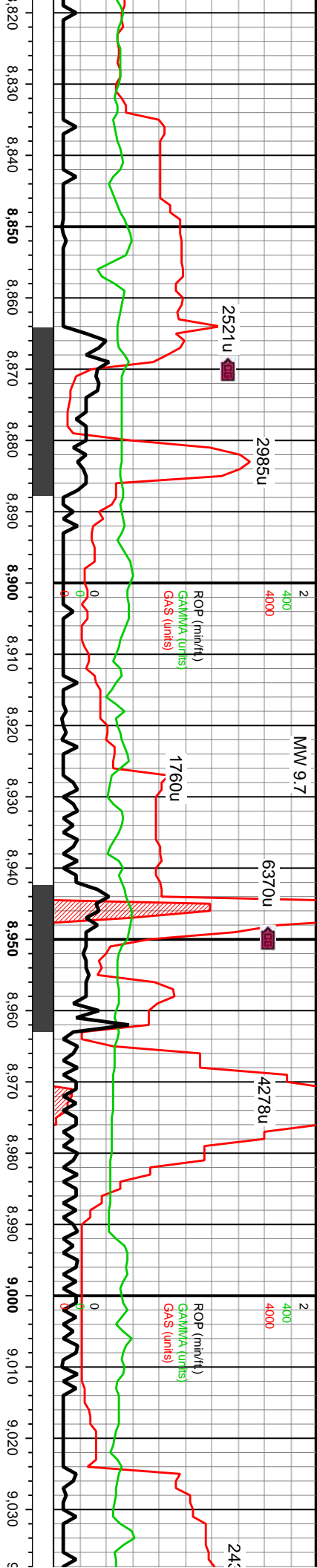
8600-8660 SS (80%): lt gy-gy-gy brn, occ off wh-lt gy
brn-bf, pred p strd vf-f sd grs grdg down to sil ip,
frm-sil fri gr sup clus cons wi arg & silc cnt, tr vf pyr,
non-sl-mod calc, grdg down to SLTST (20%): pred
gy-dk gy frm ply clgs, silty tex, tr vf pyr, tr sil vn, non calc

8660-8720 SS (80%): pred lt gy-lt gy brn-med gy brn,
occ off wh-lt gy brn-bf, p-mod strd vf-f sd grs grdg
down to dk gy silst ip, frm-sil fri gr sup clus cons wi
arg & silc cnt, tr vf pyr, non-sl-mod calc, grdg down to
SLTST (20%): pred gy-dk gy frm ply clgs, silty tex, tr vf
pyr, tr sil vn, non calc

8720-8780 SS: off wh-lt gy, occ dk gy brn wi o sin,
p-mod strd vf-u f sd grs, frm-sil fri gr sup clus
cons wi arg & silc cnt, occ mtx sup, occ uncons
sd, tr vf pyr, non-sl-mod calc

8780-8840 SS: pred off wh-lt gy, o
sin, p-mod strd vf-u f sd grs, frm-sil
clus cons wi arg & silc cnt, occ-tr
pyr, non-sl-mod calc





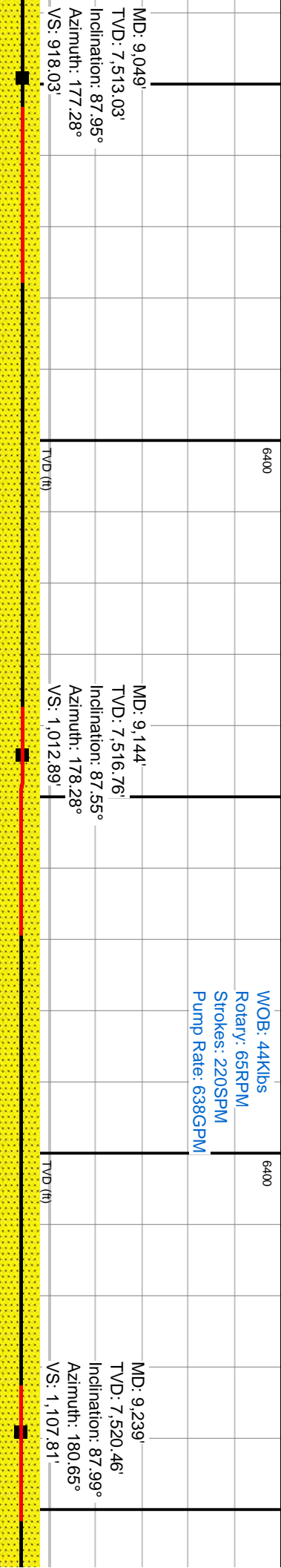
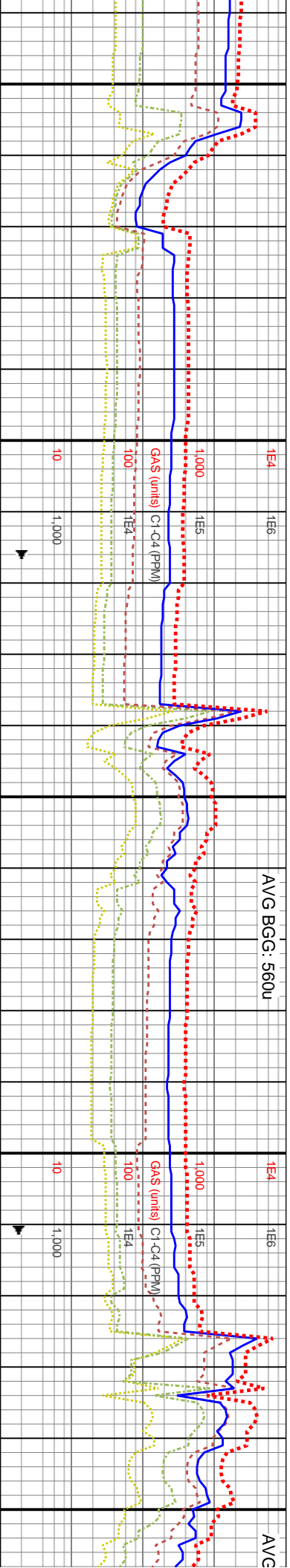
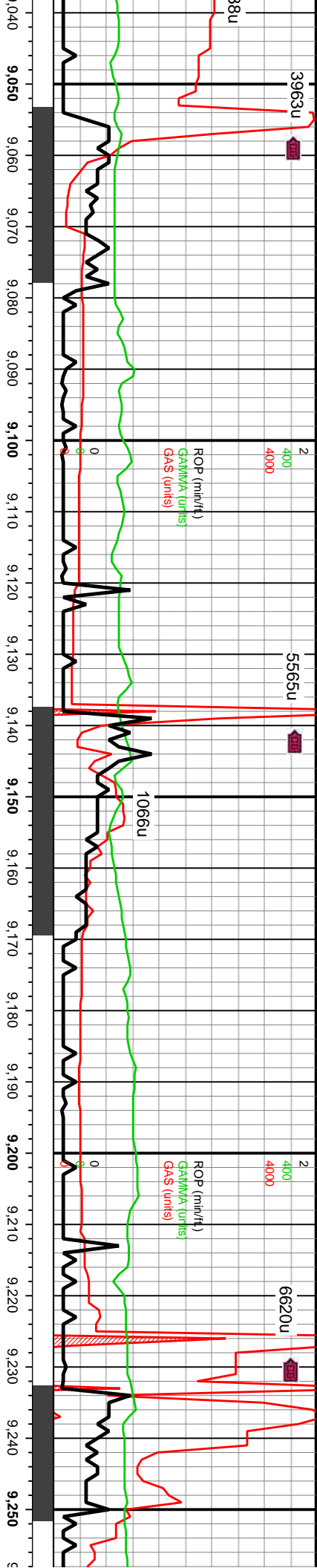
MD: 8,860'
TVD: 7,509.67'
Inclination: 91.41°
Azimuth: 177.54°
VS: 729.15'

MD: 8,954'
TVD: 7,509.92'
Inclination: 88.29°
Azimuth: 177.34°
VS: 823.06'

WOB: 30Klbs
Rotary: 66RPM
Strokes: 200SPM
Pump Rate: 581GPM

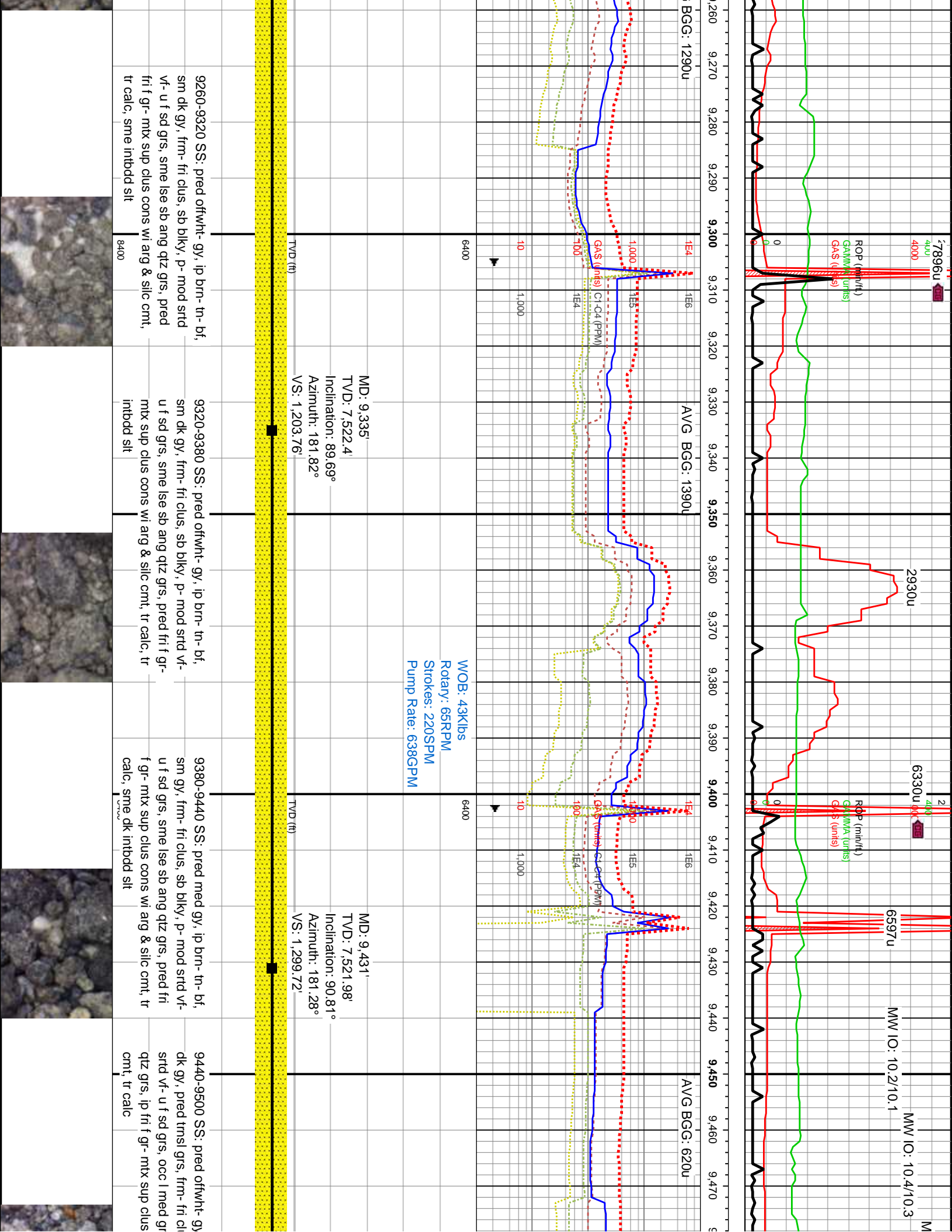
DP @ 9,000'

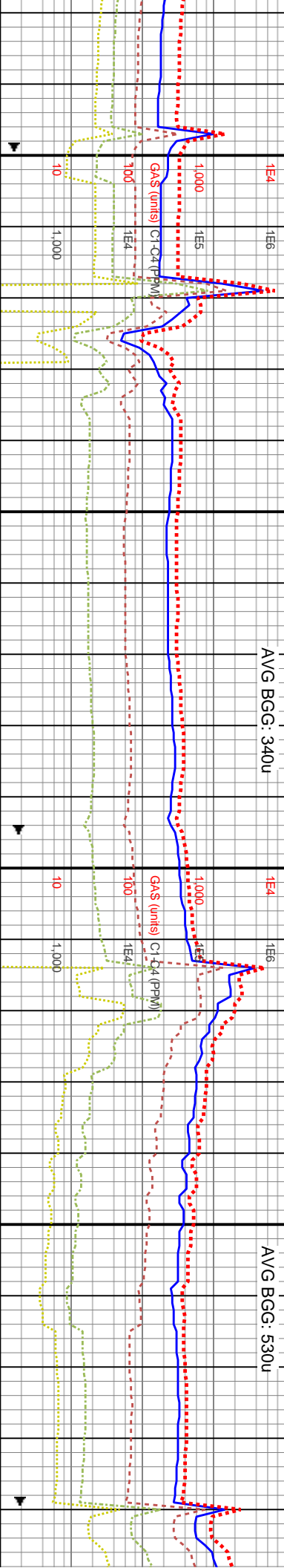
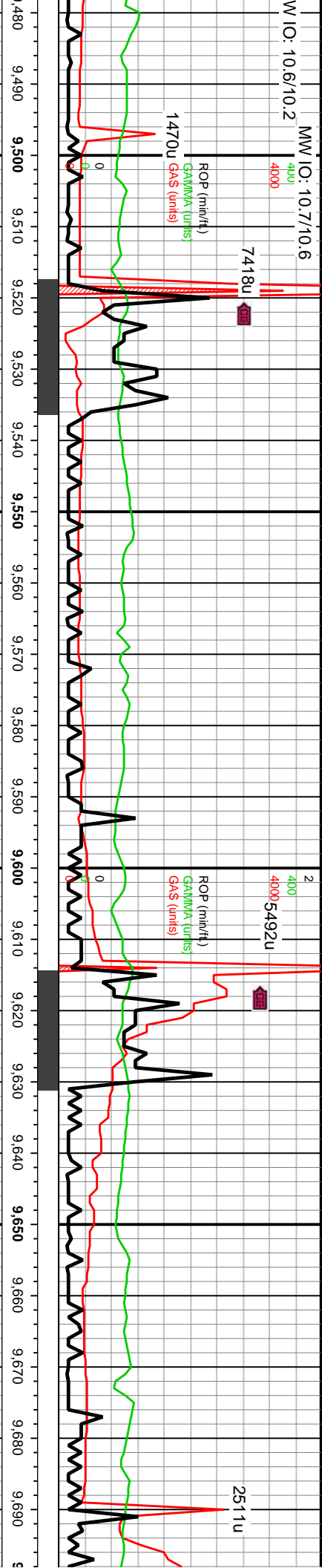
occ dk gy brn wi o	8840-8900 SS: off wh-it gy, occ dk gy brn wi o strn, p-mod strd vf-u f sd grs, frm-sil fri gr sup clus cons wi arg & silc cnt, occ mix sup, occ uncons sd, tr vf pyr, non-si-mod calc	8900-8960 SS: pred off wh-it gy, occ dk gy brn wi o strn, p-mod strd vf-u f sd grs, frm-sil fri gr-mix sup clus cons wi arg & silc cnt, occ-rr uncons sd ip, tr vf pyr, non-si-mod calc	8960-9020 SS: pred offwhit- gy, ip brn- tn- bf, sm dk gy, frm- fri clus, sb blkly, p- mod strd vf- u f sd grs, abnt lse sb ang qtz grs, ip fri f gr- mix sup clus cons wi arg & silc cnt, tr calc, sme inbdd slt	9020 sm d vf- u gr- m calc,
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MD: 9,049' TVD: 7,513.03' Inclination: 87.95° Azimuth: 177.28° VS: 918.03'	MD: 9,144' TVD: 7,516.76' Inclination: 87.55° Azimuth: 178.28° VS: 1,012.89'	MD: 9,239' TVD: 7,520.46' Inclination: 87.99° Azimuth: 180.65° VS: 1,107.81'
9080 SS: pred offwht- gy, ip brn- tn- bf, k gy, frm- fri clus, sb blkly, p- mod strd f sd grs, abnt lse sb ang qtz grs, ip fri f ix sup clus cons wi arg & silc cnt, tr sme intbdd slt	9080-9140 SS: pred offwht- gy, ip brn- tn- bf, sm dk gy, frm- fri clus, sb blkly, p- mod strd vf- u f sd grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cnt, tr calc, sme intbdd slt	9140-9200 SS: pred offwht- gy, ip brn- tn- bf, sm dk gy, frm- fri clus, sb blkly, p- mod strd vf- u f sd grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cnt, tr calc, sme intbdd slt



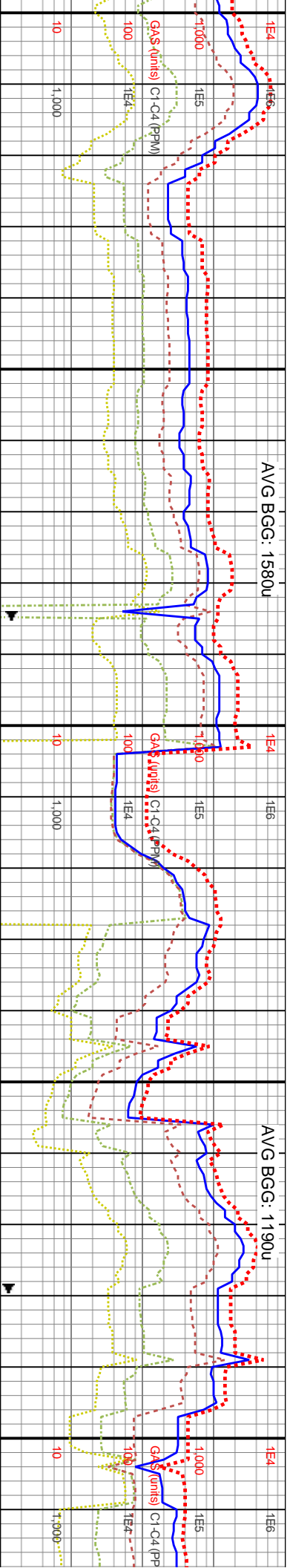
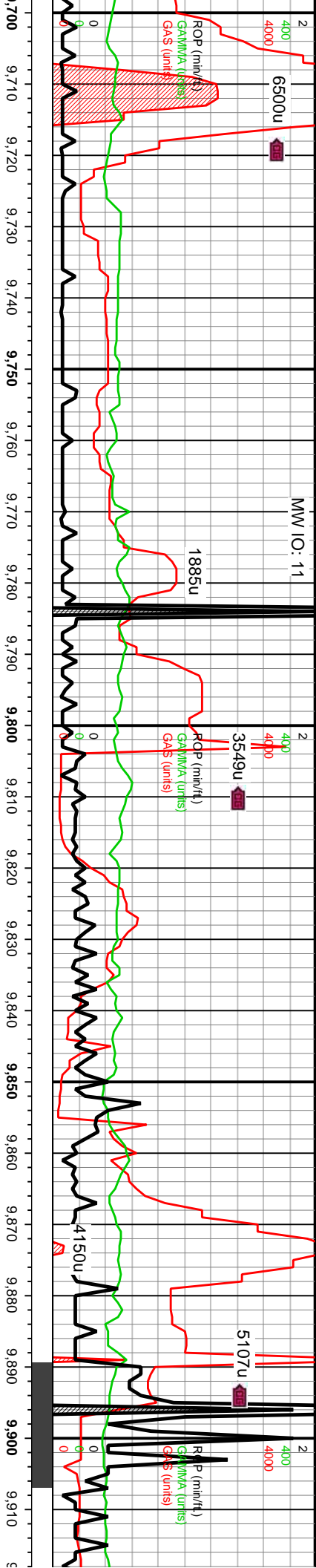




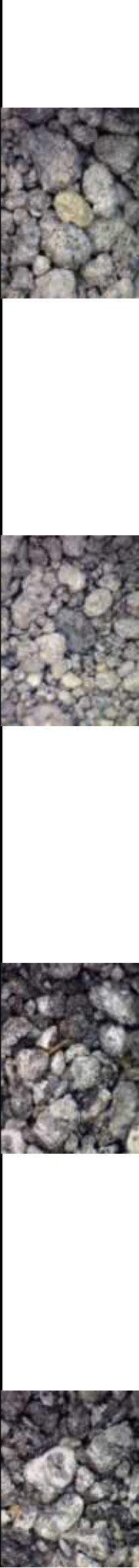
6400	MD: 9,526' TVD: 7,521' Inclination: 90.37° Azimuth: 181.24° VS: 1,394.69'	TVD (ft)
6400	MD: 9,622' TVD: 7,522.08' Inclination: 89.73° Azimuth: 180.56° VS: 1,585.66'	TVD (ft)

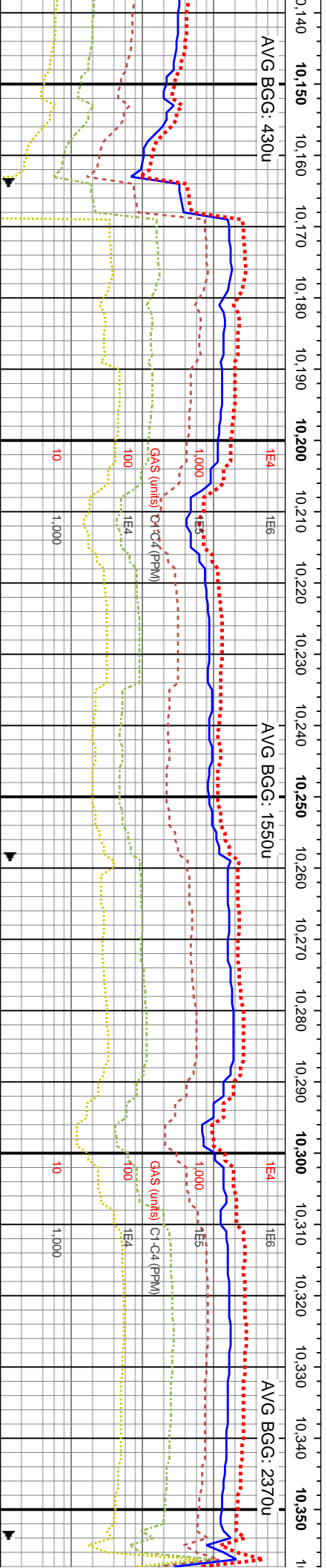
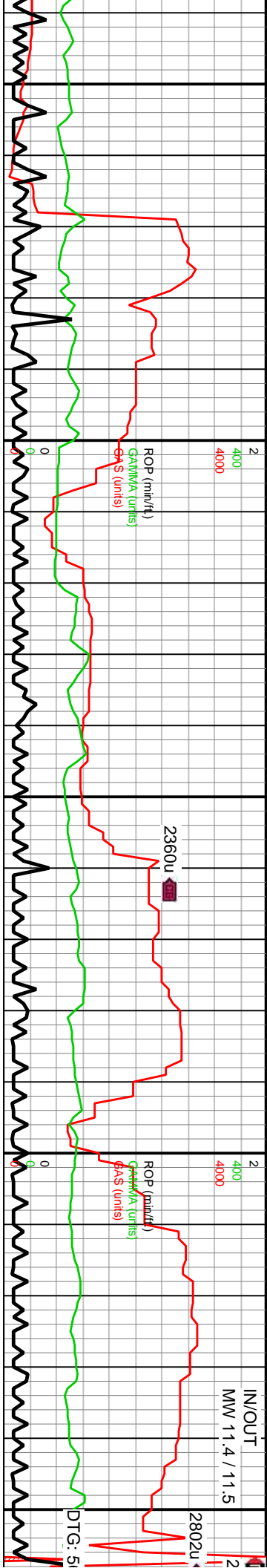
9500-9560 SS: pred offwht- gy, ip brn- tn- bf, sm dk gy, pred trnsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, tr calc	9560-9620 SS: pred offwht- gy, ip brn- tn- bf, sm dk gy, pred trnsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, tr calc	9620-9680 SS: offwht gy, occ gy, brn-tn-bf ip, sm dk gy, pred trnsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, tr calc	9680-9740 SS: gy, pred trnsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus
8400	8400	8400	





9740-9800 SS: offwht gy, occ gy, brn-tn-bf ip, sm dk gy, pred tmsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f fri f gr- mtx sup clus cons wi arg & silc cmt, tr calc	9800-9860 SS: pred off wh- lt- gy- gy, occ dk gy grdg down to slst ip, p- mod strd vf- f sd grs, occ u f- med uncons sd grs, pred gr sup clus cons wi silc arg & dolc cmt, occ dk slst lithic frags ip, non- mod calc, grdg to 10% SLTST: dk gy, occ dk gy brn, frm- brit med- hi fis sb blkly- pty ctgs, slty- sdy gt tex ip, tr vf pyr, non calc	9860-9920 SS: off wh- lt- gy- gy, occ dk gy- dk gy brn, p- mod strd vf- f sd grs, occ u f- med uncons sd grs, pred gr sup clus cons wi silc arg & dolc cmt, occ dk slst lithic frags ip, non- mod calc, sup clus, occ dk slst frags ip, non- mod calc, occ dk gy grdg down to SLTST: dk gy, occ dk gy brn, frm- brit med- hi fis sb blkly- pty ctgs, slty- sdy gt tex ip, tr vf pyr, non calc
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WOB: 23Klbs
Rotary: 71RPM
Strokes: 206SPM
Pump Rate: 597GPM

MD: 10,190'
TVD: 7,531.51'
Inclination: 86.92°
Azimuth: 180.6°
VS: 2,058.31'

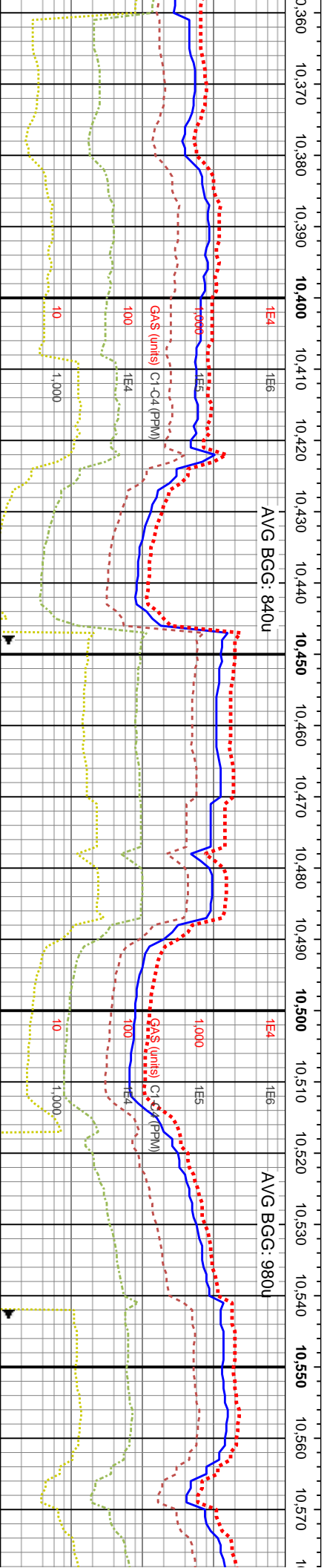
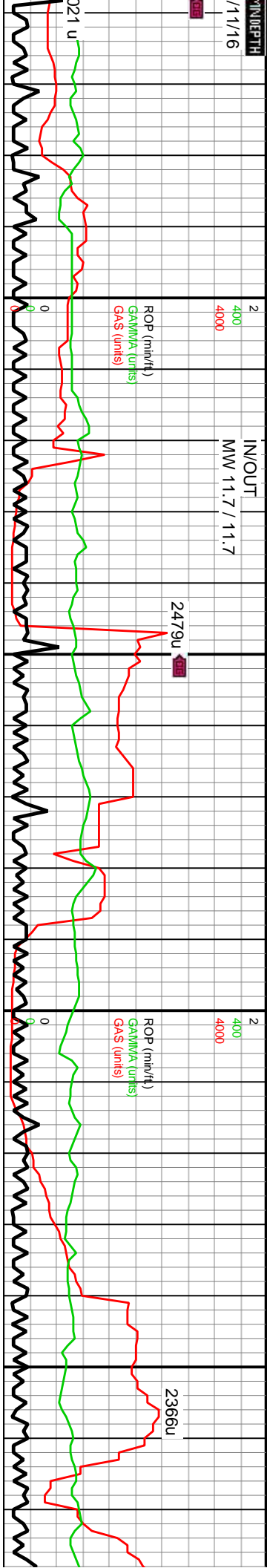
TVD (ft)

MD: 10,286'
TVD: 7,536.11'
Inclination: 87.58°
Azimuth: 180.59°
VS: 2,154.19'

TVD (ft)

10160-10220 SS: off wh-lt gy-gy ip, p-mod strd vf-f sd grs, gr-mtx sup clus cons wi silc arg & dolc cnt, tr pyr strg, non-mod calc	8400
10220-10280 SS: off wh-lt gy-gy, p-mod strd vf-f sd grs, gr-mtx sup clus cons wi silc arg & dolc cnt, non-mod calc	8400
10280-10340 SS: pred gy wi sl brn hue, occ lt gy, dk gy lamn ip, mod strd vf-f sd grs, frm sli fri gr-mtx sup clus cons wi silc & arg cnt, tr gn glauc, tr vf pyr, pred non-sl calc, mod calc ip	8400
10340-10400 SS: gy-gy, occ dk gy sli fri gr-mtx sup tr glauc, non-sl c	





WOB: 32Klbs
Rotary: 70RPM
Strokes: 199SPM
Pump Rate: 580GPM

MD: 10,380'
TVD: 7,539.17'
Inclination: 88.69°
Azimuth: 181.15°
VS: 2,248.12'

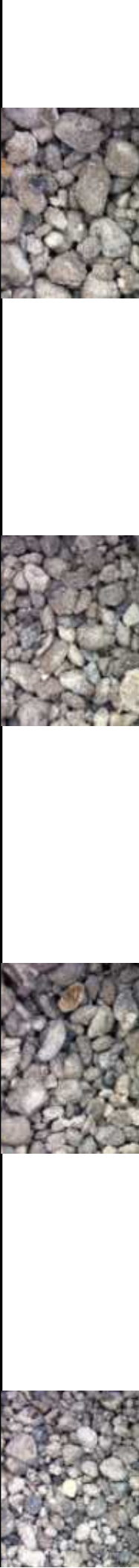
MD: 10,475'
TVD: 7,540.48'
Inclination: 89.73°
Azimuth: 180.77°
VS: 2,343.09'

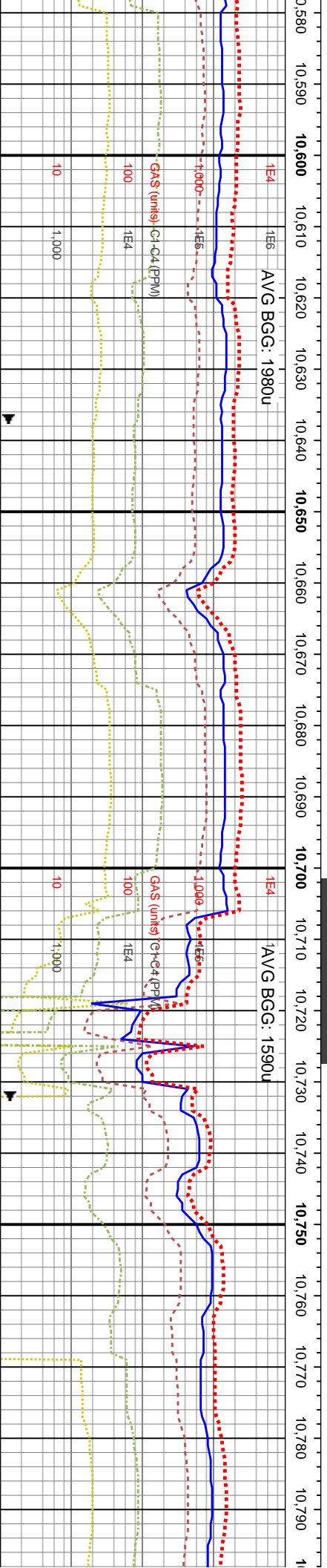
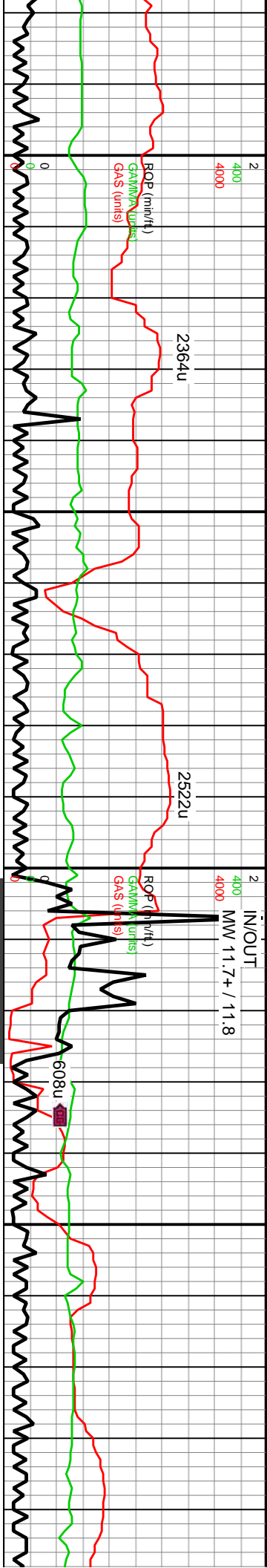
MD: 10,569'
TVD: 7,540.29'
Inclination: 90.5°
Azimuth: 180.81°
VS: 2,437.08'

10400-10460 SS: pred gy wi sl brn hue, occ lt gy, dk gy lamn ip, mod strd v-f sd grs, frm sup clus cons wi silc & arg cnt, tr vn pyr, pred non-sl calc, mod calc ip

10460-10520 SS: pred gy-gy brn-bf, occ off wh-lt gy-gy, occ dk gy-brn lamn ip, mod strd v-f sd grs, frm sil fri gr-mix sup clus cons wi silc & arg cnt, tr vn pyr, tr glauc, non-sl calc, mod calc ip

10520-10640 SS (90%): pred off wh-lt gy-gy, occ c f-med uncons sd grs, pred gr sup clus cons wi silc calc, grdg to 10% SLTST: dk gy, occ dk gy brn, frm pyr, non calc





OJB: 35Klbs
Rotary: 71RPM
Strokes: 198SPM
Pump Rate: 579GPM

MD: 10,664'
TVD: 7,538.65'
Inclination: 91.48°
Azimuth: 180.21°
VS: 2,532.06'

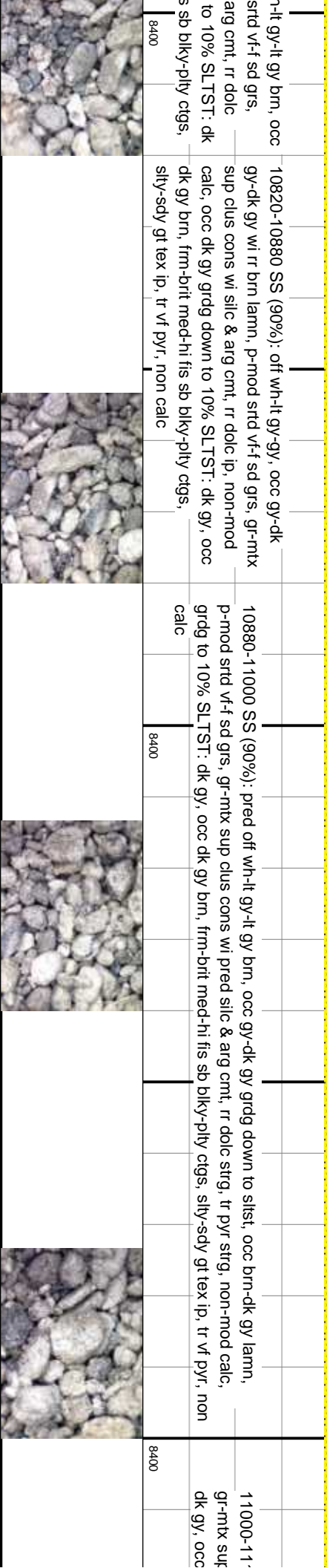
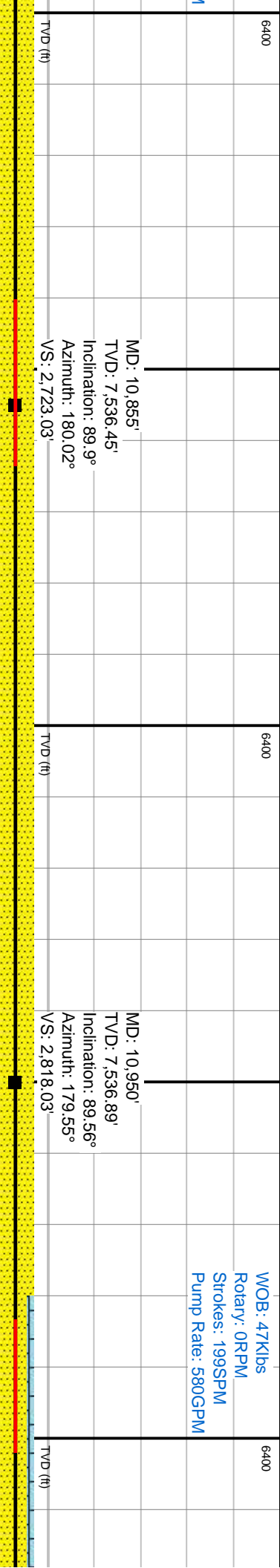
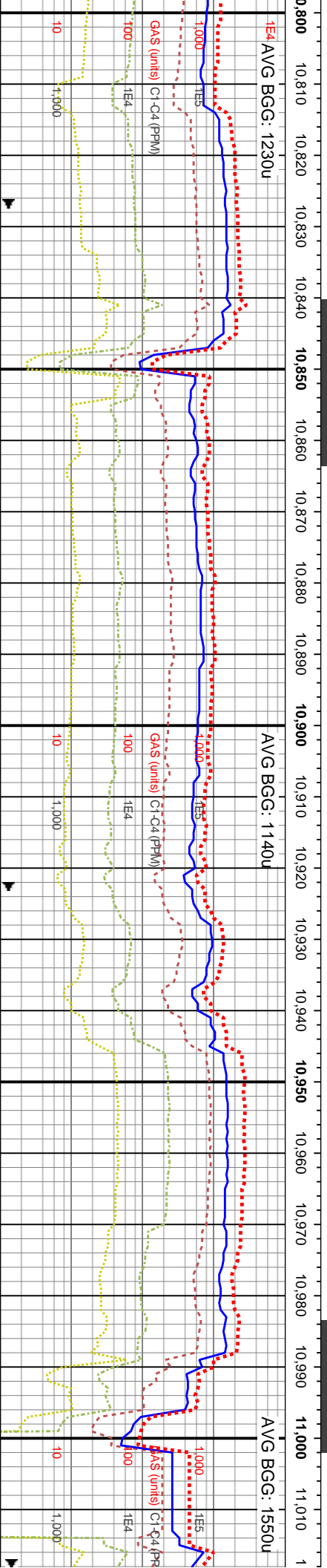
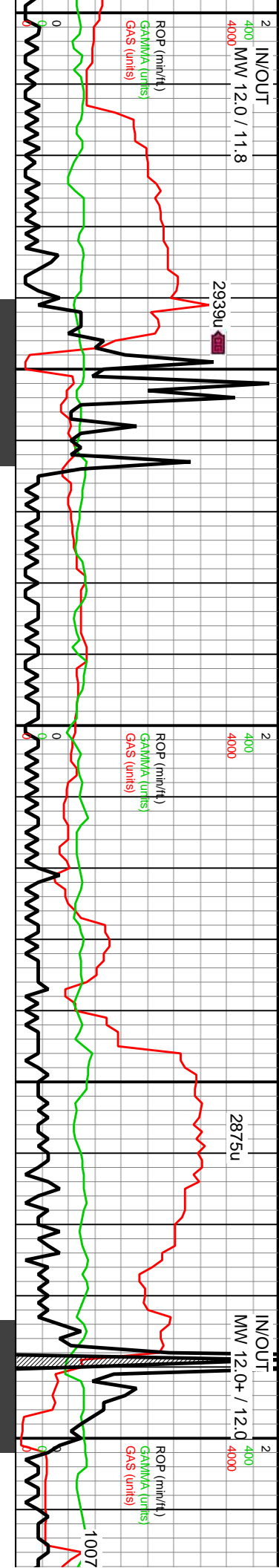
10640-10760 SS (90%): off wh-lt-gy-gy, occ dk gy-dk gy brn, p-mod strd vf-f sd grs, occ u f-med uncons
sd grs, pred gr sup clus cons w/ silic arg & dolc cmt, occ mx sup clus, occ dk slst frags ip, non-mod
calc, occ dk gy grdg down to 10% SLTST; dk gy, occ dk gy brn, frm-brit med-hi fis sb blk-ply cigs,
sily-sdy gt tex ip, tr vf pyr, non calc

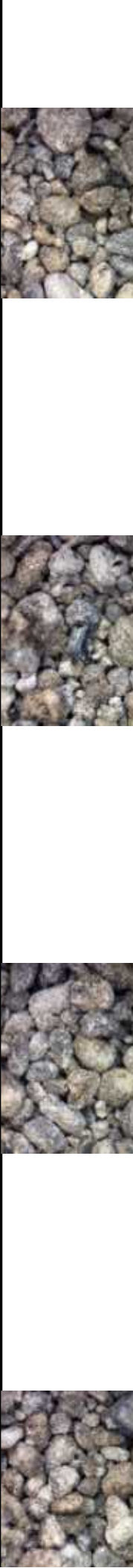
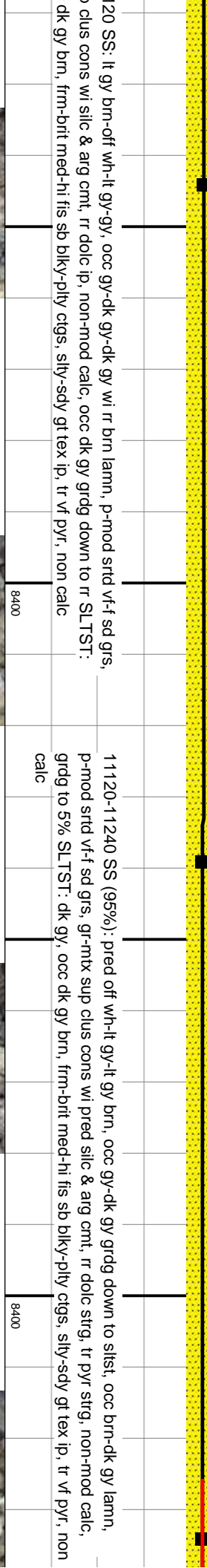
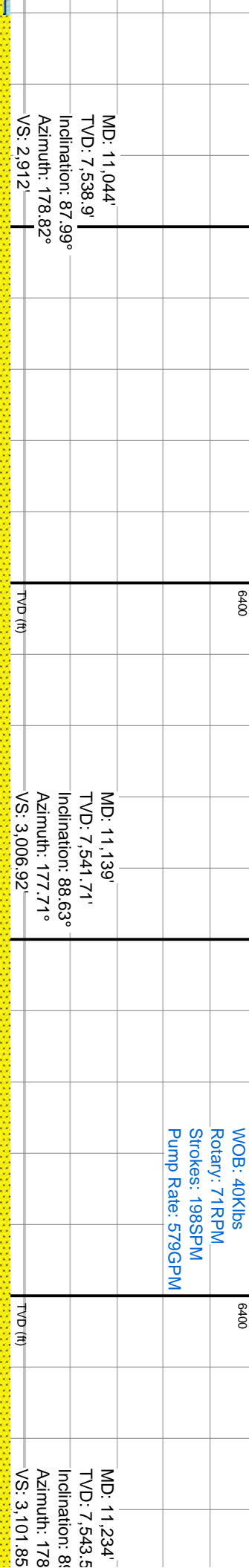
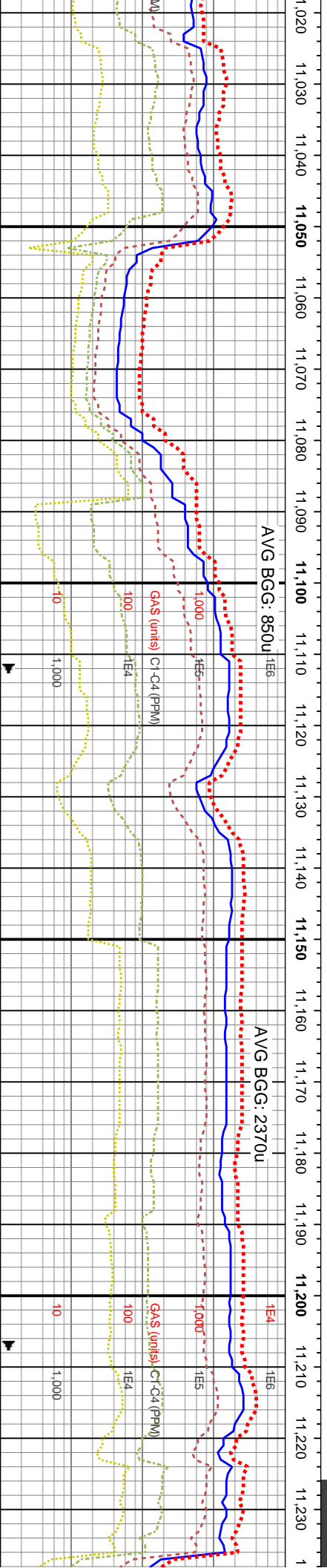
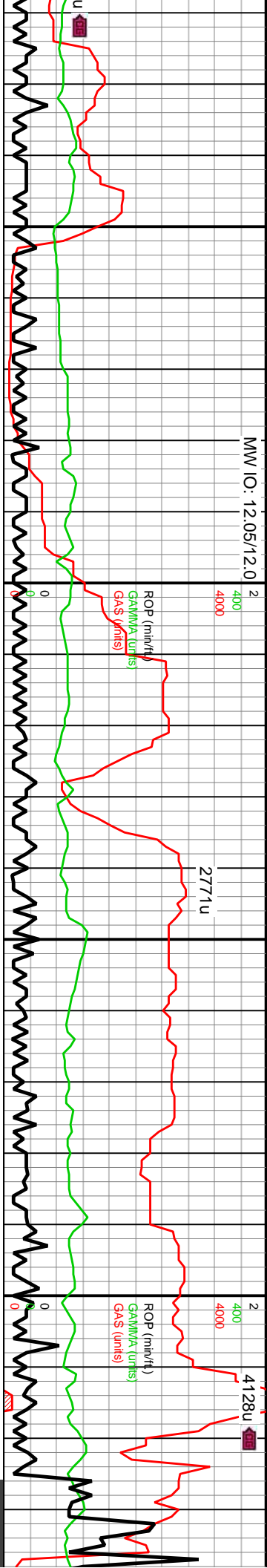
WOB: 31Klbs
Rotary: 70RPM
Strokes: 199SPM
Pump Rate: 580GPM

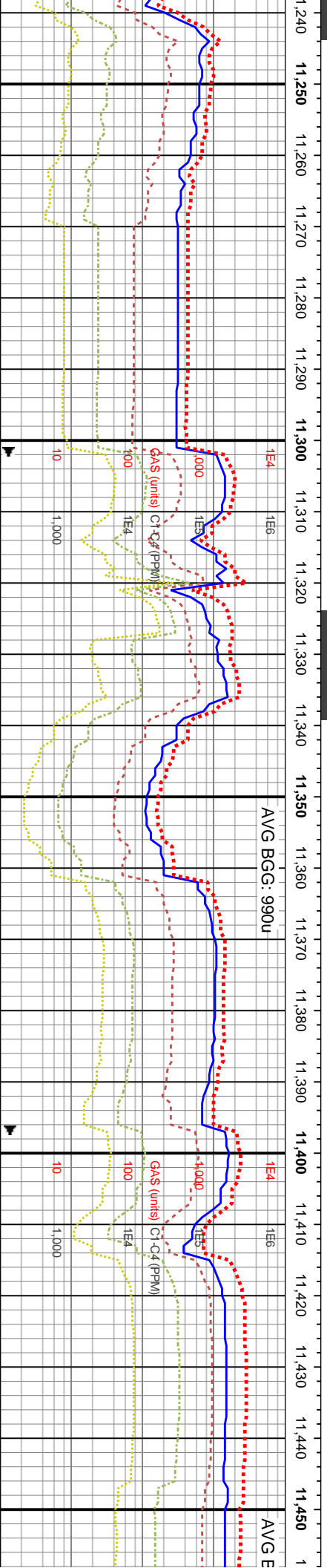
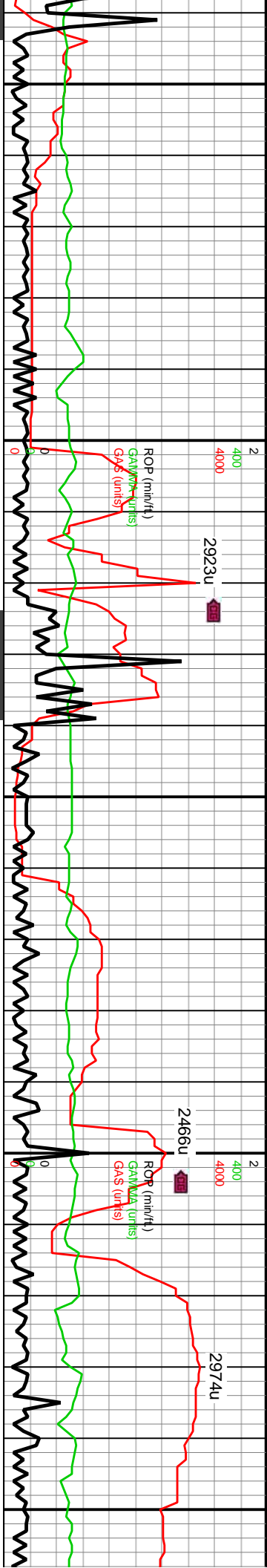
MD: 10,759'
TVD: 7,536.9'
Inclination: 90.64°
Azimuth: 180.61°
VS: 2,627.04'

10760-10820 SS (90%): pred off wh-lt-gy-gy, occ dk gy grdg down to slst, p-mod
gr-mtx sup clus cons w/ pred silic & strg, tr pyr strg, non-mod calc, grdg
gy, occ dk gy brn, frm-brit med-hi fis sb blk-ply cigs,
sily-sdy gt tex ip, tr vf pyr, non calc





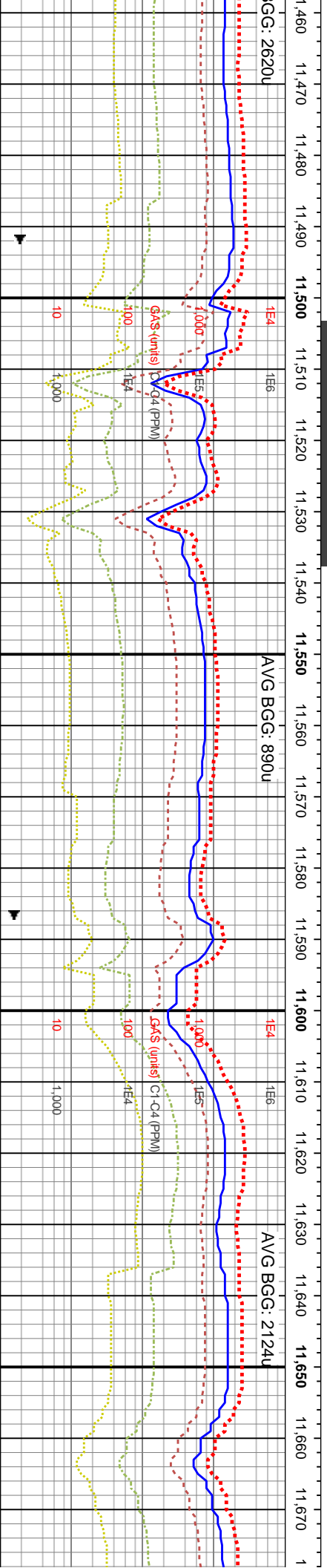
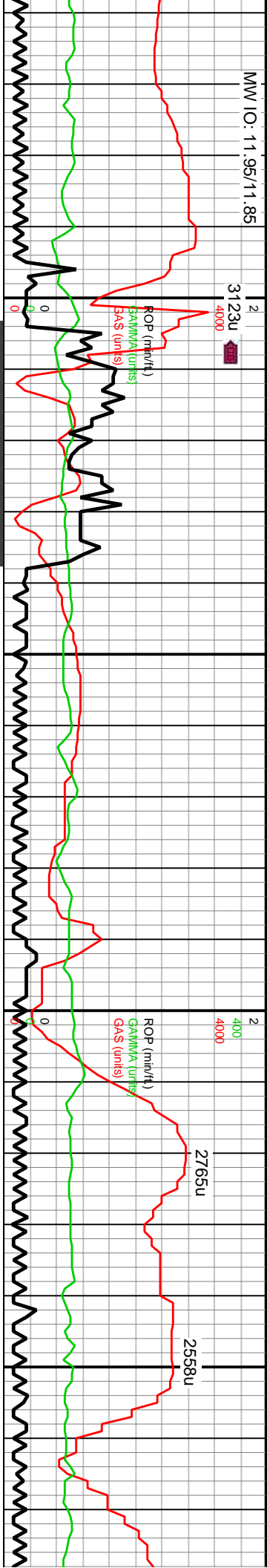




7° 9.13° 3°	6400	DP @ 11,350'	6400	MD: 11,329' TVD: 7,544.74' Inclination: 89.43° Azimuth: 179.21° VS: 3,196.97'	6400	MD: 11,424' TVD: 7,544.8' Inclination: 90.5° Azimuth: 179.21° VS: 3,291.96'
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11240-11300 SS: lt gy brn-of wh-it gy-gy, occ gy-dk gy-dk gy wi rr brn lamn, p-mod strd vf f sd grs, gr-mtx sup clus cons wi silc & arg cnt, rr dolc ip, non-mod calc, occ dk gy grdg down to rr SLTST: dk gy, occ dk gy brn, frm-brt med-hi fis sb blk-y-pty ctgs, silty-sdy gt tex ip, tr vf pyr, non calc	8400	11300-11360 SS: pred offwh- gy, ip med- dk gy, brn- tn-bf mot ip, abnt trnsi grs, pred frm- fri clus, sb blk-y, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cnt, tr calc, sme intbdd sit	8400	11360-11420 SS: pred offwh- gy, ip med- dk gy, brn- tn-bf mot ip, abnt trnsi grs, pred frm- fri clus, sb blk-y, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cnt, tr calc, sme intbdd sit	8400	11420-11480 SS: pred offwh- gy, ip med- dk gy, brn- tn-bf mot ip, abnt trnsi grs, pred frm- fri clus, sb blk-y, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clu cnt, tr calc
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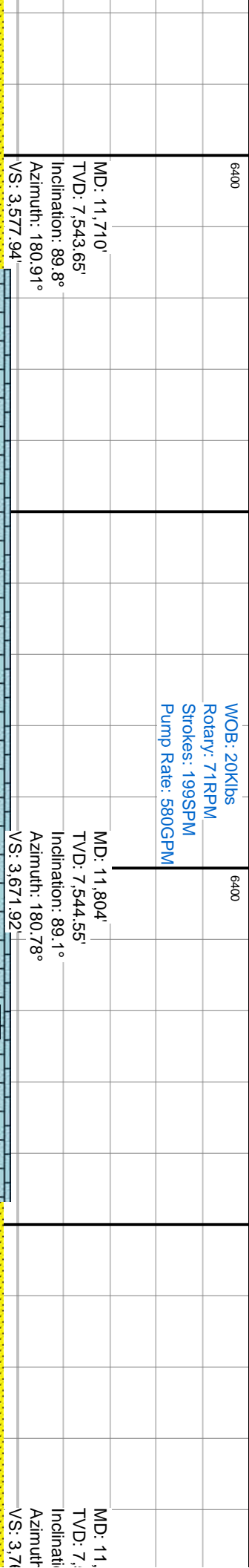
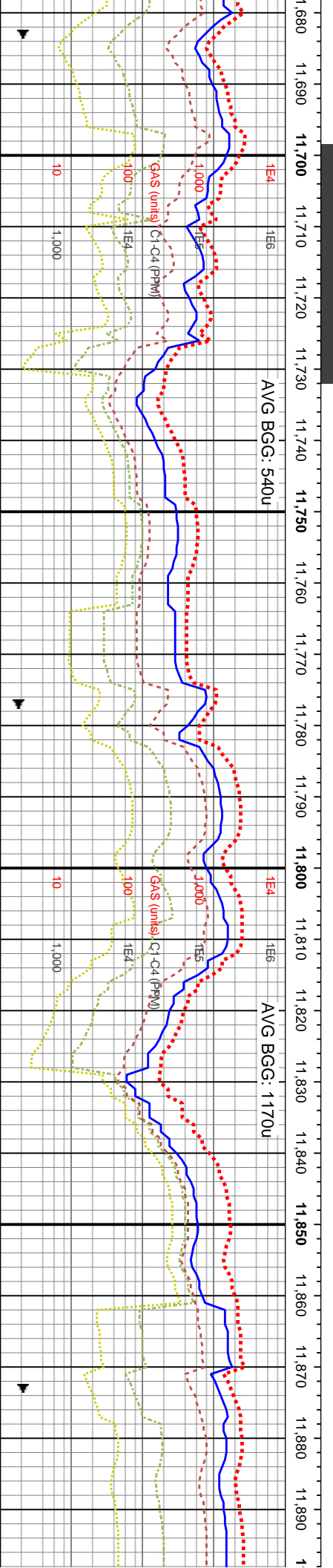
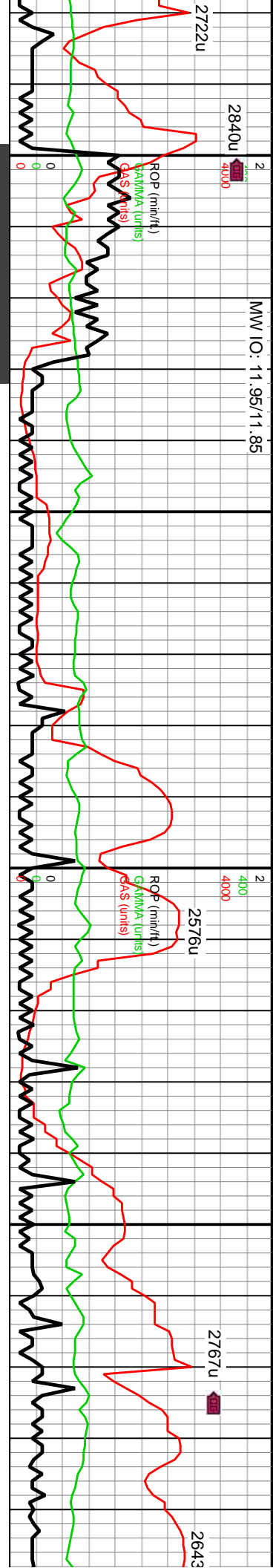




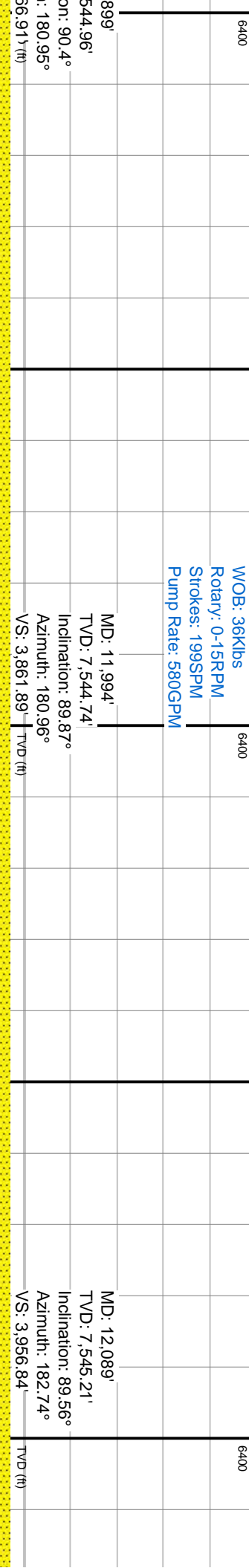
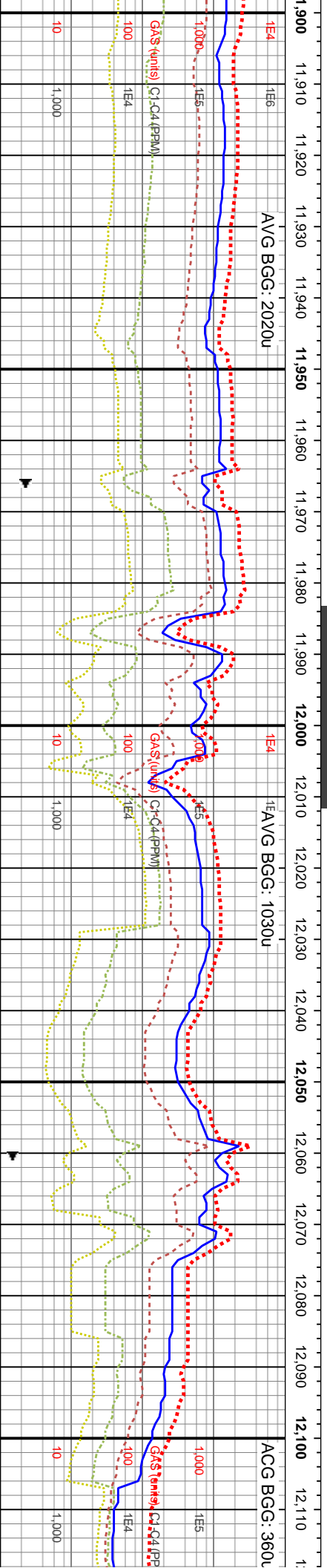
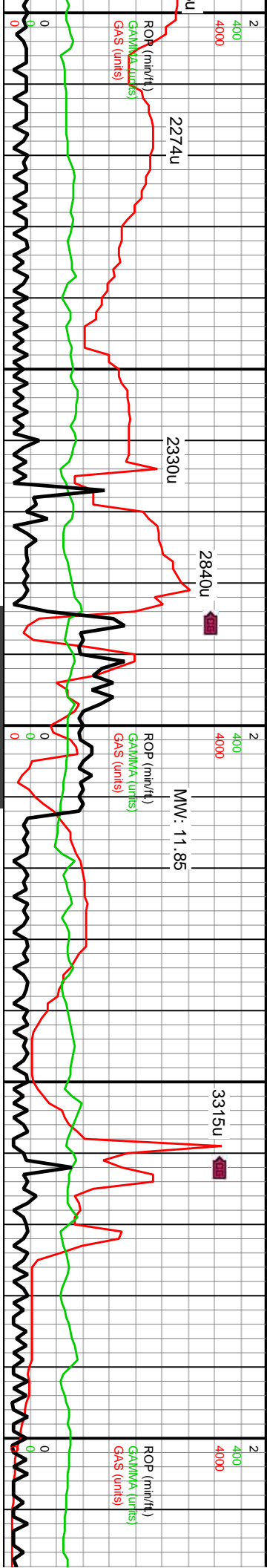
6400	MD: 11,520' TVD: 7,544.29' Inclination: 90.1° Azimuth: 180.71° VS: 3,387.95'	6400	MD: 11,615' TVD: 7,543.85' Inclination: 90.44° Azimuth: 180.6° TVD VS: 3,482.94'
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11480-11540 SS: pred offwht- gy, ip med- dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cntl, tr calc	11540-11600 SS: pred offwht- gy, ip med- dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cntl, tr calc	11600-11660 SS: pred offwht- gy, ip med, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cntl, ip calc cntl, sme sl slty, tr cal	11660-11720 SS: pred offwht- gy, ip med, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silc cntl, ip calc cntl, sme sl slty, tr cal
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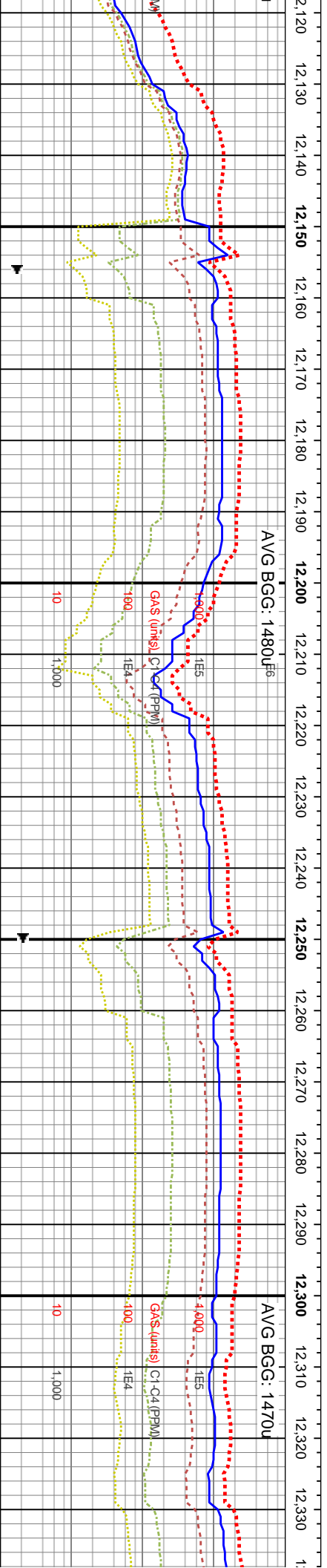
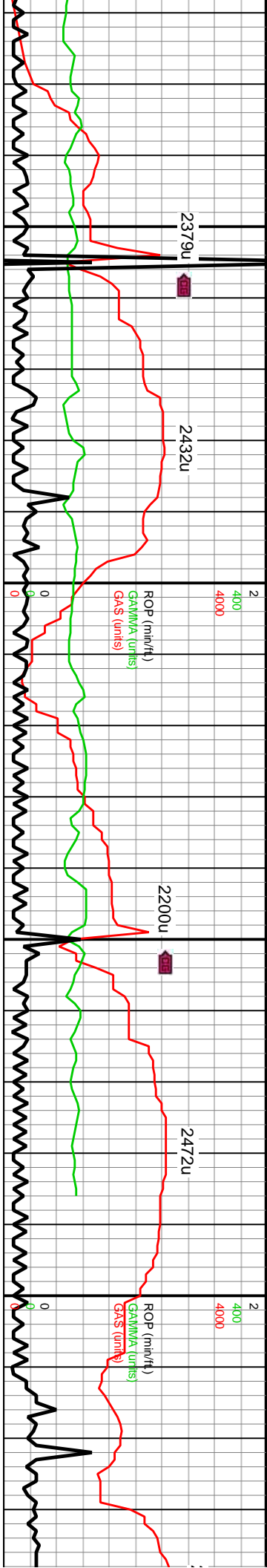


0-11720 SS: pred offwh- gy, ip med, dk gy, brn- tn-bf mot ip, abnt tmsl grs, frm- fri clus, sb blkly, mod strd vf- u f sd	11720-11780 SS: pred offwh- gy, ip med, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fr f gr- mtx sup clus cons wi arg & silic	11780-11840 SS: pred offwh- gy, ip med, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fr f gr- mtx sup clus cons wi arg & silic	11840-11900 SS: pred offwh- gy, ip med, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blkly, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fr f gr- mtx sup clus cons wi arg & silic
calc cmt, sme sl silty, tr cal	arg & silic cmt, ip calc cmt, sme sl silty, tr cal	calc cmt, sme sl silty, tr cal	calc cmt, sme sl silty, tr cal



11900-11960 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blk, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl stly thru, tr cal	11960-12020 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blk, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl stly thru, tr cal	12020-12080 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blk, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl stly thru, tr cal	12140-12200 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, sb blk, mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl stly thru, tr cal
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WOB: 18Klbs
Rotary: 70RPM
Strokes: 200SPM
Pump Rate: 581GPM

MD: 12,184'
TVD: 7,545.3'
Inclination: 90.33°
Azimuth: 182.18°
VS: 4,051.75'

MD: 12,273'
TVD: 7,544.19'
Inclination: 91.1°
Azimuth: 181.99°
VS: 4,140.68'

12140-12200 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, pred mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl arg thru, tr cal	12200-12260 SS: pred offwh- gy, ip med gy- lt gy, sme dk gy, brn- tn-bf mot ip, abnt tmsl grs, pred frm- fri clus, pred mod strd vf- u f sd grs, occ l med grs, abnt lse sb ang qtz grs, ip fri f gr- mtx sup clus cons wi arg & silic cnt, ip calc cnt, sl arg thru, tr cal	12260-12343 SS: pred tn- gy, ip med gy- lt offwh, sme dk gy, brn- tn-bf mot ip, abnt tr grs, pred frm- fri clus, pred mod strd vf- u f grs, occ l med grs, abnt lse sb ang qtz grs, fri f gr- mtx sup clus cons wi arg & silic cnt, calc cnt, sl arg thru, tr cal
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