



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Johnson Trust 4_HZ

Location Sec. 13-T2N-R68W

State Colorado

Country USA

API Number 05-123-42320-00

Geographic Region DJ Basin

Spud Date 1/22/2016

County Weld

Rig Number Patterson UTI 346

Field Wattenberg

Drilling Completed 1/24/2016

Surface Coordinates SHL: 2181' FSL, 389' FWL Sec. 13 T2N R68W

Lat: 40° 8' 14.697 N

Long: 104° 57' 34.632 W

Bottom Hole Coordinates PBHL:

Lat: 40° 7' 31.181 N

Long: 104° 57' 15.980 W

Ground Elevation 4,926'

K.B. Elevation 4,950.5'

Logged Interval 6,800' **To** 12,206'

Total Depth 12,206'

Formation Niobrara B Chalk

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: 1-22-16
Standby: 1-23-16
TD: 1-24-16

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

O OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTTL

COAL - THIN BEDS

DOLOMITIC

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

K KAOLIN

M MARLSTONE

MINERAL CRYSTALS

N NODULES

PHOSPHATE PELLETS

P PYRITE

SALT CAST

SANDY

SILICEOUS

+ FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

TUFFACEOUS

Stringer

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

O ORGANIC

P PINPOINT

D DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

GAS SH

MINDEPTH

V VUGGY

NORMAL

OIL SHK

OVERTURN

Engineering

CASING

REVERS

OVERT

CONNECTION (LEFT)

CONNECTION (RIGHT)

SIDEAWA

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

X INTERCRYSTALLINE

O INTEROOLITIC

M MOLDIC

SLIDE

SURV

TRIP C

WIRELIN

FAULT

WIRELIN

Watkins

my N

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

SE FAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

C CHALKY W WELL

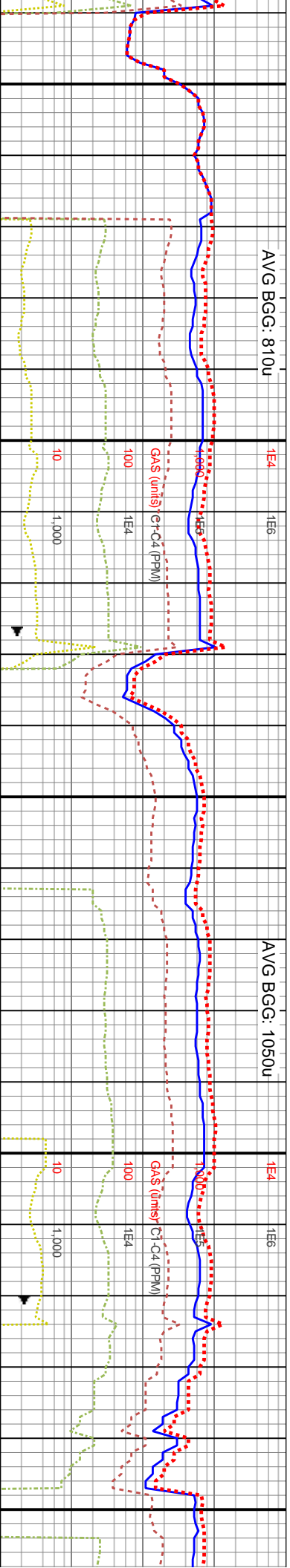
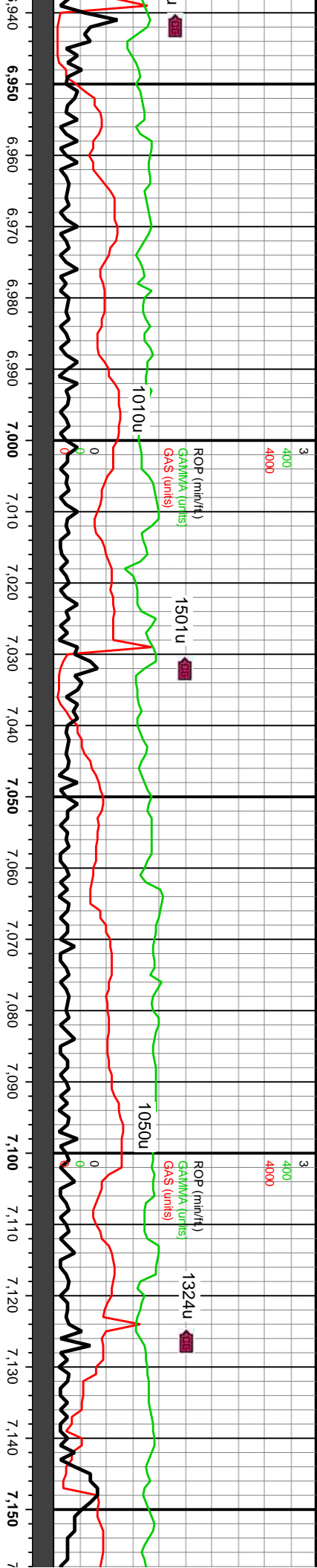
CRY CRYPTOXLN

E EARTHY

IE TESTED - LEFT FX FINELYXLN

IE TESTED - RT GS GRAINSTONE

<div>ROP ROP GAMMA GAS</div>		<div>Extraction OG Weld County, Colorado Spud Date: 01-19-16 Surface Casing @ 1,585' 2-man Logging / Geosteering Began: 01-23-16</div>		<div>Johnson Trust 4 TP Bures: 3773u</div>	
<div>Slide/Rotate</div>		<div>Linear Scale</div>		<div>ROP (min/hr) GAMMA (units) GAS (units)</div>	
<div>Depth Labels</div>		<div>6,760 6,770 6,780 6,790 6,800 6,810 6,820 6,830 6,840 6,850 6,860 6,870 6,880 6,890 6,900 6,910 6,920 6,930</div>		<div>1260u 1154u 1435u</div>	
<div>Total Gas & Chromatograph</div>		<div>100 units = 1% methane</div>		<div>AVG BGG: 700UE4</div>	
<div>GAS C1 C2 C3 C4</div>		<div>Logarithmic Scale</div>		<div>GAS (units) C1-C4 (PPM)</div>	
<div>Well Bore</div>		<div>WOB: 42Klbs Rotary: 0RPM Strokes: 160SPM Pump Rate: 661GPM</div>		<div>MD: 6,874' TVD: 6,615.2' Inclination: 9.3° Azimuth: 142.65° VS: -633.82</div>	
<div>TVD (ft)</div>		<div>6300</div>		<div>6200</div>	
<div>Images</div>		<div>6800-6860 50% SLTST: med- dk gy, occ blk, sme tn- brn mot, frm- hd, blk- sb blk, sme intbd sd grs, sme cal, cal incl, sme f lam shy intbds: 50% SLTY SH: lt gy- gy, sl frm- frm, sb ply, sme f lam, wtr reac</div>		<div>6860-6920 50% SLTST: med- dk gy, occ blk, sme tn- brn mot, frm- hd, blk- sb blk, sme intbd sd grs, sme cal, cal incl, sme f lam shy intbds: 50% SLTY SH: lt gy- gy, sl frm- frm, sb ply, sme f lam, wtr reac</div>	
		<div>6920-6980</div>		<div>sme tn- brn sme sl ply incl, sme f gy, sl frm- frags</div>	



MD: 6.968'
TVD: 6,706.41'
Inclination: 18.32°
Azimuth: 156.75°
VS: -614.16°

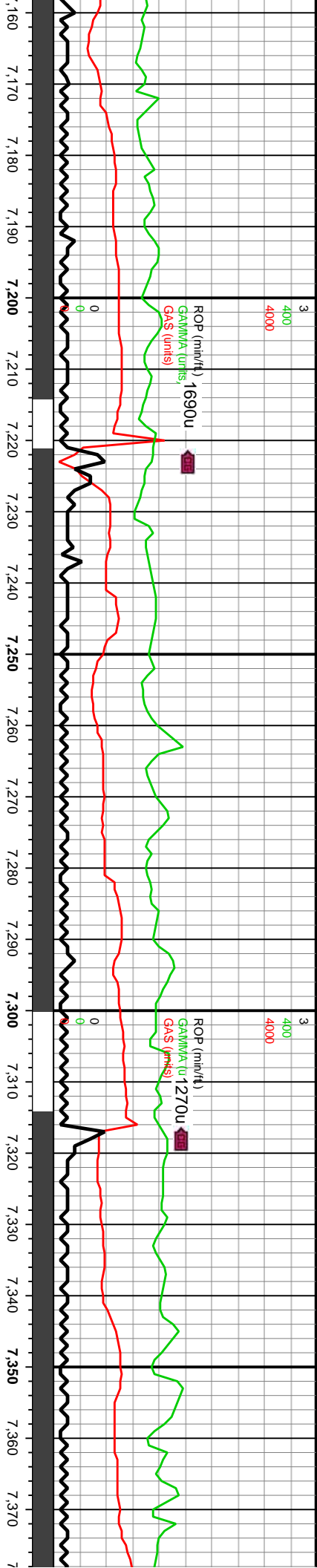
WOB: 37Klbs
Rotary: 61RPM
160SPM
Pump Rate: 660GPM

MD: 7.064'
TVD: 6,795.79'
Inclination: 24.7°
Azimuth: 175.96°
VS: -580.22°

MD: 7.114'
TVD: 6.8°
Inclination:
Azimuth
VS: -538°

50% SLTST: med- dk gy, occ sl blk, - offwht mot, frm- hd, blkly- sb blkly, sme inbd sd grs, sme cal, occ cal lam shy inbds; 50% SLTY SH: lt gy- frm, sb ply, occ sb blkly, sme f lam, lith	6980-7040 50% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blkly- sb blkly, sme sl ply, sme inbd sd grs, sme cal, occ cal incl, sme f lam shy inbds; 50% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blkly, sme f lam, lith frags	7040-7100 50% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blkly- sb blkly, sme sl ply, sme inbd sd grs, sme cal, occ cal incl, sme f lam shy inbds; 50% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blkly, sme f lam, lith frags	7100-7160 60% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blkly, sme f lam, lith frags; 40% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blkly- sb blkly, sme sl blkly, sme inbd sd grs, sme cal, occ cal incl, sme f lam shy inbds
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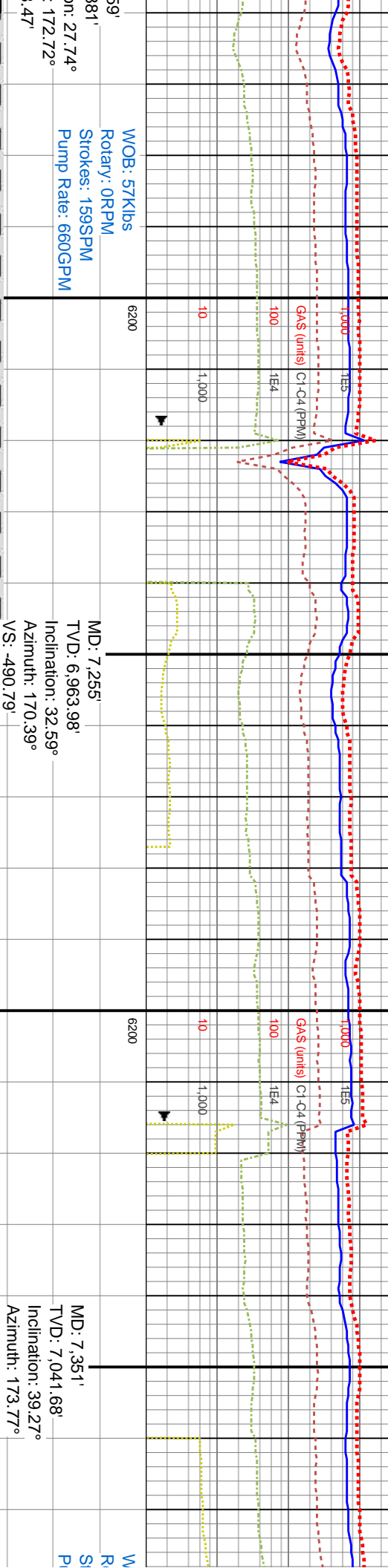




AVG BGG: 840u

AVG BGG: 830u

AVG BGG: 1000u



WOB: 57Klbs
Rotary: 0RPM
Strokes: 159SPM
Pump Rate: 660GPM

MD: 7.255'
TVD: 6,963.98'
Inclination: 32.59°
Azimuth: 170.39°
VS: -490.79°

MD: 7.351'
TVD: 7,041.68'
Inclination: 39.27°
Azimuth: 173.77°
VS: -435.03°

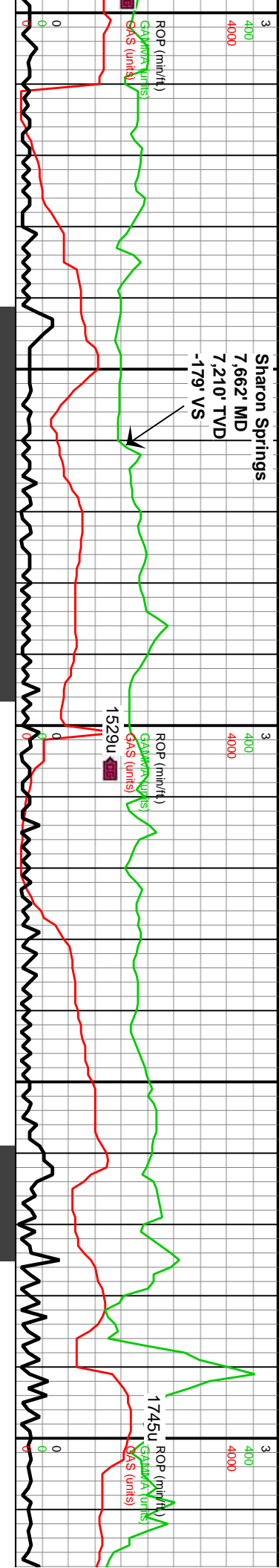
7160-7220 60% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blk, sme f lam, lith frags; 40% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blk- sb blk, sme sl ply, sme intbd sd grs, sme cal, occ cal incl, sme f lam shy intbds

7220-7280 60% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blk, sme f lam, lith frags; 40% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blk- sb blk, sme sl ply, sme intbd sd grs, sme cal, occ cal incl, sme f lam shy intbds

7280-7340 60% SLTY SH: lt gy- gy, sl frm- frm, sb ply, occ sb blk, sme f lam, lith frags; 40% SLTST: med- dk gy, occ sl blk, sme tn- brn- offwht mot, frm- hd, blk- sb blk, sme sl ply, sme intbd sd grs, sme cal, occ cal incl, sme f lam shy intbds

7340-7400 60% SLTY SH: med- dk gy, sl frm- frm, sb ply, occ sb frags; 40% SLTST: med- dk g tn- brn- offwht mot, frm- hd, blk- sb blk, sme sl ply, sme intbd vf sd, sme cal, lam shy intbds, tr pyr





Sharon Springs
7,662' MD
7,210' TVD
-179° VS

3 4000 4000 4000

ROP (min/ft)

GA\$ (units)

GA\$ (units)

GA\$ (units)

1529u

3 4000 4000 4000

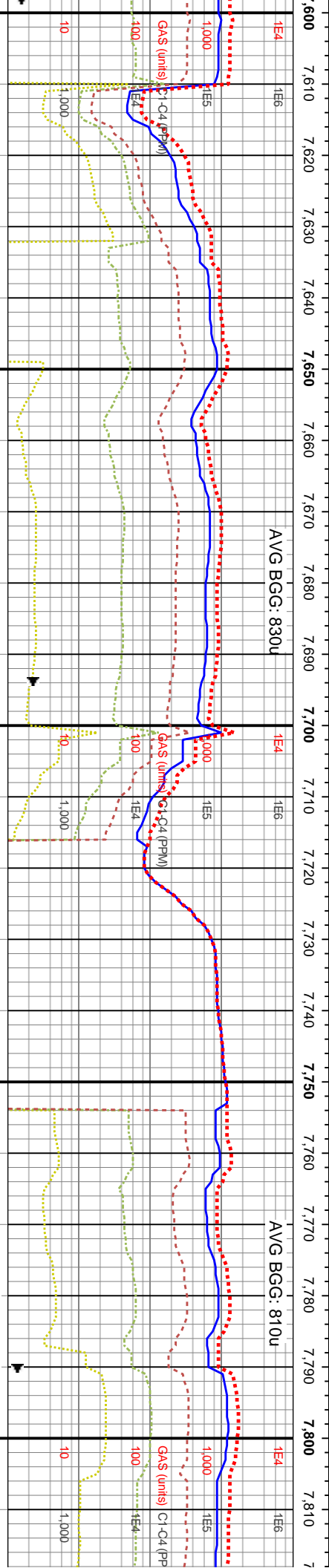
ROP (min/ft)

GA\$ (units)

GA\$ (units)

GA\$ (units)

1745u



MD: 7,636'
TVD: 7,201.12'
Inclination: 68.48°
Azimuth: 190.53°
VS: -203.49°

MD: 7,731'
TVD: 7,230.26'
Inclination: 75.8°
Azimuth: 185.19°
VS: -114.01°

WOB: 32Klbs
Rotary: 30RPM
Strokes: 160SPM
Pump Rate: 660GPM

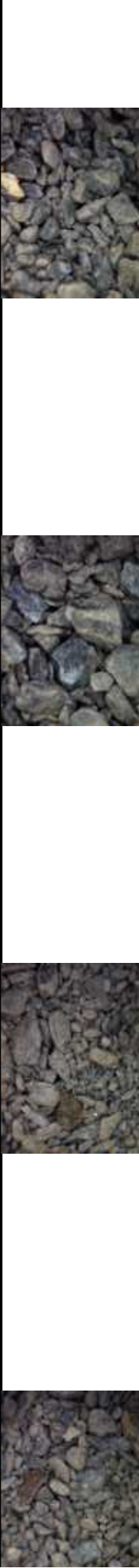


Y SH (50%): pred med gy-gy brn, rr lt
dk gy, med frm-frm, l fis pred sb rd
f pyr stng, occ slst frag incl, non calc,
dk gy-v dk gy, frm, brit mod fis sb
ctgs, tr vf pyr, silc cnt, non calc

7640-7700 SH (55%): gy-dk gy, frm, brit, ang-sb
ang-sb rd-sb biky mod fis ctgs, sm-sily tex, occ sl
incr pk-in-brn mrly incl, tr vf pyr, l-mod calc, wi 35%
MRLST: gy-dk gy, frm, brit, wi pk/in mrly incl, mod
calc wi brn resd, wi rr chk

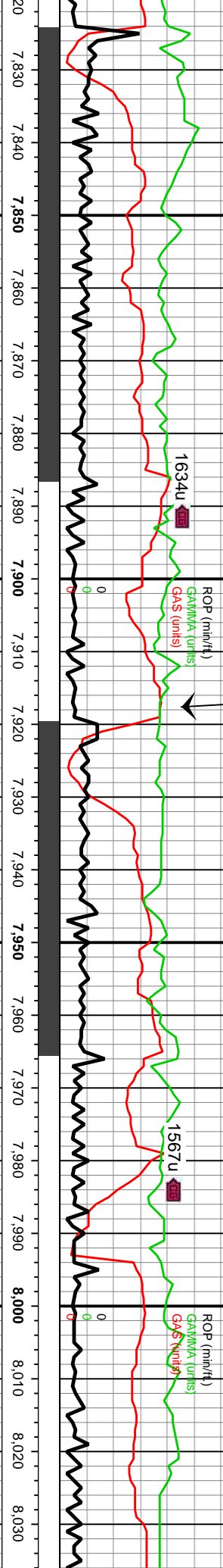
7700-7760 60% CHK: pred lt gy-gy, v lt gy wi com thn
wh chky lamn & com vf incl, frm, v arg LS, l-mod fis
sb ang-sb rd ctgs, tr vf pyr, mod-hi calc wi cin HCL
rxn, MRLST (40%): gy-dk gy, frm, brit, l fis sb rd-rd occ
sb ang ctgs, com mot wi brn-in mrly incl, tr vf pyr, sl
sily-sm tex, mod calc wi brn resd

7760-7820 MRLST (50%): dk gy-dk gy wi brn mrly
lamn & incl, frm, brit mod fis sb ang-sb biky ctgs, l
calc wi quick brn resd, wi 50% CHK: lt gy-gy, frm, brit
v arg LS wi com wh chky lamn & f chky incl, pred mod
fis sb biky-sb ang ctgs, rr ply, rr c free chk, tr vf pyr, h
calc wi cin HCL rxn



MW 9.2
VIS 36

Niobrara B Chaik
7,920' MD
7,271' TVD
70' VS



AVG BGC: 1780u

AVG BGC: 1160u

WOB: 33Klbs
Rotary: 30RPM
Strokes: 159SPM
Pump Rate: 660GPM

D: 7,826
VD: 7,254.06'
Inclination: 75.17°
Azimuth: 184.18°
S: -18.35'

MD: 7,921'
TVD: 7,271.53'
Inclination: 83.64°
Azimuth: 178.22°
VS: 74.88'

MD: 8,015'
TVD: 7,276.2'
Inclination: 90.67°
Azimuth: 178.14°
VS: 168.66'

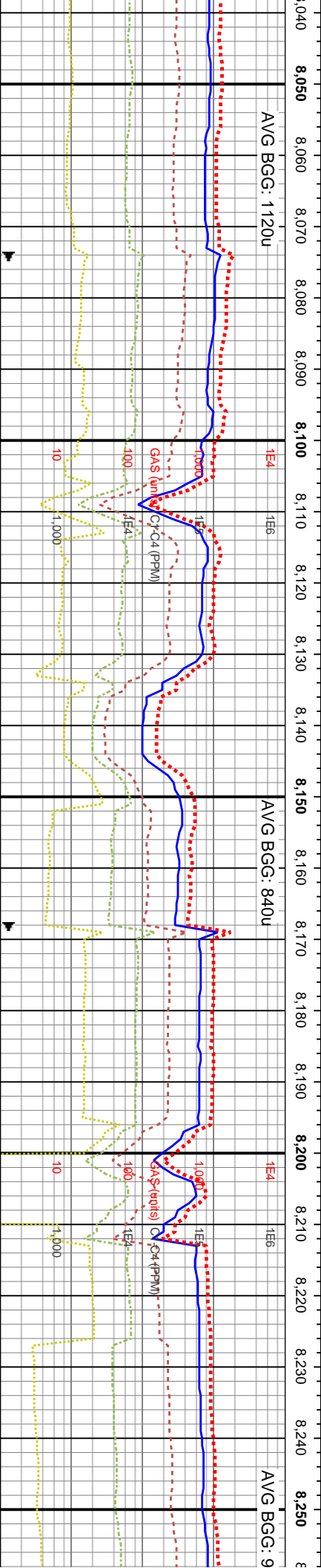
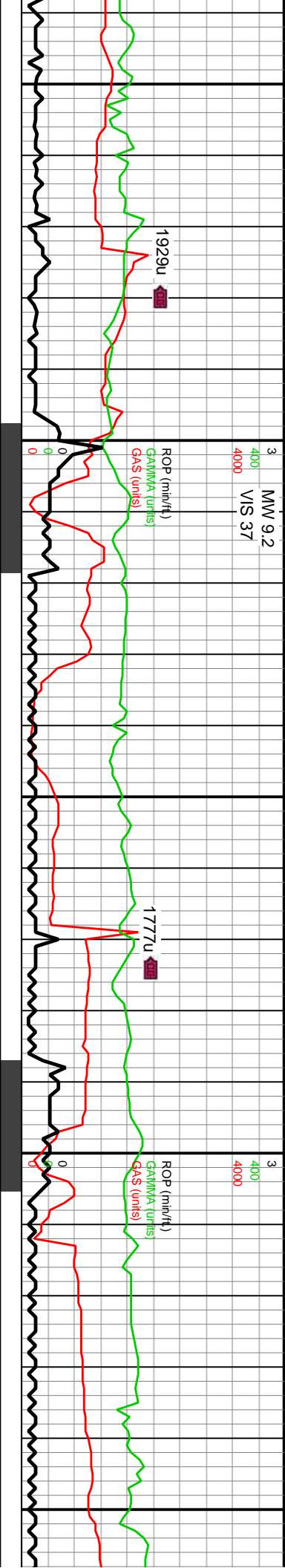
7820-7880 CHK (60%): lt gy-gy, frm, brit, v arg LS wi com wh chky lamn & f chky incl, pred mod fis sb blkly-sb ang ctgs, rr ply, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, wi com intbdd MRLST (40%): dk gy-dk gy wi brn mrly lamn & incl, frm, brit mod fis sb ang-sb blkly ctgs, l calc wi quick brn resdl

7880-7940 CHK (70%): pred lt gy-gy, sl brn hue, occ gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi com wh chky thn lamn & incl, tr vf pyr, med-hi calc wi cin HCL rxn, intbdd wi 30% MRLST: gy-dk gy, mot sh wi brn mst incl, frm, brit mod fis ctgs, l-mod calc wi slow brn resdl

7940-8000 CHK (70%): lt gy-gy, frm, brit, v arg LS wi com wh chky lamn & f chky incl, pred mod fis sb blkly-sb ang ctgs, rr ply, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, wi com intbdd MRLST (30%): dk gy-dk gy wi brn mrly lamn & incl, frm, brit mod fis sb ang-sb blkly ctgs, l calc wi quick brn resdl

8000-8060 CHK (70%): pred lt gy-gy, frm-brit l-mod fis sb rd-sb blkly com wh chky thn lamn & incl, tr vf cin HCL rxn, intbdd wi 30% MRLS wi brn mst incl, frm, brit mod fis c slow brn resdl





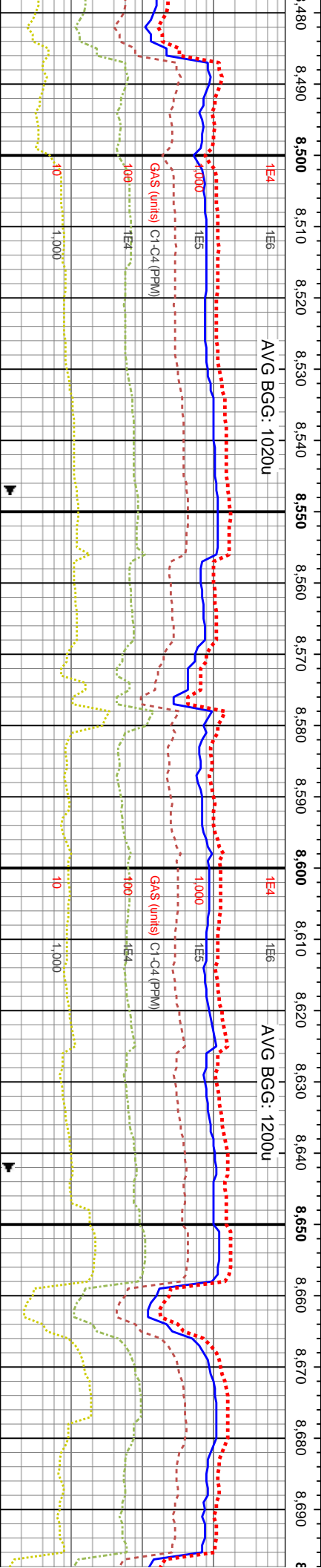
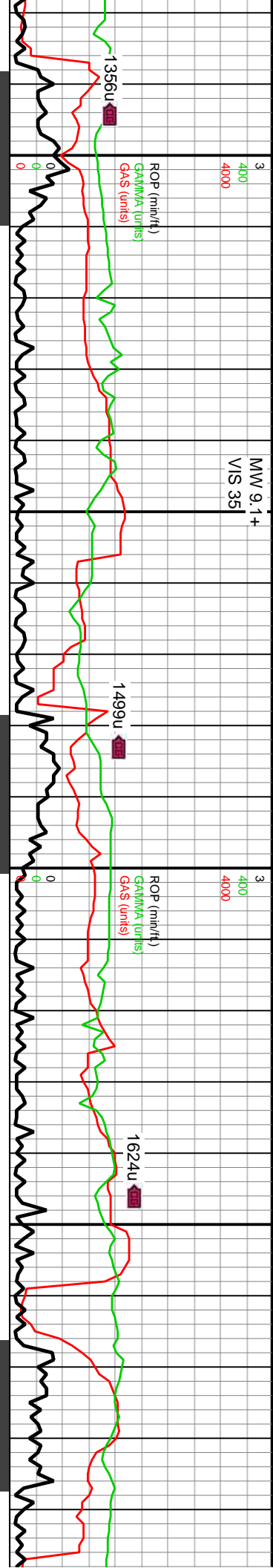
MD: 8,110'
TVD: 7,274.89'
Inclination: 90.91°
Azimuth: 180.55°
VS: 263.64'

WOB: 56Klbs
Rotary: 0RPM
Strokes: 160SPM
Pump Rate: 660GPM

MD: 8,204'
TVD: 7,274.75'
Inclination: 89.26°
Azimuth: 182.92°
VS: 357.58'

gy, sl brn hue, occ ctgs, v arg LS wi pyr, med-hi calc wi T: gy-dk gy, mot sh ctgs, l-mod calc wi	8060-8120 CHK (75%): lt gy-gy, rr dk gy wi OBM stn, frm, brit, v arg LS wi com wh chky lamn & f chky incl, pred mod fis sb blk-y-sb ang ctgs, sl stly tex, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (25%): dk gy-dk gy wi brn mly lamn & incl, frm, brit, mod fis sb ang-sb blk-y ctgs, sm-sily tex, l calc wi quick brn resd	8120-8180 CHK (75%): pred lt gy-gy, occ gy, frm-brit l-mod fis sb rd-sb blk-y ctgs, v arg LS wi com wh chky thn lamn & incl, tr vf pyr, sl stly tex, med-hi calc wi cin HCL rxn, intbdd wi 25% MRLST: gy-dk gy, mot sh wi brn mltst incl, frm, brit mod fis ctgs, l-mod calc wi slow brn resd	8180-8240 CHK (70%): lt gy-gy, rr dk gy wi OBM stn, frm, brit, v arg LS wi com wh chky lamn & f chky incl, pred mod fis sb blk-y-sb ang ctgs, sl stly tex, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): dk gy-dk gy wi brn mly lamn & incl, frm, brit, mod fis sb ang-sb blk-y ctgs, sm-sily tex, l calc wi quick brn resd	8240-8300 CHK l-mod fis sb rd-s thn lamn & incl, HCL rxn, intbdd brn mltst incl, frm resd
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MD: 8,488'
TVD: 7,287.18'
Inclination: 86.23°
Azimuth: 182.31°
VS: 640.83'

MD: 8,583'
TVD: 7,293.03'
Inclination: 86.71°
Azimuth: 180.6°
VS: 735.61'

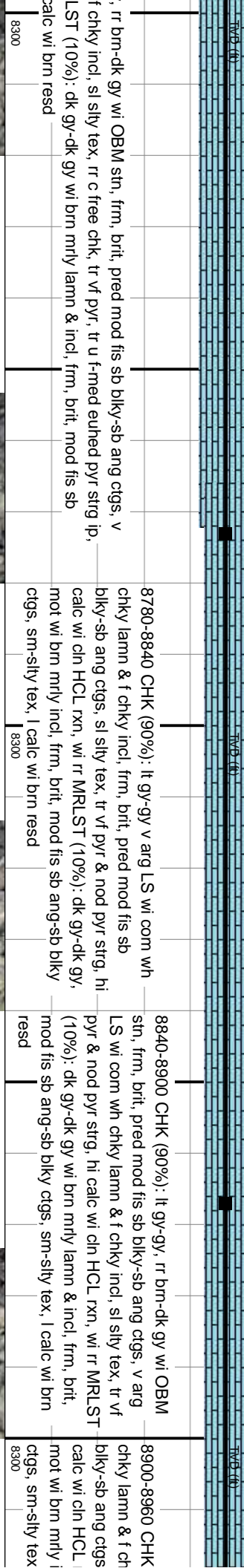
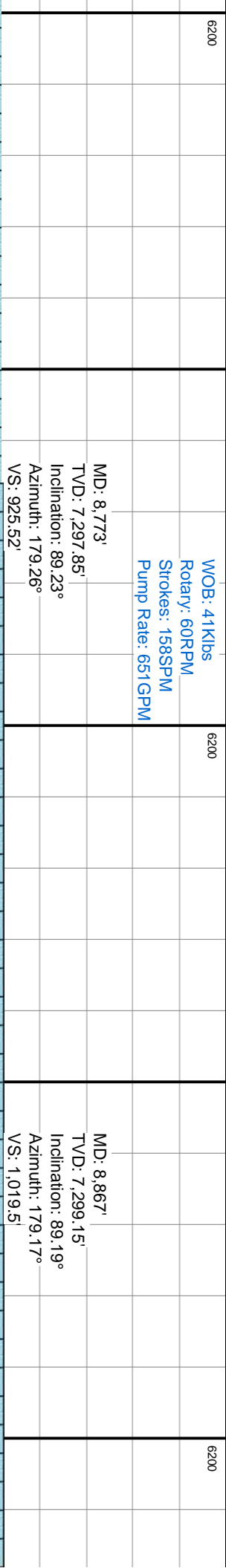
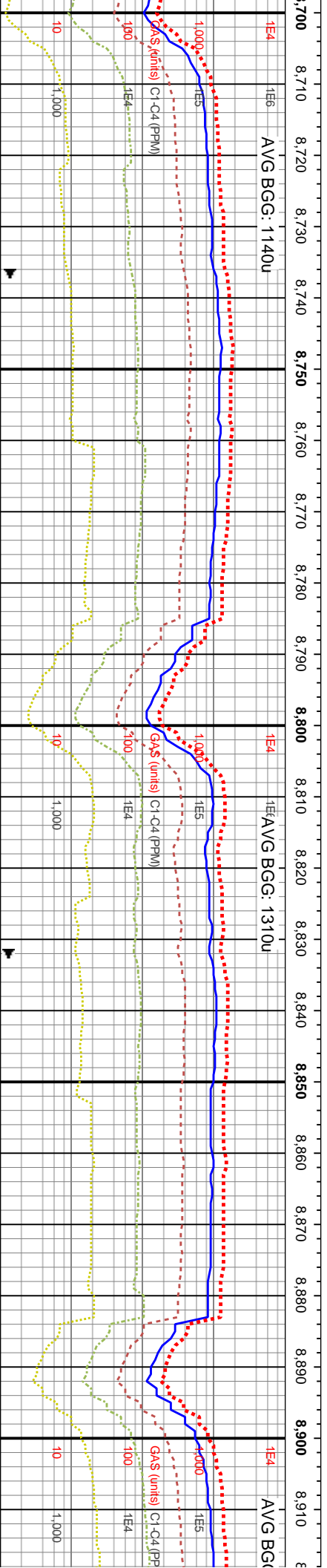
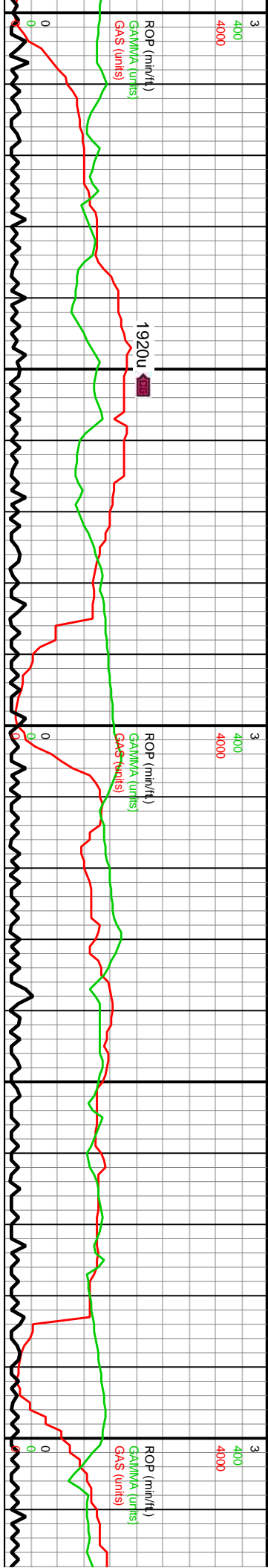
MD: 8,678'
TVD: 7,296.48'
Inclination: 89.12°
Azimuth: 178.71°
VS: 830.54'

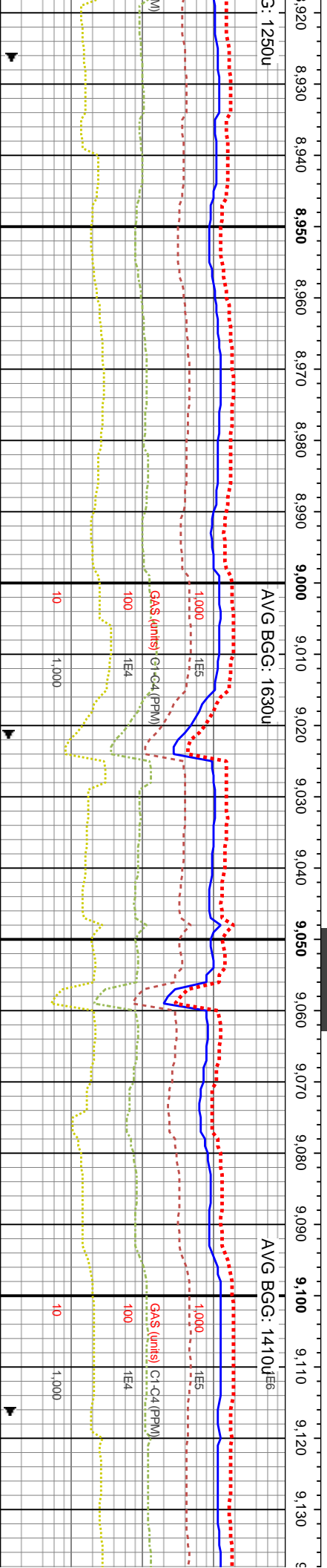
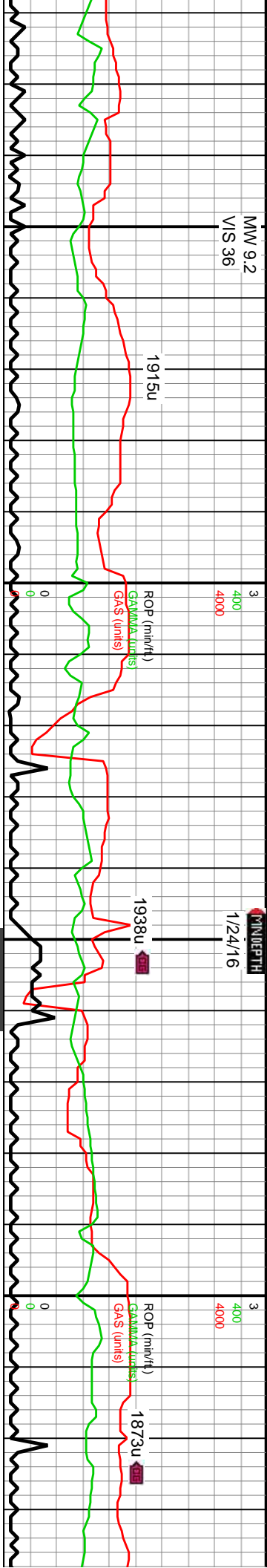
8480-8540 CHK (85%): lt gy-gy, rr brn-dk gy wi OBM stn, v arg LS wi com wh chky lamm & f chky incl, frm, brit, pred mod fis sb blk-y-sb ang ctgs, sl stly tex, rr c free chk, tr vf pyr, tr u f-med euhed pyr strg ip, hi calc wi cin HCL rxn, wi occ MRLST (15%): dk gy-dk gy wi brn mrly lamm & incl, frm, brit, mod fis sb ang-sb blk ctgs, sm-sily tex, l calc wi quick brn resd

8540-8660 CHK (90%): lt gy-gy, rr brn-dk gy wi OBM stn, v arg LS wi com wh chky lamm & f chky incl, frm, brit, pred mod fis sb blk-y-sb ang ctgs, sl stly tex, rr c free chk, tr vf pyr, tr u f-med euhed pyr strg ip, hi calc wi cin HCL rxn, wi occ MRLST (10%): dk gy-dk gy wi brn mrly lamm & incl, frm, brit, mod fis sb ang-sb blk ctgs, sm-sily tex, l calc wi quick brn resd

8660-8780 CHK (90%): lt gy-gy arg LS wi com wh chky lamm & hi calc wi cin HCL rxn, wi rr MR ang-sb blk-y ctgs, sm-sily tex, l calc



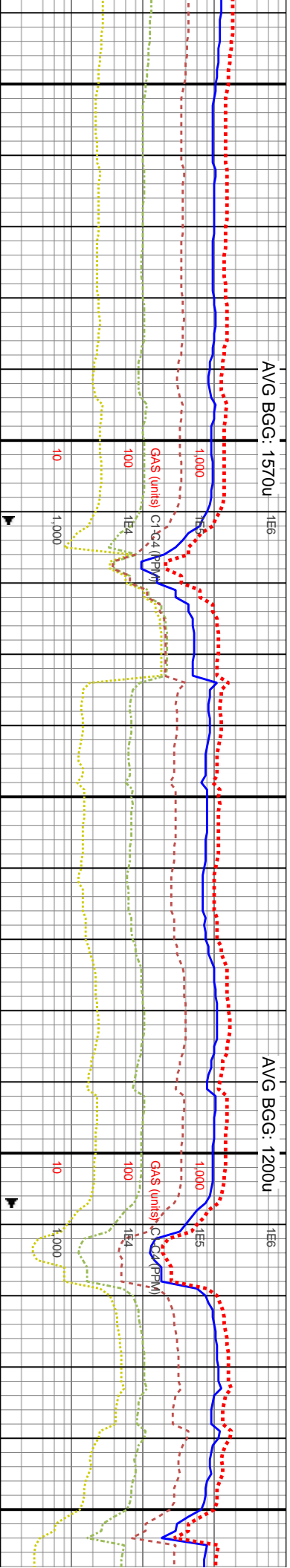
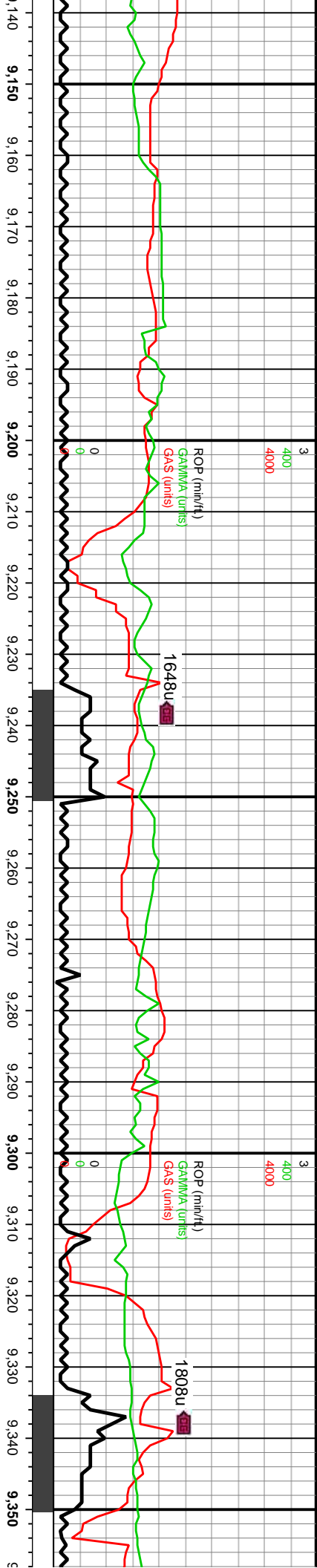




MD: 8.962'	MD: 9.058'
TVD: 7,300.68'	TVD: 7,301.07'
Inclination: 88.96°	Inclination: 90.57°
Azimuth: 179.59°	Azimuth: 177.93°
VS: 1,114.49'	VS: 1,210.46'

WOB: 45Klbs Rotary: 60RPM Strokes: 156SPM Pump Rate: 644GPM	6200	6200
8960-9020 CHK (90%): lt gy-gy, rr brn-dk gy wi OBM strn, frm, brit, pred mod fis sb blk-y-sb ang ctgs, v arg LS wi com wh chky lamm & f chky incl, sl stly tex, tr vf pyr & nod pyr strg, hi calc wi cin HCL rxn, wi tr MRLST (10%): dk gy-dk gy wi brn mrlly lamm & incl, frm, brit, mod fis sb ang-sb blk-y ctgs, sm-stly tex, l calc wi brn resd	8300	8300
9020-9140 CHK (90%): lt gy-gy, rr brn-dk gy wi OBM strn, frm, brit, pred mod fis sb blk-y-sb ang ctgs, v arg LS wi com wh chky lamm & f chky incl, sl stly tex, tr c free chk, tr vf pyr, tr u f pyr strg ip, hi calc wi cin HCL rxn, wi tr MRLST (10%): dk gy-dk gy wi brn mrlly lamm & incl, frm, brit, mod fis sb ang-sb blk-y ctgs, sm-stly tex, l calc wi brn resd	8300	8300





WOB: 43Klbs
Rotary: 60RPM
Strokes: 151SPM
Pump Rate: 627GPM

MD: 9,152'
TVD: 7,299.38'
Inclination: 91.48°
Azimuth: 177.29°
VS: 1,304.37'

MD: 9,248'
TVD: 7,297.38'
Inclination: 90.9°
Azimuth: 178.65°
VS: 1,400.3'

MD: 9,344'
TVD: 7,296.6'
Inclination: 90.03°
Azimuth: 179.43°
VS: 1,496.29'

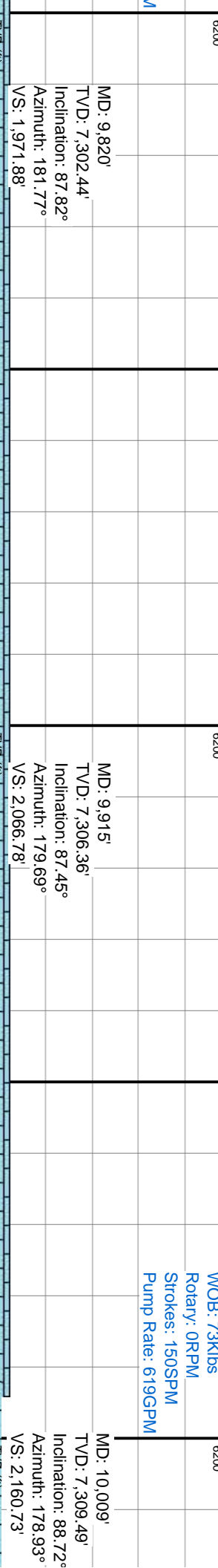
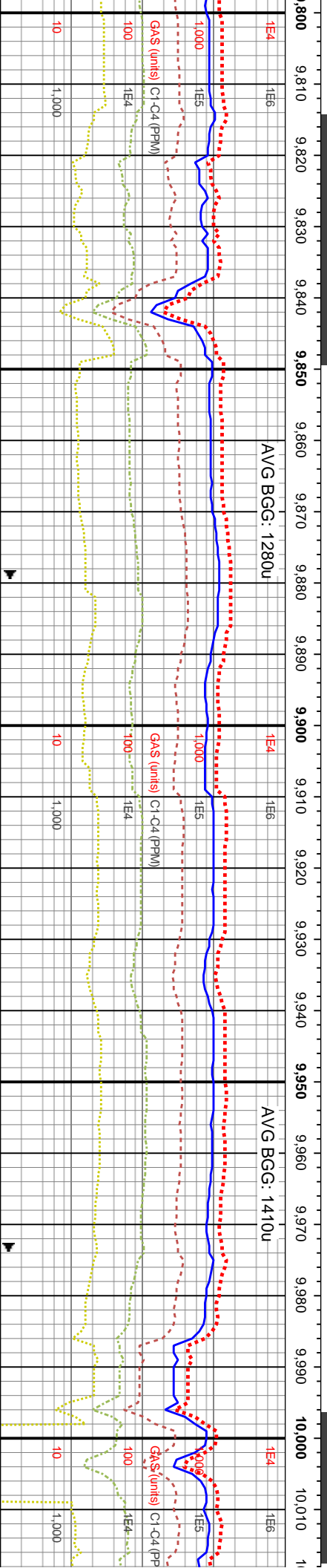
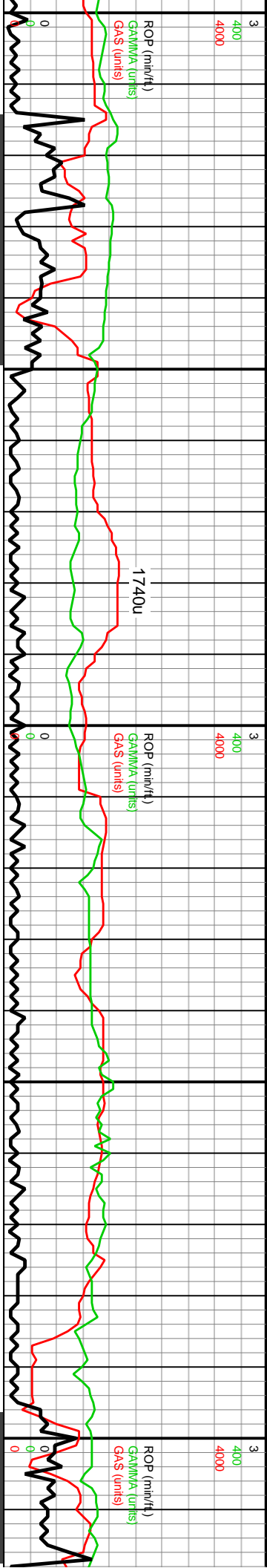
9140-9200 CHK (90%): lt gy-gy v arg LS wi com wh
chky lamm & f chky incl, frm, brit, pred mod fis sb
biky-sb ang ctgs, sl stly tex, tr vf pyr & nod pyr strg, hi
calc wi cin HCL rxn, wi rr MRLST (10%): dk gy-dk gy
wi brn mrly lamm & incl, frm, brit, mod fis sb ang-sb
biky ctgs, sm-sily tex, l calc wi brn resd

9200-9260 CHK (90%): lt gy-gy v arg LS wi com wh
chky lamm & f chky incl, frm, brit, pred mod fis sb
biky-sb ang ctgs, sl stly tex, tr vf pyr & nod pyr strg, hi
calc wi cin HCL rxn, wi rr MRLST (10%): dk gy-dk gy
wi brn mrly lamm & incl, frm, brit, mod fis sb ang-sb
biky ctgs, sm-sily tex, l calc wi brn resd

9260-9320 CHK (90%): lt gy-gy v arg LS wi com f
chky incl, frm, brit, pred mod fis sb biky-sb ang ctgs,
sl stly tex, rr-occ free c chk, tr vf pyr & thin pyr strg, hi
calc wi cin HCL rxn, wi rr MRLST (10%): dk gy-dk gy,
frm, brit, mod fis sb ang-sb biky ctgs, brn mrly lamm
& incl sm-sily tex, l calc wi brn resd

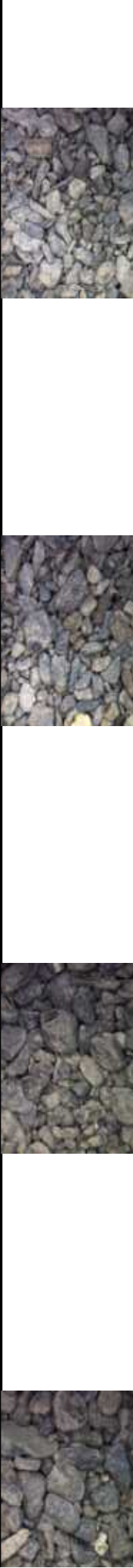
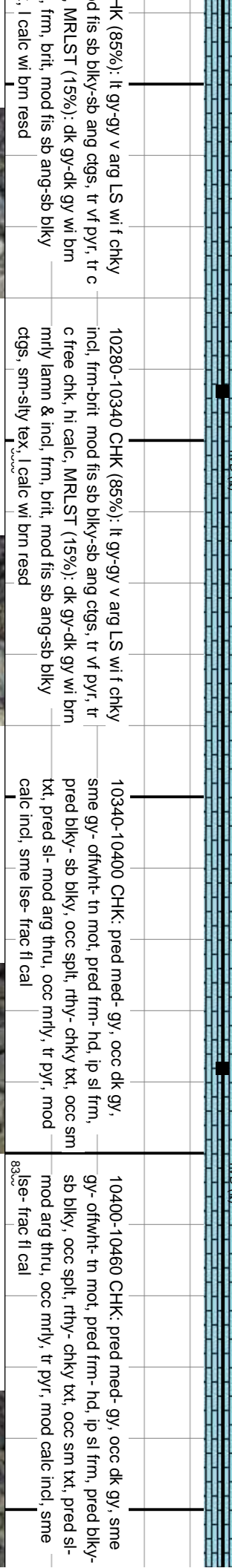
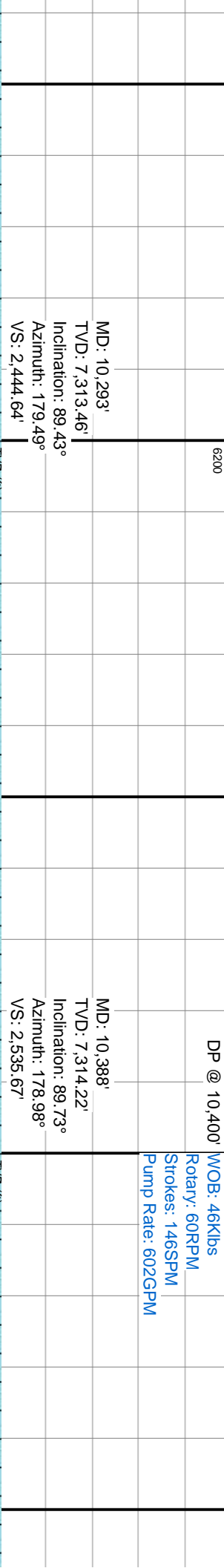
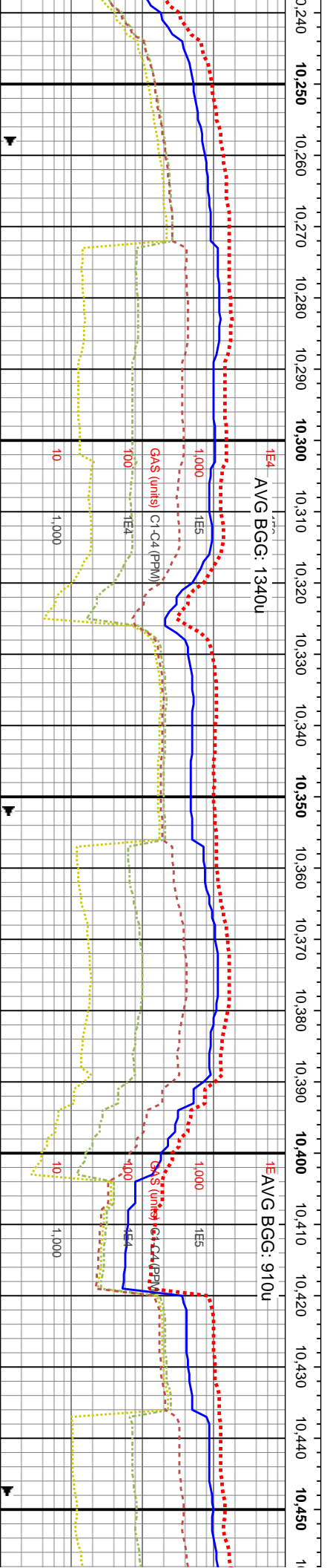
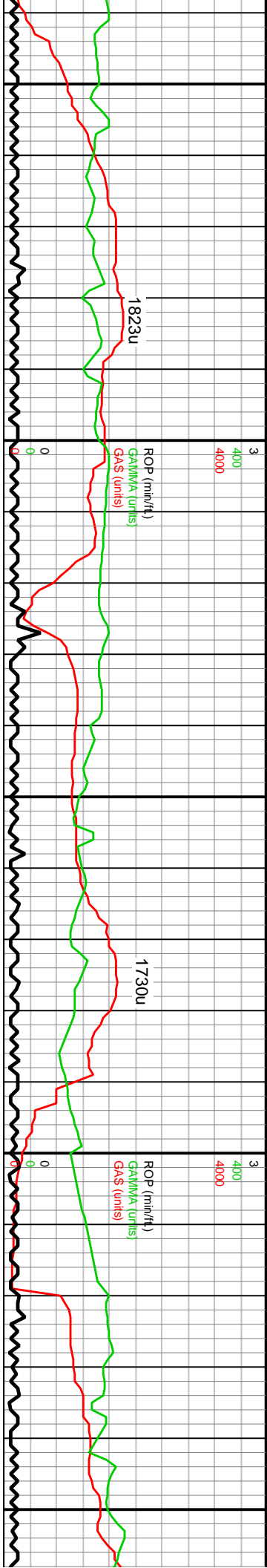
9320-9380 CHK (90%): lt gy-gy v e
chky lamm & f chky incl, frm, brit, p
biky-sb ang ctgs, sl stly tex, tr vf py
calc wi cin HCL rxn, wi rr MRLST (
wi brn mrly lamm & incl, frm, brit, m
biky ctgs, sm-sily tex, l calc wi brn

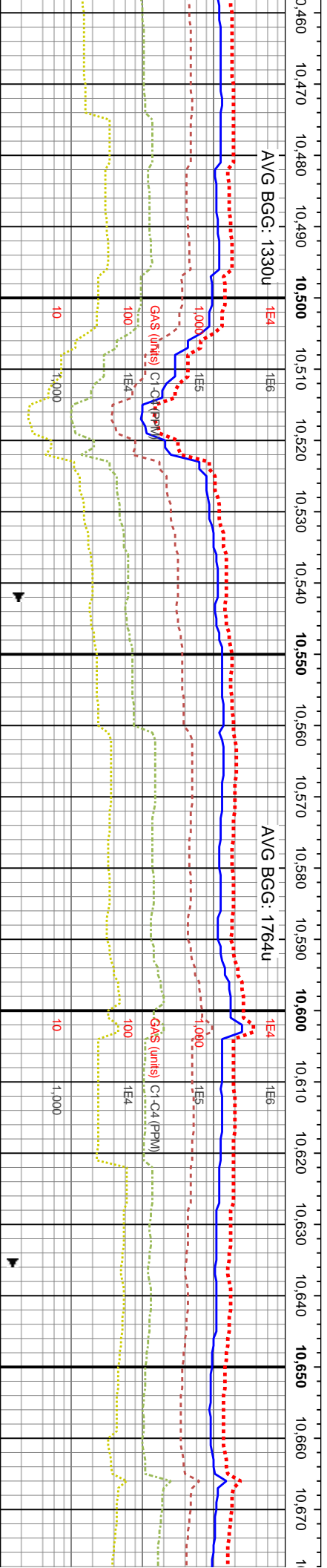
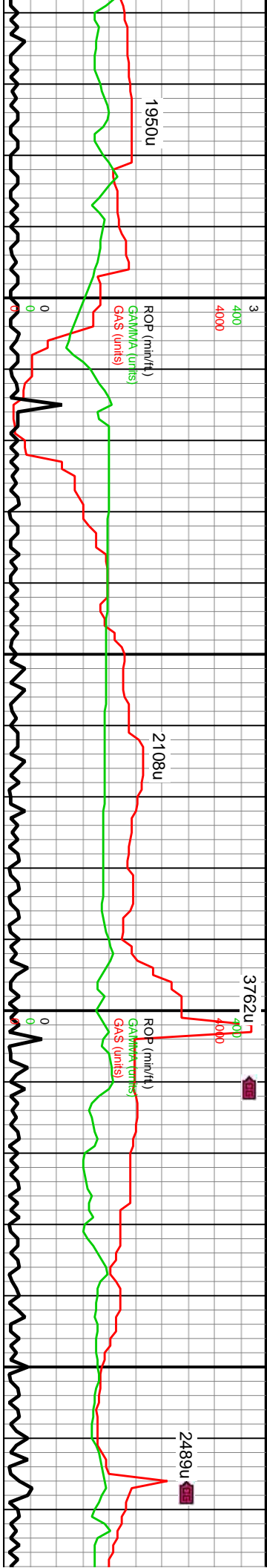




9800-9860 CHK (85%): lt gy-gy v arg LS wi f chky incl, frm-brit mod fis sb blkly-sb ang ctgs, tr vf pyr, tr c free chk, hi calc, MRLST (15%): dk gy-dk gy wi brn mly lamn & incl, frm, brit, mod fis sb ang-sb blkly ctgs, sm-sily tex, l calc wi brn resd	9860-9920 CHK: lt gy-gy v arg LS wi f chky incl, frm-brit mod fis sb blkly-sb ang ctgs, tr vf pyr, tr c free chk, hi calc
MD: 9,820' TVD: 7,302.44' Inclination: 87.82° Azimuth: 181.77° VS: 1,971.88'	MD: 9,915' TVD: 7,306.36' Inclination: 87.45° Azimuth: 179.69° VS: 2,066.78'







MD: 10,483'
TVD: 7,314.51'
Inclination: 89.93°
Azimuth: 178.47°
VS: 2,630.64'

MD: 10,578'
TVD: 7,313.87'
Inclination: 90.84°
Azimuth: 178.47°
VS: 2,725.61'

WOB: 42Klbs
Rotary: 60RPM
Strokes: 146SPM
Pump Rate: 602GPM

MD: 10,672'
TVD: 7,312.05'
Inclination: 91.1°
Azimuth: 179°
VS: 2,819.57'

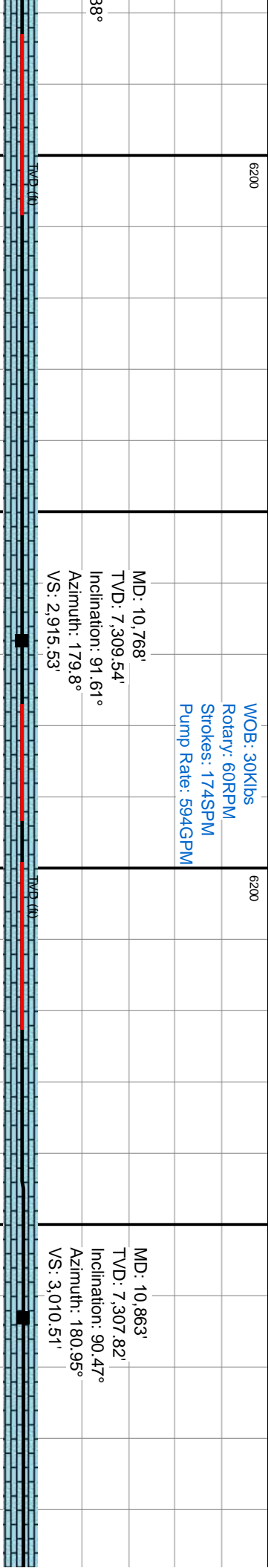
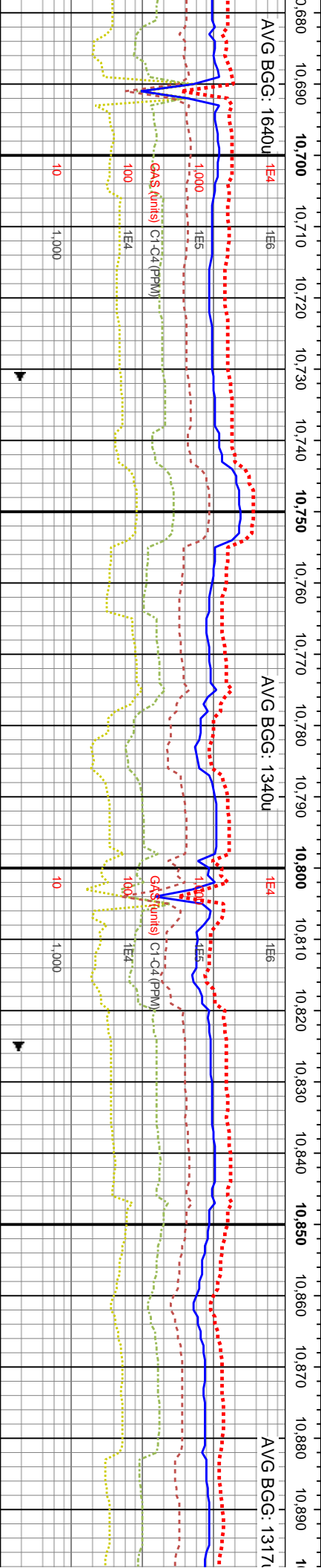
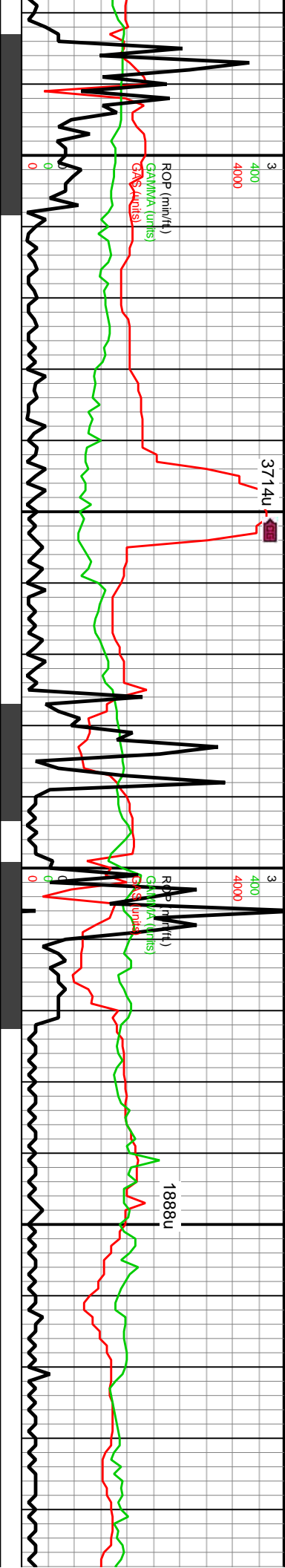
10460-10520 CHK: pred med- gy, occ dk gy, sme gy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ mly, tr pyr, mod calc incl, sme lse- frac fl cal

10520-10580 CHK: pred med- gy, occ dk gy, sme gy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ mly, tr pyr, mod calc incl, sme lse- frac fl cal

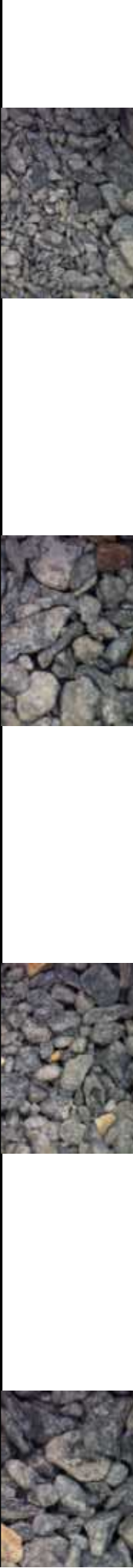
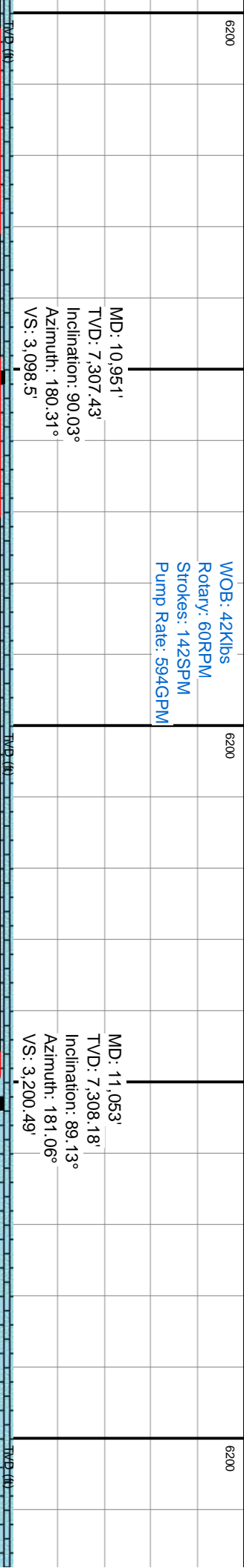
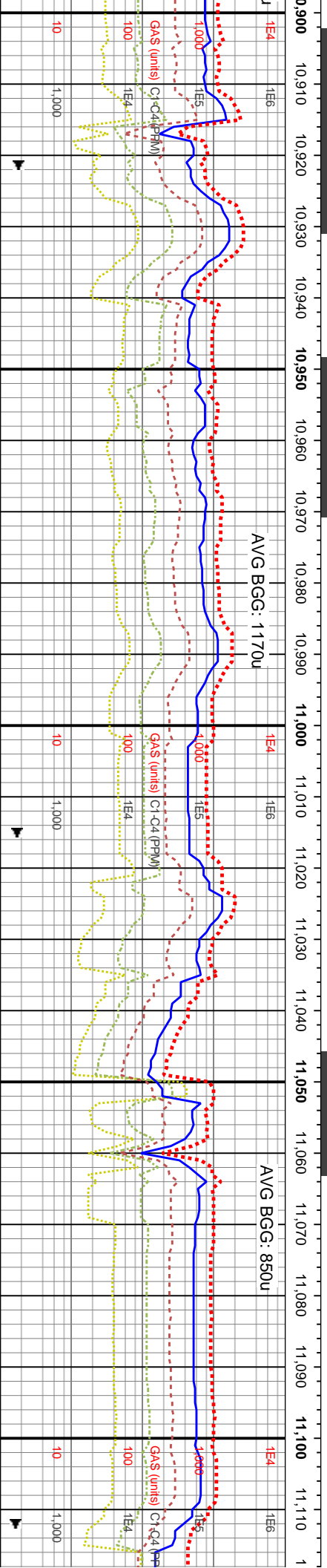
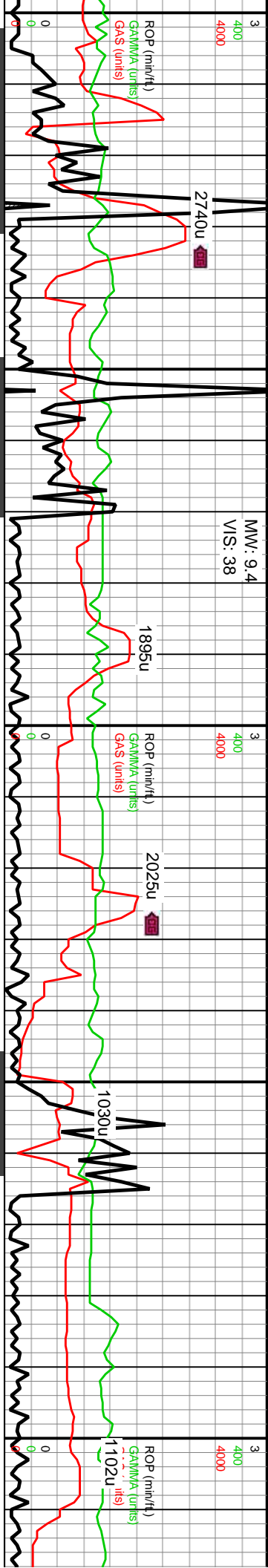
10580-10640 CHK: pred med- gy, occ dk gy, sme gy- offwht- tn mot, pred frm- hd, ip sl frm, pred blk- sb blk, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ mly, tr pyr, mod calc incl, sme lse- frac fl cal

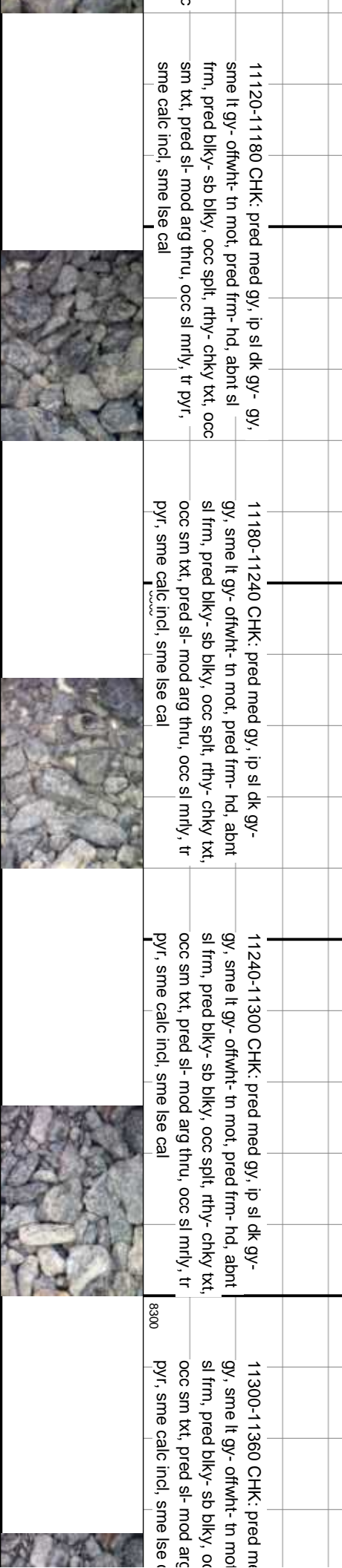
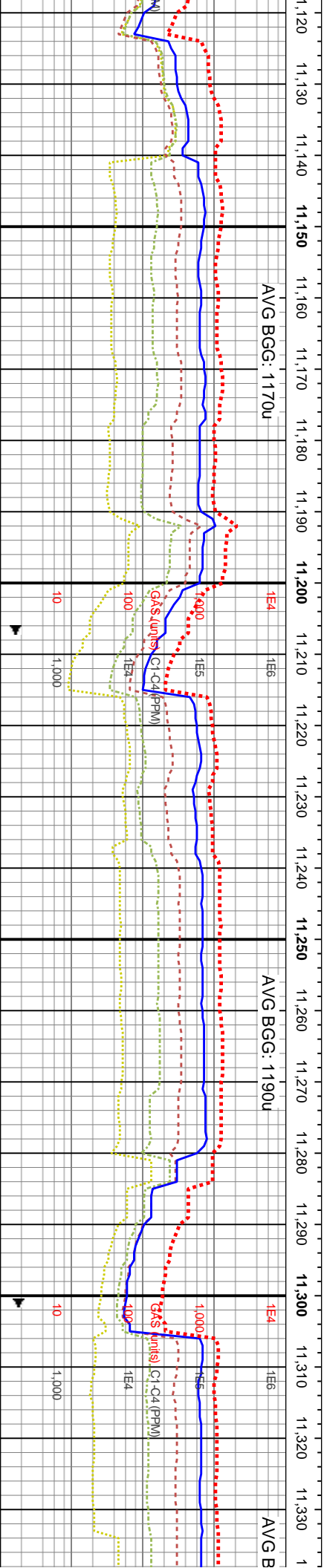
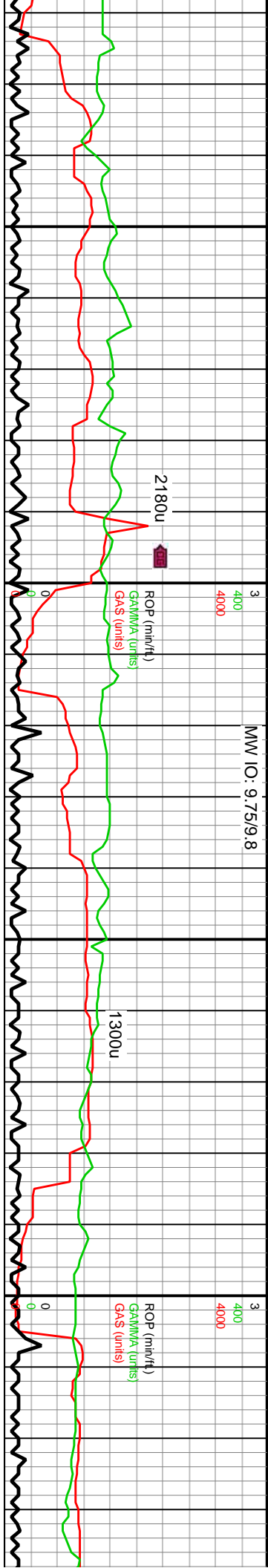
10640-10700 CHK: pred gy- gy, sme lt gy- offwht- tn mot, frm, pred blk- sb blk, occ s occ sm txt, pred sl arg thru, c pyr, occ- mod calc incl, sme

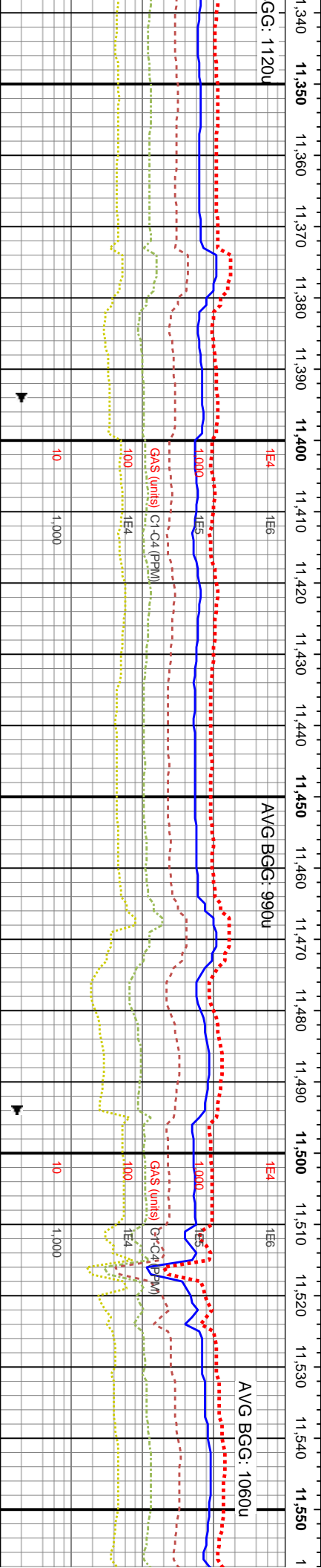
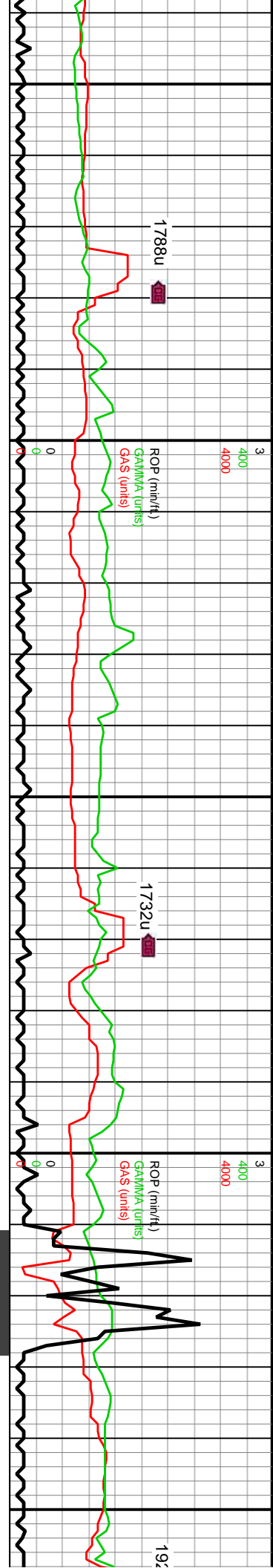




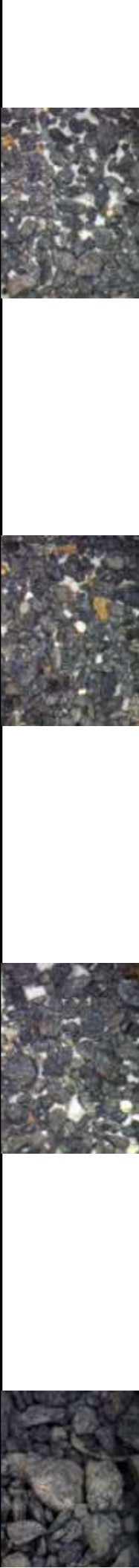
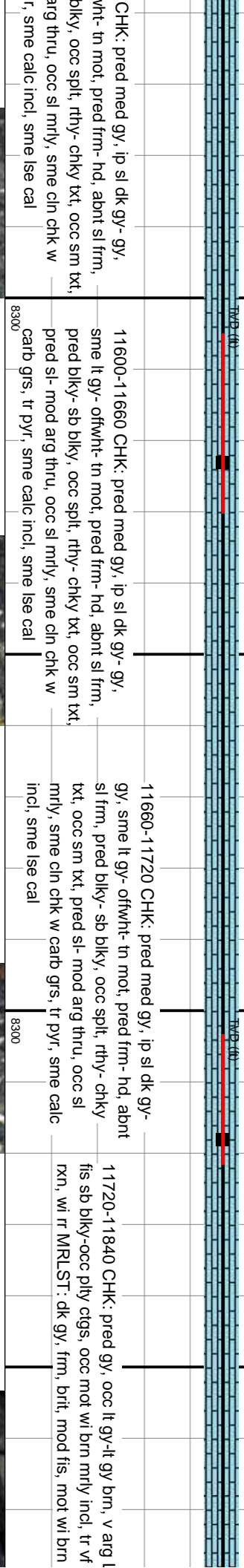
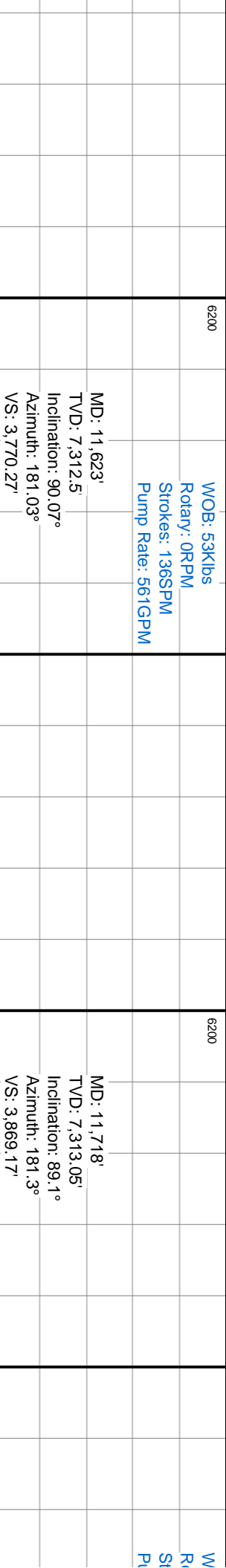
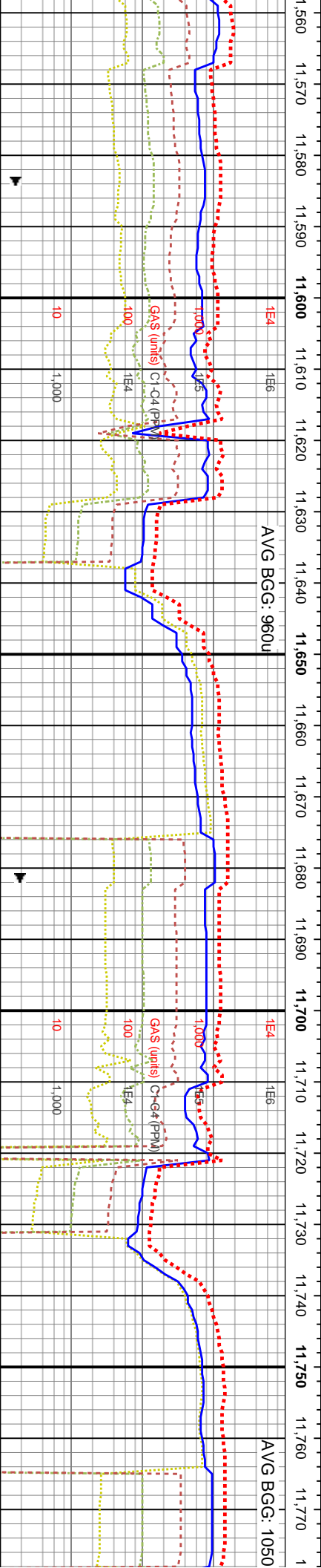
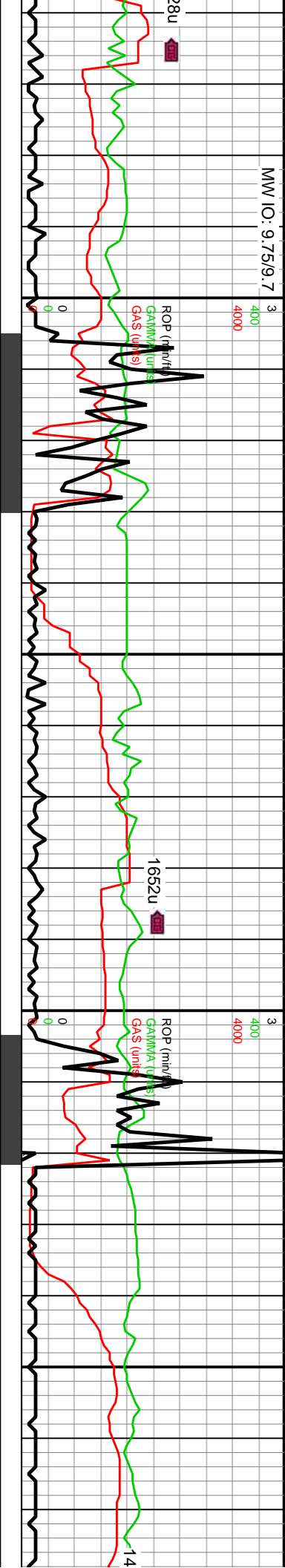
med gy, occ sl dk pred frm- hd, ip sl plt, rthy- chky txt, occ sl mrlly, sme lse cal	10700-10760 CHK: pred gy- med gy, occ sl dk gy, sme lt gy- offwht- in mot, pred frm- hd, ip sl frm, pred blkly- sb blkly, occ splt, rthy- chky txt, occ sm txt, pred sl arg thru, occ sl mrlly, sme pyr, occ- mod calc incl, sme lse cal	10760-10820 CHK: pred gy- med gy, occ sl dk gy, sme lt gy- offwht- in mot, pred frm- hd, ip sl frm, pred blkly- sb blkly, occ splt, rthy- chky txt, occ sm txt, pred sl arg thru, occ sl mrlly, sme pyr, occ- mod calc incl, sme lse cal	10820-10880 CHK: pred gy- med gy, occ sl dk gy, sme lt gy- offwht- in mot, pred frm- hd, ip sl frm, pred blkly- sb blkly, occ splt, rthy- chky txt, occ sm txt, pred sl arg thru, occ sl mrlly, sme pyr, occ- mod calc incl, sme lse cal	10880-10940 sme lt gy- offw pred blkly- sb t pred sl- mod a incl, sme lse c

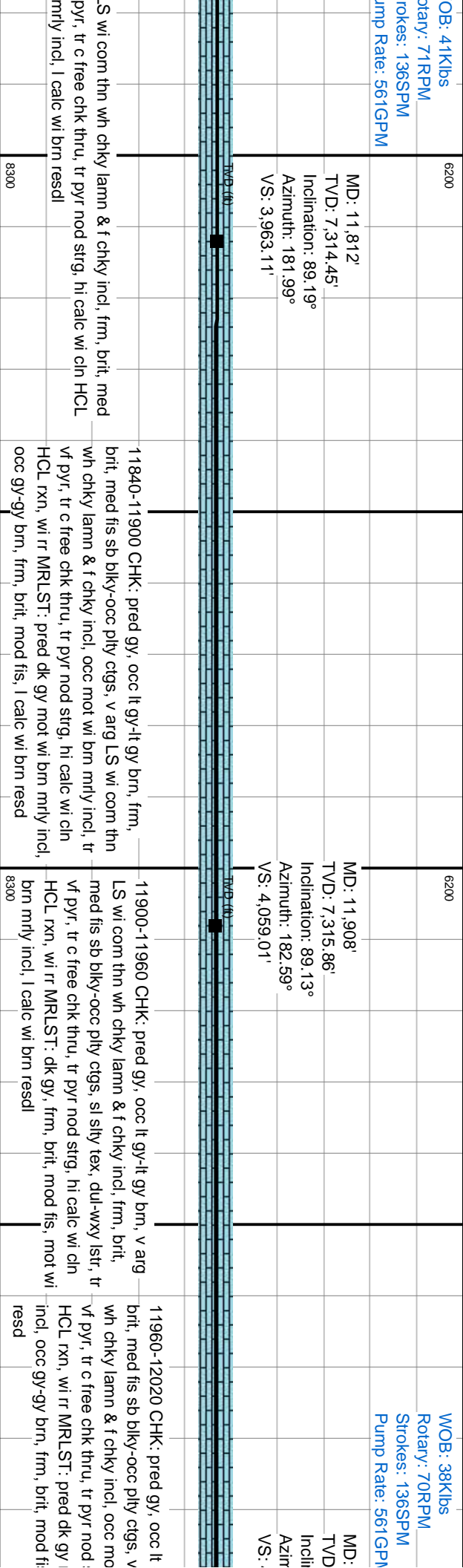
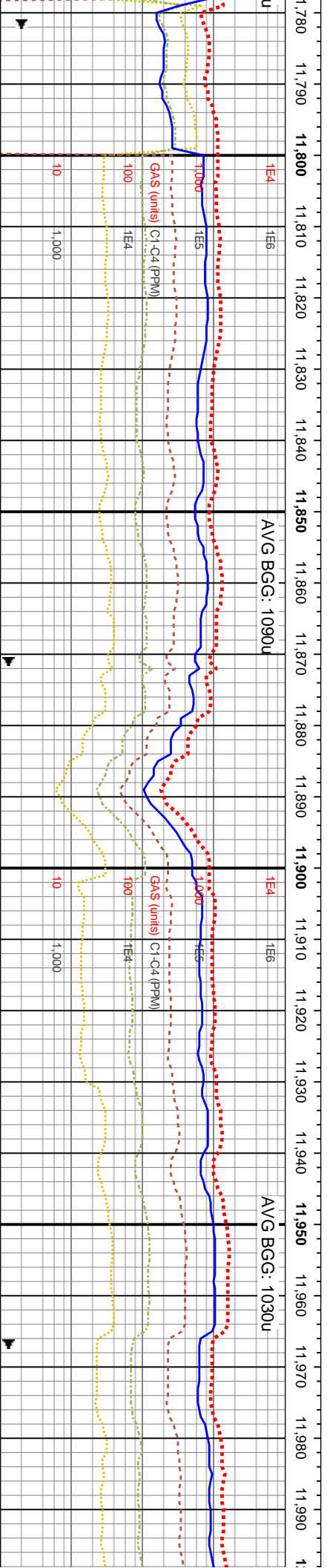
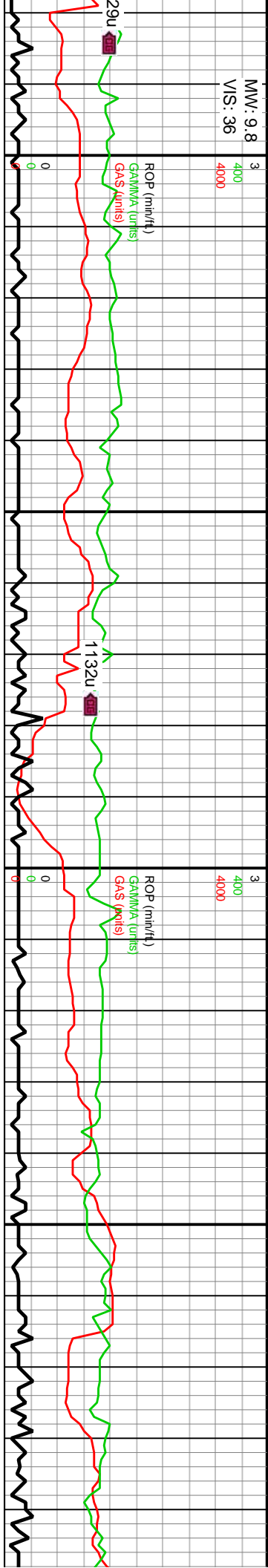


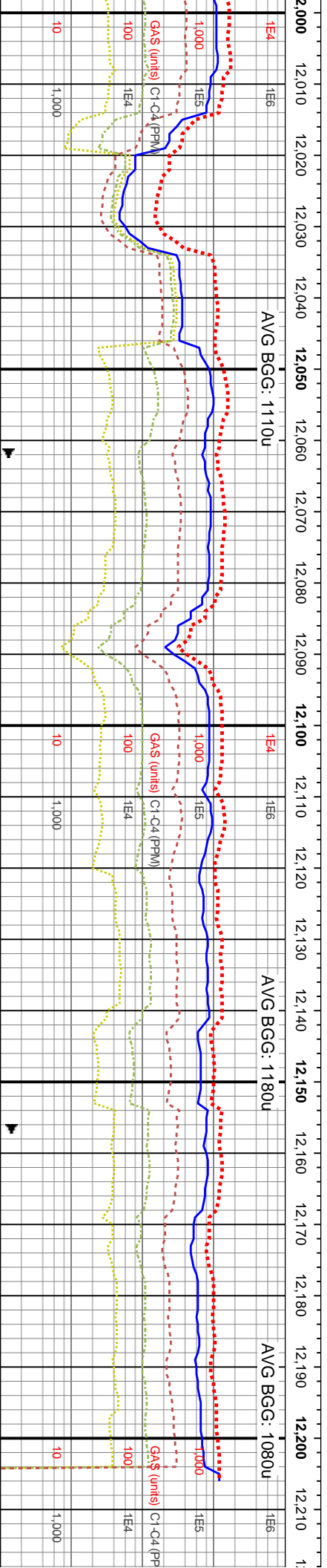
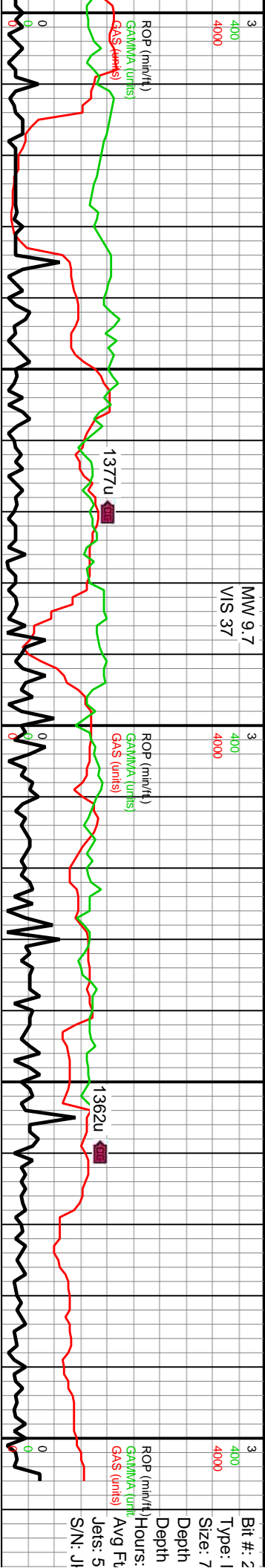




GG: 1120u		1E4	1E6	AVG BGG: 990u		1E4	1E6	AVG BGG: 1060u		1E4	1E6
WOB: 37Klbs		GAS (units)		C1-C4 (PPM)		GAS (units)		C1-C4 (PPM)		GAS (units)	
Rotary: 60RPM		100		1E4		100		1E4		100	
Strokes: 136SPM		10		1,000		10		1,000		10	
Pump Rate: 561GPM		6200		6200		6200		6200		6200	
MD: 11,433'		TVD: 7,311.75'		Inclination: 89.77°		Azimuth: 182.08°		VS: 3,580.34'		MD: 11,528'	
1.27'		89.66°		81.83°		TVD: 7,312.25'		Inclination: 89.63°		Azimuth: 181.52°	
4'		VS: 3,580.34'		VS: 3,675.29'		VS: 3,675.29'		VS: 3,675.29'		VS: 3,675.29'	
pred gy, ip sl dk gy- gy, pred frm- hd, abnt occ spl, rthy- chky txt, thru, occ sl mrlly, tr cal, occ frac fl cal		11360-11420 CHK: pred med gy, ip sl dk gy- gy, sme lt gy- offwht- tn mot, pred frm- hd, abnt sl frm, pred blkly- sb blkly, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ sl mrlly, tr pyr, sme calc incl, sme lse cal, occ frac fl cal		11420-11480 CHK: pred med gy, ip sl dk gy- gy, sme lt gy- offwht- tn mot, pred frm- hd, abnt sl frm, pred blkly- sb blkly, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ sl mrlly, tr pyr, sme calc incl, sme lse cal, occ frac fl cal		11480-11540 CHK: pred med gy, ip sl dk gy- gy, sme lt gy- offwht- tn mot, pred frm- hd, abnt sl frm, pred blkly- sb blkly, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ sl mrlly, tr pyr, sme calc incl, sme lse cal, occ frac fl cal		11540-11600 sme lt gy- offwht- tn mot, pred frm- hd, abnt sl frm, pred blkly- sb blkly, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ sl mrlly, tr pyr, sme calc incl, sme lse cal, occ frac fl cal		11540-11600 sme lt gy- offwht- tn mot, pred frm- hd, abnt sl frm, pred blkly- sb blkly, occ spl, rthy- chky txt, occ sm txt, pred sl- mod arg thru, occ sl mrlly, tr pyr, sme calc incl, sme lse cal, occ frac fl cal	







6200		6200		6200		6200	
12,003'		MD: 12,098'		MD: 12,147'		WOB: 29Klbs Rotary: 70RPM Strokes: 136SPM Pump Rate: 561GPM	
7,317.8		TVD: 7,320.14'		TVD: 7,321.35'		*Projection to bit* MD: 12,206' TVD: 7,322.89' Inclination: 88.52° Azimuth: 182.19° VS: 4,356.65'	
Inclination: 88.52°		Inclination: 88.66°		Inclination: 88.52°			
Azimuth: 182.41°		Azimuth: 182.42°		Azimuth: 182.19°			
VS: 4,153.89'		VS: 4,248.76'		VS: 4,297.7'			

Time	Event	Time	Event	Time	Event	
8300	arg LS wi com thn t wi brn mntly incl, tr stng, hi calc wi chn mot wi brn mntly s, l calc wi brn	12020-12080 CHK (90%): pred gy, occ lt gy-lt gy brn, v arg LS wi com thn wh chky lamm & f chky incl, frm, brit, med fis sb blyk-occ ply ctgs, occ mot wi brn mntly incl, tr vf pyr, tr c free chk thru, tr pyr nod stng, hi calc wi chn HCL rxn, wi 10% MRLST: dk gy, frm, brit, mod fis, mot wi brn mntly incl, l calc wi brn resd	8300	12080-12140 CHK (90%): pred gy, occ lt gy-lt gy brn, v frm, brit, med fis sb blyk-occ ply ctgs, v arg LS wi com thn wh chky lamm & f chky incl, occ mot wi brn mntly incl, tr vf pyr, tr c free chk thru, tr pyr nod stng, hi calc wi chn HCL rxn, wi intbdd MRLST (10%): pred dk gy mot wi brn mntly incl, occ gy-gy brn, frm, brit, mod fis, l calc wi brn resd	8300	12140-12206 CHK: pred gy, occ lt gy-lt gy brn, v arg LS wi com thn wh chky lamm & f chky incl, frm, brit, med fis sb blyk-occ ply ctgs, sl silty tex, dul-wxy lst, tr vf pyr, tr c free chk thru, tr pyr nod stng, hi calc wi chn HCL rxn, wi rr MRLST: dk gy, frm, brit, mod fis, mot wi brn mntly incl, l calc wi brn resd



