



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Winder South 1

Location Sec. 9-T6N-R67W

State Colorado

Country USA

County Weld

Rig Number Patterson 346

API Number 05-123-43402-00

Field Wattenberg

Geographic Region DJ Basin

Drilling Completed 8/19/2016

Spud Date 8/15/2016

Surface Coordinates SHL: 2325'FSL, 603' FEL, Sec. 9

Lat: 40° 30' 9.615"

Long: 104° 53' 23.928"

Bottom Hole Coordinates PBHL: 2613' FNL & 460' FWL, Sec 8

Lat: 40° 30' 4.921"

Long: 104° 55' 29.626"

Ground Elevation 4,854'

K.B. Elevation 4,878.5'

Logged Interval 6,680' **To** 16,960'

Total Depth 16,960'

Formation Niobrara C Chalk

Type of Drilling Fluid Oil Based Mud

Operator

Company Extraction Oil & Gas

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

Geologist

Name Jared Rouse

Company Extraction Oil & Gas

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



Other

Equipment ML-574

Comments Start: 8-16-16
TD: 8-19-16

Services Provided 2-man Logging
On Site Geosteering

Logger Names Dominic Pitre/ Dan Scott

Address ALS Empirica
6510 Guhn Road
Houston, Texas 77040

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

CHALK

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

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

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 PELLET

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

Nicholas Watkins

Other Syn

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

FORM

GAS SHOW

VUGGY

NORMAL F

OIL SHOW

OVERTURN

Oil Show

Engineering

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

SIDEWALL

SLIDE

SURVEY

TRIP GAS

WIRELINE

WIRELINE

mbols

L LITHOGRAPHIC

Rounding

MX MICROXLN

A ANGULAR **MS** MUDSTONE

R ROUNDED **PS** PACKSTONE

S SUBANG **WS** WACKESTONE

F SUBRND

Sorting

Textures

M MODERATE

B BOUNDSTONE **P** POOR

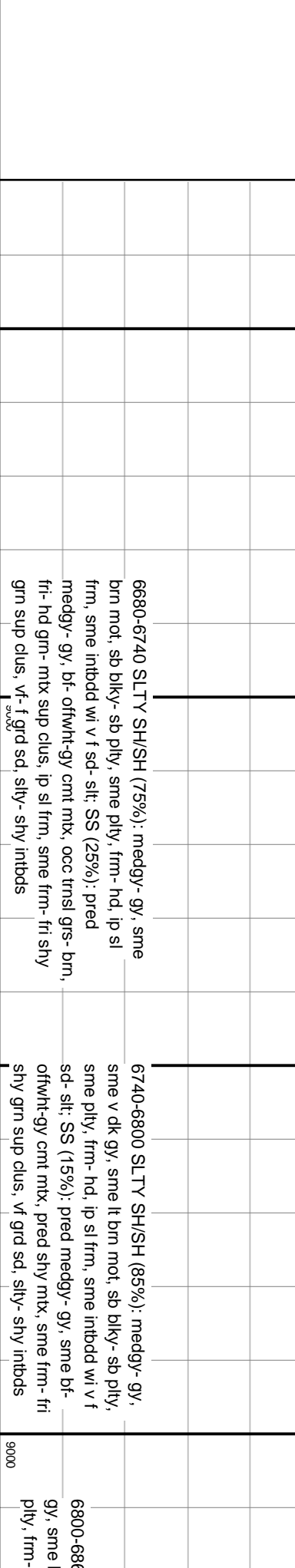
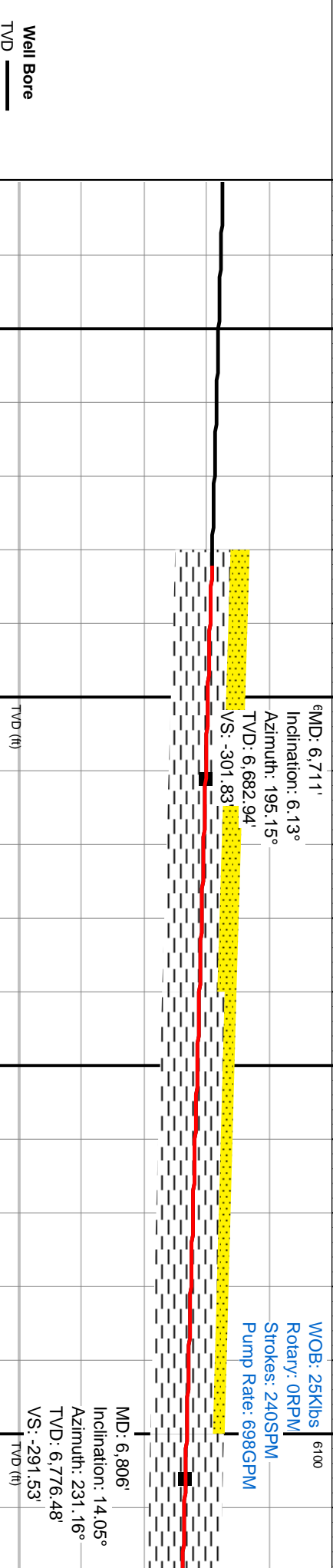
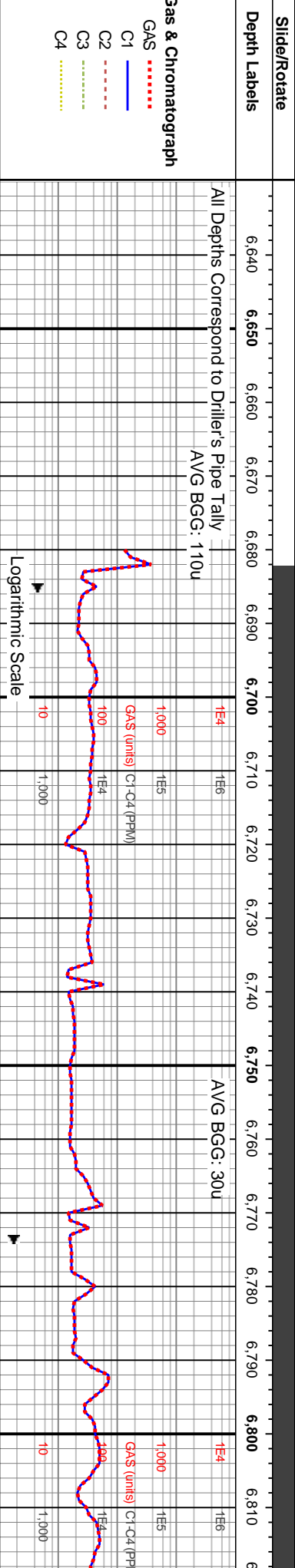
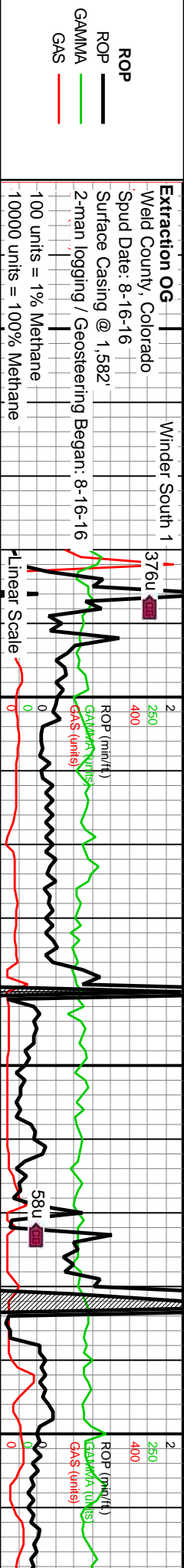
C CHALKY **W** WELL

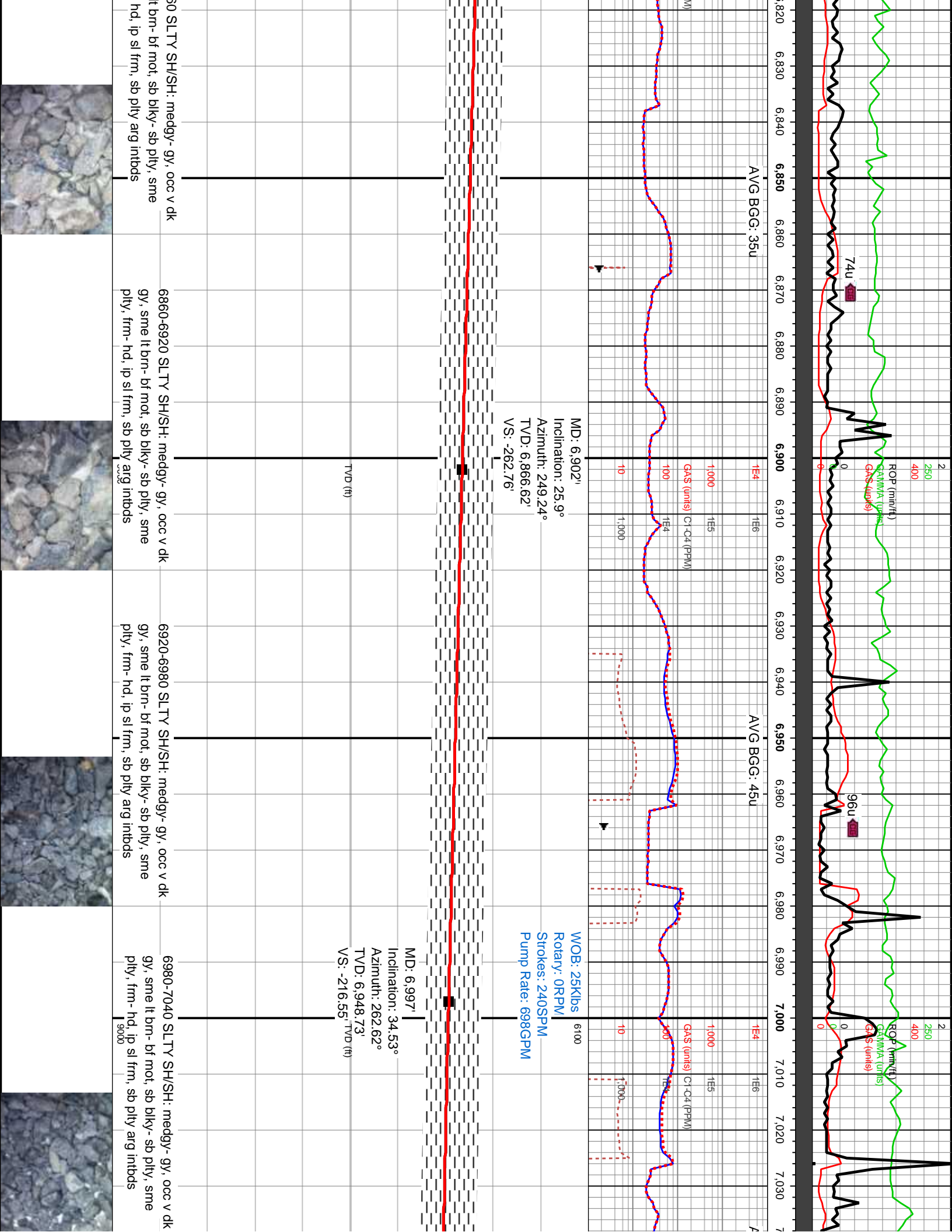
CX CRYPTOXLN

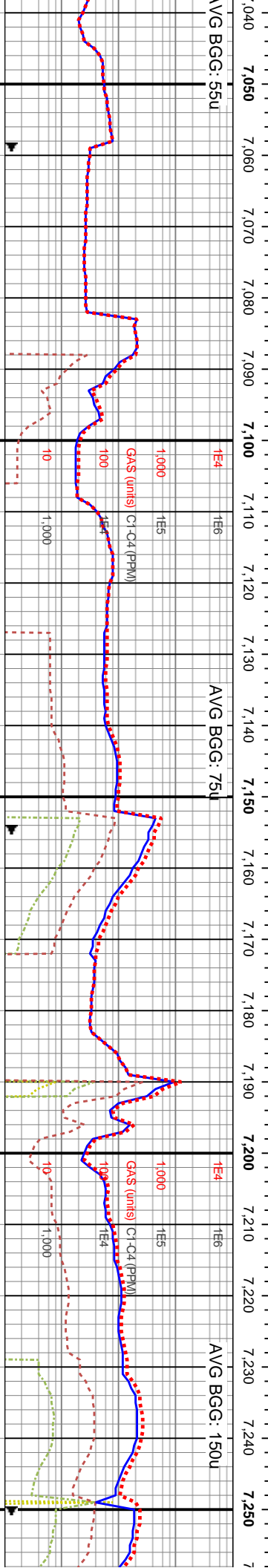
E EARTHY

FX FINELYXLN

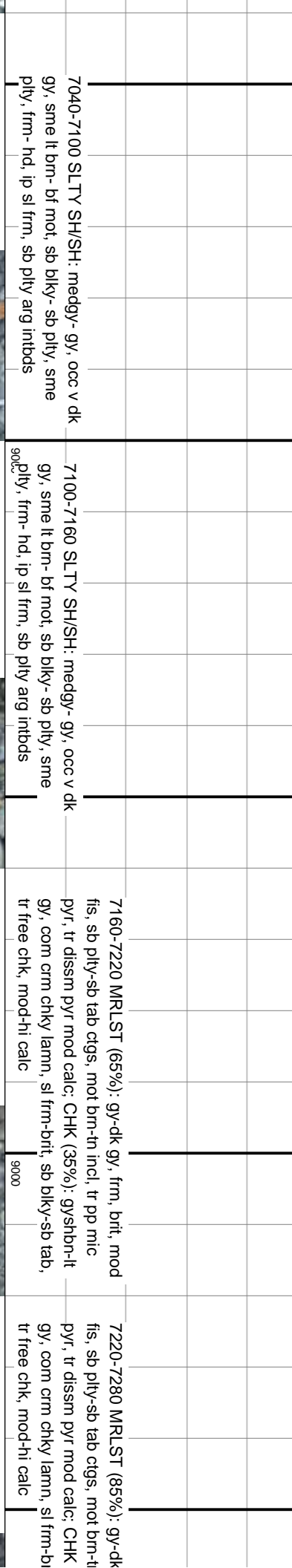
GS GRAINSTONE

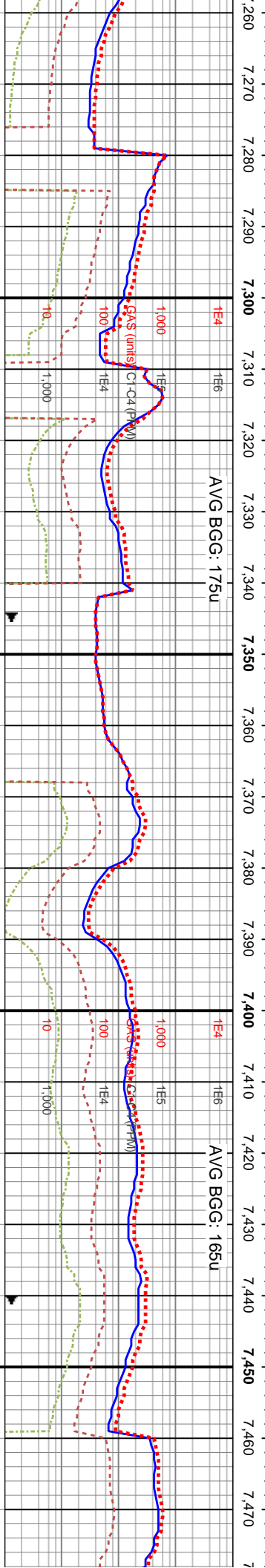






WOB: 31Klbs
Rotary: 0RPM
MD: 7,188' Strokes: 241SPM
Inclination: 53.84° Rate: 699GPM
Azimuth: 270.4°
TVD: 7,084.65'
VS: -83.86'



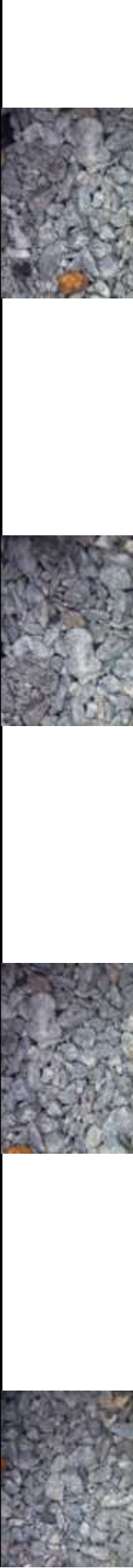
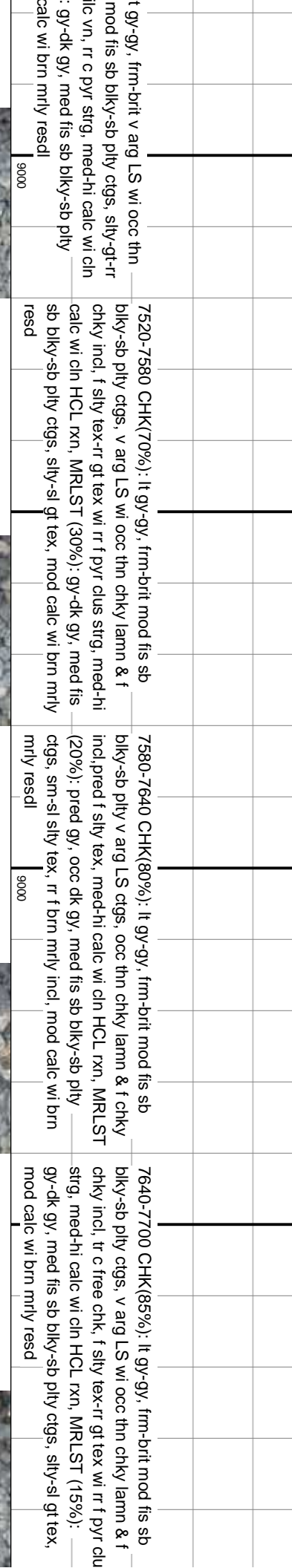
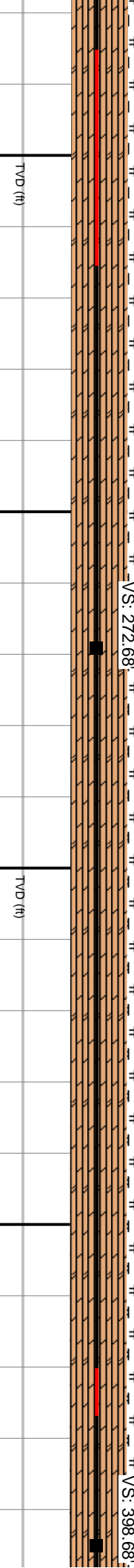
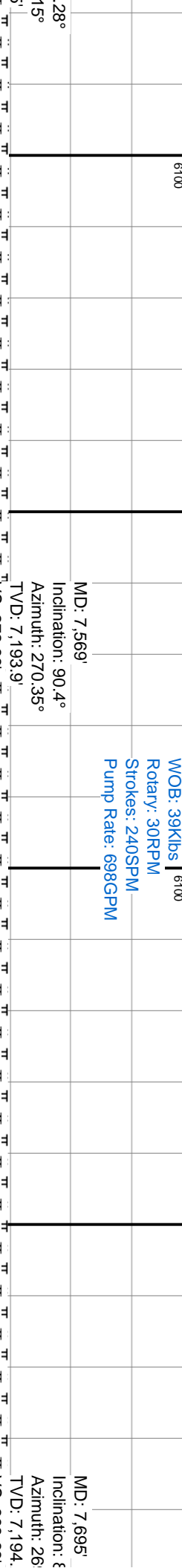
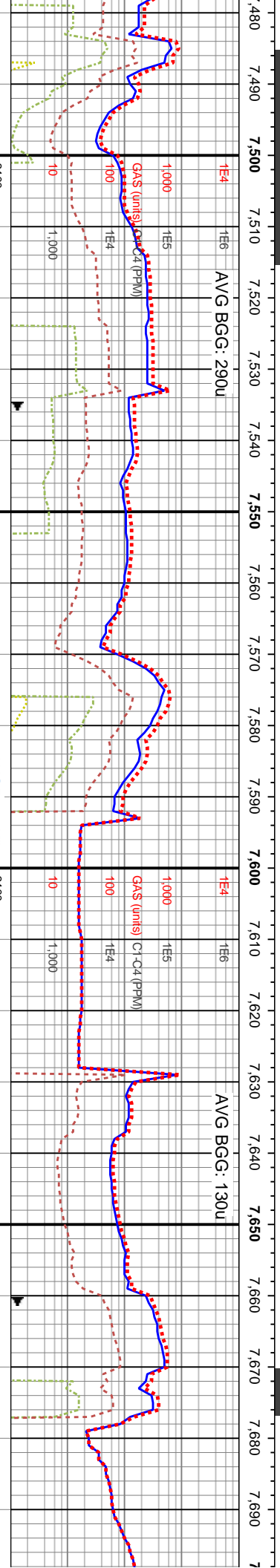
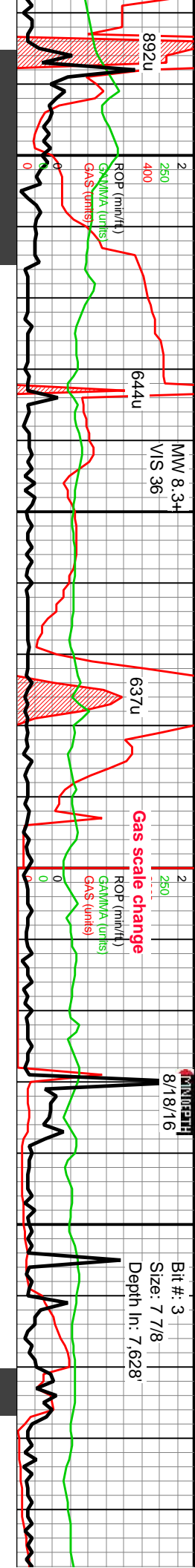


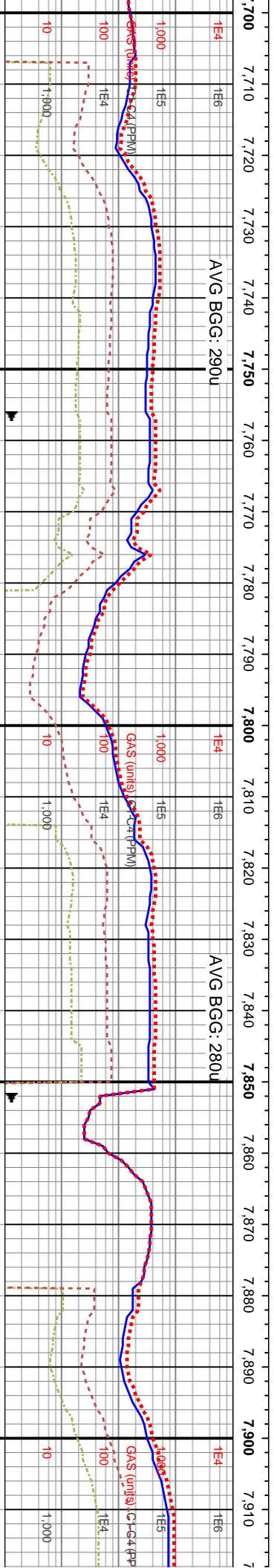
Inclination: 73.88°
 Azimuth: 273.5°
 TVD: 7,171.48'
 VS: 83.87°
 Inclination: 84°
 Azimuth: 272°
 TVD: 7,169.48'
 VS: 176.85°

MD: 7,473'
Inclination: 84
Azimuth: 272.
TVD: 7,189.4ft
VS: 176.85' T

	TVD (ft)	TVD (ft)	TVD (ft)
7280-7340 MRLST (85%): gy-dk gy, frm, brit, mod fis, sb pily-sb tab ctgs, mot brn-tin incl, tr pp mic pyr, tr dissim pyr mod calc; CHK (15%): gysbhn-lt-gy, com crm chky lamm, sl frm-brit, sb blk-y-sb tab, tr free chk, mod-hi calc	9000	7340-7400 MRLST (85%): gy-dk gy, frm, brit, mod fis, sb pily-sb tab ctgs, mot brn-tin incl, tr pp mic pyr, tr dissim pyr mod calc; CHK (15%): gysbhn-lt-gy, com crm chky lamm, sl frm-brit, sb blk-y-sb tab, tr free chk, mod-hi calc	9000
7400-7460 MRLST (85%): gy-dk gy, frm, brit, mod fis, sb pily-sb tab ctgs, mot brn-tin incl, tr pp mic pyr, tr dissim pyr mod calc; CHK (15%): gysbhn-lt-gy, com crm chky lamm, sl frm-brit, sb blk-y-sb tab, tr free chk, mod-hi calc	9000	7460-7520 CHK(60%): chlgy, chlgy lamn & f chlgy incl, sdy tex, tr c gt-sdy cal-s HCL rxn, MRLST (40%) ctgs, silty-sl gt tex, mod	

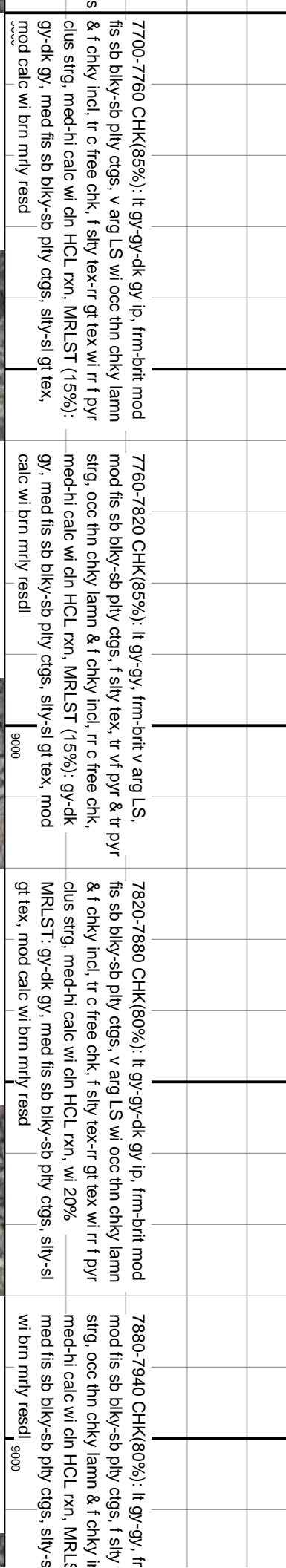
7460-7520 CHK(60%): l
chky larnn & f chky incl,
sdy tex, tr c gt-sdy cal-s
HCL rxn, MRLST (40%)



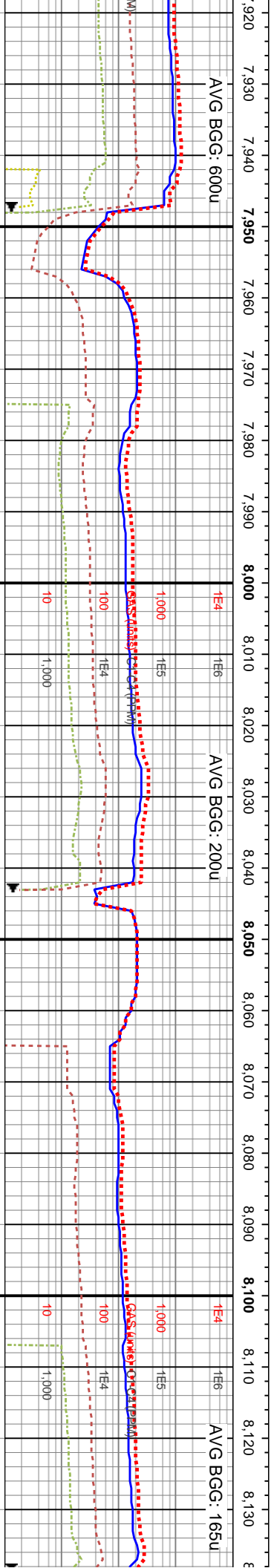
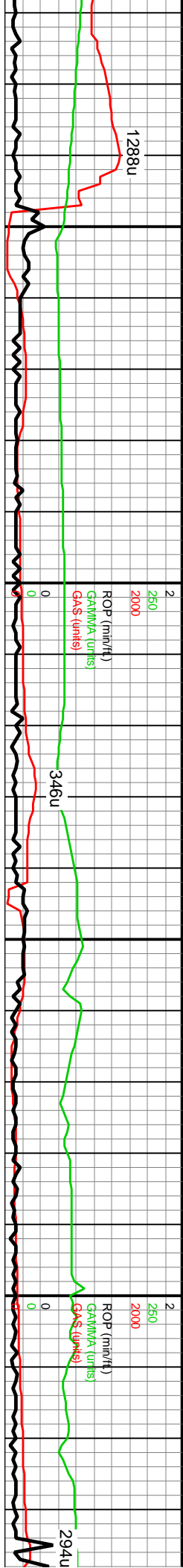


MD: 7,790'
Inclination: 89.43°
Azimuth: 269.55°
TVD: 7,195.3'
TVS: 493.67'

MD: 7,885'	
Inclination: 89.33°	
Azimuth: 269.6°	
TVD: 7,196.33'	
VS: 588.65'	π π



7880-7940 CHK(80%): It gy-gy, fr
mod fis sb biky-sb ply ctgs, f sily
stly, occ thn chky lamm & f chky if
med-hi calc wi ch HCL rxn, MRL&L
med fis sb biky-sb ply ctgs, sily-s
wi bmn mtry resdl 9000



WOB: 31Klbs
Rotary: 60RPM
Strokes: 240SPM
Pump Rate: 697GPM

MD: 7,981'
Inclination: 89.73°
Azimuth: 270.22°
TVS: 684.65'

MD: 8,076'
Inclination: 90.91°
Azimuth: 270.23°
TVS: 779.65'

TVD (ft)

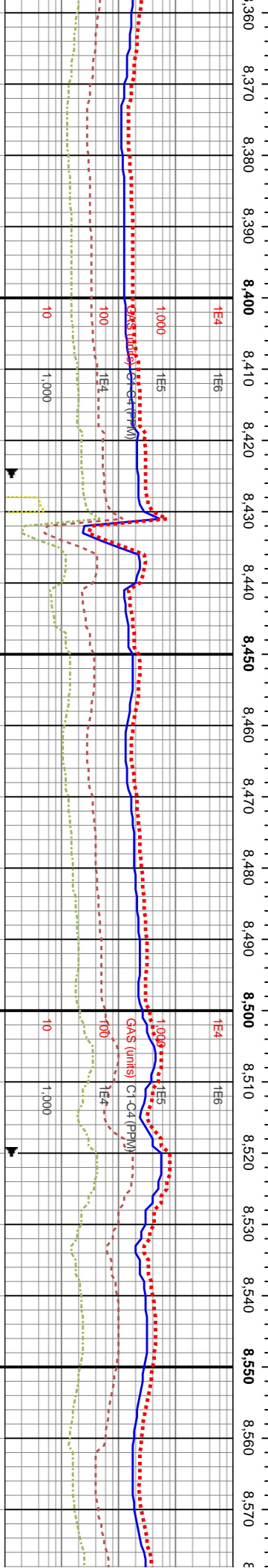
TVD (ft)

m-brit v arg LS, tex, tr vf pyr & tr pyr & f chky incl, tr c free chk, st (20%): gy-dk gy, l gt tex, mod calc

7940-8000 CHK (80%): It gy-gy-dk gy ip, frm-brit mod fis sb biky-sb ply ctgs, v arg LS wi occ thn chky lamm & f chky incl, tr c free chk, f slty tex-tr gt tex wi rr f pyr ctus strg, med-hi calc wi chn HCL rxn, wi 20% MRLST: gy-dk gy, med fis sb biky-sb ply ctgs, slty-sl gt tex, mod calc wi brn mly resd

8000-8060 CHK (80%): It gy-gy-dk gy ip, frm-brit v arg LS wi f elong chky incl & thn lamm, mod fis sb biky-sb ply ctgs, rr bent, f slty tex, tr vf pyr & tr pyr strg, occ c free chk, med-hi calc wi chn HCL rxn, MRLST (20%): gy-dk gy, med fis sb biky-sb ply ctgs, slty-sl gt tex, mod calc wi brn mly resd

9000

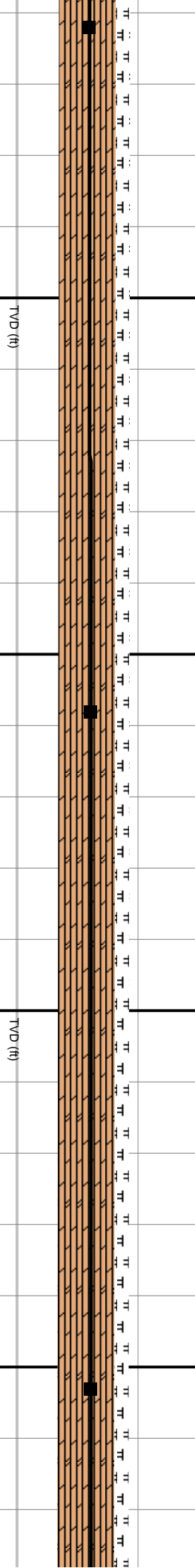


8,362'
ation: 90.1°
uth: 268.77°
7,195.44'
,065.65'

MD: 8,458'
Inclination: 90.4°
Azimuth: 270.12°
TVD: 7,195.02'
VS: 1,161.64'

WOB: 39Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 698GPM

MD: 8,553'
Inclination: 90.57°
Azimuth: 270.17°
TVD: 7,194.22'
VS: 1,256.63'



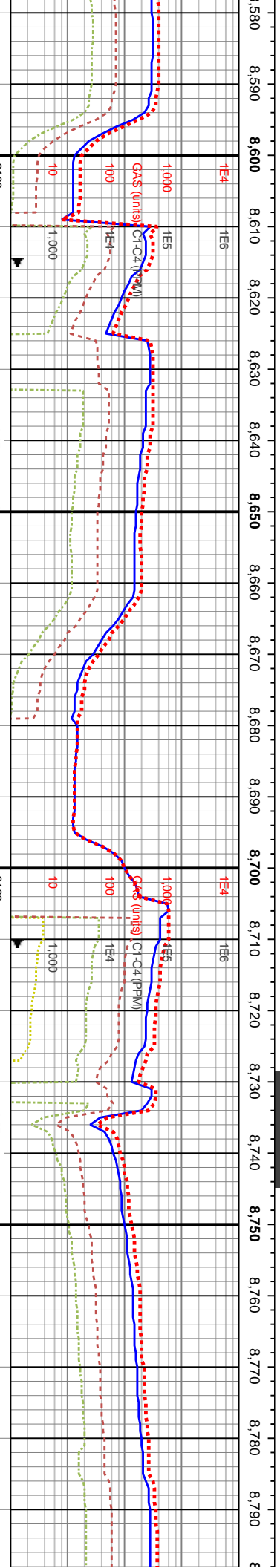
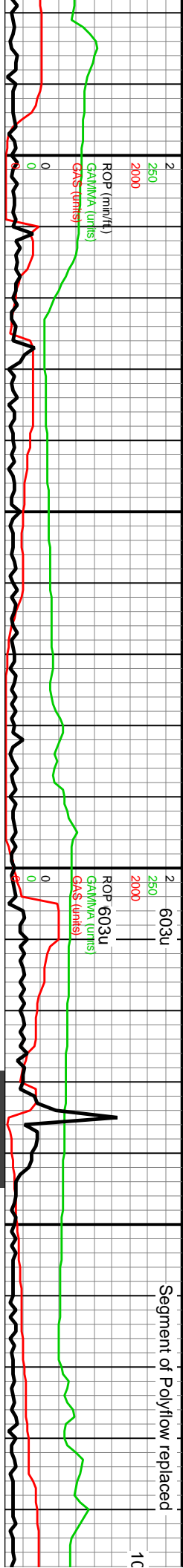
8360-8420 CHK (90%): pred gy, sme lt gy- med gy, offwht- bf- lt brn mot thru, pred frm, pred sb blk- blk, sl arg thru, mly intbds, lse cal, mod calc incl, occ frac fl- euhed cal, tr pyr; MRLST (10%): dk gy- blk, sb blk, sl frm- sl hd, intbdd wi chk

8420-8480 CHK (90%): pred gy, sme lt gy- med gy, offwht- bf- lt brn mot thru, pred frm, pred sb blk- blk, sl arg thru, tr sl mly intbds, lse cal, mod calc incl, occ euhed cal, tr pyr; MRLST (10%): dk gy- blk, sb blk, sl frm- sl hd, intbdd wi chk

8480-8540 CHK (90%): pred gy, sme lt gy- med gy, offwht- bf- lt brn mot thru, pred frm, pred sb blk- blk, sl arg thru, tr sl mly intbds, lse cal, mod calc incl, occ euhed cal, tr pyr; MRLST (10%): dk gy- blk, sb blk, sl frm- sl hd, intbdd wi chk

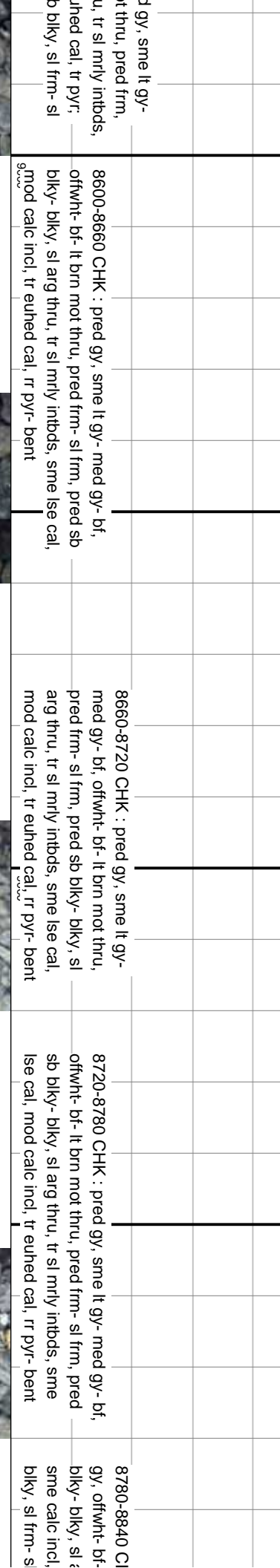
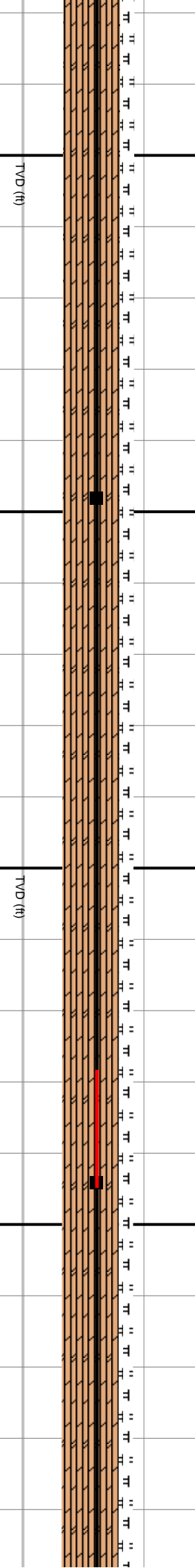
8540-8600 CHK (90%): pred gy, offwht- bf- lt brn mot thru, pred sb blk- blk, sl arg thru, lse cal, mod calc incl, occ euhed cal, tr pyr; MRLST (10%): dk gy- blk, sb blk, sl frm- sl hd, intbdd wi chk

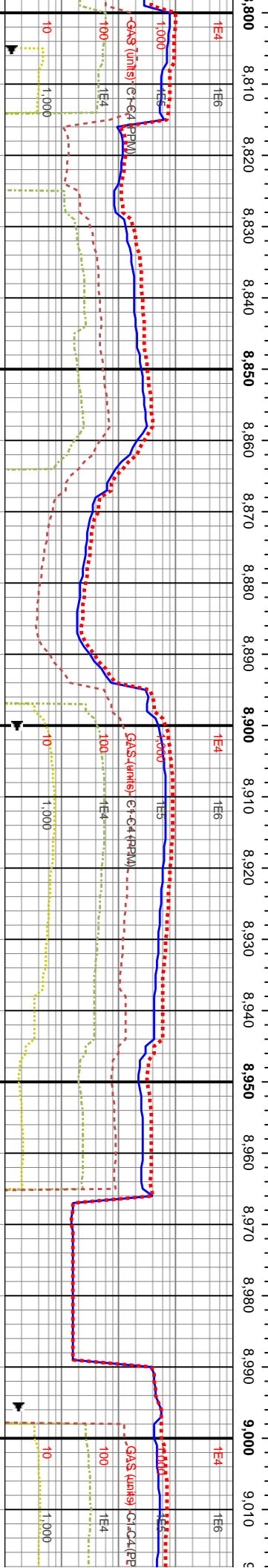
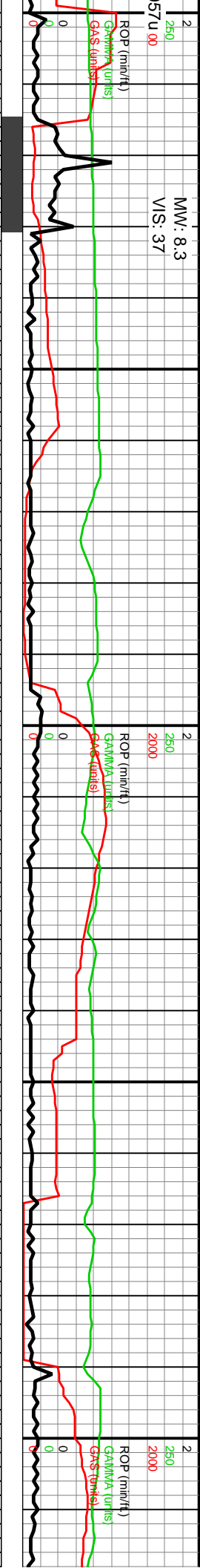




MD: 8,648'
Inclination: 90.87°
Azimuth: 269.97°
TVD: 7,193.03'
VS: 1,351.63'

MD: 8,744'
Inclination: 90.77°
Azimuth: 270.75°
TVD: 7,191.65'
VS: 1,447.61'

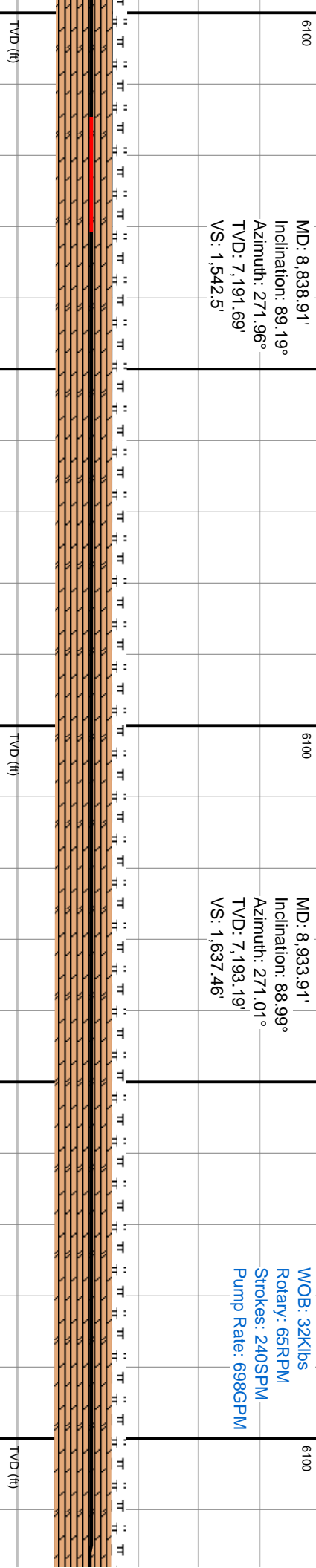




MD: 8,838.91'
Inclination: 89.19°
Azimuth: 271.96°
TVD: 7,191.69'
VS: 1,542.5'

MD: 8,933.91'
Inclination: 88.99°
Azimuth: 271.01°
TVD: 7,193.19'
VS: 1,637.46'

WOB: 32Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 698GPM

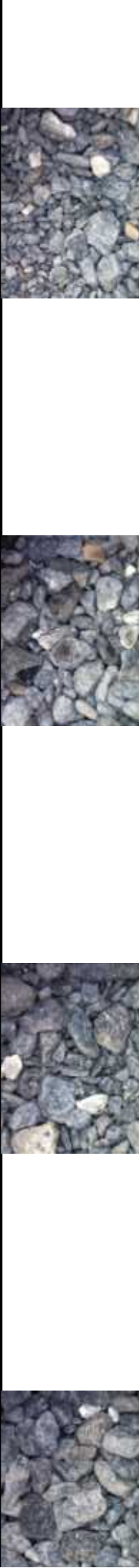


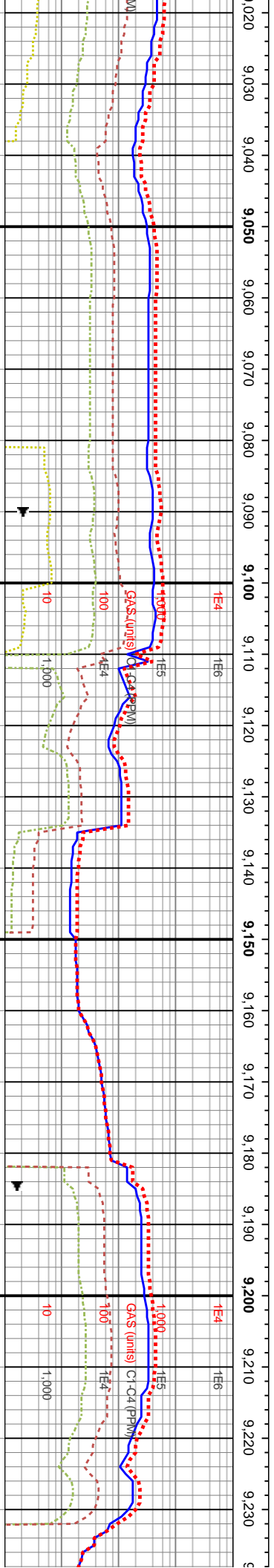
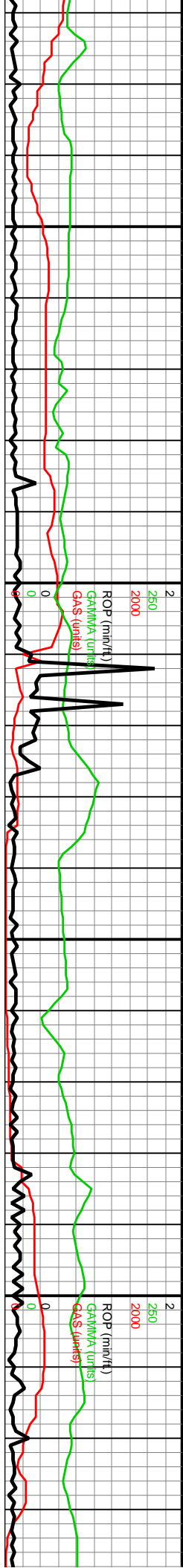
MD: 8,838.91'
Inclination: 89.19°
Azimuth: 271.96°
TVD: 7,191.69'
VS: 1,542.5'

MD: 8,933.91'
Inclination: 88.99°
Azimuth: 271.01°
TVD: 7,193.19'
VS: 1,637.46'

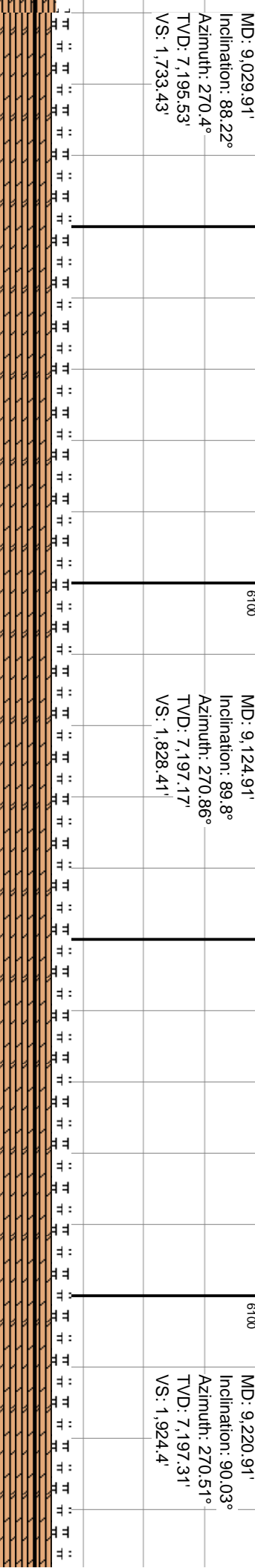
WOB: 32Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 698GPM

CHK (85%): pred gy, sme lt gy- med lt brn mot thru, pred frm, pred sb arg thru, sme sl mrlly inbds, lse cal, rr bent; MRLST (15%): dk gy- blk, sb hd, inbddd wi chk	8840-8900 CHK (85%): pred gy, sme lt gy- med gy, offwht- bf- lt brn mot thru, pred frm- sl frm, pred sb blk- blk, sl arg thru, sme sl mrlly inbds, lse cal, sme calc incl, rr bent; MRLST (15%): dk gy- blk, sb blk, sl frm- sl hd, inbddd wi chk	8900-8960 CHK (85%): pred gy, sme lt gy- med gy, offwht- bf- lt brn mot thru, pred frm, pred sb blk- blk, sl arg thru, sme sl mrlly inbds, lse cal, sme calc incl, rr bent; MRLST (15%): dk gy- sl blk, sb blk, sl frm- sl hd, inbddd wi chk	8960-9020 CHK (75%): pred med gy, sme lt gy, offwht- bf- lt brn mot thru, pred frm- sl hd, pred sb blk- blk, sl arg thru, sme sl mrlly inbds, mod arg, lse cal, sme calc incl, rr bent; MRLST (25%): dk gy- sl blk, sb blk, sl frm- sl hd, inbddd wi chk
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)

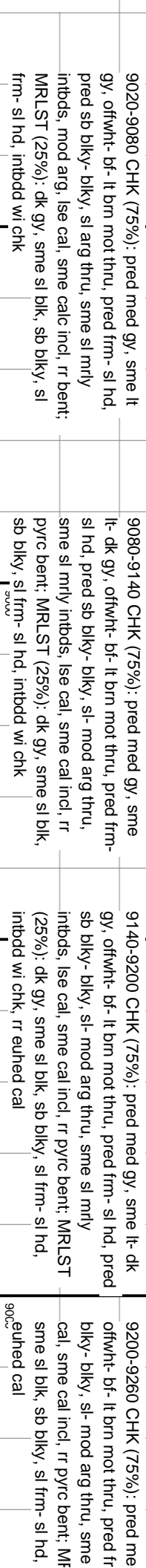
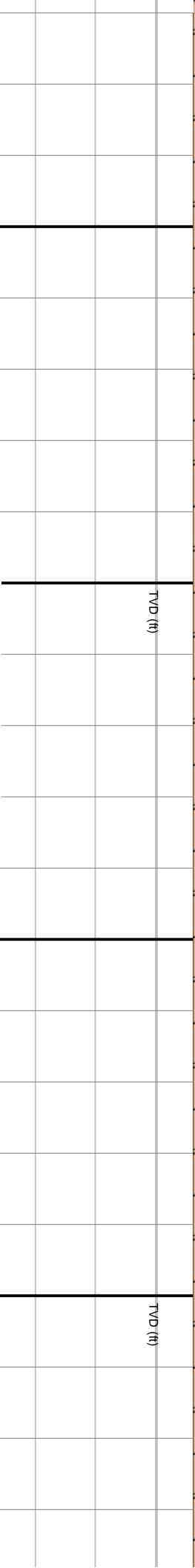


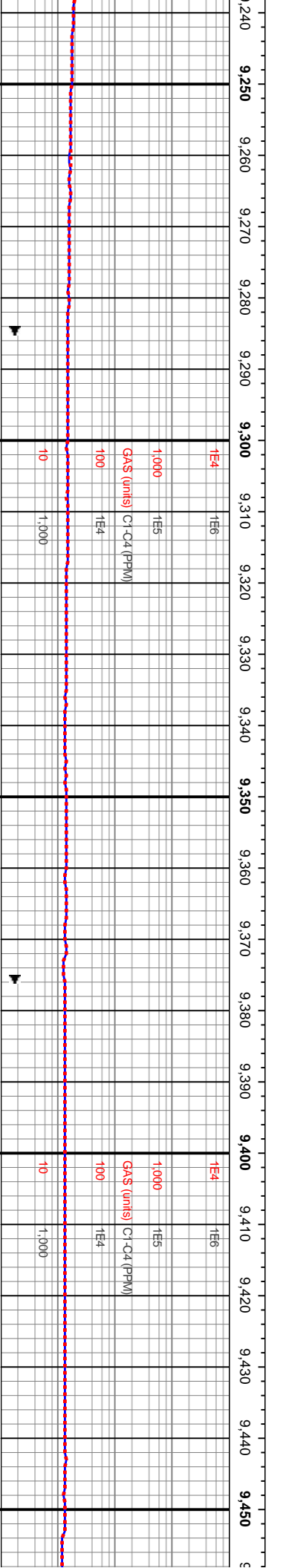


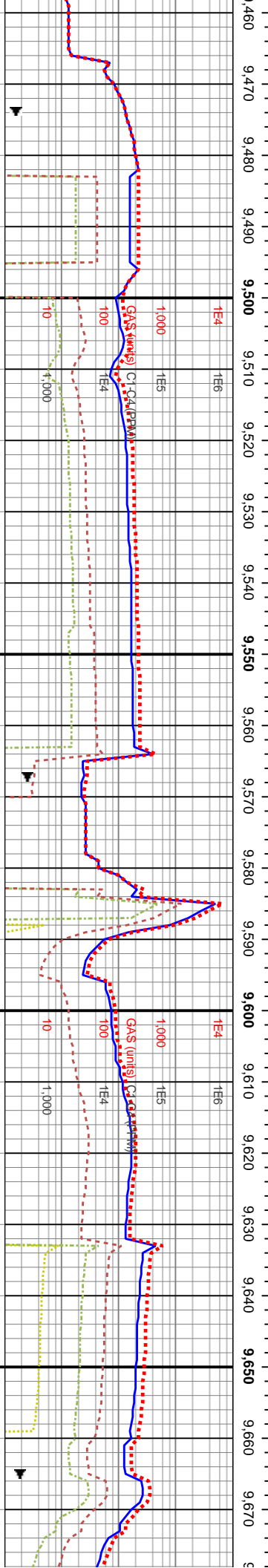
MD: 9,029.91'
Inclination: 88.22°
Azimuth: 270.4°
TVD: 7,195.53'
VS: 1,733.43'



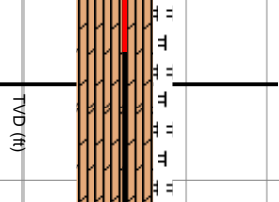
MD: 9,124.91'
Inclination: 89.8°
Azimuth: 270.86°
TVD: 7,197.17'
VS: 1,828.41'



A vertical strip of four images showing a dark, textured surface (possibly gravel or soil) transitioning into a white background. The top image shows a close-up of dark, irregularly shaped particles. The second image is a solid white rectangle. The third image shows a close-up of dark, irregularly shaped particles, similar to the first. The bottom image shows a close-up of dark, irregularly shaped particles, similar to the first.

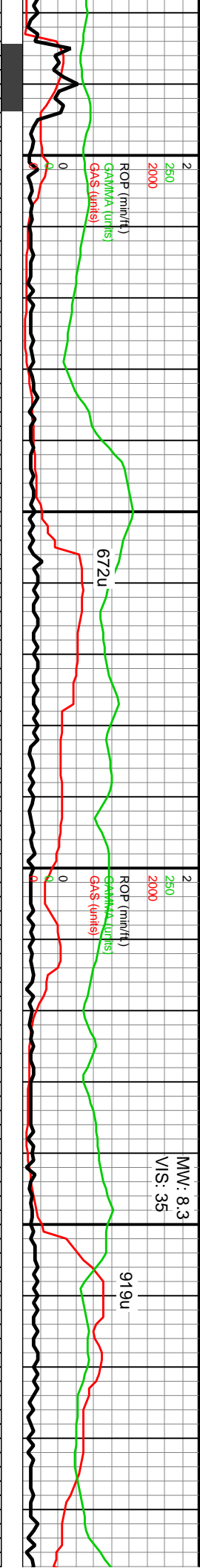


MD: 9,601.91'
Inclination: 91.24°
Azimuth: 270.55°
TV D: 7,186.4'
VS: 2,305.15'

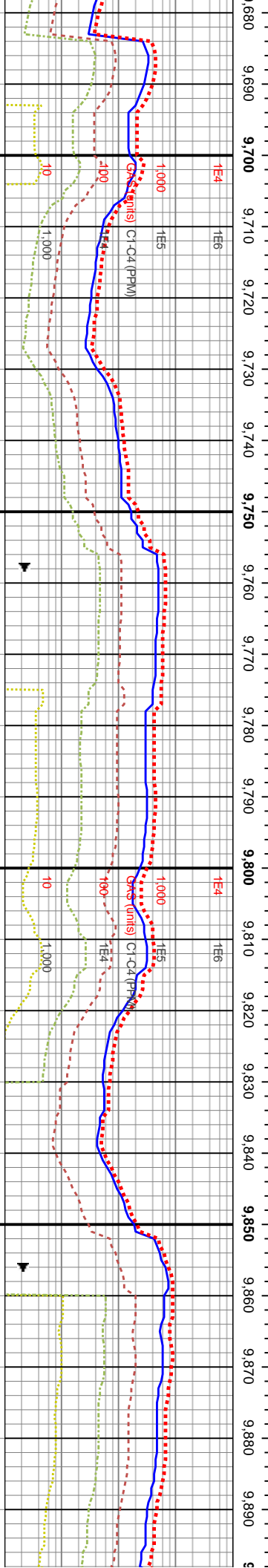


9620-9680 CHK (90%): pred med gy, ip lt-dk gy, sme brn-tn offwh-bf lt brn mot thru, pred frm-si hd, pred sb blk-y-biky, ip sb ply, sl arg thru, lse cal, mod cal incl, mod frac fl cal, tab-eurned cal; MRLST (10%): dk gy, sme sl blk, sb biky, sl frm-si hd, chky inbds, mod calc incl





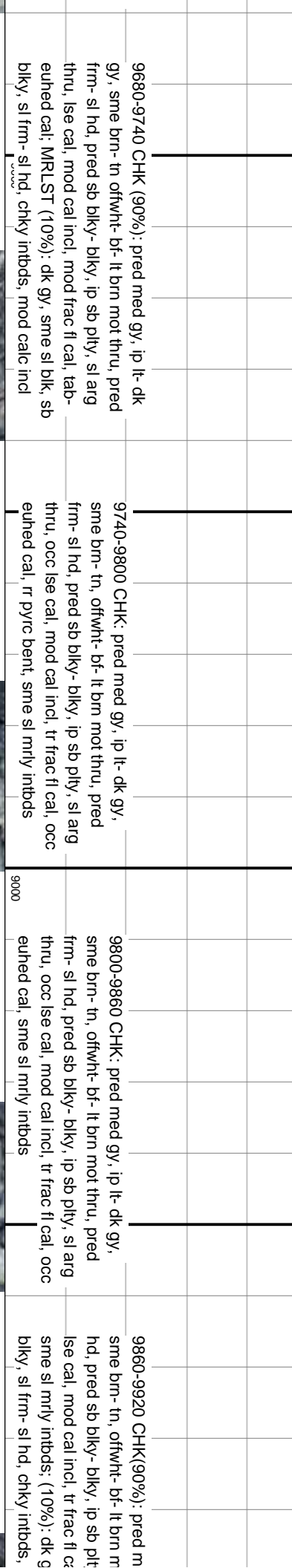
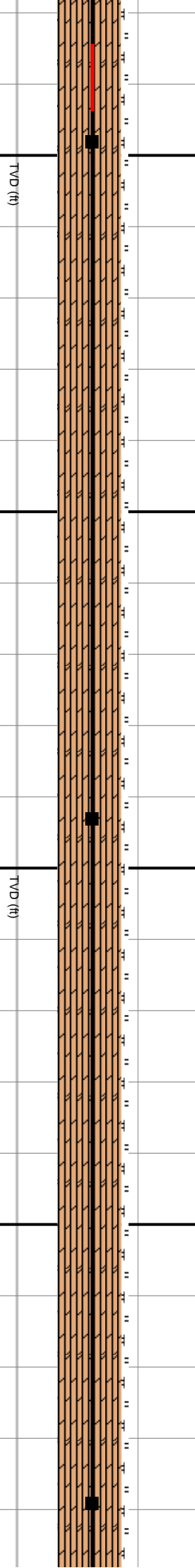
MW: 8.3
VIS: 35



MD: 9,698'
Inclination: 91.11°
Azimuth: 269.75°
TVD: 7,184.43'
VS: 2,401.22'

MD: 9,793'
Inclination: 90.34°
Azimuth: 269.91°
TVD: 7,183.23'
VS: 2,496.21'

MD: 9,889'
Inclination: 89.5°
Azimuth: 270.01°
TVD: 7,183.36'
VS: 2,592.21'



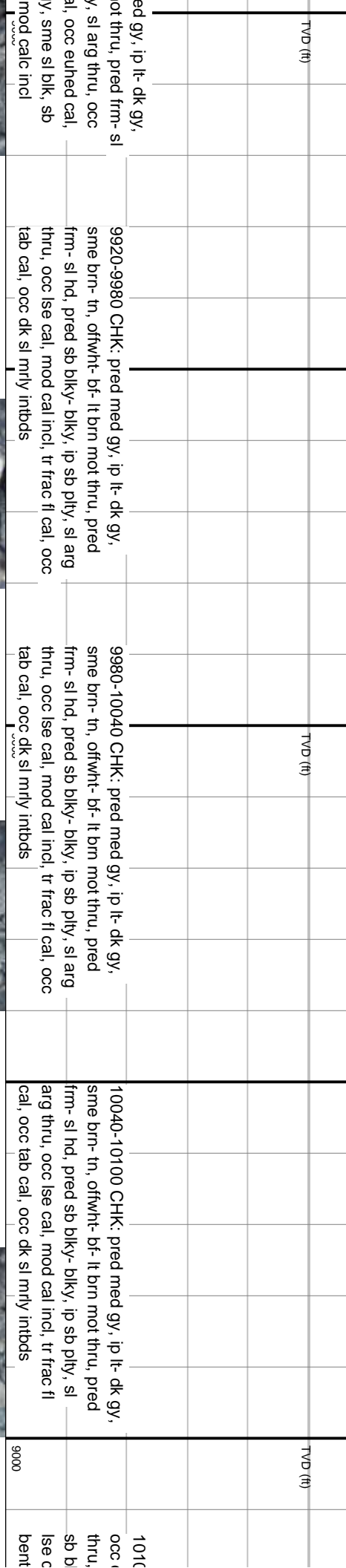
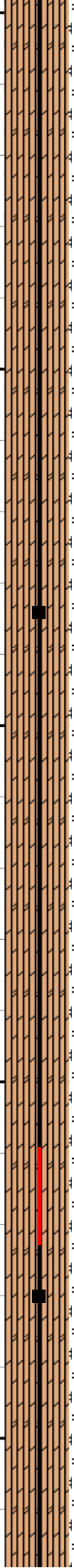
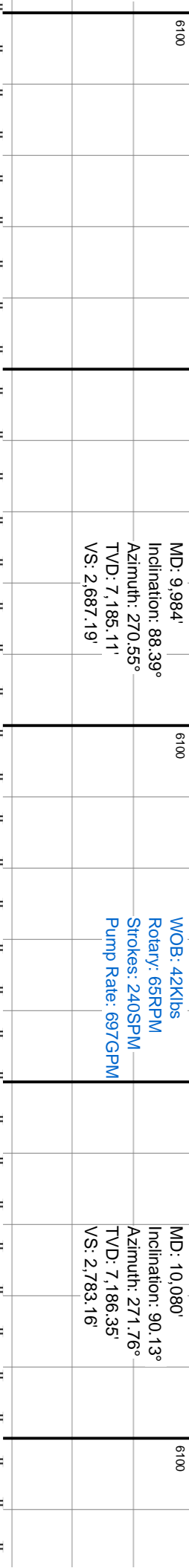
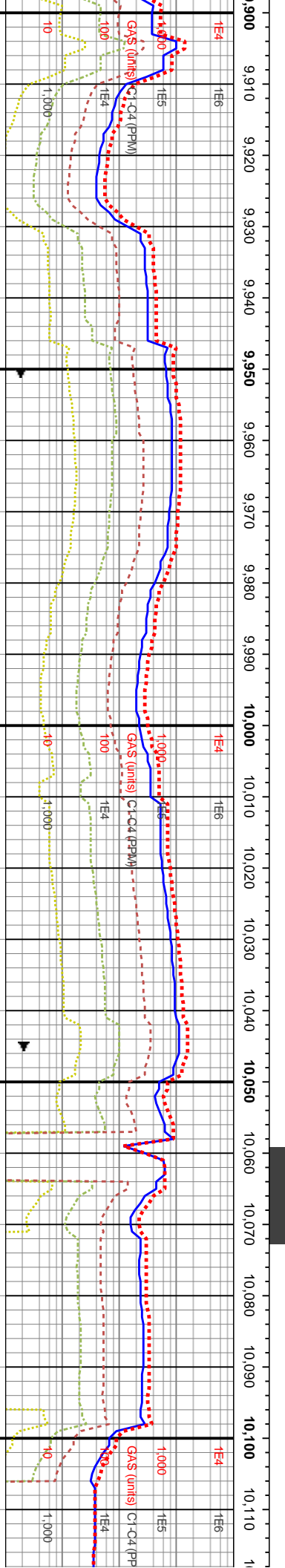
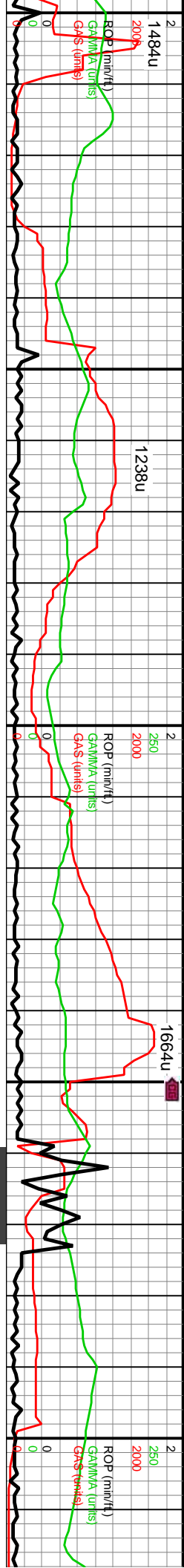
9680-9740 CHK (90%): pred med gy, ip lt-dk gy, sme brn-tn offwht-bf-lt brn mot thru, pred frm-si hd, pred sb blk- blk, ip sb ply, sl arg thru, lse cal, mod cal incl, mod frac fl cal, tab-euhed cal, MRLST (10%): dk gy, sme sl blk, sb blk, sl frm-si hd, chky intbds, mod calc incl

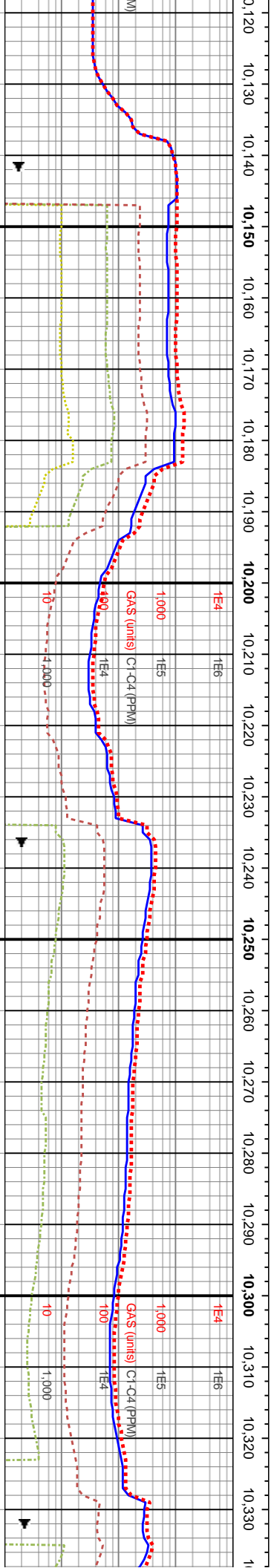
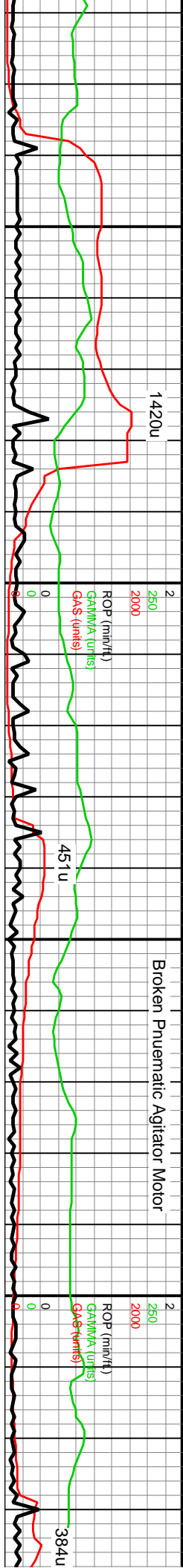
9740-9800 CHK: pred med gy, ip lt-dk gy, sme brn-tn, offwht-bf-lt brn mot thru, pred frm-si hd, pred sb blk- blk, ip sb ply, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, occ euhed cal, tr pyrc bent, sme sl mrly intbds

9800-9860 CHK: pred med gy, ip lt-dk gy, sme brn-tn, offwht-bf-lt brn mot thru, pred frm-si hd, pred sb blk- blk, ip sb ply, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, occ euhed cal, sme sl mrly intbds

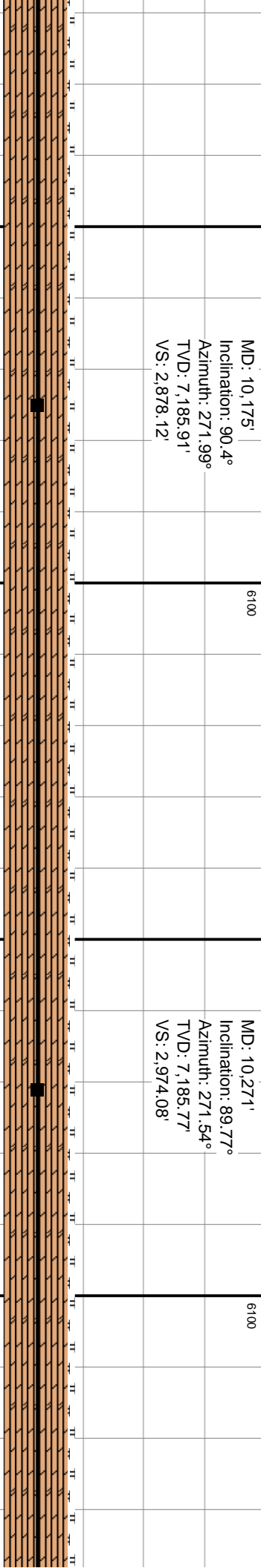
9860-9920 CHK(90%): pred m sme brn-tn, offwht-bf-lt brn m hd, pred sb blk- blk, ip sb ply lse cal, mod cal incl, tr frac fl cal, sme sl mrly intbds: (10%): dk g blk, sl frm-si hd, chky intbds,







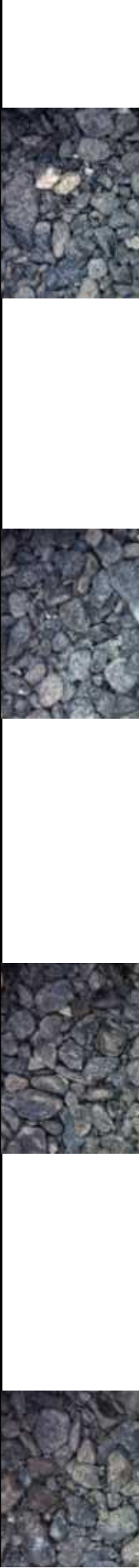
MD: 10,175'
Inclination: 90.4°
Azimuth: 271.99°
TVD: 7,185.91'
VS: 2,878.12'

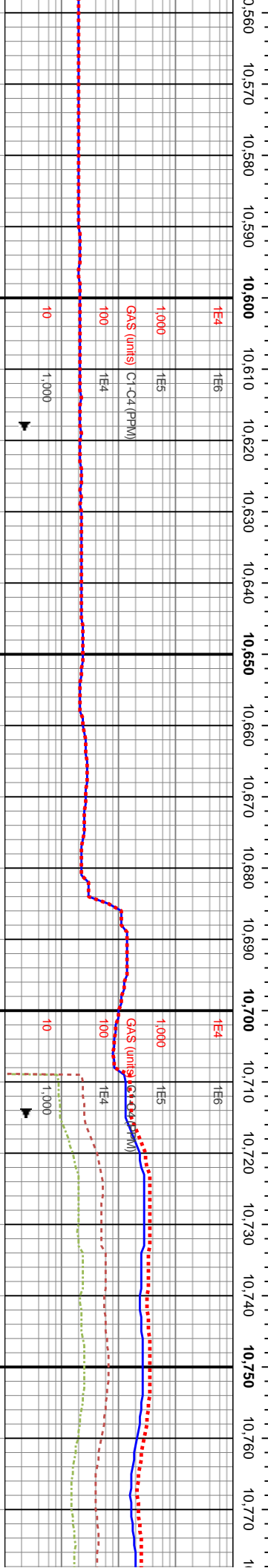
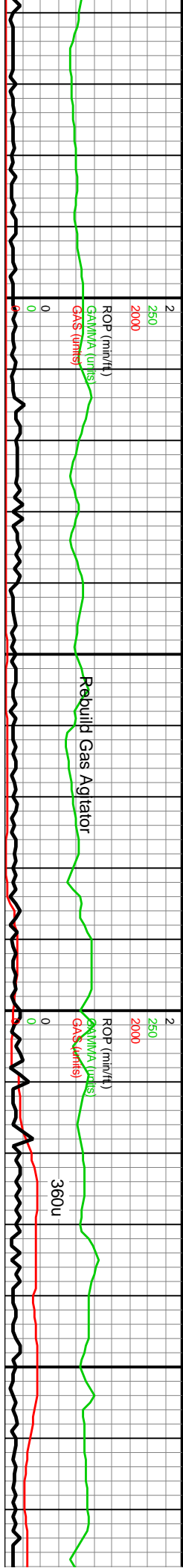


MD: 10,271'
Inclination: 89.77°
Azimuth: 271.54°
TVD: 7,185.77'
VS: 2,974.08'



100-10160 CHK: pred med gy- gy, ip lt, dk gy, tr brn- tn, offwhit- bf- lt brn mot pred frm- sl hd,sme hd- sl frm, pred ky- bly, occ sb ply, sl arg thru, occ cal, mod cal incl, rr frac fl cal, rr pyrc , tr dk sl mrlly intbds	10160-10220 CHK: pred med gy- gy, ip lt, dk gy, tr brn- tn, offwhit- bf- lt brn mot thru, pred frm- sl hd,sme hd- sl frm, pred sb bly- bly, occ sb ply, sme sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, rr pyrc bent, tr dk sl mrlly intbds	10220-10280 CHK: pred med gy- gy, ip lt, occ dk gy, tr brn- tn, offwhit- bf- lt brn mot thru, pred frm- sl hd,sme hd- sl frm, pred sb bly- bly, occ sb ply, sme sl arg thru, tr dk sl mrlly intbds, occ lse cal, mod cal incl, tr frac fl cal, rr pyrc bent	10280-10340 CHK(90%): pred med gy- gy, ip lt, dk gy, tr brn- tn, offwhit- bf- lt brn mot thru, pred frm- sl hd,sme hd- sl frm, pred sb bly- bly, occ sb ply, sme sl arg thru, tr dk sl mrlly intbds, occ lse cal, mod cal incl, tr frac fl cal, rr pyrc bent, MRLST(10%): dk gy, sme sl blk, sb bly, sl frm- sl hd, chky intbds, mod calc incl
	9000		9000

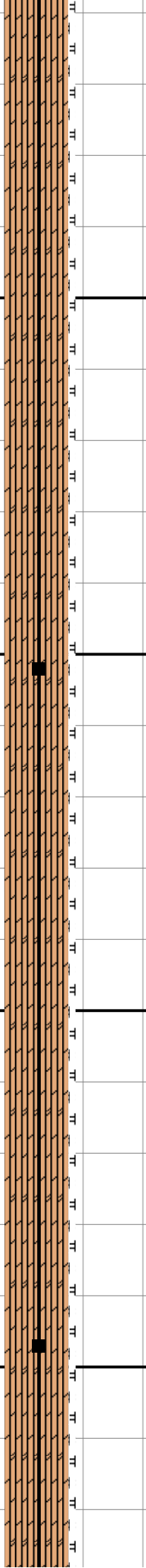




7' 91.78° 69.43° 0.99'

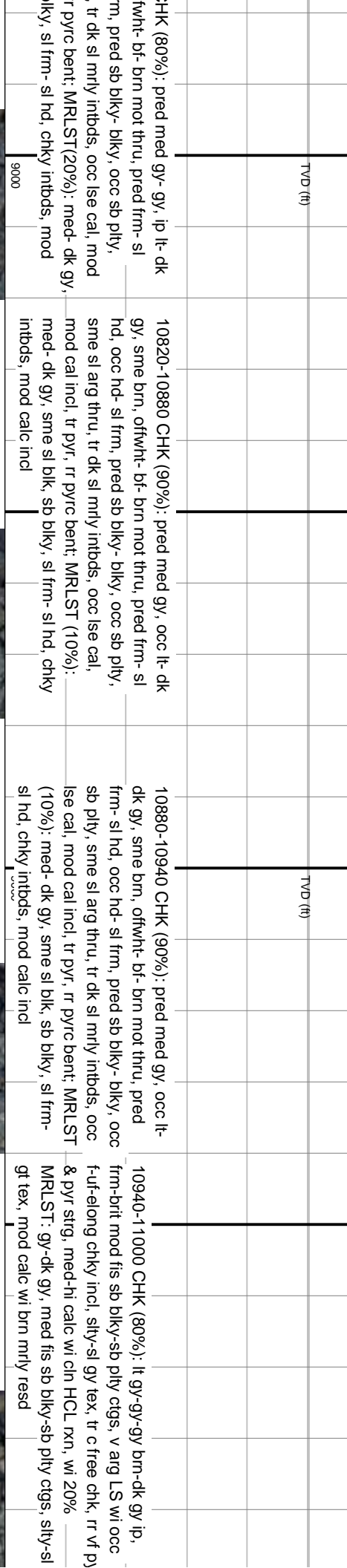
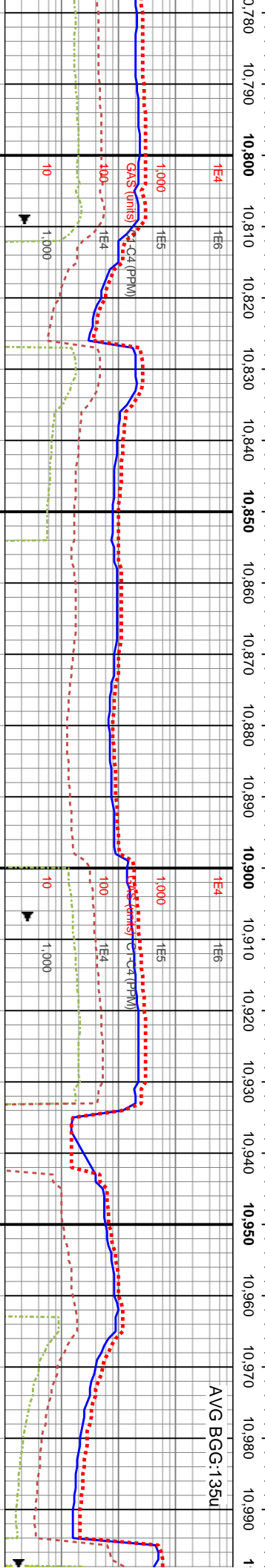
MD: 10,652' Inclination: 91.48° Azimuth: 268.53° TVD: 7,178.29' VS: 3,354.94'

MD: 10,747' Inclination: 91.11° Azimuth: 268.36° TVD: 7,176.14' VS: 3,449.87'

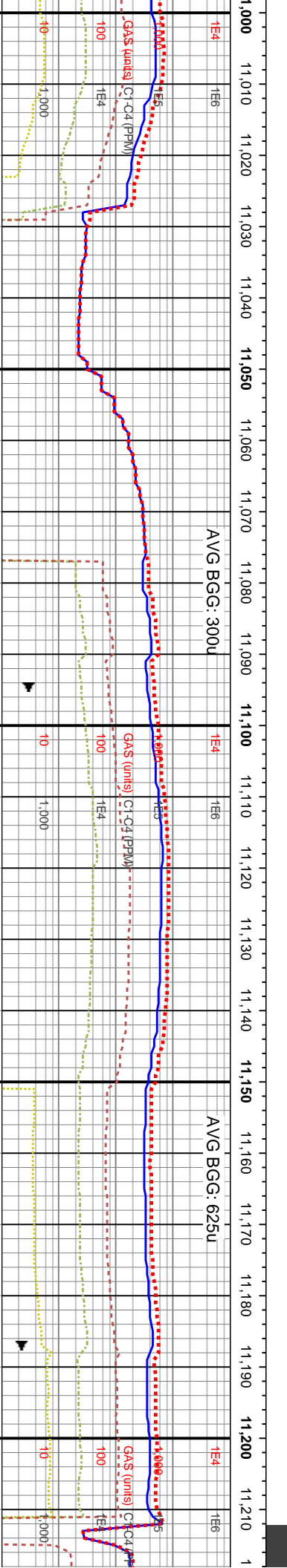
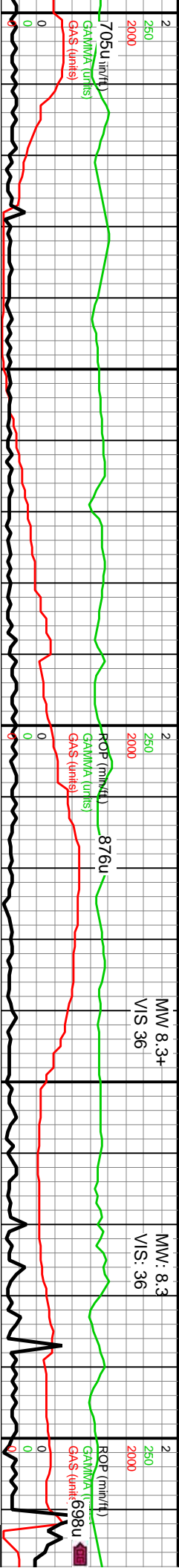


lt gy- med gy, tr ru, pred sl frm, sme occ sb pty, occ arg y intbds	10580-10640 CHK: pred gy, ip lt gy- med gy, tr brn- tn, offwht- bf- lt brn mot thru, pred sl frm, sme sl hd- sft, pred sb blk- blk, occ sb pty, occ arg thru, tr lse cal, tr cal incl, rr mrly intbds	10640-10700 CHK (90%): pred med gy- gy, ip lt- dk gy, tr brn- tn, offwht- bf- brn mot thru, pred frm- sl hd, sme hd- sl frm, pred sb blk- blk, occ sb pty, sme sl arg thru, tr dk sl mrly intbds, occ lse cal, mod cal incl, tr pyr, rr pyrc bent; MRLST(10%): med- dk gy, sme sl blk, sb blk, sl frm- sl hd, chky intbds, mod calc incl	10700-10760 CHK (90%): pred med gy- gy, ip lt- dk gy, tr brn- tn, offwht- bf- brn mot thru, pred frm- sl hd, sme hd- sl frm, pred sb blk- blk, occ sb pty, sme sl arg thru, tr dk sl mrly intbds, occ lse cal, mod cal incl, tr pyr, rr pyrc bent; MRLST(10%): med- dk gy, sme sl blk, sb blk, sl frm- sl hd, chky intbds, mod calc incl	10760-10820 C gy, tr brn- tn, of hd, sme hd- sl fr sme sl arg thru cal incl, tr pyr, r sme sl blk, sb t calc incl
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The image consists of four vertical panels, each showing a close-up of dark, irregularly shaped stones or pebbles. The stones are dark grey to black, with some lighter, brownish-grey patches. They are arranged in a dense, overlapping pattern, typical of a stone wall or a decorative surface. The lighting is somewhat uneven, with some areas appearing brighter than others, highlighting the texture and shape of the individual stones. The panels are separated by thin white lines, and the overall composition is a vertical strip of four identical or nearly identical images.



MD: 11,033'
Inclination: 92.35°
Azimuth: 268.24°
TVD: 7,167.33'
VS: 3,735.61'

MD: 11,128'
Inclination: 91.68°
Azimuth: 267.76°
TVD: 7,163.99'
VS: 3,830.49'

MD:
Incli
Azir
TVL
VS:



TV D (ft)

TV D (ft)

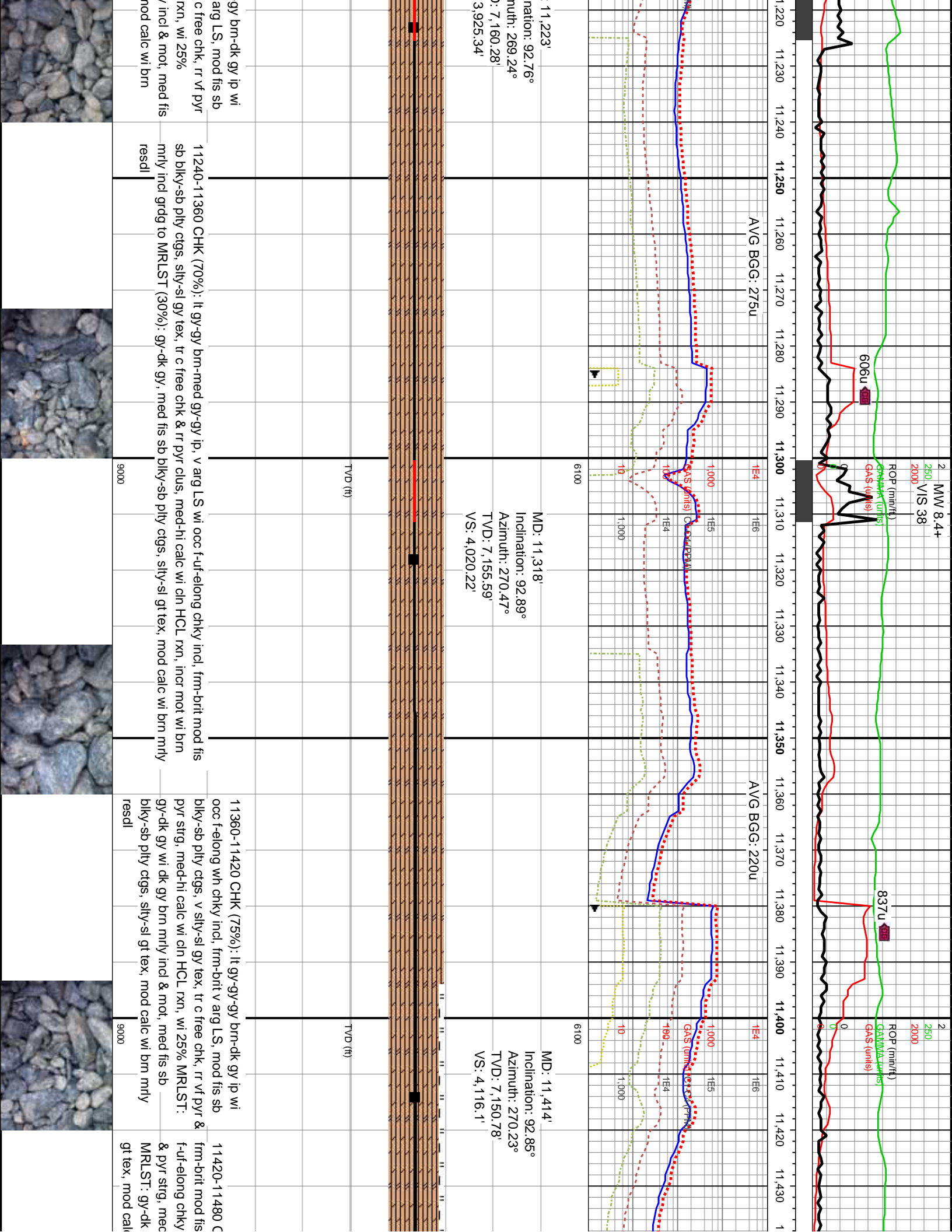
TV D (ft)

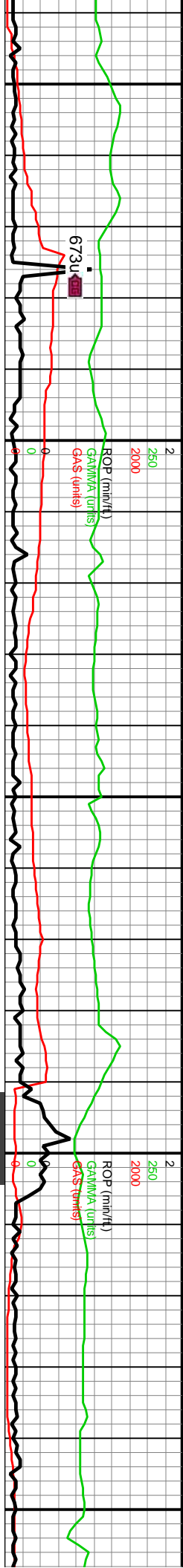
11060-11120 CHK (80%): lt-gy-gy-gy brn-dk gy ip wi occ f-e-long wh chk incl, frm-bri v arg LS, mod fis sb biky-sb ply ctgs, v sily-sl gy tex, tr c free chk, rr vf pyr & pyr strg, med-hi calc wi cin HCL rxn, wi 20% -MRLST: gy-dk gy wi dk gy brn mrlly incl & mot, med fis sb biky-sb ply ctgs, sily-sl gt tex, mod calc wi brn mrlly resld

11120-11180 CHK (80%): It gy-gy-gy bm-dk gy ip, firm-bit mod fis sb blk-y-sb pily ctgs, v arg LS wi occ f-uf-elong chky incl, slty-sl gy tex, tr c free chk, rr vf pyrn & pyr stg, med-hi calc wi cin HCL rxn, wi 20% MRLST: gy-dk gy, med fis sb blk-y-sb pily ctgs, slty-sl gt:tex, mod calc wi bm mrlly resld

11180-11240 CHK (75%): It gy-gy-
occ f-elong wh chky incl, frm-brit v
bly-sb ply ctgs. v sly-sl gy tex, tr
& pyr strg, med-hi calc wi cin HCL
MRLST: gy-dk gy wi dk gy brn mly
sb bly-sb ply ctgs. sly-sl gt tex, r
mly resd



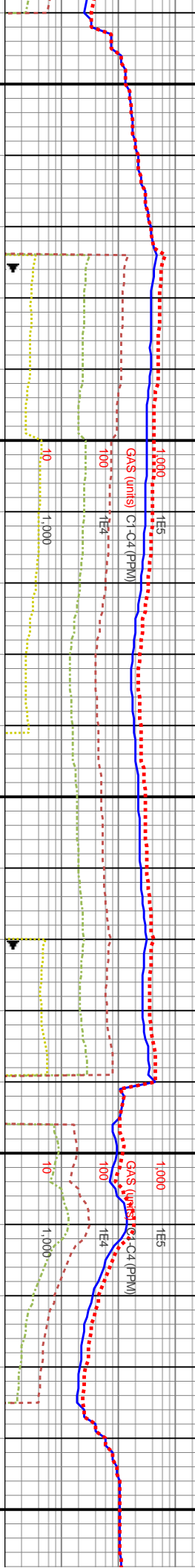




AVG BGC: 295u

AVG BGC: 375u

AVG BGC:



WOB: 39Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 697GPM

MD: 11,509'
Inclination: 93.26°
Azimuth: 270.25°
TVD: 7,145.72'
VS: 4,210.96'

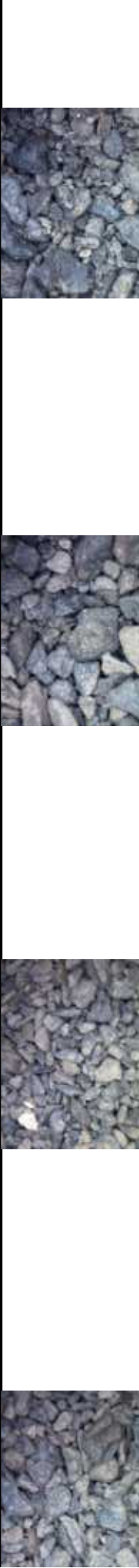
6100

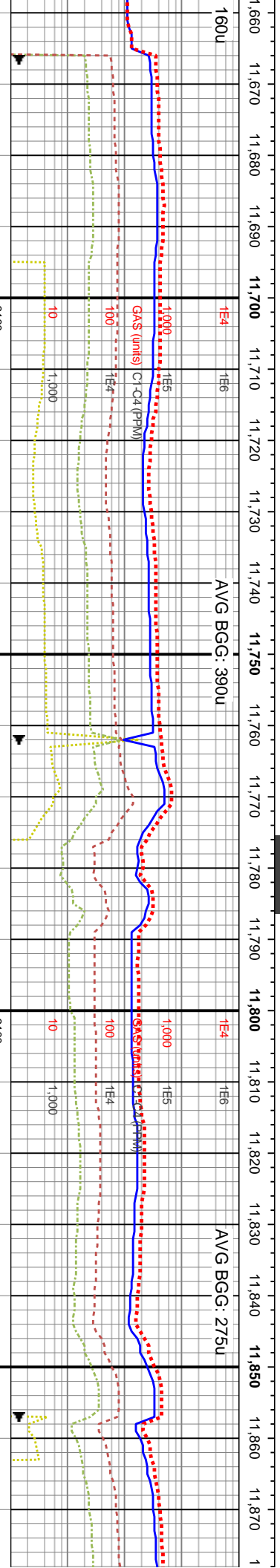
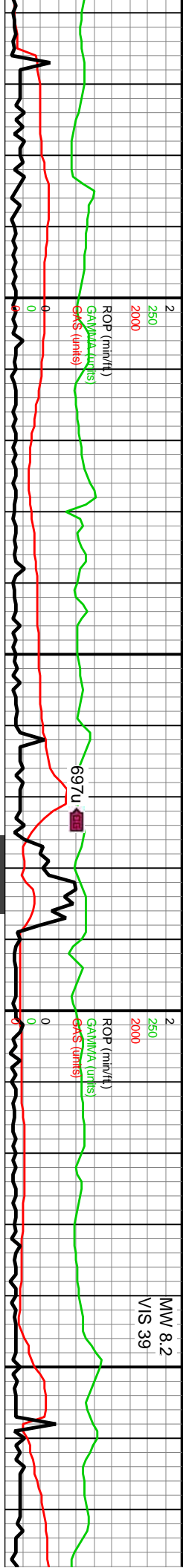
MD: 11,604'
Inclination: 92.32°
Azimuth: 270.73°
TVD: 7,141.1'
VS: 4,305.85'

TVD (ft)

TVD (ft)

CHK (70%): It gy-gy-gy brn-dk gy ip, sb blk-y-sb ply ctgs, v arg LS wi occ incl, silty-sl gt tex, tr c free chk, rr vf pyr	11480-11540 CHK (70%): It gy-gy brn-med gy-gy ip, v arg LS wi occ f-uf-long chky incl, frm-brit mod fis sb blk-y-sb ply ctgs, silty-sl gt tex, tr c free chk & rr pyr clus, med-hi calc wi cin HCL rxn, incr mot wi brn mrly incl grdg to MRLST (30%): gy-dk gy, med fis sb blk-y-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrly resdl	11540-11600 CHK (75%): pred lt gy, occ gy brn & dk gy v arg LS mot wi f-elong chky incl, frm-brit mod fis sb blk-y-sb ply ctgs, silty-sl gt tex, rr vf pyr & pyr strg, tr c free chk, med-hi calc wi cin HCL rxn, wi 25% MRLST: gy-dk gy, med fis sb blk-y-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrly resdl	11600-11660 CHK (80%): pred lt gy, occ gy-gy brn-dk gy, v arg LS wi occ f-uf-long chky incl, frm-brit mod fis sb blk-y-sb ply ctgs, silty-sl gt tex, rr vf pyr & tr pyr strg, tr c free chk, med-hi calc wi cin HCL rxn, incr mot wi brn mrly incl grdg to MRLST (20%): gy-dk gy, med fis sb blk-y-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrly resdl
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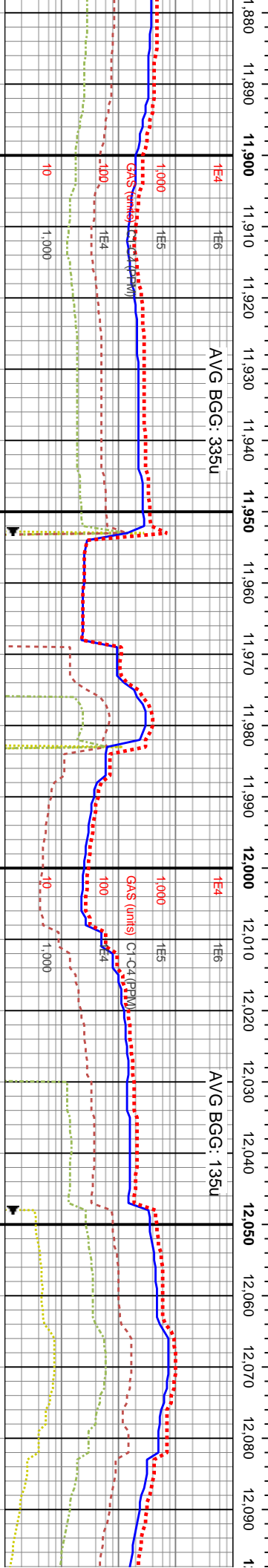
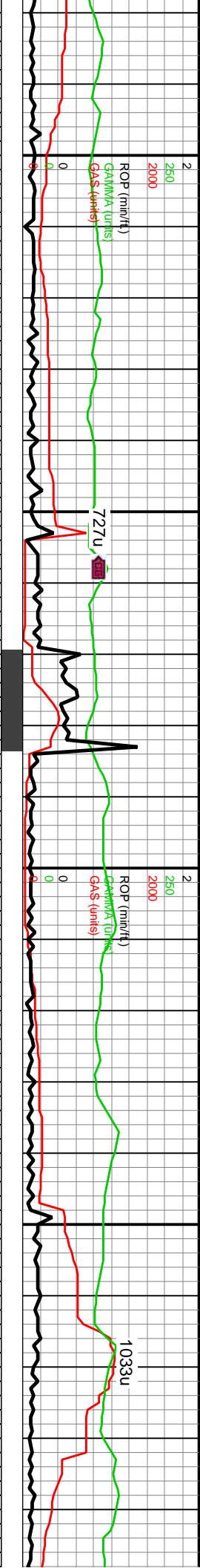


MD: 11,700'
Inclination: 93.17°
Azimuth: 270.74°
TVD: 7,136.5'
VS: 4,401.73'

MD: 11,795'
Inclination: 91.24°
Azimuth: 270.04°
TVD: 7,132.85'
VS: 4,496.66'

11660-11720 CHK (80%): lt gy-gy-gy brn-dk gy ip, frm-brit mod fis sb blk-y-sb pily ctgs, v arg LS wi occ f-uf-elong chky incl, silty-sl gt tex, tr c free chk, rr vt pyr & pyr strig, med-hi calc wi cln HCL rxn, wi 20% MRLST: gy-dk gy, med fis sb blk-y-sb pily ctgs, silty-sl gt tex, mod calc wi brn mly resd	11720-11780 CHK (80%): lt gy-gy-gy brn-dk gy ip, frm-brit mod fis sb blk-y-sb pily ctgs, v arg LS wi occ f-uf-elong chky incl, silty-sl gt tex, tr c free chk, rr vt pyr & pyr strig, med-hi calc wi cln HCL rxn, wi 20% MRLST: gy-dk gy, med fis sb blk-y-sb pily ctgs, silty-sl gt tex, mod calc wi brn mly resd	11780-11900 CHK (85%): pred lt gy-gy, occ dk gy, frm-brit mod fis sb blk-y-sb pily ctgs, v f-uf-elong chky incl, occ c chky lamn & incl, rr c free chk, silty-sl gt tex, rr vt pyr & pyr strig, HCL rxn, wi 15% MRLST: gy-dk gy, med fis sb blk-y-sb pily ctgs, silty-sl gt tex, mod calc wi
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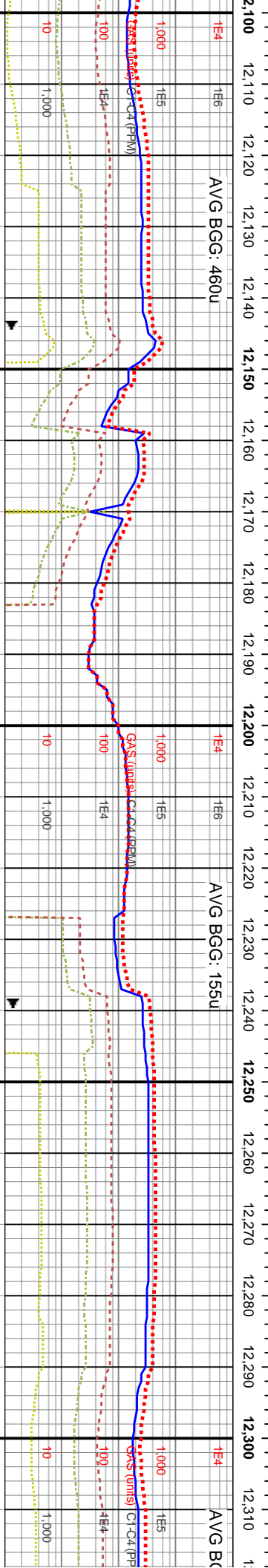
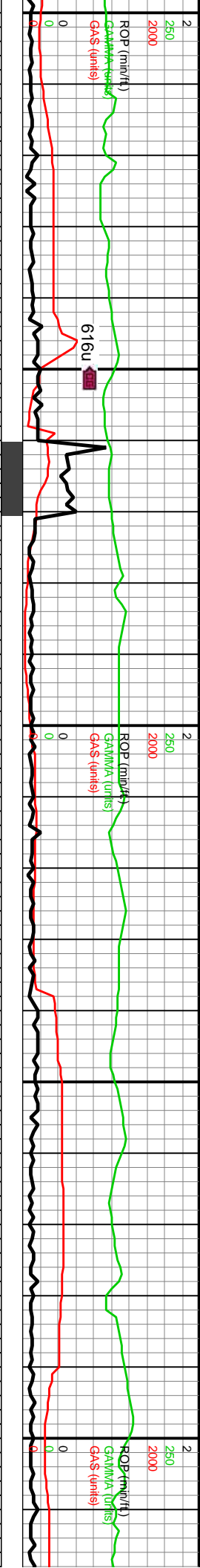
MD: 11,891'
Inclination: 90.67°
Azimuth: 269.96°
TVD: 7,131.25'
VS: 4,592.64'

MD: 11,986'
Inclination: 92.46°
Azimuth: 272.19°
TVD: 7,128.65'
VS: 4,687.58'

MD: 12,082'
Inclination: 93.09°
Azimuth: 272.15°
TVD: 7,124.01'
VS: 4,783.41'

arg LS wi com med-hi calc wi cin brn mrlly resdl	11900-12020 CHK (85%): pred lt gy, occ gy-gy brn-dk gy, frm-brit mod fis sb blk-y-sb pily ctgs, slty-sl gt tex, v arg LS wi occ f-uf-elong chky incl & occ-r c chky incl & intbds & c free chk, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL rxn, occ grdg to MRLST (15%): gy-dk gy, med fis sb blk-y-sb pily ctgs, slty-sl gt tex, mod calc wi brn mrlly resdl	12020-12080 CHK (80%): lt gy-gy-dk gy v arg LS wi occ chky lamn & f-elong chky incl, frm-brit mod fis sb blk-y-sb pily ctgs, rr c free chk, slty-sl gt tex, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL rxn, wi 20% MRLST: gy-dk gy, med fis sb blk-y-sb pily ctgs, slty-sl gt tex, mod calc wi brn mrlly resdl	12080-12200 (arg LS wi occ f-uf-elong chky incl & intbds & c free chk, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL rxn, occ grdg to MRLST (15%): gy-dk gy, med fis sb blk-y-sb pily ctgs, slty-sl gt tex, mod calc wi brn mrlly resdl
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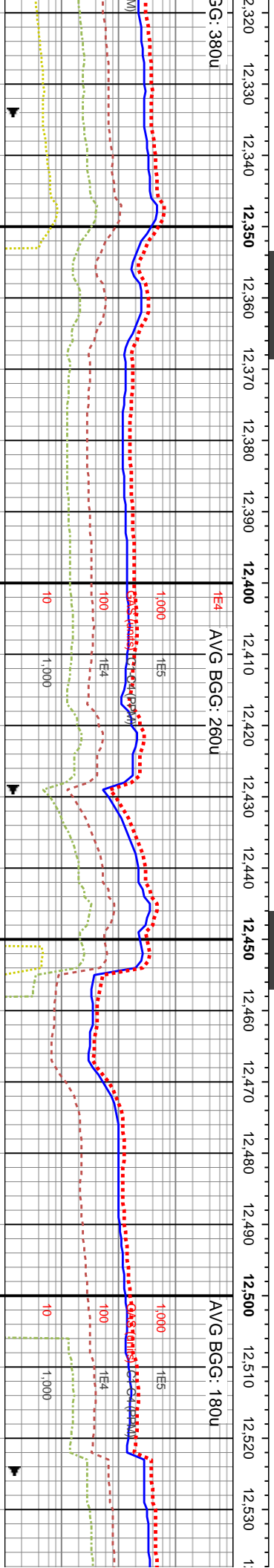
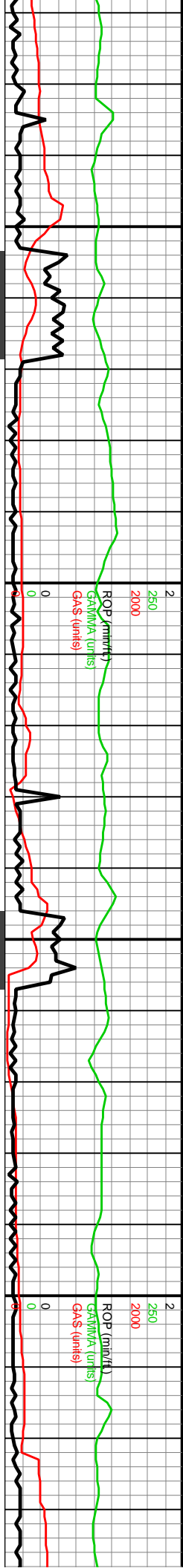


MD: 12,177'
Inclination: 92.82°
Azimuth: 271.55°
TVD: 7,119.11'
VS: 4,878.24'



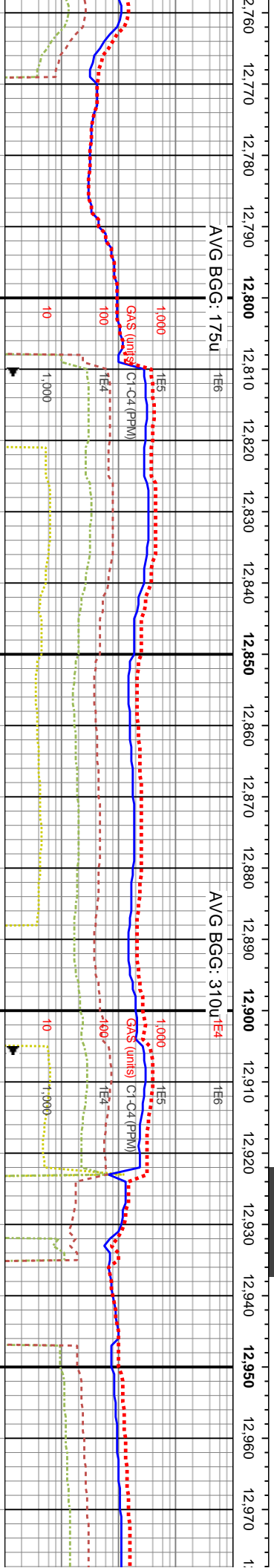
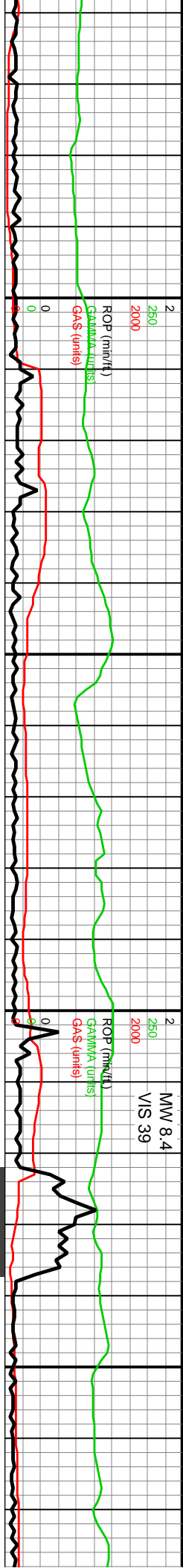
TVD (ft)	AVG BGC: 460u	
	1E4	1E6
TVD (ft)	AVG BGC: 155u	
	1E4	1E6
TVD (ft)	AVG BGC: 155u	
	1E4	1E6

CHK (75%): pred gy, occ lt gy-gy brn-dk gy, frm-brit mod fis sb blk-y-sb ply ctgs, slty-sl gt tex, v	
uf-elong chky incl & chky lamn, rr-tr c free chk, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL	
o MRLST (15%): gy-dk gy, med fis sb blk-y-sb ply ctgs, slty-sl gt tex, mod calc wi brn mrl y	
9000	
12200-12260 CHK (75%): lt gy-gy-dk gy v arg LS wi	
occ chky lamn & f-elong chky incl, frm-brit mod fis sb	
blk-y-sb ply ctgs, rr c free chk, slty-sl gt tex, rr vf pyr & tr	
pyr strg, med-hi calc wi cin HCL rxn, wi 25% MRLST:	
gy-dk gy, med fis sb blk-y-sb ply ctgs, slty-sl gt tex,	
mod calc wi brn mrl y resdl	
9000	
12260-12320 CHK (75%): pred gy, occ lt gy-gy brn-dk	
gy, frm-brit mod fis sb blk-y-sb ply ctgs, slty-sl gt tex, v	
arg LS wi occ f-uf-elong chky incl & chky lamn, rr-tr c	
free chk, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL	
rxn, occ grdg to MRLST (15%): gy-dk gy, med fis sb	
blk-y-sb ply ctgs, slty-sl gt tex, mod calc wi brn mrl y	
resdl	
9000	



3G: 380u		1E4	AVG BGC: 260u	1E4	AVG BGC: 180u
12320-12440 CHK (70%):gy-it gy brn-dk gy ip wi occ f-long wh chky incl, frm-bit v arg LS, mod fis sb blk-y-sb ply ctgs, v silty-sl gt tex, tr c free chk, rr vf pyr & pyr strg, med-hi calc wi cin HCL rxn, wi 25% MRLST: gy-dk gy wi dk gy brn mrly incl & mot, med fis sb blk-y-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrly resd		9000			9000

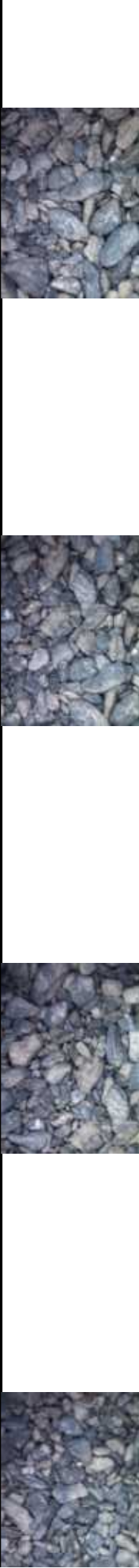


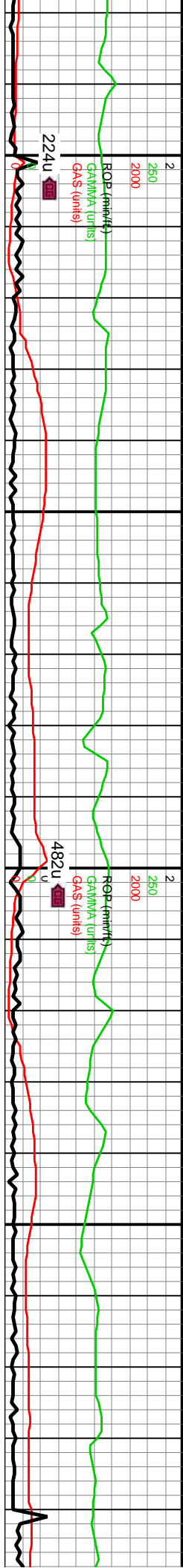


MD: 12,844'
Inclination: 93.05°
Azimuth: 269.49°
TVD: 7,089.23'
VS: 5,544.39'

MD: 12,939'
Inclination: 91.04°
Azimuth: 268.89°
TVD: 7,065.83'
VS: 5,639.31'

12800-12920 CHK (70%): gy-lt gy brn-dk gy wi occ f-elong wh chk incl, frm-brit v arg LS, mod fis sb blk-y-sb ply ctgs, slty-sl gt tex, tr c free chk, rr vf pyr & pyr strg, med-hi calc wi cin HCL rxn, wi 25% MRLST: gy-dk gy wi dk gy brn mrlly incl & mot, med fis sb blk-y-sb ply ctgs, pred slty tex, mod calc wi brn mrlly resd	9000
12920-13040 CHK (65%): lt gy-gy brn-gy-dk gy ip slty-sl gt tex ip, occ f-elong wh chk incl & tr c free intbdd MRLST (35%): gy-dk gy wi dk gy brn mrlly incl chk lamm & incl ip, mod calc wi brn mrlly resd	9000





AVG BGC: 170u

1E4 1E6

1,000 1E5

AVG BGC: 285u

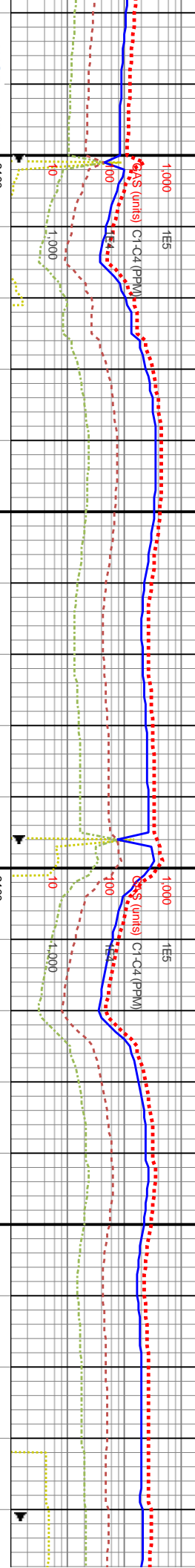
1E4 1E6

1,000 1E5

AVG BGC: 240u

1E4 1E6

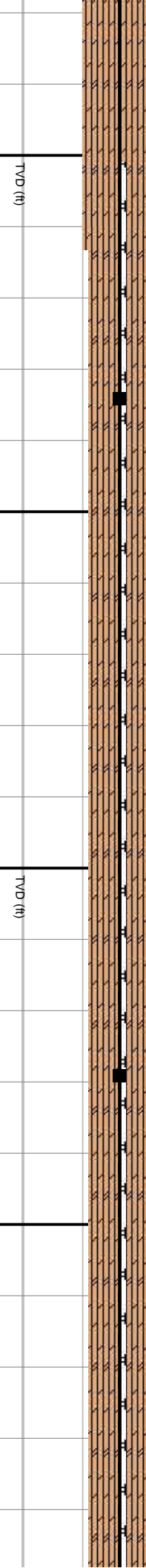
1,000 1E5



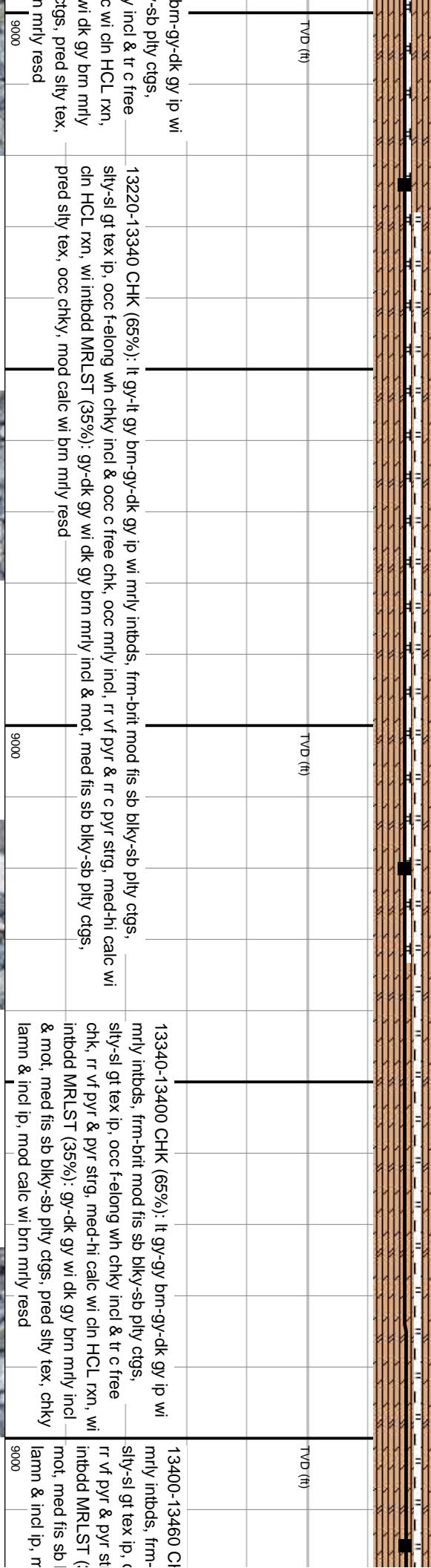
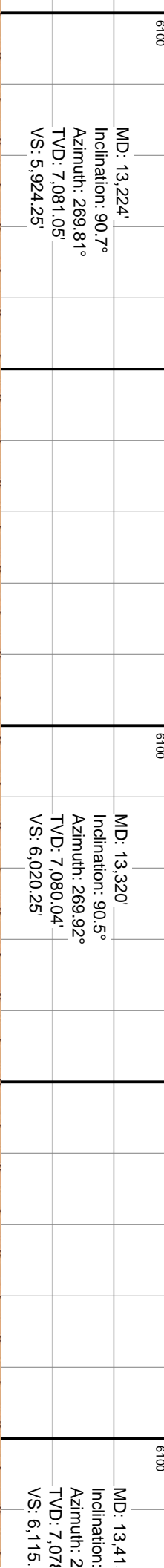
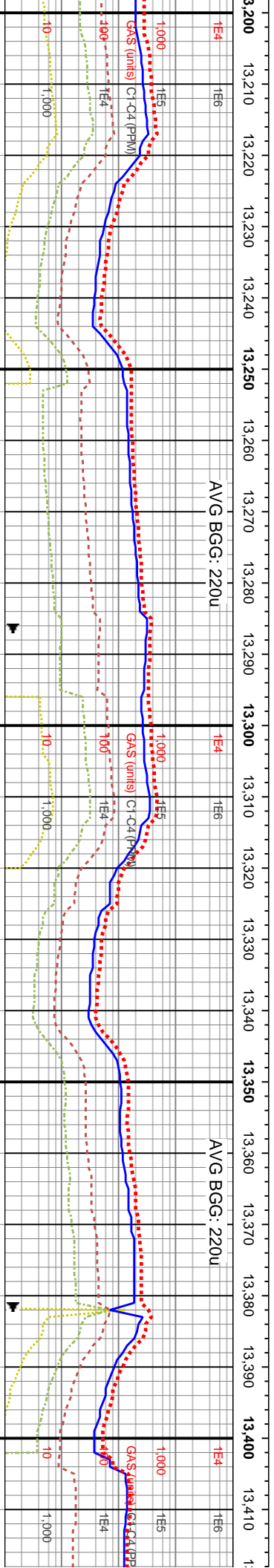
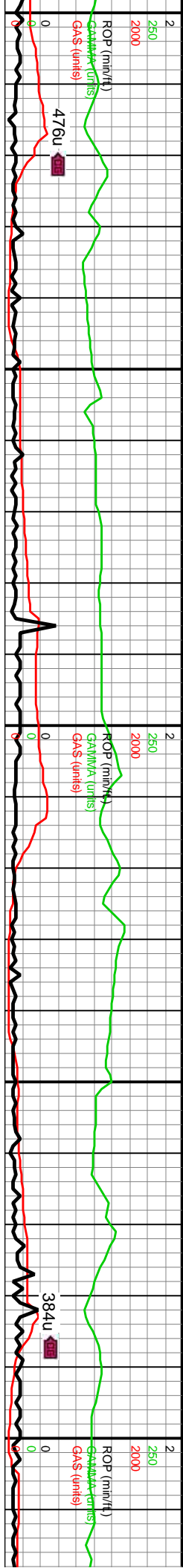
WOB: 14Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 698GPM

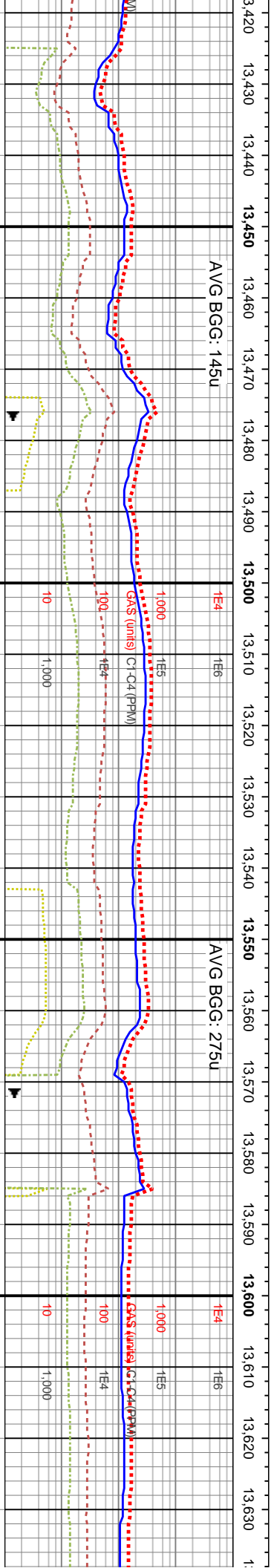
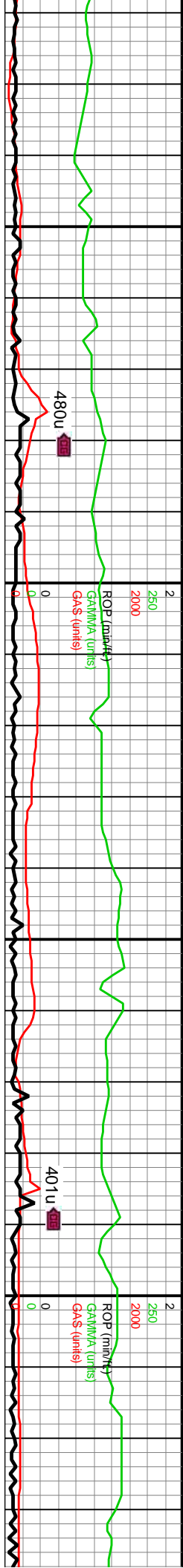
MD: 13,034'
Inclination: 91.01°
Azimuth: 269.68°
TVD: 7,084.13'
VS: 5,734.28'

MD: 13,129'
Inclination: 91.01°
Azimuth: 270.21°
TVD: 7,082.47'
VS: 5,829.27'



13040-13100 CHK (60%): gy-lt gy brn-dk gy wi occ felong wh chky incl, frm-brit v arg LS, mod fis sb blkly-sb pty cigs, slty-sl gt tex, tr c free chk, rr vf pyr & pyr strg, med-hi calc wi cin HCL rxn, wi gy-dk gy wi dk gy brn mrlly incl & mot, med fis sb blkly-sb pty cigs, pred slty tex, mod calc wi brn mrlly resd	9000
13100-13160 CHK (65%): lt gy-gy brn-gy-dk gy ip wi mrlly intbds, frm-brit mod fis sb blkly-sb pty cigs, slty-sl gt tex ip, occ f-elong wh chky incl & tr c free chk, rr vf pyr & pyr strg, med-hi calc wi cin HCL rxn, wi intbdd MRLST (35%): gy-dk gy wi dk gy brn mrlly incl & mot, med fis sb blkly-sb pty cigs, pred slty tex, chky lamm & incl ip, mod calc wi brn mrlly resd	9000
13160-13220 CHK (65%): lt gy-gy mrlly intbds, frm-brit mod fis sb blkly-sb pty cigs, slty-sl gt tex ip, occ f-elong wh chky chk, rr vf pyr & pyr strg, med-hi cal wi intbdd MRLST (35%): gy-dk gy v incl & mot, med fis sb blkly-sb pty c	





WOB: 35klbs
Rotary: 65RPM
Strokes: 239SPM
Pump Rate: 694GPM

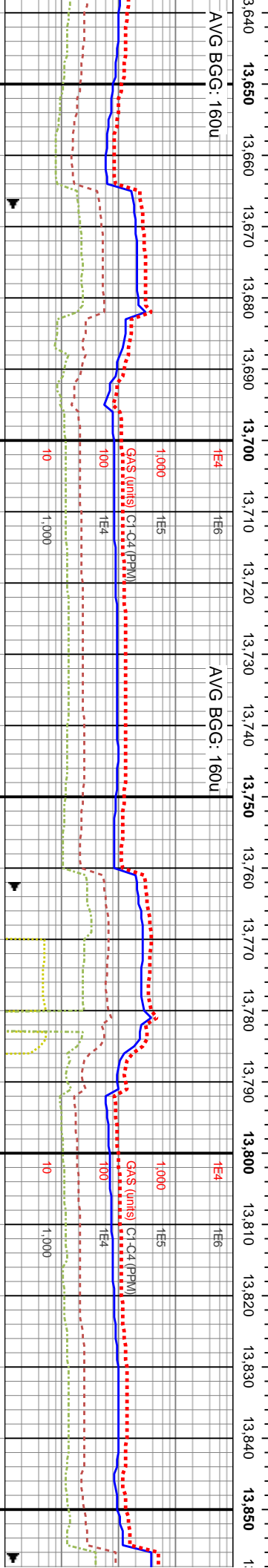
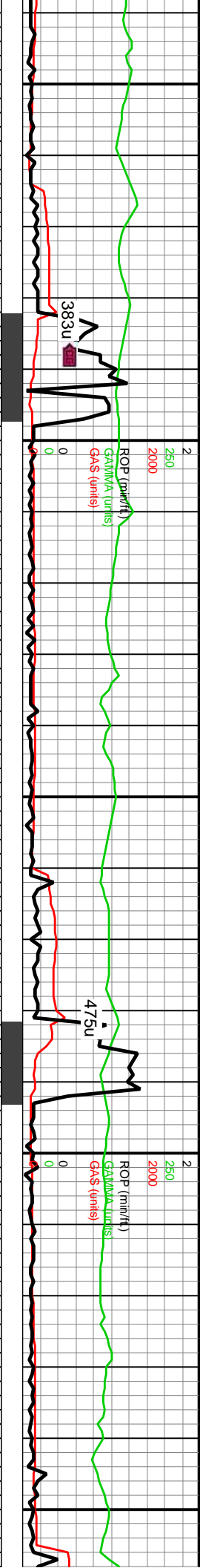
MD: 13,510'
Inclination: 91.88°
Azimuth: 271.6°
TVD: 7,076.34'
VS: 6.210.19'

TVD (ft)

13460-13520 CHK (65%): It gy-it gy brn-gy-dk gy ip wi mly inbds, frm-brit mod fis sb blk-sb ply cigs, slty-sl gt tex ip, occ f-elong wh chky incl & occ c free chk, occ mly incl, rr vf pyr & rr c pyr strg, med-hi calc wi cin HCL rxn, wi inbddd MRLST (35%): gy-dk gy wi dk gy brn mly incl & mot, med fis sb blk-sb ply cigs, pred slty tex, occ chky, mod calc wi brn mly resd	13520-13580 CHK (60%): gy-dk gy, occ lt gy, frm-brit mod fis sb blk-sb ply cigs, slty-sl gt tex ip, v aig LS wi occ f-elong wh chky incl & occ c free chk, occ mly incl, rr vf pyr & rr c pyr strg, med-hi calc wi cin HCL rxn, wi inbddd MRLST (40%): gy brn-dk gy mot wi dk brn mly incl, med fis sb blk-sb ply cigs, slty tex, mod calc wi brn mly resd	13580-13640 CHK (65%): It gy-it gy brn-gy-dk gy ip wi mly inbds, frm-brit mod fis sb blk-sb ply cigs, slty-sl gt tex ip, occ f-elong wh chky incl & occ c free chk, occ mly incl, rr vf pyr & rr c pyr strg, med-hi calc wi cin HCL rxn, wi inbddd MRLST (35%): gy-dk gy wi dk gy brn mly incl & mot, med fis sb blk-sb ply cigs, pred slty tex, occ chky, mod calc wi brn mly resd
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TVD (ft)





MD: 13,700'±
Inclination: 91.44°
Azimuth: 271.86°
TVD: 7,070.01'
VS: 6,400.02'

MD: 13,795'
Inclination: 91.38°
Azimuth: 271.15°
TVD: 7,067.67'
VS: 6,494.97'

DP

TVD (ft)

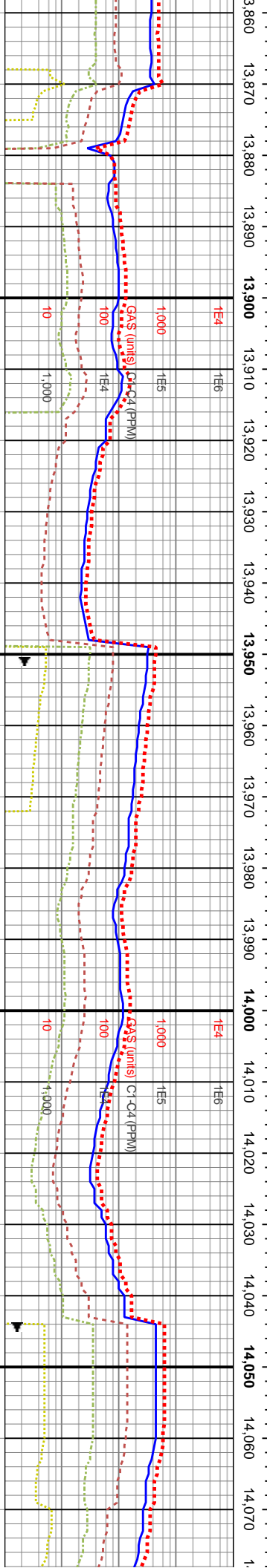
TVD (ft)

13640-13760 CHK (60%): gy-dk gy, occ lt gy, frm-brit mod fis sb blk-ly-sb pty ctgs, silty-sl gt tex ip, v arg LS wi occ f-elong wh chky incl & occ c free chk, occ mrlly incl, rr v f pyr & rr c pyr strg, med-hi calc wi cin HCL rxn, wi intbdd MRLST (40%): gy brn-dk gy mot wi dk brn mrlst incl, med fis sb blk-ly-sb pty ctgs, silty tex, mod calc wi brn mrlly resd

9000

9000

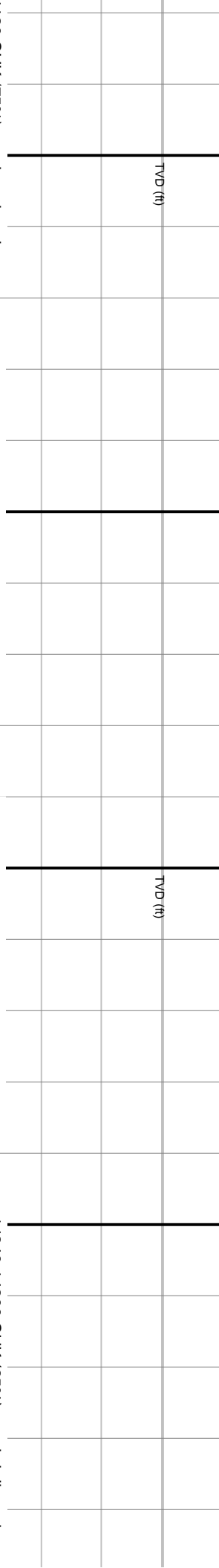
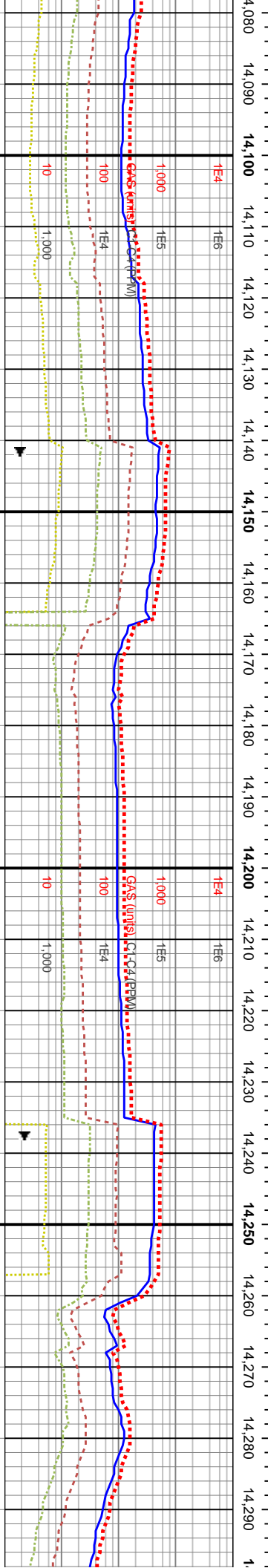
13820-13880 CHK (80%): pred offwh- bf- lt brn mot thru, pred fi blk-ly- blk-ly, sl- mod arg thru, occ tr frac fi cal, tr pyr; MRLST (20%) sl blk, sb blk-ly- sb pty, sl hd, int



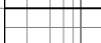
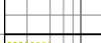
MD: 13,985' **bs**
Inclination: 89.36°
Azimuth: 269.51° **✓**
TVD: 7,068.22' **96GPM**
VS: 6,684.94'

med gy, ip lt- dk gy, frm- sl hd, pred sb lse cal, occ cal incl, med- dk gy, sme add wi chk	13880-13940 CHK (80%): pred med gy, ip lt- dk gy, offwht- bf- lt brn mot thru, pred frm- sl hd, pred sb biky- biky, sl- mod arg thru, occ lse cal, occ cal incl, tr frac fl cal, tr pyr; MRLST (20%): med- dk gy, sme sl blk, sb biky- sb pily, sl hd, intbdd wi chk	13940-14000 CHK (80%): pred med gy- gy, ip lt- dk gy, offwht- bf- lt brn mot thru, pred frm- sl hd, pred sb biky- biky, sl- mod arg thru, occ lse cal, occ cal incl, tr frac fl cal, tr pyr; MRLST (20%): med- dk gy, sme sl blk, sb biky- sb pily, sl hd, intbdd wi chk	14000-14060 CHK (80%): pred med gy- gy, ip lt- dk gy, offwht- bf- lt brn mot thru, pred frm- sl hd, pred sb biky- biky, sl- mod arg thru, occ lse cal, occ cal incl, tr frac fl cal, tr pyrc bent; MRLST (20%): med- dk gy, sme sl blk, sb biky- sb pily, sl hd, intbdd wi chk	14060-14120 CHK (80%): pred med- dk sl hd, pyr, lse cal, c tr pyrc b, sb
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The image consists of four vertical panels, each showing a different texture of gravel and crushed stone. The top panel shows a mix of dark grey and brownish-grey stones of various sizes. The second panel shows a dense layer of dark grey, angular stones. The third panel shows a mix of dark grey and brownish-grey stones, with some larger, lighter-colored stones visible. The bottom panel shows a dense layer of dark grey, angular stones, similar to the second panel.



Inclination: 89.77°
Azimuth: 269.9°
TV D: 7,073.84'
VS: 7,065.87'

MD: 14,461'	WOB: 42Klbs
Inclination: 89.83°	Rotary: 65RPM
Azimuth: 270.55°	Strokes: 234SPM
TVD: 7,074.17'	Pump Rate: 680GPM
VS: 7,160.86'	



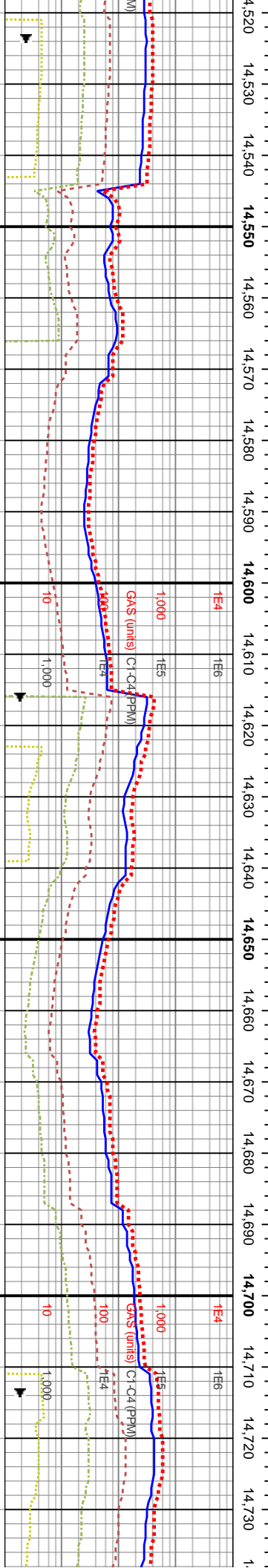
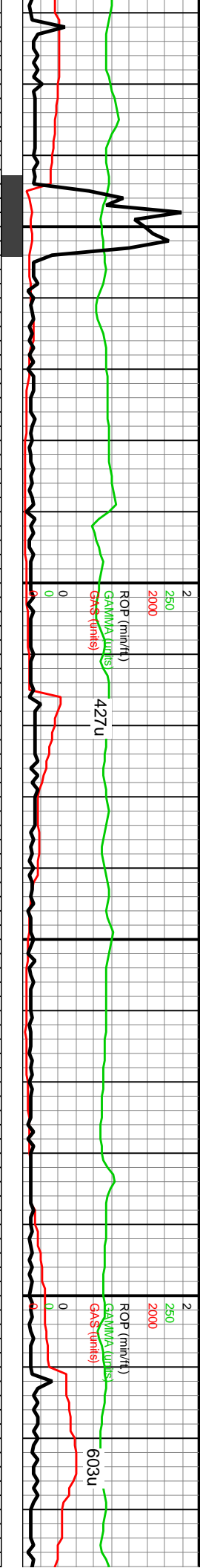
14300-14360 CHK (65%); pred sl dk gy, ip
medgy, offwhite- bf- brn mot thru, pred frm- s
hd, pred sb biky- biky, sl- mod arg thru, occa
lise cal, mod cal incl, tr frac fl- euhed cal, tr
tr pyrc bent; MRLST (35%); dk gy, ip sl blk-
sb biky- sb pily, sl hd, ip sl frm

14360-14420 CHK (80%): pred med gy- lt gy,
sme sl dk gy, offwht- bf- lt bm mot thru, pred s
frm, sme sl hd, pred sb bky- bky, sl aig thru,
occ lse cal, mod cal incl, tr pyr: MRLST (20%),
dk gy- sl blk, sb bky- sb ply, sl hd, ip sl frm

14420-14480 CHK (80%); pred med gy- it gy,
sme sl dk gy, offwht- bf- it btm mot thru, pred s
firm, sme sl hd, pred sb biky- biky, sl arg thru,
occ lse cal, mod cal incl, tr pyr: MRLST (20%)
dk gy- sl blk, sb biky- sb ply, sl hd, ip sl frm

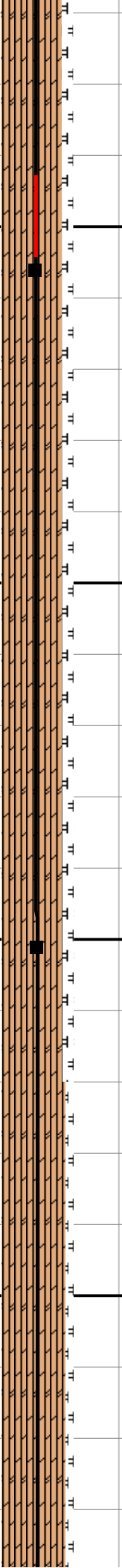
14480-14540 CHK (90%):
sme sl dk gy, offwht- br- lt t
frm, sme sl hd, pred sb blk-
occ lse cal, mod cal inci, tr
dk gy- sl blk, sb blk- sb pht





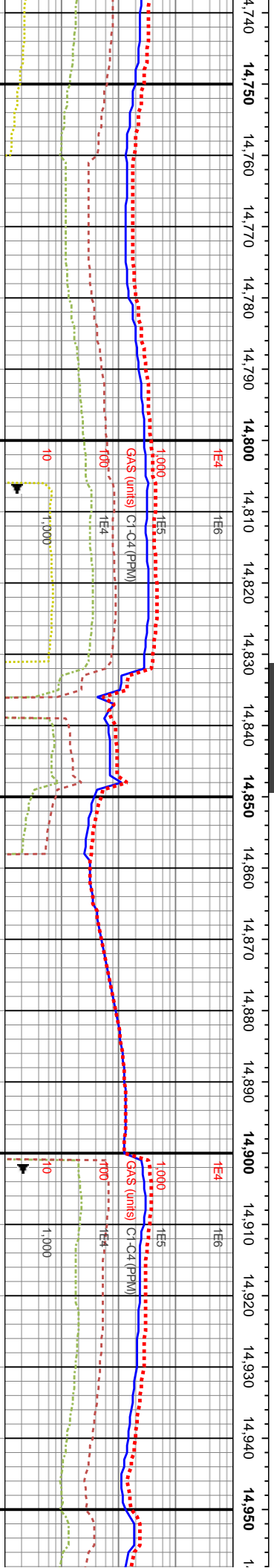
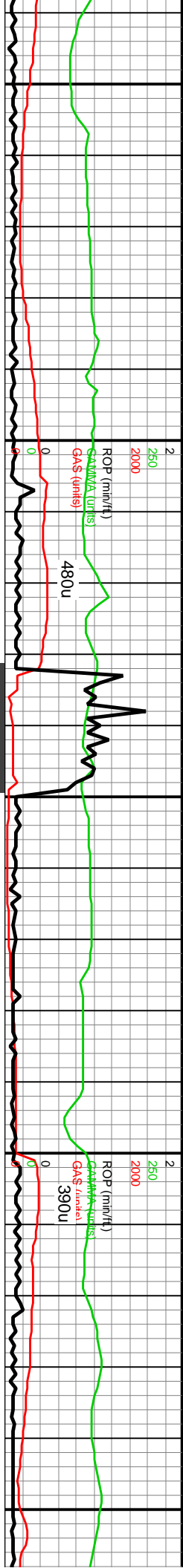
MD: 14,556'
Inclination: 90.67°
Azimuth: 270.53°
TVD: 7,073.76'
VS: 7,255.86'

MD: 14,651'
Inclination: 91.11°
Azimuth: 271.45°
TVD: 7,072.28'
VS: 7,350.84'



14540-14600 CHK (80%): pred med gy- gy, sme sl dk gy, offwhit- bf- lt brn mot thru, pred sl frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, tr pyr; MRLST (20%): dk gy- sl blk, sb blk- sb pty, sl hd, ip sl frm, sme calc incl	14600-14660 CHK (80%): pred med gy- gy, sme sl dk gy, offwhit- bf- lt brn mot thru, pred sl frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, tr pyr; MRLST (20%): dk gy- sl blk, sb blk- sb pty, sl hd, ip sl frm, sme calc incl, mod dk obm stn	14660-14720 CHK (90%): pred gy, abnt med gy, sme sl dk gy, offwhit- bf- lt brn mot thru, pred sl frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, tr pyr, tr bent; MRLST (10%): dk gy- sl blk, sb blk- sb pty, sl hd, ip sl frm, sme calc incl, sme dk obm stn	14720-14780 CHK (90%): pred med gy, abnt med gy, sme sl dk gy, offwhit- bf- lt brn mot thru, pred sl frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr frac fl cal, tr pyr, tr bent; MRLST (10%): dk gy- sl blk, sb blk- sb pty, sl hd, ip sl frm, sme calc incl, sme dk obm stn

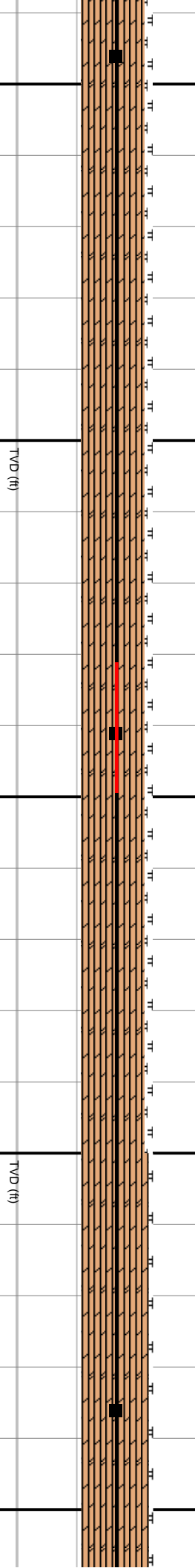




D: 14,746'
Inclination: 91.04°
Azimuth: 273°
V/D: 7,070.5'
S: 7,445.76'

MD: 14,841'
Inclination: 90.84°
Azimuth: 271.57°
TVD: 7,068.94'
VS: 7,540.67'

MD: 14,936'
Inclination: 90.67°
Azimuth: 270.74°
TVD: 7,067.69'
VS: 7,635.65'

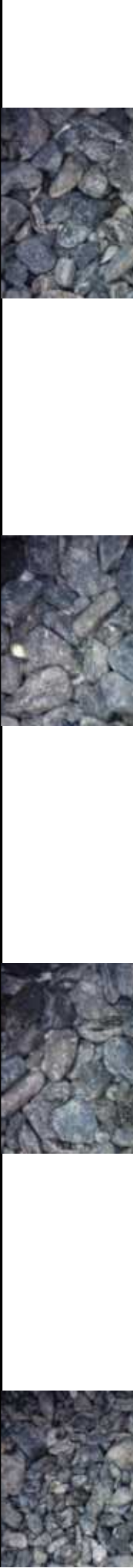


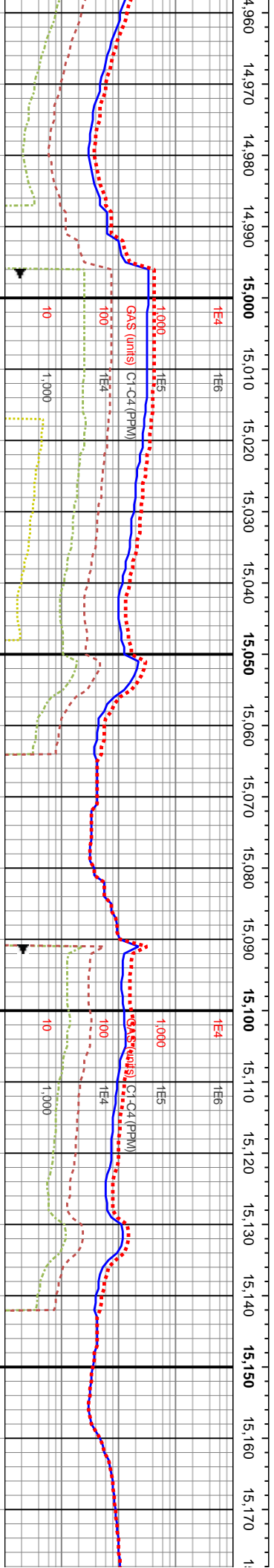
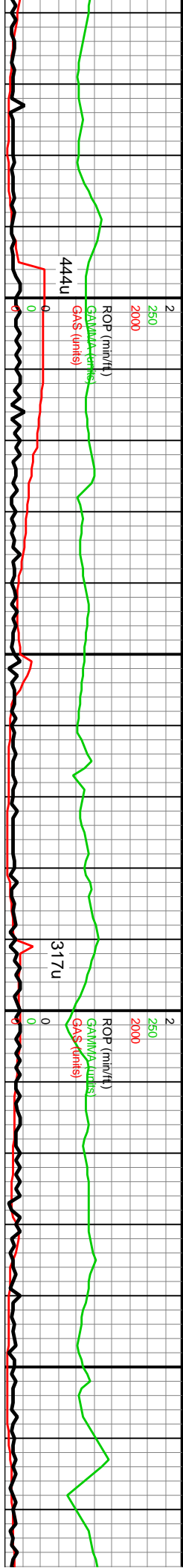
14780-14840 CHK (90%): pred gy, abnt med
si dk gy, offwht- bf- lt brn mot thru, sme sl hd, pred sb blk- blk, sl occ lse cal, mod cal incl, tr frac fl cal, MRLST (10%): dk gy- sl blk, sb blk, ip sl frm, sme calc incl, sbm stn

14780-14840 CHK (90%): pred gy, abnt med gy, sme sl dk gy, offwht- bf- lt brn mot thru, pred si frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr pyr, tr bent, MRLST (10%): dk gy- sl blk, sb blk- sb blk, ip sl frm, sme calc incl, sme dk obm stn

14840-14900 CHK (90%): pred gy, abnt med gy, sme sl dk gy, offwht- bf- lt brn mot thru, pred si frm, sme sl hd, pred sb blk- blk, sl arg thru, occ lse cal, mod cal incl, tr pyr, tr bent, MRLST (10%): dk gy- sl blk, sb blk- sb blk, ip sl frm, sme calc incl, sme dk obm stn

14900-14960 CHK: pred gy, abnt med gy, sme sl dk gy- brn, offwht- bf- lt brn mot thru, pred si frm, occ si hd, pred sb blk- blk, sl arg thru, ip mod arg- mrlly intbds, tr lse cal, tr cal incl, tr pyr





WOB: 25Klbs
Rotary: 65RPM
Strokes: 240SPM
Pump Rate: 697GPM

MD: 15,031'
Inclination: 90.57°
Azimuth: 270.48°
TVD: 7,066.66'
VS: 7,730.64'

MD: 15,126'
Inclination: 90.07°
Azimuth: 269.72°
TVD: 7,066.13'
VS: 7,825.64'

TVD (ft)

TVD (ft)

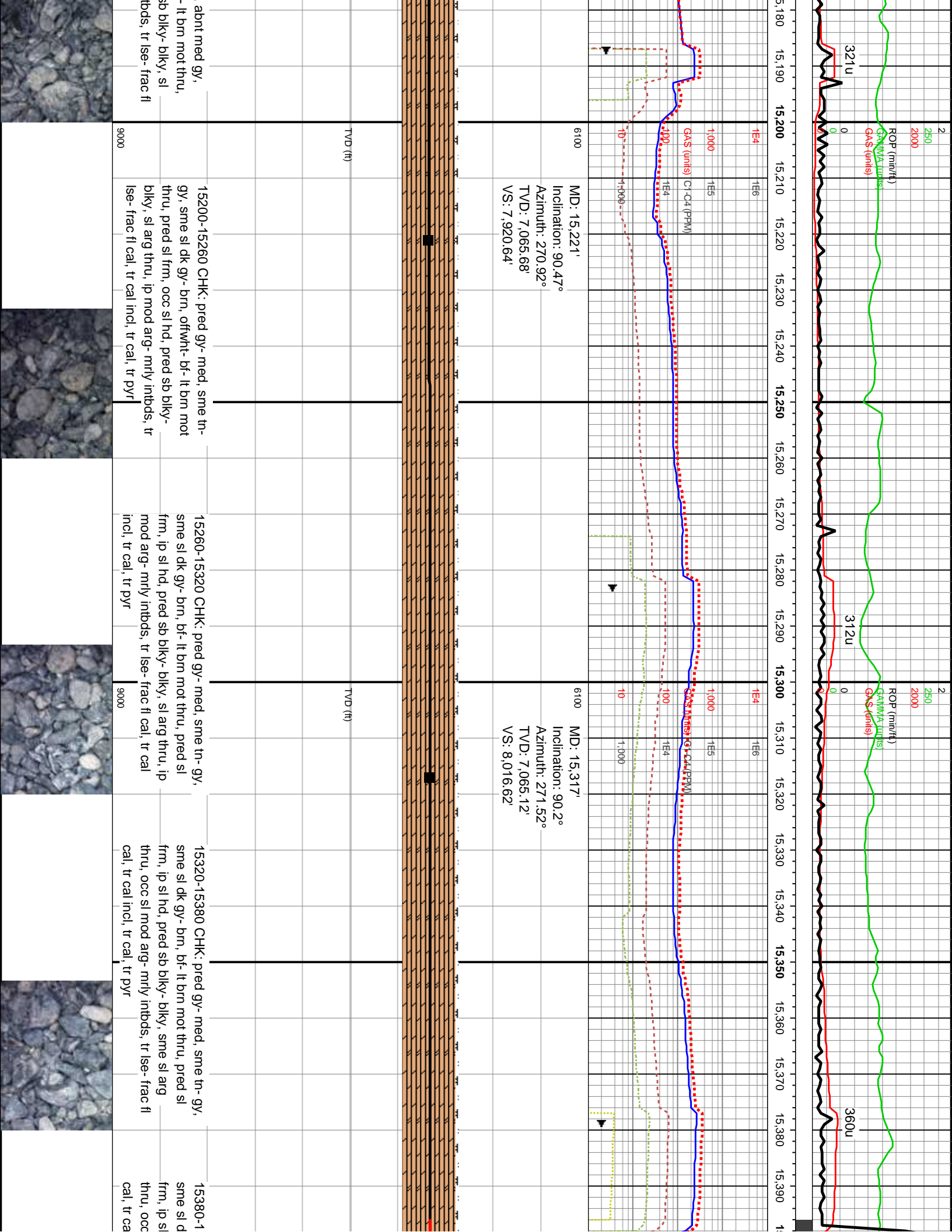
14960-15020 CHK: pred gy, abnt med gy, sme sl dk gy- brn, offwhit- bf- lt brn mot thru, pred sl frm, occ sl hd, pred sb blkly- blkly, sl arg thru, ip mod arg- mrly intbds, tr lse cal, tr cal incl, tr cal, tr pyr

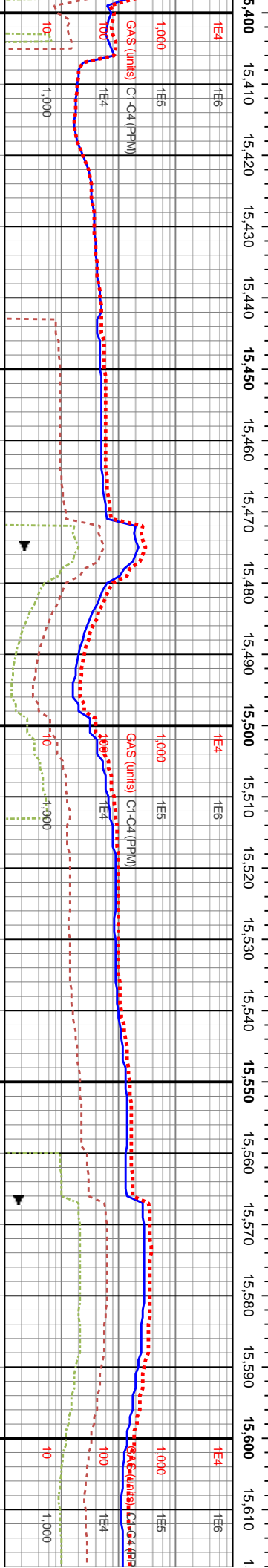
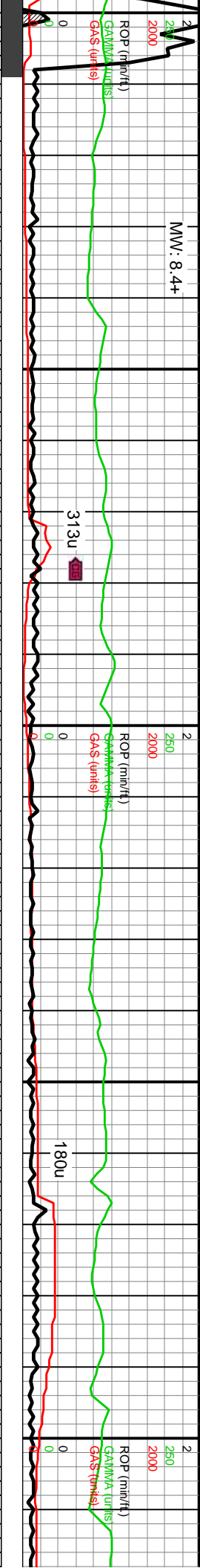
15020-15080 CHK: pred gy, abnt med gy, sme sl dk gy- brn, offwhit- bf- lt brn mot thru, pred sl frm, occ sl hd, pred sb blkly- blkly, sl arg thru, ip mod arg- mrly intbds, tr lse cal, tr cal incl, tr cal, tr pyr

15080-15140 CHK: pred gy, abnt med gy, sme sl dk gy- brn, offwhit- bf- lt brn mot thru, pred sl frm, occ sl hd, pred sb blkly- blkly, sl arg thru, ip mod arg- mrly intbds, tr lse- frac fl cal, tr cal incl, tr cal, tr pyr

15140-15200 CHK: pred gy, sme sl dk gy- brn, offwhit- bf- lt brn mot thru, pred sl frm, occ sl hd, pred sb blkly- blkly, sl arg thru, ip mod arg- mrly intbds, tr lse cal, tr cal incl, tr cal, tr pyr

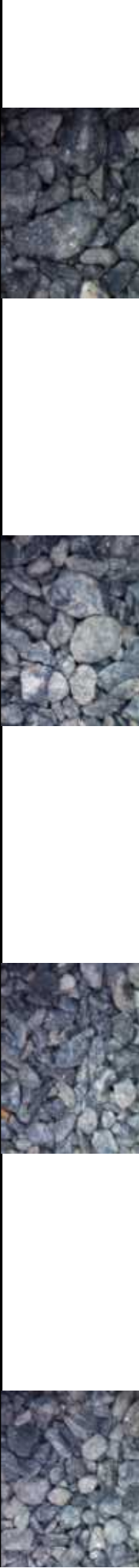


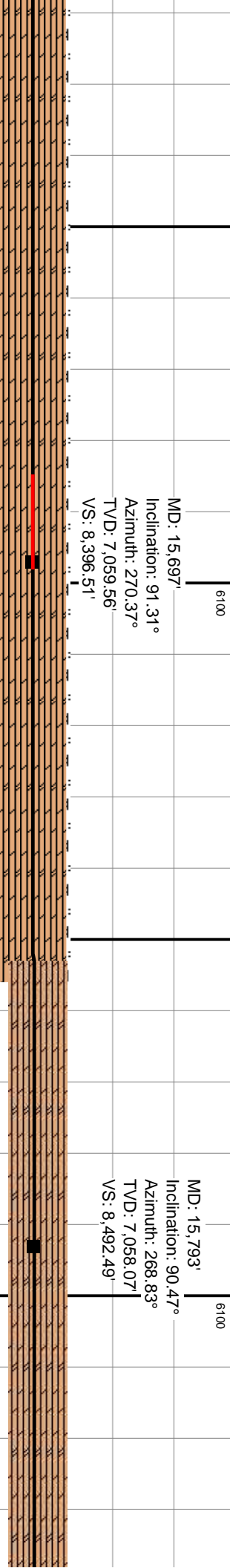
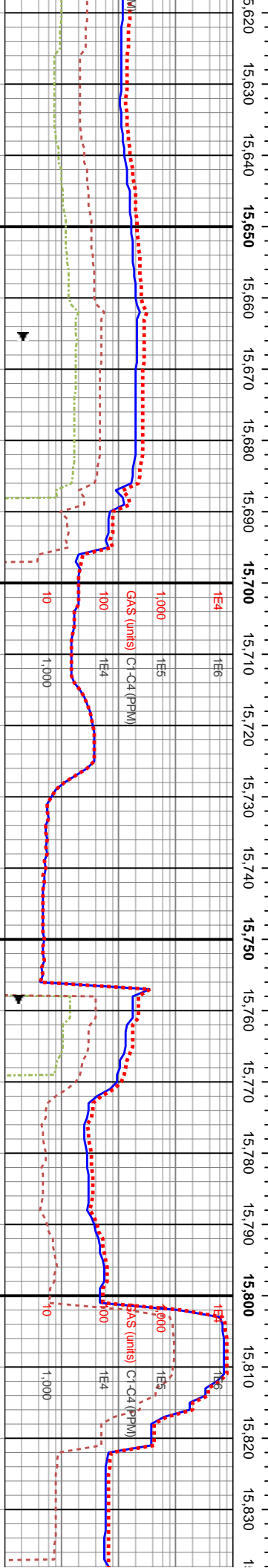
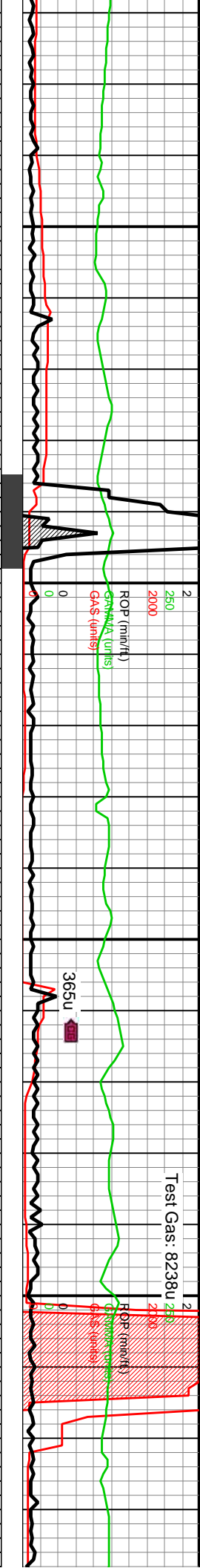




MD: 15,411'	MD: 15,506'	MD: 15,602'
Inclination: 90.84°	Inclination: 90.54°	Inclination: 91.21°
Azimuth: 270.92°	Azimuth: 270.26°	Azimuth: 271.09°
TVD: 7,064.27'	TVD: 7,063.13'	TVD: 7,061.66'
VS: 8,110.6'	VS: 8,205.59'	VS: 8,301.57'

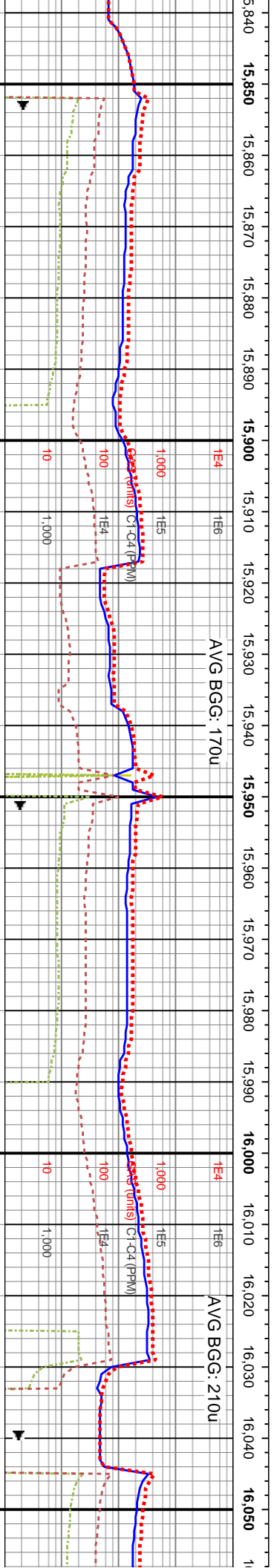
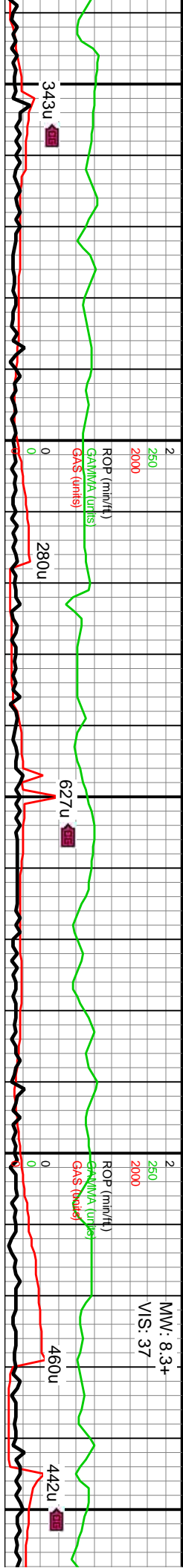
5440-15440 CHK: pred gy- med, sme tn- gy, k gy- brn, bf- lt brn mot thru, pred sl hd, pred sb blkly- blkly, sme sl arg sl mod arg- mrlly intbds, tr lse- frac fl incl, tr cal, tr pyr	15440-15500 CHK: pred gy- med, sme tn- gy, sme sl dk gy- brn, bf- lt brn mot thru, pred sl frm, ip sl hd, pred sb blkly- blkly, sme sl arg thru, occ sl mod arg- mrlly intbds, tr lse- frac fl cal, tr cal incl, tr pyr	15500-15560 CHK: pred gy- med, sme tn- gy, sme sl dk gy, bf- lt brn- brn mot thru, pred sl frm, ip sl hd, pred sb blkly- blkly, sme sl arg thru, sme sl mod arg- mrlly intbds, tr lse- frac fl cal, tr cal incl, tr pyr	15560-15620 CHK: pred gy- med, sme tn- gy, sme sl dk gy, bf- lt brn- brn mot thru, pred sl frm, ip sl hd, pred sb blkly- blkly, sme sl arg thru, sme sl mod arg- mrlly intbds, tr lse- frac fl cal, tr cal incl, tr pyr
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15620-15680 CHK: pred gy- med, sme tn- gy, sme sl dk gy, bf- lt brn- brn mot thru, pred sl frm, ip sl hd, pred sb blk- blk, sme sl arg thru, sme sl mod arg- mrlly intbds, tr cal incl, tr cal, tr pyr	15680-15740 CHK: pred gy- med, sme tn- gy, sme sl dk gy, bf- lt brn- brn mot thru, pred sl frm, ip sl hd, pred sb blk- blk, sme sl arg thru, sme sl mod arg- mrlly intbds, tr cal incl, tr cal, tr pyr	15740-15860 CHK (80%): lt gy-gy, gy brn-dk gy wi OBM sin, v arg LS wi occ f-uf-elong ch fis sb blk- sb ply cigs, silty-sl gt tex, rr vf pyr & tr pyr strg, tr c free chk, med-hi calc wi cin l brn mrlly incl grdg to MRLST (20%): gy-dk gy, med fis sb blk- sb ply cigs, silty-sl gt tex, m resd
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MD: 15,888'
Inclination: 90.4°
Azimuth: 268.89°
TVD: 7,057.35'
VS: 8,587.46'

MD: 15,983'
Inclination: 90.84°
Azimuth: 269.32°
TVD: 7,056.32'
VS: 8,682.44'

WOB: 38Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM

TVD (ft)

TVD (ft)

15860-15920 CHK (80%): lt gy-gy-dk gy, frm-brit mod
15920-15980 CHK (80%): pred lt gy-gy, v arg LS wi
15980-16100 CHK (80%): pred lt gy-gy, frm-brit l-mod fis sb rd-sb blk

fit sb blk-ty-sb ply-pty ctgs, silty-sl gt tex, v arg LS wi
occ f chky incl & thn lamn, r v pyr & tr pyr strg, tr c free med-hi calc wi cin HCL rxn, wi incr mrlly incl grdg to
chk, med-hi calc wi cin HCL rxn, MRLST (20%): gy-dk
gy, med fis sb blk-ty-sb ply ctgs, silty-sl gt tex, mod calc
wi brn mrlly resd

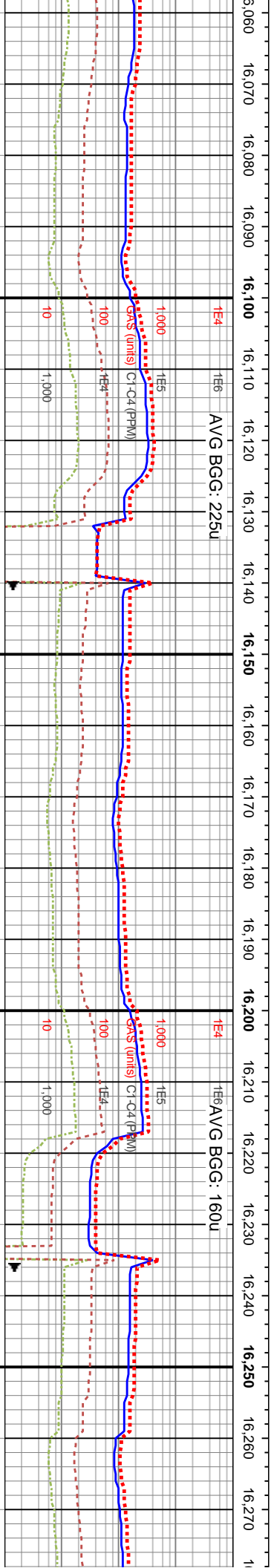
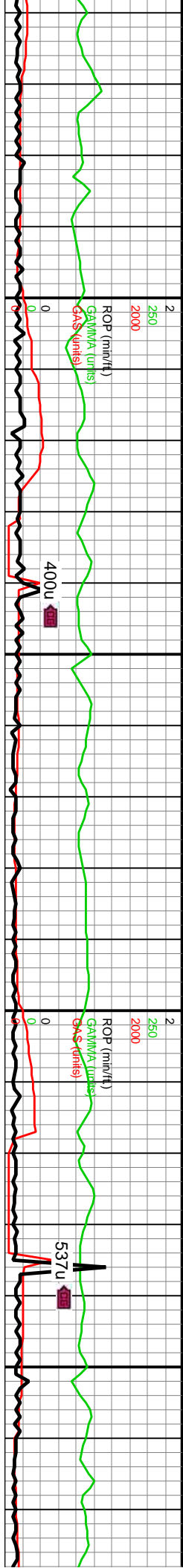
occ f-uf-elong chky incl, frm-brit mod fis sb blk-ty-sb ply
ctgs, silty-sl gt tex, r v pyr & tr pyr strg, tr c free chk,
20% MRLST: gy-dk gy brn-dk gy wi OBM stn, med fis
sb blk-ty-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrlly
rescl

15980-16100 CHK (80%): pred lt gy-gy, frm-brit l-mod fis sb rd-sb blk
chky incl & thn chky lamn, tr c free chk, r v pyr & tr pyr strg, med-hi cal
gy brn-dk gy wi OBM stn, med fis sb blk-ty-sb ply ctgs, silty-sl gt tex, mod

9000

9000

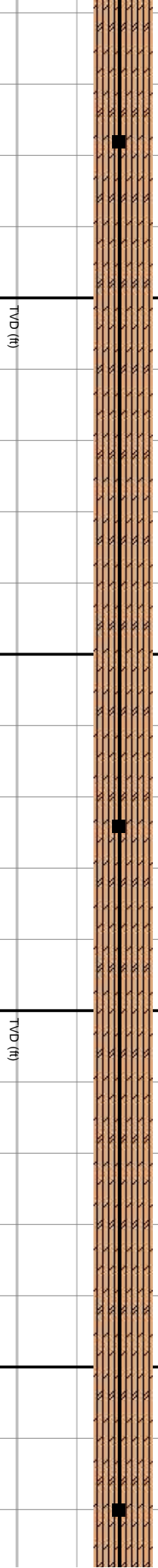




MD: 16,078'
Inclination: 90.4°
Azimuth: 269.12°
TVD: 7,055.29'
VS: 8,777.42'

MD: 16,174'
Inclination: 90.5°
Azimuth: 269.48°
TVD: 7,054.53'
VS: 8,873.41'

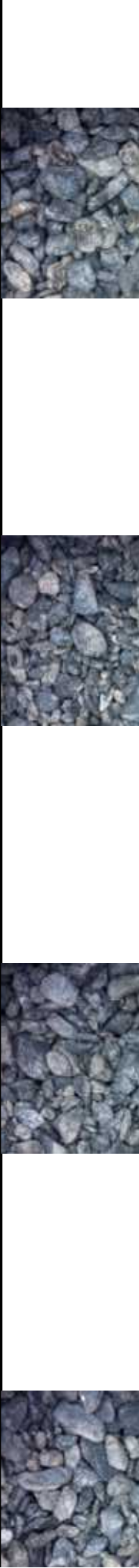
MD: 16,270'
Inclination: 90.17°
Azimuth: 269.61°
TVD: 7,053.96'
VS: 8,969.4'

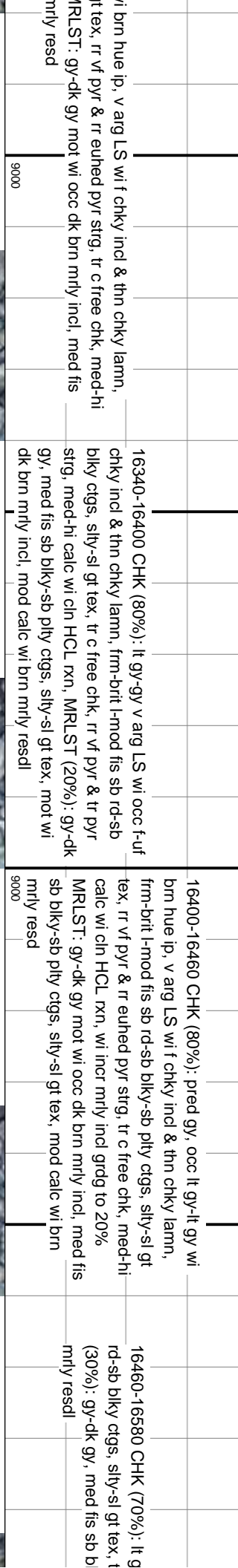
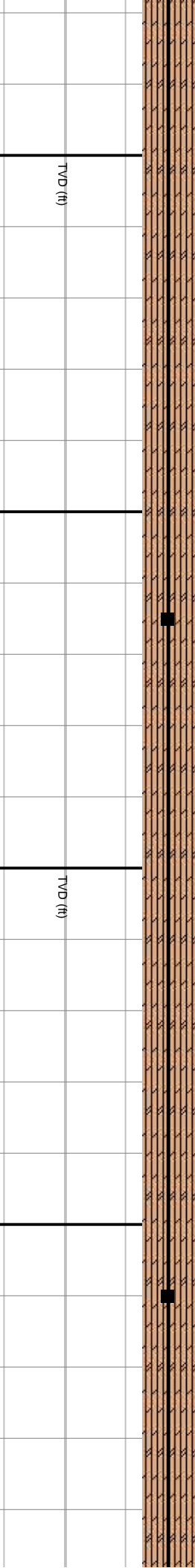
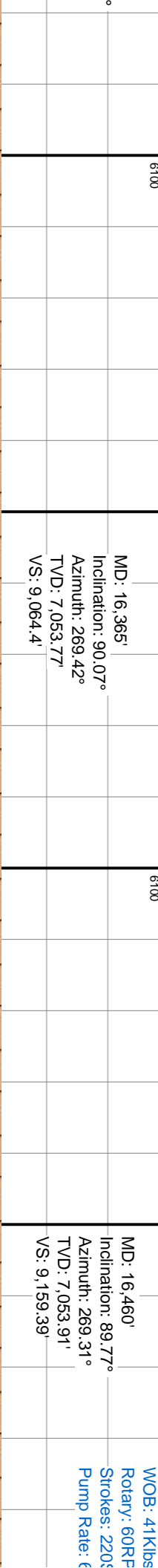
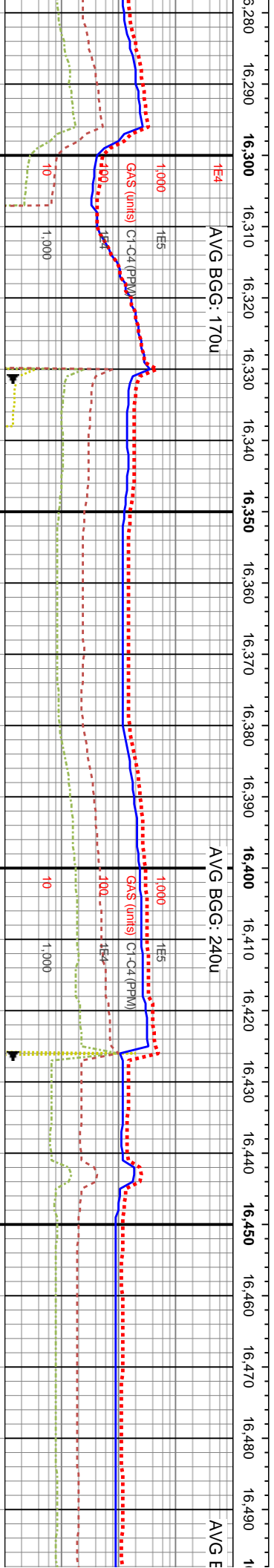
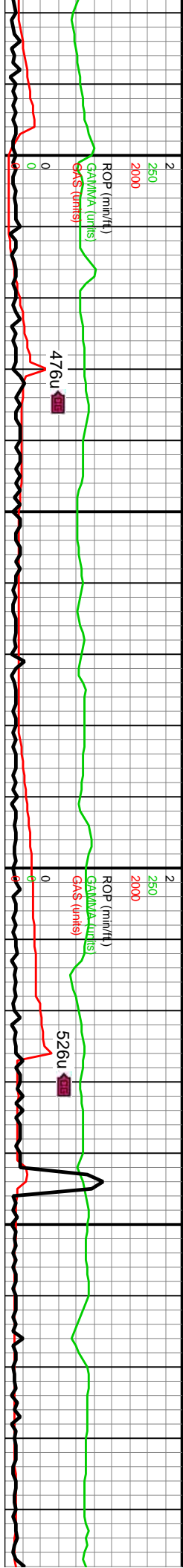


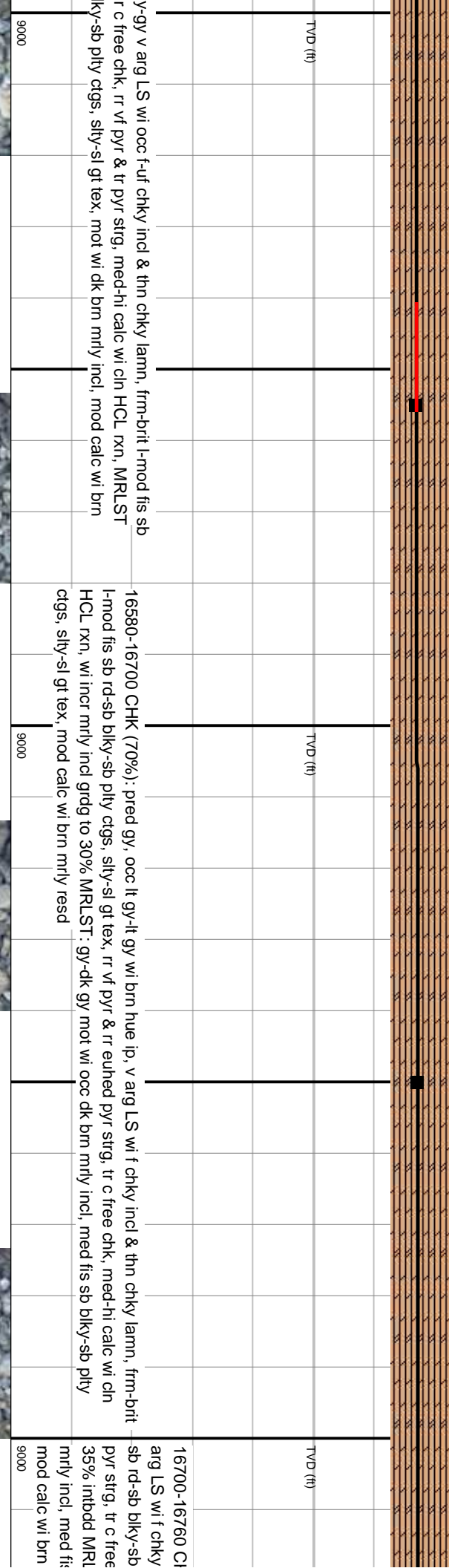
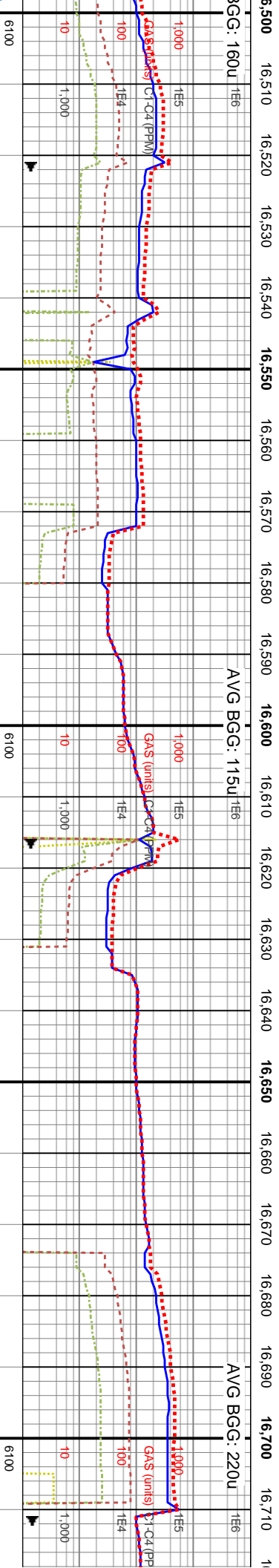
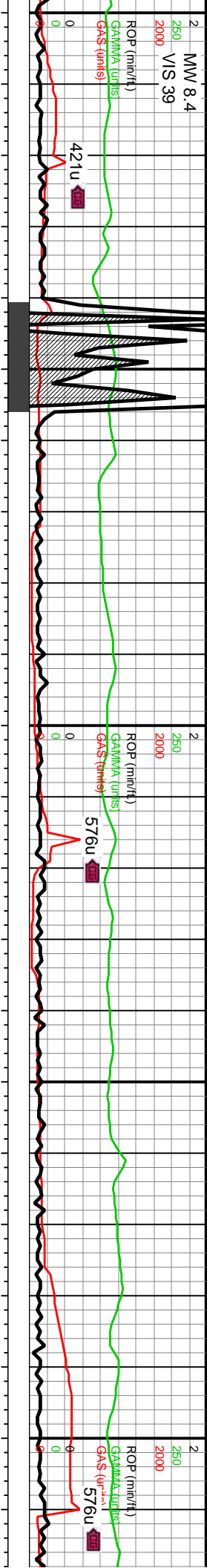
TVD (ft)

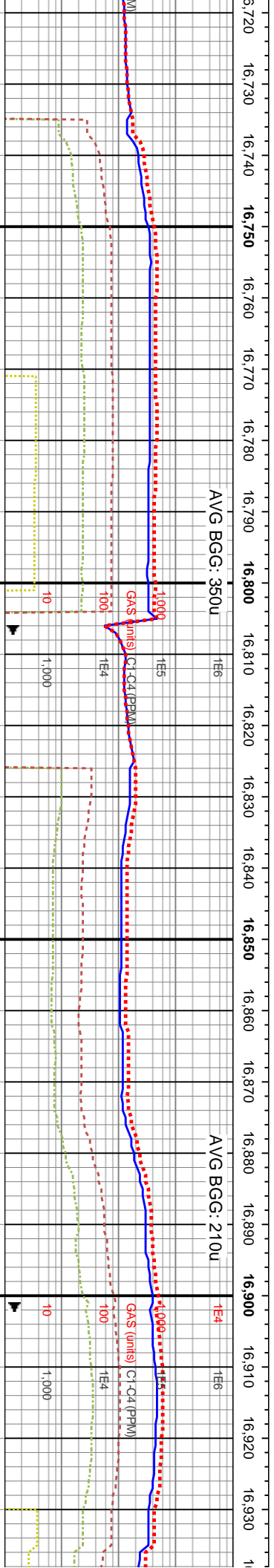
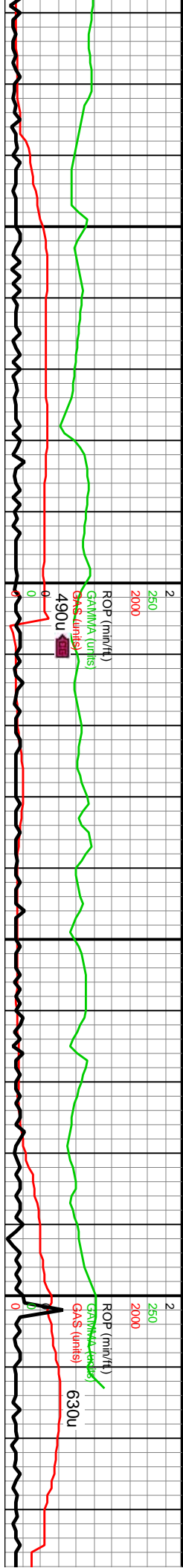
TVD (ft)

16100-16160 CHK (80%): pred lt gy-gy, v arg LS wi occ f-uf along chky incl, frm-brit mod fis sb blkly-sb ply ctgs, silty-sl gt tex, rr vf pyr & tr pyr strg, tr c free chk, med-hi calc wi cin HCL rxn, wi incr mrlly incl grdg to 20% MRLST: gy-dk gy mot wi occ dk brn mrlly incl, med fis sb blkly-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrlly resd	16160-16220 CHK (80%): lt gy-gy v arg LS wi occ f-uf chky incl & thin chky lamn, frm-brit l-mod fis sb rd-sb blkly ctgs, silty-sl gt tex, tr c free chk, rr vf pyr & tr pyr strg, med-hi calc wi cin HCL rxn, MRLST (20%): gy-dk gy, med fis sb blkly-sb ply ctgs, silty-sl gt tex, mot wi dk brn mrlly incl, mod calc wi brn mrlly resd	16220-16340 CHK (80%): pred gy, occ lt gy-lt gy w frm-brit l-mod fis sb rd-sb blkly-sb ply ctgs, silty-sl gt calc wi cin HCL rxn, wi incr mrlly incl grdg to 20% MRLST: sb blkly-sb ply ctgs, silty-sl gt tex, mod calc wi brn mrlly resd
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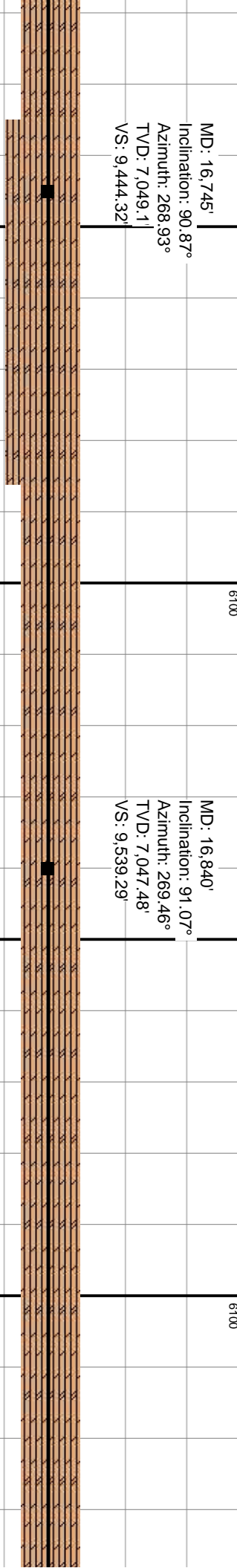




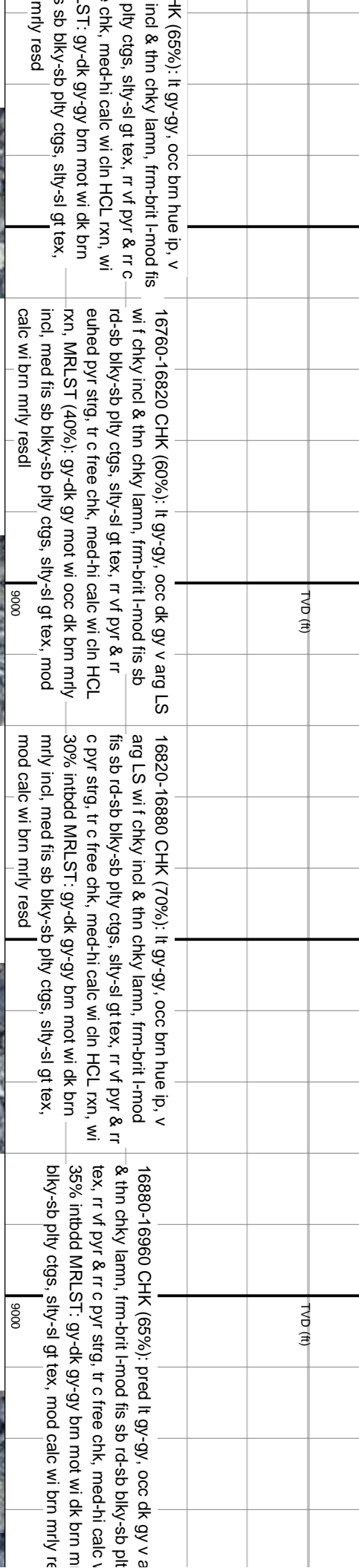




MD: 16,745'
Inclination: 90.87°
Azimuth: 268.93°
TVD: 7,049.11'
VS: 9,444.32'



MD: 16,840'
Inclination: 91.07°
Azimuth: 269.46°
TVD: 7,047.48'
VS: 9,539.29'

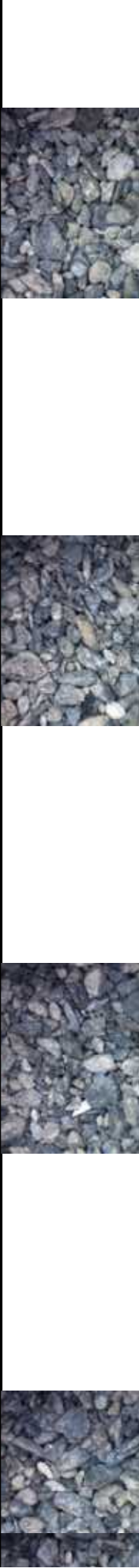


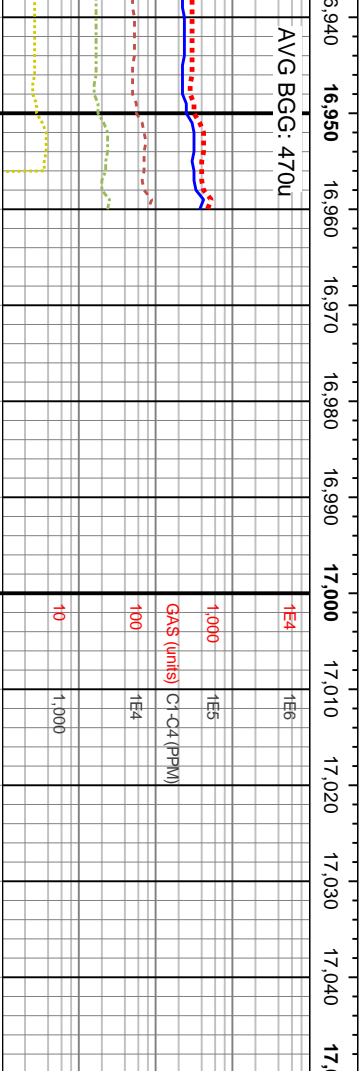
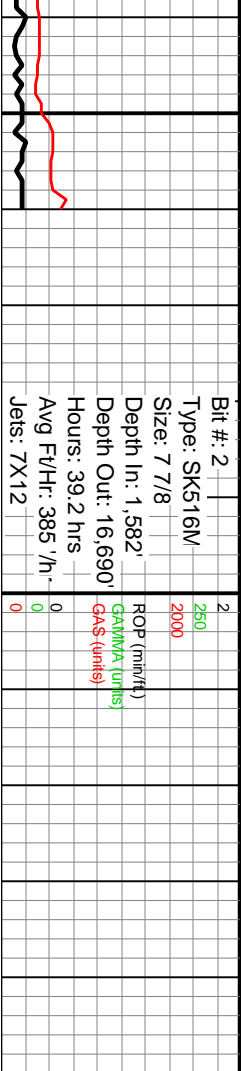
CHK (65%): lt gy-gy, occ brn hue ip, v
incl & thn chky lamn, frm-brit l-mod fis
ply cigs, slty-sl gt tex, rr vf pyr & rr c
chk, med-hi calc wi cin HCL rxn, wi
ST: gy-dk gy-gy brn mot wi dk brn
s s sb blkly-sb ply cigs, slty-sl gt tex,
mrly resd

16760-16820 CHK (60%): lt gy-gy, occ dk gy v arg LS
wi f chky incl & thn chky lamn, frm-brit l-mod fis sb
rd-sb blkly-sb ply cigs, slty-sl gt tex, rr vf pyr & rr
euhed pyr stfg, tr c free chk, med-hi calc wi cin HCL
rxn, MRLST (40%): gy-dk gy mot wi occ dk brn mrly
incl, med fis sb blkly-sb ply cigs, slty-sl gt tex, mod
calc wi brn mrly resd

16820-16880 CHK (70%): lt gy-gy, occ brn hue ip, v
arg LS wi f chky incl & thn chky lamn, frm-brit l-mod
fis sb rd-sb blkly-sb ply cigs, slty-sl gt tex, rr vf pyr & rr
c pyr stfg, tr c free chk, med-hi calc wi cin HCL rxn, wi
30% intbdd MRLST: gy-dk gy-gy brn mot wi dk brn
mrly incl, med fis sb blkly-sb ply cigs, slty-sl gt tex,
mod calc wi brn mrly resd

16880-16960 CHK (65%): pred lt gy-gy, occ dk gy v a
& thn chky lamn, frm-brit l-mod fis sb rd-sb blkly-sb ply
tex, rr vf pyr & rr c pyr stfg, tr c free chk, med-hi calc v
35% intbdd MRLST: gy-dk gy-gy brn mot wi dk brn m
blkly-sb ply cigs, slty-sl gt tex, mod calc wi brn mrly re





Projection to bit

MD: 16,960'

Inclination: 91.48°

Azimuth: 270.09°

TV D: 7,044.82"

VS: 9,659.25"

Reach TD on 8/19/2016

TV_D (ft)

ing LS w/ f chky incl
y ctgs, slty-sl gt
w/ clin HCL rxn, w/
rly incl, med fis sb
ssdl

