



# Empirica

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Fairview 10

**Location** Sec 5, T2N, R68W

**State** CO

**Country** USA

**API Number** 05-123-41517

**Geographic Region** DJ Basin

**Spud Date** 12/10/2015

**Surface Coordinates** Lat: 40° 9' 56.7684" N  
Long: 105° 2' 8.0448" W

**Bottom Hole Coordinates** Lat: 40° 8' 18.461" N  
Long: -104° 57' 59.162" W

**Ground Elevation** 4948'

**Logged Interval** 5000 To 13954' MD

**Formation** Niobrara B

**Type of Drilling Fluid** Invert

**K.B. Elevation** 4963'

**Total Depth** 13954' MD

**County** Weld

**Rig Number** Savannah 802

**Field** Wattenberg

**Drilling Completed** 12/15/2015

## 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-197

**Comments** Start: 12-12-15  
End: 12-15-15

**Services Provided** 2-man logging

**Logger Names** Mark Gross/ Stuart Pri

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

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

**Fossils**

F FOSSIL

GASTROPOD

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHERT

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

**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 Symbols

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

BIT

GAS S

VUGGY

NORM

OIL SH

OVERTURN

REVERSAL

Engineering

CASING

REVERSAL

Porosity

E EARTHY

FENESTRAL

F FRACTURE

INTERCRYSTALLINE

INTEROOLITIC

MOLDIC

CONNECTION (RIGHT)

CONNECTION (LEFT)

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

SIDEVIEW

SLIDE

SURVEY

TRIP

WIRELINE

WIRELINE

ntz  
Pkwy N

# Symbols

FORMATION TOP      L LITHOGRAPHIC

## Rounding

HOW      MX MICROXLN

MIN DEPTH      AN ANGULAR      MS MUDSTONE

ALL FAULT      R ROUNDED      PS PACKSTONE

LOW      SUBANG      WS WACKESTONE

TURNED STRATA      P SUBRND

## Sorting

SE FAULT

## Textures

ALL CORE (LEFT)      M MODERATE

ALL CORE (RIGHT)      BS BOUNDSTONE      P POOR

CHALKY      W WELL

CRY      CX CRYPTOXLN

GAS      E EARTHY

NE TESTED - LEFT      FX FINELYXLN

NE TESTED - RT      GS GRANSTONE

ROP  
GAMMA  
GAS  
DPSX

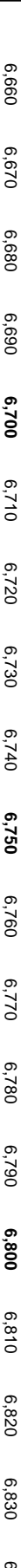
Extraction OG  
Fairview 10  
Weid County, CO  
Spud Date: 12-10-15  
Surface Casing @ 1,537'  
2-man logging began: 12-12-15  
1% Methane = 100 Units  
Depths Correspond to Driller's Pipe Tally

Linear Scale



Slide/Rotate

Depth Labels



Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Logarithmic Scale



Well Bore  
TVD



6680-6740 SH (70%): dk gy-med gy, pred  
ply-sb blkly, frm-sl hrd, non-sl calc, sm-sl silty  
tex, tr micnica, tr pp pyr, SLTST (30%): pred  
med gy-dk gy, gysbhn, v arg, occ sdy, pred  
non calc, tr flamm

6740-6800 SH (75%): dk gy-med gy, dk  
gysbhn, frm-sl hrd, sb ply-tab, abrv tex, tr f  
lamm, micnica, non calc, SLTST (25%): med  
gy-dk gy, frm-v frm, sb tab-blky, ply, sl calc,  
silty tex

6800-6860 SH (60%): dk gy  
frm, sl brit, sb ply-ply, sm-  
tr-scat pp pyr, SLTST (40%): dk  
occ gysbhn, frm-sl hrd, tab  
calc, tr sm tex, pred abrv

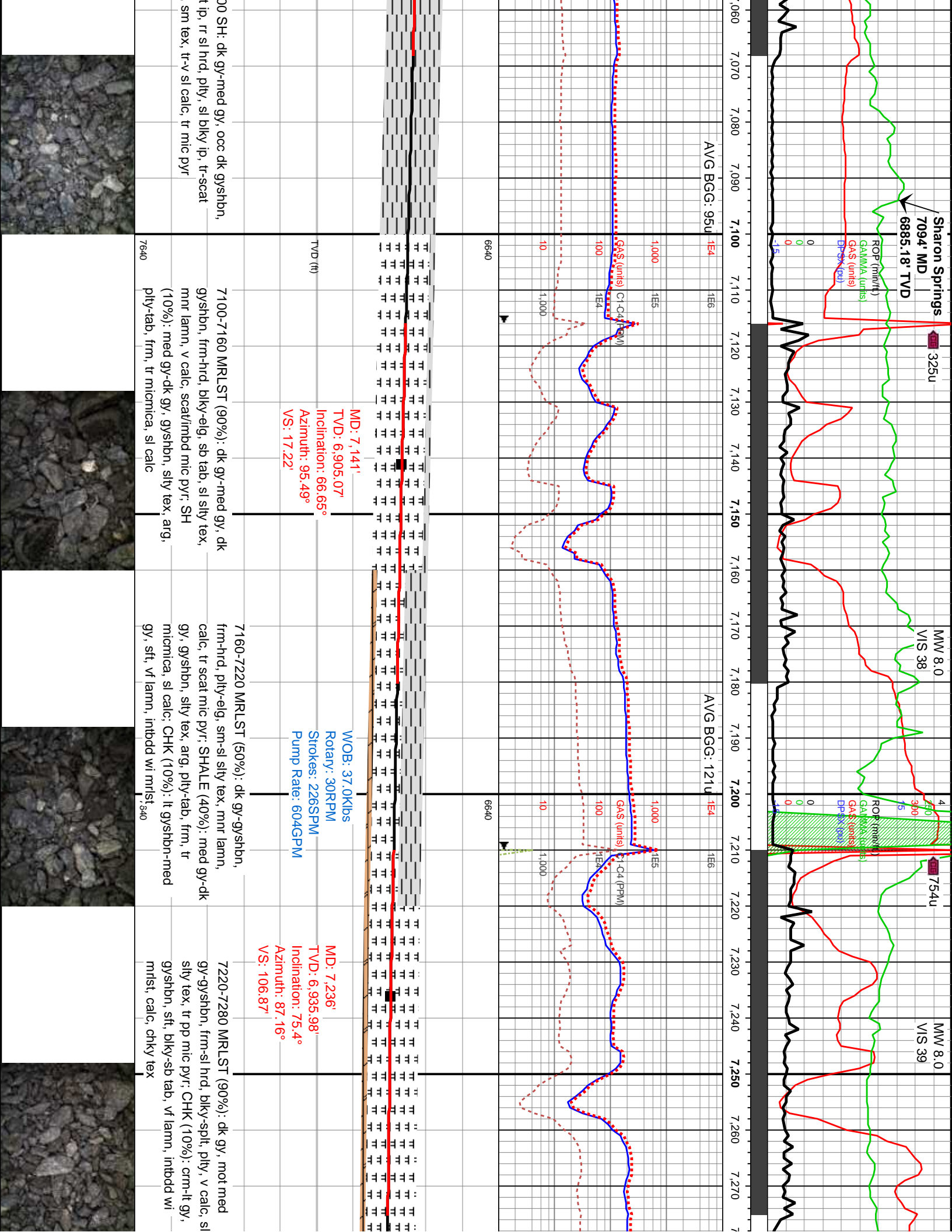
Images



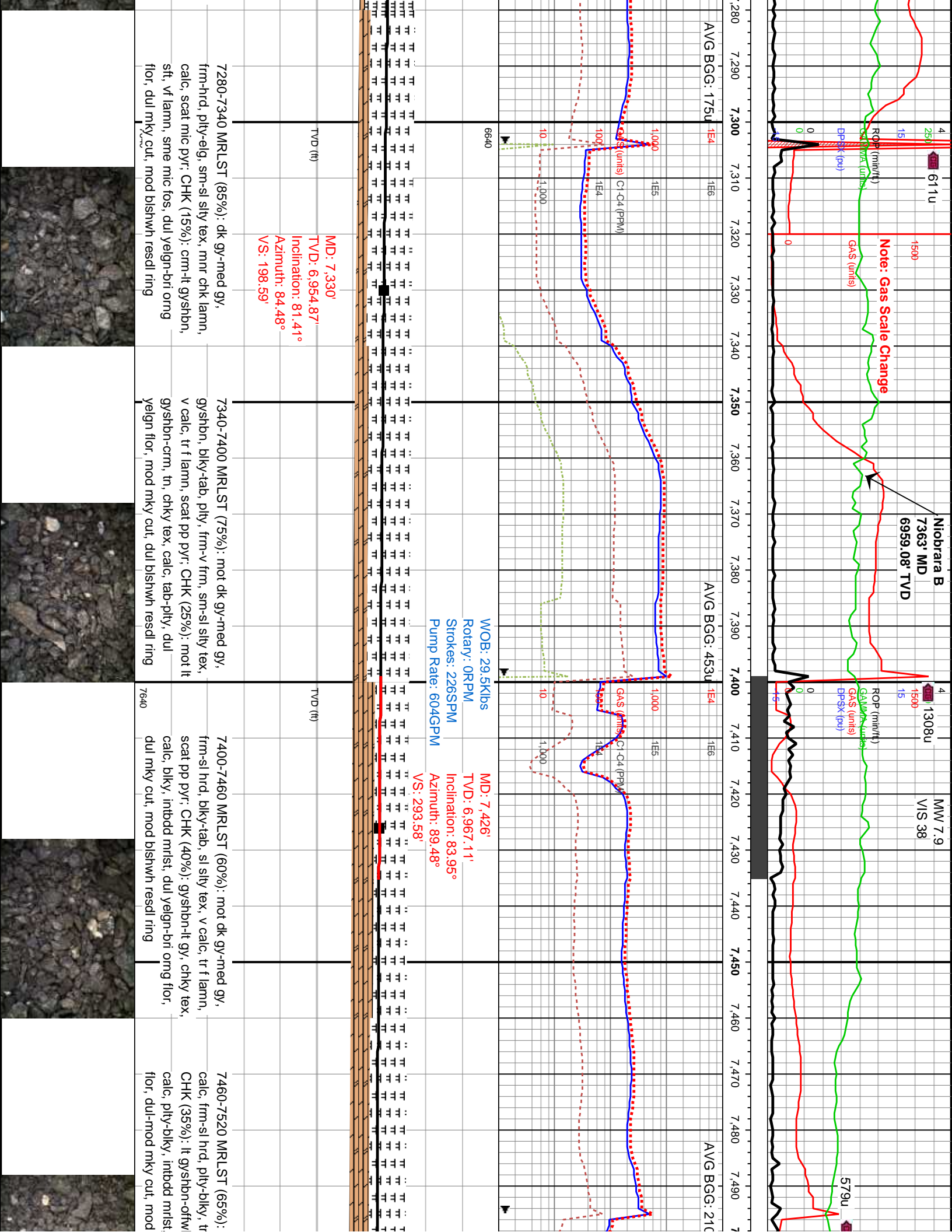
MD: 6,762'  
TVD: 6,698.49'  
Inclination: 37.23°  
Azimuth: 94.7°  
VS: -295.77'

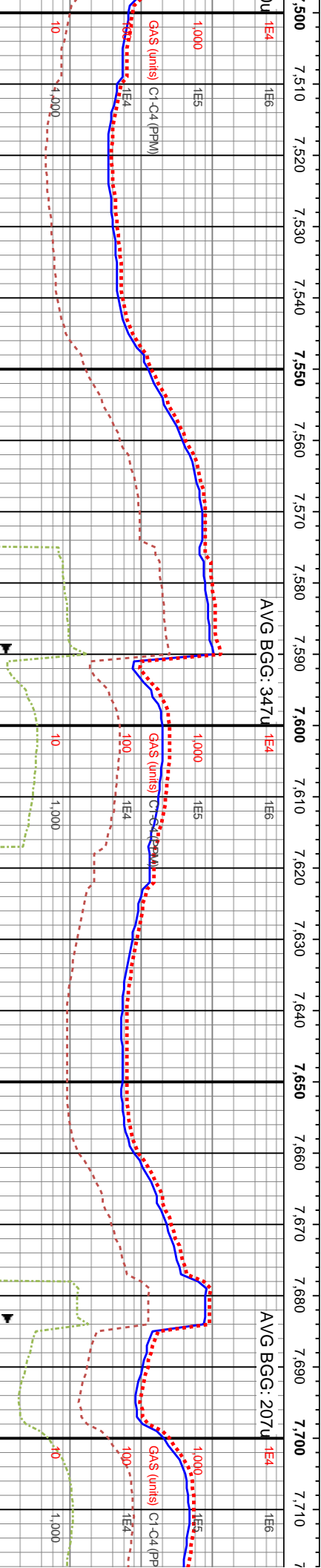
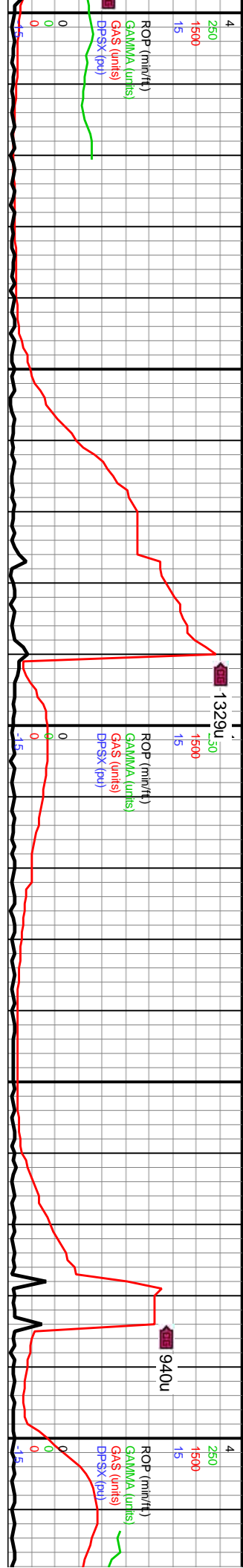
Bit #: 2  
Type: E516-B34-7  
Size: 7.88"  
Depth In: 1,548'  
Depth Out: 9,956'  
Hours: 18.9 hrs  
Avg Ft/Hr: 444.87'/hr  
Jets: 7x10  
S/N: A220684







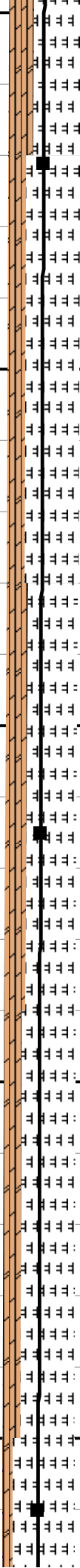




MD: 7.521'  
TVD: 6.975.87'  
Inclination: 85.46°  
Azimuth: 90.5°  
VS: 388.17'

WOB: 37.9Klbs  
Rotary: 45RPM  
Strokes: 260SPM  
Pump Rate: 695GPM  
VS: 481.95'

MD: 7.710'  
TVD: 6.986.93'  
Inclination: 87.65°  
Azimuth: 90.19°  
VS: 576.83'



TVD (ft)

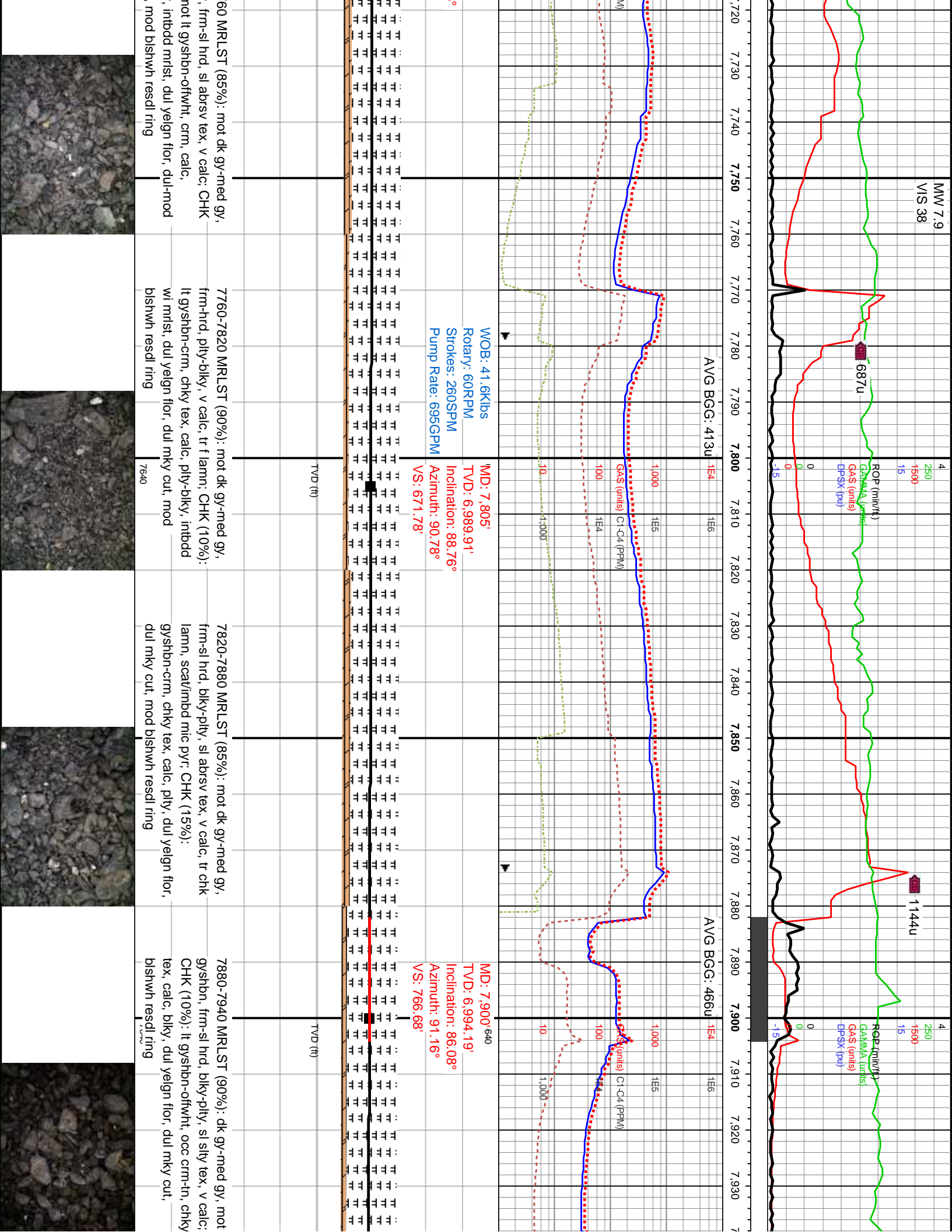
TVD (ft)

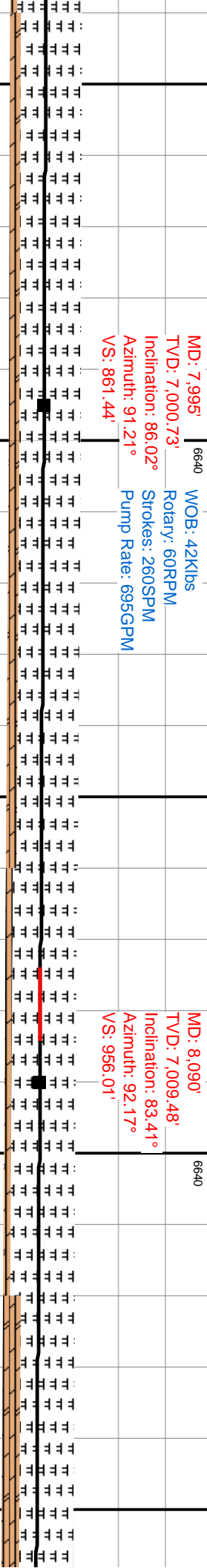
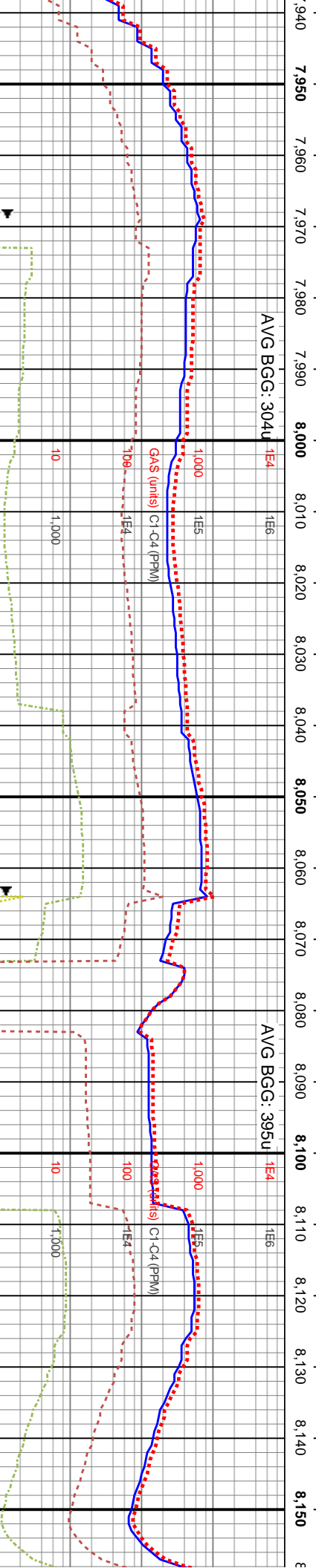
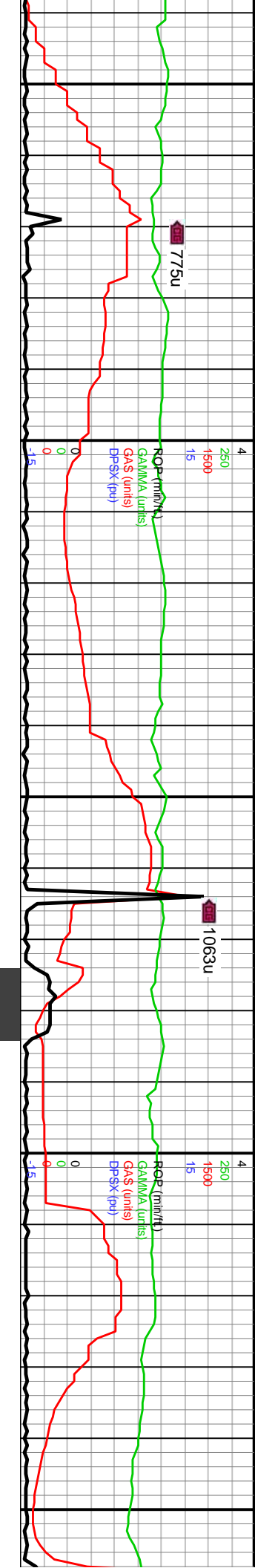
TVD (ft)

dk gy-med gy, v lamm, scat pyr, nt, crm, chky tex, dul yeign-bri orng bishwn resdl ring	7520-7580 MRLST (75%): mot dk gy-med gy, blk-y-sb pfty, sl silty tex, frm, v calc, tr f lamm, scat pp pyr, CHK (25%): gysbhn-crm, chky tex, blk-y-elg, calc, intbdd mrst, dul yeign-bri orng flor, dul mky cut, mod bishwn resdl ring	7580-7640 MRLST (75%): dk gy-med gy, frm, blk-y-tab, sl absrv tex, v calc, mnr micos, scat pp pyr, CHK (25%): lt gysbhn-crm, chky tex, calc, pty-sb blk-y, dul yeign-bri orng flor, dul mky cut, bishwn resdl ring	7640-7700 MRLST (75%): mot dk gy-med gy, frm-v frm, blk-y-splt, sl silty tex, v calc, tr f lamm, scat pp pyr, CHK (25%): gysbhn-crm, chky tex, calc, blk-y-sl elg, intbdd wi mrst, dul yeign flor, dul mky cut, mod bishwn resdl ring	7700-7770 MRLST (75%): blk-y-sb pfty, blk-y-elg, calc, intbdd mrst, dul yeign-bri orng flor, dul mky cut, mod bishwn resdl ring
---	---	--	---	---



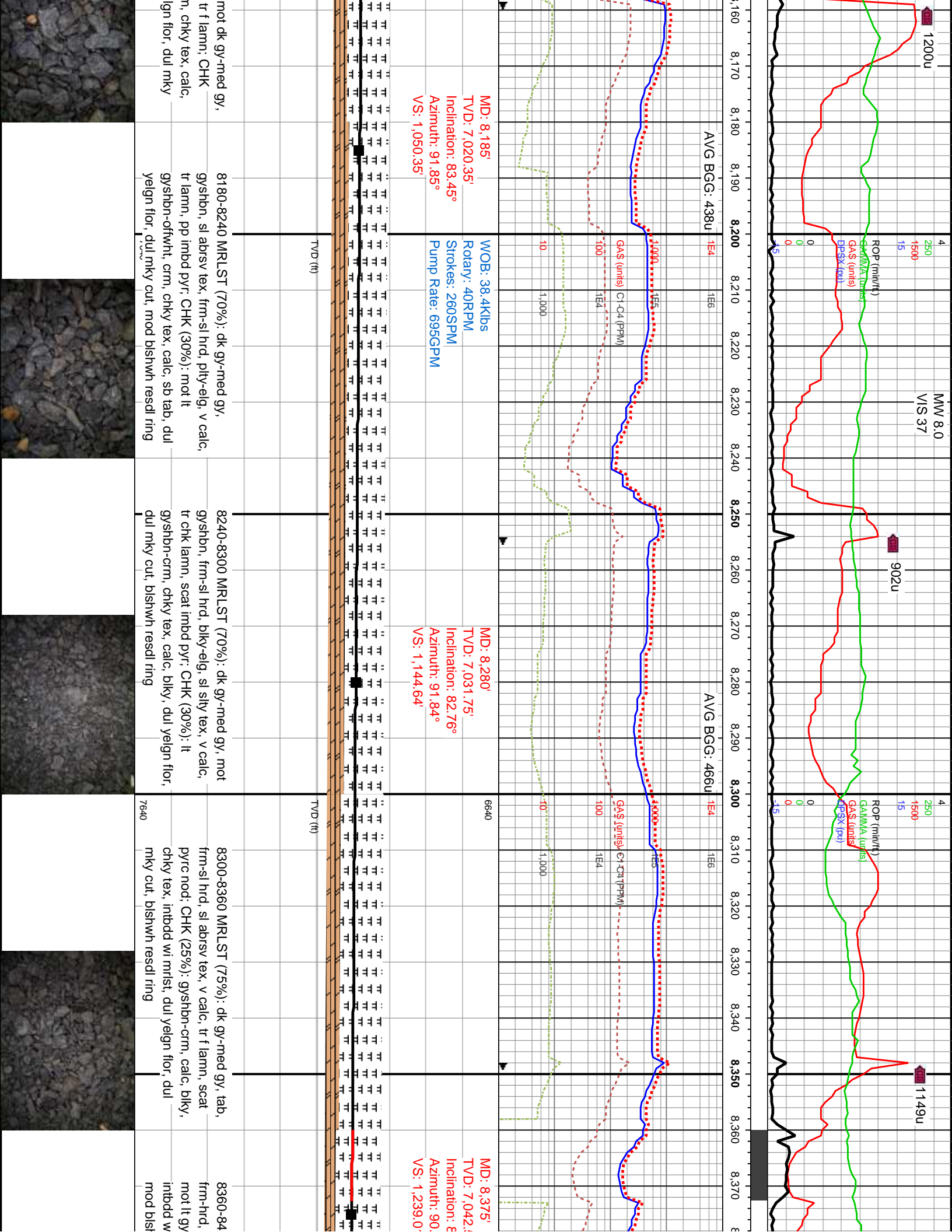


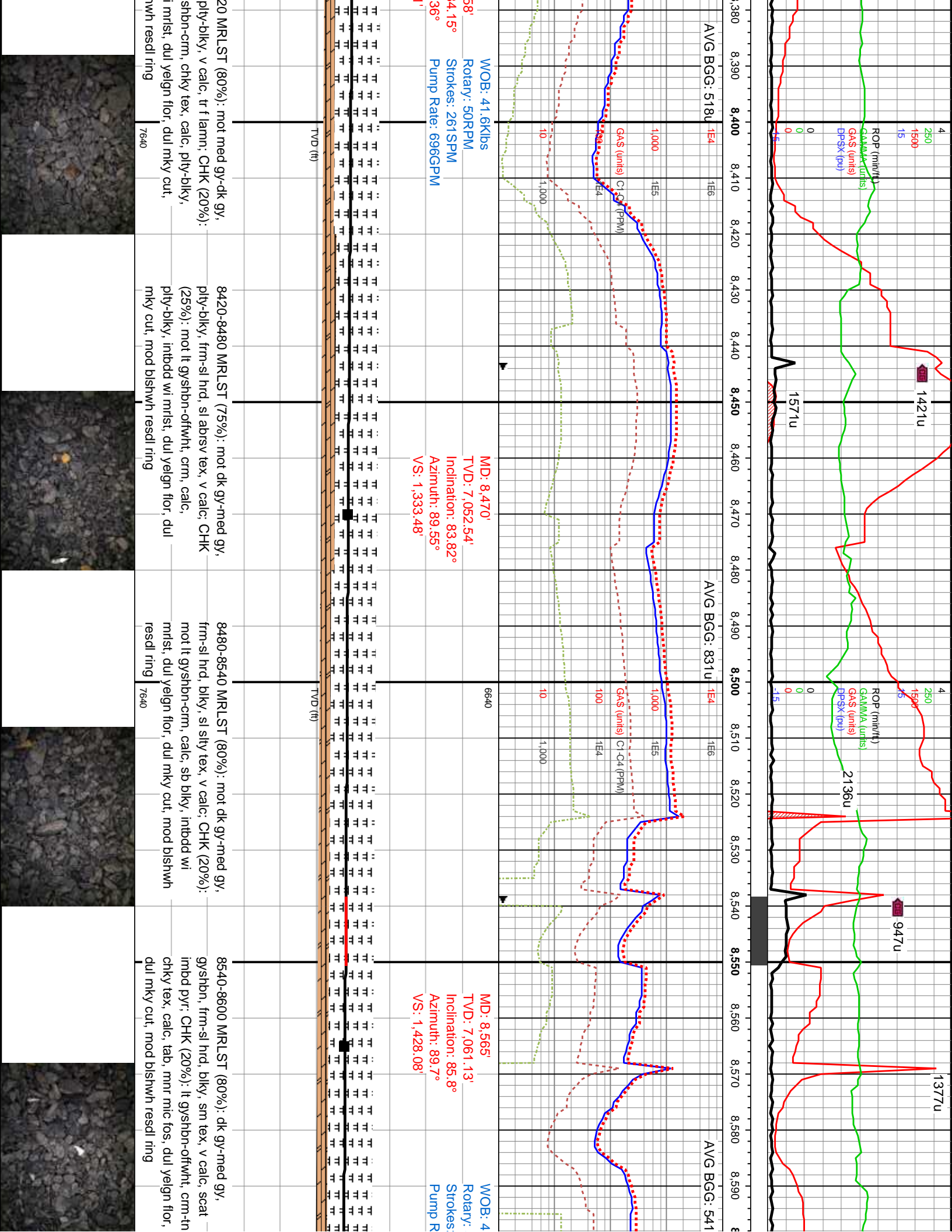




7940-8000 MRLST (85%): dk gy-med gy, mot gysbhn, frm-sl hrd, blk-y-pty, sl silty tex, v calc, tr f lamn, pp mic pyr: CHK (15%): mot lt gysbhn, chky tex, calc, blk, dul yelgn flor, dul mky cut, blshwn resdl ring		7640	7640
--	--	------	------





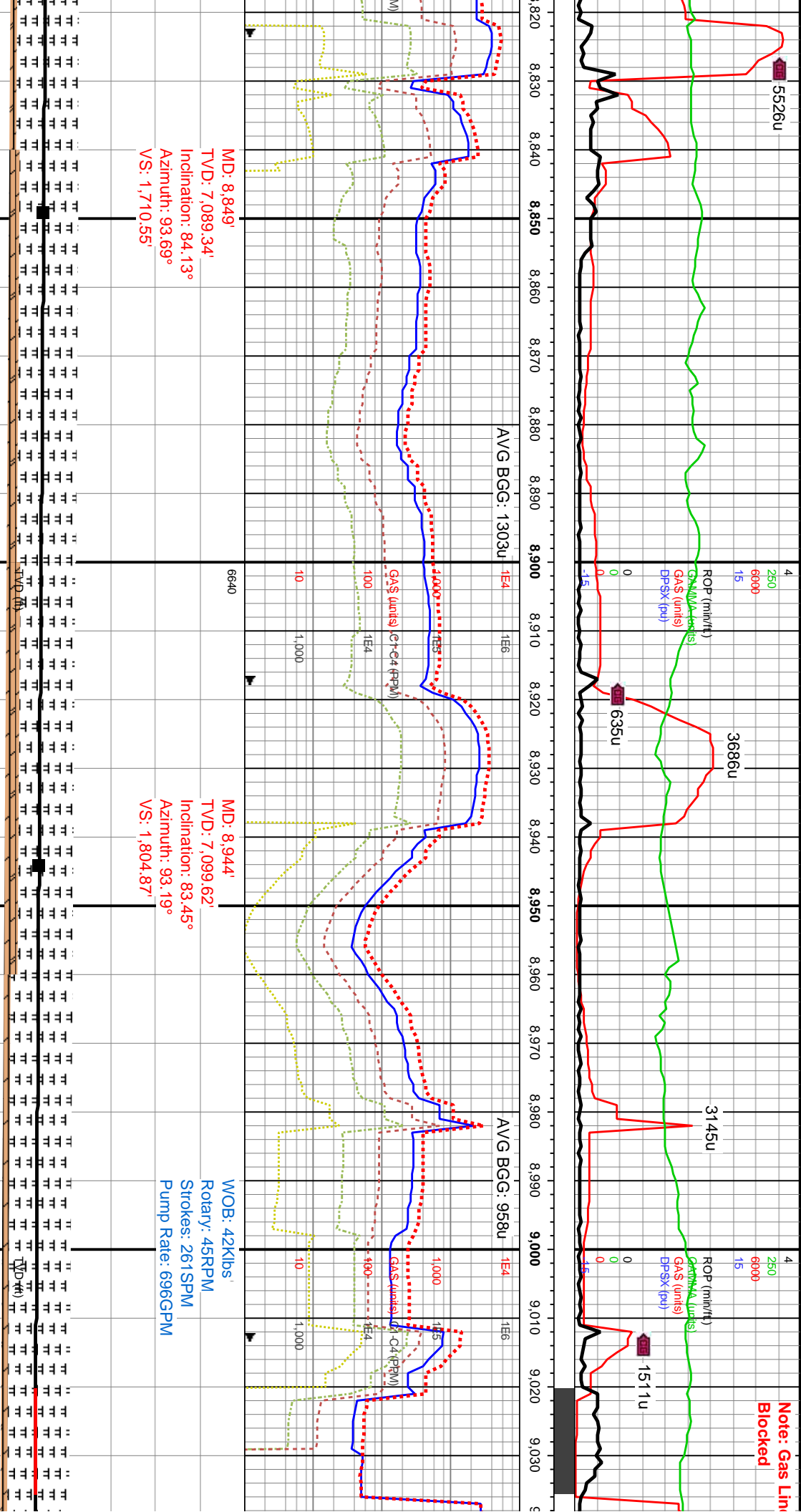




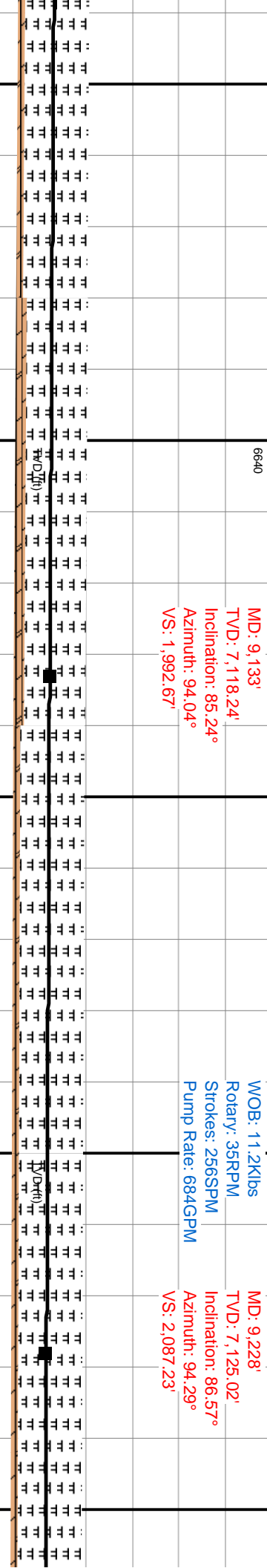
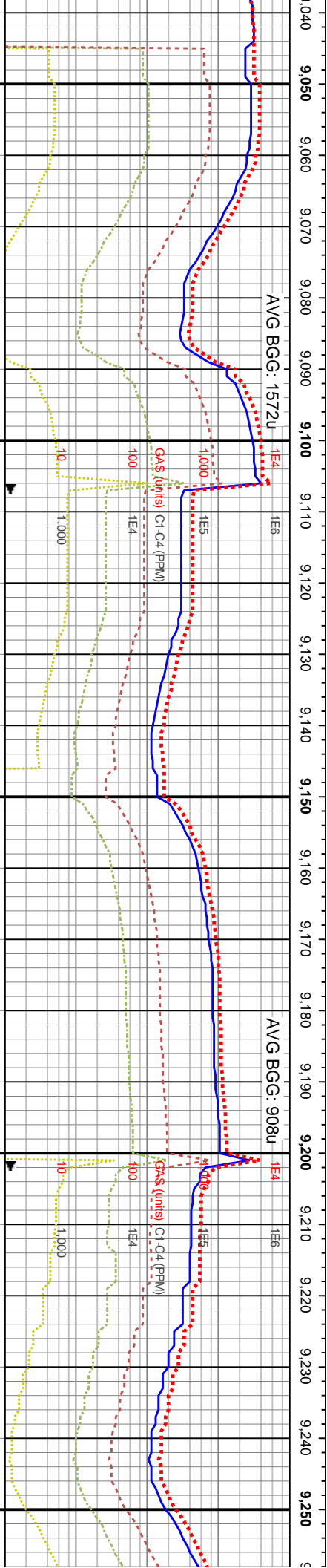
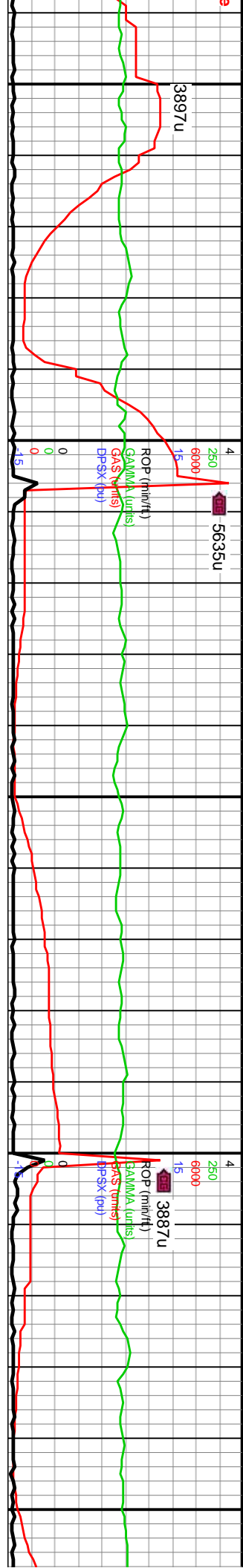




Note: Gas Lim  
Blocked

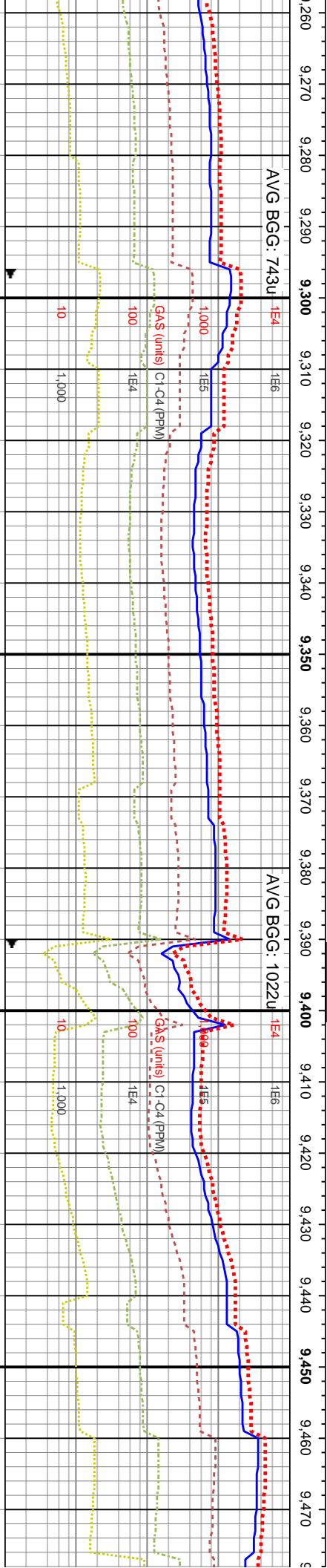
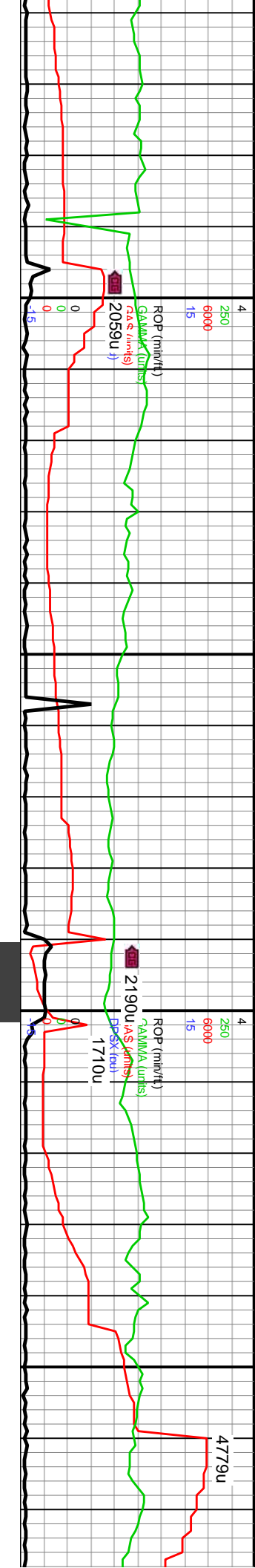


dk gy-gyshbn, tex, mnr lamm, 10%): crm-It gy, wi mrlst, dul yelgn h resdl ring	8840-8900 MRLST (85%): dk gy-med gy, frm-sl hrd, blk-y-pty, sl abrsv tex, v calc, tr chk lamm, pp mic pyr; CHK (15%): gysbhn-crm, chky tex, calc, pty, dul yelgn flor, dul mky cut, mod blshwh resdl ring	8900-8960 MRLST (80%): dk gy-med gy, frm-sl hrd, pty-sl elg, sm-sl sily tex, v calc, tr chk lamm, scat pyrc nod; CHK (20%): It gysbhn-crm, chky tex, calc, blk-y, dul yelgn flor, dul mky cut, mod blshwh resdl ring	8960-9020 MRLST (90%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk-y-sl elg, sm-sl sily tex, v calc; CHK (10%): mot It gysbhn-gy, chky tex, calc, pty, blshwh-dul yelgn flor, mky cut, dul blshwh resdl ring	9020-9020 MRLST (90%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk-y-sl elg, sm-sl sily tex, v calc; CHK (10%): mot It gysbhn-gy, chky tex, calc, pty, blshwh-dul yelgn flor, mky cut, dul blshwh resdl ring
--	---	--	--	--



80 MRLST (90%): mot dk gy-med gy, pty-blky, v calc, tr f lamn; CHK (10%): -crn, chky tex, calc, pty-blky, intbdd	9080-9140 MRLST (85%): dk gy-med gy, frm-v frm, blky, sl silty tex, v calc, intbdd wi chk, pp imbd pyr; CHK (15%): lt gyshbn, chky tex, sft, blky, dul yelgn flor, dul mky cut, mod resdl ring	9140-9200 MRLST (90%): dk gy-v dk gy, med gy-gyshbn, frm-v frm, pty-tab, sm-sl silty tex, v calc, tr f lam, pp imbd pyr; CHK (10%): mot lt gyshbn-ofwht, crn, chky tex, calc, pty-blky, dul yelgn flor, dul mky cut, blshwh resdl ring	9200-9260 MRLST (90%): mot dk gy, med gy-gyshbn, frm-sl hrd, blky, sm-sl silty tex, v calc, scat imbd pyr; CHK (10%): mot lt gyshbn, chky tex, calc, pty, dul yelgn flor, dul mky cut, mod blshwh resdl ring
--	--	--	--





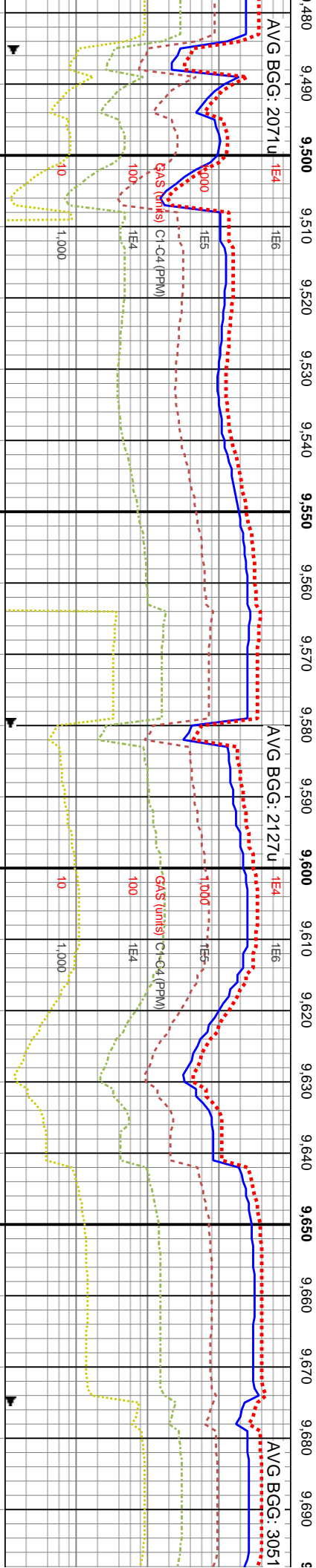
MD: 9,323'  
TVD: 7,129.85'  
Inclination: 87.6°  
Azimuth: 94.13°  
VS: 2,181.91'

WOB: 22.6Klbs  
Rotary: 70RPM  
Strokes: 254SPM  
Pump Rate: 678GPM

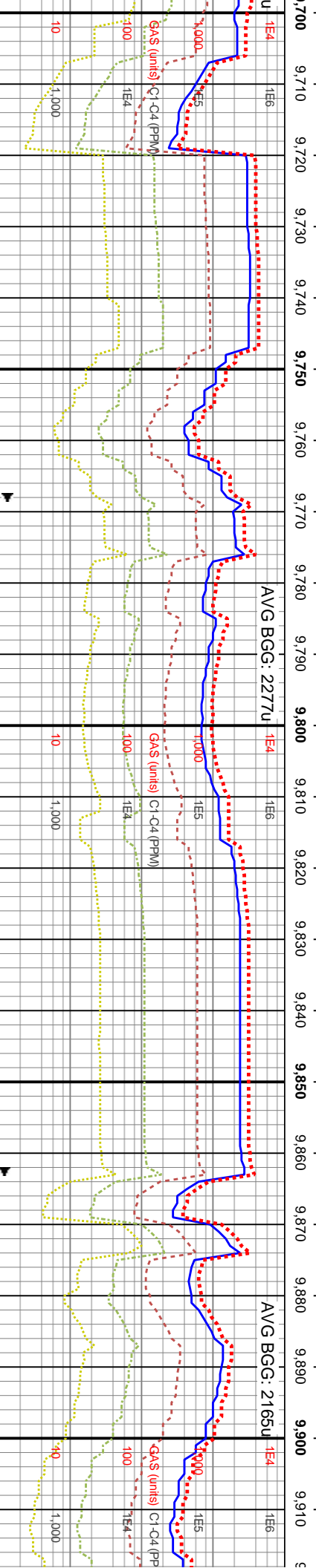
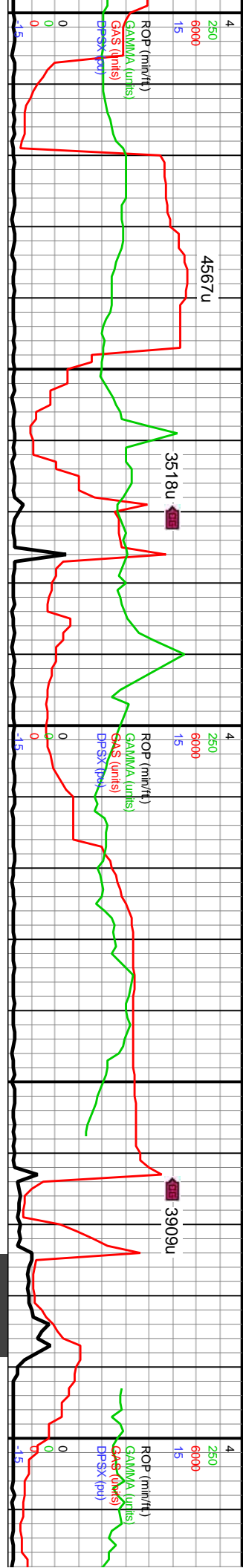
MD: 9,417'  
TVD: 7,135.77'  
Inclination: 85.18°  
Azimuth: 93.47°  
VS: 2,275.56'

9260-9320 MRLST (85%): med gy-dk gy, frm-sl hrd, sb pily, sl silty tex, v calc, tr chk lam, scat pyrc nod; CHK (15%): mot gysbhn-crm, chky tex, calc, dul yel gn flor, fnt dul yel sting cut, mod blshwh resdl ring	9320-9380 MRLST (75%): dk gy-med gy, frm-sl hrd, blk-y-pily, sl abrsv tex, tr flamn, v calc, pp mic pyr; CHK (25%): mot lt gysbhn, chky tex, blk-y, calc, dul yelgn flor, dul mky cut, blshwh resdl ring	9380-9440 MRLST (85%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk-y-sl eig, sm-sl silty tex, v calc, scat frac fill cal; CHK (15%): mot lt gysbhn-gy, chky tex, calc, pily, blshwh-dul yeign flor, mky cut, dul blshwh resdl ring	9440-9500 MRLST (75%): blk gy, frm-sl hrd, pily-blky, lamn; CHK (25%): mot lt gy chky tex, calc, pily-blky, mrc flor, dul mky cut, mod blshwh
7640			





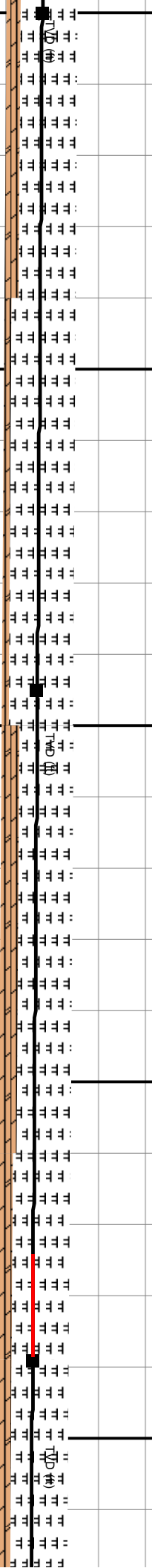




MD: 9.795'  
TVD: 7,171.68'  
Inclination: 83.43°  
Azimuth: 88.26°  
VS: 2.651.69'

WOB: 41.2Klbs  
Rotary: 50RPM  
Strokes: 252SPM  
Pump Rate: 673GPM

MD: 9.889'  
TVD: 7,182.42'  
Inclination: 83.45°  
Azimuth: 87.17°  
VS: 2.744.96'



MRLST (80%): dk gy, mot med  
frm-sl hrd, ply-tab, sm-sly tex, v calc,  
k lamm, pp imbd pyr; CHK (20%): lt  
gshbn, chky tex, calc, tab-biky, dul yeign  
gy cut, mod bishwh resd ring

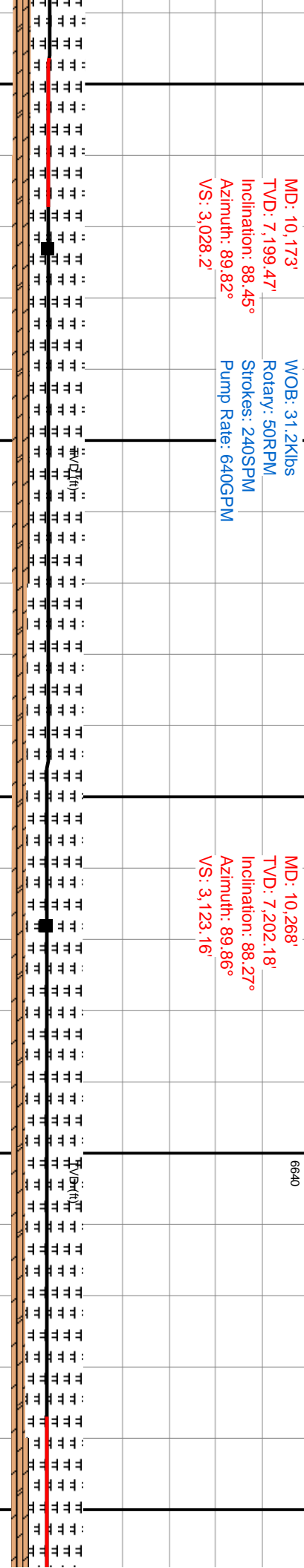
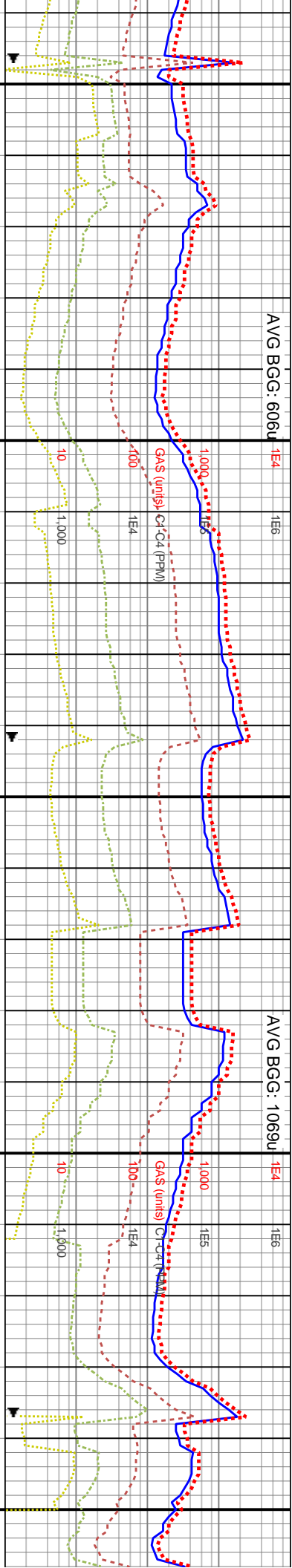
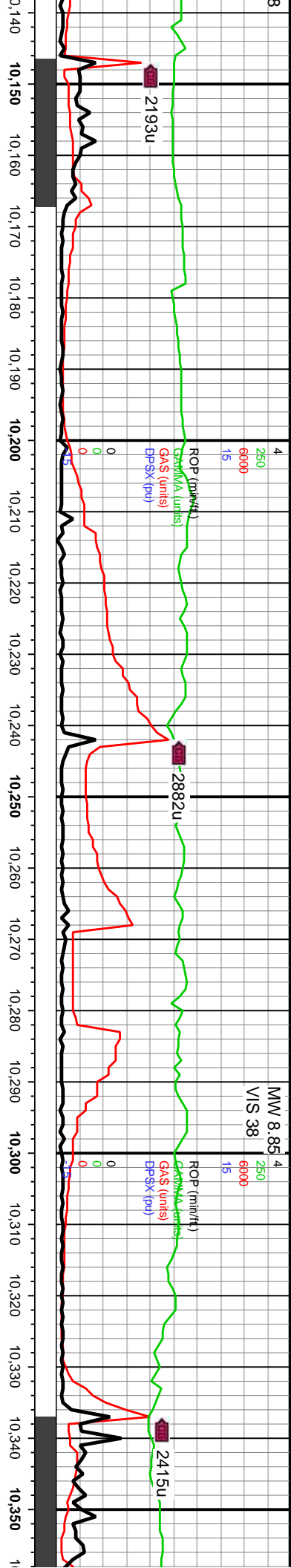
9740-9800 MRLST (90%): mot dk gy-med gy,  
frm-sl hrd, biky-pty, sl sly tex, v calc,intbdd  
chk lamm; CHK (10%): lt gysbhn-offwht, crm,  
chky tex, calc, ply-biky, dul yeign flor, dul mky  
cut, bishwh resd ring

9800-9860 MRLST (75%): dk gy-med gy,  
frm-hrd, ply-elg, sm-sl sly tex, mnr lamm, v  
calc, tr scat mic pyr; CHK (25%): lt gy-gyshbn,  
sft, v f lamm, intbdd wi mrlst, du yeign flor, dul  
mky cut, mod bishwh resd ring

9860-9920 MRLST (80%): dk gy-v dk gy, med  
gy, frm-v frm, ply-tab, sl sly tex, v calc, tr f lar  
pp imbd pyr; CHK (20%): lt gysbhn-offwht,  
crm, chky tex, calc, sb biky, dul yeign flor, dul  
mky cut, mod bishwh resd ring

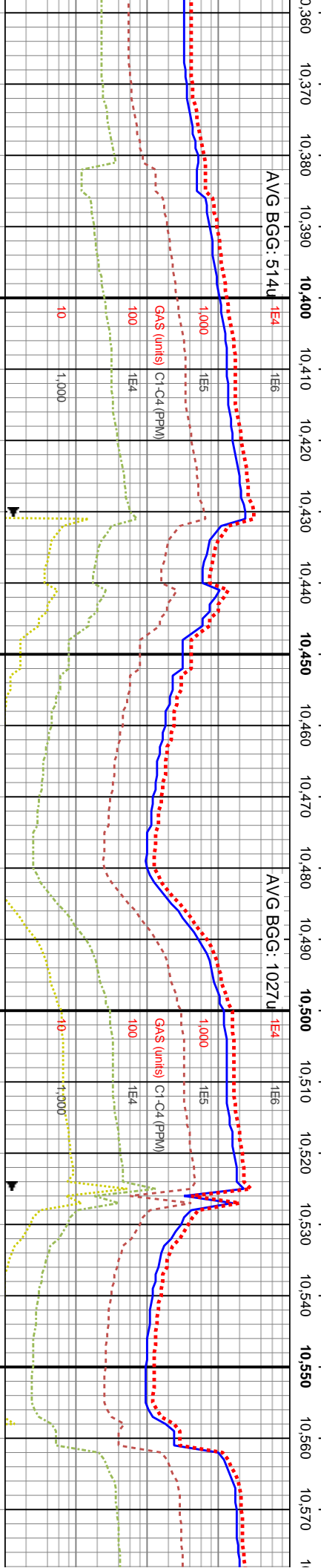
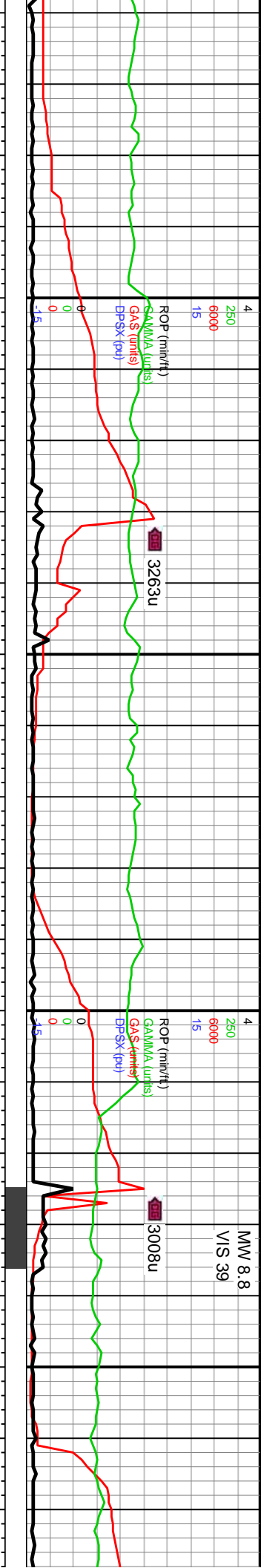






10160-10220 MRLST (75%): dk gy-med frm-v frm, blk-y-pty, sl silty tex, v calc, intbdd chk, scat pp pyr: CHK (25%): lt gysbhn, chky tex, blkly, sft, dul yelgn-bri org flor, dul mky cut, mod blshwn resd ring	10220-10280 MRLST (75%): pred dk gy-gysbhn, blk gy, frm-sl hrd, pty-sb blkly, sm tex, occ sl silty, v calc, scat imbd pp pyr: CHK (25%): mot gysbhn-crm, chky tex, sft, dul yelgn flor, dul mky cut, mod blshwn resd ring	10280-10340 MRLST (80%): mot dk gy-med gy, tab-bkly, frm-hrd, sm-sl silty tex, v calc, scat imbd pyr: CHK (20%): mot lt gysbhn-crm, mnr micfos, calc, pty, dul yelgn flor, dul mky cut, mod blshwn resd ring	10340-10350 MRLST (80%): mot dk gy-med gy, frm-s, imbd chl gysbhn-crm, mnr dul mky
---	---	--	---



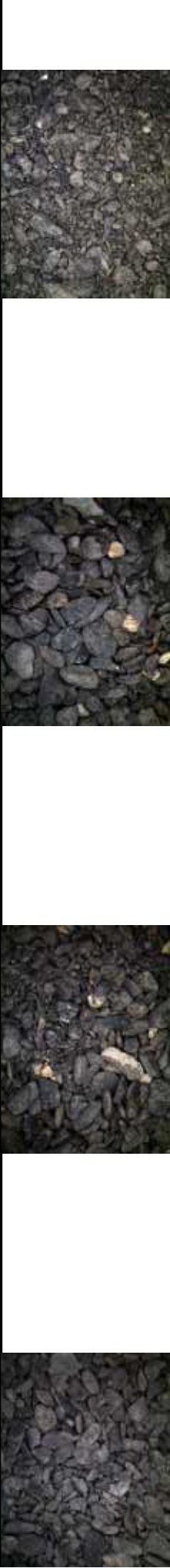


WOB: 39.2Klbs  
Rotary: 50RPM  
Strokes: 240SPM  
Pump Rate: 64IGPM

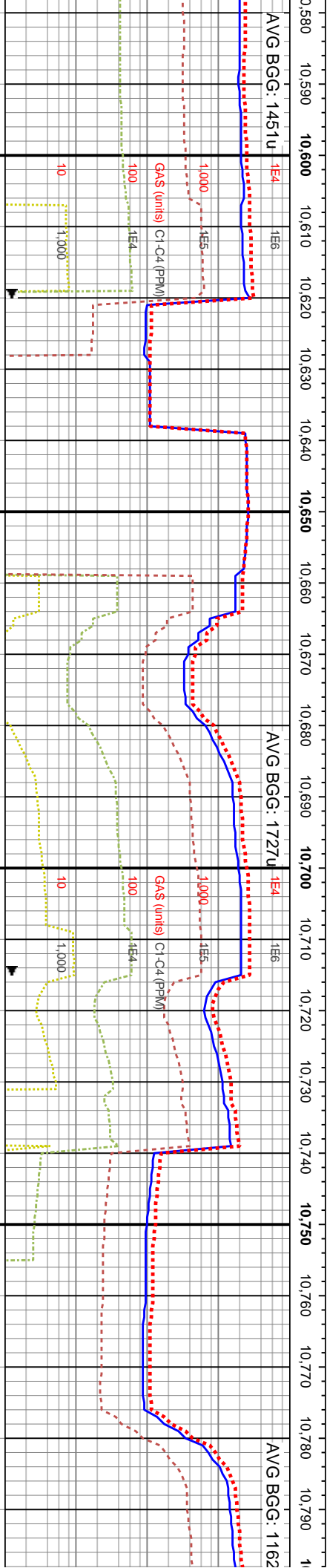
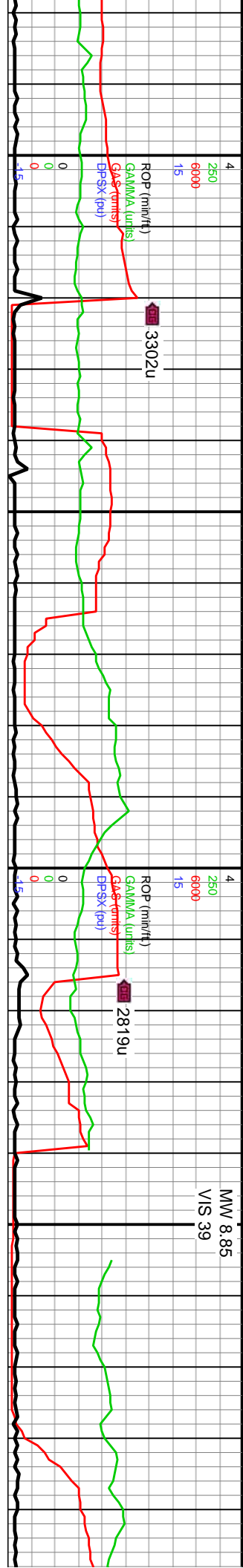
MD: 10,456'  
TVD: 7,203.56'  
Inclination: 90.89°  
Azimuth: 90.56°  
VS: 3,311.13'

MD: 10,551'  
TVD: 7,202.53'  
Inclination: 90.36°  
Azimuth: 90.59°  
VS: 3,406.13'

0400 MRLST (75%): mot dk gy-med sl hrd, blk-ely, sl silty tex, v calc, tr k lam, scat imbd pyr; CHK (25%): lt cm, chky tex, calc, blk, dul yelgn flr, cut, blshwh resd ring	10400-10460 MRLST (85%): med gy-dk gy, frm-v frm, sb blk-tab, sl abrsv tex, v calc, pp imbd pyr; CHK (15%): lt gysbhn-offwht, chky tex, calc, tab, dul yelgn flr, dul mky cut, mod blshwh resd ring	10460-10520 MRLST (75%): mot dk gy-med gysbhn, pily-blky, frm-sl hrd,sl silty tex, v calc; CHK (25%): mot-stri lt gysbhn-gysbhn, sft-sl frm, chky tex, blk-sl pily, scat mic fos, v calc, tr frac fil cal, dul yelgn flr, dul mky cut, blshwh resd ring	10520-10560 MRLST (65%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk-yl elg, sm silty tex, v calc, scat pyrc nod; CHK (35%): mot lt gysbhn, chky tex, calc, sft, blshwh-dul yelgn flr, mky cut, dul blshwh resd ring
---	---	---	--





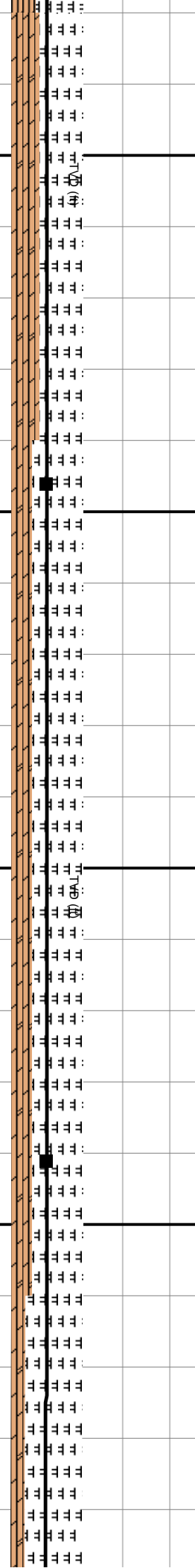


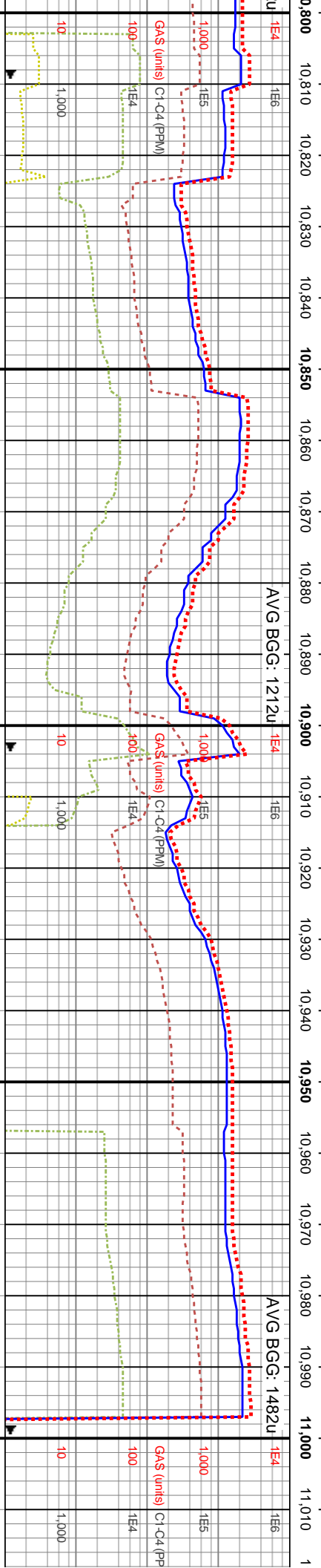
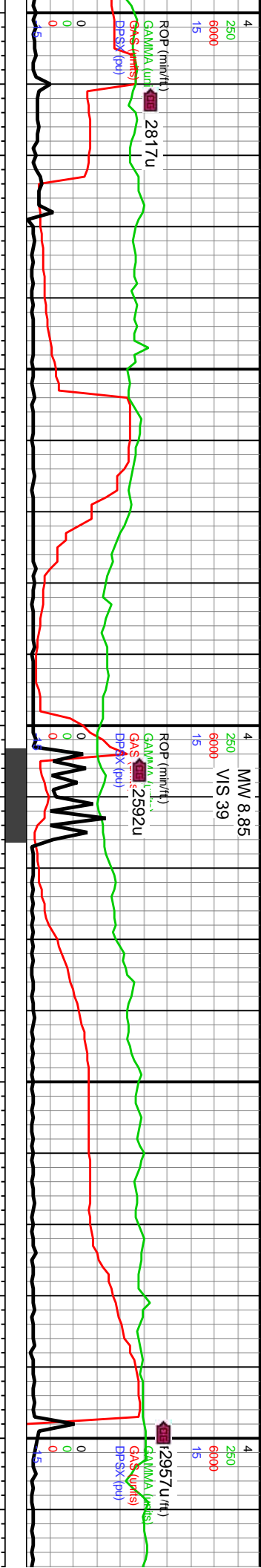
WOB: 38.4Klbs  
Rotary: 60RPM  
Strokes: 240SPM  
Pump Rate: 642GPM

MD: 10,646'  
TVD: 7,202.62'  
Inclination: 89.53°  
Azimuth: 90.4°  
VS: 3,501.13'

MD: 10,741'  
TVD: 7,203.88'  
Inclination: 88.95°  
Azimuth: 89.92°  
VS: 3,596.12'

WOB: :  
Rotary:  
Strokes:  
Pump l

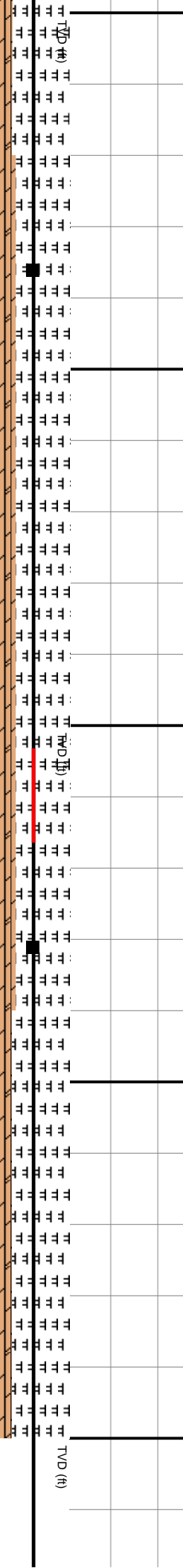




MD: 10,836'  
TVD: 7,205.98'  
Inclination: 88.52°  
Azimuth: 89.75°  
VS: 3,691.09'

MD: 10,931'  
TVD: 7,206.93'  
Inclination: 90.33°  
Azimuth: 91.07°  
VS: 3,786.07'

WOB: 25.6Klbs  
Rotary: 50RPM  
Strokes: 236SPM  
Pump Rate: 629GPM



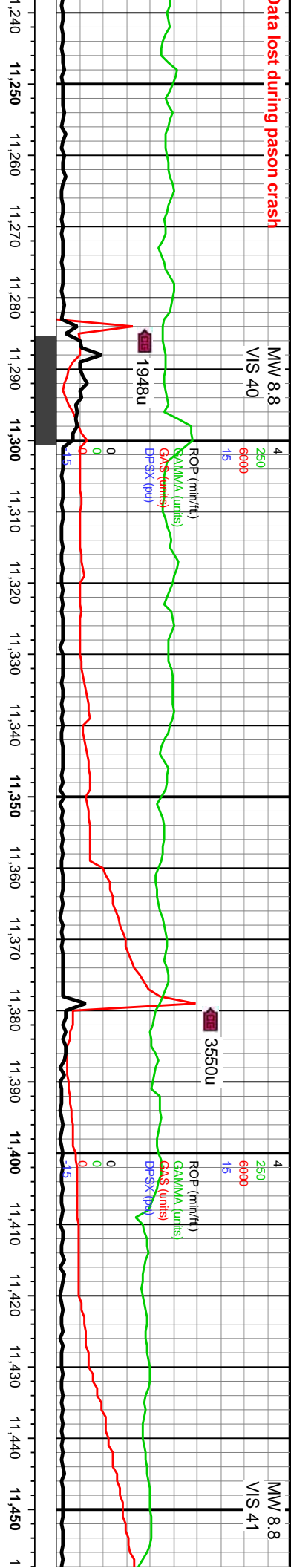
10820-10880 MRLST (75%): mot dk gy-med	10880-10940 MRLST (75%): mot dk gy-med	10940-11000 MRLST (80%): mot med gy-dk
gyshbn, ply-biky, frm-sl hrd, tr micnica, sl stly tex, v calc; CHK (25%): mot-stiri lt gyshbn, sl frm, biky-sl ply, tr mic fos, v calc, tr frac fil cal, dul yeign flor, dul mky cut, dul bishwh resdl ring	gy, mot gyshbn, frm-sl hrd, ply-tab, sl stly tex, v calc, tr lamm; CHK (25%): mot lt gyshbn-crm, chky tex, calc, ply-tab, intbd wi mntst, dul yeign flor, dul mky cut, mod bishwh resdl ring	gy, gyshbn, frm-sl hrd, biky-sl elg, sm-sl stly tex, v calc, scat frac fil cal; CHK (20%): mot lt gyshbn-gy, chky tex, calc, ply, bishwh-dul yeign flor, mky cut, dul bishwh resdl ring



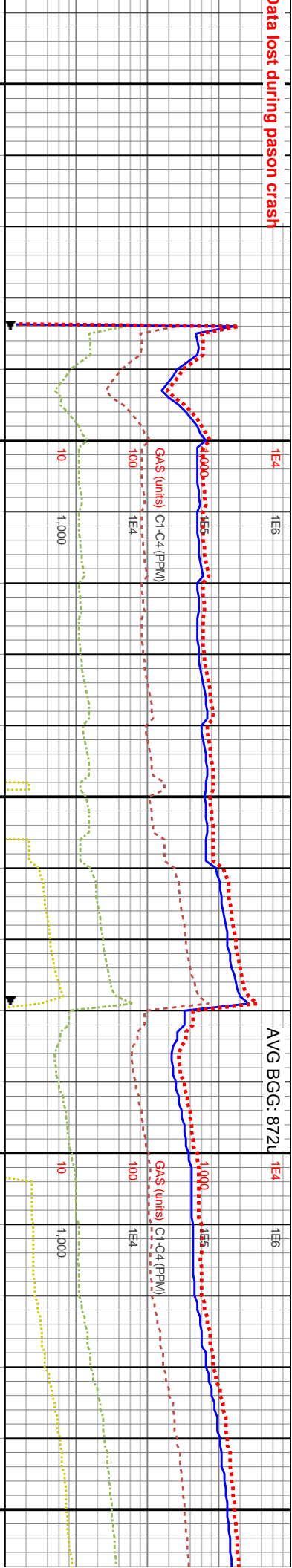




ata lost during pason crash



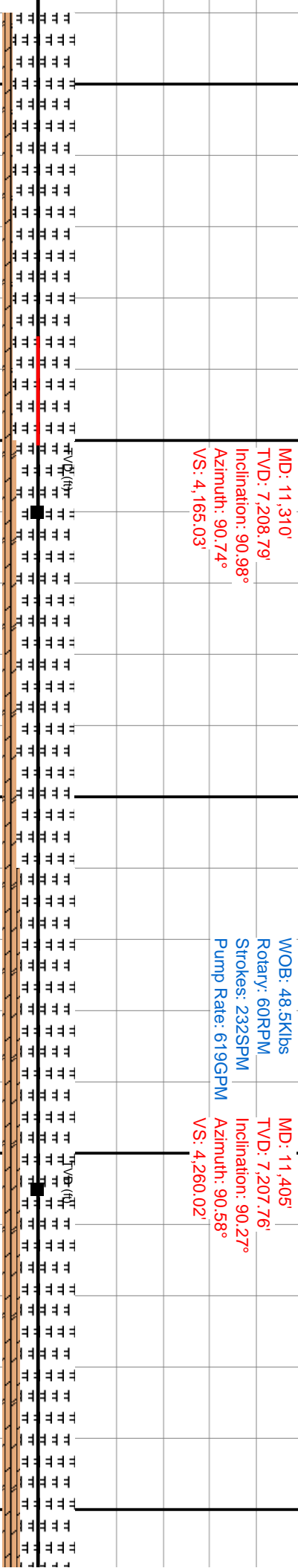
ata lost during pason crash



MD: 11,310'  
TVD: 7,208.79'  
Inclination: 90.98°  
Azimuth: 90.74°  
VS: 4,165.03'

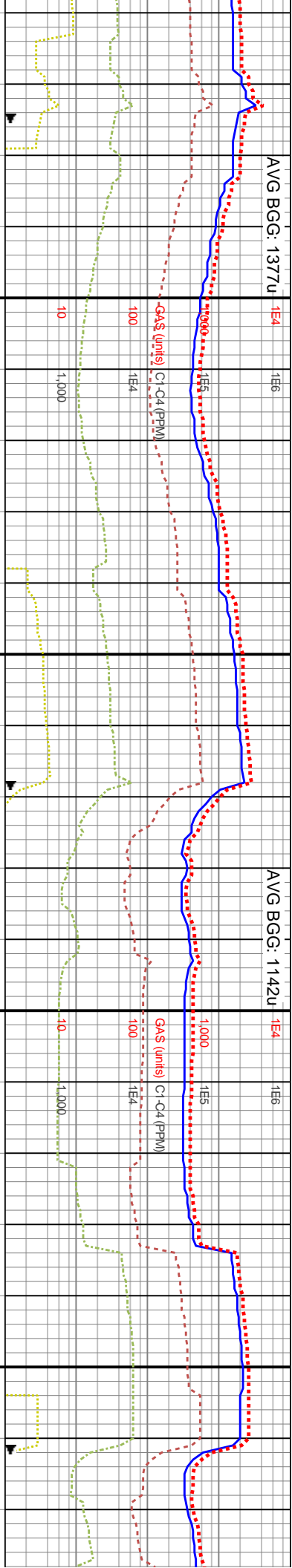
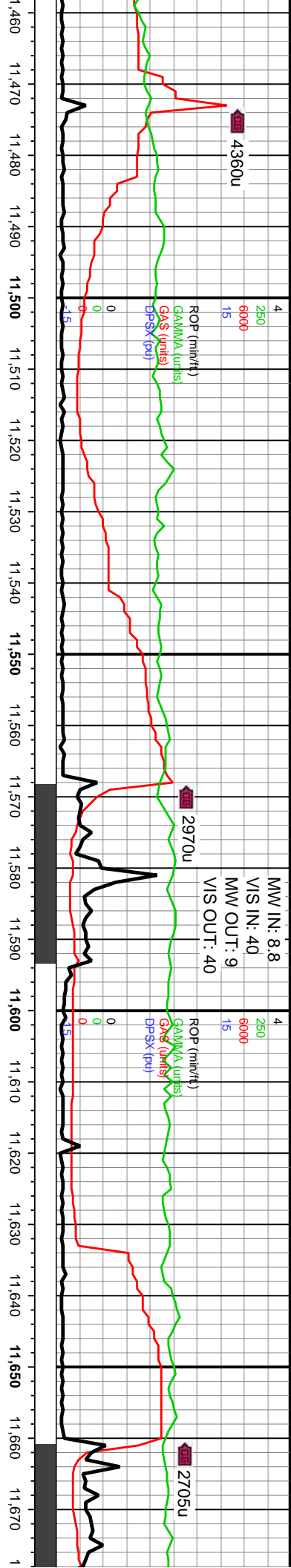
WOB: 48.5Klbs  
Rotary: 60RPM  
Strokes: 232SPM  
Pump Rate: 619GPM  
VS: 4,260.02'

MD: 11,405'  
TVD: 7,207.76'  
Inclination: 90.27°  
Azimuth: 90.58°  
VS: 4,260.02'



11240-11300 MRLST (85%): mot dk gy-med gysbhn, pily-blky, frm-sl hrd, sl silty tex, v calc; CHK (15%): mot lt gysbhn-gysbhn, sft-sl frm, chky tex, blkyl-sl pily, scat mic fos, v calc; dul yelgn flr, dul mky cut, blshwn resdl ring	11300-11360 MRLST (80%): med gy-gysbhn, dk gy, frm-sl hrd, pily, sl abrv tex, v calc, tr f chk lam, scat pyrc nod; CHK (20%): mot gysbhn-offwht, chky tex, calc, dul yelgn flr, dul mky cut, mod blshwn resdl ring	11360-11420 MRLST (75%): mot dk gy, med gy, frm-hrd, tab-blky, sm-sl silty tex, v calc, scat imbd pyr; CHK (25%): mot lt gysbhn-lt gy, stri, chky tex, calc, pily, dul yelgn flr, dul mky cut, mod blshwn resdl ring	11420-11480 MRLST (75%): gysbhn, frm-sl hrd, blkyl-pily tr chk lamm, pp mic pyr; CHK (25%): mot lt gysbhn-lt gy, stri, chky tex, calc, tab-sl elg, dul cut, blshwn resdl ring
---	--	--	---



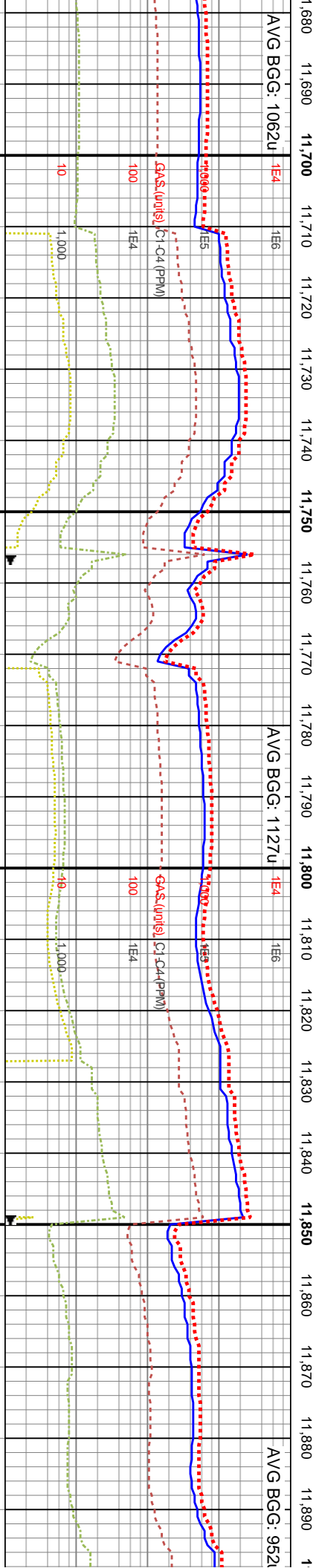
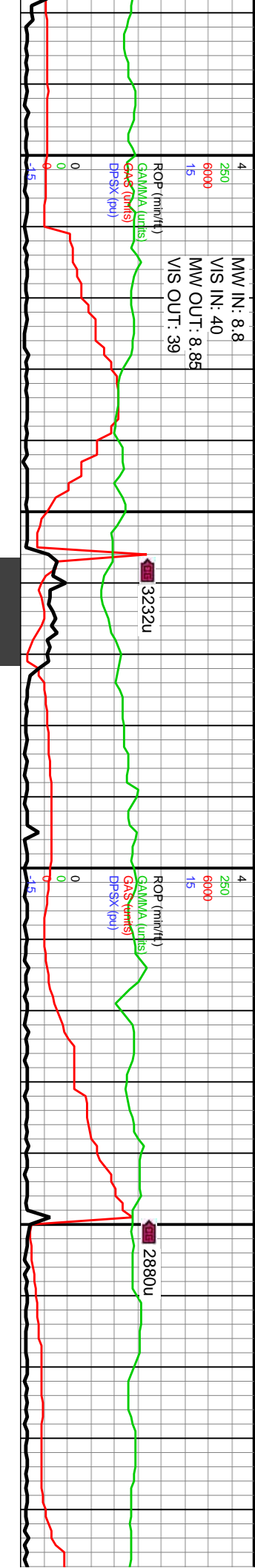


MD: 11,500'  
TVD: 7,208.79'  
Inclination: 88.48°  
Azimuth: 89.98°  
VS: 4,355.01'

MD: 11,594'  
TVD: 7,211.34'  
Inclination: 88.42°  
Azimuth: 91.16°  
VS: 4,448.98'

WOB: 33.2Klbs  
Rotary: 50RPM  
Strokes: 232SPM  
Pump Rate: 619GPM

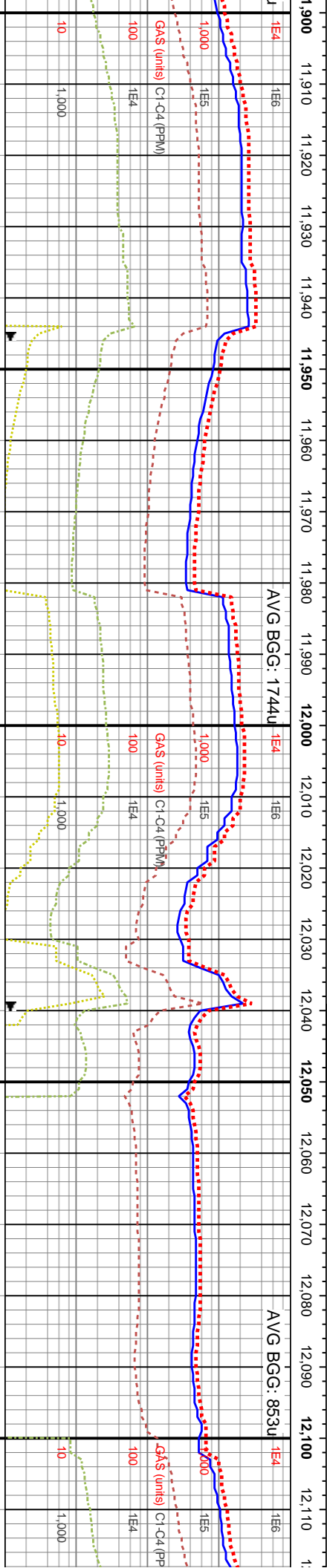
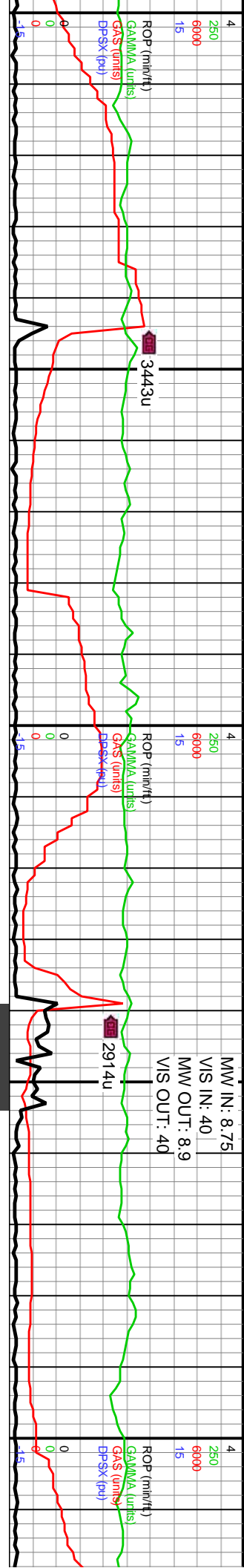
11480-11540 MRLST (70%): dk gy-blk gy, gysbhn, frm-hrd, ply-blky, sm-sl abrsv tex, v calc, tr chk lamm, CHK (30%): lt gysbhn, stri, chky tex, calc, blk, sft, dul yelgn flr, dul mky cut, bishwn resd ring	11540-11600 MRLST (70%): med gy-dk gy, gysbhn, frm-sl hrd, ply, sl abrsv tex, tr f chk lam, v calc, scat pyrc nod, CHK (30%): mot gysbhn, crm-offwht, chky tex, calc, dul yelgn flr, dul mky cut, mod bishwn resd ring	11600-11660 MRLST (70%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk, sm-sl sily tex, v calc, scat frac fil cal, CHK (30%): mot lt gysbhn-gy, chky tex, calc, ply, bishwn-dul yelgn flr, mky cut, dul bishwn resd ring	11660-11720 MRLST (70%): frm-sl hrd, pp pyr, C calc, chky cut, bishwn resd ring
--	--	--	---



11720 MRLST (60%): med gy-dk gy, d, ply-sl eig, v calc, mnr micfos, scat CHK (40%): pred lt gysbhn-crm, ofwht, y tex, blshwn-dul yelgn flor, mky cut, h resd ring	11720-11780 MRLST (65%): dk gy-v dk gy, occ gysbhn-med gy, frm-sl hrd, ply-blky, v calc, tr f lam, scat pp pyr: CHK (35%): pred lt gysbhn, stri ip, tr mic fos, calc, blshwn-dul yelgn flor, mky cut, dul blshwn resd ring	11780-11840 MRLST (75%): dk gy-med gy, frm-v frm, sl slty tex, sb blk-y-pty, v calc, pp imbd pyr: CHK (25%): lt gysbhn-crm, chky tex, calc, sb pty, dul yelgn flor, dul mky cut, blshwn resd ring	11840-11900 MRLST (80%): dk gy-med gy, frm-sl hrd, ply-blky, sm-sl slty tex, v calc, tr f lam, scat pp pyr: CHK (20%): pred lt gysbhn-lt gy, stri, chky tex, calc, bri orng-dul yelgn flor, mod mky cut, dul blshwn resd ring
---	--	---	---







MD: 11,973'  
TVD: 7,213.08'  
Inclination: 89.69°  
Azimuth: 90.27°  
VS: 4.827.94'

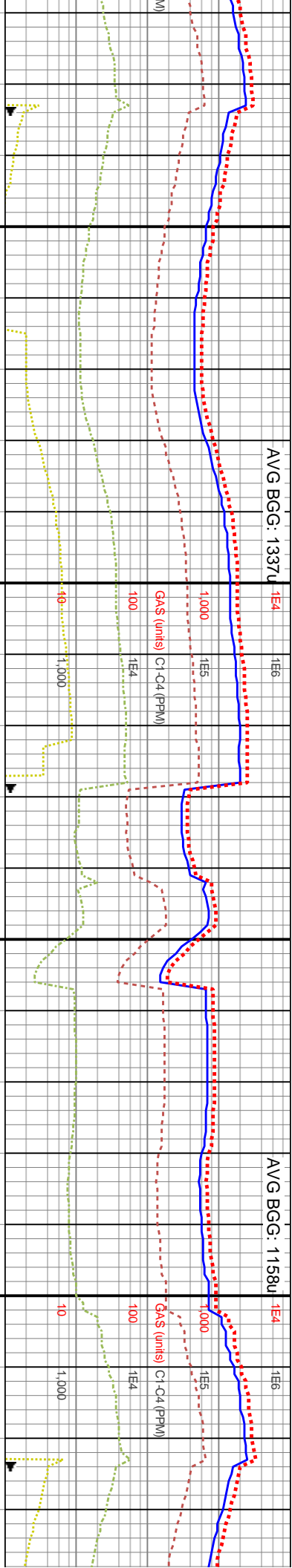
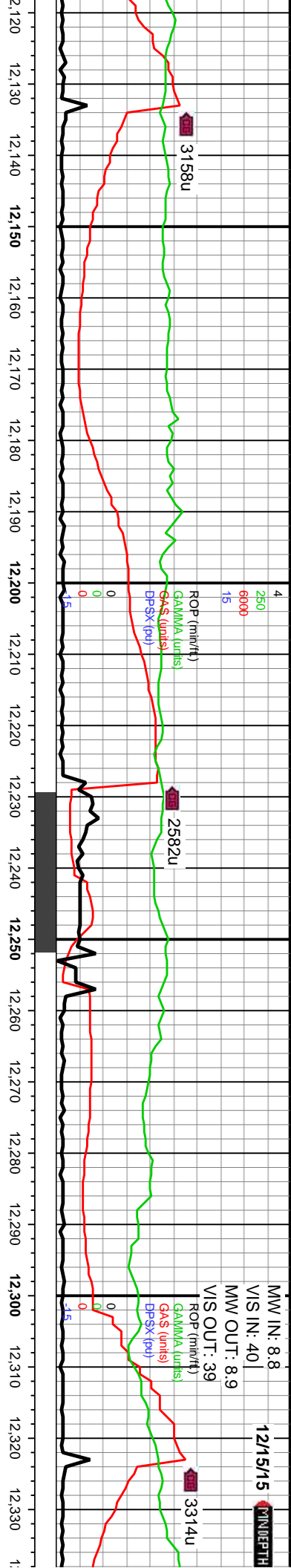
WOB: 43.7Klbs  
Rotary: 50RPM  
Strokes: 232SPM  
Pump Rate: 620GPM

MD: 12,068'  
TVD: 7,212.7'  
Inclination: 90.77°  
Azimuth: 89.98°  
VS: 4.922.93'

11900-11960 MRLST (80%): mot dk gy-med gy, gysbhn, blk, frm-sl hrd, sm-sl silty tex, v calc, scat imbd pyr; CHK (20%): mot lt gysbhn-crm, calc, pily, chky tex, dul yelgn flr, dul mky cut, mod bishwh resd ring	11960-12020 MRLST (85%): mot dk gy-med gysbhn, pily-blk, frm-sl hrd, tr micnica,sl silty tex, v calc; CHK (15%): mot-stir lt gysbhn, sl frm, blk-sl pily, v calc, tr frac fill cal, dul yelgn flr, dul mky cut, bishwh resd ring	12020-12080 MRLST (85%): mot dk gy-med gy, frm-v frm, pily-blk, sl abrsv tex, v calc, tr f chk lamn; CHK (15%): mot lt gysbhn, crm, chky tex, calc, pily-blk, sft, dul yelgn flr, dul mky cut, mod bishwh resd ring	12080-12140 MRLST (75%) mot gysbhn, frm-sl hrd, sb lamn; CHK (25%): mot lt g tex, calc, sb pily, dul yelgn mod bishwh resd ring
--	--	---	---



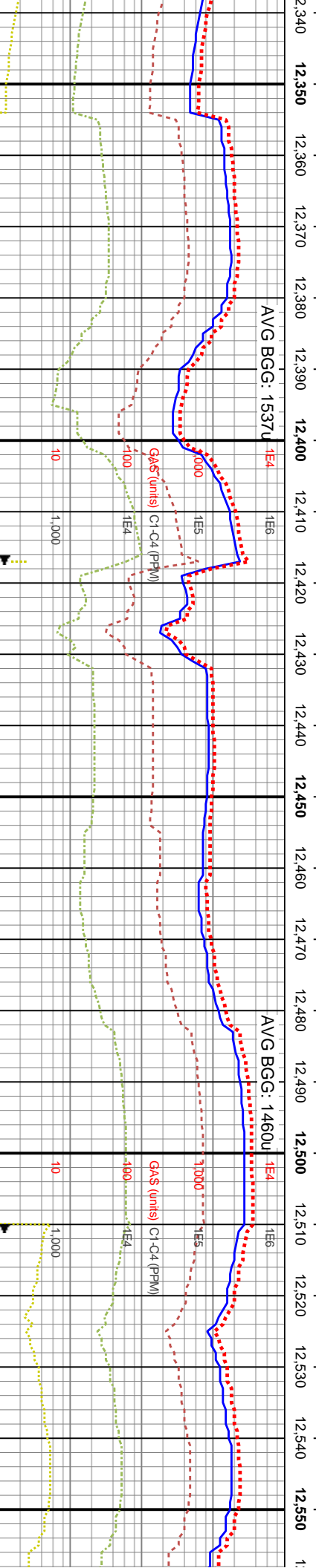
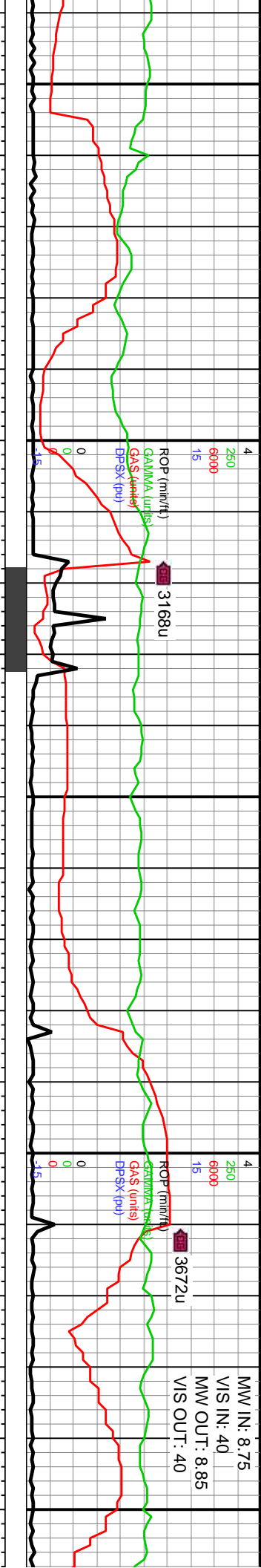




MD: 12,163'	WOB: 43.5Klbs
TVD: 7,212.68'	Rotary: 50RPM
Inclination: 89.26°	Strokes: 232SPM
Azimuth: 87.71°	Pump Rate: 619GPM
VS: 5.017.88'	
MD: 12,258'	MD: 12,258'
TVD: 7,212.15'	TVD: 7,212.15'
Inclination: 91.38°	Inclination: 91.38°
Azimuth: 90.61°	Azimuth: 90.61°
VS: 5.112.84'	VS: 5.112.84'

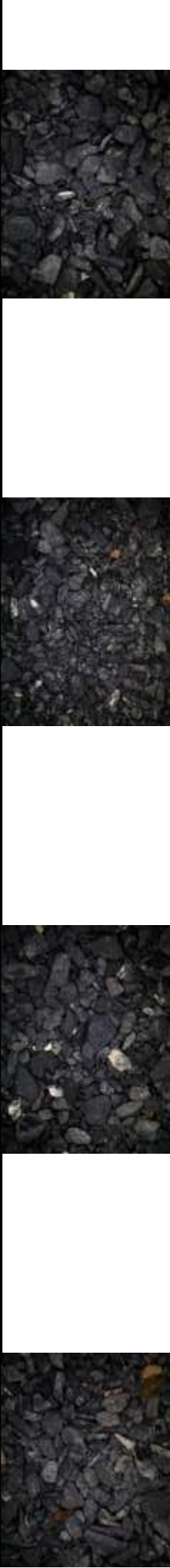
6640	12140-12200 MRLST (70%): mot med gy-dk biky, v calc, tr chk pyr; CHK (30%): lt gysbhn-ofwht, crm-tn, chky tex, calc, ply-biky, dul yelgn flor, dul mky cut, mod blshwn resdl ring	12200-12260 MRLST (65%): mot dk gy-med gy, frm-sl hrd, biky-elg, sl silty tex, v calc, tr intbd chk lam, scat imbd pyr; CHK (35%): lt gysbhn, chky tex, calc, biky, dul yelgn flor, dul mky cut, blshwn resdl ring	12260-12320 MRLST (60%): mot dk gy-med gy, frm-sl hrd, sb tab, sl silty tex, v calc, scat pp pyr; CHK (40%): lt gysbhn-crm, calc, sb biky, intbdd wi mlst, mmr mic fos, dul yelgn flor, dul mky cut, mod blshwn resdl ring	12320-12330 MRLST (50%): mot dk gy-med gy, frm-sl hrd, sb tab, sl silty tex, v calc, scat pp pyr; CHK (40%): lt gysbhn-crm, calc, sb biky, intbdd wi mlst, mmr mic fos, dul yelgn flor, dul mky cut, mod blshwn resdl ring
------	---	--	--	--

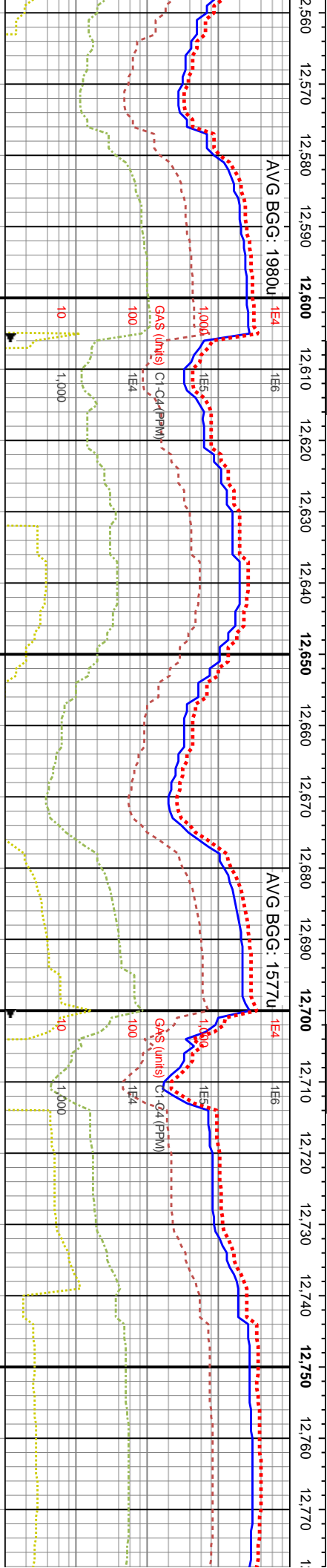




MD: 12,352' TVD: 7,209.3' Inclination: 92.09° Azimuth: 91° VS: 5,206.8'	WOB: 43.1Klbs Rotary: 50RPM Strokes: 230SPM Pump Rate: 615GPM	MD: 12,447' TVD: 7,207.19' Inclination: 90.46° Azimuth: 91.08° VS: 5,301.77'	MD: 12,543' TVD: 7,206.29' Inclination: 90.61° Azimuth: 90.51° VS: 5,397.76'
---	--	--	--

12380-12440 MRLST (70%): mot dk gy-med ply-blky, frm-sl hrd, tr micmica, sl silty alic; CHK (25%): mot-stiri lt gysbhn, sl y tex, blkly-sl ply, scat mic fos, v calc, n flor, dul mky cut, blshwn resdl ring	12380-12440 MRLST (70%): mot dk gy-med gysbhn, ply-blky, frm-sl hrd, sl silty tex, v calc; CHK (30%): mot lt gysbhn-gysbhn, st-sl frm, chky tex, blkly-sl ply, scat mic fos, v calc, dul yelgn flor, dul mky cut, blshwn resdl ring	12440-12500 MRLST (70%): mot dk gy-med gy, frm-hrd, blkly, sl silty tex, v calc, tr intbd chk lam, scat imbd pyr; CHK (30%): gysbhn-crm, chky tex, calc, sb tab, dul yelgn flor, dul mky cut, blshwn resdl ring	12500-12560 MRLST (70%): pred med gy-gysbhn, dk gy, frm-sl hrd, ply-sb blkly, silty tex, v calc, scat imbd pp pyr; CHK (30%): mot gysbhn-ofwht, chky tex, sb blkly, dul yelgn flor dul mky cut, mod blshwn resdl ring
--	---	---	---

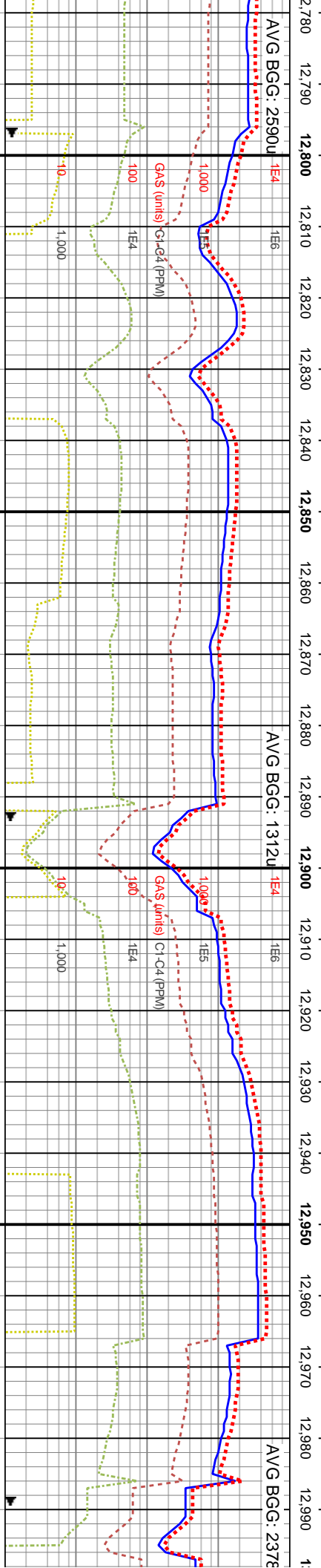
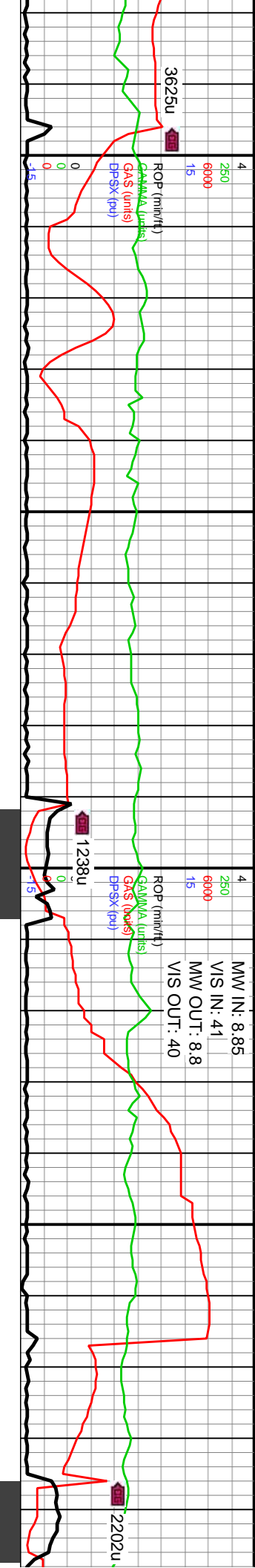




MD: 12,637'  
TVD: 7,205.49'  
Inclination: 90.37°  
Azimuth: 91.72°  
VS: 5,491.75'

6640	MD: 12.732'
	TVD: 7,206.82'
	Inclination: 88.02°
	Azimuth: 92.16°
	VS: 5,586.7'

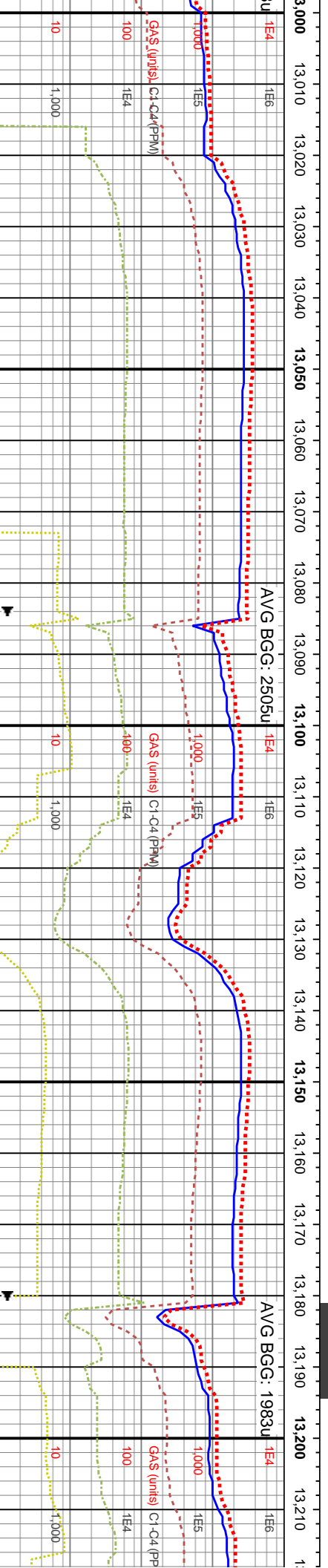
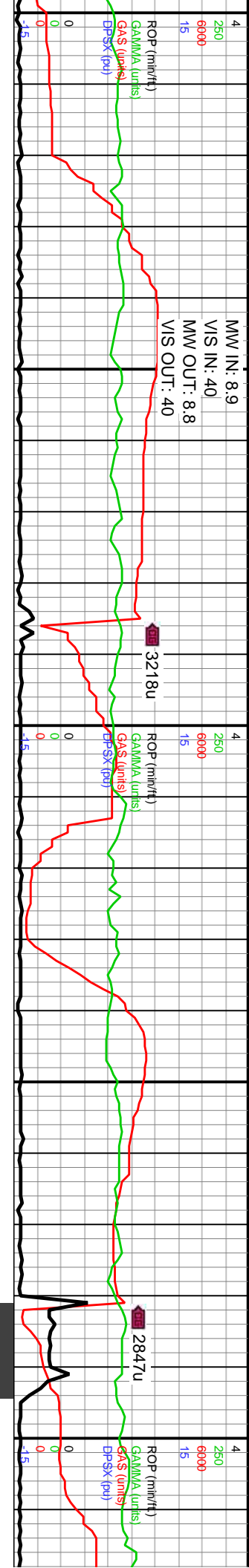
12740-12800 MRLST (80%)  
occ gyshbn, frm-sl hrd, pty  
lam, scat pp pyr; CHK (20%)  
chky tex, mnr mic fos, dul y  
dul-mod mky cut, mod bish



WOB: 13.6Klbs Rotary: 60RPM Strokes: 230SPM Pump Rate: 615GPM	MD: 12,827' TVD: 7,210.53' Inclination: 87.5° Azimuth: 92.21° VS: 5.681.59'	6640	MD: 12,922' TVD: 7,213.63' Inclination: 88.76° Azimuth: 91.66° VS: 5,776.51'	WOB: 25.9Klbs Rotary: 50RPM Strokes: 228SPM Pump Rate: 609GPM
--	---	------	--	--

); dk gy-med gy, -biky, v calc, tr chk s); lt gyshbn, stri ip, eign-bri orng flor, wth resdl ring	12800-12860 MRLST (90%): mot dk gy-med gy, sm-sl sily tex, sb spl, frm, v calc, tr f lamm, scat mic pyr; CHK (10%): mot gyshbn, crm, chky tex, biky, intbdd mrlst, calc, dul yelgn-bri orng flor, dul mky cut, mod bishwh resdl ring	12860-12920 MRLST (75%): dk gy-med gy, gyshbn, frm-hrd, ply-sb biky, sl absv tex, v calc, intbdd chk; CHK (25%): lt gyshbn, chky tex, calc, biky, sft, mmr micos, dul yelgn flor, dul mky cut, mod bishwh resdl ring	12920-12980 MRLST (65%): mot dk gy-med gy, frm-sl hrd, ply-biky, sl sily tex, tr chk lamm, v calc, tr pp mic pyr; CHK (35%): crm-gyshbn, sft, vt lamm, mmr micos, calc, chky tex, dul yelgn flor, dul mky cut, bishwh resdl ring	12980-1 gy, gysh ply-sb t (40%): r flor, dul
---	--	--	--	--



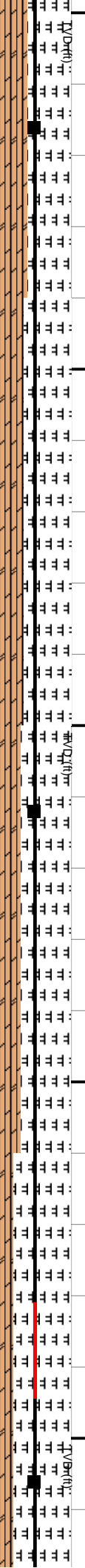


MD: 13,016'  
TVD: 7,215.13'  
Inclination: 89.41°  
Azimuth: 91.24°  
VS: 5,870.48'

6MD: 13,112'  
TVD: 7,216.28'  
Inclination: 89.22°  
Azimuth: 91.05°  
VS: 5,966.47'

WOB: 41.8Klbs  
Rotary: 50RPM  
Strokes: 227SPM  
Pump Rate: 606GPM

MD: 13,206'  
TVD: 7,216.29'  
Inclination: 90.7  
Azimuth: 90.38°  
VS: 6.060.47'



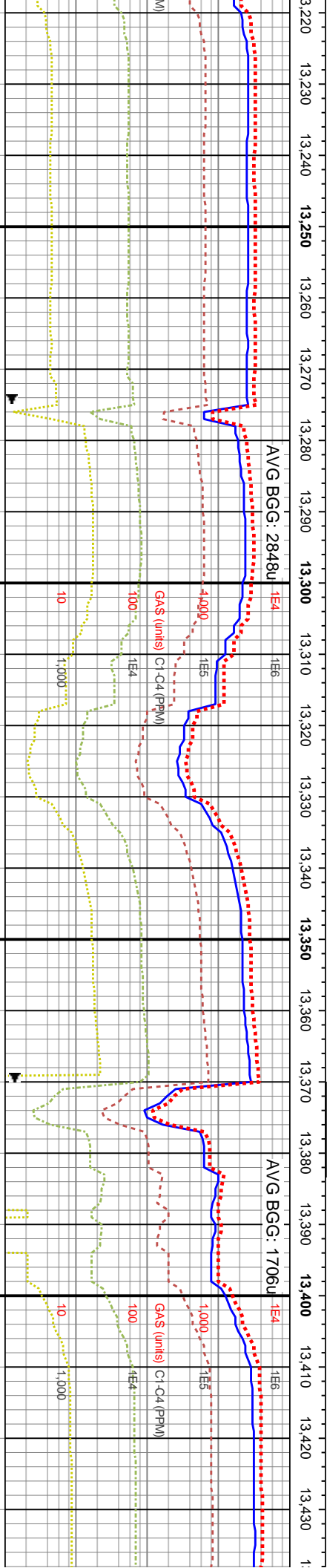
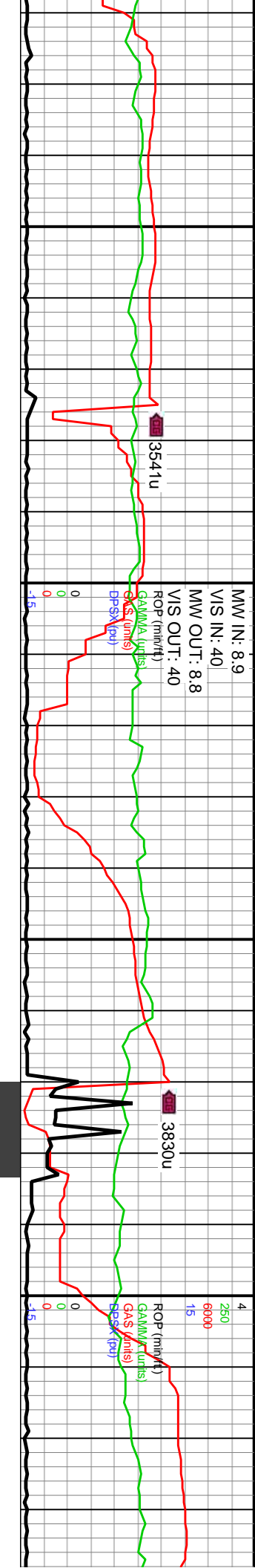
3040 MRLST (60%): pred dk gy-med  
bn, firm-sl hrd, sm tex, occ sl silty,  
milly, v calc, scat imbd pp pyr; CHK  
not gys/bn-lt gy, sft, chky tex, dul yelgr  
mky cut, mod bishwh resdl ring

13040-13100 MRLST (65%): dk gy-med gy, frm-v frm, bky-sb ply, sl stly tex, v calc, imbdd chk, mntr imbd pyr, CHK (35%): lt gysthbn-crm, chky tex, sti, calc, dul yelgn flor, dul mky cut, mod bishwh resdl ring

13100-13160 MRLST (70%): mot dk gy-med  
gy, frm-hrd, tab-sb blyk, v calc, sm-sl stly tex,  
scat imbd pyr; CHK (30%): mot lt gyshb-crm,  
chky tex, sb pty, calc, dul yelgn flor, dul mky  
cut, mod blshwnh resd ring

13160-13220 MRJST (80%): mot dk gy, med  
gy, frm-hrd, tab-bkly, sm-sl absv tex, v calc,  
scat imbd pyr; CHK (20%): mot crm-tl gysbhn,  
chy tex, calc, mntr mchts, dul yelgn flwr, dul  
mky cut, mod blshwh resl ring<sub>0</sub>





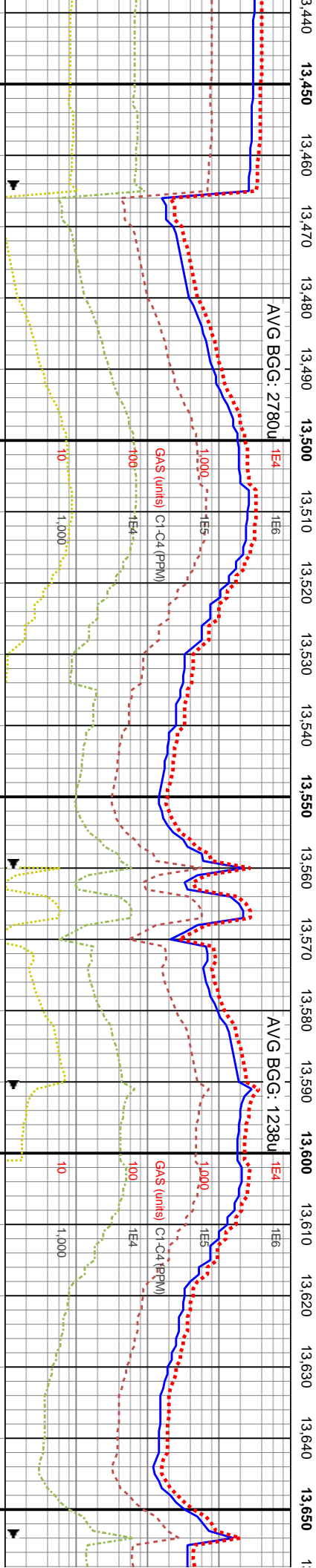
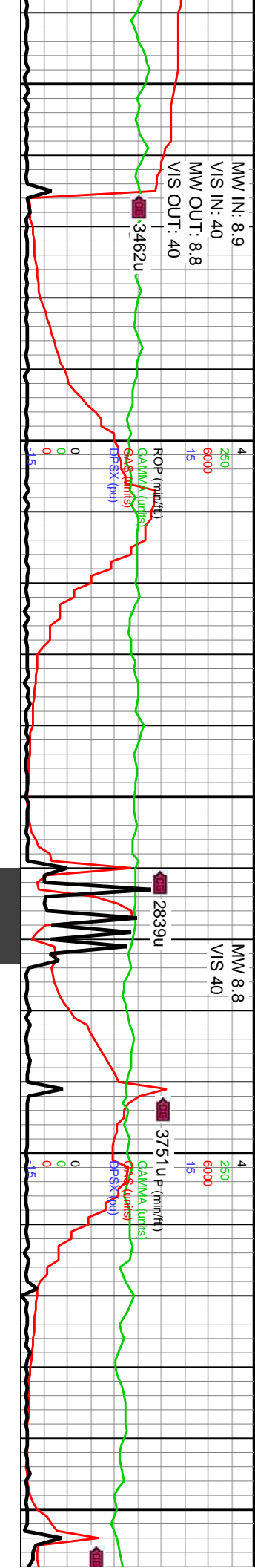
MD: 13,301'  
TVD: 7,214.61'  
Inclination: 91.26°  
Azimuth: 90.49°  
VS: 6,155.45'

MD: 13,396'  
TVD: 7,214.46'  
Inclination: 88.92°  
Azimuth: 89.55°  
VS: 6,250.44'

WOB: 39.8Klbs  
Rotary: 65RPM  
Strokes: 226SPM  
Pump Rate: 604GPM

13220-13280 MRLST (75%): mot dk gy-med gysbhn, sb splt-biky, frm-sl hrd, tr micmica, sl silty tex, v calc: CHK (25%): mot-stri lt gysbhn, sl frm, tr mic fos, blkly-sl pily, dul yelgn flor, dul mky cut, mod blshwn resdl ring	13280-13340 MRLST (85%): mot dk gy-med gy, mot gysbhn, frm-sl hrd, blkly-pily, sl silty tex, v calc, tr f lamm, mnr mic fos: CHK (15%): mot lt gysbhn, chky tex, calc, pily-biky, dul yelgn flor, dul mky cut, mod blshwn resdl ring	13340-13400 MRLST (70%): pred dk gy-gysbhn, frm-sl hrd, blkly, sm tex, v calc, scat pp pyr, mnr microf: CHK (30%): lt gysbhn-crm, tn, chky tex, calc, pily-biky, dul yelgn flor, dul mky cut, mod blshwn resdl ring	13400-13460 MRLST (80%): mot gysbhn, frm-sl hrd, sb chk lamm, mnr pp mic pyr, gysbhn, chky tex, calc, sb p dul mky cut, mod blshwn resdl ring
---	--	---	---

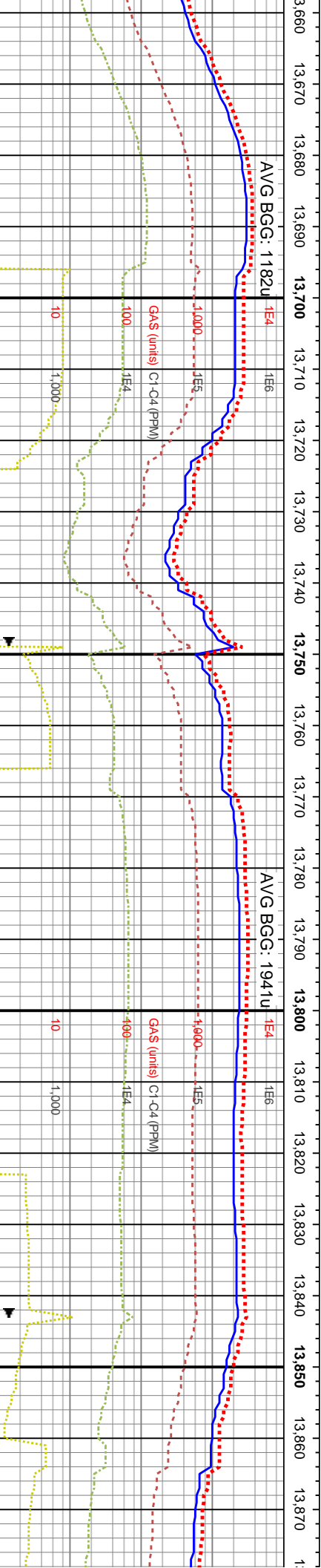
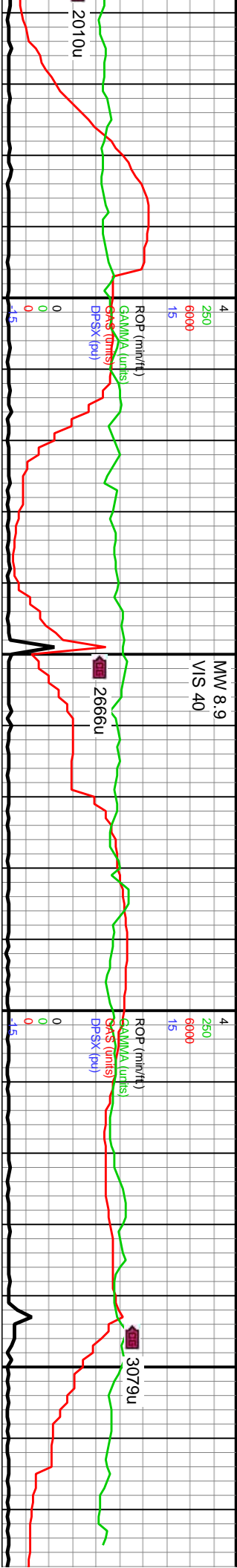




13460-13520 MRLST (90%): med gy-dk gy.	13520-13580 MRLST (80%): mot dk gy-med gy, frm-sl hrd, bky-elg, sl stly tex, v calc, intbd chk lam, scat imbd pyr. CHK (20%): lt gysbhn, stri, chky tex, calc, bky, dul yeign flor, dul mky cut, mod bishwh resdl ring	13580-13640 MRLST (65%): dk gy-med gy, frm-v frm, sb bky, sl stly tex, v calc, intbd chk lam, scat imbd pyr. CHK (35%): crm-lt gysbhn, tr mic fos, chky tex, calc, dul yeign-bri orng flor, dul mky cut, bishwh resdl ring	13640-13640 MRLST (65%): dk gy-med gy, frm-sl hrd, scat pyr, tn, chky
dk gy-med gy, ab, v calc, sme CHK (20%): crm-lt mly, dul yeign flor, resdl ring	frm-sl hrd, sb pty, sl stly tex, mnr scat mic pyr, v calc: CHK (10%): lt gysbhn-crm, calc, intbd mlt, mnr mifos, sb bky, dul yeign-bri orng flor, dul mky cut, mod bishwh resdl ring	frm-v frm, sb bky, sl stly tex, v calc, intbd chk lam, scat imbd pyr. CHK (35%): crm-lt gysbhn, tr mic fos, chky tex, calc, dul yeign-bri orng flor, dul mky cut, bishwh resdl ring	frm-sl hrd, scat pyr, tn, chky



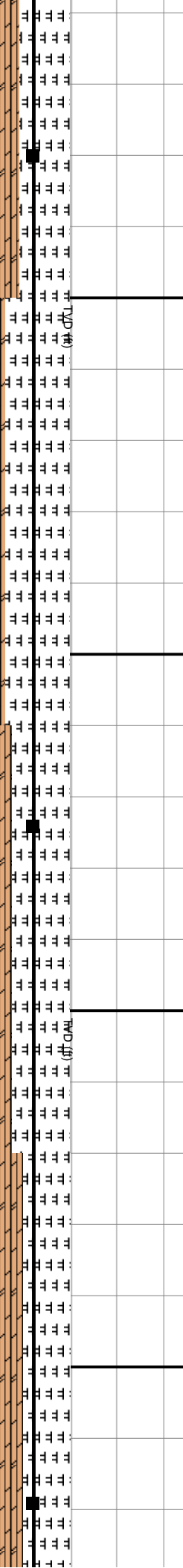




MD: 13,680'  
TVD: 7,218.93'  
Inclination: 89.56°  
Azimuth: 88.16°  
VS: 6.534.31'

MD: 13,774'  
TVD: 7,219'  
Inclination: 90.36°  
Azimuth: 88.43°  
VS: 6.628.23'

MD: 13,869'  
TVD: 7,217.45'  
Inclination: 91.51°  
Azimuth: 88.49°  
VS: 6.723.16'



13700 MRLST (70%): med gy-dk gy, d, bly-si elg, sl silty tex, v calc, tr f lam, mod; CHK (30%): crm-lt gysbhn, lt gy, _tex, calc, bly, bri orgg-dul yelgn flor, _cut, mod blshwh resd ring	13700-13760 MRLST (90%): pred dk gy, med gy, frm-hrd, sb tab-splt, sm-sl silty tex, v calc, scat imbd pyr; CHK (10%): mot lt gysbhn-crm, strf, chky tex, calc, splt, dul yelgn-bri orgg flor, _dul mky cut, mod blshwh resd ring	13760-13820 MRLST (80%): mot dk gy-dk gysbhn, frm-hrd, ply-sb bly, sm-sl silty tex, v calc, chk lamm; CHK (20%): crm-lt gysbhn, chky tex, calc, bly, sft, mnr mifcos, dul yelgn flor, dul mky cut, blshwh resd ring	13820-13880 MRLST (65%): mot dk gy-med gy, gysbhn, frm, bly-ply, sl silty tex, v calc, intbdd chk, imbd/scat mic pyr; CHK (35%): mot crm-lt gysbhn, chky tex, calc, sb ply, dul yelgn flor, dul mky cut, blshwh resd ring
--	--	---	---





