



# Empirica

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Fairview 6

**Location** Sec 5, T2N, R68W

**State** CO

**Country** USA

**API Number** 05-123-41519

**County** Weld

**Rig Number** Savanna 802

**Field** Wattenberg

**Geographic Region** DJ Basin

**Drilling Completed** 1/16/2016

**Spud Date** 12/8/2015

**Surface Coordinates** Lat: 40° 9' 56.7468" N

Long: 105° 2' 6.6012" W

**Bottom Hole Coordinates** Lat: 40° 9' 47.7648" N

Long: 105° 0' 35.1367" W

**Ground Elevation** 4,948'

**K.B. Elevation** 4,963'

**Logged Interval** 5,000' **To** 14,486'

**Total Depth** 14,486'

**Formation** Niobrara B

**Type of Drilling Fluid** Invert

## 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: 1-11-16  
End: 1-13-16


**Services Provided** 2-Man Logging


**Logger Names** Brian Ferwerda / Mark G


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


Zone Color Coding


 Oil


 Note


 Error


 Condensate

 Core

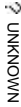
 Water


 Gas


 Pressure


 Seal


Rock Types


 UNKNOWN


 ANHYDRITE


 GYPSUM


 SALT


 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


Other Syn


 ORGANIC


 PINPOINT


 DEAD


 EVEN


 QUESTIONABLE


 SPOTTED STAINING


 FORM

 GAS SHOW

 VUGGY

 NORMAL F

 OIL SHOW

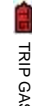
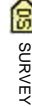
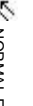
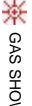
 OVERTURN

Oil Show

Engineering



Porosity



# mbols

ATION TOP L LITHOGRAPHIC

## Rounding

**MX** MICROXLN

**A** ANGULAR **MS** MUDSTONE

**R** ROUNDED **PS** PACKSTONE

**S** SUBANG **WS** WAKESTONE

**F** SUBRND

## Sorting

## Textures

**M** MODERATE

**B** BOUNDSTONE **P** POOR

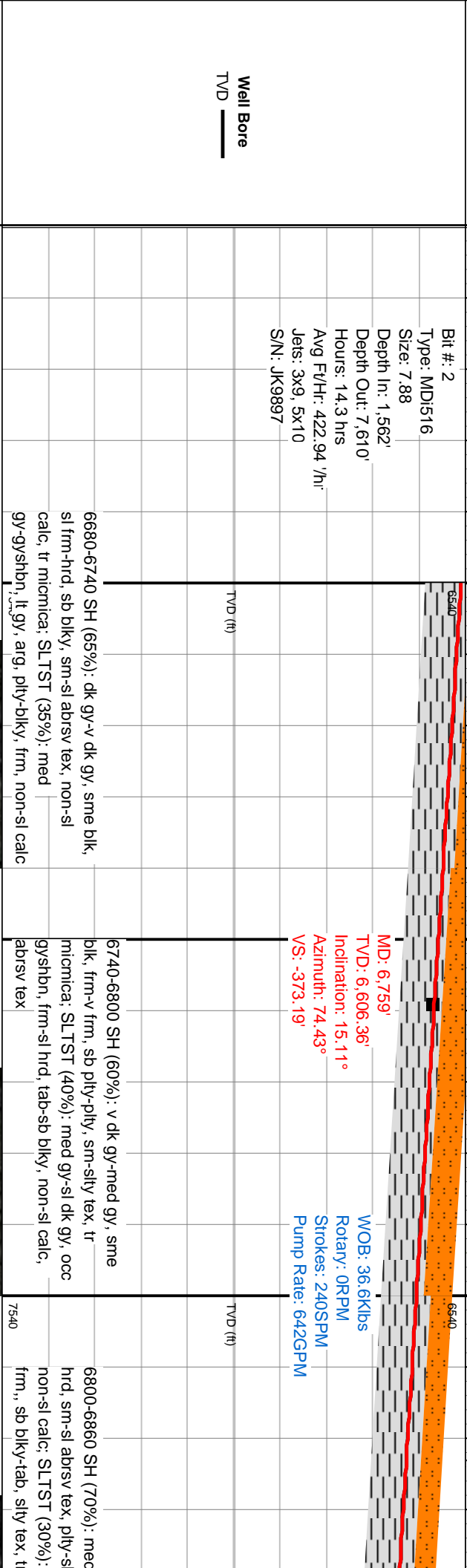
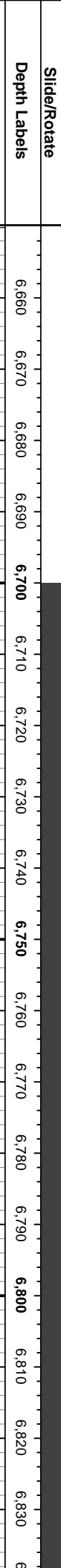
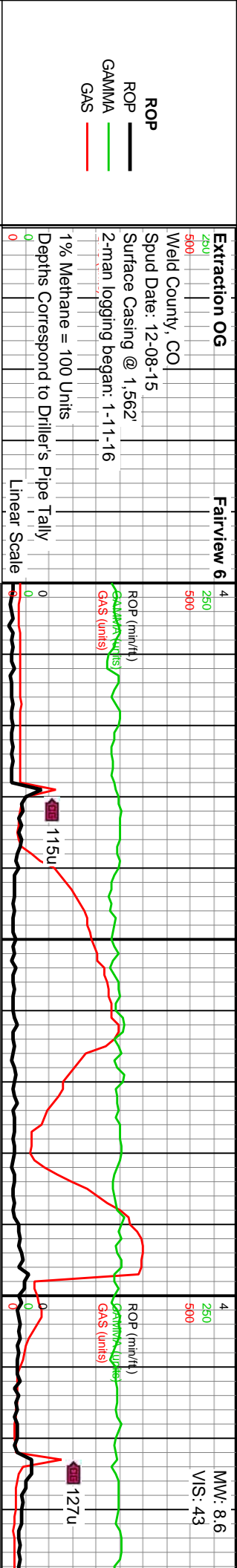
**C** CHALKY **W** WELL

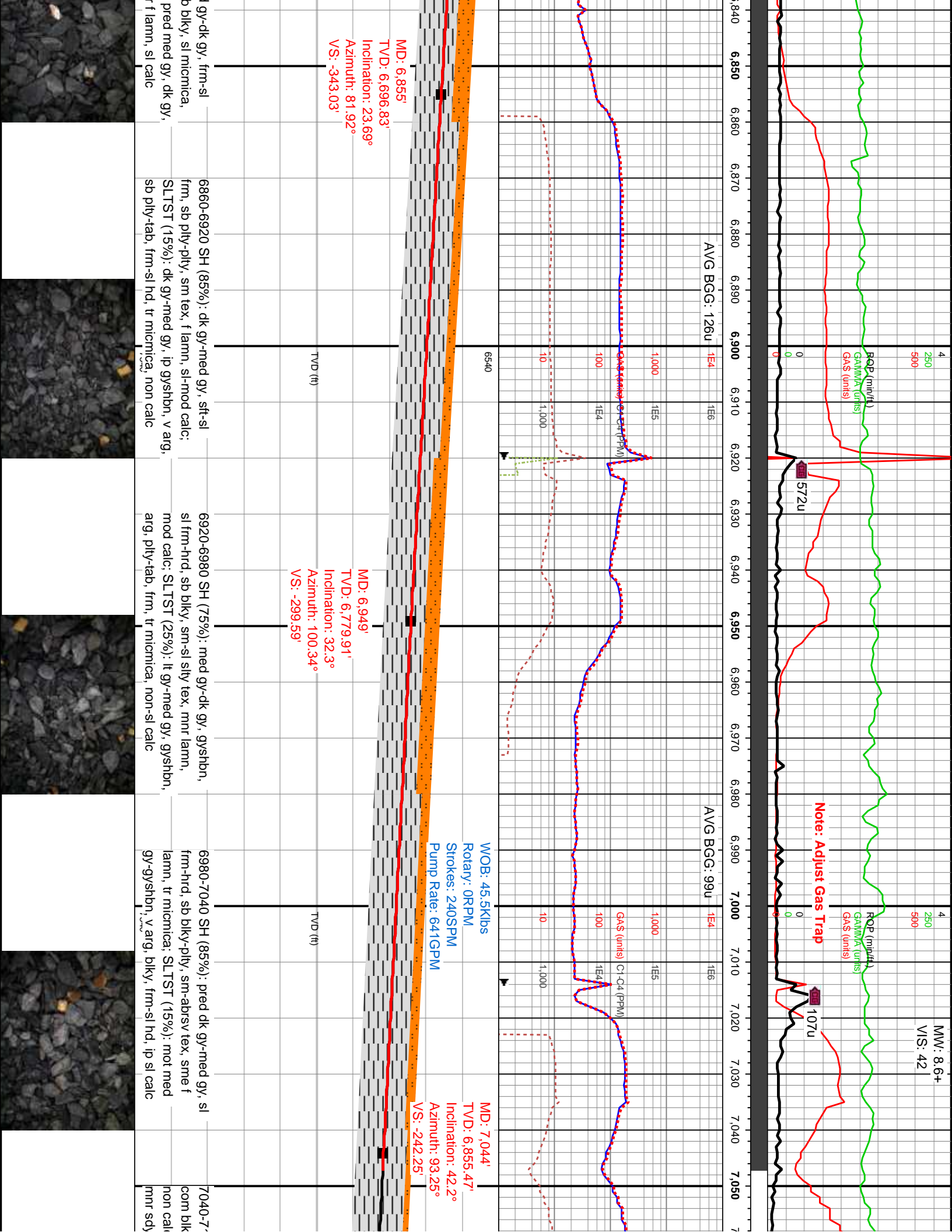
**CX** CRYPTOXLN

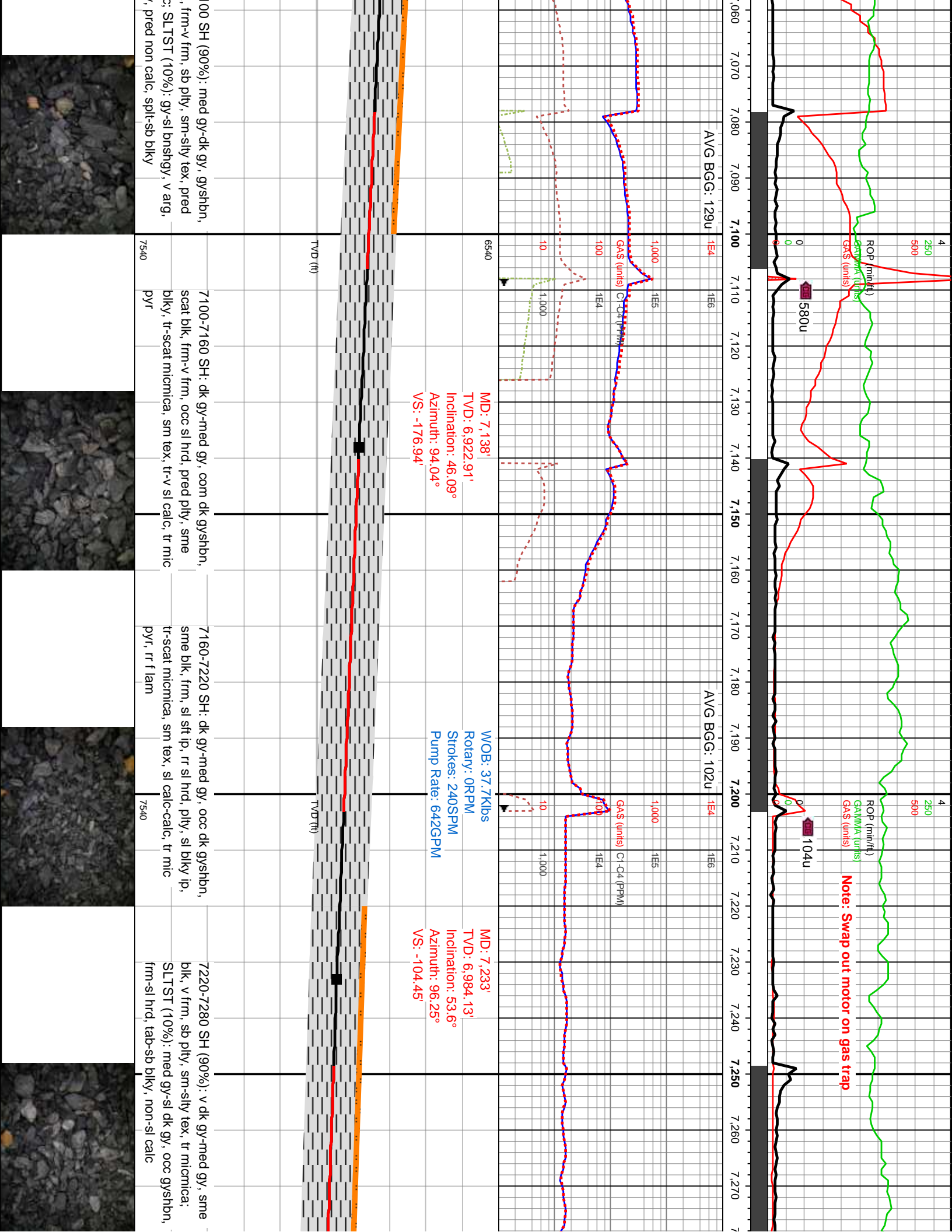
**E** EARTHY

**FX** FINELYXLN

**GS** GRAINSTONE

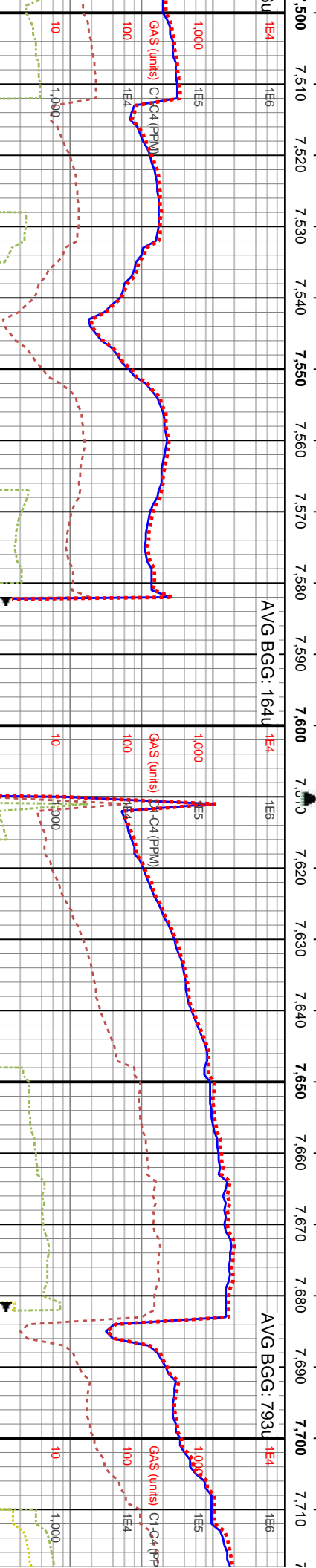
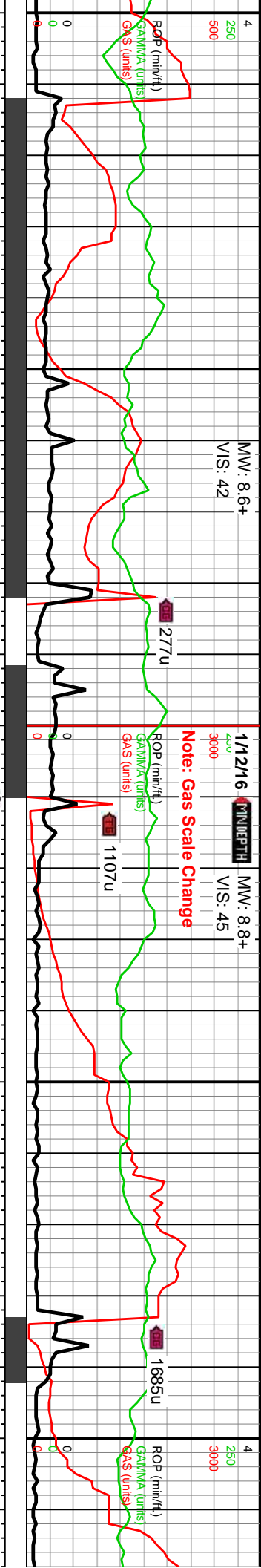












MD: 7.518'  
TVD: 7,098.14'  
Inclination: 76.09°  
Azimuth: 97.35°  
VS: 154.33'

Bit #: 3  
Type: E516-B34-Z  
Size: 7.88  
Depth In: 7.610'  
Depth Out: 14.586'  
Hours: 26.1 hrs  
Avg Ft/Hr: 267.28 '/hr  
Jets: 7x10  
S/N: A1196174

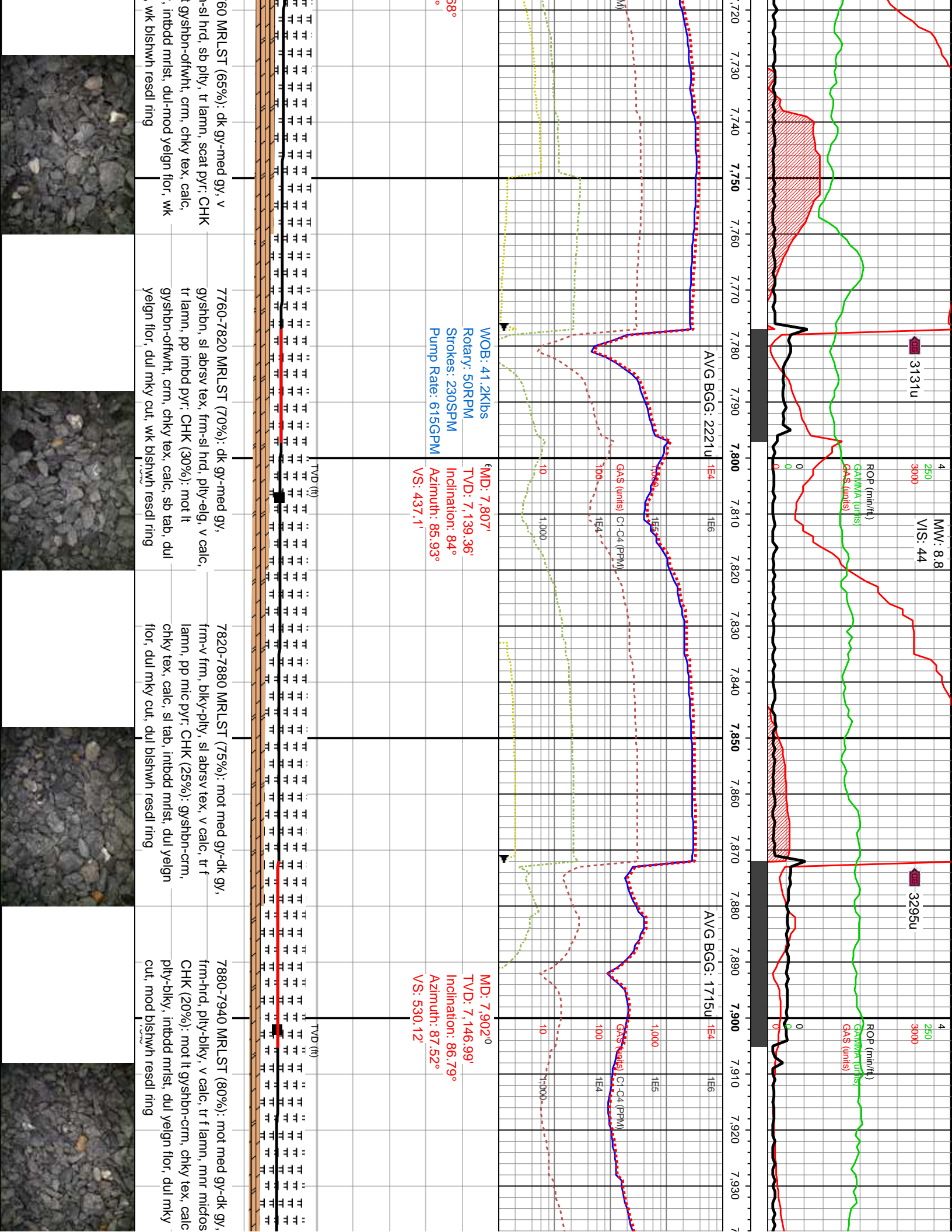
WOB: 34.5Klbs  
Rotary: 0RPM  
Strokes: 240SPM  
Pump Rate: 641GPM  
VS: 252.25'

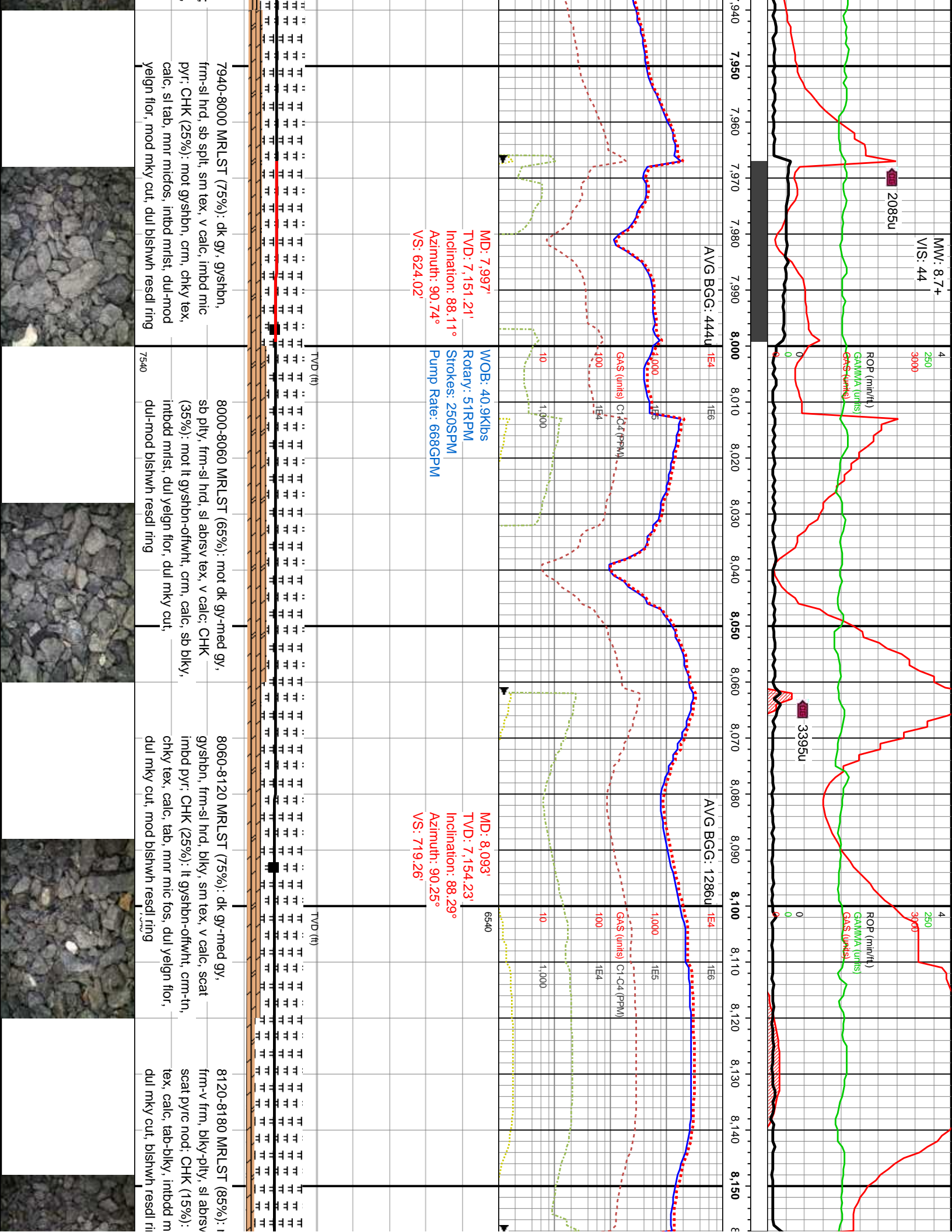
Note: TOOHP for motor

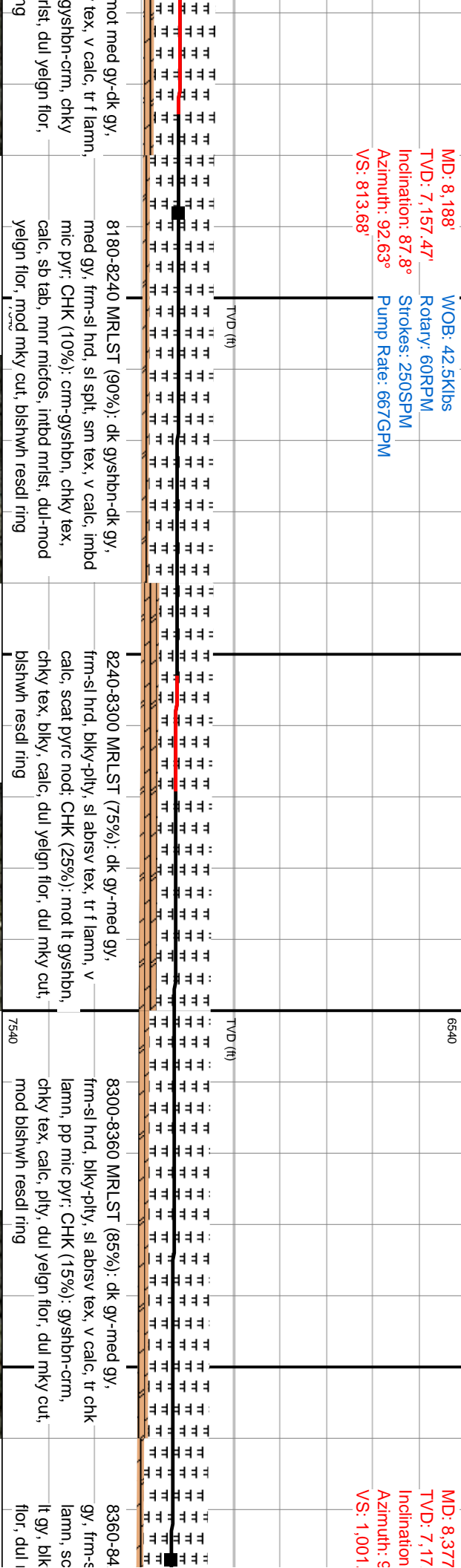
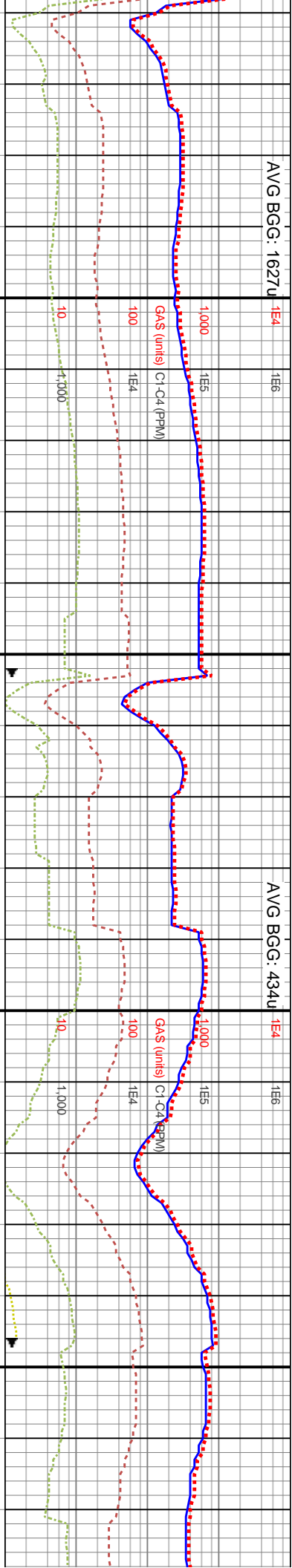
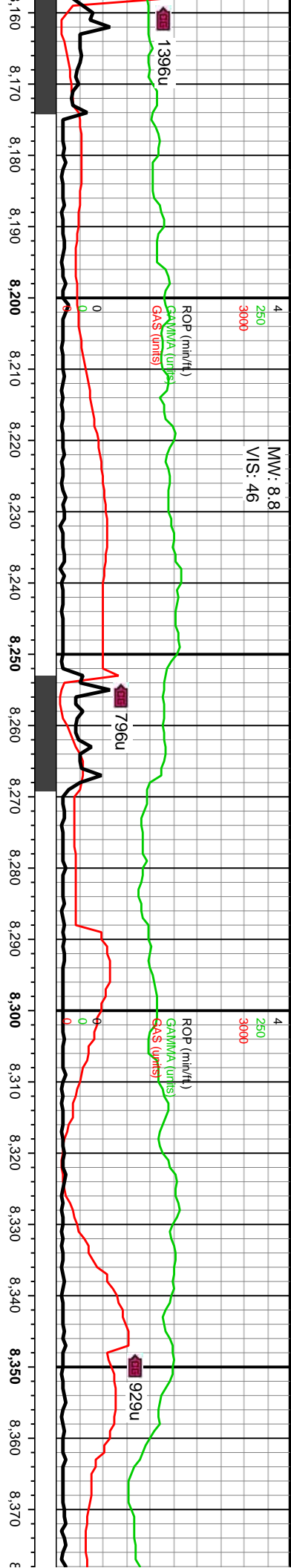
MD: 7.712'  
TVD: 7,128.34'  
Inclination: 82.6°  
Azimuth: 87.65°  
VS: 344.37'

mot dk gy-med gy, f lamn; CHK (15%): ly-biky, intbdd wi y cut, mod bishwh	7520-7580 MRLST (90%): dk gy-med gy, frm-hrd, sl rgh tex, v calc, sb biky, tr chk lam, scat pp pyr; CHK (10%): gysbhn-lt gy, calc, sft, chky tex, dul yelgn flor, mod mky cut, dul bishwh resdl ring	7580-7640 MRLST (85%): mot dk gy-med gy, biky-sb pily, sl slty tex, frm-v frm, v calc, tr f lamn, scat pp pyr; CHK (15%): gysbhn-crm, chky tex, biky-splt, calc, intbdd mlst, dul yelgn flor, dul-wk mky cut, mod bishwh resdl ring	7640-7700 MRLST (70%): predy dk gy-dk gysbhn, frm-v frm, sb pily, sl slty tex, v calc, scat pyrc nod; CHK (30%): mot gysbhn-crm, chky tex, calc, sb biky, mlst intbdd, dul-mod yelgn flor, v wk mky cut,	7700-77 calc, frm (35%): l pily-biky mky cut
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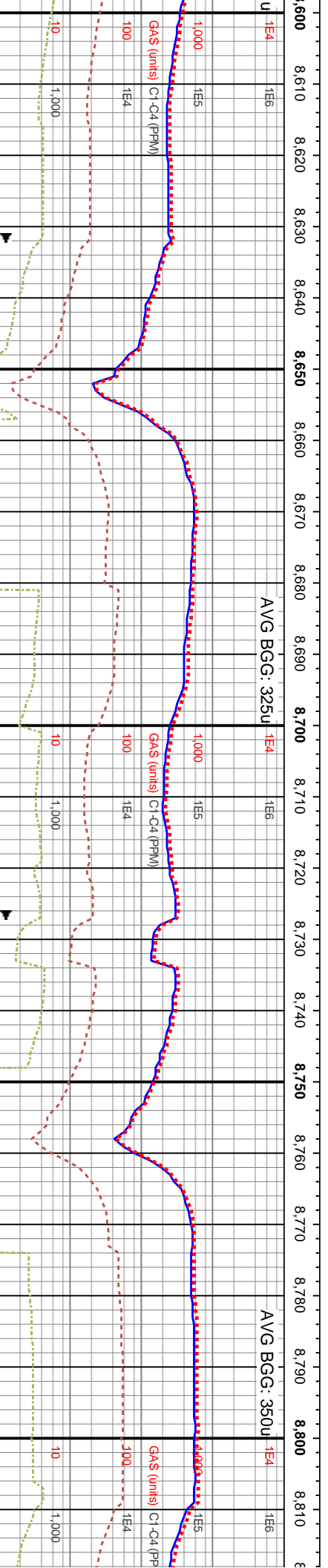
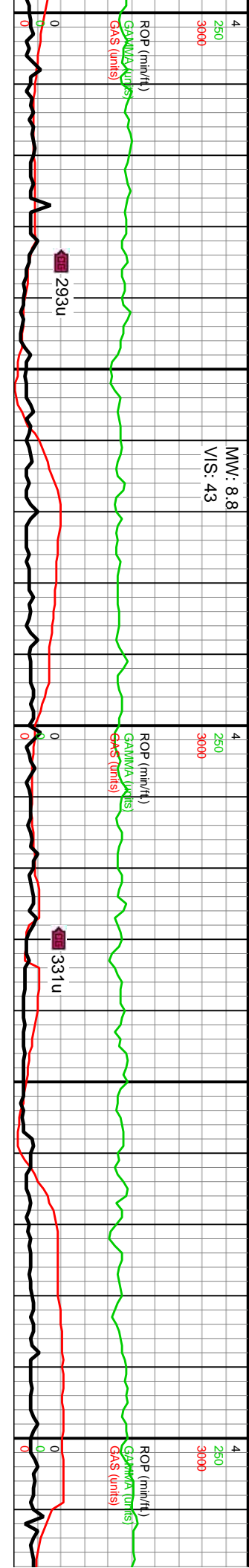




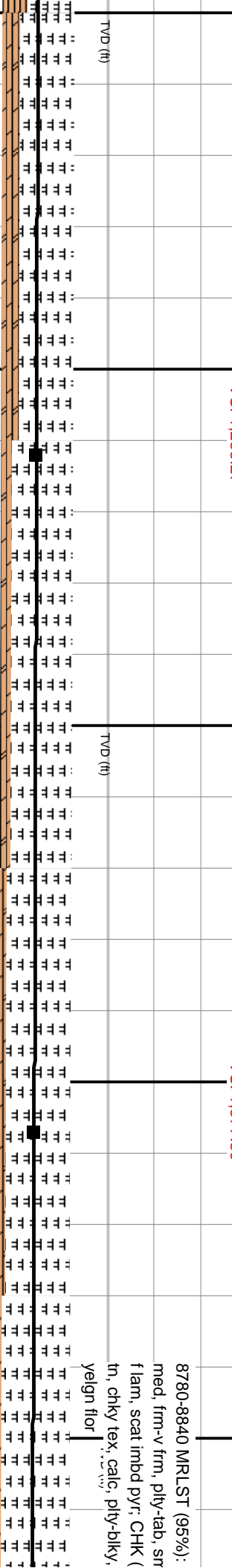








9klbs		MD: 8.662'	65-40	MD: 8.757'	WOB: 42.9klbs
2RPM		TVD: 7.192.42'		TVD: 7.197.45'	Rotary: 53RPM
250SPM		Inclination: 86.92°		Inclination: 87.01°	Strokes: 250SPM
ite: 667GPM		Azimuth: 89.86°		Azimuth: 90.74°	Pump Rate: 668GPM
		VS: 1.283.27'		VS: 1.377.39'	

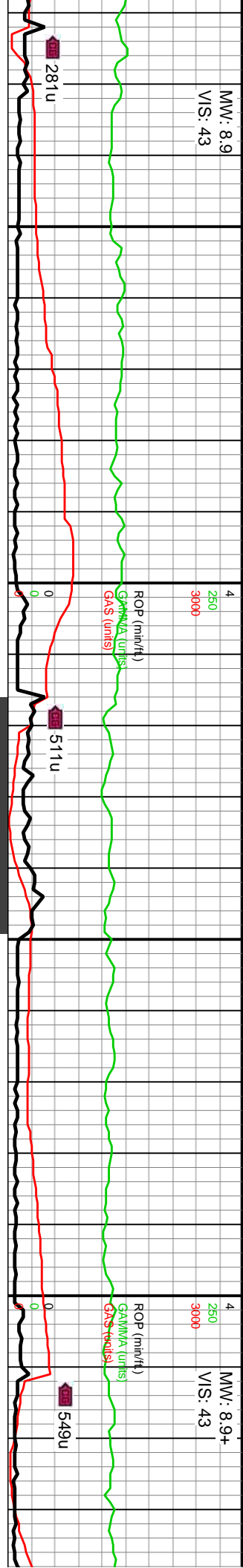


8600-8660 MRLST (75%): mot dk gy-med gy, mot gysbhn, frm-sl hrd, bky-pty, sl sily tex, v calc; CHK (25%): mot lt gysbhn-lt gy, stri ip, chky tex, calc, pty-bky, dul yelgn flor, dul mky cut, bishwh resdl ring	8660-8720 MRLST (85%): dk gy, mot med gy-gysbhn, frm-sl hrd, pty-tab, sm-sily tex, v calc, intbdd chk, pp imbd pyr; CHK (15%): gysbhn-crm, chky tex, calc, tab-bky, dul yelgn flor, dul mky cut, bishwh resdl ring	8720-8780 MRLST (90%): mot dk gy-gysbhn, frm-sl hrd, bky-pty, sl sily tex, v calc, intbdd chk lamm, mnr pyrc not; CHK (10%): lt gysbhn-crm, chky tex, calc, pty-bky, dul yelgn flor, dul mky cut, bishwh resdl ring				75-40
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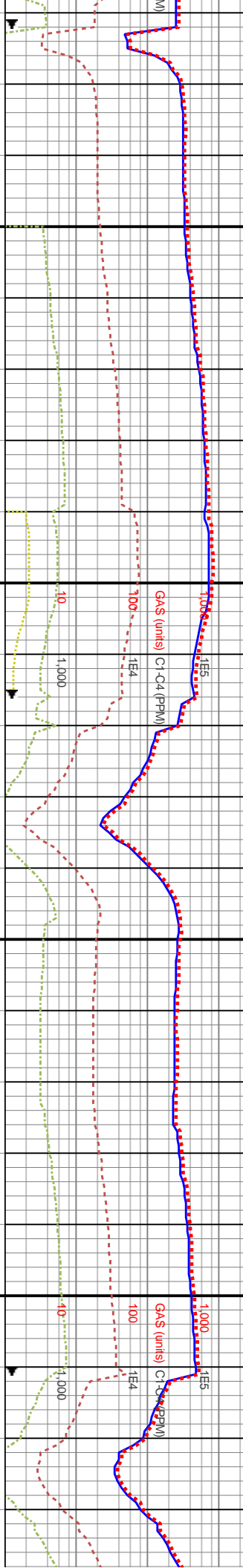
MW: 8.9  
VIS: 43

MW: 8.9+  
VIS: 43



AVG BGG: 490u

AVG BGG: 316u



MD: 8,851'  
TVD: 7,203.33'  
Inclination: 85.82°  
Azimuth: 90.74°  
VS: 1,470.57'

MD: 8,946'  
TVD: 7,207.62'  
Inclination: 89°  
Azimuth: 89.24°  
VS: 1,564.65'

WOB: 40.5Klbs  
Rotary: 50RPM  
Strokes: 250SPM  
Pump Rate: 667GPM

MD: 9  
TVD: 7  
Inclination: 89  
Azimuth: 89  
VS: 1

8840-8900 MRLST (90%): mot dk gy-med gy, frm-si hrd, biky-pty, si silty tex, v calc, intbdd chk lamm; CHK (10%): lt gysbhn-crm, chky tex, calc, pty-biky, dul yeign flor, dul mky cut, bishwh resdl ring

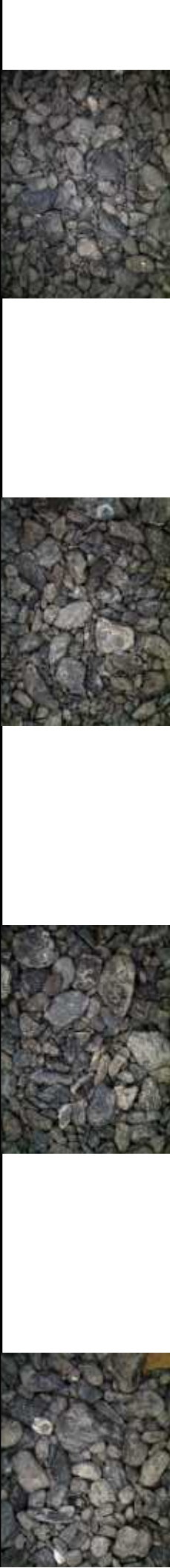
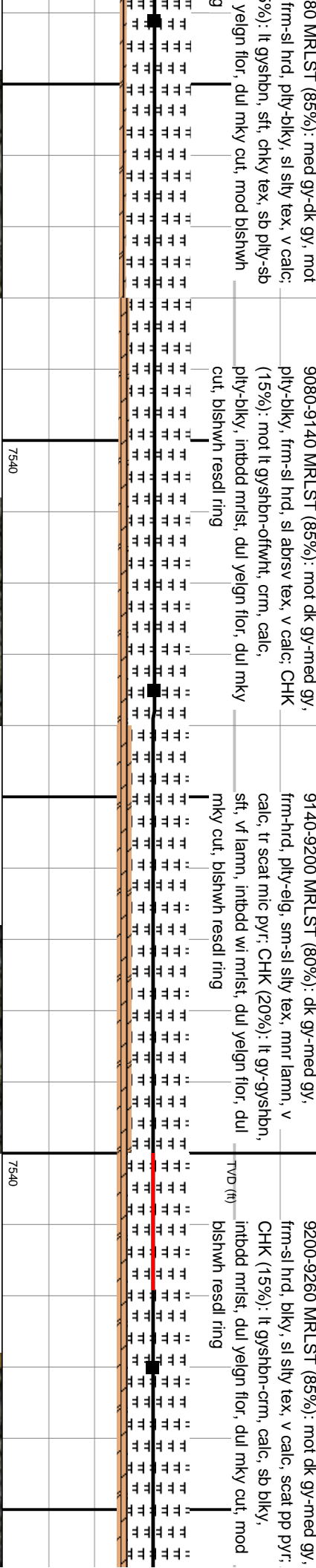
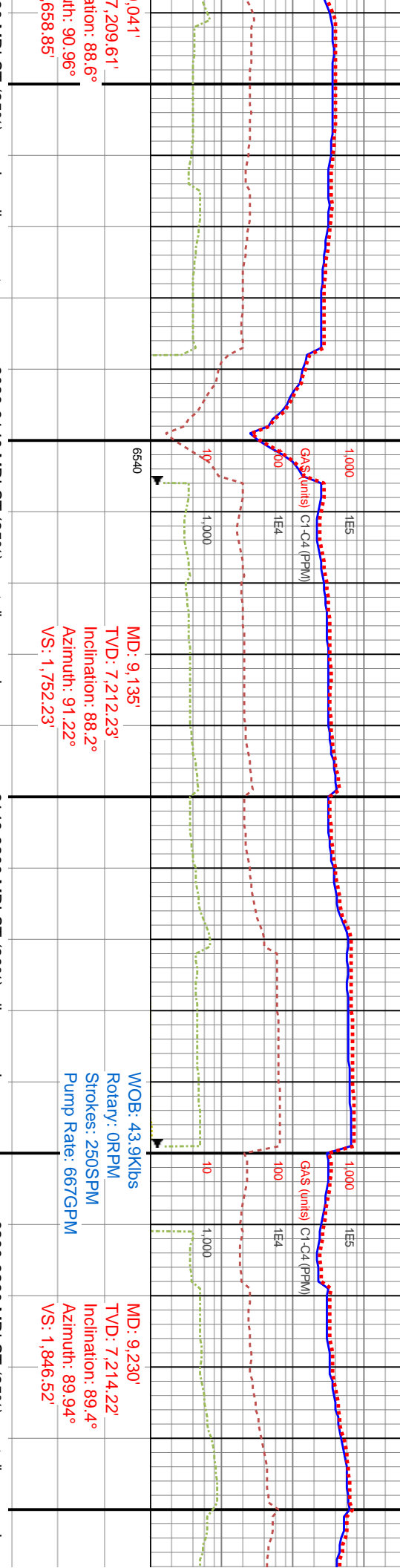
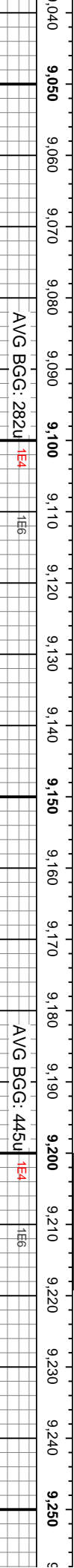
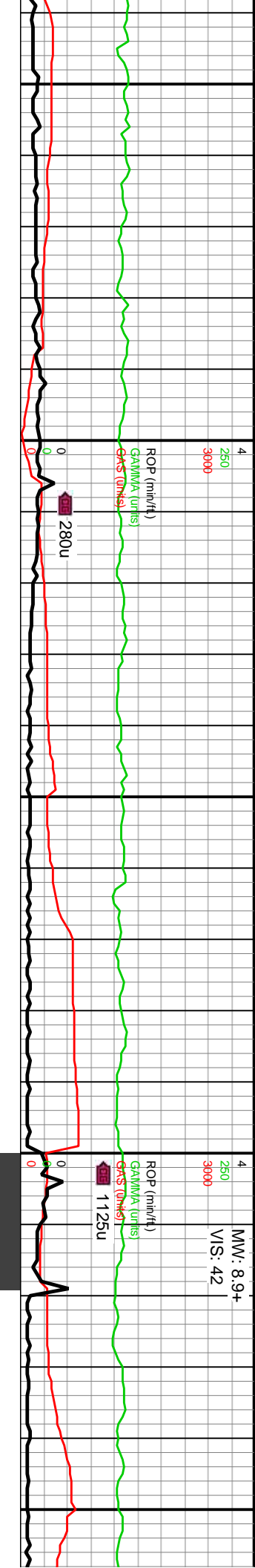
8900-8960 MRLST (85%): mot med gy-mot gysbhn, frm-si hrd, pty-biky, si abrsv tex, v calc, tr f lamm; CHK (15%): lt gysbhn-offwht, crm, chky tex, calc, pty-biky, intbdd mrlst, dul yeign flor, dul mky cut, bishwh resdl ring

8960-9020 MRLST (85%): med gy-gysbhn, frm-si hrd, pty, si silty tex, v calc, tr chk lamm; CHK (15%): gysbhn-crm, chky tex, calc, tab, intbdd mrlst, dul yeign flor, dul mky cut, bishwh resdl ring

9020-90 gysbhn, CHK (15%): biky, dul resdl rin







MW: 8.9+  
VIS: 42

MD: 9.041'  
TVD: 7,209.61'  
Inclination: 88.6°  
Azimuth: 90.96°  
VS: 658.85'

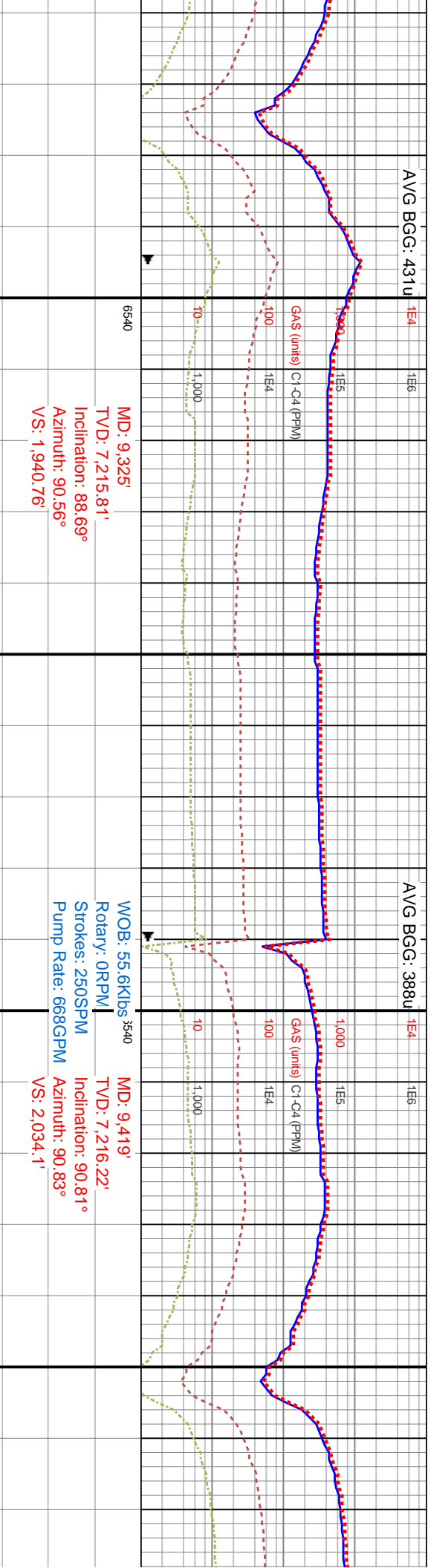
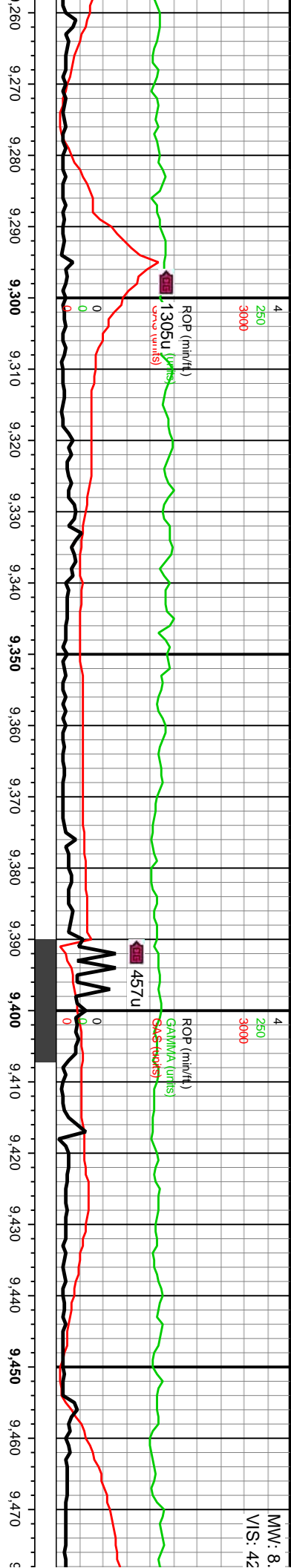
WOB: 43.9Klbs  
Rotary: 0RPM  
Strokes: 250SPM  
Pump Rate: 667GPM

MD: 9.230'  
TVD: 7,214.22'  
Inclination: 89.4°  
Azimuth: 89.94°  
VS: 1,846.52'

9080-9140 MRLST (85%): mot dk gy-med gy, pty-biky, frm-sl hrd, sl abrsv tex, v calc; (15%): mot lt gysbn-offwht, crn, calc, pty-biky, inbdd mst, du yeign flr, du mky cut, bishwh resd ring

9140-9200 MRLST (80%): dk gy-med gy, frm-hrd, pty-elg, sn-sl sly tex, mnr lamm, v calc, tr scat mic pyr; CHK (20%): lt gy-gysbn, sft, vt lamm, inbdd wl mst, du yeign flr, du mky cut, bishwh resd ring

9200-9260 MRLST (85%): mot dk gy-med gy, frm-sl hrd, biky, sl sly tex, v calc, scat pp pyr; CHK (15%): lt gysbn-crn, calc, sb biky, inbdd mst, du yeign flr, du mky cut, mod bishwh resd ring

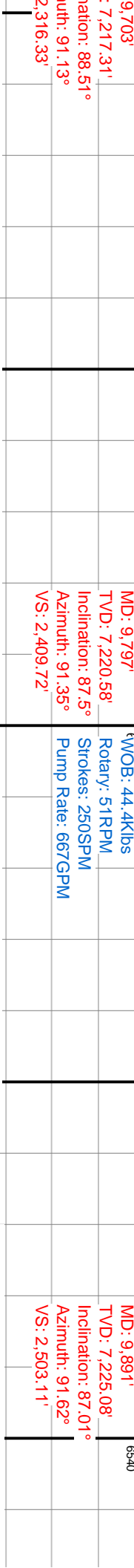
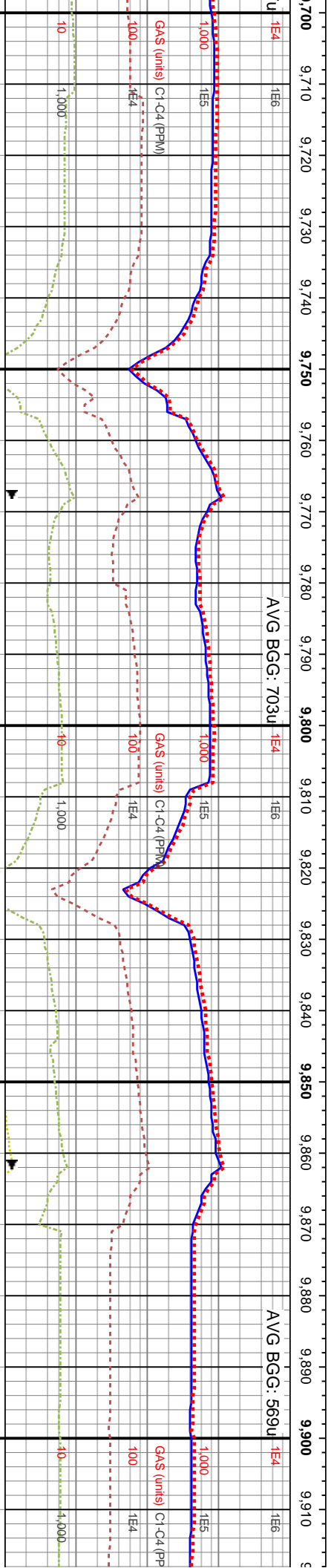
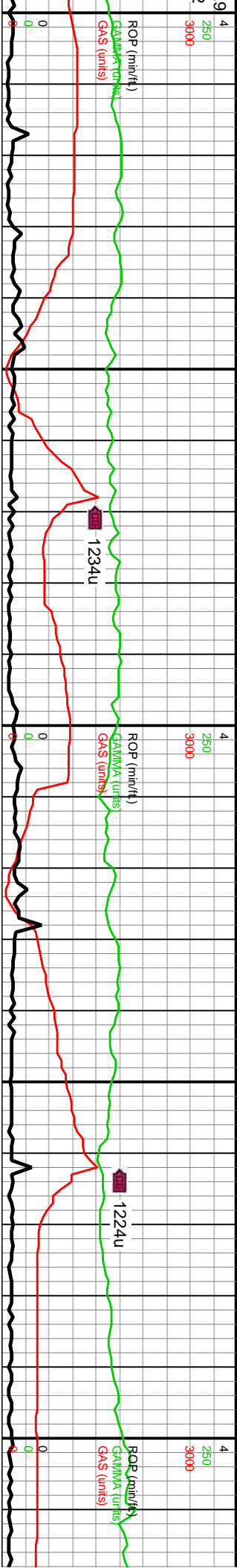


9260-9320 MRLST (90%): mot dk gy-gyshbn, frm-hrd, pfty, sm-sl silty tex, mnr lamm, calc, tr pyrc nod; CHK (10%): crm-lt gy, gysbhn, sft, vf lamm, intbdd mrlst, dul yelgn flor, dul mky cut, bishwh resdl ring	9320-9380 MRLST (85%): predy med gy-gyshbn, frm-sl hrd, pfty-splt, v calc, scat imbd pyr; CHK (15%): lt gysbhn-crm, chky tex, mod calc, sb tab, intbdd mrlst, dul-mod yelgn flor, dul mky cut, bishwh resdl ring	9380-9440 MRLST (85%): mot med gy-dk gysbhn, frm-sl hrd, sm tex, sb tab, v calc, scat pp pyr; CHK (15%): lt gysbhn-crm, tn, chky tex, calc, mnr mifos, split-biky, dul yelgn flor, dul mky cut, bishwh resdl ring	9440-9500 MRLST (90%): gysbhn, frm-sl hrd, biky-sl e calc, tr f lam, scat mic pyr, gysbhn, chky tex, calc, biky mky cut, mod bishwh resdl
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7540	7540	7540	7540
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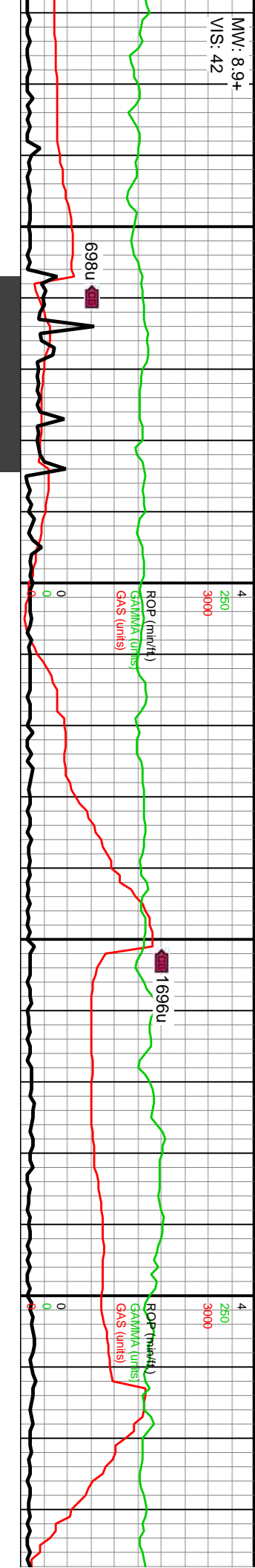


9,703'	9,7217.31'	MD: 9,797'	TVD: 7,220.58'	Rotary: 51RPM	Strokes: 250SPM	Pump Rate: 667GPM	9,891'	TVD: 7,225.08'	MD: 9,891'	TVD: 6540
Station: 88.51°	Auth: 91.13°	Inclination: 87.5°	Azimuth: 91.35°				Inclination: 87.01°	Azimuth: 91.62°	VS: 2,503.11'	
2,316.33'		VS: 2,409.72'								



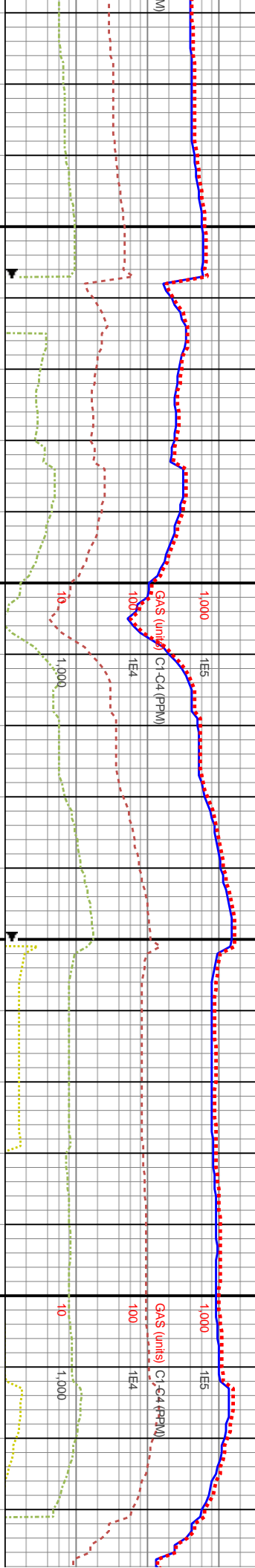


MW: 8.9+  
VIS: 42



AVG BGC: 413u

AVG BGC: 852u



MD: 9,986'  
TVD: 7,228.46'  
Inclination: 88.91°  
Azimuth: 90.34°  
VS: 2,597.44'

WOB: 29.5Klbs  
Rotary: 50RPM  
Strokes: 250SPM  
Pump Rate: 668GPM

MD: 10,081'  
TVD: 7,231.12'  
Inclination: 87.89°  
Azimuth: 90.65°  
VS: 2,691.7'

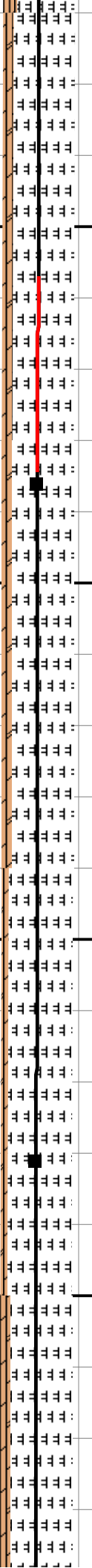
6540

9920-9980 MRLST (85%): mot med gy-dk gy, gyshbn, frm-sl hrd, blk-y-sl elg, sm-sl slty tex, v calc: CHK (15%): mot lt gyshbn-gy, chky tex, calc, pty, bishwn-dul yelgn flor, mky cut, dul bishwn resdl ring

9980-10040 MRLST (85%): mot dk gy-med gy, frm-sl hrd, blk-y-pty, sl slty tex, v calc, intbdd chk lamn: CHK (15%): lt gyshbn-offwht, crm, chky tex, calc, pty-blky, dul yelgn flor, dul mky cut, bishwn resdl ring

10040-10100 MRLST (90%): dk gy-gyshbn, med gy, frm-v frm, blk-y-tab, sl slty tex, v calc, pp imbd pyr: CHK (10%): lt gyshbn-offwht, chky tex, calc, pty-tab, dul yelgn flor, dul mky cut, mod bishwn resdl ring

10100-10160 MRLST (80%)  
gy, frm-hrd, tab-blky, sm-sl scat imbd pyr: CHK (20%)  
chky tex, calc, mnr micros, mky cut, mod bishwn resdl



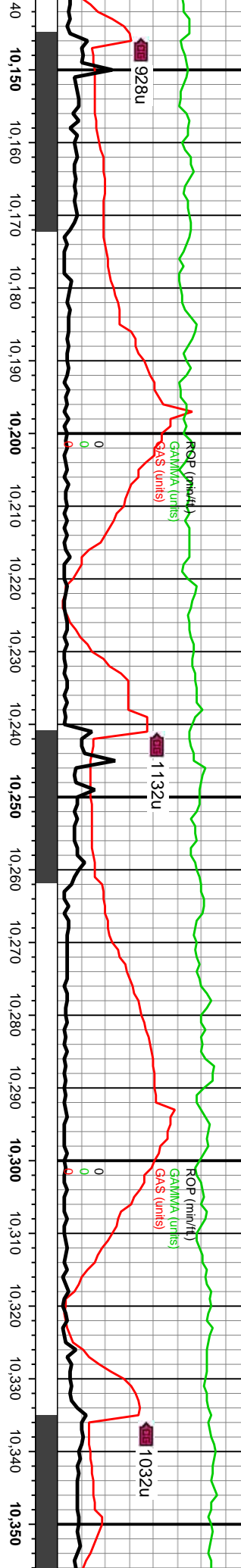
7540

7540



MW: 9.0  
VIS: 42

MW: 9.0+  
VIS: 42

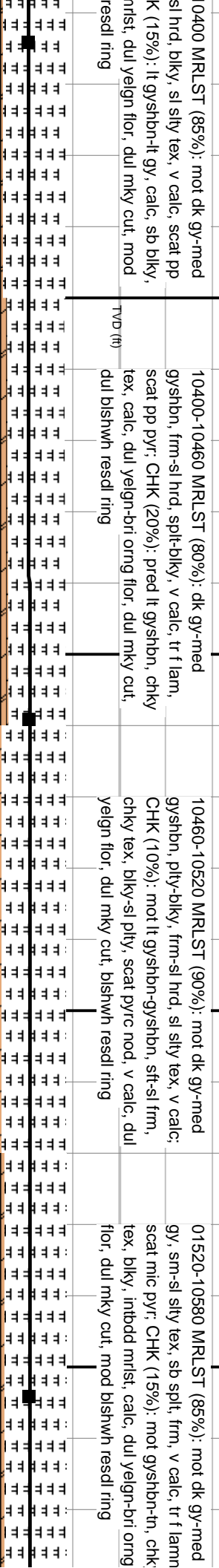
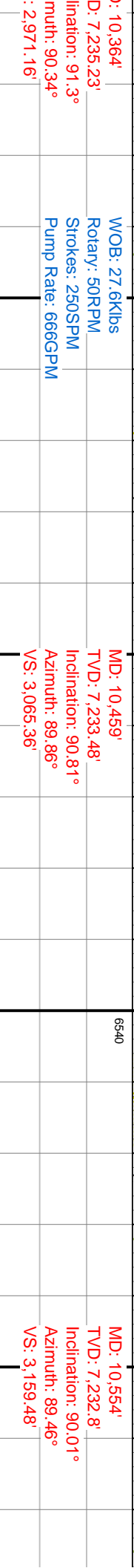
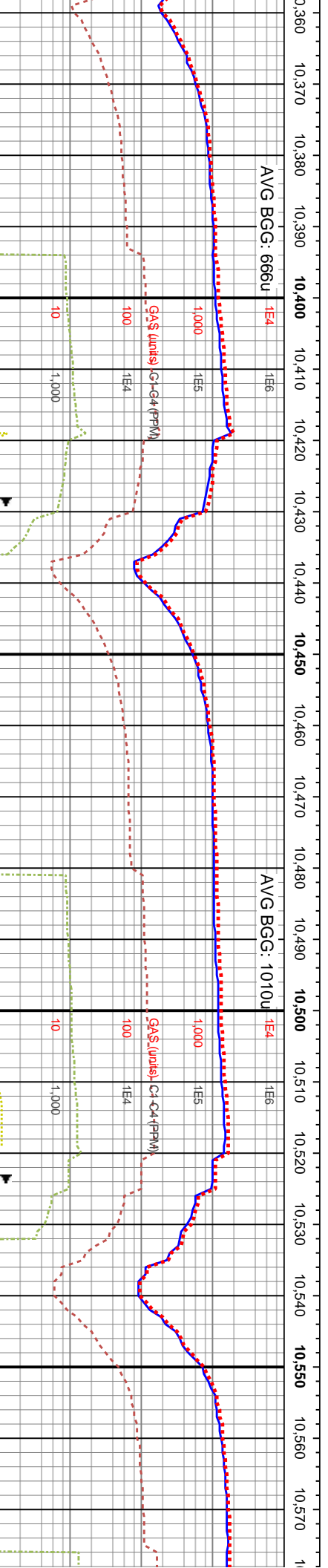
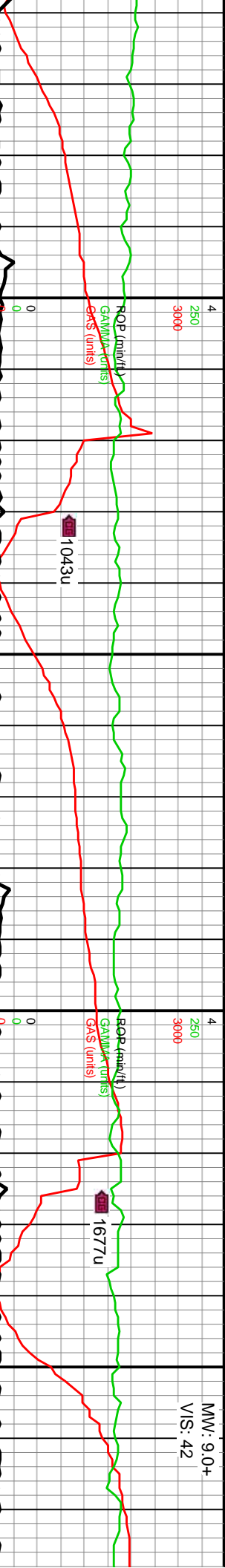


10.140	10.150	10.160	10.170	10.180	10.190	10.200	10.210	10.220	10.230	10.240	10.250	10.260	10.270	10.280	10.290	10.300	10.310	10.320	10.330	10.340	10.350
AVG BGC: 833u												AVG BGC: 757u									
1E4												1E4									
1E6												1E6									
1,000												1,000									
100												100									
1E4												1E4									
10												10									
1,000												1,000									
MD: 10,175'												MD: 10,270'									
TVD: 7,234.07'												TVD: 7,235.8'									
Inclination: 88.51°												Inclination: 89.4°									
Azimuth: 87.34°												Azimuth: 87.74°									
VS: 2,784.62'												VS: 2,878.18'									
WOB: 34.2Klbs												6540									
Rotary: 50RPM																					
Strokes: 250SPM																					
Pump Rate: 666GPM																					

6): mot dk gy, med abrsv tex, v calc, mot crm-lt gysbhn, dul yeign flor, dul ring	10160-10220 MRLST (95%): med gy-gysbhn, frm-v frm, blk-y-tab, sl sm tex, v calc, tr lse & frac fil cal: CHK (5%): mot lt gysbhn, chky tex, calc, tab-pty, intbdd mrlst, dul yeign flor, dul mky cut, blshwn resd ring	10220-10280 MRLST (90%): mot med gy-dk gy, gysbhn, frm-sl hrd, blk-y-sl eig, sm-sl slty tex, v calc: CHK (10%): mot lt gysbhn-gy, chky tex, calc, pty, blshwn-dul yeign flor, mky cut, dul blshwn resd ring	10280-10340 MRLST (95%): dk gy-gysbhn, mot med, frm-v frm, pty-tab, sm-sl slty tex, v calc, tr f lam, scat imbd pyr: CHK (5%): lt gysbhn, chky tex, calc, pty-blky, mnr mifcos, dul yeign flor	10340-10350 MRLST (95%): dk gy-gysbhn, mot med, frm-v frm, pty-tab, sm-sl slty tex, v calc, tr f lam, scat imbd pyr: CHK (5%): lt gysbhn, chky tex, calc, pty-blky, mnr mifcos, dul yeign flor
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
7540	7540	7540	7540	7540









MW: 9.1  
VIS: 41

4  
250  
3000

MW: 9.1  
VIS: 41

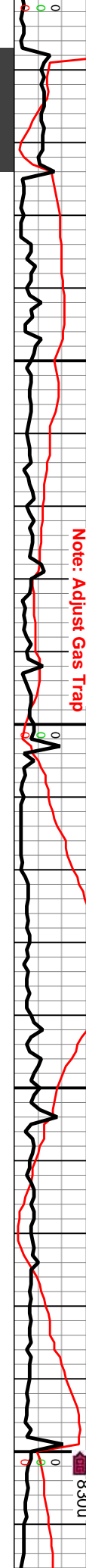
4  
250  
3000

MW: 9.1  
VIS: 41

4  
250  
3000



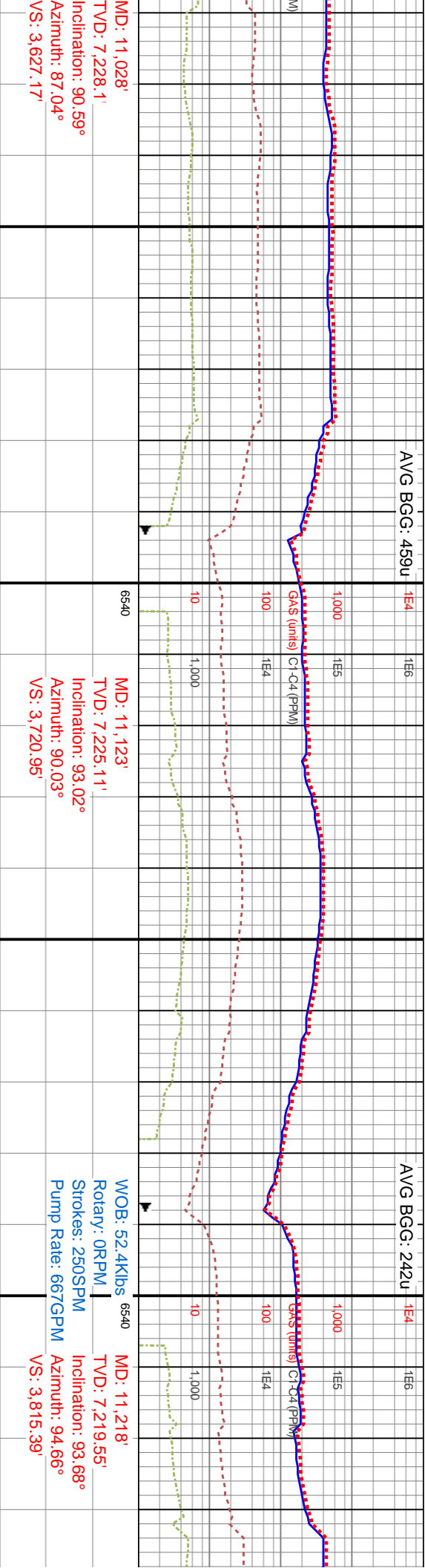
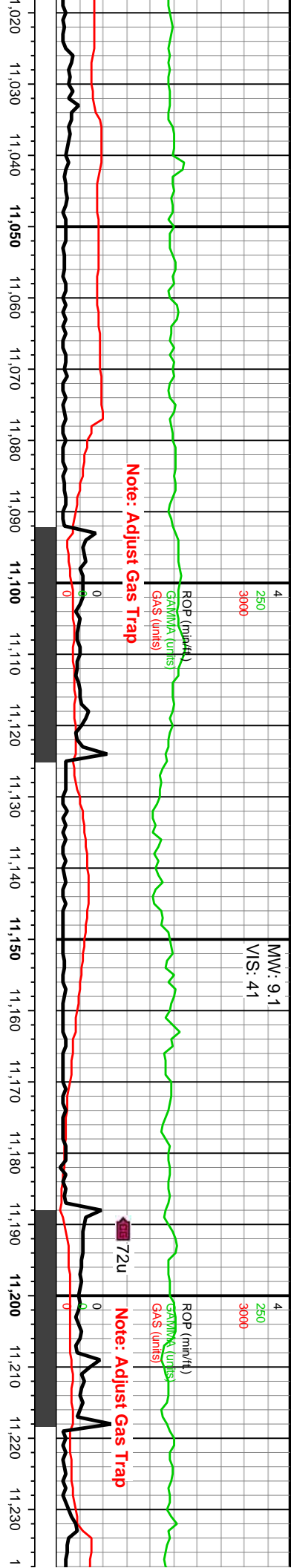
Note: Adjust Gas Trap



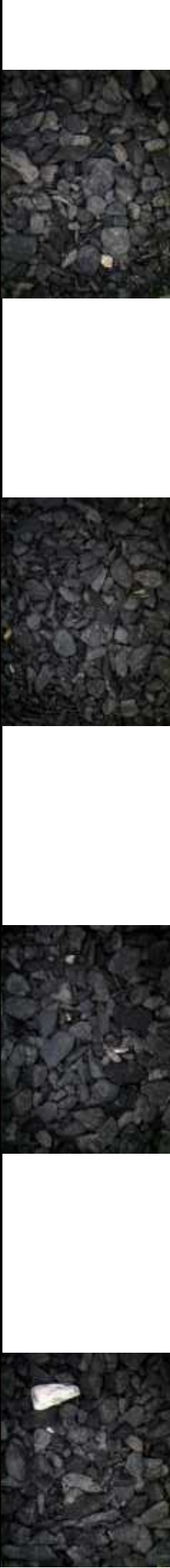
10820-10880 MRLST (85%): mot dk gy-med gyshbn, pty-blky, frm-sl hrd,sl slty tex, v calc, com-abnt pyrc nod: CHK (15%): mot-stri lt gyshbn, sl frm, blkly-sl pty, v calc, tr frac fil cal, dul yeign flor, dul mky cut, bishwh resdl ring	10880-10940 MRLST (70%): dk gy-med gy, frm-sl hrd, pty-sl spl, sm-sl slty tex, v calc, occ chk lam, scat pyrc nod intbdd w/cal, frac fil cal, pyrc vn: CHK (30%): lt gysbhn-crm, chky tex, calc, blkly, dul yeign flor, dul mky cut, bishwh resdl ring	10940-11000 MRLST (80%): mot med gy-dk gy, gysbhn, frm-sl hrd, blkly-sl eig, sm-sl slty tex, v calc: CHK (20%): mot lt gysbhn-gy, chky tex, calc, pty, bishwh-dul yeign flor, mky cut, dul bishwh resdl ring
MD: 10,838' TVD: 7,232.11' Inclination: 92° Azimuth: 87.34° VS: 3,440.27'	MD: 10,933' TVD: 7,229.52' Inclination: 91.12° Azimuth: 87.12° VS: 3,533.73'	WOB: 28.4kbs Rotary: 50RPM Strokes: 250SPM Pump Rate: 666GPM

mot dk gy-med gyshbn, pty-blky, frm-sl hrd,sl slty tex, v calc, com-abnt pyrc nod: CHK (15%): mot-stri lt gyshbn, sl frm, blkly-sl pty, v calc, tr frac fil cal, dul yeign flor, dul mky cut, bishwh resdl ring	dk gy-med gy, frm-sl hrd, pty-sl spl, sm-sl slty tex, v calc, occ chk lam, scat pyrc nod intbdd w/cal, frac fil cal, pyrc vn: CHK (30%): lt gysbhn-crm, chky tex, calc, blkly, dul yeign flor, dul mky cut, bishwh resdl ring	mot med gy-dk gy, gysbhn, frm-sl hrd, blkly-sl eig, sm-sl slty tex, v calc: CHK (20%): mot lt gysbhn-gy, chky tex, calc, pty, bishwh-dul yeign flor, mky cut, dul bishwh resdl ring
10820-10880 MRLST (85%)	10880-10940 MRLST (70%)	10940-11000 MRLST (80%)
10800	10880	10960
10840	10920	11000
10880	10960	11040
10920	11000	11080
10960	11040	11120
11000	11080	11160
11040	11120	11200
11080	11160	11240
11120	11200	11280
11160	11240	11320
11200	11280	11360
11240	11320	11400
11280	11360	11440
11320	11400	11480
11360	11440	11520
11400	11480	11560
11440	11520	11600
11480	11560	11640
11520	11600	11680
11560	11640	11720
11600	11680	11760
11640	11720	11800
11680	11760	11840
11720	11800	11880
11760	11840	11920
11800	11880	11960
11840	11920	12000
11880	11960	12040
11920	12000	12080
11960	12040	12120
12000	12080	12160
12040	12120	12200
12080	12160	12240
12120	12200	12280
12160	12240	12320
12200	12280	12360
12240	12320	12400
12280	12360	12440
12320	12400	12480
12360	12440	12520
12400	12480	12560
12440	12520	12600
12480	12560	12640
12520	12600	12680
12560	12640	12720
12600	12680	12760
12640	12720	12800
12680	12760	12840
12720	12800	12880
12760	12840	12920
12800	12880	12960
12840	12920	13000
12880	12960	13040
12920	13000	13080
12960	13040	13120
13000	13080	13160
13040	13120	13200
13080	13160	13240
13120	13200	13280
13160	13240	13280



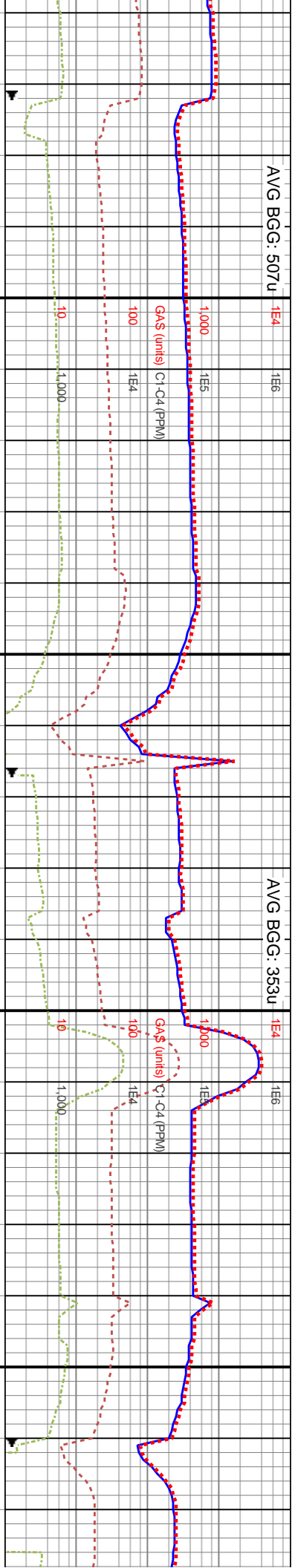
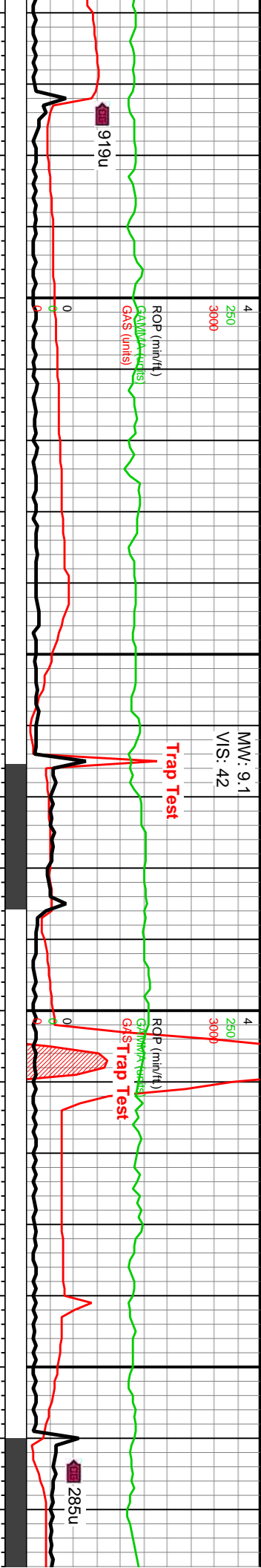


11060 MRLST (85%): mot dk gy-med v frm, pty-biky, sl rgh tex, v calc, tr f chk	11060-11120 MRLST (90%): dk gy-med gysbhn, frm-sl hrd, split-biky, v calc, tr f lam, scat pp pyr: CHK (10%): pred lt gysbhn, chk tex, calc, dul yelgn-bri orng flor, dul mky cut, dul bishwh resdl ring	11120-11180 MRLST (85%): mot dk gy-med gy, sm-sl rgh tex, sb split, frm, v calc, tr f lamn, scat mic pyr: CHK (15%): mot gysbhn, chk tex, biky, intbdd mlst, calc, dul yelgn flor, dul mky cut, mod bishwh resdl ring	11180-11240 MRLST (75%): dk gy-med gy, mot gysbhn, frm-sl hrd, v calc, sme chk lamn, mnr pp mic pyr, scat lse cal: CHK (25%): lt gysbhn, chk tex, calc, sb pty, dul yelgn flor, dul mky cut, mod bishwh resdl ring
11060 MRLST (85%): mot dk gy-med v frm, pty-biky, sl rgh tex, v calc, tr f chk	11060-11120 MRLST (90%): dk gy-med gysbhn, frm-sl hrd, split-biky, v calc, tr f lam, scat pp pyr: CHK (10%): pred lt gysbhn, chk tex, calc, dul yelgn-bri orng flor, dul mky cut, dul bishwh resdl ring	11120-11180 MRLST (85%): mot dk gy-med gy, sm-sl rgh tex, sb split, frm, v calc, tr f lamn, scat mic pyr: CHK (15%): mot gysbhn, chk tex, biky, intbdd mlst, calc, dul yelgn flor, dul mky cut, mod bishwh resdl ring	11180-11240 MRLST (75%): dk gy-med gy, mot gysbhn, frm-sl hrd, v calc, sme chk lamn, mnr pp mic pyr, scat lse cal: CHK (25%): lt gysbhn, chk tex, calc, sb pty, dul yelgn flor, dul mky cut, mod bishwh resdl ring
11060 MRLST (85%): mot dk gy-med v frm, pty-biky, sl rgh tex, v calc, tr f chk	11060-11120 MRLST (90%): dk gy-med gysbhn, frm-sl hrd, split-biky, v calc, tr f lam, scat pp pyr: CHK (10%): pred lt gysbhn, chk tex, calc, dul yelgn-bri orng flor, dul mky cut, dul bishwh resdl ring	11120-11180 MRLST (85%): mot dk gy-med gy, sm-sl rgh tex, sb split, frm, v calc, tr f lamn, scat mic pyr: CHK (15%): mot gysbhn, chk tex, biky, intbdd mlst, calc, dul yelgn flor, dul mky cut, mod bishwh resdl ring	11180-11240 MRLST (75%): dk gy-med gy, mot gysbhn, frm-sl hrd, v calc, sme chk lamn, mnr pp mic pyr, scat lse cal: CHK (25%): lt gysbhn, chk tex, calc, sb pty, dul yelgn flor, dul mky cut, mod bishwh resdl ring

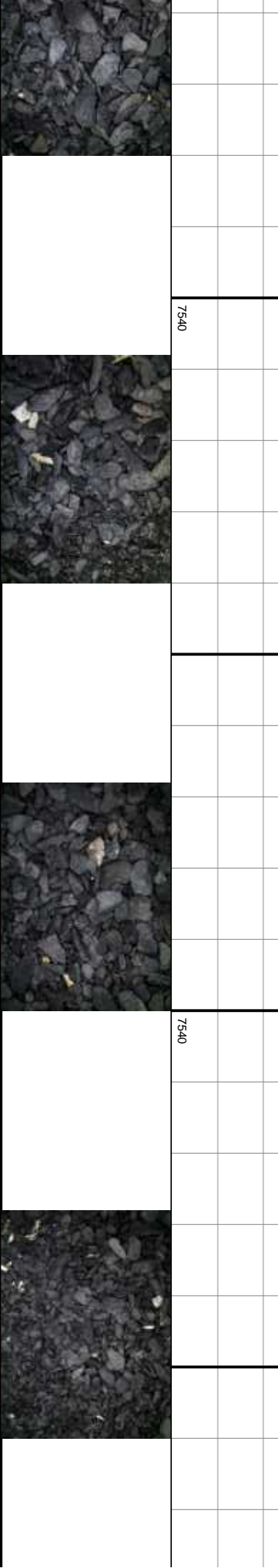




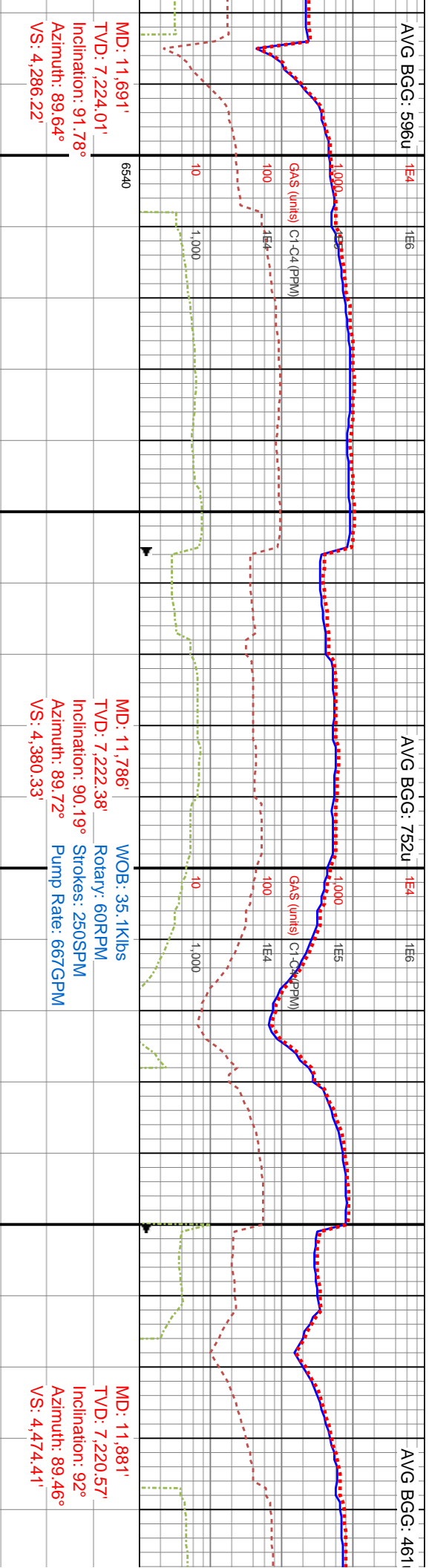
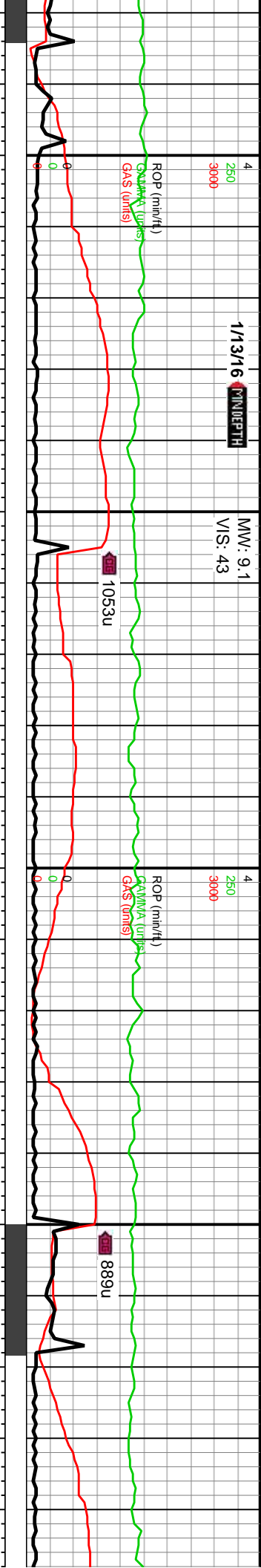




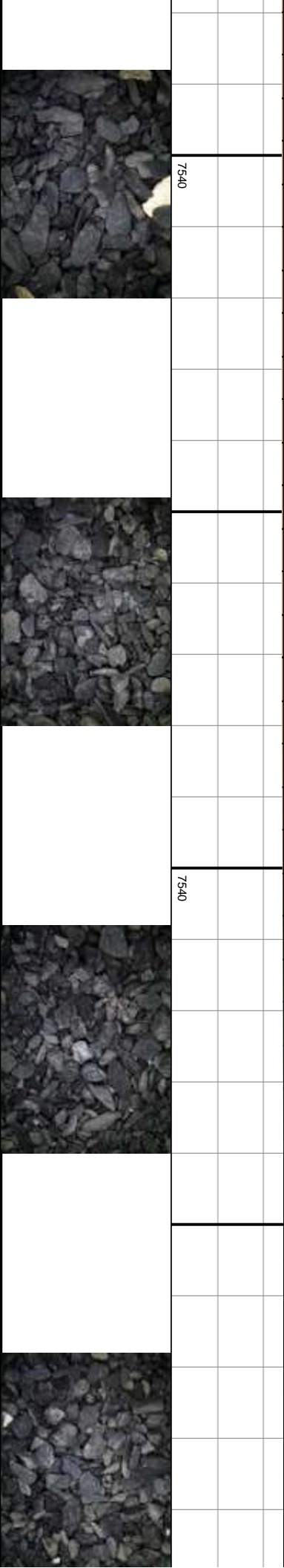
6540	11480-11540 MRLST (90%): med gy-dk gy, frm-sl hrd, sb ply, sl rgn tex, mnr scat mic pyr, v calc; CHK (10%); lt gysbhn-crm, calc; intbdd mlst, mnr micfos, sb blk, dul yelgn flr, dul mky cut, mod blshwh resdl ring	11540-11600 MRLST (85%): mot dk gy-med gy, sm-sl rgn tex, sb spl, frm, v calc, tr f lamn, scat mic pyr; CHK (15%); mot gysbhn, crm, chky tex, blk, intbdd mlst, calc, dul yelgn flr, dul mky cut, mod blshwh resdl ring	11600-11660 MRLST (95%): dk gy-med gy, frm-sl hrd, blk-ply, sl absrv tex, tr f lamn, v calc, pp mic pyr; CHK (5%); mot lt gysbhn, chky tex, blk, calc, dul yelgn flr, dul mky cut, bishwh resdl ring	11660-11720 MRLST (95%): dk gy-med gy, frm-sl hrd, blk-ply, sl absrv tex, tr f lamn, v calc, pp mic pyr; CHK (5%); mot lt gysbhn, chky tex, blk, calc, dul yelgn flr, dul mky cut, bishwh resdl ring
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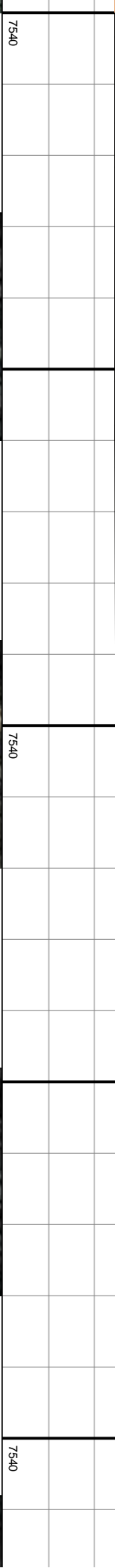
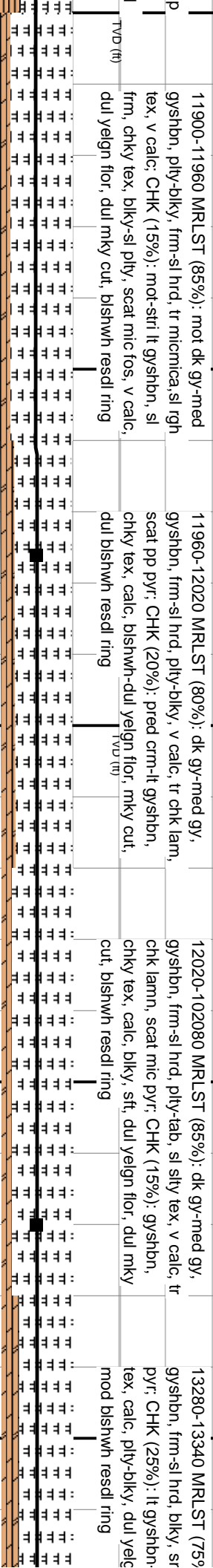
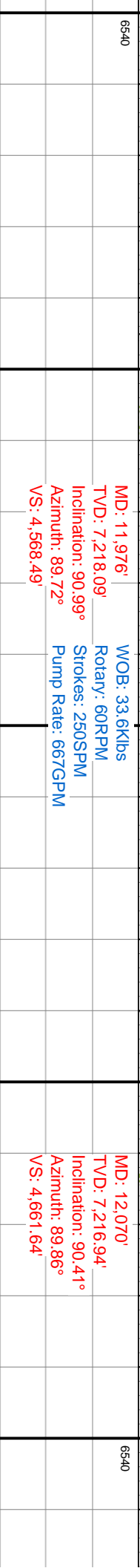
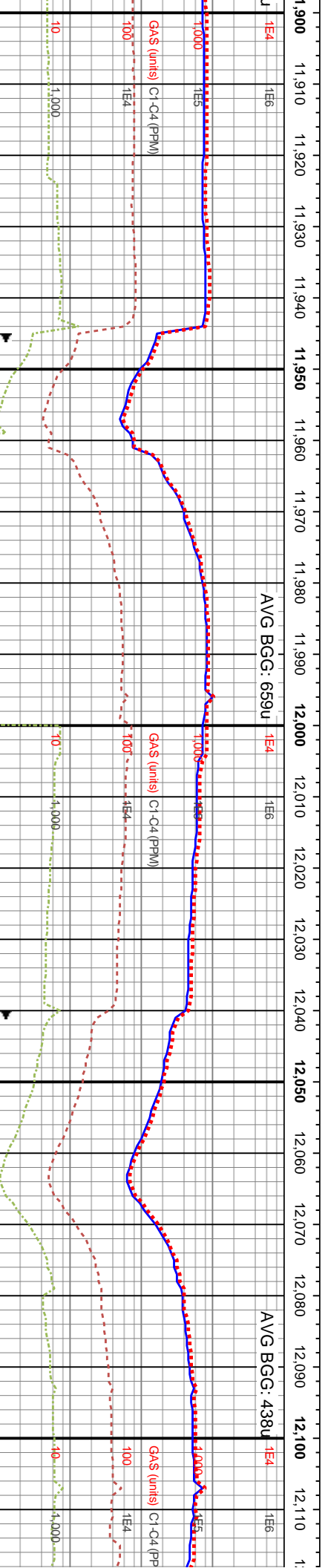
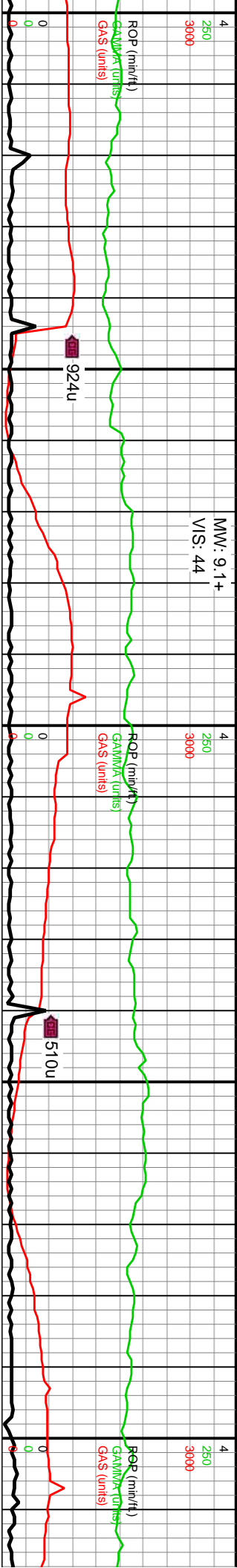


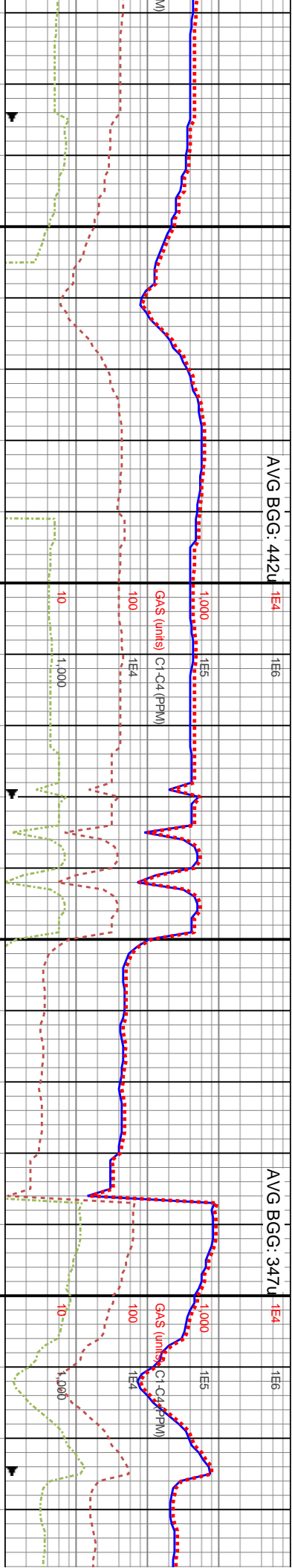
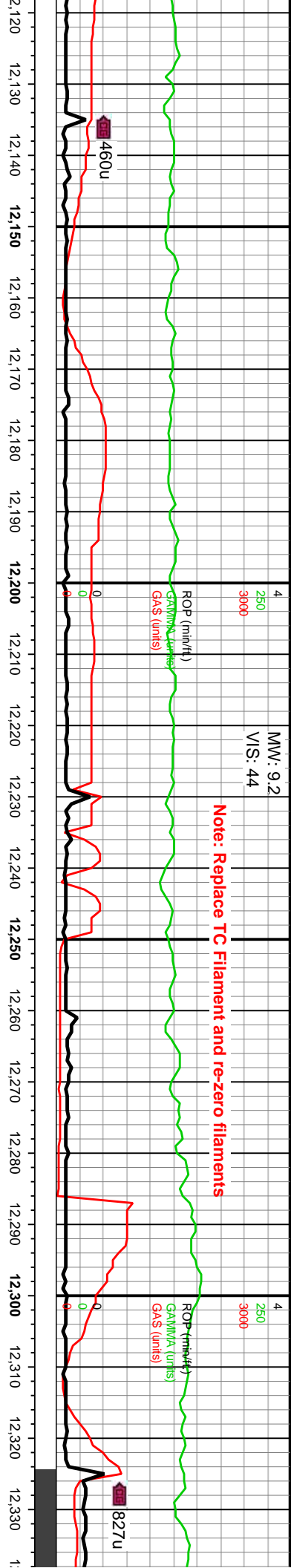




11720 MRLST (80%): mot dk gy-med ply-biky, frm-sl hrd, tr micmica,sl slty calc: CHK (20%): mot-siri lt gysbhn, sl v-sl ply, v calc, tr frac fil cal, dul yelgn mky cut, blshwn resdl ring	11720-11780 MRLST (80%): mot dk gy-med gy, sm-sl rgn tex, sb spl, frm, v calc, tr f lamn, scat mic pyr: CHK (20%): mot gysbhn, chky tex, biky, intbdd mlst, calc, dul yelgn flr, dul mky cut, mod blshwn resdl ring	11780-11840 MRLST (75%): mot dk gy-med gy, frm-sl hrd, biky-ply, sl rgn tex, v calc, tr intbd chk lam, scat imbd pyr: CHK (25%): lt gysbhn, chky tex, calc, biky, dul yelgn flr, dul mky cut, blshwn resdl ring	11840-11900 MRLST (65%): mot dk gy-med gy, frm-sl hrd, sb tab, sl slty tex, v calc, scat p pyr: CHK (35%): lt gysbhn-tr, calc, sb biky, intbdd wi mlst, mnr mic fos, dul yelgn flr, du mky cut, mod blshwn resdl ring
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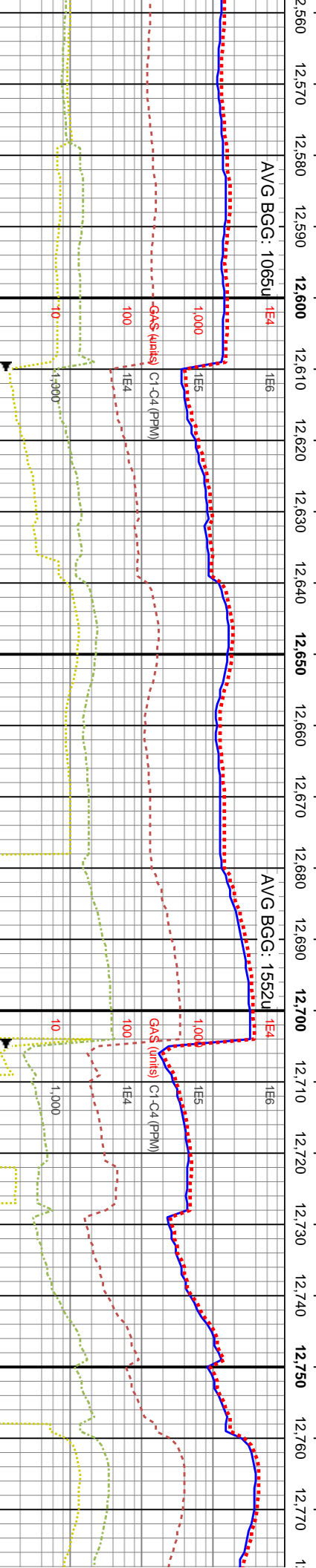
MD: 12,165' TVD: 7,216.59' Inclination: 90.01° Azimuth: 89.24° VS: 4,755.74'	WOB: 35.8Klbs Rotary: 50RPM Strokes: 250SPM Pump Rate: 667GPM	MD: 12,260' TVD: 7,217.49' Inclination: 88.91° Azimuth: 90.03° VS: 4,849.85'	6540
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12140-12200 MRLST (70%): mot dk gy-med gysbhn, pty-blky, frm-sl hrd, sl silty tex, v calc: CHK (30%): mot lt gysbhn-gysbhn, sft-sl frm, chky tex, blk-y-sl pty, scat mic fos, v calc, dul yelgn flor, dul mky cut, bishwh resdl ring	12200-12260 MRLST (75%): mot dk gy-med gysbhn, pty-blky, frm-sl hrd, sl silty tex, v calc: CHK (25%): mot lt gysbhn-gysbhn, sft-sl frm, chky tex, blk-y-sl pty, scat mic fos, v calc, dul yelgn flor, dul mky cut, bishwh resdl ring	12260-12320 MRLST (70%): mot med gy-dk gysbhn, frm-sl hrd, blk-y, sm tex, v calc, scat pp pyr: CHK (30%): lt gysbhn-offwh, crm, chky tex, calc, pty-blky, dul yelgn flor, dul mky cut, mod bishwh resdl ring	12320-12330-1 mot med silty tex, (25%): n dul yelgn
TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)









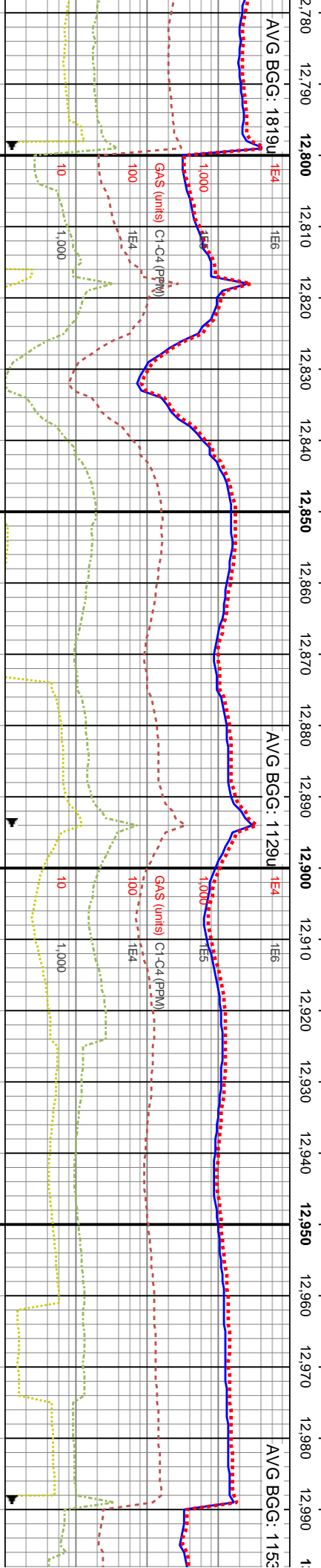
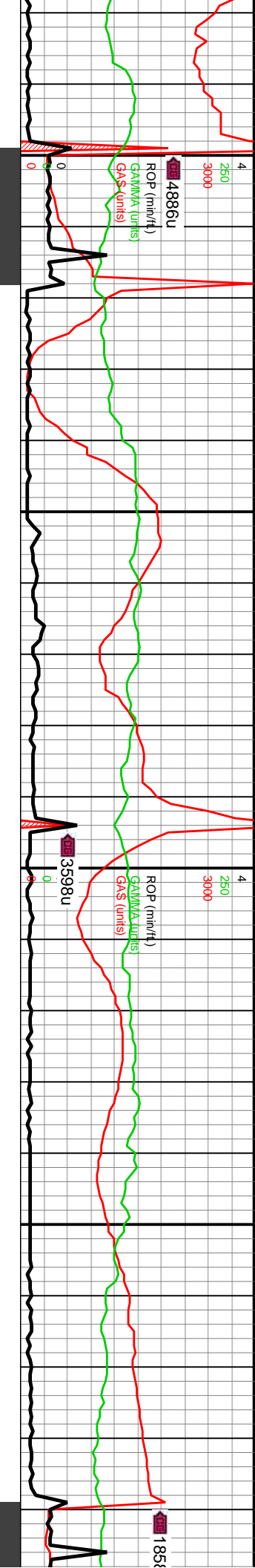
MD: 12,640'  
TVD: 7,211.64'  
Inclination: 92.4°  
Azimuth: 89.24°  
VS: 5,226.47'

6540	MD: 12,734'
	TVD: 7,208.68
	Inclination: 91°
	Azimuth: 91.22
	VS: 5,319.67'

12680-12740 MRLST (60%): mot dk gy-med  
gy, frm-hrd, tab-sb biky, v calc, sm-sl sily tex,  
scat pyrc nod; CHK (40%): mot it gy/shn-crm,  
chky tex, sb pily, calc, dui yeign flor, dui mky  
cut, mod bishwh resdl ring

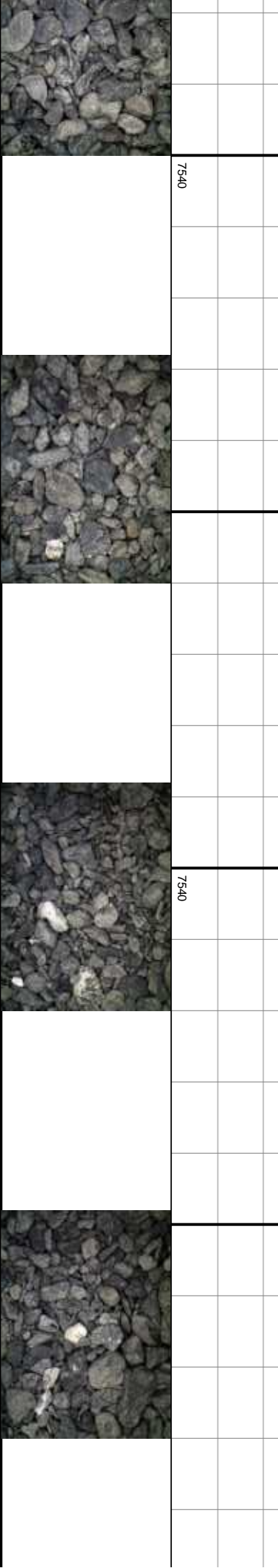
12740-12800 MRLEST (55%)  
frn-sl hrd, ply-sb blkly, sm  
imbd pp pyr; CHK (45%): r  
chky tex, predy intbdd mrlst  
mky cut, mod bishwh resdl





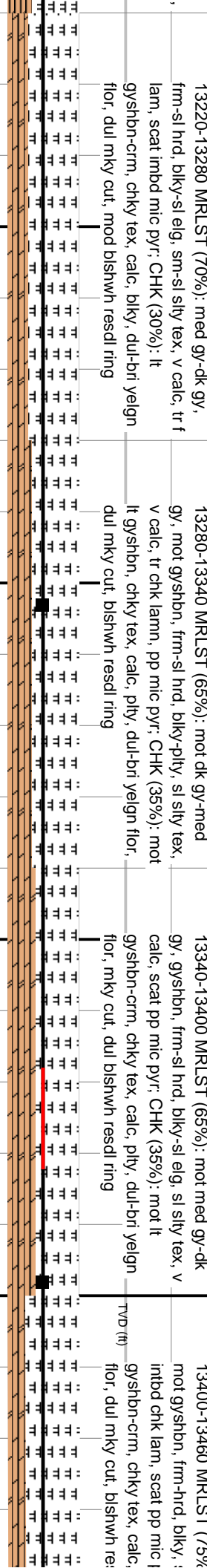
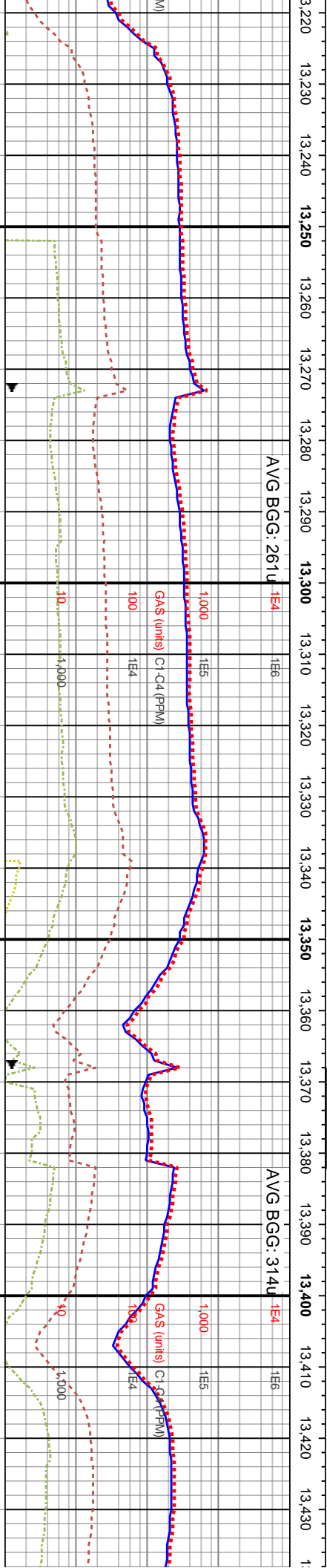
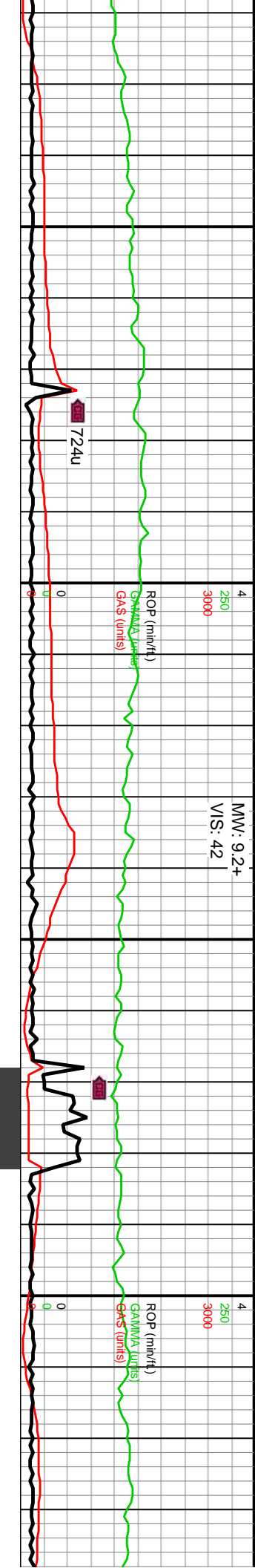
WOB: 54.3kIbs Rotary: 0RPM Strokes: 226SPM Pump Rate: 657GPM	MD: 12,829' TVD: 7,208.76' Inclination: 88.69° Azimuth: 92.32° VS: 5.414.19'	WOB: 82.1 Rotary: 0R Strokes: 22 Pump Rate:
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12800-12860 MRLST (60%): dk gy-med gy, ply-sb blk, frm-hrd, sl abrsv tex, v calc; CHK (40%): mot crm-gyshbn, sft-sl frm, chky tex, blk, scat mic fos, predy inbdd mrist, dul yeign flor, dul mky cut, bishwh resdl ring	12860-12920 MRLST (75%): dk gy, mot med gy, frm-sl hrd, ply-blky, sl sfty tex, chk lamm, v calc, pp mic pyr; CHK (25%): crm-gyshbn, sft, vf lamm, inbdd mrist, calc, chky tex, dul yeign flor, dul mky cut, bishwh resdl ring	12920-12980 MRLST (65%): mot dk gy-med gy, frm-sl hrd, blk-elig, sl sfty tex, v calc, inbd chk lam, scat imbd pyr; CHK (35%): lt gyshbn, chky tex, calc, blk, dul yeign flor, dul mky cut, bishwh resdl ring	12980-12990 MRLST (65%): mot dk gy-med gy, frm-sl hrd, blk-elig, sl sfty tex, v calc, inbd chk lam, scat imbd pyr; CHK (35%): lt gyshbn, chky tex, calc, blk, dul yeign flor, dul mky cut, bishwh resdl ring
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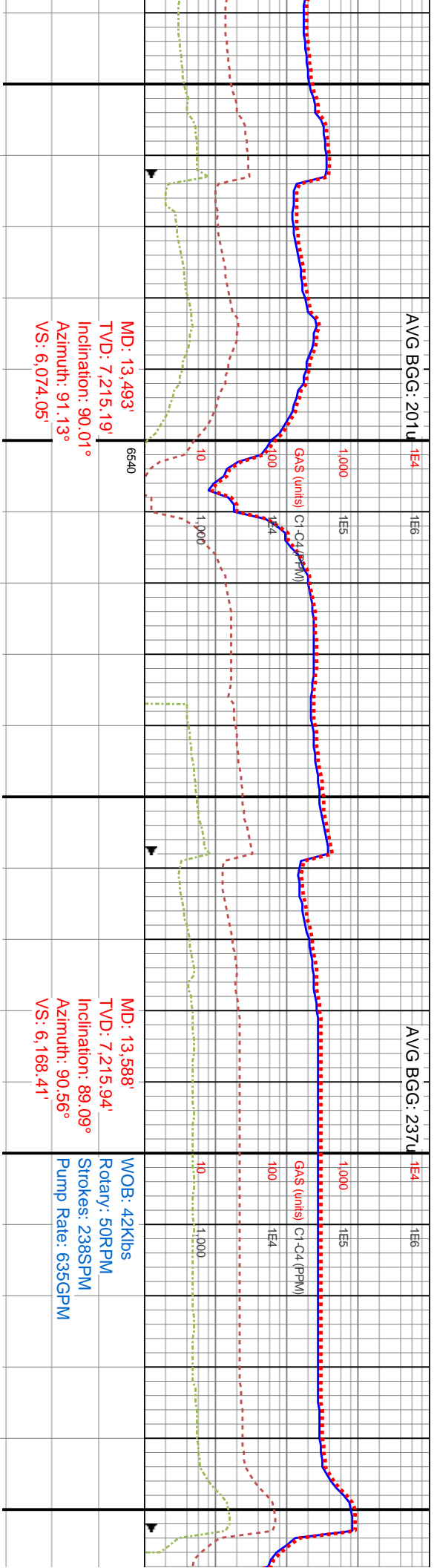
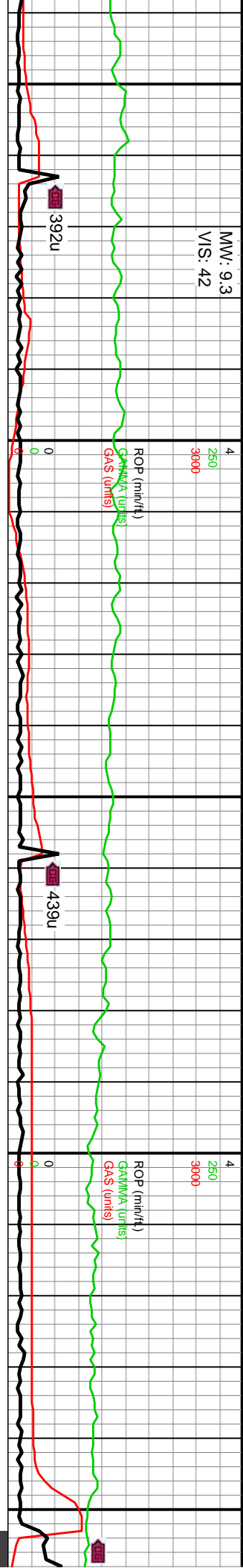








MW: 9.3  
VIS: 42



MD: 13,493'  
TVD: 7,215.19'  
Inclination: 90.01°  
Azimuth: 91.13°  
VS: 6,074.05'

MD: 13,588'  
TVD: 7,215.94'  
Inclination: 89.09°  
Azimuth: 90.56°  
VS: 6,168.41'

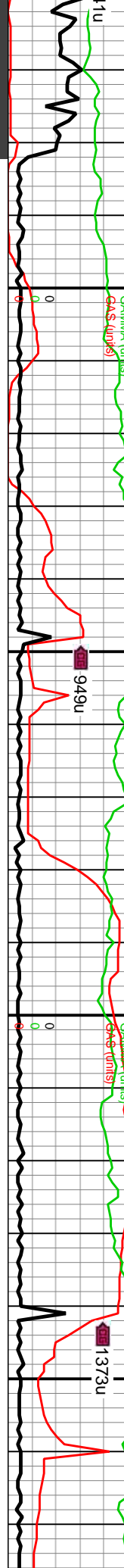
WOB: 42Klbs  
Rotary: 50RPM  
Strokes: 238SPM  
Pump Rate: 635GPM

13440-13450 mot dk gy-blk gy, sl abrsv tex, v calc, gyr: CHK (25%): lt biky, dul-bri yeign resdl ring	13460-13520 MRLST (80%): dk gy-med gy, occ gysbhn, frm-sl hrd, pily-blky, v calc, chk lam, scat pp pyr: CHK (20%): lt gysbhn, stri ip, chky tex, mnr mic fos, dul-bri yeign flor, dul mky cut, mod bishwh resdl ring	13520-13580 MRLST (80%): dk gy-med gy, occ gysbhn, frm-sl hrd, pily-blky, v calc, tr chk lam, scat pp pyr: CHK (20%): lt gysbhn, stri ip, chky tex, mnr mic fos, dul-bri yeign flor, dul mky cut, mod bishwh resdl ring	13580-13640 MRLST (75%): dk gy-med gy, gysbhn, frm-sl hrd, pily-sb biky, sm tex, occ sl sily, v calc, scat imbd pp pyr: CHK (25%): mot gysbhn-offwnt, chky tex, sft, dul-bri yeign flor, dul mky cut, mod bishwh resdl ring	13640-13650 gy, gysb calc, sce gysbhn- flor, mky





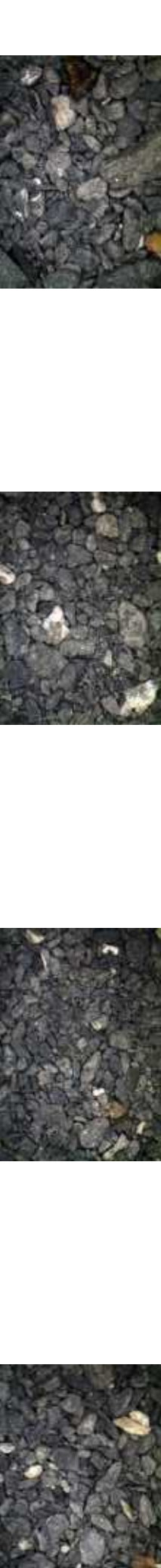
Note: C/O Section of Gas Line



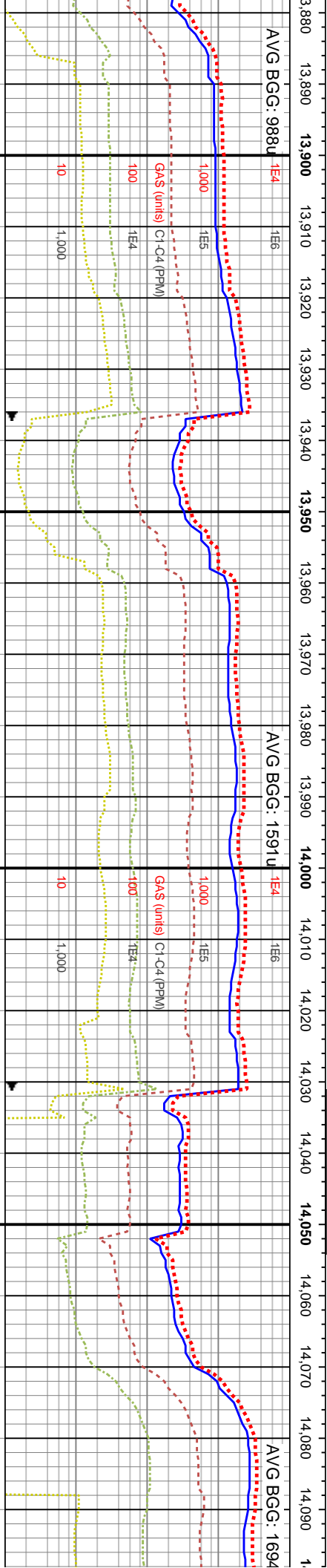
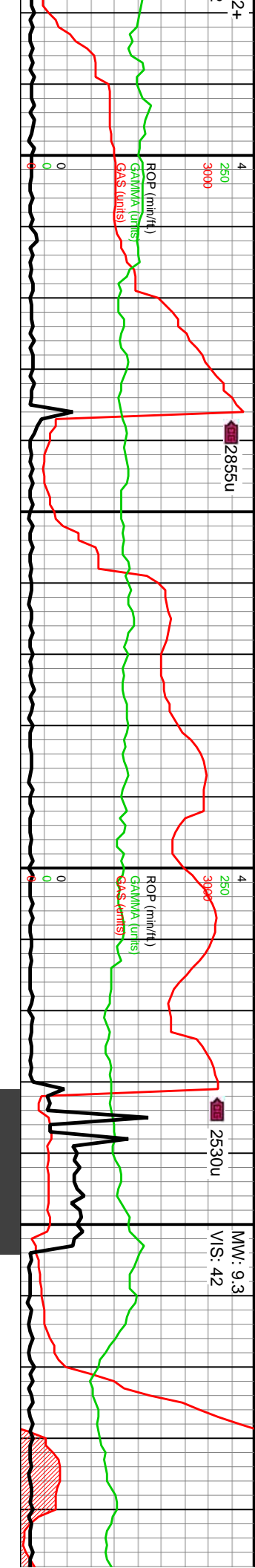
13,660 13,670 13,680 13,690 13,700 13,710 13,720 13,730 13,740 13,750 13,760 13,770 13,780 13,790 13,800 13,810 13,820 13,830 13,840 13,850 13,860 13,870 1-

AVG BGG: 230u		1E4	1E6
MD: 13,683'		GAS (units)	
TVD: 7,215.55'		C1-C4 (PPM)	
Inclination: 91.38°		1000 1E5	
Azimuth: 87.74°		100 1E4	
VS: 6,262.4'		10 1,000	
13700 MRLST (65%): mot med gy-dk bn, frm-sl hrd, blkyl-sl elg, sl silty tex, v it pyc nod; CHK (35%): mot lt crm, chky tex, calc, pily, dul-bri yeign cut, dul bishwh resdl ring	13700-13760 MRLST (70%): med gy-gyshbn, dk gy, frm-sl hrd, pily-sb blkyl, silty tex, v calc, scat imbd pp pyr; CHK (30%): gysbhn-crm, chky tex, sb blkyl, dul-bri yeign flor, dul mky cut, bishwh resdl ring	13760-13820 MRLST (60%): dk gy-gyshbn, blk gy, frm-sl hrd, pily-sb blkyl, sm tex, occ sl silty, v calc, scat imbd pp pyr; CHK (40%): mot gyshbn-offwnt, chky tex, sft, dul yeign flor, dul mky cut, bishwh resdl ring	13820-13880 MRLST (70%): dk gy-med gy, frm-v frm, sb blkyl, sl silty tex, v calc, imbd chk, scat imbd pyr; CHK (30%): crn-lt gysbhn, tr mic fos, chky tex, calc, dul yeign-bri ornng flor, dul mky cut, bishwh resdl ring

AVG BGG: 519u		1E4	1E6
MD: 13,777'		GAS (units)	
TVD: 7,213.5'		C1-C4 (PPM)	
Inclination: 91.12°		1000 1E5	
Azimuth: 87.65°		100 1E4	
VS: 6,355.02'		10 1,000	
13700 MRLST (65%): mot med gy-dk bn, frm-sl hrd, blkyl-sl elg, sl silty tex, v it pyc nod; CHK (35%): mot lt crm, chky tex, calc, pily, dul-bri yeign cut, dul bishwh resdl ring	13700-13760 MRLST (70%): med gy-gyshbn, dk gy, frm-sl hrd, pily-sb blkyl, silty tex, v calc, scat imbd pp pyr; CHK (30%): gysbhn-crm, chky tex, sb blkyl, dul-bri yeign flor, dul mky cut, bishwh resdl ring	13760-13820 MRLST (60%): dk gy-gyshbn, blk gy, frm-sl hrd, pily-sb blkyl, sm tex, occ sl silty, v calc, scat imbd pp pyr; CHK (40%): mot gyshbn-offwnt, chky tex, sft, dul yeign flor, dul mky cut, bishwh resdl ring	13820-13880 MRLST (70%): dk gy-med gy, frm-v frm, sb blkyl, sl silty tex, v calc, imbd chk, scat imbd pyr; CHK (30%): crn-lt gysbhn, tr mic fos, chky tex, calc, dul yeign-bri ornng flor, dul mky cut, bishwh resdl ring



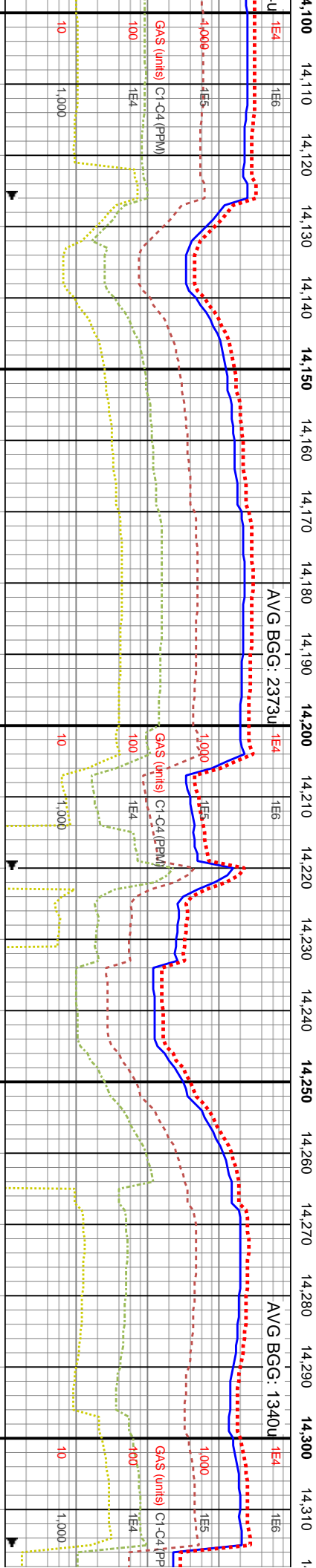
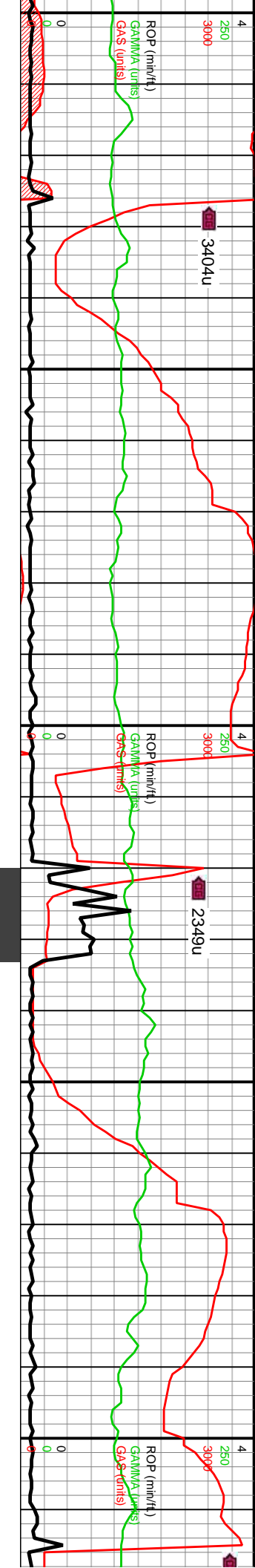




13880-13940 MRLST (60%): pred dk gy-med gy, gysbhn, frm-sl hrd, sm tex, occ sl silty, pfty-sb blk, v calc, scat imbd pp pyr, CHK (40%): mot gysbhn-lt gy, sft, chky tex, dul-bri yeign flr, dul mky cut, mod bishwh resdl ring	13940-14100 MRLST (65%): dk gy-med gy, gysbhn, frm-sl hrd, pfty-tab, sl silty tex, v calc, chk lamm, scat pyrc nod: CHK (35%): gysbhn-crm, chky tex, calc, blk, sft, dul yeign flr, dul mky cut, bishwh resdl ring	14100-14160 MRLST (80%): mot dk gy, med gy, frm-hrd, tab-blky, sm-sl abrsv tex, v calc, scat imbd pyr, CHK (20%): mot crm-lt gysbhn, chky tex, calc, mnr micfos, dul-bri yeign flr, dul mky cut, mod bishwh resdl ring	14160-14220 MRLST (65%): gy, mot gysbhn, frm-sl hrd, v calc, tr micmica, pp mic p lt gysbhn-crm, offwht, chky dul yeign flr, dul mky cut, t
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13880-13940 MRLST (60%): pred dk gy-med gy, gysbhn, frm-sl hrd, sm tex, occ sl silty, pfty-sb blk, v calc, scat imbd pp pyr, CHK (40%): mot gysbhn-lt gy, sft, chky tex, dul-bri yeign flr, dul mky cut, mod bishwh resdl ring	13940-14100 MRLST (65%): dk gy-med gy, gysbhn, frm-sl hrd, pfty-tab, sl silty tex, v calc, chk lamm, scat pyrc nod: CHK (35%): gysbhn-crm, chky tex, calc, blk, sft, dul yeign flr, dul mky cut, bishwh resdl ring	14100-14160 MRLST (80%): mot dk gy, med gy, frm-hrd, tab-blky, sm-sl abrsv tex, v calc, scat imbd pyr, CHK (20%): mot crm-lt gysbhn, chky tex, calc, mnr micfos, dul-bri yeign flr, dul mky cut, mod bishwh resdl ring	14160-14220 MRLST (65%): gy, mot gysbhn, frm-sl hrd, v calc, tr micmica, pp mic p lt gysbhn-crm, offwht, chky dul yeign flr, dul mky cut, t
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MD: 14,155'  
TVD: 7,206.43'  
Inclination: 90.99°  
Azimuth: 89.64°  
VS: 6,728.32'

WOB: 41.8kIbs  
Rotary: 70RPM  
Strokes: 234SPM  
Pump Rate: 625GPM

MD: 14,250'  
TVD: 7,205.86'  
Inclination: 89.7°  
Azimuth: 90.96°  
VS: 6,822.58'

14120-14180 MRLST (60%): mot dk gy-med  
gysbhn, pty-blky, frm-sl hrd, sl rgh tex, v calc,  
scat pyrc nod; CHK (40%): mot lt gysbhn, sl  
frm, chky tex, blk-sl pty, v calc, dul yelgn flr,  
dul mky cut, bishwh resdl ring

14180-14240 MRLST (75%): dk gy-med gy,  
frm-v frm, sb blk, sl rgh tex, v calc, intbd chk  
lam, scat pyrc nod; CHK (25%): lt gysbhn, tr  
mic fos, chky tex, calc, dul yelgn, dul mky cut,  
bishwh resdl ring

14240-14300 MRLST (60%): mot dk gy-med  
gysbhn, pty-blky, frm-sl hrd, sl rgh tex, v calc;  
CHK (40%): mot lt gy-gysbhn, sft-sl frm, chky  
tex, blk-sl pty, tr mic fos, v calc, dul yelgn flr,  
dul mky cut, bishwh resdl ring

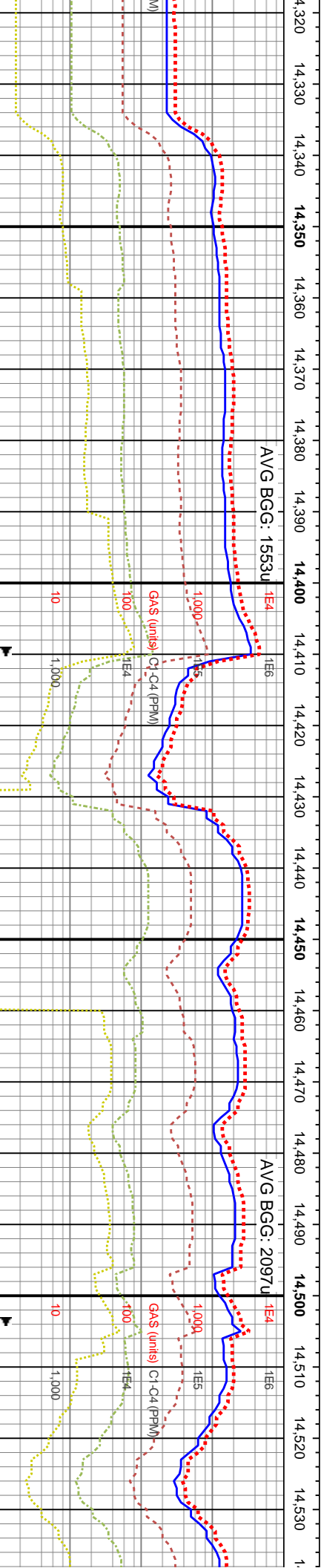
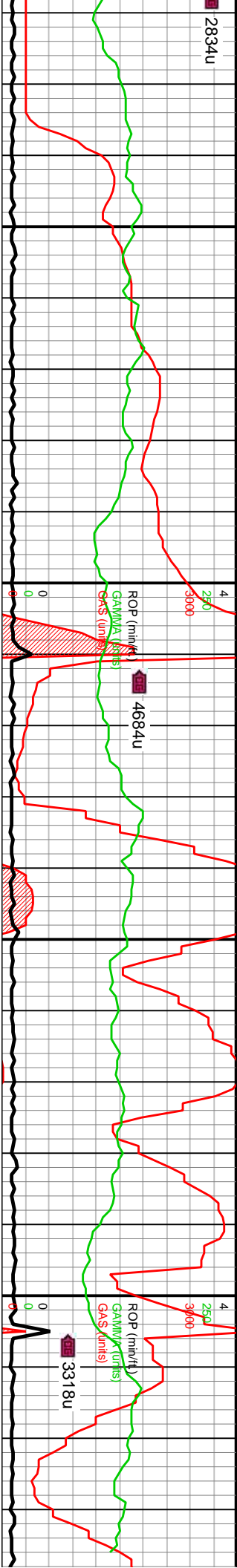
14300-  
gy, gysl  
pty-sb l  
mot gys  
dul mky

7540

7540

7540

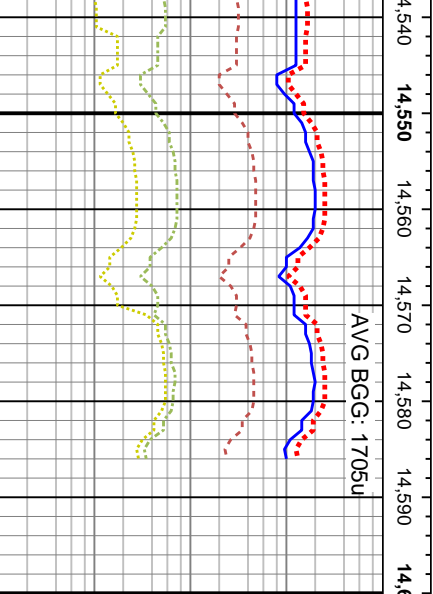
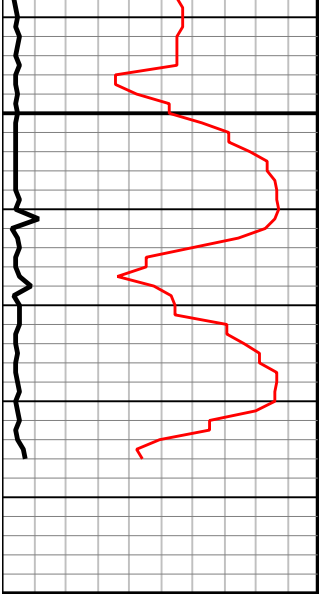




MD: 14,344' TVD: 7,206.02' Inclination: 90.1° Azimuth: 90.34° VS: 6,915.91'		WOB: 42.4Klbs Rotary: 60RPM Strokes: 232SPM Pump Rate: 620GPM		MD: 14,439' TVD: 7,205.6' Inclination: 90.41° Azimuth: 90.56° VS: 7,010.2'		MD: 14,522' TVD: 7,205.1' Inclination: 90.28° Azimuth: 89.94° VS: 7,092.55'	
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14360 MRLST (70%): pred dk gy-med bly, frm-sl hrd, sm tex, occ sl silty, bly, v calc, scat pyrc nod; CHK (30%): hbn-lt gy, sft, chky tex, dul yelgn flr, cut, mod bishwh resd ring	14360-14420 MRLST (65%): pred dk gy-gyshbn, frm-sl hrd, bly, sm tex, v calc, scat pp pyr, mnr micfos; CHK (35%): lt gyshbn-tn, chky tex, calc, pty-bly, dul yelgn flr, dul mky cut, mod bishwh resd ring	14420-14480 MRLST (70%): dk gy-med gy, frm-v frm, sb bly, sl silty tex, v calc, intbd chk lam, scat imbd pyr; CHK (30%): pred lt gyshbn, tr mic fos, chky tex, calc, dul yelgn flr, dul mky cut, bishwh resd ring	14480-14540 MRLST (75%): pred dk gy, mec gy, frm-hrd, sb tab-splt, sm-sl rgh tex, v calc, scat pyrc nod; CHK (25%): mot lt gyshbn, stri chky tex, calc, spl, dul yelgn flr, dul mky cut mod bishwh resd ring
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**\*\*Projection to Bit\*\***

MD: 14,586'  
TVD: 7,204.79'  
Inclination: 90.28°  
Azimuth: 89.94°  
VS: 7.156'

14540-14586 MRLST (75%): mot dk gy-dk  
gysbhn, frm-hrd, pty-sb blk, sm-sl sily tex, v  
calc, chk lamm; CHK (25%): pred lt gysbhn,  
chky tex, calc, blk, sft, mnr micfos, dul yelgn  
flor, dul mky cut, bshwh resdl ring

