



RESERVOIR GROUP

Scale: 5" / 100'
Measured Depth Log

Well Name 70 Ranch 10-14-1L

Location 104°25'45.552"W, 40°20'05.136"N

State CO

County WELD

Country USA

Rig Number ENSIGN 140

API Number 05-123-47593

AFE # 101031

Geographic Region ROCKIES

Field WATTENBURG

Spud Date 5/27/2019

Drilling Completed 16,347'

Surface Coordinates 104°25'45.552"W
40°20'05.136"N

Bottom Hole Coordinates 104°25'37.164"W
40°19'58.260"N

Ground Elevation 4,597'

K.B. Elevation 4,617'

Logged Interval 6,000' To 16,347'

Total Depth 16,347'

Formation NIO A BENCH

Type of Drilling Fluid OIL BASED MUD

Operator

Company CONFLUENCE DJ LLC

Address 621 17th St. STE. 1401
DENVER, CO. 80293



Geologist

Name Robin Swank

Company CONFLUENCE DJ LLC

Address 621 17th St. STE. 1401
DENVER, CO. 80293



Other

Service Type Two-Man Logging + ASW
Logger(s) Robert Kelley / Micah Morgan
Equipment ML-570
Start Date 6/23/2019
Release Date 6/29/2019
Address Reservoir Group
6360 W Sam Houston Pkwy N
Houston, TX 77041
Job Number 2280RK1906

Accesso

- Fossils**

F FOSSIL

ARGILLACEOUS

ARGILLITE GRAIN

ALGAE

AMORPHITE

BITUMENOUS SUBSTANCE

BELEMNITE

BRYOZOA

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CRINOID

ECHINOID

FISH

FORAMINIFERA

OOLITE

OSTRACOD

PELECYPOD

BELEMNITE

PISOLITE

PLANT REMAINS

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

OOLITE

OSTRACOD

PELECYPOD

BELEMNITE

PISOLITE

PLANT REMAINS

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

Minerals

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

DOLOMITIC

COAL - THIN BEDS

CHERT

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

DOLOMITIC

COAL - THIN BEDS

CHERT

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

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

Other Syn

- Oil Show**

ORGANIC

PINPOINT

VUGGY

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

Engineering

BIT

CASING

REVERSE FLOW

SIDEWALL CORE

SLIDE

SURVEY

TRIP GAS

WIRELINE TEST

WIRELINE TEST

FAULT

Porosity

E EARTHY

F FENESTRAL

INTERFRACTURE

INTERCRYSTALLINE

INTERCRYSTALLINE

MOLDIC

ries

	GLAUCONITE		
	GYPSEFEROUS		
	HEAVY MINERAL		ANHYDRITE STRINGER
	KAOLIN		BENTONITE STRINGER
	MARLSTONE		COAL STRINGER
	MINERAL CRYSTALS		DOLOMITE STRINGER
	NODULES		GYPSEUM STRINGER
	PHOSPHATE PELLETS		LIMESTONE STRINGER
	PYRITE		MARLSTONE (CALC) STRG
	SALT CAST		MARLSTONE (DOL) STRG
	SANDY		SANDSTONE STRINGER
	SILICEOUS		SHALE STRINGER
	SILTY		SILTSTONE STRINGER
	TUFFACEOUS		

Stringer

mbols

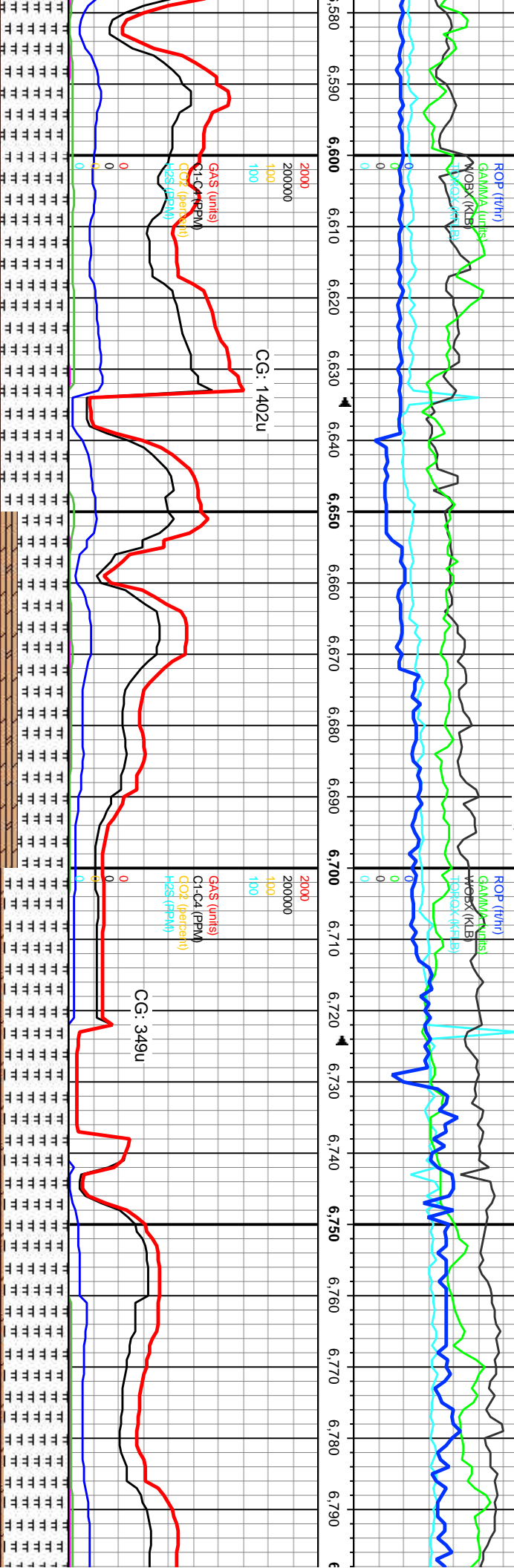
ATION TOP		L LITHOGRAPHIC
	Rounding	MICROCLIN
DEPTH	ANGULAR	MUDSTONE
ULT	ROUNDED	PACKSTONE
	SUBANG	WACKESTONE
ED STRATA	SUBRND	
ULT		
	Textures	
ORE (LEFT)		MODERATE
ORE (RIGHT)	BOUNDSTONE	POOR
	CHALKY	WELL
	CRYPTOXLN	
	EARTHY	
ESTED - LEFT	FINELYXLN	
ESTED - RT	GRAINSTONE	

MW I/O
9.7/48
9.7/45

WOB: 23
RPM: 120
SPM: 200
PP: 2.890

MINDEPTH
6/25/2019
@ 6,749' MD

MW I/O
9.6+/4
9.6+/4



DK GY, SME BLK
R, FRM TO SL HD,
AMOR, SB FISS, SL

100% MRLST: MUDST, DK GY TO BLK,
GRITTY TEX, DL TO RTHY LSTR, FRM TO
SL HD, HD IP, SB BLKY TO BLKY, AMOR,
SB FISS, SL SLTY, CALC, TR CHK IP

70% MRLST: MDSTN, DK GY TO BLK, SL
SM TO GRITTY TEX, RTHY LSTR, SL HD
TO HRD, SB BLKY-BLKY, AMOR, SL FISS,
TR INTBDD CHK, SLTY IP, CALC;
30% CHK, LT GY, SFT TO FRM, SB
BLKY-BLKY, V CALC

90% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, RTHY LSTR, SL HD, SB
BLKY-BLKY, AMOR, SL FISS, SLTY IP,
CALC;
10% CHK, MED GY, SFT TO FRM, SB
BLKY-BLKY, V CALC

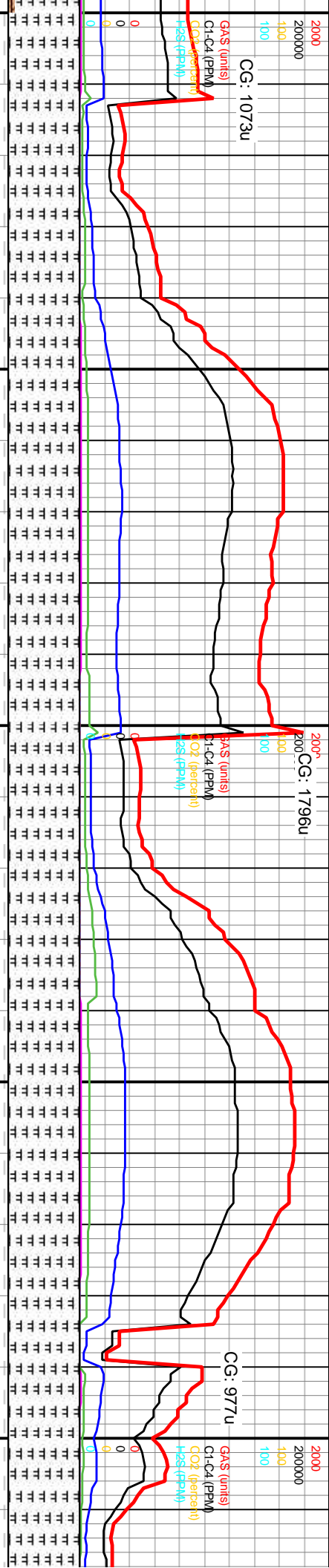
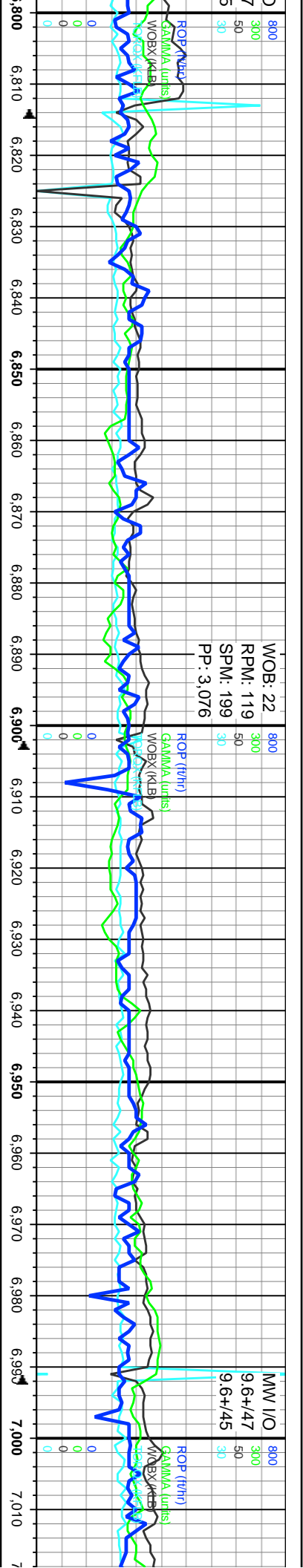
MD: 6,617'
Inclination: 82.75°
Azimuth: 178.29°
TVD: 6,343.98'

LANDED CURVE @ 6,688' MD

MD: 6,706'
Inclination: 91.51°
Azimuth: 180.08°
TVD: 6,348.43'

MD: 6,795'
Inclination: 5
Azimuth: 17
TVD: 6,345.
VS: 851.81'





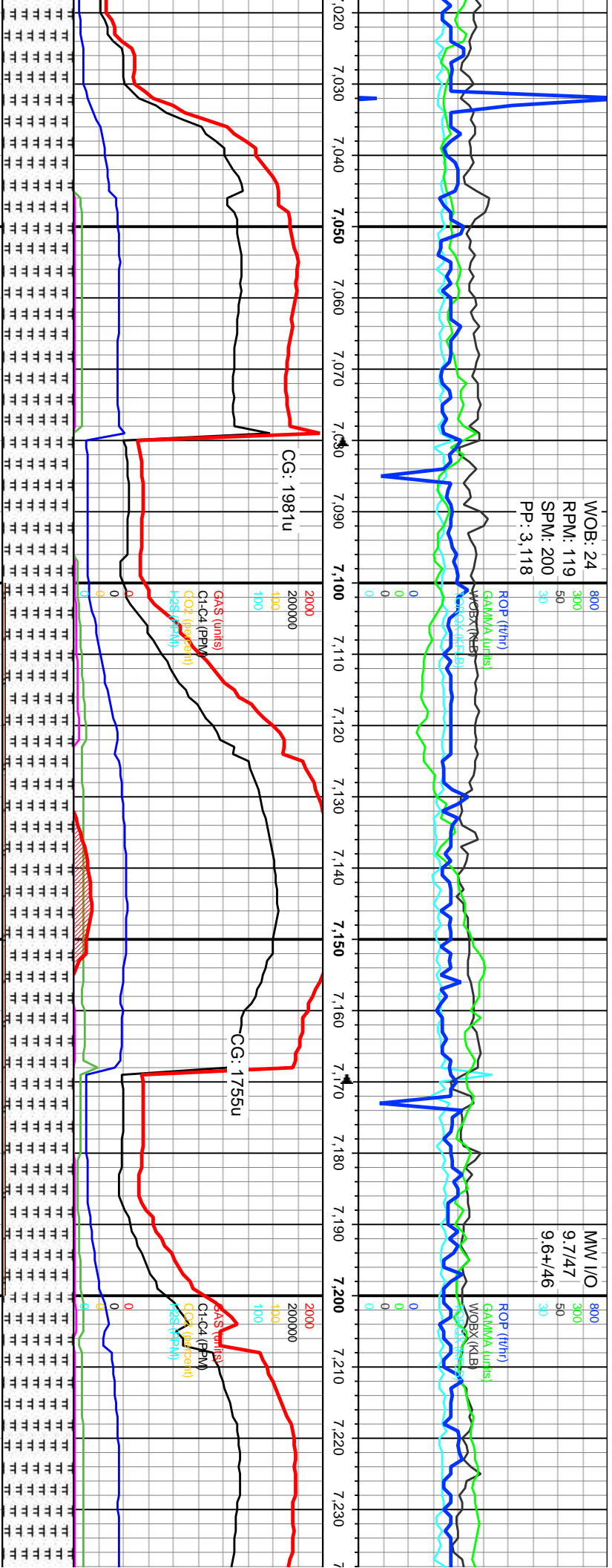
100% MR1ST: MDSTN, DK GY TO BLK,
GRTTY TEX, DULL TO RTHY LSTR, SL
HRD TO HRD, SB BLKY-BLKY, AMOR, SL
FISS, SLTY IP, CALC, TR INTBDD CHK IP,
TR CHK

MD: 6,885'
Inclination: 92.31°
Azimuth: 176.95°
TVD: 6,341.46'

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, RTHY LSTR, SL HRD TO
HRD, SB BLKY-BLKY, AMOR, SL FISS,
SLTY IP, CALC, TR CHK IP

MD: 6,974'
Inclination: 92.15°
Azimuth: 176.9°
TVD: 6,338'
VS: 1,030.61 ft

100% MRLST: I
SME MD GY, G
FRM TO SL HR
SL FISS, SLTY



MDSTN, DK GY TO BLK,
RTTY TEX, DULL LSTR,
D, SB BLKY-BLKY, AMOR,
IP, CALC, TR CHK IP

MD: 7,063'
Inclination: 92.09°
Azimuth: 177.62°
TVD: 6,334.7'
VS: 1,119.53'

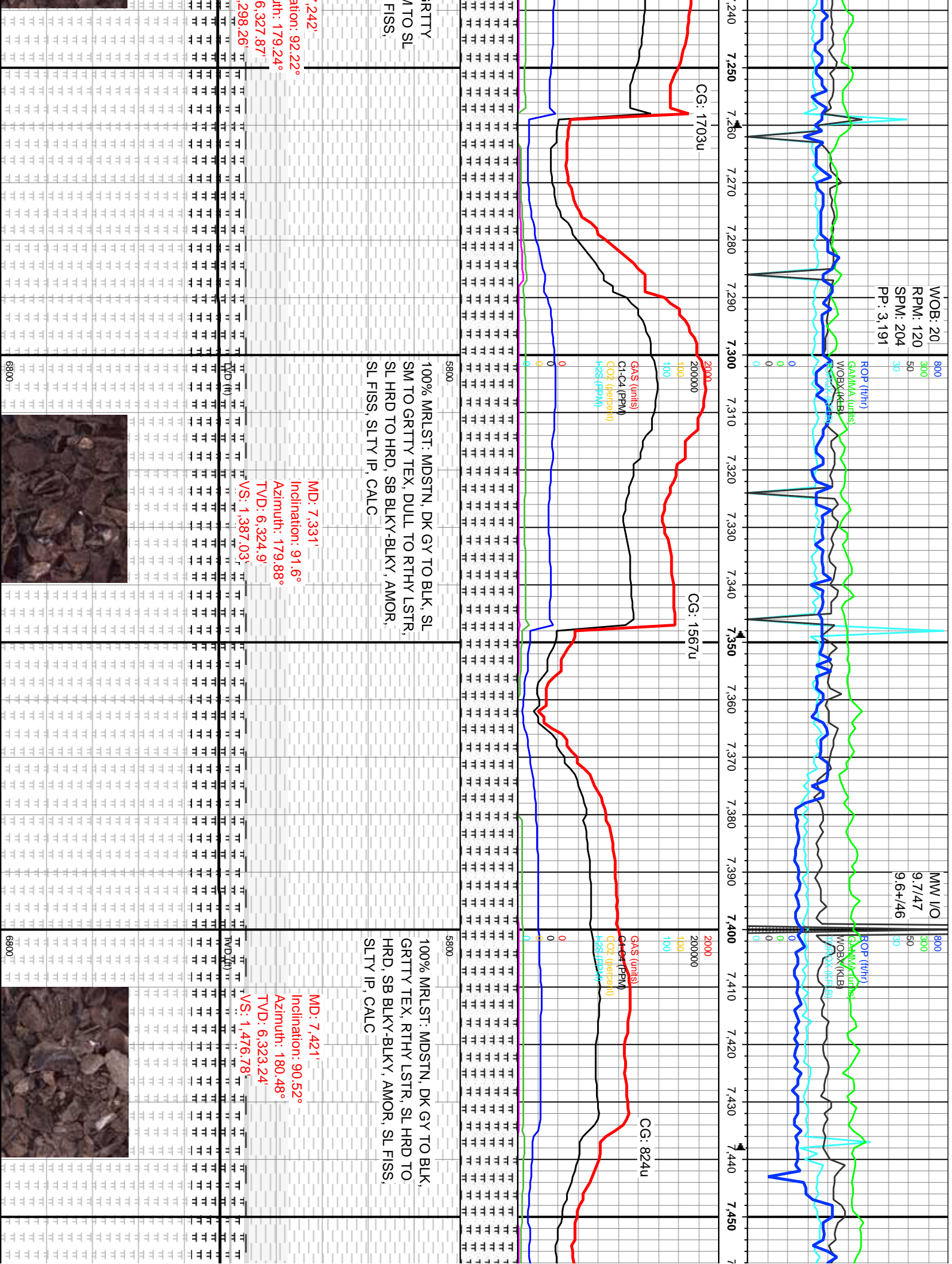
100% MRLST: MDSTN, MED TO DK GY,
GRITTY TEX, RTHY LSTR, FRM TO SL HRD
SB BLKY-BLKY, AMOR, SL FISS, SLTY IP,
CALC, TR CHK

MD: 7,152
Inclination: 92.22°
Azimuth: 178.06°
TVD: 6,331.36'
VS: 1,208.42'

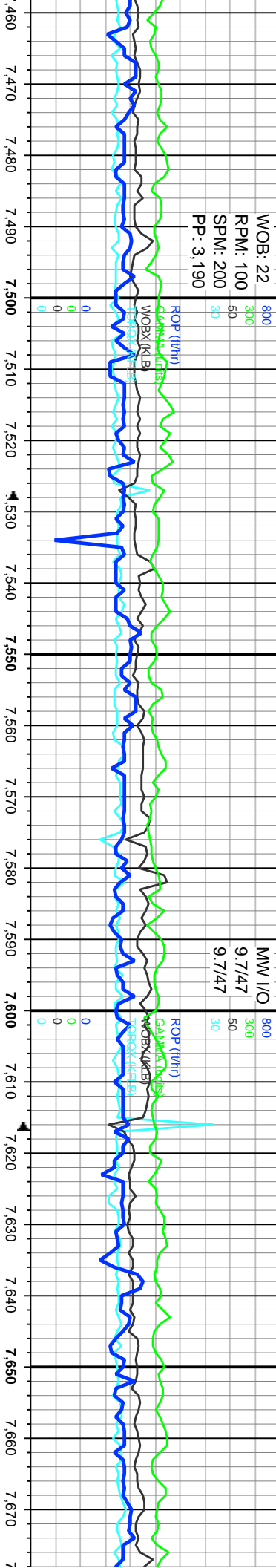
100% MRLST: MDSTN, DK GY, G
TEX, SL SM IP, RTHY LSTR, FRN
HRD, SB BLKY-BLKY, AMOR, SL
SLTY IP, CALC

MD: 7
Inclina
Azimu
TVD:
VS: 1



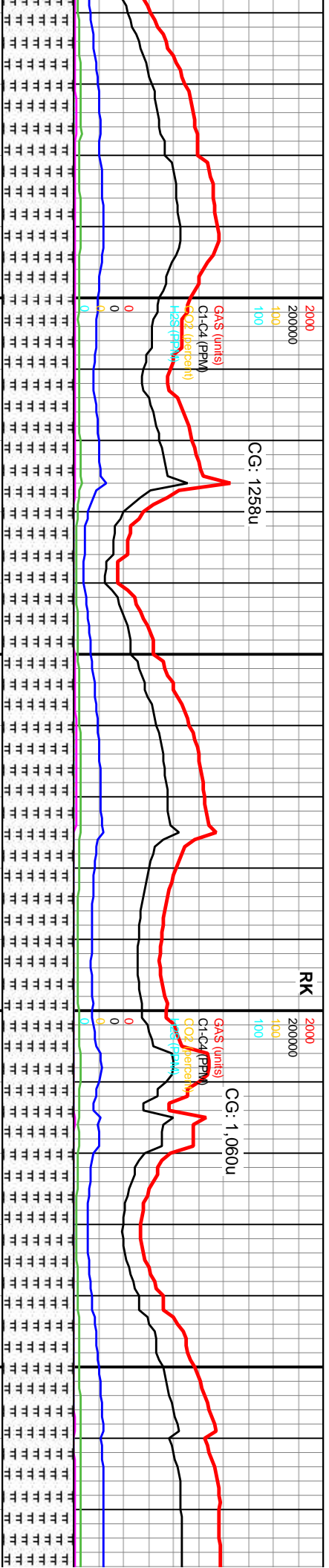


WOB: 22
RPM: 100
SPM: 200
PP: 3.190



NW I/O
9.7/47
9.7/47

RK



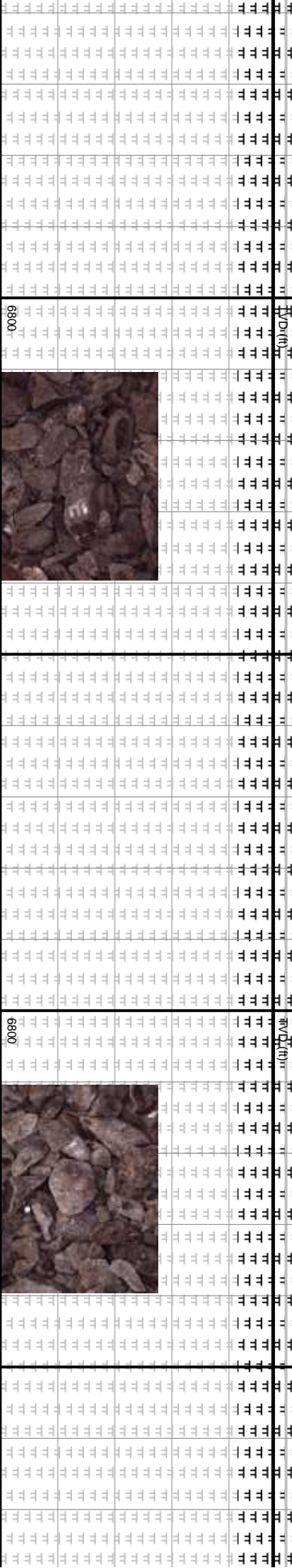
CG: 1.060u

100% MR.LST: MDSTN, DK GY TO BLK,
GR.TTY TEX, DULL TO RTHY LSTR, FRM
TO HRD, SB BLKY-BLKY, AMOR, SL FISS,
FISS IP, SLTY IP, CALC, TR CHK IP

100% MR.LST: MDSTN, DK GY TO BLK,
GR.TTY TEX, DL LSTR, FRM TO HRD, DNS,
MASS, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, SLTY, CALC, TR CHK IP

MD: 7.510'
Inclination: 90.15°
Azimuth: 180.08°
TVD: 6.322.72'

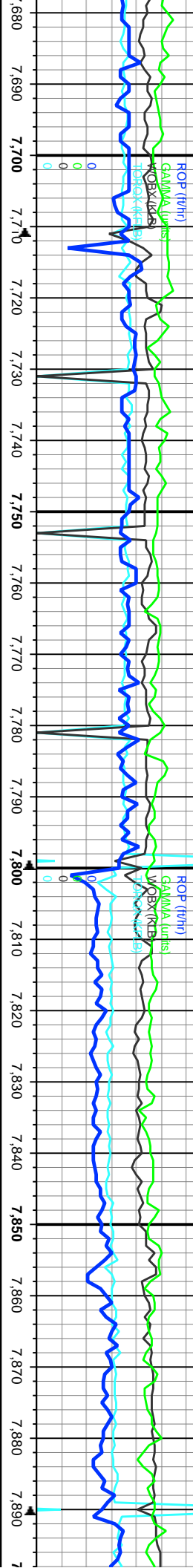
MD: 7.599'
Inclination: 90.62°
Azimuth: 181.32°
TVD: 6.322.12'



WOB: 22
RPM: 101
SPM: 200
PP: 3.234

MW I/O
9.7/48
9.6+/47

WOB: 23
RPM: 101
SPM: 201
PP: 3.341



BG: 1,218u
CG: 1,472u

CG: 469u

CG: 463u

GAS (units)
C1-C4 (PPM)
CO2 (percent)
H2S (PPM)

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, DL LSTR, FRM TO HRD, DNS,
MASS, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, SLTY, CALC, TR CHK IP

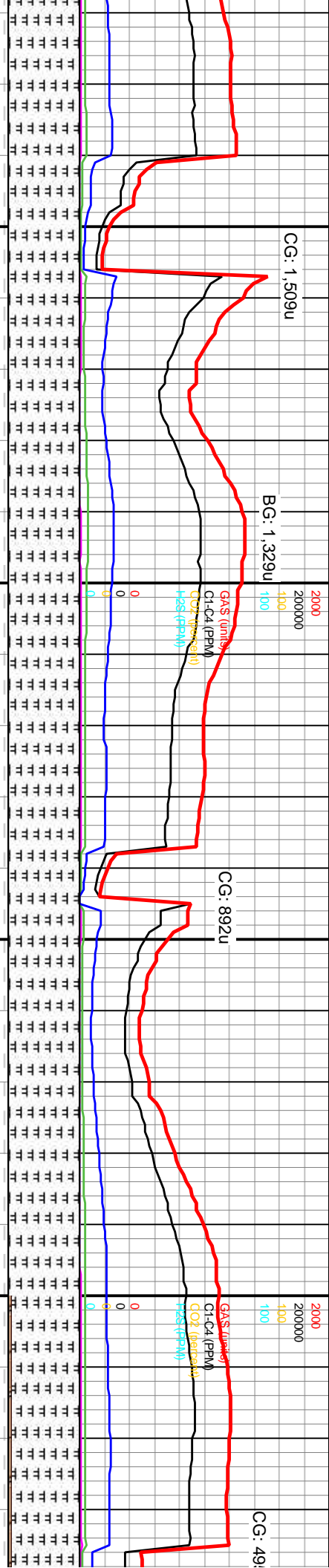
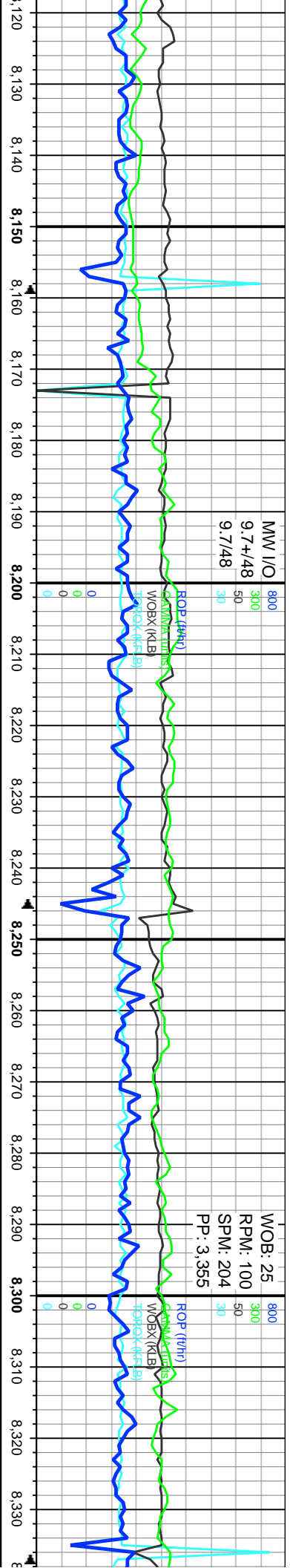
100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, DL TO RTHY LSTR, FRM TO
HRD, DNS, MASS, SB BLKY TO BLKY,
AMOR, SB FISS TO FISS, SLTY, CALC, TR
CHK IP




MD: 7,689'
Inclination: 90.46°
Azimuth: 179.63°
TVD: 6,321.27'
VS: 1,743.95'

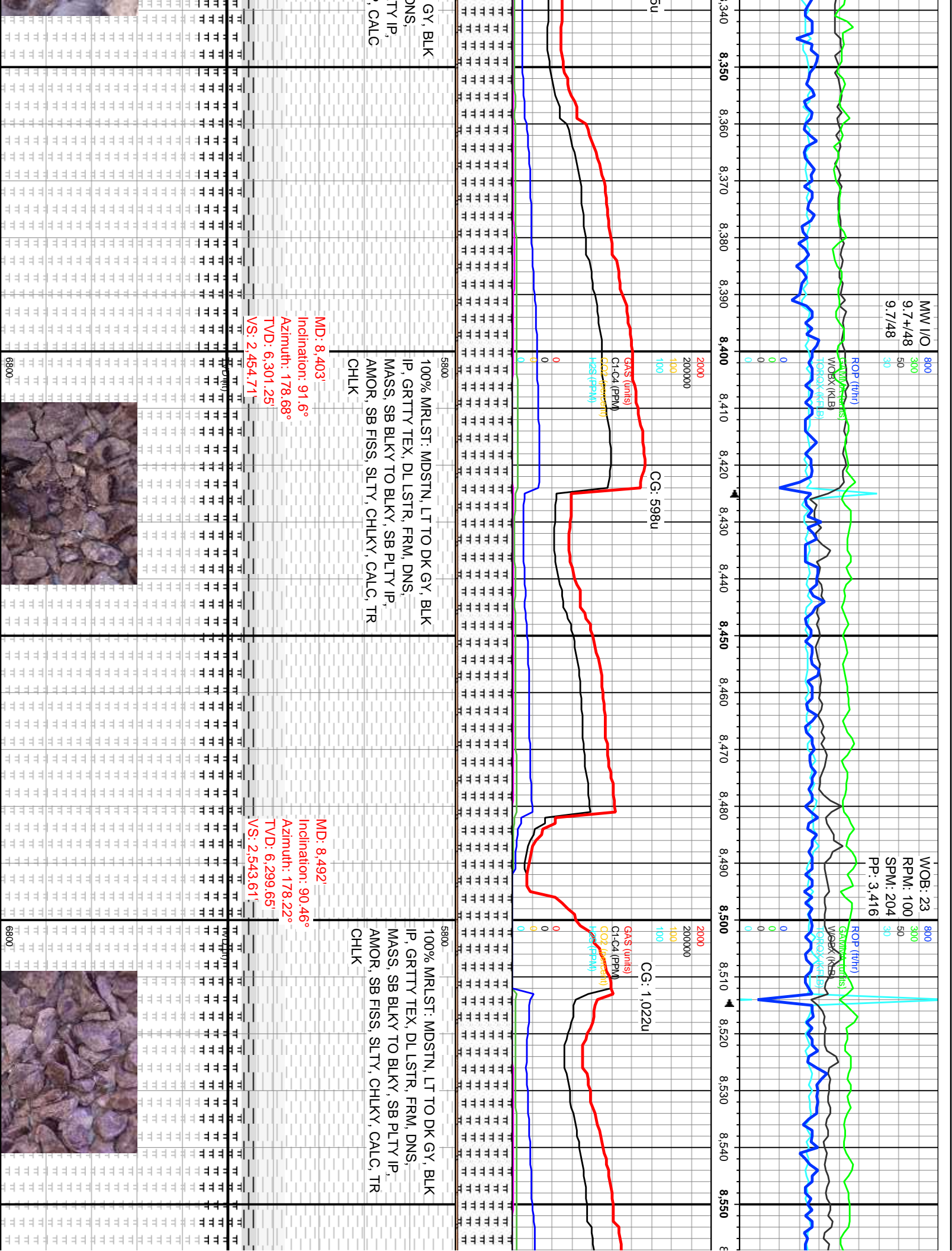
MD: 7,778'
Inclination: 90.55°
Azimuth: 180°
TVD: 6,320.49'
VS: 1,832.75'

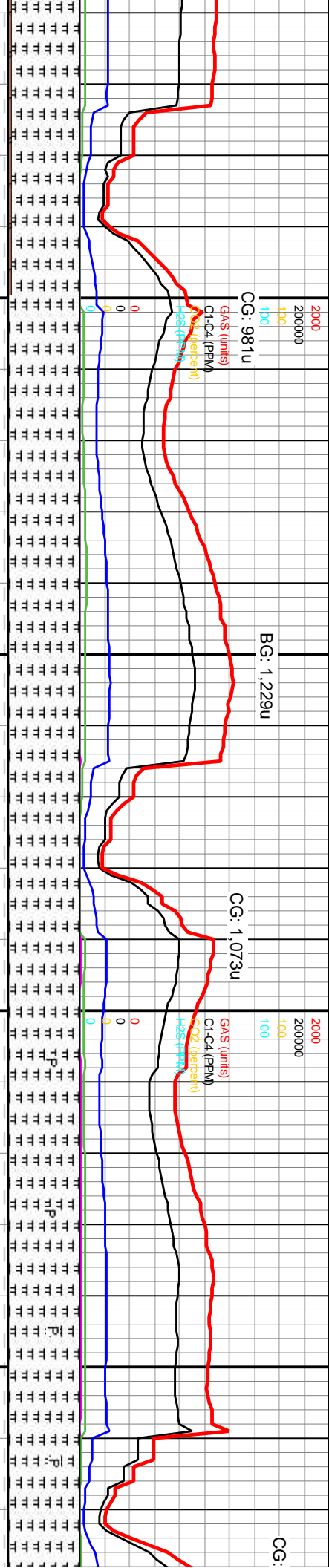
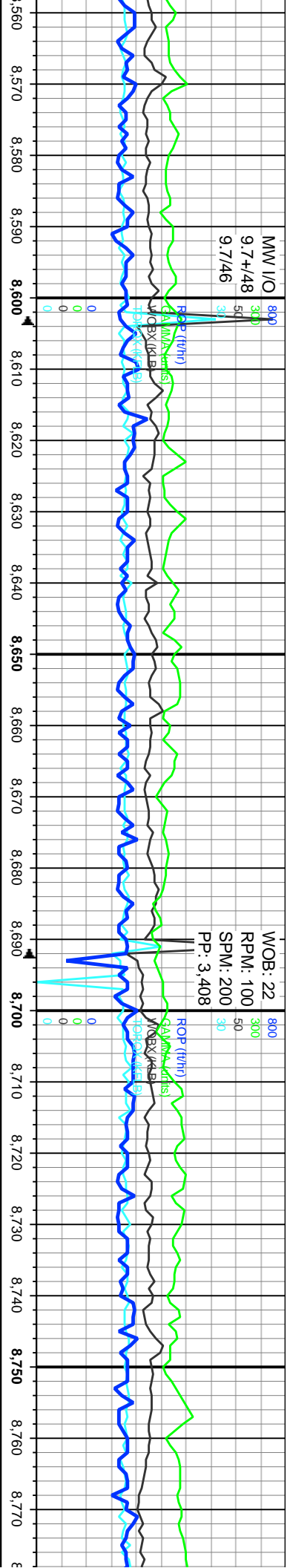
MD: 7,867'
Inclination: 91.54°
Azimuth: 181.63°
TVD: 6,318.86'
VS: 1,921.42'





<p>MDSTN, LT TO DK GY, BLK K, DL LSTR, FRM TO HRD, SB BLKY TO BLKY, AMOR, SB SLTY, CALC</p> <p>MD: 8,135' Inclination: 91.91° Azimuth: 182.11° TVD: 6,310.27' VS: 2,187.57'</p> 		<p>100% MRLST: MDSTN, LT TO DK GY, BLK IP, GRITTY TEX, DL LSTR, FRM TO HRD, DNS, MASS, SB BLKY TO BLKY, SB PLTY IP, AMOR, SB FISS TO FISS, SLTY, CALC</p> <p>MD: 8,224' Inclination: 92° Azimuth: 180.53° TVD: 6,307.23' VS: 2,276.13'</p> 		<p>100% MRLST: MDSTN, LT TO DK IP, GRITTY TEX, DL LSTR, FRM, L MASS, SB BLKY TO BLKY, SB PL AMOR, SB FISS, SLTY, CHLKY IP</p> <p>MD: 8,314' Inclination: 92.03° Azimuth: 179.19° TVD: 6,304.07' VS: 2,365.87'</p> 
--	--	--	--	--





100% MRLST; MDSTN, LT TO DK GY, BLK
IP, GRTTY TEX, DL LSTR, FRM, DNS,
MASS, SB BLKY TO BLKY, SB PLTY IP,
AMOR, SB FISS, SLTY, CHLKY, CALC, TR
CHLK

100%MRST: MDSTN, LT TO DK GY, BLK IP, GRITTY TEX, DL LSTR, FRM, DNS, MASS, SB BLKY TO BLKY, SB PLTY IP, AMOR, SB FISS, SLTY, CHLKY, CALC

MD: 8,581'
Inclination: 89.97°
Azimuth: 177.8°
TVD: 6,299.32'
VS: 2,632.56'

MD: 8,670'
Inclination: 90°
Azimuth: 177.84°
TVD: 6,299.34'
VS: 2,721.51'

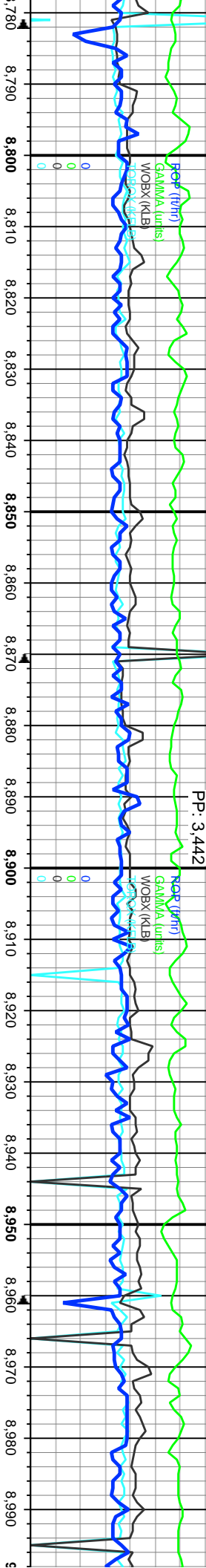
MD: 8,760
Inclination: 90°
Azimuth: 178.04°
TVD: 6,299.34'
VS: 2,811.46'



NW I/O
9.7+/48
9.7/48

WOB: 21
RPM: 101
SPM: 202
PP: 3.442

NW I/O
9.7+/48
9.7/48



1,403u

CG: 898u

C/O SHAHR SCREENS

C/O SHAHR SCREENS

C/O SHAHR SCREENS

GA5 (units)
C1-C4 (PPM)
C/O2 (percent)
H2S (PPM)

GA5 (units)
C1-C4 (PPM)
C/O2 (percent)
H2S (PPM)

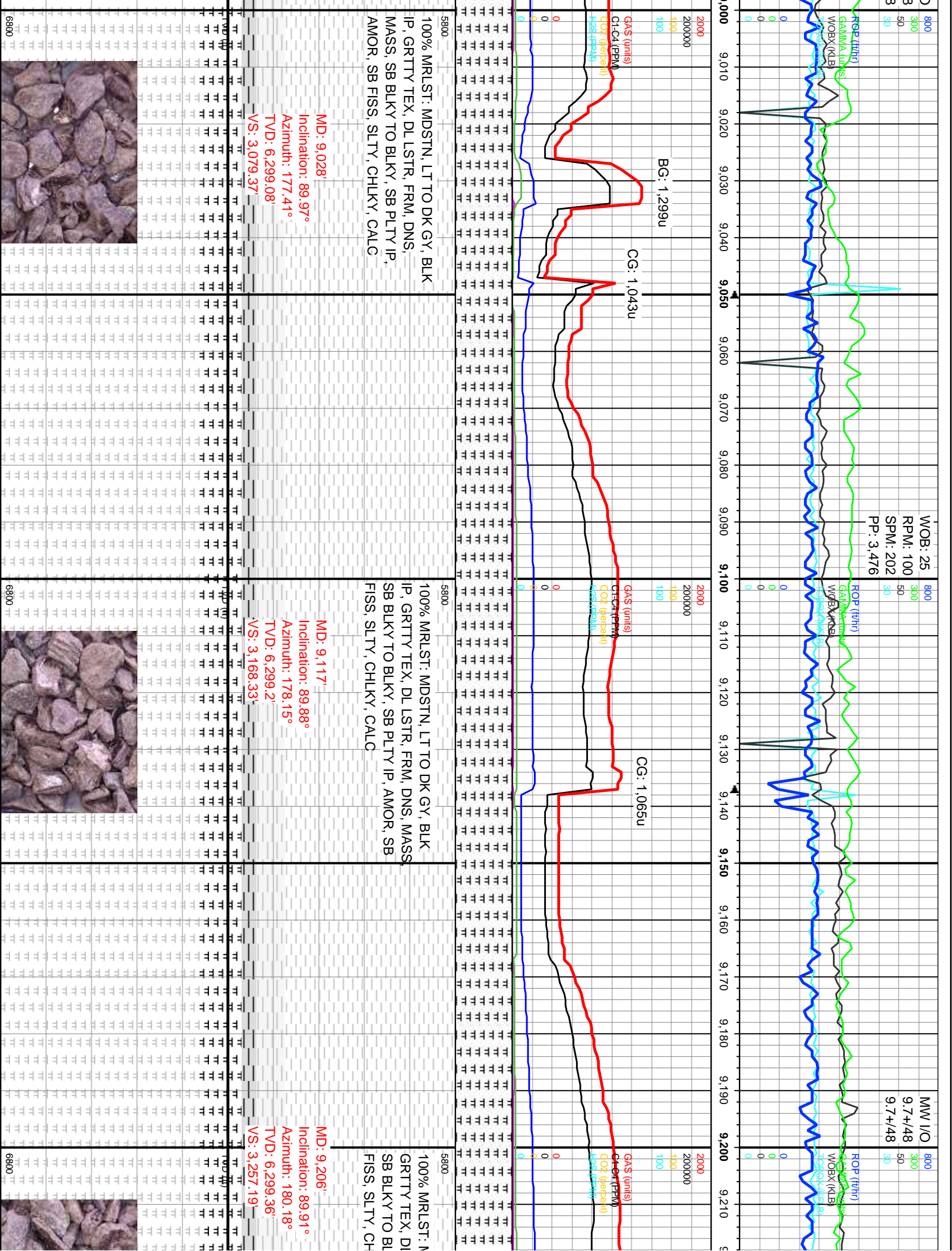
100% MRLST: MDSTN, LT TO DK GY, BLK
IP, GRITTY TEX, DL LSTR, FRM, DNS,
MASS, SB BLKY TO BLKY, SB PLTY IP,
AMOR, SB FISS, SLTY, CHLKY, CALC, TR
CHLK, TR F DISSM PYR

100% MRLST: MDSTN, LT TO DK GY, BLK
IP, GRITTY TEX, DL LSTR, FRM, DNS, MASS,
SB BLKY TO BLKY, SB PLTY IP, AMOR, SB
FISS, SLTY, CHLKY, CALC, TR CHLK

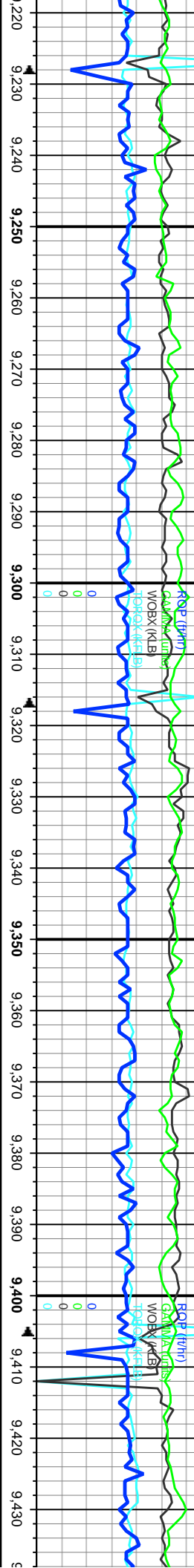
MD: 8.849
Inclination: 90°
Azimuth: 177.62°
TVD: 6,299.34'
VS: 2,900.41'

MD: 8.938
Inclination: 90.18°
Azimuth: 177.02°
TVD: 6,299.2
VS: 2,989.39'





WOB: 27
RPM: 101
SPM: 200
PP: 3.474



CG: 897u

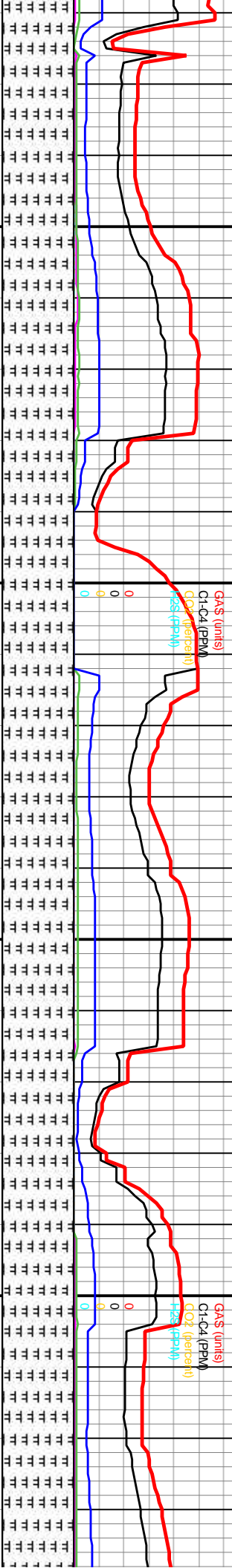
2000
1000
100

CG: 781u

2000
1000
100

CG: 575u

MW I/C
9.7/47
9.8/47



MDSTN, LT TO DK GY,
LSTR, FRM, DNS, MASS,
BLKY, SB PLTY IP, AMOR, SB
ILKY, CALC

5800
100% MRSLT: MDSTN, LT TO DK GY,
GRITTY TEX, DL LSTR, FRM, DNS, MASS,
SB BLKY TO BLKY, SB PLTY IP, AMOR, SB
FISS, SLTY, CHLKY, CALC

5800
100% MRSLT: MDSTN, LT TO DK GY,
GRITTY TEX, DL LSTR, FRM, DN
SB BLKY TO BLKY, SB PLTY TO
AMOR, SB FISS TO FISS, SLTY,
CALC

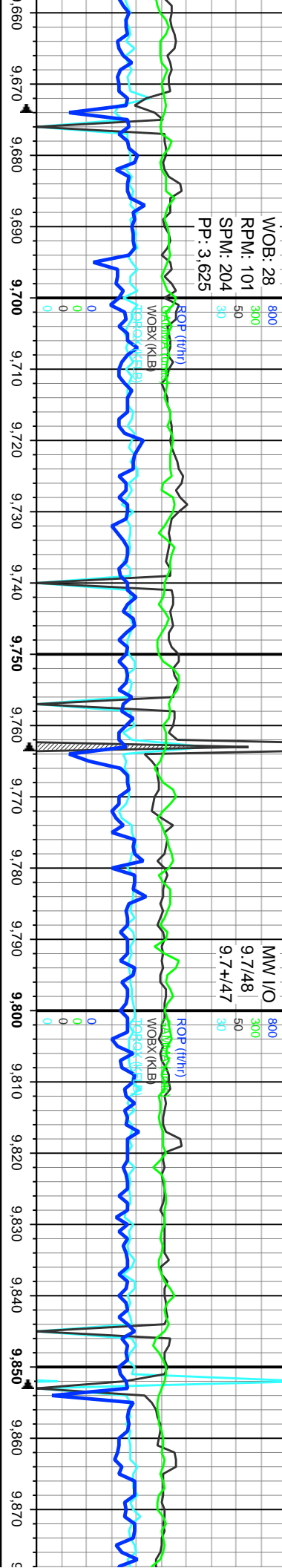
MD: 9,296
Inclination: 89.97°
Azimuth: 181.47°
TVD: 6,299.46'
VS: 3,346.87'

MD: 9,385
Inclination: 89.88°
Azimuth: 181.93°
TVD: 6,299.57'
VS: 3,435.43'



WOB: 28
RPM: 101
SPM: 204
PP: 3.625

NW I/O
9.7/48
9.7+/47



CG: 1137u

CG: 1098u

CG: 876u

GAS (units)
C1-C4 (PPM)
O2 (lbepent)
H2S (PPM)

GAS (units)
C1-C4 (PPM)
O2 (lbepent)
H2S (PPM)

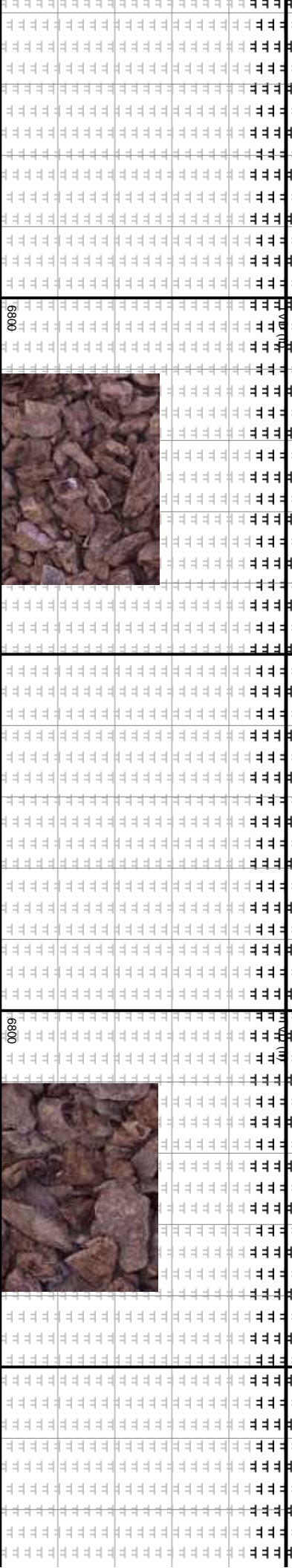


100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, DULL TO RTHY LSTR, FRM
TO HRD, SB BLKY-BLKY, AMOR, SL FISS,
FISS IP, SLTY IP, CALC, CHKY

100% MRLST: MDSTN, DK GY, GRITTY
TEX, RTHY LSTR, FRM TO SL HRD, SB
BLKY-BLKY, SB PLTY IP, AMOR, SL FISS,
SLTY IP, CALC, CHKY

MD: 9.743'
Inclination: 90.12°
Azimuth: 180.55°
TVD: 6,299.85'
VS: 3,791.35'

MD: 9.832'
Inclination: 90.06°
Azimuth: 179.13°
TVD: 6,299.71'
VS: 3,880.15'



WOB: 26
RPM: 100
SPM: 202
PP: 3.564

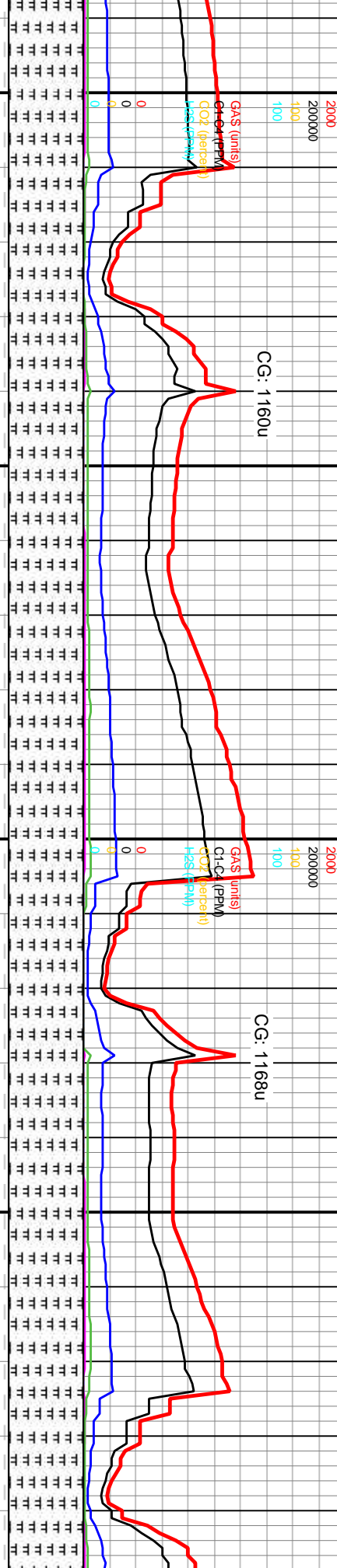
ROP (ft/hr)
SAM (lb/min)
WOBX (klb)
TPOBX (klb)

NW I/O
9.7/48
9.7/48

ROP (ft/hr)
SAM (lb/min)
WOBX (klb)
TPOBX (klb)

WOB: 24
RPM: 10
SPM: 20
PP: 3.58

ROP (ft/hr)
SAM (lb/min)
WOBX (klb)
TPOBX (klb)



5800
100% MRLST: MDSTN, DK GY, SME BLK IP,
GRITTY TEX, DULL LSTR, FRM TO SL HRD,
SB BLKY-BLKY, AMOR, SL FISS, SLTY IP,
CALC, CHKY

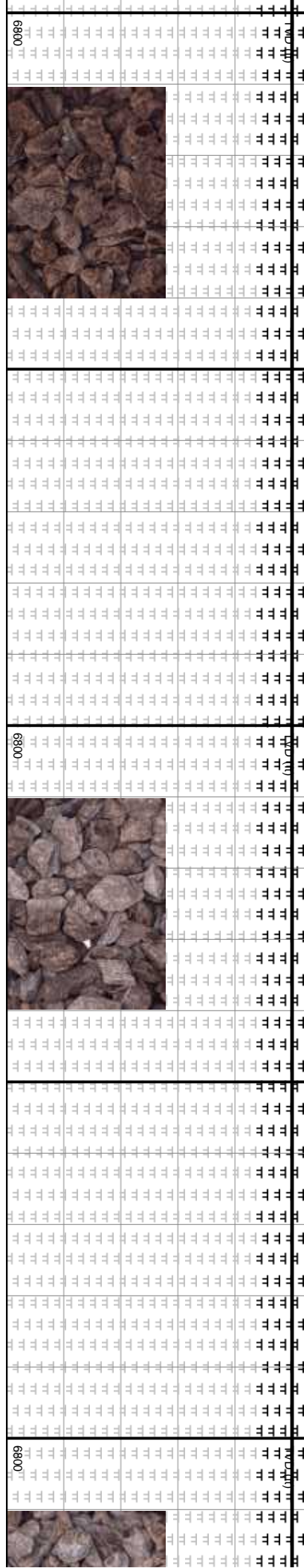
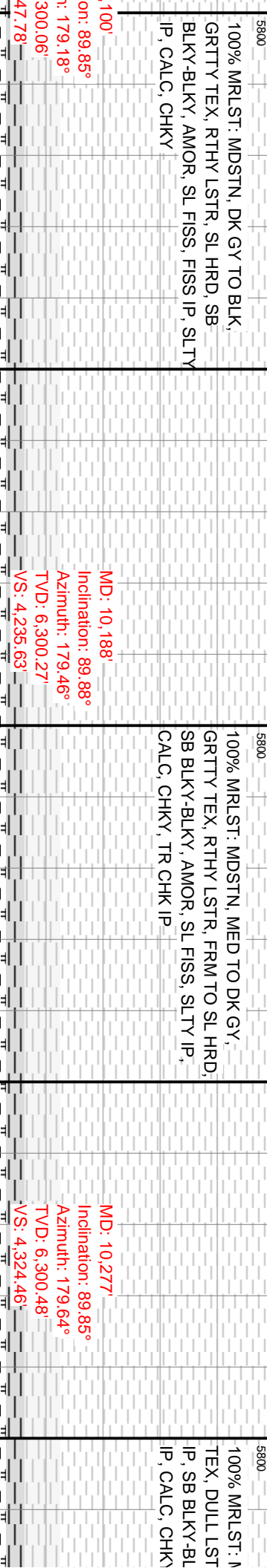
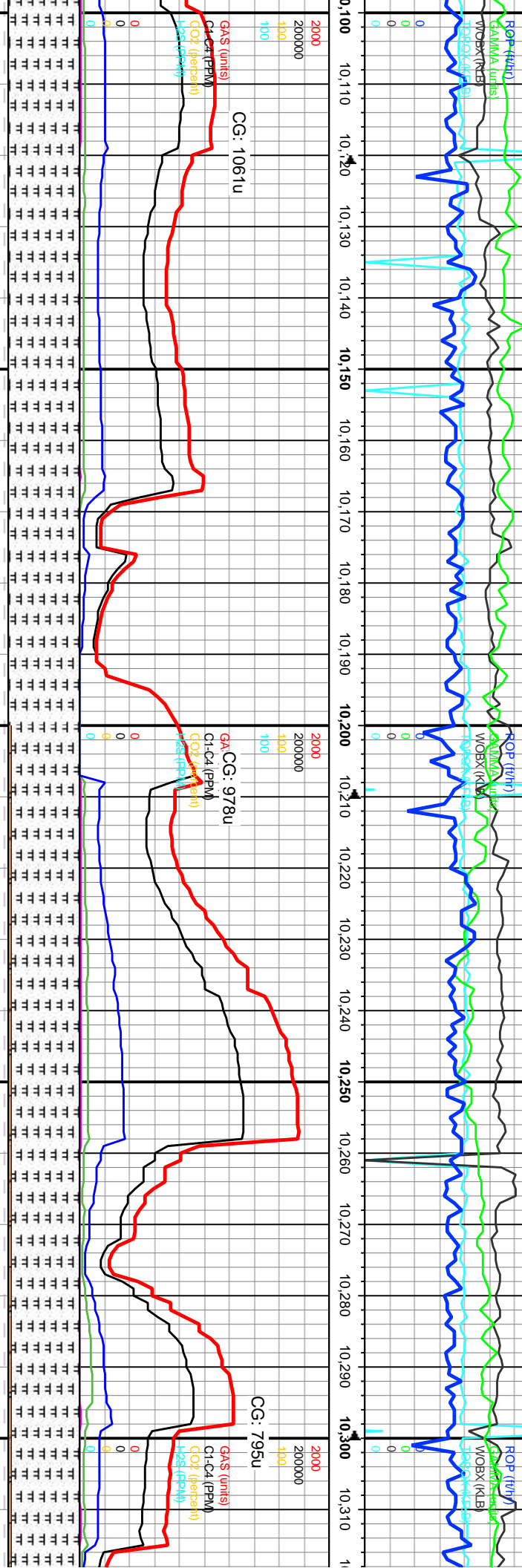
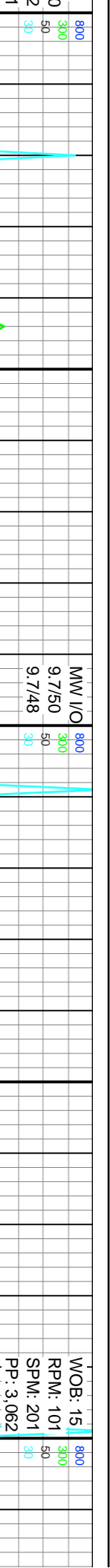
MD: 9.921
Inclination: 89.94°
Azimuth: 178.86°
TVD: 6,299.71'
VS: 3,969.03'

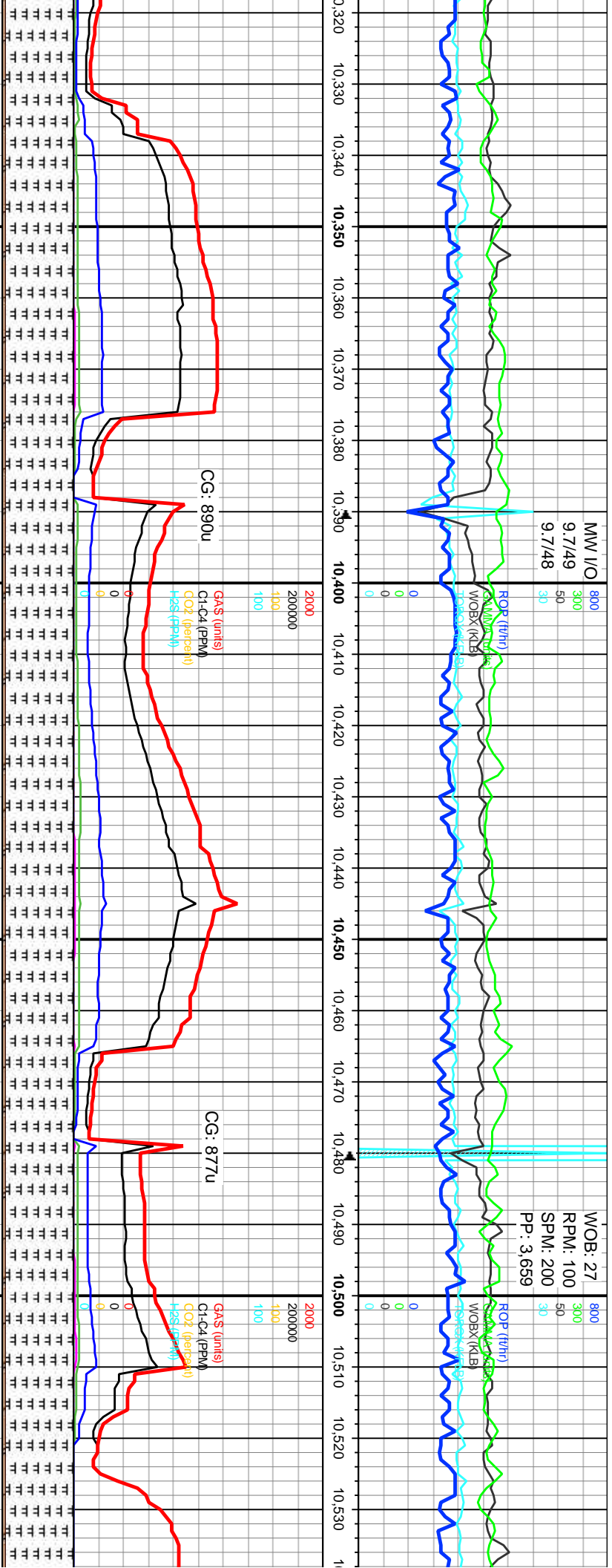


5800
100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, DULL TO RTHY LSTR, SL
HRD, SB BLKY-BLKY, AMOR IP, SL FISS,
SLTY IP, CALC, CHKY

MD: 10.010
Inclination: 89.88°
Azimuth: 179.12°
TVD: 6,299.85'
VS: 4,057.91'







MDSTN, MED GY, GRITTY
R, FRM TO SL HRD, HRD
BLKY, AMOR, SL FISS, SLTY
/, TR CHK IP

MD: 10,367'
Inclination: 89.88°
Azimuth: 179.7°
TVD: 6,300.69'
VS: 4,414.28'

100% MRLST: MDSTN, MED TO DK GY,
SME BLK IP, GRITTY TEX, DULL TO RTHY
LSTR, FRM TO SL HRD, SB BLKY-BLKY,
AMOR, SL FISS, SLTY IP, CALC, CHKY, TR
CHK IP

MD: 10,456'
Inclination: 90.03°
Azimuth: 180.61°
TVD: 6,300.76'
VS: 4,503.04'

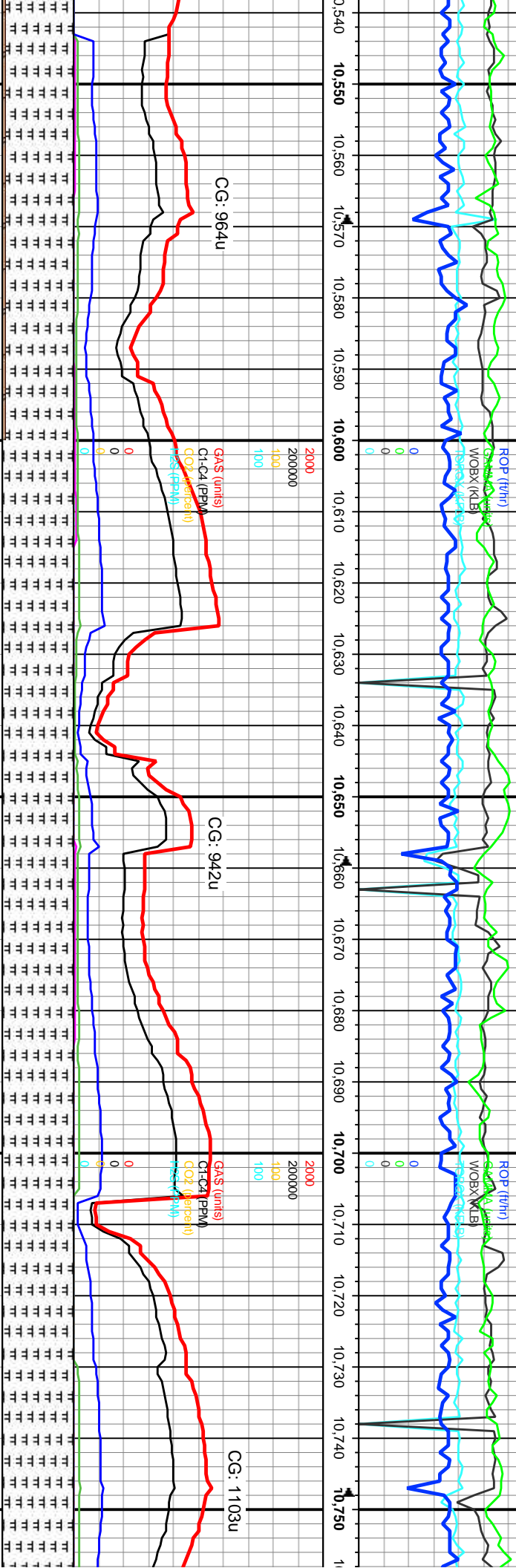
100% MRLST: MDSTN, MED TO I
GRITTY TEX, RTHY LSTR, FRM T
SB BLKY-BLKY, AMOR, SL FISS,
CALC, CHKY, TR CHK IP



NW I/O
9.7/50
9.7/49

6/26/2019
MINDEPTH
@ 10,667' MD

WOB: 26
RPM: 99
SPM: 200
PP: 3.729



CG: 964u

Gas (units)
C1-C4 (ppm)
CO2 (percent)
H2S (ppm)

CG: 942u

Gas (units)
C1-C4 (ppm)
CO2 (percent)
H2S (ppm)

CG: 1103u

OK GY,
O SL HRD
SLTY IP,

100% MRIST: MDSTN, DK GY, SME BLK
IP, GRITTY TEX. DULL TO RTHY LSTR,
FRM TO SL HRD, SB BLKY-BLKY, AMOR,
SL FISS, SL SLTY, CALC, CHKY

100% MRIST: MDSTN, DK GY TO BLK,
GRITTY TEX, DULL TO RTHY LSTR, FRM
TO SL HRD, HRD IP, SB BLKY-BLKY,
AMOR, SL FISS TO FISS, SL SLTY, CALC,
CHKY

D: 10,546'
Inclination: 90.09°
Azimuth: 179.91°
VD: 6,300.67'
VS: 4,592.79'

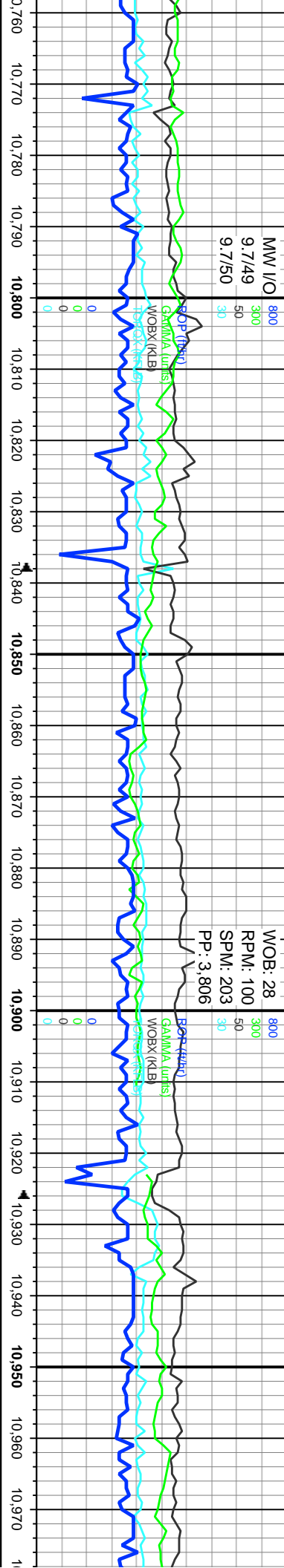
MD: 10,635'
Inclination: 90.09°
Azimuth: 178.69°
TVD: 6,300.53'
VS: 4,681.65'

MD: 10,724'
Inclination: 90.09°
Azimuth: 178.66°
TVD: 6,300.39'
VS: 4,770.55'



MW I/O
9.7/49
9.7/50

WOB: 28
RPM: 100
SPM: 203
PP: 3.806



2000

2000

1000

1000

100

100

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

CG: 1002u

CG: 1665u

GAS (units)

C1-C4 (PPM)

CO2 (lb/bsl)

H2S (PPM)

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

GAS (units)

C1-C4 (PPM)

CO2 (lb/bsl)

H2S (PPM)

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

100% MRLST: MDSTN, DK GY, SME BLK,
GRITTY TEX, DULL LSTR, FRM TO SL
HRD, SB BLKY-BLKY, AMOR, SL FISS, SL
SLTY, CALC, CHKY

100% MRLST: MDSTN, MED TO DK GY TO
BLK IP, GRITTY TEX, RTHY LSTR, SL HRD,
SB BLKY-BLKY, AMOR, SL FISS, SL SLTY,
CALC, CHKY

MD: 10,814'

Inclination: 90.09°

Azimuth: 178.94°

TVD: 6,300.25'

VS: 4,860.44'

MD: 10,903'

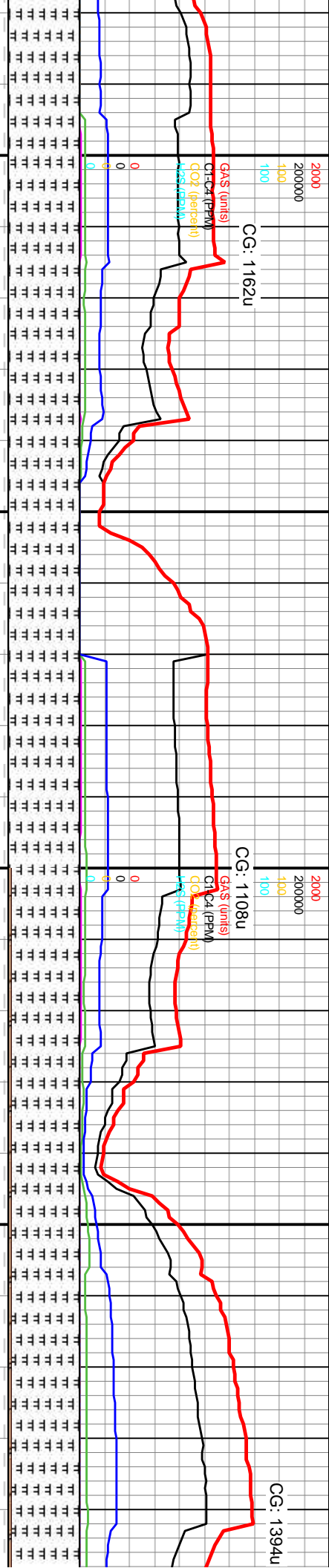
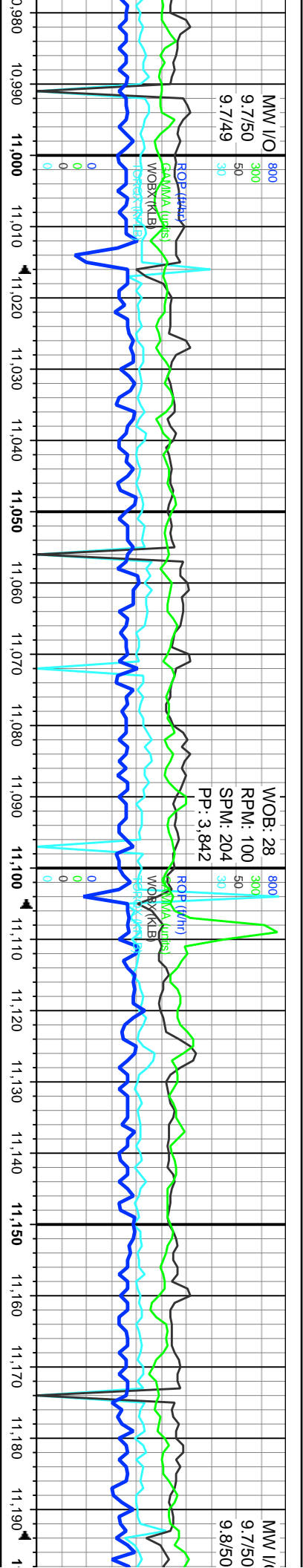
Inclination: 90°



Azimuth: 179.26°

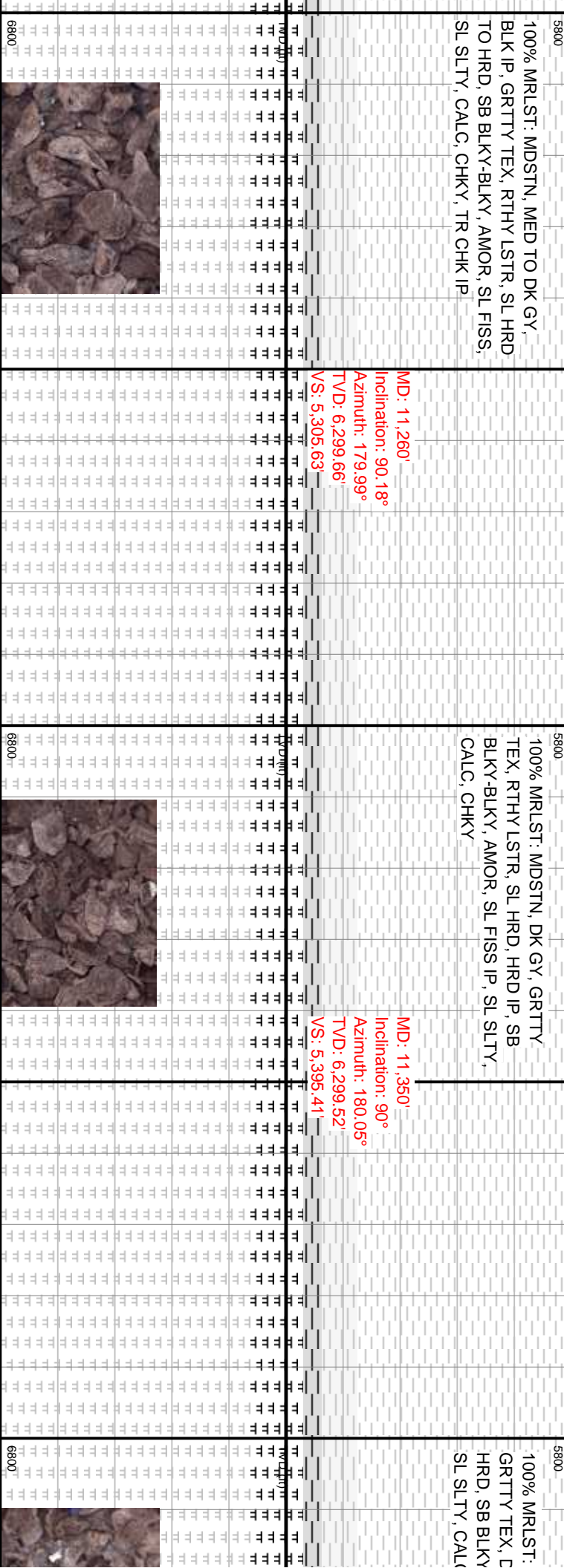
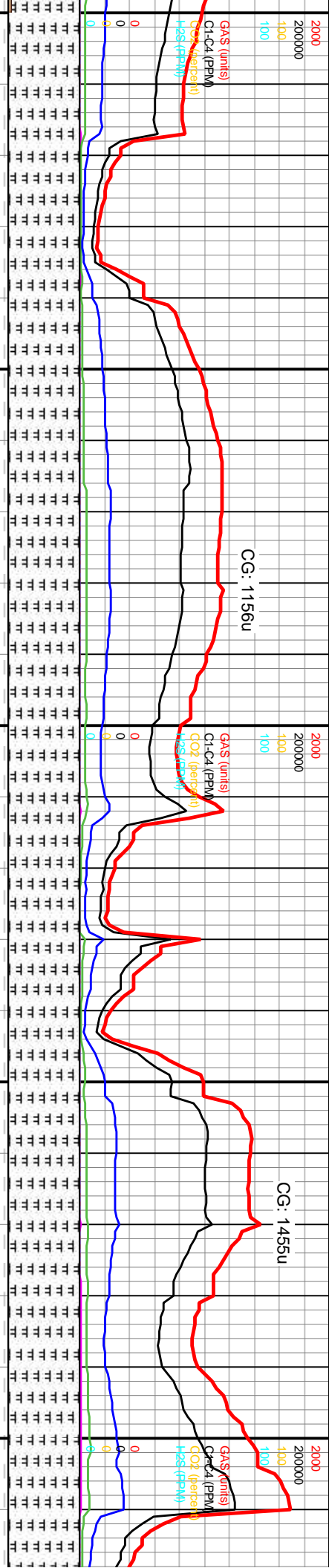
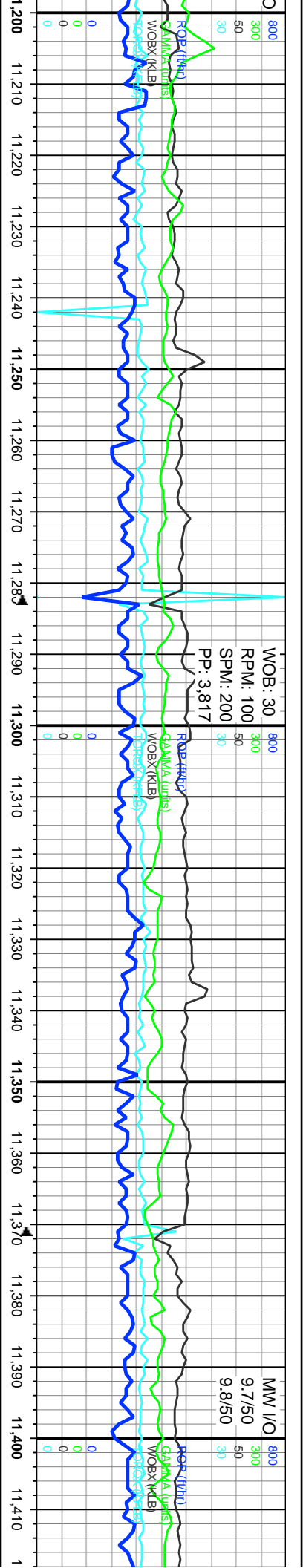
TVD: 6,300.18'

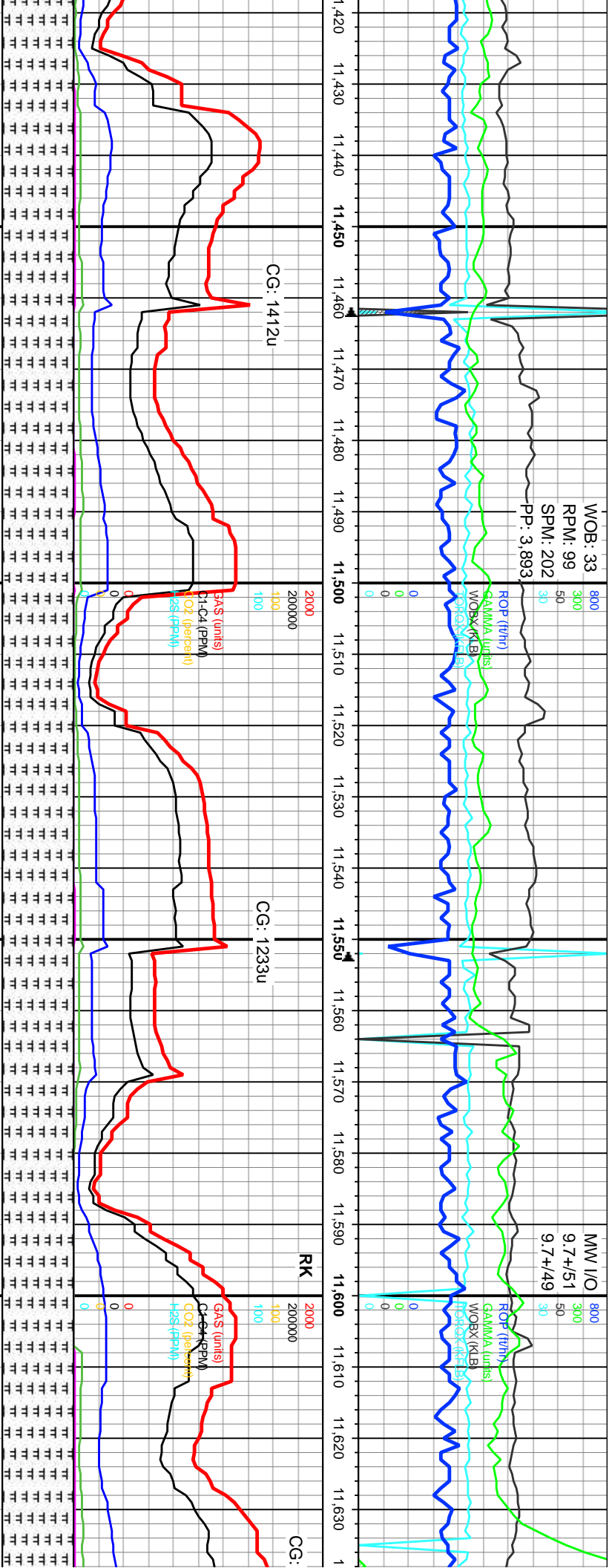
VS: 4,949.31'





MD: 10.993° Inclination: 90.12° Azimuth: 179.35° TVD: 6,300.08' VS: 5,039.16'		MD: 11.082° Inclination: 90.03° Azimuth: 179.57° TVD: 6,299.97' VS: 5,128'		MD: 11.171° Inclination: 90.09° Azimuth: 179.69° TVD: 6,299.87' VS: 5,216.82'	
100% MR LST. MDSTN. MED TO DK GY TO BLK. GRITTY TEX. DULL LSTR. FRM TO SL HRD. SFT IP. SB BLKY-BLKY. AMOR. SL FISS IP. SL SLTY. CALC. CHKY		100% MR LST. MDSTN. MED TO DK GY. BLK IP. GRITTY TEX. DULL TO RTHY LSTR. FRM TO SL HRD TO HRD. SB BLKY-BLKY. AMOR. SL FISS IP. SL SLTY. CALC. CHKY. TR CHK			
					





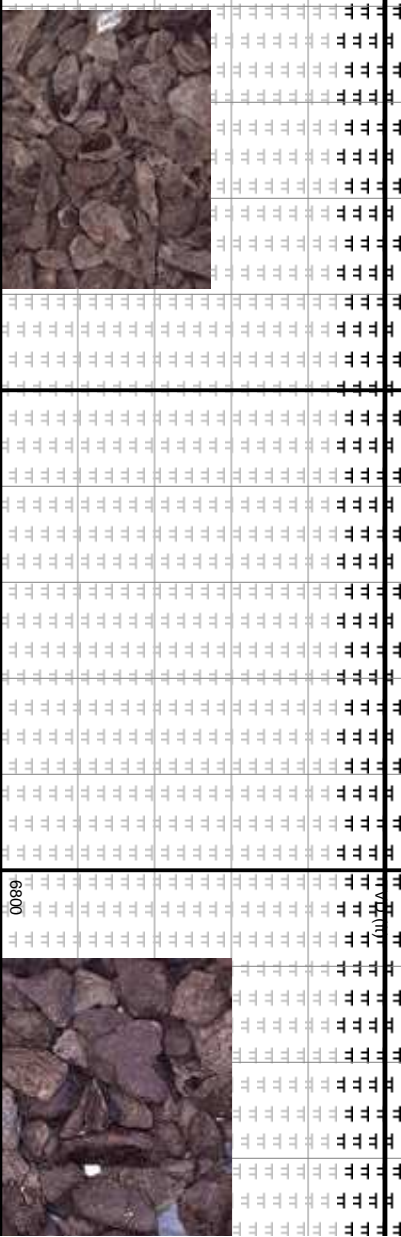
MDSTN, DK GY, SME BLK,
DULL TO RTHY LSTR, SL
-BLKY, AMOR, SL FISS IP,
C, CHKY, TR CHK IP

MD: 11,439'
Inclination: 90.22°
Azimuth: 179.8°
TVD: 6,299.35'
VS: 5,484.2'



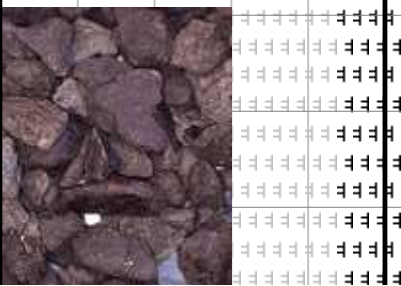
100% MRLST: MDSTN, DK GY, SME BLK,
GRITTY TEX, DULL TO RTHY LSTR, SL
HRD, SB BLKY-BLKY, AMOR, SL FISS IP,
SL SLTY, CALC, CHKY, TR CHK IP

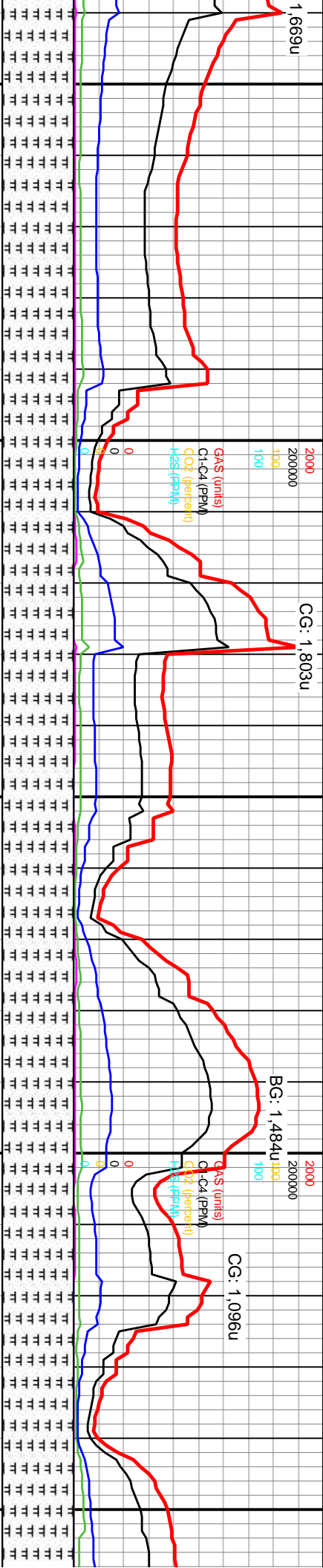
MD: 11,528'
Inclination: 89.97°
Azimuth: 180.75°
TVD: 6,299.2'
VS: 5,572.96'



100% MRLST: MDSTN, GY TO DK
IP, GRITTY TEX, DL LSTR, FRM T
BLKY TO BLKY, SB PLTY IP, AMO
FISS, SLTY, CALC, CHKY IP, TR

MD: 11,618'
Inclination: 89.91°
Azimuth: 179.67°
TVD: 6,299.3'
VS: 5,662.71'

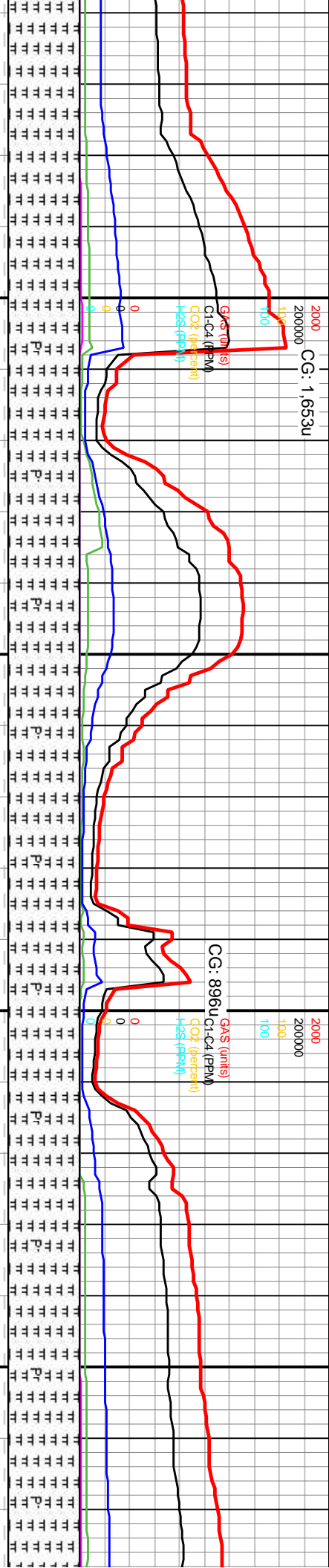
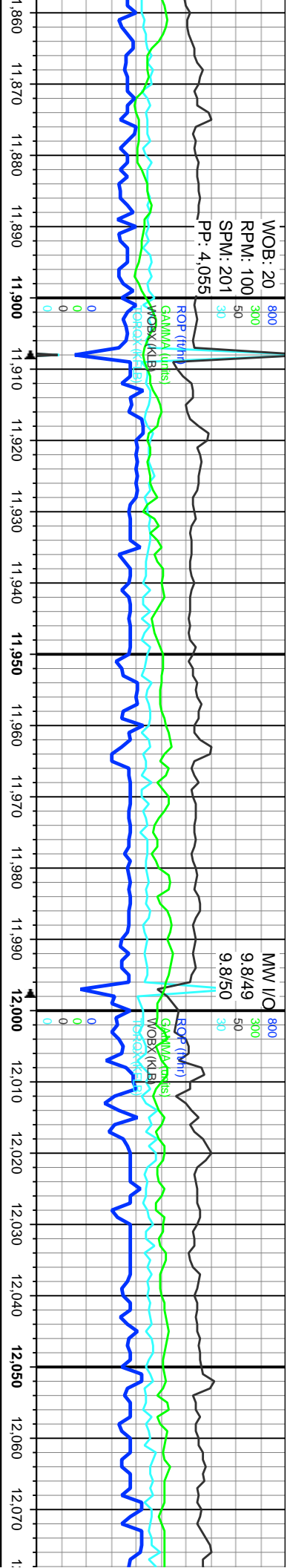




100% MRLST, MDSTN, GY TO DK GY,
BLK IP, GRTTY TEX, DL LSTR, FRM TO
HD, SB BLKY TO BLKY, SB PLTY IP,
AMOR, SB FISS, SLTY, CALC, CHKY IP,
AMOR, SB FISS, SLTY, CALC, CHKY IP,

MD: 11,796'
Inclination: 89.82
Azimuth: 178.63°
TVD: 6,299.6'
VS: 5,840.49'





MD: 11,886'
Inclination: 89.94°
Azimuth: 178.96°
TVD: 6,299.79'
VS: 5,930.38'



MD: 11,975'
Inclination: 89.88°
Azimuth: 178.58°
TVD: 6,299.93'
VS: 6,019.28'

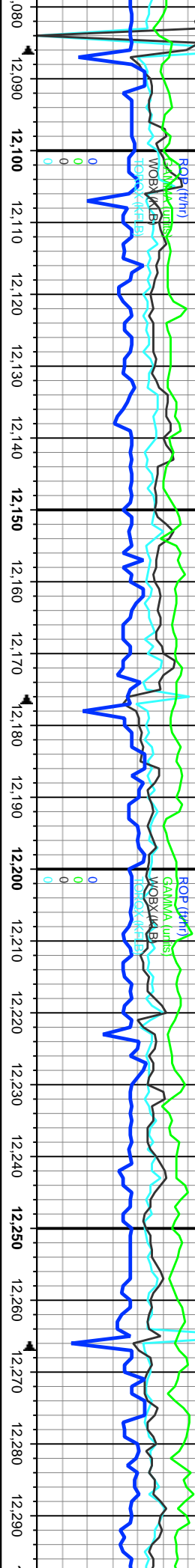


MD: 12,064'
Inclination: 89.88°
Azimuth: 178.43°
TVD: 6,300.12'
VS: 6,108.19'

WOB: 23
RPM: 101
SPM: 202
PP: 4.080

WOB: 22
RPM: 10
SPM: 20
PP: 4.05

MW I/C
9.8/50
9.8/49



CG: 1,206u

CG: 1,041u

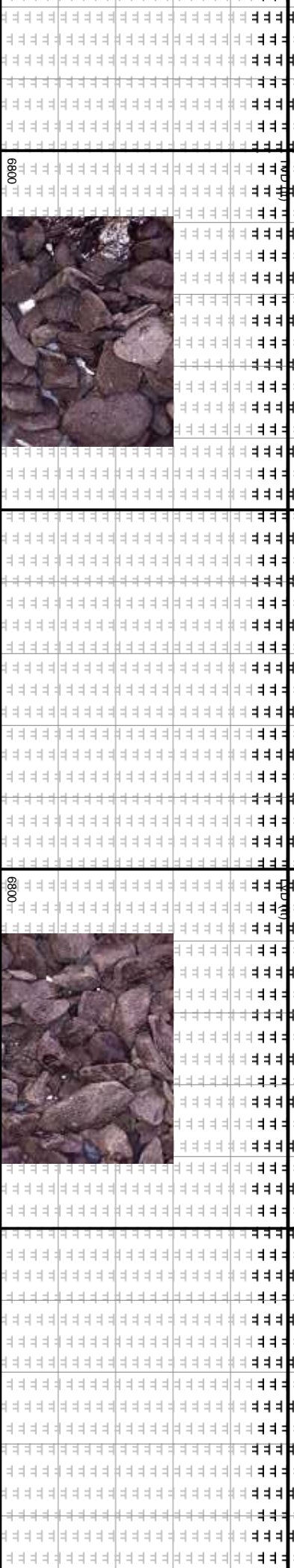
CG: 615u

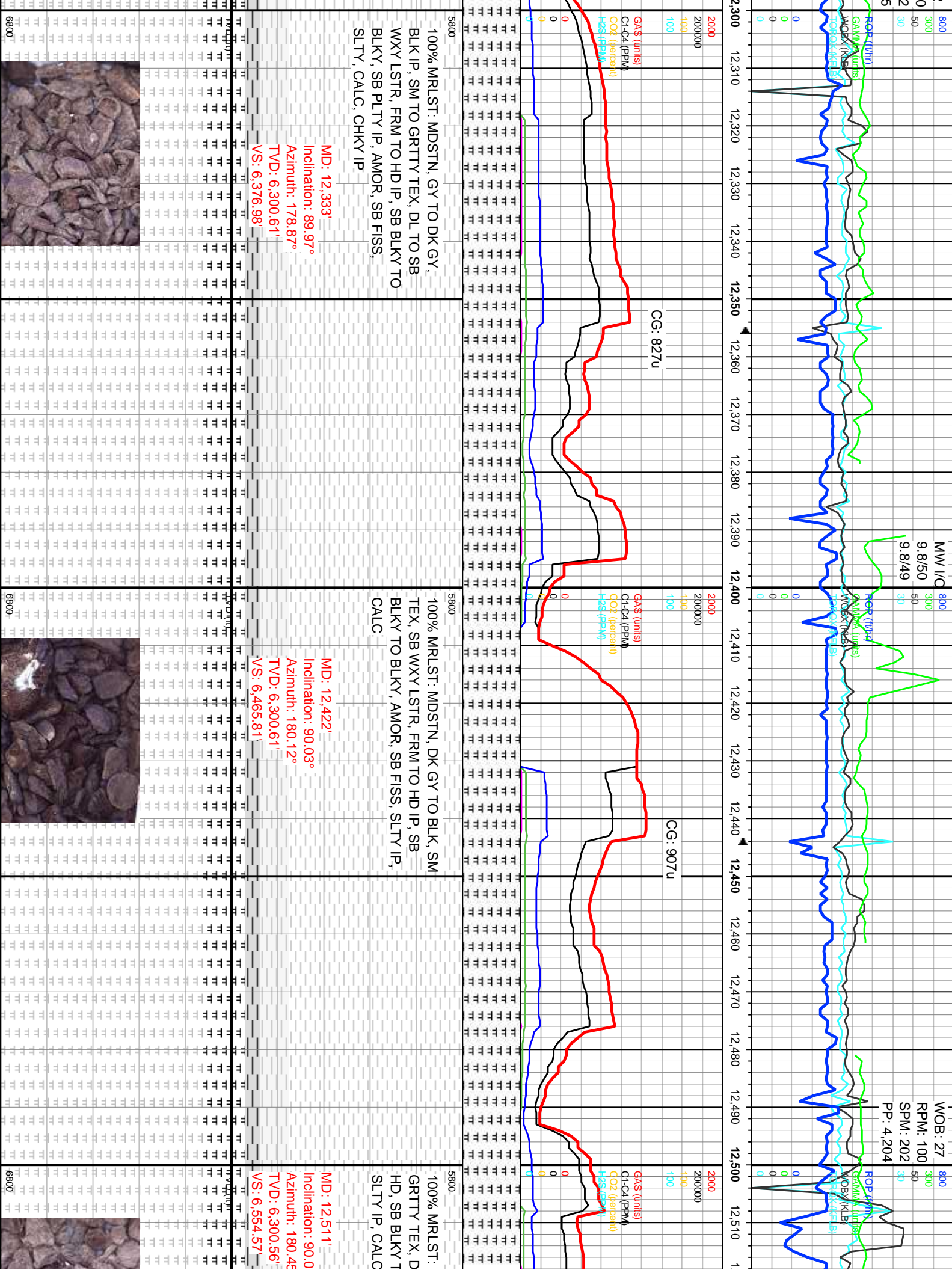
100% MRLST: MDSTN, GY TO DK GY, BLK IP, SM TO GRITTY TEX, DL TO SB WXY LSTR, FRM TO HD IP, SB BLKY TO BLKY, SB PLTY IP, AMOR, SB FISS, SLTY, CALC, CHKY IP, TR CHK IP, TR F DISSM PYR

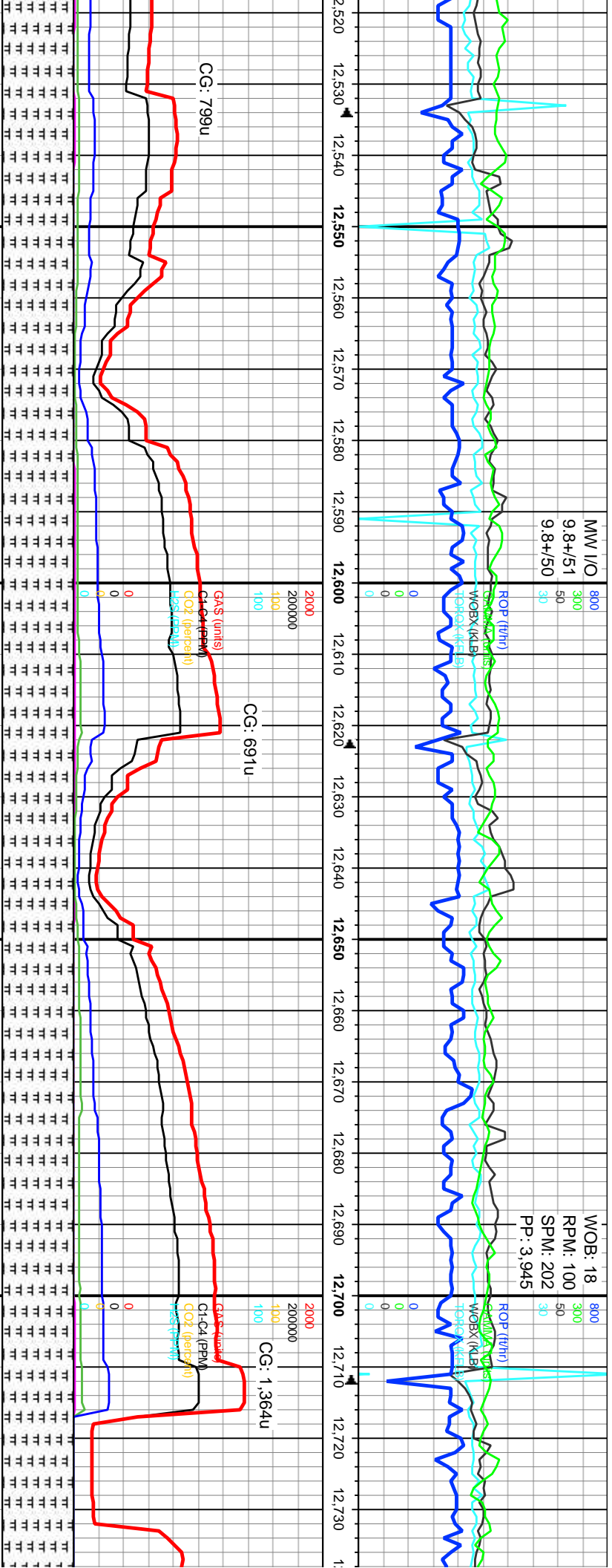
100% MRLST: MDSTN, GY TO DK GY, BLK IP, SM TO GRITTY TEX, DL TO SB WXY LSTR, FRM TO HD IP, SB BLKY TO BLKY, SB PLTY IP, AMOR, SB FISS, SLTY, CALC, CHKY IP

MD: 12,154'
Inclination: 89.85°
Azimuth: 177.96°
TVD: 6,300.33'
VS: 6,198.12'

MD: 12,243'
Inclination: 89.91°
Azimuth: 178.16°
TVD: 6,300.51'
VS: 6,287.07'







MDSTN, LT TO DK GY,
L TO RTHY LSTR, FRM TO
O BLKY, AMOR, SB FISS,
, TR CHLK

MD: 12,601'
Inclination: 90°
Azimuth: 181.59°
TVD: 6,300.54'
VS: 6,644.22'

100% MRLST: MDSTN, LT TO DK GY,
GRITTY TEX. DL TO RTHY LSTR, FRM TO
HD, SB BLKY TO BLKY, AMOR, SB FISS,
SLTY, CALC. TR CHLK

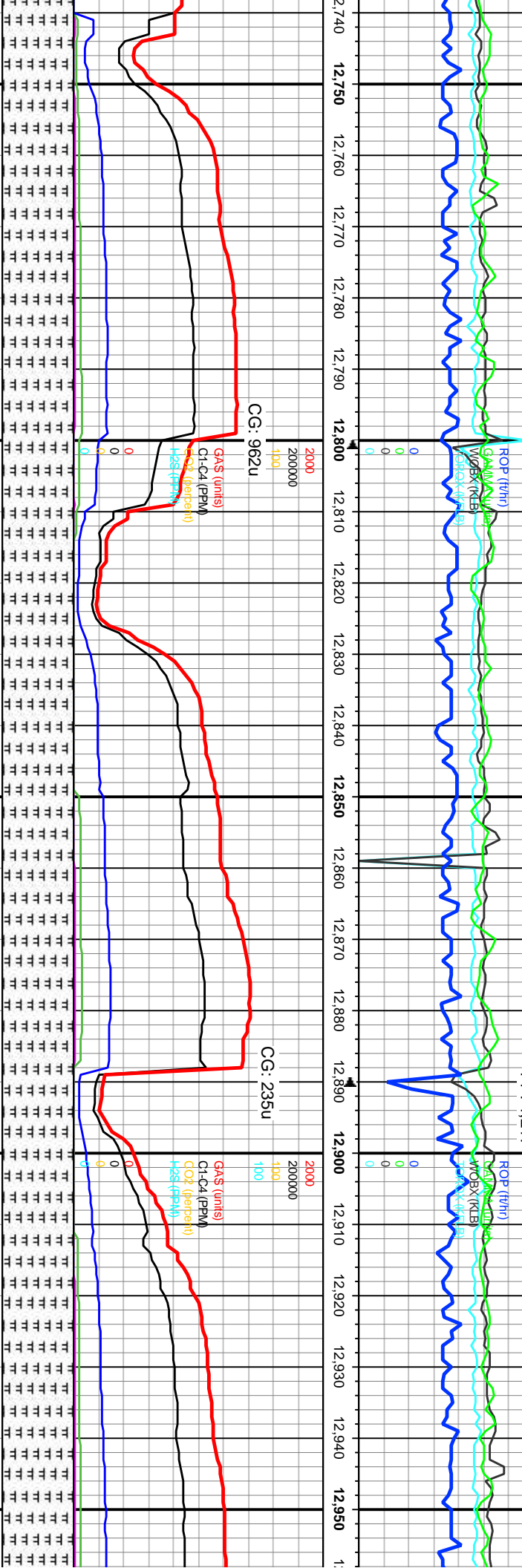
MD: 12,690'
Inclination: 90°
Azimuth: 181.75°
TVD: 6,300.54'
VS: 6,732.79'

100% MRLST: MDSTN, LT TO DK
GRITTY TEX. DL TO RTHY LSTR,
HD, SB BLKY TO BLKY, AMOR, S
SLTY, CALC. TR CHLK



NW I/O
9.8+/51
9.8+/50

WOB: 27
RPM: 100
SPM: 202
PP: 4.217



5800
100% MRLST: MDSTN, LT TO DK GY,
GRITTY TEX. DL TO RTHYLSTR, FRM TO
HD, SB BLKY TO BLKY, AMOR, SB FISS,
SLTY, CALC, TR CHLK

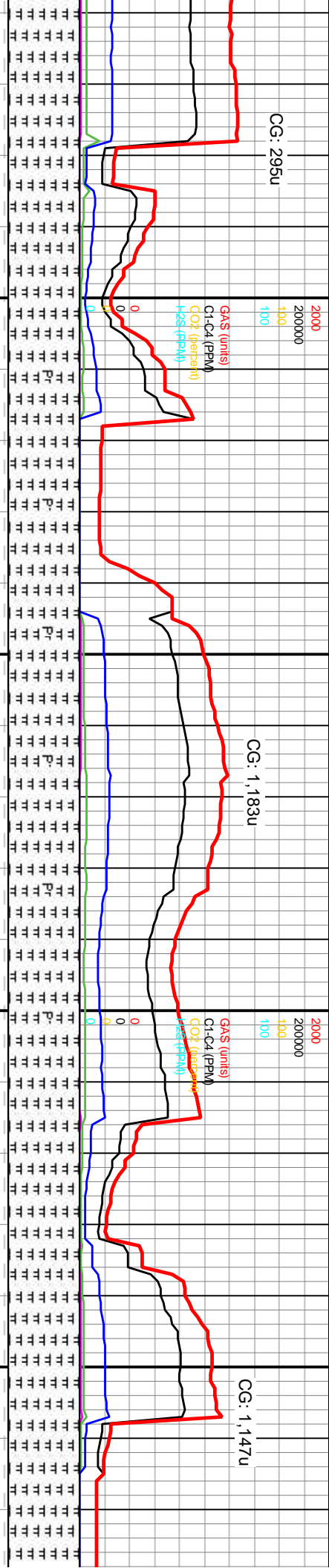
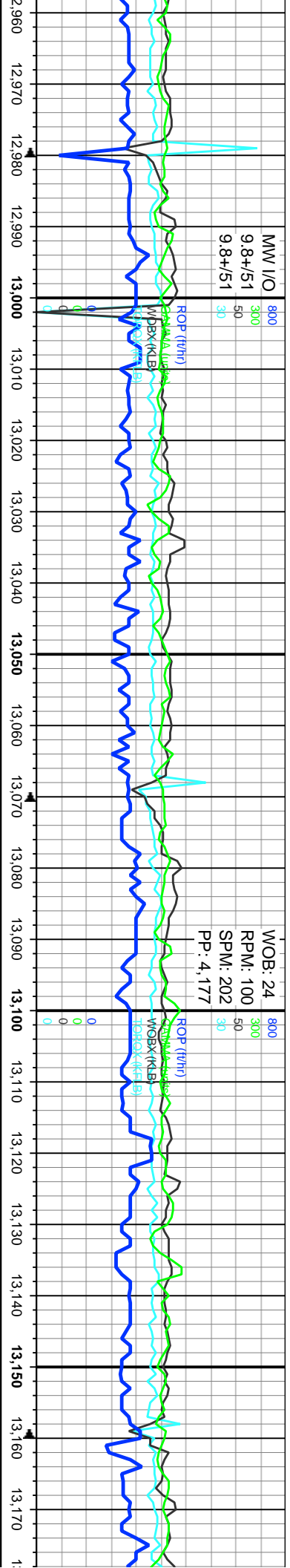
5800
100% MRLST: MDSTN, LT TO DK GY, V
GRITTY TEX. DL TO RTHYLSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, V SLTY, CALC, TR CHLK

MD: 12,779'
Inclination: 89.94°
Azimuth: 181.51°
TVD: 6,300.59'
VS: 6,821.36'

MD: 12,869'
Inclination: 90.06°
Azimuth: 180.98°
TVD: 6,300.59'
VS: 6,910.98'

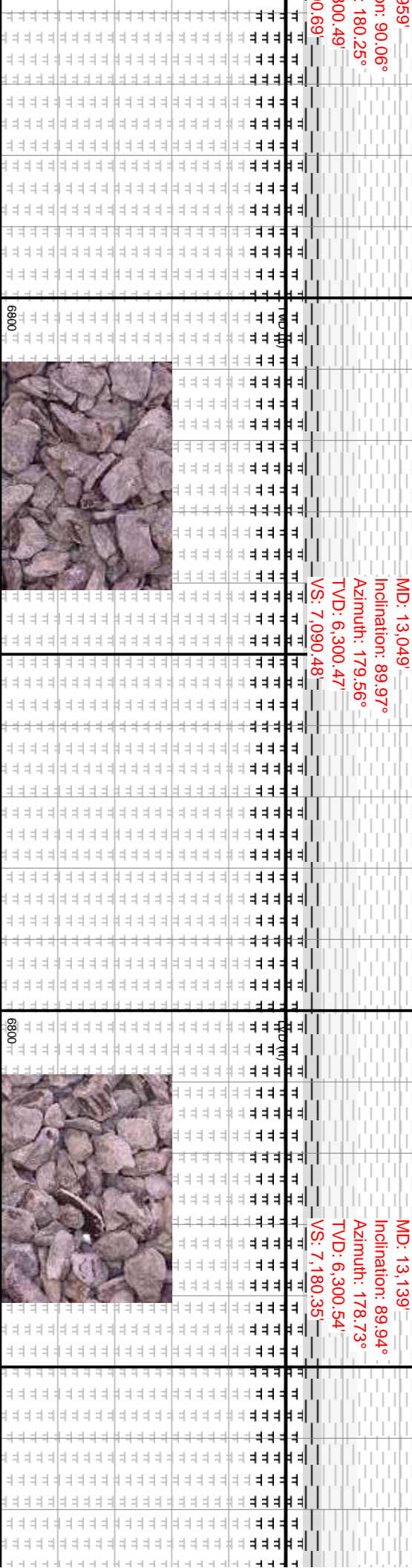
MD: 12,869'
Inclination: 90.06°
Azimuth: 180.98°
TVD: 6,300.59'
VS: 6,910.98'

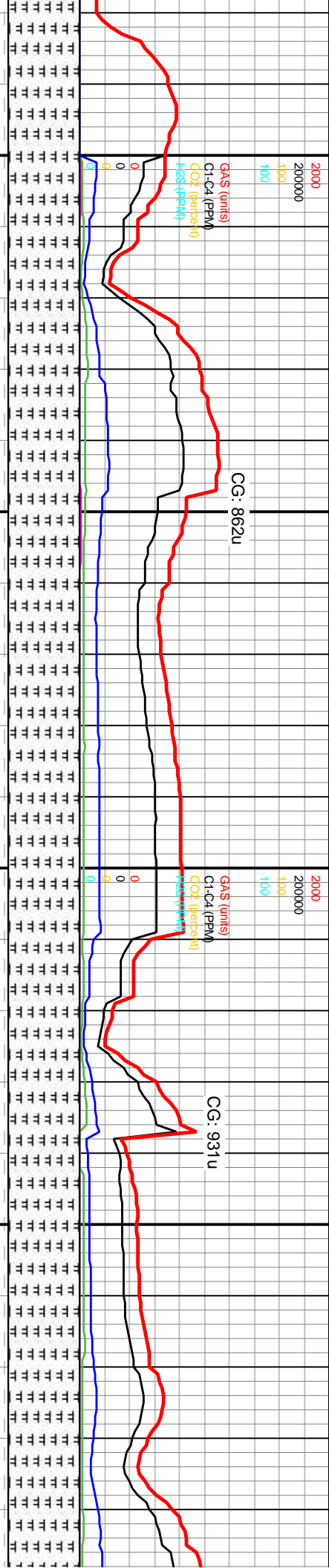
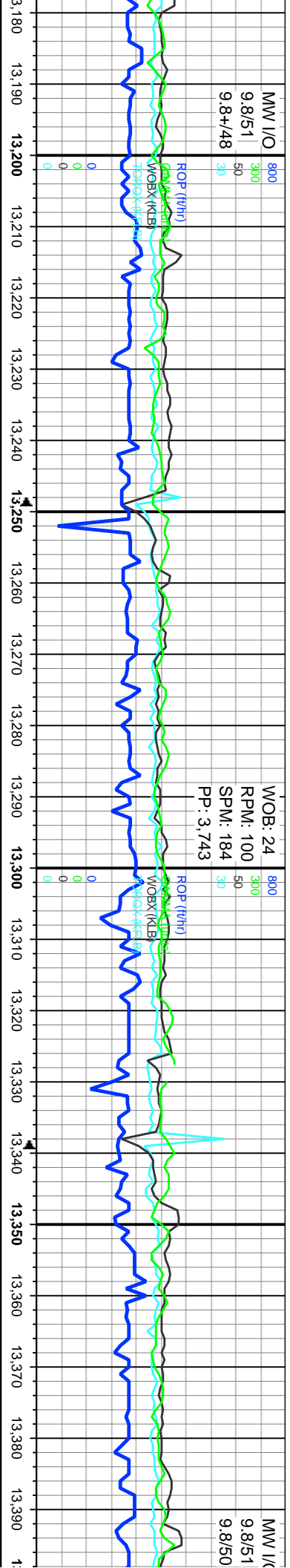




100% MRLST: MDSTN, LT TO DK GY, V
GRTTY TEX, DL TO RTHY LSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB
FISS TO FISS, V SLTY, CALC, TR CHLK

100%MR.LST: MDSTN, LT TO DK GY, V
GRITTY TEX, DL TO RTHY LSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB
FISS TO FISS, V SLTY, CALC, TR CHLK,
TR F DISSM PYR





100% MRLST: MDSTN, LT TO DK GY, V GRITTY TEX, DL TO RTHY LSTR, FRM TO HD IP, SB BLKY TO BLKY, AMOR, SB FISS TO FISS, V SLTY, CALC. TR CHLK

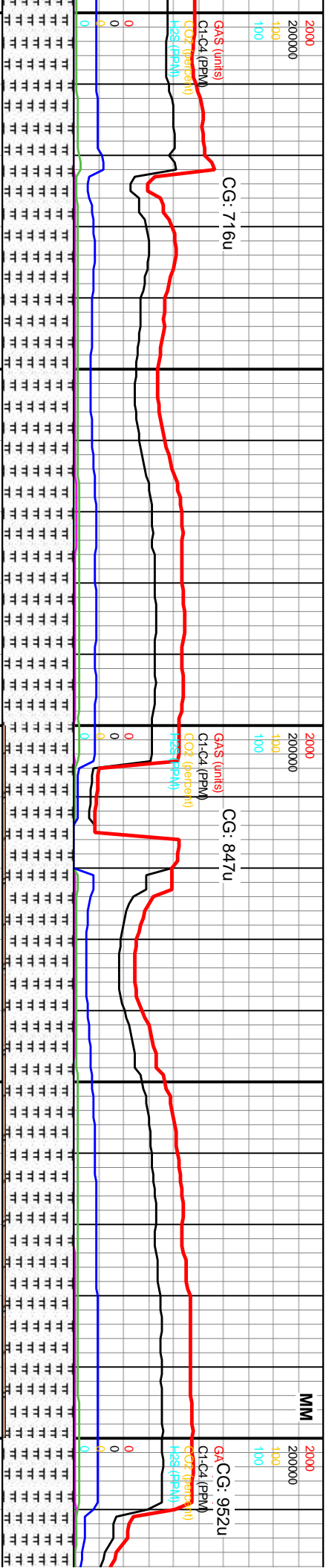
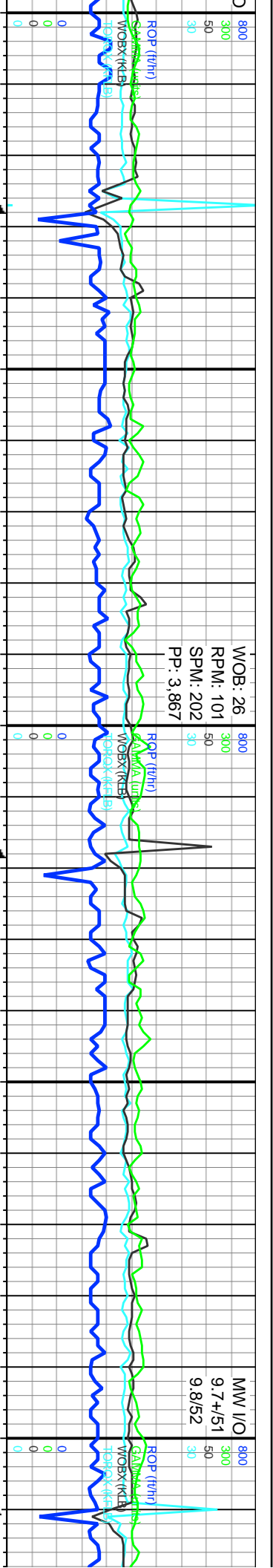
MD: 13,229'
Inclination: 90.12°
Azimuth: 178.54°
TV D: 6,300.49'
VS: 7,270.25'



100% MR.LST: MDSTN, LT TO DK GY, V
GRTTY TEX, DL TO RTHY LSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, V SLTY, CALC, TR CHLK

MD: 13,319'
Inclination: 90°
Azimuth: 178.11°
TVD: 6,300.4'
VS: 7,360.18'





100% MRLST: MDSTN, LT TO DK GY, V
GRITTY TEX, DL TO RTHY LSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, V SLTY, CALC, TR CHLK

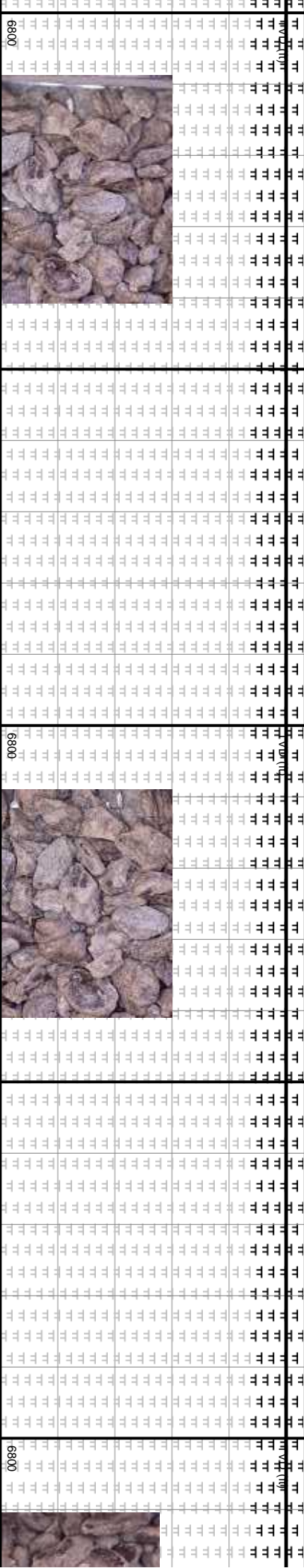
100% MRLST: MDSTN, DK GY, GRITTY TEX,
DL TO RTHY LSTR, FRM TO HD IP, SB
BLKY TO BLKY, AMOR, SB FISS, V SLTY,
CALC, TR CHLK

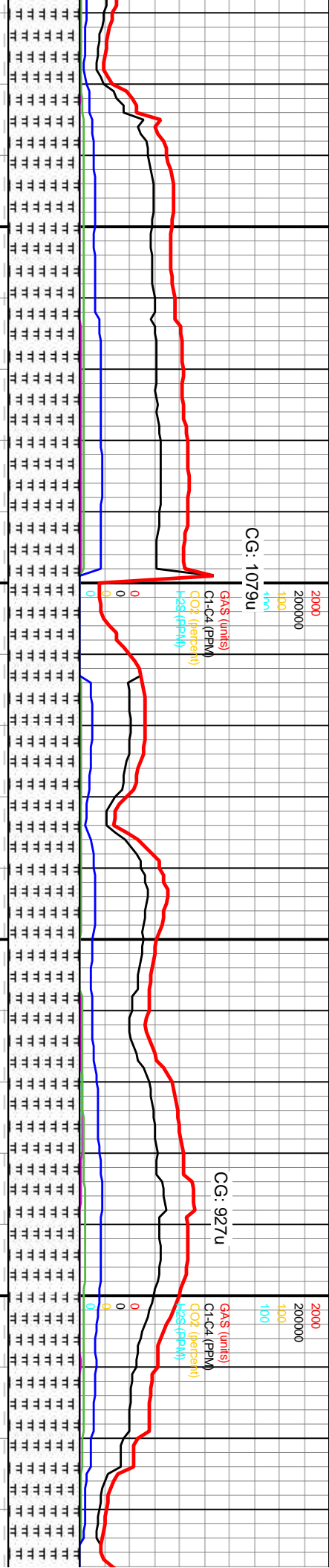
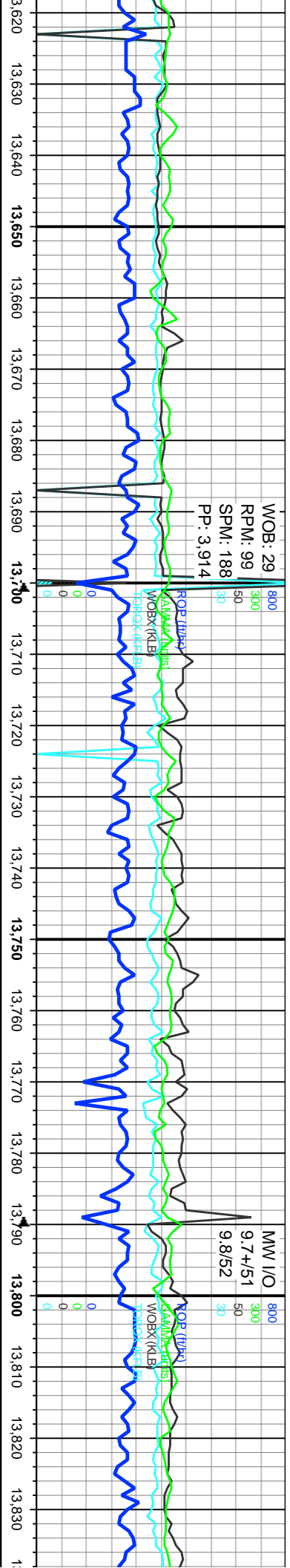
100% MRLST: MDSTN, LT TO DK GY, V
GRITTY TEX, DL TO RTHY LSTR, FRM TO
HD IP, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS, V SLTY, CALC, TR CHLK

MD: 13,409'
Inclination: 90.31°
Azimuth: 177.94°
TVD: 6,300.15'
VS: 7,450.12'

MD: 13,498'
Inclination: 90.22°
Azimuth: 177.91°
TVD: 6,299.74'
VS: 7,539.07'

MD: 13,588'
Inclination: 90.22°
Azimuth: 177.85°
TVD: 6,299.4'
VS: 7,629.03'





MDSTN, DK GY, SME BLK, DULL TO RTHY LSTR, FRM TO GY TO BLKY, AMOR, SB FISS, R CHLK IP	MD: 13.678 Inclination: 90.25° Azimuth: 177.93° TVD: 6,299.03' VS: 7,718.98'	100% MRLST: MDSTN, MED TO DK GY, GRITTY TO V GRITTY TEX, DULL LSTR, SL HD, SB BLKY TO BLKY, AMOR, SB FISS IP, SLTY, CALC, TR CHLK	MD: 13.767 Inclination: 90.34° Azimuth: 178.61° TVD: 6,298.57' VS: 7,807.91'	100% MRLST: MDSTN, DK GY, S V GRITTY TEX, DULL LSTR, FRM SB BLKY TO BLKY, AMOR, SB FI CALC, TR CHLK
--	--	--	--	--

WOB: 26
RPM: 100
SPM: 188
PP: 3.928

NW I/O
9.7+/49
9.8/50

ROP (ft/hr)
GAMMA (API)
MOBX (KB)
TOPOX (K/FT)

ROP (ft/hr)
GAMMA (API)
MOBX (KB)
TOPOX (K/FT)

CG: 963u

CG: 1290u

CG: 95

GAS (units)
C1-C4 (PPM)
CO2 (lbperbbl)
H2S (PPM)

GAS (units)
C1-C4 (PPM)
CO2 (lbperbbl)
H2S (PPM)

ME BLK IP
TO SL HD
SS, SLTY,

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX. RTHY LSTR, FRM TO SL HD,
HRD IP, SB BLKY TO BLKY, AMOR, SB FISS
TO FISS IP, SLTY, CALC, TR CHLK

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX. DULL TO RTHY LSTR,
FRM TO SL HD, SB BLKY TO BLKY,
AMOR, SB FISS, SL SLTY, CALC, TR
CHLK IP

MD: 13.856°
Inclination: 90.25°
Azimuth: 178.07°
TVD: 6,298.11'
VS: 7,896.83'

MD: 13.946°
Inclination: 90.03°
Azimuth: 179.59°
TVD: 6,297.89'
VS: 7,986.72'

MD: 14.036°
Inclination: 90.09°
Azimuth: 179.64°
TVD: 6,297.8'
VS: 8,076.54'



WOB: 30
RPM: 100
SPM: 190
PP: 3.927

ROP (in) 800
GAMMA (units) 300
WOBX (KB) 50
TDRX (KRB) 30

14,060 14,070 14,080 14,090 14,100 14,110 14,120 14,130 14,140 14,150 14,160 14,170 14,180 14,190 14,200 14,210 14,220 14,230 14,240 14,250 14,260 14,270

NW I/O
9.7+/50
9.8/48

ROP (in) 800
GAMMA (units) 300
WOBX (KB) 50
TDRX (KRB) 30

2000
1000
100

GA\$ (units)
C1-C4 (PPM)
CO2 (lbperbbl)
H2S (PPM)

CG: 860u

2000
1000
100

GA\$ (units)
C1-C4 (PPM)
CO2 (lbperbbl)
H2S (PPM)

CG: 769u

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, DULL LSTR, FRM TO SL
HD, SB BLKY TO BLKY, AMOR, SB FISS
IP, SL SLTY, CALC

MD: 14,126'
Inclination: 90.34°
Azimuth: 180.24°
TVD: 6,297.46'
VS: 8,166.33'

100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TO V GRITTY TEX, DULL LSTR,
FRM TO SL HD, SB BLKY TO BLKY,
AMOR, SB FISS TO FISS IP, SL SLTY,
CALC, TR CHK

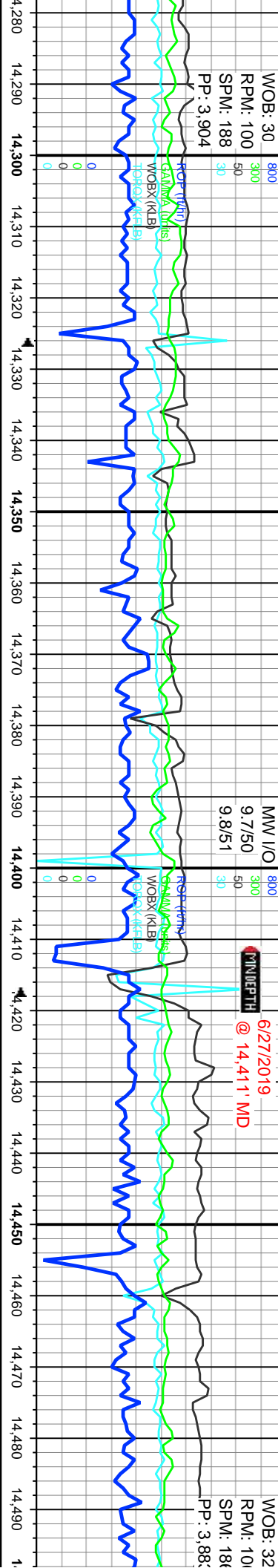
MD: 14,216'
Inclination: 90.28°
Azimuth: 180.75°
TVD: 6,296.97'
VS: 8,256.05'

WOB: 30
RPM: 100
SPM: 188
PP: 3.904

NW I/O
9.7/50
9.8/51

WOB: 30
RPM: 100
SPM: 188
PP: 3.883

6/27/2019
@ 14,411' MD



100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TEX, RTHY LSTR, FRM TO SL
HD, SB BLKY TO BLKY, AMOR, SB
FISS, SL SLTY, CALC

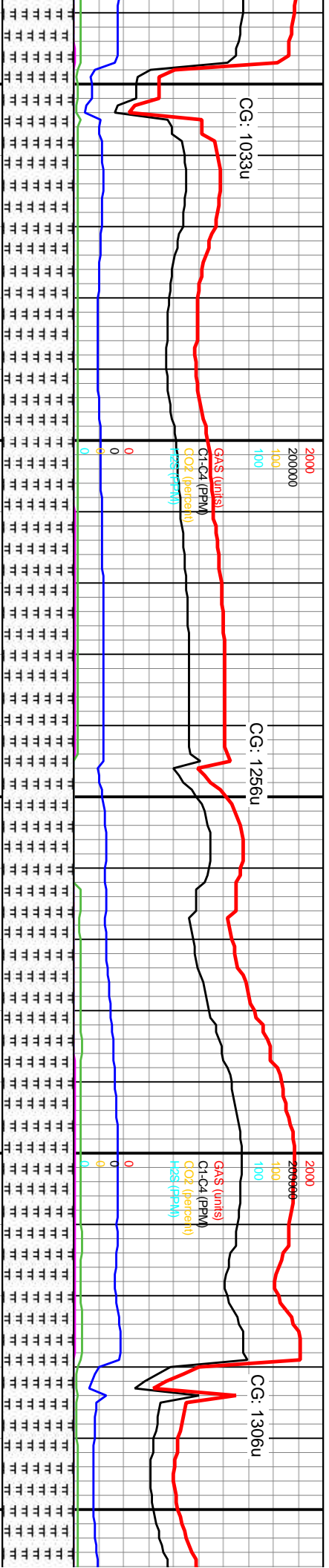
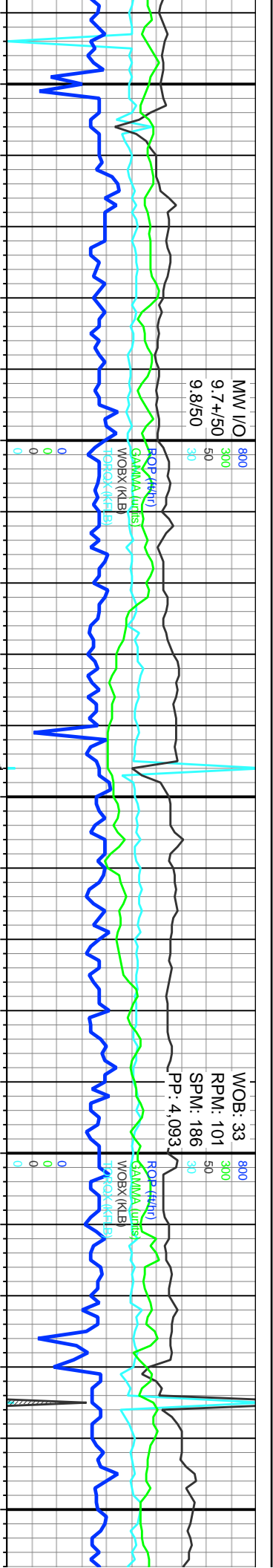
100% MRLST: MDSTN, DK GY TO BLK,
GRITTY TO V GRITTY TEX, DULL LSTR, FRM
TO SL HD, SB BLKY TO BLKY, AMOR, SB
FISS, SLTY, CALC, TR CHLK IP

MD: 14,305'
Inclination: 90.34°
Azimuth: 179.85°
TVD: 6,296.49'
VS: 8,344.8'

MD: 14,395'
Inclination: 90.25°
Azimuth: 179.18°
TVD: 6,296.03'
VS: 8,434.63'

MD: 14,484'
Inclination: 90.34°
Azimuth: 179.95°
TVD: 6,295.57'
VS: 8,523.46'





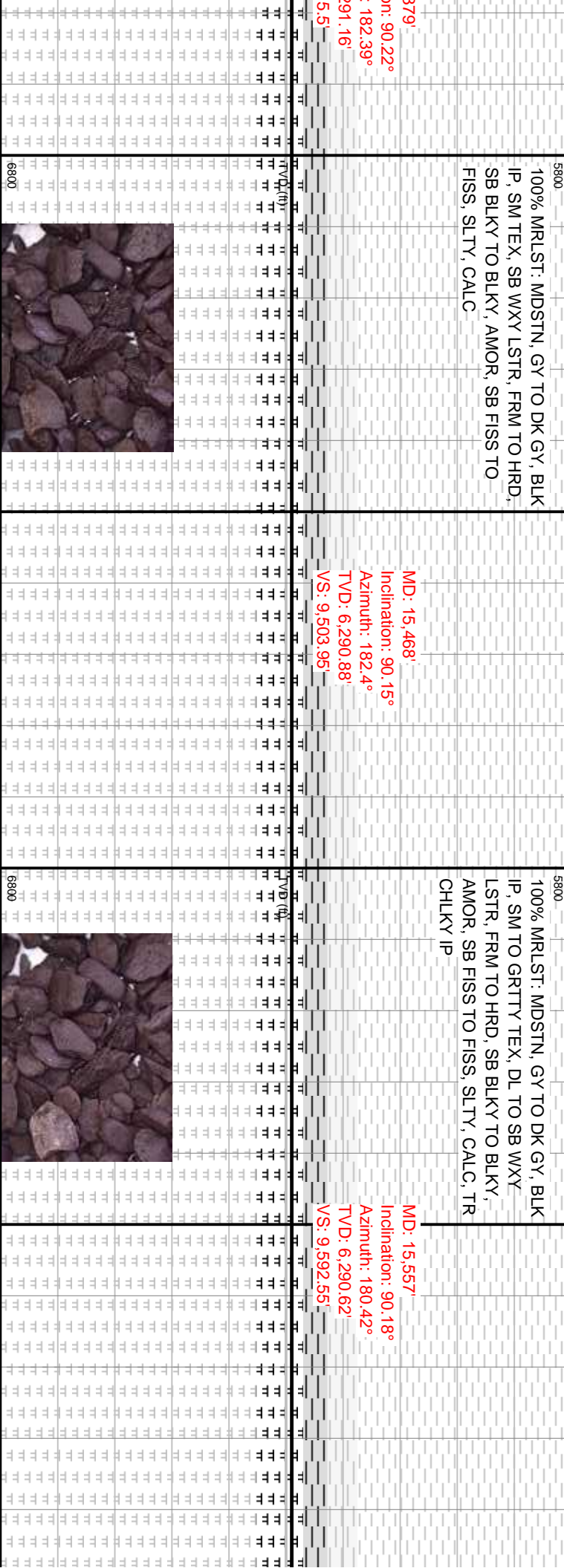
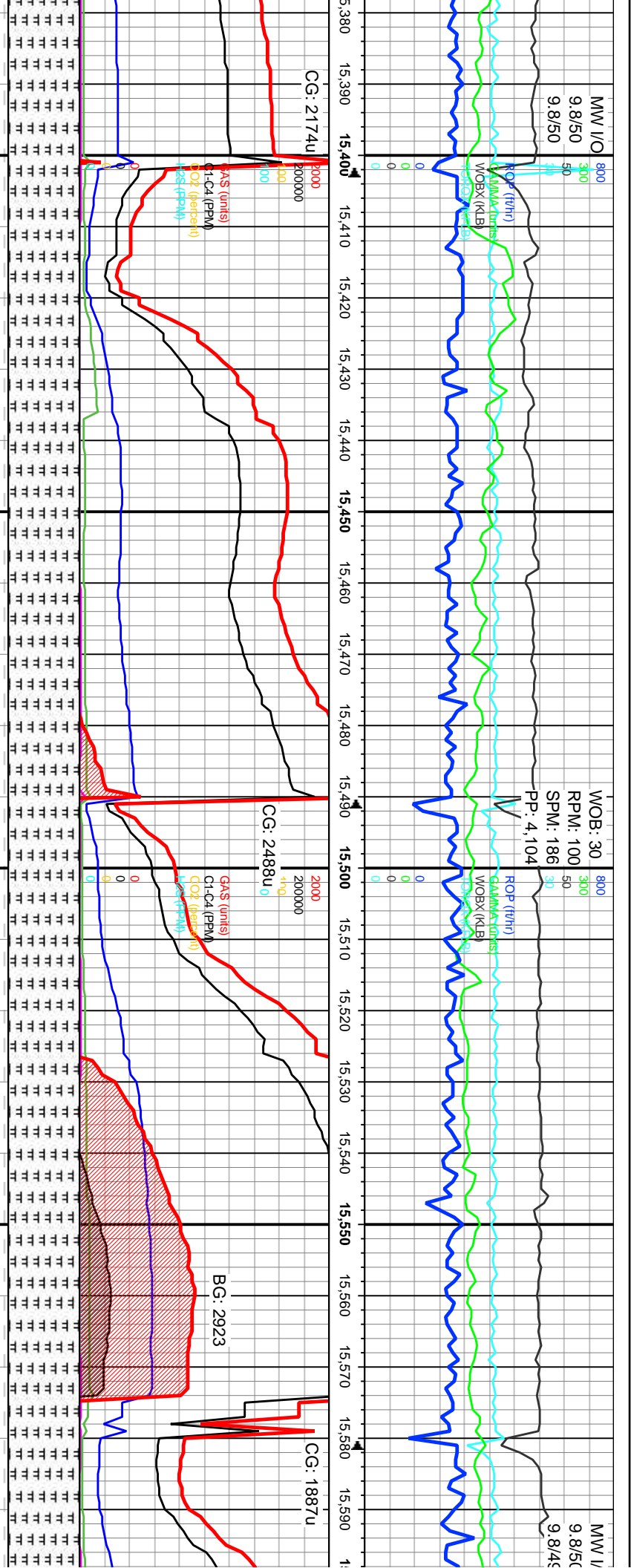
DK GY, V R, FRM TO R, SB	100% MRLST: MDSTN, DK GY TO BLK, GRITTY TEX, RTHY LSTR, HRD, SB BLKY TO BLKY, AMOR, SB FISS TO FISS, SL SLTY, CALC	MD: 15.022° Inclination: 90.31° Azimuth: 180.05° TVD: 6,293.07' VS: 9,060.06'	6800
DK GY, V R, FRM TO R, SB	100% MRLST: MDSTN, GY TO DK GY, BLK IP, GRITTY TEX, DL TO RTHY LSTR, FRM TO HRD, SB BLKY TO BLKY, AMOR, SB FISS TO FISS, SLTY, CALC, TR CHLK	MD: 15.111° Inclination: 90.28° Azimuth: 180.53° TVD: 6,292.61' VS: 9,148.81'	6800

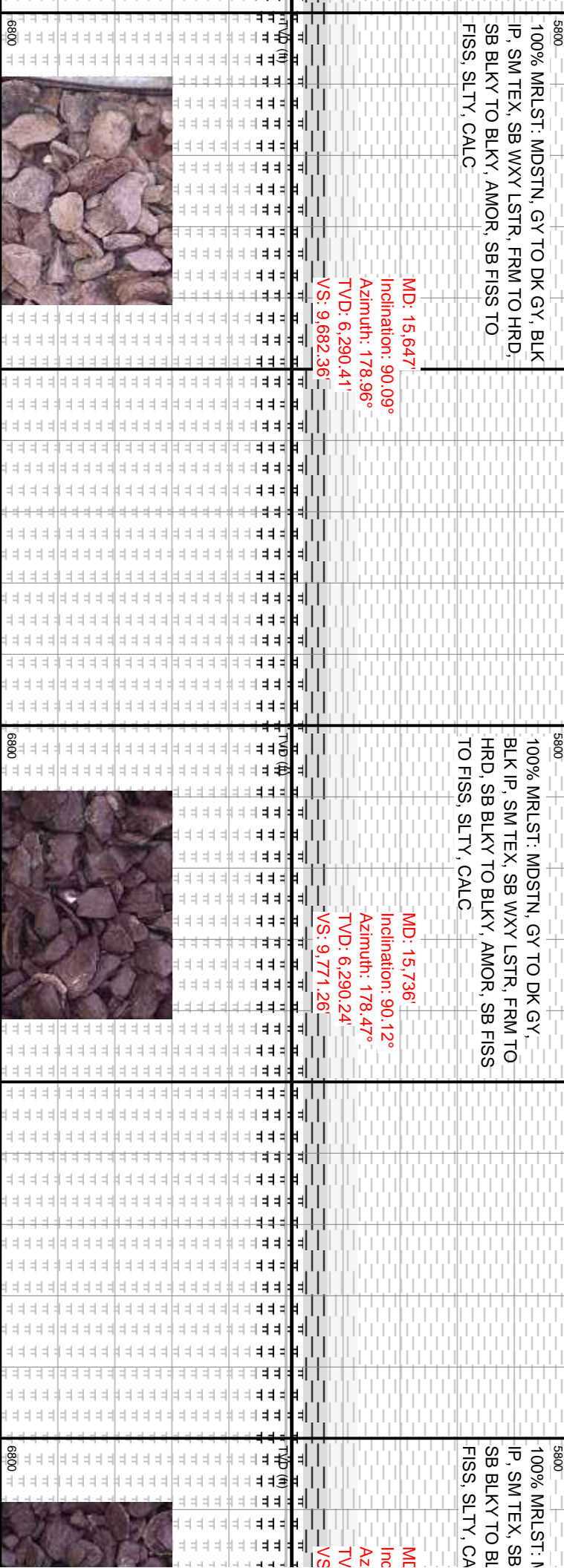
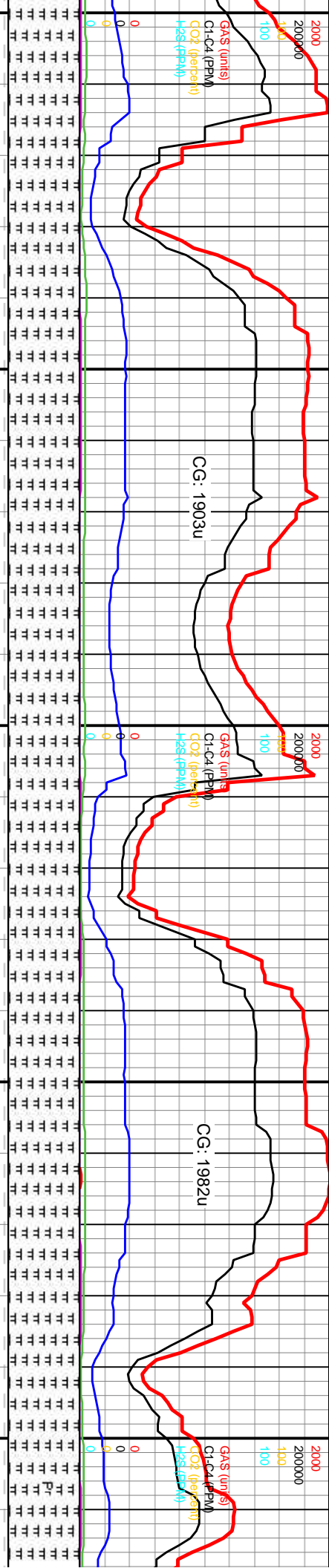
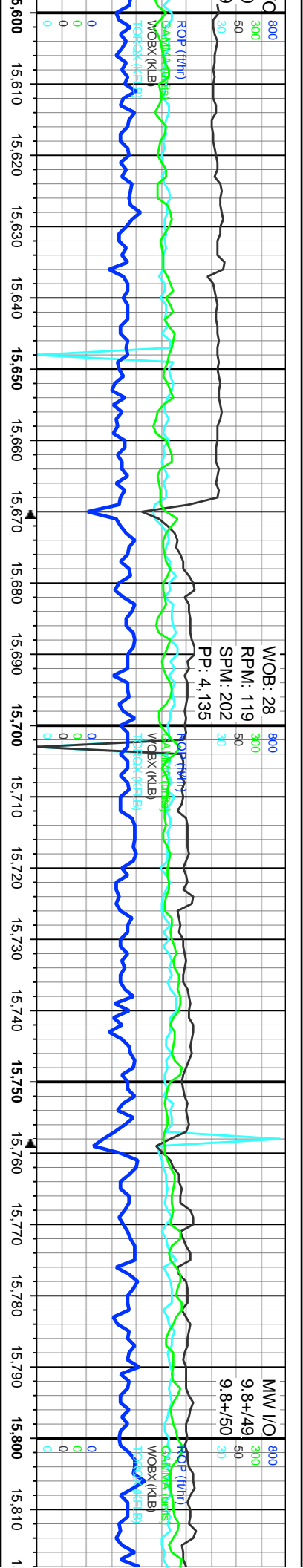


100% WRJST: MDSTN, GY TO DK GY, BLK
IP, SM TO GRITTY TEX, DL TO SB WXY
LSTR, FRM TO HRD, SB BLKY TO BLKY,
AMOR, SB FISS TO FISS, SLTY, CALC

MD: 15,3
Inclination:
Azimuth:
TVD: 6,2
VS: 9,41

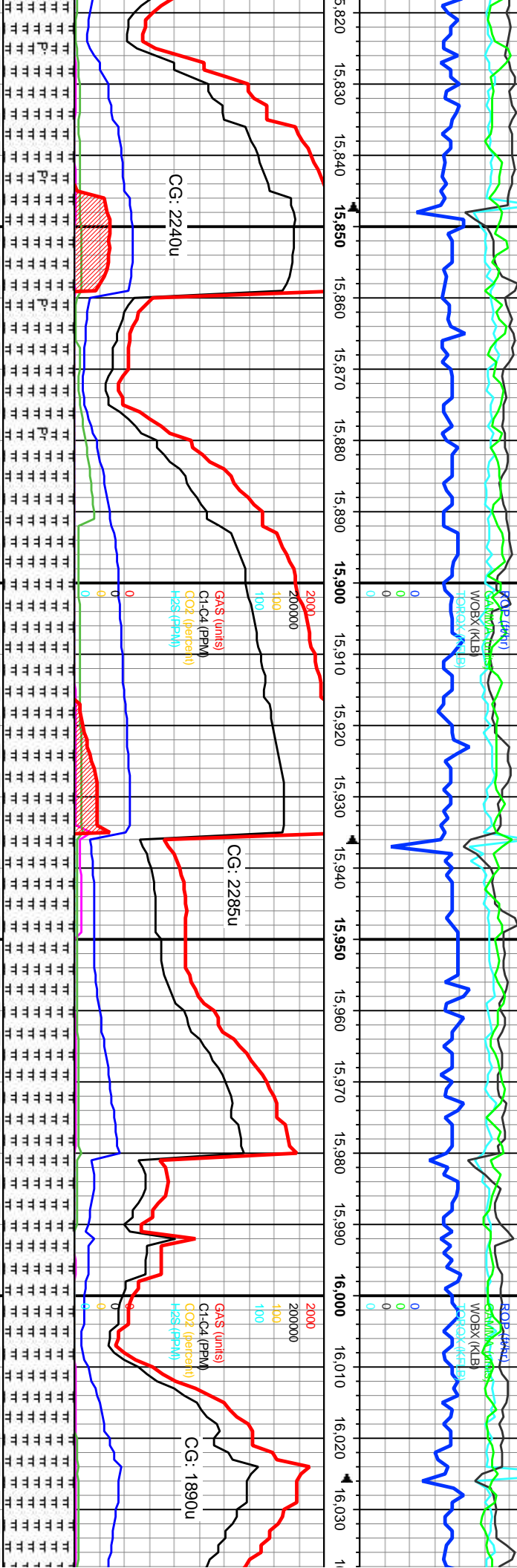






WOB: 23
RPM: 120
SPM: 186
PP: 3.921

NW I/O
9.8+/50
9.8+/50



MDSTN, GY TO DK GY, BLK
WXY LSTR, FRM TO HRD,
BKY, AMOR, SB FISS TO
LC

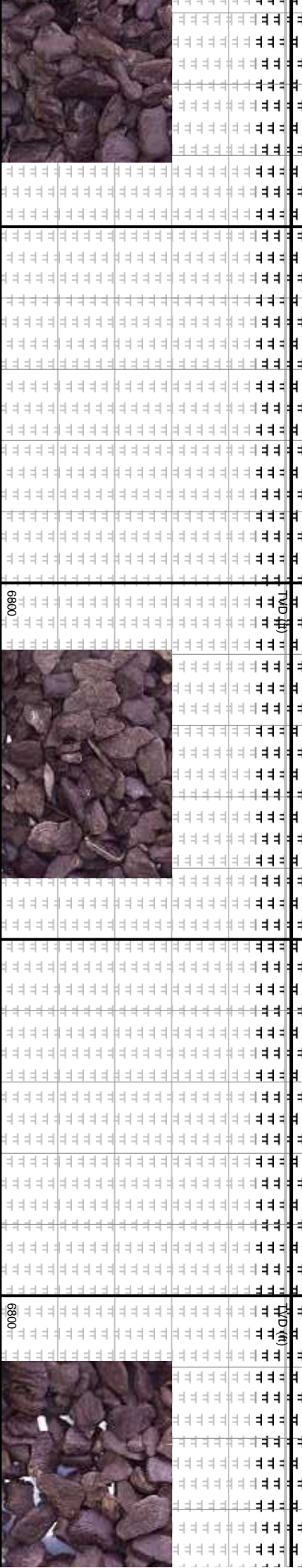
100% MRLST: MDSTN, GY TO DK GY, BLK
IP, SM TEX, SB WXY LSTR, FRM TO HRD,
SB BLKY TO BLKY, AMOR, SB FISS TO
FISS, SLTY, CALC, TR F DISSM PYR

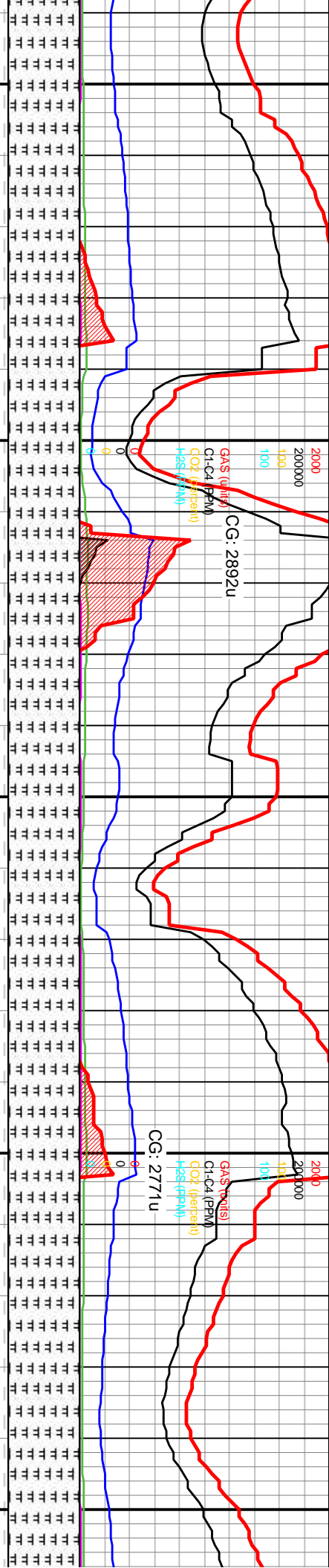
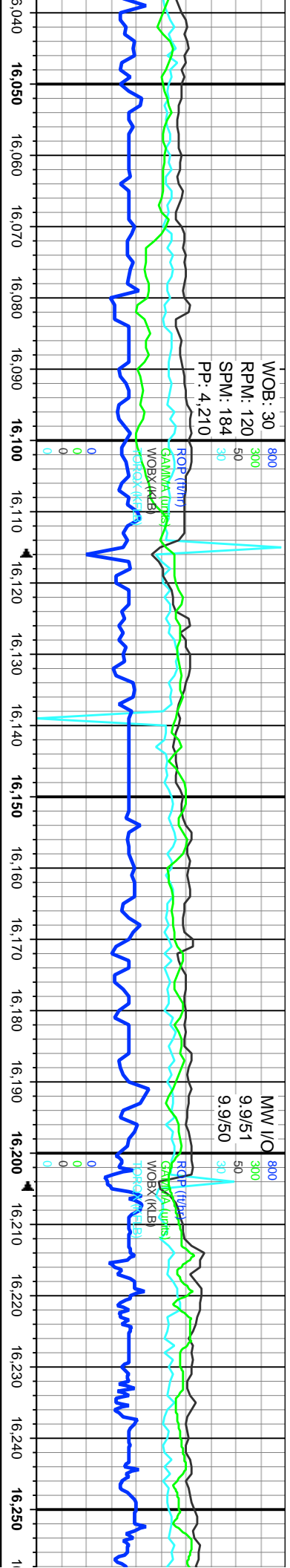
100% MRLST: MDSTN, GY TO D
IP, SM TEX, SB WXY LSTR, FRM
SB BLKY TO BLKY, AMOR, SB F
FISS, SL SLTY IP, CALC

: 15.825'
Inclination: 90.18°
Azimuth: 177.6°
D: 6,290.01'
VS: 9,860.21'

MD: 15,914'
Inclination: 90.18°
Azimuth: 176.16°
TVD: 6,289.73'
VS: 9,949.19'

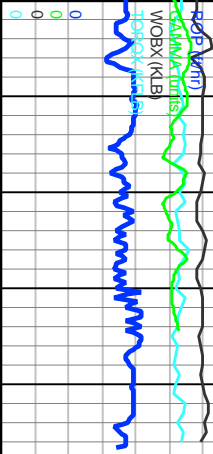
MD: 16,004'
Inclination: 90.25°
Azimuth: 177.24°
TVD: 6,289.39'
VS: 10,039.18'



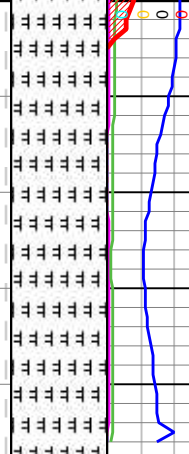


K GY, BLK TO HRD, FISS TO		100% MRLST: MDSTN, GY TO DK GY, BLK IP, SM TEX, SB WXY LSTR, FRM TO HRD, SB BLKY TO BLKY, AMOR, SB FISS TO FISS, SL SLTY IP, CALC		100% MRLST: MDSTN, GY TO DK GY, BLK IP, SM TEX, SB WXY LSTR, FRM TO HRD, SB BLKY TO BLKY, AMOR, SB FISS TO FISS, SL SLTY IP, CALC	
MD: 16,093° Inclination: 90.18° Azimuth: 178.05° TVD: 6,289.06' VS: 10,128.15'		MD: 16,182° Inclination: 90.15° Azimuth: 178.77° TVD: 6,288.8' VS: 10,217.07'		MD: 16,182° Inclination: 90.15° Azimuth: 178.77° TVD: 6,288.8' VS: 10,217.07'	
6800'		6800'		6800'	

WOB: 32
RPM: 120
SPM: 200
PP: 4.012



CG: 2145u



100% MRLST: MDSTN, GY TO DK GY, BLK
IP, SM TEX, SB WXY LSTR, FRM TO HRD,
SB BLKY TO BLKY, AMOR, SB FISS TO
FISS, SL SLTY IP, CALC

MD: 16,272'
Inclination: 90.15°
Azimuth: 180.44°
TVD: 6,288.57'
VS: 10,306.89'

MD: 16,323'
Inclination: 90.12°
Azimuth: 181.09°
TVD: 6,288.45'
VS: 10,357.71'

MD: 16,347'
Inclination: 90.12°
Azimuth: 181.09°
TVD: 6,288.4'
VS: 10,381.62'

