

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name State Pronghorn X44-32-31 MRLNC

Location SESE SEC. 32 T5N R62W

State COLORADO

County WELD

Country USA

Rig Number XTREME 20

API Number 05-123-41261

AFE # 15206

Region DJ BASIN

Field WATTENBERG

Spud Date 5/19/2015

Drilling Completed 5/25/2015

Surface Coordinates 393' FSL x 1143' FEL (LAT: 40.35105, -104.22743)

Bottom Hole Coordinates 990' FSL x 860' FEL (LAT: 40.35260, -104.24518)PROJECTED

Ground Elevation 4531'

K.B. Elevation 4548'

Logged Interval 5850' To 12016'

Total Depth 12016'

Formation NIOBRARA, C-CHALK

Type of Drilling Fluid H2O, LSND

Operator

Company Bonanza Creek Energy Inc.

Address 410 17th Street, Suite 1500 Denver, CO 80202

Geologist

Name Paul McKay

Company Bonanza Creek

Address 410 17TH STREET, SUITE 1500 DENVER, CO

Zone Color Coding

Oil
Note
Error

Condensate
Core
Water

Rock Types

UNKNOWN
ANHYDRITE
GYPSUM
SALT
SIDERITE or LIMONITE
LIMESTONE
DOLOMITE
CHERT

COAL
MARLSTONE
CLAYSTONE
SHALE
SHALE GRAY
SHALE COLORET
SILTSTONE
SANDSTONE

CHALK
SANDSTONE

Accessories

Fossils			Stringer
F FOSSIL	— ARGILLACEOUS	↘ GLAUCONITE	
GASTROPOD	/ ARGILLITE GRAIN	≡ GYPSIFEROUS	
ALGAE	⊖ OOLITE	B BENTONITE	ANHYDRITE STRINGER
AMPHIPORA	OSTRACOD	BITUMENOUS SUBSTANCE	BENTONITE STRINGER
BELEMNITE	PELECYPOD	BRECCIA FRAGMENTS	COAL STRINGER
BIOLCLASTIC	PELLET	1 CALCAREOUS	DOLOMITE STRINGER
BRACHIOPOD	⊖ PISOLITE	■ CARBONACEOUS FLAKES	GYPSUM STRINGER
BRYOZOA	PLANT REMAINS	CHTDK	PHOSPHATE PELLET:
CERPHALOPOD	PLANT SPORES	CHTLT	P PYRITE
CORAL	SCAPHOPOD	— COAL - THIN BEDS	⊞ SALT CAST
CRINOID	STROMATOPOROID	⊘ DOLOMITIC	: SANDY
ECHINOID		+ FELDSPAR	↗ SILICEOUS
Minerals		● FERRUGINOUS PELLET	
FISH		≡ FERRUGINOUS	↖ SILTY
FORAMINIFERA	ANHYDRITIC		↗ TUFFACEOUS
			SILTSTONE STRINGER

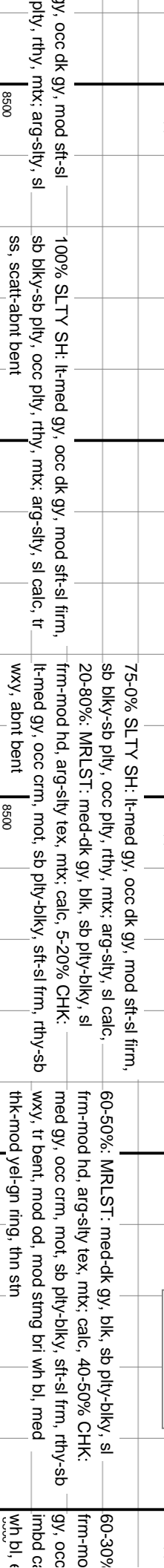
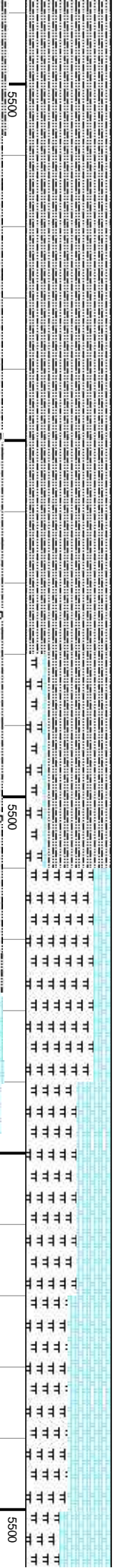
Other Symbols

O ORGANIC	↔ FORMATION TOP	CONNECTION GAS	CRYPTOXLN
P PINPOINT	✳ GAS SHOW	CONNECTION DOWN	E EARTHY
D DEAD	MINDEPTH MN DEPTH	CASING	FX FINELYXLN
● EVEN			
QUESTIONABLE		FORMATION TOP	GS GRAINSTONE
SPOTTED STAINING			L LITHOGRAPHIC
Engineering			MX MICROXLN
BIT	OIL SHOW	OVERTURNED STRATA	
CASING	REVERSE FAULT	A ANGULAR	MS MUDSTONE
CONNECTION (LEFT)	SIDEWALL CORE (LEFT)	R ROUNDED	PS PACKSTONE
CONNECTION (RIGHT)	SIDEWALL CORE (RIGHT)	B SUBANG	WS WACKSTONE
FENESTRAL	SLIDE	P SUBRND	
F FRACTURE	↓ CORE - LOST		
INTERCRYSTALLINE	CORE - RECOVERED		
INTEROOLITIC	DST INTERVAL		
MOLDIC	FAULT		
	WIREFINE TESTED - LEFT	B3 BOUNDSTONE	M MODERATE
	WIREFINE TESTED - RT	C CHALKY	P POOR
			W WELL
Textures			
Sorting			

80202

ng
Gas
Pressure
Seal

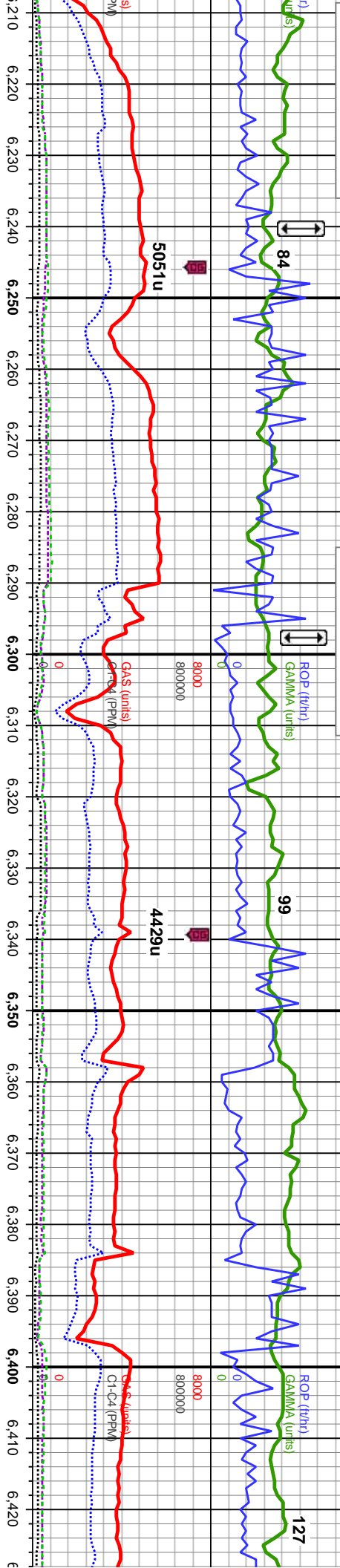
CONGLOMERATE
BRECCIA
TILL
BENTONITE
TUFF
IGNEOUS
METAMORPHIC
CEMENT
CHALK
SILTY SHALE
NO SAMPLE
SHALY SANDSTONE
SHALY SILTSTONE



Niobrara B Chalk Top
6240' MD, 5953' TVD

Niobrara B Marl Top
6298' MD, 5982' TVD

VIS 28 WT 9.9



MD: 6,224'
Inclination: 56.9°
Azimuth: 269.8°
TVD: 5,945.14'
VS: -834.77'

MD: 6,271'
Inclination: 61.2°
Azimuth: 271.1°
TVD: 5,969.3'
VS: -794.47'

MD: 6,318'
Inclination: 64.4°
Azimuth: 269.9°
TVD: 5,990.79'
VS: -752.68'

MD: 6,366'
Inclination: 70.8°
Azimuth: 268.8°
TVD: 6,009.07'
VS: -708.33'

MD: 6,413'
Inclination: 75.9°
Azimuth: 267.9°
TVD: 6,022.53'
VS: -663.33'

MRLST: med-dk gy, blk, sb pty-biky, sl
d hd, arg-sily tex, mtx; calc, 40-70% CHK: med
crm, mot, sb pty-biky, sft-sl frm, rthy-sb wxy, tr
al, scatt cal frags, tr bent, tr pyr, mod sting bri
even mod thk bri yel grn ring, mod sin

85-60% CHK: med gy, occ crm, mot, sb pty-biky,
sft-sl frm, rthy-sb wxy, 15-40%: MRLST: med-dk gy,
blk, sb pty-biky, sl frm-mod hd, arg-sily tex, mtx; calc,
tr foss frags, tr pyr, tr bent, mod sting bri wh bl, even
mod thk bri yel grn ring, mod sin

50-80%: MRLST: med-dk gy, blk, sb pty-biky, sl
frm-mod hd, arg-sily tex, mtx; calc, 50-20% CHK:
med gy, occ crm, mot, sb pty-biky, sft-sl frm, rthy-sb
wxy, tr foss frags, tr pyr, tr bent, mod sting bri wh bl,
mod dull amb ring, thn sin

80-85%: MRLST: med-dk gy, blk, sb pty-blk
frm-mod hd, arg-sily tex, mtx; calc, 20-15% (C
lt-med gy, mot, sb pty-biky, sft-sl frm, rthy-sl
foss frags, tr pyr, scat bent, mod sting bri wh
dull amb ring, thn sin

8500

5500

5500

Niobrara C Chalk Top
6482' MD, 6036' TVD

VIS 38 WT 10.0

54

ROP (ft/hr)
GAMMA (units)

ROP Scale Change
0-800 F/Hr

ROP (ft/hr)
GAMMA (units)

4748u

5692u

49

TD for Build @ 6593' MD
5/21/2015 @ 12:25 MST

Drilling Lateral Commenced
on 05/23/2015 @ 04:50 MST

G1-C4 (PPM)

G1-C4 (PPM)

5500

5500

Projection to Bit

MD: 6,460'
Inclination: 80.6°
Azimuth: 267°
TVD: 6,032.1'
VS: -617.36'

MD: 6,493'
Inclination: 83.7°
Azimuth: 266.6°
TVD: 6,036.6'
VS: -584.71'

MD: 6,593'
Inclination: 89.6°
Azimuth: 268°
TVD: 6,042.45'
VS: -485.01'

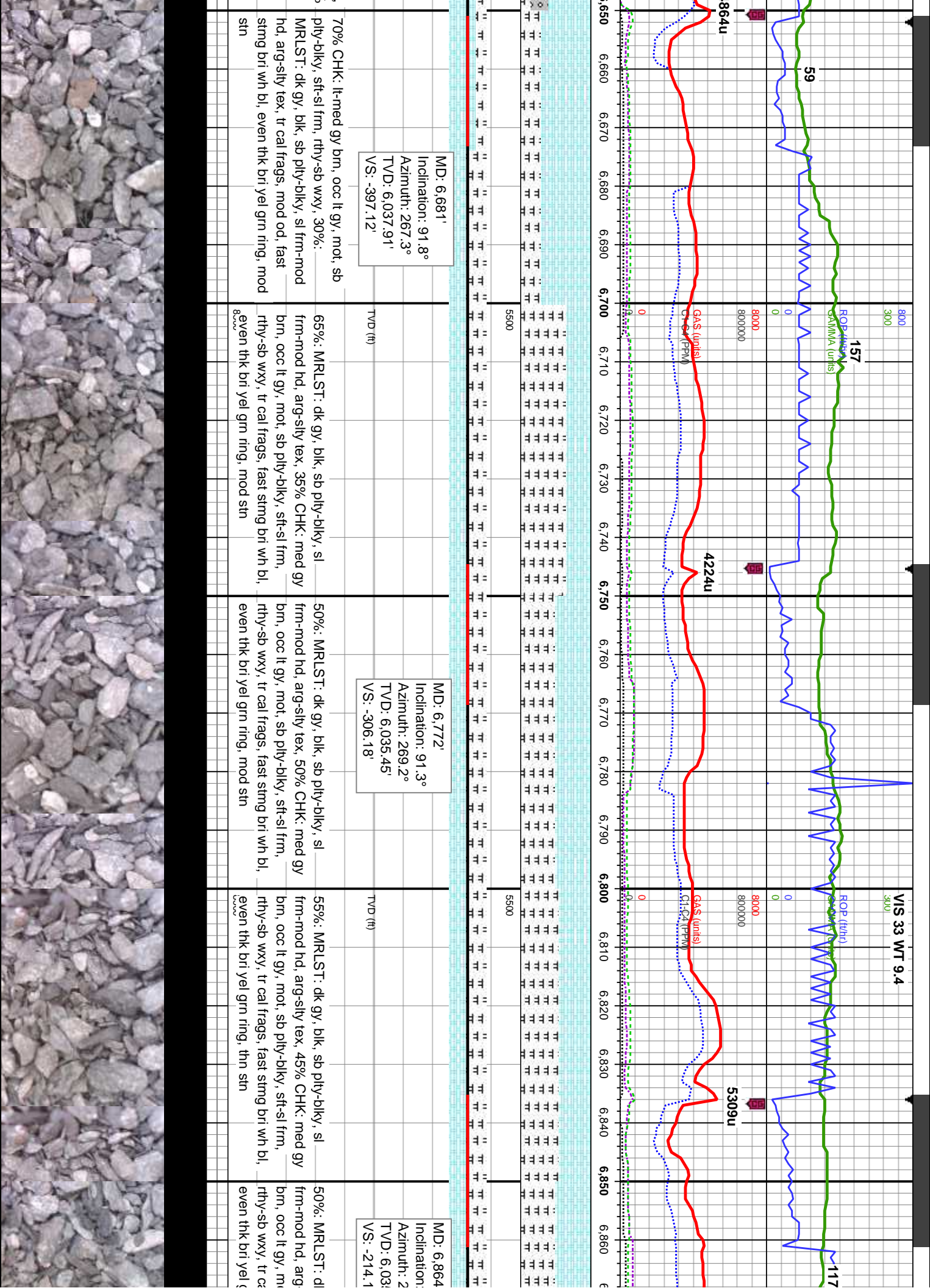
MD: 6,609'
Inclination: 92.4°
Azimuth: 267.5°
TVD: 6,040.55'
VS: -469.01'

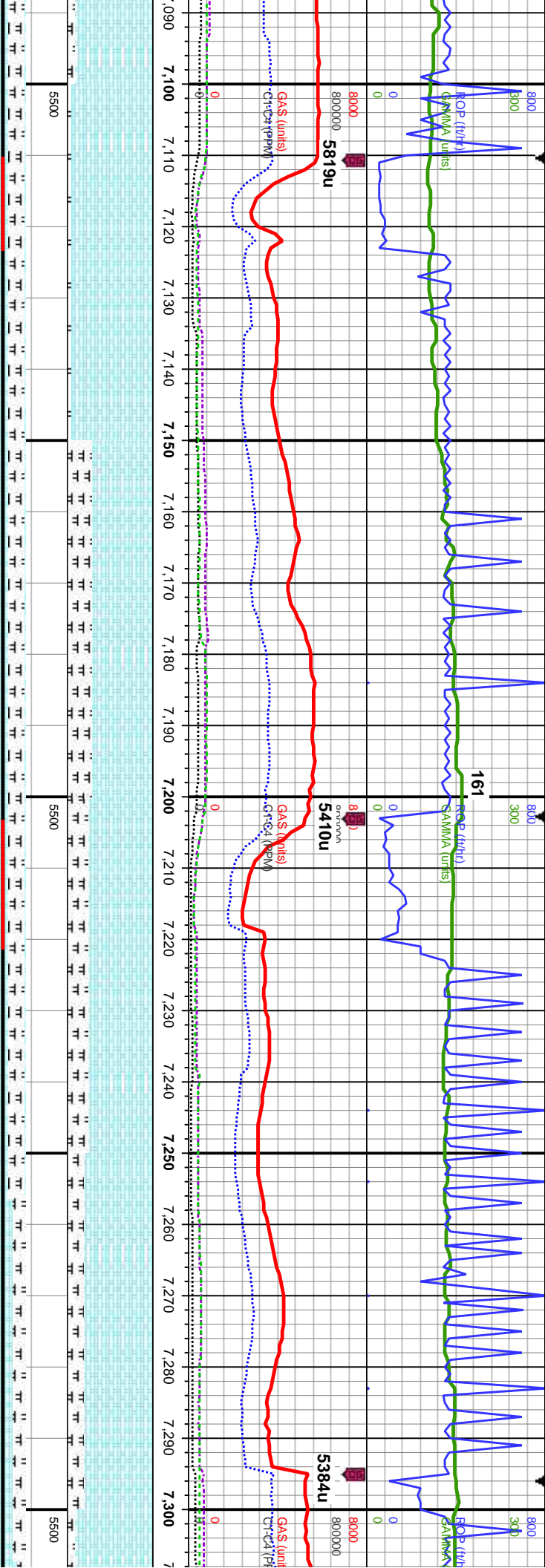
CHK: 80-15%: MRLST: med-dk gy, blk, sb pty-biky, sl
frm-mod hd, arg-sily tex, mix; calc, 20-85% CHK:
lt-med gy, mot, sb pty-biky, sft-sl frm, rthy-sb wxy, tr
foss frags, tr pyr, tr bent

95-100% CHK: wht-crm, lt-med gy brn, mot, sb
pty-biky, sft-sl frm, rthy-sb wxy, 15-0%: MRLST: dk gy, fos frags, mod chk flor, g od, fast sting bri
blk, sb pty-biky, sl frm-mod hd, arg-sily tex, tr cal
frags, occ foss frags, mod chk flor, mod od, fast
sting bri wh bl, even thk bri yel grn ring, thk sin

100% CHK: wht-crm, lt-med gy brn, mot, sb 60% CHK: lt-med gy brn, occ lt gy, mot
pty-biky, sft-sl frm, rthy-sb wxy, occ cal and sb pty-biky, sft-sl frm, rthy-sb wxy, 25%
wht, even thk bri yel grn ring, thk sin, fast
sting bri wh bl, even thk bri yel grn ring,
mod sin
cal frags, fast sting bri wh bl, even thk
bri yel grn ring, mod sin

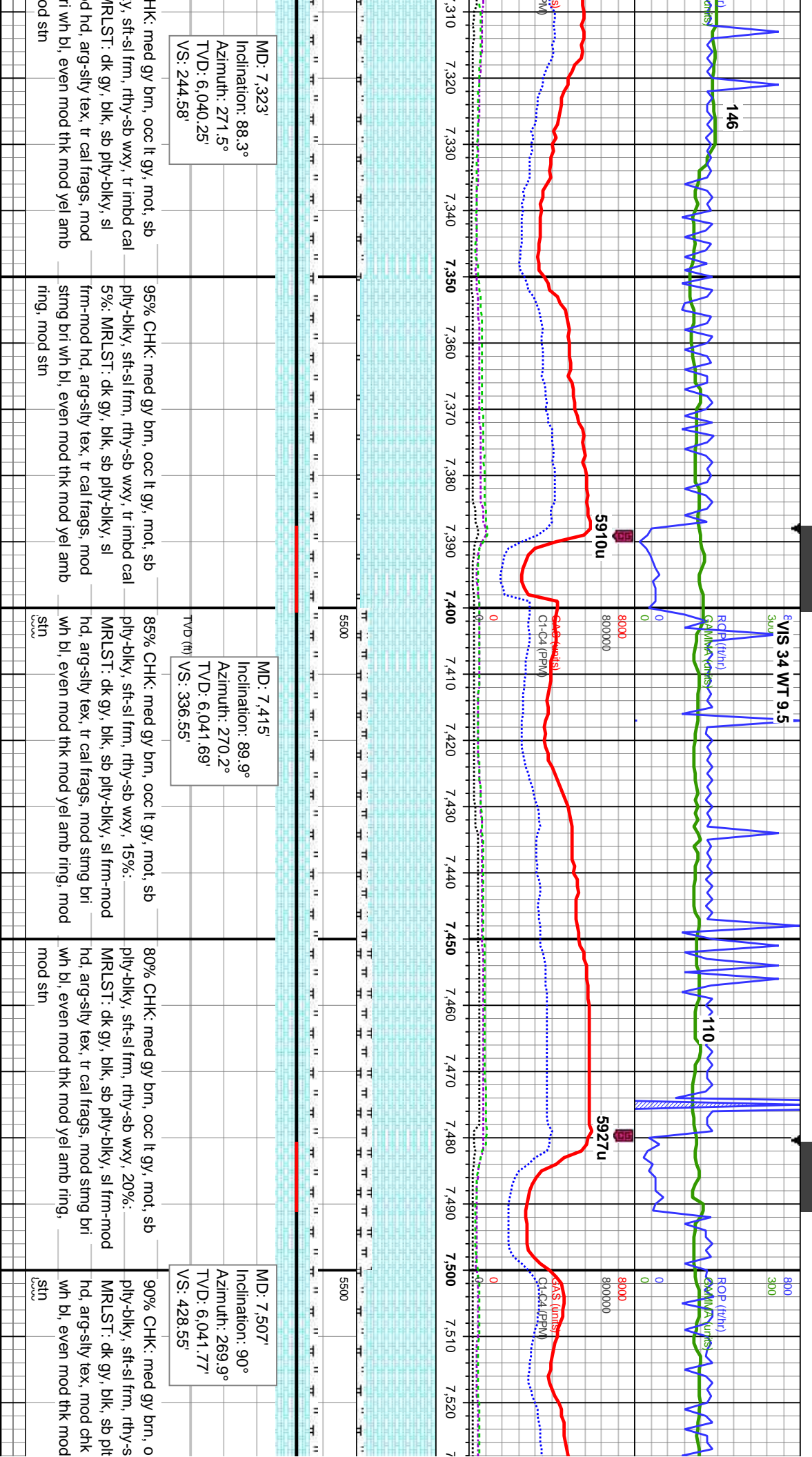






MD: 7,139' Inclination: 90.2° Azimuth: 271.7° TVD: 6,036.96' VS: 60.74'		MD: 7,231' Inclination: 88.7° Azimuth: 271.8° TVD: 6,037.84' VS: 152.67'		MD: 7,231' Inclination: 88.7° Azimuth: 271.8° TVD: 6,037.84' VS: 152.67'	
TVD (ft)		TVD (ft)		TVD (ft)	
mot, sb		70% CHK: med gy brn, occ lt gy, mot, sb		80% CHK: med gy brn, occ lt gy, mot, sb	
95% CHK: lt-med gy brn, occ lt gy, mot, sb		ply-biky, sft-sl frm, rthy-sb wxy, 30%:		ply-biky, sft-sl frm, rthy-sb wxy, 20%:	
MRLST: dk gy, blk, sb ply-biky, sl frm-mod		hd, arg-sily tex, tr cal frags, mod od, fast		MRLST: dk gy, blk, sb ply-biky, sl frm-mod	
arg-sily tex, mod chk flor, mod od, fast stmg		stmg bri wh bl, even v thk bri yel grn ring, thn stn		hd, arg-sily tex, tr cal frags, fast stmg bri	
bri wh bl, even v thk bri yel grn ring, thn stn		wh bl, even mod thk mod yel amb ring,		bl, even mod thk mod yel amb ring, mod stn	
ring, m		mod stn		ring, m	





MD: 7,323'
Inclination: 88.3°
Azimuth: 271.5°
TVD: 6,040.25'
VS: 244.58'

CHK: med gy brn, occ lt gy, mot, sb
y, sft-sl frm, rthy-sb wxy, tr imbd cal
MRLST: dk gy, blk, sb pty-blky, sl
hd, arg-sily tex, tr cal frags, mod
sting bri wh bl, even mod thk mod yel amb
mod sin

95% CHK: med gy brn, occ lt gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, tr imbd cal
5%: MRLST: dk gy, blk, sb pty-blky, sl
frm-mod hd, arg-sily tex, tr cal frags, mod
sting bri wh bl, even mod thk mod yel amb
ring, mod sin

MD: 7,415'
Inclination: 89.9°
Azimuth: 270.2°
TVD: 6,041.69'
VS: 336.55'

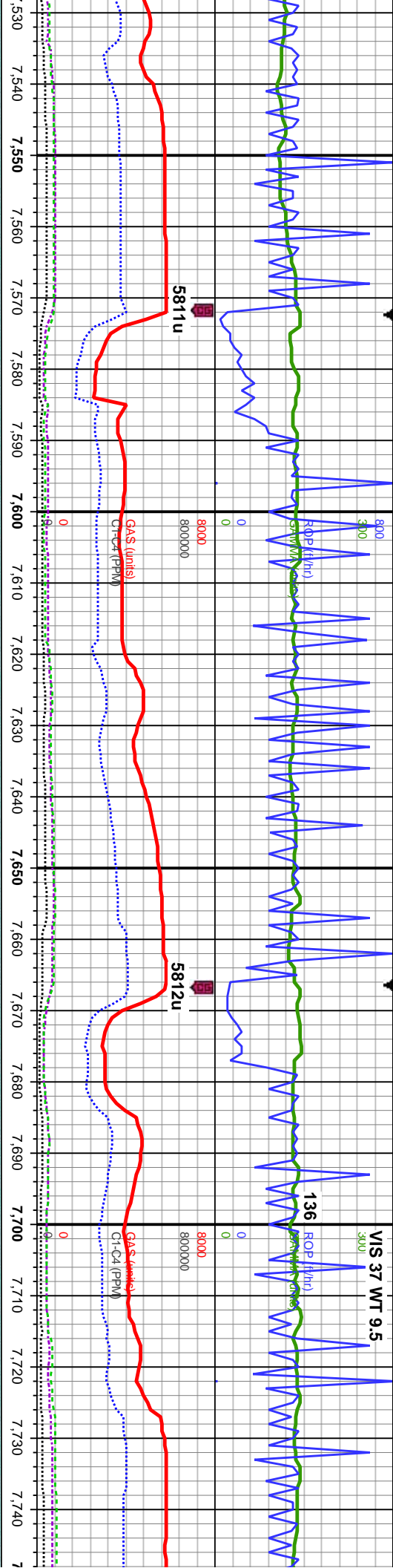
85% CHK: med gy brn, occ lt gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, 15%:
MRLST: dk gy, blk, sb pty-blky, sl frm-mod
hd, arg-sily tex, tr cal frags, mod sting bri
wh bl, even mod thk mod yel amb ring, mod
sin

80% CHK: med gy brn, occ lt gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, 20%:
MRLST: dk gy, blk, sb pty-blky, sl frm-mod
hd, arg-sily tex, tr cal frags, mod sting bri
wh bl, even mod thk mod yel amb ring,
mod sin

MD: 7,507'
Inclination: 90°
Azimuth: 269.9°
TVD: 6,041.77'
VS: 428.55'

90% CHK: med gy brn, o
pty-blky, sft-sl frm, rthy-s
MRLST: dk gy, blk, sb pit
hd, arg-sily tex, mod chk
wh bl, even mod thk mod
sin



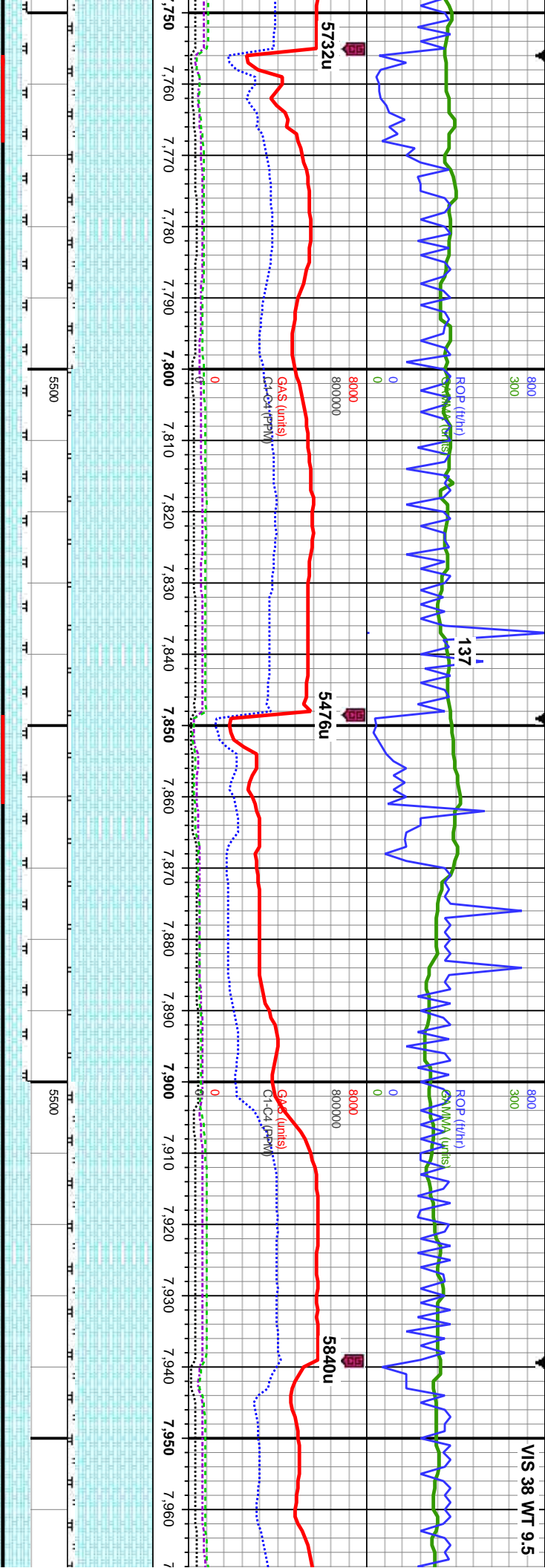


MD: 7,599'
Inclination: 89.5°
Azimuth: 269.2°
TVD: 6,042.18'
VS: 520.54'

MD: 7,691'
Inclination: 89.5°
Azimuth: 269.3°
TVD: 6,042.98'
VS: 612.54'

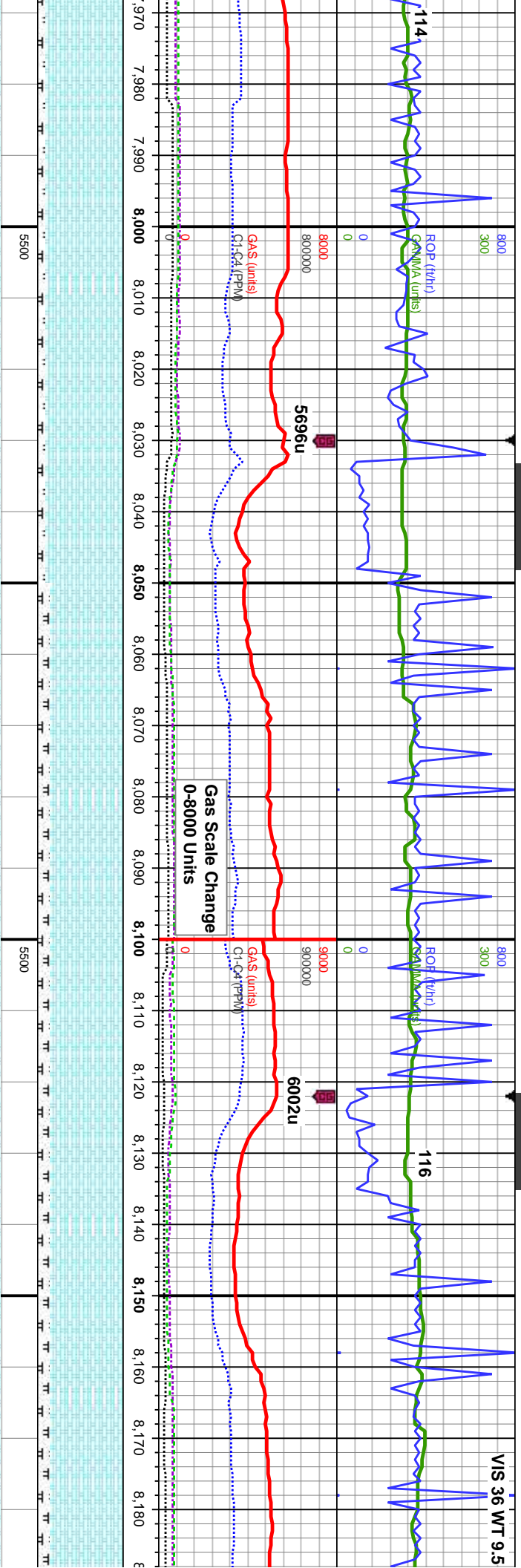
cc lt gy, mot, sb	90% CHK: med gy brn, occ lt gy, mot, sb	95% CHK: med gy brn, occ lt gy, mot, sb	95% CHK: med gy brn, occ lt gy, mot, sb
b wxy, 10%:	ply-biky, sft-sl frm, rthy-sb wxy, 10%:	ply-biky, sft-sl frm, rthy-sb wxy, 5%: MRLST:	ply-biky, sft-sl frm, rthy-sb wxy, 5%: MRLST:
y-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	dk gy, blk, sb ply-biky, sl frm-mod hd,	dk gy, blk, sb ply-biky, sl frm-mod hd,
flor, mod sting bri	hd, arg-sily tex, mod chk flor, mod sting bri	arg-sily tex, mod chk flor, mod sting bri wh	arg-sily tex, mod chk flor, mod sting bri wh
yel amb ring, mod	mod sin	bl, even mod thk mod yel amb ring, mod	bl, even mod thk mod yel amb ring, mod
		sin	sin





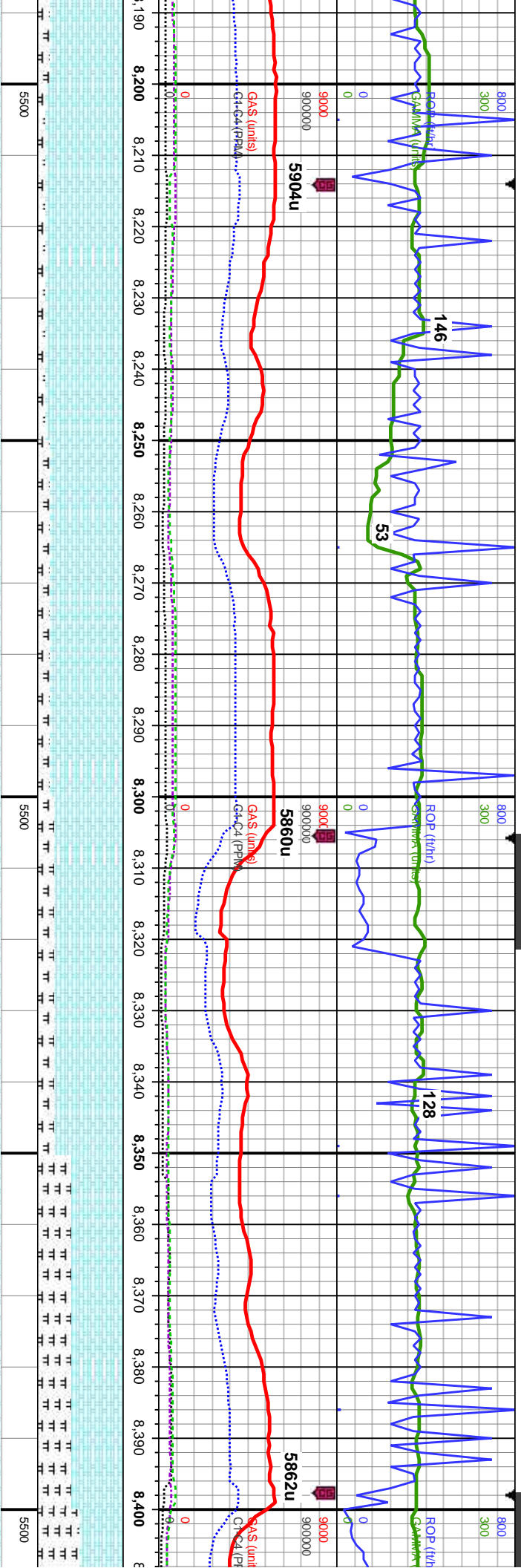
MD: 7,783' Inclination: 90.3° Azimuth: 269.5° TVD: 6,043.14' VS: 704.54'		MD: 7,874' Inclination: 89° Azimuth: 268.7° TVD: 6,043.7' VS: 795.53'		MD: 7,966' Inclination: Azimuth: 2 TVD: 6,04 VS: 887.5	
90% CHK: med gy brn, occ lt gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 10%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, mod chk flor, fast sting bri wh bl, even thk bri yel grn ring, thk sin	95% CHK: lt-med gy brn, occ lt gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, tr imbd cal 5%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, mod chk flor, mod od, fast sting bri wh bl, even thk bri yel grn ring, thk sin	95% CHK: lt-med gy brn, occ lt gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, tr imbd cal 5%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, mod chk flor, mod od, fast sting bri wh bl, even thk bri yel grn ring, thk sin	90% CHK: lt-med gy brn, occ lt gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 10%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, mod chk flor, mod od, fast sting bri wh bl, even thk bri yel grn ring, thk sin	90% CHK: lt-me ply-biky, sft-sl fr MRLST: dk gy, l hd, arg-sily tex, sting bri wh bl, e	





: 90.1° 669.3° 4.42'		MD: 8,059' Inclination: 89.5° Azimuth: 270.6° TVD: 6,044.74' VS: 980.51'		MD: 8,150' Inclination: 89.2° Azimuth: 270.6° TVD: 6,045.78' VS: 1,071.49'	
d gy brn, occ lt gy, mot, sb	90% CHK: lt-med gy brn, occ lt gy, mot, sb	85% CHK: lt-med gy brn, occ lt gy, mot, sb	85% CHK: lt-med gy brn, mot, sb	85% CHK: lt-med gy brn, mot, sb	85% CHK: lt-med gy brn, mot, sb
ply-sb wxy, 10%:	ply-biky, sft-sl frm, rthy-sb wxy, 10%:	ply-biky, sft-sl frm, rthy-sb wxy, 15%:	sft-sl frm, rthy-sb wxy, occ cal incl, 15%:	sft-sl frm, rthy-sb wxy, occ cal incl,	sft-sl frm, rthy-sb wxy, occ cal incl,
dk, sb ply-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod
mod chk flr, mod od, fast	hd, arg-sily tex, mod chk flr, mod od, mod	hd, arg-sily tex, mod chk flr, mod od, mod	hd, arg-sily tex, mod od, mod	hd, arg-sily tex, mod od, mod	hd, arg-sily tex, mod od, mod
sting thk bri yel grn ring, thk	sting bri wh bl, even mod thk mod yel amb	sting bri wh bl, even mod thk mod yel amb	bl, even mod thk mod yel amb ring, mod sin	bl, even mod thk mod yel amb ring, mod sin	bl, even mod thk mod yel amb ring, mod sin
	ring, mod sin	ring, mod sin	sin	sin	sin

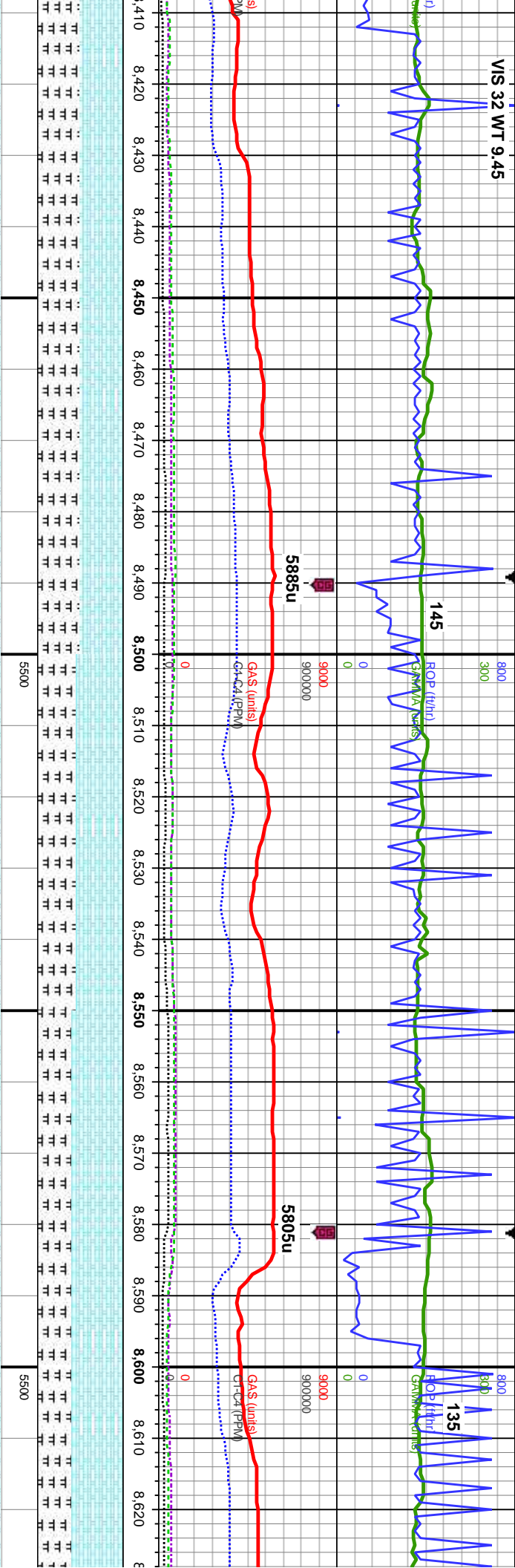




MD: 8,242' Inclination: 90° Azimuth: 270.6° TVD: 6,046.42' VS: 1,163.48'		90% CHK: lt-med gy brn, occ wht-crm, mot, sb ply-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb ply-blky, sl frm-mod hd, arg-sily tex, mod od, mod stmg bri wh bl, even mod thk mod yel amb ring, mod stn	85% CHK: lt-med gy brn, mot, sb ply-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 15%: MRLST: dk gy, blk, sb ply-blky, sl frm-mod hd, arg-sily tex, mod od, mod stmg bri wh bl, even mod thk mod yel amb ring, mod stn	TVD (ft)
MD: 8,334' Inclination: 90.5° Azimuth: 269.9° TVD: 6,046.02' VS: 1,255.47'		80% CHK: lt-med gy brn, occ dk gy, mot, sb ply-blky, sft-sl frm, rthy-sb wxy, cal incl, 20%: MRLST: dk gy, blk, sb ply-blky, sl frm-mod hd, arg-sily tex, mod stmg bri wh bl, even dull yel mod amb ring, fr stn	60% CHK: lt-med gy brn, occ dk gy, mot, sb ply-blky, sft-sl frm, rthy-sb wxy, cal incl, 40%: MRLST: dk gy, blk, sb ply-blky, sl frm-mod hd, arg-sily tex, mod stmg bri wh bl, even dull yel mod amb ring, fr stn	TVD (ft)
MD: 8,334' Inclination: 90.5° Azimuth: 269.9° TVD: 6,046.02' VS: 1,255.47'		50% C: ply-blk	50% C: ply-blk	TVD (ft)



VIS 32 WT 9.45



MD: 8,426'
Inclination: 89.2°
Azimuth: 268.2°
TVD: 6,046.26'
VS: 1,347.46'

HK: med gy brn-dk gy, mot, sb
gy, sft-sl frm, rthy-sb wxy, cal incl, 50%:
dk gy, blk, sb pty-blky, sl frm-mod
sily tex, occ cal frags, tr pyr, mod
ri wh bl, even dull yel mod amb ring,

50% CHK: med gy brn-dk gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, cal incl, 50%:
MRLST: dk gy, blk, sb pty-blky, sl frm-mod
hd, arg-sily tex, occ cal frags, tr pyr, mod
stmg bri wh bl, even dull yel mod amb ring,
fr sin

MD: 8,517'
Inclination: 90.3°
Azimuth: 268.6°
TVD: 6,046.65'
VS: 1,438.44'

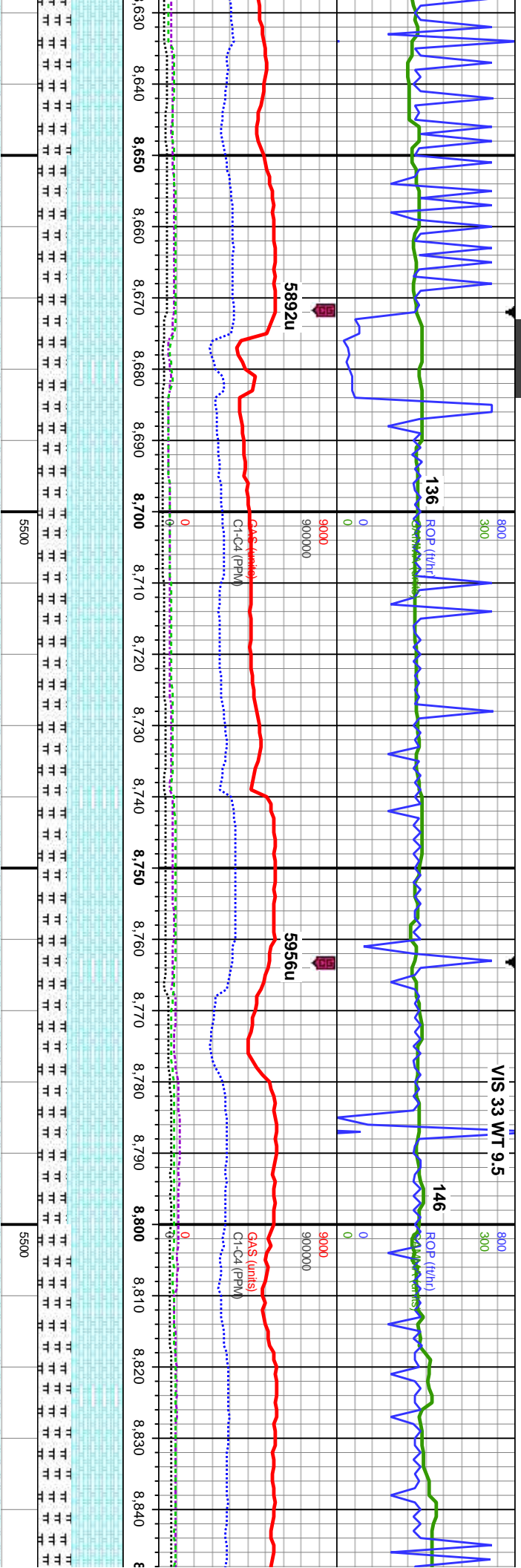
55% CHK: med gy brn-dk gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, cal incl,
MRLST: dk gy, blk, sb pty-blky, sl
frm-mod hd, arg-sily tex, occ cal frags, mod
stmg bri wh bl, even dull yel mod amb ring,
fr sin

60% CHK: med gy brn-dk gy, mot, sb
pty-blky, sft-sl frm, rthy-sb wxy, cal incl, 40%:
MRLST: dk gy, blk, sb pty-blky, sl frm-mod
hd, arg-sily tex, mod stmg bri wh bl, even
dull yel mod amb ring, fr sin

MD: 8,608'
Inclination: 90.5°
Azimuth: 269°
TVD: 6,046.02'
VS: 1,529.42'

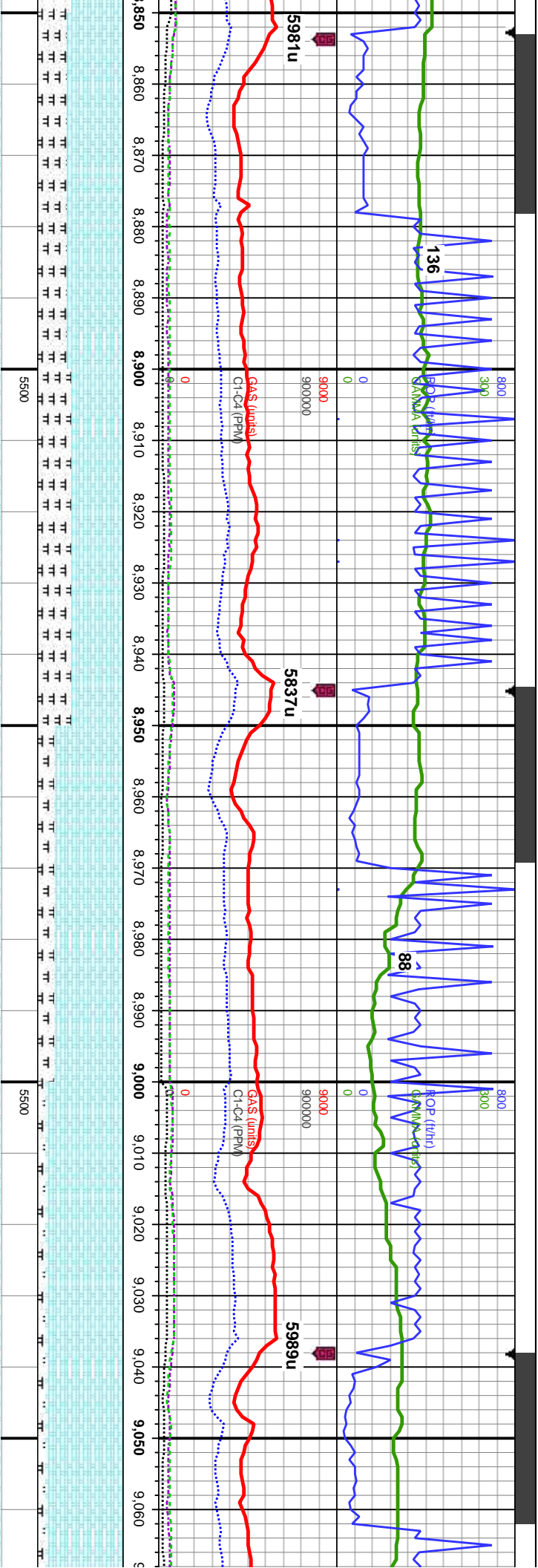
60% CHK: med gy brn-dk
pty-blky, sft-sl frm, rthy-sl
40%: MRLST: dk gy, blk,
frm-mod hd, arg-sily tex, i
stmg bri wh bl, even mod
ring, mod sin





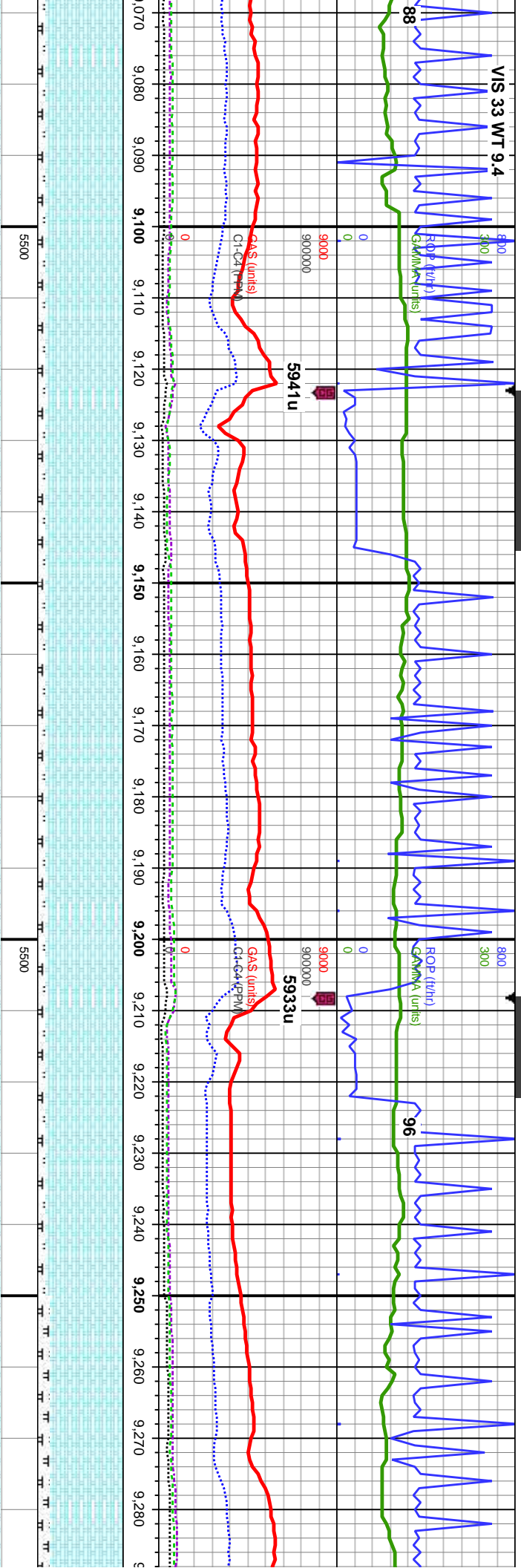
gy, mot, sb		MD: 8,700' Inclination: 89.9° Azimuth: 269.7° TVD: 6,045.7' VS: 1,621.42'		MD: 8,791' Inclination: 89.8° Azimuth: 268.3° TVD: 6,045.94' VS: 1,712.41'	
o wxy, cal incl,	65% CHK: med gy brn-dk gy, mot, sb	ply-biky, sft-sl frm, rthy-sb wxy, cal incl, 35%:	65% CHK: med gy brn-dk gy, mot, sb	ply-biky, sft-sl frm, rthy-sb wxy, cal incl, 35%:	60% CHK: med gy brn-dk gy, mot, sb
sb ply-biky, sl	ply-biky, sft-sl frm, rthy-sb wxy, cal incl, 35%:	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	ply-biky, sft-sl frm, rthy-sb wxy, cal incl, 35%:	MRLST: dk gy, blk, sb ply-biky, sl	ply-biky, sft-sl frm, rthy-sb wxy, cal incl,
mod od, mod	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	hd, arg-sily tex, mod sting bri wh bl, even	MRLST: dk gy, blk, sb ply-biky, sl frm-mod	hd, arg-sily tex, mod sting bri wh bl, even	40%: MRLST: dk gy, blk, sb ply-biky, sl
thk mod yei-gn	mod thk mod yei-gn ring, mod sin	mod thk mod yei-gn ring, mod sin	mod thk mod yei-gn ring, mod sin	mod thk mod yei-gn ring, mod sin	frm-mod hd, arg-sily tex, some cal and fos
					frags, mod sting bri wh bl, even mod thk
					mod yei-gn ring, mod sin





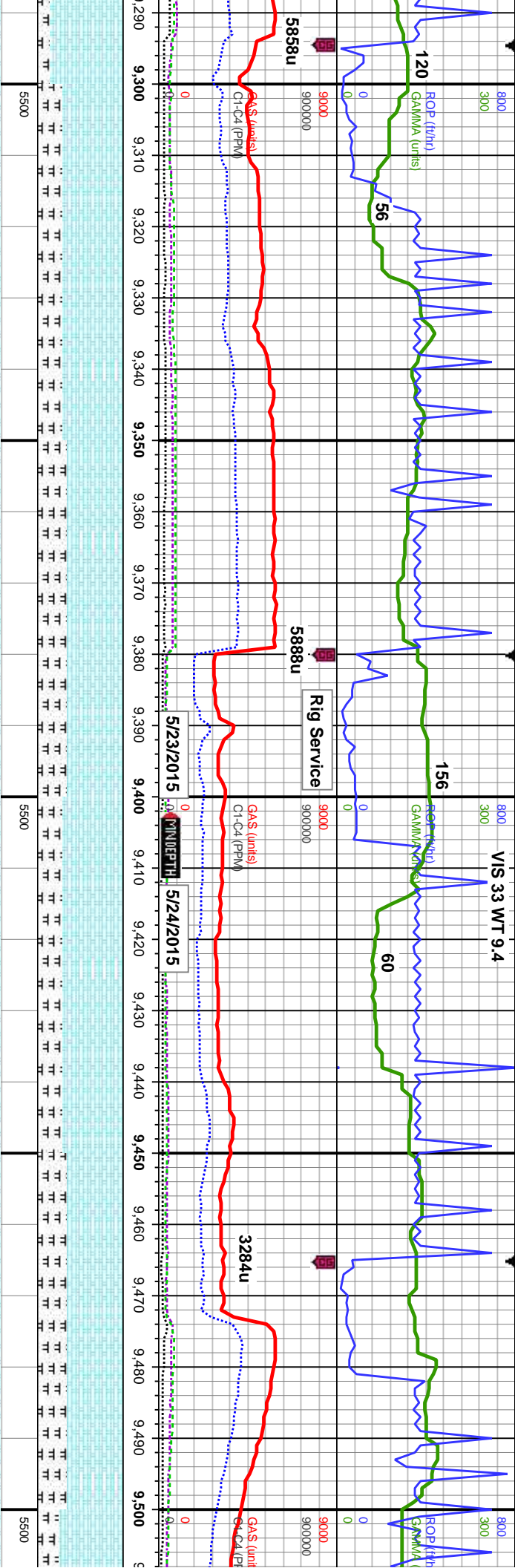
65% CHK: med gy brn-dk gy, mot, sb ply-bkly, sft-sl frm, rthy-sb wxy, cal incl, 35%: MRLST: dk gy, blk, sb ply-bkly, sl frm-mod hd, arg-sily tex, some cal and fos frags, mod stimg bri wh bl, even mod thk mod yel-gn ring, mod str	MD: 8,884' Inclination: 90.6° Azimuth: 269.1° TVD: 6,045.61' VS: 1,805.4'	
	TVD (ft)	
60% CHK: med gy brn-dk gy, mot, sb ply-bkly, sft-sl frm, rthy-sb wxy, cal incl, 40%: MRLST: dk gy, blk, sb ply-bkly, sl frm-mod hd, arg-sily tex, some cal frags, even dull yel mod amb ring, mod str	MD: 8,976' Inclination: 88.3° Azimuth: 268.1° TVD: 6,046.49' VS: 1,897.37'	
	TVD (ft)	
80% CHK: lt-med gy brn, mot, sb ply-bkly, sft-sl frm, rthy-sb wxy, cal incl, 20%: MRLST: dk gy, blk, sb ply-bkly, sl frm-mod hd, arg-sily tex, some cal frags, mod chk flwr, g od, even dull yel mod amb ring, mod str	MD: 8,976' Inclination: 88.3° Azimuth: 268.1° TVD: 6,046.49' VS: 1,897.37'	
	TVD (ft)	
90% CHK: lt-med gy brn, mot, sb ply-bkly, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb ply-bkly, sl frm-mod hd, arg-sily tex, some cal and fos frags, mod chk flwr, g od, fast stimg bri wh bl, even thk bri yel gm ring, thk str	MD: 8,976' Inclination: 88.3° Azimuth: 268.1° TVD: 6,046.49' VS: 1,897.37'	
	TVD (ft)	
90% CHK: lt-me sft-sl frm, rthy-sl MRLST: dk gy, l hd, arg-sily tex, mod chk flwr, g c thk bri yel gm rir	MD: 9,060' Inclination: 88.3° Azimuth: 269.7° TVD: 6,048.55' VS: 1,981.34'	
	TVD (ft)	





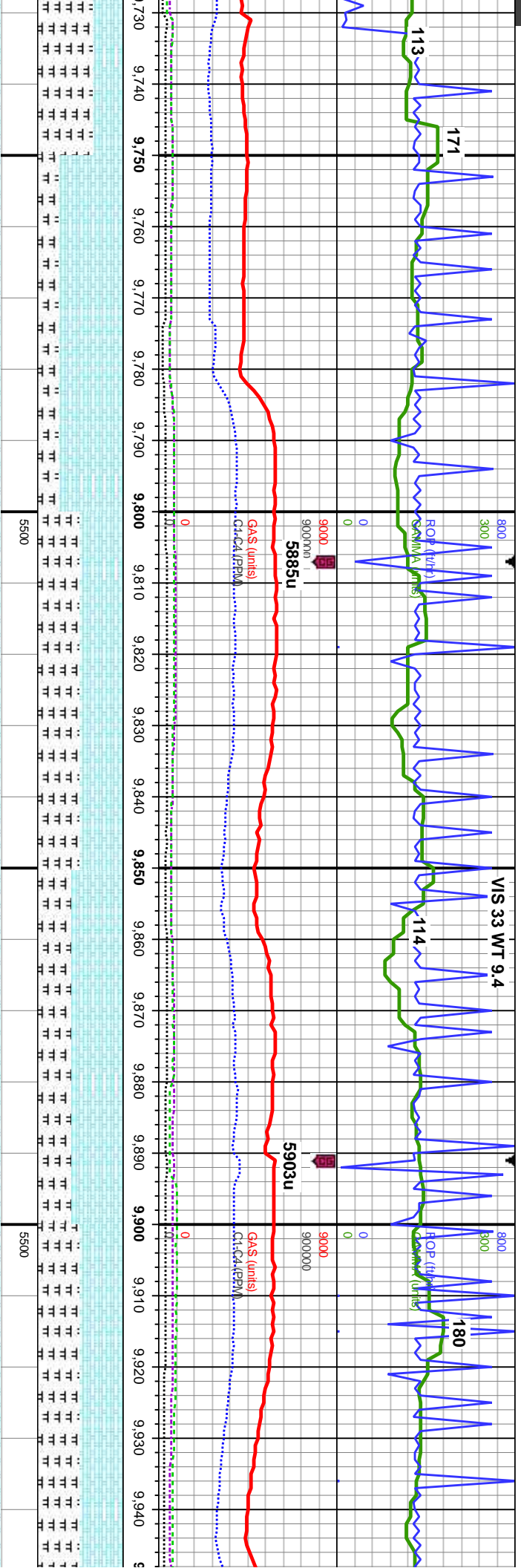
90°	MD: 9,145' Inclination: 90.6° Azimuth: 271.9° TVD: 6,048.92' VS: 2,066.31'	90% CHK: lt-med gy brn, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, mod chk flor, g od, fast stmg bri wh bl, even mod thk dull amb ring, thk stn	90% CHK: lt-med gy brn, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, mod chk flor, g od, fast stmg bri wh bl, even mod thk dull amb ring, thk stn	90% CHK: lt-med gy brn, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, mod chk flor, g od, fast stmg bri wh bl, even mod thk dull yel amb ring, thk stn	85% CHK: lt-med gy brn, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, occ cal incl, 10%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, tr cal and fos frags, stmg bri wh bl, even mod thk dull y ring, thk stn
TVD (ft)					





lty-bkly, 15%: frm-mnd fast el amb	MD: 9,317' Inclination: 89.6° Azimuth: 273.1° TVD: 6,048.01' VS: 2,238.07'	70% CHK: lt-med gy brn, occ dk gy, mot, sb pty-bkly, sft-sl frm, rthy-sb wxy, occ cal incl, 30%: MRLST: dk gy, blk, sb pty-bkly, sl frm-mnd hd, arg-sily tex, occ cal frags, some chk flor, fast sting bri wh bl, even thk mod yel gm ring, thk sin	65% CHK: lt-med gy brn, occ dk gy, mot, sb pty-bkly, sft-sl frm, rthy-sb wxy, occ cal incl, 35%: MRLST: dk gy, blk, sb pty-bkly, sl frm-mnd hd, arg-sily tex, occ cal frags, some chk flor, fast sting bri wh bl, even thk mod yel gm ring, thk sin	MD: 9,401' Inclination: 90.2° Azimuth: 271.3° TVD: 6,048.15' VS: 2,321.98'	70% CHK: lt-med gy brn, occ dk gy, mot, sb pty-bkly, sft-sl frm, rthy-sb wxy, occ cal incl, 30%: MRLST: dk gy, blk, sb pty-bkly, sl frm-mnd hd, arg-sily tex, occ cal frags, some chk flor, fast sting bri wh bl, even mod thk dull amb ring, thk sin	65% CHK: lt-med gy brn, occ dk gy, mot, sb pty-bkly, sft-sl frm, rthy-sb wxy, occ cal incl, 35%: MRLST: dk gy, blk, sb pty-bkly, sl frm-mnd hd, arg-sily tex, occ cal frags, some chk flor, fast sting bri wh bl, even mod thk dull amb ring, thk sin	MD: 9,488' Inclination: 89.2° Azimuth: 270.6° TVD: 6,048.61' VS: 2,408.95'	75% C pty-bkly 25%: N frm-mnd some c mod yel
	TVD (ft)							TVD (ft)





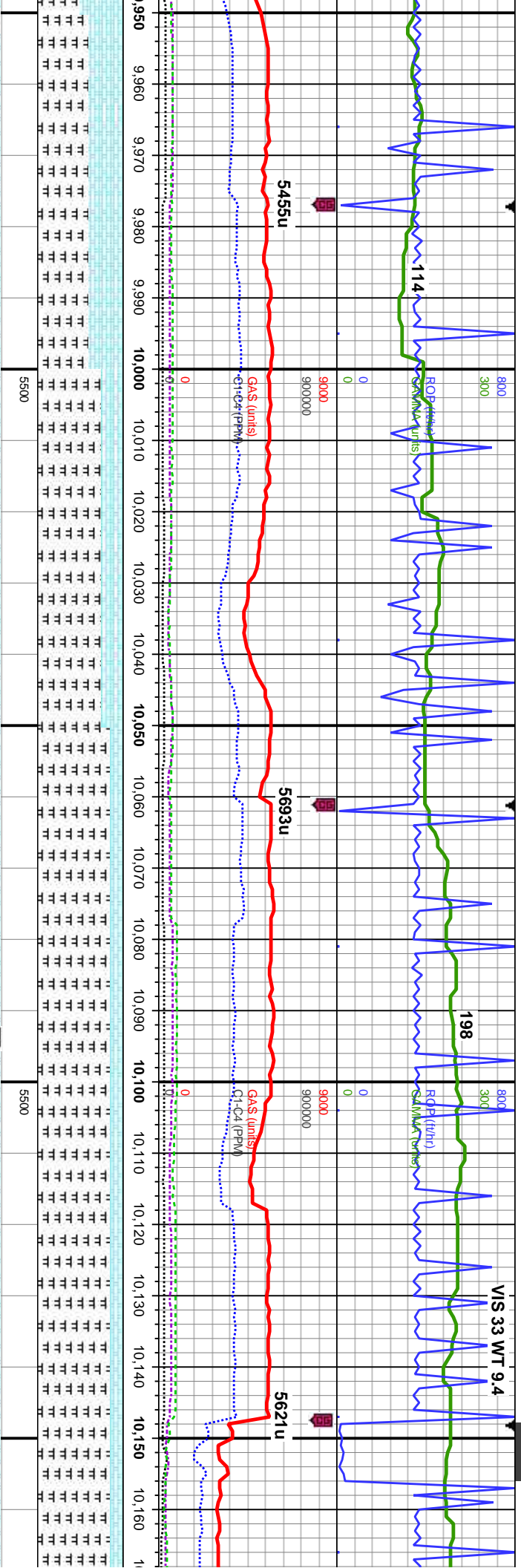
MD: 9,744'
Inclination: 89.8°
Azimuth: 269.2°
TVD: 6,051.29'
VS: 2,664.92'

MD: 9,828'
Inclination: 90.1°
Azimuth: 269.2°
TVD: 6,051.36'
VS: 2,748.92'

MD: 9,914'
Inclination: 90.4°
Azimuth: 269.2°
TVD: 6,050.99'
VS: 2,834.91'

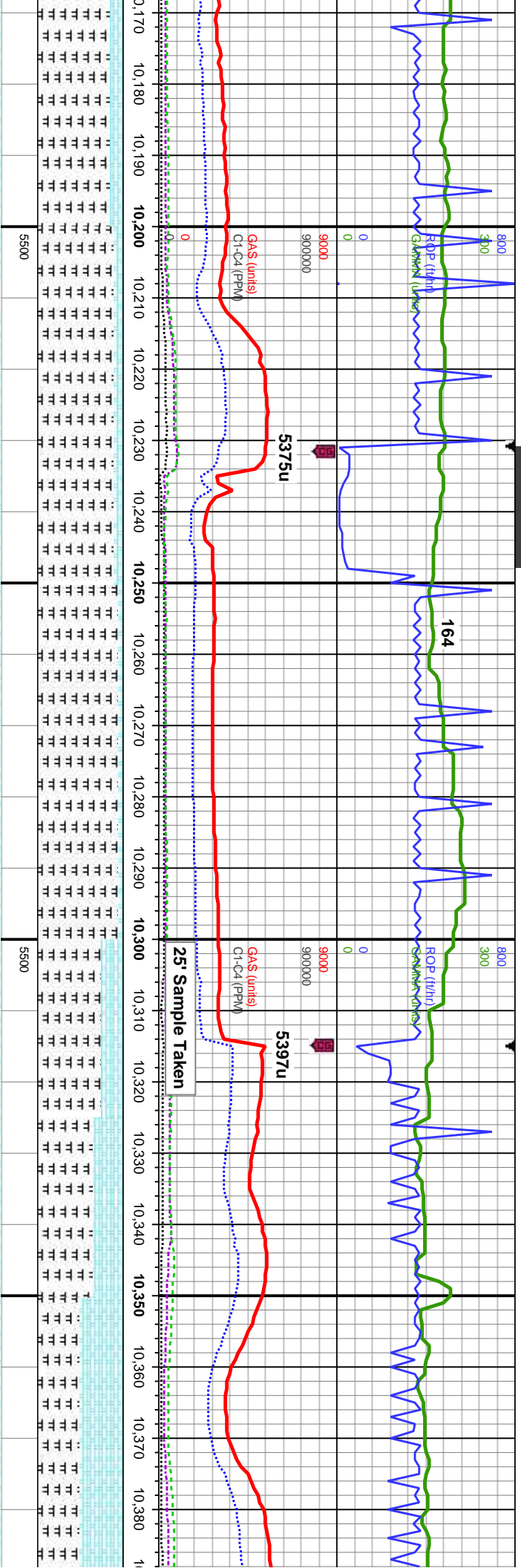
Depth (ft)	ROP (ft/hr)	GAMMA (API)	GAs (units)	C1-C4 (PPM)	Lithology	Core Sample
9,730	113	171	5885u	0	55% CHK: med gy, rthy-sb wxy, tr cal incl, frn-mod hd, arg-sily tex, tr cal frags, fast stmg bri wh bl, even thk mod yel grn ring, thk stn	
9,740						
9,750						
9,760						
9,770						
9,780						
9,790						
9,800						
9,810						
9,820						
9,830						
9,840						
9,850						
9,860						
9,870						
9,880						
9,890						
9,900						
9,910						
9,920						
9,930						
9,940						





MD: 9,999' Inclination: 90.5° Azimuth: 269.1° TVD: 6,050.32' VS: 2,919.91'		60%: MR.LST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 40% CHK: med gy brn-dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, occ cal incl, scatt cal frags, scatt foss, tr bent, fast stimg bri wh bl, even mod thn dull yel amb ring, mod stn	75%: MR.LST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, tr imbd cal 25% CHK: med gy brn-dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, scatt cal frags, tr bent, mod stimg bri wh bl, even mod thk dull yel amb ring, mod stn	85%: MR.LST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, tr imbd cal 15% CHK: med gy brn-dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, scatt cal frags, tr bent, mod stimg bri wh bl, even mod thk dull yel amb ring, mod stn	85%: MR.LST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, tr imbd cal 15% CHK: med gy brn-dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal frags, tr bent, mod-fast stimg bri wh bl, even thn dull yel amb ring, fr stn	MD: 10,083' Inclination: 90.7° Azimuth: 269° TVD: 6,049.44' VS: 3,003.9'	TVD (ft)	MD: 10, Inclinati Azimutht TVD: 6, VS: 3,0
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168'
Inclination: 90.8°
Azimuth: 269.4°
TVD: 6,048.33'
VS: 3.88.89'

TVD (ft)
90%: MRLST: dk gy, blk, sb pily-blky, sl
frm-mod hd, arg-sily tex, 10% CHK: med gy
brn-dk gy, mot, sb pily-blky, sft-sl frm,
rthy-sb wxy, tr pyr, scatt cal frags, tr bent,
fast sting bri wh bl, even thk mod yel grn
ring, mod str

MD: 10,253'
Inclination: 89.5°
Azimuth: 269.5°
TVD: 6,048.1'
VS: 3.173.88'

TVD (ft)
75-65%: MRLST: dk gy, blk, sb pily-blky, sl
frm-mod hd, arg-sily tex, 25-35% CHK: med
gy brn-dk gy, mot, sb pily-blky, sft-sl frm,
rthy-sb wxy, tr pyr, scatt cal frags, tr bent,
even dull yel mod amb ring, mod sin

MD: 10,338'
Inclination: 89.7°
Azimuth: 269.4°
TVD: 6,048.7'
VS: 3.258.88'

dk gy, blk, sb pily-blky, sl
sily tex, tr imbd cal 15%
brn-dk gy, mot, sb pily-blky,
o wxy, tr cal frags, tr bent,
fri wh bl, even thn dull yel

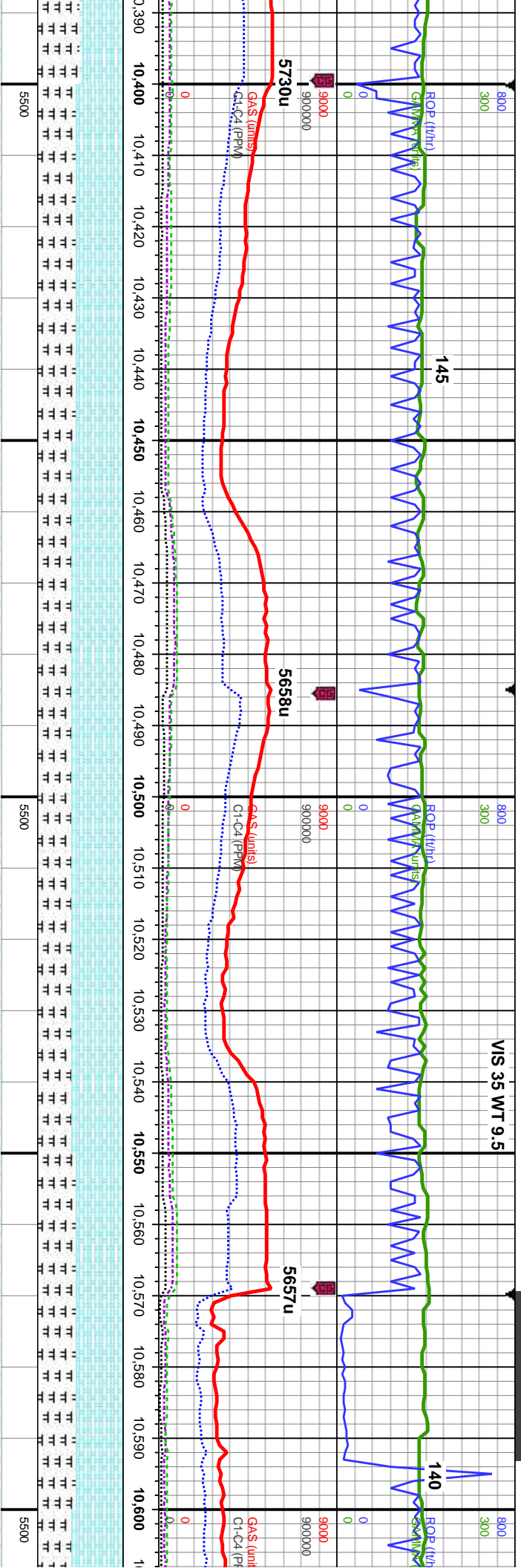
90%: MRLST: dk gy, blk, sb pily-blky, sl
frm-mod hd, arg-sily tex, 10% CHK: med gy
brn-dk gy, mot, sb pily-blky, sft-sl frm,
rthy-sb wxy, tr pyr, scatt cal frags, tr bent,
fast sting bri wh bl, even thk mod yel grn
ring, mod str

95%: MRLST: dk gy, blk, sb pily-blky, sl
frm-mod hd, arg-sily tex, 5% CHK: med gy
brn-dk gy, mot, sb pily-blky, sft-sl frm,
rthy-sb wxy, tr pyr, scatt cal frags, tr bent,
fast sting bri wh bl, even thk mod yel grn
ring, mod str

75-65%: MRLST: dk gy, blk, sb pily-blky, sl
frm-mod hd, arg-sily tex, 25-35% CHK: med
gy brn-dk gy, mot, sb pily-blky, sft-sl frm,
rthy-sb wxy, tr pyr, scatt cal frags, tr bent,
even dull yel mod amb ring, mod sin

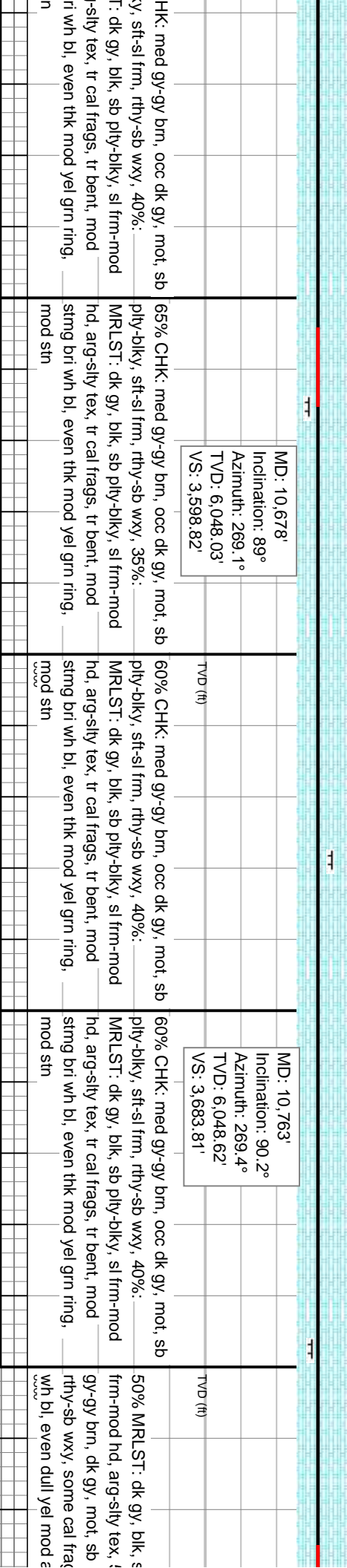
50%: MRLST: dk gy, blk, sb pily-blky,
frm-mod hd, arg-sily tex, 50% CHK
brn-dk gy, occ lt gy, mot, sb pily-blky
frm, rthy-sb wxy, tr pyr, scatt cal fra
even dull yel mod amb ring, mod sin

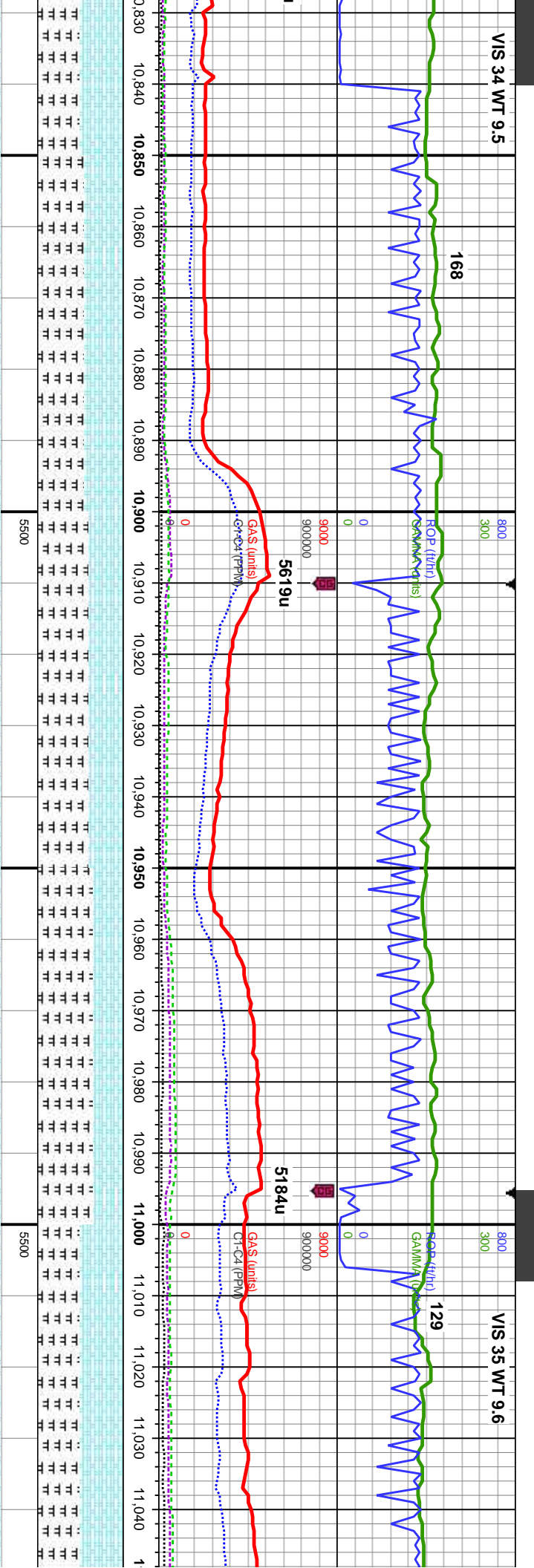




5500		5500		5500		5500	
MD: 10,423' Inclination: 90.2° Azimuth: 268.9° TVD: 6,048.77' VS: 3,343.88'		MD: 10,508' Inclination: 90.9° Azimuth: 267.8° TVD: 6,047.95' VS: 3,428.85'		MD: 10,593' Inclination: 90° Azimuth: 269° TVD: 6,047.29' VS: 3,513.82'			
55% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 45%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 40%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 40%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	55% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 45%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% C	ply-blk	MRLS	hd, arg
55% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 45%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 40%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 40%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	55% CHK: lt-med gy, occ dk gy, mot, sb ply-biky, sft-sl frm, rthy-sb wxy, 45%: MRLST: dk gy, blk, sb ply-biky, sl frm-mod hd, arg-sily tex, tr cal frags, tr bent, even dull yel mod amb ring, mod stn	60% C	ply-blk	MRLS	hd, arg





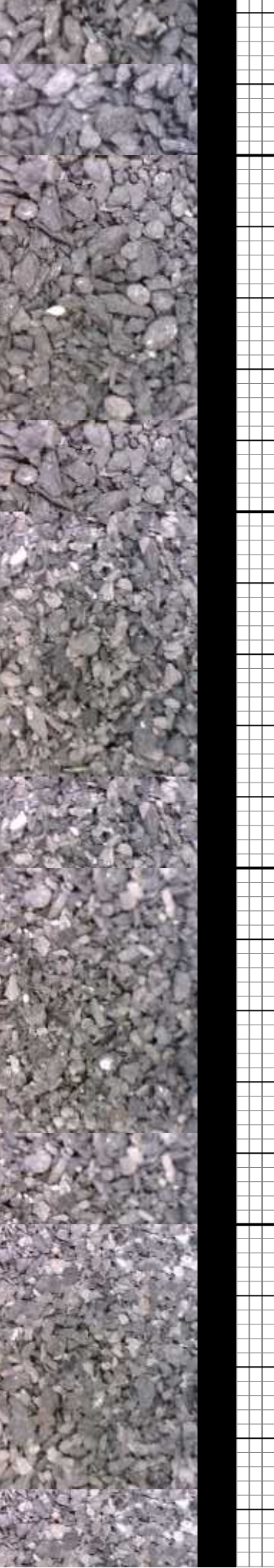


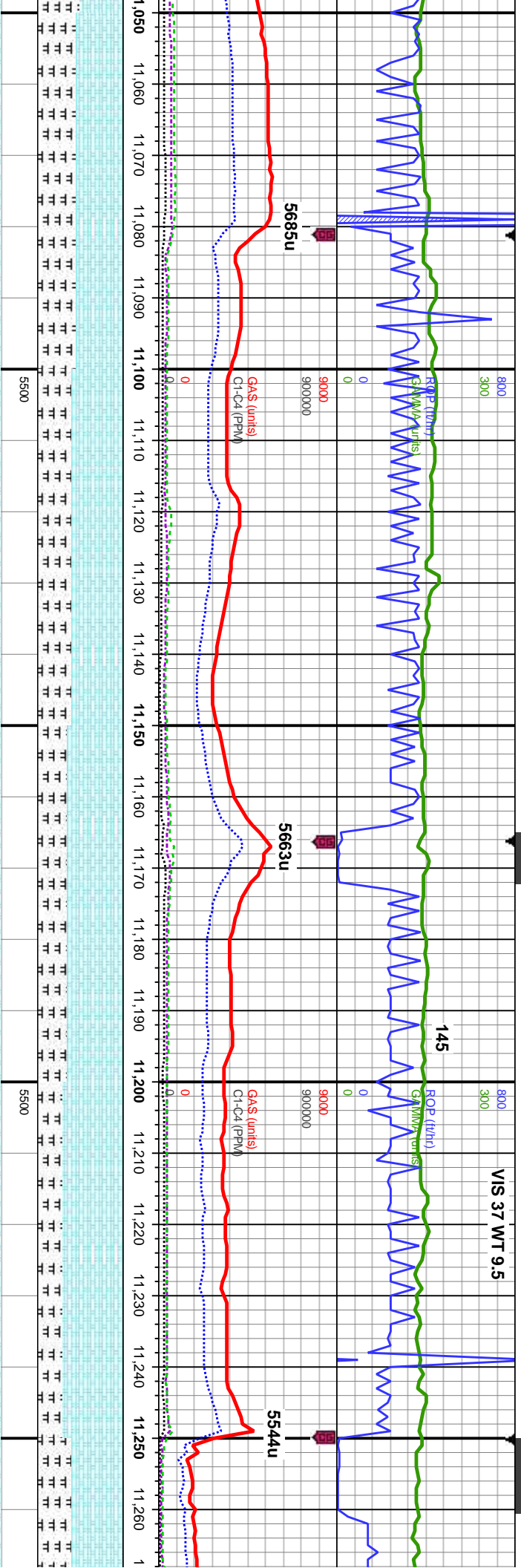
MD: 10,848'
Inclination: 89.7°
Azimuth: 269.9°
TVD: 6,048.7'
VS: 3,768.81'

MD: 10,933'
Inclination: 89.8°
Azimuth: 269.1°
TVD: 6,049.07'
VS: 3,853.81'

MD: 11,017'
Inclination: 89.1°
Azimuth: 269.7°
TVD: 6,049.87'
VS: 3,937.8'

sb ply-blky, sl	55% MRLST: dk gy, blk, sb ply-blky, sl	60% MRLST: dk gy, blk, sb ply-blky, sl	65% MRLST: dk gy, blk, sb ply-blky, sl	50% CHK: med gy-gy brn, occ dk gy, mot, sl
50% CHK: med	frn-mod hd, arg-sily tex, 45% CHK: med	frn-mod hd, arg-sily tex, 40% CHK: med	frn-mod hd, arg-sily tex, 35% CHK: med	ply-blky, sft-sl frm, rthy-sb wxy, 50%:
ply-blky, sft-sl frm,	gy-gy brn, dk gy, mot, sb ply-blky, sft-sl frm,	gy-gy brn, dk gy, mot, sb ply-blky, sft-sl frm,	gy-gy brn, dk gy, mot, sb ply-blky, sft-sl frm,	MRLST: dk gy, blk, sb ply-blky, sl frn-mod
frags, mod sting bri	rthy-sb wxy, mod sting bri wh bl some cal	rthy-sb wxy, some cal frags, mod sting bri	rthy-sb wxy, some cal frags, mod sting bri	hd, arg-sily tex, fr cal frags, mod sting bri wh
amb ring, mod sin	amb ring, mod sin	wh bl, even dull yel mod amb ring, fr sin	wh bl, even dull yel mod amb ring, fr sin	bl, even dull yel mod amb ring, fr sin





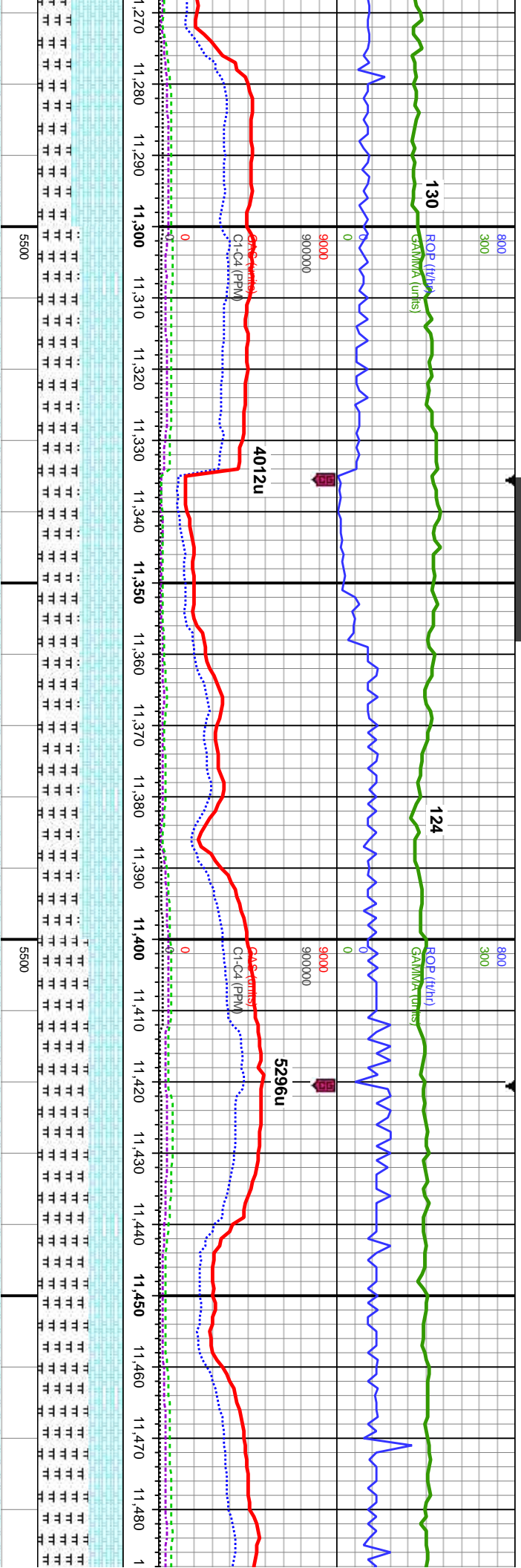
MD: 11,102'
Inclination: 90.7°
Azimuth: 270.4°
TVD: 6,050.02'
VS: 4,022.8'

MD: 11,187'
Inclination: 90.6°
Azimuth: 270°
TVD: 6,049.06'
VS: 4,107.79'

55% CHK: lt-med gy-gy brn, occ dk gy, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, 50%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, tr pyr, mod sting bri wh bl, even dull yel mod anb ring, fr stn	60% CHK: lt-med gy-gy brn, occ dk gy, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, 40%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, tr pyr, fast sting bri wh bl, even thk bri yel grn ring, mod stn	65% CHK: lt-med gy-gy brn, occ dk gy, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, 35%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, fast sting bri wh bl, even thk bri yel grn ring, mod stn	70% CHK: lt-med gy-gy brn, occ dk gy, mot, sb pily-blky, sft-sl frm, rthy-sb wxy, 30%: MRLST: dk gy, blk, sb pily-blky, sl frm-mod hd, arg-sily tex, some cal and fos frags, fast sting bri wh bl, even v thk bri yel grn ring, thn stn	60% CHK: lt-me sb pily-blky, sft-i MRLST: dk gy, t hd, arg-sily tex, bri wh bl, even v
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MD
Incl
Azim
TVD
VS:

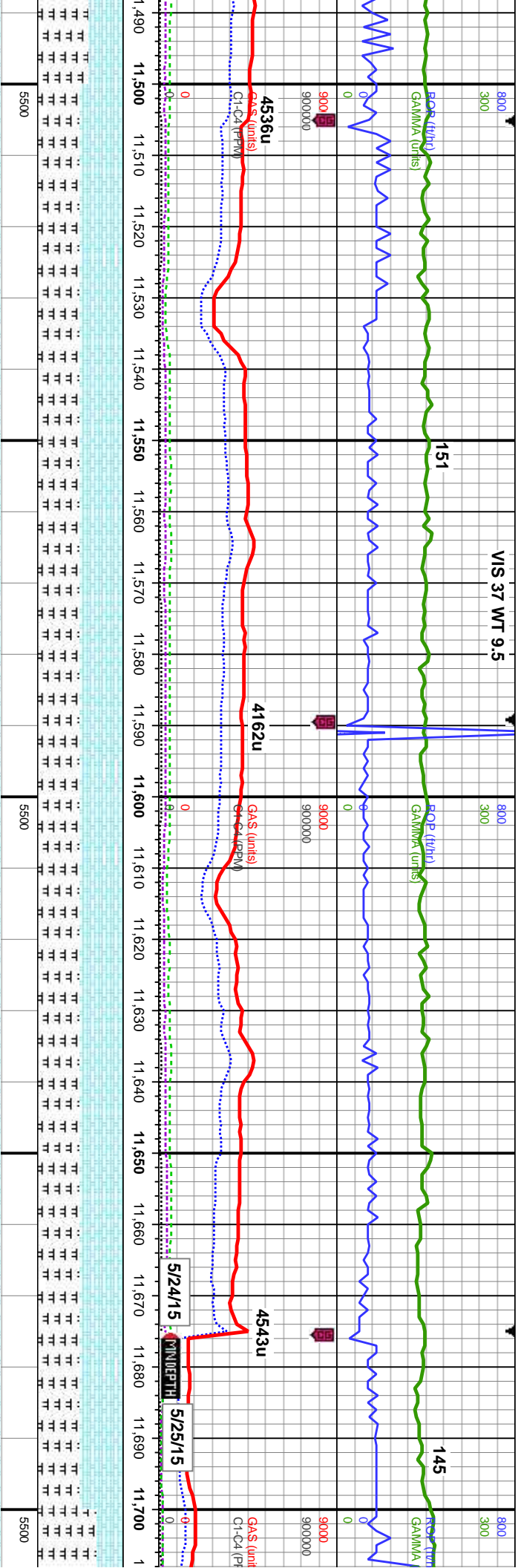




MD: 11,272' Inclination: 90.1° Azimuth: 270.4° TVD: 6,048.54' VS: 4,192.78'	MD: 11,357' Inclination: 88.4° Azimuth: 270.3° TVD: 6,049.65' VS: 4,277.76'	MD: 11,442' Inclination: 88.8° Azimuth: 270.3° TVD: 6,051.73' VS: 4,362.73'
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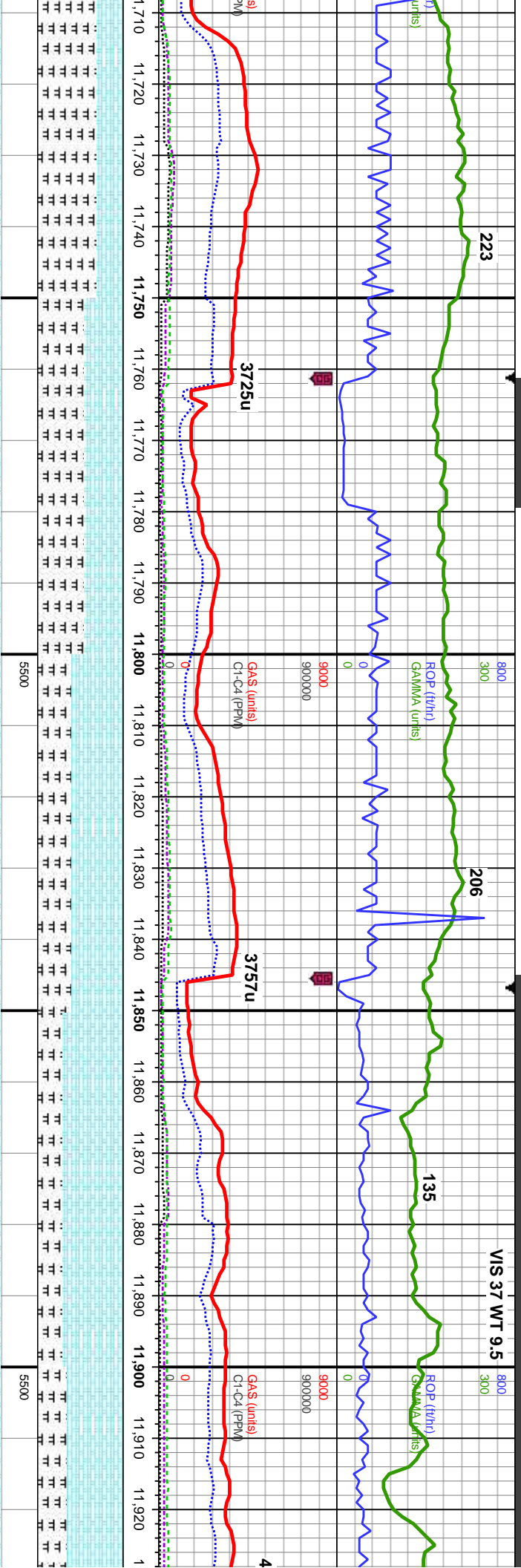
50% CHK: med gy brn, dk gy, mot, sb ply-biky, sft-si frm, rthy-sb wxy, 50%: MRLST: dk gy, blk, sb ply-biky, si frm-mod hd, arg-sily tex, cal and fos frags, fast stmg bri wh bl, even thk bri yel gm ring, mod sin	50% CHK: med gy brn, dk gy, mot, sb ply-biky, sft-si frm, rthy-sb wxy, 50%: MRLST: dk gy, blk, sb ply-biky, si frm-mod hd, arg-sily tex, cal and fos frags, fast stmg bri wh bl, even thk bri yel gm ring, mod sin	60% MRLST: dk gy, blk, sb ply-biky, si frm-mod hd, arg-sily tex, 40% CHK: med gy-gy brn, dk gy, mot, sb ply-biky, sft-si frm, rthy-sb wxy, tr cal frags, tr bent, tr pyr, mod stmg bri wh bl, even dull yel mod amb ring, mod sin	60% MRLST: dk gy, blk, sb ply-biky frm-mod hd, arg-sily tex, 40% CHK gy-gy brn, dk gy, mot, sb ply-biky, rthy-sb wxy, tr cal frags, tr bent, tr f stmg bri wh bl, even dull yel mod a mod sin
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MD: 11,526' Inclination: 89.1° Azimuth: 269.1° TVD: 6,053.27' VS: 4,446.72'	50% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 50% CHK: med gy-gy brn, dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal fos frags, tr bent, fast sting bri wh bl, even thk bri yel grn ring, mod str	50% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 50% CHK: med gy-gy brn, dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal fos frags, tr bent, fast sting bri wh bl, even thk bri yel grn ring, mod str	50% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 50% CHK: med gy-gy brn, dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal frags, tr bent, mod sting bri wh bl, even dull yel mod amb ring, mod str	MD: 11,697' Inclination: 90.5° Azimuth: 267.7° TVD: 6,054.31' VS: 4,617.66'	70% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 50% CHK: med gy-gy brn, dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal frags, tr bent, mod sting bri wh bl, even dull yel mod amb ring, mod str
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MD: 11,781' Inclination: 90.9° Azimuth: 269.3° TVD: 6,053.28' VS: 4,701.63'		55% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, 45% CHK: med gy-gy brn, dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, tr cal frags, tr bent, mod sting bri wh bl, even dull yel mod amb ring, mod sin	60% CHK: lt-med gy, occ dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, 40% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, abnt foss & cal frags, tr bent, fast sting bri wh bl, even thk bri yel gm ring, mod sin	70% CHK: lt-med gy, occ dk gy, mot, sb pty-blky, sft-sl frm, rthy-sb wxy, 30% MRLST: dk gy, blk, sb pty-blky, sl frm-mod hd, arg-sily tex, abnt foss & cal frags, tr bent, fast sting bri wh bl, even thk bri yel gm ring, mod sin	65% CHK: lt-med gy, occ pty-blky, sft-sl frm, rthy-s- frm-mod hd, arg-sily tex, 35% MRLST: dk gy, blk, frm-mod hd, arg-sily tex, bri wh bl, even dull yel m
TVD (ft)		TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)



