



Scale: 5" / 100'
Measured Depth Log

Well Name Spurling_14N_34HZ

Location NW/4NW: SEC 34, TWP 2N 67W 6 PM

State COLORADO County WELD

Country U.S.A. Rig Number XTREME 6

API Number 05123391270000 AFE # 2085787.DRL

Region D-J BASIN Field WATTENBERG

Spud Date 4/28/2014 Drilling Completed 5/5/2014

Surface Coordinates 377' FNL, 1148' FWL

Bottom Hole Coordinates 460' FFSSL, 1990' FFWLL

Ground Elevation 5,014' K.B. Elevation 5,034'

Logged Interval 7,000' To 12,023' Total Depth 12,023'

Formation NIOBRARA

Type of Drilling Fluid LSND/ PHPA

Operator

Company Anadarko

Address Granite Tower
1099 18th St. #1800
Denver, CO 80202
(JG)(JS)

Geologist

Name ISAAC SMITH & MIKE GREENE (LATERAL)

Company COLUMBINE LOGGING INC.

Address 2385 S. Lipan Street
Denver, CO 80223
Phone: 303-289-7764

Zone Color Coding

Oil
Note
Error

Condensate
Core
Water

G
Pl
S

Rock Types

UNKNOWN	COAL	MARLSTONE	SHALY SANDSTONE
ANHYDRITE	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
BENTONITE	DOLOMITE	NO SAMPLE	SILTY SHALE
BRECCIA	DOLOMITIC LIMESTONE	SALT	SILTSTONE
CHALK	GRANITE	SANDSTONE	TILL
CEMENT	GYPSUM	SALT-PEPPER SAND	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SAND	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	
INOCERAMUS	B BENTONITE	K KAOLIN	
ALGAE	BITUMENOUS SUBSTANCE	M MARCASITE	ANHYDRITE STRINGER
AMPHIPORA	BRECCIA FRAGMENTS	M MARLSTONE	BENTONITE STRINGER
BELEMNITE	PELCOYPOD	M MICACEOUS	COAL STRINGER
BIOCLASTIC	PELLET	MINERAL CRYSTALS	DOLOMITE STRINGER
BRACHIOPOD	PISOLITE	N NODULES	GYPSUM STRINGER
BRYOZOA	PLANT REMAINS	PHOSPHATE PELLETS	LIMESTONE STRINGER
CEPHALOPOD	PLANT SPORES	COAL - THIN BEDS	MARLSTONE (CALC) STRG
CORAL	SCAPHOPOD	D DOLOMITIC	MARLSTONE (DOL) STRG
CRINOID	STROMATOPOROID	F FELDSPAR	S SANDY
ECHINOID		S SIDERITE	SHALE STRINGER
FISH		FERRUGINOUS PELLET	
FORAMINIFERA	ANHYDRITIC	F FERRUGINOUS	SILTY
F FOSSIL	ARGILLACEOUS	GLAUCONITE	SILTY TUFFACEOUS
		GYPSIFEROUS	TUFFACEOUS

Oil Show

P PINPOINT
V VUGGY






































Engineering

D DEAD
E EVEN
Q QUESTIONABLE
B BIT
S SPOTTED STAINING
C CONNECTION (UP)

Porosity

C CONNECTION (DOWN)
E EARTHY
F FENESTRAL
T TRIP GAS
F FRACTURE
T TRIP GAS (LEFT)
I INTERCRYSTALLINE
D DOWN TIME GAS
I INTEROOLITIC
D DOWN TIME GAS
M MOLDIC
C CORE - LOST
O ORGANIC
C CORE - RECOVER

Other Symbols

	DST INTERVAL		WIRELINE TESTED - LEFT		E EARTHY
	FAULT		WIRELINE TESTED - RT		FX FINELYXLN
	FORMATION TOP		DRILL STEM TEST		GS GRAINSTONE
	GAS SHOW		MINDEPTH MN DEPTH		L LITHOGRAPHIC
	OIL SHOW				MX MICROXLN
	MN DEPTH UP				MS MUDSTONE
Rounding					
	MN DEPTH (DOWN)		A ANGULAR		PS PACKSTONE
	NORMAL FAULT		R ROUNDED		WS WACKSTONE
	OVERTURNED STRATA		B SUBANG		
	REVERSE FAULT		N SUBRND		
Sorting					
	CASING				M MODERATE
Textures					
	SIDEWALL CORE (LEFT)				P POOR
	SIDEWALL CORE (RIGHT)		BS BOUNDSTONE		W WELL
	SLIDE		C CHALKY		
	SURVEY		CX CRYPTOXLN		

Slide/Rotate

ROP

ROF

GAMMA

Total Gas & Chromatograph

GAS

C1

C2

Ω
⋮

C4

Depth Labels

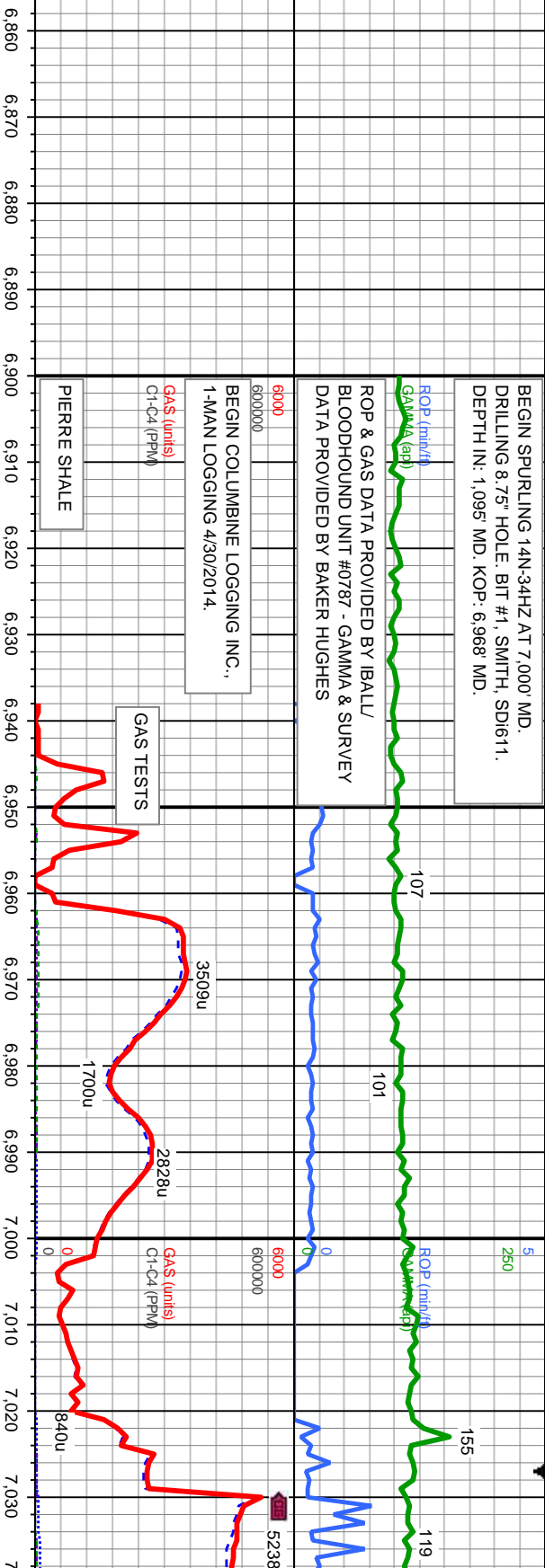
% Lith

Well Bore

TV-D

Oil Show

Images



BEGIN SPURLING 14N-34HZ AT 7,000' MD.
DRILLING 8.75" HOLE. BIT #1, SMITH, SDI611.
DEPTH IN: 1,095' MD. KOP: 6,968' MD.

ROP (mm) 1000
Gamma (ap) 1000
ROP & GAS DATA PROVIDED BY IBALL/
BLOODHOUND UNIT #0787 - GAMMA & SURVEY
DATA PROVIDED BY BAKER HUGHES

BEGIN COLUMBINE LOGGING INC.,
1-MAN LOGGING 4/30/2014.

GAS (units)
C1-C4 (PPM)

PIERRE SHALE

GAS TESTS

THE IDEALIZED INTERPRETATION OF THE WELLBORE LITHOLOGY IS NOT TO SCALE

SCAVENGER TANK IN OPERATION
WITH FOUR TOTAL SHAKERS.

100' SAMPLE INTERVAL	100' SAMPLE DESCRIPTION
100' SAMPLE INTERVAL	100' SAMPLE DESCRIPTION

6000	WT IN 10.1/ OUT 10.1
	VIS IN 40/ OUT 40

MD: 6,895.
TVD: 6,802.67
Incl.: 1.03
Azim.: 90
VS: -330.01

ACETONE WAS USED AS THE CUTTING AGENT WITH THE DIMPLE FILLED TO THE RIM. THE RATINGS ARE BASED ON 7 DESCRIPTORS: NONE, SLIGHT TRACE, TRACE FAIR, MODERATE, GOOD, AND EXCELLENT. THE DESCRIPTOR USED IS BASED ON THE JUDGERS OBSERVATIONS AND BEST JUDGMENT OF BRILLIANCE, COLOR AND LONGEVITY OF THE CUT.

MD: 6,937
TVD: 6,844.66
Incl.: 1.62
Azim.: 109.3
VS: -329.82

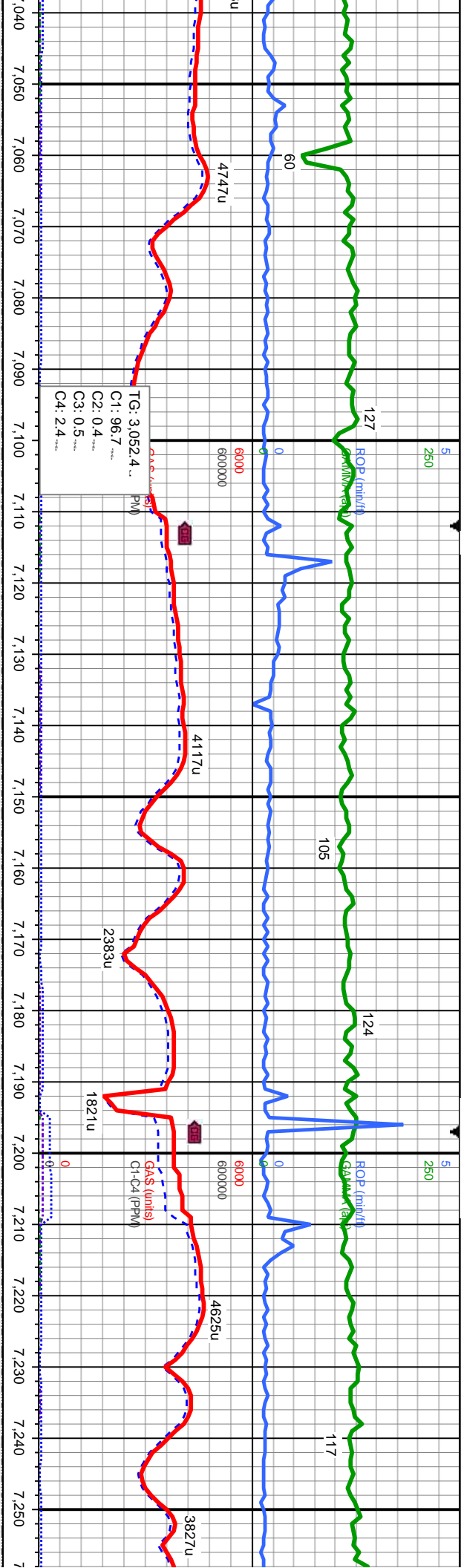
MD: 6,980
TVD: 6,887.59
Incl.: 4.89 -
Azim.: 160.9 -
VS: -327.89

MD: 7,022.	
TVD: 6,929.24	
Incl.: 9.72	
Azim.: 172.14	

SLTY SH: med-dk gy-blk, sb blk-y-sb pily -
pily, frm-mod frm, sl fri, slty, sl gt; difse
stmg dul bl cut, thn dul bl resdl ring

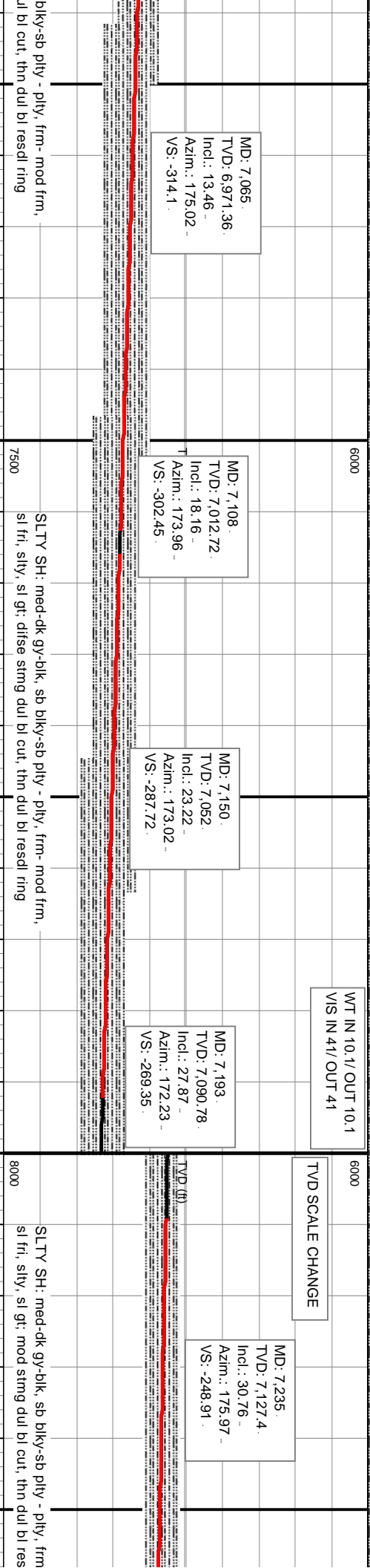
SLTY SH: med-dk gy-blk, sb
sl fri, slty, sl gt; difse strng d

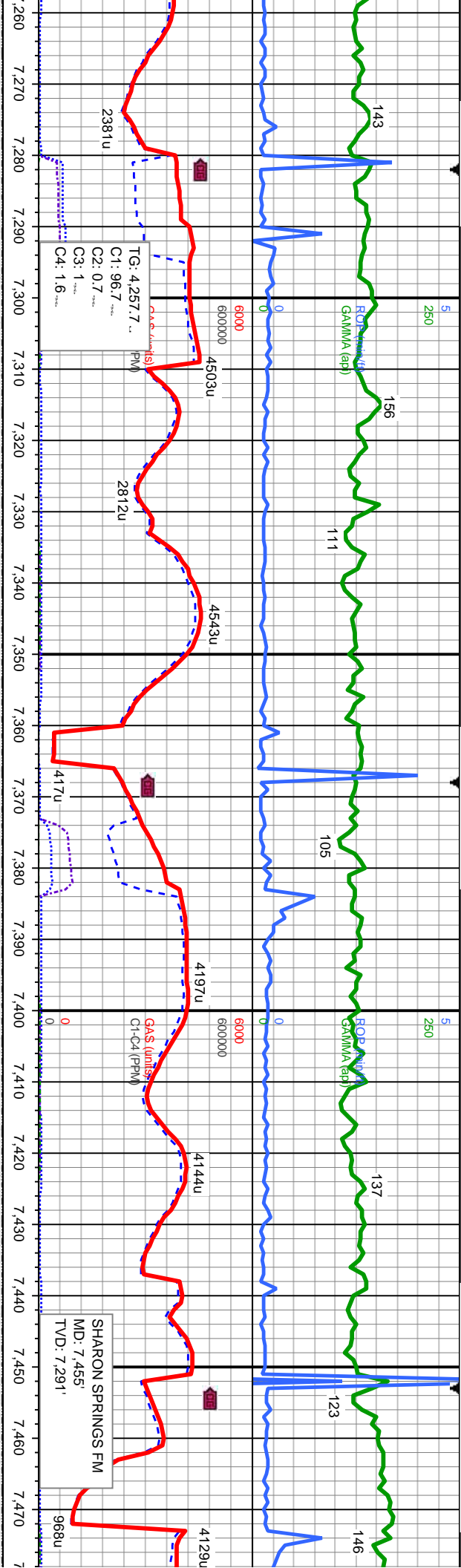




WT IN 10.1/ OUT 10.1
VIS IN 41/ OUT 41

TVDS SCALE CHANGE





MD: 7.278.
TVD: 7.163.61.
Incl.: 34.52 -
Azim.: 180.73 -
VS: -225.74.

MD: 7.321.
TVD: 7.198.15.
Incl.: 38.58 -
Azim.: 184.33 -
VS: -200.18.

MD: 7.364.
TVD: 7.230.57.
Incl.: 43.53 -
Azim.: 185.6 -
VS: -172.04.

MD: 7.406.
TVD: 7.260.
Incl.: 47.49 -
Azim.: 184.43 -
VS: -142.19.

MD: 7.449.
TVD: 7.287.78.
Incl.: 51.98 -
Azim.: 183.72 -
VS: -109.47.

50' SAMPLE INTERVAL
50' SAMPLE DESCRIPTION

WT IN 10.2 OUT 10.2
VIS IN 42/ OUT 42

- mod frm, -
di ring

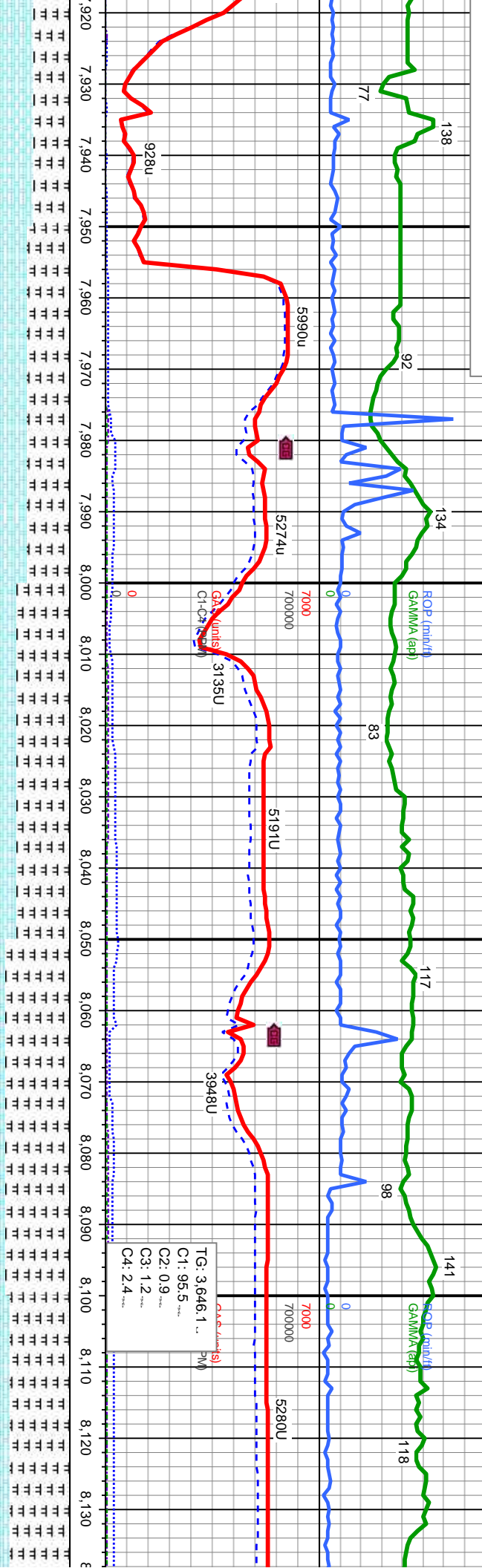
SLTY SH: med-dk gy-blk, sb blk-ly-sb ply - ply, frm- mod frm, -
sl fri, silty, sl gt; mod string dul bl cut, thn dul bl resdl ring

SLTY SH: med-dk gy-blk, sb blk-ly-sb ply -
ply, frm- mod frm, sl fri, silty, sl gt; mod
string dul bl cut, thn dul bl resdl ring

SLTY SH: med-dk gy-blk, sb blk-ly-sb ply -
ply, frm- mod frm, sl fri, silty
string dul bl cut, thn dul bl r



BEGIN DRILLING LATERAL ON 5/2/14 AT 4:47 PM.
6.125" HOLE WITH BIT #2. DEPTH IN: 7877' MD.



100' SAMPLE INTERVAL
100' SAMPLE DESCRIPTION

MD: 7.926
TVD: 7.449.49
Incl.: 87.5
Azim.: 2.47
VS: 329.35

MD: 8.011
TVD: 7.453.49
Incl.: 88.67
Azim.: 0
VS: 414.12

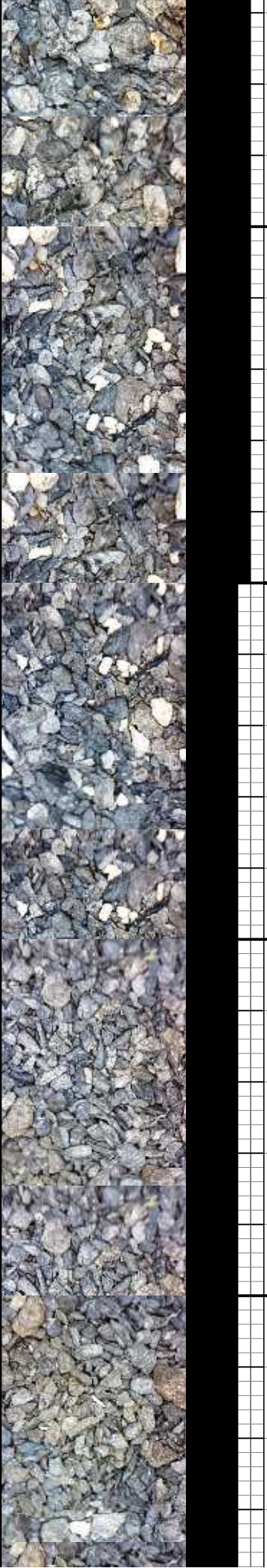
MD: 8.096
TVD: 7.456.59
Incl.: 89.23
Azim.: 359.85
VS: 498.96

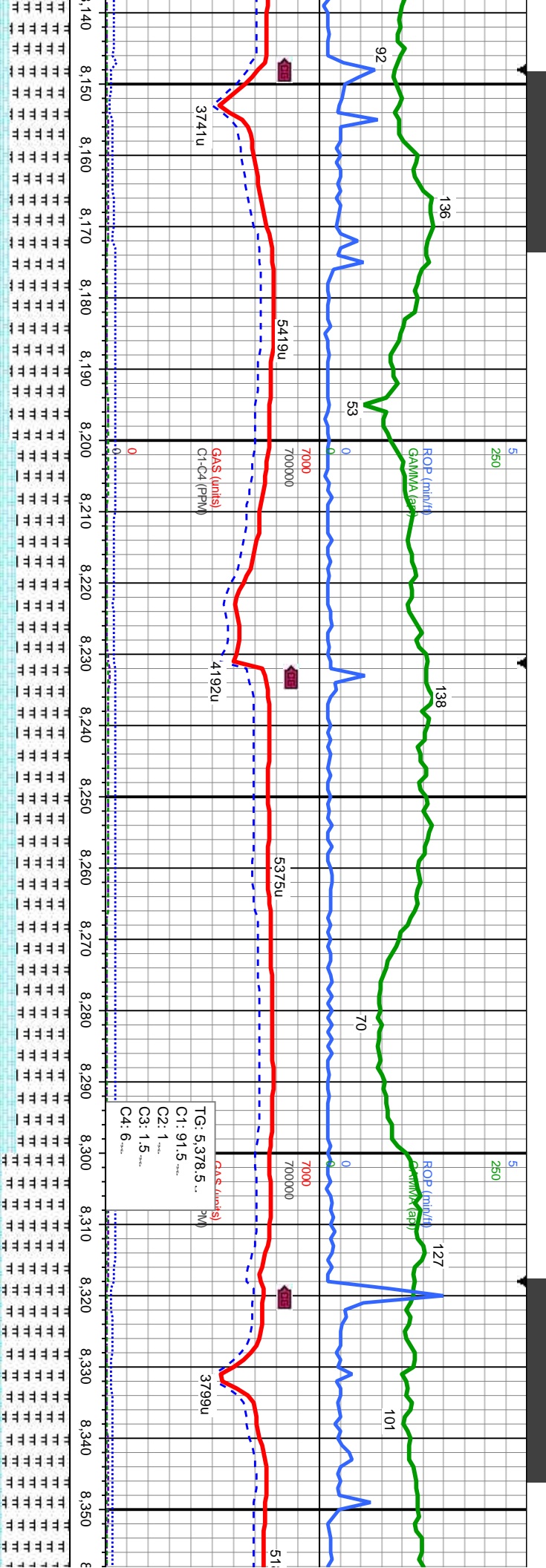
82F
8000
8000
8000

med-dk gy, sb blk-ly-sb ply, frm, arg-si silty, v calc. CHK: med gy-lt gy, sl mot tex, sft-si frm, sl arg, v calc, difse hvy stmg wi mod-g bl-wh cut, thk bri bl ring

MRSLT: dk gy-blk, sb blk-ly-sb ply, hd-frm, arg-si silty, v calc. CHK: med gy-lt gy, sl mot tex, sb blk-ly-sb ply, sft-si frm, sl arg, v calc, difse hvy stmg wi mod-g bl-wh cut, thk bri bl ring

MRSLT: dk gy-blk, sb blk-ly-sb p frag, tr dissim pyr; CHK: med gy frm, sl arg, v calc, difse hvy str





MD: 8,181
TVD: 7,458.73
Incl.: 89.23
Azim.: 359.85
VS: 583.87

MD: 8,267
TVD: 7,461.19
Incl.: 89.87
Azim.: 358.81
VS: 669.8

MD: 8,352
TVD: 7,463.11
Incl.: 90.24
Azim.: 357.2
VS: 754.76

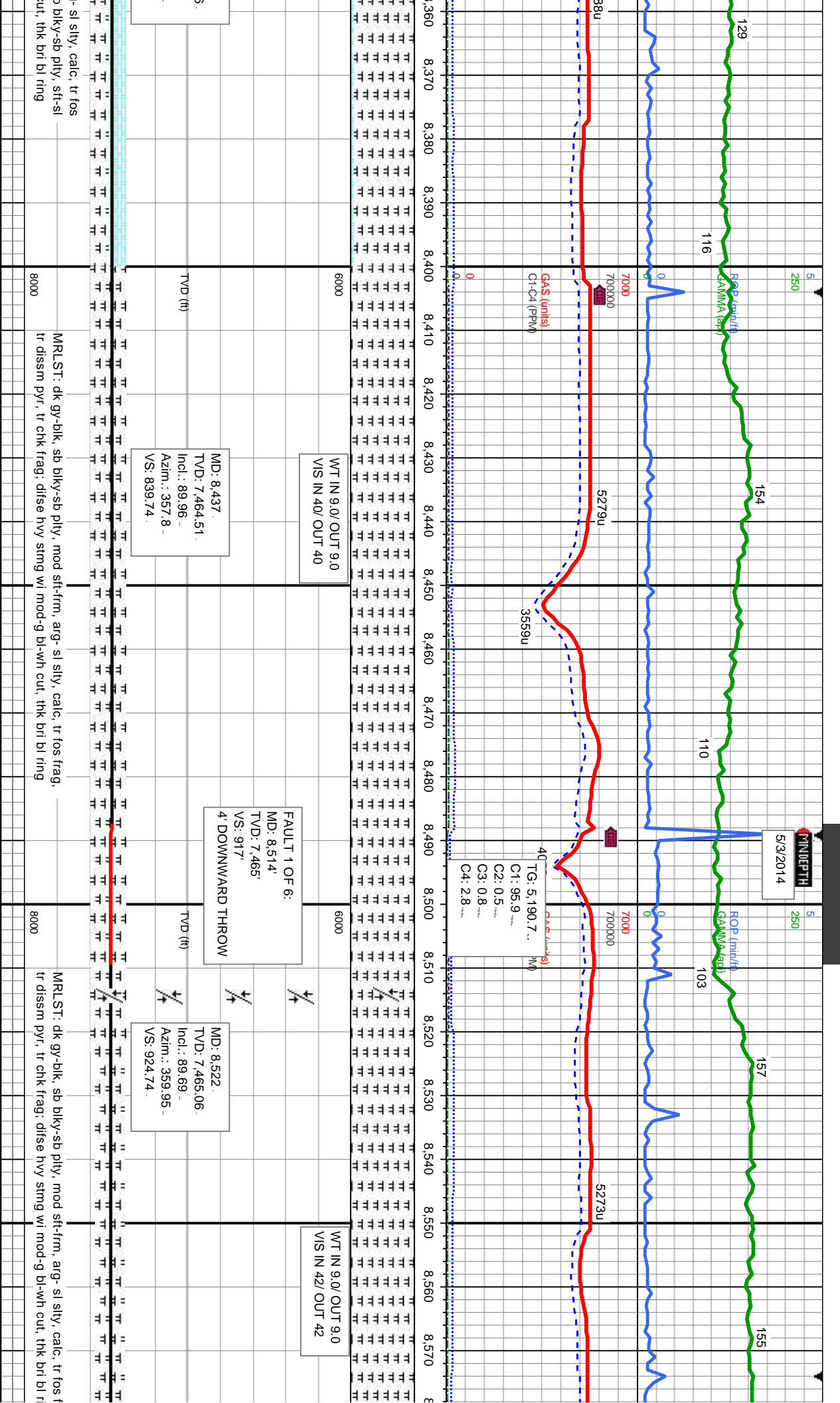
WT IN 9.4/ OUT 9.4
VIS IN 39/ OUT 39

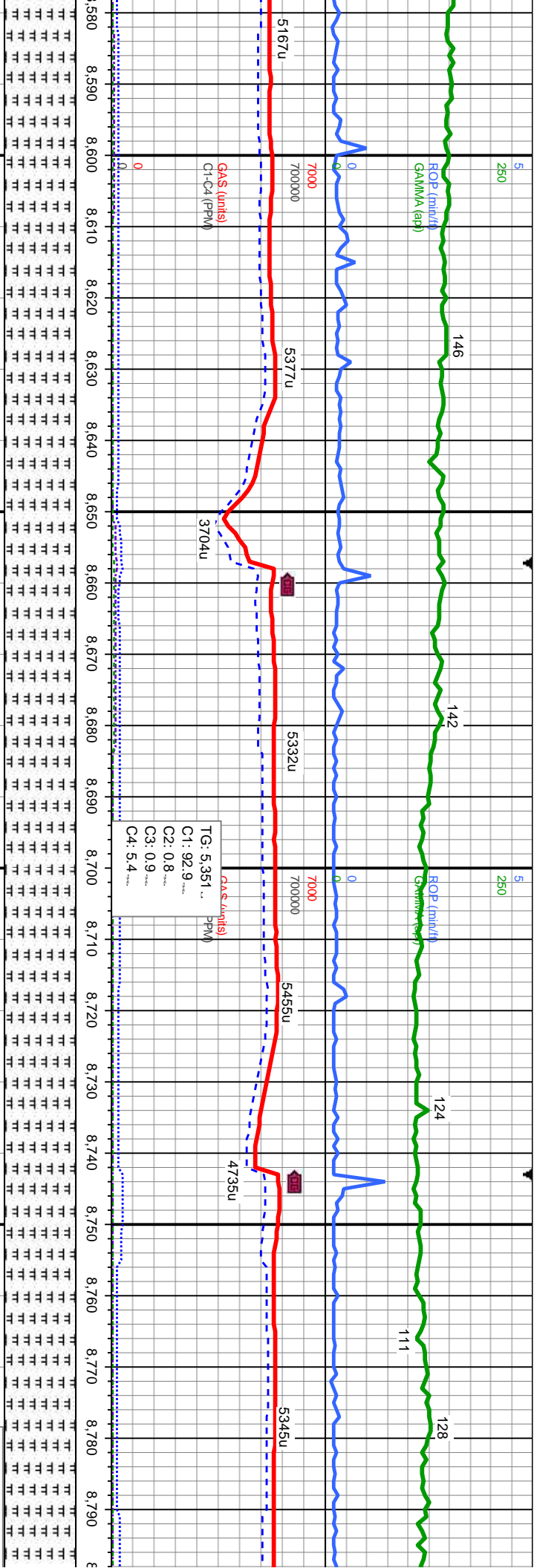
TG: 5,378.5...
C1: 91.5
C2: 1
C3: 1.5
C4: 6

MUD DATA
WT: 9.4 @ 86F
FV: 40
PV: 11
YP: 11
CK: 1/
Sol: 6
pH / Temp.: 9.6 @ 86F
Chl: 2,600

mod sft-frm, arg- sl silty, calc, tr fos	8000	MRL ST: dk gy-blk, sb blk-frm, mod sft-frm, arg- sl silty, calc, tr fos
-/-lt-med brn, mot, sb blk-frm, sft-sl		frag, tr diss pyr: CHK: med gy-lt-med brn, mot, sb blk-frm, sft-sl
ing wi mod-g bl-wh cut, thk bri bl ring		frm, sl arg, v calc, disse hvy string wi mod-g bl-wh cut, thk bri bl ring







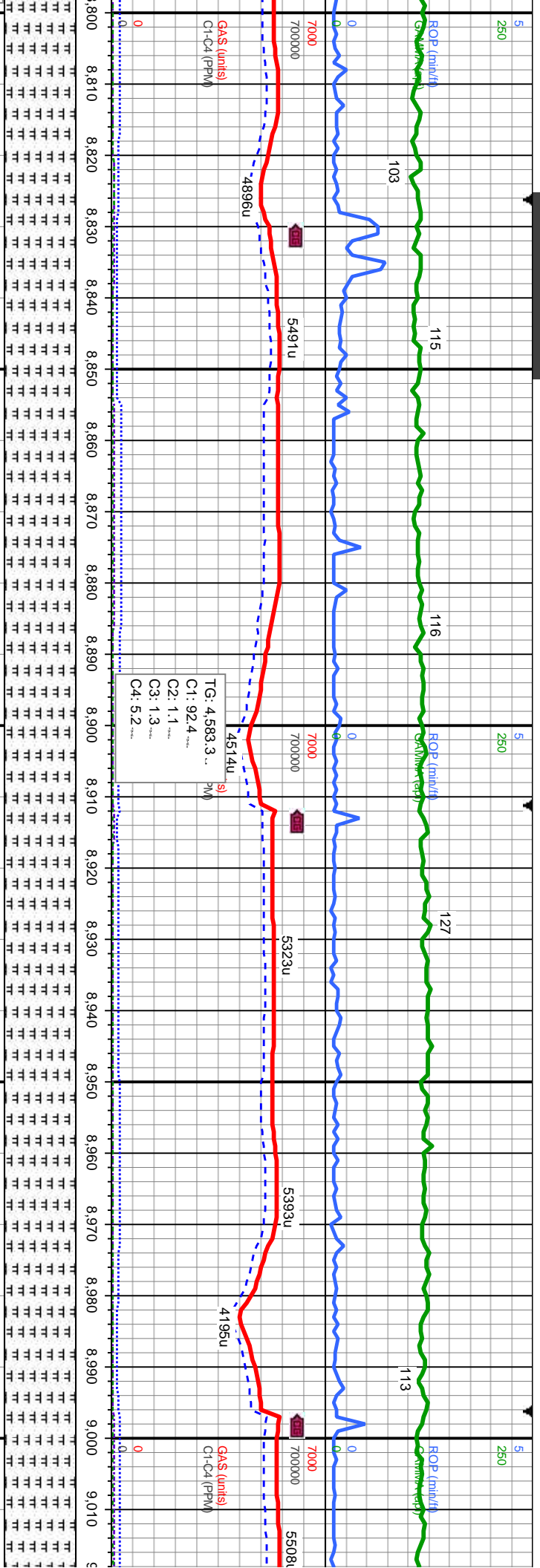
MD: 8.606.
TVD: 7,464.75.
Incl.: 89.96 -
Azim.: 179.08 -
VS: 1,008.73 .

MD: 8.691.
TVD: 7,465.22.
Incl.: 89.41 -
Azim.: 179 .
VS: 1,093.71 .

MD: 8.774.
TVD: 7,466.39.
Incl.: 88.98 -
Azim.: 178.37 -
VS: 1,176.67 .

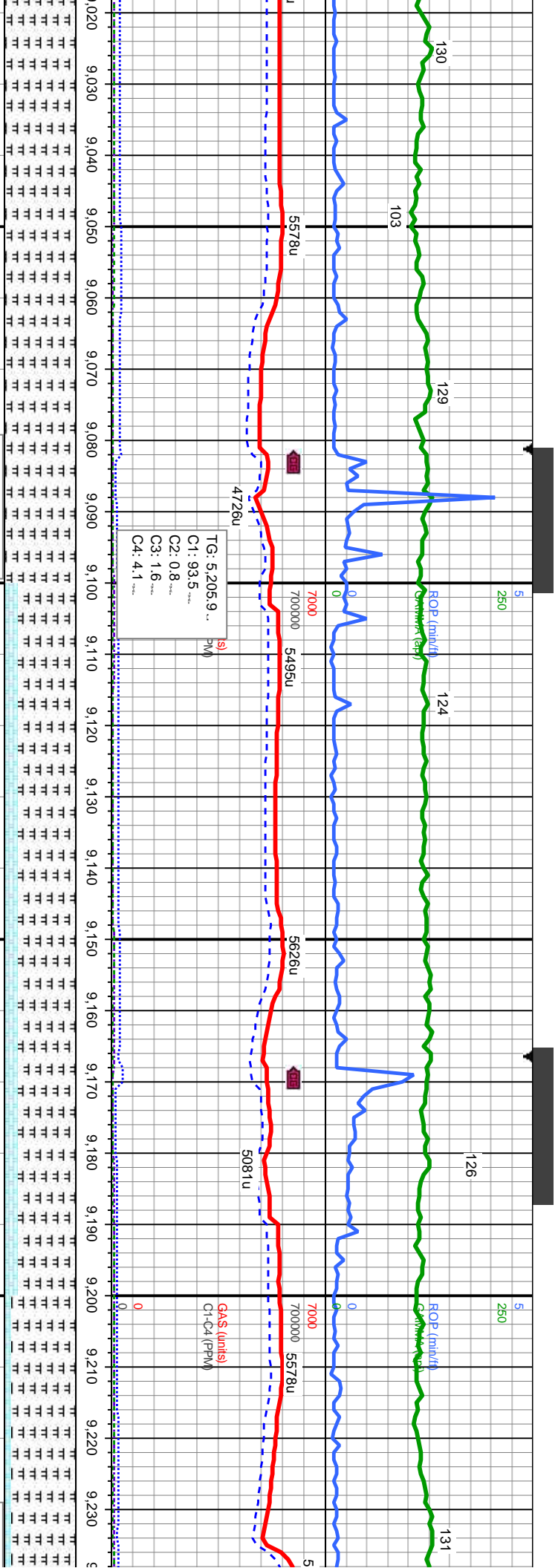
8000	tr dissim pyr, tr chk frag: difse hvy sting wi mod-g bl-wh cut, thk bri bl ring
8000	tr dissim pyr, tr chk frag: difse hvy sting wi mod-g bl-wh cut, thk bri bl ring





8000	MRLST: dk gy-blk, sb blk-y-sb pily, mod sft-frm, arg-sl silty, calc, tr fos frag, tr bent, tr cal frag, difse hvy string wi mod-g bl-wh cut, thk bri bl ring	8000	MRLST: dk gy-blk, sb blk-y-sb pily, mod sft-frm, arg-sl silty, calc, tr fos frag, abnt bent, tr cal frag, v fast difse string bri bl-wh mky cut, thk bri bl-wh resd ring	8000	MRLST: dk gy-blk, sb blk-y-sb pily, mod sft-frm, arg-sl silty, calc, tr fos frag, abnt bent, tr cal frag, v fast difse string bri bl-wh mky cut, thk bri bl-wh resd ring
6000		6000		6000	
MD: 8,859 TVD: 7,466.46 Incl.: 90.92 Azim.: 179.06 VS: 1,261.64		MD: 8,944 TVD: 7,465.42 Incl.: 90.49 Azim.: 178.89 VS: 1,346.61			
TVD (ft)		TVD (ft)		TVD (ft)	





WT IN 9.4/ OUT 9.4
VIS IN 41/ OUT 41

MD: 9.029
TVD: 7.465.17
Incl.: 89.84
Azim.: 177.68
VS: 1.431.56

MD: 9.115
TVD: 7.464.67
Incl.: 90.83
Azim.: 177.88
VS: 1.517.49

MD: 9.199
TVD: 7.463.39
Incl.: 90.92
Azim.: 179.08
VS: 1.601.44

gy-blk, sb biky-sb pily, mod sft-frm, arg- sl sily, calc, tr fos frag, abnt
frag: occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resd ring

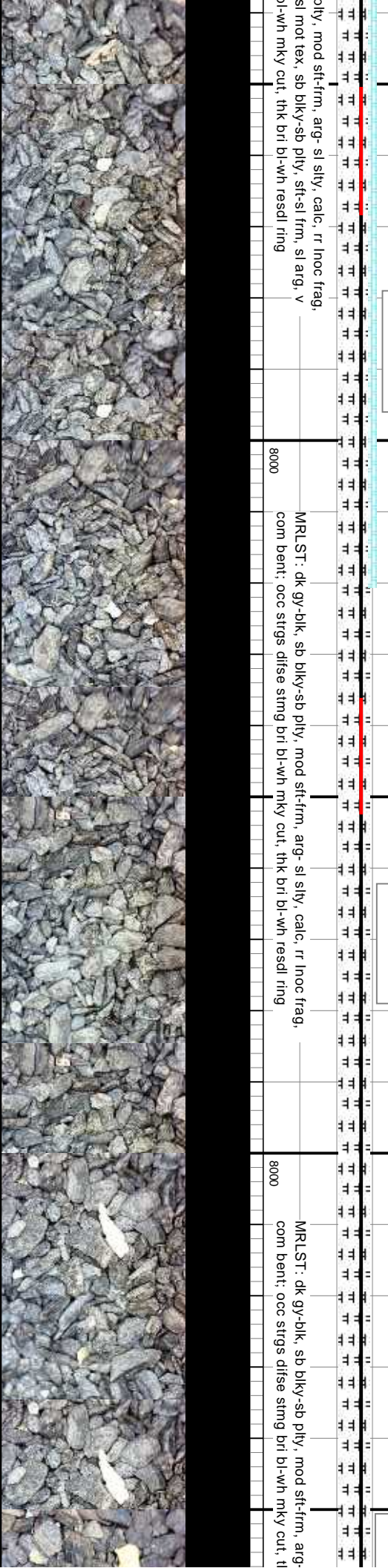
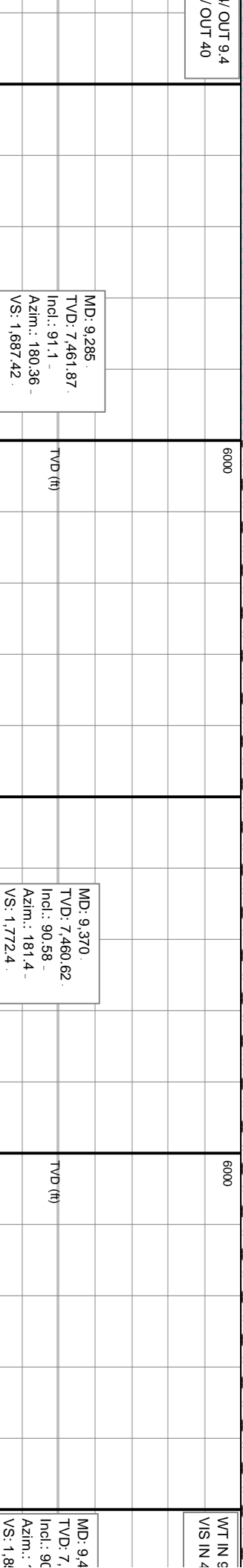
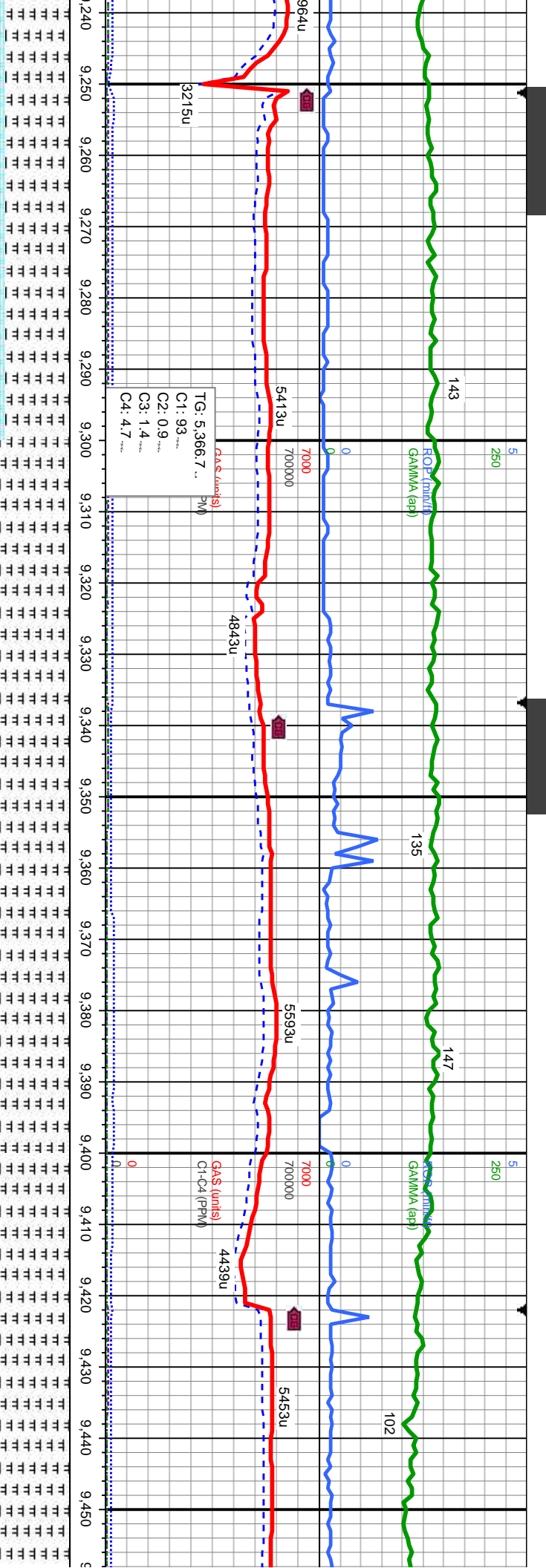
8000

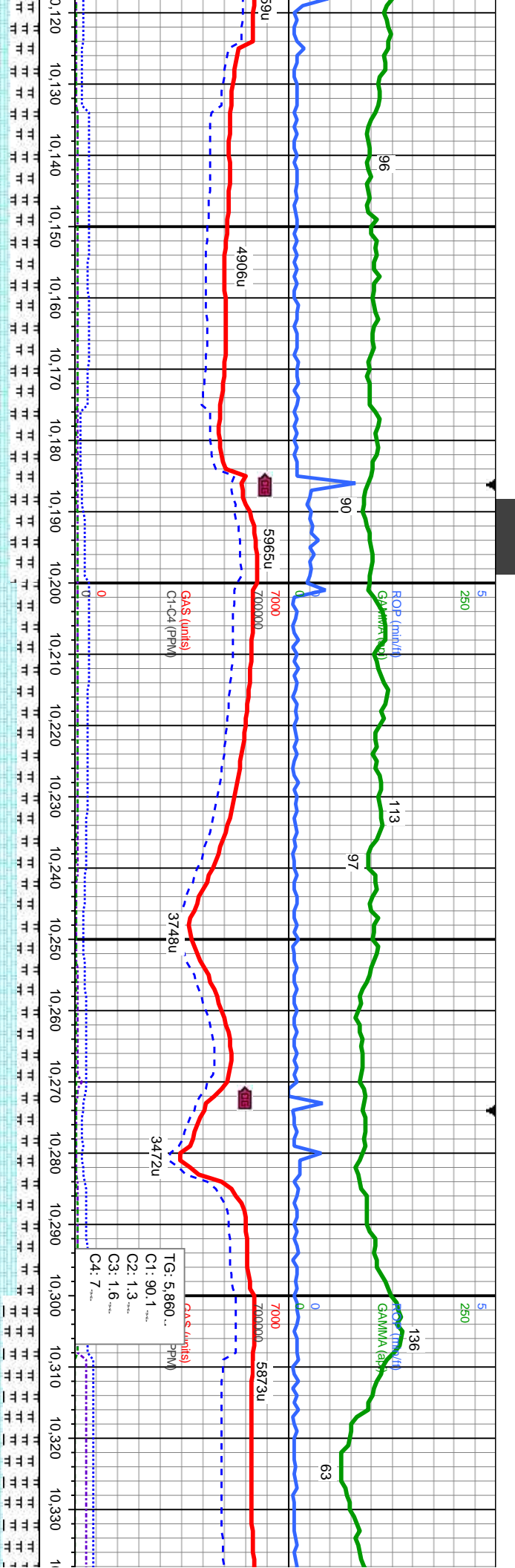
MRSLT: dk gy-blk, sb biky-sb pily, mod sft-frm, arg- sl sily, calc, tr inoc frag, abnt bent; CHK: med gy-lt gy, sl mot tex, sb biky-sb pily, sft-sl frm, sl arg, v
calc: occ strgs difse stmg bri bl-wh mky cut, thk bri bl-wh resd ring

8000

MRSLT: dk gy-blk, sb biky-sb
com bent; CHK: med gy-lt gy,
calc: occ strgs difse stmg bri t







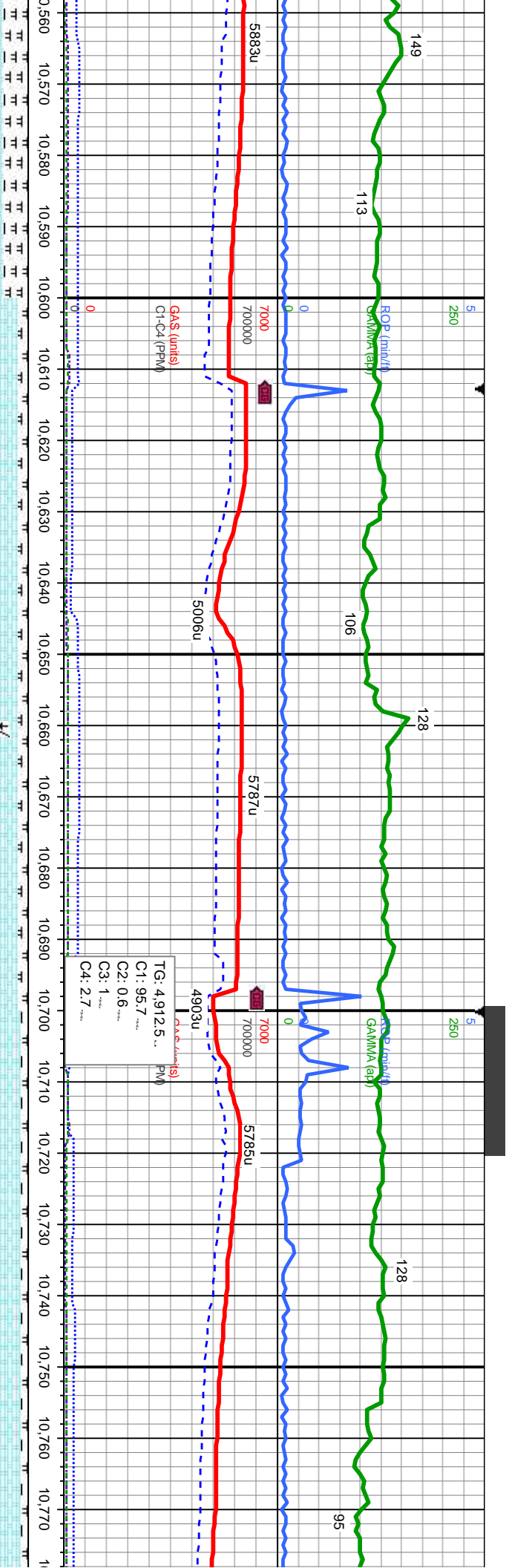
MD: 10,137.
TVD: 7,449.73.
Incl.: 88.91 -
Azim.: 1.69.
VS: 2,538.81.

MD: 10,222.
TVD: 7,450.63.
Incl.: 88.91 -
Azim.: 1.69.
VS: 2,623.67.

MD: 10,308.
TVD: 7,452.34.
Incl.: 89 -
Azim.: 182.61 -
VS: 2,709.56.

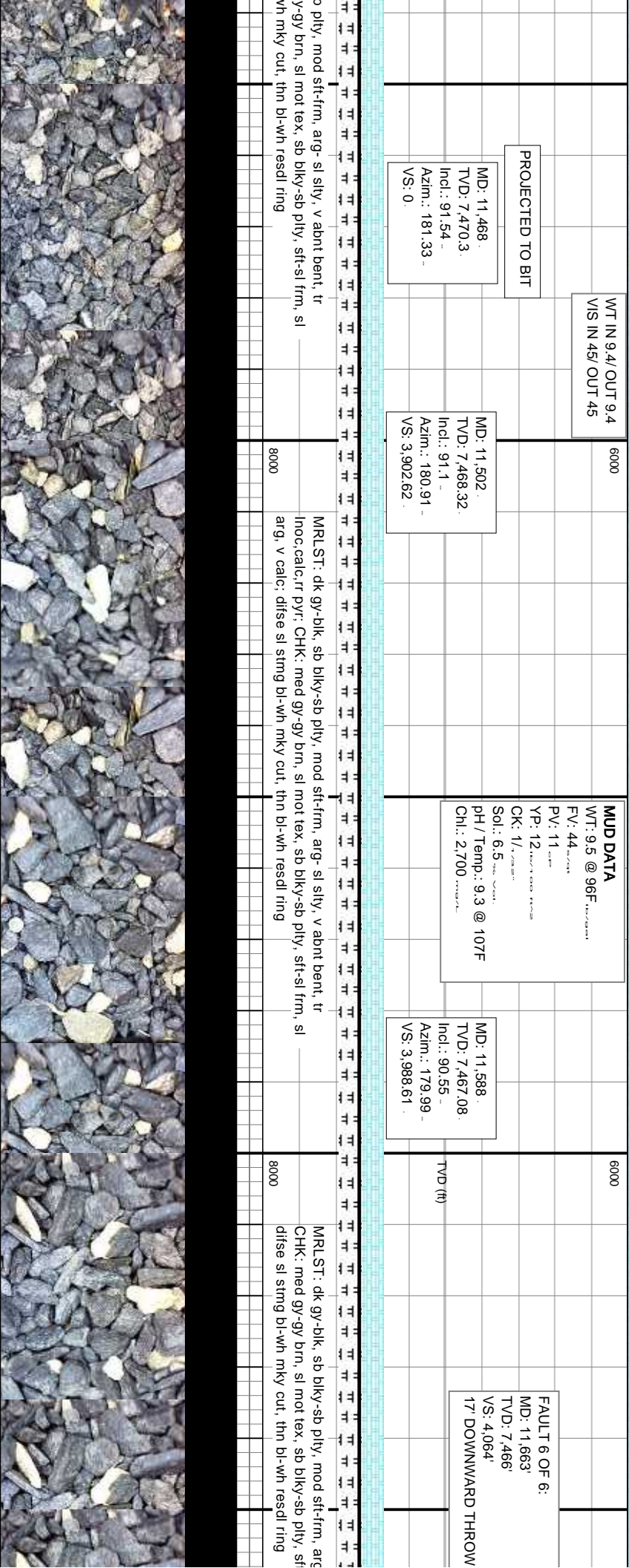
dk gy-blk, sb blk-y-sb pily, mod sft-frm, arg- sl silty, calc, v rr Inoc frag, v rr cal	8000	MRLST: dk gy-blk, sb blk-y-sb pily, mod sft-frm, arg- sl silty, calc, v rr Inoc frag, v rr cal frags: CHK: med gy-lt gy, sl mot tex, sb blk-y-sb pily, sft-sl frm, sl arg, v calc; occ strgs dife smng bri bl-wh mky cut, thk bri bl-wh resd ring	8000
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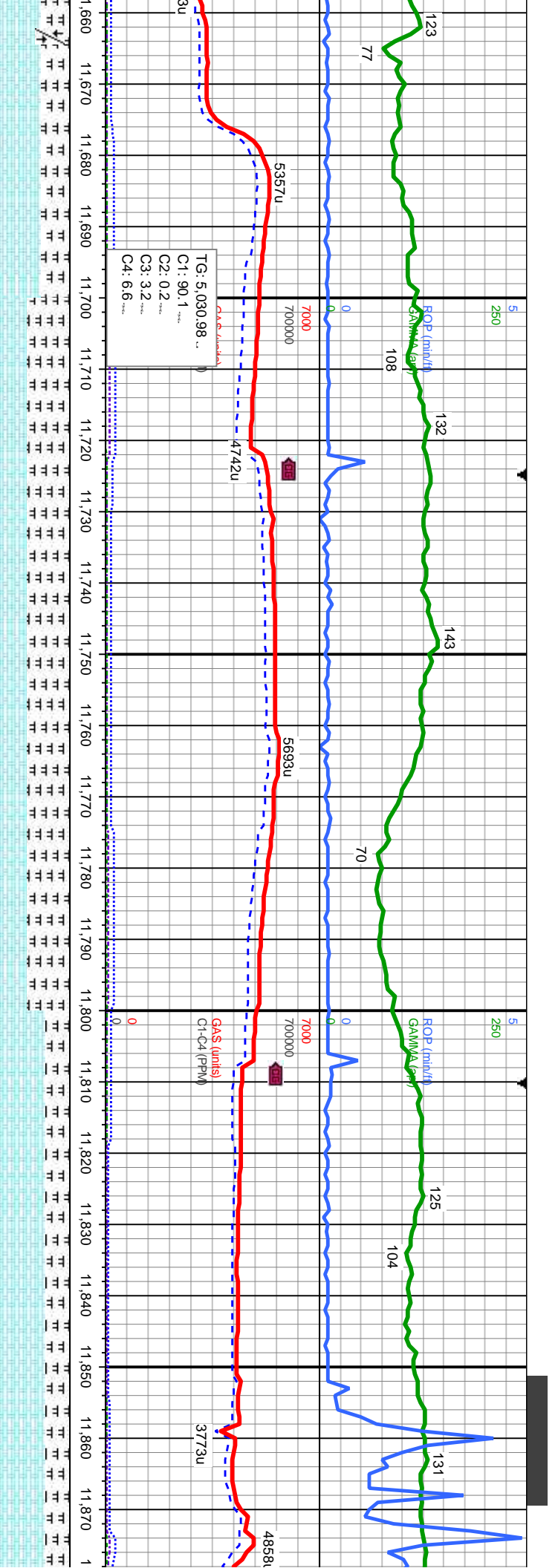




WT IN 9.4/ OUT 9.4 VIS IN 43/ OUT 43		WT IN 9.4/ OUT 9.4 VIS IN 43/ OUT 43	
MD: 10.563. D: 7.456.4. Incl: 88.3. Azim: 182.53. VS: 2.964.21.		MD: 10.648. TVD: 7.459.08. Incl: 88.09 - Azim: 182.78 - VS: 3.049.09.	
TVD (ft)		TVD (ft)	
arg, v calc; occ strgs difse string bri		MRSLST: dk gy-blk, sb blk-yl sb ply, mod sft-firm, arg-si silty, tr dissim pyr frags: CHK: med gy-gy brn, sl mot tex, sb blk-yl sb ply, sft-sil frm, sl arg, v calc; occ strgs difse string bri bl-wh mky cut, thk bri bl-wh resd ring	
8000		8000	







<div>WT IN 9.5/ OUT 9.5 VIS IN 45/ OUT 45</div>	6000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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	8000	MR LST: dk gy-blk, sb blk-y-sb ply, mod sft-frm, arg- sl silty, tr bent, calc; CHK: med gy-gy brn, sl mot tex, sb blk-y-sb ply, sft-sl frm, sl arg, v calc; difse sl sting bl-wh mky cut, thn bl-wh resd ring		8000	MR LST: dk gy-blk, sb blk-y-sb ply, mod sft-frm, arg- sl silty, tr bent, calc; CHK: med gy-gy brn, sl mot tex, sb blk-y-sb ply, sft-sl frm, sl arg, v calc; difse sl sting bl-wh mky cut, thn bl-wh resd ring

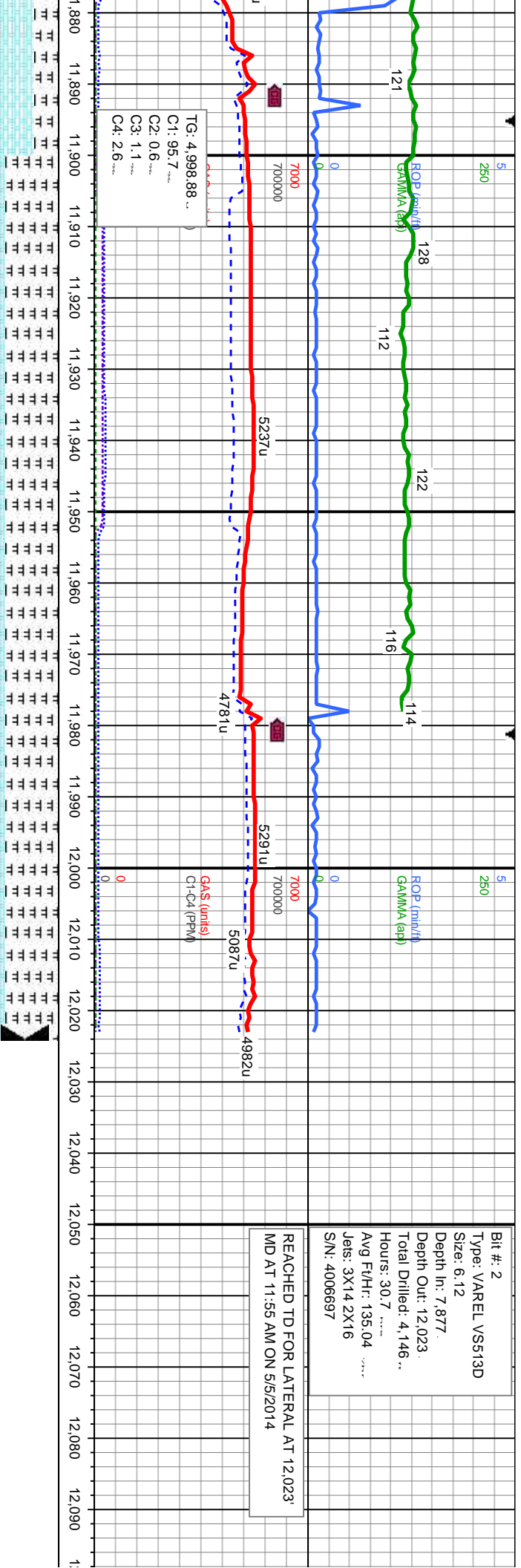


Bit #: 2
Type: VAREL VS513D
Size: 6.12
Depth In: 7.877.
Depth Out: 12.023.
Total Drilled: 4,146..
Hours: 30.7
Avg Ft/Hr: 135.04
Jets: 3X14 2X16
S/N: 4006697

REACHED TD FOR LATERAL AT 12.023'
MD AT 11:55 AM ON 5/5/2014

TG: 4,998.88 ..
C1: 95.7
C2: 0.6
C3: 1.1
C4: 2.6

GAS (units)
C1-C4 (PPM)



THANK YOU FOR USING
COLUMBINE LOGGING INC.!

MUD DATA
WT: 9.5 @ 103F
FV: 44
PV: 12
YP: 11
CK: 1/
Sol.: 7
pH / Temp: 9.3 @ 103F
Chl.: 2,700

PROJECTED TO BIT

MD: 12.023.
TVD: 7,468.78
Incl.: 89.19
Azim.: 179.7
VS: 4,423.58.

TVD (ft)

MD: 11.930.
TVD: 7,467.64.
Incl.: 89.66
Azim.: 179.75
VS: 4,330.6.

MD: 11.972.
TVD: 7,468.06.
Incl.: 89.19
Azim.: 179.7
VS: 4,372.59.

TVD (ft)

MRLST: dk gy-blk, sb blk-y-sb pily, mod stf-fm, arg- sl silty, tr bent, calc: CHK- med gy-gy brn, sl
mot tex, sb blk-y-sb pily, stf-sl frm, sl arg, v calc, difse sl string bl-wh mky cut, thn bl-wh resd ring

8000

6000

6000



