



Scale: 5" / 100'  
Measured Depth Log

Well Name Waste Management 2T-401

Location SESE SEC 2, T2N, R64W, 6TH

State COLORADO

Country USA

API Number 05-123-36961-0000

Region DJ BASIN

Spud Date 8/2/2013

Surface Coordinates 230' FSL x 1076' FEL

Bottom Hole Coordinates 500' FNL x 1144' FEL

Ground Elevation 4892

Logged Interval 6200

Formation CODELL SANDSTONE

Type of Drilling Fluid LSND

County WELD

Rig Number ENSIGN 119

Field WATTENBERG

K.B. Elevation 4915

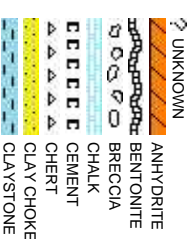
Company PDC Energy

Address 1775 Sherman  
Denver , CO 80

Name Brian Hoffman

Company PDC Energy

Address 1775 Sherman  
Denver , CO 80



# Operator

Street, Ste 3000

203

# Geologist

Street, Ste 3000





































































203

## Rock Types

[illegible]

## Accessories

## Fossils






















































































































































































































































































	<b>Fossils</b>		F FOSSIL		— ARGILLACEOUS		✓ TUFFACEOUS
	GASTROPOD		✓ ARGILLITE GRAIN		✓ GLAUCONITE		
	OOLITE		✓ GYPSIFEROUS				
	OSTRACOD		✓ B BENTONITE		✓ HEAVY MINERAL		
	PELECYPOD		✓ BITUMENOUS SUBSTANCE		✓ INOCERAMUS		
	PELLET		✓ BRECCIA FRAGMENTS		✓ KAOLIN		
	PSOLITE		✓ CALCALEOUS		✓ MARLSTONE		
	PLANT REMAINS		✓ CARBONACEOUS FLAKES		✓ MINERAL CRYSTALS		
	PLANT SPORES		✓ CHITIN		✓ NODULES		
	SCAPHOPOD		✓ CHITL		✓ PHOSPHATE PELLET		
	STROMATOPOROID		✓ COAL - THIN BEDS		✓ PYRITE		
			✓ DOLOMITIC		✓ SALT CAST		
			✓ FELDSPAR		✓ SANDY		
			✓ FERRUGINOUS PELLET		✓ SILICEOUS		
			✓ FERRUGINOUS				
			✓ SILTY				
							

## Other Symbols

# Oil Show

- ☒ OIL SHOW
- ☒ MOLDIC
- ☒ ORGANIC
- ☒ PINPOINT
- ☒ DEAD
- ☒ VUGGY
- ☒ MINDEPTH
- ☒ MN DEPTH
- ☒ FAULT
- ☒ FORMATION TOP
- ☒ WIRELINE TESTED - LEFT
- ☒ WIRELINE TESTED - RT
- ☒ E EARTHY
- ☒ FINELYXXLN
- ☒ G5 GRAINSTONE
- ☒ L LITHOGRAPHIC
- ☒ Rounding


## Porosity

	QUESTIONABLE		ANGULAR		M <sub>X</sub> MICROX LN
	SPOTTED STAINING		NORMAL FAULT		M <sub>S</sub> MUDSTONE
<b>Engineering</b>					
	BIT		OIL SHOW		SUBANG
	CONNECTION (LEFT)		OVERTURNED STRATA		MS SUBSAND
	CONNECTION (RIGHT)		REVERSE FAULT		MS SUBROCK
	FENESTRAL		SIDEWALL CORE (LEFT)		MS SUBSTONE
	FRACTURE		SIDEWALL CORE (RIGHT)		MS SUBTEXT
	INTERCRYSTALLINE		SLIDE		MS SUBBOUNDSTONE
	INTEROOLITIC		SURVEY		MS SUBCHALK
	DST INTERVAL		TRIP GAS		MS SUBCRYSTOXLN
<b>Textures</b>					
	MODERATE		WELL		M <sub>X</sub> MICROX LN
	POOR		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUDSTONE
	WELL		M <sub>S</sub> MUDSTONE		M <sub>S</sub> MUD

## Textures

## Sorting

**Stringer**

	ANHYDRITE STRINGER
	BENTONITE STRINGER
	COAL STRINGER
	DOLOMITE STRINGER
	GYPSUM STRINGER
	LIMESTONE STRINGER
	MARLSTONE (CALC) STRG
	MARLSTONE (DOL) STRG
	SANDSTONE STRINGER

Slide/Rotate

ROP  
ROF  
GAMMA

Columbine Logging  
2-Manned Geosteering  
Operational 08/06/2013  
Bloodhound # 312

Total Gas & Chromatograph  
GAS  
C1  
C2  
C3  
C4  
CO2

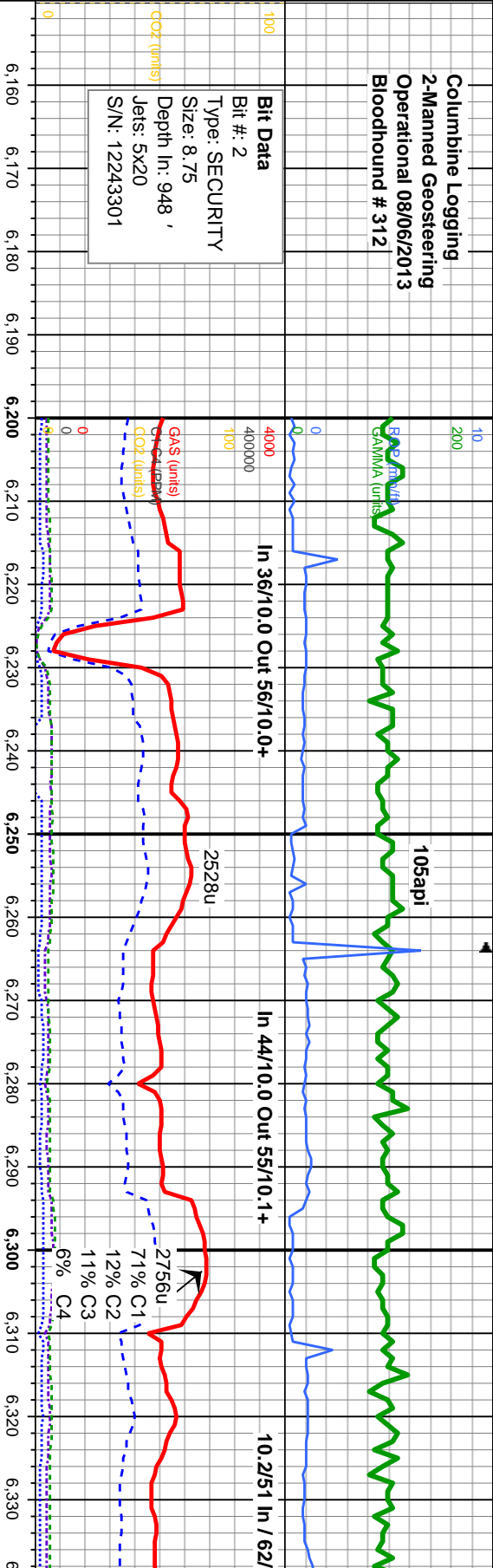
Depth Labels

% Lith

Well Bore  
TVD

Oil Show

Images



MD: 6.215'  
TVD: 6.204 94'  
Inclination: 2.4°  
Azimuth: 1.9°  
VS: -187.11°

MD: 6.262'  
TVD: 6.251 82'  
Inclination: 5.4°  
Azimuth: 359.1°  
VS: -183.86°

MD: 6.310'  
TVD: 6.299 42'  
Inclination: 5°  
Azimuth: 0°  
VS: -177.82°

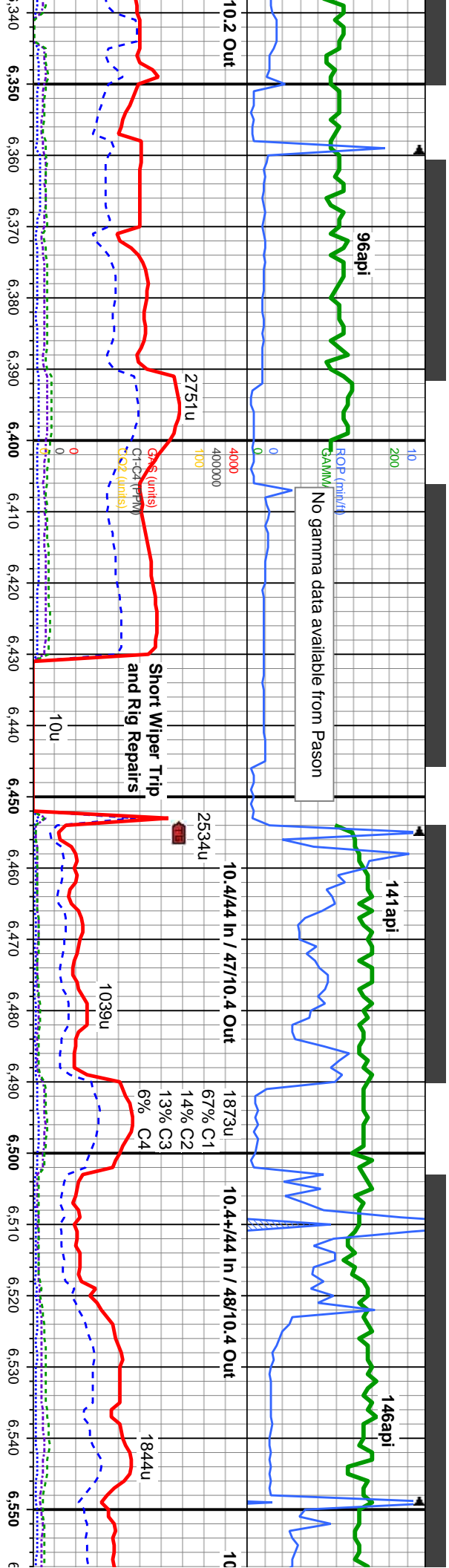
TVD (ft)

SLTY SH: med-lt gy, sft, sb pily - pily,  
sily-grty tex, non calc, grdg to SLTST: lt gy,  
sft, sb blkly, sily, sl calc, SHY SS: lt  
gy-offwht, vfg, ang-sb rd, w srted, mod w  
cons, sl calc cnt, tr pyr, no mnrl flor, fnt lt  
yel cut, no stn  
7300

SLTY SH: med-lt gy, sft, sb pily - pily,  
sily-grty tex, non calc, grdg to tr slst, SHY  
SS: lt gy-offwht, vfg, ang-sb rd, w srted,  
mod w cons, sl calc cnt, tr pyr, no mnrl  
flor, fnt lt yel cut, no stn

SLTY SH: lt-m gy, sft, sb pily& blkly  
sily -sb grty tex, sl calc cnt, occ SH  
gy, s&p, vfg, ang, w srted, m consol  
cnt n vis por NSFOC

TR  
P  
FR  
G  
E



6200

MD: 6,357'  
TVD: 6,345.6'  
Inclination: 12.5°  
Azimuth: 359.1°  
VS: -169.2°

MD: 6,405'  
TVD: 6,392.2'  
Inclination: 15.5°  
Azimuth: 358.5°  
VS: -158.0°

MD: 6,452'  
TVD: 6,437.32'  
Inclination: 18.5°  
Azimuth: 358.2°  
VS: -144.5°

MD: 6,500'  
TVD: 6,482.44'  
Inclination: 21.5°  
Azimuth: 357.7°  
VS: -128.2°

MD: 6,547'  
TVD: 6,525.45'  
Inclination: 25.5°  
Azimuth: 358.4°  
VS: -109.2°

SLTY SH: lt-m gy, sft, sb ply& blkly, rthy lstr, slty -sb grty tex, sl calc cnt, occ SHLY SS: lt gy, s&dp, vfgr, ang, w strd, m consol, sl calc cnt n vis por NSFOC

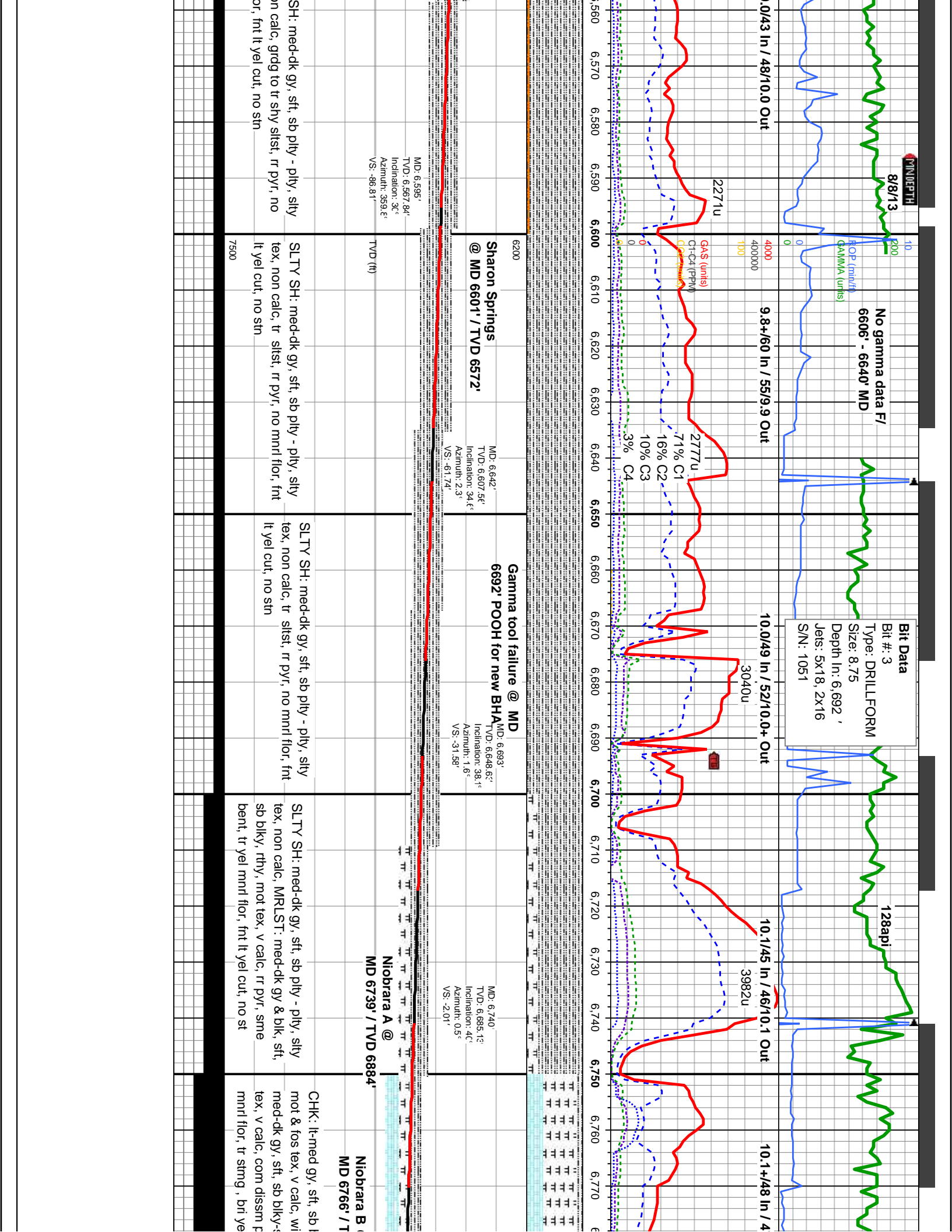
SLTY SH: lt-m gy, sft, sb ply& blkly, rthy lstr, slty -sb grty tex, sl calc cnt, occ SHY SS: lt gy, s&dp, vfgr, ang, w strd, m consol, sl calc cnt n vis por NSFOC

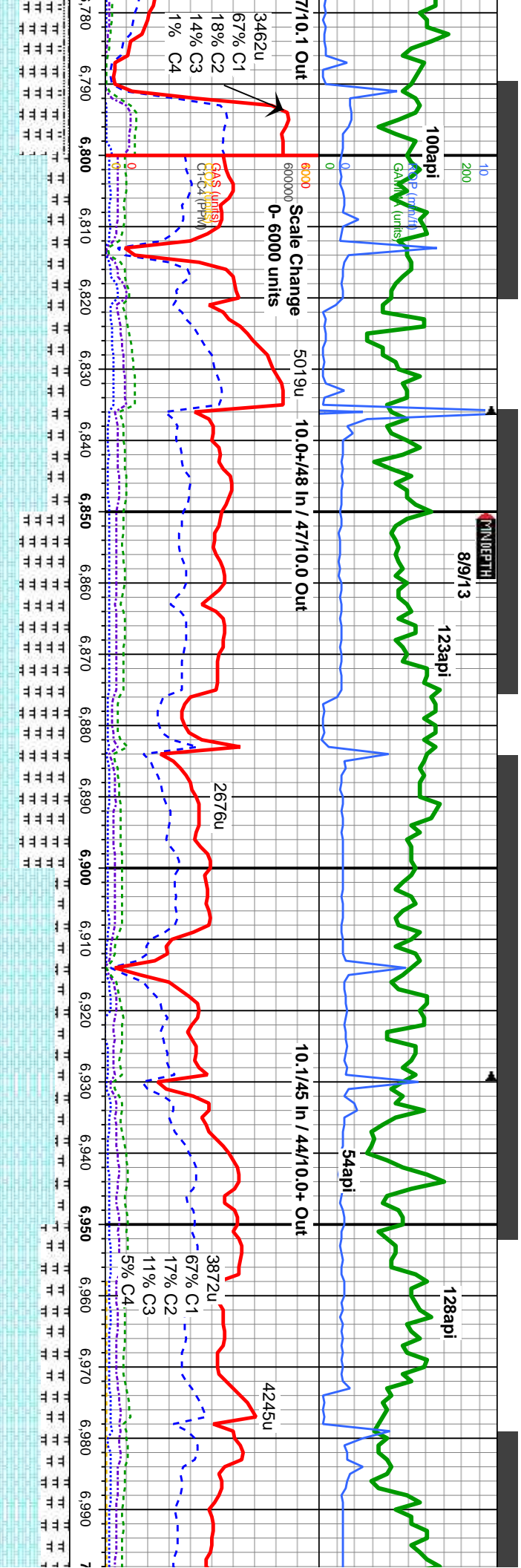
SLTY SH: med-lt gy, sft, sb ply - ply, slty-grty tex, non calc, grdg to SHY SLTST: lt gy, sft, sb blkly, slty, sdy ip, sl calc, rr pyr, no mnrl flr, fnt lt yel cut, no stn

SLTY SH: med-lt gy, sft, sb ply - ply, slty-grty tex, non calc, grdg to SHY SLTST: lt gy, sft, sb blkly, slty, sdy ip, sl calc, rr pyr, no mnrl flr, fnt lt yel cut, no stn

SLTY SH: med-lt gy, sft, sb ply - ply, slty-grty tex, non calc, grdg to SHY SLTST: lt gy, sft, sb blkly, slty, sdy ip, sl calc, rr pyr, no mnrl flr, fnt lt yel cut, no stn







MD: 6.788'  
TVD: 6.721.36'  
Inclination: 41.1°  
Azimuth: 358.4°  
VS: 29.44'

MD: 6.835.5'  
TVD: 6.755.76°  
Inclination: 44.5°  
Azimuth: 357.2°  
VS: 61.46°

MD: 6.883'  
TVD: 6.789.14°  
Inclination: 47.1°  
Azimuth: 358.4°  
VS: 95.97'

Niobrara C @  
MD 6934' / TVD 6823'

MD: 6.930'  
TVD: 6.819.5°  
Inclination: 51.4°  
Azimuth: 358.5°  
VS: 131.82'

MD: 6.979'  
TVD: 6.848.24°  
Inclination: 56.3°  
Azimuth: 358.1°  
VS: 171.45°

@  
VD 6705'

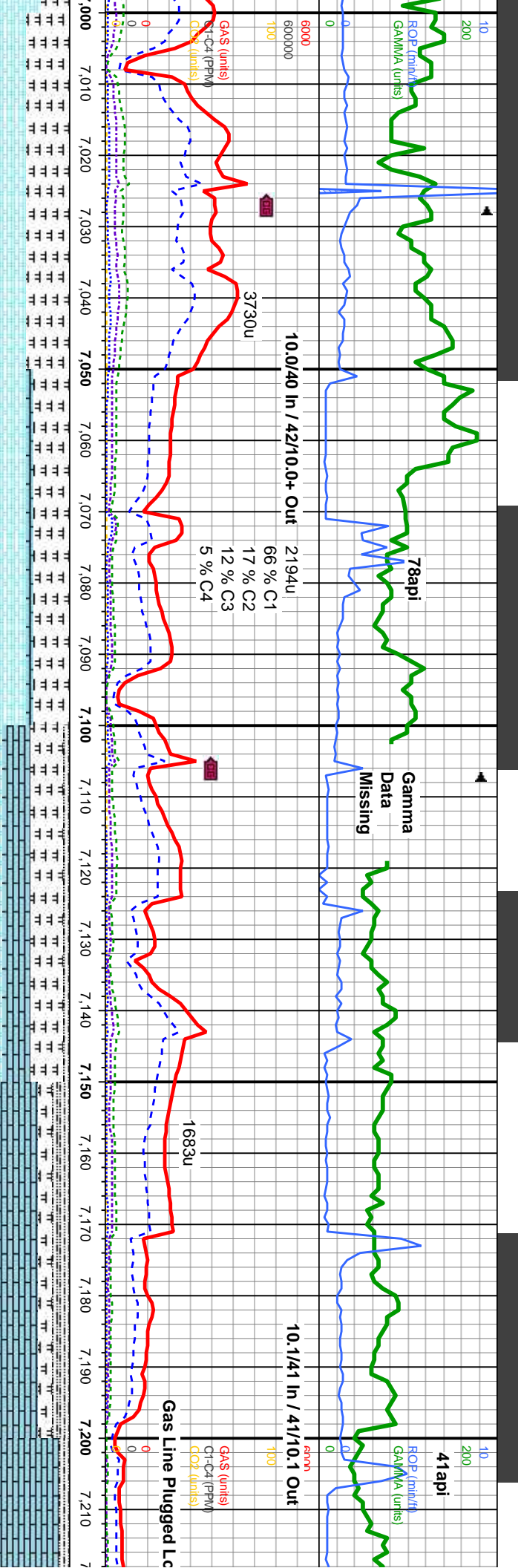
CHK: lt-m med gy, lt gy brn, sft, sb blkly-blky, rthy, rthy-sb wxy, tr fos, MRLST: sb ply, rthy, sl mot tex, v calc, tr diss pyr, no mnrl flr, mod stmg, bri yel cut, tr fnt brn stn

CHK: lt-med gy, lt gy brn, sft, sb blkly-blky, rthy, mot & fos tex, v calc, wi abnt fos, MRLST: med-dk gy, firm, sb ply, sl mot tex, v calc, tr diss pyr, no mnrl flr, mod stmg, bri yel cut, tr fnt brn stn

MRLST: med-dk gy, firm, sb ply - sb blkly, mot tex, v calc, wi tr fos, CHK: med gy - gy brn, lt gy, sft, sb blkly-blky, rthy, mot, v calc, wi occ fos, sme diss pyr, no mnrl flr, mod stmg, bri yel cut, tr fnt brn stn

CHK: med gy brn - brn, lt gy, sft, sb blkly-blky, rthy, mot, v calc, wi com fos, MRLST: dk-med gy, firm, sb ply, sl mot tex, v calc, wi tr fos, tr diss pyr, no mnrl flr, mod stmg, bri yel cut, tr fnt brn stn

CHK: lt-m gy, sft-mushy, sb blkly, rthy lsutr, silty tex, intbd w/ MRLST: m-dk gy & blk, sft sb blkly, rthy silty, v calc wi org mat, n flr, fast stmg yel cut, lt brn stn



MD: 7,026'  
TVD: 6,872.56'  
Inclination: 61.4°  
Azimuth: 357.7°  
VS: 211.7'

MD: 7,074'  
TVD: 6,894.2'  
Inclination: 65°  
Azimuth: 357.5°  
VS: 254.5'

MD: 7,121'  
TVD: 6,912.64'  
Inclination: 68.4°  
Azimuth: 357.4°  
VS: 297.7'

MD: 7,169'  
TVD: 6,929.0°  
Inclination: 71.2°  
Azimuth: 358.2°  
VS: 342.8'

MD: 7,216'  
TVD: 6,942  
Inclination:  
Azimuth: 35°  
VS: 387.8'

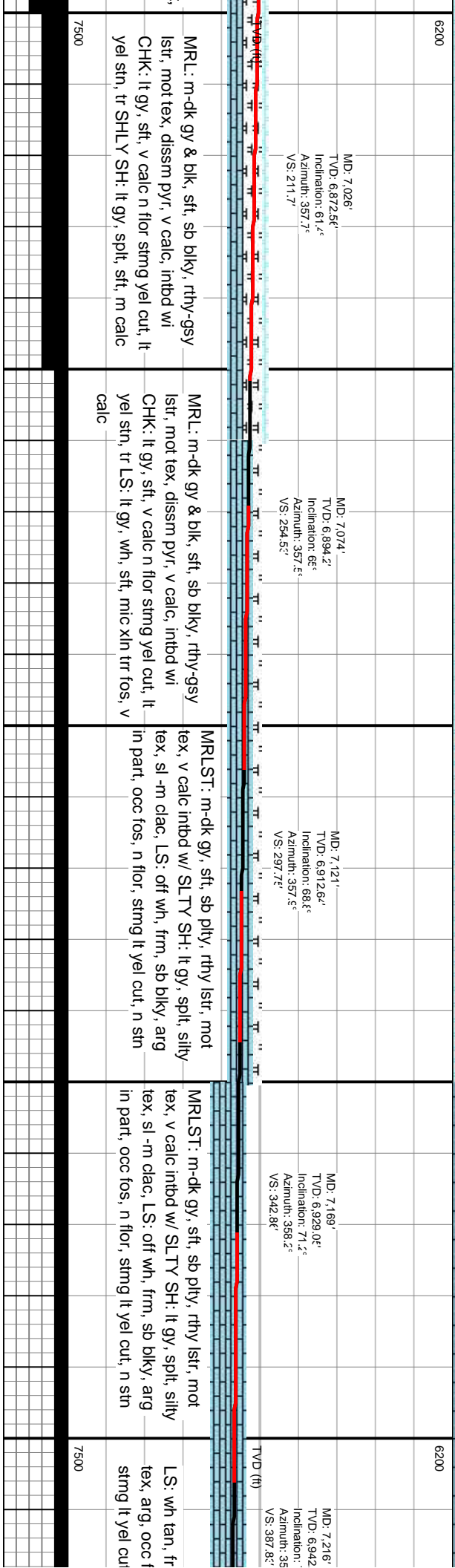
MRL: m-dk gy & blk, sft, sb blk, rthy-gsy  
lstr, mot tex, dissm pyr, v calc, inbnd w/  
CHK: lt gy, sft, v calc n flr stmg yel cut, lt  
yel str, tr SHLY SH: lt gy, spl, sft, m calc

MRL: m-dk gy & blk, sft, sb blk, rthy-gsy  
lstr, mot tex, dissm pyr, v calc, inbnd w/  
CHK: lt gy, sft, v calc n flr stmg yel cut, lt  
yel str, tr LS: lt gy, wh, sft, mic xin tr fos, v  
calc

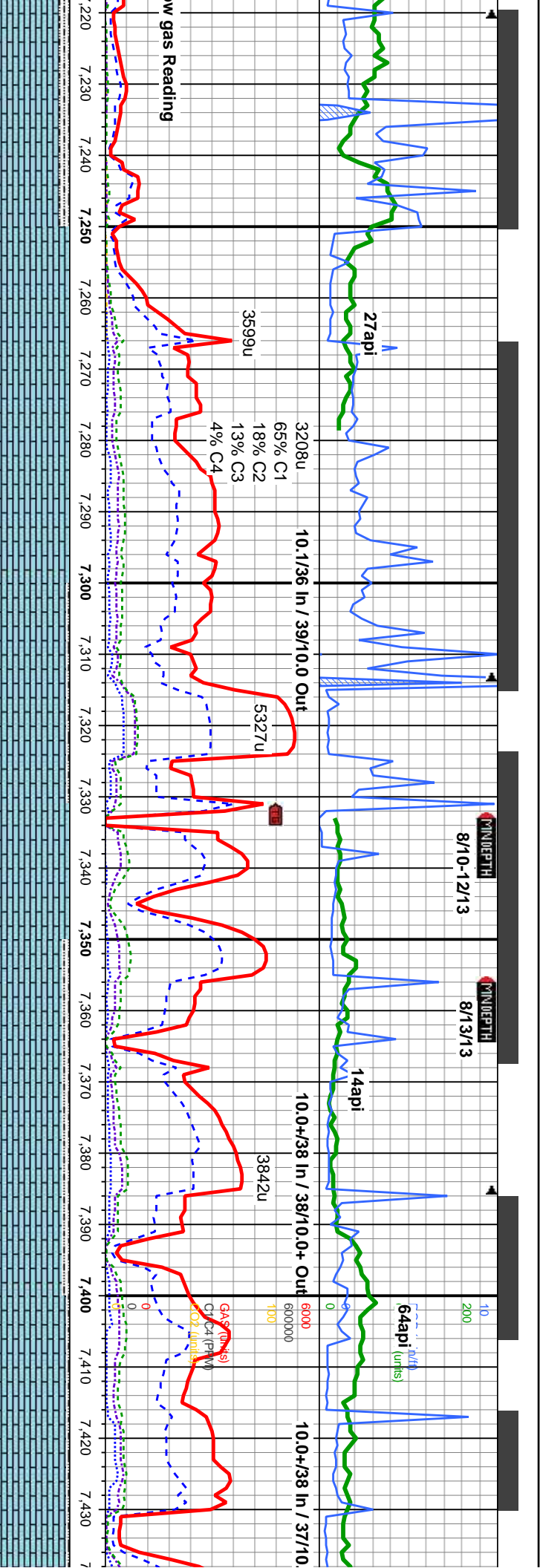
MRLST: m-dk gy, sft, sb pty, rthy lstr, mot  
tex, v calc inbnd w/ SLTY SH: lt gy, spl, silty  
tex, sl -m clac, LS: off wh, frm, sb blk, arg  
in part, occ fos, n flr, stmg lt yel cut, n str

MRLST: m-dk gy, sft, sb pty, rthy lstr, mot  
tex, v calc inbnd w/ SLTY SH: lt gy, spl, silty  
tex, sl -m clac, LS: off wh, frm, sb blk, arg  
in part, occ fos, n flr, stmg lt yel cut, n str

LS: wh tan, fr  
tex, arg, occ f  
stmg lt yel cut

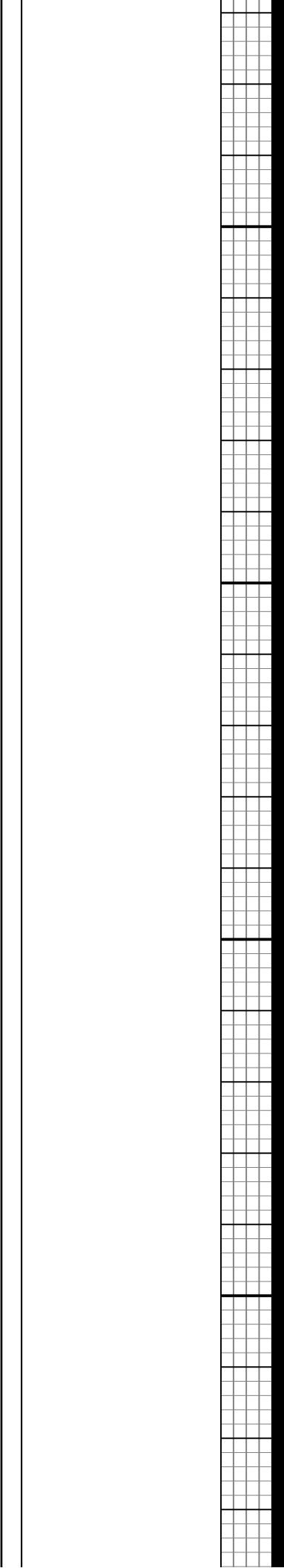




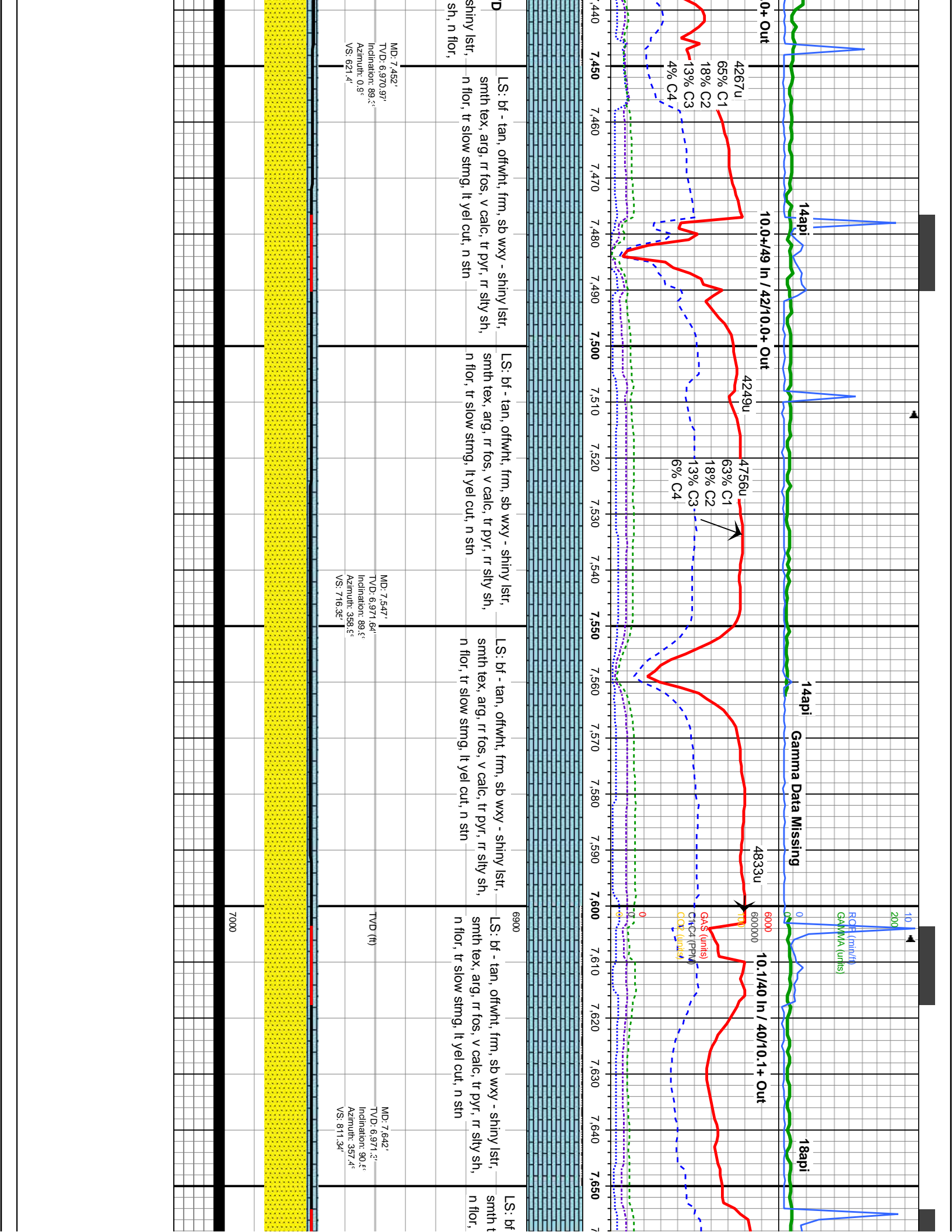


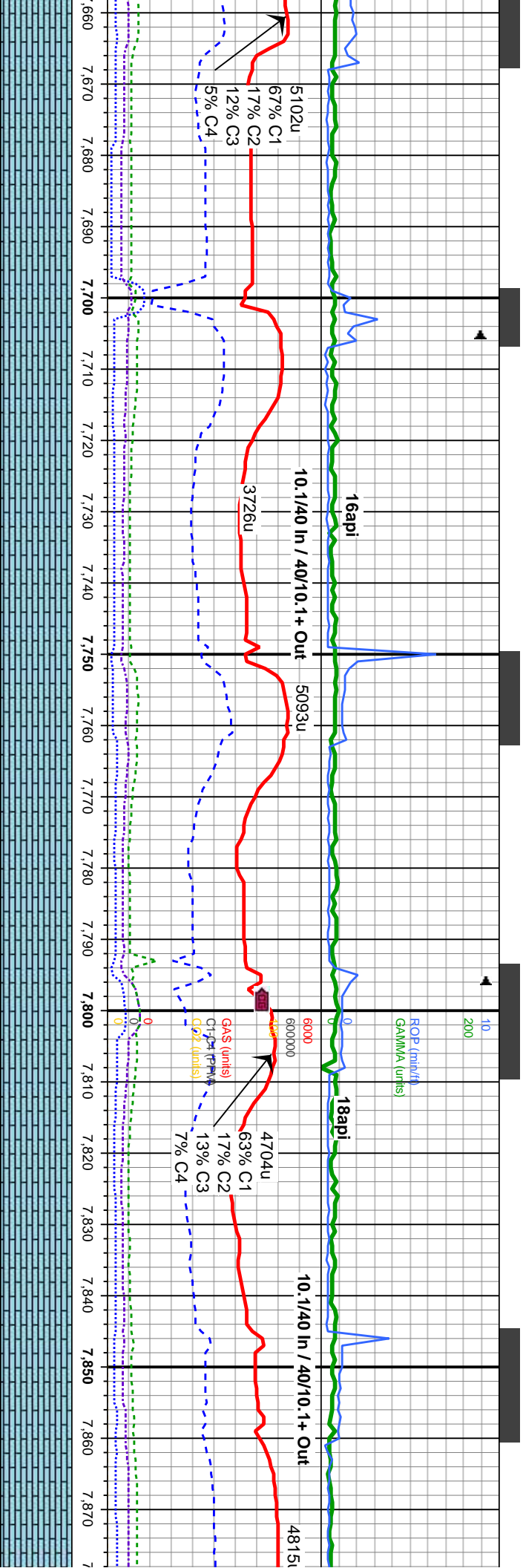
MD: 7,264' TVD: 6,953.63' Inclination: 78.45° Azimuth: 358.4° VS: 434.52'		MD: 7,281' TVD: 6,956.72' Inclination: 80.4° Azimuth: 359.1° VS: 451.22'		MD: 7,330' TVD: 6,963.32' Inclination: 84.4° Azimuth: 0.3° VS: 499.72'		MD: 7,391' TVD: 6,968.52' Inclination: 86.1° Azimuth: 0.2° VS: 560.51'	
67'		67'		67'		67'	
m, splt, shiny lstr, smth		m, splt, shiny lstr, smth		m, splt, shiny lstr, smth		m, splt, shiny lstr, smth	
os, v calc n flor, tr slow		os, v calc n flor, tr slow		os, v calc n flor, tr slow		os, v calc n flor, tr slow	
, n stn		, n stn		, n stn		, n stn	

m, splt, shiny lstr, smth		L.S: wh tan, frm, splt, shiny lstr, smth		L.S: wh tan, frm, splt, shiny lstr, smth		L.S: bf - tan, offwht, frm, sb wxy - shiny lstr,	
os, v calc n flor, tr slow		tex, arg, occ fos, v calc n flor, tr slow		tex, arg, occ fos, v calc n flor, tr slow		smth tex, arg, tr fos, v calc, SLTY SH: lt gy	
, n stn		stng lt yel cut, n stn		stng lt yel cut, n stn		- dk gy, stly tex, sb blk y - pily, n flor, tr slow	
						stng, lt yel cut, n stn	









- tan, offwht, frm, sb wxy - shiny lstr,  
tex, arg, rr fos, v calc, tr pyr, rr silty sh,  
tr slow stmg, lt yel cut, n stn

LS: bf - tan, offwht, frm, sb wxy - shiny lstr,  
smth tex, arg, rr fos, v calc, tr pyr, rr silty sh,  
n flor, tr slow stmg, lt yel cut, n stn

LS: bf - tan, offwht, frm, sb wxy - shiny lstr,  
smth tex, arg, rr fos, v calc, tr pyr, rr silty sh,  
n flor, tr slow stmg, lt yel cut, n stn

LS: bf - tan, offwht, frm, sb wxy - shiny lstr,  
smth tex, arg, rr fos, v calc, tr pyr, rr silty sh,  
n flor, tr slow stmg, lt yel cut, n stn

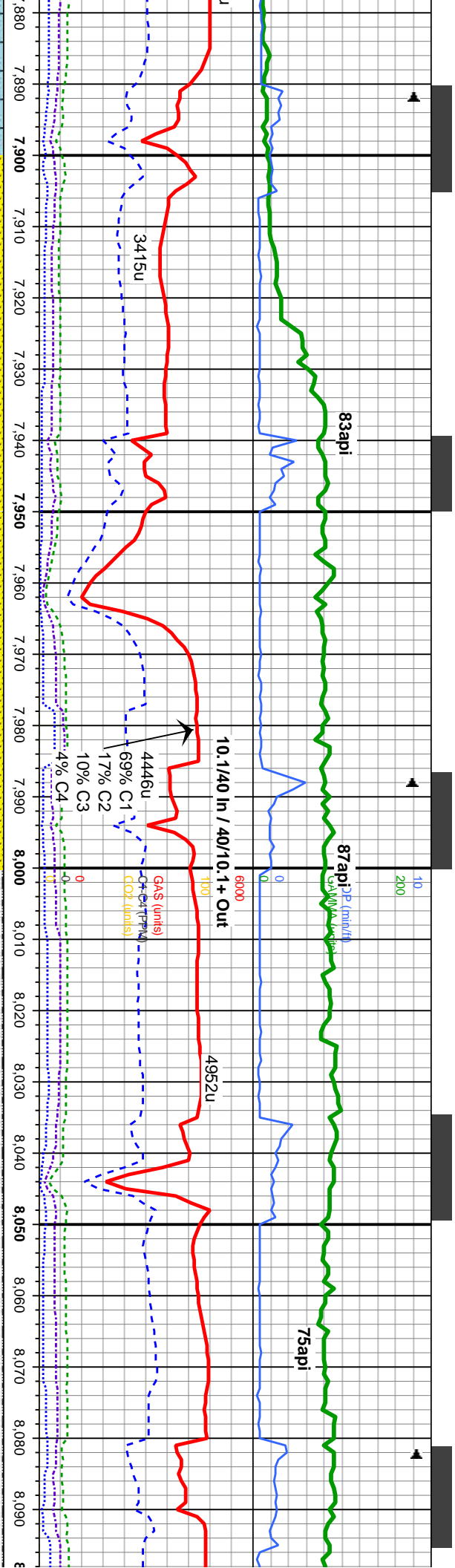
LS: bf - tan, offwht, frm, s  
smth tex, arg, rr fos, v cal

MD: 7.738'  
TVD: 6,970.47'  
Inclination: 90.4°  
Azimuth: 356.3°  
VS: 907.31'

TVD (ft)

MD: 7.832'  
TVD: 6,970.75'  
Inclination: 89.1°  
Azimuth: 354.7°  
VS: 1,001.27'

7000



SS: tmsl , lt gy, vf-f gr, ang-sb rd, w strd, m consol, sl-m calc cmt,dark mtx, gen gn supp, n vis, por vrl lt yel flor, sting lt yel cut, lt yel stn

SS: lt-m gy, tmsl, clr, frosty qtz grms, vf-f gr, ang-sb rd, w strd, p consol, sl calc lt gy mtx, pred gn supp, n vis por, lt yel/gn flor, sting m yel cut, ly yel stn, TR LS: buff wh, tan, sft, sb blkly, rthy lstr, smth tex tr fos

SS: lt gy, gy brn, lt brn tmsl , vf-f gr, ang-sb rd, w strd, m-p consol, sl calc cmt, m ghly brn mtx, tr pyr tr glauc, scat lt gn flor, fast sting m gn/yel cut, lt yel stn,

**Codell In @**  
**MID 7925/ TVD 6974.1'**

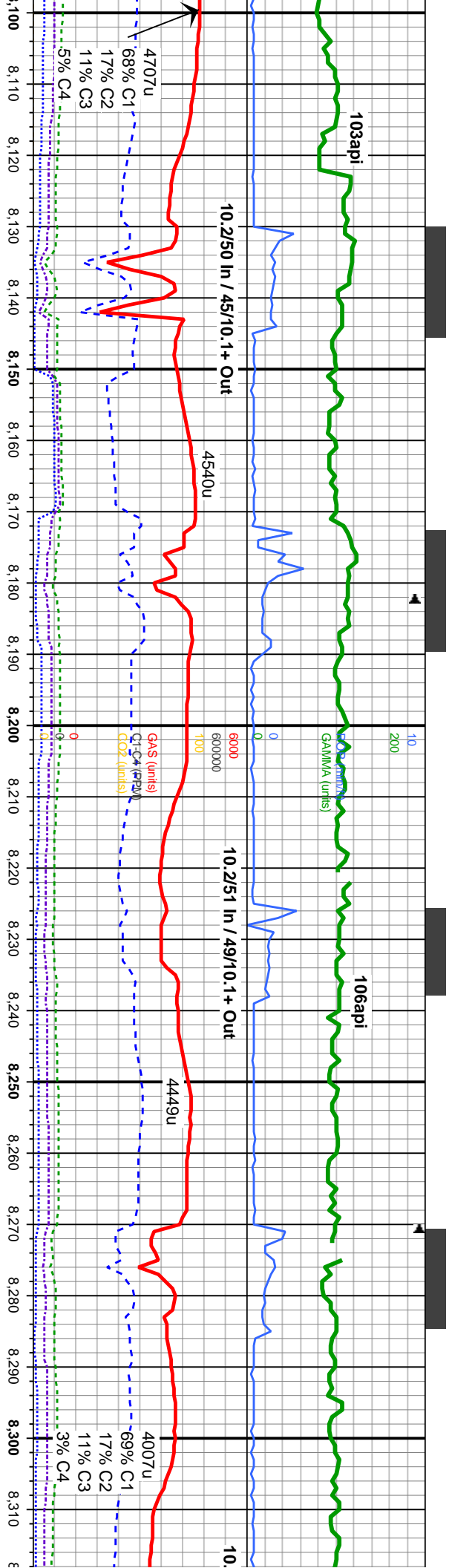
MD: 7.928  
TVD: 6.974.0f  
Inclination: 87°  
Azimuth: 356.3°  
VS: 1.097.0f

TVD (ft)

MD: 8.023  
TVD: 6.978.8f  
Inclination: 87.2°  
Azimuth: 356.7°  
VS: 1.191.8f

7000





SS: lt gy, gy brn, lt brn trnsl , vf-f gr, ang-sb rd, w strd, m-p consol, sl calc cnt, m ghy brn mtrx, tr pyr tr glauc, scat lt gn flor, fast stmg m gn/yel cut, lt yel str, TR SLTY SH: dk gy& blk, sft, splt, rthy-smth , tr dissim pyr.	SS: lt gy, gy brn, lt brn trnsl , vf-f gr, ang-sb rd, w strd, m-p consol, sl calc cnt, m gy brn mtrx, tr glauc, tr SLTY SH: dk gy& blk, sft, splt, rthy-smth , tr dissim pyr, scat lt gn flor, fast stmg m gn/yel cut, lt yel str	SS: lt gy, gy brn, lt brn trnsl , vf-f gr, ang-sb rd, w strd, m-p consol, sl calc cnt, m gy brn mtrx, tr glauc, SLTY SH: dk gy & blk, sft, splt, rthy-smth, tr linst, tr dissim pyr, scat lt gn flor, fast stmg m gn/yel cut, lt yel str	SS: lt brn, lt gy - gy brn, trnsl , vf-f gr, ang-sb rd, w strd, mod cons, sl calc cnt, med gy brn mtrx, tr glauc, SLTY SH: dk gy & blk, sft, splt, rthy-smth, tr linst, tr dissim pyr, scat lt gn flor, fast stmg m gn/yel cut, lt yel str	SS: lt brn, lt gy - rd, w strd, mod brn mtrx, tr glau splt, rthy-smth, t gn flor, fast stmg
--	---	--	--	---

MD: 8,118'  
TVD: 6,983.01'  
Inclination: 87.1°  
Azimuth: 358.6°  
VS: 1,286.71'

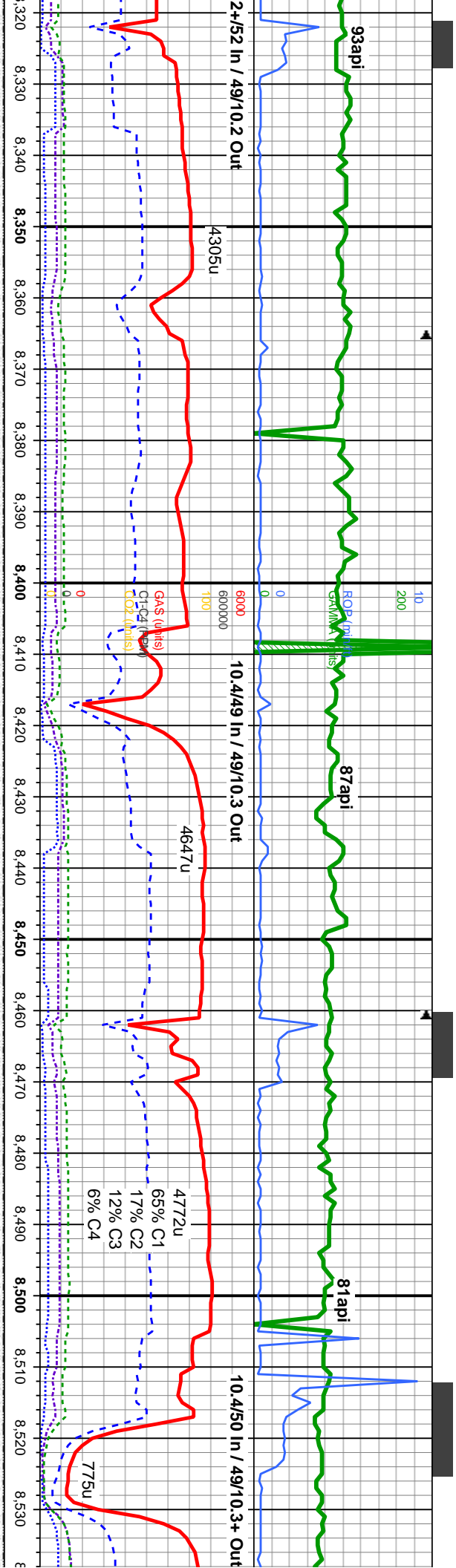
TVD (ft)

MD: 8,214'  
TVD: 6,985.44'  
Inclination: 89.2°  
Azimuth: 359.6°  
VS: 1,382.73'

MD: 8,309'  
TVD: 6,985.26'  
Inclination: 90.5°  
Azimuth: 1°  
VS: 1,477.63'

7000





Log Type	Log Description
SS: lt brn, lt gy - gy brn, trns l, vf-f gr, ang-sb	SS: lt brn, lt gy - gy brn, trns l, vf-f gr, ang-sb
rd, w strd, mod cons, sl calc cnt, med gy	rd, w strd, mod cons, sl calc cnt, med gy
c, SLTY SH: dk gy & blk, sft,	c, SLTY SH: dk gy & blk, sft,
r inst, tr diss m pyr, scat lt	r inst, tr diss m pyr, scat lt
gn flr, fast sting m gn/yel cut, lt yel stn	gn flr, fast sting m gn/yel cut, lt yel stn

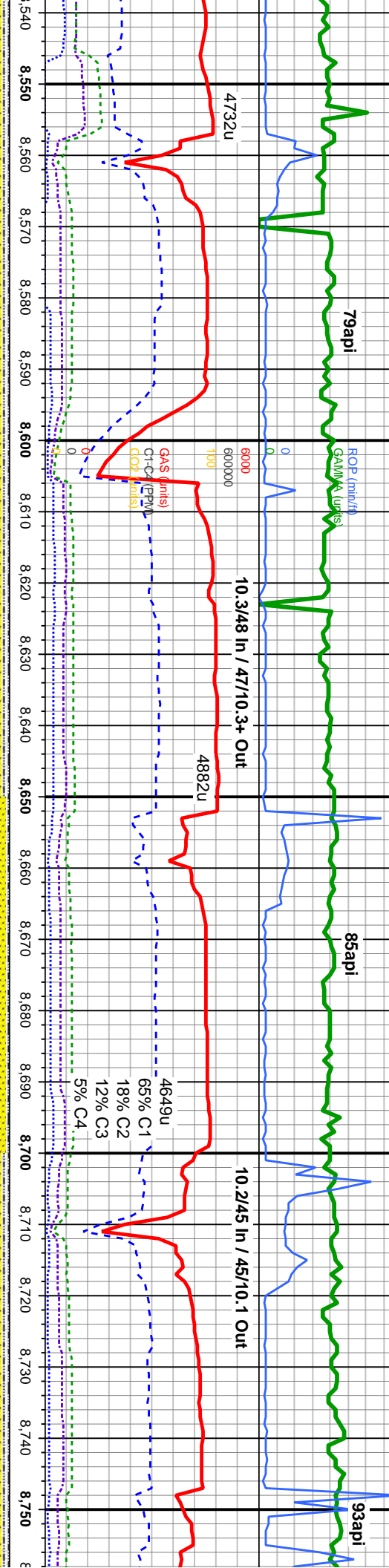
MD: 8.404'  
TVD: 6.983.2'  
Inclination: 91.4°  
Azimuth: 0.5°  
VS: 1.572.52

TVD (ft)

MD: 8.499'  
TVD: 6.981.54'  
Inclination: 90.2°  
Azimuth: 359.8°  
VS: 1.667.46

Log Type	Log Description
SS: gy brn - brn, occ lt gy & ofwht	SS: gy brn - brn, occ lt gy & ofwht
gr, sb ang-sb rd, mod - w strd, mo	gr, sb ang-sb rd, mod - w strd, mo
sl calc cnt, gy brn mtr, tr glauc, S	sl calc cnt, gy brn mtr, tr glauc, S
dk gy & blk, sft, spl, rthy-smth, tr l	dk gy & blk, sft, spl, rthy-smth, tr l
diss m pyr, scat lt gn flr, fast sting	diss m pyr, scat lt gn flr, fast sting
cut, lt yel stn	cut, lt yel stn

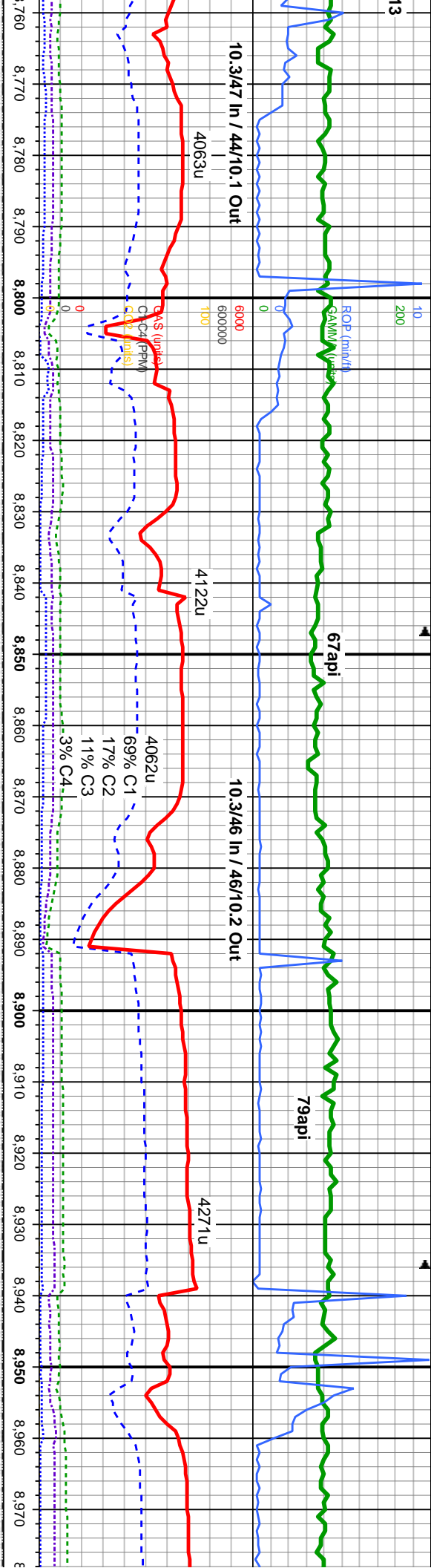
7000



SS: gy brn - brn, occ lt gy & ofwht, trns, vf-f	SS: gy brn - brn, occ lt gy & ofwht, trns, vf-f	SS: lt brn - brn, occ ofwht & dk gy brn, trns	SS: lt brn - gy, occ ofwht & gy brn, trns, vf-f	SS: lt
gr, sb ang-sb rd, mod - w strd, mod cons,	gr, sb ang-sb rd, mod - w strd, mod cons,	, vf-f gr, sb ang-sb rd, mod - w strd, mod	gr, sb ang-sb rd, mod - w strd, mod cons,	gr, sb
sl calc cmt, gy brn mtx, tr glauc, SLTY SH:	sl calc cmt, gy brn mtx, tr glauc, SLTY SH:	cons, sl calc cmt, gy brn mtx, tr glauc, tr sily	sl calc cmt, gy brn mtx, tr glauc, tr sily sh, tr	sl calc
dk gy & blk, sft, rthy-smth, tr lms, tr	dk gy & blk, sft, rthy-smth, tr lms, tr	sh, tr dissim pyr, tr lt gn flr, fast stmg, m yel	dissim pyr, tr lt gn flr, fast stmg, m yel cut,	dissim
cut, lt yel sin	cut, lt yel sin	cut, lt yel sin	lt yel sin	yl str
	MD: 8.594' TVD: 6.981.62' Inclination: 89.1° Azimuth: 358.6° VS: 1.762.44'		MD: 8.690' TVD: 6.982.3° Inclination: 89.1° Azimuth: 358.6° VS: 1.858.44'	

7000





gy brn, occ offwht & gy brn, trnsi, vf-f  
ang-sb rd, mod - w strd, mod cons,  
cmt, gy brn mtk, tr glauc, tr slty sh, tr  
pyr, tr lt gn flor, tr fast sting, yel cut, lt

SS: lt gy brn, occ offwht & gy brn, trnsi, vf-f  
gr, sb ang-sb rd, mod - w strd, mod cons,  
sl calc cmt, gy brn mtk, tr glauc, SLTY SH:  
dk gy & blk, sft, split, rthy, tr dissn pyr, scat  
lt gn flor, tr sting, yel cut, lt yel stn

SS: lt brn - gy brn, occ offwht, trnsi, vf-f gr,  
sb ang-sb rd, mod strd, mod cons, sl calc  
cmt, tr glauc, SLTY SH: dk gy & blk, sft, split,  
sl rthy, tr lnst, tr dissn pyr, tr lt gn flor, tr  
stimg, yel cut, lt yel stn

SS: ltgy, trnsi, clr, fros, qtz grms, vf-f gr,  
ang-sb rd, w strd, p consol, fri, m clac  
cmt, n vis por, TR LS: wh, sft, sb blk, TR  
dissn pyr scat lt gn flor, stimg m yel cut,  
m yel stn.

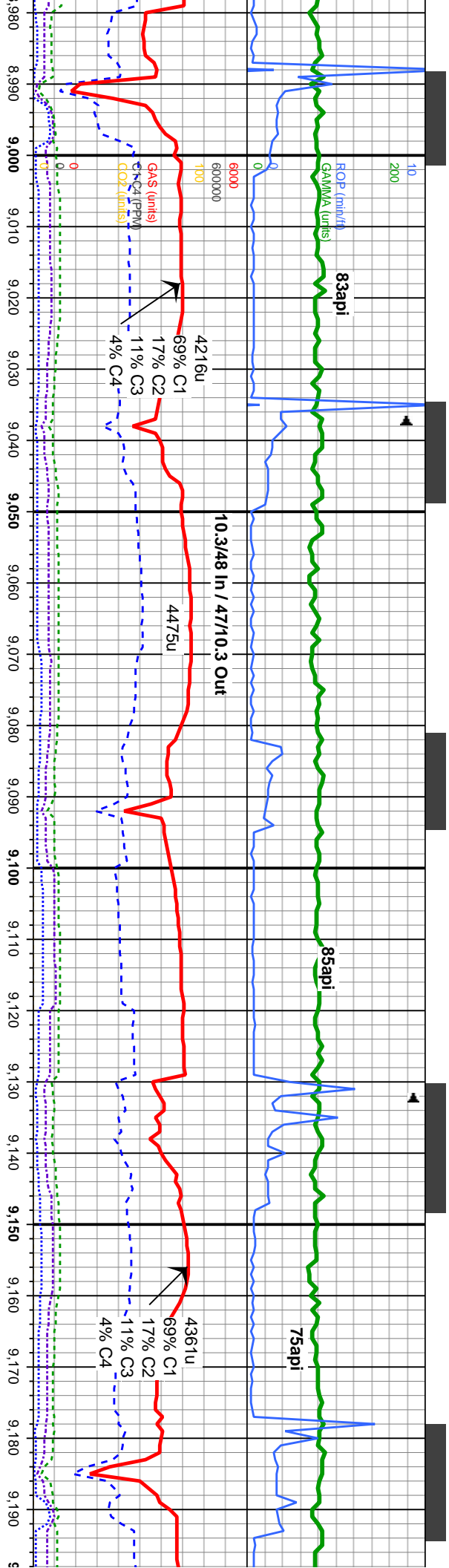
SS: ltgy-m gy, lt brn, tms  
grms, vf-f gr, ang-sb rd, w  
fri, m clac cmt, n vis por,  
sb blk, TR dissn pyr sca  
m yel cut, m yel stn.

MD: 8,785'  
TVD: 6,982.96'  
Inclination: 89.4°  
Azimuth: 359.3°  
VS: 1,953.4'

MD: 8,880'  
TVD: 6,984.46'  
Inclination: 88.1°  
Azimuth: 359.3°  
VS: 2,048.3'

MD: 8,975'  
TVD: 6,986.1'  
Inclination: 89°  
Azimuth: 359°  
VS: 2,143.3'

7000



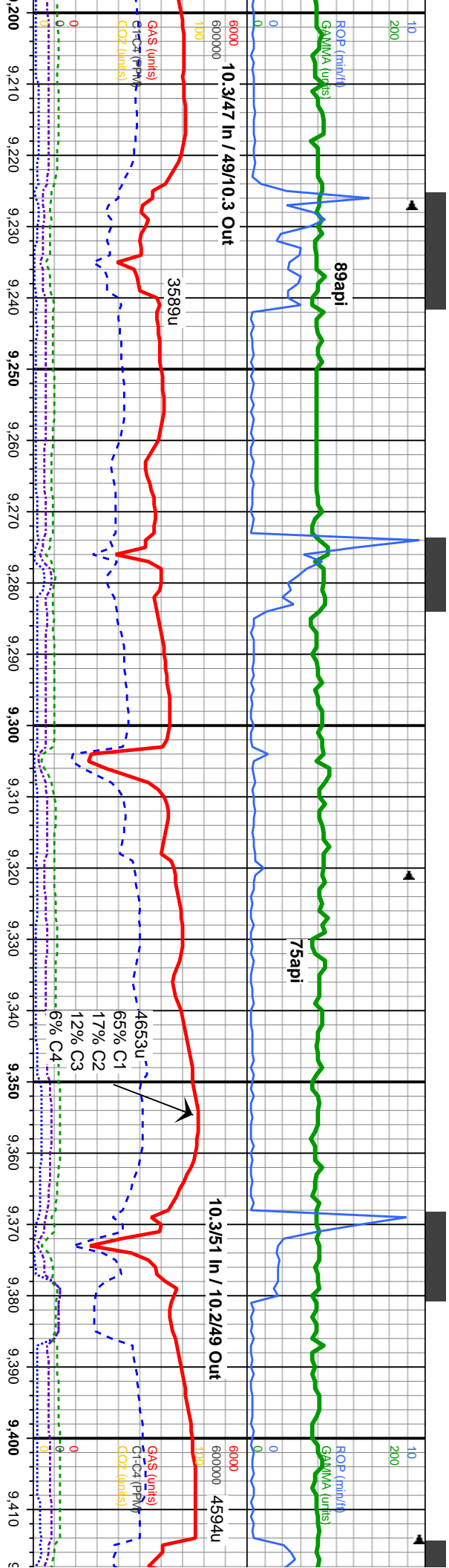
SS: ltgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, TR LS: wh, sft, sb blk, TR dissim pyr scat lt gn flor, sting m yel cut, m yel str.	SS: ltgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blk, TR dissim pyr scat lt gn flor, sting m yel cut, m yel str.	SS: ltgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blk, TR dissim pyr scat lt gn flor, sting m yel cut, m yel str.	SS: ltgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blk, TR dissim pyr scat lt gn flor, sting m yel cut, m yel str.

MD: 9.070'  
TVD: 6,986.66'  
Inclination: 90°  
Azimuth: 0.3°  
VS: 2.238,3°

MD: 9.166'  
TVD: 6,986.94'  
Inclination: 89.7°  
Azimuth: 358.5°  
VS: 2.394,2°

7000



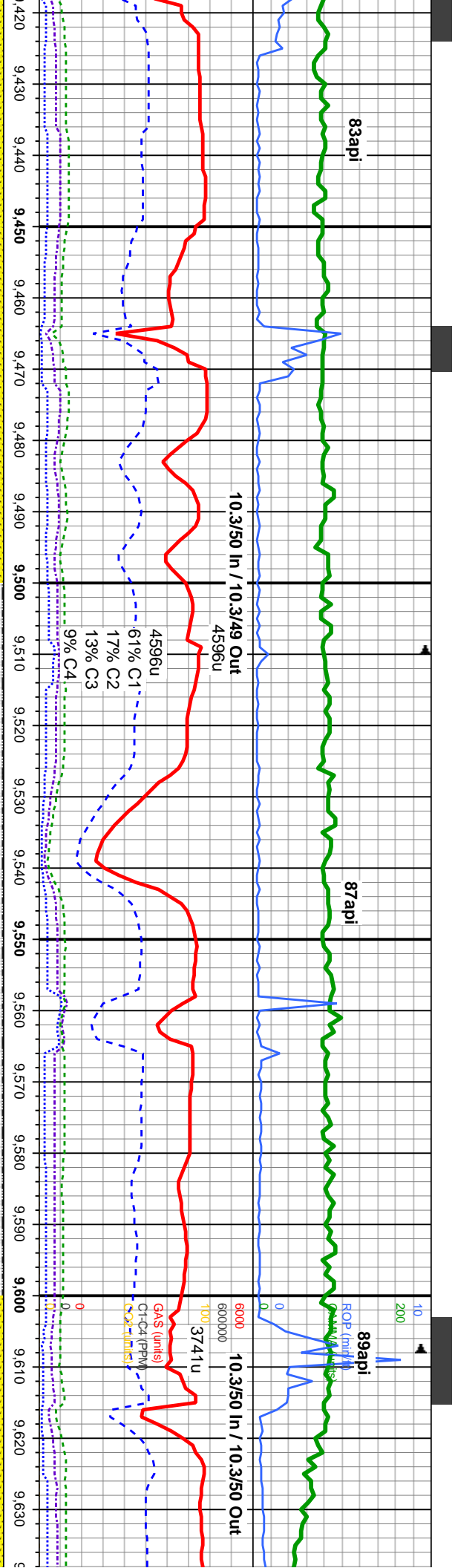


SS: Itgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blkly, TR dissim pyr scat lt gn flor, stmg m yel cut, m yel str.	SS: Itgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blkly, TR dissim pyr scat lt gn flor, stmg m yel cut, m yel str.	SS: Itgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blkly, TR dissim pyr scat lt gn flor, stmg m yel cut, m yel str.	SS: Itgy-m gy, lt brn, trnsl , clr, fros, qtz grms, vf-f gr, ang-sb rd, w strd, p consol, fri, m clac cnt, n vis por, tr glauc TR LS: wh, sft, sb blkly, TR dissim pyr scat lt gn flor, stmg m yel cut, m yel str.
6900	6900	6900	6900

TVD (ft)	TVD (ft)	TVD (ft)	TVD (ft)
MD: 9.260' TVD: 6.986.02' Inclination: 91.4° Azimuth: 0.3° VS: 2.428.22'	MD: 9.356' TVD: 6.984.42' Inclination: 90.4° Azimuth: 358.6° VS: 2.524.11'		

7000

7000



t brn, tmsl , clt, fros, qtz g-sb rd, w srt, p consol, n vis por, tr glauc TR LS: TR dissn pyr scat lt gn cut, m yel sin.	SS: ltgy-m gy, lt brn, tmsl , clt, fros, qtz grns, vf-f gr, ang-sb rd, w srt, p consol, fri, m clac cmt, n vis por, tr glauc TR LS: wh, sft, sb blk, tr dissn pyr, scat lt gn flor, stmg, m yel cut, m yel sin	SS: ltgy-m gy, lt brn, tmsl , clt, fros, qtz grns, vf-f gr, ang-sb rd, w srt, p consol, fri, m clac cmt, n vis por, tr glauc, tr SLTY SH: blk, rthy, pthy, tr dissn pyr, scat lt gn flor, stmg, m yel cut, m yel sin	SS: ltgy-m gy, lt brn, tmsl , clt, fros, qtz grns, vf-f gr, ang-sb rd, w srt, p consol, fri, m clac cmt, n vis por, tr glauc, tr SLTY SH: blk, rthy, pthy, tr dissn pyr, scat lt gn flor, stmg, m yel cut, m yel sin
---	--	--	--

MD: 9.451'  
TVD: 6.982.44'  
Inclination: 91.5°  
Azimuth: 359.1°  
VS: 2.619.14'

MD: 9.547'  
TVD: 6.979.44'  
Inclination: 91.7°  
Azimuth: 359.1°  
VS: 2.715.11'

TVD (ft)

MC  
TV  
Ine  
Azi  
VS

7000

69 LS: bf - tan, ofwht, frm, sb wxy -  
lstr, smth tex, arg, r fos, v calc, S  
ltgy-m gy, lt brn, tmsl , clt, fros, qtz  
vf-f gr, ang-sb rd, w srt, p conso  
clac cmt, n vis por, tr glauc, tr pyr  
sh, n flor, tr slow stmg, lt yel cut, l





DEPTH

8/16/2013

ROP (in/hr)  
GAMMA (units)

10.3+/45 In / 10.3+/45 Out

10.2+/49 In / 10.3/46 Out

POOH @ 10,043'

Problems Drilling Ahead  
8/15/2013 @ 9:00 MST

26api

39api

3707u

3498u

4661u

4008u

68% C1  
17% C2  
11% C3  
4% C4

GAS (units)  
C1-C4 (PPM)  
T-SOL (units)

63% C1  
17% C2  
12% C3  
5% C4

9.860 9.870 9.880 9.890 9.900 9.910 9.920 9.930 9.940 9.950 9.960 9.970 9.980 9.990 10.000 10.010 10.020 10.030 10.040 10.050 10.060 10.070 1

f - tan, offwht, frm, sb wxy - shiny  
smth tex, arg, rr fos, v calc, tr ss, tr  
h, n flor, tr slow sting, lt yel cut, n stn

LS: off wh, buff, tan, sft, sb blk, rthy-sb  
wxy lsfr, sm tes, v calc arg, occ fos,  
inbnd w/ tr SS: trnsf lt gy, vf-f gr, ang, m  
srtf, p consol, sl calc cnt, n vis por n  
flor, tr sting lt yel cut, lt yel stn

LS: bf - tan, offwht, frm, sb wxy - shiny  
lsfr, smth tex, arg, rr fos, v calc, tr ss, tr  
sily sh, n flor, tr slow sting, lt yel cut, n stn

LS: wh, tan, sft, sb blk, rthy-sb wxy lsfr, smth  
tex, occ fos, v calc inbnd SS: dk gy-blk mty,  
trnsf qtz grns, SH: blk, dk gy, sft, ply, fis, sl  
calc, dissm pyr, tr slow sting cut, n stn

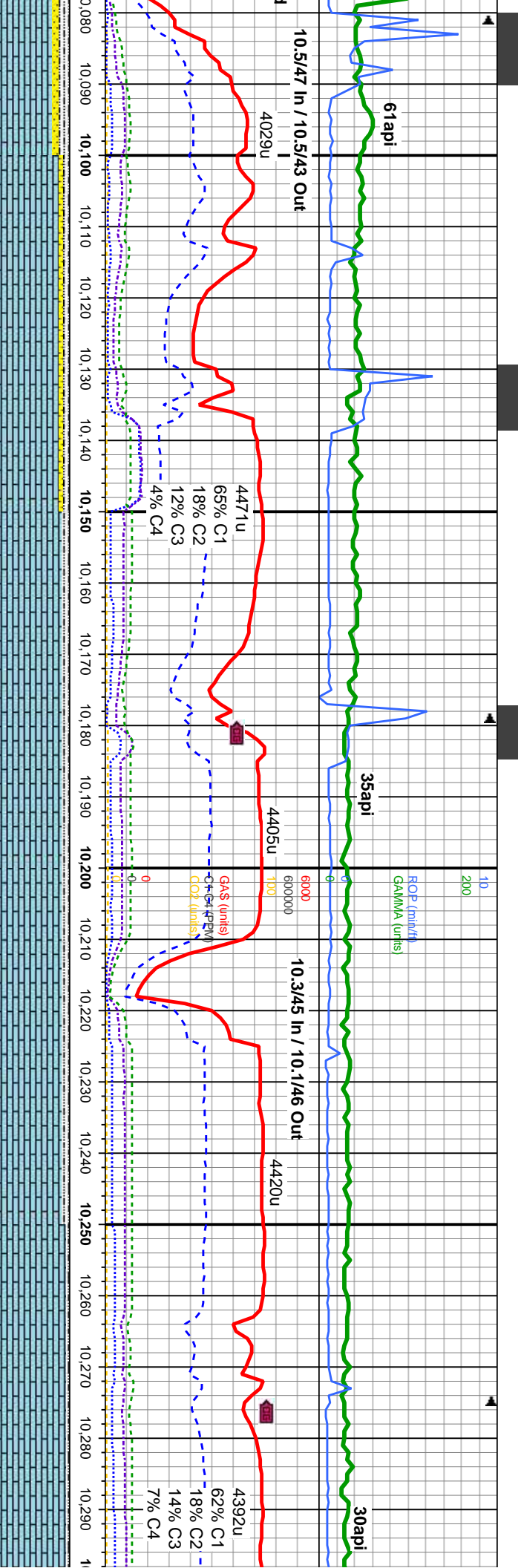
LS: wh, tan, sft, sb blk, rthy-sb wxy lsfr, smth  
tex, occ fos, v calc inbnd SS: dk gy-blk mty,  
trnsf qtz grns, SH: blk, dk gy, sft, ply, fis, sl  
calc, dissm pyr, tr slow sting cut, n stn

MD: 9.928  
TVD: 6,978.36'  
Inclination: 88.4°  
Azimuth: 360°  
VS: 3,096.07'

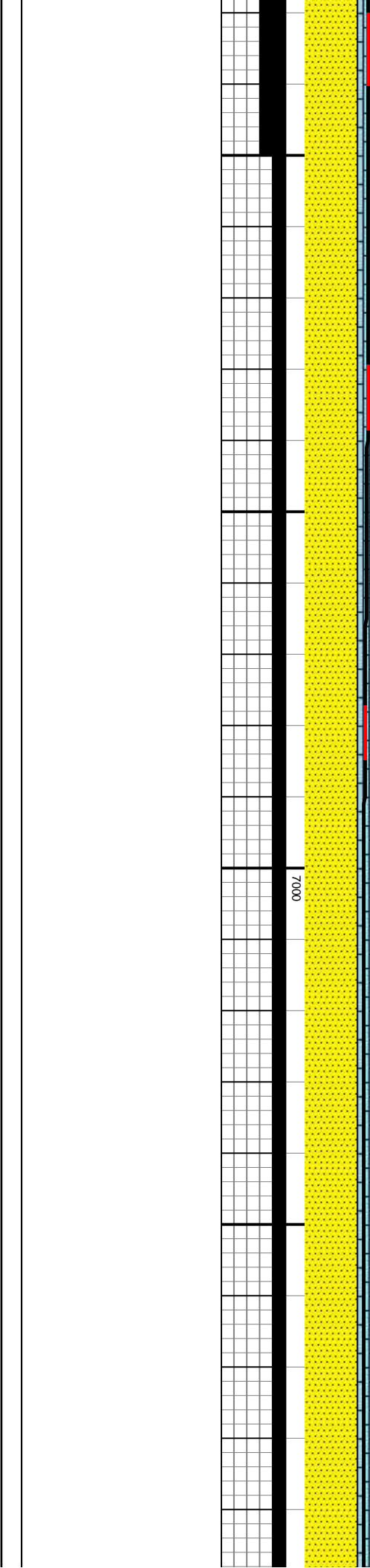
MD: 10.023'  
TVD: 6,978.56'  
Inclination: 91.4°  
Azimuth: 2.8°  
VS: 3,190.87'

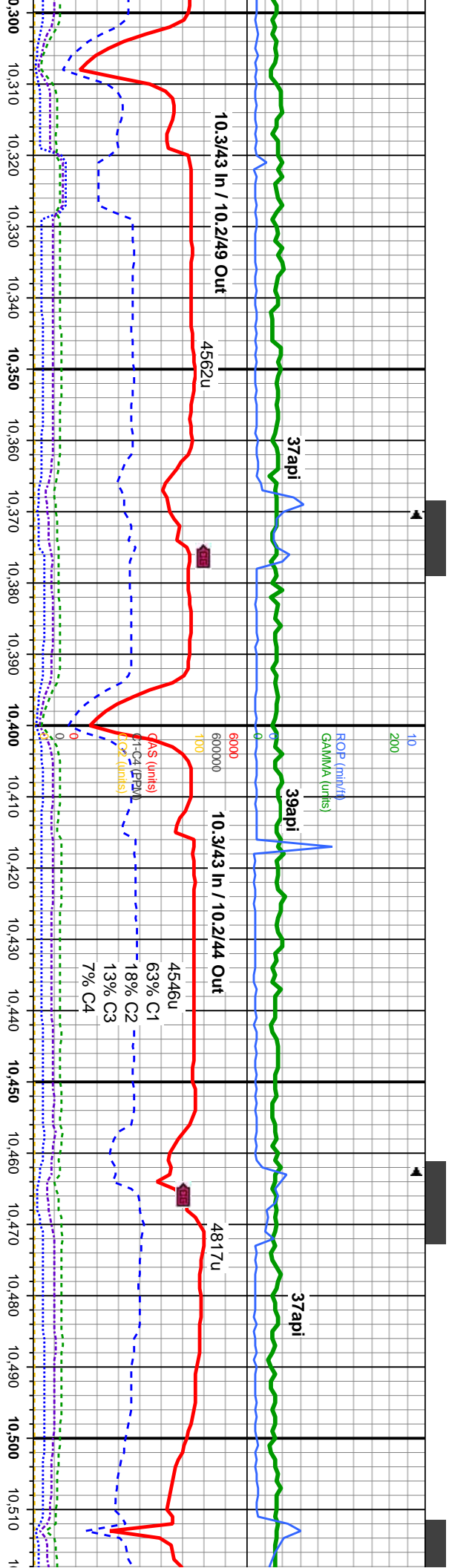
7000





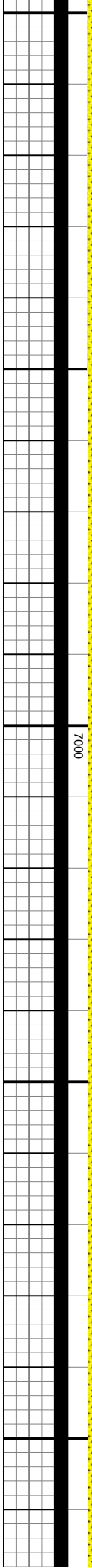
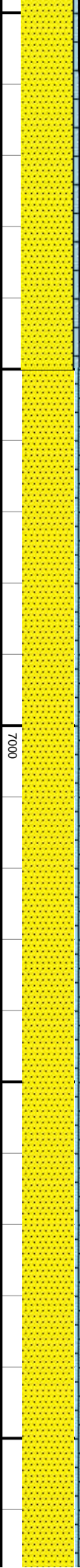
rh-y-sb wxy lstr, smth SS: dk gy-blk mtry, gy, sft, ply, fis, sl mng cut, n stn	L.S: wh, tan, sft, sb blk, rthy-sb wxy lstr, smth tex, occ fos, v calc intbd SS: dk gy-blk mtry, trns qtz grns, SH: blk, dk gy, sft, ply, fis, sl calc, dissim pyr, tr slow stmg cut, n stn	L.S: wh, tan, sft, sb blk, rthy-sb wxy lstr, smth tex, occ fos, v calc intbd SS: dk gy-blk mtry, trns qtz grns, SH: blk, dk gy, sft, ply, fis, sl calc, dissim pyr, tr slow stmg cut, n stn	L.S: wh, tan, sft, sb blk, rthy-sb wxy lstr, smth tex, occ fos, v calc intbd SS: dk gy-blk mtry, trns qtz grns, SH: blk, dk gy, sft, ply, fis, sl calc, dissim pyr, tr slow stmg cut, n stn
	MD: 10,118' TVD: 6,978.5f' Inclination: 88.4° Azimuth: 1.4° VS: 3,285.6"		MD: 10,213' TVD: 6,979.9f' Inclination: 89.7° Azimuth: 0.5° VS: 3,380.4f'

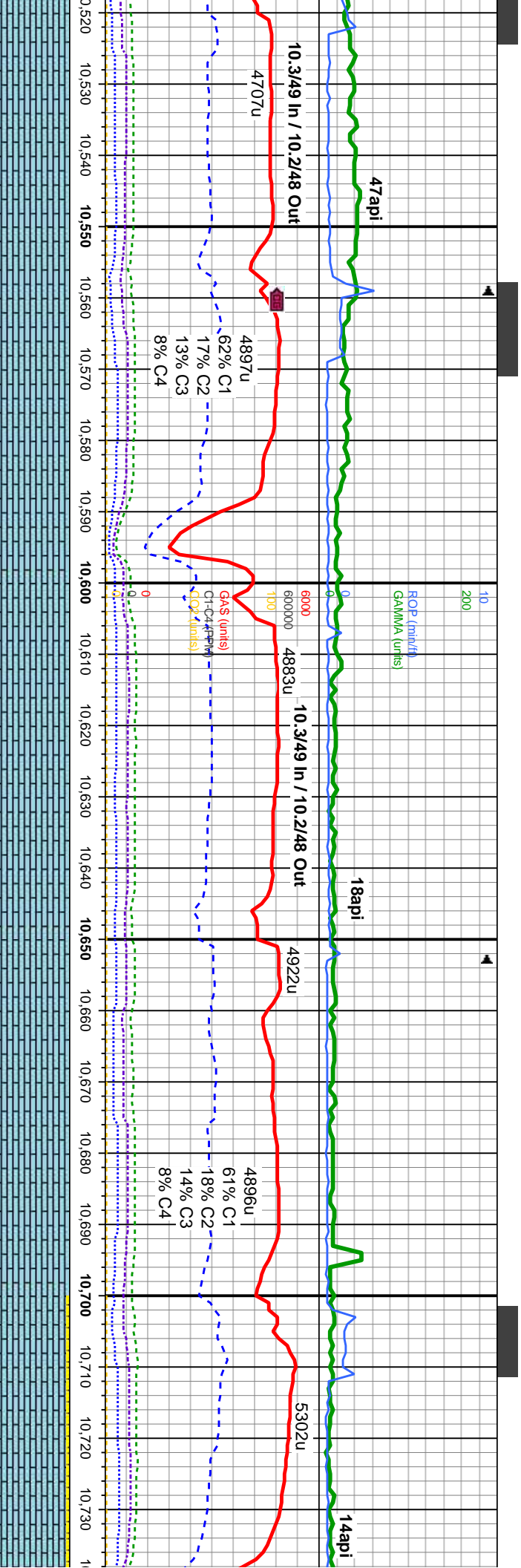




10.300	10.310	10.320	10.330	10.340	10.350	10.360	10.370	10.380	10.390	10.400	10.410	10.420	10.430	10.440	10.450	10.460	10.470	10.480	10.490	10.500	10.510
LS: wh, tan, sft, sb blk, rthy-sb wxy lstr, smith tex, occ fos, v calc intbd SS: dk gy-blk mnty, trnsi qtz grns, SH: blk, dk gy, sft, plty, fis, sl calc, dissim pyr, tr slow sting cut, n stn																					
LS: wh, tan, sft, sb blk, rthy-sb wxy lstr, smith tex, occ fos, v calc intbd SS: dk gy-blk mnty, trnsi qtz grns, SH: blk, dk gy, sft, plty, fis, sl calc, dissim pyr, tr slow sting cut, n stn																					
LS: wh, tan, sft, sb blk, rthy-sb wxy lstr, smith tex, occ fos, v calc, tr dissim pyr, slow sting yel cut, lt brn stn																					
LS: wh, tan, sft, sb blk, rthy-sb wxy lstr, smith tex, occ fos, v calc, tr dissim pyr, slow sting yel cut, lt brn stn																					
LS: wh, tan, sft, smith tex, occ fo																					

MD: 10.309°	TVD: 6.979.6°	Inclination: 90.7°	VS: 3.476.2°
TVD (ft)			
MD: 10.404°			
TVD: 6.978.47°			
Inclination: 90.7°			
Azimuth: 357.2°			
VS: 3.571.3°			
MD: 10.499°			
TVD: 6.977.31°			
Inclination: 90.7°			
Azimuth: 358.6°			
VS: 3.666.36°			





LS: wh, tan, sft, sb blkly, rthy-sb wxy lstr, smth tex, occ fos, v calc, tr dissim pyr, slow string yel cut, lt brn sin	6900	TVD (ft)	MD: 10.594' TVD: 6,977.47' Inclination: 89.1° Azimuth: 359.3° VS: 3.761.36'
LS: wh, tan, sft, sb blkly, rthy-sb wxy lstr, smth tex, occ fos, v calc, tr dissim pyr, slow string yel cut, lt brn sin	6900	TVD (ft)	MD: 10.689' TVD: 6,978.71' Inclination: 89.4° Azimuth: 359.6° VS: 3.856.31'

