

Scale: 5" / 100'
Measured Depth Log

Well Name	Antelope E14-20-17XRLNC		
Location	SESW Sec.20 T5N R62W		
State	Colorado	County	Weld
Country	United States	Rig Number	Atika 19
API Number	05-123-48965-000C	AFE #	18188
Geographic Region	D.J. Basin	Field	Wattenberg
Spud Date	1/6/2019	Drilling Completed	1/10/2019
Surface Coordinates	SESW Sec.20 T5N R62W 210' FSL 1318' FWL		
Bottom Hole Coordinates	SESW Sec.20 T5N R62W 470' FNL 330' FWL		
Ground Elevation	4,665	K.B. Elevation	4,682
Logged Interval	6,000 To 16,465	Total Depth	16,465
Formation	Niobrara C Chalk		
Type of Drilling Fluid	Oil Based Mud		

Operator

Company Bonanza Creek
Address Bonanza Creek Energy
410 17th Street
Suite 1400
Denver, CO 80202

Geologist

Name Nick Bauer
Company Bonanza Creek Energy
Address Bonanza Creek Energy
410 17th Street
Suite 1400
Denver, CO 80202

Other

Dan Kabala Wellsite Geologist
Ryan Scribner Wellsite Geologist

Zone Color Coding

Oil
Noise
Error

Condensate
Core
Water

Ga
Pre
Se

Rock Types

UNKNOWN	MARLSTONE	SILTSTONE	BENTONITE
GYPSUM	CLAYSTONE	SANDSTONE	TUFF
LIMESTONE	SHALE	CONGLOMERATE	CEMENT
CHERT	SHALE GRAY	BRECCIA	CHALK
COAL	SHALE COLORED	TILL	SILTY SHALE

Accessories

FORAMINIFERA	GLAUCONITE	COAL STRINGER
FOSSIL	ANHYDRITIC	DOLOMITE STRINGER
ALGAE	BENTONITE	GYPSUM STRINGER
AMPHIPORA	BITUMENOUS SUBSTANCE	LIMESTONE STRINGER
BELEMNITE	CALCAREOUS	MARLSTONE (CALC) STRG
BIOCLASTIC	CARBONACEOUS FLAKES	MARLSTONE (DOL) STRG
BRACHIOPOD	CHTDK	SANDSTONE STRINGER
BRYOZOA	PISOLITE	SHALE STRINGER
CEPHALOPOD	COAL - THIN BEDS	SILTSTONE STRINGER
CORAL	DOLOMITIC	CHALK STRINGER
CRINOID	SCAPHOPOD	SILTY SHALE STRINGER
ECHINOID	STROMATOPOROID	
FISH	FERRUGINOUS PELLET	
	FERRUGINOUS	

Minerals

Other Symbols

MOLDIC	ORGANIC	OIL
DEAD	PINPOINT	SIDE
EVEN	VUGGY	SIDE
QUESTIONABLE		SLIDE
SPOTTED STAINING		SU
	Engineering	
Porosity		
EARTHY	CONNECTION (RIGHT)	WIRE
FENESTRAL	CONNECTION GAS	
FRACTURE	CORE - LOST	
INTERCRYSTALLINE	CORE - RECOVERED	ANGULAR
INTEROOLITIC	FAULT	ROUND

Symbols

FORMATION TOP **B** SUBANG **P** PACKSTONE

SHOW **P** SUBRND **W** WACKESTONE

WALL CORE (LEFT)

Textures Sorting

WALL CORE (RIGHT)

B BOUNDSTONE **M** MODERATE

C CHALKY **P** POOR

CX CRYPTOXLN **W** WELL


ELINE TESTED - LEFT **E** EARTHY

ELINE TESTED - RT **FX** FINELYXLN

Cut


ES GRAINSTONE  No Cut

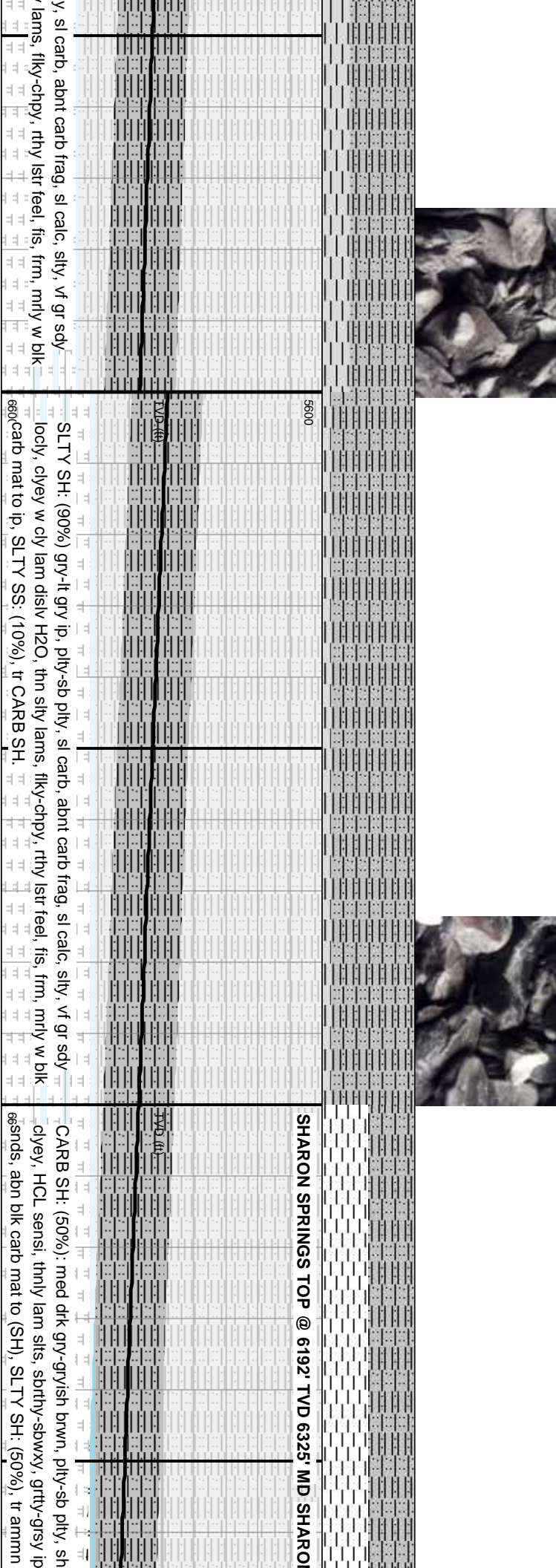
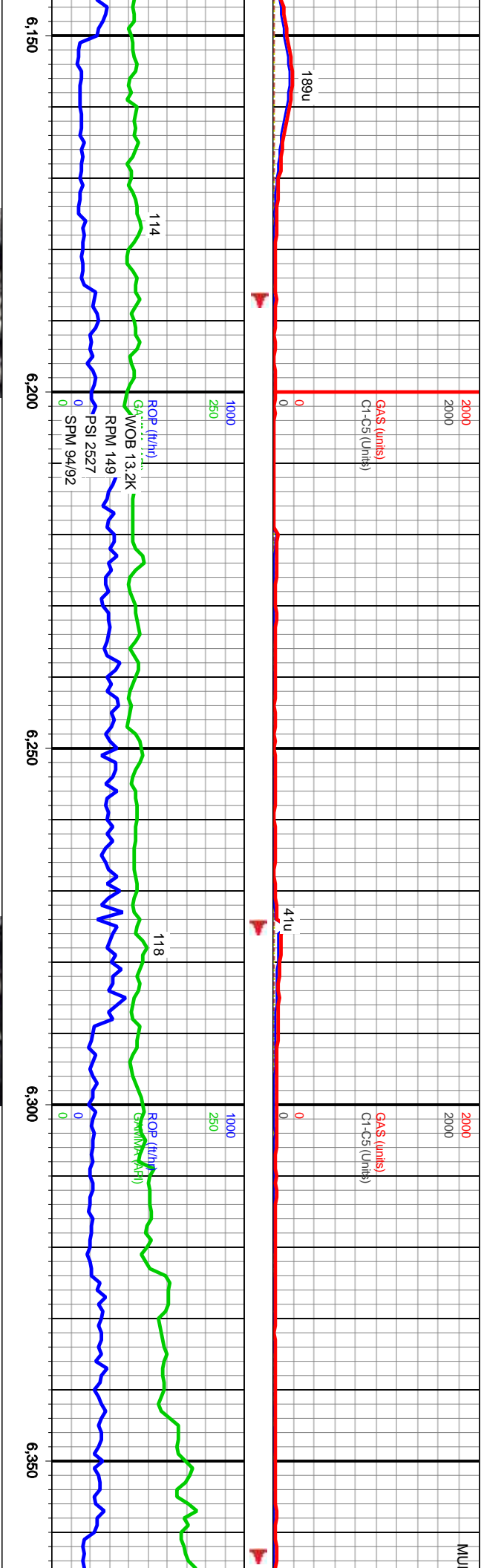
L LITHOGRAPHIC  Fair Cut

MX MICROXLN  Good Cut

M MUDSTONE Blank

Binding

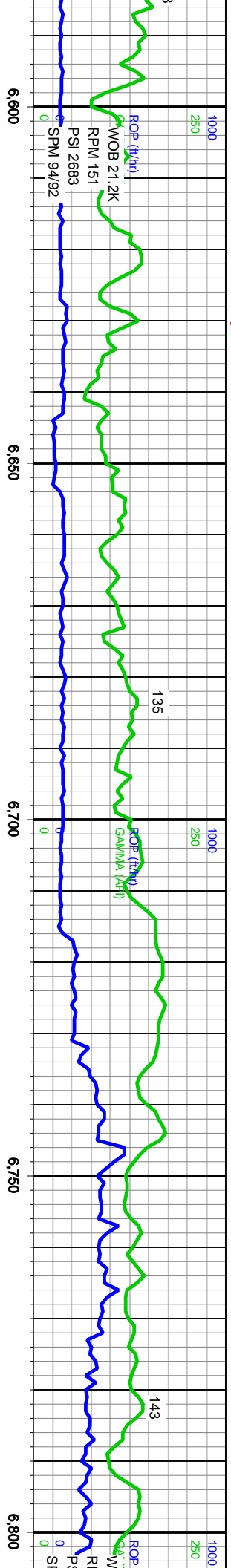
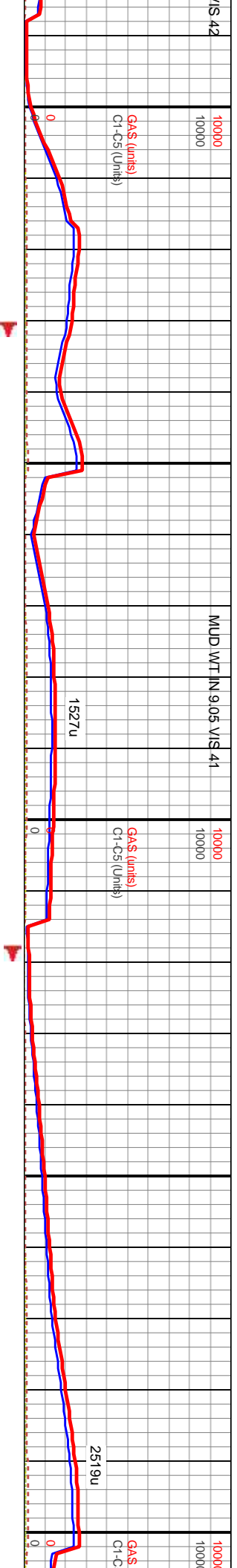
Logger on Shift		Dan Kabala on Tour		MUD WT IN 8.9 VIS 45	
Curve/Survey Data GAS — C1 — C2 - - - C3 - - - C4 - - - C5 —		GAS SCALE 0 TO 2000 (200 UNITS/DIVISION) CONNECTIONS MARKED WITH RED TRIANGLES		GAS (units) C1-C5 (Units) 24u	
Connections		ROP SCALE 0-1000 GAMMA SCALE 0-250 (GAMMA & SURVEYS RECEIVED FROM BAKER HUGHES)		ROP (ft/hr) GAMMA (API) WOB 12.5K RPM 149 PSI 2509 SPM 94/92	
Depth Labels		6,000 6,050 6,100		1000 250 1000 250	
Sample Photographs					
% Lith		5400		5400	
Well Bore TVD —		LOGGERS: DANIEL KABALA & RYAN SCRIBNER CALLED OUT on 01/10/2019. Bit #: REED. TYPE: TK56. SERIAL #: A238324 IN @ 1,606' MD out on 01/10/2019 @ 16,465' MD.		SLTY SH: (75%) gry-lt gry ip, pty-sb pty, sl carb, abnt carb frag, sl calc, slty, v' gr sdv locy, clyey w cly lam dislv H2O, thn stly lams, flky-chpy, rthy lst feel, f'is, frm, mrlly w blk 660carb mat to ip, SLTY SS: (25%). MD: 6,074' Inclination: 13° Azimuth: 305° TVD: 5,960' VS: -223'	
Survey Data		5400		5400	



MD: 6,161'
Inclination: 18°
Azimuth: 325°
TVD: 6,044'
VS: -205'

MD: 6,250'
Inclination: 25°
Azimuth: 336°
TVD: 6,127'
VS: -175'

MD: 6,338'
Inclination: 32°
Azimuth: 346°
TVD: 6,204'
VS: -134'

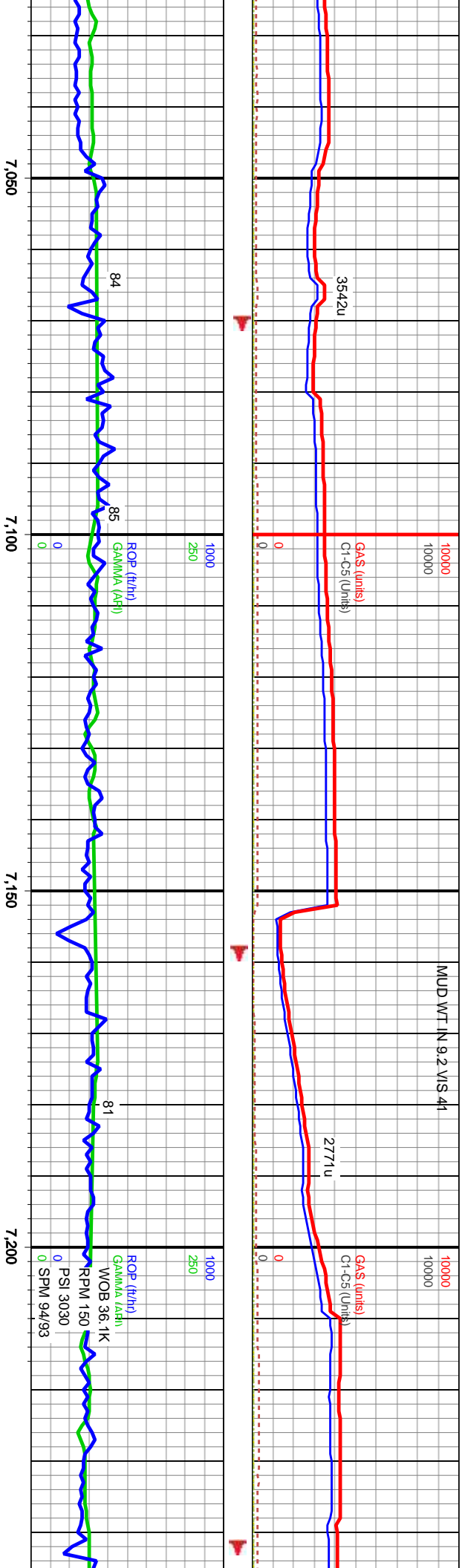


FOSSILIFEROUS MRLSTN: (50%) med-med dkf gry-brwn, rthy, sbchky, occ sbwxy sprkng ip, frm brtl, sbply, lent chky lns, no vis perm or por, cmmn blk carb mat (SH) to, NSFOC, OBM contm, ARG CARB CHLK (50%) abn alt BENT (phylio) w pyr nodes & ls FOSS frags.		CHLKY MRLST: (80%) med brwn gry, sb ply-sb blk, vry carb, v calc, mic xln-sug txt, frm, hly mttld, est 20% micrite & 80% clay mtrx, crm micrite spks to, MARLSTN: (20%) dkf brwn, sbdkly-sbply, v carb, calc, tr fos frags, arg, frm-sft, hly mttld, sprkng lstr ip, CHLK: (tt)	
TVD (ft)		TVD (ft)	

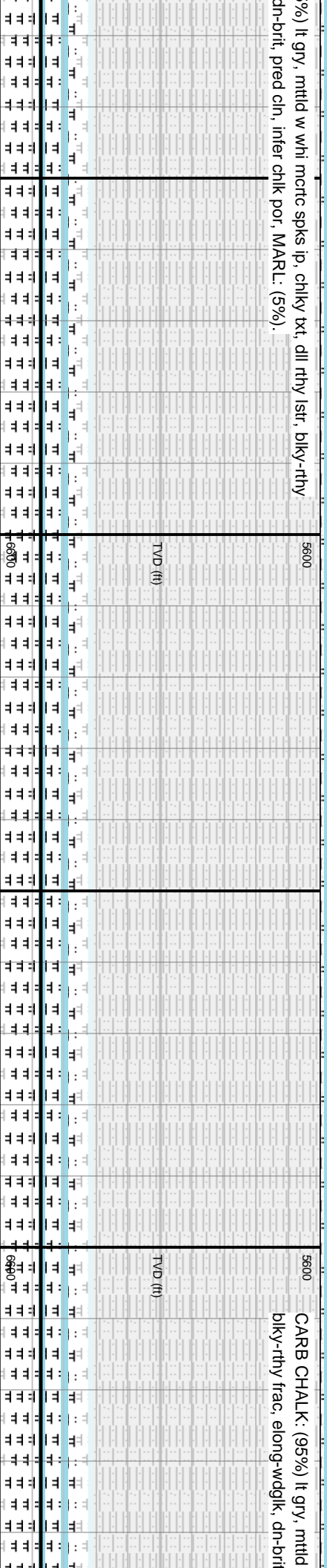
MD: 6,605'
Inclination: 60°
Azimuth: 349°
TVD: 6,389'
VS: 53'

MD: 6,692'
Inclination: 69°
Azimuth: 356°
TVD: 6,427'
VS: 131'

MD: 6,780'
Inclination: 76°
Azimuth: 359°
TVD: 6,453'
VS: 215'



%) It gry, mttld w whi mcrtc spks ip, chlkly txt, dll rthy lstr, blkly-rthy
 ddn-brit, pred chn, infer chlk por, MARL: (5%).

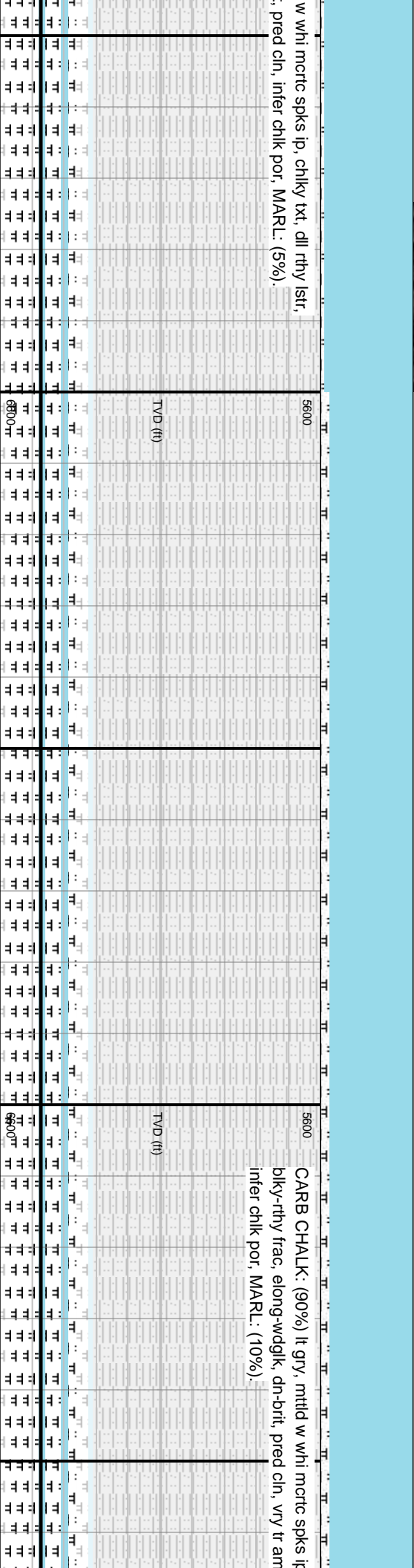
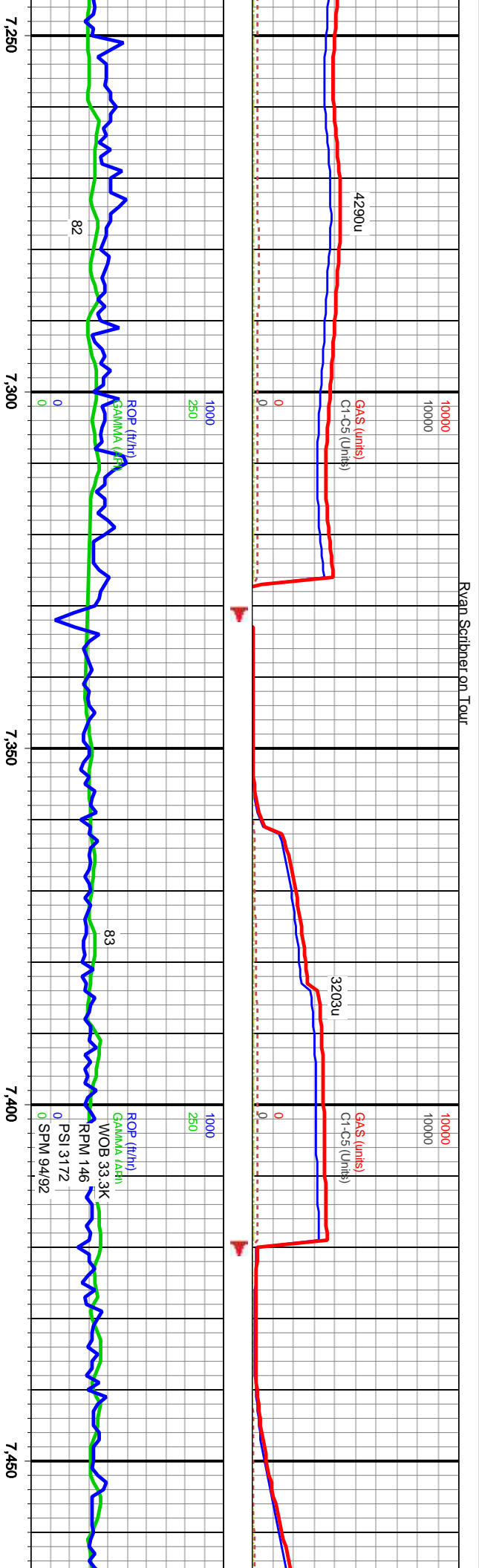


MD: 7,044'
Inclination: 90°
Azimuth: 2°
TVD: 6,471'
VS: 476'

MD: 7,132'
Inclination: 90°
Azimuth: 3°
TVD: 6,471'
VS: 564'

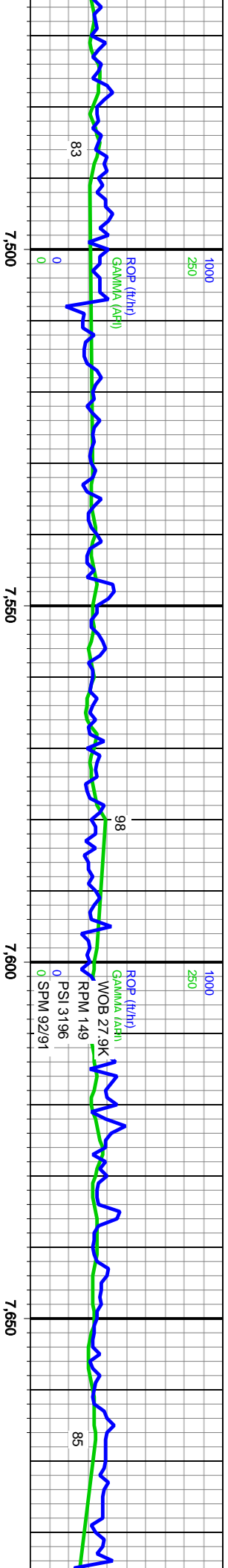
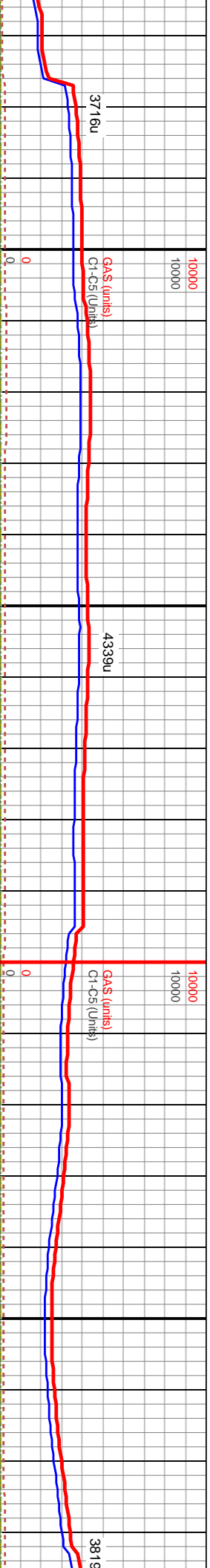
MD: 7,218'
Inclination: 90°
Azimuth: 2°
TVD: 6,470'
VS: 649'

CARB CHALK: (95%) lt gry, mttld
biky-rthy frac, elong-wdglk, dn-bri

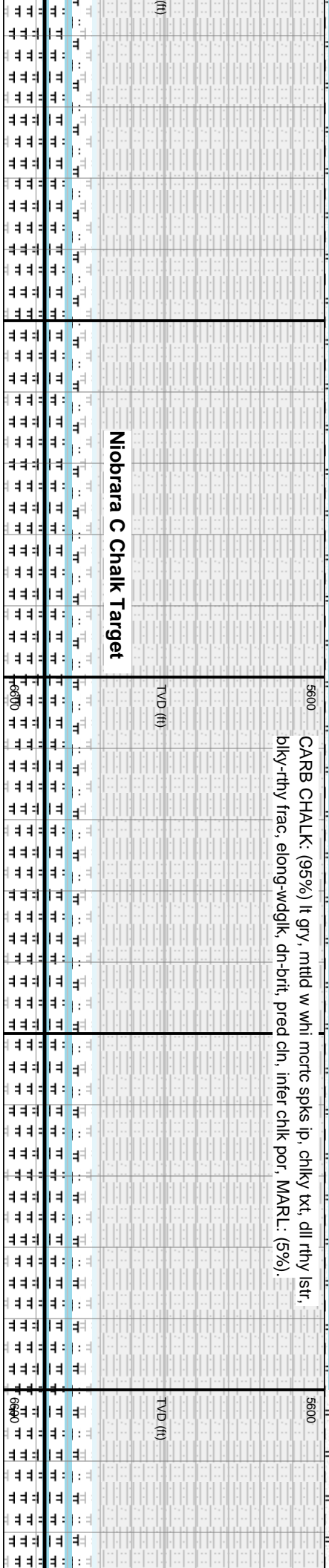
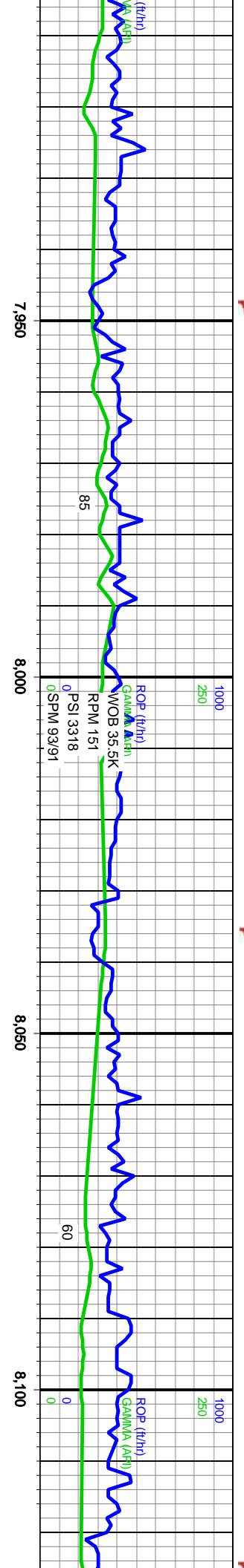
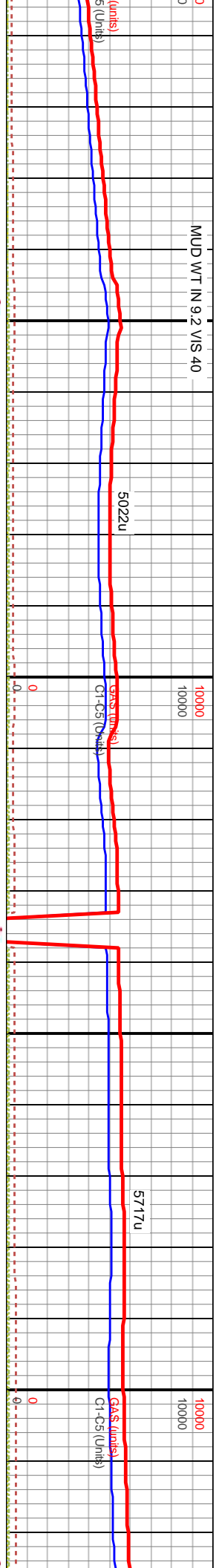


MD: 7,307'
Inclination: 90°
Azimuth: 0°
TVD: 6,470'
VS: 737'

MD: 7,396'
Inclination: 90°
Azimuth: 2°
TVD: 6,470'
VS: 826'



), chiky txt, dll rthy lstr,		5600	TVD (ft)		5600	TVD (ft)		5600	TVD (ft)		5600
mm blk carb mat (SH) to,											



MD: 7,924' Inclination: 90° Azimuth: 2° TVD: 6,471' VS: 1,349'

MD: 8,012' Inclination: 90° Azimuth: 1° TVD: 6,471' VS: 1,436'

MD: 8,101' Inclination: 90° Azimuth: 0° TVD: 6,471' VS: 1,525'



5600	CARB CHALK: (85%) lt gry, mttld w whi mortc spks ip, chlky bxt, dll rthy lstr, blkly-rthy frac, along-wdglk, dn-brlt, pred cln, vry tr ammn blk carb mat (SH) to, infer chlck por, MARL. (15%).	5600		5600
TVD (ft)		TVD (ft)		TVD
76690		76690	Niobrara C Chalk Target	76690

5600	TVD
6600	

Inclination: 90°
Azimuth: 3°
TVD: 6,470'
VS: 2,224'

Inclination: 90°
Azimuth: 3°
TVD: 6,470'
VS: 2.311'

Inclination: 90°
Azimuth: 2°
TVD: 6,470'
VS: 2,398'

MUD WT IN 9.2 VIS 40

10000
10000

4142u

GAS (units)
C1-C5 (Units)

0

3476u

GAS (units)
C1-C5 (Units)

0

4222u

1000
250
0

ROP (ft/h)

SAVING RATE

128

ROP (ft/h)

SAVING RATE

113

9,700

9,750

9,800

9,850



, chky txt, dll rthy lstr,
k por. MARL: (5%).

5600

TVD (ft)

5600

TVD (ft)

CARB CHALK: (95%) lt gry, mttld w whi merte spks ip, chky txt, dll rthy lstr
biky-rthy frac, elong-wdgk, dn-brt, pred cin, infer chlk por. MARL: (5%).

MD: 9,682'

Inclination: 90°

Azimuth: 1°

TVD: 6,470'

VS: 3.095'

MD: 9,771'

Inclination: 90°

Azimuth: 0°

TVD: 6,470'

VS: 3.183'

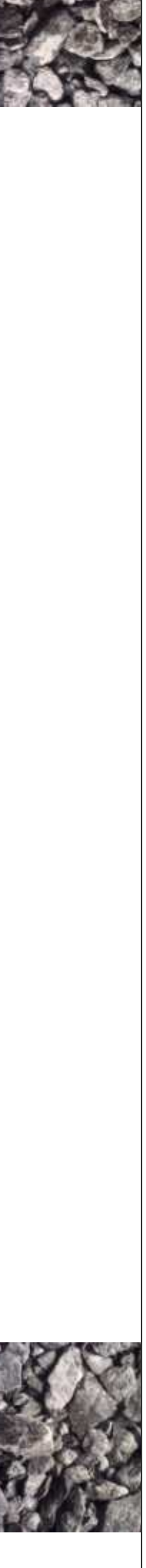
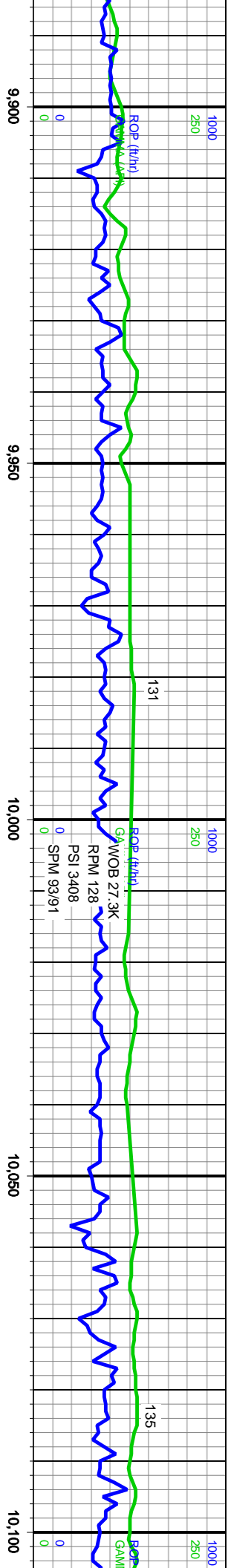
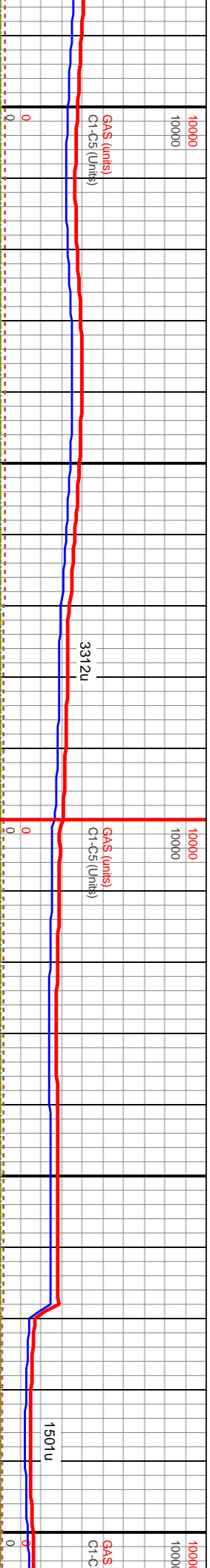
MD: 9,859'

Inclination: 90°

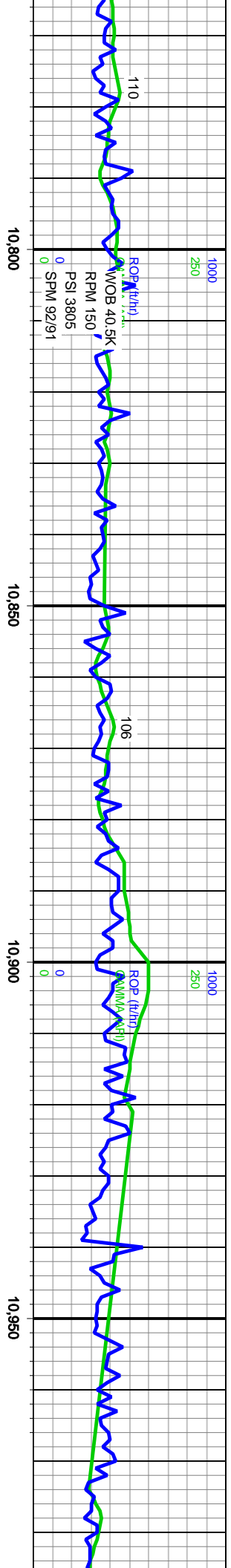
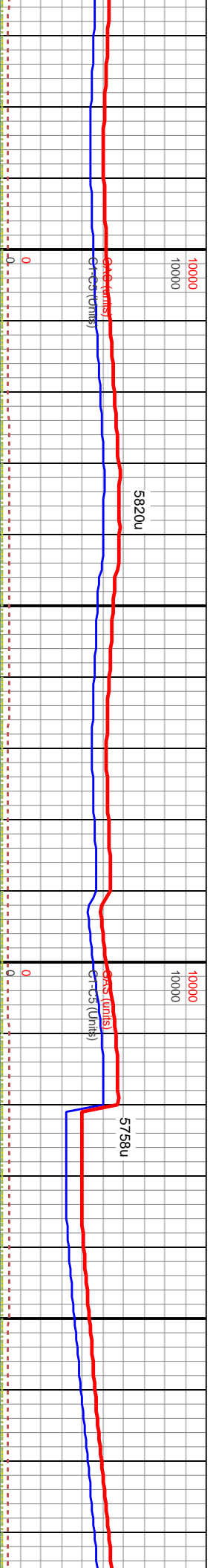
Azimuth: 1°

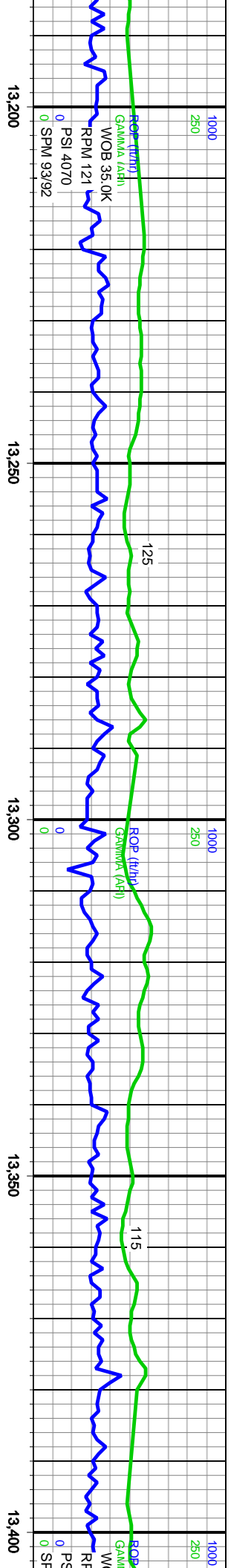
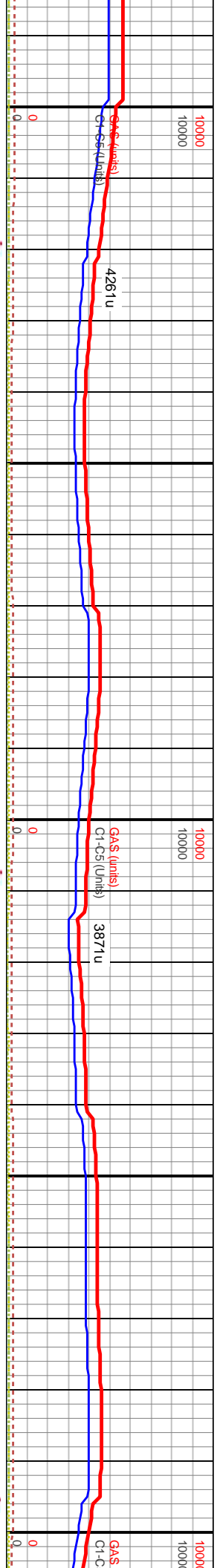
TVD: 6,470'

VS: 3.271'



TVD (ft)	5600										5600										5600																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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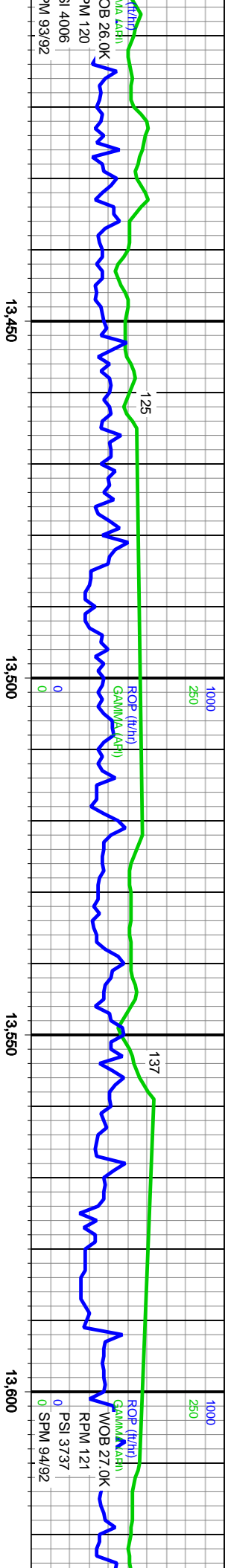
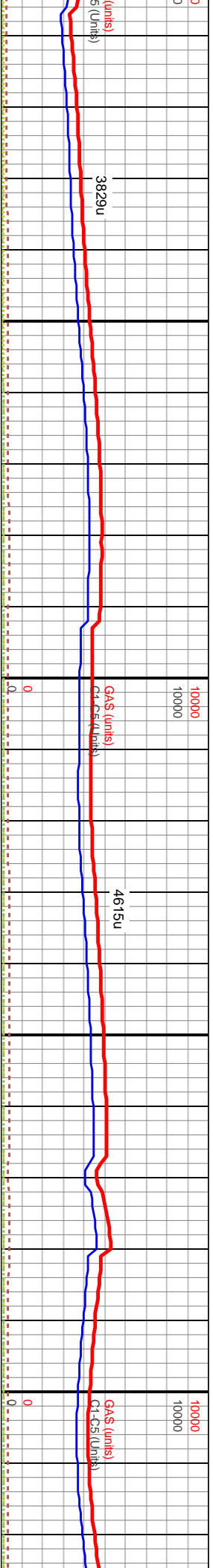


s ip, chlk		5600		5600		5600		5600	
TVD (ft)		5600		5600		5600		5600	
CARB CHALK: (60%) lt gry-brwn, mttld w whi mcrtc spks ip, fossiliferous ip, chlkly txt, dll rthy lst, bky-rthy frac, elong-wdglk, dn-brit, pred cin, infer chlk por, MARL: (40%).		5600		5600		5600		5600	
TVD		5600		5600		5600		5600	

MD: 13,196'
Inclination: 91°
Azimuth: 358°
TVD: 6,462'
VS: 6,587'

MD: 13,284'
Inclination: 91°
Azimuth: 358°
TVD: 6,459'
VS: 6,674'

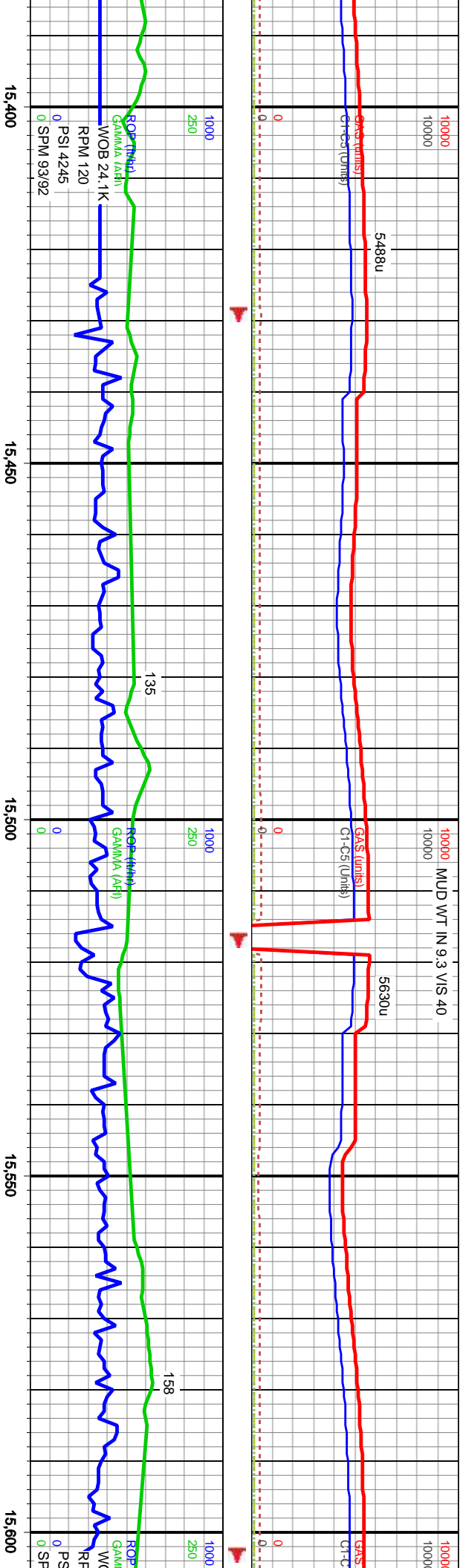
MD: 13,372'
Inclination: 91°
Azimuth: 359°
TVD: 6,457'
VS: 6,762'

[illegible]



<p>mttd w whi mortc spks ip, fossiliferous frac, elong-wdgk, dn-brt, pred cln, infer</p>	5600		5600	<p>CARB CHALK: (90%) lt gry-brwn, mttd w whi mort ip, chlkly txt, dll rthy lstr, blyk-rthy frac, elong-wdgk chlk por, MARL: (10%).</p>
<p>Niobrara C Chalk Target</p>	TVD (ft)		TVD (ft)	
6600			6600	

MD: 15,141'
Inclination: 90°
Azimuth: 358°
TVD: 6,452'
VS: 8,523'

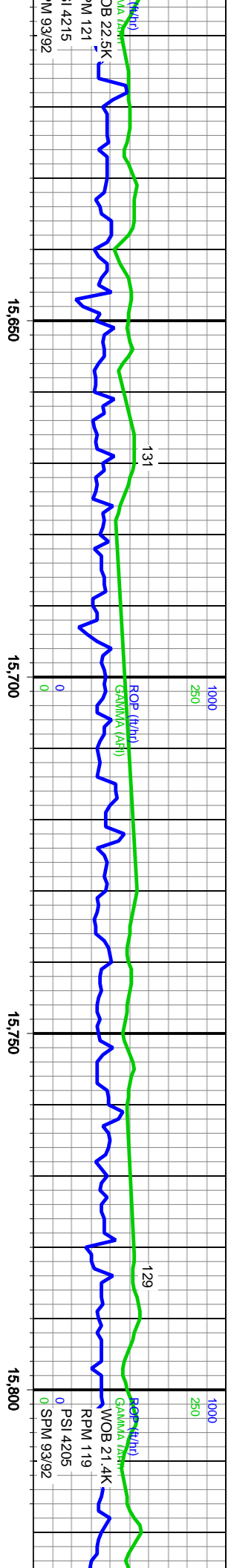
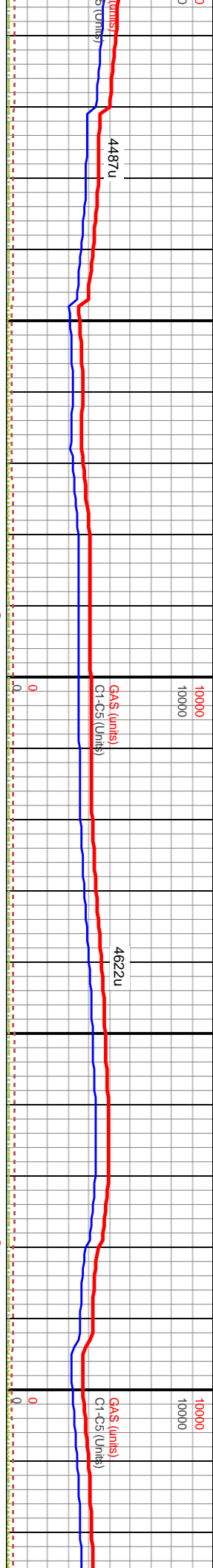


is ip, chik		TVD (ft)		Niobrara C Chalk Target		TVD (ft)		CARB CHALK: (80%) lt gry-brwn, mttld w whi mcrct spks ip, fossilliferous ip, chiky txt, dll rthy lstr, blk-y-rthy frac, elong-wdglik, dn-bit, pred cln, infer chik por, MARL: (20%).		TVD	
5600		5600		5600		5600		5600		5600	
5607		5607		5607		5607		5607		5607	
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5660		5660		5660		5660		5660		5660	

MD: 15,405'
Inclination: 90°
Azimuth: 359°
TVD: 6,452
VS: 8,786'

MD: 15,493'
Inclination: 90°
Azimuth: 357°
TVD: 6,452
VS: 8,874'

MD: 15,579'
Inclination: 90°
Azimuth: 359°
TVD: 6,452
VS: 8,960'



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