



Scale: 5" / 100'
Measured Depth Log

Well Name Smith State LD12-73-1BHN(HORZ)

Location SESE SEC 1, T9N, R58W, 6 PM

State COLORADO **County** WELD

Country USA **Rig Number** H&P 326

API Number 05-123-39703 **Field** WILDCAT

Region DJ BASIN **Drilling Completed** 12/12/2014

Spud Date 12/8/2014

Surface Coordinates SESE SEC 1, T9N, R58W, 6PM
250' FSL, 1227' FEL
40.77386
-103.80675

Ground Elevation 4653' **K.B. Elevation** 46863'

Logged Interval 1260' To 10286' **Total Depth** 10286'

Formation NIOBRARA-B CHALK

Type of Drilling Fluid LSND

Operator

Company Noble Energy Inc

Address 1625 Broadway Suite 2200
Denver, CO 80202

Geologist

Name EVAN HOWELL

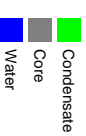
Company NOBLE ENERGY INC.

Address 1625 Broadway Suite 2200
Denver, CO 80202

Other

COLUMBINE LOGGING INC. Mike Kerschen

Zone Color Coding



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 SANIC	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SANIC	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	ANHYDRITE STRINGER
INOCERAMUS	B BENTONITE	K KAOLIN	BENTONITE STRINGER
OOLITE	BITUMENOUS SUBSTANCE	M MARLSTONE	COAL STRINGER
OSTRACOD	BRECCIA FRAGMENTS	M MICACEOUS	DOLOMITE STRINGER
PELECYPOD	↑ CALCAREOUS	M MINERAL CRYSTALS	GYPSUM STRINGER
PELLET	CARBONACEOUS FLAKES	N NODULES	LIMESTONE STRINGER
PISOLITE	CHTDK	PHOSPHATE PELLETS	MARLSTONE (CALC) STRG
PLANT REMAINS	CHTLT	P PYRITE	MARLSTONE (DOL) STRG
CEPHALOPOD	COAL - THIN BEDS	S SALT CAST	SANDSTONE STRINGER
CORAL	SCAPHOPOD	S SANDY	SHALE STRINGER
CRINOID	STROMATOPOROID	± FELDSPAR	SILTSTONE STRINGER
ECHINOID	FERRUGINOUS PELLET	S SILTY	
FISH	FERRUGINOUS	TUFACEOUS	
FORAMINIFERA	ANHYDRITIC	GLAUCONITE	
F FOSSIL	ARGILLACEOUS	GYPSIFEROUS	

Stringer

Oil Show

P PINPOINT
V VUGGY






































Engineering

D DEAD
EVEN
QUESTIONABLE
BIT
SPOTTED STAINING
CONNECTION (UP)

Porosity

CONNECTION (DOWN)	CONNECTION GAS
E EARTHY	CONNECTION GAS (LEFT)
FENESTRAL	TRIP GAS
F FRACTURE	TRIP GAS (LEFT)
INTERCRYSTALLINE	DOWN TIME GAS
INTEROOULTIC	DOWN TIME GAS (LEFT)
MOLDIC	CORE - LOST
ORGANIC	CORE - RECOVERED

Other Symbols

	DST INTERVAL		WIRELINE TESTED - LEFT		E EARTHY
	FAULT		WIRELINE TESTED - RT		FX FINELYXLN
	FORMATION TOP		DRILL STEM TEST		BS GRAINSTONE
	GAS SHOW		MINDEPTH MN DEPTH		L LITHOGRAPHIC
	OIL SHOW				MX MICROXLN
	MINDEPTH UP				MS MUDSTONE
Rounding					
	MINDEPTH (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

ROP

ROP (twh)

0

3000

300000

Total Gas & Chromatograph

GAS

C1

C2

C3

C4

COLUMBINE LOGGING INC.
RIGGED UP ON 12/08/2014
MANNED 2-PERSON LOGGING
WITH BLOODHOUND GAS
CHROMATOGRAPH UNIT #331

CONTINUED FROM
Smith State LD12-73-1BHN(VERT)

1446u

Mud Wt: 10.50 / 46 Vis

506

1791u

Depth Labels

% Lith

GAMMA

GR

GR (units)

0

200

4700

GR (units)

0

200

4700

87

50' Sample Intervals

Bit Data

Bit #: 1

Type: PDC

Size: 8.75

Depth In: 1,252'

Jets: 7x13

TVD (ft)

MD: 4.872'
Inclination: 14.25 °
Azimuth: 193.49 °
TVD: 4,843.05'
VS: 52.01'

SLTY SH: lt-dk gy, mod frm, sb blk-
gritty, rthy, silky, occ string of shy ss

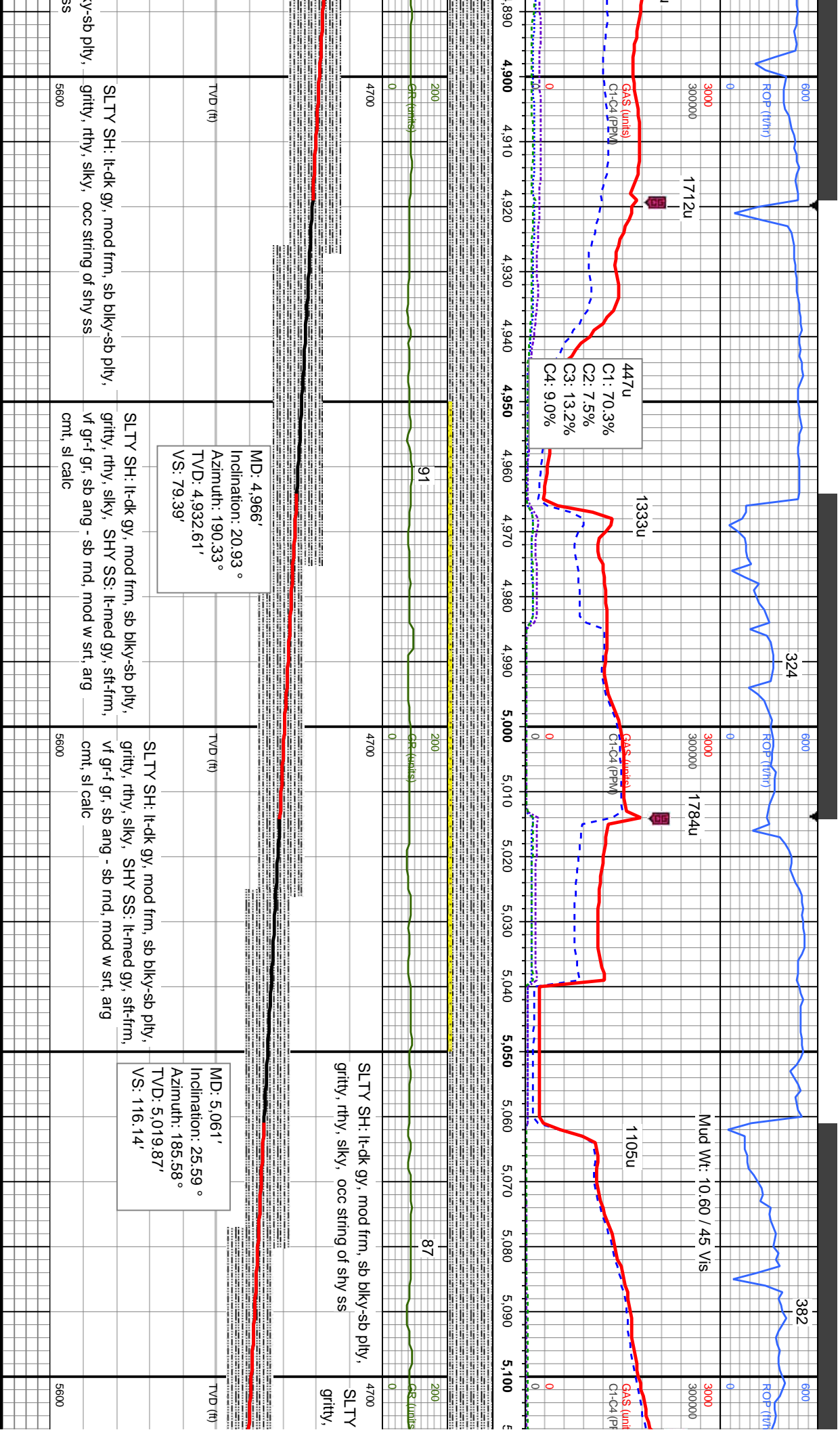
SLTY SH: lt-dk gy, mod frm, sb blk
gritty, rthy, silky, occ string of shy ss

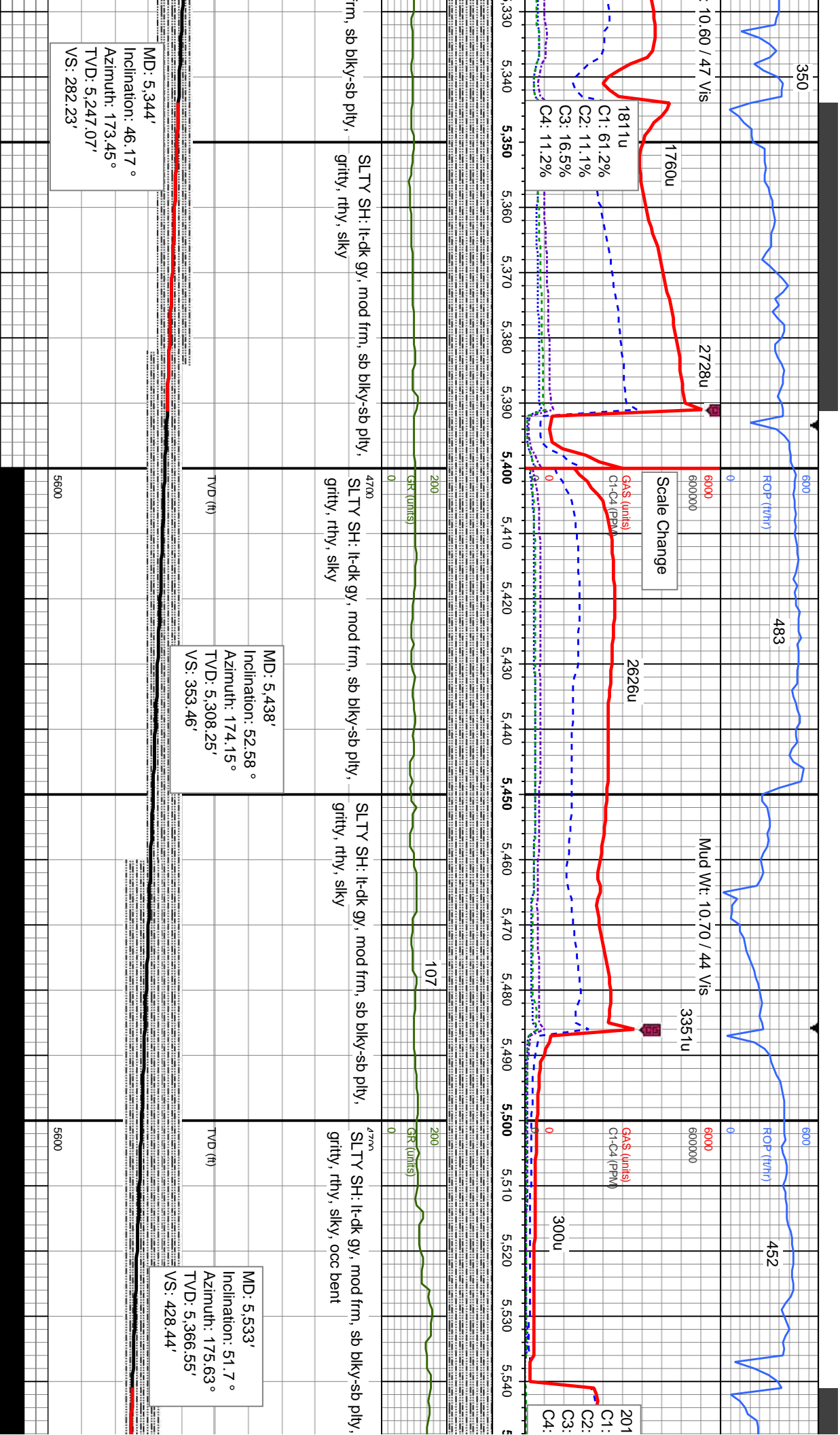
Oil Show

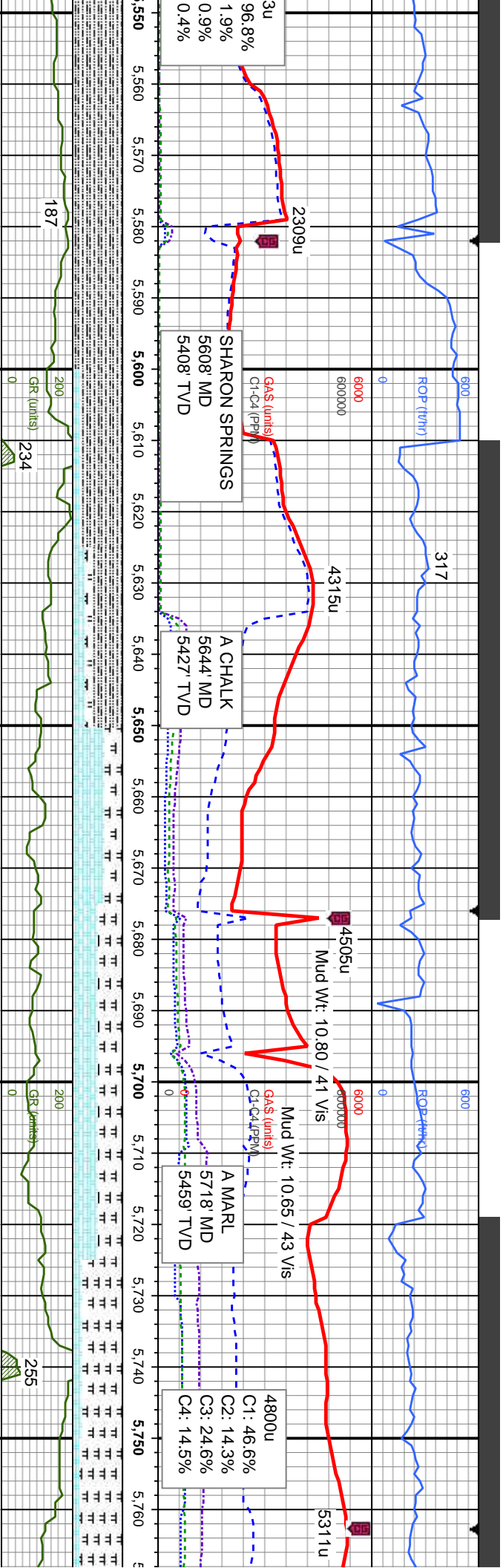
Oil Show

Images









SLTY SH: lt-dk gy, mod frm, sb blk-ly-sb ply, grtly, rthy, silky, abnt bent

25' Sample Intervals

SLTY SH: lt-dk gy, mod frm, sb blk-ly-sb ply, grtly, rthy, silky, abnt bent, CHK: ltgy, occ medgy, mod sft - mod frm, sb ply-sb blk-ly, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blk-dk brn, blk-ly-sb ply, mod frm, rthy tex, v calc

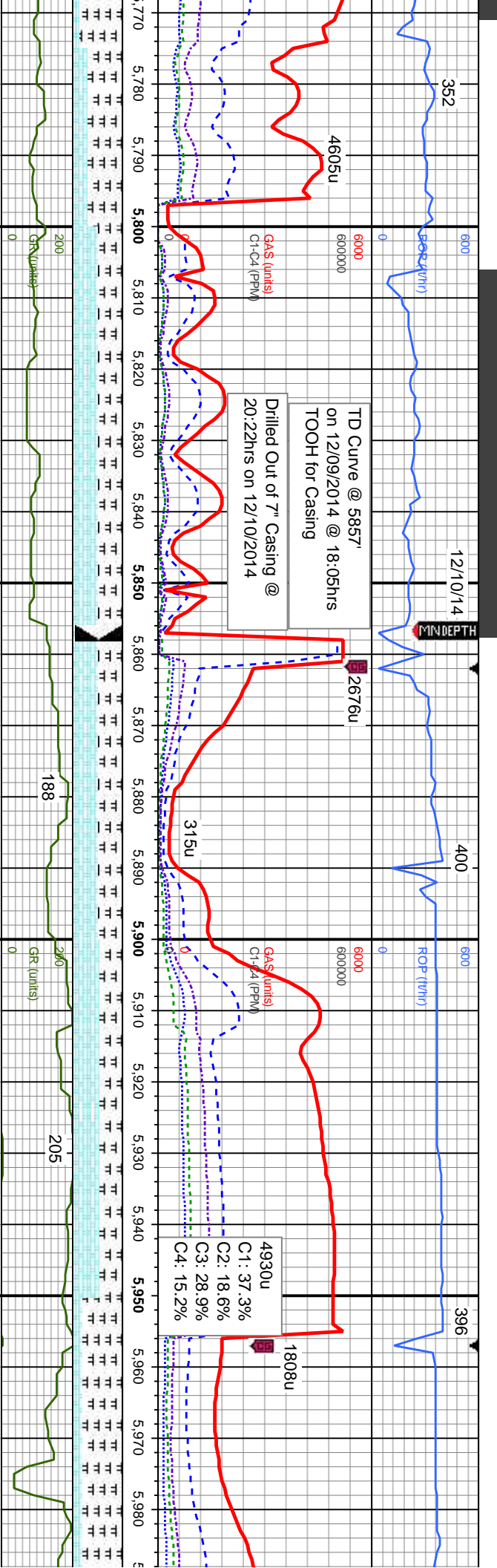
MD: 5,628'
Inclination: 59.53°
Azimuth: 176.44°
TVD: 5,420.16'
VS: 506.77'

CHK: ltgy, occ medgy, mod sft - mod frm, sb ply-sb blk-ly, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blk-ly-sb ply, mod frm, rthy tex, v calc

MD: 5,722'
Inclination: 68.24°
Azimuth: 181.36°
TVD: 5,461.52'
VS: 590.97'

MRLST: medgy ply, mod frm, r occ medgy, mo blk-ly, sb wxy tex





TD Curve @ 5857'
on 12/09/2014 @ 18:05hrs
TOOH for Casing

Gas (units)
C1-C4 (PPM)

4930u
C1: 37.3%
C2: 18.6%
C3: 28.9%
C4: 15.2%

- gy blk-dk brn, blkly-sb
pty tex, v calc CHK: lgy,
mod sft - mod frm, sb pty-sb
- mot, v calc

MRST: medgy - gy blk-dk brn, blkly-sb
pty, mod frm, rthy tex, v calc CHK: lgy,
occ medgy, mod sft - mod frm, sb
pty-sb blkly, sb wxy tex - mot, v calc

MRST: medgy - gy blk-blk, blkly-sb pty,
mod frm, rthy tex, v calc CHK: lgy, occ
medgy, mod sft - sft, sb pty-sb blkly, wxy
tex - mot, v calc

CHK: lgy, occ medgy, mod sft - mod frm, sb
pty-sb blkly, sb wxy tex - mot, v calc MRST:
medgy - gy blk-dk brn, blkly-sb pty, mod frm,
rthy tex, v calc

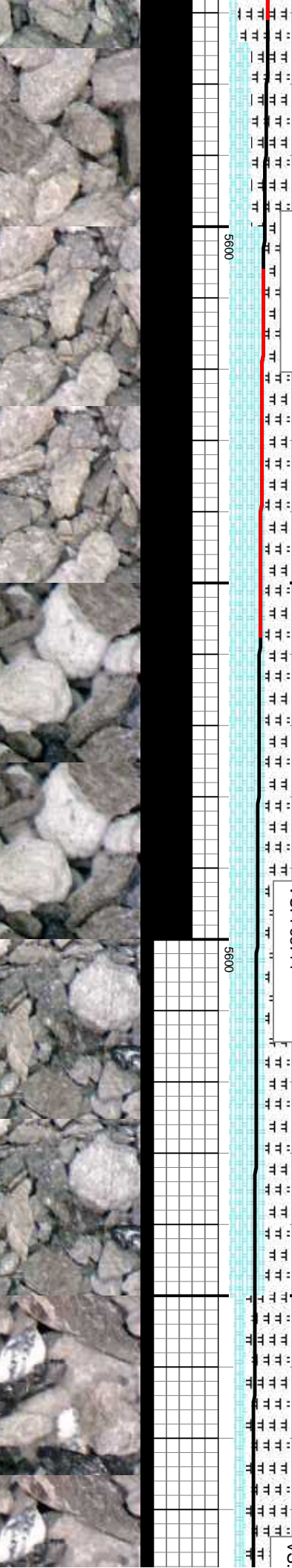
MRST: medgy - gy blk-dk brn, blk
mod frm, rthy tex, v calc CHK: lgy,
medgy, mod sft - mod frm, sb pty-sb
sb wxy tex - mot, v calc

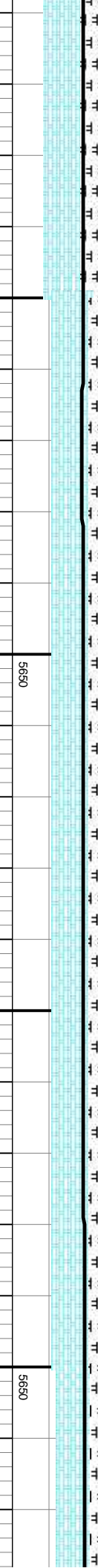
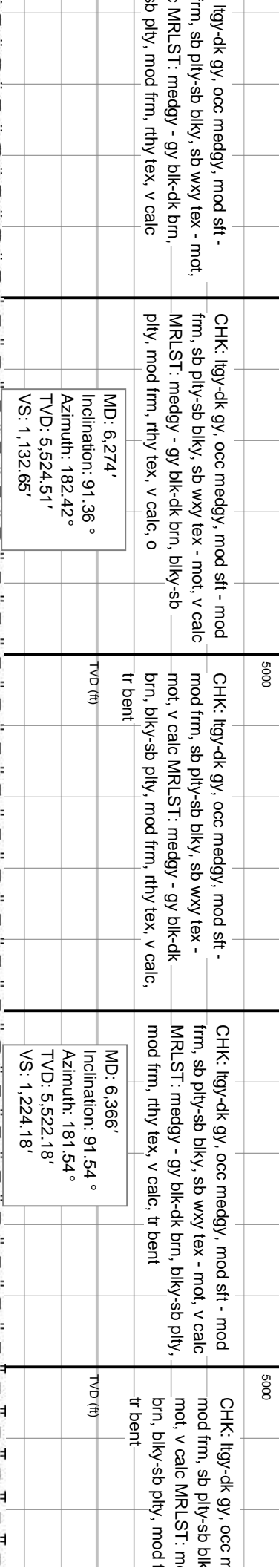
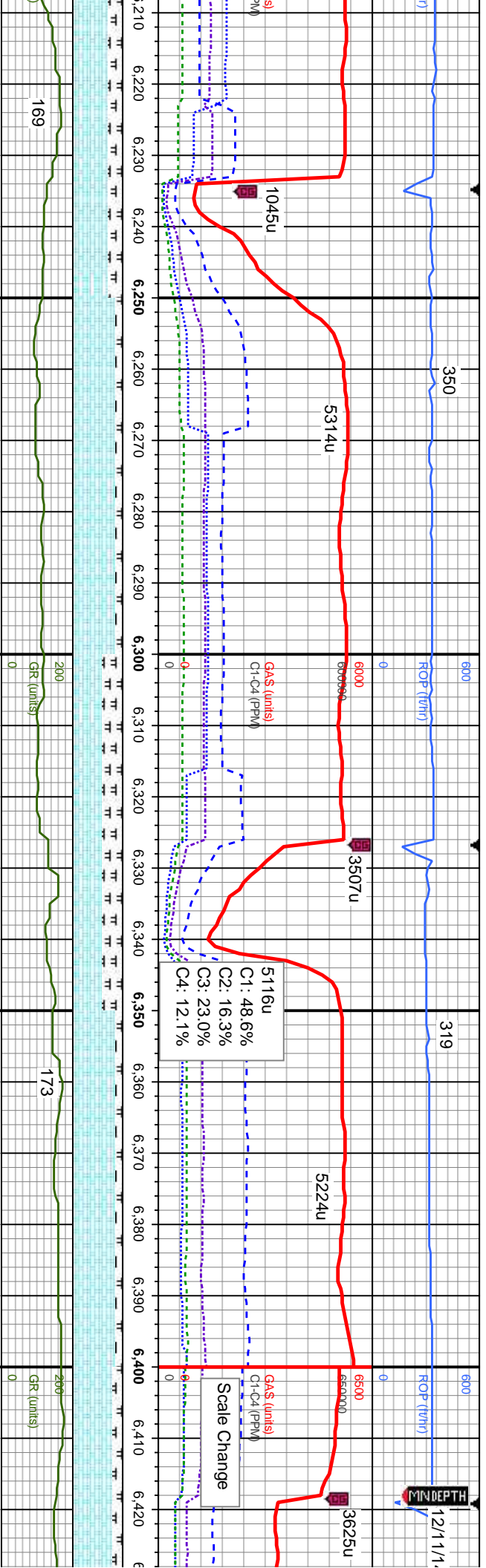
MD: 5,809'
Inclination: 76.77°
Azimuth: 182.59°
TVD: 5,487.65'
VS: 673.48'

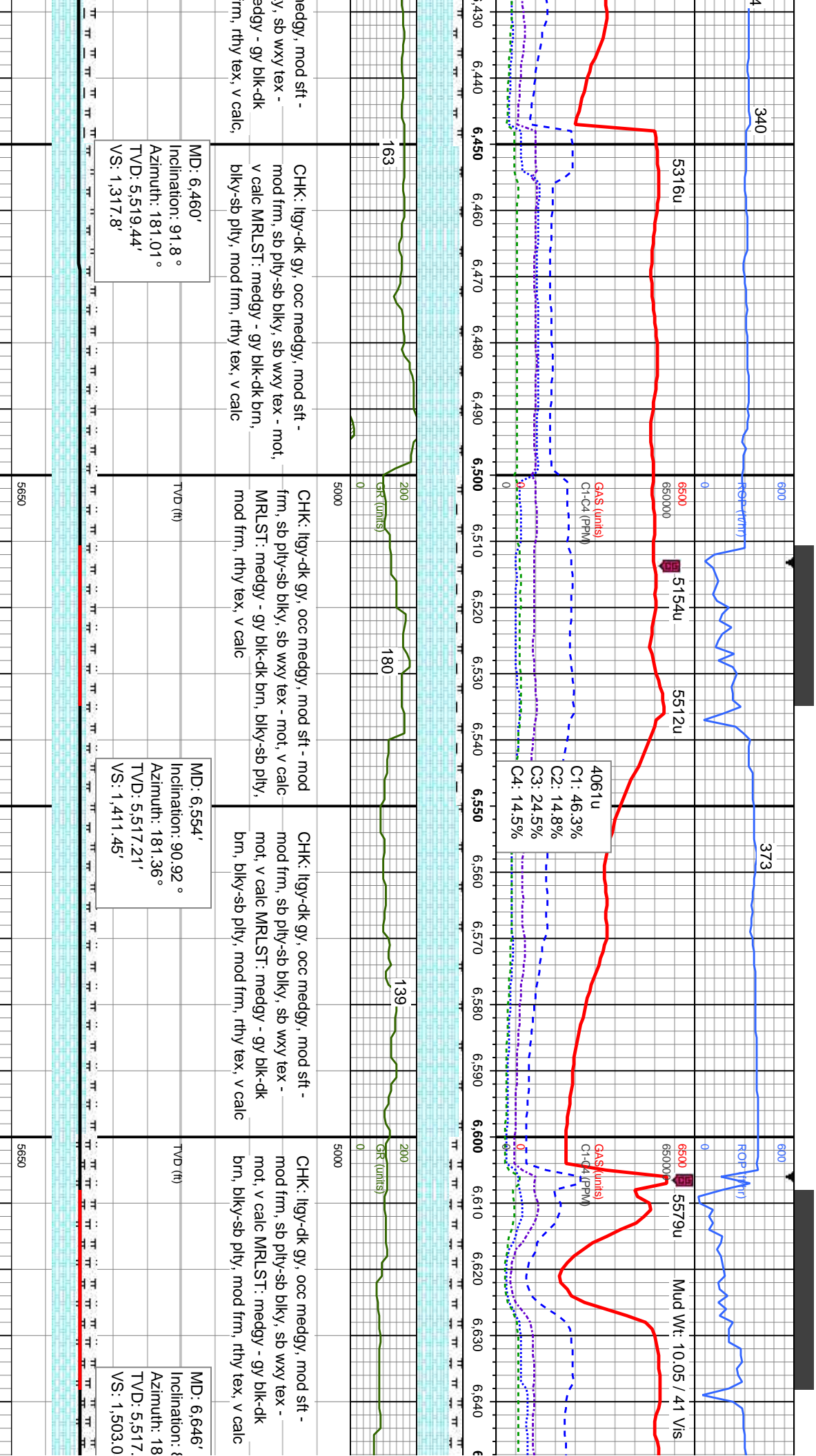
Bit Data
Bit #: 2
Type: H/STC/SDI 513L
Size: 6.12
Depth In: 5857'
Jets: 2x13/3x11

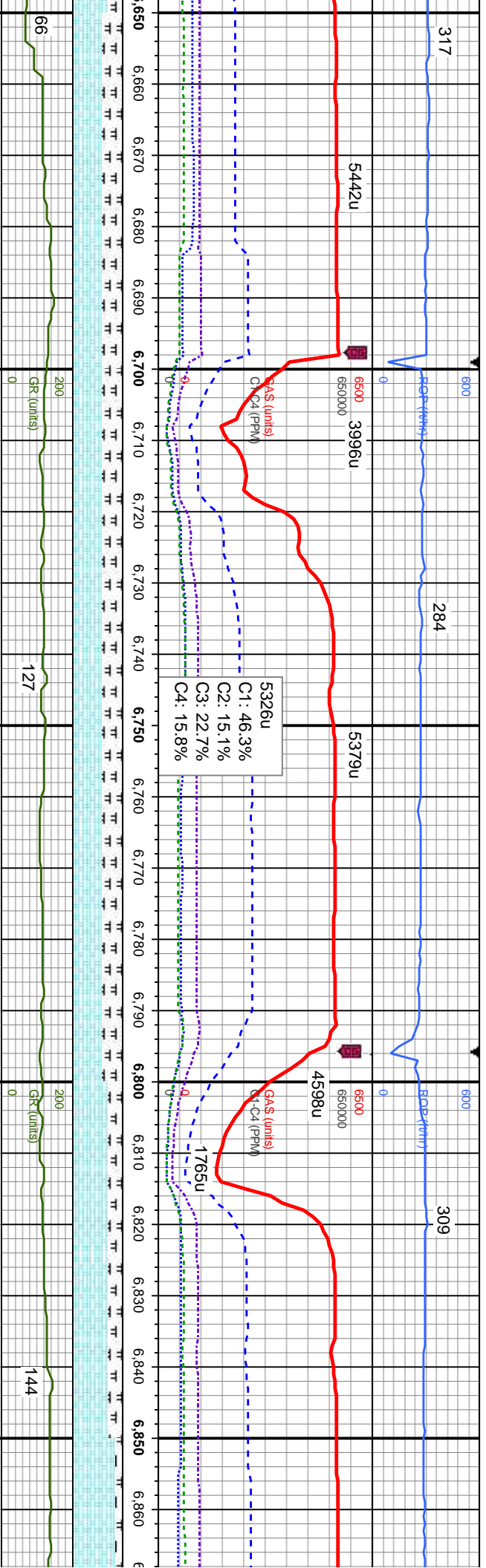
MD: 5,903'
Inclination: 83.71°
Azimuth: 183.47°
TVD: 5,503.58'
VS: 765.44'

MD
Incl
Azi
TVD
VS







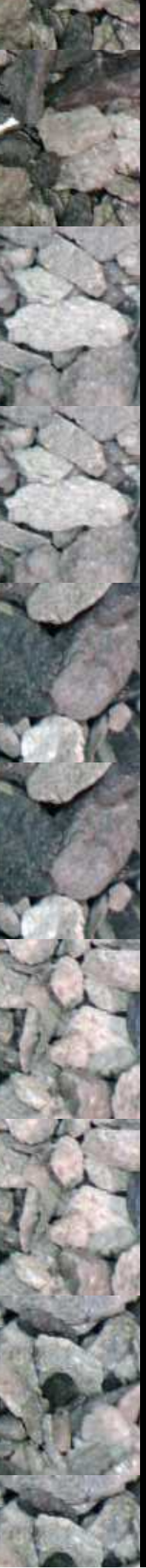
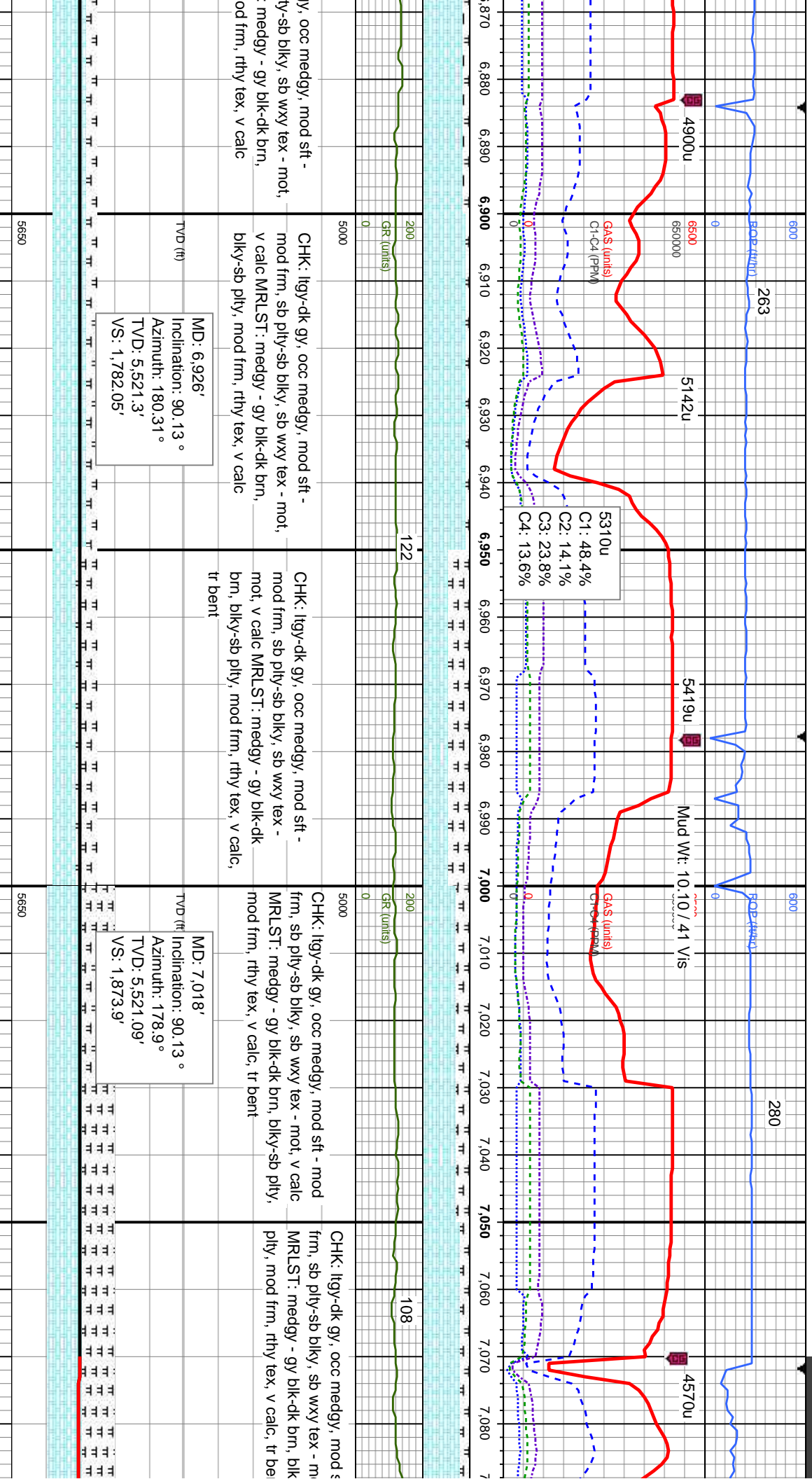


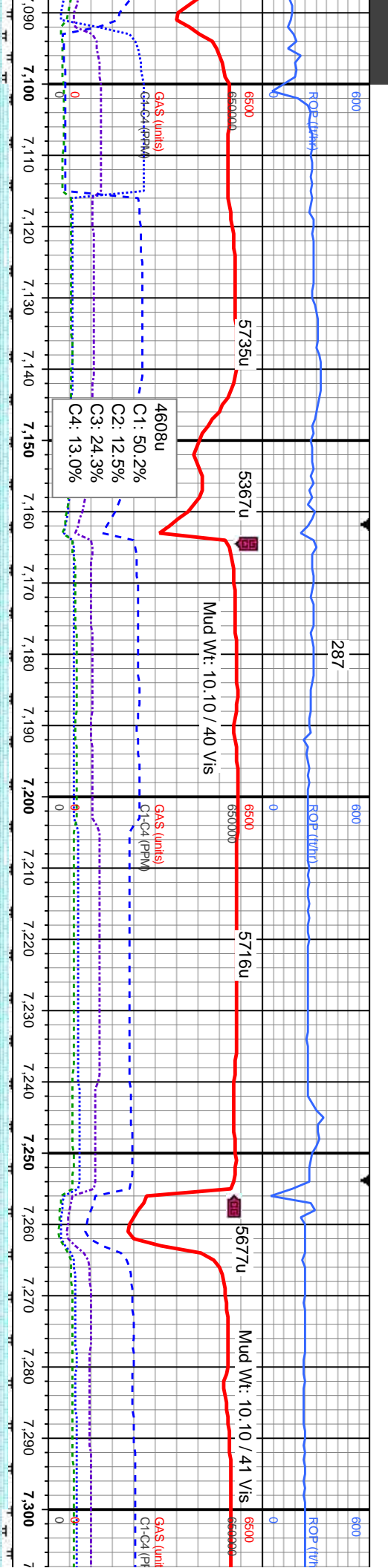
Depth (ft)	ROP (ft/hr)	G4S (units)	G4C4 (PPM)	GR (units)	Notes
6,650	0	0	0	0	
6,660	0	0	0	0	
6,670	0	0	0	0	
6,680	0	0	0	0	
6,690	0	0	0	0	
6,700	0	0	0	0	
6,710	0	0	0	0	
6,720	0	0	0	0	
6,730	0	0	0	0	
6,740	0	0	0	0	
6,750	0	0	0	0	
6,760	0	0	0	0	
6,770	0	0	0	0	
6,780	0	0	0	0	
6,790	0	0	0	0	
6,800	0	0	0	0	
6,810	0	0	0	0	
6,820	0	0	0	0	
6,830	0	0	0	0	
6,840	0	0	0	0	
6,850	0	0	0	0	
6,860	0	0	0	0	

Depth (ft)	ROP (ft/hr)	G4S (units)	G4C4 (PPM)	GR (units)	Notes
6,650	0	0	0	0	
6,660	0	0	0	0	
6,670	0	0	0	0	
6,680	0	0	0	0	
6,690	0	0	0	0	
6,700	0	0	0	0	
6,710	0	0	0	0	
6,720	0	0	0	0	
6,730	0	0	0	0	
6,740	0	0	0	0	
6,750	0	0	0	0	
6,760	0	0	0	0	
6,770	0	0	0	0	
6,780	0	0	0	0	
6,790	0	0	0	0	
6,800	0	0	0	0	
6,810	0	0	0	0	
6,820	0	0	0	0	
6,830	0	0	0	0	
6,840	0	0	0	0	
6,850	0	0	0	0	
6,860	0	0	0	0	

Depth (ft)	ROP (ft/hr)	G4S (units)	G4C4 (PPM)	GR (units)	Notes
6,650	0	0	0	0	
6,660	0	0	0	0	
6,670	0	0	0	0	
6,680	0	0	0	0	
6,690	0	0	0	0	
6,700	0	0	0	0	
6,710	0	0	0	0	
6,720	0	0	0	0	
6,730	0	0	0	0	
6,740	0	0	0	0	
6,750	0	0	0	0	
6,760	0	0	0	0	
6,770	0	0	0	0	
6,780	0	0	0	0	
6,790	0	0	0	0	
6,800	0	0	0	0	
6,810	0	0	0	0	
6,820	0	0	0	0	
6,830	0	0	0	0	
6,840	0	0	0	0	
6,850	0	0	0	0	
6,860	0	0	0	0	







ft - mod	5000	CHK: ltgy-dk gy, occ medgy, mod sft - mod frm, sb ply-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb ply, mod frm, rthy tex, v calc	CHK: ltgy-dk gy, occ medgy, mod sft - mod frm, sb ply-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb ply, mod frm, rthy tex, v calc	CHK: ltgy-dk gy, occ medgy, mod sft - mod frm, sb ply-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb ply, mod frm, rthy tex, v calc
ot, v calc				
ty-sb				
nt				

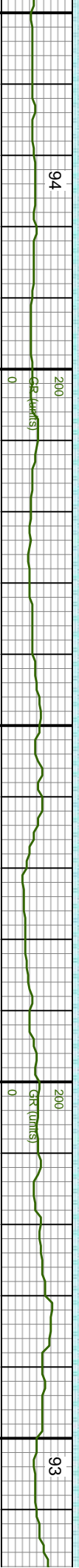
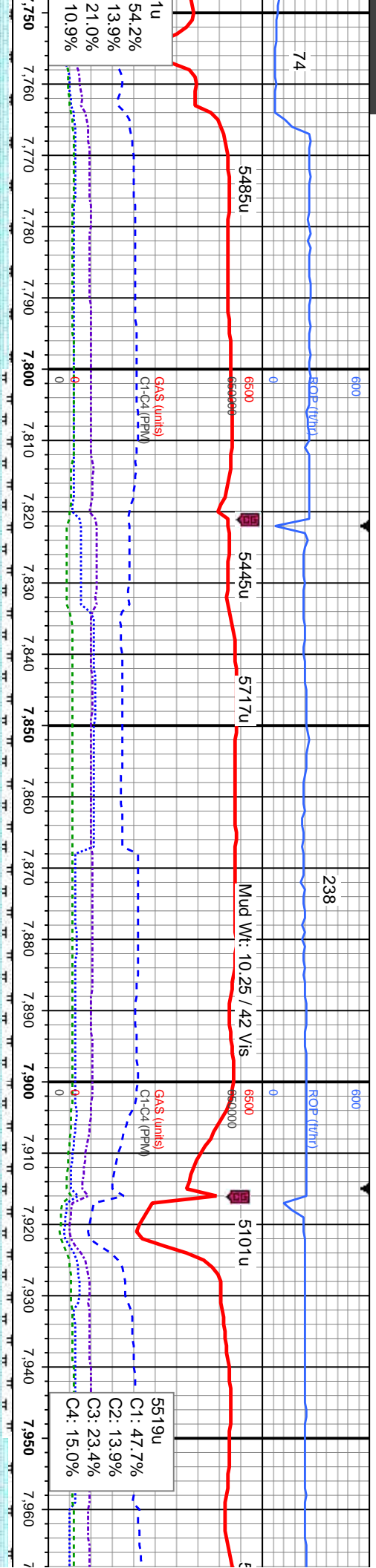
MD: 7,111'
Inclination: 88.46°
Azimuth: 179.78°
TVD: 5,522.24'
VS: 1,966.77'

MD: 7,202'
Inclination: 88.9°
Azimuth: 178.9°
TVD: 5,524.33'
VS: 2,057.63'

MD: 7,296'
Inclination: 89.34°
Azimuth: 178.02°
TVD: 5,525.78'
VS: 2,151.55'

5650	5650	5650	5650
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CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

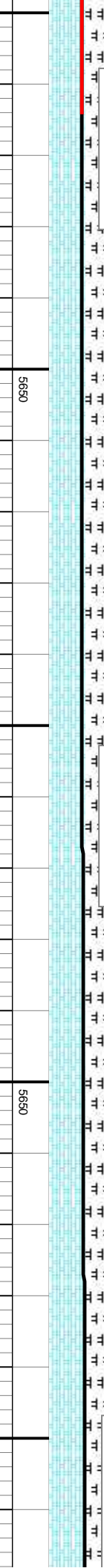
CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkgy, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkgy-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

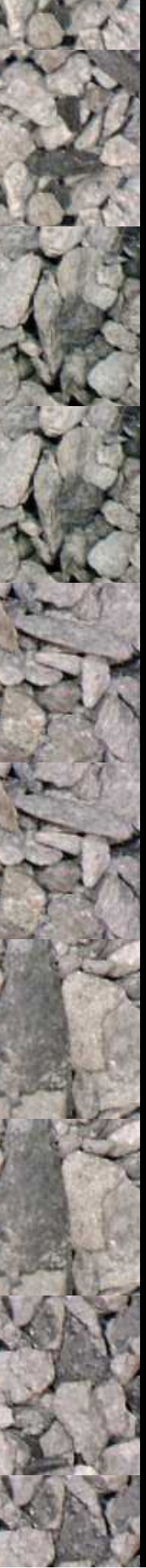
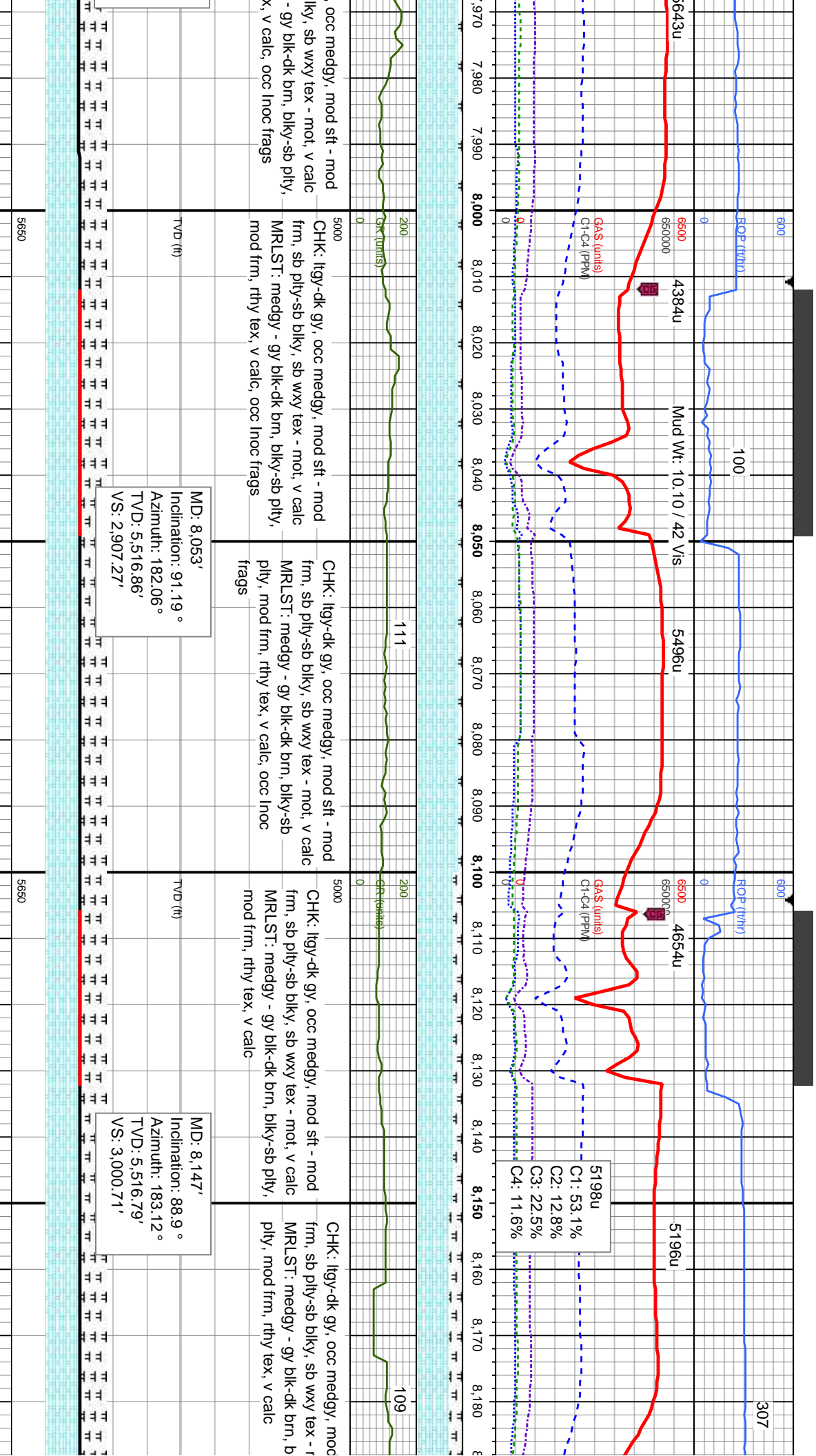
CHK: Itgy-dk gy frm, sb pily-sb b MRLST: medgy mod frm, rthy te

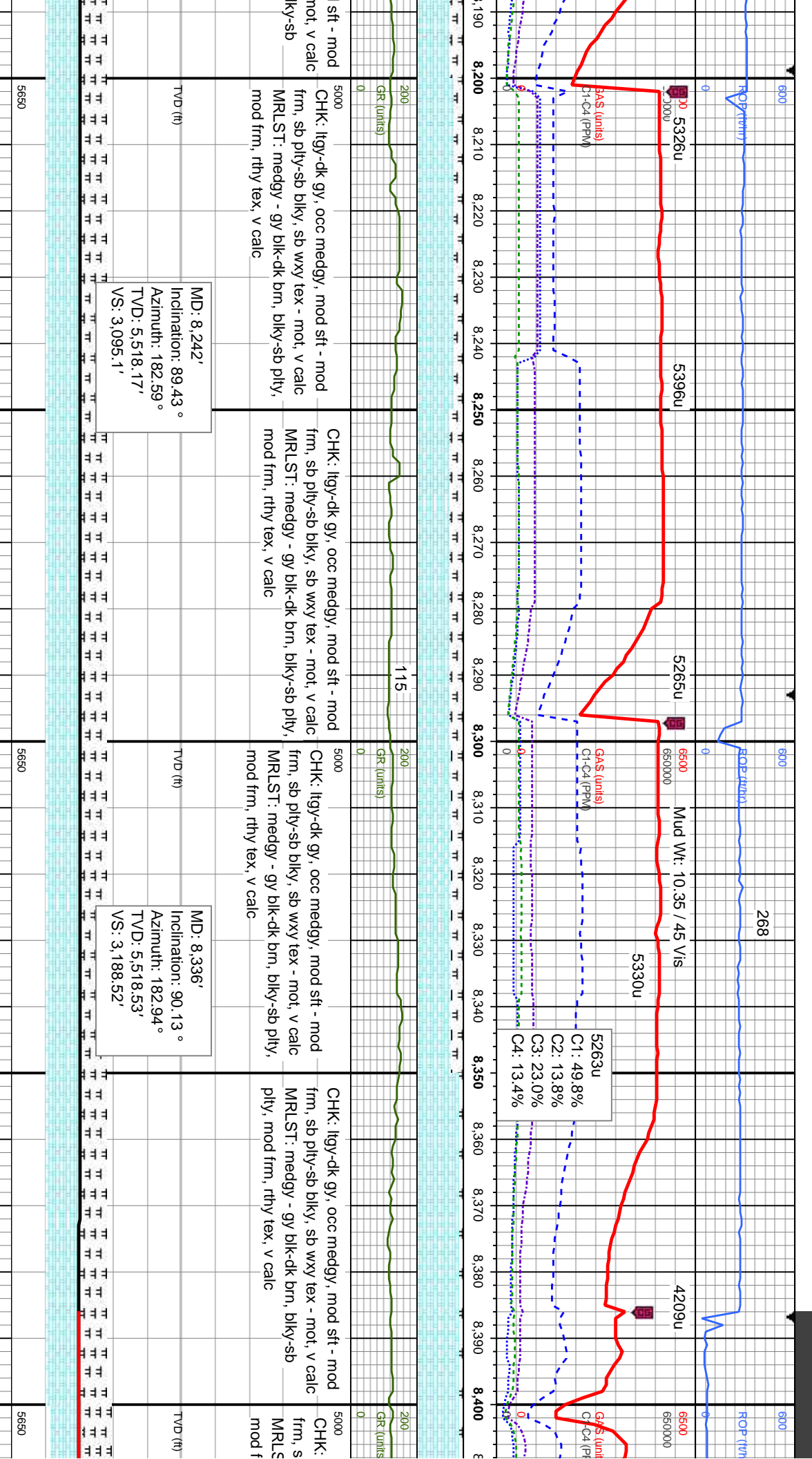
MD: 7,769'
Inclination: 90.57°
Azimuth: 180.66°
TVD: 5,526.3'
VS: 2,624.18'

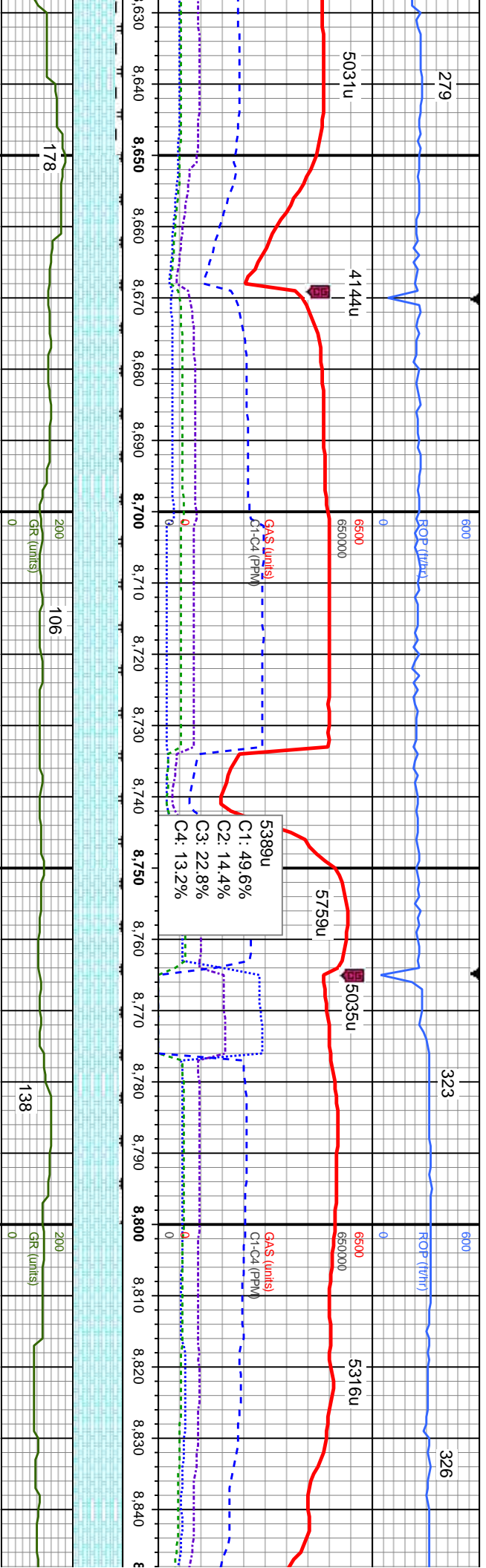
MD: 7,864'
Inclination: 91.63°
Azimuth: 180.31°
TVD: 5,524.48'
VS: 2,718.92'

MD: 7,958'
Inclination: 93.21°
Azimuth: 179.78°
TVD: 5,520.51'
VS: 2,812.65'









CHK: lgy-dk gy, occ medgy, mod sft - mod frm, sb pty-sb blk, wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blk-sb pty, mod frm, rthy tex, v calc

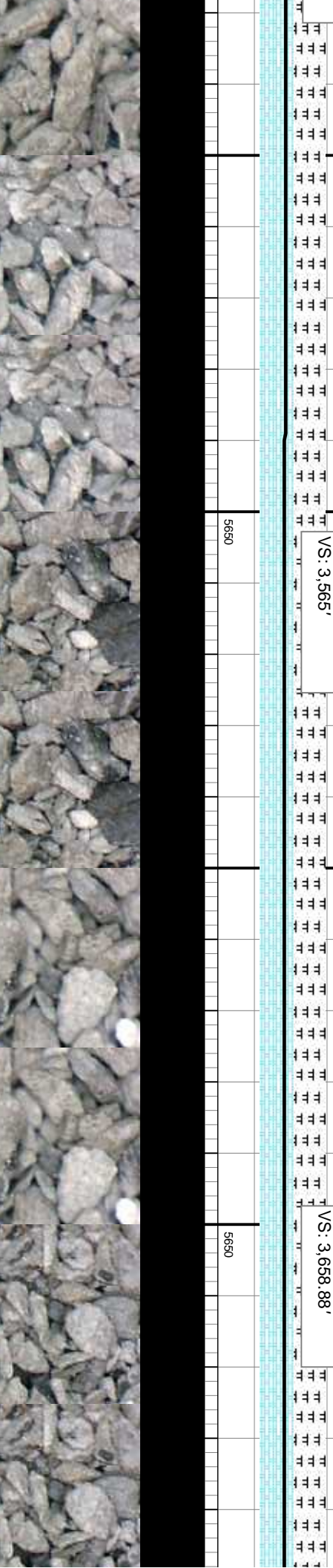
CHK: lgy-dk gy, occ medgy, mod sft - mod frm, sb pty-sb blk, wxy tex - sb mot, v calc MRLST: medgy - gy blk-dk brn, blk-sb pty, mod frm, rthy tex, v calc

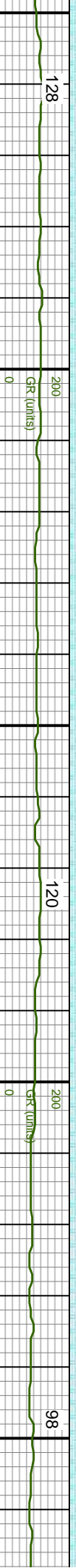
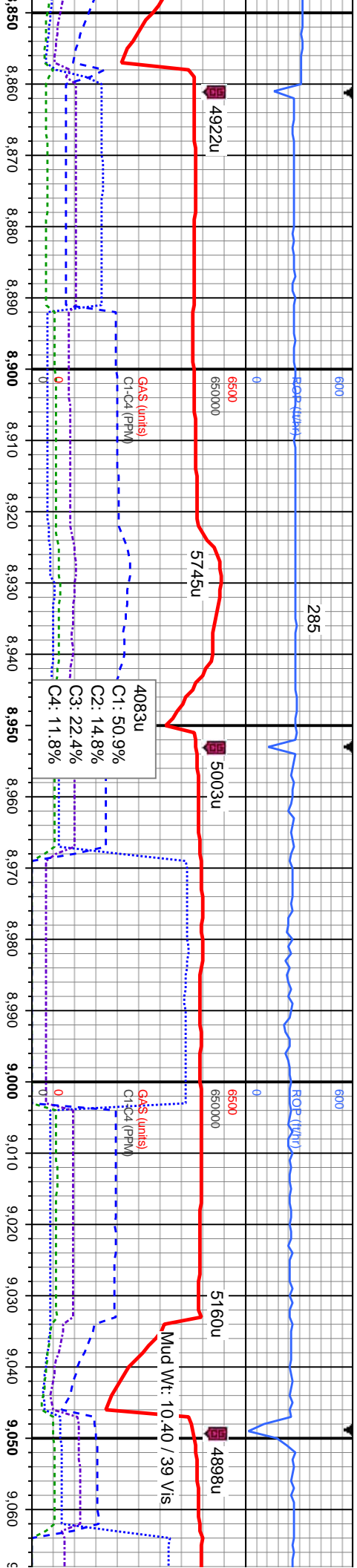
CHK: lgy-dk gy, occ medgy, mod sft - mod frm, sb pty-sb blk, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blk-sb pty, mod frm, rthy tex, v calc, occ inoc frags

CHK: lgy-dk gy, occ medgy, mod sft - mod frm, sb pty-sb blk, wxy tex - sb mot, v calc MRLST: medgy - gy blk-dk brn, blk-sb pty, mod frm, rthy tex, v calc, o

MD: 8,714'
Inclination: 88.29°
Azimuth: 179.43°
TVD: 5,530.2'
VS: 3,565'

MD: 8,808'
Inclination: 90.31°
Azimuth: 178.9°
TVD: 5,531.35'
VS: 3,658.88'





CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkly, wxy tex - sb mot, v calc MRLST: medgy - gy blk-dk brn, blkly-sb pily, mod frm, rthy tex, v calc, o

CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, blkly-sb blkly, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkly-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

CHK: Itgy-dk gy, occ medgy, mod sft - mod frm, sb pily-sb blkly, sb wxy tex - mot, v calc MRLST: medgy - gy blk-dk brn, blkly-sb pily, mod frm, rthy tex, v calc, occ Inoc frags

CHK: Itgy, occ medgy, mod sft - mod frm, sb pily-sb blkly, wxy tex - sb mot, v calc MRLST: medgy - gy blk-dk brn, blkly-sb pily, mod frm, rthy tex, v calc

CHK: Itgy-dk mod frm, sb pily-sb blkly, wxy tex - sb mot, v calc MRLST: medgy - gy blk-dk brn, blkly-sb pily, mod frm, rthy tex, v calc

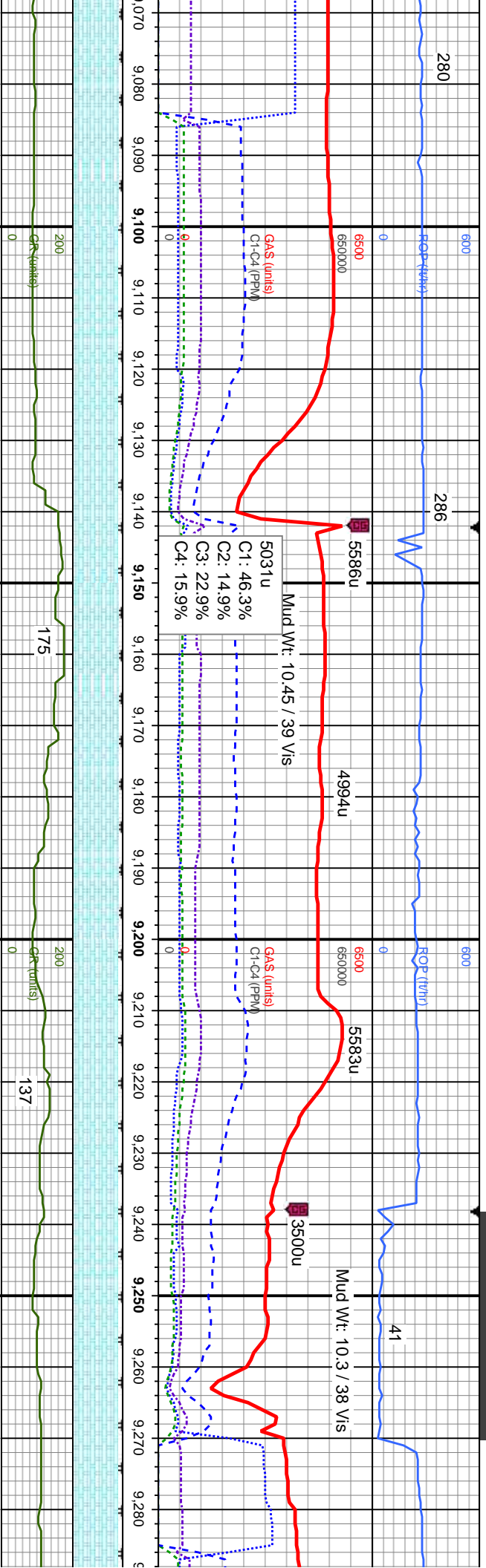
MD: 8,903'
Inclination: 89.87°
Azimuth: 179.6°
TVD: 5,531.2'
VS: 3,753.76'

MD: 8,998'
Inclination: 89.96°
Azimuth: 178.2°
TVD: 5,531.34'
VS: 3,848.67'

5650

5650





MD: 9,093'
Inclination: 90.57 °
Azimuth: 178.9 °
TVD: 5,530.9'
VS: 3,943.6'

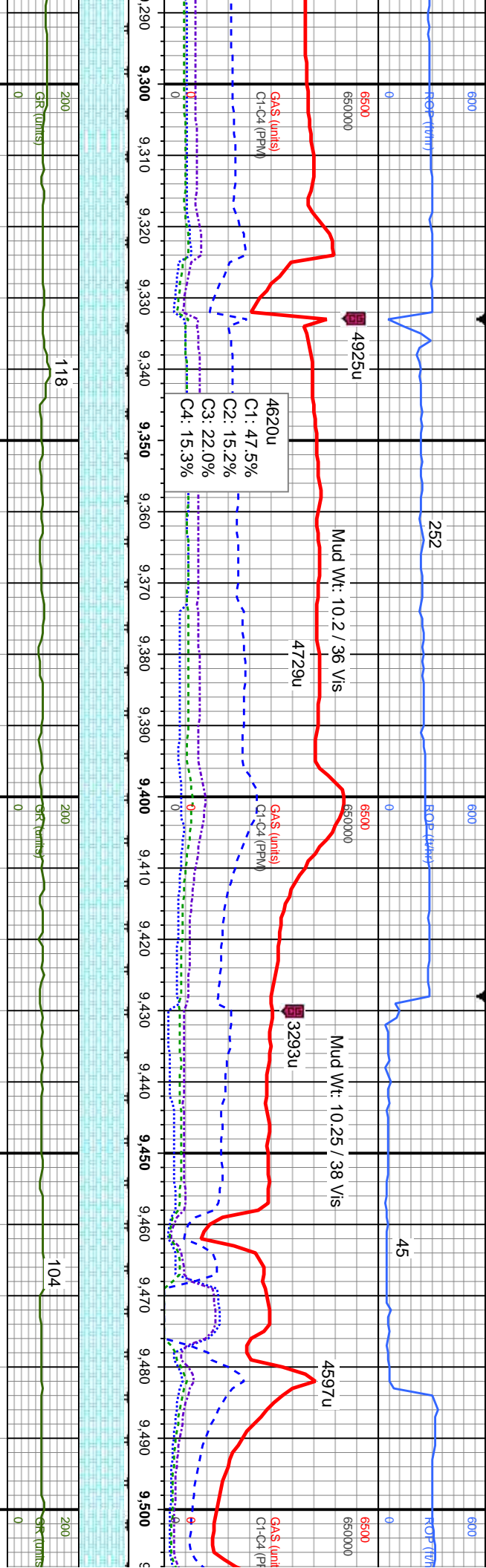
MD: 9,187'
Inclination: 90.4 °
Azimuth: 177.85 °
TVD: 5,530.1'
VS: 4,037.54'

TVD (ft)

5650

5650





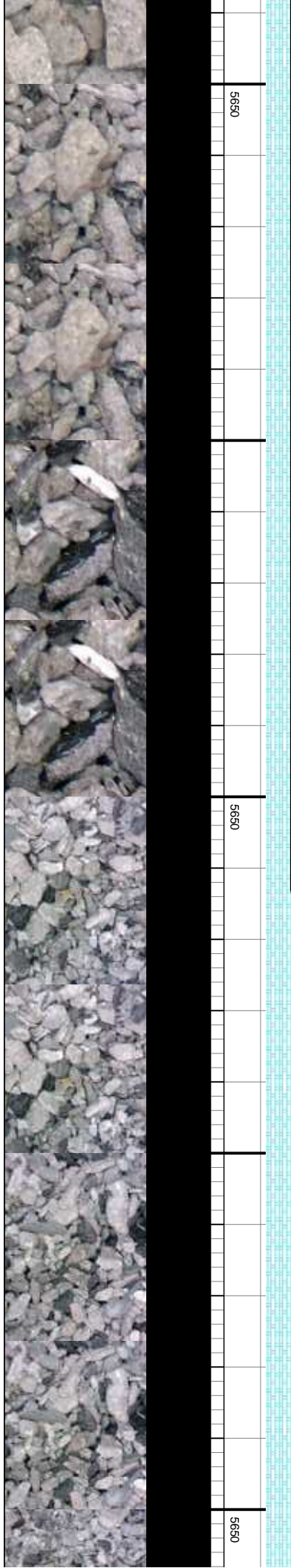
mod sft - CHK: ltgy, occ medgy, mod sft - mod
- gy frm, sb pty-sb blk, wxy tex - sb mot, v
- n, rthy calc MRLST: medgy - gy blk-dk brn,
bent, Inoc frag

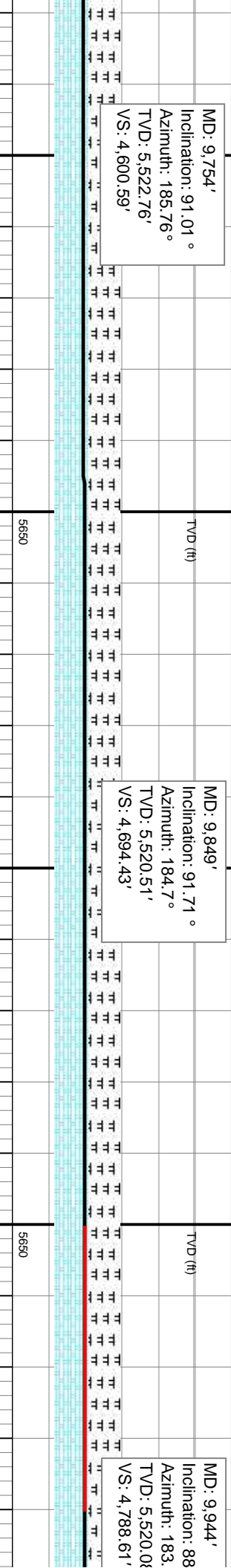
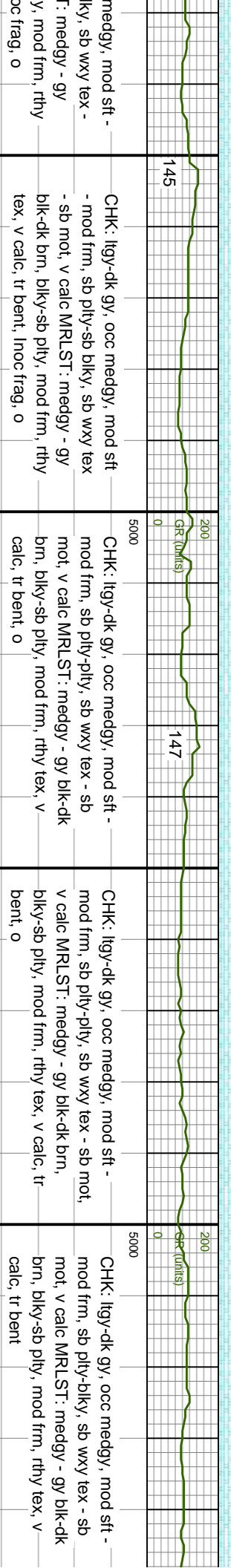
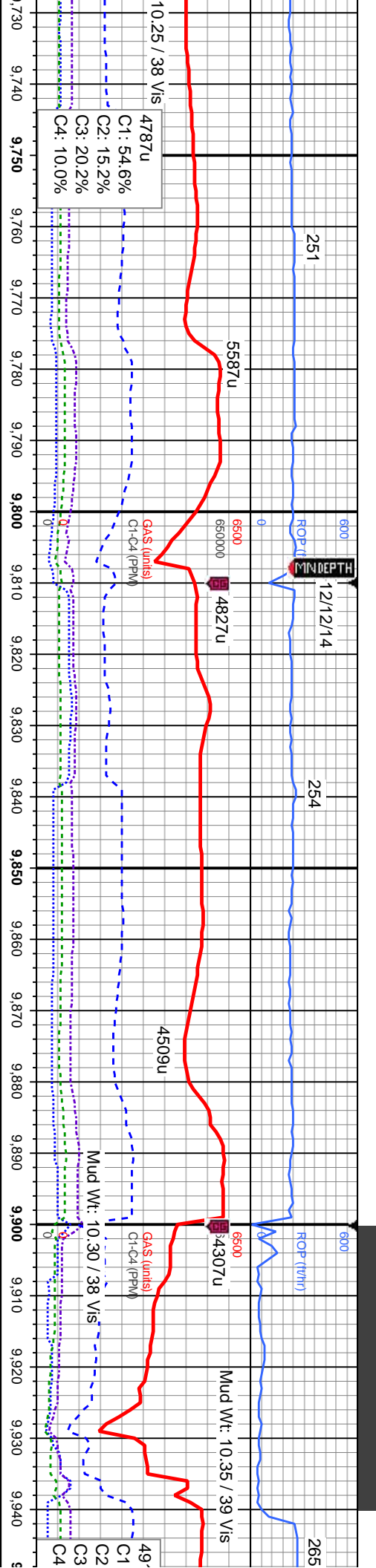
MD: 9,376'
Inclination: 90.57 °
Azimuth: 177.49°
TVD: 5,527.19'
VS: 4,226.39'

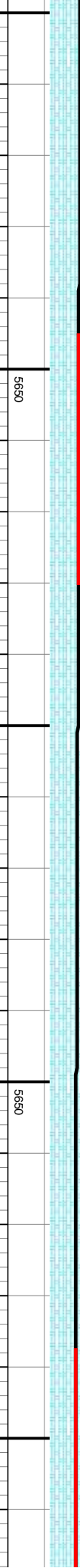
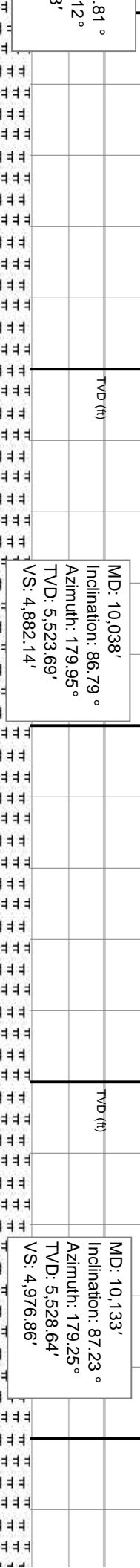
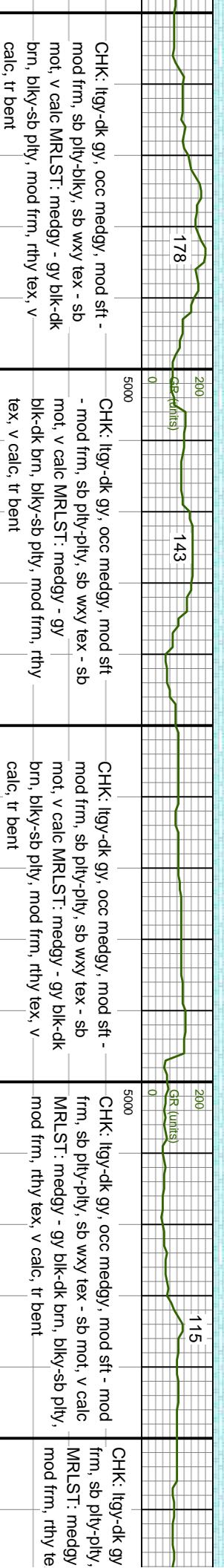
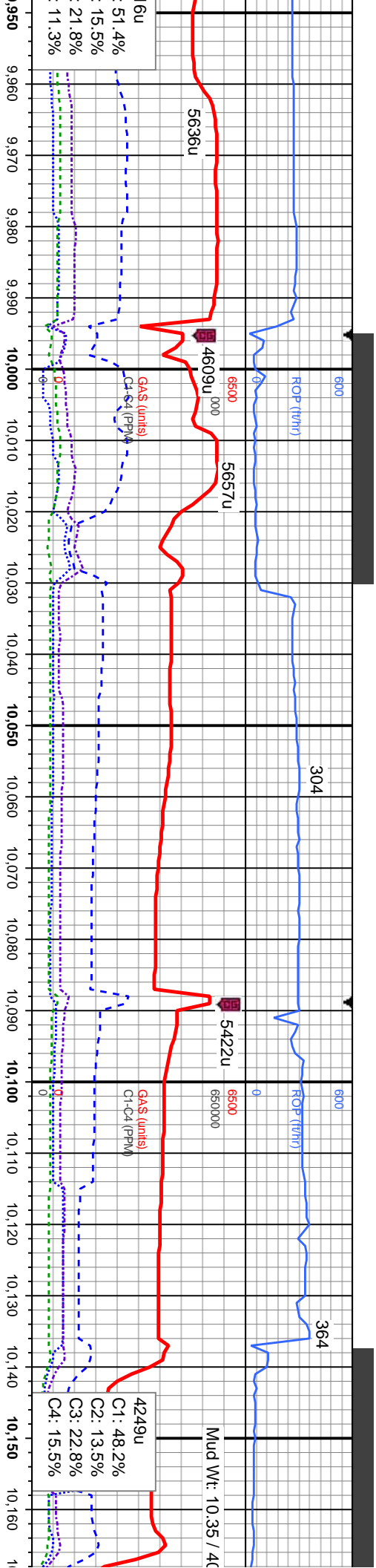
mod sft - CHK: ltgy-dk gy, occ medgy, mod sft -
- gy frm, sb pty-sb blk, sb wxy tex -
- n, rthy sb mot, v calc MRLST: medgy - gy
blk-dk brn, blk-sb pty, mod frm, rthy
tex, v calc, tr bent, Inoc frag

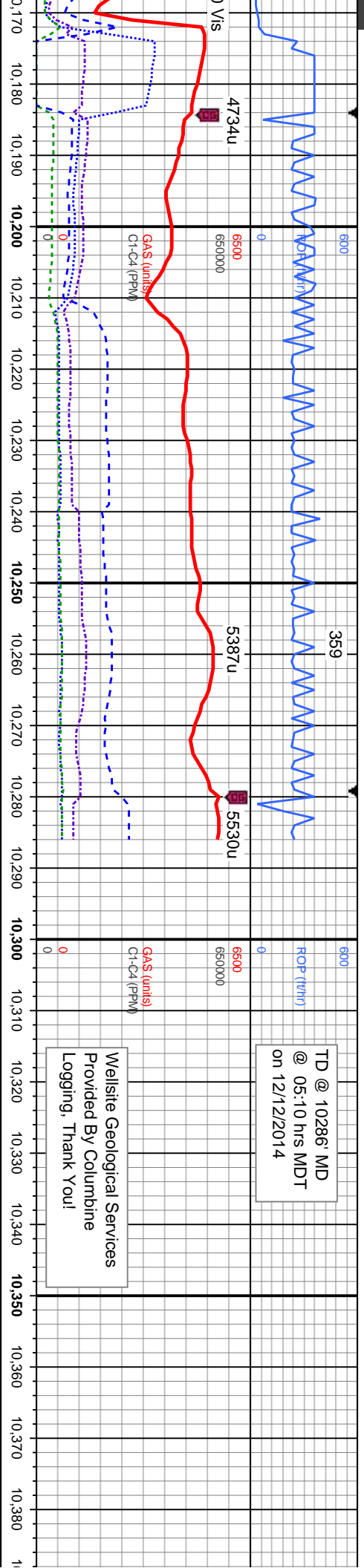
mod sft - CHK: ltgy-dk gy, occ medgy, mod sft -
- gy frm, blk-sb blk, sb wxy tex - sb
- n, rthy mot, v calc MRLST: medgy - gy blk-dk
brn, blk-sb pty, mod frm, rthy tex, v
calc, tr bent, Inoc frag

mod sft - CHK: ltgy-dk gy, occ medgy, mod sft -
- gy frm, blk-sb blk, sb wxy tex - sb
- n, rthy mot, v calc MRLST: medgy - gy blk-dk
brn, blk-sb pty, mod frm, rthy tex, v
calc, tr bent, Inoc frag



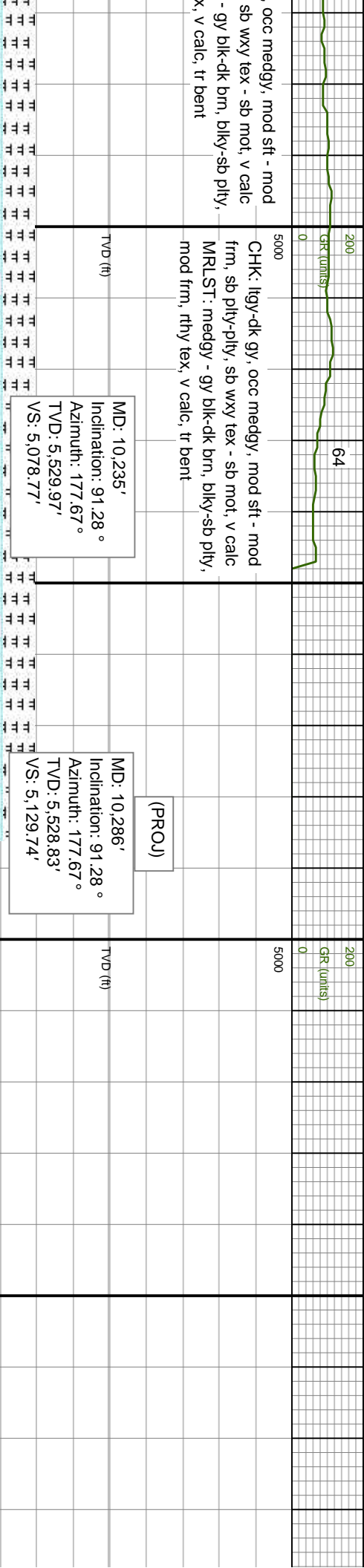






TD @ 10286' MD
@ 05:10 hrs MDT
on 12/12/2014

Wellsite Geological Services
Provided By Columbine
Logging, Thank You!



(PROJ)

MD: 10,235'
Inclination: 91.28°
Azimuth: 177.67°
TVD: 5,529.97'
VS: 5,078.77'

MD: 10,286'
Inclination: 91.28°
Azimuth: 177.67°
TVD: 5,528.83'
VS: 5,129.74'

