



Scale: 5" / 100'
Measured Depth Log

Well Name Herren 11-33H-H367

Location Sec. 33 T3N R67W

State Colorado

County Weld

Country USA

Rig Number Ensign 153

API Number 05-123-47726

AFE # 16191568

Geographic Region Rockies

Field Wattenberg

Spud Date 1/2/2019

Drilling Completed 1/5/2019

Surface Coordinates Latitude: 40.183203
Longitude: -104.886662

SHL: Sec: 33 Twp: 3N 67W
Footage: 2,150 FNL 460 FEL

Bottom Hole Coordinates Proposed BHL: Sec: 33 Twp: 3N 67W
Footages: 2,150 FNL 460 FWL

Ground Elevation 4,849'

K.B. Elevation 4,872'

Logged Interval 6,300' **To** 11,830'

Total Depth 11,830'

Formation Niobrara B

Type of Drilling Fluid Synthetic Oil Based Mud

Operator

Company Crestone Peak Resources

Address 1801 California Street
Suite 2500
Denver, CO 80202



CRESTONE PEAK
RESOURCES

Geologist

Name John Ready

Company Crestone Peak Resources

Address 1801 California Street
Suite 2500
Denver, CO 80202



Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Other

Loggers: Shana Swirin-Miles / Heather Daivs

Services Provided: 2-Man Mudlogging / Geosteering

Equipment: ML-515

Contractor: Reservoir Group
6360 West Sam Houston Pkwy N
Houston, Texas, 77041

Start Date 01/02/2019

Job #: 1828RK1812

Release Date: 01/06/2019

Rock Types

UNKNOWN	DOLOMITE	SHALE GRAY	TILL
ANHYDRITE	CHERT	SHALE COLORED	BENTONITE
GYPSUM	COAL	SILTSTONE	TUFF
SALT	MARLSTONE	SANDSTONE	IGNEOUS
SIDERITE or LIMONITE	CHALK	CONGLOMERATE	METAMORPHIC
LIMESTONE	SHALE	BRECCIA	CEMENT

Accessories

Fossils

ALGAE
 AMPHIPORA
 BELEMNITE
 BRYOZOA
 CEPHALOPOD
 CORAL
 CRINOID

F FOSSIL

GASTROPOD
 OOLITE
 OSTRACOD
 PELECYPOD
 PELLET
 PISOLITE
 PLANT REMAINS
 PLANT SPORES
 SCAPHOPOD
 STROMATOLITE

ARGILLACEOUS

ARGILLITE GRAIN
 BENTONITE
 BITUMENOUS SUBSTANCE
 BRECCIA FRAGMENTS
 CALCAREOUS
 CARBONACEOUS FLAKES
 CHTDK
 CHTLT
 COAL - THIN BEDS
 DOLOMITE

GLAUCONITE

GYPSIFEROUS
 HEAVY MINERAL
 KAOLIN
 MARLSTONE
 MINERAL CRYSTALS
 NODULES
 PHOSPHATE PELLETS
 PYRITE
 SALT CAST
 SANDY

Stringer

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

CRINOID
ECHINOID
FISH
FORAMINIFERA

STROMATOPOROID
Minerals
ANHYDRITIC

DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS

SANDY
SILICEOUS
SILTY
TUFFACEOUS

SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

E EARTHY
F FENESTRAL
F FRACTURE
X INTERCRYSTALLINE
O INTEROOLITIC
M MOLDIC

ORGANIC
PINPOINT
VUGGY

Engineering

BIT
CASING
CONNECTION (LEFT)
CONNECTION (RIGHT)
CONNECTION GAS
CORE - LOST
CORE - RECOVERED
DST INTERVAL
FAULT

Other Symbols

FORMATION TOP
GAS SHOW
MN DEPTH
NORMAL FAULT
OIL SHOW
OVERTURNED STRATA
REVERSE FAULT
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)
SLIDE
SURVEY
TRIP GAS
WIRELINE TESTED - LEFT
WIRELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

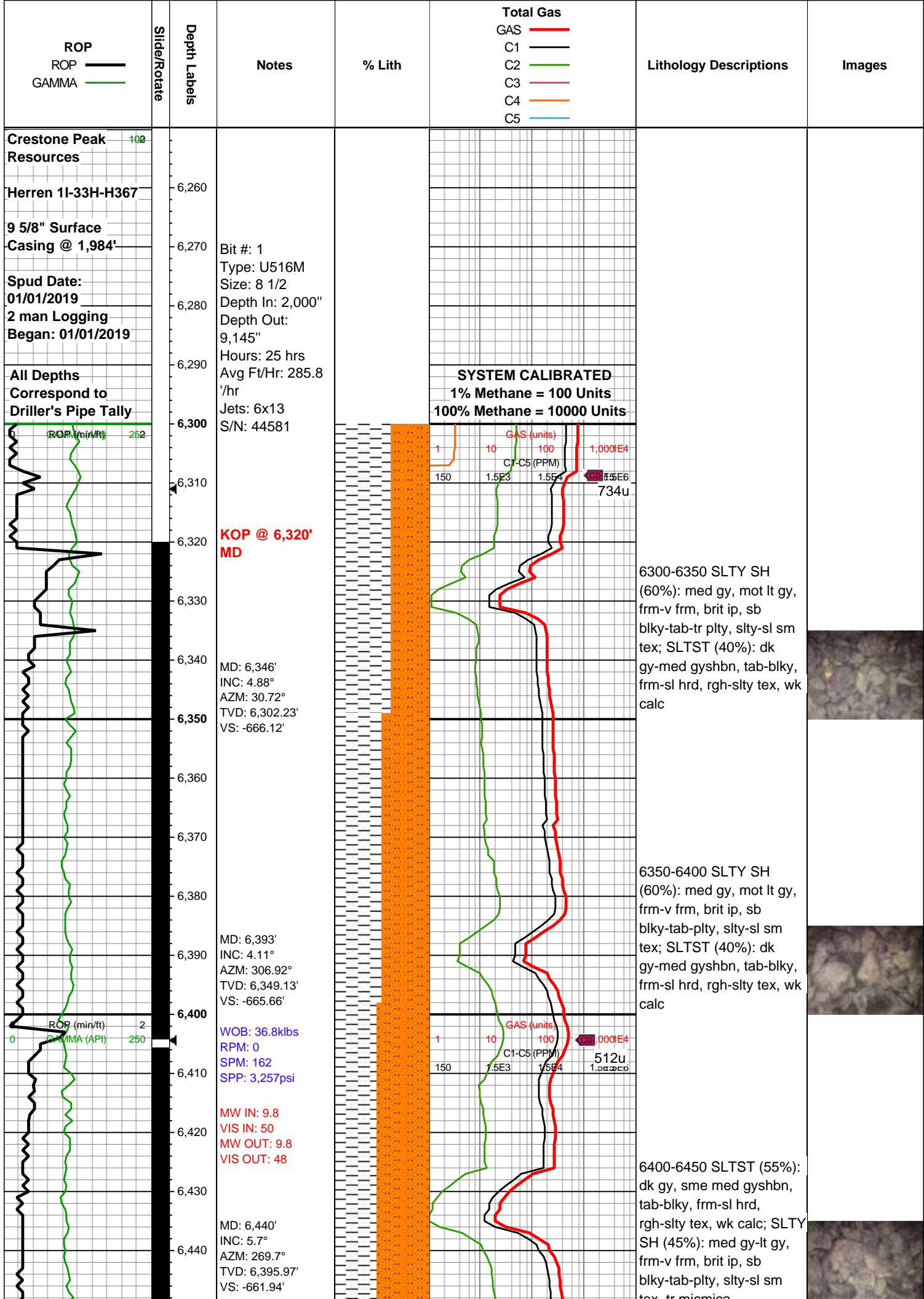
Textures

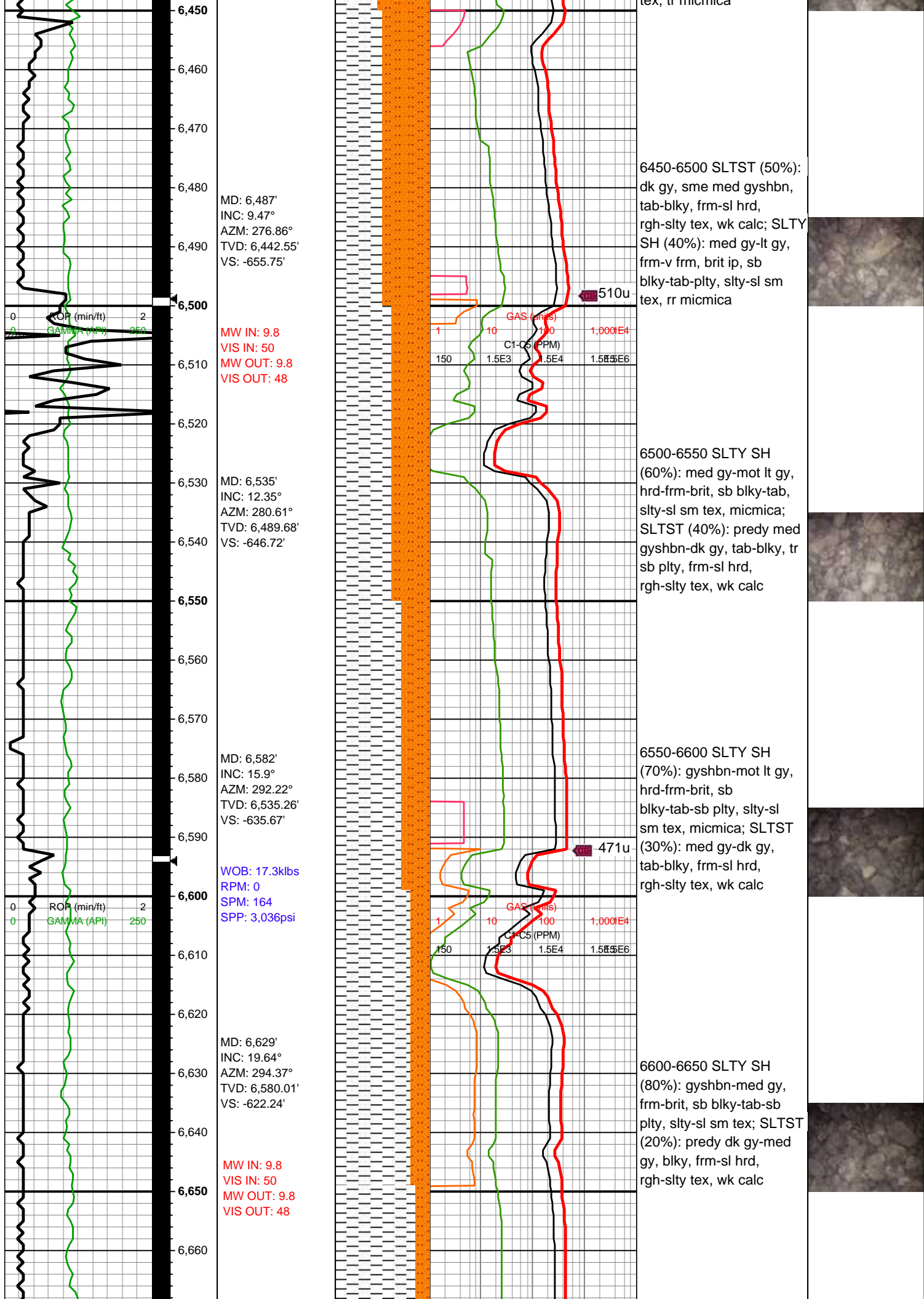
BOUNDSTONE
CHALKY
CRYPTOXLN
E EARTHY
FINELYXLN
GRAINSTONE

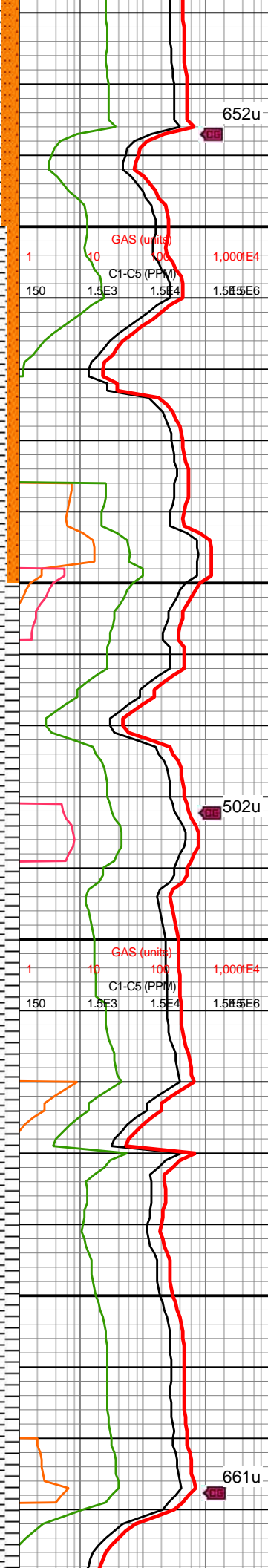
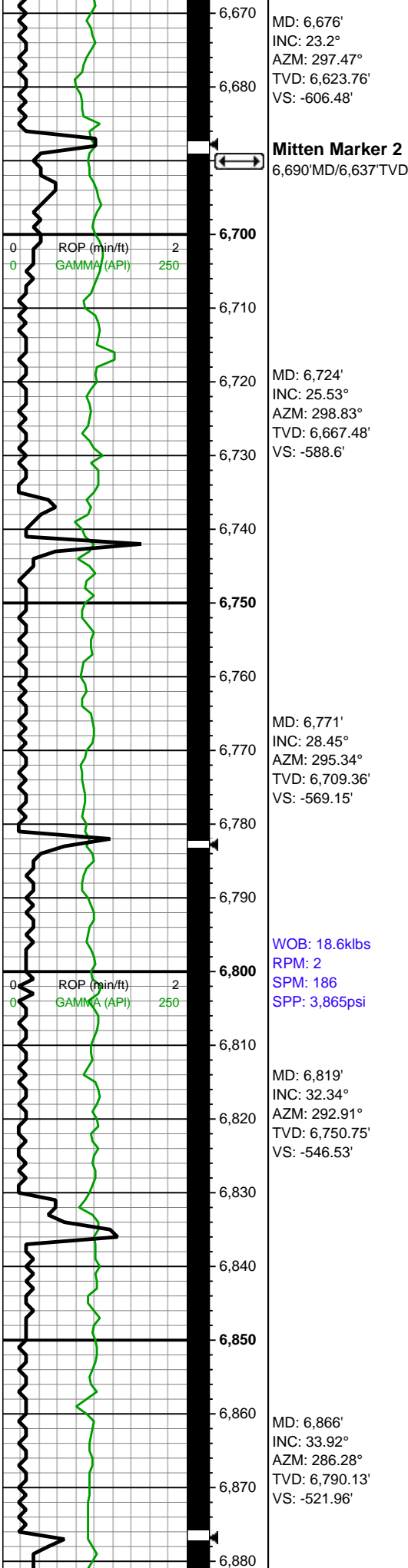
L LITHOGRAPHIC
MX MICROXLN
MS MUDSTONE
PS PACKSTONE
WS WACKESTONE

Sorting

M MODERATE
P POOR
W WELL







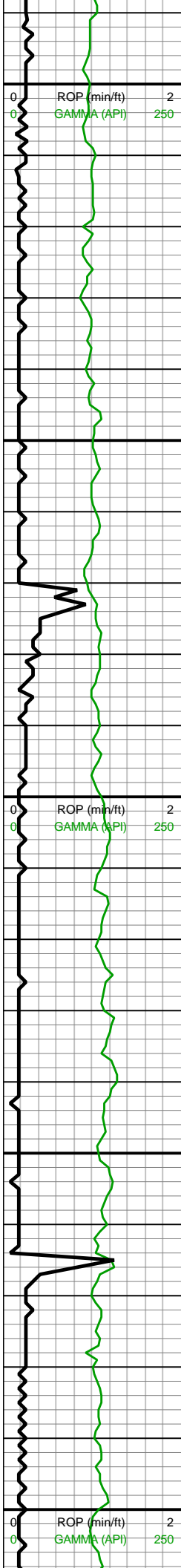
6650-6700 SLTY SH
(85%): predy
gyshbn-med gy, frm-brit,
sb blkyl-sb plty, slty-sm
tex; SLTST (15%): dk gy,
blkyl, frm-sl hrd, rgh-slty
tex, wk calc

6700-6750 SLTY SH
(90%): predy gyshbn-mot
lt gy, frm-brit, sb blkyl-sb
plty, slty-sm tex; SLTST
(10%): dk gy, blkyl,
frm-hrd, rgh-slty tex, wk
calc

6750-6800 SH (100%):
gyshbn, mot med gy, tr dk
gy, frm, brit ip, sb blkyl-sb
plty, slty-sl sm tex, non
calc

6800-6850 SH (100%):
gyshbn, mot med gy, frm,
brit ip, sb blkyl-sb plty,
slty-sm tex, non calc





6,890
6,900
6,910
6,920
6,930
6,940
6,950
6,960
6,970
6,980
6,990
7,000
7,010
7,020
7,030
7,040
7,050
7,060
7,070
7,080
7,090
7,100

MD: 6,913'
INC: 35.77°
AZM: 280.26°
TVD: 6,828.71'
VS: -495.58'

MD: 6,960'
INC: 38.56°
AZM: 273.74°
TVD: 6,866.17'
VS: -467.3'

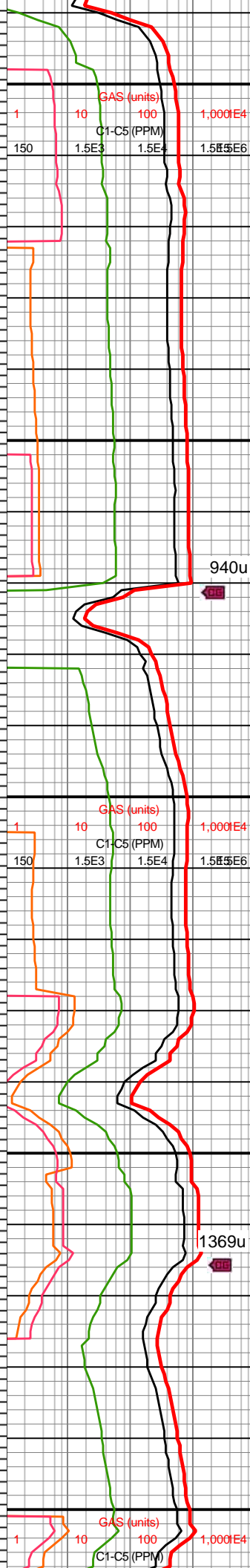
WOB: 25.6klbs
RPM: 0
SPM: 184
SPP: 3.958psi

MD: 7,008'
INC: 43.05°
AZM: 273.54°
TVD: 6,902.5'
VS: -435.94'

MW IN: 10
VIS IN: 52
MW OUT: 9.8+
VIS OUT: 48

MD: 7,055'
INC: 48.5°
AZM: 273.26°
TVD: 6,935.27'
VS: -402.27'

MD: 7,103'
INC: 53.16°
AZM: 271.36°
TVD: 6,965.58'
VS: -365.08'



6850-6900 SH (100%):
gyshbn, mot lt-med gy,
frm-brit, sb blk-y-sb plty,
sity-sm tex, non calc

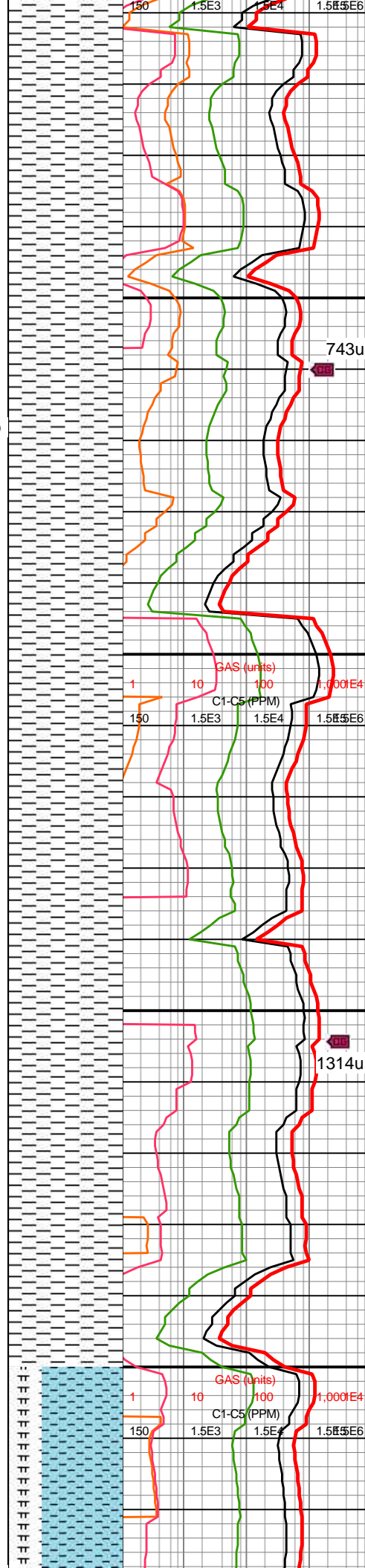
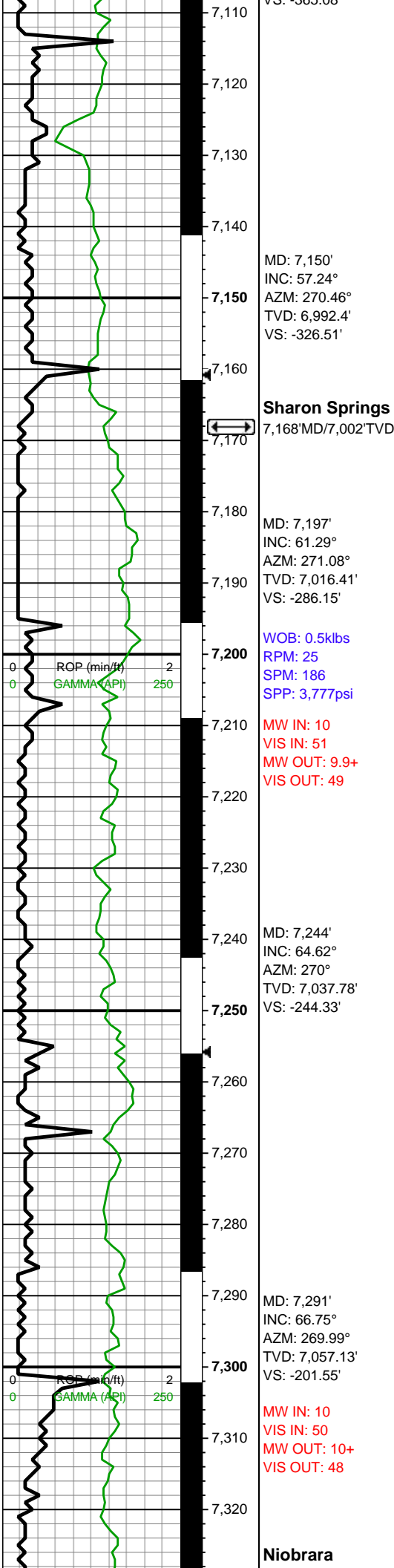
6900-6950 SH (100%):
predy gyshbn, sme lt gy,
tr dk gy, frm-brit, sb
blk-y-sb plty, sity-sm tex,
non calc, tr diss pyr

6950-7000 SH (100%):
predy gyshbn, sme mot lt
gy, frm-brit, sb blk-y-sb
plty, sity-sm tex, non calc,
sme diss pyr

7000-7050 SH (100%):
mot lt-med gy, sme
gyshbn, frm-brit, sb
blk-y-sb plty, sity-sm tex,
non calc

7050-7100 SH (100%):
mot med gy-gyshbn, tr dk
gy, frm-brit, sb blk-y-sb
plty, sity-sm tex, non calc





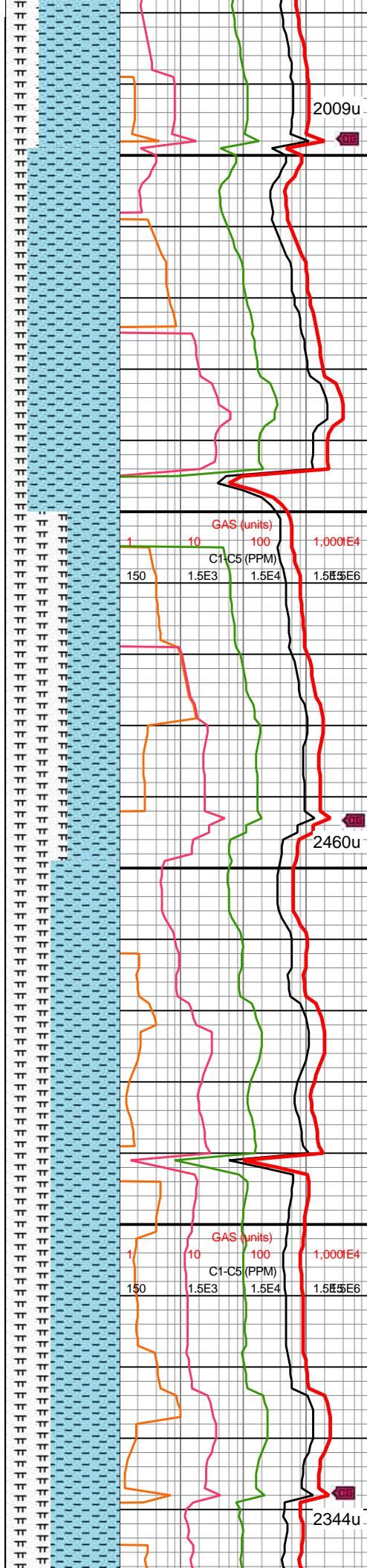
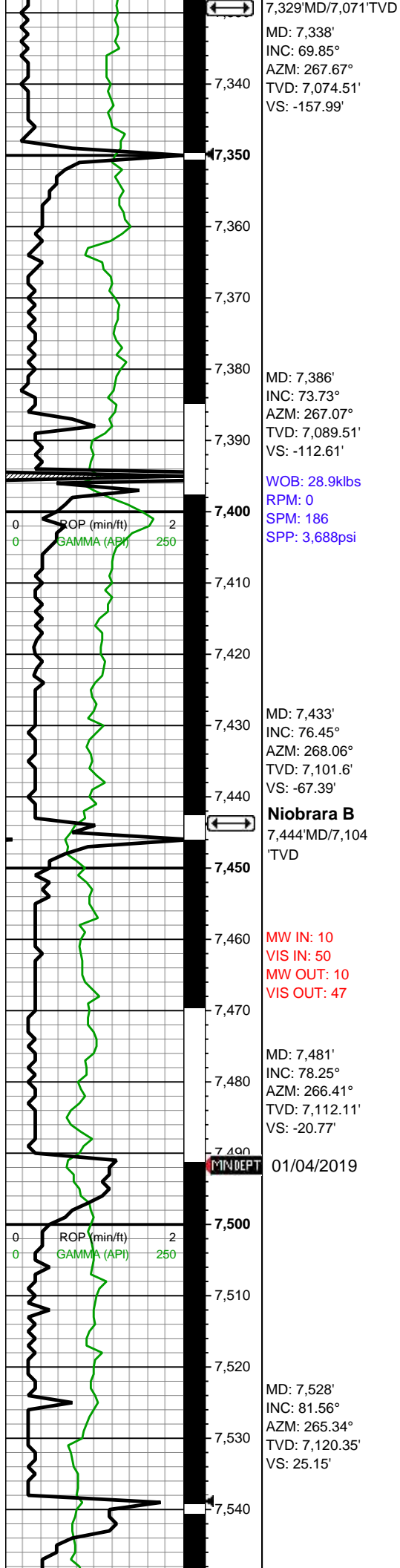
7100-7150 SH (100%):
predy gyshbn, sme lt gy,
tr dk gy, frm-brit, sb
blky-sb plty, slty-sm tex,
non calc, tr dissim pyr

7150-7200 SH (100%):
predy gyshbn, sme mot lt
gy, frm-brit, sb blky-sb
plty, slty-sm tex, non calc,
sme dissim pyr

7200-7250 SH (100%):
dk gy-mot med gy,
frm-brit, sb blky-sb plty,
sme v thn lam, non calc

7250-7300 SH (100%):
dk gy-mot med gy,
frm-brit, sb blky-sb plty,
sme v thn lam, non calc

7300-7350 CHK (70%):
mot lt gy, sm gyshbn, sb



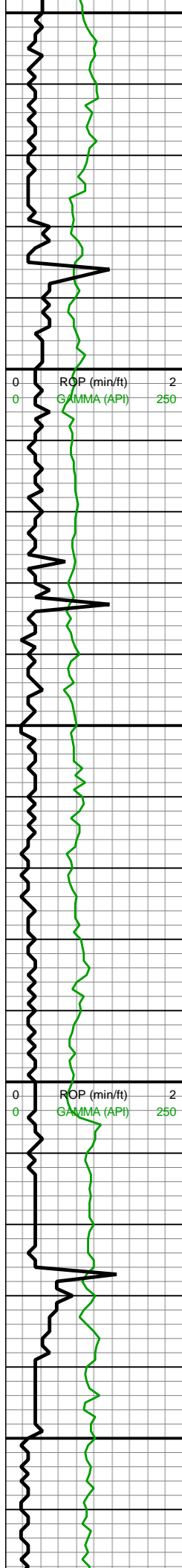
mot lt gy, sm gysnbn, sb
blky, sl frm-brit, tr MRLST
incl, sm chky tex, v calc;
MRLST (30%): dk gy-med
gy, frm, sb blky-sb ang, tr
intbd CHK, mod calc, tr
free pyr

7350-7400 CHK (80%):
mot lt gy-gyshbn, sb blky,
sl frm-brit, tr MRLST incl,
sm chky tex, v calc;
MRLST (20%): med gy, tr
dk gy, frm, sb blky-sb
ang, tr intbd CHK, mod
calc, tr free pyr

7400-7450 MRLST
(55%): dk gy, frm, sb
blky-sb ang, tr intbd CHK,
mod calc; CHK (45%):
mot lt gy-med gy, sb blky,
sl frm-brit, tr MRLST incl,
sm chky tex, v calc

7450-7500 CHK (60%):
mot lt gy-med gy, sb blky,
frm-brit, tr MRLST incl,
sm chky tex, v calc;
MRLST (40%): dk gy,
frm-sl hrd, sb blky-sb
ang, tr intbd CHK, mod
calc

7500-7550 CHK (60%):
mot lt gy-med gy, sb blky,
frm-brit, tr MRLST incl,
sm chky tex, v calc;
MRLST (40%): dk gy,
frm-sl hrd, sb blky-sb
ang, tr intbd CHK, mod
calc



MD: 7,575'
INC: 86.39°
AZM: 263°
TVD: 7,125.28'
VS: 71.35'

MW IN: 10
VIS IN: 59
MW OUT: 10
VIS OUT: 46

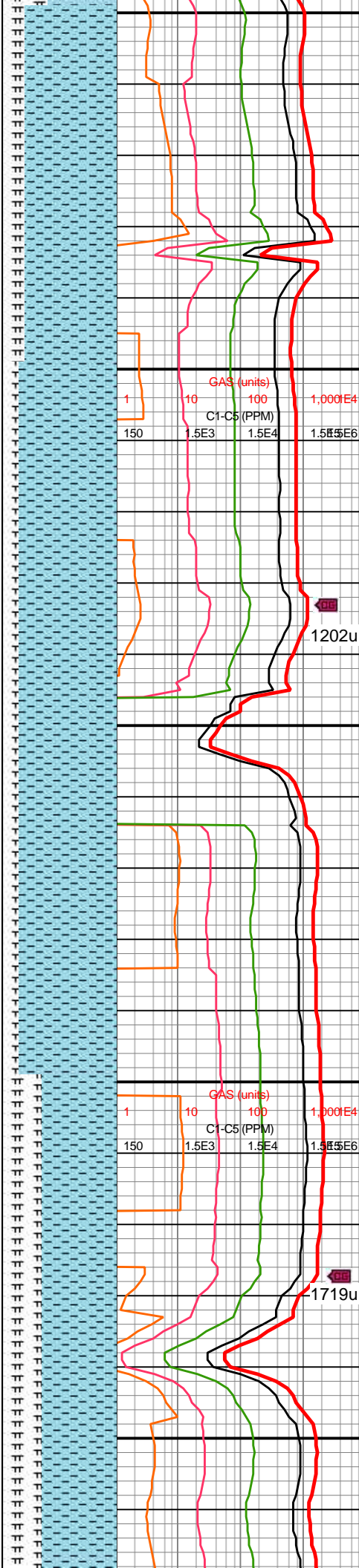
WOB: 47.4klbs
RPM: 0
SPM: 186
SPP: 4,042psi

Curve Landed
@ 7,630' MD

MD: 7,669'
INC: 93.29°
AZM: 263.98°
TVD: 7,125.54'
VS: 164.06'

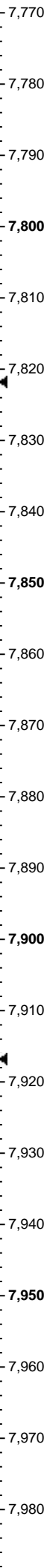
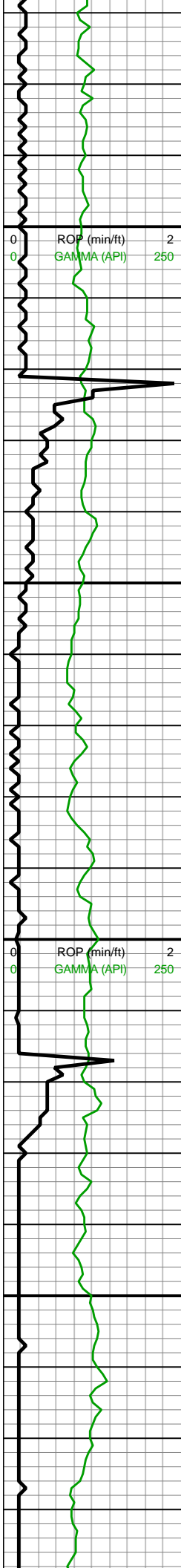
MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

MD: 7,764'
INC: 92.09°
AZM: 265.59°
TVD: 7,121.08'



7550-7600 CHK (80%):
mot lt gy, sme med gy, sb
blky, frm-brit, MRLST incl,
sm chky tex, v calc;
MRLST (20%): dk gy,
frm-sl hrd, sb blky-sb
ang, tr intbd CHK, mod
calc, tr free pyr

7600-7700 CHK (85%):
mot lt gy, sb blky-sb plty,
frm-brit, sme MRLST incl,
sm chky tex, v calc, tr
imbd pyr; MRLST (15%):
dk gy, frm-hrd, sb blky-sb
ang, sme intbd CHK,
mod calc

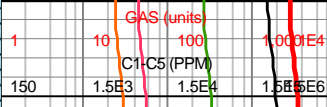


WOB: 35.7kls
RPM: 50
SPM: 188
SPP: 4,319psi

MD: 7,859'
INC: 89.67°
AZM: 268.17°
TVD: 7,119.62'
VS: 352.49'

MD: 7,953'
INC: 89.16°
AZM: 268.79°
TVD: 7,120.58'
VS: 446.22'

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 46

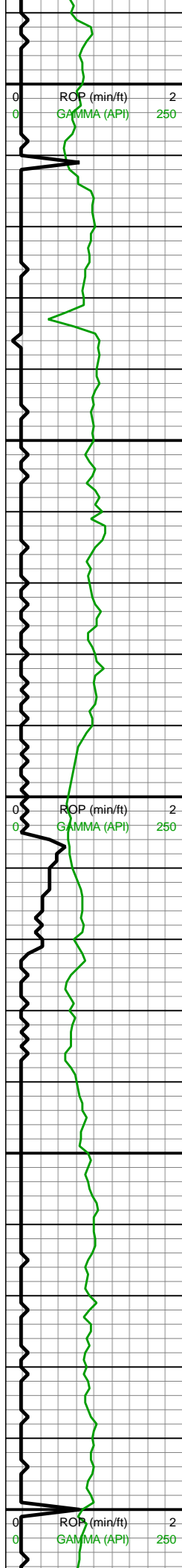


7700-7800 CHK (65%):
mot lt-med gy, sb blk-y-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc, tr imbd pyr; MRLST
(35%): dk gy, frm-hrd, sb
blk-y-sb ang, sme intbd
CHK, mod calc

7800-7900 CHK (75%):
mot med gy, sb blk-y-sb
plty, frm-brit, sme MRLST
incl, sl sm chky tex, v
calc, rr imbd pyr; MRLST
(25%): dk gy, frm-hrd, sb
blk-y-sb ang, sme intbd
CHK, mod calc

7900-8000 CHK (70%):
mot med gy, sb blk-y-sb
plty, frm-brit, sme MRLST
incl, sl sm chky tex, v





7,990
8,000
8,010
8,020
8,030
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
8,120
8,130
8,140
8,150
8,160
8,170
8,180
8,190
8,200

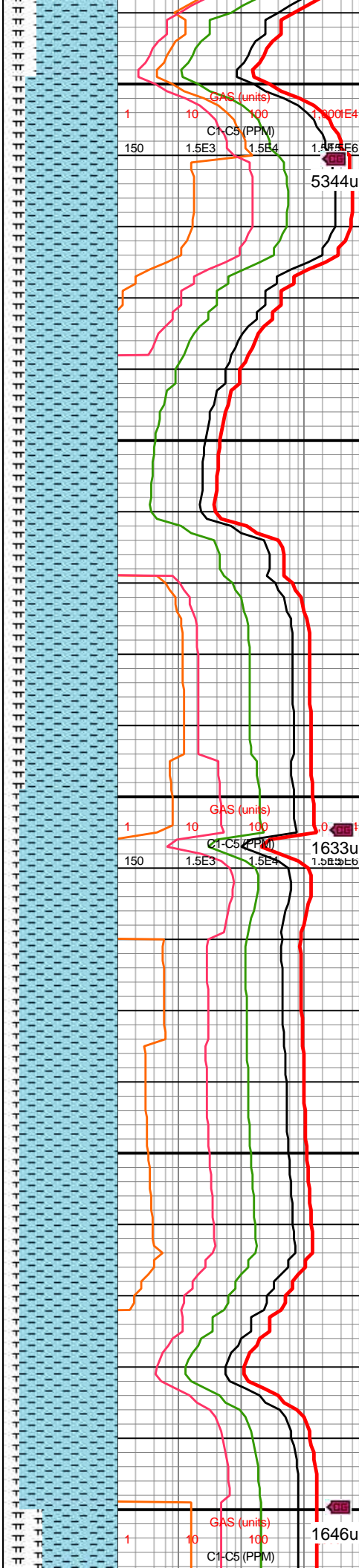
WOB: 40.9klbs
RPM: 54
SPM: 188
SPP: 4,468psi

MD: 8,047'
INC: 88.8°
AZM: 268.23°
TVD: 7,122.26'
VS: 539.94'

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 46

MD: 8,142'
INC: 89.26°
AZM: 269.99°
TVD: 7,123.87'
VS: 634.73'

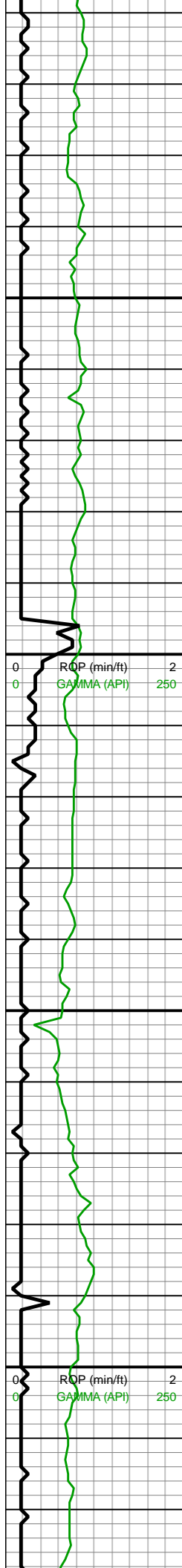
WOB: 29.5klbs
RPM: 55
SPM: 188
SPP: 3,975psi



calc, rr imbd pyr; MRLST
(30%): dk gy, frm-hrd, sb
blky-sb ang, sme intbd
CHK, mod calc

8000-8100 CHK (80%):
mot lt gy, sb blky-sb plty,
frm-brit, sme MRLST incl,
sm chky tex, v calc, tr
imbd pyr; MRLST (20%):
dk gy, frm-hrd, sb blky-sb
ang, sme intbd CHK,
mod calc

8100-8200 CHK (85%):
mot lt gy, sb blky-sb plty,
frm-brit, sme MRLST incl,
sm chky tex, v calc, tr
imbd pyr; MRLST (15%):
dk gy, frm-hrd, sb blky-sb
ang, sme intbd CHK,
mod calc



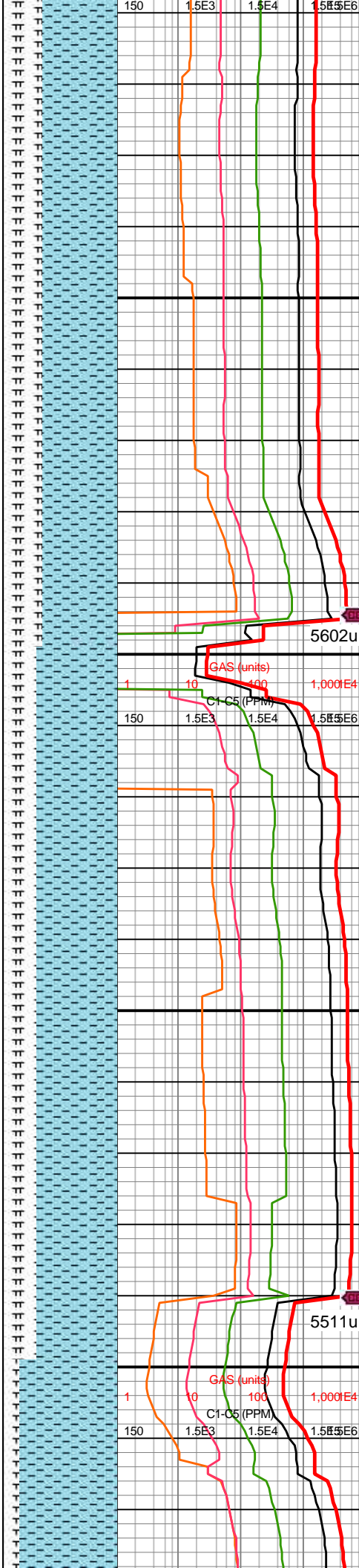
MD: 8,237'
INC: 88.96°
AZM: 269.25°
TVD: 7,125.34'
VS: 729.57'

MD: 8,331'
INC: 88.52°
AZM: 271.64°
TVD: 7,127.41'
VS: 823.46'

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 46

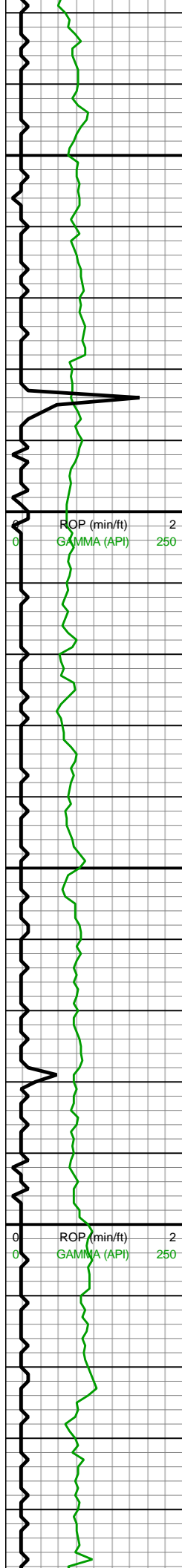
WOB: 42.5klbs
RPM: 54
SPM: 188
SPP: 4,626psi

MD: 8,426'
INC: 88.61°
AZM: 271.63°



8200-8300 CHK (65%):
mot lt-med gy, sb blk-y-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc, tr imbd pyr; MRLST
(35%): dk gy, frm-hrd, sb
blk-y-sb ang, sme intbd
CHK, mod calc

8300-8400 CHK (70%):
mot lt-med gy, sme
gyshbn, sb blk-y-sb plty, sl
frm-brit, sme MRLST incl,
sm chky tex, v calc, tr
imbd pyr; MRLST (30%):
dk gy, frm-hrd, sb blk-y-sb
ang, sme intbd CHK,
mod calc



8,430
8,440
8,450
8,460
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
8,560
8,570
8,580
8,590
8,600
8,610
8,620
8,630
8,640

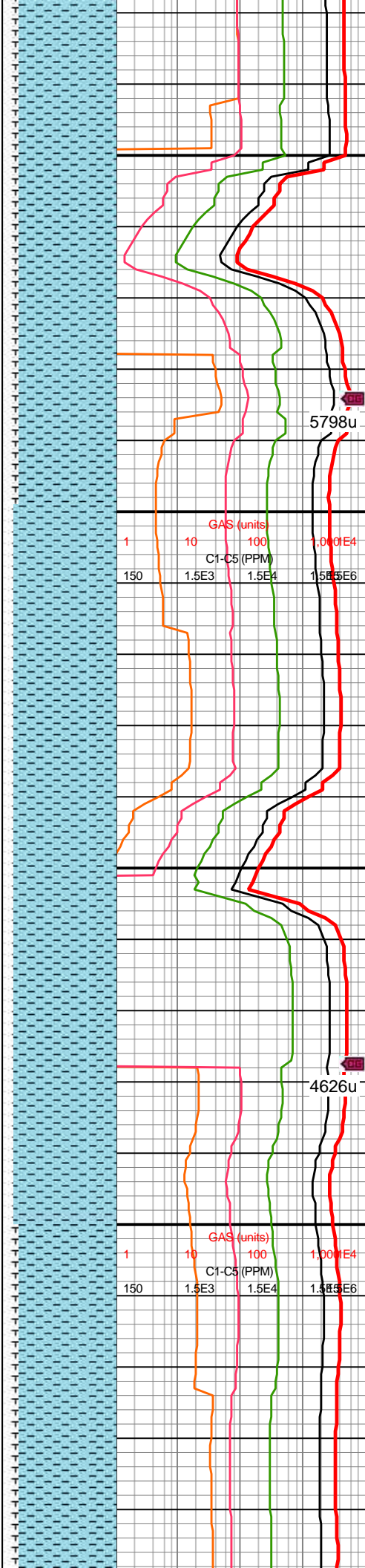
TVD: 7,129.79'
VS: 918.41'

MW IN: 10
VIS IN: 49
MW OUT: 10
VIS OUT: 47

MD: 8,520'
INC: 88.39°
AZM: 271.44°
TVD: 7,132.25'
VS: 1,012.36'

WOB: 38.3klbs
RPM: 55
SPM: 188
SPP: 4,668psi

MD: 8,614'
INC: 87.91°
AZM: 271.22°
TVD: 7,135.28'
VS: 1,106.28'

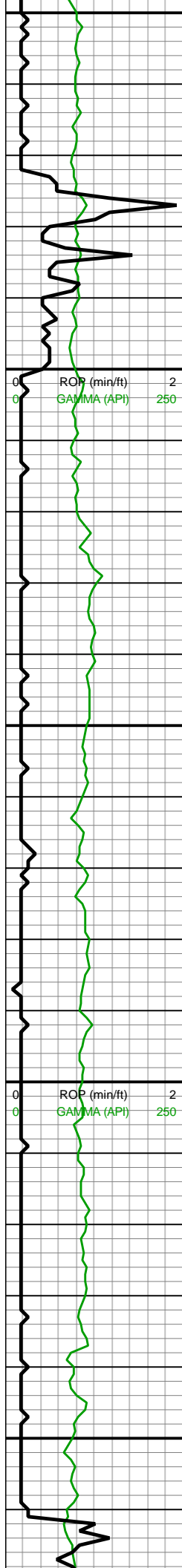


8400-8500 CHK (80%):
predy mot lt-med gy, sb
blky-sb plty, sl frm-brit,
sme MRLST incl, sm
chky tex, v calc; MRLST
(20%): dk gy, frm-hrd, sb
blky-sb ang, sme intbd
CHK, mod calc

5798u

8500-8600 CHK (90%):
predy mot lt-med gy, sme
mot gysbhn, sb blky-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc; MRLST (10%): dk
gy, frm-hrd, sb blky-sb
ang, sme intbd CHK,
mod calc

4626u



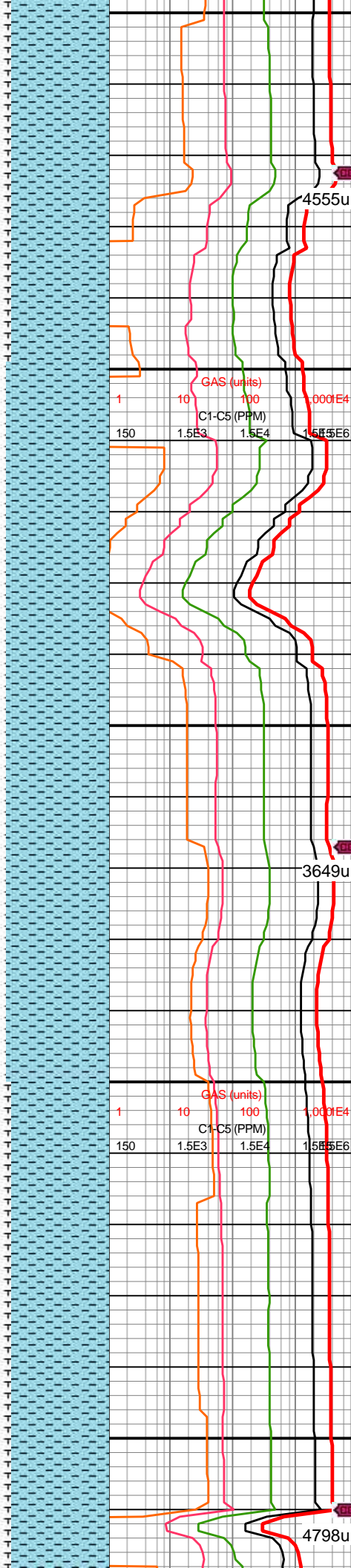
MW IN: 10.1+
VIS IN: 49
MW OUT: 10
VIS OUT: 47

MD: 8,709'
INC: 89.32°
AZM: 272.28°
TVD: 7,137.58'
VS: 1,201.23'

WOB: 36.4klbs
RPM: 55
SPM: 188
SPP: 4,719psi

MD: 8,803'
INC: 89.07°
AZM: 272.35°
TVD: 7,138.9'
VS: 1,295.22'

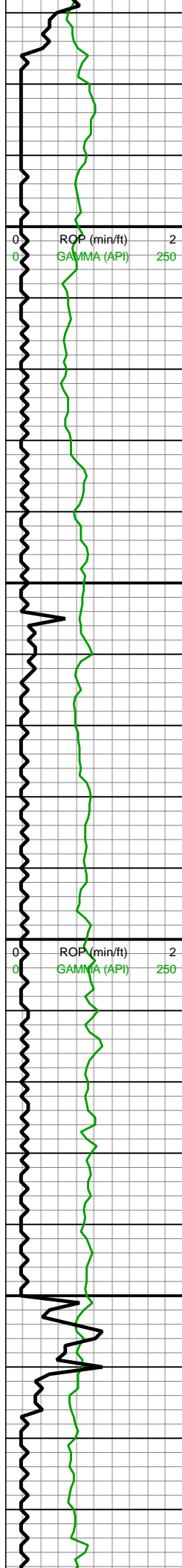
MW IN: 10.1+
VIS IN: 48



8600-8700 CHK (90%):
predy mot med gy, sme
mot lt gy, sb blkgy-sb plty,
sl frm-brit, sme MRLST
incl, sm chky tex, v calc;
MRLST (10%): dk gy,
frm-hrd, sb blkgy-sb ang,
sme intbd CHK, mod
calc

8700-8800 CHK (90%):
mot med gy, sb blkgy-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc; MRLST (10%): v dk
gy, frm-hrd, sb blkgy-sb
ang, sme intbd CHK,
mod calc

8800-8900 CHK (90%)



MW OUT: 10.1+
VIS OUT: 47

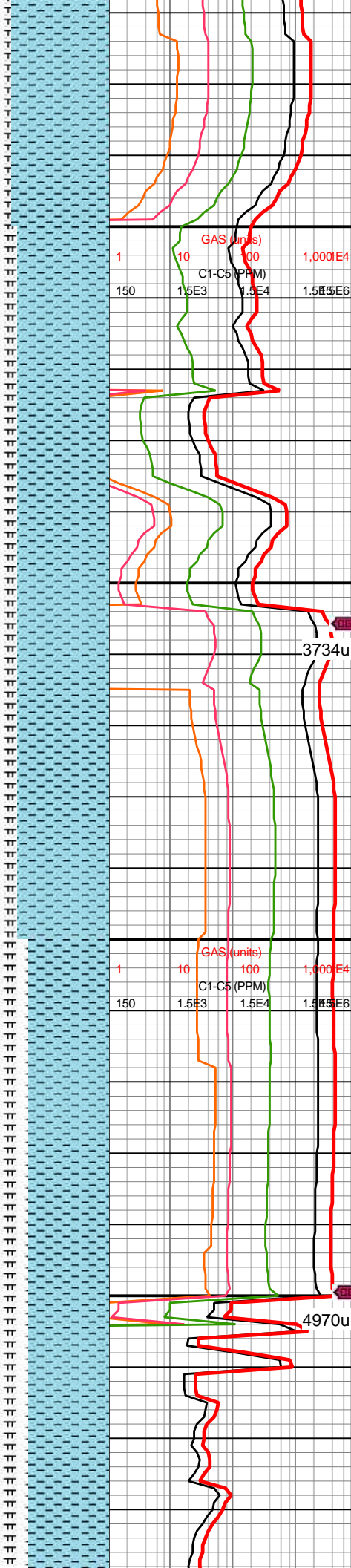
MD: 8,897'
INC: 90.45°
AZM: 271.5°
TVD: 7,139.29'
VS: 1,389.2'

MD: 8,992'
INC: 90.62°
AZM: 271.7°
TVD: 7,138.41'
VS: 1,484.18'

WOB: 40.8klbs
RPM: 50
SPM: 188
SPP: 4,659psi

MW IN: 10.1+
VIS IN: 48
MW OUT: 10.1+
VIS OUT: 47

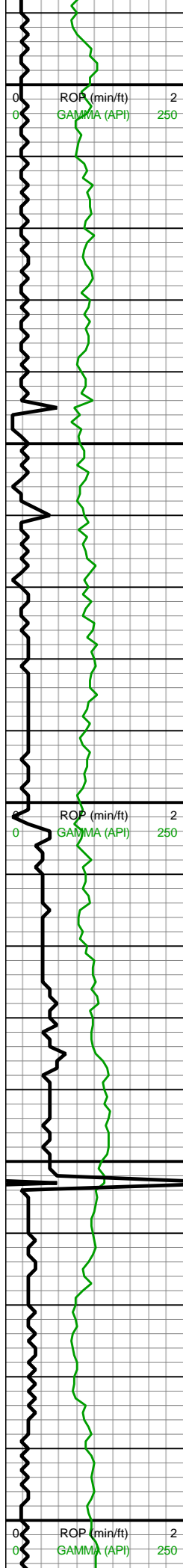
MD: 9,088'
INC: 90.05°
AZM: 269.5°



8800-8900 CHK (85%):
mot med gy, sme mot lt
gy-mot gyshbn, sb
blky-sb plty, sl frm-brit,
sme MRLST incl, sm
chky tex, v calc; MRLST
(15%): v dk gy, frm-hrd,
sb blky-sb ang, sme
intbd CHK, mod calc, tr
mic pyr

8900-9000 CHK (80%):
predy mot med gy-mot lt
gy, sme mot gyshbn, sb
blky-sb plty, sl frm-brit,
sme MRLST incl, sm
chky tex, v calc; MRLST
(20%): v dk gy, frm-hrd,
sb blky-sb ang, sme
intbd CHK, mod calc

9000-9100 CHK (70%):
gyshbn, mot-sl stri, sb
blky, sl frm, tr MRLST
lamn, sm chky tex, v calc;
MRLST (30%): dk gy-dk



AZM: 269.3
TVD: 7,137.84'
VS: 1,580.1'

9,100

9,110

9,120

9,130

9,140

9,150

9,160

9,170

9,180

9,190

9,200

9,210

9,220

9,230

9,240

9,250

9,260

9,270

9,280

9,290

9,300

Bit #: 2
Type: U516M
Size: 8 1/2
Depth In: 9,145"
Depth Out: 11,830"
Hours: 10.5 hrs
Avg Ft/Hr: 255.71 /hr
Jets: 6x13
S/N: 45708

MD: 9,183'
INC: 89.76°
AZM: 268.92°
TVD: 7,138'
VS: 1,674.92'

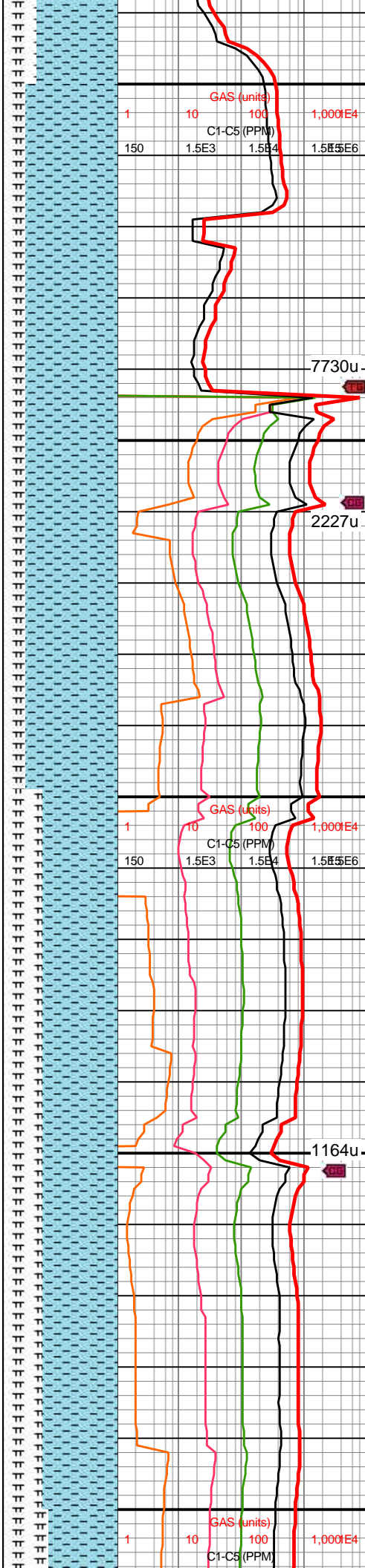
WOB: 29.6klbs
RPM: 59
SPM: 186
SPP: 4,812psi

MW IN: 10.4
VIS IN: 63
MW OUT: 10.3+
VIS OUT: 53

MD: 9,277'
INC: 88.86°
AZM: 268.72°
TVD: 7,139.13'
VS: 1,768.68'

MINDEPT

01/05/2018



MRLST (50%): dk gy-dk
gyshbn, mot, hd-frm, sb
blky, tr intbd CHK, mod
calc, occ pyr nod

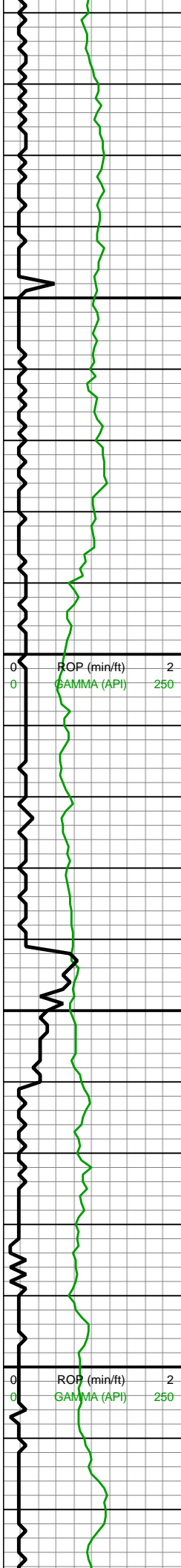
7730u

2227u

9100-9200 CHK (80%):
predy mot med gy-mot lt
gy, sme mot gyshbn, sb
blky-sb plty, sl frm-brit,
sme MRLST incl, sm
chky tex, v calc; MRLST
(20%): v dk gy, frm-hrd,
sb blky-sb ang, sme
intbd CHK, mod calc

1164u

9200-9300 CHK (65%):
med gyshbn, mot-sl stri,
sb blky, sl frm, tr MRLST
lamn, sm chky tex, v calc;
MRLST (35%): dk gy-dk
gyshbn, mot, hd-frm, sb
blky, tr intbd CHK, mod
calc, tr pyr nod

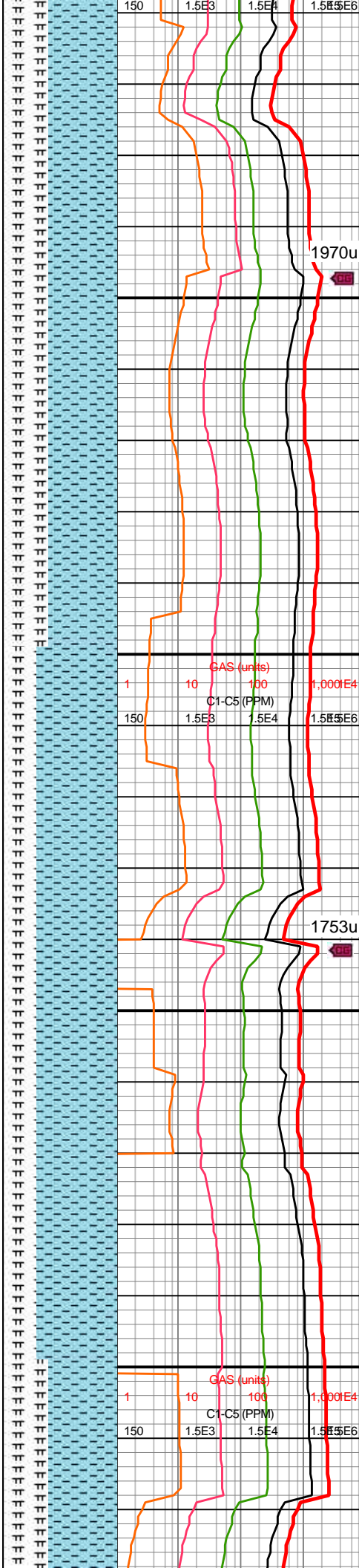


MD: 9,371'
INC: 88.08°
AZM: 268.37°
TVD: 7,141.64'
VS: 1,862.39'

WOB: 40klbs
RPM: 65
SPM: 192
SPP: 5,132psi

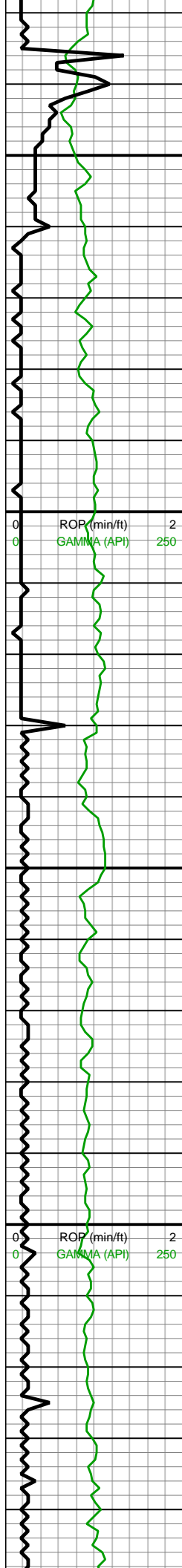
MD: 9,466'
INC: 89.32°
AZM: 269.05°
TVD: 7,143.8'
VS: 1,957.12'

MW IN: 10.4
VIS IN: 57
MW OUT: 10.4
VIS OUT: 51



9300-9400 CHK (60%):
mot med gy, sme mot lt
gy, blk-y-sb blk-y, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (40%): dk
gy-v dk gy, mot, hd-frm,
sb blk-y, tr intbd CHK,
mod calc

9400-9500 CHK (70%):
mot med gy, sb blk-y-sb
plty, frm-brit, sme MRLST
incl, sl sm chky tex, v
calc, rr imbd pyr; MRLST
(30%): dk gy, frm-hrd, sb
blk-y-sb ang, sme intbd
CHK, mod calc



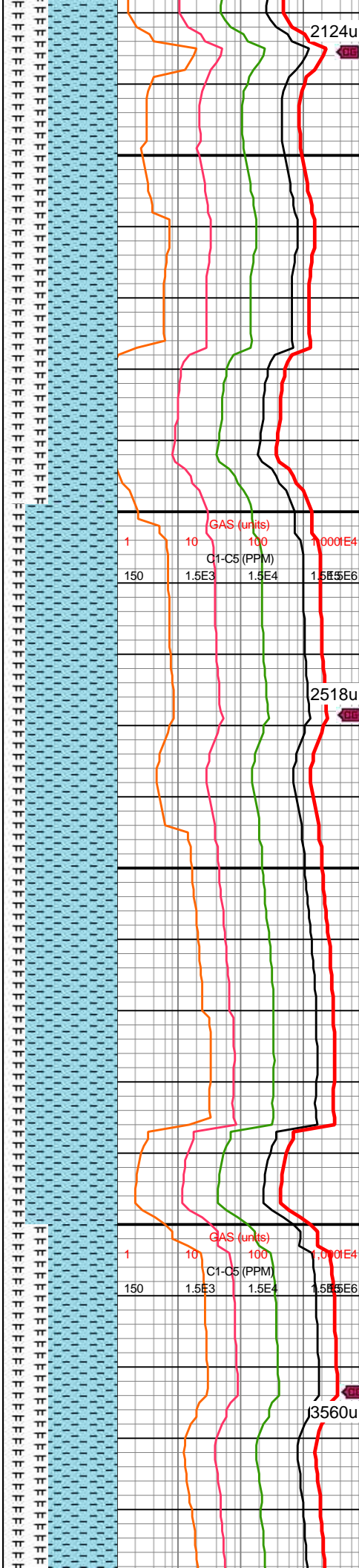
MD: 9,560'
INC: 91.01°
AZM: 269.99°
TVD: 7,143.53'
VS: 2,050.96'

WOB: 39.9kibs
RPM: 65
SPM: 191
SPP: 5,314psi

MD: 9,655'
INC: 91.01°
AZM: 270.55°
TVD: 7,141.85'
VS: 2,145.86'

MW IN: 10.4
VIS IN: 53
MW OUT: 10.4+
VIS OUT: 48

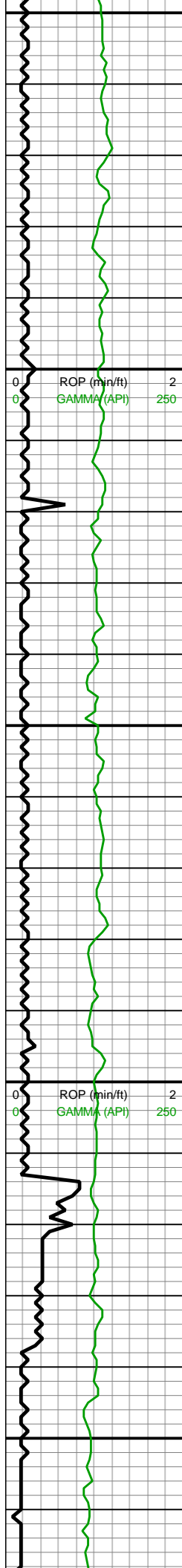
MD: 9,749'
INC: 90.31°



9500-9600 CHK (60%):
mot med gy, sme mot lt
gy, blk-y-sb blk-y, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (40%): dk
gy-v dk gy, mot, hd-frm,
sb blk-y, tr intbd CHK,
mod calc

9600-9700 CHK (80%):
mot lt gy-mot med gy,
blk-y-sb blk-y, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (20%): dk
gy, mot, hd-frm, sb blk-y, tr
intbd CHK, mod calc





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
9,950
9,960

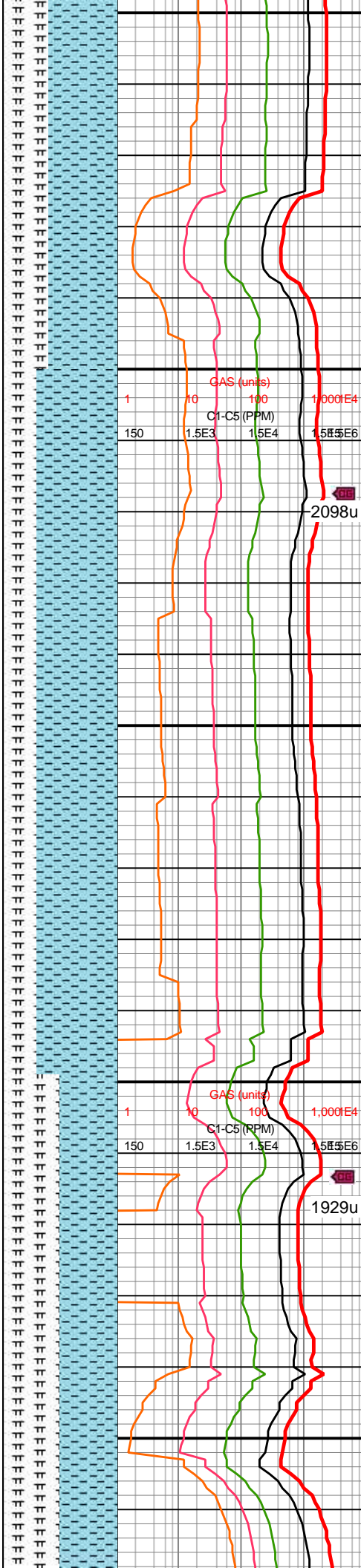
AZM: 270.19°
TVD: 7,140.77'
VS: 2,239.77'

WOB: 41.8klbs
RPM: 65
SPM: 192
SPP: 5,151psi

MD: 9,843'
INC: 89.56°
AZM: 269.79°
TVD: 7,140.88'
VS: 2,333.65'

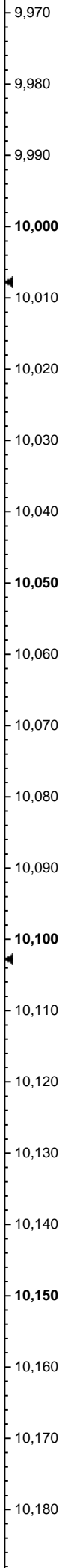
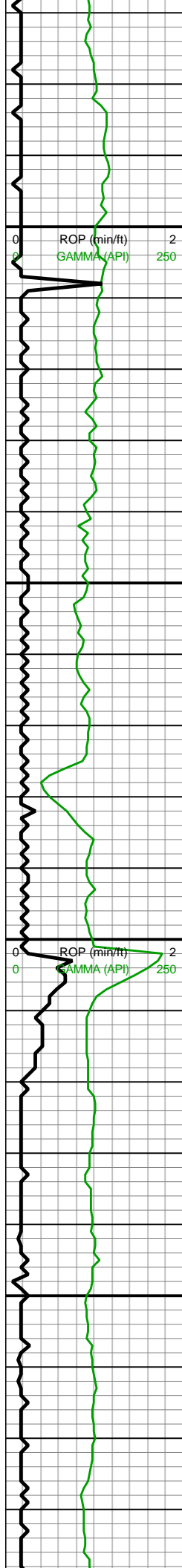
MW IN: 10.4
VIS IN: 52
MW OUT: 10.4
VIS OUT: 48

MD: 9,938'
INC: 90.37°
AZM: 271.95°
TVD: 7,140.94'
VS: 2,428.59'



9700-9800 CHK (60%):
mot lt gy-mot med gy,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (40%): dk
gy, mot, hd-frm, sb blky, tr
intbd CHK, mod calc

9800-9900 CHK (70%):
predy mot med gy-mot lt
gy, sme med gyshbn,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc, tr imbd cal; MRLST
(30%): v dk gy, mot,
hd-frm, sb blky, tr intbd
CHK, mod calc, tr diss
pyr

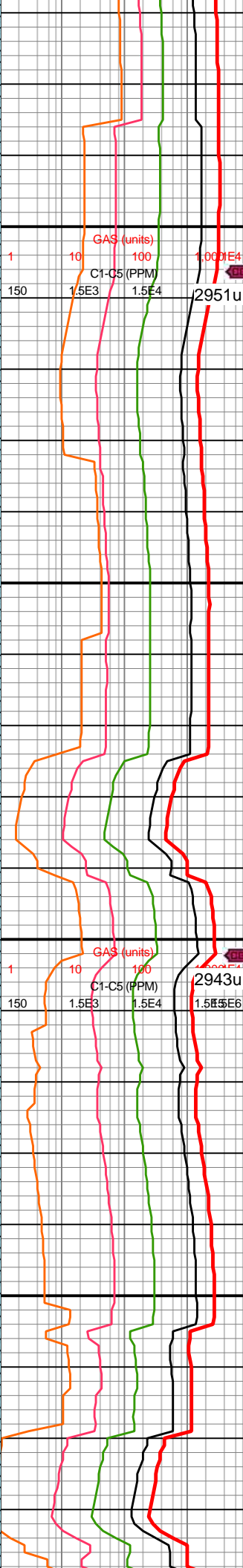
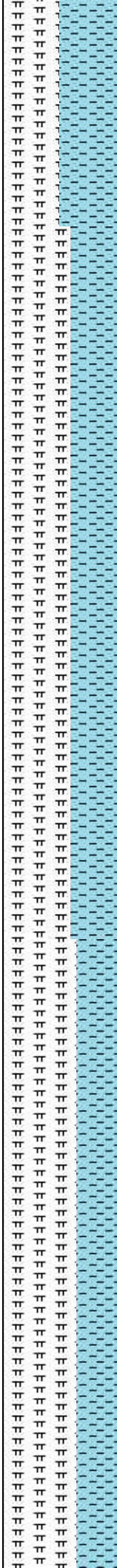


WOB: 41.8klbs
RPM: 65
SPM: 191
SPP: 5,331psi

MD: 10,032'
INC: 89.83°
AZM: 271.7°
TVD: 7,140.77'
VS: 2,522.58'

MD: 10,127'
INC: 91.05°
AZM: 271.8°
TVD: 7,140.04'
VS: 2,617.56'

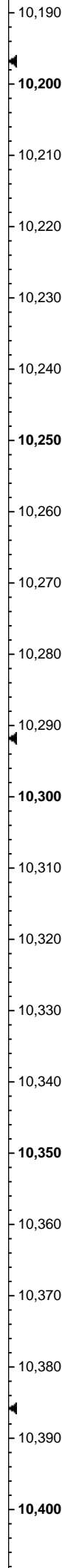
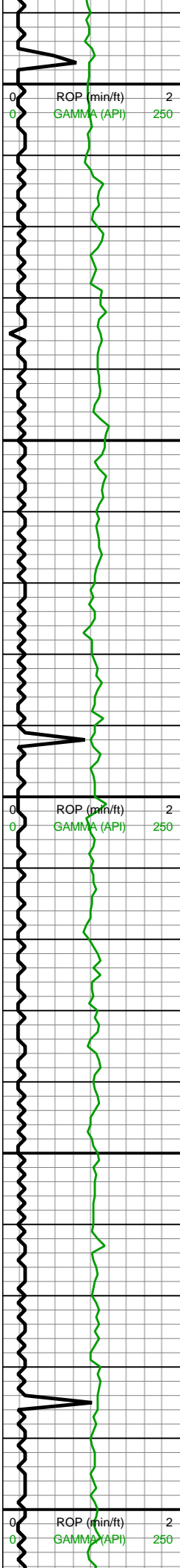
MW IN: 10.1
VIS IN: 51
MW OUT: 10.4
VIS OUT: 48



9900-10000 CHK (50%):
mot lt gy-mot med gy,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (50%): dk
gy, mot, hd-frm, sb blky, tr
intbd CHK, mod calc

10000-10100 MRLST
(60%): dk gy, mot, hd-frm,
sb blky, tr intbd CHK,
mod calc; CHK (40%):
mot lt gy-mot med gy,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc

10100-10200 MRLST
(65%): dk gy, mot, hd-frm,
sb blky, tr intbd CHK,
mod calc; CHK (35%):



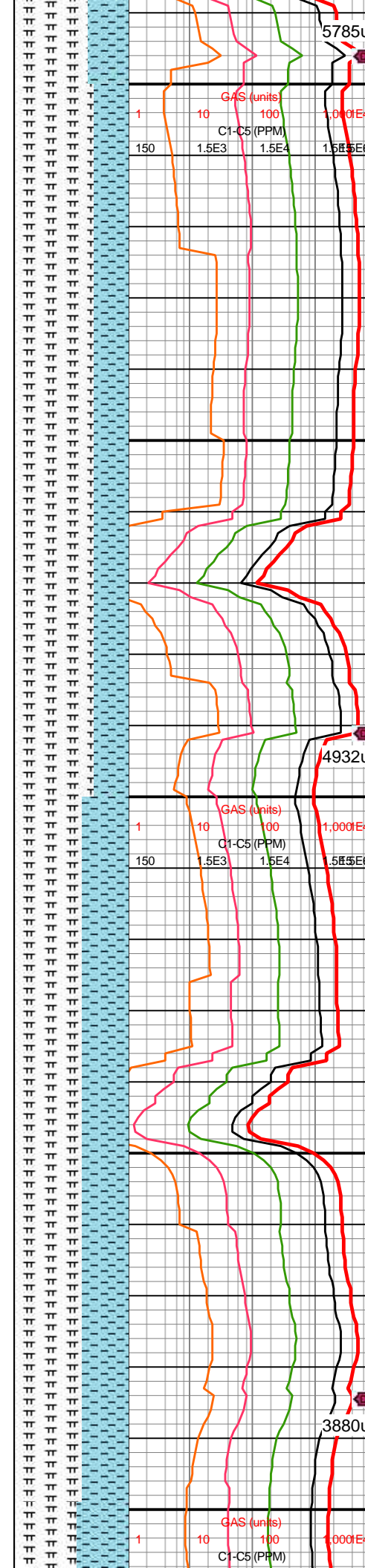
WOB: 39.7klbs
RPM: 65
SPM: 192
SPP: 5,156psi

MD: 10,221'
INC: 90.56°
AZM: 271.52°
TVD: 7,138.72'
VS: 2,711.53'

MD: 10,315'
INC: 89.84°
AZM: 270.97°
TVD: 7,138.39'
VS: 2,805.5'

WOB: 41.6klbs
RPM: 65
SPM: 191
SPP: 5,200psi

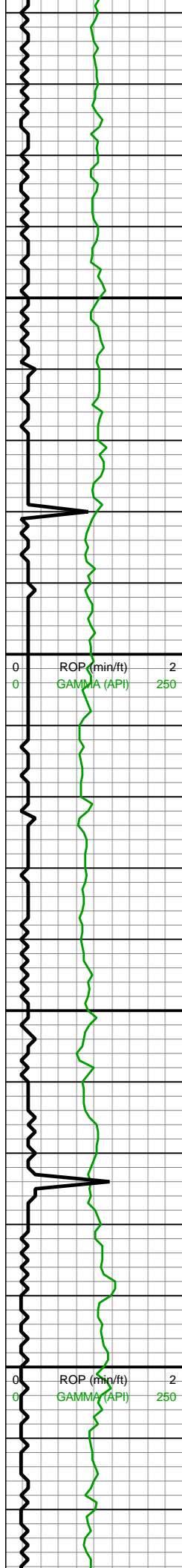
MD: 10,410'
INC: 89.23°



mot med gy-mot gyshbn,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc, rr free pyr

10200-10300 MRLST
(70%): dk gy, mot, hd-frm,
sb blky, tr intbd CHK,
mod calc; CHK (30%):
mot med gy-mot gyshbn,
sme mot lt gy, blky-sb
blky, frm-brit, MRLST incl,
sl sm, chky, v calc, rr free
pyr

10300-10400 MRLST
(60%): dk gy, mot, hd-frm,
sb blky, tr intbd CHK,
mod calc; CHK (40%):
mot med gy, sme mot
gyshbn, blky-sb blky,
frm-brit, MRLST incl, sl
sm, chky, v calc



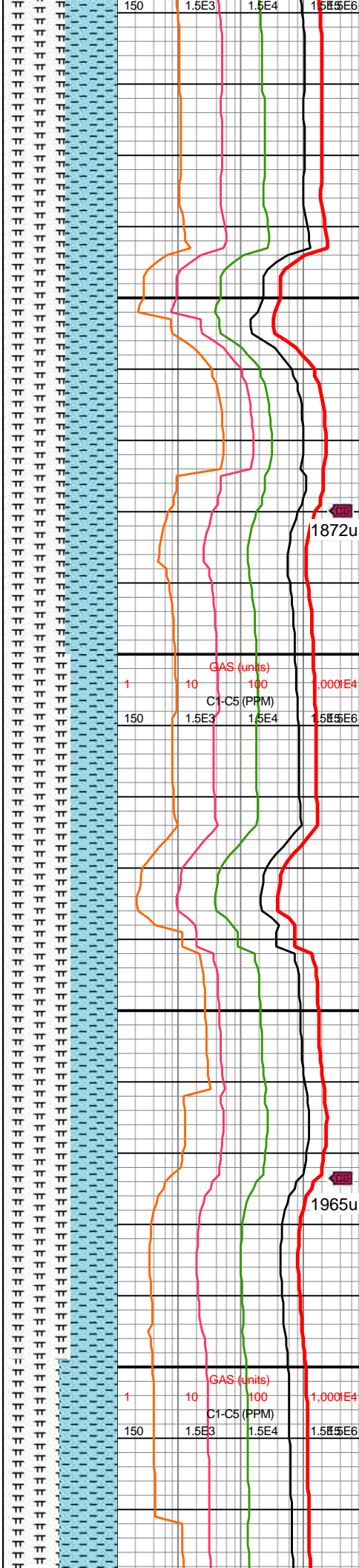
AZM: 270.11°
TVD: 7,139.16'
VS: 2,900.42'

MD: 10,504'
INC: 88.44°
AZM: 269.72°
TVD: 7,141.08'
VS: 2,994.28'

MW IN: 10.4
VIS IN: 50
MW OUT: 10.4
VIS OUT: 48

MD: 10,599'
INC: 87.73°
AZM: 269.68°
TVD: 7,144.25'
VS: 3,089.09'

WOB: 37.1klbs
RPM: 64
SPM: 192
SPP: 5,367psi

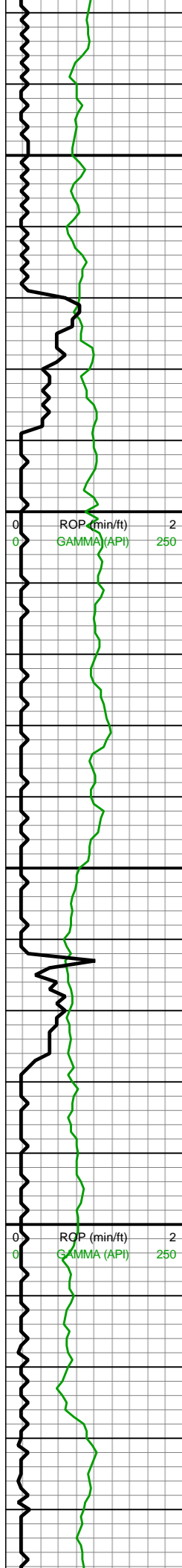


10400-10500 MRLST
(55%): v dk gy-dk gy, mot,
hd frm, sb blk, tr intbd
CHK, mod calc; CHK
(45%): mot med gy-mot lt
gy, blk-sb blk, frm-brit,
MRLST incl, sl sm, chky,
v calc, rr free pyr



10500-10600 MRLST
(55%): v dk gy-dk gy, mot,
hd frm, sb blk, tr intbd
CHK, mod calc; CHK
(45%): mot lt gy-mot med
gy, blk-sb blk, frm-brit,
MRLST incl, sl sm, chky,
v calc, pp pyr





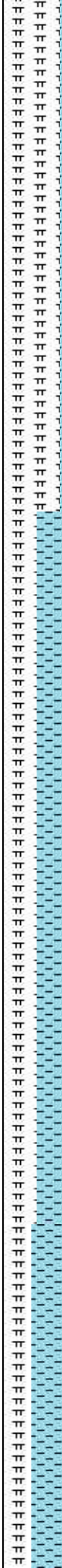
10,630
10,640
10,650
10,660
10,670
10,680
10,690
10,700
10,710
10,720
10,730
10,740
10,750
10,760
10,770
10,780
10,790
10,800
10,810
10,820
10,830
10,840

MD: 10,693'
INC: 89.61°
AZM: 269.66°
TVD: 7,146.43'
VS: 3,182.92'

MW IN: 10.4
VIS IN: 51
MW OUT: 10.4
VIS OUT: 49

MD: 10,788'
INC: 91.14°
AZM: 269.55°
TVD: 7,145.81'
VS: 3,277.77'

WOB: 34.8klbs
RPM: 64
SPM: 192
SPP: 5,453psi

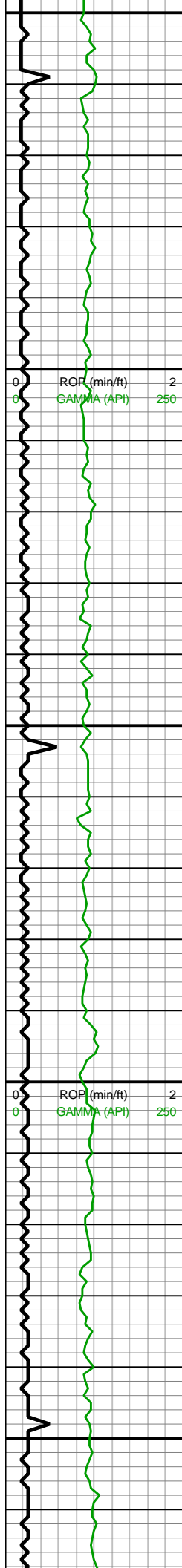


1288u

10600-10700 MRLST
(50%): dk gy, mot, hd-frm,
sb blk, tr intbd CHK,
mod calc; CHK (50%):
mot lt gy-mot med gy,
blk-sb blk, frm-brit,
MRLST incl, sl sm, chky,
v calc

1407u

10700-10800 CHK
(70%): mot med gy-mot lt
gy, blk-sb blk, frm-brit,
MRLST incl, sl sm, chky,
v calc, imbd pyr; MRLST
(30%): dk gy, mot, hd-frm,
sb blk, tr intbd CHK,
mod calc, tr free pyr



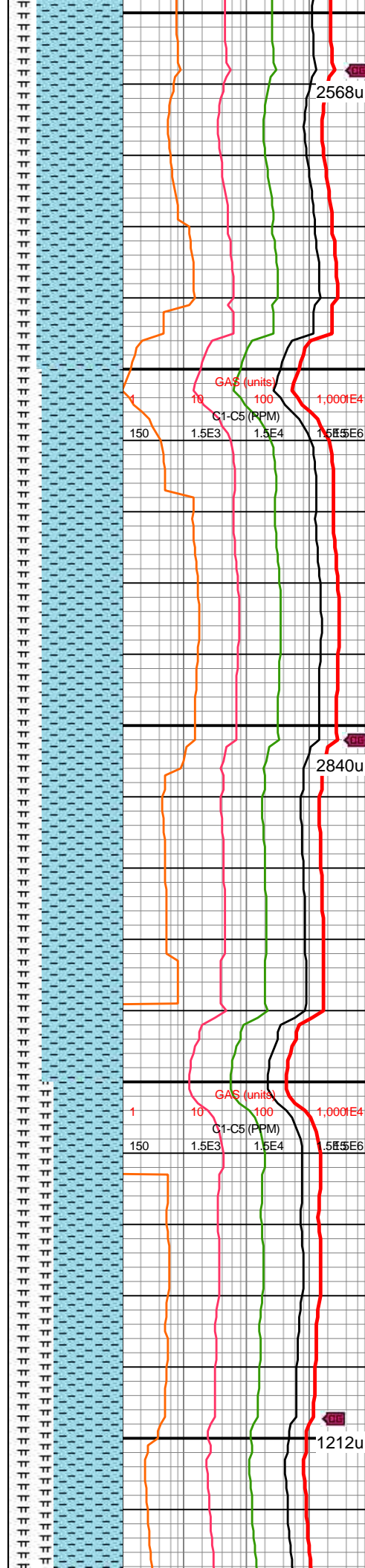
10,850
10,860
10,870
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
10,980
10,990
11,000
11,010
11,020
11,030
11,040
11,050
11,060

MD: 10,883'
INC: 90.77°
AZM: 269.28°
TVD: 7,144.23'
VS: 3,372.59'
MW IN: 10.4
VIS IN: 51
MW OUT: 10.4
VIS OUT: 48

MD: 10,977'
INC: 90.83°
AZM: 268.95°
TVD: 7,142.91'
VS: 3,466.39'

WOB: 40.2klbs
RPM: 65
SPM: 192
SPP: 5,389psi

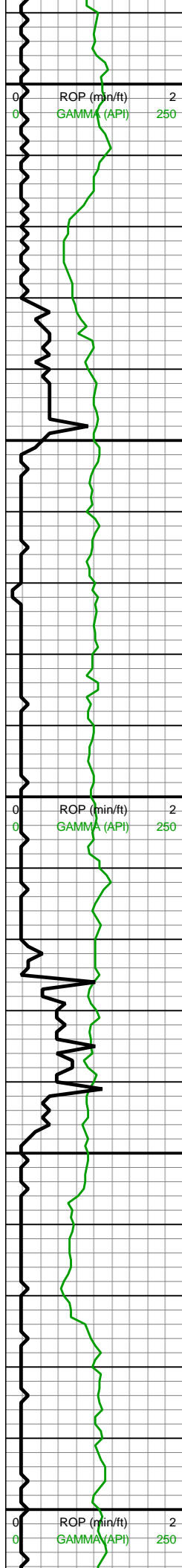
MD: 11,072'
INC: 90.28°



10800-10900 CHK
(75%): predy mot med
gy-mot lt gy, blkly-sb blkly,
frm-brit, MRLST incl, sl
sm, chky, v calc, tr imbd
pyr; MRLST (25%): dk gy,
mot, hd-frm, sb blkly, tr
intbd CHK, mod calc

10900-11000 CHK
(70%): mot med gy, sme
mot lt gy, blkly-sb blkly,
frm-brit, MRLST incl, sl
sm, chky, v calc; MRLST
(30%): dk gy, mot, hd-frm,
sb blkly, tr intbd CHK,
mod calc, rr free pyr





11,290
11,300
11,310
11,320
11,330
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
11,420
11,430
11,440
11,450
11,460
11,470
11,480
11,490
11,500

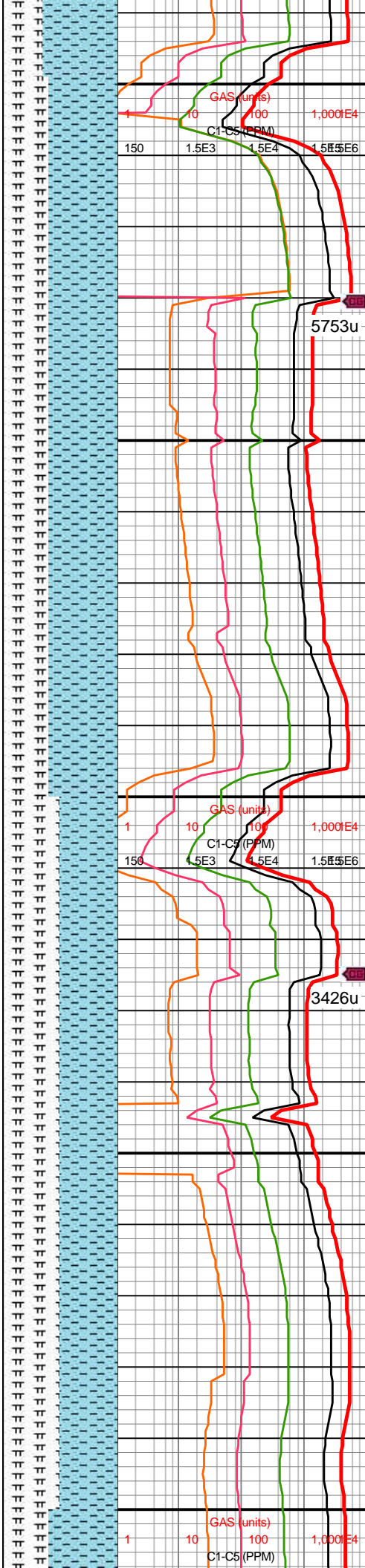
MW IN: 10.4
VIS IN: 51
MW OUT: 10.4
VIS OUT: 49

MD: 11,356'
INC: 88.19°
AZM: 270.33°
TVD: 7,147.96'
VS: 3,842.44'

WOB: 36.1klbs
RPM: 64
SPM: 189
SPP: 5,495psi

MD: 11,450'
INC: 89°
AZM: 271.56°
TVD: 7,150.27'
VS: 3,936.36'

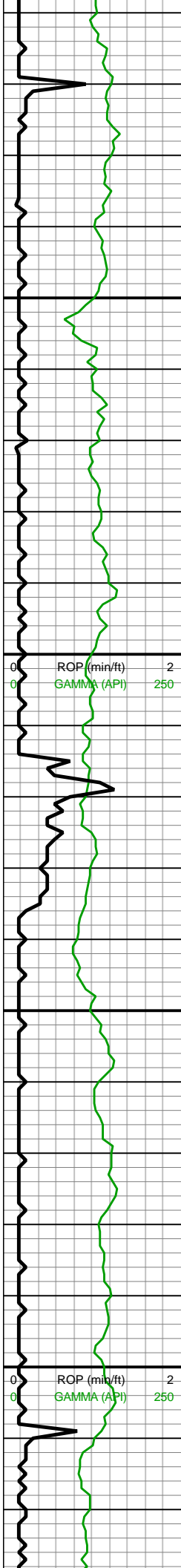
MW IN: 10.4
VIS IN: 50
MW OUT: 10.4
VIS OUT: 49



v calc; MRLST (35%): v dk
gy-dk gy, mot, hd-frm, sb
blky, tr intbd CHK, mod
calc

11300-11400 CHK
(60%): predy mot
med-mot lt med gy,
blky-sb blky, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (40%): v dk
gy-dk gy, mot, hd-frm, sb
blky, tr intbd CHK, mod
calc, tr free pyr

11400-11500 CHK
(50%): predy mot lt-mot
med med gy, blky-sb
blky, frm-brit, MRLST incl,
sl sm, chky, v calc, rr pp
pyr; MRLST (50%): dk gy,
mot, hd-frm, sb blky, tr
intbd CHK, mod calc, rr
free pyr



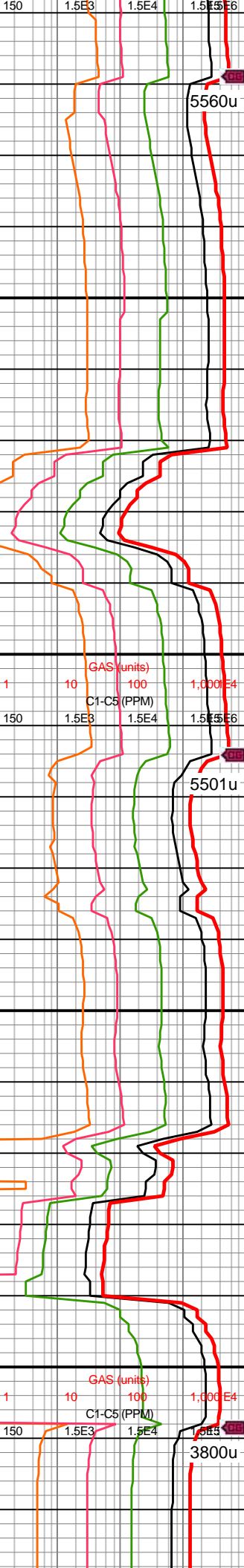
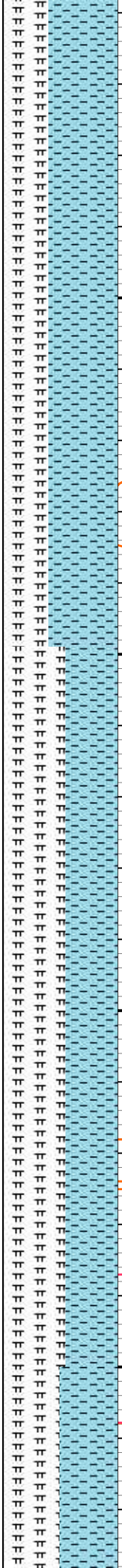
11,510
11,520
11,530
11,540
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
11,640
11,650
11,660
11,670
11,680
11,690
11,700
11,710
11,720

MD: 11,545'
INC: 88.34°
AZM: 271.42°
TVD: 7,152.47'
VS: 4,031.31'

WOB: 39.7klbs
RPM: 64
SPM: 190
SPP: 5,528psi

MD: 11,639'
INC: 89.05°
AZM: 271.45°
TVD: 7,154.61'
VS: 4,125.26'

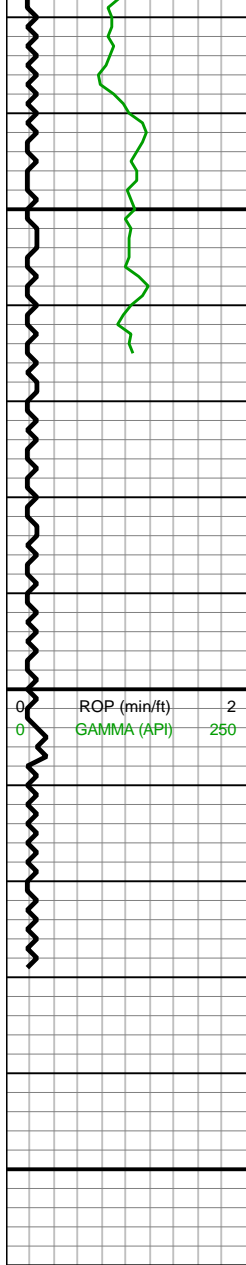
MW IN: 10.4
VIS IN: 50
MW OUT: 10.4
VIS OUT: 48



11500-11600 CHK
(60%): mot lt-mot med
med gy, sme mot
gyshbn, blk-y-sb blk-y,
frm-brit, MRLST incl, sl
sm, chky, v calc; MRLST
(40%): dk gy, mot, hd-frm,
sb blk-y, tr intbd CHK,
mod calc

11600-11700 MRLST
(55%): dk gy, sme
gyshbn, mot, hd-frm, sb
blk-y, tr intbd CHK, mod
calc; CHK (45%): mot
lt-mot med med gy,
blk-y-sb blk-y, frm-brit,
MRLST incl, sl sm, chky,
v calc





MD: 11,734'
INC: 87.69°
AZM: 271.3°
TVD: 7,157.31'
VS: 4,220.19'

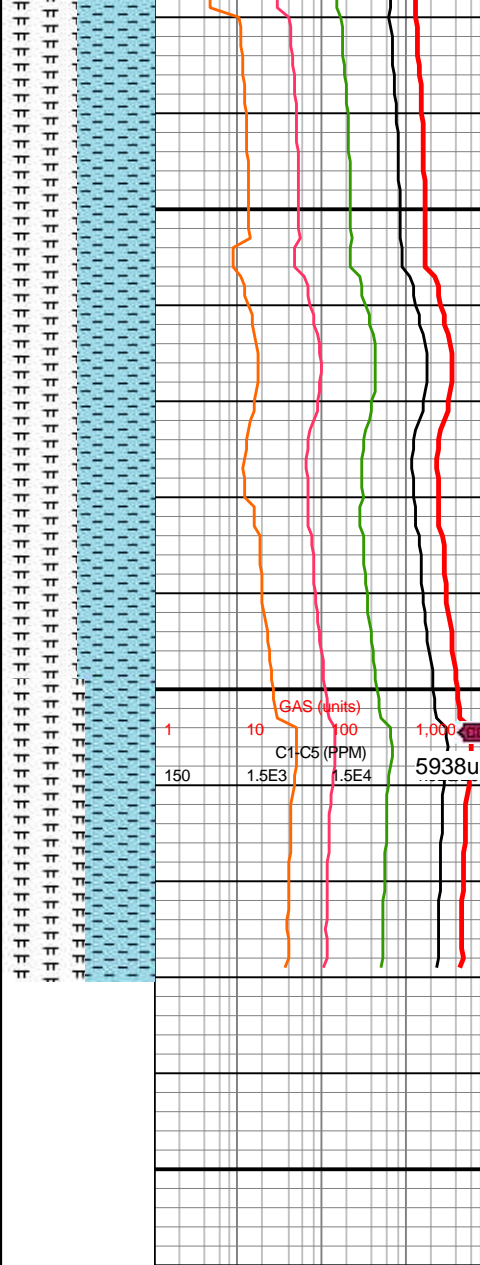
MD: 11,760'
INC: 87.25°
AZM: 271.36°
TVD: 7,158.46'
VS: 4,246.15'

WOB: 39.9klbs
RPM: 65
SPM: 190
SPP: 5,503psi

Projection to Bit

MD: 11,830'
INC: 87.25°
AZM: 271.36°
TVD: 7,161.82'
VS: 4,316.05'

Total Depth of
11,830' MD
Reached on
01/05/2019 @
12:45 MST



11700-11800 MRLST
(50%): med gy-gyshbn,
mot, hd-frm, sb blk, tr
intbd CHK, mod calc;
CHK (50%): mot lt-mot
med gy, blk-sb blk,
frm-brit, MRLST incl, sl
sm, chky, v calc

11800-11830 MRLST
(55%): med gy-gyshbn,
sme dk gy, mot, hd-frm,
sb blk, tr intbd CHK,
mod calc; CHK (45%):
mot lt-mot med gy,
blk-sb blk, frm-brit,
MRLST incl, sl sm, chky,
v calc