

Décollement Consulting Inc.



Scale: 5" / 100'
Measured Depth Log

Well Name State Antelope B12-V42-2HNC_Lateral

Location SW/NW Section 2, T5N - R62W

State CO

County Weld

Country USA

Rig Number Xtreme 22

API Number 05-123-41046

Field Wattenberg

Region D.J. Basin

Drilling Completed 8/14/2015

Spud Date 7/30/2015

Surface Coordinates 354 FWL x 1399 FNL (Lat: 40.432924, -104.298767)

Bottom Hole Coordinates 470 FEL x 1650 FNL (Lat: 40.432700, -104.282538)

Ground Elevation 4,646

K.B. Elevation 4,663

Logged Interval 6,700 To 10,900

Total Depth 10,923

Formation Niobrara "C" Chalk

Type of Drilling Fluid Water Based Mud

Operator

Address Bonanza Creek Energy, Inc.
410 17th Street, Suite 1500
Denver, Colorado 80202

Geologist

Name Dan Kabala & Brian Spitzmiller
Company Decollement Consulting Inc.
Address 13300 Braun Rd.
Golden, CO. 80401

Zone Color Coding

Oil
Note
Error

Condensate
Core
Water

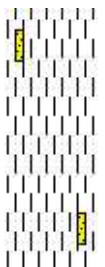
Gas
Pressure
Seal

Rock Types

Blank

 CEMENT

 MPF



 SHALE S

CHALK

 LIMESTONE













 SANDSTONE

 SHALE SF


CPF  MARLSTONE  SHALE

Accessories


Fossils


-  ALGAE
-  AMPHIPORA
-  BELEMNITE
-  BIOCLASTIC
-  BRACHIOPOD
-  BRYOZOA
-  CEPHALOPOD
-  CORAL
-  CRINOID
-  ECHINOID
-  FISH
-  FORAMINIFERA

 FOSSIL


 GASTROPOD


 OOLITE


 OSTRACOD

 PELECYPOD

 PELLET

 PISOLITE


 PLANT REMAINS

 PLANT SPORES


 SCAPHOPOD


 STROMATOPOROID


Minerals

 ANHYDRITE


 ARGILLACEOUS

 ARGILLITE GRAIN

 BENTONITE

 BITUMENOUS SUBSTANCE

 BRECCIA FRAGMENTS

 CALCAREOUS

 CARBONACEOUS FLAKES


 CHERT


 COAL - THIN BEDS


 DOLOMITIC

 FELDSPAR

 FERRUGINOUS PELLET

 FERRUGINOUS


 GLAUCONITE


 GYPSIFEROUS


 HEAVY MINERAL


 KAOLIN

 MARLSTONE


 MINERAL CRYSTALS

 NODULES


 PHOSPHATE PELLETS

 PYRITE

 SALT CAST

 SANDY


 SILTY

 TUFFACEOUS


Stringer

 ANHYDRITE STRINGER

 BENTONITE STRINGER


 COAL STRINGER


 DOLOMITE STRINGER

 GYPSUM STRINGER

 LIMESTONE STRINGER

 MARLSTONE (CAL.) STRG



 MARLSTONE (DOL.) STRG

 SANDSTONE STRINGER

 SHALE STRINGER

 SILTSTONE STRINGER


Other Symbols

 FORMATION TOP  L LITHOGRAPHIC

Oil Show

 P PINPOINT  GAS SHOW  M_X MICROXLN

DEAD  V VUGGY  MNDEPTH MN DEPTH  A ANGULAR  M_S MUDSTONE

EVEN  NORMAL FAULT  R ROUNDED  P_S PACKSTONE


QUESTIONABLE  OIL SHOW  S SUBANG  W_S WACKESTONE

Engineering

SPOTTED STAINING  BIT  OVERTURNED STRATA  P SUBRAND

Sorting

Porosity

 CASING  REVERSE FAULT  Textures  M MODERATE

EARTHY  CONNECTION (LEFT)  SIDEWALL CORE (LEFT)  B_S BOUNDSTONE  P POOR

ENESTRAL  CONNECTION GAS  SLIDE  C CHALKY  W WELL

RACTURE  CORE - LOST  SURVEY  C_X CRYPTOXLN

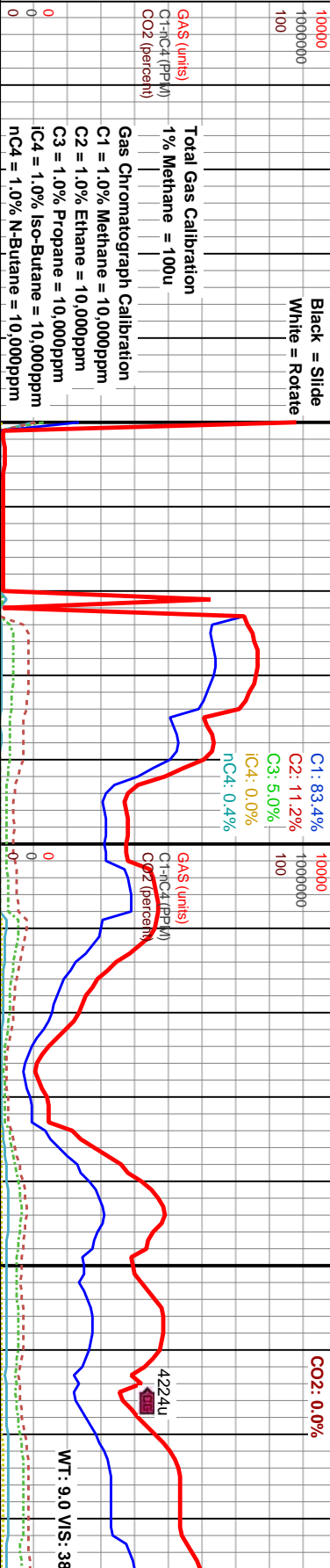
INTERCRYSTALLINE  CORE - RECOVERED  TRIP GAS  E EARTHY

INTEROOLITIC  DST INTERVAL  WIRELINE TESTED - LEFT  F_X FINELYXLN

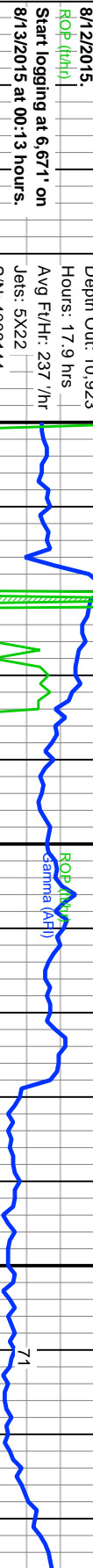
MOLDIC  FAULT  WIRELINE TESTED - RT  G_S GRAINSTONE

Total Gas & Chromatography

GAS
C1
C2
C3
iC4
nC4
CO2



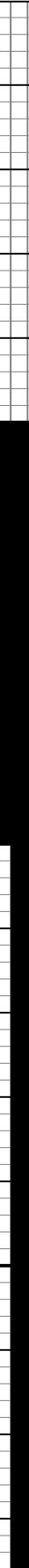
Curves
ROP
Gamma



Interpretive Lithology



Well Bore
TVD



7.010 7.020 7.030 7.040 7.050 7.060 7.070 7.080 7.090 7.100 7.110 7.120 7.130 7.140 7.150 7.160 7.170 7.180 7.190 7.200 7.210 7.220

C1: 66.0%
C2: 15.2%
C3: 11.4%
C4: 1.2%
nC4: 4.3%

10000
1000000
100

CO2: 0.0% 1" Flare

10000
1000000
100

Gas (units)
C1+IC4 (PPM)
CO2 (percent)

WT: 9.0 VS: 37

WOB 19
RPM 75
SPM 3206
SPM 0/89

WOB 18
RPM 75
SPM 3075
SPM 0/89

ROP (t/hr)
Gamma (AFI)

129

3294u

156

MD: 7.067'
TVD: 6.295.6'
Inclination: 89.29°
Azimuth: 90.23°
VS: 663'

6250

MD: 7.160'
TVD: 6.297.42'
Inclination: 88.47°
Azimuth: 90.28°
VS: 755.98'

6250

MARL: med - dk gy, rr blk, mod frm - hd, sb
biky, occ jggd, rthy istr, grty, mottld carb
mat.
tr CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft -
hd, occ brt, sb ply-sb biky, rthy istr, v calc, sl
brn/blk stn.
rr cal frags
Mod slw blu-whi strmg rad cut, mod thck blu-whi
resid ring.

100% MARL: med - dk gy, rr blk, mod frm - hd, sb
ply-sb biky, occ jggd, rthy istr, grty, mottld carb
mat.
tr CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft -
hd, occ brt, sb ply-sb biky, rthy istr, v calc, sl
brn/blk stn.
rr cal frags
Mod slw blu-whi strmg rad cut, mod thck blu-whi
resid ring.

90% MARL: med - dk gy, rr blk, mod frm - hd, sb
ply-sb biky, occ jggd, rthy istr, grty, mottld carb
mat.
tr CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft -
hd, occ brt, sb ply-sb biky, rthy istr, v calc, sl
brn/blk stn.
rr cal frags
Slw sl dul blu-whi milky cut, m

7.230 7.240 7.250 7.260 7.270 7.280 7.290 7.300 7.310 7.320 7.330 7.340 7.350 7.360 7.370 7.380 7.390 7.400 7.410 7.420 7.430 7.440

C1: 57.5%
C2: 15.6%
C3: 13.9%
iC4: 1.6%
nC4: 6.9%

10000
1000000
100

GAS (5007u)
C1+HC4 (PPH)
CO2 (percent)

1-2' Flare

CO2: 0.0%

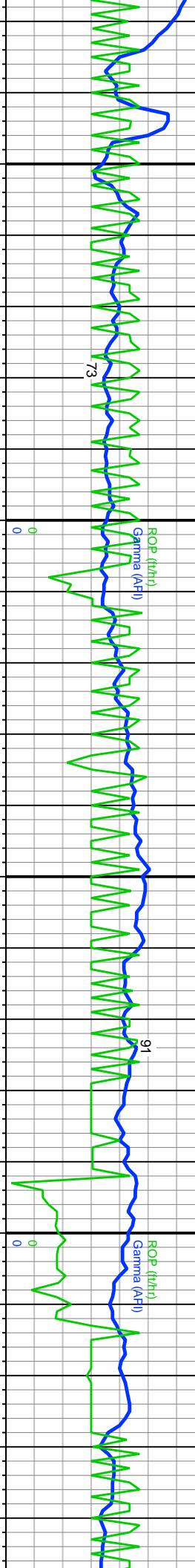
10000
1000000
100

GAS (5938u)
C1+HC4 (PPH)
CO2 (percent)

WT: 9.1 VS: 36

WOB 19
RPM 75
SPM 3199
SPM 0/89

WOB 33
RPM 0
SPM 2836
SPM 0/89

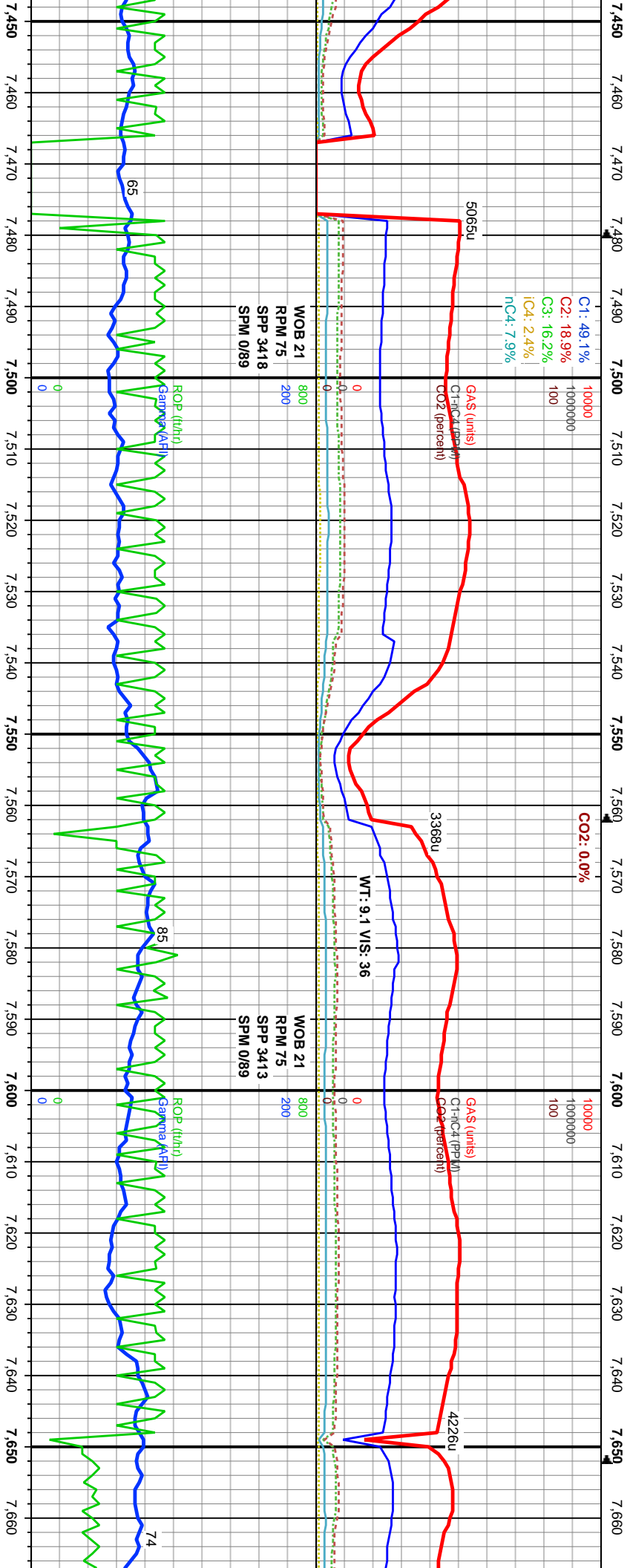


MD: 7.245'
TVD: 6.299.27'
Inclination: 89.04°
Azimuth: 90.63°
VS: 840.95'

MD: 7.330'
TVD: 6.300.01'
Inclination: 89.96°
Azimuth: 90.04°
VS: 925.94'

MD: 7.416'
TVD: 6.300.78'
Inclination: 89.01°
Azimuth: 89.6°
VS: 1,011.92'

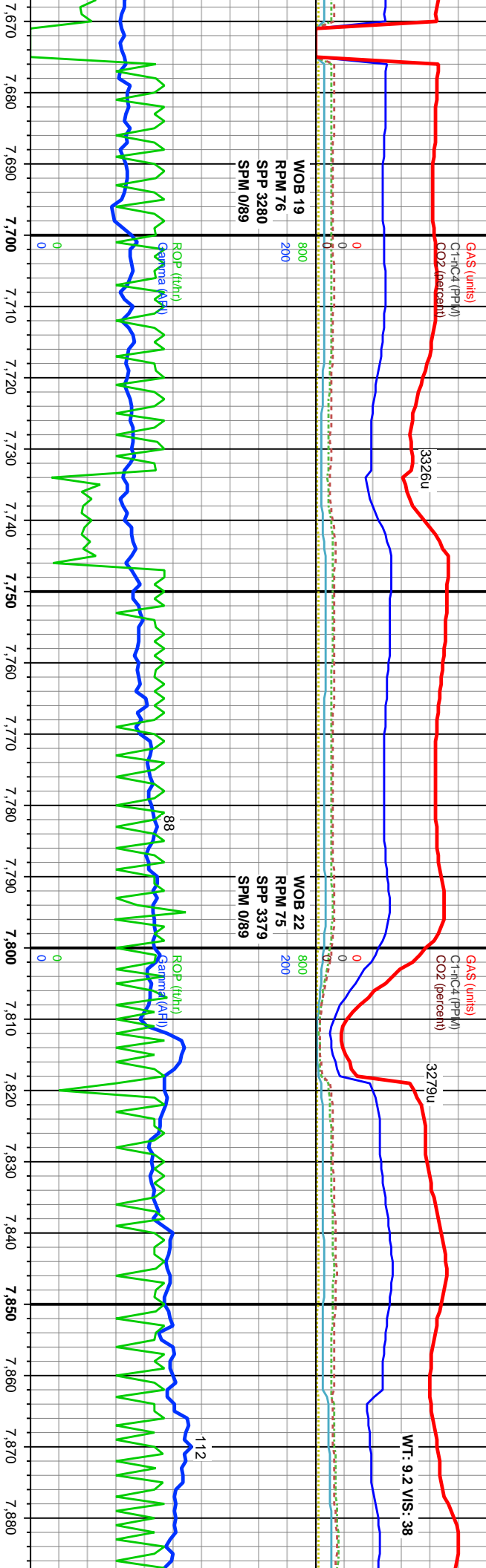
60% CHK: lt tn/gy, rr med cm/brn, mottd dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk sn.	80% CHK: lt tn/gy, rr med cm/brn, mottd dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk sn.	90% CHK: lt tn/gy, rr med cm/brn, mottd dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk sn.
40% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grty, mottd carb mat.	20% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grty, mottd carb mat.	10% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grty, mottd carb mat.
tr cal frags	tr cal frags	tr cal frags
Fst bri blu-whi blooming cut, mod thck blu-whi resid ring.	Mod fst sl bri blu-whi strng cut, mod thck blu-whi resid ring.	Fst bri blu-whi blooming cut, mod thck blu-whi resid ring.



100% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. tr MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	Insnt bri blu-whi blooming cut, mod thck blu-whi resid ring.	MD: 7.501' TVD: 6,301.81' Inclination: 89.6° Azimuth: 89.17° VS: 1,096.88'	6250	100% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. tr MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	V fst bri blu-whi blooming cut, mod thck blu-whi resid ring.
95% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. 5% MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	Fst bri blu-whi blooming cut, mod thck blu-whi resid ring.	MD: 7.587' TVD: 6,301.95' Inclination: 90.22° Azimuth: 89.72° VS: 1,182.84'	6250	100% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. tr MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	Insnt bri blu-whi blooming cut, mod thck blu-whi resid ring.
100% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. tr MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	V Fst bri blu-whi b	MD: TVD: Incl: Azir: VS:	6250	100% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brlt, sb ply-sb blkly, rthy lstr, v calc, sl brn/blk sm. tr MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grtty, mottld carb mat. rr cal frags	

C1: 57.5%
C2: 14.8%
C3: 13.2%
iC4: 1.9%
nC4: 7.2%

WOB 19
RPM 76
SPM 3280
SPM 0/89



7.672' : 6.301.38' Inclination: 90.55° Azimuth: 87.68° VS: 1,267.77'	6250	MD: 7.757' TVD: 6,300.97' Inclination: 90° Azimuth: 88.18° VS: 1,352.64'	6250	MD: 7.843' TVD: 6,300.76' Inclination: 90.28° Azimuth: 87.69° VS: 1,438.51'
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100% CHK: It tn/gy, rr med crm/brn, motild dk brn, sft - hd, occ bnt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin. 10% MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. rr cal frags	100% CHK: It tn/gy, rr med crm/brn, motild dk brn, sft - hd, occ bnt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin. 10% MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. rr cal frags, rr bent	90% CHK: It tn/gy, rr med crm/brn, motild dk brn, sft - hd, occ bnt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin. 10% MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. rr cal frags, rr bent	80% CHK: It tn/gy, rr med crm/brn, motild dk brn, sft - hd, occ bnt, sb ply-sb blk, rthy lstr, brn/blk sin. 20% MARL: med - drk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. rr cal frags, rr bent
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V Fst bri blu-whi blooming cut, mod thck blu-whi resid ring.
V Fst bri blu-whi blooming cut, mod thck blu-whi resid ring.
V Fst mod br blu-whi strmg cut, mod thck resid ring.

8.110 8.120 8.130 8.140 8.150 8.160 8.170 8.180 8.190 8.200 8.210 8.220 8.230 8.240 8.250 8.260 8.270 8.280 8.290 8.300 8.310 8.320

CO₂: 0.0%

10000
1000000
100

C1: 64.4%
C2: 14.4%
C3: 11.9%
iC4: 1.4%
nC4: 5.3%

Gas (units)
C1-iC4 (PPM)
CO2 (percent)

Gas (units)
C1-iC4 (PPM)
CO2 (percent)

5635u

4245u

Possible fault @ 8186 MD

91

ROP (t/hr)
Gamma (API)
800
162

ROP (t/hr)
Gamma (API)
800
200

WOB 20
RPM 75
SPM 3307
SPM 0/89

WOB 20
RPM 75
SPM 3341
SPM 0/89

129



MD: 8.185'
TVD: 6,298.91'
Inclination: 90.4°
Azimuth: 87.26°
VS: 1,779.62'

MD: 8.270'
TVD: 6,297.63'
Inclination: 91.32°
Azimuth: 87.03°
VS: 1,864.42'

MD: 8.270'
TVD: 6,297.63'
Inclination: 91.32°
Azimuth: 87.03°
VS: 1,864.42'

50% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.
50% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gfty, mottld carb mat.
abn cal frags
tr Bent SH w/pyr nods.
Inst bri blu-whi blooming cut, mod thck blu-whi resid ring.

95% MARL: med - dk brwn, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gfty, mottld carb mat.
5% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.
tr cal frags
Fst-mod fst blu-whi milky cut, mod thck blu-whi resid ring.

90% MARL: med - dk brwn, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gfty, mottld carb mat.
10% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.
tr cal frags
Fst blu-whi milky cut, mod thck blu-whi resid ring.

Mod-fst good blu-whi milky cut, mod thck blu-whi resid ring.

8.330 8.340 8.350 8.360 8.370 8.380 8.390 8.400 8.410 8.420 8.430 8.440 8.450 8.460 8.470 8.480 8.490 8.500 8.510 8.520 8.530 8.540

CO2: 0.0%

10000
1000000
100

GAS (units)
C1+C4 (PPM)
CO2 (percent)

WT: 9.2 VIS: 38

C1: 56.5%
C2: 16.7%
C3: 14.5%
iC4: 1.7%
nC4: 6.5%

GAS (u)
C1+C4 (PPM)
CO2 (ppm)

WT: 9.2 VIS: 39

MOB 26
RPM 75
SPM 3531
SPM 890

MOB 23
RPM 75
SPM 3447
SPM 890

ROP (t/hr)
Gamm (psi)

ROP (t/hr)
Gamm (psi)



MD: 8.356'
TVD: 6,296.32'
Inclination: 90.43°
Azimuth: 88.24°
VS: 1,950.26'

MD: 8.443'
TVD: 6,295.78'
Inclination: 90.28°
Azimuth: 88.31°
VS: 2,037.15'

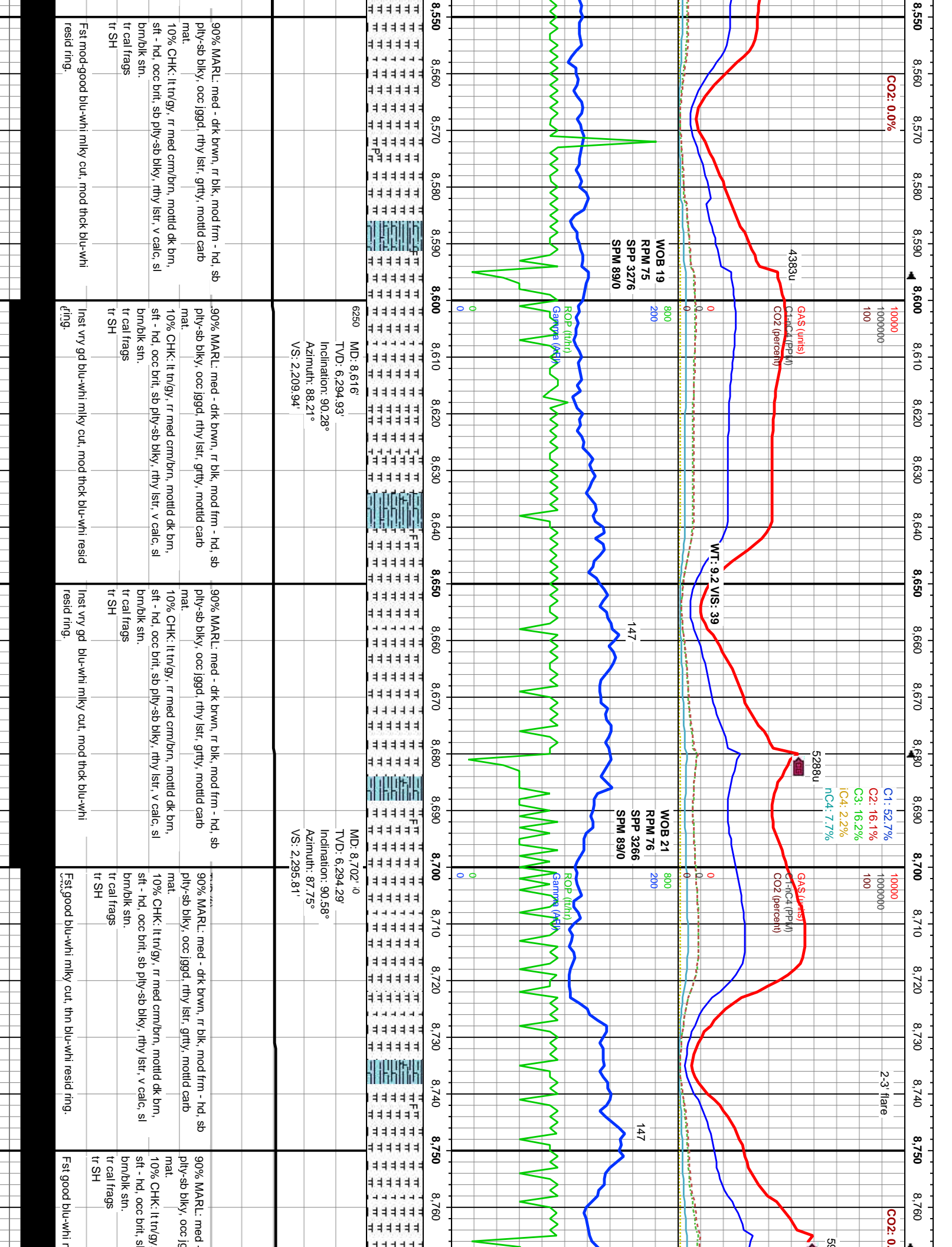
MD: 8.531'
TVD: 6,296.35'
Inclination: 90.28°
Azimuth: 88.1°
VS: 2,125.04'

95% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blkly, occ lggd, rthy istr, grtly, mottld carb
mat.
5% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft
- hd, occ brt, sb ply-sb blkly, rthy istr, v calc, sl
brn/blk str.
tr cal frags
Fst good blu-whi milky cut, mod thck blu-whi resid
ring.

95% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blkly, occ lggd, rthy istr, grtly, mottld carb
mat.
5% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft
- hd, occ brt, sb ply-sb blkly, rthy istr, v calc, sl
brn/blk str.
tr cal frags
Fst good blu-whi milky cut, mod thck blu-whi resid
ring.

95% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blkly, occ lggd, rthy istr, grtly, mottld carb
mat.
5% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft
- hd, occ brt, sb ply-sb blkly, rthy istr, v calc, sl
brn/blk str.
tr cal frags
Fst good blu-whi milky cut, mod thck blu-whi resid
ring.

95% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blkly, occ lggd, rthy istr, grtly, mottld carb
mat.
5% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft
- hd, occ brt, sb ply-sb blkly, rthy istr, v calc, sl
brn/blk str.
tr cal frags
Fst good blu-whi milky cut, mod thck blu-whi resid
ring.



8,770 8,780 8,790 8,800 8,810 8,820 8,830 8,840 8,850 8,860 8,870 8,880 8,890 8,900 8,910 8,920 8,930 8,940 8,950 8,960 8,970 8,980

0% 10000 1000000 100 100

CO2: 0.0%

C1: 53.7%
C2: 16.0%
C3: 15.2%
iC4: 2.1%
nC4: 7.6%

GAS (units)
C1+HC4 (PPM)
CO2 (percent)

461u

WT: 9.2 VIS: 41

WOB 26
RPM 75
SPM 3425
SPM 89/0

ROP (t/hr)
ROP (t/hr)

182

MD: 8,787'
TVD: 6,293.18'
Inclination: 90.92°
Azimuth: 86.89°
VS: 2,380.63'

80% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, mottd carb
mat.

20% CHK: lt tn/gy, rr med crm/brn, mottd dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl
brn/blk sn.
tr cal frags
tr SH

Inst gd blu-whi milky cut, mod thck blu-whi resid
ring.

MD: 8,873'
TVD: 6,292.21'
Inclination: 90.37°
Azimuth: 88.78°
VS: 2,466.48'

80% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, mottd carb
mat.

20% CHK: lt tn/gy, rr med crm/brn, mottd dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl
brn/blk sn.
tr cal frags
tr SH

Inst gd blu-whi milky cut, mod thck blu-whi resid
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.

130

ROP (t/hr)
ROP (t/hr)

130

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

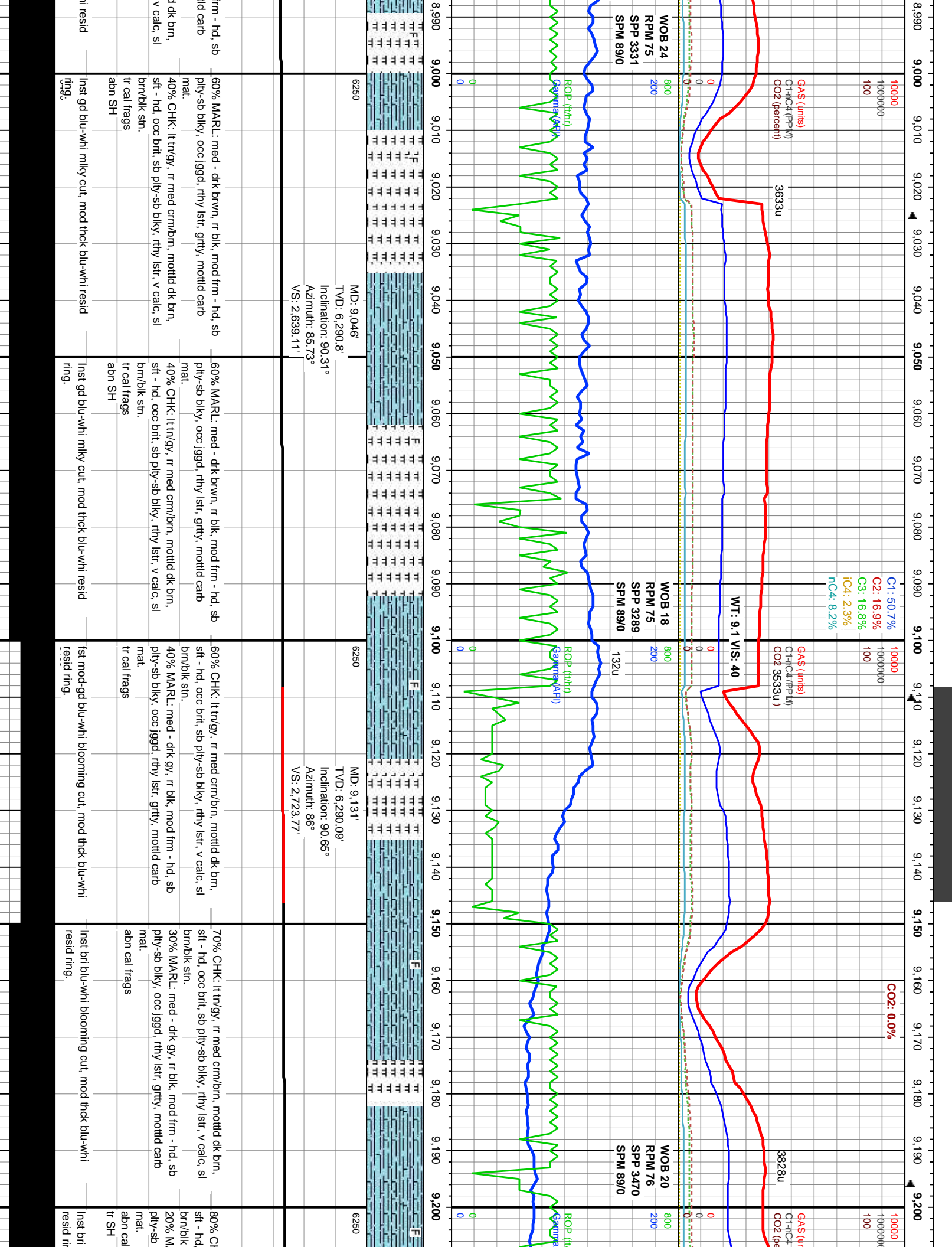
Inst gd blu-whi milky cut, mod thck blu-whi
ring.

MD: 8,960'
TVD: 6,291.48'
Inclination: 90.59°
Azimuth: 87.6°
VS: 2,553.37'

60% MARL: med - dk brwn, rr blk, mod
ply-sb blk, occ jggd, rthy lstr, grty, mottd
mat.

40% CHK: lt tn/gy, rr med crm/brn, mottd
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr cal frags
abn SH

Inst gd blu-whi milky cut, mod thck blu-whi
ring.



9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520 9,530 9,540 9,550 9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630 9,640

C1: 52.2%
C2: 16.9%
C3: 16.2%
iC4: 2.1%
nC4: 7.8%

GAS (units)
C1+I-C4 (PPM)
CO2 (percent)

10000
1000000
100

4072u

3157u

WT: 9.1 VIS: 37

3860u

WOB 21
RPM 75
SPP 3489
SPM 89/0

WOB 23
RPM 75
SPP 3529
SPM 89/0

65
103

60

MD: 9,475'
TVD: 6,287.88'
Inclination: 90.12°
Azimuth: 92.41°
VS: 3,067.41'

MD: 9,560'
TVD: 6,288.38'
Inclination: 89.2°
Azimuth: 90.24°
VS: 3,152.4'

MD: 9,645'
TVD: 6,289.
Inclination: 8
Azimuth: 90
VS: 3,237.3'

n/brn, mottld dk brn, rgy, rthy lstr, v calc, sl	50% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.	70% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.	70% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.	90% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk sin.
dkl, mod frm - hd, sb r, gttty, mottld carb	50% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gttty, mottld carb mat.	30% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gttty, mottld carb mat.	30% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gttty, mottld carb mat.	10% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, gttty, mottld carb mat.
aut, mod thck blu-whi	Inst dri blu-whi blooming cut, mod thck blu-whi resid ring.	Fst good blu-whi blooming cut, thin blu-whi resid ring.	Inst dri blu-whi blooming cut, mod thck blu-whi resid ring.	Inst dri blu-whi blooming cut, mod thck blu-whi resid ring.

9.650 9.660 9.670 9.680 9.690 9.700 9.710 9.720 9.730 9.740 9.750 9.760 9.770 9.780 9.790 9.800 9.810 9.820 9.830 9.840 9.850 9.860

C1: 52.4%
C2: 16.7%
C3: 16.2%
iC4: 2.2%
nC4: 7.9%

GAS (units)
C1: 38300
C2: 38300
C3: 38300
C4: 38300

WT: 9.1 VS: 37

WOB 22
RPM 75
SPM 3438
SPM 89/0

WOB 19
RPM 76
SPM 3531
SPM 90/0

ROP (t/hr)
Gamma (API)

ROP (t/hr)
Gamma (API)



71' 19.01° 0.03° 3'	6250 MD: 9.731' TVD: 6,291.22' Inclination: 88.98° Azimuth: 89.88° VS: 3,323.35'	6250 MD: 9.816' TVD: 6,292.71' Inclination: 89.01° Azimuth: 89.87° VS: 3,408.32'
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70% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brit, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk stn. 30% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grrty, mottld carb mat. cmnm SH	50% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brit, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk stn. 50% MARL: med - dk gy, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grrty, mottld carb mat. cmnm SH	80% MARL: med - dk brwn, rr blk, mod frm - hd, sb ply-sb blkly, occ jggd, rthy lstr, grrty, mottld carb mat. 20% CHK: lt tn/gy, rr med crm/brn, mottld dk brn, sft - hd, occ brit, sb ply-sb blkly, rthy lstr, v calc, sl brn/bk stn. tr cal frags cmnm SH	Inst brl blu-whi blooming cut, mod-thick blu-whi resid ring.	Inst gd blu-whi mky cut, mod-thick blu-whi resid ring.	Inst brl blu-whi blooming cut, mod-thick blu-whi resid ring.	Inst gd blu-whi mky cut, mod-thick blu-whi resid ring.
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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 10,080

C1: 61.2%
C2: 14.0%
C3: 12.5%
iC4: 1.7%
nC4: 6.3%

GAS (units)
C1-iC4 (PPM)
CO2 (percent)

3106u

WT: 9.2 VIS: 39

CO2: 0.0%

2576u

WT: 9.2 VIS: 39

2485u

WOB 59
RPM 0
SPP 2704
SPM 90/0

WOB 21
RPM 76
SPP 3633
SPM 90/0

ROP (t/hr)
Gamma (AFI)

ROP (t/hr)
Gamma (AFI)

ROP (t/hr)
Gamma (AFI)

ROP (t/hr)
Gamma (AFI)

ROP (t/hr)
Gamma (AFI)

ROP (t/hr)
Gamma (AFI)

MD: 9.902' 0
TVD: 6.294.34
Inclination: 88.82°
Azimuth: 89.43°
VS: 3.494.28'

MD: 9.987'
TVD: 6.294.94
Inclination: 90.37°
Azimuth: 87.92°
VS: 3.579.21'

MD: 10.072'
TVD: 6.293.46
Inclination: 91.63°
Azimuth: 87.7°
VS: 3.664.06'

80% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, motld carb
mat.
20% CHK: lt tn/gy, rr med cm/brn, motld dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl
brn/blk sn.
abn calc frag.
cmmn SH

60% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, motld carb
mat.
40% CHK: lt tn/gy, rr med cm/brn, motld dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl
brn/blk sn.
rr calc frag.
cmmn SH

70% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, motld carb
mat.
30% CHK: lt tn/gy, rr med cm/brn, motld dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl
brn/blk sn.
rr calc frag.
cmmn SH

80% MARL: med - dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, motld carb
mat.
20% CHK: lt tn/gy, rr med cm/brn, motld dk brn,
sft - hd, occ brt, sb ply-sb blk, rthy lstr,
brn/blk sn.
tr calc frag.
occ SH

dk brwn, rr blk, mod frm - hd, sb
ply-sb blk, occ jggd, rthy lstr, grty, motld carb
mat.
rr med cm/brn, motld dk brn,
b ply-sb blk, rthy lstr, v calc, sl
abn calc frag.
cmmn SH
V 1st gd blu-whi resid
ring.

V 1st gd sl bri blu-whi milky cut, mod thick blu-whi
resid ring.

V 1st gd bri blu-whi milky cut, mod thick blu-whi
resid ring.

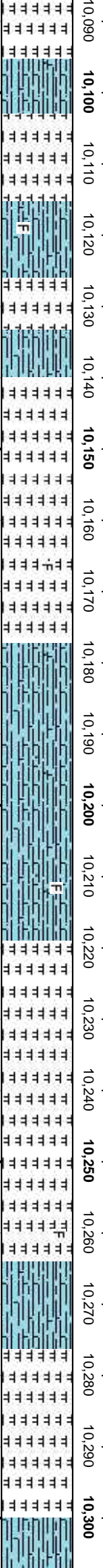
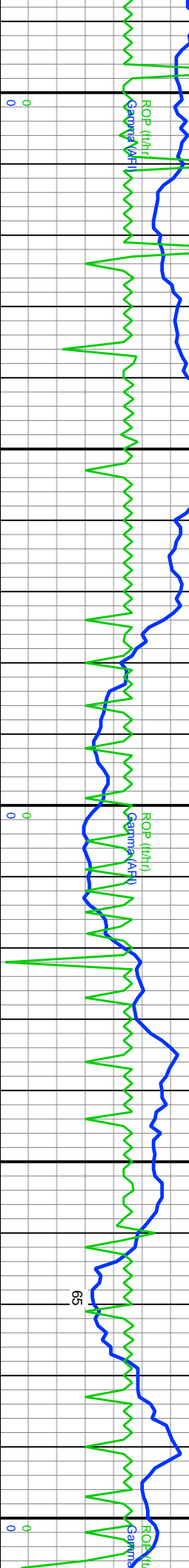
ly cut, mod thick blu-whi resid
ring.

10,090 10,100 10,110 10,120 10,130 10,140 10,150 10,160 10,170 10,180 10,190 10,200 10,210 10,220 10,230 10,240 10,250 10,260 10,270 10,280 10,290 10,300

C1: 60.0% C2: 16.2% C3: 13.0% iC4: 1.3% nC4: 5.9% C1: 50.0% C2: 18.7% C3: 17.1% iC4: 1.5% nC4: 7.5%

GAS (units) C1+IC4 (PPM) CO2 (percent) WT: 9.2 VS: 40

WOB 23 RPM 76 SPP 3698 SPM 0/89 WOB 21 RPM 76 SPP 3779 SPM 0/89 WOB 19 RPM 76 SPP 3751 SPM 0/89



MD: 10,158' TVD: 6,290.67' Inclination: 92.09° Azimuth: 87.6° VS: 3,749.86'

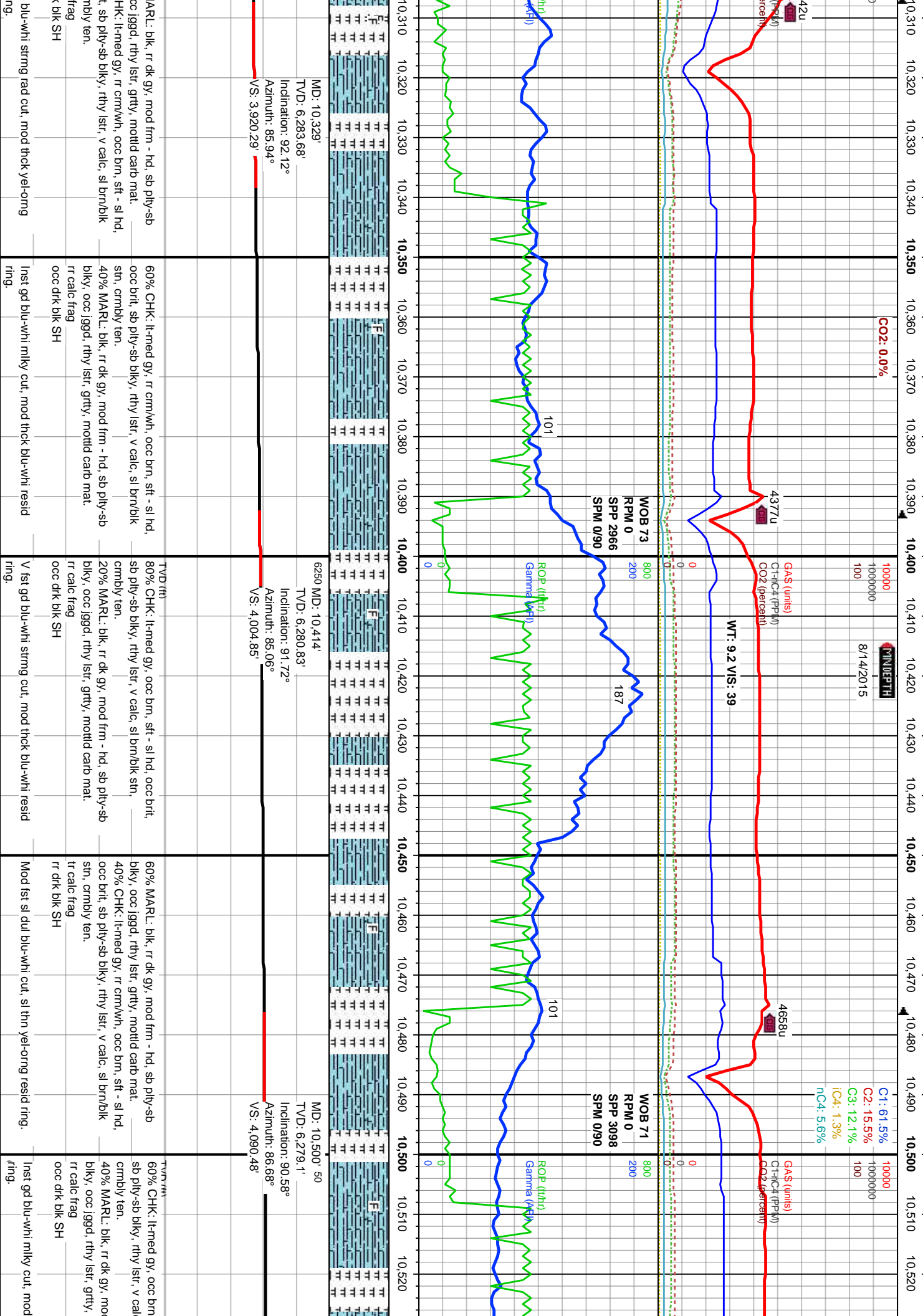
frm - hd, sb 80% MARL: med - dk brwn, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grty, motlid carb mat. 20% CHK: lt tr/gy, rr med crm/brn, motlid dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk str, tr calc frag, occ SH

90% MARL: med - dk brwn, rr blk, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grty, motlid carb mat. 10% CHK: lt tr/gy, rr med crm/brn, motlid dk brn, sft - hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk str, tr calc frag, rr bent w/ pyr nods occ SH

Mod fst sl br blu-whi milky cut, sl thick blu-whi resid ring.

60% MARL: blk, rr dk gy, mod frm - hd, sb ply-sb blk, occ jggd, rthy lstr, grty, motlid carb mat. 40% CHK: crm/wh, rr brn, occ gy, sft - sl hd, occ brt, sb ply-sb blk, rthy lstr, v calc, sl brn/blk str, crmby ten, rr calc frag, occ blk SH

Inst gd blu-whi strmg cut, mod thick blu-whi resid ring.



10,530 10,540 10,550 10,560 10,570 10,580 10,590 10,600 10,610 10,620 10,630 10,640 10,650 10,660 10,670 10,680 10,690 10,700 10,710 10,720 10,730 10,740

1-2' Flare

CO2: 0.0%

10000
1000000
100

C1: 55.4%
C2: 15.7%
C3: 14.2%
iC4: 1.4%
nC4: 7.6%

4510u

4693u

4694u

GAS (units)
CH4 (PPM)
CO2 (percent)

GAS (units)
CH4 (PPM)
CO2 (percent)

WOB 20
RPM 76
SPP 3794
SPM 900

WOB 21
RPM 75
SPP 3786
SPM 900

ROP (t/hr)
Sample 100

ROP (t/hr)
Sample 100

57

78

MD: 10,585'
TVD: 6,278.33'
Inclination: 90.46°
Azimuth: 87.25°
VS: 4,175.26'

MD: 10,670'
TVD: 6,277.75'
Inclination: 90.33°
Azimuth: 88°
VS: 4,260.11'

6250

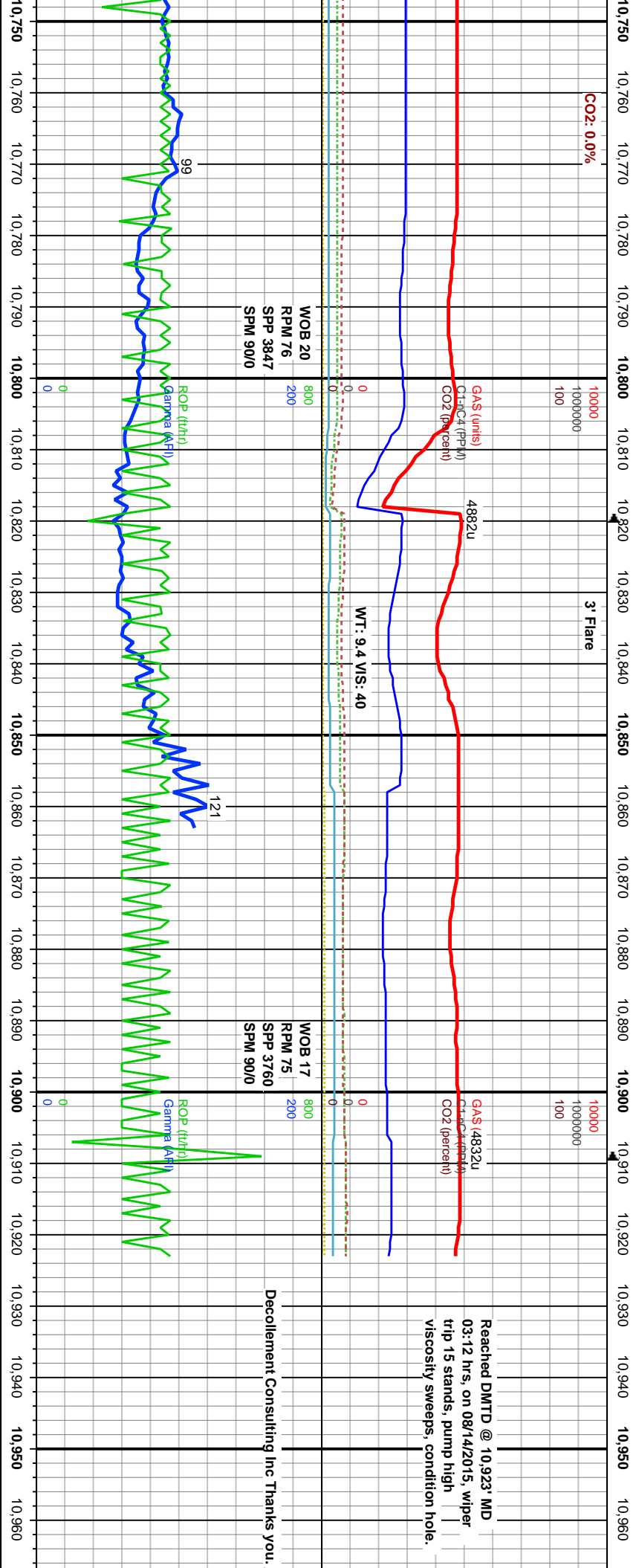
6250

TVD (ft)

TVD (ft)

sft - sl hd, occ brit,
c, sl brn/bk sin,
90% CHK: wh/crm, com lt-med gy, occ brn, sft - sl
hd, occ brit, sb ply-sb blk, rthy lstr, v calc, sl
brn/bk sin, crmbly ten.
10% MARL: blk, r dk gy, mod frm - hd, sb ply-sb
blk, occ jggd, rthy lstr, grtty, motld carb mat.

thick blu-whi resid
inst gd bri blu-whi string cut, mod thick blu-whi
resid ring.
100% CHK: wh/crm, r lt-med gy, occ brn, sft - sl
hd, occ brit, sb ply-sb blk, rthy lstr, v calc, sl
brn/bk sin, crmbly ten.
10% MARL: blk, r dk gy, mod frm - hd, sb ply-sb blk,
occ jggd, rthy lstr, grtty, motld carb mat.
inst gd bri blu-whi string cut, mod thick blu-whi resid
ring.
100% CHK: wh/crm, r lt-med gy, occ brn, sft - sl
hd, occ brit, sb ply-sb blk, rthy lstr, v calc, sl
brn/bk sin, crmbly ten.
10% MARL: blk, r dk gy, mod frm - hd, sb ply-sb
blk, occ jggd, rthy lstr, grtty, motld carb mat.
inst gd bri blu-whi string cut, mod thick blu-whi resid
ring.



MD: 10,756' TVD: 6,276.69' Inclination: 91.07° Azimuth: 88.62° VS: 4.346'	MD: 10,858' TVD: 6,274.24' Inclination: 91.69° Azimuth: 87.94° VS: 4.447.85'	MD: 10,923' TVD: 6,272.32' Inclination: 91.69° Azimuth: 87.94° VS: 4.512.73' Projection to Bit
90% CHK: wh/crm, rr lt-med gy, occ brn, sft - sl hd, occ brt, sb pty-sb blk, rthy lstr, v calc, sl brn/blk sin, crmbly ten. 10% MARL: blk, rr dk gy, mod frm - hd, sb pty-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. Inst bri blu-whi blooming cut, thick bri blu-whi resid ring.	90% CHK: wh/crm, rr lt-med gy, occ brn, sft - sl hd, occ brt, sb pty-sb blk, rthy lstr, v calc, sl brn/blk sin, crmbly ten. 10% MARL: blk, rr dk gy, mod frm - hd, sb pty-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. Inst bri blu-whi blooming cut, thick bri blu-whi resid ring.	90% CHK: wh/crm, rr lt-med gy, occ brn, sft - sl hd, occ brt, sb pty-sb blk, rthy lstr, v calc, sl brn/blk sin, crmbly ten. 10% MARL: blk, rr dk gy, mod frm - hd, sb pty-sb blk, occ jggd, rthy lstr, grtty, motild carb mat. Inst bri blu-whi blooming cut, thick bri blu-whi resid ring.
6250	6250	6250
TVD (ft)	TVD (ft)	TVD (ft)

Formation tops picked by Brant Logan, Operations Geologist at Bonanza Creek.			
Prog	TVD	Actual	MD
6000	6008	6051	
6052	6062	6110	
6082	6091	6146	
6112	6115	6175	
6127	6140	6206	
6194	6201	6299	
6223	6232	6367	
6267	6269	6477	

