GREAT DIVIDE CONSULTING

THE EXPERIENCED WELLSITE GEOLOGISTS

Scale 1:600 (2"=100') Metric
Measured Depth Log

Well Name:	Vonderlage Fed 28N-W31HZ		
Location:	Weld County, CO.		
License Number:	051233601700	**Region:**	DJ basin
Spud Date:	08/06/13	**Drilling Completed:**	08/13/13
Surface Coordinates:	491'FSL & 1800'FWL, SEC.31, T3N-R66W		
Bottom Hole Coordinates:	460' FNL & 2330' FWL,SEC.31, T3N-R66W		
Ground Elevation (m):	4843'	**K.B. Elevation (m):**	4859'
Logged Interval (m):	6644' To: 11611'	**Total Depth (m):**	11611'
Formation:	Niobrara B		
Type of Drilling Fluid:	Water Based Mud		

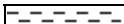Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR
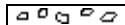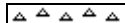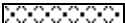
Company: Anadarko Petroleum Corporation
Address: Granite Tower
1099 18th St., Suite 1800
Denver, CO 80202

GEOLOGIST

Name: Aaron Wiggins/ Kyle Pickard
Company: Great Divide Consulting, Inc.
Address: P.O. Box 630263
Highlands Ranch, CO 80163

Comments

ROCK TYPES

Anhy	Clyst	Gyp	Mrlst	Shgy
Bent	Coal	Igne	Salt	Sltst
Brec	Congl	Lmst	Shale	Ss
Cht	Dol	Meta	Shcol	Till

ACCESSORIES

MINERAL
Anhy
Arggrn
Arg
Bent
Bit
Brecfrag
Calc
Carb
Chtdk
Chtlt
Dol
Feldspar
Ferrpel
Ferr
Glau
Gyp

Hvymin
Kaol
Marl
Minxl
Nodule
Phos
Spr calc
Pyr
Salt
Sandy
Silt
Sil
Sulphur
Tuff
New symbol
New symbol

FOSSIL
Algae
Amph
Belm
Bioclst
Brach
Bryozoa
Cephal
Coral
Crin
Echin
Fish
Foram
Fossil
Gastro
Oolite
Ostra

Pelec
Pellet
Pisolite
Plant
Strom

STRINGER
Anhy
Arg
Bent
Coal
Dol
Gyp
Ls
Mrst
Sltstrg
Ssstrg

TEXTURE
Boundst
Chalky
Cryxln
Earthy
Finexln
Grainst
Lithogr
Microxln
Mudst
Packst
Wackest

OTHER SYMBOLS

POROSITY
- E Earthy
- ▣ Fenest
- F Fracture
- ☒ Inter
- ◿ Moldic
- ▣ Organic
- P Pinpoint

- V Vuggy

SORTING
- W Well
- M Moderate
- P Poor

OIL SHOW
- ◉ Even

ROUNDING
- R Rounded
- r Subrnd
- a Subang
- A Angular

INTERVAL
- ■ Core
- ⬒ Dst

- ◐ Spotted
- ◯ Ques
- ▢ Dead

EVENT
- ▷ Rft
- ▶ Sidewall

TG, C1-C5

- **TG (Units)** ——— (red)
- **C1 (Units)** ——— (blue)
- **C2 (Units)** ——— (green)
- **C3 (Units)** ——— (cyan)

2 man logging unit with gas analyzer and sample program online 8/8/13. Bit # 2 6.125" MMD54 in @ 7636' MD.

MW: 9.8+, VIS: 39

5000

TG, C1-C5

0

C

5000

TG, C1-C5

C

0

ROP

- **ROP (min/ft)** ———

5

ROP (min/ft)

Rotate   Slide   Rotate   Slide   Rotate

0

5

ROP (min/ft)

Slide   Rotate   Slide

0

Slide/Rotate

Gamma

- **Gamma (API)** ———

250

Gamma (API)

0

250

Gamma (API)

0

Resistivity

- **Resistivity** ———

200

Resistivity

0

200

Resistivity

0

Depth

| 00 | 7320 | 7340 | 7360 | 7380 | 7400 | 7420 | 7440 | 7460 | 7480 |

Well Bore Cross Section

7050 TVD

Niobrara A Top @ 7353'MD, 7078'TVD

7050 TVD

MD 7316 TVD 7065.6
Az 357.7° Inc 69.1°

MD 7361 TVD 7080.77
Az 358° Inc 71.5°

7100

MD 7406 TVD 7094.19
Az 358° Inc 73.8°

7100

P

MD 7451 TVD 7105.6
Az 358.7° Inc 76.8°

Chalky Mrlst 70%: ltgy-mdgy, sbblky, frm, v calc, abd intbd biocl, nsfl, slw str wh cut. SH 30%: ltgy-gy, plty-sbplty, slty, sft, sl cal.

Chalky Mrlst 85%: ltgy-mdgy, sbblky, frm, v calc, abd intbd biocl, nsfl, slw str wh cut. SH 15%: ltgy-gy, plty-sbplty, slty, sft, sl cal. Tr Pryt.

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc, abd intbd biocl, nsfl, fst str wh cut. SH 10%: ltgy-gy, plty-sbplty, slty, sft, v calc. Tr Pyrt.

Chalk
intbd
plty-s

7150

7150

MW: 10.0, VIS: 39

MW: 9.9, VIS: 38

08/09/13 @ 8:55am TD Curve
for intermediate casing~7636'

Gas Buster Off

08/11/13 @ 3:45am B.O.B

5000

5000

10000

TG, C1-C5

TG, C1-C5

Scale
TG, C1

0

0

0

C

C

C

5

5

5

ROP (min/ft)

Slide OP (min/ft)

ROP (m

Rotate

Slide

Rotate

Slide

Rotate

Slide

Rotate

Rotate

0

0

0

MWD Tool
Failure

250

250

250

Gamma (API)

Gamma (API)

Gamma

0

0

0

200

200

200

Resistivity

Resistivity

Resist

0

0

7500   7520   7540   7560   7580   7600   7620   7640   7660   7680   7700

7050 TVD

7075 TVD

7075 T

08/11/13 4:30am Depth @ 7686'MD

7100

7125

Scale Change

7125

MD 7679 TVD 7125.01
Az 352.21° Inc 90.66°

MD 7496 TVD 7114.54
Az 359.9° Inc 80.3°

MD 7541 TVD 7120.72
Az 359.4° Inc 83.9°

MD 7581 TVD 7123.65
Az 359.5° Inc 87.7°

P

P

P

C

C

C

C

C

C

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc, sl
intbd biocl, nsfl, mod str wh cut. SH 5%: ltgy-gy,
plty-sbplty, slty, sft, v calc. Tr Pyrt.

Chalky Mrlst 95%: ltgy-gy, sbl
intbd biocl, nsfl, mod str wh c
plty-sbplty, slty, sft, v calc. Tr

y Mrlst 95%: ltgy-gy, sbblky, frm, v ca
biocl, nsfl, fst str wh cut. SH 5%: l
plty, slty, sft,

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc, abd
intbd biocl, nsfl, fst str wh cut. SH 10%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, abd
intbd biocl, nsfl, fst str wh cut. SH 2%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

7150

7175

7175

MW IN: 9.3 VIS: 33
OUT: 9.8 VIS 33

MW IN: 9.3 VIS: 33
OUT: 9.8 VIS 33

TG, C1-C5

10000

10000

TG, C1-C5

0

0

5

ROP (min/ft)

ROP (min/ft)

5

Slide   Rotate

0

0

250

Gamma (API)

Gamma (API)

250

0

0

200

Resistivity

Resistivity

200

0

0

7720   7740   7760   7780   7800   7820   7840   7860   7880   7900

7075 TVD

7075 TVD

MD 7769 TVD 7123.94
Az 381.58° Inc 90.75°

MD 7859 TVD 7122.41
Az 350.84° Inc 91.1°

7125

7125

7125

7125

lky, frm, v
ut. SH 5%: I

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc, abd
intbd biocl, nsfl, mod str wh cut. SH 5%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc, abd
intbd biocl, nsfl, mod str wh cut. SH 5%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, sl
intbd biocl, nsfl, fst str wh cut. SH 2%: ltgy-gy,
plty-sbplty, slty, sft, v calc. Tr Pyrt.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, sl
intbd biocl, nsfl, fst str wh cut. SH 2%: ltgy-gy,
plty-sbplty, slty, sft, v calc. Tr Pyrt.

7075 TVD

7175

7175

MW IN: 9.3 VIS: 33
OUT: 9.8 VIS 33

MW IN: 9.2 VIS: 34
OUT: 9.3 VIS 35

10000

C

TG, C1-C5

TG, C1-C5

0

C

C

5

ROP (min/ft)

ROP (min/ft)

Slide   Rotate   Slide   Rotate   Slide   Rotate

0

250

Gamma (API)

Gamma (API)

0

200

Resistivity

Resistivity

0

7920   7940   7960   7980   8000   8020   8040   8060   8080   8100   8120

7075 TVD

7075 TVD

MD 7949 TVD 7119.92
Az 351.08° Inc 92.07°

7125

MD 8038 TVD 7120.19
Az 353.32° Inc 87.58°

7125

MD
Az

7175

7175

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

MW IN: 9.2 VIS: 34
OUT: 9.3 VIS 35

Note Scale Change

8000

Scale Change
TG, C1-C5

MW IN: 9.2 VIS: 34
OUT: 9.3 VIS 35

TG, C1-C5

MW IN: 9.2 VIS: 34
OUT: 9.3 VIS 35

TG, C1-C5

ROP (min/ft)

Slide   Rotate   Slide   Rotate   Slide   Rotate   Slide   Rotate

ROP (min/ft)

250

Gamma (API)

250

Gamma (API)

200

Resistivity

200

Resistivity

8140   8160   8180   8200   8220   8240   8260   8280   8300   8320   8340

7075 TVD

7075 TVD

8128 TVD
54.79° Inc

MD 8218 TVD 7127.59
Az 0.17° Inc 88.29°

7125

7125

MD 8308 TVD 7128.9
Az 2.77° Inc 90.04°

7175

7175

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Ch
mo
ltg

MW IN: 9.2 VIS: 34
OUT: 9.3 VIS 35

MW IN: 9.2 VIS: 36
OUT: 9.2 VIS 36

TG, C1-C5

ROP (min/ft)

Gamma (API)

Resistivity

8000

8000

5

250

0

200

0

8360   8380   8400   8420   8440   8460   8480   8500   8520   8540

7075 TVD

7075 TVD

MD 8398 TVD 7127.73
Az 2.94° Inc 91.45°

MD 8488 TVD 7126
Az 3.8° Inc 90.75°

7175

7175

alky Mrlst 97%: ltgy-gy, sbblky, frm,
d intbd biocl, nsfl, mod str wh cut.
-gy, plty-sbplty, slty, sft

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 97%: ltgy-gy, sbblky, f
mod intbd biocl, nsfl, mod str wh c
ltgy-gy, plty-sbplty, slty, sft, v calc.

MW: 9.2 VIS: 36   MW: 9.25 VIS: 35

8000   8000

TG, C1-C5   TG, C1-C5

C   C

C

0   0

5   5

C

ROP (min/ft)   ROP (min/ft)

Slide   Rotate

0   0

250   250

Gamma (API)   Gamma (API)

0   0

200   200

Resistivity   Resistivity

0   0

8560   8580   8600   8620   8640   8660   8680   8700   8720   8740   8760

7075 TVD   7075 TVD

MD 8576 TVD 7125.12   MD 8666 TVD 7124.01   7125   MD 8756 TVD 7122.9
Az 5.07° Inc 90.4°   Az 3.74° Inc 91.01°   Az 359.44° Inc 90.4°

rm,
t. !

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,   CChalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,   Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,   Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:   mod intbd biocl, nsfl, mod str wh cut. SH 3%:   mod intbd biocl, nsfl, mod str wh cut. SH 3%:   mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.

7175   7175

MW: 9.25 VIS: 35   Gas Buster On   MW: 9.10 VIS: 35.50

TG, C1-C5   TG, C1-C5   TG, C1-C5

C   C   C

5   5

ROP (min/ft)   ROP (min/ft)   Slide   Rotate

0   0

250   250

Gamma (API)   Gamma (API)

0   0

200   200

Resistivity   Resistivity

0   0

8780   8800   8820   8840   8860   8880   8900   8920   8940   8960   8980

7075 TVD   7060 TVD

7125   Scale Change   7110

MD 8847 TVD 7120.53   MD 8937 TVD 7114.46
Az 356.5° Inc 92.59°   Az 355.92° Inc 95.14°

7175   7160

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

MW: 9.20 VIS: 35.50

MW: 9.10 VIS: 34.00

8000

8000

TG, C1-C5

TG, C1-C5

C

C

C

C

0

0

ROP (min/ft)

ROP (min/ft)

5

5

Slide

Rotate

Slide

Rotate

Slide

Rotate

Slide

Rotate

0

0

250

250

Gamma (API)

Gamma (API)

0

0

200

200

Resistivity

Resistivity

0

0

9000   9020   9040   9060   9080   9100   9120   9140   9160   9180

7060 TVD

7060 TVD

MD 9117 TVD 7105.22
Az 354.57° Inc 90.04°

MD 9027 TVD 7107.84
Az 354.57° Inc 93.3°

P

P

7110

7110

7160

7160

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, slw str wh cut. SH 2%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, slw str wh cut. SH 2%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, slw str wh cut. SH 2%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, slw str wh cut. SH 2%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: lt mod intbd biocl, nsf ltgy-gy, plty-sbplty,

MW: 9.20 VIS: 35.00   Note Sclae Change   MW IN: 9.1 VIS: 34
OUT: 9.2 VIS 34

TG, C1-C5

Scale Change
TG, C1-C5

TG, C1-C5

C   C   C

ROP (min/ft)   ROP (min/ft)   ROP (min/ft)

Slide   Rotate   Slide   Rotate   Slide   Rotate   Slide   Rotate   Slide   Slide   Rotate

Gamma (API)   Gamma (API)   Gamma (API)

Resistivity   Resistivity   Resistivity

9200   9220   9240   9260   9280   9300   9320   9340   9360   9380   9400

7060 TVD   7060 TVD   7060 TVD

08/12/13 4:30am Depth @ 9252'MD

P   P   P   P

MD 9207 TVD 7104.81   MD 9297 TVD 7104.33   MD 9387 TVD 7104.4
Az 355.64° Inc 90.48°   Az 356.35° Inc 90.13°   Az 358.91° Inc 89.78°

7160   7160   7160

y-gy, sbblky, frm,   Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v c
l, slw str wh cut.   mod intbd biocl, nsfl, slw str wh cut. SH 2%:   mod intbd biocl, nsfl, slw str wh cut. SH 1%:   mod intbd biocl, nsfl, slw str wh cut. SH 1%:   mod intbd biocl, nsfl, slw str wh cut. SH 1
slty, sft   ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.   ltgy-gy, plty-sbplty, slty, sft, v calc.

MW IN: 9.1 VIS: 35
OUT: 9.2 VIS 35

MW IN: 9.1 VIS: 35
OUT: 9.2 VIS 35

C

TG, C1-C5

TG, C1-C5

C

5000

5000

0

0

ROP (min/ft)

ROP (min/ft)

Slide

Rotate

Slide

Rotate

Slide

Rotate

5

5

0

0

Gamma (API)

Gamma (API)

250

250

0

0

Resistivity

Resistivity

200

200

0

0

9420   9440   9460   9480   9500   9520   9540   9560   9580   9600   9620

7060 TVD

7060 TVD

MD 9477 TVD 7104.89.
Az 4.44° Inc 89.6°

7110

MD 9567 TVD 7105.17
Az 4.38° Inc 90.04°

7110

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

7160

7160

MW IN: 9.1 VIS: 35
OUT: 9.2 VIS 35

MW IN: 9.2 VIS: 36
OUT: 9.0 VIS 35

1FT Flare

MW IN
OUT:

5000

TG, C1-C5

C

C

TG, C1-C5

C

0

0

5

ROP (min/ft)

Slide

Rotate

ROP (min/ft)

Slide

Rotate

0

5

0

250

Gamma (API)

Gamma (API)

0

250

0

200

Resistivity

Resistivity

0

200

9640   9660   9680   9700   9720   9740   9760   9780   9800   9820

7060 TVD

7060 TVD

MD 9657 TVD 7104.35
Az 3.81° Inc 91.01°

MD 9747 TVD 7103.11
Az 3.72° Inc 90.57°

7110

7110

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

7160

7160

MW IN: 9.2 VIS: 36
OUT: 9.3 VIS 36

Note Scale Change

MW IN: 9.2 VIS: 35
OUT: 9.2 VIS 35

5000

8000

TG, C1-C5

Scale Change
TG, C1-C5

C

C

0

0

5

5

ROP (min/ft)

ROP (min/ft)

Slide

Rotate

0

0

250

250

Gamma (API)

Gamma (API)

0

0

200

200

Resistivity

Resistivity

0

9840   9860   9880   9900   9920   9940   9960   9980   10000   10020   10040

7060 TVD

7060 TVD

MD 9837 TVD 7102.63
Az 2.18° Inc 90.04°

MD 9927 TVD 7103.46
Az 359.93° Inc 88.9°

MD 10017 TVD 7104.57
Az 358.31° Inc 89.69°

MD 10009 TVD 7109.58
Az 357.28° Inc 92.51°

7110

7110

7110

halky Mrlst 97%: ltgy-gy, sbblky, frm,
od intbd biocl, nsfl, mod str wh cut.
y-gy, plty-sbplty, slty, sft

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, slw str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-g
mod intbd biocl, nsfl, slw
ltgy-gy, plty-sbplty, slty,

7160

7160

MW IN: 9.2 VIS: 35
OUT: 9.2 VIS 35

MW IN: 9.3+ VIS: 36

8000

8000

C

TG, C1-C5

0

TG, C1-C5

C

0

5

ROP (min/ft)

0

5

ROP (min/ft)

0

250

Gamma (API)

0

250

Gamma (API)

0

200

Resistivity

0

200

Resistivity

0

10060   10080   10100   10120   10140   10160   10180   10200   10220   10240   10260

7060 TVD

7060 TVD

C

C

C

C

C

C

C

C

P

P

P

P

C

C

MD 10107 TVD 7103.33
Az 357.66° Inc 91.89°

MD 10197 TVD 7100.43
Az 356.76° Inc 91.8°

C

C

C

7110

7110

C

C

C

C

C

C

7160

7160

y, sbblky, frm,
str wh cut. S
sft

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, mod str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl
intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,
plty-sbplty, slty, sft, v calc.

MW IN: 9.3+ VIS: 36   2-5FT Flare   MW IN: 9.3+ VIS: 36   1-2FT Flare

8000   8000

TG, C1-C5   TG, C1-C5

C   C   C   C

5   5

ROP (min/ft)   ROP (min/ft)

0   0

250   250

Gamma (API)   Gamma (API)

0   0

200   200

Resistivity   Resistivity

0   0

10280   10300   10320   10340   10360   10380   10400   10420   10440   10460

7060 TVD   7060 TVD

MD 10287 TVD 7099.67   MD 10377 TVD 7101.47   MD 10467 TVD 71
Az 357.99° Inc 89.16°   Az 358.16° Inc 88.55°   Az 357.26° Inc 88

7110   7110

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl   Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl
intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,   intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,   intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,   intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy,
plty-sbplty, slty, sft, v calc.   plty-sbplty, slty, sft, v calc.   plty-sbplty, slty, sft, v calc.   plty-sbplty, slty, sft, v calc.

7160   7160

Track headers / labels:

8000 ... 8000

1FT Flare

MW IN: 9.3 VIS: 36
OUT: 9.3 VIS 36

1FT Flare

TG, C1-C5 ... TG, C1-C5

C ... C

0 ... 0

5 ... 5

ROP (min/ft) ... ROP (min/ft)

0 ... 0

Slide ... Rotate

250 ... 250

Gamma (API) ... Gamma (API)

0 ... 0

200 ... 200

Resistivity ... Resistivity

0 ... 0

Depth scale: 10480 10500 10520 10540 10560 10580 10600 10620 10640 10660 10680

7060 TVD ... 7060 TVD

7110 ... 7110

MD 10577 TVD 7107.06
Az 355.57° Inc 87.41°

MD 10647 TVD 7111.41
Az 356.05° Inc 87.05°

P= ... P= ... P= ... P=

7160 ... 7160

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, sl intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, fst str wh cut. SH 2%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky
mod in
ltgy-gy

MW IN: 9.35 VIS: 35
OUT: 9.4 VIS 36

MW IN: 9.3 VIS: 36
OUT: 9.3 VIS 36

TG, C1-C5
8000
0

TG, C1-C5
8000
0

TG, C1-C5
8000
0

ROP (min/ft)
5
0

ROP (min/ft)
5
0

ROP (m)
5
0

Slide

Rotate

C

C

Gamma (API)
250
0

Gamma (API)
250
0

Gamma
250
0

Resistivity
200
0

Resistivity
200
0

Resistivity
200
0

10700 10720 10740 10760 10780 10800 10820 10840 10860 10880 10900

7060 TVD

7060 TVD

7060 TV

P

P

P

MD 10737 TVD 7111.41
Az 356.7° Inc 89.16°

MD 10827 TVD 7114.46
Az 356.93° Inc 90.75°

7110

7110

7110

7160

7160

7160

Mrlst 98%: ltgy-gy, sbblky, frm, tbd biocl, nsfl, fst str wh cut. , plty-sbplty, slty, sft

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc, mod intbd biocl, nsfl, fst str wh cut. SH 1%: ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbb mod intbd biocl, nsfl, fst str wh ltgy-gy, plty-sbplty, slty, sft,

MW IN: 9.3 VIS: 36
OUT: 9.4 VIS 37

MW IN: 9.3 VIS: 36
OUT: 9.4 VIS 37

1-2FT Flare

TG, C1-C5

C

C

C

8000

8000

0

TG, C1-C5

C

0

5

ROP (min/ft)

Slide

Rotate

Slide

Rotate

Slide

Rotate

ROP (min/ft)

5

0

250

Gamma (API)

Gamma (API)

250

0

0

200

Resistivity

Resistivity

200

0

0

| 10920 | 10940 | 10960 | 10980 | 11000 | 11020 | 11040 | 11060 | 11080 | 11100 |

7060 TVD

7060 TVD

MD 11099 TVD 7105.09
Az 358.15° Inc 93.21°

MD 11009 TVD 7109.58
Az 357.28° Inc 92.51°

MD 10919 TVD 7113.69
Az 355.14° Inc 91.45°

7160

7160

lky, frm,
cut.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 98%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 2%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 99%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 1%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

MW IN: 9.3 VIS: 36
OUT: 9.5 VIS 39

MW IN: 9.4+ VIS: 35
OUT: 9.3 VIS 35

TG, C1-C5

C

ROP (min/ft)

Slide   Rotate

Gamma (API)

Resistivity

TG, C1-C5

C

ROP (min/ft)

Gamma (API)

Resistivity

11120	11140	11160	11180	11200	11220	11240	11260	11280	11300	11320

08/13/13 4:30am Depth @ 11185'MD

7060 TVD

7060 TVD

MD 11189 TVD 7099.98
Az 359.44° Inc 93.3°

MD 11279 TVD 7095.56
Az 358.94° Inc 92.33°

7110

7110

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 10%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 10%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

7160

7160

MW IN: 9.4+ VIS: 35
OUT: 9.3 VIS 35

MW IN: 9.5 VIS: 35
OUT: 9.5 VIS 34

MW IN: 9.5 VIS: 37
OUT: 9.4+ VIS 37

TG, C1-C5

8000

0

ROP (min/ft)

Slide

Rotate

Slide

Rotate

5

0

Gamma (API)

250

0

Resistivity

200

0

11340   11360   11380   11400   11420   11440   11460   11480   11500   11520   11540

7060 TVD

7110

7160

MD 11369 TVD 7091.9
Az 358.17° Inc 92.33°

MD 11459 TVD 7091.63
Az 356.25° Inc 88.02°

MD 11526 TVD 7093.69
Az 355.16° Inc 88.46°

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 10%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 90%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 10%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst 95%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 5%:
ltgy-gy, plty-sbplty, slty, sft, v calc.

Chalky Mrlst
mod intbd b
ltgy-gy, plty

8000

TG, C1-C5

0

5

ROP (min/ft)

0

250

2 man logging unit
with sample
program and gas
analyzer released
08/15/13.

Gamma (API)

0

200

Resistivity

0

11560	11580	11600	11620	11640	11(

7060 TVD

Projection to bit: 11611' MD, 88.46 INC,
355.16 AZM, 7095.97' TVD

7110

7160

t 97%: ltgy-gy, sbblky, frm,
iocl, nsfl, fst str wh cut. !
-sbplty, slty, sft

Chalky Mrlst 97%: ltgy-gy, sbblky, frm, v calc,
mod intbd biocl, nsfl, fst str wh cut. SH 3%:
ltgy-gy, plty-sbplty, slty, sft, v calc.