



Musgrove
 Petroleum Geology
 212 Main Street, Claflin KS

Geologist's Report

Company: L.D. Drilling, Inc.
 Lease: McCrary #9
 Field: Mueller
 Surface Location: SE-NE-SW-SE (950' FSL & 1641' FEL)
 Sec: 19 Twp: 21S Rge: 12W
 County: Stafford State: Kansas
 GL: 1861' KB: 1866'

Contractor: Petromark Drilling Rig #2
 Spud: 12/29/14 Comp: 1/5/15
 RTD: 3575' LTD: 3572'
 Mud Up: +/- 2600' Mud Type: Chemical Displaced

Drilling Time Kept From: 3000' to RTD
 Samples Saved From: 3000' to RTD
 Samples Examined: 3000' to RTD
 Geological Supervision: 3200' to RTD
 Geologist on Well: Jim Musgrove and Kurt Talbott

Surface Casing: 8 5/8" @ 377'
 Production Casing: 5 1/2" @

Wireline Logs: By Nabors: CNL/CDL, DIL, MEL

Well Comparison

FORMATION	WELL BEING DRILLED CHARTER MCCRARY #9 1866 KB		OFFSET HARBAR DRILLING MCCRARY #2 1868 KB		OFFSET MIDSTATES MCCRARY #6 1880 KB	
	LD	SS	LD	SS	LD	SS
ANHYDRITE	682	1184				
BASE ANHYDRITE	703	1163				
HEEBNER	3118	-1252				
TORONTO	3136	-1270				
BROWN LIME	3249	-1383				
LANSING	3264	-1398	3267	-1399	3276	-1395
BASE KC	3442	-1576				
VIOLA	3488	-1622	3486	-1618	3503	-1623
SIMPSON	3518	-1652	3509	-1641	3533	-1653
ARBUCKLE	3566	-1700	3562	-1694	3586	-1683
TOTAL DEPTH	3572	-1706	3570	-1702	3593	-1690

Spot Location



ROCK TYPES

- Cht
- Dolprim
- Lmst fw<7 shale, gm
- shale, gry
- Carbon Sh
- shale, red Ss
- Silst

EVENTS

- 1. Casing Shoe
- 2. RTE

INTERVALS

- Core
- DST

OTHER SYMBOLS

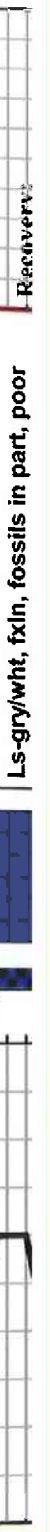
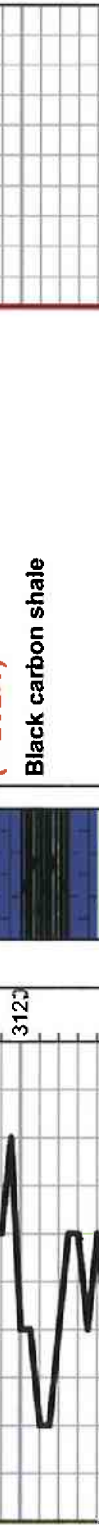
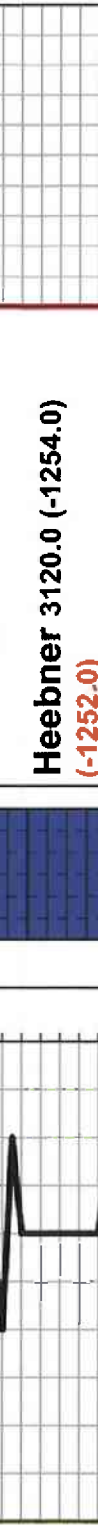
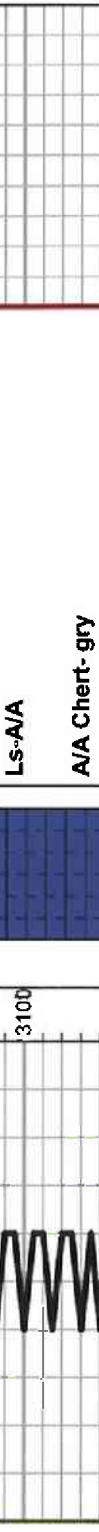
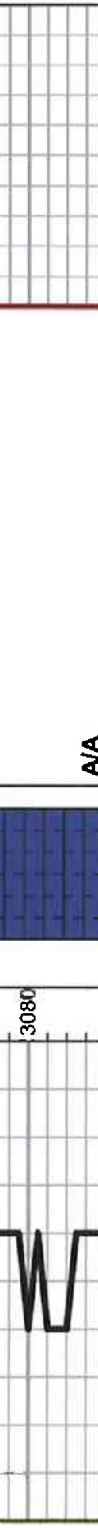
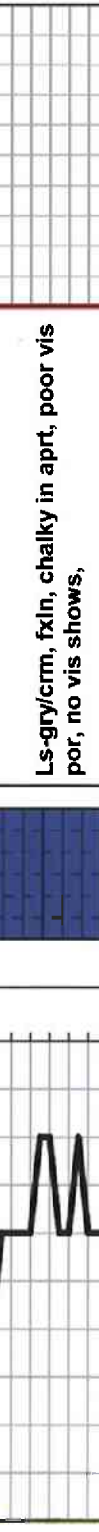
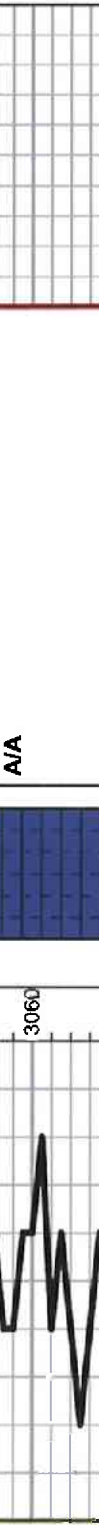
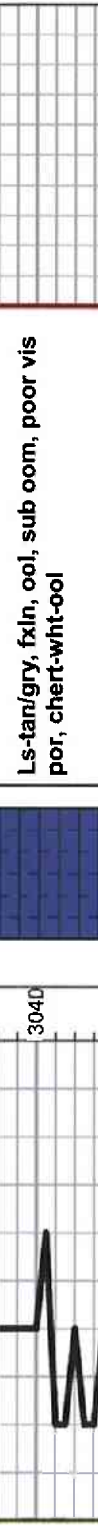
- DST Int
- DST alt

DST alt

DST

- ▶ RTF
- ▶ Sidewall
- ▶ Left Casing Shoe
- ▶ Right Casing Shoe

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 TG, C1 - C5



Geological Descriptions

Black carbon shale

Ls-tan/gry, fxln, ool, sub oom, poor vis por, chert-wht-ool

A/A

Ls-gry/crm, fxln, chalky in apt, poor vis por, no vis shows,

A/A

Ls-A/A

A/A Chert- gry

Heebner 3120.0 (-1254.0)
 (-1252.0)
 Black carbon shale

Toronto 3139.0 (-1273.0)
 (-1270.0)
 Ls-wht/crm, fxln in part, ool, chalky, poor vis por, Trace godlen brown stains, NSFO, no odor,

Douglas 3152.0 (-1286.0)
 (-1285.0)
 Shale-gry/dark gry, mica, soft,

A/A silty,

Shale-gry/dark gry

A/A

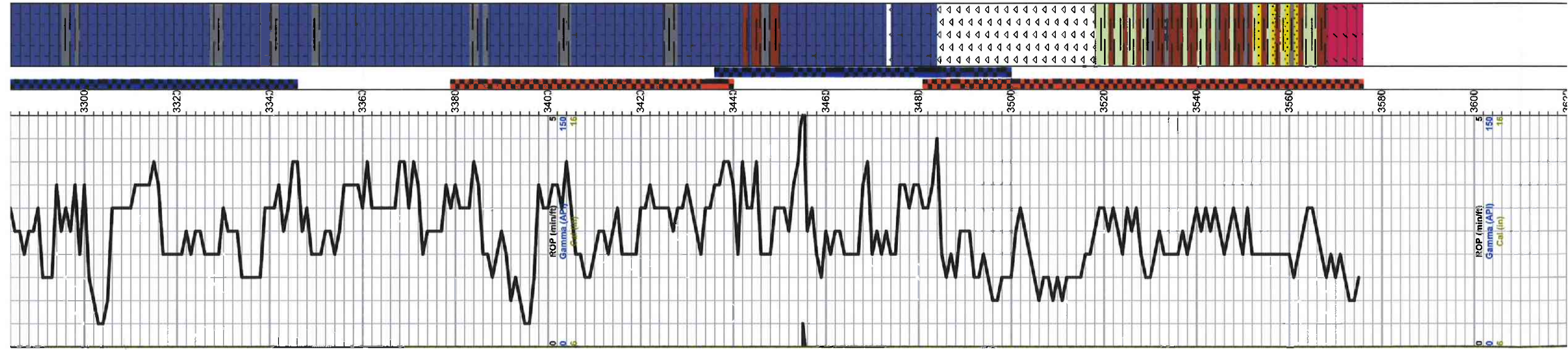
Brown Lime 3250.0 (-1384.0)
 (-1383.0)
 Ls-tan/brown, fossils in part, dense, poor vis por

Lansing 3265.0 (-1399.0)
 (-1398.0)
 Ls-tan, ool, slightly cherty in part, dense, poor developed por

Ls-gry/wht, fxln, fossils in part, poor

DST #1 3281-3344
 30-30-20-45

HF: BOB 20 sec. GTS 1
 min Fluid to Surface 4
 min
 ISI: BOB
 Recovery:



fossil cast por, golden brown to light brown stains, NSFO, faint to fair odor

12' GOCMW
10g 50-30w-55m
406' GOCMW
10g 50-80w-5m

Pressures:
ISIP 1037 psi
FSIP 1041 psi
FFP 542-614 psi
FFP 560-672 psi
HSH 1580-1573 psi

10 RTD
Kurt Talbott From 3345

DST #1 3380-3440
30-45-30-60
IF: BOB 4 min

Recovery:
112' GOCMW
10g 50-20w-65m
63' GOCMW
10g 10-50w-30m
315' GSOCMW
5g 20-88w-5m

Pressures:
ISIP 498 psi
FSIP 470 psi
IFP 36-158 psi
FFP 130-221 psi
HSH 1615-1602 psi

Total Gas (units) >100
C1 (units) 100
C2 (units) 100
C3 (units) 100
C4 (units) 100

DST #3 3436-3500
30-45-45-60
IF: BOB 25 min

Recovery:
90' GIP
30' Mud

Pressures:
ISIP 267 psi
FSIP 323 psi
IFP 9-24 psi
FFP 15-33 psi
HSH 1634-1624 psi

DST #4 3481-3575
30-45-45-60
IF: BOB 4 min

Recovery:
1764' GIP
25' VSOGM
10 20g 80m
126' HOCGM
20g 250-55m
189' HOCGM
20g 400-10w-36m
345' HOCGM
20g 600-10w-10m

Pressures:
ISIP 1239 psi
FSIP 1234 psi
IFP 33-160 psi
FFP 161-285 psi
HSH 1652-1644 psi

Total Gas (units) 100
C1 (units) 100
C2 (units) 100
C3 (units) 100
C4 (units) 100

LS-gry/tan, highly fossiliferous, scattered por, trace black dark brwn stains, NSFO, Faint odor,

LS-whtgry, fxln, chalky, poor vis por,

LS-wht/lt gry/tan, fxln, ool, sub oom por, trace light brown stains, TrSFO, no odor,

LS-crm/wht/tan, fxln, ool, poor inner ool to sub oom por, Trace stains, NSFO, no odor

LS-gry/tan, fxln, dense, poor vis por, chalky, Shale-gry/brown/blk

LS-tan/gry, fxln, dense, poor vis por, chalky in part,

LS-tan/crm/gry, fxln, ool, oom por, dark brown stains, Fair SFO, good odor,

LS-wht/lt gry, fxln, ool, poor to fair inner ool to oo mpor, light brown stains, TrSFO, good odor

LS-wht/crm, fxln, poor inner ool por, dark brown stains, TrSFO, faint to fair odor

LS-crm/tan, fxln, ool, poor inner ool por, dark brown spotty stains, NSFO, chalky Shale-gry/brwn

LS-crm/tan/wht, fxln, ool, poor vis por, cherty in part, chalky

Shale-gry/grn

Viola 3484.0 (-1618.0)
(-1622.0)

Chert-boney wht/crm, scattered semi trip,

Chert-boney wht/crm/tan,

Simpson 3520.0 (-1654.0)
(-1652.0)

Shale-maroon/brwn/grn

Shale-maroon/turq

Sand-clear/brwn, fine grained, well sorted, sub round, poor inner gran por, golden brwn stain/saturation, TrSFO, faint odor

Arbuckle 3566.0 (-1700.0)
(0.0)

Dol-tan/buff, fxln, poor to fair inner xln to finely vug por, golden to dark brown stains, SFO, good odor

Total Depth 3575.0 (-1709.0)
(-1706.0)