

Saman Sharifaie

Petroleum Geologist

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY: **Murfin Drilling Co., Inc.**
LEASE: **Schmidt-Van #A-#1-26**

FIELD: **Wildcat**
LOCATION: **330' ENL & 330' FWL**
SEC: **26** TWS: **4S** RGE: **31W**
COUNTY: **Rainbow** STATE: **Kansas**
CONTRACTOR: **Murfin Drilling #24**
SPUD: **10/1/17** COMP: **10/2/17**
RTD: **4/5/17** LTD: **4/5/17**
MUD UP: **3/1/17** TYPE MUD: **Chemical**

SAMPLES SAVED FROM: **3660'** TO RTD
DRILLING TIME KEPT FROM: **3660'** TO RTD
SAMPLES EXAMINED FROM: **3660'** TO RTD
GEOLOGICAL SUPERVISION FROM: **3360'**

CONDUCTOR: **8-5/8" at 260'**
SURFACE: **5-1/2" at 562'**
PRODUCTION: **5-1/2" at 562'**

CASING
ELECTRICAL SURVEYS
CND, DILL, MEL, Smitc
GEOLOGICAL SUPERVISION FROM: **3360'**

REFERENCE WELL: **Schmidt-Van #A-#1-26**
Fluorite, Pyrite

| Formation | Sample Tops | E-log Tops | Strat Post. |
|----------------|-------------|-------------|-------------|
| Anhydrite | 2705 (+242) | 2703 (+244) | -4 |
| Base Anhydrite | 2740 (+207) | 2736 (+211) | -4 |
| Tuskey | 3727 (+825) | 3767 (+820) | 3 |
| Hickory | 3936 (+616) | 3931 (+616) | -5 |
| Leedler | 3982 (+570) | 3980 (+573) | -3 |
| Summit | 4139 (+413) | 4149 (+402) | -4 |
| Stark | 4205 (+347) | 4196 (+349) | -3 |
| Mound City | 4311 (+241) | 4307 (+240) | -3 |
| FT Scott | 4324 (+228) | 4317 (+236) | -3 |
| Mississippi | 4324 (+228) | 4317 (+236) | -3 |

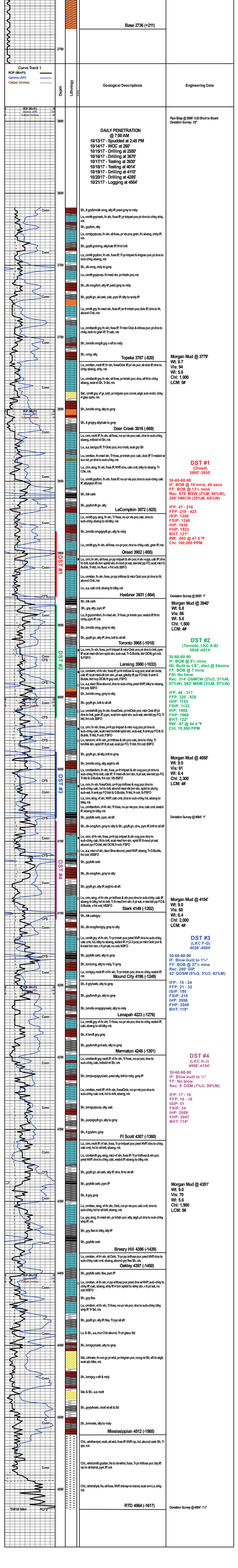
REMARKS: Despite poor shows of oil in multiple potential pay zones and negative DST results, it is recommended and agreed upon by all parties that production casing be set to further evaluate this well and to possibly use it for injection purposes.

Respectfully Submitted,

API #15-153-21203

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Petroleum Geologist

*Tops have been adjusted to electric logs



| Depth (ft) | Geological Descriptions | Engineering Data |
|-------------|---|--|
| 2700 - 2750 | Anhydrite 2703 (+244) Base 2736 (+211) | |
| 3660 - 3700 | DAILY PENETRATION @ 7:00 AM 10/13/17 - Spudded at 2:45 PM 10/14/17 - WOC at 260' 10/15/17 - Drilling at 2650' 10/17/17 - Testing at 3330' 10/18/17 - Testing at 4014' 10/19/17 - Drilling at 4110' 10/20/17 - Drilling at 4285' 10/21/17 - Logging at 4564' | Pipe Strap @ 3599': 0.53 Short to Board Deviation Survey: 1/2' |
| 3700 - 3800 | Sh, lt gry/bm/dk omg, sly IP, pred gry to mdy Ls, cm/lt gry/varic, fn xln, foss IP, pr intpart por, pt dns to chky, shly, ns Sh, gry/bm, sly Ls, cm/gry/purp, fn xln, sil foss, pr vis por, gran, ft, sbang, chky IP, ns Sh, gry/lt gry/omg, sly/calc IP, fr to brit Ls, cm/lt gry/bm, fn xln, foss IP, Tr pr intpart & intran por, pt dns to sub-chky, sbang, ns Sh, dk omg, mdy to gry Ls, cm/lt gry/purp, fn-med xln, pr intbn por, ns Sh, dk omg/bm, sly IP, pred gry to mdy Sh, gry/lt gn, sil carb, calc, pycr IP, sly to snyd IP Ls, cm/lt gry, fn-med xln, foss IP, pr fr intbn por, dolc IP, dns to fr, abund Chk, ns Ls, cm/ltan gry, fn xln, foss IP, Tr micr Oolc & infoss por, pt dns to chky, dolc to gran IP, Tr calc, ns Sh, bm/dk omg/lt gry, v sft to mdy Sh, omg, sly Topeka 3767 (-820) Ls, cm/ltan, mott IP, fn xln, foss, Oolc IP, pr vs por, sil dolc IP, dns to chky, sbang, shly, ns Ls, cm/ltan gry, fn xln, sil foss, pr intbn por, dns, sil fr to chky, sbang, scat rd Sh, Tr Sd, ns Sat, cm/lt gry, vfg, srt, pr intgan por, consl, argil, sub-midd, chky, r/glau spts, ns Sh, bm/dk omg, sly to gry Sh, lt gn/gry, sly/calc to gry | Morgan Mud @ 3779' WT: 8.7 Vis: 8.4 WI: 5.6 Chl: 1,000 LCM: 5# |
| 3800 - 3850 | Deer Creek 3816 (-869) Ls, cm, mott IP, fn xln, sil foss, no-pr vis por, calc, dns to sub-chky, sbang, intdolt rd Sh, ns Ls, aa, tan/gry IP, Tr Oolc pcs, incr mott, scat gry Sh Ls, cm, fn xln, foss, pr fr intbn por, calc, dolc IP, Tr rexted w suc txt, pt dns to sub-chky, ns Ls, cm, sing, v-fn xln, foss IP, NVP, dns, calc cmt, bily to sbang, Tr Chk, ns Ls, cm/lt gry/bm, fn xln, foss IP, no-pr vis por, dns to sub-chky, calc IP, sly/gran IP, ns Sh, blk carb Sh, gry/bm/lt gn, sly | DST #1 (Oread) 3885'-3930' IFP: 60-60-90 FF: BOB @ 10 mins, 45 secs FSI: BOB @ 13 1/2 mins Rec: 670' MSW (2%O, 98%W), 208' HMCW (35%M, 65%W) IFP: 47 - 216 FFP: 219 - 423 ISIP: 1258 FSI: 1248 IHP: 1938 FHP: 1923 BHT: 121° RW: .092 @ 47.5 °F Chl: 160,000 PPM |
| 3850 - 3900 | LeCompton 3872 (-925) Ls, cm/lt gry, sing, fn xln, Tr foss, no-pr vis por, calc, dns to sub-chky, sbang to sil bily, ns Sh, bm/dk omg/gry/lt gn, sly to mdy Ls, cm/lt gry, fn xln, sil foss, no-pr por, dns to chky, calc, gran IP, ns | Morgan Mud @ 3940' WT: 8.8 Vis: 8.6 WI: 5.6 Chl: 1,500 LCM: 4# |
| 3900 - 3950 | Oread 3902 (-955) Ls, cm, fn xln, sil foss, pr pp intpart & xln por, r xln vugs, calc IP, dns to brit, scat dk-bm spid stn, lt-med pt sat, slw bld pp FO, scat micr G Bubbles, Tr rid, no floor, v frt oolc, SSFO Ls, cm/ltan, fn xln, foss, pr pp intfoss & micr Oolc por, pt dns to fr, abund Chk, ns Ls, aa, calc cmt, sbang to bily, ns Heebner 3931 (-984) Sh, blk carb Sh, gry, sly, pycr IP Ls, lt gry/cmbm, fn-med xln, Tr foss, pr intbn por, rexted IP, fr to chky, pycr IP, ns Sh, bm/dk omg, gry to sly Sh, gry/lt gn, sly IP, dns, brit to sil sft | Deviation Survey @ 3930: 1" Morgan Mud @ 3940' WT: 8.8 Vis: 8.6 WI: 5.6 Chl: 1,500 LCM: 4# |
| 3950 - 4000 | Toronto 3965 (-1018) Ls, cm, fn xln, foss, pr fr intpart & micr Oolc por, pt dns to brit, pycr IP, scat med-dk-bm spid stn, lt-med pt sat, slw bld pp FO, scat micr G Bubbles, Tr rid, no floor, v frt oolc, SSFO Lansing 3980 (-1033) Ls, cm/lt, v-fn xln, foss IP, pr fr intfoss & vug por, scat xln inds, calc IP, scat med-dk-bm stn, pt sat, gilybry IP, pp FO bld, fr amt G Bubbles, lid hey OCK fr gry oolc, FSFO Ls, aa, deer Shw abund, dns to sub-chky, pred NVP, bily to sbang, frt oolc, SSFO Sh, bm/dk omg, gry to sly Sh, gry/lt gn, brit to sil sft Ls, cm/lt, v-fn xln, foss, Oolc, pr fr intfoss & vug por, scat xln inds, calc IP, scat med-dk-bm stn, pt sat, gilybry IP, pp FO bld, fr amt G Bubbles, Tr rid, no floor, v frt oolc, SSFO Ls, cm, sing, v-fn xln, NVP, calc cmt, dns to sub-chky, hd, sbang to bily, ns Ls, cm/ltan/bm, v-fn xln, Tr foss, no-pr vis por, dns, calc cmt, rexted IP, sbang to bily, ns Sh, gry/bk carb, pycr, calc Sh, dk omg/bm, gry to sly & Sh, gry/lt gn, dns, pycr IP, brit to sil sft | DST #2 (Toronto, LKC A-B) 3936'-4014' IFP: 60-60-90 FF: BOB @ 5 1/2 mins IS: Built to 1/8", died @ 54mins FF: BOB @ 7 mins ISIP: No blow Rec: 314' OSMCW (2%O, 31%M, 67%W), 982' MSW (3%M, 97%W) IFP: 48 - 317 FFP: 320 - 620 ISIP: 1153 FSI: 1122 IHP: 1985 FHP: 1960 BHT: 122° RW: .97 @ 44.4 °F Chl: 10,500 PPM |
| 4000 - 4050 | Stark 4149 (-1202) Sh, blk carb/gry Sh, dk omg/bm/gry, gry to sly Ls, cm/lt gry, v-fn xln, foss, pr fr intpart & micr Oolc por, pt dns to brit, calc cmt, fr to brit, Tr lt-med bm stn, lt pt sat, slw bld pp FO & G Bubbles, v frt oolc, VSSFO Sh, blk carb/gry Sh, dk omg/bm/gry, gry to sly Ls, cm/lt gry, v-fn xln, foss, pr fr intpart & micr Oolc por, pt dns to brit, calc cmt, fr to brit, Tr lt-med bm stn, lt pt sat, slw bld pp FO & G Bubbles, v frt oolc, VSSFO Mound City 4196 (-1249) Sh, lt gry/varic, sly to gry Sh, gry/bm/lt gn, sly to gry Sh, bm/dk omg/gry/varic, sly to mdy Lenapah 4223 (-1276) Ls, cm/lt gry, v-fn xln, Tr foss, no-pr vis por, dns to chky, rexted IP, calc, sbang to sil bily, ns Sh, lt bm/lt gry Sh, gry/bm/lt gr/varic, sly to gry Marmaton 4248 (-1301) Ls, cm/ltan gry, mott IP, v-fn xln, Tr foss, no-pr por, dns to sub-chky, calc, intdolt rd Sh, ns Sh, bm/purp/gry/varic, pred sly, brit to mdy, gry IP Ls, cm/ltan, mott IP, v-fn xln, foss, Oolc, no-pr vis por, dns to sub-chky, calc cmt, hd to brit, sbang, ns Sh, bm/gry/purp, sly, calc Sh, purp/gry/lt gn, sly to gry Sh, lt gry/bm, gry | DST #3 (LKC F-G) 4038'-4084' IFP: 60-60-90 FF: Blow built to 1 1/2" FSI: BOB @ 37 1/2 mins Rec: 280' GIP, 52' GOSM (5%G, 3%O, 92%M) IFP: 15 - 24 FFP: 21 - 32 ISIP: 195 FSIP: 218 IHP: 2056 FHP: 2049 BHT: 118° |
| 4050 - 4100 | Ft Scott 4307 (-1360) Ls, cm, mott IP, v-fn xln, foss, Tr pr intpart por, pred NVP, dns to chky, calc cmt, hd to sil brit, sbang, ns Ls, cm/ltan gry, sing, micr-v-fn xln, foss IP, Tr pr intfoss & xln por, pred NVP, dns to chky, calc, rexted IP, sbang to bily, ns Sh, gry/lt gn, sil carb, sly IP, dns, fr to sil sft Sh, gry/bk carb, pycr IP Sh, lt gry, gry Ls, cm/ltan, sing, v-fn xln, Oolc, no-pr vis por, calc cmt, dns to sub-chky, hd to sil brit, sbang, ns Ls, gry, sing, fn-med xln, pr intbn por, sly, argil, pt dns to sub-chky, sly IP, ns Sh, gry, fss to bily, sly IP Sh, gry/bk carb | Deviation Survey @ 4084: 1" Morgan Mud @ 4058' WT: 9.0 Vis: 6.1 WI: 6.0 Chl: 2,300 LCM: 4# |
| 4100 - 4150 | Breezy Hill 4386 (-1439) Ls, cm/ltan, v-fn xln, sil Oolc, Tr pr pp intfoss por, pred NVP, dns to sub-chky, calc cmt, sbang, abund gry fss Sh, ns Oakley 4377 (-1450) Ls, cm/ltan, v-fn xln, pr pp intfoss por, pred dns w NVP, sub-chky to chky IP, calc, sbang, sly IP, r/bm spid to stky stn, v lt pt sat, no oolc, NSFO Sh, gry, fss Ls, cm/ltan, v-fn xln, Tr foss, no-pr vis por, dns to sub-chky, bily, sly IP, Tr Sd, ns Sh, gry/lt gn, sly IP, fss, Tr pycr, sil sft Ls & Sh, aa, incr Chk abund, Tr c/glauc Sd Sh, bm/gry/varic, sly to gry Sat, dk varic, fn-cs gr, pr srt, pr intgan por, cong w Sh, sft to argil, scat qtz blk, ns Sh, bm/gry, v sft & mdy Sat & Sh, aa, mott Sh, gry/varic, mott w sft & Sd Sh, bm/varic, sly to mdy | Morgan Mud @ 4154' WT: 9.0 Vis: 6.0 WI: 6.4 Chl: 2,000 LCM: 4# DST #4 (LKC H-J) 4088'-4154' IFP: 60-60-90 FF: Blow built to 1 1/2" FSI: No blow Rec: 5' OSM (1%O, 99%M) IFP: 17 - 18 FFP: 18 - 18 ISIP: 51 FSIP: 34 IHP: 2059 FHP: 2047 BHT: 114° |
| 4150 - 4200 | Mississippi 4512 (-1565) Chl, whit/gray, mott, sil wld, foss IP, NVP, op, hd, abund varic Sh, Tr qtz, ns Chl, whit/cmt grytan, fss to sil wld, foss, Tr pr intfoss por, trip IP, op to sil trans, pycr IP, ns Chl, whit/cmt, fss, sil foss, NVP, transp to trans, scat cm Ls, shly, ns RTD 4564 (-1617) | Morgan Mud @ 4351' WT: 9.0 Vis: 7.0 WI: 5.6 Chl: 1,900 LCM: 5# Deviation Survey @ 4564: 1/2' |