# MURFIN DRILLING COMPANY, INC. — WICHITA, KANSAS

# GEOLOGIST'S REPORT

OPERATOR: MURFIN DRILLING COMPANY, INC.
LEASE: STADOR UNIT # 1-3
LOCATION: 1650 FSL & 2100 FEL
SEC. 3 TWSP 14S RGE 19W
COUNTY: ELLIS STATE: KANSAS
FIELD: STADELMAN

ELEVATIONS
KB: 2168 Ft.
GL: 2163 Ft.
ALL MEASUREMENTS FROM K.B.

CONTRACTOR: Murfin Drilling Company RIG NO. 8
COMMENCED: 11 OCT 2011 COMPLETED: 21 OCT 2011
MUD DISPLACED: 3001 MUD TYPE: Chemical
DRILLING TIME KEPT FROM: 3100 TO 3880
SAMPLES SAVED FROM: 3100 TO 3880
SAMPLES EXAMINED FROM: 3100 TO 3880
GEOLOGICAL SUPERVISION FROM: 3095 TO 3880
GEOLOGIST ON WELL: Paul Gunzelman

## CASING RECORD

Conductor: None
Surface: 8 5/8" @ 220'
Production: 5 1/2" @ 3876'

## ELECTRICAL SURVEYS:

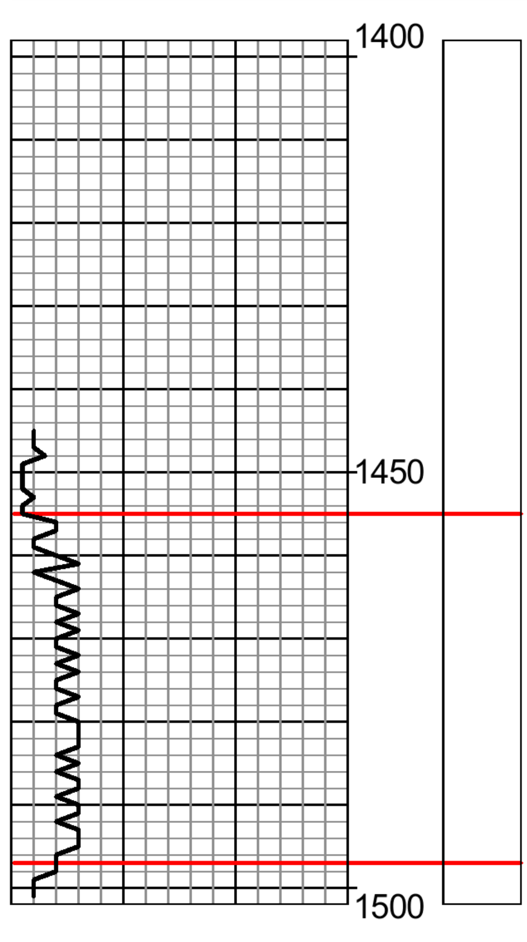
Log-Tech, Inc.
Comp. Neutron Density
Dual Induction
Micro-resistivity
Comp. Sonic

| FORMATION NAME | LOG TOP | LOG DATUM | SAMPLE TOP | SAMPLE DATUM |
|---|---|---|---|---|
| Stone Corral | 1456 | +712 | 1455 | +713 |
| Base/Anhydrite | 1497 | +671 | 1497 | +671 |
| Topeka | 3177 | -1009 | 3174 | -1006 |
| Heebner Shale | 3419 | -1251 | 3417 | -1249 |
| Toronto | 3447 | -1279 | 3445 | -1277 |
| Lansing | 3468 | -1300 | 3466 | -1298 |
| Base/Kansas City | 3717 | -1549 | 3715 | -1547 |
| Arbuckle | 3813 | -1645 | 3809 | -1641 |
| Total Depth | 3882 | -1714 | 3880 | -1712 |

## REMARKS

API 15-051-26206-00-00
Drilling Fluids: Morgan Mud, Inc. (David Lines, engineer)
Drill Stem Testing: Trilobite Testing, Inc. (Ray Schwager, tester)
Gas Trailer: No Gas Trailer
Reserve Pit Chlorides: 8,900 ppm.

DRILL TIME (MIN/FT) | DEPTH | LITHOLOGY | SHOWS | SAMPLE DESCRIPTIONS | REMARKS



STONE CORRAL
1455 (+713)

BASE/ANHYDRITE
1497 (+671)

## SAMPLE DESCRIPTIONS

3:16 PM, 14 October 2011

Sh: Med gy, fis, slty in pt, some pyr.
Ls: Crm-tn, fn-vfxln, tr org rem, some intbd lt gy-gn sh, n/s.
Ls: Gy, fxln, arg, tr org rem, intbd gy fis sh, n.v.p.
Sh: Gy gy-gn, fis, tr pyr, some slty, intbd tn-gy fxln Ls.
Sh: Lt gy-gn & lt gn, fis, vgt w/crm & v.lt gy arg sltst.
Sh: Gy, fis, some slty, tr carb mat.

Morgan Mud check @ 3144'
Vis: 78, Wt: 8.7, WL: 6.4
Chlor: 2,000 ppm, LCM: 2#

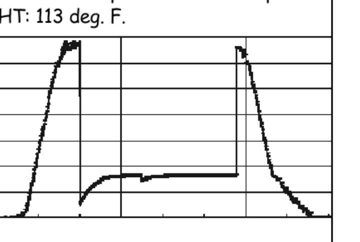
Ls: Crm-gy, fxln-gran, mott w/dk gy sh inc, tr org rem & spr calc, n/s.
Ls: Tn-gy, fxln, sli foss (Fus) cons gy fis slty sh, n/s.

TOPEKA
3174 (-1006)

Ls: Crm, fxln, ool, some sbchky, cons spr calc, n.v.p.
Ls: Crm, fxln, sbchky, some crm-gy sli foss arg Ls, occ spr calc, n/s.
Ls: Tn, fn-vfxln, tr org rem, some tn-gy fxln arg mott Ls, n.v.p.
Ls: Crm, fxln, ool, cons sec calc, bcm crm-lt gy fnly gran dol, some arg, gd intgran por, n/s.
Ls: Crm, fxln, tr org rem, occ crm-gy & arg, some lt olv gn slty sh, n/s.
Ls: Crm-tn, fxln-gran, some dk gy sh inc, tr org rem, n/s.
Ls: Crm-lt gy, fxln, tr gran, smwt arg, sbchky, foss (Brach) n.v.p.
Ls: Crm, fxln, sli ool, tr sbchky, some spr calc, occ arg, n.v.p.
Ls: Tn, tr v.lt gy, gran, tr pyr, dol, cons gd v.sml oom por, gd intgran por, n/s.
Ls: Crm, fxln, foss, sbchky, some spr calc, n/s.
Ls: Crm-tn mott w/dk gy sh, sbchky, tr org rem, crm wh & gy-brn mott op cht, n/s.
Ls: Tn & gy-brn mott, fxln, foss arg, occ silic-chty, n/s.
Sh: Blk, thn fis, carb, bcm dk gy & gn-gy fis foss (Crin), Brach) tr pyr.
Ls: Crm-tn mott w/brn inc, gran dol, some sbchky, occ arg, tr tn microxln dns Ls, gen fr-gd intgran por, n/s.
Ls: Crm, some lt gy, fxln-gran, sli ool, occ arg, tr sbchky & crm-lt gy op cht, fr intgran por, n/s.
Ls: Crm, vfxln-microxln, some sbchky, tr amor calc, v.lt gy & crm op vit cht, tr pr intxln por, v.sli odor, no FO, r.lt stn.

DST # 1 3457 - 3504
30"-60"-45"-90"
IF: Strong blow BOB in 2 min.
FF: Strong blow BOB in 9 min.
RECOVERY:
200 Ft. Gas In Pipe
5 Ft. Clean Oil
40 Ft. Sli. Oil & Gas Cut Muddy Wtr.
(10%Gas, 5%Oil, 20%Mud)
372 Ft. Sli. Oil & Gas Cut Water
(10%Gas, 1%Oil, 89%Wtr)
(Chlor: 97,000 ppm)

| | |
|---|---|
| IHP: 1669 psi. | FHP: 1645 psi. |
| IFP: 119-350 psi. | ISIP: 409 psi. |
| FFP: 356-407 psi. | FSIP: 411 psi. |
| BHT: 113 deg. F. | |



Ls: Crm-tn, fxln-gran, sli foss (Fus), gy-brn & gy mott cht, tr pyr, n/s.
Sh: Blk thn fis, carb.
Ls: Crm, occ crm-lt gy, fxln, tr sbchky & amor calc, foss (Fus), crm & lt gy op cht, n/s.
Ls: Crm, fn-vfxln, sbchky, sli foss (Fus), med gy op vit cht, pr foss cast por & pp por, sli odor, v.sli shw FO.
Ls: Crm mott w/dk gy sh, fxln, sbchky, tr amor calc, some tn-brn fxln dns Ls, n.v.p, n/s.
Sh: Lt gn, fis, slty.
Ls: Crm-lt gy, fxln, chky-sbchky, foss (Crin) gy lt gy & gy-brn op vit cht, n/s.
Ls: Crm-tn, fxln, sli ool, foss (Fus) sbchky, cons gy op cht, some lt brn gran dol Ls w/fr intgran por, fr odor, v.sli shw FO, med brn sat stn.
Ls: Crm, tr crm-tn, fxln, occ mott w/dk gy sh inc, foss (Fus) tr sbchky, n.v.p.
Ls: Crm, fxln, sli foss (Fus, Brach) sbchky, some dk gy fis sh, n/s.
Ls: Crm-tn, some lt gy, fxln, tr org rem, chty, some sbchky, n/s.

HEEBNER SHALE
3417 (-1249)

Sh: Blk, thn fis, carb.
Ls: Tn, vfxln, dns, n/s
Sh: Gy dk gy gy-gn & lt gn, fis, tr pyr, some v.lt gy-gn arg sltst.
Sh: Dk gy & gy-gn, fis, tr pyr.
Sh: Dk gy-gn & olv gn, fis, sli pyr.

TORONTO
3445 (-1277)

Morgan Mud check @ 3465'
Vis: 60, Wt: 8.9, WL: 6.4
Chlor: 3,000 ppm, LCM: 2#

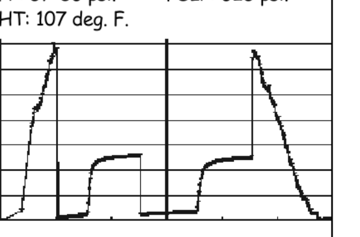
Ls: Crm, gran, sbchky, sli dol, some spr calc, fr intgran por, n/s.
Ls: Wh-crm, fn-vfxln, tr sbchky, occ silic, tr wh op-trnsl vit cht, n.v.p, n/s.
Sh: Gy dk gy & dk gy-gn, fis, tr calc.

LANSING
3466 (-1298)

Ls: Crm, fxln, some sbchky, wh-v.lt gy op-trnsl vit cht, v.sli odor, no FO, tr brn edge stn.
Ls: Crm, some mott w/dk gy sh & pyr, fxln, tr org rem, intbd olv gn & lt gn sli pyr sh, n.v.p, n/s.

DST # 2 3507 - 3549
30"-60"-60"-60"
IF: Weak 1 1/2 inch blow
FF: Weak 1 inch blow
RECOVERY:
140 Ft. Water
(Chlor: 90,000 ppm)

| | |
|---|---|
| IHP: 1665 psi. | FHP: 1647 psi. |
| IFP: 20-55 psi. | ISIP: 645 psi. |
| FFP: 57-86 psi. | FSIP: 625 psi. |
| BHT: 107 deg. F. | |

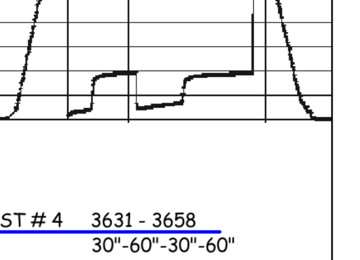


Sh: V.dk gy-blk, fis, some carb.
Ls: Crm, fxln, tr rexlzd ool, some spr calc, fr oom por, sli odor, v.sli shw FO, lt spty stn.
Ls: Tn-brn, fxln, sli arg, tr spr calc, pr pp & vug por, sli odor, fr shw FO, sli shw G, dk even stn.
Ls: Crm, fxln-frag, ool, cons sec calc, pr-fr intool por, no odor, no FO, spty stn, some blk asph res.
Sh: Gn & gy-gn, fis, slty, sli pyr, some calc.
Ls: Crm mott w/v.lt gn sh, fxln, sli ool, foss (Fus) sbchky, cons wh & lt gy op-trnsl vit cht, fr pp por, sli odor, fr shw FO, sli shw G, lt spty stn.
Sh: Blk, thn fis, carb, bcm gn & v.dk gy-gn fis, tr pyr.
Ls: Crm-v.lt gy, fxln, foss (Fus, Brach) tr pyr, bcm sbchky, fr pp por, some fr vug por, gd odor, fr shw FO, med brn spty stn.

Morgan Mud check @ 3549'
Vsi: 56, Wt: 8.9, WL: 6.0
Chlor: 4,900 ppm, LCM: 2#

DST # 3 3590 - 3632
30"-60"-60"-90"
IF: Good blow, BOB in 14 min.
FF: Good blow, BOB in 13 min.
RECOVERY:
660 Ft. Gas In Pipe
50 Ft. Clean Oil
(40 grav. API)
90 Ft. Gas & Mud Cut Oil
(30%Gas, 20%Mud)
186 Ft. Slightly Oil Cut Water
(1%Oil, 99%Water)
(Chlor: 101,000 ppm)

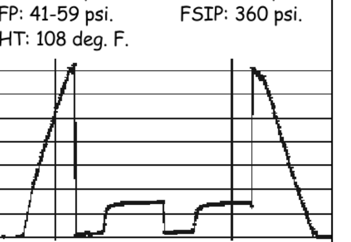
| | |
|---|---|
| IHP: 1720 psi. | FHP: 1691 psi. |
| IFP: 27-97 psi. | ISIP: 473 psi. |
| FFP: 105-165 psi. | FSIP: 468 psi. |
| BHT: 113 deg. F. | |



Ls: Crm, fxln, chky-sbchky, tr org rem, some amor calc & wh op frs cht, n.v.p.
Sh: Gy & gy-gn, fis, slty, tr pyr.
Ls: Wh-crm, fxln-frag, ool, sbchky, cons amor calc, tr wh-lt gy trnsl ool cht, fr intool por, n/s.
Ls: Crm-tn, tr lt gy, vfxln-microxln, some wthd-sbchky dns, n/s.
Ls: Crm, tr v.lt gy, fxln, sli ool, rexlzd sbchky, fr oom & intxln por, n/s.
Ls: Crm-tn, vfxln-crpxln, some wh & crm mott op devit cht, n.v.p, n/s.
Sh: Blk, thn fis, carb, bcm gy & dk gy fis sh, some tn & gy-brn lmy arg sltst.
Ls: Tn & lt gy, fxln, tr org rem, some brn & wh mott op cht, pr pp por, tr fr vug por, fr odor, sli shw FO, spty lt brn stn.
Ls: Crm, tr lt gy, fn-vfxln, sbchky, tr pyr, occ arg, n.v.p.
Sh: Dk gy, fis, some blk carb.
Ls: Crm-tn, fxln, tr ool, some spr calc, occ arg, fr-gd pp por, tr vug por, fr odor, v.sli shw FO, spty lt stn, some barren por.
Ls: Crm, fxln, sbchky, sli ool, tr cht, n.v.p.
Sh: Gy-gn & olv gn, fis, pyr, some slty, tr carb mat.
Ls: Tn, fxln, rexlzd, tr ool, some spr calc, gd oom por, fr odor, fr shw FO, fr shw G, med brn sbsat stn, cons barren por.

DST # 4 3631 - 3658
30"-60"-30"-60"
IF: Weak 1 inch blow.
FF: Very weak surf. blow after 20 min.
RECOVERY:
70 Ft. Mud

| | |
|---|---|
| IHP: 1728 psi. | FHP: 1723 psi. |
| IFP: 19-39 psi. | ISIP: 367 psi. |
| FFP: 41-59 psi. | FSIP: 360 psi. |
| BHT: 108 deg. F. | |



Ls: Crm, fxln, sli ool, tr org rem, some sbchky, bcm crm-tn fn-vfxln, n.v.p, n/s.
Sh: Gy & dk gy, fis, some slty, tr carb mat.
Ls: Crm, fxln-gran, ool, some chky, rexlzd, gd oom por, fr odor, fr-gd shw FO, spty sbsat stn, much barren por.
Ls: Crm, fxln, sbchky, sli ool, tr lt gn sh inc, pr pp por, v.sli odor, sli shw FO, dk spty stn.
Ls: Crm-tn, fxln, ool, sbchky, tr wh-crm microxln dns Ls, n/s.
Ls: Crm-v.lt gy, fxln, sbchky, some org rem & spr calc, pr intxln por, n/s.
Ls: Wh-crm, fxln, tr vfxln, sbchky, sli ool, tr org rem, r.arg, n.v.p.
Ls: Crm, fn-vfxln, sbchky, tr org rem, n.v.p.

BASE/KANSAS CITY
3715 (-1547)

Sh: Gy dk gy & gy-gn, fis, tr slty, some carb mat.
Ls: Crm-tn, fxln, sbchky, tr org rem & spr calc, n.v.p, n/s.

Morgan Mud check @ 3632'
Vis: 58, Wt: 8.9, WL: 7.2
Chlor: 4,400 ppm, LCM: 1.5#

Sh: Gn & gy-gn, some slty, tr pyr.
Ls: Crm-tn, fn-vfxln, chky-sbchky, tr org rem, n/s.
Sh: Gy dk gy gy-gn & dk gn, fis-thk fis, sli pyr, some med gy arg sltst, occ carb mat.

Morgan Mud check @ 3769'
Vis: 62, Wt: 9.0, WL: 6.4
Chlor: 6,900 ppm, LCM: 4#

Ls: Crm, fxln, tr vfxln, occ silic, some tn & brn inc, sbchky, pr pp por, sli odor, v.sli shw FO, dk spty stn.
Ls: Crm, fxln-gran, sbchky, occ silic, tr tn & crm op-trnsl cht, n.v.p.
Sh: Gy-gn rd-brn & gy, fis-blky, some mott, tr slty, amb rd-or & v.lt gy op-trnsl cht, n/s.

Morgan Mud check @ 3832'
Vis: 63, Wt: 9.2, WL: 7.2
Chlor: 7,600 ppm, LCM: 3#

Sh: Gy dk gy rd-brn gn gy-gn & gy-brn, occ slty, tr calc, some yel rd-or & gy cht, n/s.
Cgl: Gn gy-gn rd-brn & gy, some pnk & mar, intbd amb tn lt yel rd-or & gy op-trnsl cht, tr gy trnsl ool cht & clr-v.lt gy co ang qtz, tr Gil.

Morgan Mud check @ 3867'
Vis: 54, Wt: 9.2, WL: 7.6
Chlor: 8,700 ppm, LCM: 3#

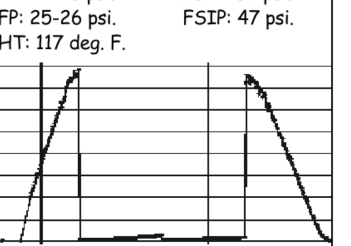
Sh: Gy-gn & lt gn, fis slty w/rd-brn fis-blky ea sh & or wh crm & lt gy op-trnsl vit cht, n/s.

ARBUCKLE
3809 (-1641)

Dol: V.lt gy, fn-vfxln, some dns, tr calc & chky, fr intxln por, tr fr-gd vug por, no odor, fr shw v.dk FO, spty v.dk stn.

DST # 5 3810 - 3820
30"-60"-30"-60"
IF: Initial surge, no blow
FF: Weak surface blow throughout
RECOVERY:
5 Ft. Slightly Oil Cut Mud
(1%Oil, 99%Mud)

| | |
|---|---|
| IHP: 1186 psi. | FHP: 1870 psi. |
| IFP: 24-26 psi. | ISIP: 67 psi. |
| FFP: 25-26 psi. | FSIP: 47 psi. |
| BHT: 117 deg. F. | |

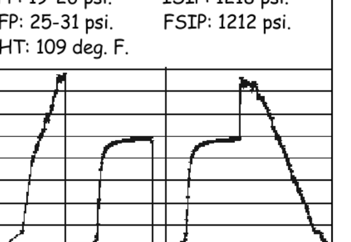


Dol: V.lt gy, fn-vfxln, cons lt gy wh & crm op & trnsl cht, tr ool & oom cht, some v.lt gn fis sh, pr intxln por, tr fr vug por, sli odor, gd spty shw FO, some barren por, tr blk asph res.
Dol: V.lt gy-crm, fn-medxln, some chk, sli pyr, intbd lt gn brn & rd-brn mott sbwxy glauc sh, gd intxln por, fr odor, tr shw FO, cons blk tar O.
Dol: V.lt gy, fxln, sli pyr, cons lt gy trnsl vit cht, fr intxln por, some blk tar O, no odor, no FO.
Dol: Crm-lt gy, fn-vfxln, sbchky, cons crm & lt gy trnsl vit cht, some ool cht, pr intxln por, n/s.
Dol: Crm-v.lt gy, fxln, tr medxln, sbchky, some cht & fn-med qtz sd, tr lt gn sh, fr-gd intxln & vug por, n/s.

TOTAL DEPTH
3880 (-1712)

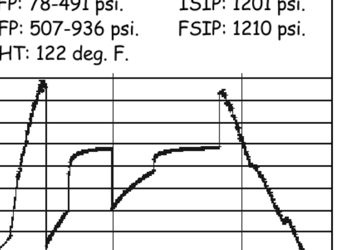
DST # 6 3820 - 3832
30"-60"-30"-60"
IF: Weak 1/4 inch blow
FF: Weak surface blow throughout
RECOVERY:
10 Ft. Oil Cut Mud
(7%Oil, 93%Mud)

| | |
|---|---|
| IHP: 1907 psi. | FHP: 1865 psi. |
| IFP: 19-26 psi. | ISIP: 1218 psi. |
| FFP: 25-31 psi. | FSIP: 1212 psi. |
| BHT: 109 deg. F. | |



DST # 7 3832 - 3842
30"-60"-60"-90"
IF: Strong blow, BOB in 2 min.
FF: Strong blow, BOB in 3 min.
RECOVERY:
1975 Ft. Water
(Chlor: 24,000 ppm)

| | |
|---|---|
| IHP: 1912 psi. | FHP: 1814 psi. |
| IFP: 78-491 psi. | ISIP: 1201 psi. |
| FFP: 507-936 psi. | FSIP: 1210 psi. |
| BHT: 122 deg. F. | |



Operator: MURFIN DRILLING COMPANY, INC.
Lease: STADOR UNIT # 1-3
Location: 1650 FSL & 2100 FEL SEC. 3 TWSP 14S RGE 19W
County: ELLIS State: KANSAS