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Mai Oil Operations Inc.
Kultgen #18
SW-SW-NE-NW (1280' FNL & 1350' FWL)
Section 12-19s-12w
Barton County, Kansas

Page 1

5 1/2" Production Casing Set

- .Contractor:** Southwind Drilling Co. (rig #3)
- Commenced:** September 3, 2019
- Completed:** September 11, 2019
- Elevation:** 1808' K.B., 1806' D.F., 1799' G.L.
- Casing program:** Surface; 8 5/8" @ 392'
Production, 5 1/2" @ 3449'
- Sample:** Samples saved and examined 2600' to the Rotary Total Depth.
- Drilling time:** One (1) foot drilling time recorded and kept 2600' to the Rotary Total Depth.
- Measurements:** All depths measured from the Kelly Bushing.
- Drill Stem Tests:** There were six (6) Drill Stem Tests ran by Trilobite Testing Co.
- Electric Log:** By Eli; Dual Induction, Compensated Density/Neutron and Micro Log.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	610	+1198
Base Anhydrite	635	+1173
Heebner	2947	-1139
Toronto	2964	-1156
Douglas	2984	-1176
Brown Lime	3063	-1255
Lansing	3080	-1272
Base Kansas City	3327	-1519
Conglomerate	3334	-1526
Arbuckle	3370	-1562
Rotary Total Depth	3460	-1652
Log Total Depth	3458	-1650

(All tops and zone(s) corrected to Electric Log Measurements)

SAMPLE ANALYSIS, SHOWS OF OIL, TESTING DATA, ETC.

TOPEKA SECTION

2832-2850' Limestone, gray; highly fossiliferous; chalky; plus gray and white chalk.

- 2854-2864' Limestone, white, gray; finely crystalline, fossiliferous; few granular; fair porosity (barren)
- 2885-2900' Limestone, gray, white, fossiliferous, fine oomoldic/vuggy type porosity; good stain and saturation; show of free oil and good odor in fresh samples.

Drill Stem Test #1 **2883-2915**

Times: 30-45-45-60

Blow: Weak

**Recovery: 30' slightly oil cut mud
(5% oil; 95% mud)**

**Pressures: ISIP 156 psi
FSIP 169 psi
IFP 19-21 psi
FFP 19-27 psi
HSH 1386-1330 psi**

- 2920-2940' Limestone, tan, gray, finely crystalline, slightly cherty (dense); plus gray and tan chert.

TORONTO SECTION

- 2964-2972' Limestone, tan; finely crystalline, fossiliferous, cherty, poorly developed porosity, no shows.
- 2972-2980' Limestone, white, chalky; scattered pinpoint porosity, brown stain, no free oil and no odor in fresh samples.

LANSING SECTION

- 3071-3080' Limestone, white, cream, slightly cherty; poor porosity, trace brown edge staining, no free oil and no odor in fresh samples.
- 3090-3100' Limestone, white, gray, finely crystalline, chalky; no shows.
- 3106-3111' Limestone, white, gray, finely crystalline in part; chalky, poor visible porosity; golden brown stain, no show of free oil and faint odor in fresh samples.
- 3123-3131' Limestone, white and gray; fossiliferous/oolitic, poor to fair fossil cast and vuggy type porosity; fair brown stain and saturation, show of free oil and good door in fresh samples.
- 3141-3146' Limestone, white, finely crystalline; oolitic, sub-oomoldic, fair porosity, golden brown stain, show of free oil and fair odor in fresh samples.

Drill Stem Test #2

3092-3154

Times: 15-20-15-X

Blow: Weak

Recovery: 5' mud

**Pressures: ISIP 45 psi
FSIP X psi
IFP 18-20 psi
FFP 18-21 psi
HSH 1542-1495 psi**

3164-3169' Limestone, tan, oomoldic; fair oomoldic porosity; brown stain, show of free oil and faint odor in fresh samples.

Drill Stem Test #3

3146-3169

Times: 30-30-45-60

Blow: Good

**Recovery: 40' slightly oil cut mud
(1% oil; 99% mud)**

**Pressures: ISIP 130 psi
FSIP 144 psi
IFP 16-22 psi
FFP 20-31 psi
HSH 1590-1574 psi**

3170-3194' Limestone, as above, decreasing stain, show of free oil and fair odor in fresh samples.

3220-3227' Limestone, white, tan, oolitic, oomoldic, fair oomoldic porosity, fair stain and saturation, show of free oil and fair to good odor in fresh samples.

3238-3246' Limestone, white, gray oolitic, chalky, poor visible porosity, brown stain, show of free oil and no odor in fresh samples.

3250-3264' Limestone, gray; oolitic, sub-oomoldic, fair porosity; gray and black stain, trace of free oil and faint odor in fresh samples.

3272-3280' Limestone, gray and white, oolitic; oomoldic in part; chalky; poor visible porosity; trace poor stain, no free oil and no odor in fresh samples.

Drill Stem Test #4 **3204-3300**

Times: 30-30-15-X
Blow: Weak
Recovery: 20' mud
Pressures: ISIP 70 psi
FSIP X psi
IFP 17-22 psi
FFP 18-21 psi
HSH 1629-1614 psi

3300-3310' Limestone, gray; buff, finely crystalline; dense; slightly cherty
3315-3326' Limestone, white, medium crystalline; chalky

COMGLOMERATE SECTION

3337-3350' Limestone, white; medium crystalline, maroon tinted; chalky; plus red, gray, pink soft shale and tan/white chert.
3350-3370' Varied colored opaque chert in matrix of red/blood red soft shales.

ARBUCKLE SECTION

3370-3386' Dolomite gray; buff, sucrosic; scatted pinpoint porosity; light brown stain; show of free oil and faint odor.

Drill Stem Test #5 **3330-3386**

Times: 45-30-45-45
Blow: Good
Recovery: 15' clean oil
165' oil cut mud
(10% oil; 90% mud)
Pressures: ISIP 845 psi
FSIP 813 psi
IFP 20-69 psi
FFP 69-101 psi
HSH 1704-1603 psi

3386-3396' Dolomite, tan; fine to medium crystalline, fair inter-crystalline porosity; good stain and saturation; good show of free oil and strong odor in fresh samples.

Drill Stem Test #6 **3386-3396**

Times: 30-30-30-30

Blow: Strong

**Recovery: 840' Slightly oil and gas cut muddy water
(5% gas; 5% oil; 80% water; 10% mud)
360' oil and gas cut water
(10% gas; 10% oil; 80% water)**

**Pressures: ISIP 1071 psi
FSIP 975 psi
IFP 103-454 psi
FFP 460-645 psi
HSH 1778-1707 psi**

- 3396-3410' Dolomite, as above, decreasing stain, trace of free oil and fair odor in fresh samples; plus white; cream, finely crystalline, dolomitic, chalky luster.
- 3410-3420' Dolomite, buff; fine and medium crystalline; fair to good inter-crystalline porosity; spotty stain, trace of free oil and faint odor in fresh samples.
- 3420-3440' Dolomite, white, gray, medium crystalline, fair inter-crystalline porosity; a few good with good porosity, trace spotty gray and black stain, no show of free oil.
- 3440-3460' Dolomite as above, no shows.

**Rotary Total Depth: 3460 (-1652)
Log Total Depth: 3458 (-1650)**

Recommendations:

5 1/2" production casing was set and cemented on the Mai Oil Operations, Inc., Kultgen #18,

Respectfully yours,

James C. Musgrove
Petroleum Geologist