

**JAMES C. MUSGROVE**

Petroleum Geologist, LLC  
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Mai Oil Operations  
Hammeke B #5  
NE-SW-NW-SE (1810' FSL & 2000' FEL)  
Section 21-21s-12w  
Stafford County, Kansas

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**5 1/2" Production Casing Set**

**Contractor:** Southwind Drilling Co. (rig #3)  
**Commenced:** February 6, 2015  
**Completed:** February 12, 2015  
**Elevation:** 1852' K.B., 1850' D.F., 1844' G.L.  
**Casing program:** Surface; 8 5/8" @ 649'  
Production, 5 1/2" @ 3698'  
**Sample:** Samples saved and examined 2900' to the Rotary Total Depth.  
**Drilling time:** One (1) foot drilling time recorded and kept 2900' to the Rotary Total Depth.  
**Measurements:** All depths measured from the Kelly Bushing.  
**Drill Stem Tests:** There were three (3) Drill Stem Tests ran by Trilobite Testing Co.  
**Electric Log:** By Nabors, Dual Induction, Compensated Density/Neutron Log and Micro Log.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	651	+1201
Base Anhydrite	671	+1181
Heebner	3117	-1265
Toronto	3137	-1285
Douglas	3150	-1278
Brown Lime	3251	-1399
Lansing	3263	-1411
Base Kansas City	3480	-1628
Viola	3490	-1638
Simpson Shale	3513	-1661
Arbuckle	3561	-1709
Rotary Total Depth	3700	-1848
Log Total Depth	3700	-1848

All tops and zones corrected to Electric Log Measurement

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

**TOPEKA SECTION**

2900-3116' No shows of oil and/or gas was noted in drilling of the Topeka Section (see attached samples log/geologist report)

**TORONTO SECTION**

3137-3148' Limestone, cream, finely crystalline, cherty in part, poorly developed porosity, black stain, no free oil and no odor in fresh samples.

**LANSING SECTION**

3263-3275' Limestone, cream, tan, finely crystalline, chalky, poor visible porosity, no shows.

3281-3293' Limestone, cream, finely crystalline, slightly cherty, poor porosity, no shows.

3301-3313' Limestone, cream, white, finely crystalline, cherty, poor porosity, questionable stain, no free oil and no odor in fresh samples.

3321-3326' Limestone, cream, fine and medium crystalline, cherty in part, poor visible porosity, no shows.

3330-3340' Limestone, as above, few oolitic, no shows, scattered porosity.

3344-3350' Limestone, cream, finely crystalline, chalky, scattered inter-crystalline porosity, trace stain, show of free oil and no odor in fresh samples.

3390-3400' Limestone, white, cream, finely crystalline, cherty, poor visible porosity, no shows.

3407-3414' Limestone, as above, chalky, dense.

3423-3428' Limestone, white/gray, cream, finely crystalline, oolitic, scattered porosity, good black stain, no free oil and no odor in fresh samples.

3441-3452' Limestone, white/cream, finely crystalline, chalky in part, no shows.

3461-3473' Limestone, white, cream; finely crystalline, chalky, trace gray/white chert, questionable edge staining, no free oil and no odor in fresh samples.

**VIOLA SECTION**

3490-3511' Chert, white/gray, boney, fresh, poor visible porosity, black stain, trace of free oil and no odor in fresh samples.

**ARBUCKLE SECTION**

3561-3571' Dolomite, tan, finely crystalline, sucrosic, scattered pinpoint porosity, brown stain, show of free oil and fair odor in fresh samples.

3571-3585' Dolomite, tan, cream, finely crystalline, few medium crystalline, sucrosic in part; golden brown stain, show of free oil and fair odor in fresh samples.

**Drill Stem Test #1** **3505-3585**

**Times:** 30-30-45-45

**Blow:** Strong

**Recovery:** 122' oil cut mud  
 (30% oil, 70% mud)  
 126' oil & gas cut mud  
 (50% gas; 30% oil; 20% mud)  
 189' oil & gas cut mud  
 (60% gas; 30% oil; 10% mud)  
 63' heavily oil & gas cut mud  
 (55% gas; 40% oil; 5% mud)  
 63' oil & gas cut mud  
 (80% gas; 15% oil; 5% mud)

**Pressures:** ISIP 746 psi  
 FSIP 712 psi  
 IFP 226-174 psi  
 FFP 186-239 psi  
 HSH 1735-1687 psi

3585-3596' Dolomite, tan, cream, medium crystalline, good inter-crystalline to vuggy type porosity, good stain, good show of free oil and strong odor in fresh samples.

3556-3615' Dolomite, cream, white, fine and medium crystalline, good golden brown stain, good show of free oil and good odor in fresh samples.

**Drill Stem Test #2** **3587-3615**

**Times:** 30-30-45-60

**Blow:** Strong; gas to surface 23 mins into initial shut in, TSTM

**Recovery:** 882' clean gassy oil

**Pressures:** ISIP 924 psi  
 FSIP 939 psi  
 IFP 120-174 psi  
 FFP 192-332 psi  
 HSH 1720-1619 psi

3616-3635' Dolomite, white, finely crystalline, few medium crystalline, sucrosic in part, good inter-crystalline and vuggy type porosity, fair stain, good show of free oil and good odor in fresh samples.

**Drill Stem Test #3** **3615-3637**

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**Times:** 30-30-45-60

**Blow:** Strong, gas to surface on opening of final flow period, TSTM.

**Recovery:** 126' oil, trace of water  
(90% oil, 10% mud)  
252' heavily oil cut gassy water  
(30% gas; 60% oil; 10% mud)  
1638' heavily oil and gas cut water  
(10% gas; 80% oil; 10% mud)  
63' oil and gas cut water  
(55% gas; 15% oil; 30% mud)  
321' muddy water

**Pressures:** ISIP 947 psi  
FSIP 976 psi  
IFP 445-766 psi  
FFP 798-945 psi  
HSH 1749-1642 psi

3640-3660' Dolomite, cream, white, medium crystalline, good inter-crystalline porosity, fair brown stain, show of free oil and good odor in fresh samples.

3660-3680' Dolomite, as above, fair/good stain, show of free oil and strong odor in fresh samples.

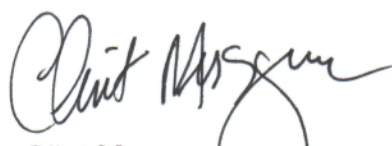
3680-3700' Dolomite, cream, tan, finely crystalline, fair to medium crystalline, fair inter-crystalline porosity, dark brown stain; show of free oil and good odor in fresh samples (free oil floating on top of the sample cups)

**Rotary Total Depth** 3700  
**Log Total Depth** 3700

**Recommendations:**

The 5 1/2" production casing was set and cemented on Mai Oil Operation Inc., Hammeke B #5.

Respectfully yours,



Clint Musgrove  
Petroleum Geologist



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Mai Oil Operations  
 8411 Preston Rd STE 800  
 Dallas TX 75225-5520  
 ATTN: Jim Musgrove

**21-21s-12w Stafford,KS**  
**Hammeke "B" #5**  
 Job Ticket: 61978      **DST#: 1**  
 Test Start: 2015.02.10 @ 00:35:00

## GENERAL INFORMATION:

Formation: **Arbuckle**  
 Deviated: **No Whipstock:**      ft (KB)  
 Time Tool Opened: 03:10:30  
 Time Test Ended: 08:00:00  
 Interval: **3505.00 ft (KB) To 3585.00 ft (KB) (TVD)**  
 Total Depth: 3585.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: **Poor**

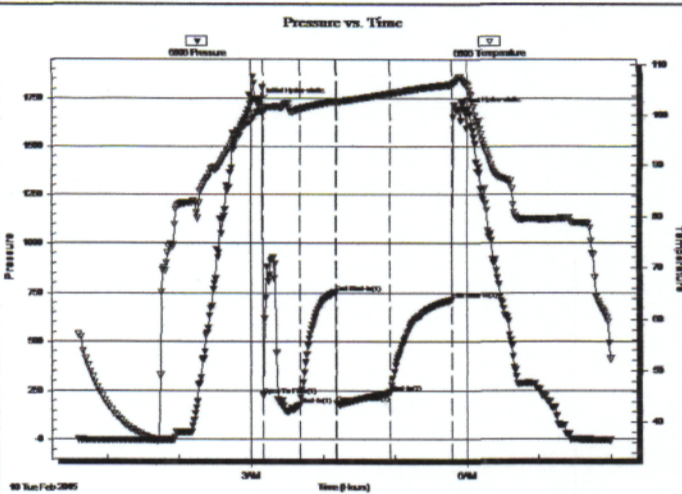
Test Type: **Conventional Bottom Hole (Initial)**  
 Tester: **Shane Konzern**  
 Unit No: **56**  
 Reference Elevations: 1852.00 ft (KB)  
 1844.00 ft (CF)  
 KB to GR/CF: 8.00 ft

## Serial #: 6806

**Inside**

Press@RunDepth: 239.05 psig @ 3581.24 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2015.02.10      End Date: 2015.02.10      Last Calib.: 2015.02.10  
 Start Time: 00:36:00      End Time: 08:00:00      Time On Btm: 2015.02.10 @ 03:07:30  
 Time Off Btm: 2015.02.10 @ 05:52:30

TEST COMMENT: FFP 30 Minutes. BOB in 12 minutes.  
 ISI 30 Minutes. 1"blow back.  
 FFP 45 Minutes. BOB in 6 minutes.  
 FSI 45 3"blow back. Gas to surface 20 minutes into shut in.



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1737.52	100.80	Initial Hydro-static
3	226.59	100.96	Open To Flow (1)
33	174.90	101.28	Shut-In(1)
63	746.30	102.77	End Shut-In(1)
64	186.74	102.75	Open To Flow (2)
109	239.05	104.37	Shut-In(2)
160	712.90	106.09	End Shut-In(2)
165	1687.45	107.27	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
127.00	OCM 30% oil, 70% mud	1.78
126.00	GMCO 50% gas, 30% oil, 20% mud	1.77
189.00	VGMCO 60% gas, 30% oil, 10% mud	2.65
63.00	VGSMCO 55% gas, 40% oil, 5% mud	0.88
63.00	VGMCO 80% gas, 15% oil, 5% mud	0.88

## Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE TESTING, INC.**

**DRILL STEM TEST REPORT**

Mai Oil Operations  
 8411 Preston Rd STE 800  
 Dallas TX 75225-5520  
 ATTN: Jim Musgrove

**21-21s-12w Stafford,KS**  
**Hammeke "B" #5**  
 Job Ticket: 61979 **DST#: 2**  
 Test Start: 2015.02.10 @ 14:43:00

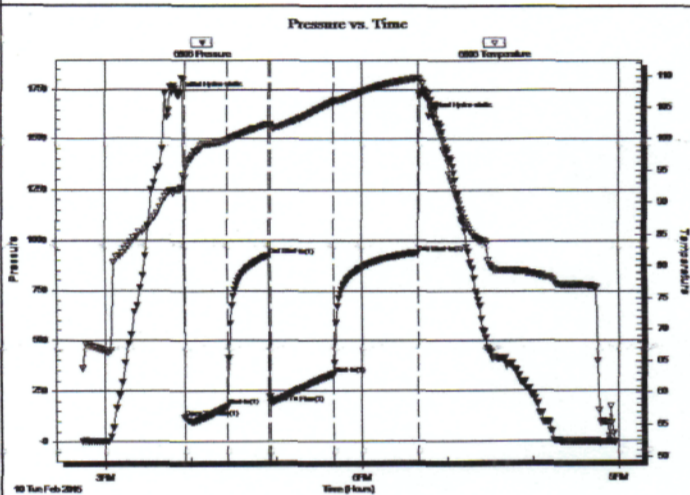
**GENERAL INFORMATION:**

Formation: **Arbuckle**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 15:55:30  
 Time Test Ended: 20:58:00  
 Interval: **3587.00 ft (KB) To 3615.00 ft (KB) (TVD)**  
 Total Depth: 3615.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Poor  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Shane Konzern  
 Unit No: 56  
 Reference Elevations: 1852.00 ft (KB)  
 1844.00 ft (CF)  
 KB to GR/CF: 8.00 ft

**Serial #: 6806**

**Inside**  
 Press@RunDepth: 332.63 psig @ 3611.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2015.02.10 End Date: 2015.02.10 Last Calib.: 2015.02.10  
 Start Time: 14:44:00 End Time: 20:58:00 Time On Btm: 2015.02.10 @ 15:51:30  
 Time Off Btm: 2015.02.10 @ 18:47:30

**TEST COMMENT:** IFP 30 Minutes. BOB in 1 minute and 20 seconds.  
 ISI 30 Minutes. BOB in 20 minutes. GTS at 23 minutes.  
 FFP 45 Minutes. BOB in 3 minutes and 10 Seconds.  
 FSI 60 Minutes. BOB



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1720.92	91.99	Initial Hydro-static
4	120.10	93.89	Open To Flow (1)
34	174.21	99.73	Shut-In(1)
63	924.98	102.38	End Shut-In(1)
65	192.18	102.26	Open To Flow (2)
109	332.63	105.94	Shut-In(2)
168	939.33	109.70	End Shut-In(2)
176	1619.70	107.27	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
882.00	100% clean gassy oil.	12.37

**Gas Rates**

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Mai Oil Operations  
 8411 Preston Rd STE 800  
 Dallas TX 75225-5520  
 ATTN: Jim Musgrove

**21-21s-12w Stafford,KS**  
**Hammeke "B" #5**  
 Job Ticket: 61980      **DST#: 3**  
 Test Start: 2015.02.11 @ 02:35:00

## GENERAL INFORMATION:

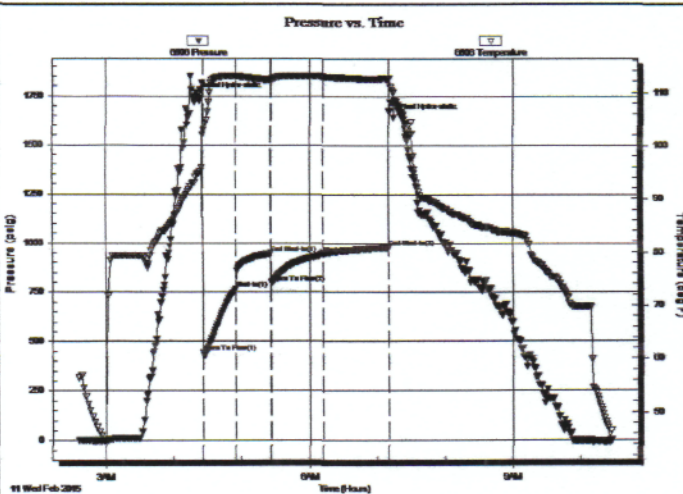
Formation: **Arbuckle**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 04:25:30  
 Time Test Ended: 10:26:30  
 Interval: **3615.00 ft (KB) To 3637.00 ft (KB) (TVD)**  
 Total Depth: 3637.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Poor  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Shane Konzern  
 Unit No: 56  
 Reference Elevations: 1852.00 ft (KB)  
 1844.00 ft (CF)  
 KB to GR/CF: 8.00 ft

## Serial #: 6806

Inside

Press@RunDepth: 945.29 psig @ 3633.00 ft (KB)  
 Start Date: 2015.02.11 End Date: 2015.02.11  
 Start Time: 02:36:00 End Time: 10:26:30  
 Capacity: 8000.00 psig  
 Last Calib.: 2015.02.11  
 Time On Btm: 2015.02.11 @ 04:20:30  
 Time Off Btm: 2015.02.11 @ 07:14:30

TEST COMMENT: IFP 30 Minutes. BOB in 20 seconds.  
 ISI 30 Minutes. BOB in 15 minutes.  
 FFP 45 Minutes. BOB in 40 seconds. GTS  
 FSI 60 Minutes. BOB in 25 minutes.



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1749.19	94.45	Initial Hydro-static
5	445.70	101.92	Open To Flow (1)
34	766.56	113.00	Shut-In(1)
65	947.26	112.30	End Shut-In(1)
66	798.23	112.37	Open To Flow (2)
111	945.29	112.86	Shut-In(2)
170	976.74	112.50	End Shut-In(2)
174	1642.42	109.92	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
126.00	WO 10% w ater, 90% oil	1.77
252.00	GWO 30% gas, 10% w ater, 60% oil	3.53
1638.00	GWO 10% gas, 10% w ater, 80% oil	22.98
63.00	VGOW 55% gas, 15% oil, 30% w ater	0.88
126.00	MW 5% mud, 95% w ater	1.77
189.00	100% w ater	2.65

## Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 1210

Date	2-6-15	Sec.	21	Twp.	21	Range	12	County	Stafford	State	KS	On Location		Finish	7:30pm
								Location							
								Great Bend 11.5 1200 6E 6000 1/2-1							

Lease	Hammeker B	Well No.	5	Owner	To Quality Oilwell Cementing, Inc.
Contractor	Southwind #3				You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.
Type Job	Surface				
Hole Size	12 1/4	T.D.	649	Charge To	Mo: 21
Csg.	8 5/8	Depth	649	Street	
Tbg. Size		Depth		City	State
Tool		Depth		The above was done to satisfaction and supervision of owner agent or contractor.	
Cement Left in Csg.	40'	Shoe Joint		Cement Amount Ordered	400 60/10 3/16 2/16 1/2 1/2 1/2
Meas Line		Displace	38 3/4 BCL		

**EQUIPMENT**

Pumptrk	18	No.	Cementer		Common
			Helper		
Bulktrk		No.	Driver	Craig	Poz. Mix
			Driver		Gel.
Bulktrk	21	No.	Driver	Chad	Calcium
			Driver		

**JOB SERVICES & REMARKS**

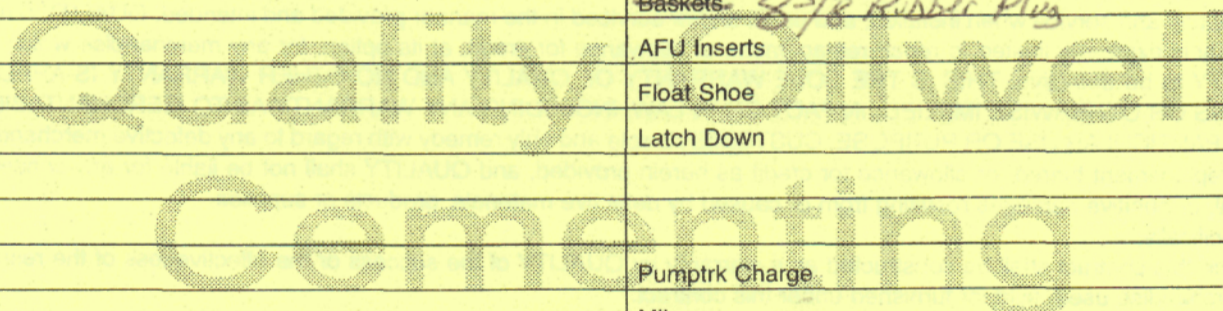
Remarks:		Hulls	
Rat Hole		Salt	
Mouse Hole		Flowseal	
Centralizers		Kol-Seal	
Baskets		Mud CLR 48	
D/V or Port Collar		CFL-117 or CD110 CAF 38	

8-5/8 on bottom. Est. Circulation  
mix 4000psi. Displace Plug

Cement Circulated

**FLOAT EQUIPMENT**

		Guide Shoe	
		Centralizer	
		Baskets	8-5/8 Rubber Plug
		AFU Inserts	
		Float Shoe	
		Latch Down	



		Pumptrk Charge	
		Mileage	
			Tax
			Discount
			Total Charge
X	Signature	Jay Klein	



# QUALITY OILWELL CEMENTING, INC.

Federal Tax I.D.# 20-2886107

Phone 785-483-2025  
Cell 785-324-1041

Home Office P.O. Box 32 Russell, KS 67665

No. 1129

Date	2-12-15	Sec.	21	Twp.	21	Range	12	County	Stafford	State	Ks	On Location		Finish	6:15 AM
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Lease *Hammeke B* Location *Great Bend Ks - 115 to 170 Rd, 6E to*

Well No. *5* Owner *60 Rd, 1/2 N W Into*

Contractor *Southwind 3* To Quality Oilwell Cementing, Inc.  
You are hereby requested to rent cementing equipment and furnish cementer and helper to assist owner or contractor to do work as listed.

Type Job *Longstring* Charge To *Main oil operations*

Hole Size *7 7/8"* T.D. *3700'* Street

Csg. *5 3/8" New 14H* Depth *3698'* City State

Tbg. Size Depth The above was done to satisfaction and supervision of owner agent or contractor.

Tool Depth Cement Amount Ordered *160 60/40 10% Salt 2% Gel*

Cement Left in Csg. *20.15'* Shoe Joint *20.15'* Cement Amount Ordered *160 60/40 10% Salt 2% Gel*

Meas Line Displace *89 3/4 BLS* *1/4" Flo-seal - 1000 Gal Mud Clear 48*

**EQUIPMENT**

Pumptrk <i>16</i>	No.	Cementer		Common
		Helper	<i>Billy</i>	Poz. Mix
Bulktrk <i>15</i>	No.	Driver	<i>Tyler</i>	Gel.
		Driver	<i>Rock</i>	Calcium

**JOB SERVICES & REMARKS**

Remarks:	Hulls
Rat Hole	Salt
Mouse Hole	Flowseal
Centralizers <i>1-11 13-14</i>	Kol-Seal
Baskets <i>Pipe on bottom break Circulation</i>	Mud CLR 48
D/V or Port Collar <i>pump 1000 gal mud clear 48</i>	CFL-117 or CD110 CAF 38
<i>plug Ratholes w/ 30% Hack to 5 1/2"</i>	Sand
<i>Carry + mix 130 S Cement</i>	Handling
<i>Shut down wash pump + lines</i>	Mileage

**FLOAT EQUIPMENT**

<i>Released plug + displaced w/ 8 1/2" of H2O</i>	Guide Shoe
<i>Released + held</i>	Centralizer <input checked="" type="checkbox"/> <i>turbo's 13</i>
<i>Lift pressure 500 #</i>	Baskets
<i>Land plug to 1600 #</i>	AFU Inserts
	Float Shoe
	Latch Down

	Pumptrk Charge
	Mileage

	Tax
	Discount
	Total Charge

X Signature *Burt*

