

**JAMES C. MUSGROVE**

Petroleum Geologist, LLC  
212 Main Street  
P.O. Box 215  
Claflin, KS 67525

Office (620) 588-4250

Res. Claflin (620) 587-3444

Mai Oil Operations  
Hammeke 'B' #8  
NE-SW-SE-SE (636' FNL & 841' FEL)  
Section 21-21s-12w  
Stafford County, Kansas

Page 1

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

- Contractor:** Southwind Drilling Co. (rig #3)
- Commenced:** December 14, 2016
- Completed:** December 20, 2016
- Elevation:** 1852' K.B., 1850' D.F., 1844' G.L.
- Casing program:** Surface; 8 5/8" @ 656'  
Production, 5 1/2" @ 3698'
- Sample:** Samples saved and examined 3000' to the Rotary Total Depth.
- Drilling time:** One (1) foot drilling time recorded and kept 3000' to the Rotary Total Depth.
- Measurements:** All depths measured from the Kelly Bushing.
- Drill Stem Tests:** There were two (2) Drill Stem Tests ran by Trilobite Testing Co.
- Electric Log:** By Eli Wireline Services, Dual Induction, Compensated Density/Neutron Log and Micro Log

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	650	+1202
Base Anhydrite	668	+1184
Heebner	3111	-1259
Toronto	3130	-1278
Douglas	3144	-1292
Brown Lime	3244	-1392
Lansing	3251	-1399
Base Kansas City	3482	-1630
Viola	3492	-1640
Simpson Shale	3524	-1672
Arbuckle	3574	-1722
Rotary Total Depth	3700	-1848
Log Total Depth	3701	-1849

(All tops and zones corrected to Electric Log Measurement)

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

**TOPEKA SECTION**

3000-3110' No shows of oil and/or gas was noted. (See attached Geologist report/Sample Log).

**TORONTO SECTION**

3130-3138' Limestone, white, cream, finely crystalline, chalky in part, no shows.

**LANSING SECTION**

3251-3260' Limestone, gray, tan, finely crystalline, few fossiliferous, chalky, increasingly cherty, poor porosity, no shows.

3262-3269' Limestone, as above.

3274-3282' Limestone, white, gray, cream, finely crystalline, fossiliferous in part, chalky, trace brown and gray stain, no show of free oil and no odor in fresh samples.

3291-3296' Limestone, white, fossiliferous/oolitic, chalky, scattered pinpoint porosity, trace brown/gray stain, no show of free oil.

3320-3330' Limestone, gray, white, oolitic, chalky, poor visible porosity, black and brown stain and saturation, no show of free oil and no odor in fresh samples.

3339-3352' Limestone, tan, gray, medium crystalline, fossiliferous, fair porosity, few sub-oomoldic, brown stain and saturation, trace of free oil and questionable odor in fresh samples.

3380-3388' Limestone, gray, white, oolitic, few sub-oomoldic scattered vuggy type porosity; brown stain, trace of free oil and no odor in fresh samples.

3398-3408' Limestone, white, gray, oolitic, fair to good porosity, fair stain and saturation, fair show of free oil and fair odor in fresh samples.

3411-3418' Limestone, white, cream oolitic, scattered porosity, brown stain, weak show of free oil and no odor in fresh samples.

3420-3427' Limestone, gray, white, oolitic, poor visible porosity, spotty stain, no free oil and no odor in fresh samples.

3438-3456' Limestone, tan, oolitic, sub-oomoldic, chalky, poorly developed porosity, fair stain and saturation show of free oil and faint odor in fresh samples.

3461-3470' Poor samples – samples 100% "Junk"

**VIOLA SECTION**

3492-3500' Poor samples – samples 100% "Junk"

3500-3524' (Sample Improving) chert; white/gray, few weathered; semi-tripolitic, scattered porosity, brown and black stain, trace of free oil and faint odor.

**SIMPSON SECTION**

3542-3555' Sand, white and gray, very fine grained; dolomitic in part; poor development; trace black stain, no free oil and no odor in fresh samples.

**ARBUCKLE SECTION**

3574-3584' Dolomite, tan, gray, medium crystalline; sucrosic, fair inter-crystalline and pinpoint porosity, good golden brown stain, show of free oil and good odor in fresh in fresh samples.

3586-3600' Dolomite; as above, fair stain and saturation, show of free oil and good odor, plus white chalk and white chert.

**Drill Stem Test #1** **3506-3600**

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

**Blow:** Strong

**Recovery:** 744' gas in pipe  
434' oil and gas cut mud  
(55% gas; 20% oil; 25% mud)

**Pressures:** ISIP 256 psi  
FSIP 291 psi  
IFP 85-152 psi  
FFP 160-197 psi  
HSH 1882-1830 psi

3600-3614' Dolomite, as above, sandy in part, fair stain, show of free oil and good odor in fresh samples.

3614-3625' Dolomite, white, gray, medium to coarse crystalline, good inter-crystalline and vuggy type porosity, fair stain and saturation, fair to good show of free oil and good odor.

**Drill Stem Test #2** **3598-3625**

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

**Blow:** Strong

**Recovery:** 279' gassy oil  
124' oil and gas cut mud  
(40% gas; 5% oil; 55% mud)

**Pressures:** ISIP 439 psi  
FSIP 448 psi  
IFP 55-106 psi  
FFP 119-165 psi  
HSH 1890-1829 psi

Mai Oil Operations  
Hammeke 'B' #8  
NE-SW-SE-SE (636' FNL & 841' FEL)  
Section 21-21s-12w  
Stafford County, Kansas

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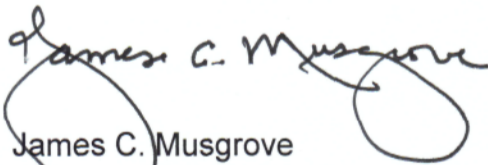
- |            |  |
|------------|--|
| 3625-3645' | Dolomite, gray, white, finely crystalline, scattered porosity, scattered porosity, trace brown stain and saturation, trace of free oil and odor in fresh samples.            |
| 3645-3660' | Dolomite, white, tan, gray, fine to medium crystalline, sucrosic in part, fair porosity, brown and gray to black stain; trace of free oil and faint odor in fresh samples.   |
| 3660-3680' | Dolomite, tan, gray, fine and medium crystalline, fair porosity, brown and golden brown stain, trace of free oil and faint odor in fresh samples, plus abundant white chalk. |
| 3680-3700' | Dolomite, white, cream, finely crystalline, slightly cherty, poor visible porosity, plus white chert and iron pyrite, no shows.  |

**Rotary Total Depth**            **3700 (-1848)**  
**Log Total Depth**            **3701 (-1849)**

**Recommendations:**

The 5 ½" production casing was set and cemented on Mai Oil Operations Inc., Hammeke 'B' #8.

Respectfully yours,

  
James C. Musgrove  
Petroleum Geologist





**TRILOBITE TESTING, INC**

**DRILL STEM TEST REPORT**

Mai Oil Operations Inc.  
 8411 Preston Road Suite 800  
 Dallas TX 75225+5520  
 ATTN: Jim Musgrove

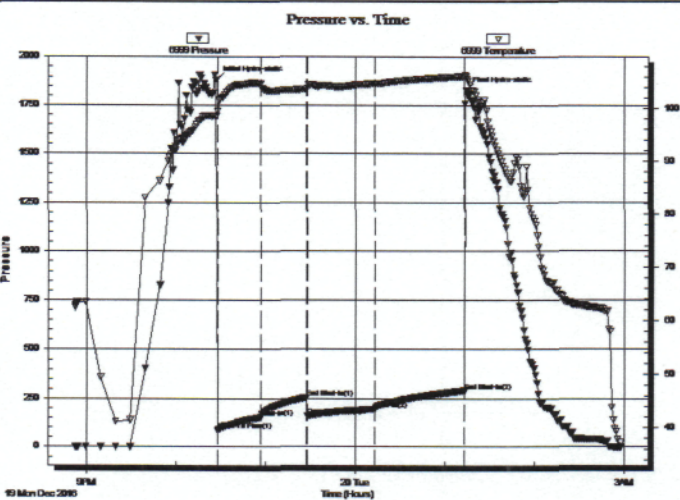
**21-21S-12 Stafford,KS**  
**Hammeke B #8**  
 Job Ticket: 63690 **DST#: 1**  
 Test Start: 2016.12.19 @ 20:52:00

**GENERAL INFORMATION:**

Formation: **Arbuckle**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 22:27:30  
 Time Test Ended: 02:57:30  
 Interval: **3506.00 ft (KB) To 3600.00 ft (KB) (TVD)**  
 Total Depth: 3600.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Poor  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Ken Swinney  
 Unit No: 72  
 Reference Elevations: 1852.00 ft (KB)  
 1844.00 ft (CF)  
 KB to GR/CF: 8.00 ft

**Serial #: 6999** **Inside**  
 Press@RunDepth: 197.05 psig @ 3596.26 ft (KB)  
 Start Date: 2016.12.19 End Date: 2016.12.20  
 Start Time: 20:52:05 End Time: 02:57:29  
 Capacity: 8000.00 psig  
 Last Calib.: 2016.12.20  
 Time On Btm: 2016.12.19 @ 22:26:30  
 Time Off Btm: 2016.12.20 @ 01:14:00

**TEST COMMENT:** IFP 30 minutes BOB in 3 minutes  
 ISI 30 minutes Blow back built to 6"  
 FFP 45 minutes BOB in 5 minutes  
 FSI 60 minutes Blow back built to 4"



**PRESSURE SUMMARY**

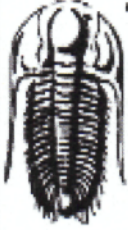
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1882.19	98.45	Initial Hydro-static
1	85.11	99.44	Open To Flow (1)
30	152.86	104.62	Shut-In(1)
61	256.26	103.61	End Shut-In(1)
61	160.67	103.82	Open To Flow (2)
107	197.05	104.68	Shut-In(2)
167	291.38	106.05	End Shut-In(2)
168	1830.12	106.02	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
434.00	VGOM Oil 20% Mud 25% Gas 55%	6.09
0.00	744' GIP	0.00

**Gas Rates**

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



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

**TOOL DIAGRAM**

Mai Oil Operations Inc.  
8411 Preston Road Suite 800  
Dallas TX 75225+5520  
ATTN: Jim Musgrove

**21-21S-12 Stafford,KS**  
**Hammeke B #8**  
Job Ticket: 63690 **DST#: 1**  
Test Start: 2016.12.19 @ 20:52:00

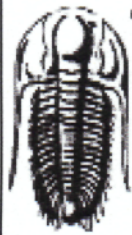
**Tool Information**

Drill Pipe:	Length: 3519.00 ft	Diameter: 3.80 inches	Volume: 49.36 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 48000.00 lb
			<u>Total Volume: 49.36 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	33.00 ft			String Weight: Initial 42000.00 lb
Depth to Top Packer:	3506.00 ft			Final 45000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	94.26 ft			
Tool Length:	114.26 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut-In Tool	5.00			3491.00	
Hydraulic tool	5.00			3496.00	
Top Packer	5.00			3501.00	
Packer	5.00			3506.00	20.00 Bottom Of Top Packer
Anchor	5.00			3511.00	
Change Over Sub	1.00			3512.00	
Drill Pipe	62.26			3574.26	
Change Over Sub	1.00			3575.26	
Anchor	20.00			3595.26	
Recorder	1.00	6999	Inside	3596.26	
Recorder	1.00	8960	Outside	3597.26	
Bullnose	3.00			3600.26	94.26 Anchor Tool

**Total Tool Length: 114.26**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Mai Oil Operations Inc.

**21-21S-12 Stafford,KS**

8411 Preston Road Suite 800  
Dallas TX 75225+5520

**Hammeke B #8**

Job Ticket: 63690

**DST#: 1**

ATTN: Jim Musgrove

Test Start: 2016.12.19 @ 20:52:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 10.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 49.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 4000.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
434.00	VGOM Oil 20% Mud 25% Gas 55%	6.088
0.00	744' GIP	0.000

Total Length: 434.00 ft

Total Volume: 6.088 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

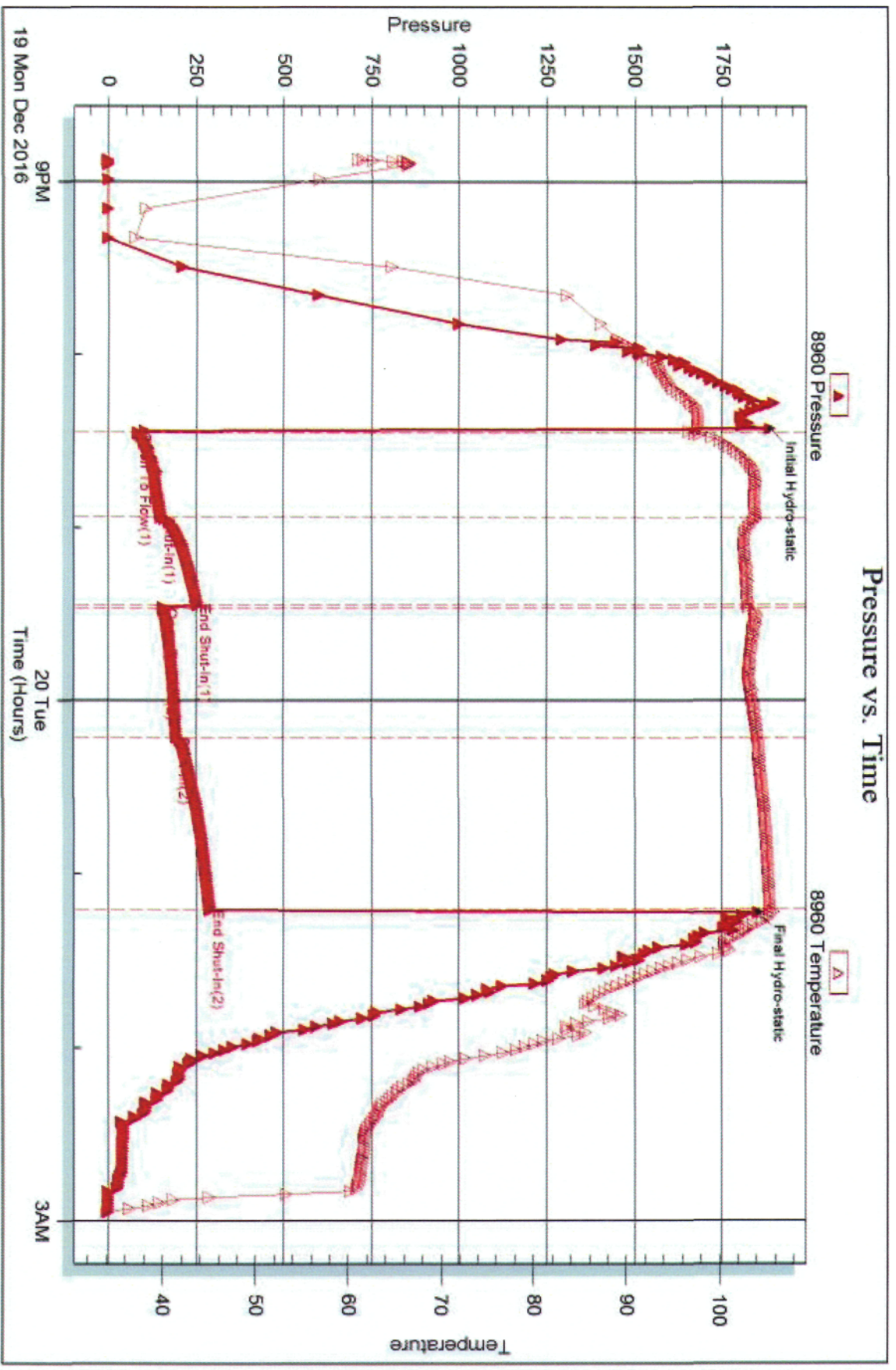
Recovery Comments:

Serial #: 8960

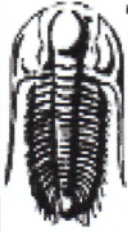
Outside Mai Oil Operations Inc.

Hammcke B #8

DST Test Number: 1







**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

Mai Oil Operations Inc.  
8411 Preston Road Suite 800  
Dallas TX 75225+5520  
ATTN: Jim Musgrove

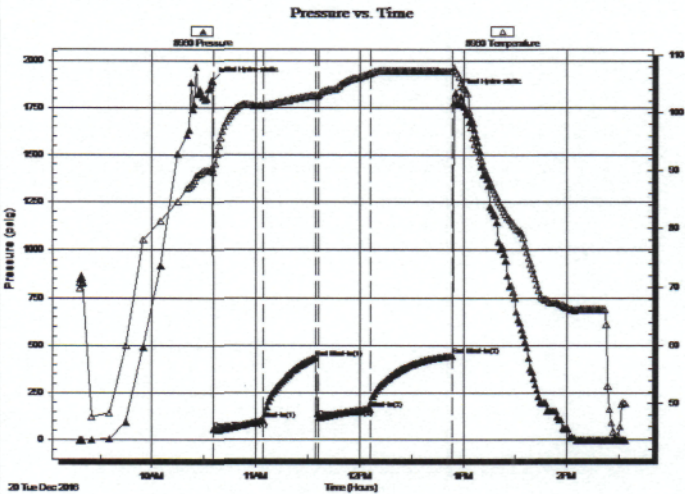
**21-21S-12 Stafford,KS**  
**Hammeke B #8**  
Job Ticket: 63691 **DST#: 2**  
Test Start: 2016.12.20 @ 09:18:00

**GENERAL INFORMATION:**

Formation: **Arbuckle**  
Deviated: No Whipstock: ft (KB)  
Time Tool Opened: 10:36:00  
Time Test Ended: 14:34:00  
Interval: **3598.00 ft (KB) To 3625.00 ft (KB) (TVD)**  
Total Depth: 3625.00 ft (KB) (TVD)  
Hole Diameter: 7.88 inches Hole Condition: Fair  
Test Type: Conventional Bottom Hole (Initial)  
Tester: Ken Swinney  
Unit No: 72 Great Bend/34  
Reference Elevations: 1852.00 ft (KB)  
1844.00 ft (CF)  
KB to GR/CF: 8.00 ft

**Serial #: 8960 Outside**  
Press@RunDepth: 446.07 psig @ 3622.00 ft (KB) Capacity: 8000.00 psig  
Start Date: 2016.12.20 End Date: 2016.12.20 Last Calib.: 2016.12.20  
Start Time: 09:18:05 End Time: 14:33:29 Time On Btm: 2016.12.20 @ 10:35:00  
Time Off Btm: 2016.12.20 @ 12:55:30

**TEST COMMENT:** IFP 30 minutes BOB in 1 min 30 sec GTS in 20 min TSTM  
ISI 30 minutes BOB in 5 min.  
FFP 30 minutes BOB in 3 min 30 sec  
FSI 45 minutes BOB in 5 min.



**PRESSURE SUMMARY**

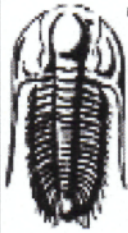
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1888.33	90.57	Initial Hydro-static
1	56.90	89.70	Open To Flow (1)
30	104.98	101.16	Shut-In(1)
60	435.38	103.07	End Shut-In(1)
61	117.47	103.03	Open To Flow (2)
91	164.81	106.83	Shut-In(2)
139	446.07	107.23	End Shut-In(2)
141	1827.64	107.38	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
124.00	VGOCM Oil 5% Gas 40% Mud 55%	1.74
279.00	VGCO Gas 50% Oil 50%	3.91

**Gas Rates**

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



**TRILOBITE  
TESTING, INC**

**DRILL STEM TEST REPORT**

**TOOL DIAGRAM**

Mai Oil Operations Inc.

**21-21S-12 Stafford,KS**

8411 Preston Road Suite 800  
Dallas TX 75225+5520

**Hammeke B #8**

Job Ticket: 63691

**DST#: 2**

ATTN: Jim Musgrove

Test Start: 2016.12.20 @ 09:18:00

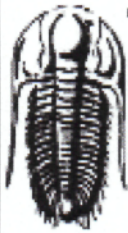
**Tool Information**

Drill Pipe:	Length: 3582.00 ft	Diameter: 3.80 inches	Volume: 50.25 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	20000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose:	48000.00 lb
			<u>Total Volume: 50.25 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	4.00 ft			String Weight: Initial	42000.00 lb
Depth to Top Packer:	3598.00 ft			Final	46000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	27.00 ft				
Tool Length:	47.00 ft				
Number of Packers:	1	Diameter: 6.75 inches			

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut-In Tool	5.00			3583.00	
Hydraulic tool	5.00			3588.00	
Top Packer	5.00			3593.00	
Packer	5.00			3598.00	20.00 Bottom Of Top Packer
Anchor	22.00			3620.00	
Recorder	1.00	6999	Inside	3621.00	
Recorder	1.00	8960	Outside	3622.00	
Bullnose	3.00			3625.00	27.00 Anchor Tool

**Total Tool Length: 47.00**



**TRILOBITE  
TESTING, INC**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Mai Oil Operations Inc.

**21-21S-12 Stafford,KS**

8411 Preston Road Suite 800  
Dallas TX 75225+5520

**Hammeke B #8**

Job Ticket: 63691

**DST#: 2**

ATTN: Jim Musgrove

Test Start: 2016.12.20 @ 09:18:00

**Mud and Cushion Information**

Mud Type: Gel Chem

Cushion Type:

Oil API:

37 deg API

Mud Weight: 10.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 54.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
124.00	VGOCM Oil 5% Gas 40% Mud 55%	1.739
279.00	VGCO Gas 50% Oil 50%	3.914

Total Length: 403.00 ft      Total Volume: 5.653 bbl

Num Fluid Samples: 0

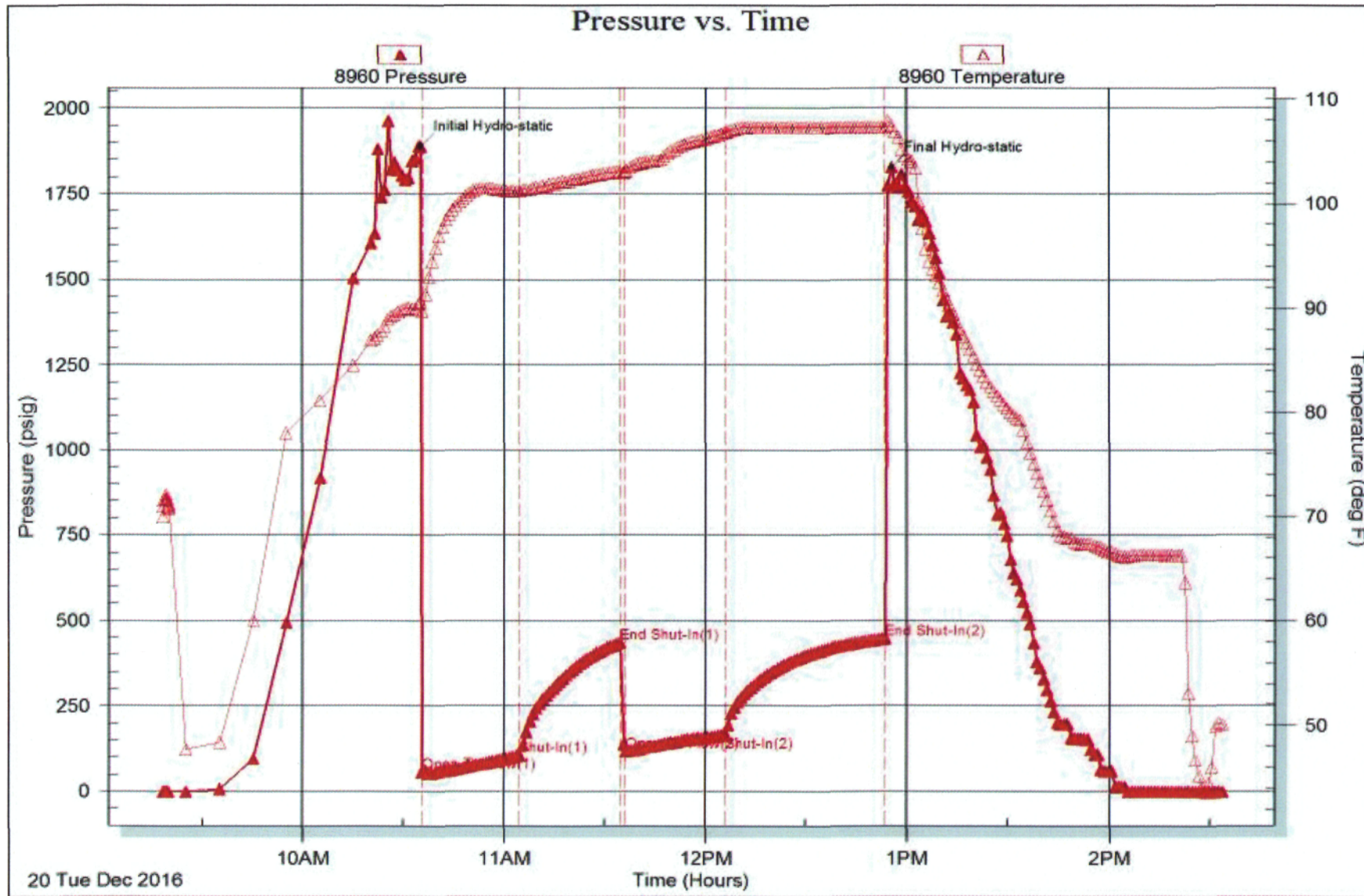
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



# 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. 3049

Date	12-15-16	Sec.	21	Twp.	21	Range	12	County	Stafford	State	Ks	On Location		Finish	7:45 AM
Lease								Location		Dartmouth 12 S to 170 Rd, 2E					
Hammeke B.								Well No.		8					
Contractor								Owner		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.					
Southwind								3							
Type Job								Charge To		Main oil operations					
Surface															
Hole Size								T.D.		656'					
12 1/4"								656'							
Csg.								Depth		656'					
8 5/8"															
Tbg. Size								Depth		City					
										State					
Tool								Depth		The above was done to satisfaction and supervision of owner agent or contractor.					
Cement Left in Csg.								Shoe Joint		Cement Amount Ordered					
20'								20'		450 60/40 3% cc 2% gel					
Meas Line								Displace		1/2 #10 seal					
								40 1/2 Bcs							
<b>EQUIPMENT</b>															
Pumptrk								No.		Common					
20															
Cementer								Helper		Poz. Mix					
Nick															
Bulktrk								No.		Gel.					
19															
Driver								Driver		Calcium					
Doug															
Bulktrk								No.		Hulls					
pu.															
Driver								Driver		Salt					
Rick															
<b>JOB SERVICES &amp; REMARKS</b>															
Remarks:								Cement did Circulate							
Rat Hole								Flowseal							
Mouse Hole								Kol-Seal							
Centralizers								Mud CLR 48							
Baskets								CFL-117 or CD110 CAF 38							
D/V or Port Collar								Sand							
								Handling							
								Mileage							
<b>FLOAT EQUIPMENT</b>															
								Guide Shoe		Rubber plug					
								Centralizer							
								Baskets							
								AFU Inserts							
								Float Shoe							
								Latch Down							
								Pumptrk Charge							
								Mileage							
										Tax					
										Discount					
										Total Charge					
X Signature								Jay [Signature]							

# 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. 3110

Date	Sec.	Twp.	Range	County	State	On Location	Finish
12-21-16	21	21	12	Stafford	Ks		11:45 AM
Lease Hammek "B"				Location: Dartmouth - 12.5 to 170 Rd, 2E			
Well No. 8			Owner: 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.				
Contractor Southwind #3			Charge To: Mai oil operations				
Type Job Longstring			Street				
Hole Size 7 7/8"			T.D. 3701'		City		
Csg. 5 1/2" 14#			Depth 3693'		State		
Tbg. Size New			The above was done to satisfaction and supervision of owner agent or contractor.				
Tool			Cement Amount Ordered 160 60/40 10% salt 2% gel				
Cement Left in Csg. 21.54'			Shoe Joint 21.54'		Meas Line Displace 8 7/8" BCS 1/4" PL seal 1000 gal mud Clear 48		
<b>EQUIPMENT</b>							
Pumptrk No. 20			Cementer Helper Nick		Common		
Bulktrk No. 3			Driver Stan		Poz. Mix		
Bulktrk No. 3			Driver Stan		Gel.		
Bulktrk No. 3			Driver Stan		Calcium		
<b>JOB SERVICES &amp; REMARKS</b>							
Remarks:			Hulls				
Rat Hole			Salt				
Mouse Hole			Flowseal				
Centralizers 1-12			Kol-Seal				
Baskets			Mud CLR 48				
D/V or Port Collar			CFL-117 or CD110 CAF 38				
Pipe on ball joint			Sand				
circulation pump 200 gal			Handling				
48 plug handle 30' 2" 1/2"			Mileage				
5 1/2" casing 1300' 1300' 1300'			<b>FLOAT EQUIPMENT</b>				
Shut down 11 wash pump lines			Guide Shoe				
Displaced plug w/ 8 7/8" BCS of			Centralizer 12				
New released + belt			Baskets				
Lift pressure 600 #			AFU Inserts				
Land plug to 1600 #			Float Shoe 1				
			Latch Down 1				
			Pumptrk Charge				
			Mileage				
			Tax				
			Discount				
			Total Charge				
X Signature <i>[Signature]</i>							