

**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  
Schmitt #9  
SW-NW-SE-SE (780' FSL & 1000' FEL)  
Section 4-15s-14w  
Russell County, Kansas

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

**Contractor:** Southwind Drilling Co. (rig #3)  
**Commenced:** May 7, 2014  
**Completed:** May 13, 2014  
**Elevation:** 1773' K.B.; 1771 D.F.; 1765' G.L.  
**Casing program:** Surface; 8 5/8" @ 425'  
Production, 5 1/2" @ 3279'  
**Sample:** Samples saved and examined 2200' to the Rotary Total Depth.  
**Drilling time:** One (1) foot drilling time recorded and kept 2200 ft. to the Rotary Total Depth.  
**Measurements:** All depths measured from the Kelly Bushing.  
**Drill Stem Tests:** There were four (4) Drill Stem Tests ran by Trilobite Testing Co.  
**Electric Log:** None

<u>Formation</u>	<u>Sample Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	765	+1008
Base Anhydrite	796	+977
Grand Haven	2336	-563
1 <sup>st</sup> Tarkio Sand	2347	-574
Dover	2360	-587
2 <sup>nd</sup> Tarkio Sand	2366	-593
Tarkio Lime	2402	-629
Elmont	2470	-697
Howard	2605	-832
Topeka	2673	-900
Heebner	2900	-1127
Toronto	2915	-1142
Lansing	2960	-1187
Base Kansas City	3171	-1398
Arbuckle	3219	-1446
Rotary Depth Total	3291	-1518

(All tops and zone determination were made from a correlation of Drilling Time and Sample Analysis).

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

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**1<sup>ST</sup> TARKIO SAND**

2348-2356 Sand, gray, very fine grained, silty; poorly developed; no shows.

**2<sup>nd</sup> TARKIO SAND**

2265-2276 Sand, gray, tan very fine grained, sub-rounded, friable, micaceous in part, fair brown stain, show of free oils, faint odor in fresh samples.

**Drill Stem Test #1 2336-2400**

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

**Blow: Strong**

**Recovery: 136' thin watery mud  
Trace of oil specks**

**Pressures: ISIP 327 psi  
FSIP 283 psi  
IFP 63-194 psi  
FFP 175-280 psi  
HSH 1135-1077 psi**

**Remarks: Plugging actions on both flows, all pressures are questionable.**

**TOPEKA SECTION**

2710-2720' Limestone, cream, gray, fossiliferous, chalky, brown stain, no show of free oil and no odor.

2847-2860' Limestone, white, cream, sub-oomoldic, chalky, poor stain, no show of free oil and no odor in fresh samples.

**TORONTO SECTION**

2918-2928' Limestone, gray white, finely crystalline, slightly fossiliferous, chalky; no shows.

**LANSING SECTION**

2960-2968' Limestone, finely crystalline, scattered inter-crystalline porosity, few with pinpoint type porosity, light brown stain, show of free oil and fair odor in fresh samples.

- 2984-2982' Limestone, tan, fossiliferous, fair fossil cast porosity, good brown and golden brown stain, show of free oil and faint odor in fresh samples.
- 3003-3011 Limestone, white, gray, sub-oomoldic, chalky, poor visible porosity, no shows.

**Drill Stem Test #2 2962-3015**

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

**Blow: Strong**

**Recovery: 126' oil cut mud  
(20% oil; 80% mud)  
94' oil & gas cut mud  
(50% gas; 20% oil; 30% mud)**

**Pressures: ISIP 477 psi  
FSIP 293 psi  
IFP 43-204 psi  
FFP 176-122 psi  
HSH 1515-1472 psi**

**Remarks: plugging action in both flow periods, all pressures questionable.**

- 3035-3045' Limestone, cream, gray, oolitic, chalky; good porosity, good stain and saturation, show of free oil and faint odor in fresh samples.
- 3062-3067' Limestone, gray, white oomoldic, fair oomoldic porosity, trace poor stain, no show of free oil and no odor in fresh samples.
- 3082-3088' Limestone, gray cream, brown, finely crystalline, chalky, few cherty; no shows.
- 3110-3116' Limestone, gray, fossiliferous, poor porosity, no shows.
- 3125-3134' Limestone, cream, white, fossiliferous, few medium crystalline, black and gray stain, show of free oil and odor in fresh samples.
- 3142-3148' Limestone, tan, fossiliferous, few oomoldic, fair porosity, fair stain and saturation, show of free oil and fair odor in fresh samples.
- 3152-3158' Limestone, as above.

**Drill Stem Test #3** **3093-3165**

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

**Blow:** Weak

**Recovery:** 15' slightly oil cut mud  
(5% oil, 95% mud)

**Pressures:**

ISIP	102	psi
FSIP	86	psi
IFP	14-18	psi
FFP	15-17	psi
HSH	1526-1476	psi

**ARBUCKLE SECTION**

- 3219-3225' Dolomite, cream, white, medium crystalline, fair inter-crystalline porosity, fair stain and saturation, show of free oils and faint odor in fresh samples.
- 3225-3231' Dolomite, white, cream, medium to coarse crystalline, good inter-crystalline porosity, fair stain and saturation, show of free oil and good odor in fresh samples.

**Drill Stem Test #4** **3189-3231**

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

**Blow:** Strong

**Recovery:** 315' slightly mud cut watery oil  
(5% mud; 10% water; 15% gas; 70% oil)  
315' oil and gas cut watery mud  
(5% mud; 30% water; 30% gas; 35% oil)  
820' clean oil  
63' slightly oil and gas cut watery mud  
(10% oil; 10% water; 30% gas; 50% mud)  
126' oil specked muddy water

**Pressures:**

ISIP	1019	psi
FSIP	1014	psi
IFP	182-414	psi
FFP	432-617	psi
HSH	1551-1529	psi

- 3240-3256' Dolomite, gray and white, medium and coarse crystalline, good inter-crystalline to vuggy type porosity, fair to good stain and saturation, show of free oil and good odor in fresh samples.

Mai Oil Operations  
Schmitt #9  
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Russell County, Kansas

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3256-3270'	Dolomite, as above, few finely crystalline, sucrosic, sandy in part, trace stain, show of free oil and faint odor.
3270-3291'	Dolomite, white, cream, fine and medium crystalline, sandy, few with chalky luster; trace stain, trace free oil and faint odor in fresh samples.


**Rotary Total Depth**      **3291**

**Remarks:** Lost circulation at 3291', unable to run open hole log.

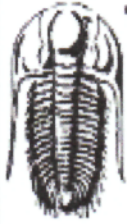
**Recommendations:**

The 5 ½' production/injection casing was set and cemented in the Schmitt #9.

Respectfully submitted;

  
James C. Musgrove  
Petroleum Geologist





**TRILOBITE TESTING, INC.**

**DRILL STEM TEST REPORT**

Mai Oil Operations

**4-15s-14w Russell,KS**

8411 Preston Rd  
Dallas TX. 75225

**Schmitt #9**

Job Ticket: 57622

**DST#: 1**

ATTN: Allen Bangert

Test Start: 2014.05.09 @ 19:15:00

**GENERAL INFORMATION:**

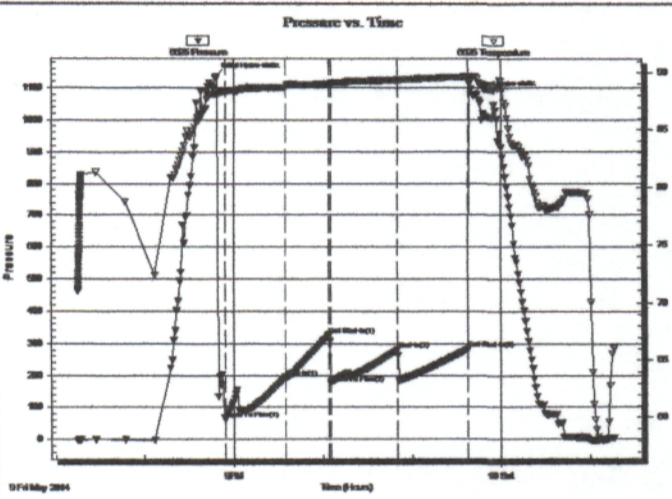
Formation: **Tarkio**  
 Deviated: **No Whipstock:** ft (KB)  
 Time Tool Opened: 20:54:00  
 Time Test Ended: 01:17:00  
 Test Type: **Conventional Bottom Hole (Initial)**  
 Tester: **Bob Hamel**  
 Unit No: **67**  
 Interval: **2336.00 ft (KB) To 2400.00 ft (KB) (TVD)**  
 Total Depth: **2400.00 ft (KB) (TVD)**  
 Hole Diameter: **7.88 inches** Hole Condition: **Fair**  
 Reference Elevations: **1772.00 ft (KB)**  
**1765.00 ft (CF)**  
 KB to GR/CF: **7.00 ft**

**Serial #: 6625**

**Outside**

Press@RunDepth: **280.75 psig @ 2371.00 ft (KB)** Capacity: **8000.00 psig**  
 Start Date: **2014.05.09** End Date: **2014.05.10** Last Calib.: **2014.05.09**  
 Start Time: **19:15:01** End Time: **01:17:00** Time On Btm: **2014.05.09 @ 20:48:00**  
 Time Off Btm: **2014.05.09 @ 23:40:30**

**TEST COMMENT:** I.F. - 45 - BOB in 18 min  
 I.S.I. - 30 - No blow back  
 F.F. - 45 - Weak blow built to 4"  
 F.S.I. - 45 - No blow back



**PRESSURE SUMMARY**

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1135.42	88.14	Initial Hydro-static
6	63.13	88.37	Open To Flow (1)
47	194.26	88.70	Shut-In(1)
76	327.30	89.02	End Shut-In(1)
77	175.36	89.08	Open To Flow (2)
122	280.75	89.37	Shut-In(2)
170	283.34	89.64	End Shut-In(2)
173	1077.84	89.68	Final Hydro-static

**Recovery**

Length (ft)	Description	Volume (bbl)
136.00	S,O,S,W,M, 5%W 95%M (FEW OIL SPEC)	0.76

**Gas Rates**

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



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

Mai Oil Operations

**4-15s-14w Russell,KS**

8411 Preston Rd  
Dallas TX. 75225

**Schmitt #9**

Job Ticket: 57623

**DST#: 2**

ATTN: Allen Bangert

Test Start: 2014.05.11 @ 03:15:00

## GENERAL INFORMATION:

Formation: **LKC "A - C"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 04:51:30

Time Test Ended: 09:17:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Bob Hamel

Unit No: 67

Interval: **2962.00 ft (KB) To 3015.00 ft (KB) (TVD)**

Reference Elevations: 1772.00 ft (KB)

Total Depth: 3015.00 ft (KB) (TVD)

1765.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

**Serial #: 6625**

**Outside**

Press@RunDepth: 122.75 psig @ 2996.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.11

End Date:

2014.05.11

Last Calib.: 2014.05.11

Start Time: 03:15:01

End Time:

09:17:00

Time On Btm: 2014.05.11 @ 04:50:30

Time Off Btm: 2014.05.11 @ 07:30:30

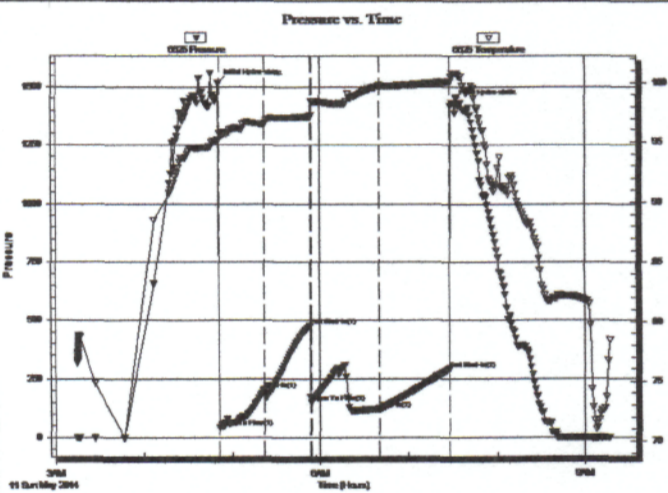
## TEST COMMENT:

I.F. - 30 - BOB in 20 min

I.S.I - 30 - No blow back

F.F. - 45 - Weak blow built to 6"

F.S.I - 45 - No blow back



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1515.17	95.11	Initial Hydro-static
1	43.71	95.67	Open To Flow (1)
32	203.85	96.50	Shut-In(1)
63	476.36	97.18	End Shut-In(1)
64	149.92	98.44	Open To Flow (2)
110	122.75	99.78	Shut-In(2)
158	292.59	100.10	End Shut-In(2)
160	1432.53	100.79	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
126.00	O,C,M 20%O 80% M	1.77
94.00	H,M,C,O,G 30%M 20%O 50%GAS	1.32

\* Recovery from multiple tests

## Gas Rates

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

Trilobite Testing, Inc

Ref. No: 57623

Printed: 2014.05.15 @ 13:48:12



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Mai Oil Operations

**4-15s-14w Russell,KS**

8411 Preston Rd  
Dallas TX. 75225

**Schmitt #9**

Job Ticket: 57624

**DST#: 3**

ATTN: Allen Bangert

Test Start: 2014.05.11 @ 23:52:00

## GENERAL INFORMATION:

Formation: **LKC "A - C"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:13:30

Time Test Ended: 05:50:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Bob Harmel

Unit No: 67

**Interval: 3093.00 ft (KB) To 3165.00 ft (KB) (TVD)**

Total Depth: 2400.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 1772.00 ft (KB)

1765.00 ft (CF)

KB to GR/CF: 7.00 ft

**Serial #: 6625**

**Outside**

Press@RunDepth: 17.04 psig @ 3161.00 ft (KB)

Start Date: 2014.05.11

End Date:

2014.05.12

Start Time: 23:52:01

End Time:

05:50:30

Capacity: 8000.00 psig

Last Calib.: 2014.05.11

Time On Btm: 2014.05.12 @ 01:12:30

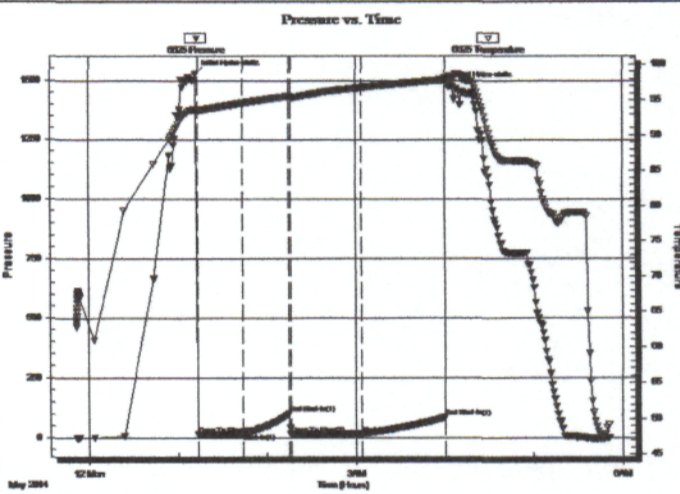
Time Off Btm: 2014.05.12 @ 04:03:00

**TEST COMMENT:** LF - 30 - weak surface blow built to 1 1/4"

I.S.I - 30 - No blow back

F.F - 45 - Weak surface blow died in 4 min

F.S.I - 45 - No blow back



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1526.49	93.71	Initial Hydro-static
1	14.44	93.52	Open To Flow (1)
32	18.08	94.58	Shut-In(1)
63	102.19	95.55	End Shut-In(1)
64	14.63	95.44	Open To Flow (2)
112	17.04	96.80	Shut-In(2)
168	85.72	97.83	End Shut-In(2)
171	1476.48	98.29	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
15.00	S,O,C,M, 5%O 95%M	0.21

\* Recovery from multiple tests

## Gas Rates

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

Trilobite Testing, Inc

Ref. No: 57624

Printed: 2014.05.15 @ 13:47:42





**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Mai Oil Operations

**4-15s-14w Russell, KS**

8411 Preston Rd  
Dallas TX. 75225

**Schmitt #9**

Job Ticket: 57625

**DST#: 4**

ATTN: Allen Bangert

Test Start: 2014.05.12 @ 15:50:00

## GENERAL INFORMATION:

Formation: **ARBUCKLE**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:52:00

Time Test Ended: 21:38:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Bob Hamel

Unit No: 67

Interval: **3189.00 ft (KB) To 3231.00 ft (KB) (TVD)**

Reference Elevations: 1772.00 ft (KB)

Total Depth: 3231.00 ft (KB) (TVD)

1765.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

**Serial #: 6625**

**Outside**

Press@RunDepth: 617.38 psig @ 3227.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.05.12

End Date:

2014.05.12

Last Calib.:

2014.05.12

Start Time: 15:50:01

End Time:

21:38:30

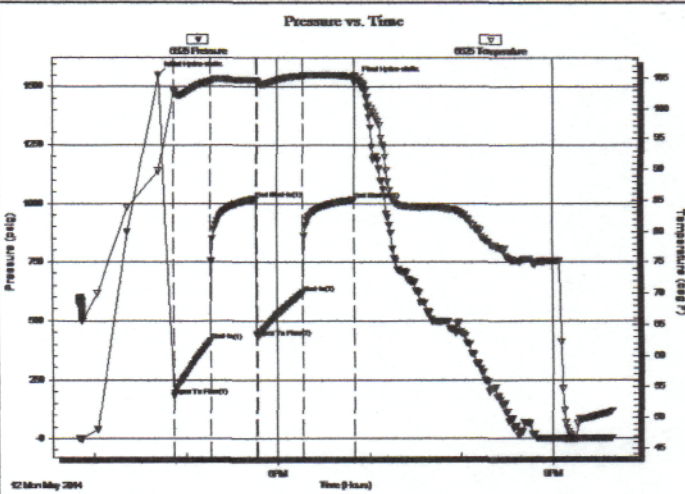
Time On Btm:

2014.05.12 @ 16:42:00

Time Off Btm:

2014.05.12 @ 18:51:30

TEST COMMENT: LF. - 30 - BOB in 45 sec  
LS.I. - 30 - No blow back  
F.F. - 30 - BOB in 1 1/2 min  
F.S.I. - 30 - No blow back



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1550.85	89.80	Initial Hydro-static
10	182.33	102.92	Open To Flow (1)
34	414.11	104.44	Shut-In(1)
64	1019.35	104.67	End Shut-In(1)
65	432.14	104.42	Open To Flow (2)
95	617.38	105.37	Shut-In(2)
128	1013.60	105.31	End Shut-In(2)
130	1528.91	105.11	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
126.00	S,O,S,M,W, 10%M 90%W (FEW OIL SP)	1.77
63.00	S,O,C,W,G,M, 10%O 10%W 30%G 50%	0.88
819.00	CLEAN OIL 100%	11.49
315.00	S,M,C,H,W,C,G,O 5%M 30%W 30%G	4.42
315.00	S,M,C,W,G,O 5%M 10%W 15%G 70%O	4.42

\* Recovery from multiple tests

## Gas Rates

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

Trilobite Testing, Inc

Ref. No: 57625

Printed: 2014.05.15 @ 13:47:07

# QUALITY OILWELL CEMENTING, INC.

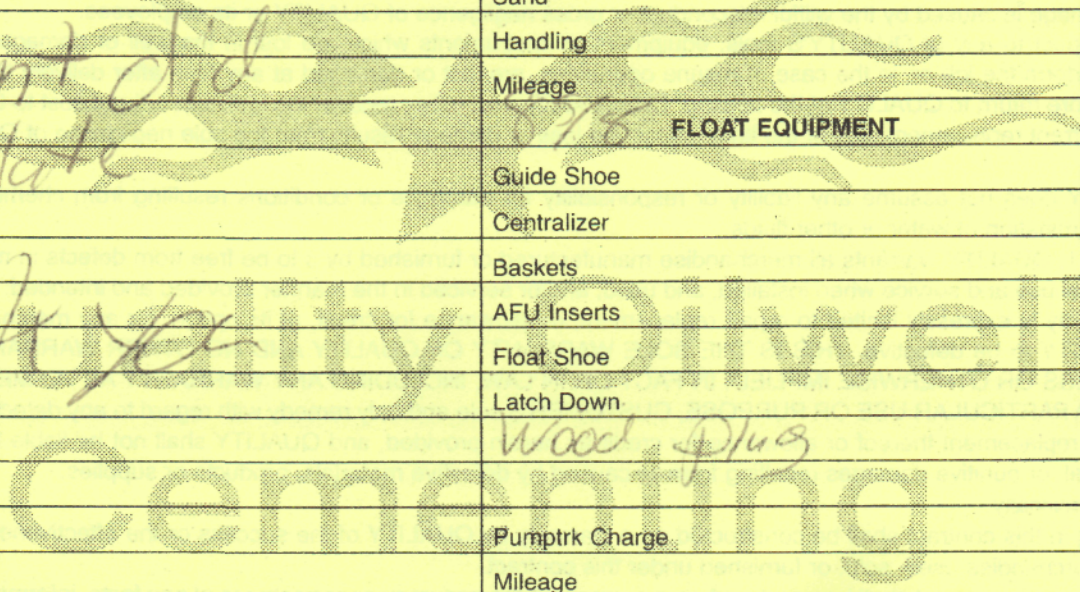
Federal Tax I.D.# 20-2886107

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

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

No. 427

Date	5-7-14	Sec.	4	Twp.	15	Range	14	County	Russell	State	8.30pm	On Location	8.30pm	Finish	10.00pm
Lease								Location		Russell Sto Watters RD					
Schmitt								Well No.	9						
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								1/2 W Ninto							
Type Job								Surface							
Hole Size				T.D.				Charge To							
12 1/4				430 ft				Man Oil							
Csg.				Depth				Street							
8 5/8				430.37											
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 ft				20 ft				275 60/40							
Meas Line				Displace				30 c.c. 240 gal							
				26. BDI											
<b>EQUIPMENT</b>								Common							
Pumptrk		No.	Cementer		Helper		MATH								
Bulktrk		No.	Driver		Driver		DUVE								
Bulktrk		No.	Driver		Driver		CLAYTON								
<b>JOB SERVICES &amp; REMARKS</b>								Hulls							
Remarks:								Salt							
Rat Hole								Flowseal							
Mouse Hole								Kol-Seal							
Centralizers								Mud CLR 48							
Baskets								CFL-117 or CD110 CAF 38							
D/V or Port Collar								Sand							
Cement did								Handling							
Circulate								Mileage							
								89.15 <b>FLOAT EQUIPMENT</b>							
								Guide Shoe							
								Centralizer							
								Baskets							
								AFU Inserts							
								Float Shoe							
								Latch Down							
								Wood Plug							
								Pumptrk Charge							
								Mileage							
								Tax							
								Discount							
X Signature								Total Charge							
Judy Shier															



# 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. 428

Date	Sec.	Twp.	Range	County	State	On Location	Finish
05-13-14	4	15	14	Russell	KS	1200 pm	4:15 pm

Lease Schmitt Location Russell Sta Walters RD

Well No. 9 Owner How Ninto

Contractor Southland 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 Lane String Charge To Mu oil

Hole Size 7 7/8 T.D. 3291 Street Mu oil

Csg. 5 1/2 Depth 3277 City \_\_\_\_\_ State \_\_\_\_\_

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

Tool \_\_\_\_\_ Depth \_\_\_\_\_

Cement Left in Csg. 2151 Shoe Joint 2151 Cement Amount Ordered 125 60/40 2% gel

Meas Line 14 Displace 79.4 BBL 15% salt + 1/4 flow

**EQUIPMENT**

Pumptrk	No.	Cementer	Helper	Poz. Mix
<u>16</u>		<u>Mike</u>		<u>Salt + 1/4 flow</u>
Bulktrk	No.	Driver	Driver	Gel.
<u>1</u>		<u>Billy</u>		
Bulktrk	No.	Driver	Driver	Calcium
<u>15</u>				

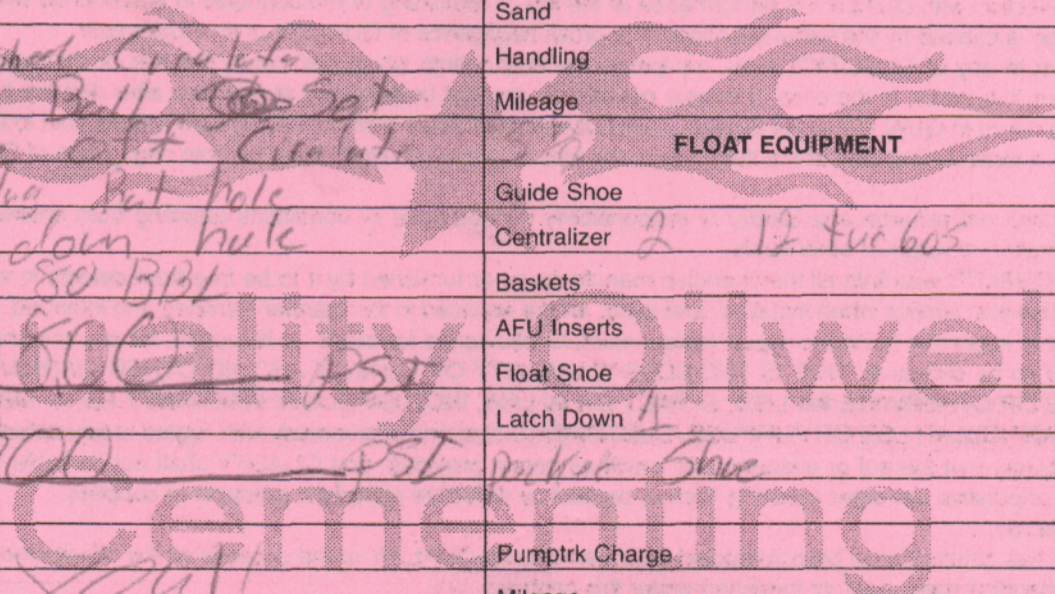
**JOB SERVICES & REMARKS**

Remarks:	Hulls
Rat Hole	Salt
<u>30 SWS</u>	
Mouse Hole	Flowseal
Centralizers	Kol-Seal
<u>+ 1-10 Reg 21, 23</u>	
Baskets	Mud CLR 48
<u>#7, 11</u>	<u>1000 gal</u>
D/V or Port Collar	CFL-117 or CD110 CAF 38
	Sand
	Handling
	Mileage

**FLOAT EQUIPMENT**

Guide Shoe
Centralizer
<u>2 12 tuc 605</u>
Baskets
AFU Inserts
Float Shoe
Latch Down
<u>1</u>
Pumptrk Charge
Mileage

Signature Kend Tax \_\_\_\_\_  
Discount \_\_\_\_\_  
Total Charge \_\_\_\_\_



~~Abashed Circulate~~  
~~Drilled Ball Set~~  
~~Rock Shear off Circulate~~  
US min Plug Rat hole  
mix 195 down hole  
displaced 80 BBL  
Lift 800 AST  
Landed 1500 PST  
Thank you!