

**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  
Maag "P" #5  
N/2-SE-NW-SW (1660'FSL & 990 FWL)  
Section 7-15s-13w  
Russell County, Kansas

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

**Contractor:** Southwind Drilling Co. (rig #3)

**Commenced:** September 17, 2015

**Completed:** September 23, 2015

**Elevation:** 1875' K.B., 1873' D.F., 1867' G.L.

**Casing program:** Surface; 8 5/8" @ 847'  
Production, 5 1/2" @ 3365'

**Sample:** Samples saved and examined 2300' to the Rotary Total Depth.

**Drilling time:** One (1) foot drilling time recorded and kept 2300' 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 Casedhole Solutions, Dual Induction, Compensated Density/Neutron Log and Micro.

<u>Formation</u>	<u>Log Depth</u>	<u>Sub-Sea Datum</u>
Anhydrite	848	+1027
Base Anhydrite	881	+994
Grand Haven	2408	-533
1 <sup>st</sup> Tarkio Sand	2417	-542
2 <sup>nd</sup> Tarkio Sand	2442	-567
Tarkio Lime	2477	-602
Willard Sand (3 <sup>rd</sup> Tarkio)	2507	-632
Elmont	2542	-667
Howard	2682	-807
Topeka	2747	-872
Heebner	2980	-1105
Toronto	2997	-1122
Douglas	3012	-1137
Lansing	3045	-1170
Arbuckle	3308	-1433
Rotary Total Depth	3365	-1490
Log Total Depth	3367	-1492

All tops and zones corrected to Electric Log Measurement

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

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

2418-2430' Sand, gray, grayish green, very fined grained; silty in part, few friable, poor visible porosity, no shows.

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

2442-2450' Sand, gray, very fined grained, few sub-angular to sub-rounded, well cemented, poor visible porosity, no shows.

**WILLARD SAND (3<sup>rd</sup> TARKIO)**

2507-2523' Sand, light gray, gray, sub-angular, poorly developed porosity, no shows.

**TOPEKA SECTION**

2747-2757' Limestone, cream, tan, finely crystalline, slightly dolomite, few fossiliferous, poorly developed inter-crystalline porosity, no shows.

2800-2825' Limestone, cream, tan, fine and medium crystalline, fossiliferous, poor visible porosity, no shows.

2860-2876' Limestone, cream, tan, buff, finely crystalline, fossiliferous, poor scattered porosity, chalky in part, no shows.

2916-2920' Limestone, cream, tan, fine and medium crystalline, fossiliferous/oolitic, fair inter-crystalline porosity, spotty brown stain, no free oil and no odor in fresh samples.

2930-2940' Limestone, tan, buff, fine and medium crystalline, fossiliferous, poor scattered pin point to inter-crystalline porosity, chalky in part, plus tan/gray chert.

2942-2955' Limestone, cream, tan, finely crystalline, fossiliferous, chalky, poor porosity, plus gray/tan chert, no shows.

**TORONTO SECTION**

2997-3012' Limestone, cream, white, fine to medium crystalline, dolomitic in part, poor pinpoint to inter-crystalline porosity, trace light brown spotty stain, no free oil and faint odor in fresh samples.

**LANSING SECTION**

- 3047-3054' Limestone, white, finely crystalline, slightly oolitic, poor scattered pin point porosity, chalky, no shows.
- 3063-3072' Limestone, cream, tan, fine and medium crystalline, slightly dolomitic; poor porosity, trace brown stain, no free oil and faint odor in fresh samples.
- 3077-3081' Limestone, cream, tan, finely crystalline, cherty in part, poor porosity, no shows.
- 3087-3091' Limestone, cream, tan, buff, finely crystalline, oolitic, poor pinpoint porosity, slightly chalky, dark brown stain, no free oil and fair odor in fresh samples.
- 3118-3124' Limestone, cream, white, oolitic, poor visible porosity, no shows.
- 3126-3133' Limestone, cream, white, finely crystalline, oolitic, oomoldic, fair oomoldic porosity, chalky in part, spotty light brown stain, no free oil and fair odor in fresh samples.
- 3139-3160' Limestone, white, finely crystalline, oolitic, oomoldic, chalky in part, fair to good oomoldic porosity, dark brown stain, no free oil and fair odor in fresh samples.
- 3193-3203' Limestone, cream, tan, finely crystalline, fossiliferous/oolitic, poor pinpoint and inter-crystalline porosity, slightly chalky, trace stain, no free oil and faint odor in fresh samples.
- 3211-3216' Limestone, tan, buff, finely crystalline, fossiliferous, poor inter-crystalline porosity, light brown stain, trace of free oil and fair odor in fresh samples.
- 3219-3230' Limestone, tan, cream, finely crystalline, oolitic/fossiliferous, poor scattered porosity, light brown to golden brown stain, trace of free oil and fair odor in fresh samples.
- 3230-3240' Limestone, tan, cream, finely crystalline, oolitic/fossiliferous, poor scattered porosity, light brown and golden brown stain, trace of free oil and fair odor in fresh samples.
- 3258-3264' Limestone, cream, tan, finely crystalline, few fossiliferous/oolitic, poor to fair scattered porosity, light to golden brown stain, trace of free oil and fair odor in fresh samples.
- 3287-3290' Limestone, cream, buff, finely crystalline, few fossiliferous, cherty in part, poor porosity, no shows.

**Drill Stem Test #1**

**3193-3290**

**----Misrun, packer failure----**

**Drill Stem Test #2** **3186-3290**

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

**Blow:** Strong

**Recovery:** 120' gas in pipe  
62' heavily oil and gas cut mud  
(10% gas; 40% mud; 50% oil)  
186' gassy oil  
(50% gas; 50% oil)  
124' gassy oil  
(20% gas; 80% oil)

**Pressures:** ISIP 505 psi  
FSIP 550 psi  
IFP 68-112 psi  
FFP 118-176 psi  
HSH 1219-1603 psi

**ARBUCKLE SECTION**

3307-3316' Dolomite, white, light gray, fine and medium crystalline, fair inter-crystalline porosity, golden brown stain, good show of free oil and good odor in fresh samples.

**Drill Stem Test #3** **3273-3316**

**Times:** 15-30-15-60

**Blow:** Strong

**Recovery:** 2400' muddy water

**Pressures:** ISIP 1091 psi  
FSIP 1096 psi  
IFP 701-933 psi  
FFP 983-1083 psi  
HSH 1714-1636 psi

3316-3330' Dolomite, white, light gray, fine and medium crystalline, fair inter-crystalline and vuggy porosity, dark brown stain trace of free oil and fair odor in fresh samples.

3330-3350' Dolomite, gray, cream, fine and medium crystalline, poor to fair inter-crystalline porosity, spotty dark brown to black stain weak show of free oil and fair odor in fresh samples.

3350-3367' Dolomite, gray, white, finely crystalline, poor to fair inter-crystalline porosity, cherty in part, spotty stain, no free oil and no odor in fresh samples.

Mai Oil Operations  
Maag "P" #5  
N/2-SE-NW-SW (1660'FSL & 990 FWL)  
Section 7-15s-13w  
Russell County, Kansas

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<b>Rotary Total Depth</b>	<b>3365</b>
<b>Log Total Depth</b>	<b>3367</b>

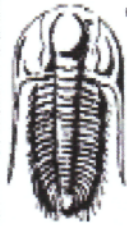
**Recommendations:**

The 5 ½" production casing was set and cemented on Mai Oil Operations Inc., Maag "P" #5.

Respectfully yours,



Kurt Talbott  
Petroleum Geologist



**TRILOBITE TESTING, INC**

# DRILL STEM TEST REPORT

Mai Oil Operations, Inc  
 8411 Preston Rd STE 800  
 Dallas TX 75225  
 ATTN: Kurt Tabott

**7-15s-13w Russell KS**  
**Maag "P" #5**  
 Job Ticket: 62442      DST#: 1  
 Test Start: 2015.09.21 @ 21:54:05

**GENERAL INFORMATION:**

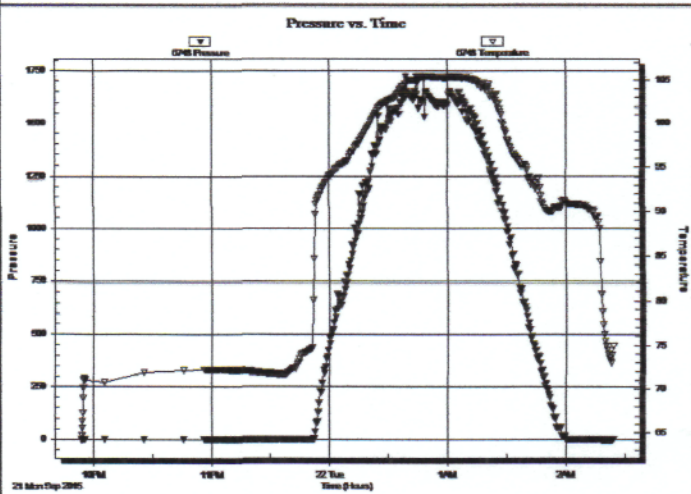
Formation: **LKC "H-K"**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened:  
 Time Test Ended: 02:23:59  
 Interval: **3193.00 ft (KB) To 3290.00 ft (KB) (TVD)**  
 Total Depth: 3290.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Cody Bloedorn  
 Unit No: 73  
 Reference Elevations: 1875.00 ft (KB)  
 1867.00 ft (CF)  
 KB to GR/CF: 8.00 ft

**Serial #: 6748**

Inside

Press@RunDepth: psig @ 3198.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2015.09.21      End Date: 2015.09.22      Last Calib.: 2015.09.22  
 Start Time: 21:54:05      End Time: 02:23:59      Time On Btm:  
 Time Off Btm:

TEST COMMENT: Opened tool - packers failed - Reopened tool - failed - Pulled tool



**PRESSURE SUMMARY**

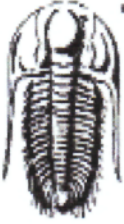
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

**Recovery**

Length (ft)	Description	Volume (bbl)
150.00	Rig Mud	2.10

**Gas Rates**

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Mai Oil Operations, Inc  
 8411 Preston Rd STE 800  
 Dallas TX 75225  
 ATTN: Kurt Tabott

**7-15s-13w Russell KS**  
**Maag "P" #5**  
 Job Ticket: 62443 **DST#: 2**  
 Test Start: 2015.09.22 @ 02:48:00

## GENERAL INFORMATION:

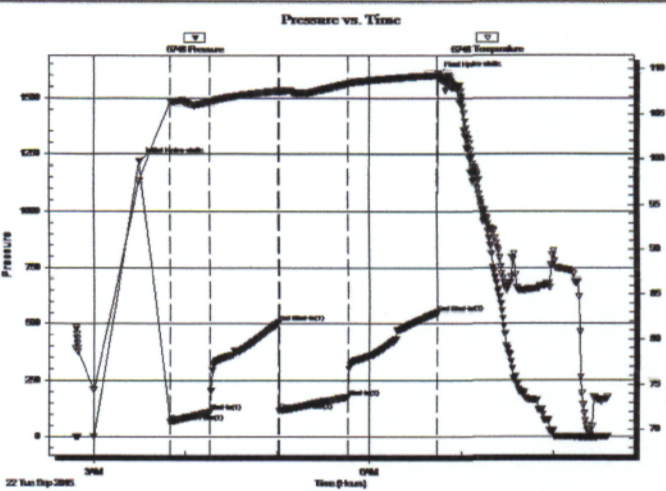
Formation: **LKC "H-K"**  
 Deviated: No Whipstock: ft (KB)  
 Test Type: Conventional Bottom Hole (Reset)  
 Time Tool Opened: 03:50:00  
 Tester: Cody Bloedorn  
 Time Test Ended: 08:35:15  
 Unit No: 73  
 Interval: **3186.00 ft (KB) To 3290.00 ft (KB) (TVD)**  
 Reference Elevations: 1875.00 ft (KB)  
 Total Depth: 3290.00 ft (KB) (TVD)  
 1867.00 ft (CF)  
 Hole Diameter: 7.88 inches  
 Hole Condition: Fair  
 KB to GR/CF: 8.00 ft

## Serial #: 6748

## Inside

Press@RunDepth: 175.61 psig @ 3191.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2015.09.22 End Date: 2015.09.22 Last Calib.: 2015.09.22  
 Start Time: 02:48:05 End Time: 08:35:14 Time On Btm: 2015.09.22 @ 03:30:00  
 Time Off Btm: 2015.09.22 @ 06:44:45

TEST COMMENT: 30 - IF- B.O.B. in 10 minutes  
 45 - IS- Surface return  
 45 - FF- B.O.B. in 26 minutes  
 60 - FS- Surface return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1218.46	97.57	Initial Hydro-static
20	68.32	106.45	Open To Flow (1)
46	111.59	106.38	Shut-in(1)
91	505.28	107.60	End Shut-in(1)
92	118.19	107.47	Open To Flow (2)
136	175.61	108.37	Shut-in(2)
195	549.86	109.30	End Shut-in(2)
195	1603.02	109.54	Final Hydro-static

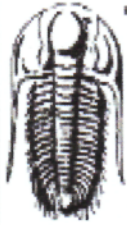
## Recovery

Length (ft)	Description	Volume (bbl)
62.00	GHOCM, 10%G, 40%M, 50%O	0.87
186.00	GO, 50%G, 50%O	2.61
124.00	GO, 20%G, 80%O	1.74
0.00	120' G.I.P.	0.00

\* Recovery from multiple tests

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Mai Oil Operations, Inc  
 8411 Preston Rd STE 800  
 Dallas TX 75225  
 ATTN: Kurt Tabott

**7-15s-13w Russell KS**  
**Maag "P" #5**  
 Job Ticket: 62444      **DST#: 3**  
 Test Start: 2015.09.22 @ 15:04:00

## GENERAL INFORMATION:

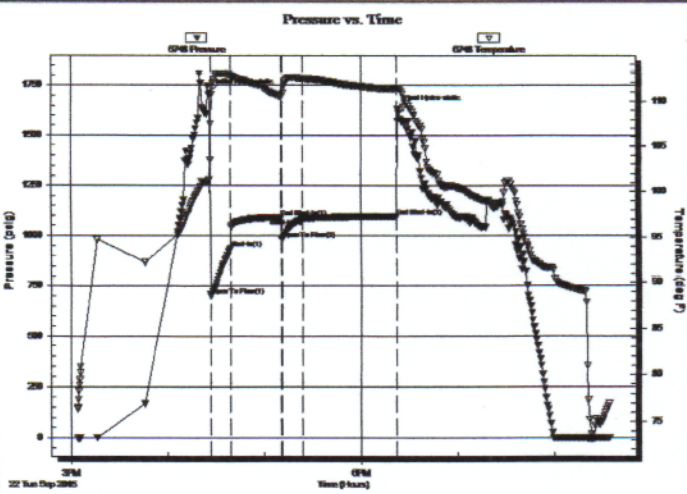
Formation: **Arbuckle**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 16:26:45  
 Time Test Ended: 20:34:00  
 Interval: **3273.00 ft (KB) To 3316.00 ft (KB) (TVD)**  
 Total Depth: 3316.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Fair  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Cody Bloedorn  
 Unit No: 73  
 Reference Elevations: 1875.00 ft (KB)  
 1867.00 ft (CF)  
 KB to GR/CF: 8.00 ft

## Serial #: 6748

Inside

Press@RunDepth: 1082.93 psig @ 3278.00 ft (KB)      Capacity: 8000.00 psig  
 Start Date: 2015.09.22      End Date: 2015.09.22      Last Calib.: 2015.09.22  
 Start Time: 15:04:05      End Time: 20:33:59      Time On Btm: 2015.09.22 @ 16:26:00  
 Time Off Btm: 2015.09.22 @ 18:23:00

TEST COMMENT: 15 - IF- B.O.B. instantly  
 30 - IS- No return  
 15 - FF- B.O.B. instantly  
 60 - FS- No return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1713.81	101.30	Initial Hydro-static
1	701.09	107.38	Open To Flow (1)
13	933.60	112.77	Shut-In(1)
45	1091.26	110.43	End Shut-In(1)
45	982.74	110.40	Open To Flow (2)
58	1082.93	112.41	Shut-In(2)
117	1095.55	111.26	End Shut-In(2)
117	1635.53	111.46	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
124.00	WM, 40%W, 60%M	1.74
2046.00	DROPPED BAR & TURNED TO WATER	28.70
248.00	Mud - Oil on top, 100%M	3.48

\* Recovery from multiple tests

## 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. 1041

Date	9-18-15	Sec.	7	Twp.	15	Range	13	County	Russell	State	KS	On Location		Finish	3:00 AM
------	---------	------	---	------	----	-------	----	--------	---------	-------	----	-------------	--	--------	---------

Location Russell S to Winterset SE 1/2 N E 1/4

Lease	Maag P	Well No.	#5	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	Ma Oil
Type Job	Surface			Street	
Hole Size	12 1/4	T.D.	847'	City	State
Csg.	8 5/8	Depth	847'	The above was done to satisfaction and supervision of owner agent or contractor.	
Tbg. Size		Depth		Cement Amount Ordered	325 6/40 3%cc 2%cc
Tool		Depth			
Cement Left in Csg.	20'	Shoe Joint			
Meas Line		Displace	52 1/2 bbl		

**EQUIPMENT**

Pumptrk	17	No.	Cementer	Brett	Common
			Helper		Poz. Mix
Bulktrk	4	No.	Driver	Billy	Gel.
			Driver		Calcium
Bulktrk		No.	Driver	Shane	
			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
	Sand
	Handling
	Mileage

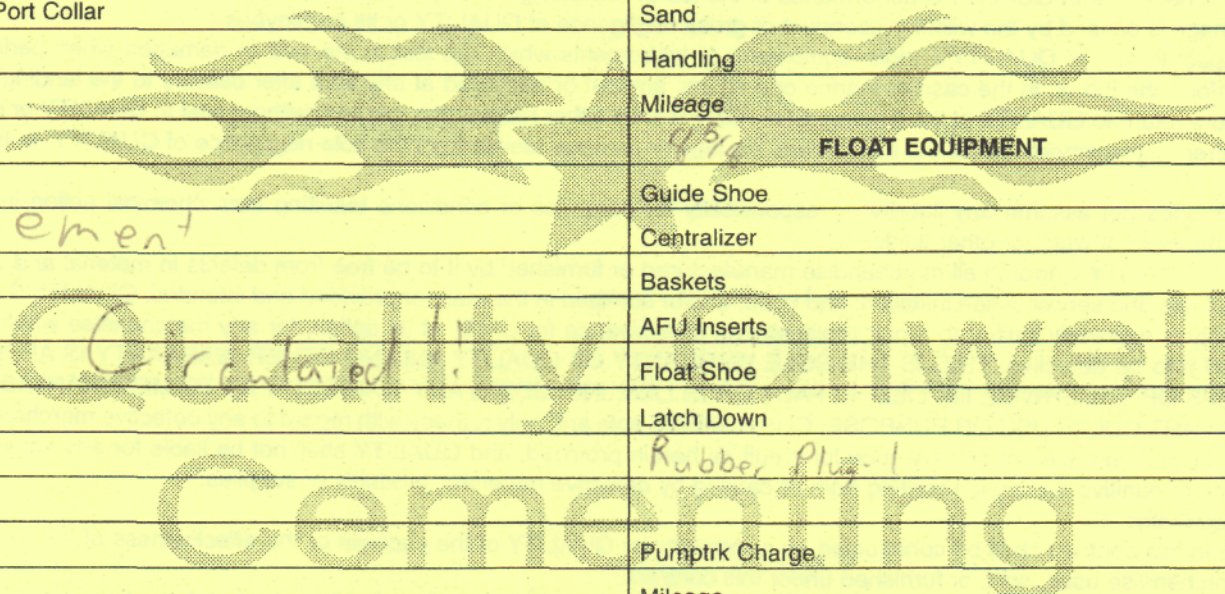
**FLOAT EQUIPMENT**

Cement	Guide Shoe
	Centralizer
	Baskets
	AFU Inserts
	Float Shoe
	Latch Down
	Rubber Plug-1
	Pumptrk Charge
	Mileage

	Tax
	Discount
	Total Charge

X Signature

*[Handwritten 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. 1632

Date	9-23-15	Sec.	7	Twp.	15	Range	13	County	Russell	State	Ks	On Location		Finish	4:15 PM
Lease								Location		Russell, Ks - 5 to Wintersel Rd, 2E					
Maag P								Well No.		5					
Contractor								Owner		1 1/2 N E 15					
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							
Hole Size								T.D.		3365'					
Csg.								Depth		3365'					
5 1/2" used 14P								Charge To							
Tbg. Size								Depth		Main oil operations					
Tool								Depth		Street					
Cement Left in Csg.								Shoe Joint		The above was done to satisfaction and supervision of owner agent or contractor.					
29.55'								29.55'		Cement Amount Ordered					
Meas Line								Displace		160 60/40 10% Salt 2% Gel					
								8 1/4 BLS		1/4# Flo-seal 1000 gal Mud Clear 48					
<b>EQUIPMENT</b>												Common			
Pumptrk		18		No.		Cementer		Helper		Billy					
Bulktrk		15		No.		Driver		Driver		Doug					
Bulktrk		pu.		No.		Driver		Driver		Rick					
<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			
plug Rathole w/ 30sx Hook to 5 1/2'												Handling			
Casing and mix 130sx Cement												Mileage			
shut down wash pump +												<b>FLOAT EQUIPMENT</b>			
lines released plug + Displace												Guide Shoe			
with 8 1/4 BLS of H2O												Centralizer 10			
Released + held												Baskets			
hit pressure at												AFU Inserts			
Land plug to #												Float Shoe 1			
												Latch Down 1			
												Pumptrk Charge			
												Mileage			
												Tax			
												Discount			
X Signature												Total Charge			