

JAMES C. MUSGROVE

Petroleum Geologist, LLC
212 Main Street
P.O. Box 215
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Mai Oil Operations
Ochs 'A' #5
w/2 NE-NE-NE (330' FNL & 425' FEL)
Section 22-15s-14w
Russell County, Kansas

Page 1

5 1/2" Production Casing Set

Contractor: Southwind Drilling Co. (rig #3)
Commenced: February 7, 2017
Completed: February 12, 2017
Elevation: 1882' K.B., 1880' D.F., 1874' G.L.
Casing program: Surface; 8 5/8" @ 516'
Production, 5 1/2" @ 3395'
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 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	899	+983
Base Anhydrite	928	+954
Grand Haven	2440	-558
1 st Tarkio Sand	2452	-570
Dover	2463	-581
2 nd Tarkio	2472	-590
Tarkio Lime	2509	-627
Topeka	2781	-899
Heebner	3009	-1127
Toronto	3025	-1143
Lansing	3072	-1190
Base Kansas City	3277	-1395
Arbuckle	3319	-1437
Rotary Total Depth	3400	-1518
Log Total Depth	3400	-1518

(All tops and zones corrected to Electric Log Measurement)

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

TARKIO SECTION

1st Sand

2451-2457' Sand; gray, tan, very fine grained; micaeous, silty, few friable; no shows.

2nd Sand

2472-2484' Sand; gray, very fined grained; micaeous, silty; friable in part; no shows.

TOPEKA SECTION

2958-2980' Limestone, tan, fine to medium crystalline scattered porosity, brown stain, show of free oil and faint odor.

TORONTO SECTION

3025-3034 Limestone, gray, tan, fossiliferous, chalky, poorly developed porosity, trace black and brown stain.

LANSING SECTION

3072-3080' Limestone, tan, gray fossiliferous, chalky; few cherty; (dense)

3094-3100' Limestone, gray, cream, fossiliferous, chalky, poor visible porosity, no shows.

3110-3122' Limestone, white, cream, oomoldic, fair oomoldic porosity, chalky; trace poor brown edge staining; no show of free oil and no odor in fresh samples.

3150-3156' Limestone, gray, tan, oolitic, poor visible porosity, gray, black and brown spotty stain, no show of free oil and faint odor in fresh samples.

3169-3182' Limestone, white, cream, oomoldic, fair oomoldic porosity; slightly chalky no shows.

3218-3229' Limestone, gray, tan, finely crystalline, few fossiliferous, chalky; no shows.

3236-3242' Limestone, white, cream, fossiliferous/oolitic, chalky, light brown stain, trace of free oil and no odor in fresh samples.

3257-3263' Limestone, white, tan, oomoldic, good oomoldic porosity, brown stain, trace of free oil and no odor.

3290-3296' Limestone, white, finely crystalline, scattered porosity, trace brown stain, no show of free oil and no odor fresh samples.

Drill Stem Test #1 **3200-3300**

Times: 30-30-30-45

Blow: Weak

Recovery: 47' oil cut mud
 (10% oil; 90% mud)

Pressures: ISIP 685 psi
 FSIP 659 psi
 IFP 15-28 psi
 FFP 31-38 psi
 HSH 1653-1595 psi

3290-3300' Limestone, tan, buff, finely crystalline, dense, no shows.

ARBUCKLE SECTION

3319-3323' Dolomite, white, cream, fine to medium crystalline, fair inter-crystalline porosity, few sucrosic, light brown stain, show of free and strong odor in fresh samples.

Drill Stem Test #2 **3265-3323**

Times: 30-30-30-30

Blow: Strong

Recovery: 236' oil cut muddy water
 (10% oil; 15% water; 75% mud)
 1823' oil cut muddy water
 (10% oil; 75% water; 15% mud)

Pressures: ISIP 1079 psi
 FSIP 1079 psi
 IFP 85-622 psi
 FFP 626-884 psi
 HSH 1666-1633 psi

3323-3330' Dolomite, white, fine and medium crystalline, fair inter-crystalline porosity, sucrosic, brown stain, trace of free oil and strong odor in fresh samples.

3330-3350' Dolomite, white, tan, medium crystalline, sucrosic, light brown stain, show of free oil and fair odor in fresh samples.

3350-3370' Dolomite, white, tan, finely crystalline, dense, poor scattered porosity, light brown stain, no show of free oil and faint odor in fresh samples.

Mai Oil Operations
Ochs 'A' #5
w/2 NE-NE-NE (330' FNL & 425' FEL)
Section 22-15s-14w
Russell County, Kansas

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3370-3390' Dolomite, white, medium crystalline, scattered porosity, light brown stain, show of free oil and questionable odor in fresh samples.

3390-3400' Dolomite, white/cream, fine to medium crystalline, poor inter-crystalline porosity, no shows, no odor.

Rotary Total Depth	3400	-1518
Log Total Depth	3400	-1518

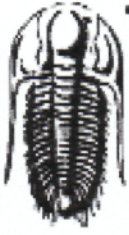
Recommendations:

The 5 ½" production casing was set and cemented on Mai Oil Operations Inc., Ochs 'A' #5.

Respectfully yours,

James C. Musgrove
James C. Musgrove
Wyatt Urban
Petroleum Geologist





**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Mai Oil Operations, Inc.
8411 Preston Rd
Ste 800
Dallas, TX 75225
ATTN: Jim Musgrove

22-15S-14W Russell,KS

Ochs "A" #5

Job Ticket: 58108 DST#: 1
Test Start: 2017.02.11 @ 18:39:50

GENERAL INFORMATION:

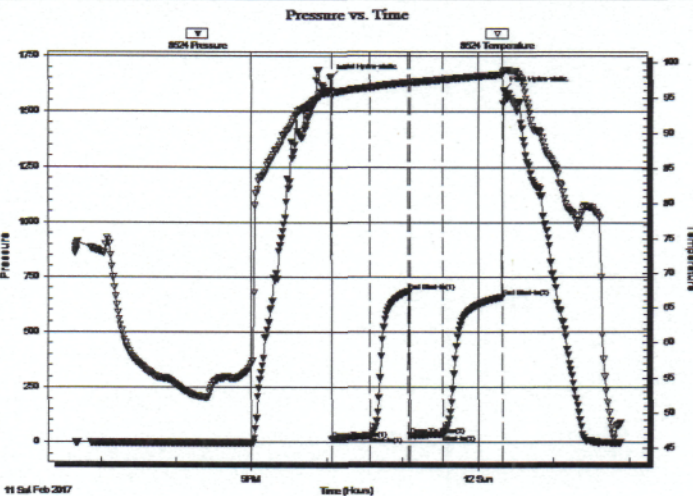
Formation: **LKC "H-K"**
Deviated: No Whipstock: ft (KB)
Time Tool Opened: 22:03:36
Time Test Ended: 01:52:51
Interval: **3200.00 ft (KB) To 3300.00 ft (KB) (TVD)**
Total Depth: 3300.00 ft (KB) (TVD)
Hole Diameter: 7.88 inches Hole Condition: Fair
Test Type: Conventional Bottom Hole (Initial)
Tester: Brannan Lonsdale
Unit No: 73
Reference Elevations: 1882.00 ft (KB)
1874.00 ft (CF)
KB to GR/CF: 8.00 ft

Serial #: 8524

Outside

Press@RunDepth: 37.65 psig @ 3201.00 ft (KB)
Start Date: 2017.02.11 End Date: 2017.02.12
Start Time: 18:39:51 End Time: 01:52:51
Capacity: 8000.00 psig
Last Calib.: 2017.02.12
Time On Btm: 2017.02.11 @ 22:03:21
Time Off Btm: 2017.02.12 @ 00:20:21

TEST COMMENT: 30- IF- Built slowly to 1 1/2"
30- IS- No blow
30- FF- Surface blow throughout
45- FS- No blow



PRESSURE SUMMARY

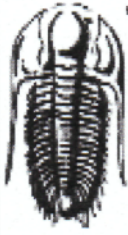
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1652.75	96.00	Initial Hydro-static
1	15.36	95.22	Open To Flow (1)
31	27.83	96.49	Shut-In(1)
62	684.94	97.15	End Shut-In(1)
63	31.27	97.10	Open To Flow (2)
89	37.65	97.55	Shut-In(2)
136	658.71	98.27	End Shut-In(2)
137	1595.36	98.84	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
47.00	SOCM, 10%O 90%M	0.67

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 Rd
Ste 800
Dallas, TX 75225
ATTN: Jim Musgrove

22-15S-14W Russell,KS

Ochs "A" #5

Job Ticket: 58108

DST#: 1

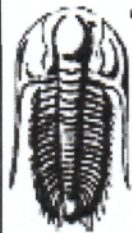
Test Start: 2017.02.11 @ 18:39:50

Tool Information

Drill Pipe:	Length: 3207.00 ft	Diameter: 3.82 inches	Volume: 45.46 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 38000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	27.00 ft			String Weight: Initial 36000.00 lb
Depth to Top Packer:	3200.00 ft			Final 36000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	100.00 ft			
Tool Length:	120.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3181.00	
Shut In Tool	5.00			3186.00	
Hydraulic tool	5.00			3191.00	
Packer	5.00			3196.00	20.00 Bottom Of Top Packer
Packer	4.00			3200.00	
Stubb	1.00			3201.00	
Recorder	0.00	6838	Inside	3201.00	
Recorder	0.00	8524	Outside	3201.00	
Perforations	2.00			3203.00	
Change Over Sub	1.00			3204.00	
Drill Pipe	92.00			3296.00	
Change Over Sub	1.00			3297.00	
Bullnose	3.00			3300.00	100.00 Bottom Packers & Anchor
Total Tool Length:		120.00			



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Mai Oil Operations, Inc.

22-15S-14W Russell,KS

8411 Preston Rd

Ochs "A" #5

Ste 800

Job Ticket: 58108

DST#: 1

Dallas, TX 75225

ATTN: Jim Musgrove

Test Start: 2017.02.11 @ 18:39:50

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

33 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 49.00 sec/qt

Cushion Volume:

bbl

Water Loss: 8.79 in³

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
47.00	SOCM, 10%O 90%M	0.666

Total Length: 47.00 ft Total Volume: 0.666 bbl

Num Fluid Samples: 0

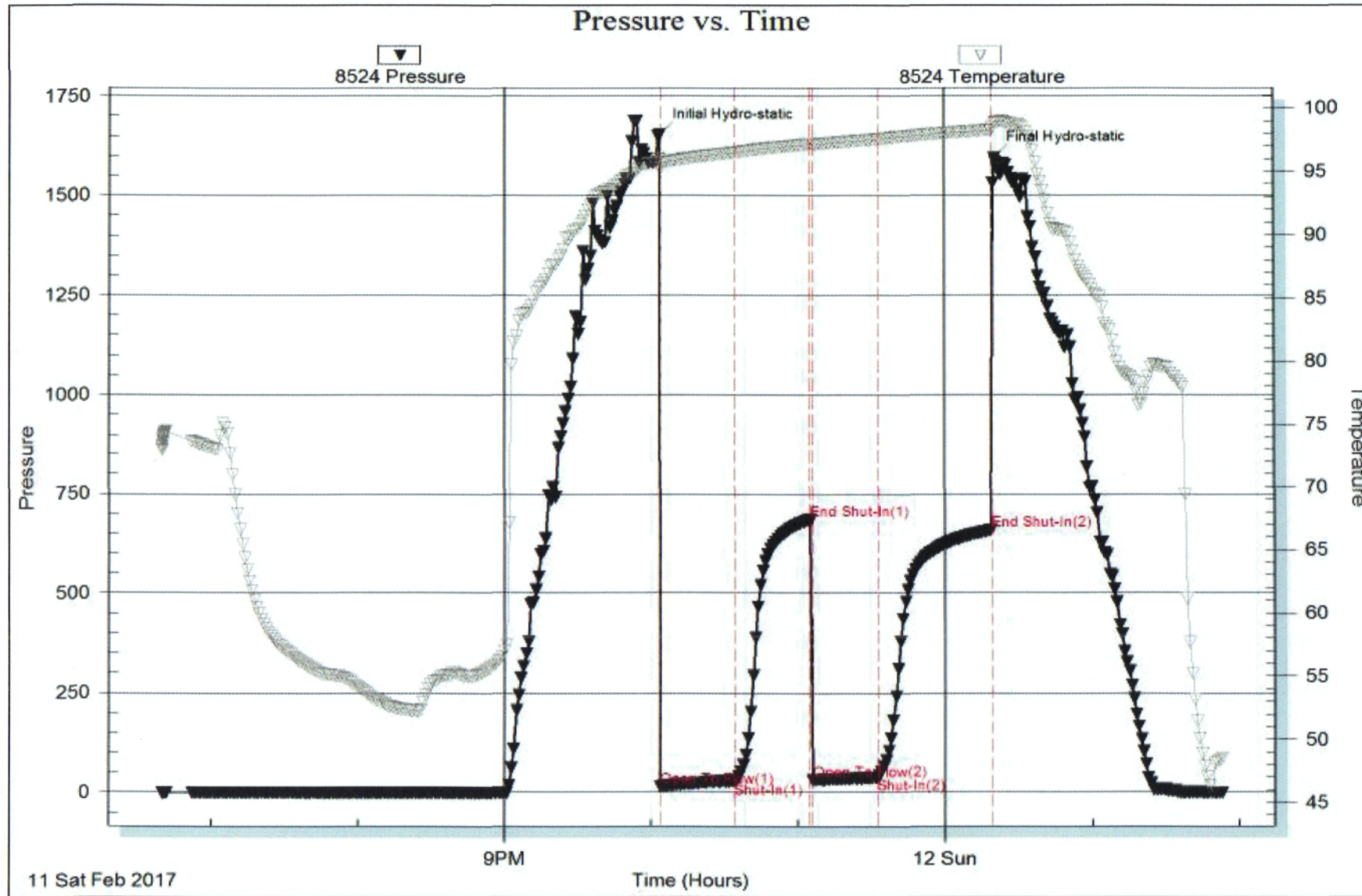
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:





TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Mai Oil Operations, Inc.
 8411 Preston Rd
 Ste 800
 Dallas, TX 75225
 ATTN: Jim Musgrove

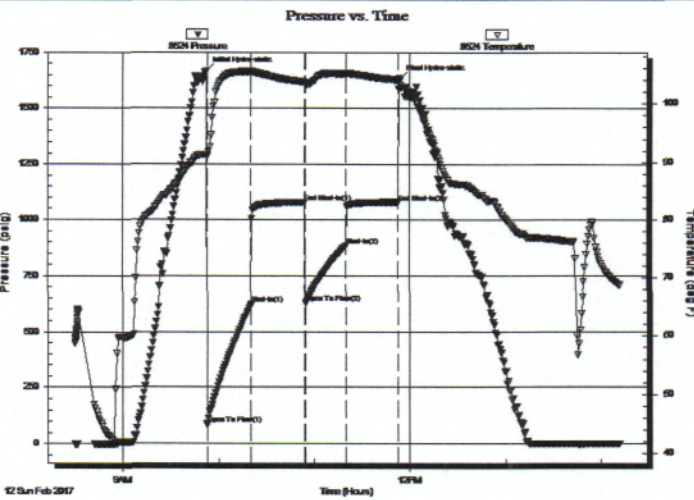
22-15S-14W Russell, KS
Ochs "A" #5
 Job Ticket: 58109 **DST#: 2**
 Test Start: 2017.02.12 @ 08:29:44

GENERAL INFORMATION:

Formation: **Arbuckle**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 09:52:45
 Time Test Ended: 14:12:15
 Interval: **3265.00 ft (KB) To 3323.00 ft (KB) (TVD)**
 Total Depth: 3323.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Brannan Lonsdale
 Unit No: 73
 Reference Elevations: 1882.00 ft (KB)
 1874.00 ft (CF)
 KB to GR/CF: 8.00 ft

Serial #: 8524 Outside
 Press@RunDepth: 883.57 psig @ 3266.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2017.02.12 End Date: 2017.02.12 Last Calib.: 2017.02.12
 Start Time: 08:29:45 End Time: 14:12:15 Time On Btm: 2017.02.12 @ 09:52:15
 Time Off Btm: 2017.02.12 @ 11:53:30

TEST COMMENT: 30- IF- BOB 30 secs
 30- IS- No blow
 30- FF- BOB 90 secs
 30- FS- No blow



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1666.26	91.25	Initial Hydro-static
1	85.37	90.93	Open To Flow (1)
29	622.23	105.40	Shut-In(1)
62	1079.31	103.63	End Shut-In(1)
63	626.13	103.37	Open To Flow (2)
88	883.57	105.17	Shut-In(2)
121	1079.30	104.07	End Shut-In(2)
122	1633.16	104.00	Final Hydro-static

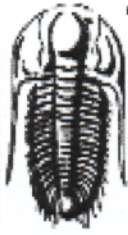
Recovery

Length (ft)	Description	Volume (bbl)
1823.00	OCMW, 10%O 15%M 75%W	25.84
236.00	WOCM, 10%O 15%W 75%M	3.35

* Recovery from multiple tests

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 Rd
Ste 800
Dallas, TX 75225
ATTN: Jim Musgrove

22-15S-14W Russell,KS
Ochs "A" #5
Job Ticket: 58109 **DST#: 2**
Test Start: 2017.02.12 @ 08:29:44

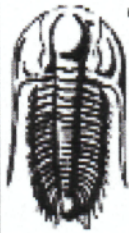
Tool Information

Drill Pipe:	Length: 3269.00 ft	Diameter: 3.82 inches	Volume: 46.34 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose: 44000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	24.00 ft			String Weight: Initial 35000.00 lb
Depth to Top Packer:	3265.00 ft			Final 43000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	58.00 ft			
Tool Length:	78.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3246.00	
Shut In Tool	5.00			3251.00	
Hydraulic tool	5.00			3256.00	
Packer	5.00			3261.00	20.00 Bottom Of Top Packer
Packer	4.00			3265.00	
Stubb	1.00			3266.00	
Recorder	0.00	6838	Inside	3266.00	
Recorder	0.00	8524	Outside	3266.00	
Perforations	21.00			3287.00	
Change Over Sub	1.00			3288.00	
Drill Pipe	31.00			3319.00	
Change Over Sub	1.00			3320.00	
Bullnose	3.00			3323.00	58.00 Bottom Packers & Anchor

Total Tool Length: 78.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Mai Oil Operations, Inc.

22-15S-14W Russell,KS

8411 Preston Rd

Ochs "A" #5

Ste 800

Job Ticket: 58109

DST#: 2

Dallas, TX 75225

ATTN: Jim Musgrove

Test Start: 2017.02.12 @ 08:29:44

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

29 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

35000 ppm

Viscosity: 49.00 sec/qt

Cushion Volume:

bbl

Water Loss: 8.78 in³

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
1823.00	OCMW, 10%O 15%M 75%W	25.842
236.00	WOVM, 10%O 15%W 75%M	3.345

Total Length: 2059.00 ft Total Volume: 29.187 bbl

Num Fluid Samples: 0

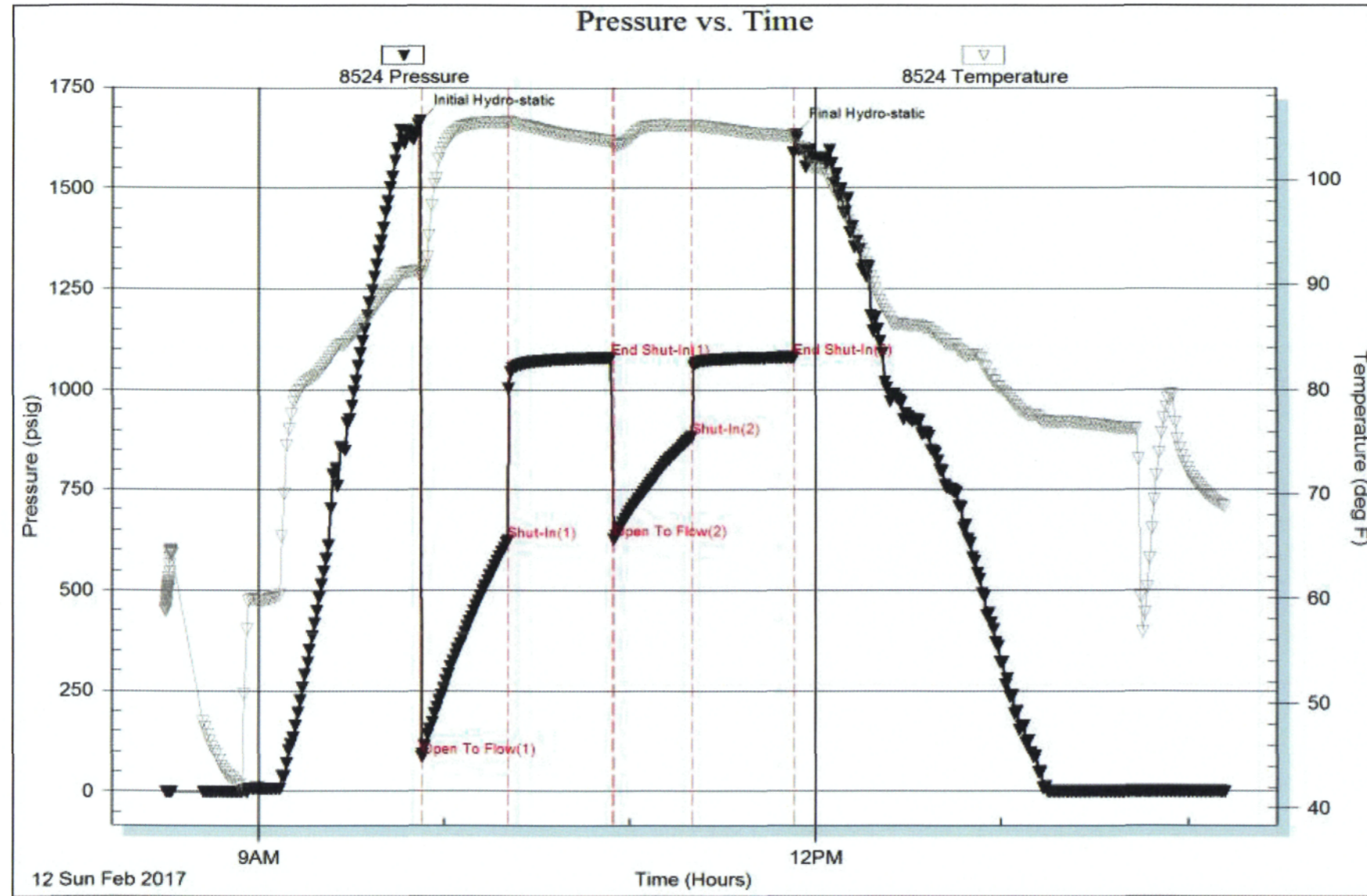
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: RW: .21@62deg



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. 3141

Date	2-13-17	Sec.	22	Twp.	15	Range	14	County	Russell	State	Ks	On Location		Finish	9:30 AM
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Location: 281 + Winterset - 1/2 W, 5/1 into

Lease	Ochs "A"	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 ² oil operations
Type Job	Longstring	T.D.	3400'	Street	
Mole Size	7 7/8"	Depth	3398'	City	State
Csg.	5 1/2" New 14#	Depth		The above was done to satisfaction and supervision of owner agent or contractor.	
Tbg. Size		Shoe Joint	21.72'	Cement Amount Ordered	160 60/40 10% salt 2% Gel
Tool		Displace	82 1/4 BLS	1/4# Fl ^o -seal	= 1000 gal mud Clear 48
Cement Left in Csg.	21.72				

EQUIPMENT

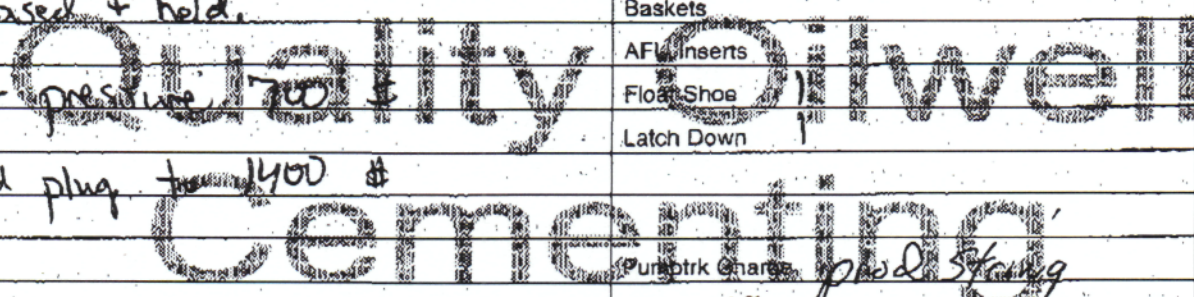
Pumptrk	18	No.	Cementer		Common	96
			Helper	Nick	Poz. Mix	64
Bulktrk	3	No.	Driver	Doug	Gel.	83
			Driver	Rick	Calcium	
Bulktrk	pu.	No.	Driver		Hulls	

JOB SERVICES & REMARKS

Remarks:	Salt	14
Rat Hole	Flowseal	40#
Mouse Hole	Kol-Seal	
Centralizers	Mud CLR 48	1000 gal
Baskets	CFL-117 or CD110 CAF 38	
D/V or Port Collar	Sand	
plug Rat hole	Handling	
5/8" casing mix	Mileage	
Start down pump line	LOST EQUIPMENT	
Displaced plug col	Guide Shoe	
Released + hold.	Centralizer	7
Lift pressure	Baskets	
Land plug to 1400 #	AFI inserts	
	Float Shoe	
	Latch Down	
	Pumptrk Charge	prod 5000
	Mileage	12

X Signature *[Signature]*

Tax
Discount
Total Charge



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. 3140

Date	2-8-17	Sec.	22	Twp.	15	Range	14	County	Russell	State	Ks	On Location		Finish	2:00 PM
------	--------	------	----	------	----	-------	----	--------	---------	-------	----	-------------	--	--------	---------

Location Russell Sto Winterset Rd, 1/2 W

Lease	<u>Ochs "A"</u>	Well No.	<u>5</u>	Owner	<u>S. G. Do</u>
Contractor	<u>Southwind</u>		<u>3</u>	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	<u>Surface</u>			Charge To	<u>Major oil operations</u>
Hole Size	<u>12 1/4"</u>	T.D.	<u>516'</u>	Street	
Csg.	<u>8 5/8"</u>	Depth	<u>516'</u>	City	
Tbg. Size		Depth		State	
Tool		Depth		The above was done to satisfaction and supervision of owner agent or contractor.	
Cement Left in Csg.	<u>15'</u>	Shoe Joint	<u>15'</u>	Cement Amount Ordered	<u>225 60/40 4% CC 2% Gel</u>
Meas Line		Displace	<u>31 3/4 BCS</u>		

EQUIPMENT

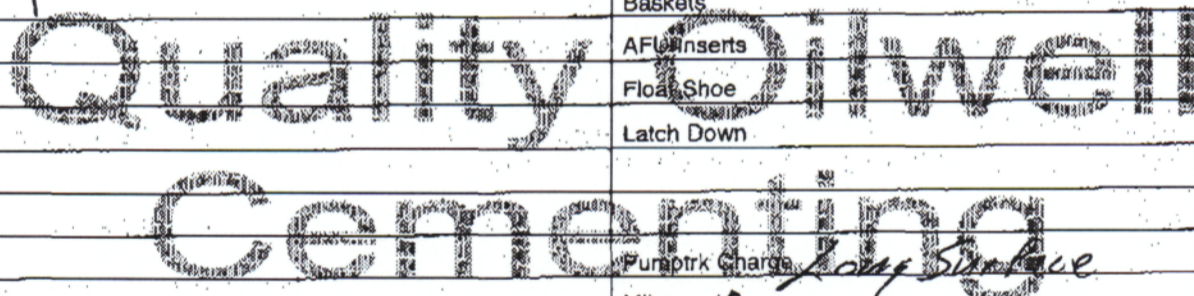
Pumptrk	<u>18</u>	No.		Cementer	<u>Dave</u>	Common	<u>125</u>
				Helper		Poz. Mix	<u>90</u>
Bulktrk	<u>3</u>	No.		Driver	<u>Nick</u>	Gel.	<u>4</u>
				Driver		Calclum	<u>10</u>
Bulktrk	<u>p.u.</u>	No.		Driver	<u>Rick</u>		

JOB SERVICES & REMARKS

Remarks:	<u>Cement did Circulate</u>	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	

Handling	<u>139</u>
Mileage	

Guide Shoe	<u>Rubber plug</u>
Centralizer	
Baskets	
AF Inserts	
Floa Shoe	
Latch Down	



Pumptrk Charge	<u>from Surface</u>
Mileage	<u>2</u>

Tax	
Discount	
Total Charge	

X Signature Guy [Signature]