



## DRILL STEM TEST REPORT

Prepared For: **H&C Oil Operating, Inc.**

PO Box 86  
Plainville, KS 67663

ATTN: Marc Downing

### **Waggoner #24-1**

#### **24-9S-25W Graham,KS**

Start Date: 2014.03.28 @ 09:36:46

End Date: 2014.03.28 @ 16:20:46

Job Ticket #: 54024                      DST #: 1

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.03 @ 13:35:56



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54024

**DST#: 1**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 09:36:46

## GENERAL INFORMATION:

Formation: **LKC "C-D"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:06:16

Time Test Ended: 16:20:46

Test Type: Conventional Bottom Hole (Initial)

Tester: Brannan L

Unit No: 48

**Interval: 3893.00 ft (KB) To 3940.00 ft (KB) (TVD)**

Reference Elevations: 2544.00 ft (KB)

Total Depth: 3940.00 ft (KB) (TVD)

2537.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Poor

KB to GR/CF: 7.00 ft

## Serial #: 8372

Inside

Press@RunDepth: 611.15 psig @ 3936.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.03.28

End Date:

2014.03.28

Last Calib.:

2014.03.28

Start Time: 09:36:47

End Time:

16:20:46

Time On Btm:

2014.03.28 @ 12:04:46

Time Off Btm:

2014.03.28 @ 13:58:46

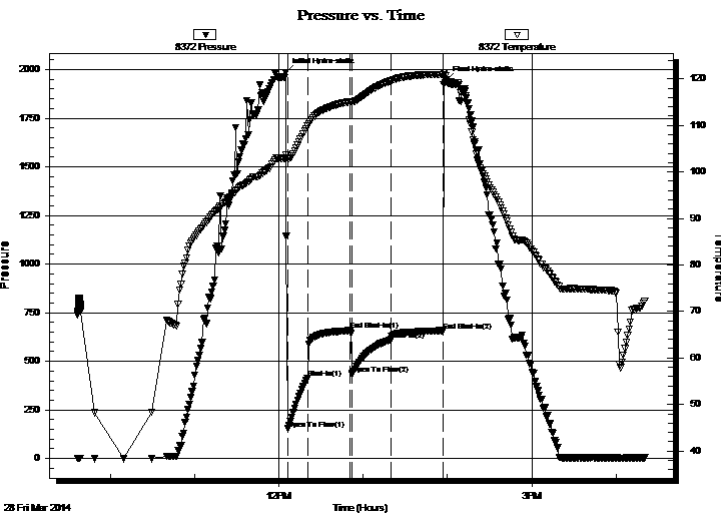
## TEST COMMENT:

15- IF- BOB 1 min

30- IS- No blow

30- FF- Built very quickly to 2 1/2" then slowly died. Dead @ 25 mins

30- FS- No blow



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1983.95	102.95	Initial Hydro-static
2	152.80	102.81	Open To Flow (1)
16	414.94	109.79	Shut-In(1)
46	658.05	115.11	End Shut-In(1)
47	432.62	115.06	Open To Flow (2)
75	611.15	119.60	Shut-In(2)
112	657.46	120.95	End Shut-In(2)
114	1942.59	120.68	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
1260.00	MW, 30%M 70%W	16.95

## Gas Rates

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





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54024

**DST#: 1**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 09:36:46

## Tool Information

Drill Pipe:	Length: 3869.00 ft	Diameter: 3.75 inches	Volume: 52.85 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: 2.75 inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 5.00 ft
Drill Pipe Above KB:	26.00 ft			String Weight: Initial 53000.00 lb
Depth to Top Packer:	3893.00 ft			Final 59000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	47.00 ft			
Tool Length:	67.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3874.00	
Shut In Tool	5.00			3879.00	
Hydraulic tool	5.00			3884.00	
Packer	5.00			3889.00	20.00 Bottom Of Top Packer
Packer	4.00			3893.00	
Stubb	1.00			3894.00	
Perforations	9.00			3903.00	
Change Over Sub	1.00			3904.00	
Drill Pipe	32.00			3936.00	
Recorder	0.00	8372	Inside	3936.00	
Recorder	0.00	8321	Outside	3936.00	
Change Over Sub	1.00			3937.00	
Bullnose	3.00			3940.00	47.00 Bottom Packers & Anchor

**Total Tool Length: 67.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54024

**DST#: 1**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 09:36:46

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

66000 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbl

Water Loss: 6.78 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1400.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1260.00	MW, 30%M 70%W	16.950

Total Length: 1260.00 ft      Total Volume: 16.950 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

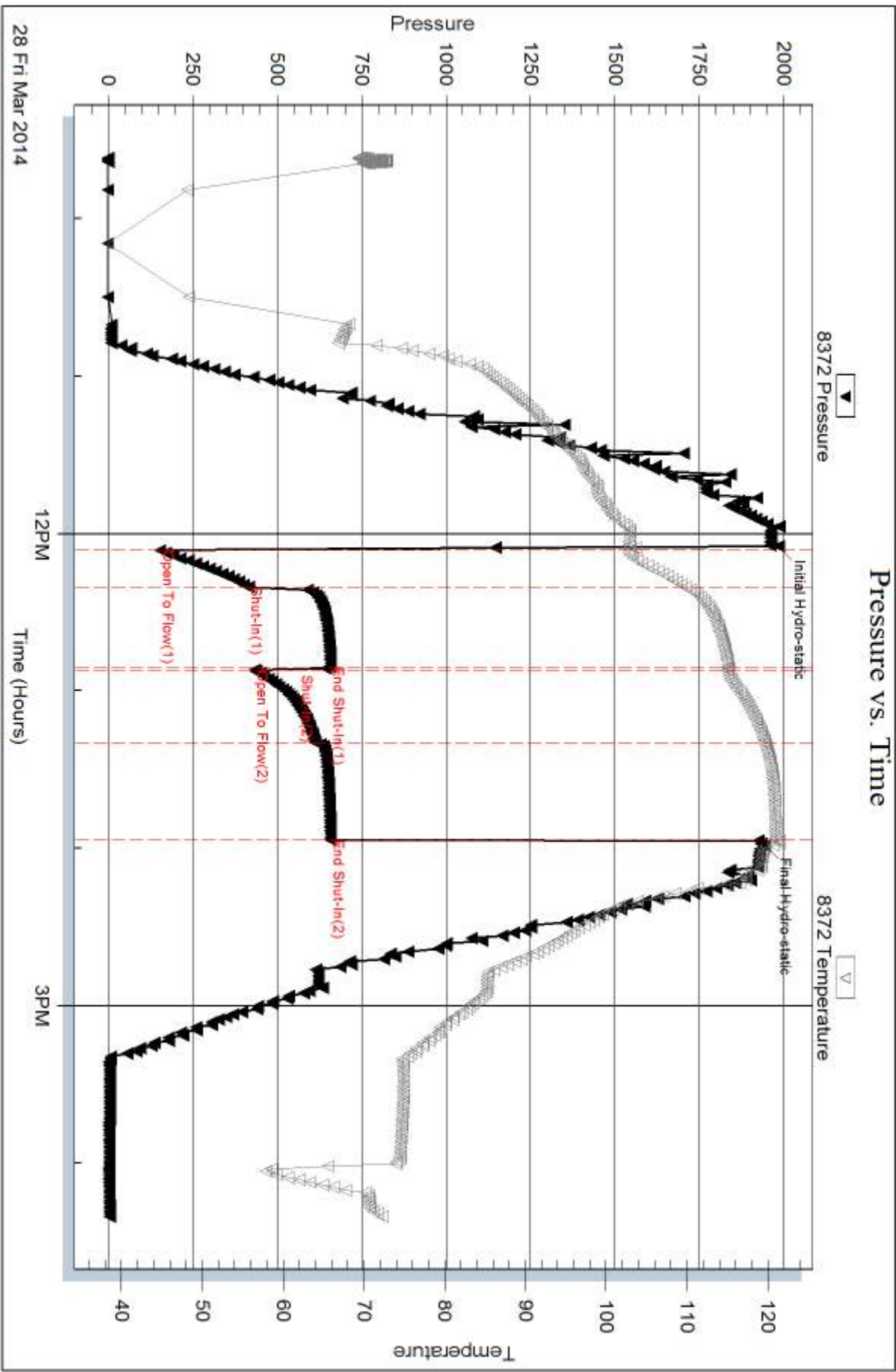
Serial #: 8372

Inside

H&C Oil Operating, Inc.

Waggoner #24-1

DST Test Number: 1



28 Fri Mar 2014

12PM

Time (Hours)

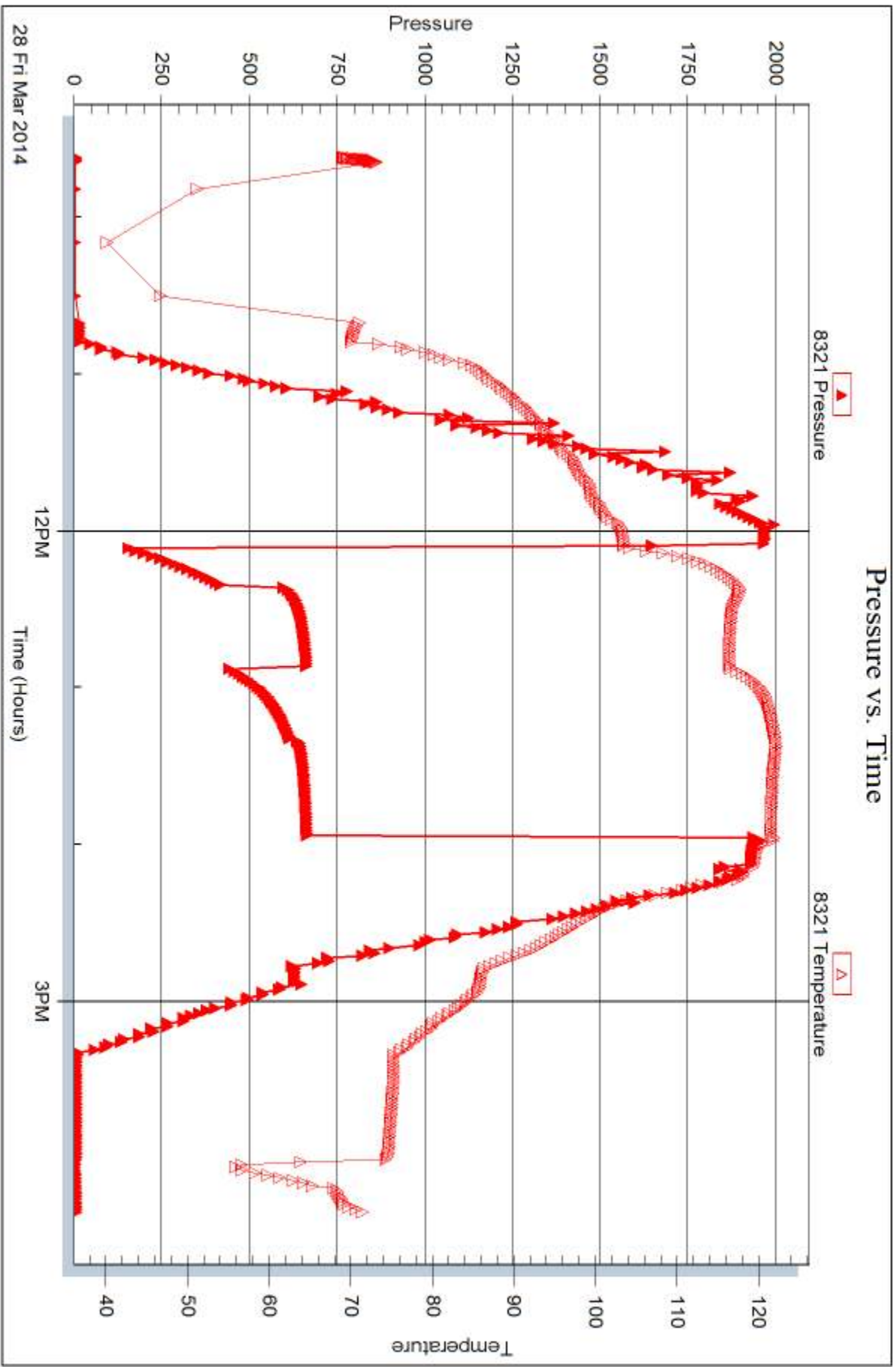
3PM

Serial #: 8321

Outside H&C Oil Operating, Inc.

Waggoner #24-1

DST Test Number: 1



Triobite Testing, Inc

Ref. No: 54024

Printed: 2014.04.03 @ 13:35:58



## DRILL STEM TEST REPORT

Prepared For: **H&C Oil Operating, Inc.**

PO Box 86  
Plainville, KS 67663

ATTN: Marc Downing

### **Waggoner #24-1**

#### **24-9S-25W Graham,KS**

Start Date: 2014.03.28 @ 23:08:10

End Date: 2014.03.29 @ 06:04:40

Job Ticket #: 54025                      DST #: 2

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.03 @ 13:35:30





**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54025

**DST#: 2**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 23:08:10

## GENERAL INFORMATION:

Formation: **LKC "F"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 01:05:40

Time Test Ended: 06:04:40

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan L

Unit No: 48

**Interval: 3934.00 ft (KB) To 3964.00 ft (KB) (TVD)**

Reference Elevations: 2544.00 ft (KB)

Total Depth: 3964.00 ft (KB) (TVD)

2537.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 7.00 ft

**Serial #: 8372**

**Inside**

Press@RunDepth: 190.45 psig @ 3961.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.03.28

End Date:

2014.03.29

Last Calib.:

2014.03.29

Start Time: 23:08:11

End Time:

06:04:40

Time On Btm:

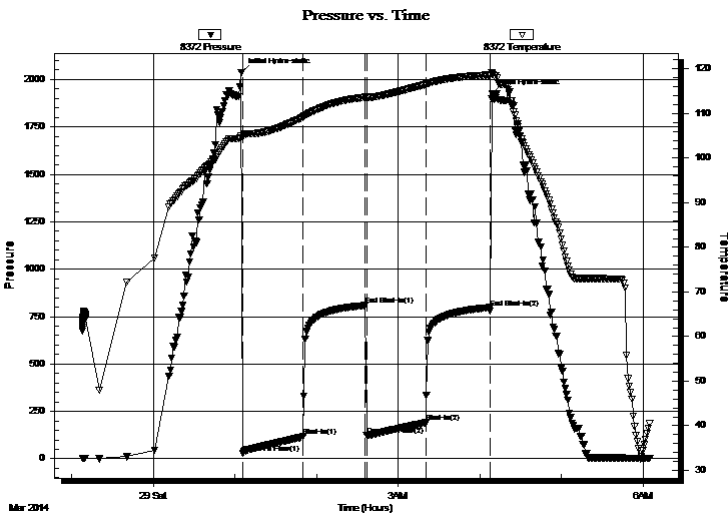
2014.03.29 @ 01:04:40

Time Off Btm:

2014.03.29 @ 04:09:10

**TEST COMMENT:** 45- IF- BOB 22 mins  
45- IS- No blow  
45- FF- BOB 29 mins  
45- FS- No blow

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2037.31	104.92	Initial Hydro-static
1	30.59	104.60	Open To Flow (1)
46	118.20	109.20	Shut-In(1)
91	808.86	113.64	End Shut-In(1)
92	122.61	113.46	Open To Flow (2)
136	190.45	116.49	Shut-In(2)
183	797.83	118.63	End Shut-In(2)
185	1924.62	118.86	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
375.00	MW, 40%M 60%W	4.86

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54025

**DST#: 2**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 23:08:10

## Tool Information

Drill Pipe:	Length: 3901.00 ft	Diameter: 3.75 inches	Volume: 53.29 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: 2.75 inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	17.00 ft			String Weight: Initial 53000.00 lb
Depth to Top Packer:	3934.00 ft			Final 55000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	30.00 ft			
Tool Length:	50.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3915.00	
Shut In Tool	5.00			3920.00	
Hydraulic tool	5.00			3925.00	
Packer	5.00			3930.00	20.00 Bottom Of Top Packer
Packer	4.00			3934.00	
Stubb	1.00			3935.00	
Perforations	26.00			3961.00	
Recorder	0.00	8372	Inside	3961.00	
Recorder	0.00	8321	Outside	3961.00	
Bullnose	3.00			3964.00	30.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>50.00</b>				



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 54025

**DST#: 2**

ATTN: Marc Downing

Test Start: 2014.03.28 @ 23:08:10

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

85000 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.77 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1400.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
375.00	MW, 40%M 60%W	4.860

Total Length: 375.00 ft      Total Volume: 4.860 bbl

Num Fluid Samples: 0

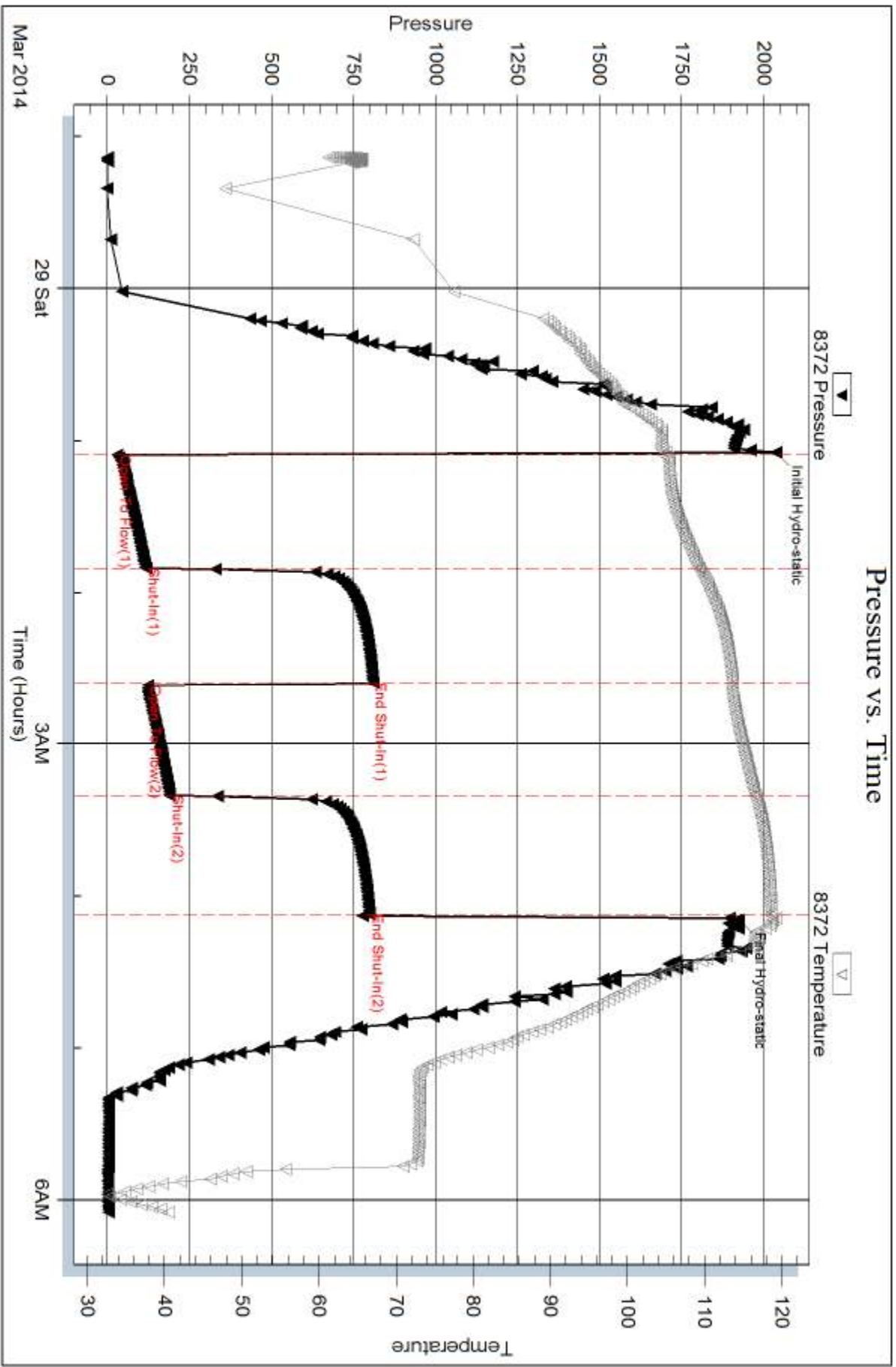
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

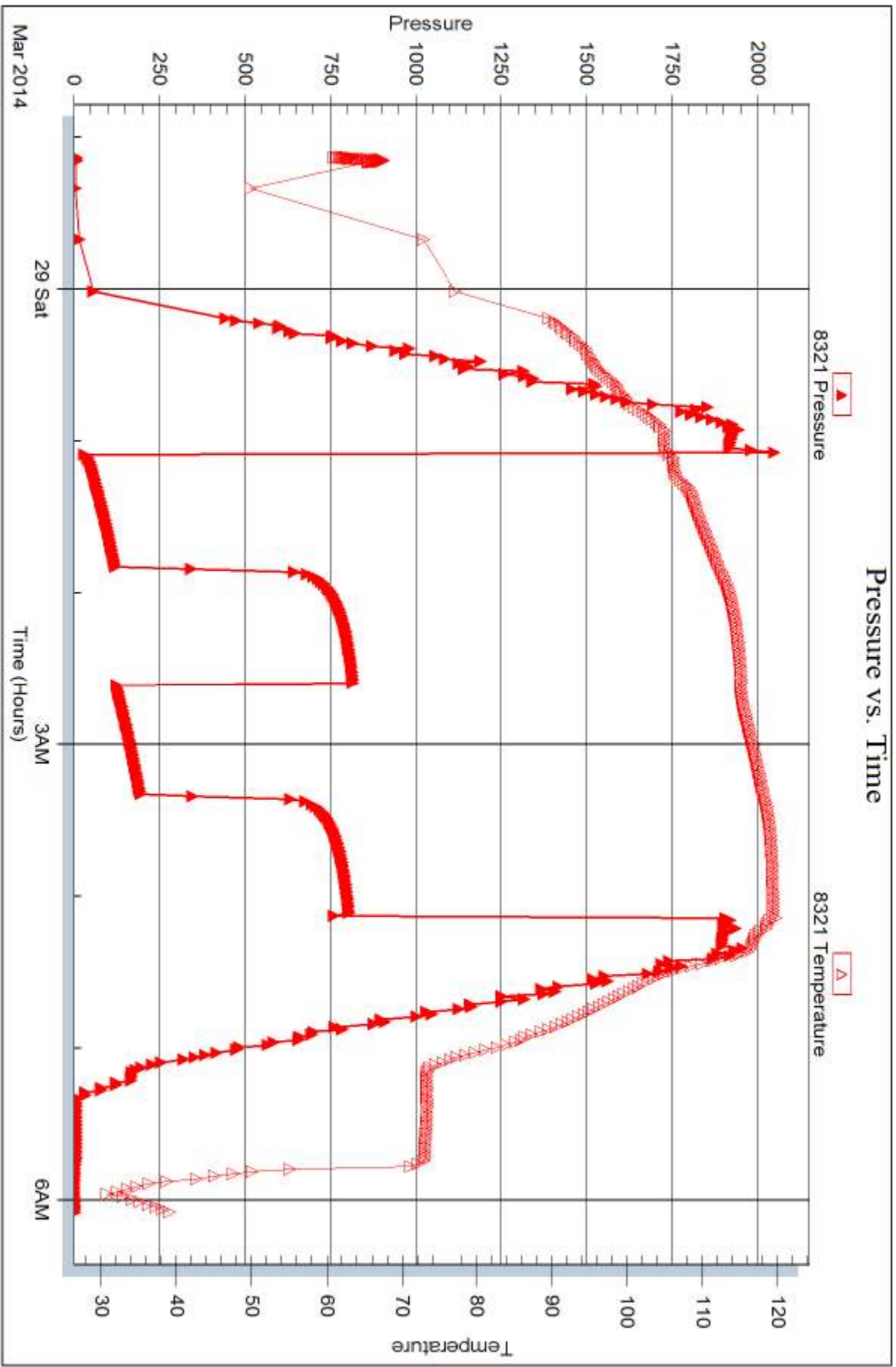


Serial #: 8321

Outside H&C Oil Operating, Inc.

Waggoner #24-1

DST Test Number: 2



Triobite Testing, Inc

Ref. No: 54025

Printed: 2014.04.03 @ 13:35:32



## DRILL STEM TEST REPORT

Prepared For: **H&C Oil Operating, Inc.**

PO Box 86  
Plainville, KS 67663

ATTN: Marc Downing

### **Waggoner #24-1**

#### **24-9S-25W Graham,KS**

Start Date: 2014.03.29 @ 16:25:00

End Date: 2014.03.29 @ 23:57:00

Job Ticket #: 55379                      DST #: 3

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.03 @ 13:34:39

H&C Oil Operating, Inc.  
24-9S-25W Graham,KS  
Waggoner #24-1  
DST # 3  
LKC "H.J."  
2014.03.29



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 55379

**DST#: 3**

ATTN: Marc Downing

Test Start: 2014.03.29 @ 16:25:00

## GENERAL INFORMATION:

Formation: **LKC "H-J"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:15:00

Time Test Ended: 23:57:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Brannan L/Phillip Ga

Unit No: 48

**Interval: 3995.00 ft (KB) To 4065.00 ft (KB) (TVD)**

Reference Elevations: 2544.00 ft (KB)

Total Depth: 4065.00 ft (KB) (TVD)

2537.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Poor

KB to GR/CF: 7.00 ft

**Serial #: 8372**

**Inside**

Press@RunDepth: 1097.26 psig @ 4061.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.03.29

End Date:

2014.03.29

Last Calib.:

2014.03.30

Start Time: 16:25:01

End Time:

23:57:00

Time On Btm:

2014.03.29 @ 18:14:30

Time Off Btm:

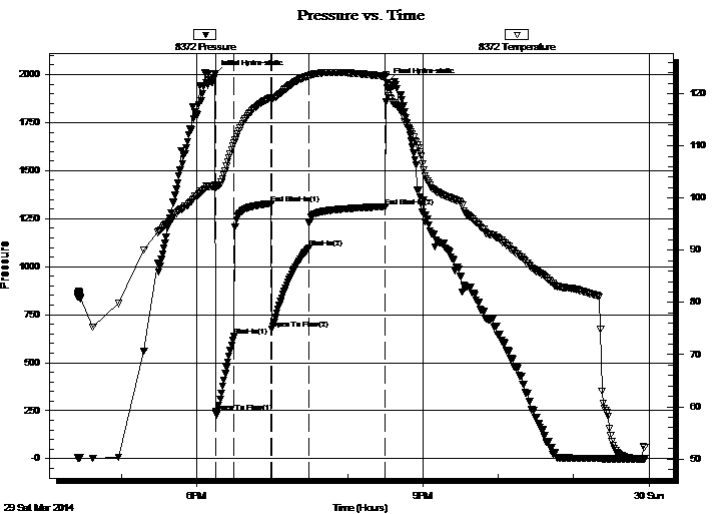
2014.03.29 @ 20:31:30

**TEST COMMENT:** 15-IF-BOB in 30 secs

30-ISI-1 1/2" Return

30-FF-BOB in 1 min

60-FSI-2 3/4" Return



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2002.48	102.49	Initial Hydro-static
1	244.07	102.11	Open To Flow (1)
15	639.62	110.60	Shut-In(1)
45	1328.67	119.18	End Shut-In(1)
45	674.29	119.07	Open To Flow (2)
75	1097.26	123.39	Shut-In(2)
136	1313.14	123.31	End Shut-In(2)
137	1958.38	121.17	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	M, 100% m, with oil spots	0.60
1512.00	GSOMCW, 5%g, 5%o, 10%m, 80%w	20.65
315.00	GOMCW, 30%g, 10%o, 10%m, 50%w	4.30
378.00	GOSMCW, 15%g, 10%o, 5%m, 70w	5.16

\* Recovery from multiple tests

## Gas Rates

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







**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 55379

**DST#: 3**

ATTN: Marc Downing

Test Start: 2014.03.29 @ 16:25:00

## Tool Information

Drill Pipe:	Length: 3967.00 ft	Diameter: 3.75 inches	Volume: 54.19 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: ft	Diameter: 2.75 inches	Volume: - bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 61000.00 lb
			<u>Total Volume: - bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	22.00 ft			String Weight: Initial 53000.00 lb
Depth to Top Packer:	3995.00 ft			Final 59000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	70.00 ft			
Tool Length:	90.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			3976.00	
Shut In Tool	5.00			3981.00	
Hydraulic tool	5.00			3986.00	
Packer	5.00			3991.00	20.00 Bottom Of Top Packer
Packer	4.00			3995.00	
Stubb	1.00			3996.00	
Perforations	4.00			4000.00	
Change Over Sub	1.00			4001.00	
Drill Pipe	60.00			4061.00	
Recorder	0.00	8372	Inside	4061.00	
Recorder	0.00	8321	Outside	4061.00	
Change Over Sub	1.00			4062.00	
Bullnose	3.00			4065.00	70.00 Bottom Packers & Anchor

**Total Tool Length: 90.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 55379

**DST#: 3**

ATTN: Marc Downing

Test Start: 2014.03.29 @ 16:25:00

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.58 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2800.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
63.00	M, 100%m, with oil spots	0.598
1512.00	GSOMCW, 5%g, 5%o, 10%m, 80%w	20.655
315.00	GOMCW, 30%g, 10%o, 10%m, 50%w	4.303
378.00	GOSMCW, 15%g, 10%o, 5%m, 70w	5.164

Total Length: 2268.00 ft      Total Volume: 30.720 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Salinity: .133 @ 47 degrees = 94,000

Serial #: 8372

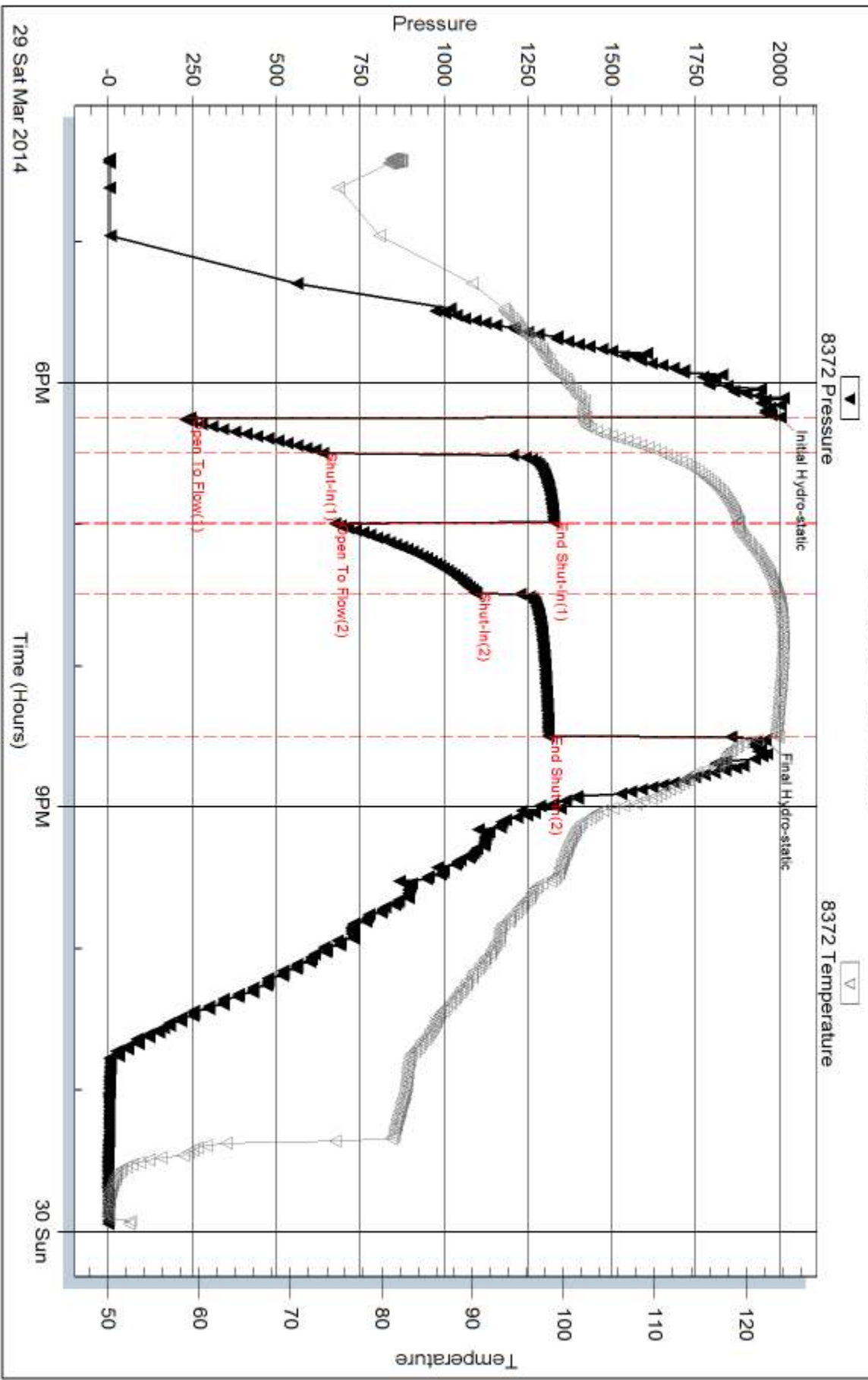
Inside

H&C Oil Operating, Inc.

Waggoner #24-1

DST Test Number: 3

### Pressure vs. Time

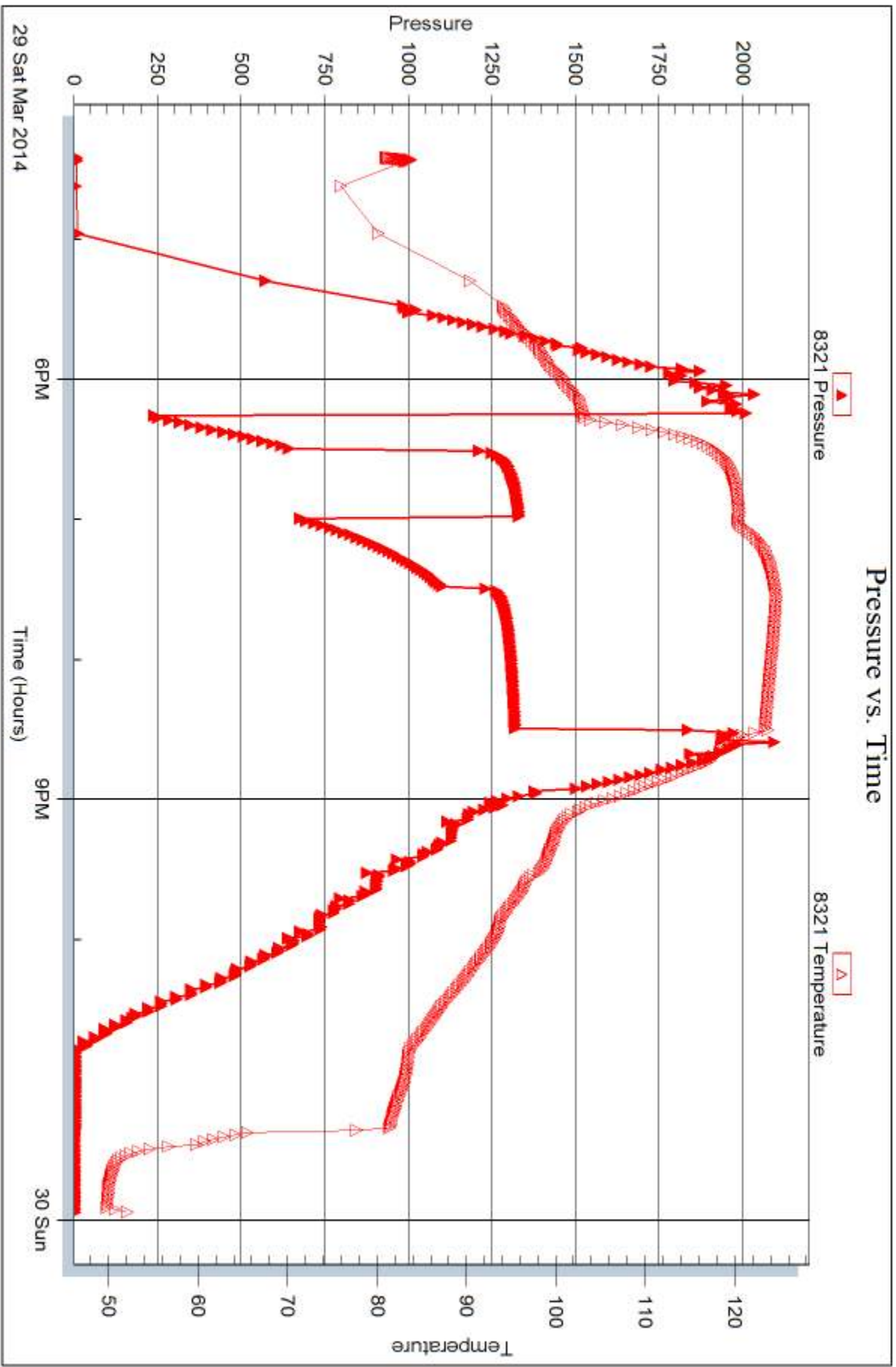


Serial #: 8321

Outside H&C Oil Operating, Inc.

Waggoner #24-1

DST Test Number: 3





## DRILL STEM TEST REPORT

Prepared For: **H&C Oil Operating, Inc.**

PO Box 86  
Plainville, KS 67663

ATTN: Marc Downing

### **Waggoner #24-1**

#### **24-9S-25W Graham,KS**

Start Date: 2014.03.30 @ 07:39:00

End Date: 2014.03.30 @ 13:20:00

Job Ticket #: 57512                      DST #: 4

Trilobite Testing, Inc  
PO Box 362 Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2014.04.03 @ 13:33:47



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 57512

**DST#: 4**

ATTN: Marc Downing

Test Start: 2014.03.30 @ 07:39:00

## GENERAL INFORMATION:

Formation: **LKC "K&L"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 09:45:30

Time Test Ended: 13:20:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Phillip Gage

Unit No: 48

**Interval: 4062.00 ft (KB) To 4108.00 ft (KB) (TVD)**

Reference Elevations: 2544.00 ft (KB)

Total Depth: 4108.00 ft (KB) (TVD)

2537.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Poor

KB to GR/CF: 7.00 ft

**Serial #: 8372**

**Inside**

Press@RunDepth: 35.94 psig @ 4105.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.03.30

End Date:

2014.03.30

Last Calib.:

2014.03.30

Start Time: 07:39:01

End Time:

13:20:00

Time On Btm:

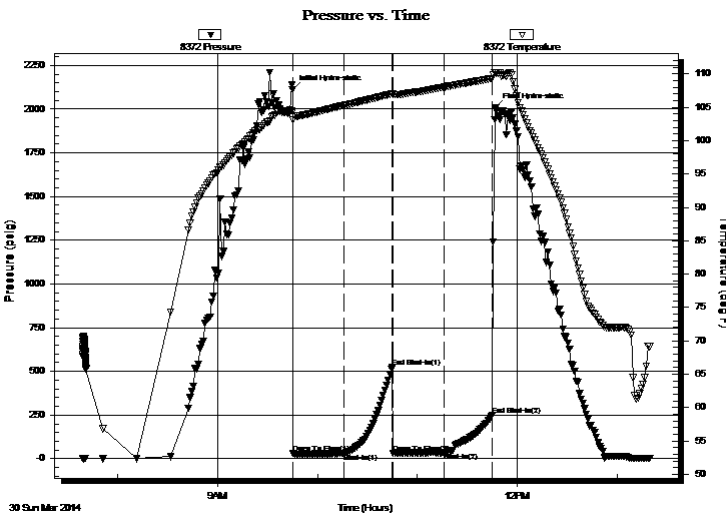
2014.03.30 @ 09:45:00

Time Off Btm:

2014.03.30 @ 11:47:00

**TEST COMMENT:** 30-IF-Built to 3/8"  
30-ISI-No Return  
30-FF-No Blow  
30-FSI-No Return

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2111.41	104.37	Initial Hydro-static
1	30.98	103.17	Open To Flow (1)
31	31.50	105.28	Shut-In(1)
60	523.26	107.03	End Shut-In(1)
61	32.58	106.86	Open To Flow (2)
91	35.94	108.02	Shut-In(2)
120	247.84	109.32	End Shut-In(2)
122	2005.80	110.15	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
10.00	M, 100% m with oil spots	0.05

## Gas Rates

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

\* Recovery from multiple tests







**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 57512

**DST#: 4**

ATTN: Marc Downing

Test Start: 2014.03.30 @ 07:39:00

## Tool Information

Drill Pipe:	Length: 4027.00 ft	Diameter: 3.75 inches	Volume: 55.01 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 2.75 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 30.00 ft	Diameter: 2.25 inches	Volume: 0.15 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: 55.16 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial 54000.00 lb
Depth to Top Packer:	4062.00 ft			Final 54000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	47.00 ft			
Tool Length:	67.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			4043.00	
Shut In Tool	5.00			4048.00	
Hydraulic tool	5.00			4053.00	
Packer	5.00			4058.00	20.00 Bottom Of Top Packer
Packer	4.00			4062.00	
Stubb	1.00			4063.00	
Perforations	10.00			4073.00	
Change Over Sub	1.00			4074.00	
Drill Pipe	31.00			4105.00	
Recorder	0.00	8372	Inside	4105.00	
Recorder	0.00	8321	Outside	4105.00	
Change Over Sub	1.00			4106.00	
Bullnose	3.00			4109.00	47.00 Bottom Packers & Anchor

**Total Tool Length: 67.00**



**TRILOBITE  
TESTING, INC**

# DRILL STEM TEST REPORT

## FLUID SUMMARY

H&C Oil Operating, Inc.

**24-9S-25W Graham,KS**

PO Box 86  
Plainville, KS 67663

**Waggoner #24-1**

Job Ticket: 57512

**DST#: 4**

ATTN: Marc Downing

Test Start: 2014.03.30 @ 07:39:00

### Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 2800.00 ppm

Filter Cake: inches

### Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	M, 100%mw ith oil spots	0.049

Total Length: 10.00 ft      Total Volume: 0.049 bbl

Num Fluid Samples: 0

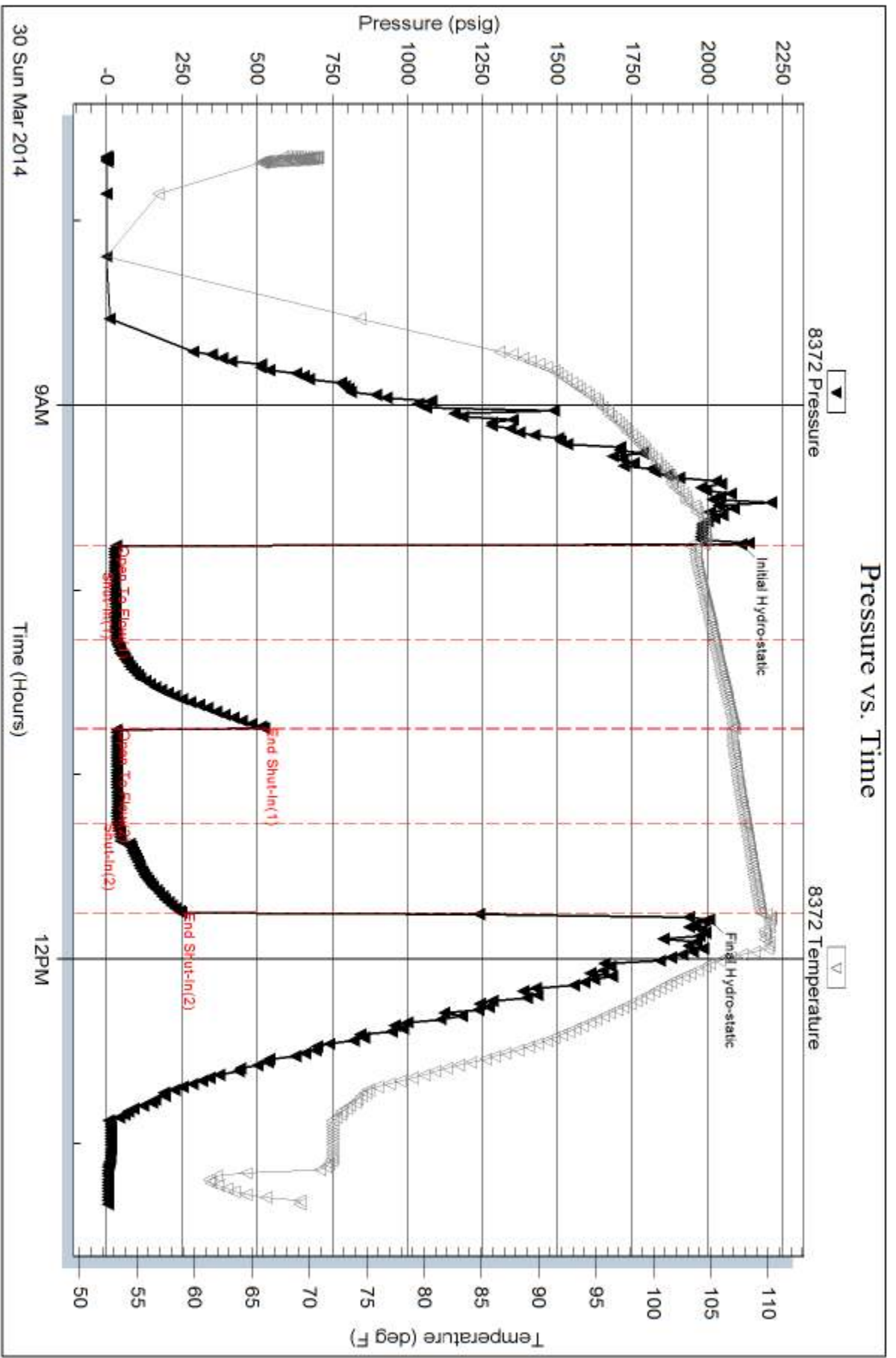
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

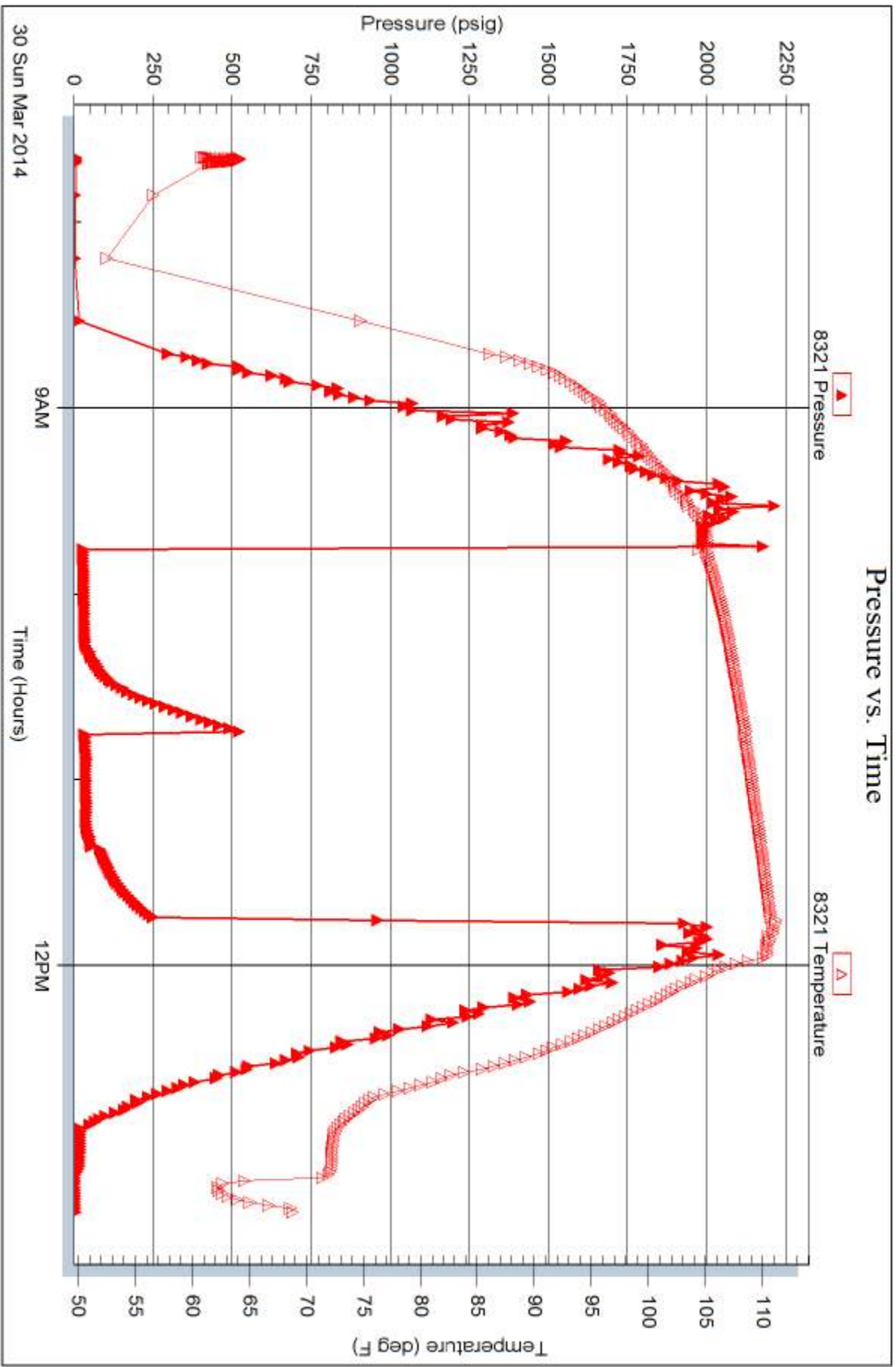


Serial #: 8321

Outside H&C Oil Operating, Inc.

Waggoner #24-1

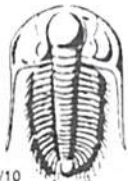
DST Test Number: 4



Trilobite Testing, Inc

Ref. No: 57512

Printed: 2014.04.03 @ 13:33:50



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 54024

Well Name & No. Waggoner #24-1 Test No. 1 Date 3/28/14  
 Company H&C Oil Operating, Inc. Elevation 2544 KB 2537 GL  
 Address PO Box 86 Plainville, KS 67663  
 Co. Rep / Geo. Marc Downing Rig American Eagle 2  
 Location: Sec. 24 Twp. 9S Rge. 25W Co. Graham State KS

Interval Tested 3893-3940 Zone Tested LKC "C-D"  
 Anchor Length 47' Drill Pipe Run 3869 Mud Wt. 9.4  
 Top Packer Depth 3888 Drill Collars Run 30 Vis 55  
 Bottom Packer Depth 3893 Wt. Pipe Run          WL 6.8  
 Total Depth 3940 Chlorides 1,400 ppm System LCM 3#

Blow Description IF - BOB 1 min  
ISI - No blow  
FF - Built very quickly to 2 1/2" then slowly died. Dead @ 25 min  
FSI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>1260</u>	<u>MW</u>			<u>70%</u>	<u>30%</u>

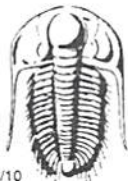
Rec Total 1260' BHT 121° Gravity          API RW .1 @ 69 °F Chlorides 66000 ppm  
 (A) Initial Hydrostatic 1984  Test 1150 T-On Location 0922  
 (B) First Initial Flow 153  Jars          T-Started 0922 0937  
 (C) First Final Flow 415  Safety Joint          T-Open 0937 1206  
 (D) Initial Shut-In 658  Circ Sub          T-Pulled 1351  
 (E) Second Initial Flow 433  Hourly Standby          T-Out 1621  
 (F) Second Final Flow 611  Mileage 134 RT 207.70 Comments           
 (G) Final Shut-In 657  Sampler           
 (H) Final Hydrostatic 1943  Straddle           
 Shale Packer           
 Extra Packer           
 Extra Recorder           
 Day Standby           
 Accessibility         

Initial Open 15  
 Initial Shut-In 30  
 Final Flow 30  
 Final Shut-In 30  
 Sub Total 0  
 Total 1357.70  
 MP/DST Disc't           
 Sub Total 1357.70

Approved By          Our Representative Brannan L

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 54025

Well Name & No. Waggoner #24-1 Test No. 2 Date 3/29/14  
 Company H&C Oil Operating, Inc. Elevation 2544 KB 2537 GL  
 Address PO Box 86 Plainville, KS 67663  
 Co. Rep / Geo. Marc Downing Rig American Eagle 2  
 Location: Sec. 24 Twp. 9S Rge. 25W Co. Graham State KS

Interval Tested 3934-3964 Zone Tested LKC "F"  
 Anchor Length 30' Drill Pipe Run 3901 Mud Wt. 9.4  
 Top Packer Depth 3929 Drill Collars Run 36 Vis 55  
 Bottom Packer Depth 3934 Wt. Pipe Run \_\_\_\_\_ WL 6.8  
 Total Depth 3964 Chlorides 1,400 ppm System LCM 3#

Blow Description IF - BOB 22 mins  
ISI - No blow  
FF - BOB 29 mins  
FSI - No blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>375</u>	<u>MW</u>		<u>60</u>	<u>40</u>	
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____

Rec Total 375' BHT 119° Gravity \_\_\_\_\_ API RW .25 @ 23 °F Chlorides 85,000 ppm

(A) Initial Hydrostatic 2037  Test 1150 T-On Location 2303  
 (B) First Initial Flow 31  Jars \_\_\_\_\_ T-Started 2308  
 (C) First Final Flow 118  Safety Joint \_\_\_\_\_ T-Open 0106  
 (D) Initial Shut-In 809  Circ Sub \_\_\_\_\_ T-Pulled 0406  
 (E) Second Initial Flow 123  Hourly Standby \_\_\_\_\_ T-Out 0605  
 (F) Second Final Flow 190  Mileage 134 RT 207.70 Comments \_\_\_\_\_  
 (G) Final Shut-In 298  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1925  Straddle \_\_\_\_\_

Initial Open 45  Shale Packer \_\_\_\_\_  Ruined Shale Packer \_\_\_\_\_  
 Initial Shut-In 45  Extra Packer \_\_\_\_\_  Ruined Packer \_\_\_\_\_  
 Final Flow 45  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Final Shut-In 45  Day Standby \_\_\_\_\_ Total 1357.70  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Sub Total 1357.70

Approved By \_\_\_\_\_ Our Representative Braman L

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. **55379**

Well Name & No. Waggoner #24-1 Test No. 3 Date 3/29/14  
 Company H&C Oil Operating, Inc. Elevation 2544 KB 2537 GL  
 Address PO Box 86 Plainville, KS 67663  
 Co. Rep / Geo. Marc Downing Rig American Eagle 2  
 Location: Sec. 24 Twp. 9S Rge. 25W Co. Graham State KS

Interval Tested 3995-4065 Zone Tested LKC-"A-J"  
 Anchor Length 20' Drill Pipe Run 3967 Mud Wt. 9.4  
 Top Packer Depth 3990 Drill Collars Run 30 Vis 60  
 Bottom Packer Depth 3995 Wt. Pipe Run \_\_\_\_\_ WL 5.6  
 Total Depth 4065 Chlorides 2800 ppm System LCM 5#

Blow Description IF- BOB in 30 sec  
ISI- 1 1/2 Return  
PF- BOB in 1 min  
FSI- 2 3/4" Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>63</u>	<u>M with oil spots</u>			<u>100</u>	
<u>1512</u>	<u>SOCM</u>	<u>5</u>	<u>5</u>	<u>80</u>	<u>10</u>
<u>315</u>	<u>OCM</u>	<u>30</u>	<u>10</u>	<u>50</u>	<u>10</u>
<u>378</u>	<u>OCM</u>	<u>15</u>	<u>10</u>	<u>5</u>	<u>70</u>
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 2268 BHT 123 Gravity \_\_\_\_\_ API RW 133 @ 47 °F Chlorides 94,000 ppm  
 (A) Initial Hydrostatic 2002  Test 1250 T-On Location 1620  
 (B) First Initial Flow 244  Jars \_\_\_\_\_ T-Started 1625  
 (C) First Final Flow 639  Safety Joint \_\_\_\_\_ T-Open 18:15  
 (D) Initial Shut-In 1328  Circ Sub \_\_\_\_\_ T-Pulled 20:30  
 (E) Second Initial Flow 674  Hourly Standby \_\_\_\_\_ T-Out 23:58  
 (F) Second Final Flow 1097  Mileage 134 RT 207.70  
 (G) Final Shut-In 1313  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 1958  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_

Initial Open 15  Ruined Shale Packer \_\_\_\_\_  
 Initial Shut-In 30  Ruined Packer \_\_\_\_\_  
 Final Flow 30  Extra Copies \_\_\_\_\_  
 Final Shut-In 60 Sub Total \_\_\_\_\_  
 Total \_\_\_\_\_  
 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_

Our Representative Brannon L. Phillips

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 57512

Well Name & No. Waggoner #24-1 Test No. 4 Date 3-30-14  
 Company H+C Oil Operating, Inc Elevation 2544 KB 2537 GL  
 Address P.O. Box 86 Plainville, KS 67663  
 Co. Rep / Geo. Mark Downing Rig American Eagle 2  
 Location: Sec. 24 Twp. 9S Rge. 25W Co. Covadham State KS

Interval Tested 4062-4108 Zone Tested LKC "K+L"  
 Anchor Length 46' Drill Pipe Run 4027 Mud Wt. 9.4  
 Top Packer Depth 4103 Drill Collars Run 30 Vis 60  
 Bottom Packer Depth 4108 Wt. Pipe Run          WL 5.6  
 Total Depth 4108 Chlorides 2,800 ppm System LCM 5#  
 Blow Description IF- Built to 3/8"  
ISI- No Return  
FF- No Blow  
FSI- No Return

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>M with oil spots</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 10 BHT 110 Gravity          API RW          °F Chlorides          ppm

(A) Initial Hydrostatic 2111  Test 1250 T-On Location 07:27  
 (B) First Initial Flow 30  Jars          T-Started 07:39  
 (C) First Final Flow 31  Safety Joint          T-Open 09:46  
 (D) Initial Shut-In 523  Circ Sub          T-Pulled 11:46  
 (E) Second Initial Flow 32  Hourly Standby          T-Out 13:21  
 (F) Second Final Flow 35  Mileage 134 RT x 2 415.40 Comments           
 (G) Final Shut-In 247  Sampler           
 (H) Final Hydrostatic 2005  Straddle           Ruined Shale Packer           
 Shale Packer           Ruined Packer           
 Extra Packer           Extra Copies           
 Extra Recorder          Sub Total 0  
 Day Standby          Total 1665.40  
 Accessibility          MP/DST Disc't           
 Sub Total 1665.40

Approved By \_\_\_\_\_ Our Representative Phil Gray

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