



## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co Inc**

PO Box 1019  
Hays KS 67601

ATTN: Marc Downing

**Muhlheim B #11**

**15-13s-21w Trego,KS**

Start Date: 2018.02.07 @ 03:20:19

End Date: 2018.02.07 @ 10:38:58

Job Ticket #: 63507                      DST #: 1

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.02.12 @ 08:42:38



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63507

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.02.07 @ 03:20:19

## GENERAL INFORMATION:

Formation: **LKC H-J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:44:59

Time Test Ended: 10:38:58

Test Type: Conventional Bottom Hole (Initial)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3647.00 ft (KB) To 3720.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3720.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8360**

**Inside**

Press@RunDepth: 30.80 psig @ 3653.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.07

End Date:

2018.02.07

Last Calib.:

2018.02.07

Start Time:

03:20:19

End Time:

10:38:58

Time On Btm:

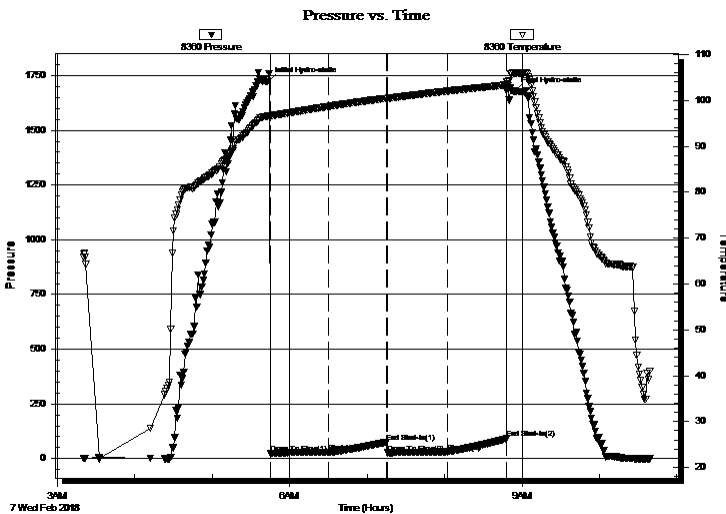
2018.02.07 @ 05:43:14

Time Off Btm:

2018.02.07 @ 08:53:58

**TEST COMMENT:** 45-IFP-w k bl thru-out 1/2" to 2 1/4" bl  
45-ISIP-no bl bk  
45-FFP-w k bl thru-out 1/2" to 2 1/4" bl  
45-FSIP-no bl bk

## PRESSURE SUMMARY



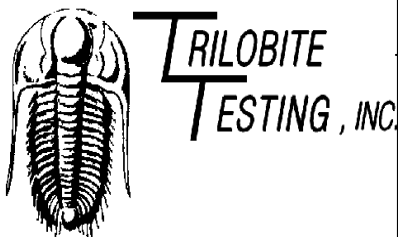
Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1721.07	96.57	Initial Hydro-static
2	22.21	96.36	Open To Flow (1)
47	29.77	98.68	Shut-In(1)
92	75.07	100.46	End Shut-In(1)
93	25.64	100.46	Open To Flow (2)
139	30.80	102.02	Shut-In(2)
185	90.35	103.35	End Shut-In(2)
191	1678.60	105.97	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
30.00	OCM 10%O 90%M	0.21
0.00	60' GIP	0.00

## Gas Rates

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



## DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63507      **DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.02.07 @ 03:20:19

**GENERAL INFORMATION:**

Formation: **LKC H-J**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 05:44:59

Time Test Ended: 10:38:58

Test Type: Conventional Bottom Hole (Initial)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3647.00 ft (KB) To 3720.00 ft (KB) (TVD)**

Total Depth: 3720.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2237.00 ft (KB)

2229.00 ft (CF)

KB to GR/CF: 8.00 ft

**Serial #: 8673      Outside**

Press@RunDepth:              psig @    3653.00 ft (KB)

Start Date:                    2018.02.07

End Date:

2018.02.07

Start Time:                    03:20:47

End Time:

10:39:26

Capacity:                              8000.00 psig

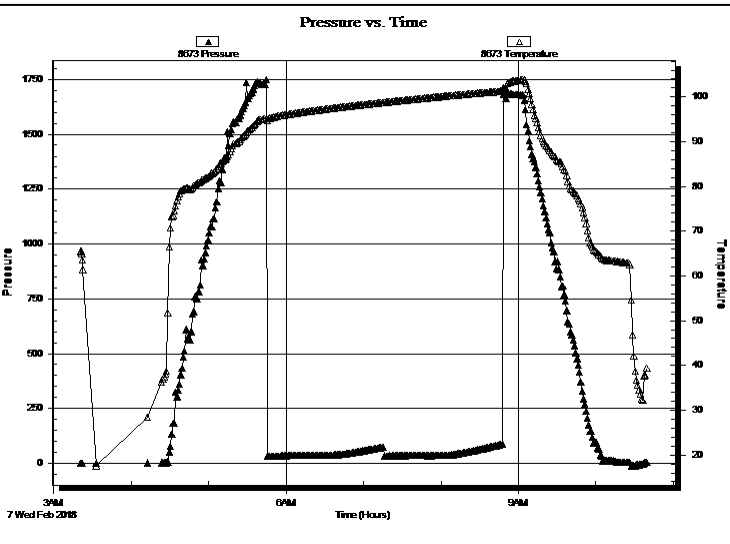
Last Calib.:

2018.02.07

Time On Btm:

Time Off Btm:

**TEST COMMENT:** 45-IFP-w k bl thru-out 1/2" to 2 1/4" bl  
45-ISIP-no bl bk  
45-FFP-w k bl thru-out 1/2" to 2 1/4" bl  
45-FSIP-no bl bk



**PRESSURE SUMMARY**

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

**Recovery**

Length (ft)	Description	Volume (bbl)
30.00	OCM 10%O 90%M	0.21
0.00	60' GIP	0.00

**Gas Rates**

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63507

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.02.07 @ 03:20:19

## Tool Information

Drill Pipe:	Length: 3341.00 ft	Diameter: 3.80 inches	Volume: 46.87 bbl	Tool Weight: 2200.00 lb
Heavy Wt. Pipe:	Length: 310.00 ft	Diameter: 2.70 inches	Volume: 2.20 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 85000.00 lb
			<u>Total Volume: 49.07 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	25.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	3647.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval betw een Packers:	73.00 ft			
Tool Length:	94.00 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			3627.00	
Shut In Tool	5.00			3632.00	
Hydraulic tool	5.00			3637.00	
Packer	5.00			3642.00	21.00 Bottom Of Top Packer
Packer	5.00			3647.00	
Stubb	1.00			3648.00	
Perforations	5.00			3653.00	
Recorder	0.00	8360	Inside	3653.00	
Recorder	0.00	8673	Outside	3653.00	
Blank Spacing	64.00			3717.00	
Bullnose	3.00			3720.00	73.00 Bottom Packers & Anchor

**Total Tool Length: 94.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63507

**DST#: 1**

ATTN: Marc Dow ning

Test Start: 2018.02.07 @ 03:20:19

## 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: 50.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.14 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
30.00	OCM 10%O 90%M	0.212
0.00	60' GIP	0.000

Total Length: 30.00 ft      Total Volume: 0.212 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Serial #: 8360

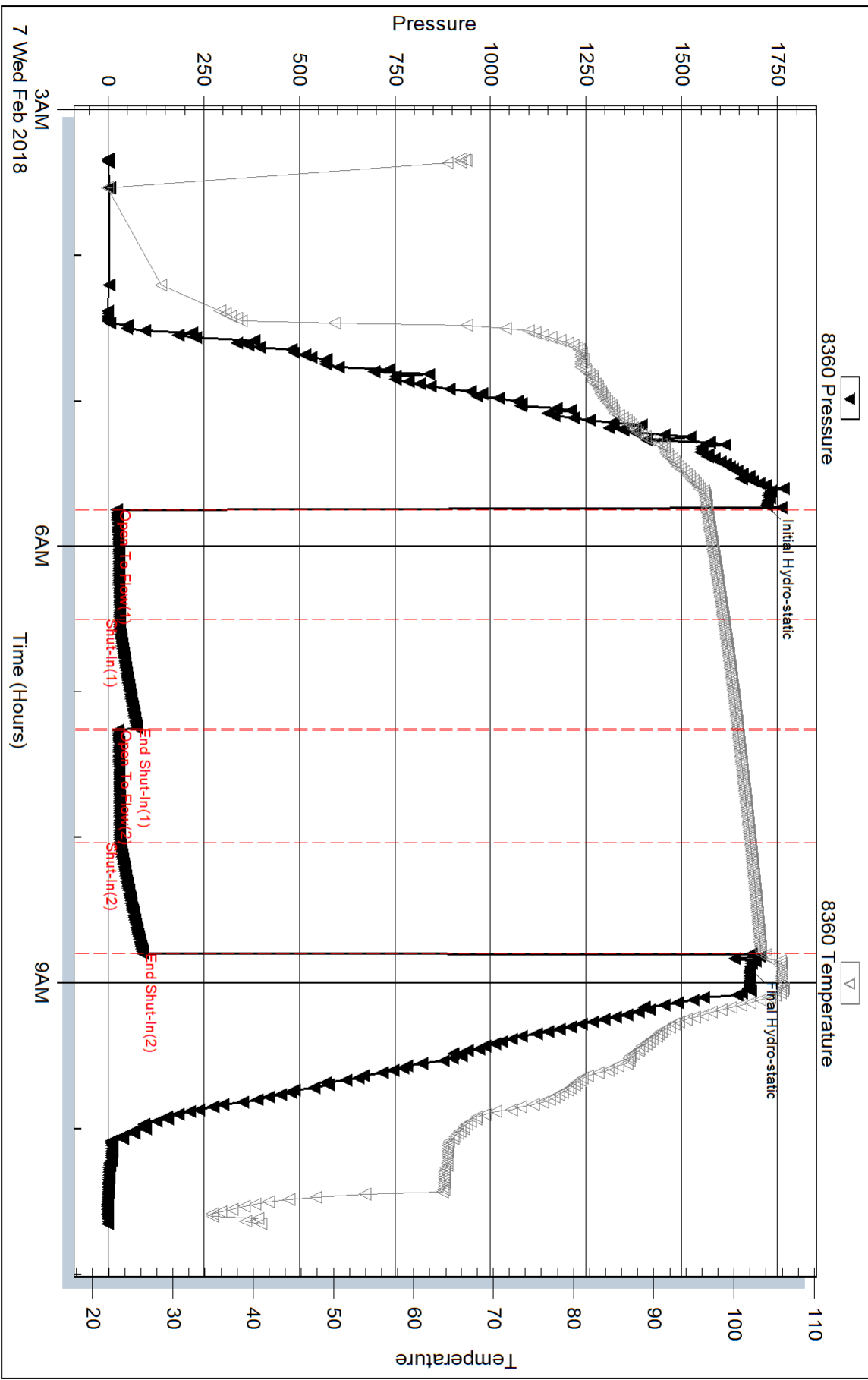
Inside

Dow n/mg-Nelson Oil Co Inc

Muhlheim B #11

DST Test Number: 1

### Pressure vs. Time

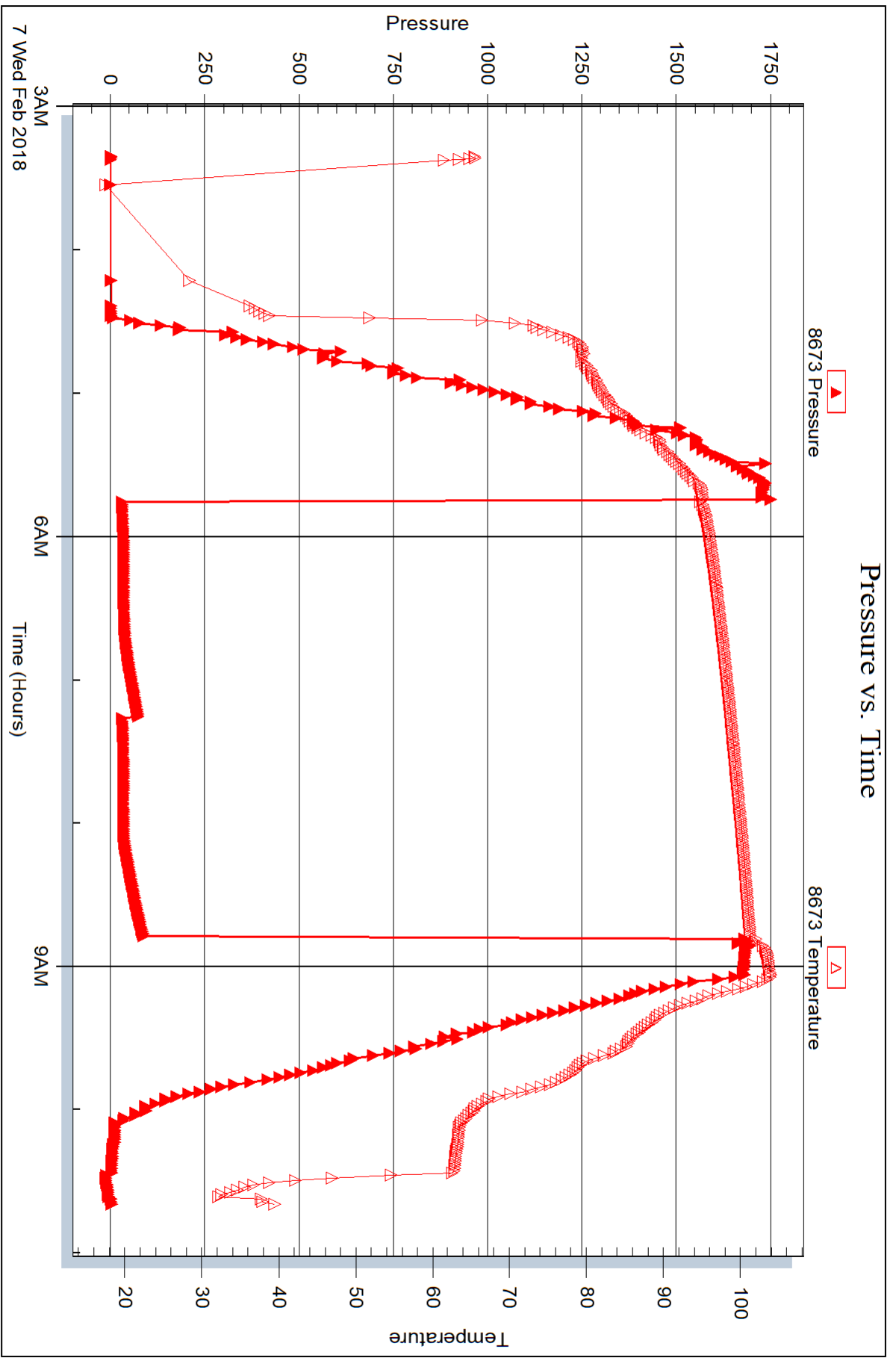


Serial #: 8673

Outside Dow nung-Nelson Oil Co Inc

Muhlheim B #11

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co Inc**

PO Box 1019  
Hays KS 67601

ATTN: Marc Downing

**Muhlheim B #11**

**15-13s-21w Trego,KS**

Start Date: 2018.02.08 @ 00:15:24

End Date: 2018.02.08 @ 06:54:03

Job Ticket #: 63508                      DST #: 2

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.02.12 @ 08:42:07





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63508

**DST#: 2**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 00:15:24

## GENERAL INFORMATION:

Formation: **Marmaton**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 02:08:19

Time Test Ended: 06:54:03

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3848.00 ft (KB) To 3884.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3884.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8360**

**Inside**

Press@RunDepth: 93.72 psig @ 3857.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.08

End Date:

2018.02.08

Last Calib.:

2018.02.08

Start Time:

00:15:24

End Time:

06:54:03

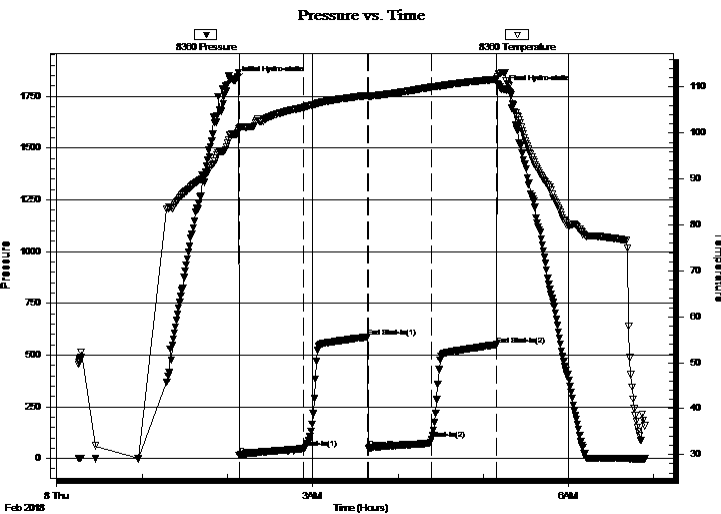
Time On Btm:

2018.02.08 @ 02:05:34

Time Off Btm:

2018.02.08 @ 05:13:18

**TEST COMMENT:** 45-IFP-w k to a fr bl 1/2" to 5" blow  
45-ISIP-no bl bk  
45-FFP-w k to a fr bl 1/2" to 4" blow  
45-FSIP-no bl bk 1st 30 min, then surface bl bk



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1827.13	99.75	Initial Hydro-static
3	17.00	100.84	Open To Flow (1)
48	48.38	105.61	Shut-In(1)
93	588.14	108.19	End Shut-In(1)
94	48.53	108.05	Open To Flow (2)
138	93.72	110.11	Shut-In(2)
184	550.18	111.72	End Shut-In(2)
188	1781.75	113.12	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
145.00	MGO 15%G 30%M 55%O	1.03
0.00	105' GIP	0.00

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63508

**DST#: 2**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 00:15:24

## Tool Information

Drill Pipe:	Length: 3532.00 ft	Diameter: 3.80 inches	Volume: 49.54 bbl	Tool Weight:	2200.00 lb
Heavy Wt. Pipe:	Length: 310.00 ft	Diameter: 2.70 inches	Volume: 2.20 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose:	75000.00 lb
			<u>Total Volume: 51.74 bbl</u>	Tool Chased	5.00 ft
Drill Pipe Above KB:	15.00 ft			String Weight: Initial	61000.00 lb
Depth to Top Packer:	3848.00 ft			Final	62000.00 lb
Depth to Bottom Packer:	ft				
Interval betw een Packers:	36.00 ft				
Tool Length:	57.00 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			3828.00	
Shut In Tool	5.00			3833.00	
Hydraulic tool	5.00			3838.00	
Packer	5.00			3843.00	21.00 Bottom Of Top Packer
Packer	5.00			3848.00	
Stubb	1.00			3849.00	
Perforations	8.00			3857.00	
Recorder	0.00	8360	Inside	3857.00	
Recorder	0.00	8673	Outside	3857.00	
Perforations	24.00			3881.00	
Bullnose	3.00			3884.00	36.00 Bottom Packers & Anchor

**Total Tool Length: 57.00**



**TRILOBITE  
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# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63508

**DST#: 2**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 00:15:24

## 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: 58.00 sec/qt

Cushion Volume:

bbf

Water Loss: 8.71 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 5000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbf
145.00	MGO 15%G 30%M 55%O	1.027
0.00	105' GIP	0.000

Total Length: 145.00 ft      Total Volume: 1.027 bbf

Num Fluid Samples: 0

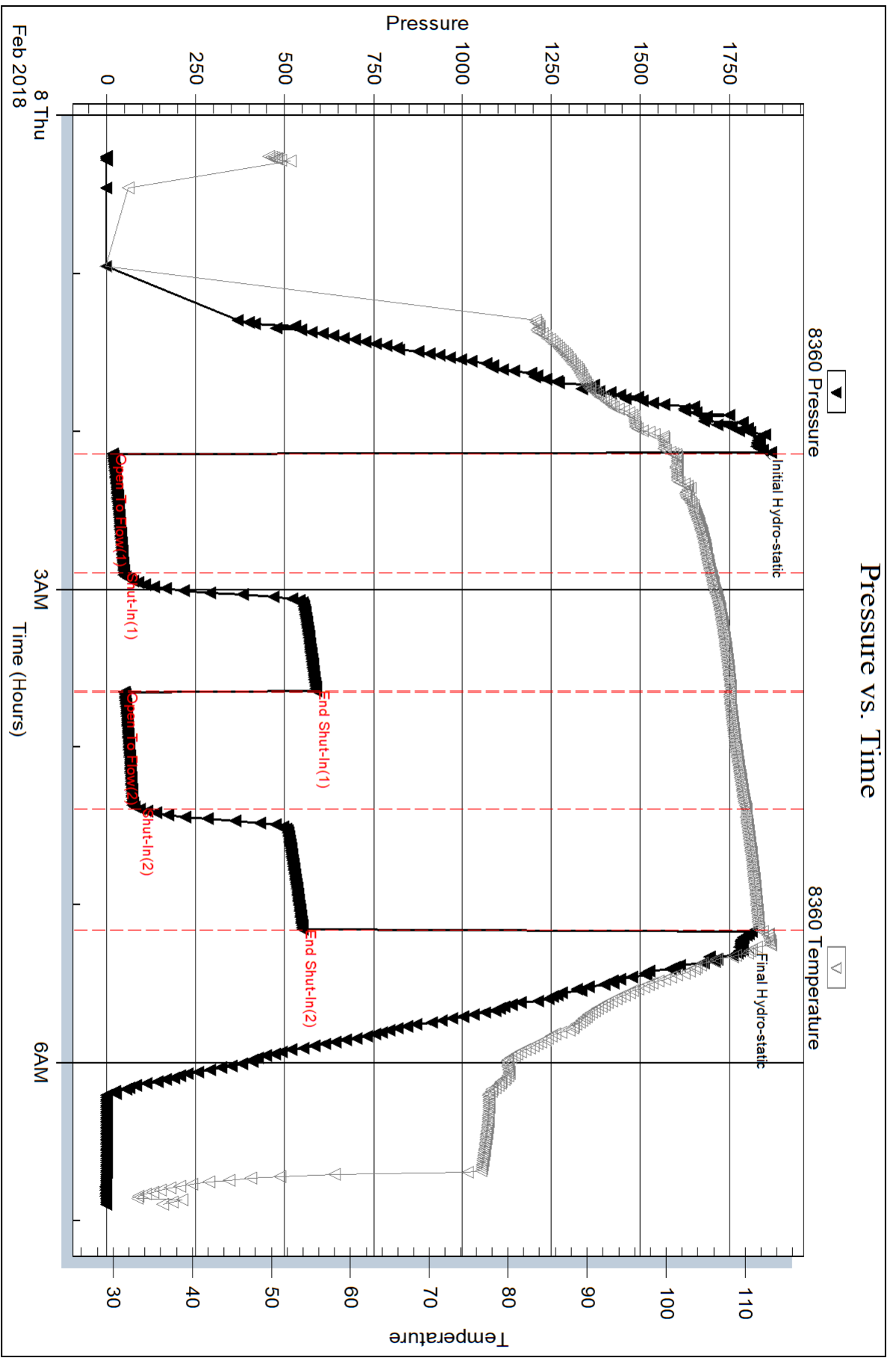
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

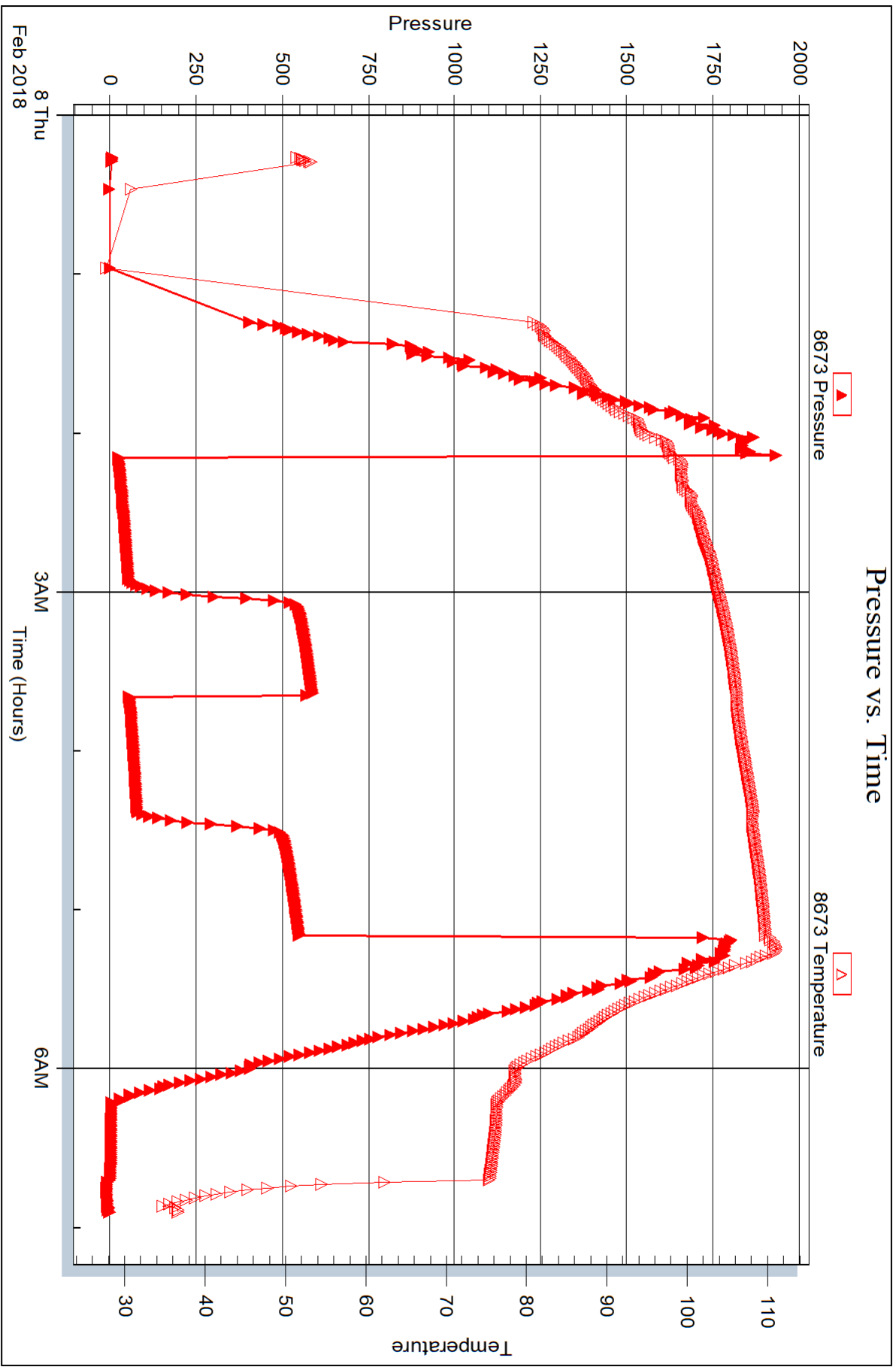


Serial #: 8673

Outside Dow nting-Nelson Oil Co Inc

Muhlheim B #11

DST Test Number: 2





## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co Inc**

PO Box 1019  
Hays KS 67601

ATTN: Marc Downing

**Muhlheim B #11**

**15-13s-21w Trego,KS**

Start Date: 2018.02.08 @ 15:20:47

End Date: 2018.02.08 @ 22:59:56

Job Ticket #: 63509                      DST #: 3

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.02.12 @ 08:41:40



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63509

**DST#: 3**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 15:20:47

## GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:29:57

Time Test Ended: 22:59:56

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3875.00 ft (KB) To 3919.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3919.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8360**

**Inside**

Press@RunDepth: 36.08 psig @ 3883.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.08

End Date:

2018.02.08

Last Calib.:

2018.02.08

Start Time:

15:20:47

End Time:

22:59:56

Time On Btm:

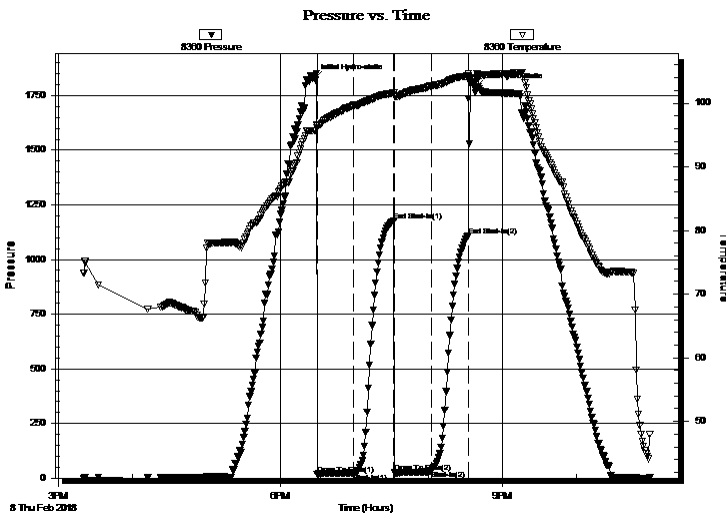
2018.02.08 @ 18:27:57

Time Off Btm:

2018.02.08 @ 20:37:56

**TEST COMMENT:** 30-IFP-w k bl thru-out 1/2" to 1 1/4" bl  
30-ISIP-no bl  
30-FFP-w k bl thru-out 1/2" to 1" bl  
30-FSIP-no bl bk

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1825.80	95.70	Initial Hydro-static
2	16.53	96.19	Open To Flow (1)
32	23.93	99.68	Shut-In(1)
65	1175.17	101.58	End Shut-In(1)
65	24.32	101.13	Open To Flow (2)
95	36.08	102.67	Shut-In(2)
125	1109.49	104.27	End Shut-In(2)
130	1786.82	103.71	Final Hydro-static

## Recovery

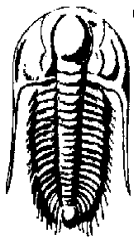
Length (ft)	Description	Volume (bbl)
20.00	OCM 20%O 80%M	0.14
0.00	40' GIP	0.00

## Gas Rates

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

\* Recovery from multiple tests





**TRILOBITE TESTING, INC.**

## DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63509

**DST#: 3**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 15:20:47

### GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:29:57

Time Test Ended: 22:59:56

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3875.00 ft (KB) To 3919.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3919.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inchesHole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8673** Outside

Press@RunDepth: psig @ 3883.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.08 End Date: 2018.02.08

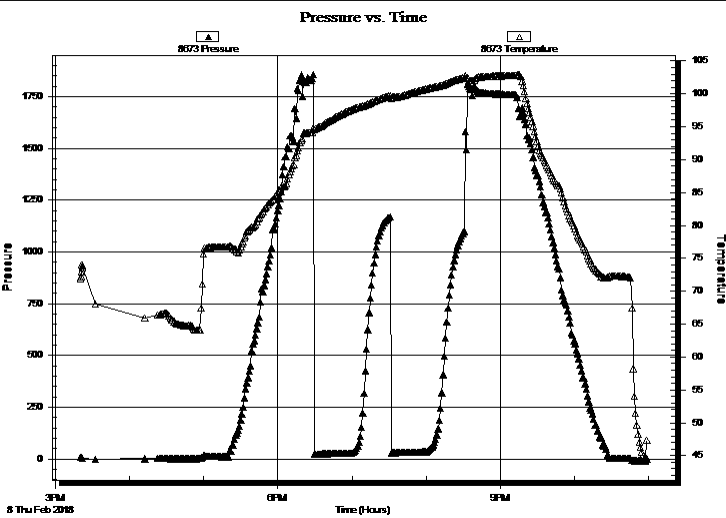
Last Calib.: 2018.02.08

Start Time: 15:20:10 End Time: 22:59:19

Time On Btm:

Time Off Btm:

**TEST COMMENT:** 30-IFP-w k bl thru-out 1/2" to 1 1/4" bl  
30-ISIP-no bl  
30-FFP-w k bl thru-out 1/2" to 1" bl  
30-FSIP-no bl bk



### PRESSURE SUMMARY

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

### Recovery

Length (ft)	Description	Volume (bbl)
20.00	OCM 20%O 80%M	0.14
0.00	40' GIP	0.00

\* Recovery from multiple tests

### Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63509

**DST#: 3**

ATTN: Marc Dow ning

Test Start: 2018.02.08 @ 15:20:47

## Tool Information

Drill Pipe:	Length: 3565.00 ft	Diameter: 3.80 inches	Volume: 50.01 bbl	Tool Weight:	2200.00 lb
Heavy Wt. Pipe:	Length: 310.00 ft	Diameter: 2.70 inches	Volume: 2.20 bbl	Weight set on Packer:	25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose:	80000.00 lb
			<u>Total Volume: 52.21 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	21.00 ft			String Weight: Initial	61000.00 lb
Depth to Top Packer:	3875.00 ft			Final	61000.00 lb
Depth to Bottom Packer:	ft				
Interval betw een Packers:	44.00 ft				
Tool Length:	65.00 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			3855.00	
Shut In Tool	5.00			3860.00	
Hydraulic tool	5.00			3865.00	
Packer	5.00			3870.00	21.00 Bottom Of Top Packer
Packer	5.00			3875.00	
Stubb	1.00			3876.00	
Perforations	7.00			3883.00	
Recorder	0.00	8360	Inside	3883.00	
Recorder	0.00	8673	Outside	3883.00	
Blank Spacing	33.00			3916.00	
Bullnose	3.00			3919.00	44.00 Bottom Packers & Anchor

**Total Tool Length: 65.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Downing-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63509

**DST#: 3**

ATTN: Marc Downing

Test Start: 2018.02.08 @ 15:20:47

## 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: 59.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 9.55 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 7500.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
20.00	OCM 20%O 80%M	0.142
0.00	40' GIP	0.000

Total Length: 20.00 ft      Total Volume: 0.142 bbl

Num Fluid Samples: 0

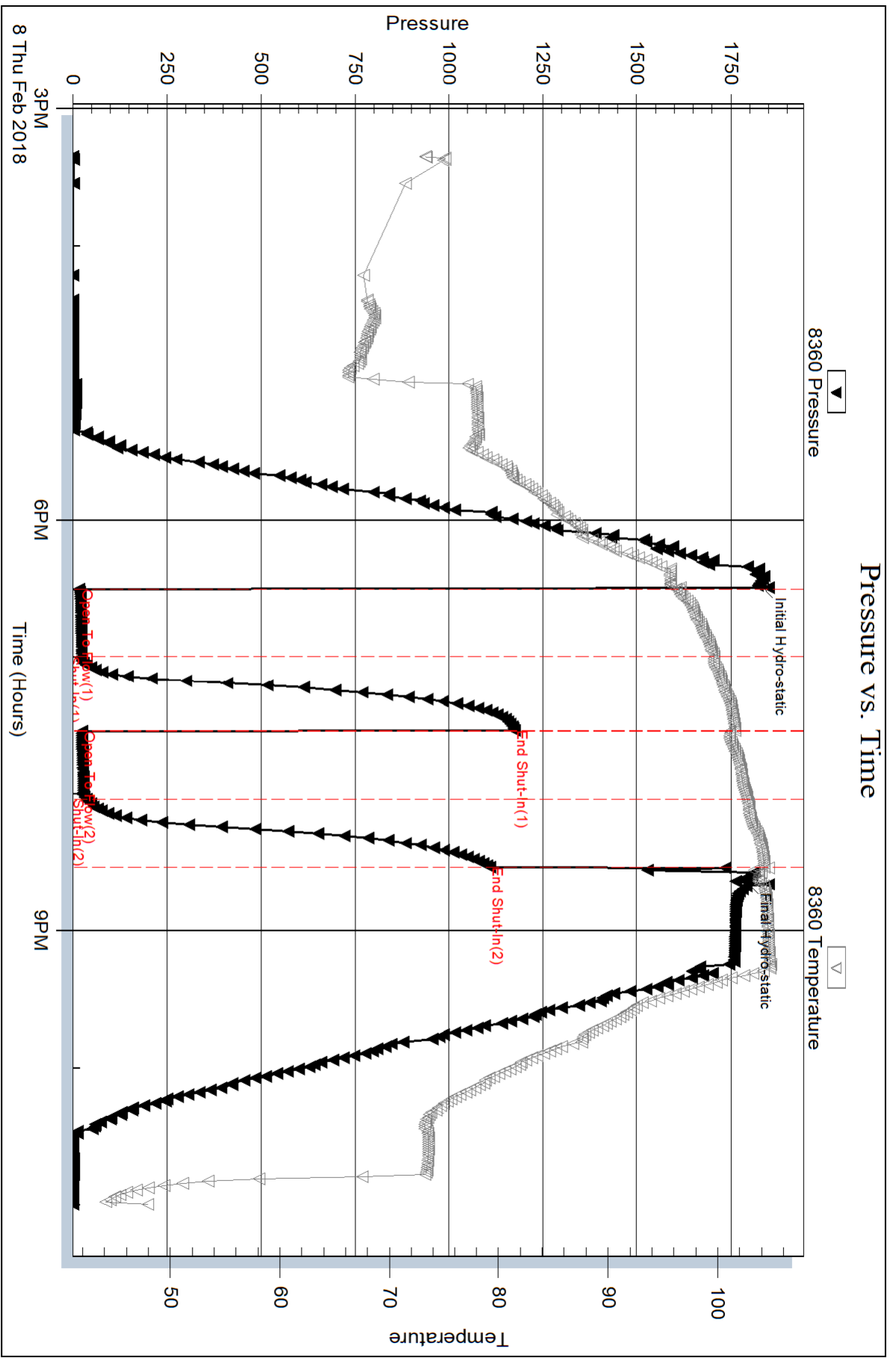
Num Gas Bombs: 0

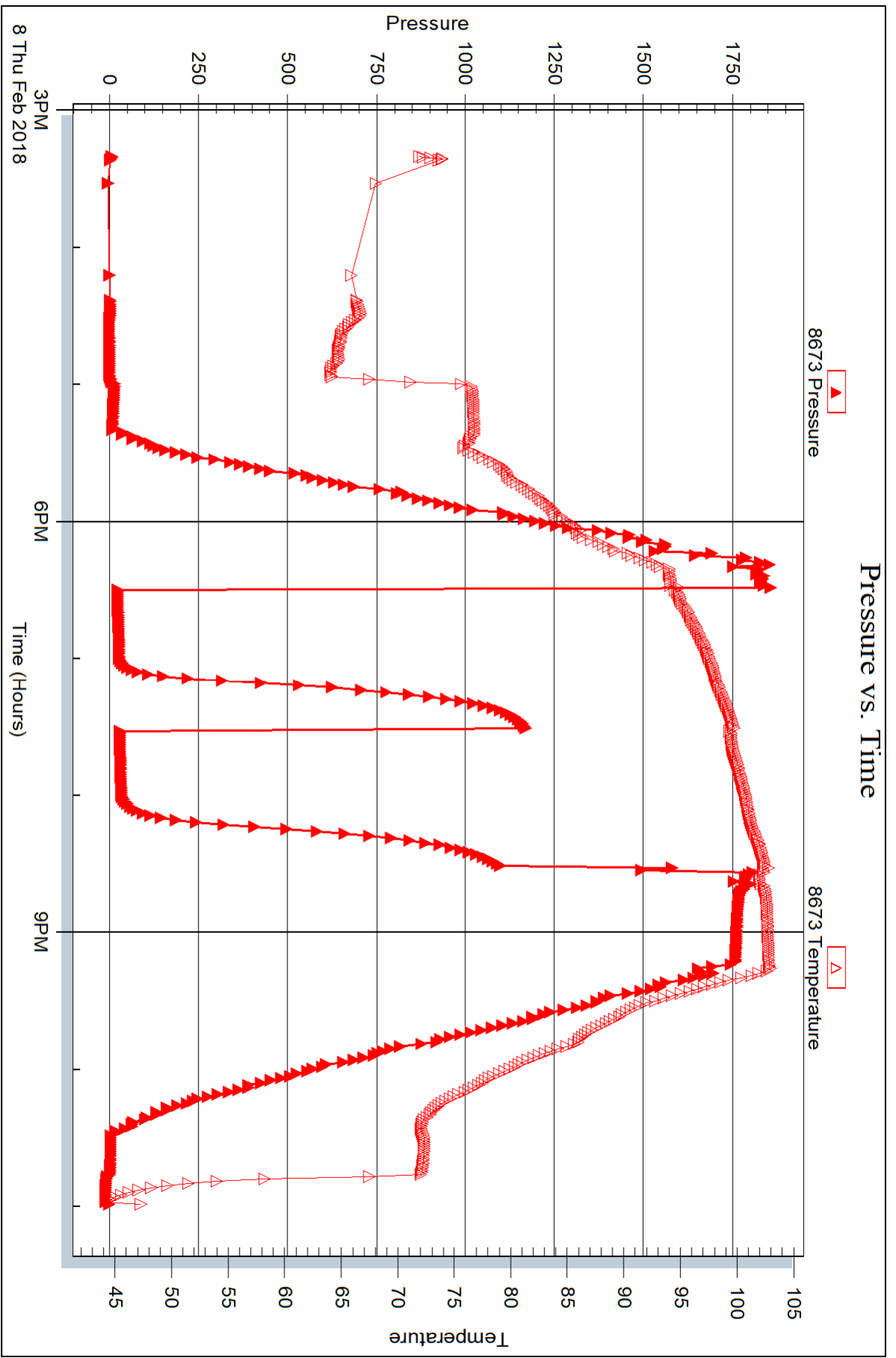
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







## DRILL STEM TEST REPORT

Prepared For: **Downing-Nelson Oil Co Inc**

PO Box 1019  
Hays KS 67601

ATTN: Marc Downing

**Muhlheim B #11**

**15-13s-21w Trego,KS**

Start Date: 2018.02.09 @ 04:45:51

End Date: 2018.02.09 @ 11:59:30

Job Ticket #: 63510                      DST #: 4

Trilobite Testing, Inc  
1515 Commerce Parkway Hays, KS 67601  
ph: 785-625-4778 fax: 785-625-5620

Printed: 2018.02.12 @ 08:30:42



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63510

**DST#: 4**

ATTN: Marc Dow ning

Test Start: 2018.02.09 @ 04:45:51

## GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 07:05:00

Time Test Ended: 11:59:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3919.00 ft (KB) To 3925.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3925.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8360**

**Inside**

Press@RunDepth: psig @ 3920.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.09

End Date:

2018.02.09

Last Calib.:

2018.02.09

Start Time: 04:45:51

End Time:

11:59:30

Time On Btm:

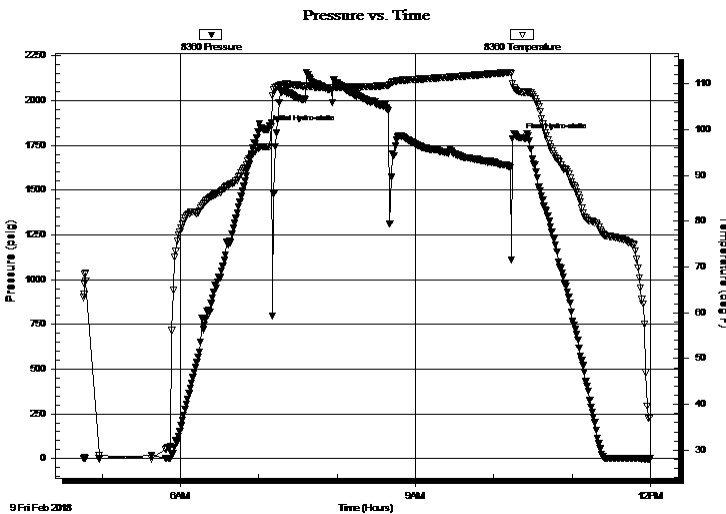
2018.02.09 @ 07:06:01

Time Off Btm:

2018.02.09 @ 10:20:00

**TEST COMMENT:** 45-IFP-w k bl 1/2" to 2" bl - Tool plugged  
45-ISIP-no bl  
45-FFP-surface blow - Tool Plugged  
45-FSIP-no bl

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1837.64	96.23	Initial Hydro-static
194	1791.55	108.29	Final Hydro-static

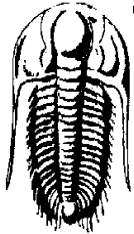
## Recovery

Length (ft)	Description	Volume (bbl)
10.00	SOCM 2%O 98%M	0.07

## Gas Rates

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

\* Recovery from multiple tests



**TRILOBITE  
TESTING, INC.**

## DRILL STEM TEST REPORT

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego, KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63510

**DST#: 4**

ATTN: Marc Dow ning

Test Start: 2018.02.09 @ 04:45:51

### GENERAL INFORMATION:

Formation: **Arbuckle**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 07:05:00

Time Test Ended: 11:59:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Ray Schw ager

Unit No: 77

**Interval: 3919.00 ft (KB) To 3925.00 ft (KB) (TVD)**

Reference Elevations: 2237.00 ft (KB)

Total Depth: 3925.00 ft (KB) (TVD)

2229.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 8.00 ft

**Serial #: 8673 Outside**

Press@RunDepth: psig @ 3920.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.02.09

End Date:

2018.02.09

Last Calib.:

1899.12.30

Start Time: 04:45:16

End Time:

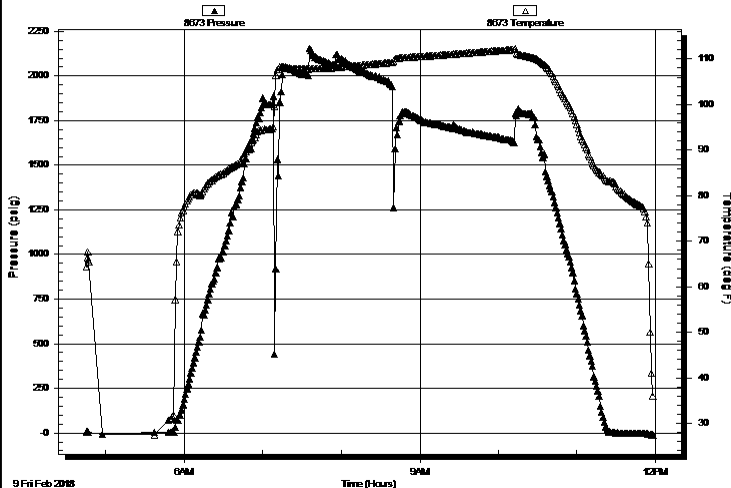
11:58:10

Time On Btm:

Time Off Btm:

**TEST COMMENT:** 45-IFP-w k bl 1/2" to 2" bl - Tool plugged  
45-ISIP-no bl  
45-FFP-surface blow - Tool Plugged  
45-FSIP-no bl

Pressure vs. Time



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
10.00	SOCM 2%O 98%M	0.07

Gas Rates

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

\* Recovery from multiple tests





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63510

**DST#: 4**

ATTN: Marc Dow ning

Test Start: 2018.02.09 @ 04:45:51

## Tool Information

Drill Pipe:	Length: 3596.00 ft	Diameter: 3.80 inches	Volume: 50.44 bbl	Tool Weight: 2200.00 lb
Heavy Wt. Pipe:	Length: 310.00 ft	Diameter: 2.70 inches	Volume: 2.20 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 52.64 bbl</u>	Tool Chased 2.00 ft
Drill Pipe Above KB:	8.00 ft			String Weight: Initial 59000.00 lb
Depth to Top Packer:	3919.00 ft			Final 59000.00 lb
Depth to Bottom Packer:	ft			
Interval betw een Packers:	6.00 ft			
Tool Length:	27.00 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			3899.00	
Shut In Tool	5.00			3904.00	
Hydraulic tool	5.00			3909.00	
Packer	5.00			3914.00	21.00 Bottom Of Top Packer
Packer	5.00			3919.00	
Stubb	1.00			3920.00	
Recorder	0.00	8360	Inside	3920.00	
Recorder	0.00	8673	Outside	3920.00	
Perforations	2.00			3922.00	
Bullnose	3.00			3925.00	6.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>27.00</b>				



**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Dow ning-Nelson Oil Co Inc

**15-13s-21w Trego,KS**

PO Box 1019  
Hays KS 67601

**Muhlheim B #11**

Job Ticket: 63510

**DST#: 4**

ATTN: Marc Dow ning

Test Start: 2018.02.09 @ 04:45:51

**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: 59.00 sec/qt

Cushion Volume:

bbf

Water Loss: 9.56 in<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 7500.00 ppm

Filter Cake: 1.00 inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbf
10.00	SOCM 2%O 98%M	0.071

Total Length: 10.00 ft Total Volume: 0.071 bbf

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

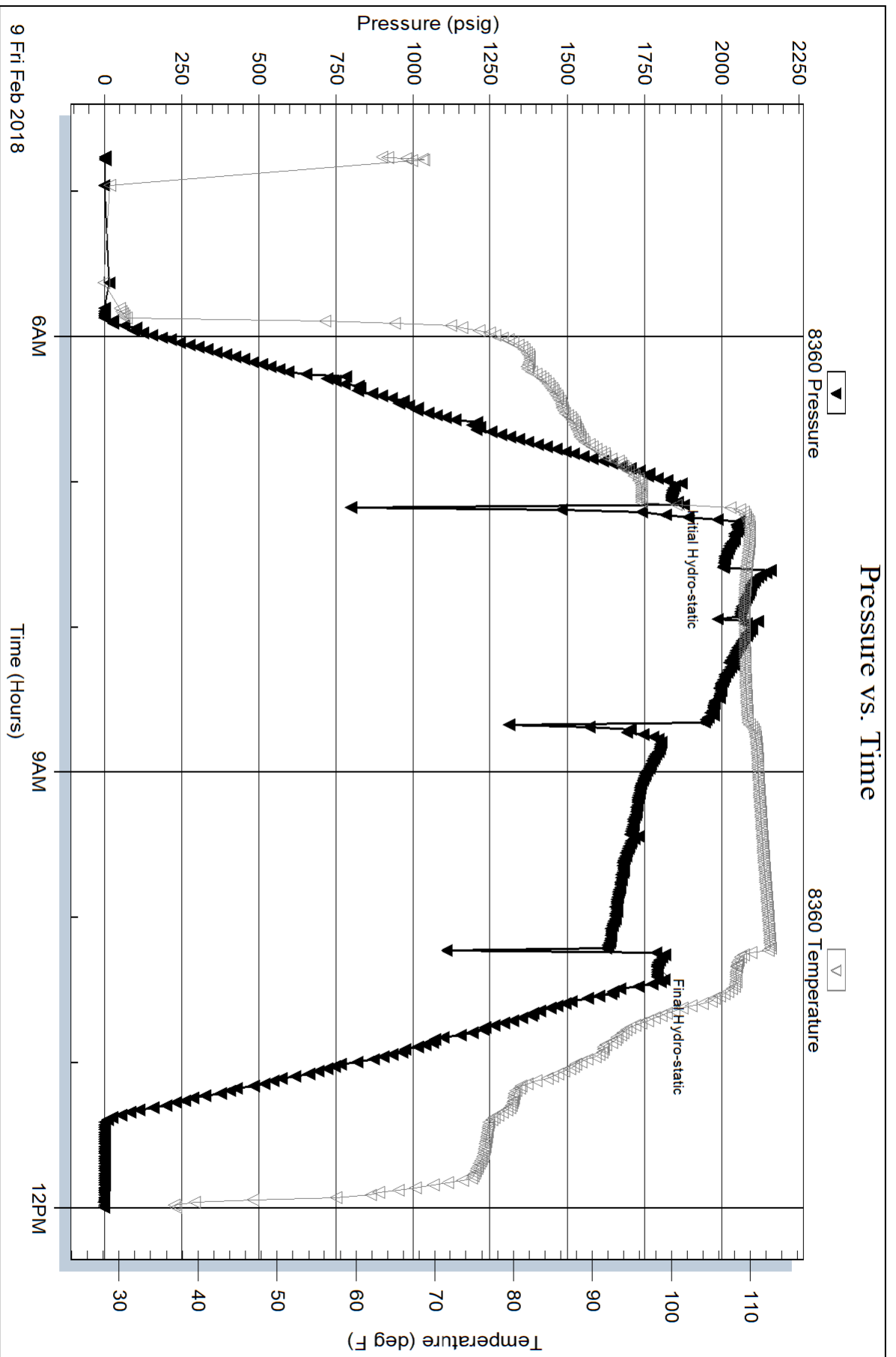
Serial #: 8360

Inside

Dow nging-Nelson Oil Co Inc

Muhlheim B #11

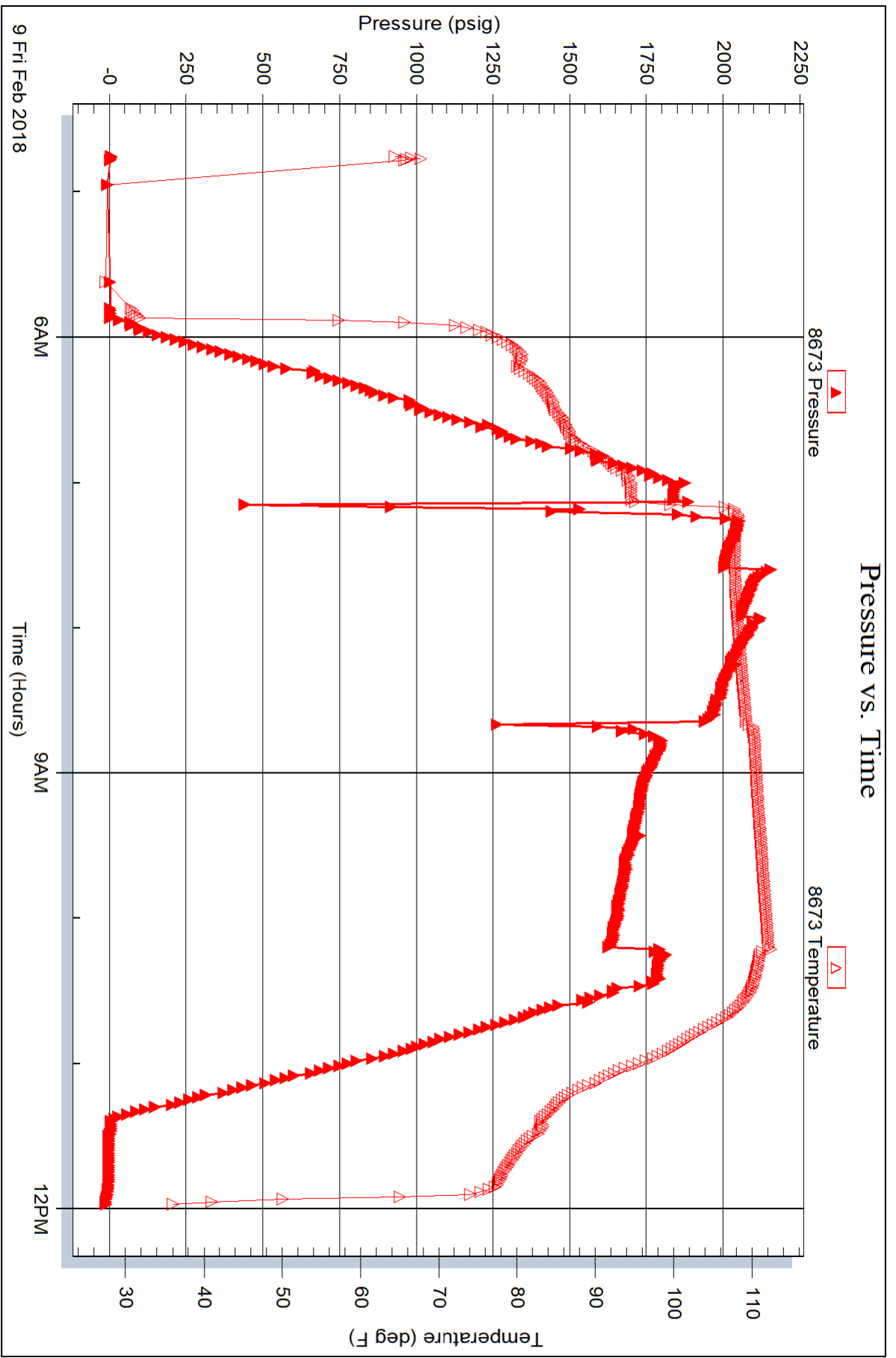
DST Test Number: 4

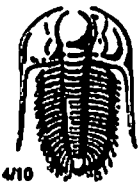


Triobite Testing, Inc

Ref. No: 63510

Printed: 2018.02.12 @ 08:30:43





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63507

Well Name & No. Muhlheim B" H Test No. 1 Date 2-7-18  
 Company Downing-Nelson Oil Co Inc Elevation 2237 KB 2229 GL  
 Address Po Box 1019 Hays, Ks 67601  
 Co. Rep / Geo. MARC Downing Rig DISCOVERY 192  
 Location: Sec. 15 Twp 13<sup>s</sup> Rge. 21<sup>w</sup> Co. TREGO State Ks

Interval Tested 3647-3720 Zone Tested LKC H-5  
 Anchor Length 73 Drill Pipe Run 3341 Mud Wt. 8.8  
 Top Packer Depth 3642 Drill Collars Run - Vis 50  
 Bottom Packer Depth 3647 Wt. Pipe Run 310 WL 7.2  
 Total Depth 3720 Chlorides 3000 ppm System LCM 2 1/2 #  
 Blow Description IFP-WEAK Blow thru-out 1/2" To 2 1/4" Blow  
ISIP-NO BLOW BACK  
FFP-WEAK Blow thru-out 1/2" To 2 1/4" Blow  
FSIP-NO BLOW BACK

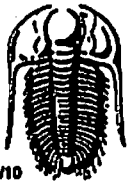
Rec	Feet of	%gas	%oil	%water	%mud
<u>60</u>	<u>GIP</u>				
<u>30</u>	<u>OCM</u>		<u>10</u>		<u>80</u>

Rec Total 30 BHT 103 Gravity - API RW - @ - °F Chlorides - ppm

(A) Initial Hydrostatic <u>1721</u>	<input checked="" type="checkbox"/> Test <u>1050</u>	T-On Location <u>0145</u>
(B) First Initial Flow <u>22</u>	<input type="checkbox"/> Jars	T-Started <u>0320</u>
(C) First Final Flow <u>29</u>	<input type="checkbox"/> Safety Joint	T-Open <u>0540</u>
(D) Initial Shut-In <u>75</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>0840</u>
(E) Second Initial Flow <u>25</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>0038</u>
(F) Second Final Flow <u>30</u>	<input checked="" type="checkbox"/> Mileage <u>48 RT</u> 48	Comments
(G) Final Shut-In <u>90</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1678</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> Ruined Shale Packer
	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Packer
	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Extra Copies
Initial Open <u>45</u>	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
Initial Shut-In <u>45</u>	<input type="checkbox"/> Day Standby	Total <u>1098</u>
Final Flow <u>45</u>	<input type="checkbox"/> Accessibility	MP/DST Disc't
Final Shut-In <u>45</u>	Sub Total <u>1098</u>	

Approved By \_\_\_\_\_ Our Representative RAY SCHWAGER Thank you

TriLOBITE TESTING INC. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63508

Well Name & No. Muhlheim "B" 11 Test No. 2 Date 2-7-18  
 Company Downing-Nelson Oil Co Inc Elevation 2237 KB 2229 GL  
 Address Po Box 1019 Hays, Ks 67601  
 Co. Rep / Geo. MARC Downing Rig DISCOVERY rig 2  
 Location: Sec. 15 Twp 13<sup>59</sup> Rge. 21<sup>W</sup> Co. Trego State Ks

Interval Tested 3848-3884 Zone Tested MARMA TON  
 Anchor Length 36 Drill Pipe Run 3532 Mud Wt. 8.8  
 Top Packer Depth 3843 Drill Collars Run — Vis 58  
 Bottom Packer Depth 3848 Wt. Pipe Run 310 WL 8.8  
 Total Depth 3884 Chlorides 5000 ppm System LCM 2#

Blow Description IFP - WEAK TO A FAIR BLOW 1/2" TO 5" BLOW  
ISIP - NO BLOW BACK  
FFP - WEAK TO A FAIR BLOW 1/2" TO 4" BLOW  
FSIP - NO BLOW BACK, 1<sup>st</sup> 30 min, Then surface blow back

Rec	Feet of	%gas	%oil	%water	%mud
<u>105</u>	<u>GIP</u>				
<u>145</u>	<u>MGO</u>	<u>15</u>	<u>55</u>	<u>30</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

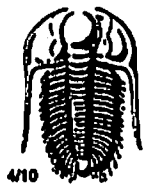
Rec Total 145 BHT 111 Gravity — API RW — @ — ° F Chlorides — ppm  
 Test 1050 T-On Location 2335  
 Jars \_\_\_\_\_ T-Started 0015  
 Safety Joint \_\_\_\_\_ T-Open 0205  
 Circ Sub \_\_\_\_\_ T-Pulled 0505  
 Hourly Standby \_\_\_\_\_ T-Out 0654  
 Mileage 48 Comments \_\_\_\_\_  
 Sampler \_\_\_\_\_  
 Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1098

Initial Open 45  
 Initial Shut-In 45  
 Final Flow 45  
 Final Shut-In 45

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

Our Representative Ray Schwager Thank you

TriLOBITE TESTING INC. shall not be liable for damaged or any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63509

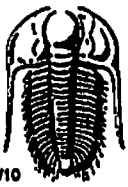
Well Name & No. Muhlheim 'B' 11 Test No. 3 Date 2-8-18  
 Company Downing-Nelson Oil Co Inc Elevation 2237 KB 2229 GL  
 Address PO Box 1019 Hays, Ks 67601  
 Co. Rep / Geo. MARC Downing Rig Discovery rig 2  
 Location: Sec. 15 Twp 13<sup>s</sup> Rge. 21<sup>w</sup> Co. Trego State Ko

Interval Tested 3875-3919 Zone Tested Arbuckle  
 Anchor Length 44 Drill Pipe Run 3565 Mud Wt. 8.9  
 Top Packer Depth 3870 Drill Collars Run — Vls 59  
 Bottom Packer Depth 3875 Wt. Pipe Run 310 WL 9.6  
 Total Depth 3919 Chlorides 7500 ppm System LCM 2#  
 Blow Description IJP - WEAK Blow thru-out 1/2" to 1/4" Blow  
ISIP - NO BLOW  
FFP - WEAK Blow thru-out 1/2" to 1" Blow  
FSTIP - NO BLOW

Rec	Feet of	%gas	%oil	%water	%mud
<u>40</u>	<u>GIP</u>				
<u>20</u>	<u>OCM</u>	<u>20</u>		<u>80</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 20 BHT 104 Gravity — API RW — @ — °F Chlorides — ppm  
 (A) Initial Hydrostatic 1825  Test 1050 T-On Location 1430  
 (B) First Initial Flow 16  Jars — T-Started 1520  
 (C) First Final Flow 23  Safety Joint — T-Open 1830  
 (D) Initial Shut-In 1175  Circ Sub — T-Pulled 2030  
 (E) Second Initial Flow 24  Hourly Standby — T-Out 2259  
 (F) Second Final Flow 36  Mileage 48 Comments —  
 (G) Final Shut-In 1109  Sampler —  
 (H) Final Hydrostatic 1786  Straddle —  Ruined Shale Packer —  
 Shale Packer —  Ruined Packer —  
 Extra Packer —  Extra Copies —  
 Initial Open 30  Extra Recorder — Sub Total 0  
 Initial Shut-In 30  Day Standby — Total 1098  
 Final Flow 30  Accessibility — MP/DST Disc't —  
 Final Shut-In 30 Sub Total 1098

Approved By \_\_\_\_\_ Our Representative Ray Schwagn Thank you  
 Triobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 63510

Well Name & No. Muhlheim "B" II Test No. 4 Date 2-9-18  
 Company Downing-Nelson Oil Co. Inc Elevation 2237 KB 2229 GL  
 Address PO Box 1019 Hays, Ks 67601  
 Co. Rep / Geo. Marc Downing Rig Discovery rig 2  
 Location: Sec. 15 Twp 13<sup>s</sup> Rge. 21<sup>w</sup> Co. Trego State Ks

Interval Tested 3919-3925 Zone Tested Arbuckle  
 Anchor Length 6 Drill Pipe Run 3596 Mud Wt. 8.9  
 Top Packer Depth 3914 Drill Collars Run - Vis 59  
 Bottom Packer Depth 3919 Wt. Pipe Run 310 WL 9.6  
 Total Depth 3925 Chlorides 7500 ppm System LCM 2#  
 Blow Description TEP - WEAK Blow 2" To 2" Blow  
ISIP - NO Blow  
FFP - surface Blow  
FSTP - No Blow

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>50CM</u>	<u>2</u>		<u>98</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of <u>MISRUN</u>	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 10 BHT \_\_\_\_\_ Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ °F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 1837  Test 850 T-On Location 0420  
 (B) First Initial Flow -  Jars \_\_\_\_\_ T-Started 0445  
 (C) First Final Flow -  Safety Joint \_\_\_\_\_ T-Open 0705  
 (D) Initial Shut-In -  Circ Sub \_\_\_\_\_ T-Pulled 0005  
 (E) Second Initial Flow -  Hourly Standby \_\_\_\_\_ T-Out 1159  
 (F) Second Final Flow -  Mileage 96 Comments \_\_\_\_\_  
 (G) Final Shut-In -  Sampler \_\_\_\_\_ Loaded Tool 2-10-18  
 (H) Final Hydrostatic 1791  Straddle \_\_\_\_\_ 0230  
 Ruined Shale Packer \_\_\_\_\_  
 Ruined Packer \_\_\_\_\_  
 Extra Copies \_\_\_\_\_  
 Initial Open 45  Shale Packer \_\_\_\_\_  
 Initial Shut-In 45  Extra Packer \_\_\_\_\_  
 Final Flow 45  Extra Recorder \_\_\_\_\_  
 Final Shut-In 45  Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 946 Sub Total \_\_\_\_\_  
 MP/DST Disc't \_\_\_\_\_

Approved By \_\_\_\_\_ Our Representative RAY SCHWAGER THANK YOU  
 Triobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.