



## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

#### **3-19s-29w Lane,KS**

Start Date: 2018.11.29 @ 12:35:04

End Date: 2018.11.29 @ 20:20:04

Job Ticket #: 64304                      DST #: 1

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

Printed: 2018.12.06 @ 09:32:53



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co  
 PO Box 164  
 Andover KS 67002  
 ATTN: Jeff Christian

**3-19s-29w Lane, KS**

**Keenan #3**

Job Ticket: 64304

**DST#: 1**

Test Start: 2018.11.29 @ 12:35:04

## GENERAL INFORMATION:

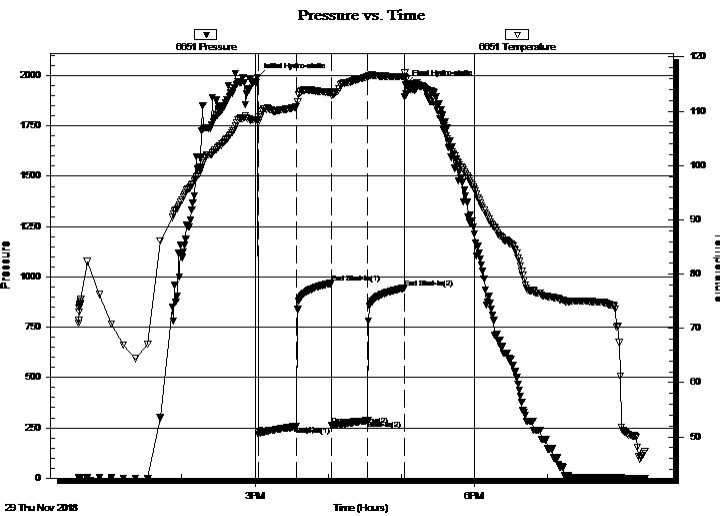
Formation: **LKC E-F**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 15:03:04  
 Time Test Ended: 20:20:04  
 Interval: **4050.00 ft (KB) To 4086.00 ft (KB) (TVD)**  
 Total Depth: 4086.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Brandon Turley  
 Unit No: 79  
 Reference Elevations: 2820.00 ft (KB)  
 2810.00 ft (CF)  
 KB to GR/CF: 10.00 ft

## Serial #: 6651

Inside

Press@RunDepth: 286.33 psig @ 4051.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2018.11.29 End Date: 2018.11.29 Last Calib.: 2018.11.29  
 Start Time: 12:35:09 End Time: 20:20:03 Time On Btm: 2018.11.29 @ 15:02:04  
 Time Off Btm: 2018.11.29 @ 17:03:34

TEST COMMENT: IF: 3" blow built to 10 1/2 Slid and open tool before we got to bottom  
 IS: No return.  
 FF: Surface blow built to 6"  
 FS: No return.



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	1988.39	108.41	Initial Hydro-static
1	218.60	107.83	Open To Flow (1)
32	257.85	110.83	Shut-In(1)
61	968.09	113.46	End Shut-In(1)
61	263.96	112.95	Open To Flow (2)
91	286.33	116.30	Shut-In(2)
121	944.53	116.36	End Shut-In(2)
122	1954.37	116.21	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	gocm 10%g 10%o 80%m	0.88
378.00	ocm 10%o 90%m	5.30
126.00	ocm 50%o 50%m	1.77
10.00	oil 100%o	0.14

## Gas Rates

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



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co  
 PO Box 164  
 Andover KS 67002  
 ATTN: Jeff Christian

**3-19s-29w Lane, KS**

**Keenan #3**

Job Ticket: 64304

**DST#: 1**

Test Start: 2018.11.29 @ 12:35:04

## GENERAL INFORMATION:

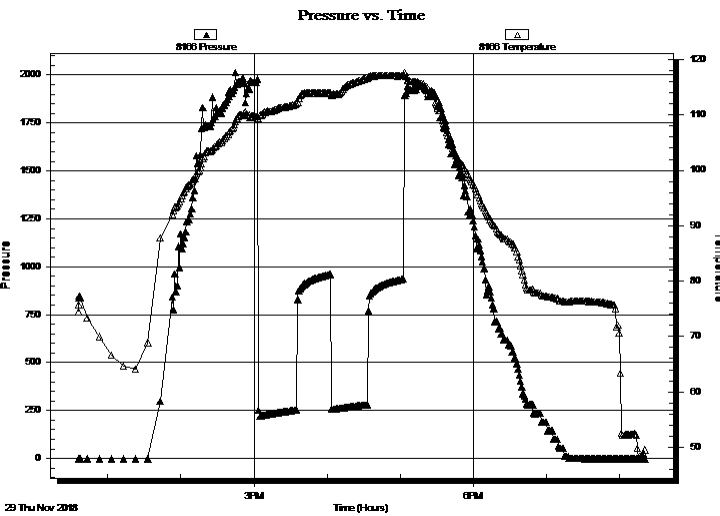
Formation: **LKC E-F**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 15:03:04  
 Time Test Ended: 20:20:04  
 Interval: **4050.00 ft (KB) To 4086.00 ft (KB) (TVD)**  
 Total Depth: 4086.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Initial)  
 Tester: Brandon Turley  
 Unit No: 79  
 Reference Elevations: 2820.00 ft (KB)  
 2810.00 ft (CF)  
 KB to GR/CF: 10.00 ft

**Serial #: 8166**

**Outside**

Press@RunDepth: psig @ 4051.00 ft (KB) Capacity: 8000.00 psig  
 Start Date: 2018.11.29 End Date: 2018.11.29 Last Calib.: 2018.11.29  
 Start Time: 12:36:01 End Time: 20:20:55 Time On Btm:  
 Time Off Btm:

**TEST COMMENT:** IF: 3" blow built to 10 1/2 Slid and open tool before we got to bottom  
 IS: No return.  
 FF: Surface blow built to 6"  
 FS: No return.



## PRESSURE SUMMARY

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

## Recovery

Length (ft)	Description	Volume (bbl)
63.00	gocm 10%g 10%o 80%m	0.88
378.00	ocm 10%o 90%m	5.30
126.00	ocm 50%o 50%m	1.77
10.00	oil 100%o	0.14

## Gas Rates

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



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64304

**DST#: 1**

ATTN: Jeff Christian

Test Start: 2018.11.29 @ 12:35:04

## Tool Information

Drill Pipe:	Length: 4058.00 ft	Diameter: 3.80 inches	Volume: 56.92 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 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:	85000.00 lb
			<u>Total Volume: 56.92 bbl</u>	Tool Chased	14.00 ft
Drill Pipe Above KB:	28.00 ft			String Weight: Initial	38000.00 lb
Depth to Top Packer:	4050.00 ft			Final	42000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	36.00 ft				
Tool Length:	56.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Stubb	1.00			4031.00	
Shut In Tool	5.00			4036.00	
Hydraulic tool	5.00			4041.00	
Packer	5.00			4046.00	20.00 Bottom Of Top Packer
Packer	4.00			4050.00	
Stubb	1.00			4051.00	
Recorder	0.00	6651	Inside	4051.00	
Recorder	0.00	8166	Outside	4051.00	
Perforations	30.00			4081.00	
Bullnose	5.00			4086.00	36.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>56.00</b>				



**TRILOBITE**  
TESTING, INC.

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64304

**DST#: 1**

ATTN: Jeff Christian

Test Start: 2018.11.29 @ 12:35:04

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 55.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 2400.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
63.00	gocm 10%g 10%o 80%m	0.884
378.00	ocm 10%o 90%m	5.302
126.00	ocm 50%o 50%m	1.767
10.00	oil 100%o	0.140

Total Length: 577.00 ft

Total Volume: 8.093 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

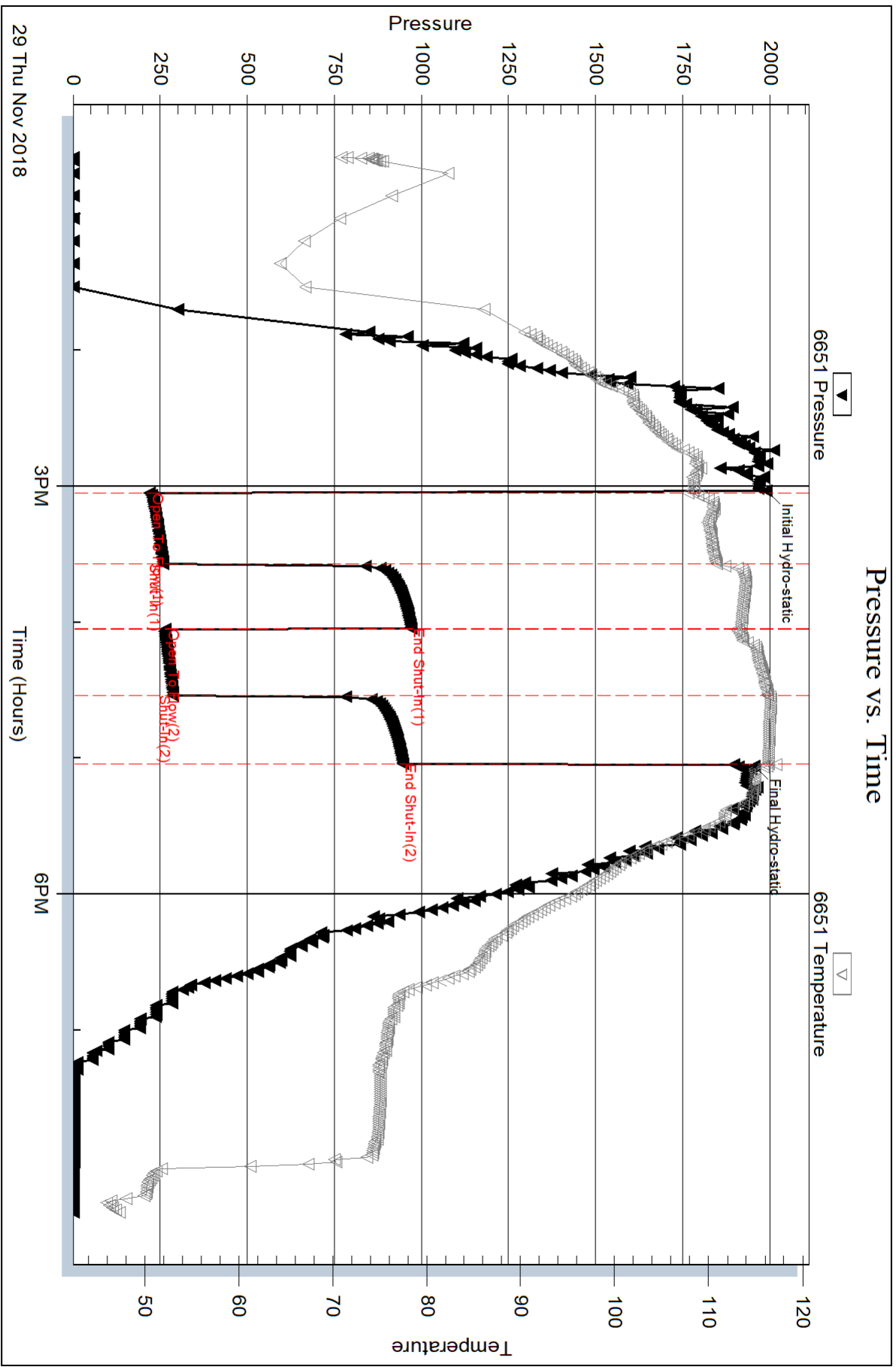
Serial #: 6651

Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 1

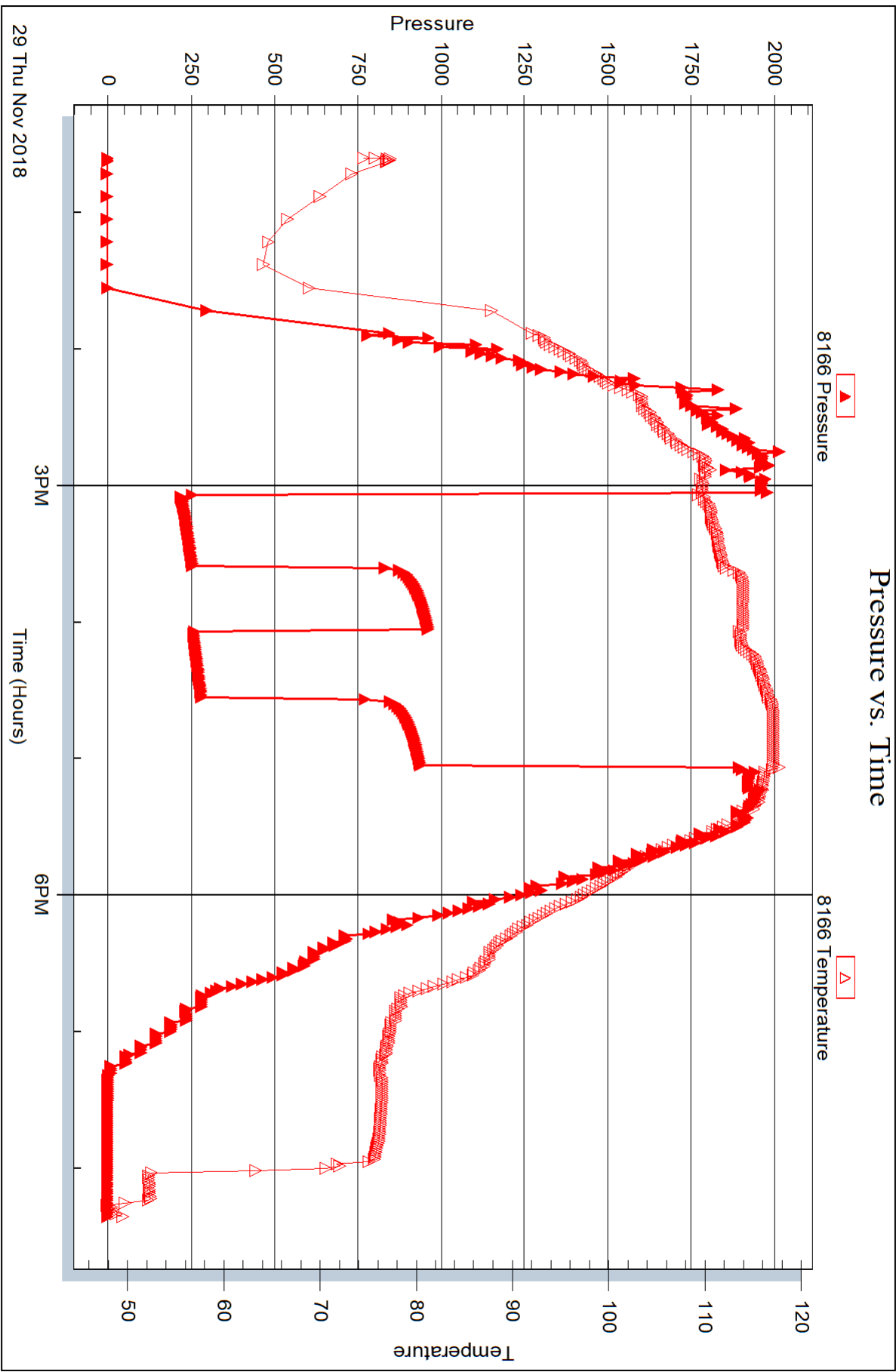


Serial #: 8166

Outside Northern Lights Oil Co

Keenan #3

DST Test Number: 1





## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

#### **3-19s-29w Lane,KS**

Start Date: 2018.11.30 @ 11:07:37

End Date: 2018.11.30 @ 18:07:37

Job Ticket #: 64305                      DST #: 2

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

Printed: 2018.12.06 @ 09:32:08





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co  
PO Box 164  
Andover KS 67002  
ATTN: Jeff Christian

**3-19s-29w Lane, KS**

**Keenan #3**

Job Ticket: 64305

**DST#: 2**

Test Start: 2018.11.30 @ 11:07:37

## GENERAL INFORMATION:

Formation: **LKC G**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 13:06:37  
 Time Test Ended: 18:07:37  
 Interval: **4148.00 ft (KB) To 4195.00 ft (KB) (TVD)**  
 Total Depth: 4195.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Brandon Turley  
 Unit No: 79  
 Reference Elevations: 2820.00 ft (KB)  
 2810.00 ft (CF)  
 KB to GR/CF: 10.00 ft

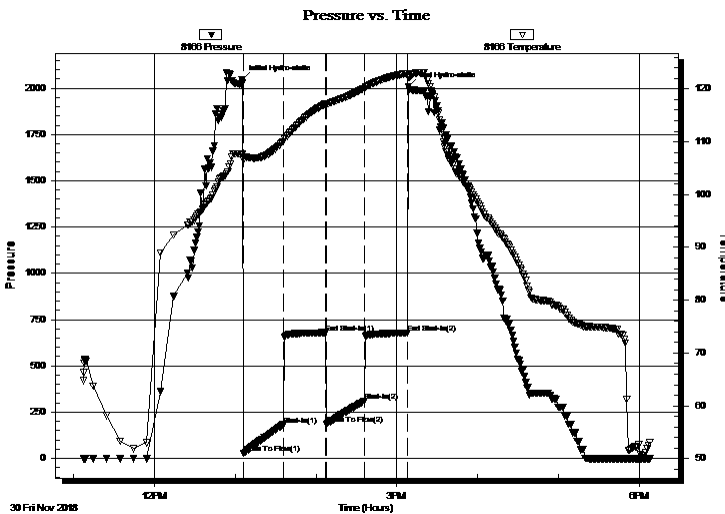
**Serial #: 8166**

**Outside**

Press@RunDepth: 308.32 psig @ 4149.00 ft (KB)  
 Start Date: 2018.11.30 End Date: 2018.11.30  
 Start Time: 11:07:42 End Time: 18:07:36  
 Capacity: 8000.00 psig  
 Last Calib.: 2018.11.30  
 Time On Btm: 2018.11.30 @ 13:05:07  
 Time Off Btm: 2018.11.30 @ 15:08:37

**TEST COMMENT:** IF: 3" blow BOB in 8 mins. 33"  
 IS: Surface blow built to 1/2.  
 FF: BOB in 11 mins. 27"  
 FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2046.33	107.75	Initial Hydro-static
2	26.51	106.60	Open To Flow (1)
31	181.68	110.06	Shut-In(1)
62	679.36	117.16	End Shut-In(1)
63	184.75	117.05	Open To Flow (2)
91	308.32	120.09	Shut-In(2)
123	677.03	122.92	End Shut-In(2)
124	2008.49	122.17	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
252.00	mcw 80%w 20%m	3.53
189.00	gocw m 10%g 5%o 40%w 45%m	2.65
189.00	gcw m 10%o 10%w 80%m	2.65
2.00	free oil 100%o	0.03

\* Recovery from multiple tests

## Gas Rates

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





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64305

**DST#: 2**

ATTN: Jeff Christian

Test Start: 2018.11.30 @ 11:07:37

## Tool Information

Drill Pipe:	Length: 4151.00 ft	Diameter: 3.80 inches	Volume: 58.23 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer:	20000.00 lb
Drill Collar:	Length: 0.00 ft	Diameter: 2.25 inches	Volume: 0.00 bbl	Weight to Pull Loose:	48000.00 lb
			<u>Total Volume: 58.23 bbl</u>	Tool Chased	5.00 ft
Drill Pipe Above KB:	30.00 ft			String Weight: Initial	35000.00 lb
Depth to Top Packer:	4148.00 ft			Final	42000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	47.00 ft				
Tool Length:	74.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Stubb	1.00			4122.00	
Shut In Tool	5.00			4127.00	
Hydraulic tool	5.00			4132.00	
Jars	5.00			4137.00	
Safety Joint	2.00			4139.00	
Packer	5.00			4144.00	27.00 Bottom Of Top Packer
Packer	4.00			4148.00	
Stubb	1.00			4149.00	
Recorder	0.00	6651	Inside	4149.00	
Recorder	0.00	8166	Outside	4149.00	
Perforations	7.00			4156.00	
Change Over Sub	1.00			4157.00	
Drill Pipe	32.00			4189.00	
Change Over Sub	1.00			4190.00	
Bullnose	5.00			4195.00	47.00 Bottom Packers & Anchor

**Total Tool Length: 74.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64305

**DST#: 2**

ATTN: Jeff Christian

Test Start: 2018.11.30 @ 11:07:37

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

46000 ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
252.00	mcw 80%w 20%m	3.535
189.00	gocw m 10%g 5%o 40%w 45%m	2.651
189.00	gcw m 10%o 10%w 80%m	2.651
2.00	free oil 100%o	0.028

Total Length: 632.00 ft      Total Volume: 8.865 bbl

Num Fluid Samples: 0

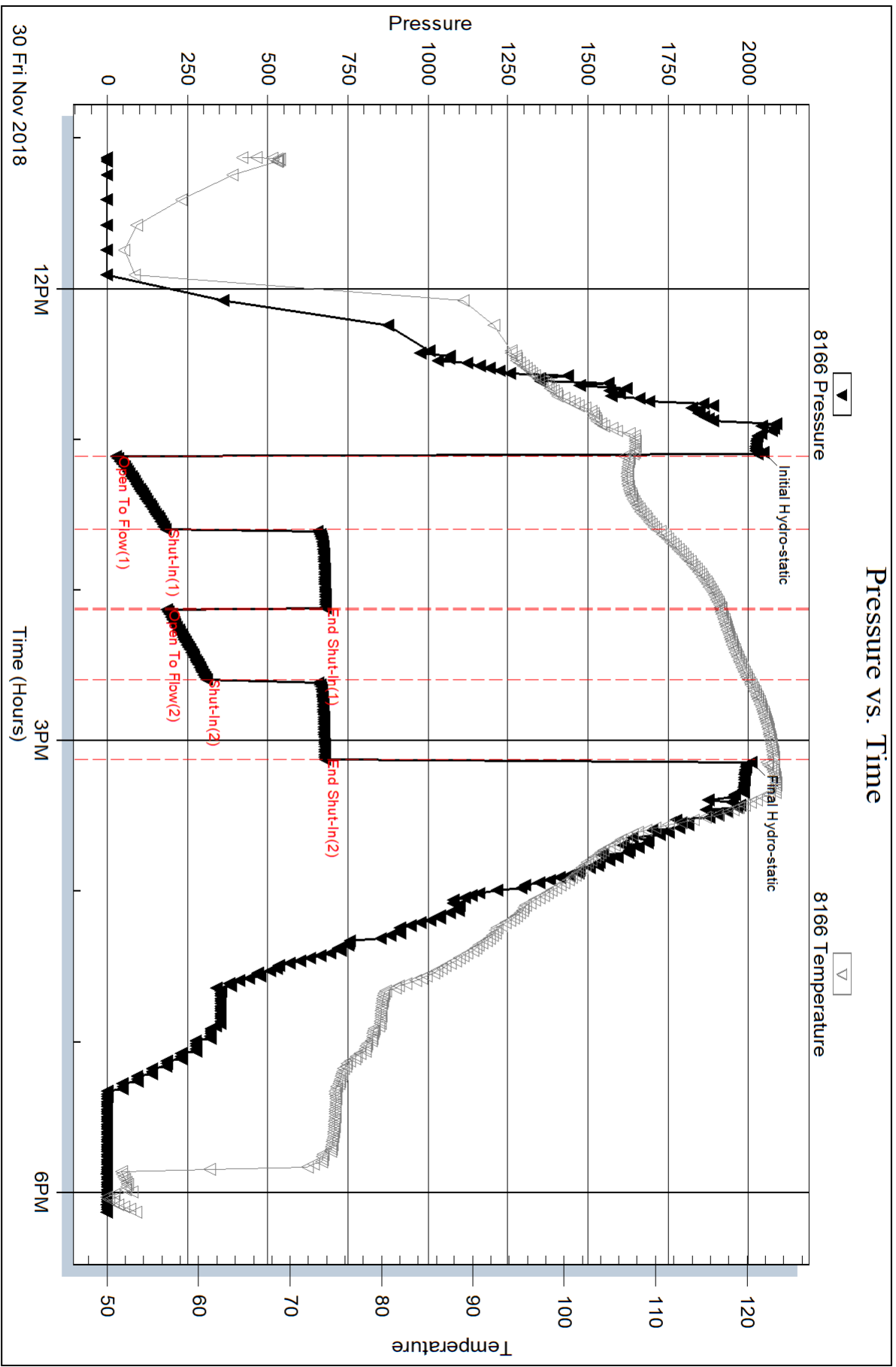
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .29@40=46000



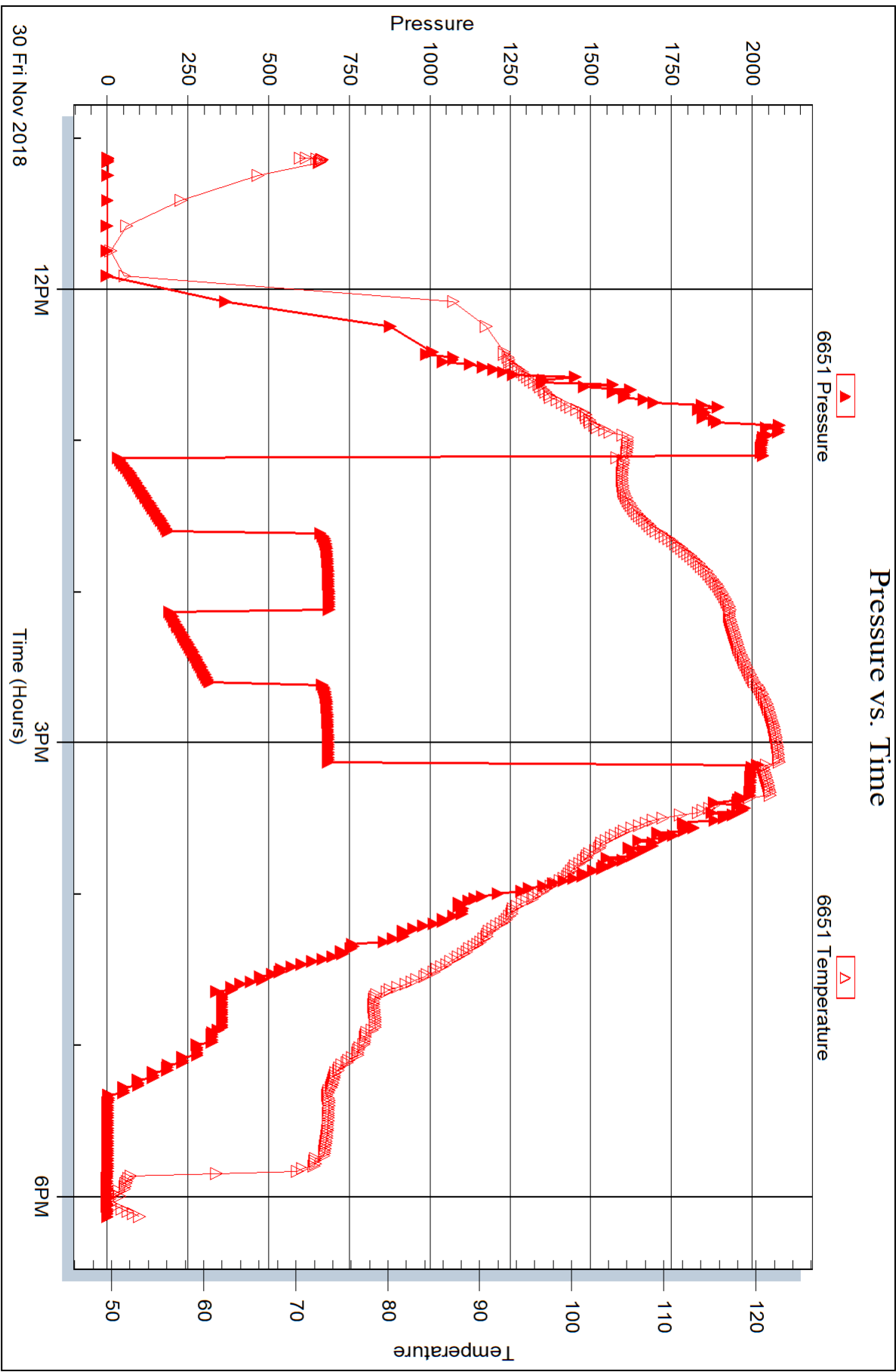
Serial #: 6651

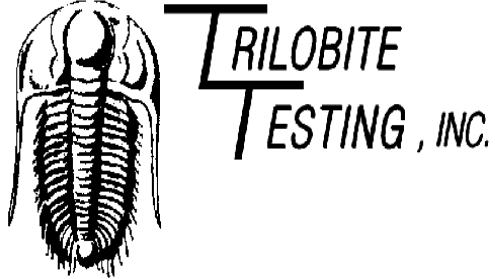
Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 2





## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

### **3-19s-29w Lane,KS**

Start Date: 2018.12.01 @ 08:45:18

End Date: 2018.12.01 @ 15:01:18

Job Ticket #: 64306                      DST #: 3

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

Printed: 2018.12.06 @ 09:30:35



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co  
 PO Box 164  
 Andover KS 67002  
 ATTN: Jeff Christian

**3-19s-29w Lane, KS**

**Keenan #3**

Job Ticket: 64306

**DST#: 3**

Test Start: 2018.12.01 @ 08:45:18

## GENERAL INFORMATION:

Formation: **LKC H**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 11:09:18  
 Time Test Ended: 15:01:18  
 Interval: **4193.00 ft (KB) To 4223.00 ft (KB) (TVD)**  
 Total Depth: 4223.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Brandon Turley  
 Unit No: 79  
 Reference Elevations: 2820.00 ft (KB)  
 2810.00 ft (CF)  
 KB to GR/CF: 10.00 ft

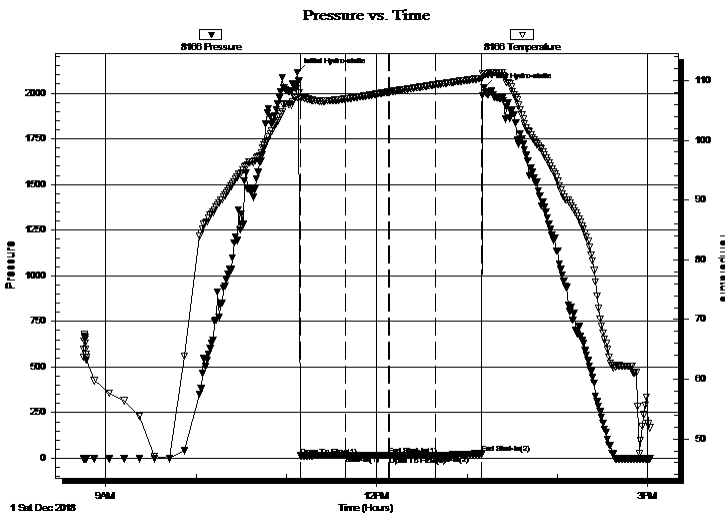
## Serial #: 8166

Outside

Press@RunDepth: 15.62 psig @ 4194.00 ft (KB)  
 Start Date: 2018.12.01 End Date: 2018.12.01  
 Start Time: 08:45:23 End Time: 15:01:17  
 Capacity: 8000.00 psig  
 Last Calib.: 2018.12.01  
 Time On Btm: 2018.12.01 @ 11:07:18  
 Time Off Btm: 2018.12.01 @ 13:11:18

TEST COMMENT: IF: 1/2" blow built to 1 1/2" and died in 3/4"  
 IS: No return.  
 FF: Surface blow died in 10 min.  
 FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2113.70	107.10	Initial Hydro-static
2	13.48	107.20	Open To Flow (1)
32	14.90	106.92	Shut-In(1)
61	15.67	108.07	End Shut-In(1)
61	13.55	108.09	Open To Flow (2)
92	15.62	109.31	Shut-In(2)
123	25.85	110.38	End Shut-In(2)
124	2028.84	111.09	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
1.00	mud oil spots 100%m	0.01

\* Recovery from multiple tests

## Gas Rates

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







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64306

**DST#: 3**

ATTN: Jeff Christian

Test Start: 2018.12.01 @ 08:45:18

## Tool Information

Drill Pipe:	Length: 4182.00 ft	Diameter: 3.80 inches	Volume: 58.66 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 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:	48000.00 lb
			<u>Total Volume: 58.66 bbl</u>	Tool Chased	2.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial	38000.00 lb
Depth to Top Packer:	4193.00 ft			Final	38000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	30.00 ft				
Tool Length:	57.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
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Stubb	1.00			4167.00	
Shut In Tool	5.00			4172.00	
Hydraulic tool	5.00			4177.00	
Jars	5.00			4182.00	
Safety Joint	2.00			4184.00	
Packer	5.00			4189.00	27.00 Bottom Of Top Packer
Packer	4.00			4193.00	
Stubb	1.00			4194.00	
Recorder	0.00	6651	Inside	4194.00	
Recorder	0.00	8166	Outside	4194.00	
Perforations	24.00			4218.00	
Bullnose	5.00			4223.00	30.00 Bottom Packers & Anchor

**Total Tool Length: 57.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64306

**DST#: 3**

ATTN: Jeff Christian

Test Start: 2018.12.01 @ 08:45:18

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.59 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1.00	mud oil spots 100%m	0.014

Total Length: 1.00 ft      Total Volume: 0.014 bbl

Num Fluid Samples: 0

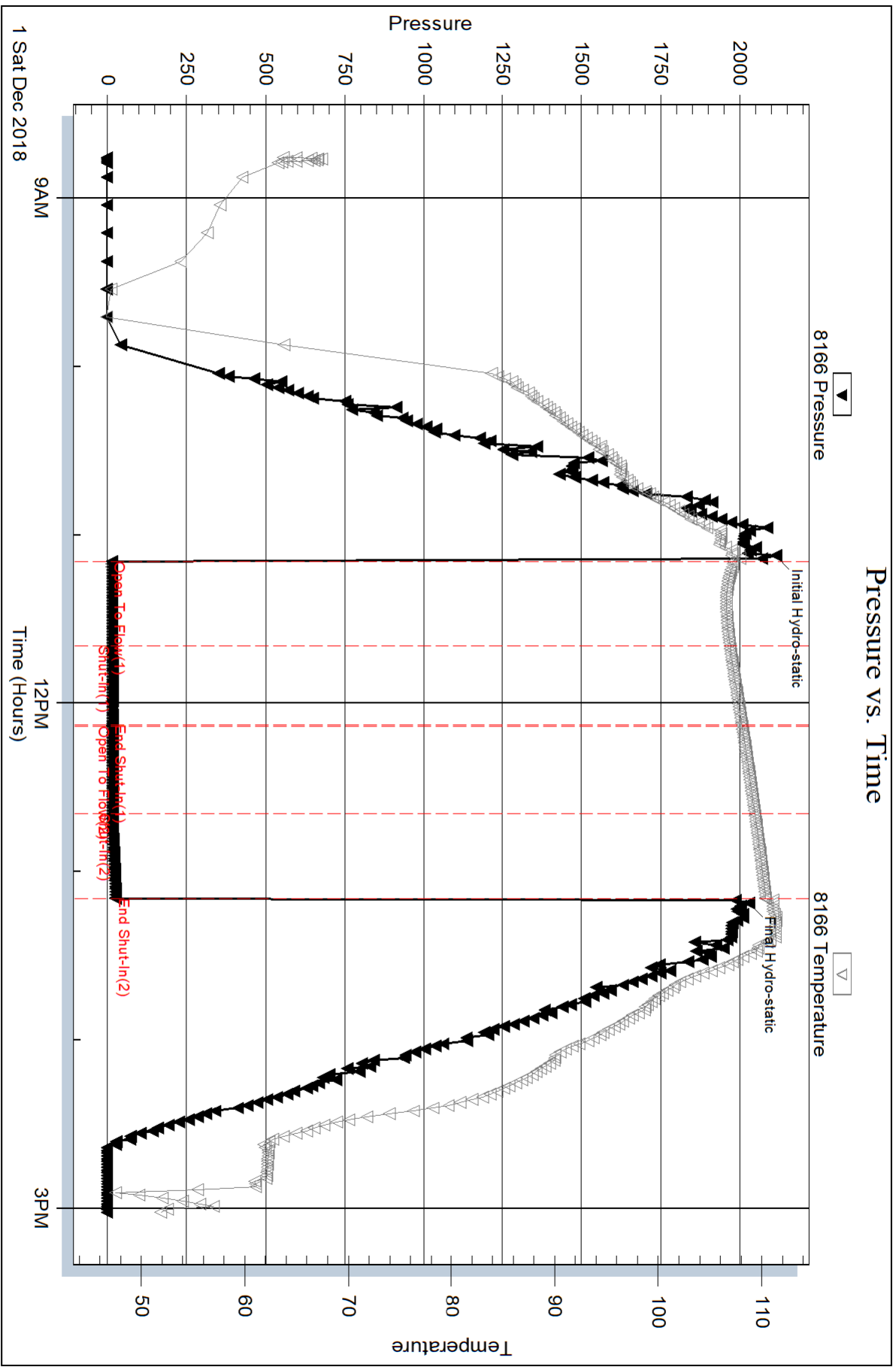
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



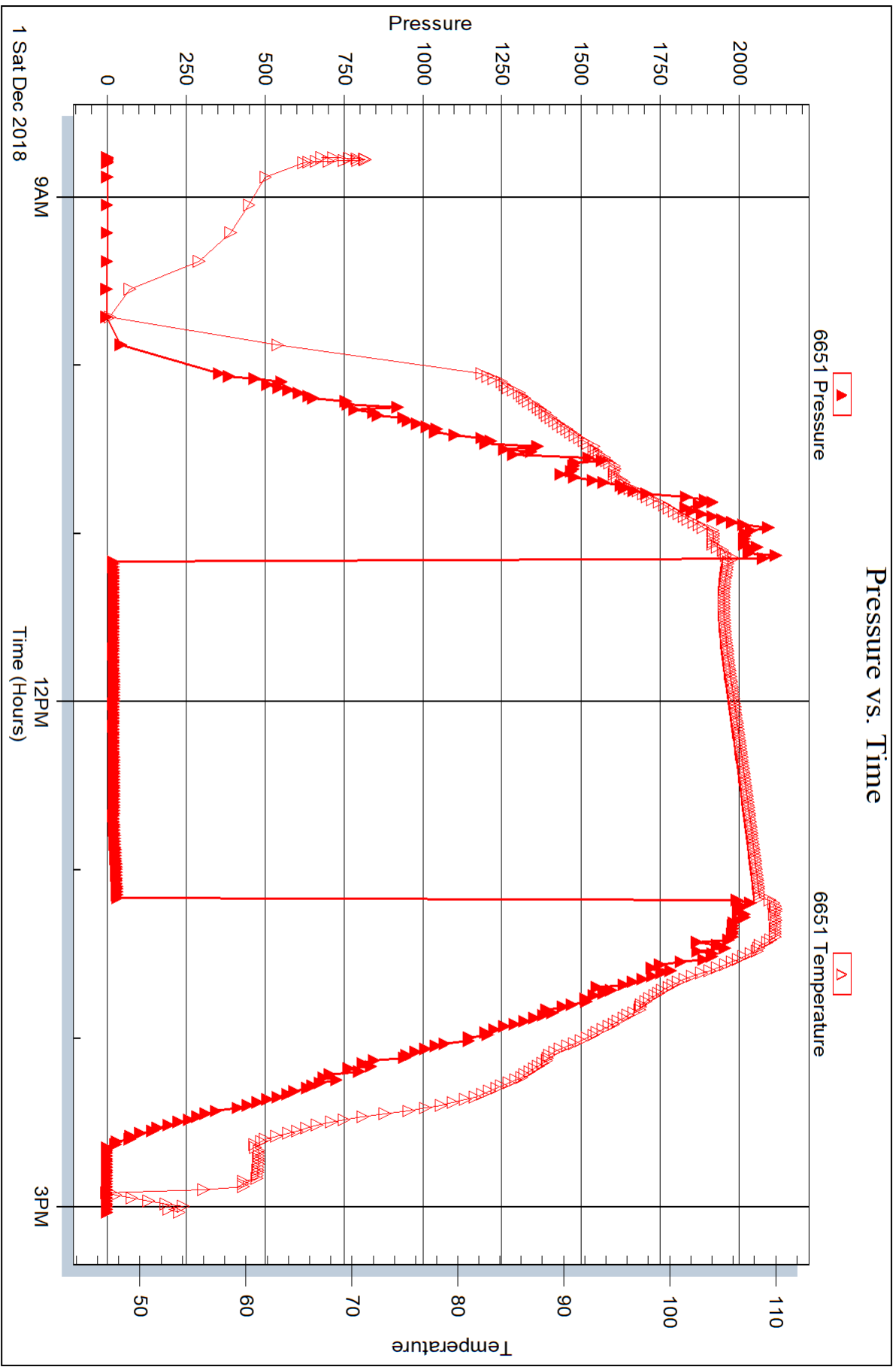
Serial #: 6651

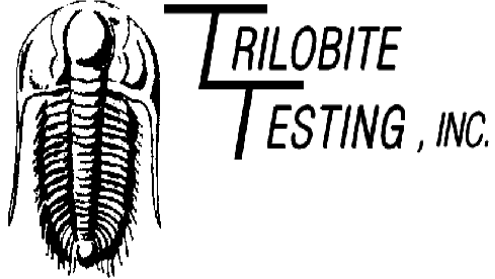
Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 3





## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

### **3-19s-29w Lane,KS**

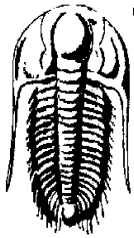
Start Date: 2018.12.02 @ 06:48:02

End Date: 2018.12.02 @ 13:24:02

Job Ticket #: 64307                      DST #: 4

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

Printed: 2018.12.06 @ 09:27:14



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co

**3-19s-29w Lane, KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64307

**DST#: 4**

ATTN: Jeff Christian

Test Start: 2018.12.02 @ 06:48:02

## GENERAL INFORMATION:

Formation: **Middle Creek**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 09:06:02

Time Test Ended: 13:24:02

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

**Interval: 4290.00 ft (KB) To 4301.00 ft (KB) (TVD)**

Reference Elevations: 2820.00 ft (KB)

Total Depth: 4301.00 ft (KB) (TVD)

2810.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 10.00 ft

**Serial #: 8166 Outside**

Press@RunDepth: 26.74 psig @ 4291.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.12.02 End Date: 2018.12.02

Last Calib.: 2018.12.02

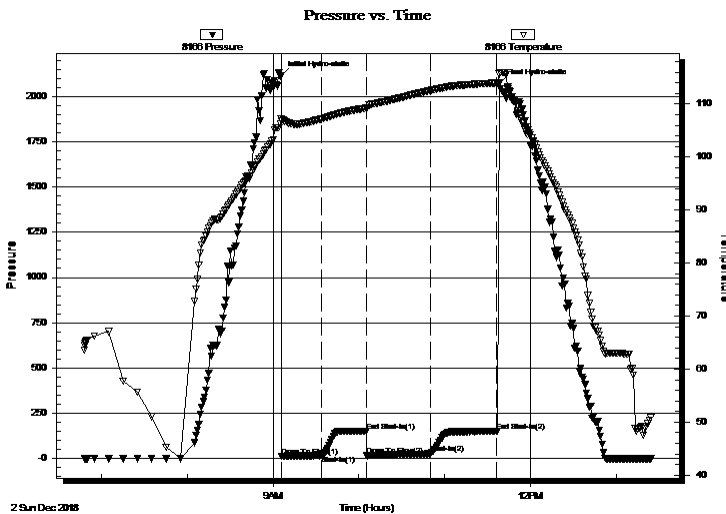
Start Time: 06:48:07 End Time: 13:24:01

Time On Btm: 2018.12.02 @ 09:05:32

Time Off Btm: 2018.12.02 @ 11:38:02

**TEST COMMENT:** IF: 1/4" blow built to 3"  
IS: No return.  
FF: 1/2" blow built to 5 3/4"  
FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2115.28	107.17	Initial Hydro-static
1	12.59	106.87	Open To Flow (1)
28	16.06	107.18	Shut-In(1)
60	150.36	109.23	End Shut-In(1)
60	16.27	109.18	Open To Flow (2)
105	26.74	112.55	Shut-In(2)
151	148.63	113.98	End Shut-In(2)
153	2073.62	115.66	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
10.00	ocm 10%o 90%m	0.14
10.00	free oil 100%o	0.14
0.00	103 GIP	0.00

## Gas Rates

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

\* Recovery from multiple tests







**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64307

**DST#: 4**

ATTN: Jeff Christian

Test Start: 2018.12.02 @ 06:48:02

## Tool Information

Drill Pipe:	Length: 4282.00 ft	Diameter: 3.80 inches	Volume: 60.07 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 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:	50000.00 lb
			<u>Total Volume: 60.07 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial	40000.00 lb
Depth to Top Packer:	4290.00 ft			Final	40000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	11.00 ft				
Tool Length:	31.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

## Tool Description

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Stubb	1.00			4271.00	
Shut In Tool	5.00			4276.00	
Hydraulic tool	5.00			4281.00	
Packer	5.00			4286.00	20.00 Bottom Of Top Packer
Packer	4.00			4290.00	
Stubb	1.00			4291.00	
Recorder	0.00	6651	Inside	4291.00	
Recorder	0.00	8166	Outside	4291.00	
Perforations	5.00			4296.00	
Bullnose	5.00			4301.00	11.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>31.00</b>				



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64307

**DST#: 4**

ATTN: Jeff Christian

Test Start: 2018.12.02 @ 06:48:02

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

34 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 6000.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
10.00	ocm 10%o 90%m	0.140
10.00	free oil 100%o	0.140
0.00	103 GIP	0.000

Total Length: 20.00 ft      Total Volume: 0.280 bbl

Num Fluid Samples: 0

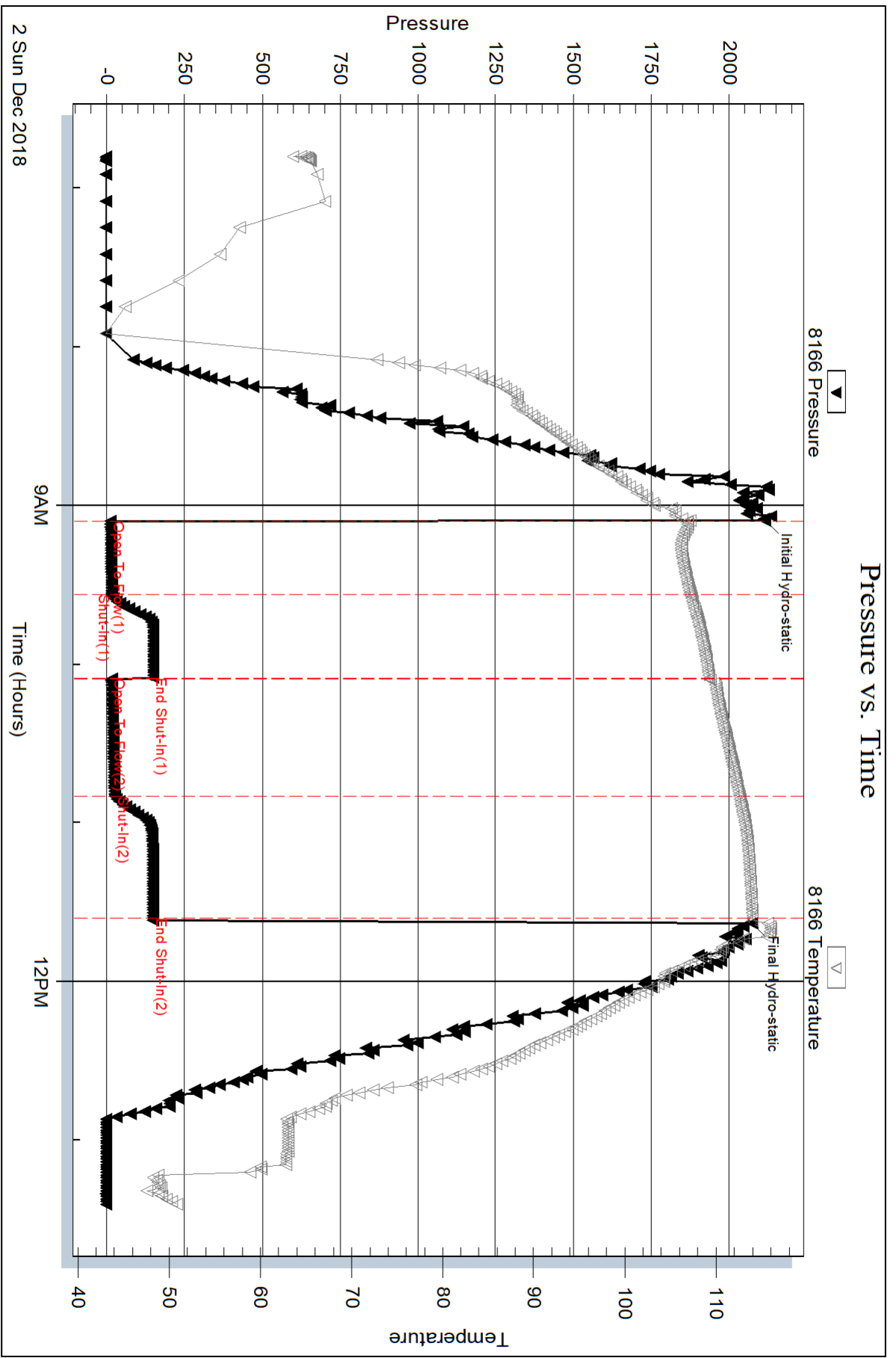
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: 33@50=34



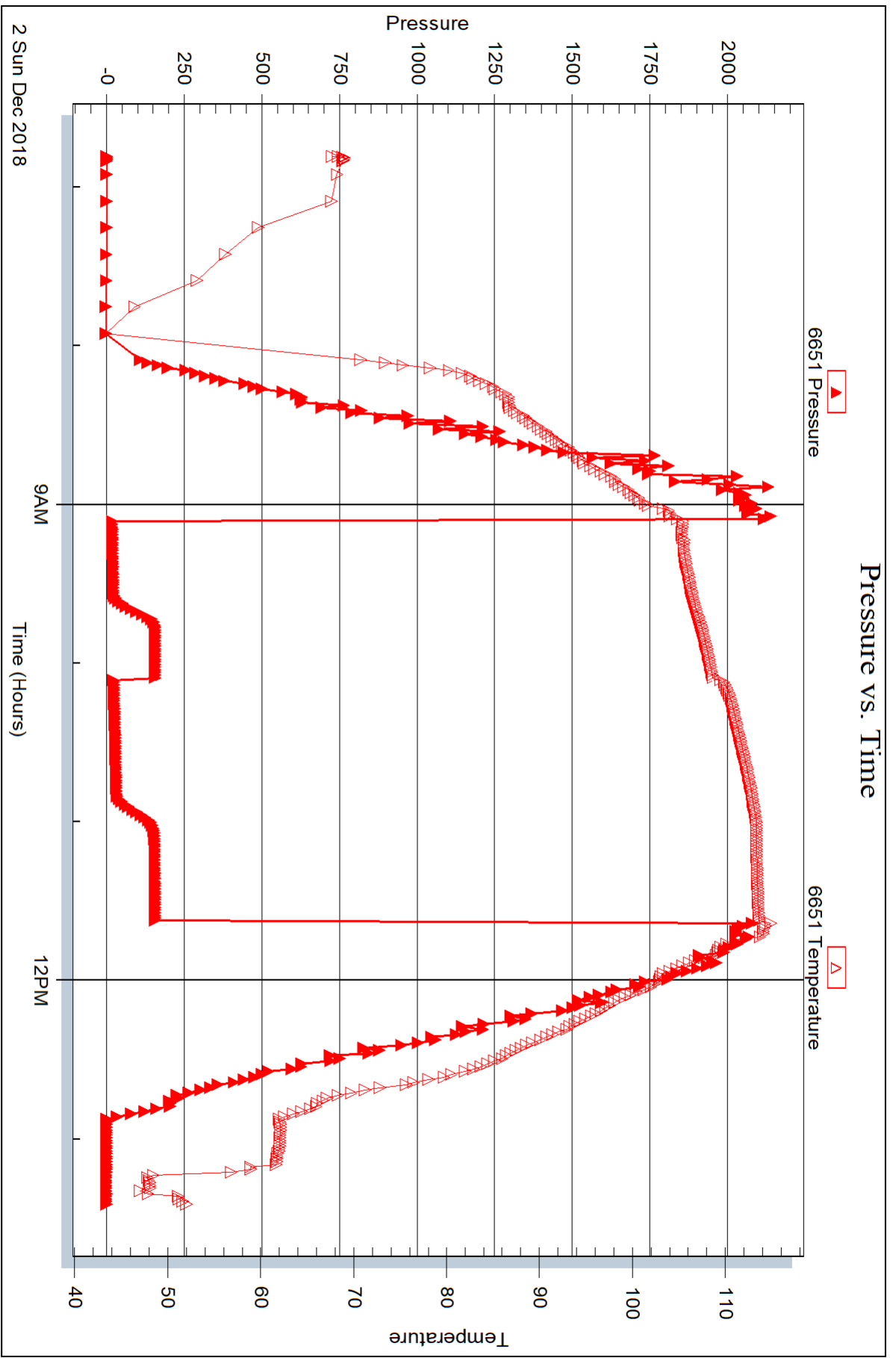
Serial #: 6651

Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 4





## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

#### **3-19s-29w Lane,KS**

Start Date: 2018.12.03 @ 06:10:25

End Date: 2018.12.03 @ 13:02:25

Job Ticket #: 64308                      DST #: 5

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

Printed: 2018.12.06 @ 09:26:51



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co  
 PO Box 164  
 Andover KS 67002  
 ATTN: Jeff Christian

**3-19s-29w Lane, KS**

**Keenan #3**

Job Ticket: 64308

**DST#: 5**

Test Start: 2018.12.03 @ 06:10:25

## GENERAL INFORMATION:

Formation: **Altamont**  
 Deviated: No Whipstock: ft (KB)  
 Time Tool Opened: 08:45:55  
 Time Test Ended: 13:02:25  
 Interval: **4394.00 ft (KB) To 4430.00 ft (KB) (TVD)**  
 Total Depth: 4430.00 ft (KB) (TVD)  
 Hole Diameter: 7.88 inches Hole Condition: Good  
 Test Type: Conventional Bottom Hole (Reset)  
 Tester: Brandon Turley  
 Unit No: 79  
 Reference Elevations: 2820.00 ft (KB)  
 2810.00 ft (CF)  
 KB to GR/CF: 10.00 ft

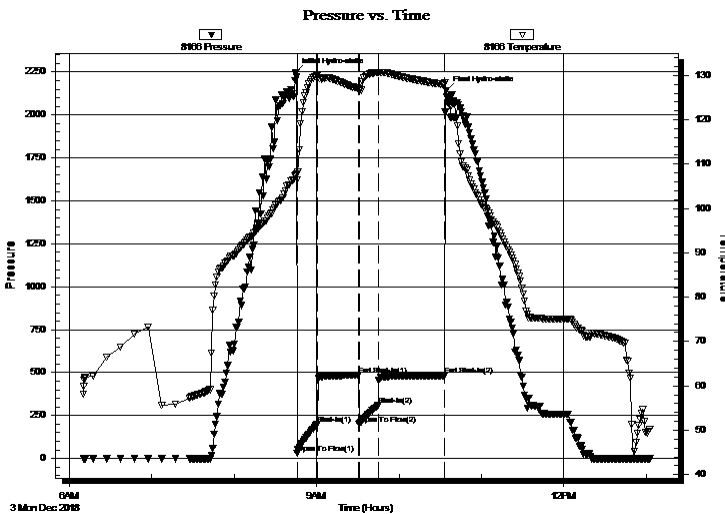
## Serial #: 8166

**Outside**

Press@RunDepth: 310.60 psig @ 4395.00 ft (KB)  
 Start Date: 2018.12.03 End Date: 2018.12.03  
 Start Time: 06:10:30 End Time: 13:02:24  
 Capacity: 8000.00 psig  
 Last Calib.: 2018.12.03  
 Time On Btm: 2018.12.03 @ 08:44:55  
 Time Off Btm: 2018.12.03 @ 10:34:25

**TEST COMMENT:** IF: BOB in 4 min. 35"  
 IS: Weak surface blow never built.  
 FF: BOB in 5 min. 26"  
 FS: No return.

## PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2247.57	107.52	Initial Hydro-static
1	30.16	106.47	Open To Flow (1)
16	199.78	129.91	Shut-In(1)
46	484.60	127.01	End Shut-In(1)
46	198.30	126.77	Open To Flow (2)
60	310.60	130.60	Shut-In(2)
108	482.88	127.95	End Shut-In(2)
110	2141.18	125.21	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
378.00	mcw 70%w 30%m	5.30
272.00	w cm 30%w 70%m	3.82
0.00	50 ppm H2S	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**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64308

**DST#: 5**

ATTN: Jeff Christian

Test Start: 2018.12.03 @ 06:10:25

## Tool Information

Drill Pipe:	Length: 4379.00 ft	Diameter: 3.80 inches	Volume: 61.43 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 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:	50000.00 lb
			<u>Total Volume: 61.43 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial	40000.00 lb
Depth to Top Packer:	4394.00 ft			Final	42000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	36.00 ft				
Tool Length:	56.00 ft				
Number of Packers:	2	Diameter: 6.75 inches			
Tool Comments:					

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Stubb	1.00			4375.00	
Shut In Tool	5.00			4380.00	
Hydraulic tool	5.00			4385.00	
Packer	5.00			4390.00	20.00 Bottom Of Top Packer
Packer	4.00			4394.00	
Stubb	1.00			4395.00	
Recorder	0.00	6651	Inside	4395.00	
Recorder	0.00	8166	Outside	4395.00	
Perforations	30.00			4425.00	
Bullnose	5.00			4430.00	36.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>56.00</b>				





**TRILOBITE  
TESTING, INC.**

**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64308

**DST#: 5**

ATTN: Jeff Christian

Test Start: 2018.12.03 @ 06:10:25

**Mud and Cushion Information**

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

45000 ppm

Viscosity: 45.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.79 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 2800.00 ppm

Filter Cake: 1.00 inches

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
378.00	mcw 70%w 30%m	5.302
272.00	w cm 30%w 70%m	3.815
0.00	50 ppm H2S	0.000

Total Length: 650.00 ft      Total Volume: 9.117 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

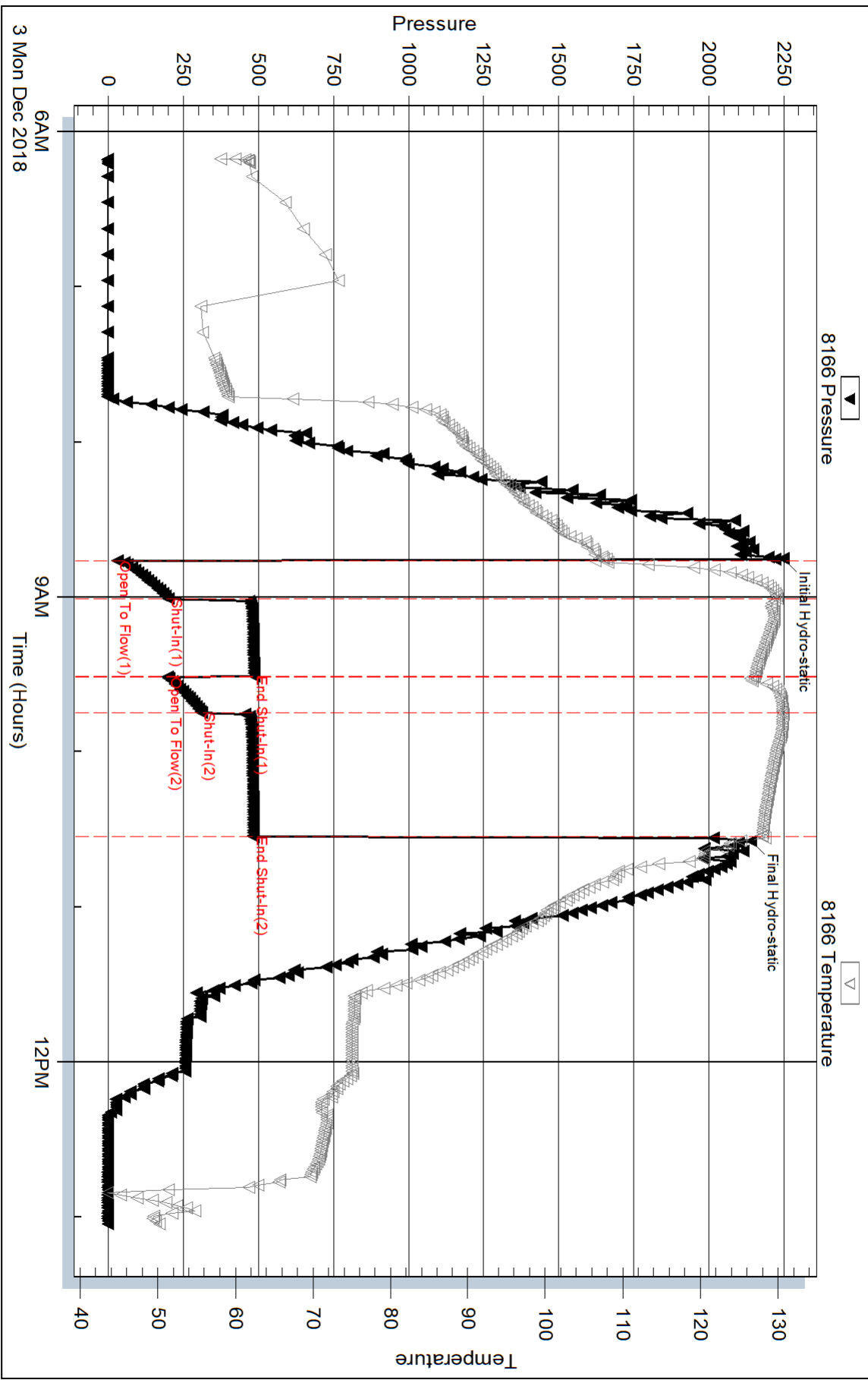
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: .33@35=45000

### Pressure vs. Time



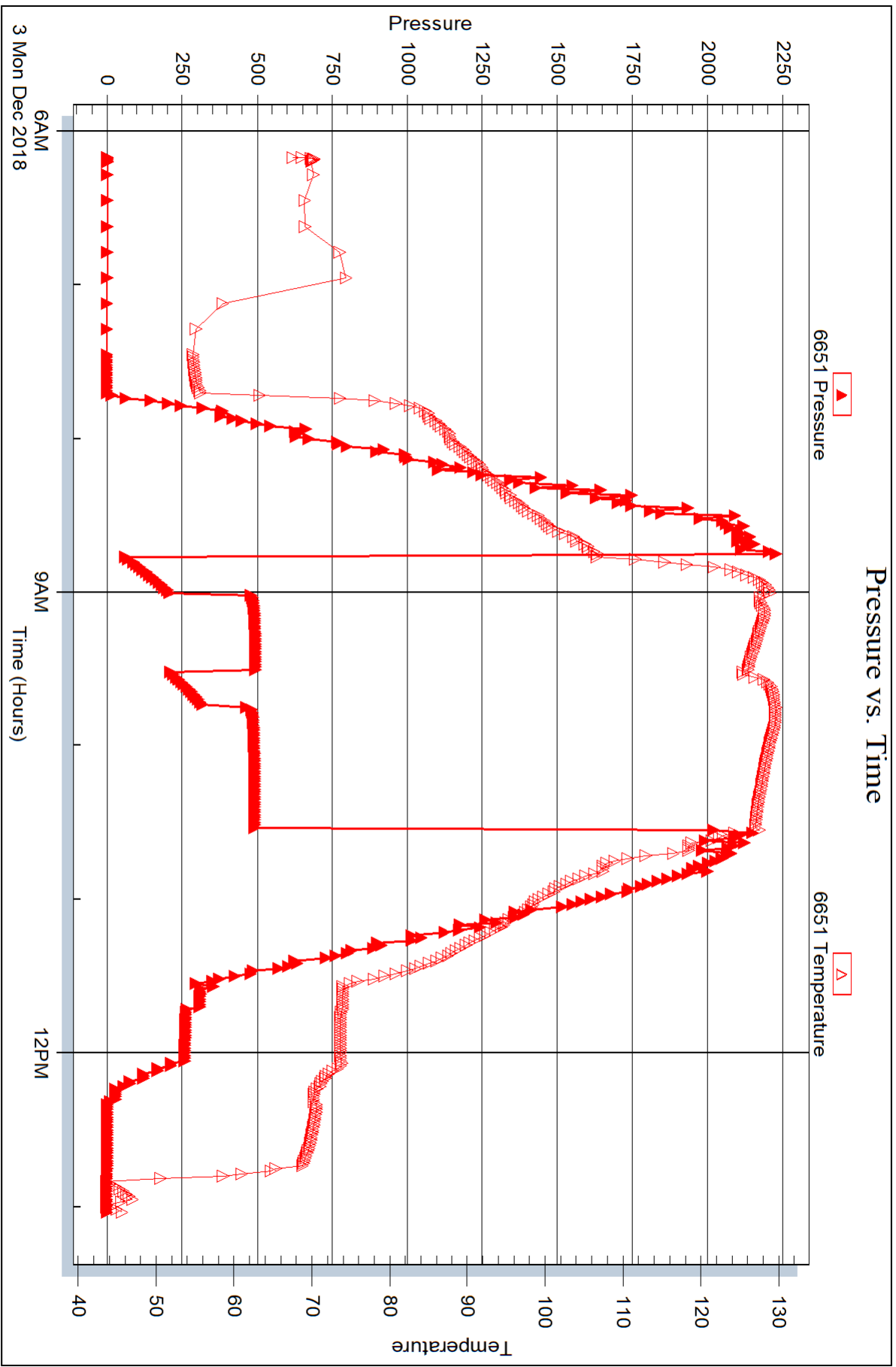
Serial #: 6651

Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 5



Triobite Testing, Inc

Ref. No: 64308

Printed: 2018.12.06 @ 09:26:52



## DRILL STEM TEST REPORT

Prepared For: **Northern Lights Oil Co**

PO Box 164  
Andover KS 67002

ATTN: Jeff Christian

### **Keenan #3**

### **3-19s-29w Lane,KS**

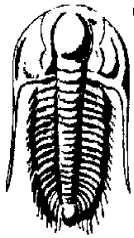
Start Date: 2018.12.04 @ 12:52:51

End Date: 2018.12.04 @ 18:59:51

Job Ticket #: 64309                      DST #: 6

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

Printed: 2018.12.06 @ 09:26:28



**TRILOBITE TESTING, INC.**

# DRILL STEM TEST REPORT

Northern Lights Oil Co

**3-19s-29w Lane, KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64309

**DST#: 6**

ATTN: Jeff Christian

Test Start: 2018.12.04 @ 12:52:51

## GENERAL INFORMATION:

Formation: **Johnson**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 14:43:21

Time Test Ended: 18:59:51

Test Type: Conventional Bottom Hole (Reset)

Tester: Brandon Turley

Unit No: 79

**Interval: 4536.00 ft (KB) To 4587.00 ft (KB) (TVD)**

Reference Elevations: 2820.00 ft (KB)

Total Depth: 4587.00 ft (KB) (TVD)

2810.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 10.00 ft

**Serial #: 8166 Outside**

Press@RunDepth: 22.45 psig @ 4537.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2018.12.04

End Date:

2018.12.04

Last Calib.:

2018.12.04

Start Time: 12:52:56

End Time:

18:59:50

Time On Btm:

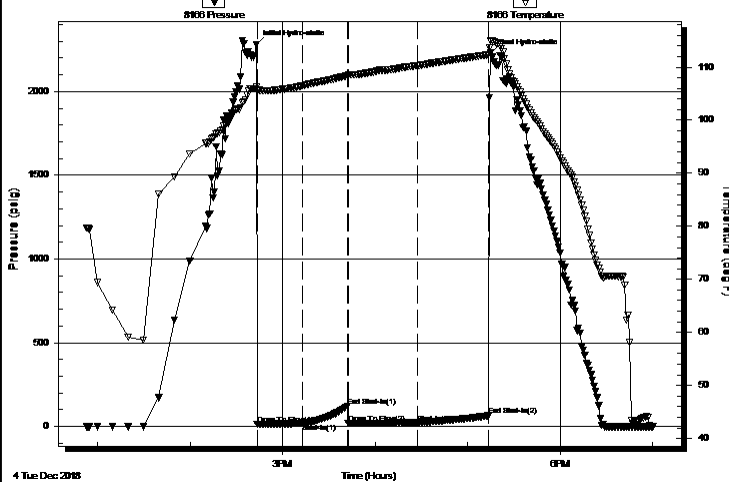
2018.12.04 @ 14:42:51

Time Off Btm:

2018.12.04 @ 17:14:51

**TEST COMMENT:** IF: 1/4" blow built to 1 1/2"  
IS: No return.  
FF: Surface blow built to 1/2"  
FS: No return.

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2281.58	106.22	Initial Hydro-static
1	14.26	105.61	Open To Flow (1)
30	17.16	106.47	Shut-In(1)
59	121.69	108.38	End Shut-In(1)
60	19.36	108.42	Open To Flow (2)
105	22.45	110.29	Shut-In(2)
151	64.05	112.34	End Shut-In(2)
152	2228.95	115.03	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
20.00	ocm 10%o 90%m	0.28

## Gas Rates

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

\* Recovery from multiple tests





**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64309

**DST#: 6**

ATTN: Jeff Christian

Test Start: 2018.12.04 @ 12:52:51

## Tool Information

Drill Pipe:	Length: 4536.00 ft	Diameter: 3.80 inches	Volume: 63.63 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 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: 50000.00 lb
			<u>Total Volume: 63.63 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	20.00 ft			String Weight: Initial 40000.00 lb
Depth to Top Packer:	4536.00 ft			Final 40000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	51.00 ft			
Tool Length:	71.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Stubb	1.00			4517.00	
Shut In Tool	5.00			4522.00	
Hydraulic tool	5.00			4527.00	
Packer	5.00			4532.00	20.00 Bottom Of Top Packer
Packer	4.00			4536.00	
Stubb	1.00			4537.00	
Recorder	0.00	6651	Inside	4537.00	
Recorder	0.00	8166	Outside	4537.00	
Perforations	12.00			4549.00	
Change Over Sub	1.00			4550.00	
Drill Pipe	31.00			4581.00	
Change Over Sub	1.00			4582.00	
Bullnose	5.00			4587.00	51.00 Bottom Packers & Anchor

**Total Tool Length: 71.00**



**TRILOBITE  
TESTING, INC.**

# DRILL STEM TEST REPORT

**FLUID SUMMARY**

Northern Lights Oil Co

**3-19s-29w Lane,KS**

PO Box 164  
Andover KS 67002

**Keenan #3**

Job Ticket: 64309

**DST#: 6**

ATTN: Jeff Christian

Test Start: 2018.12.04 @ 12:52:51

## Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

0 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 52.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.19 in<sup>3</sup>

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 2800.00 ppm

Filter Cake: 1.00 inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
20.00	ocm 10%o 90%m	0.281

Total Length: 20.00 ft      Total Volume: 0.281 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

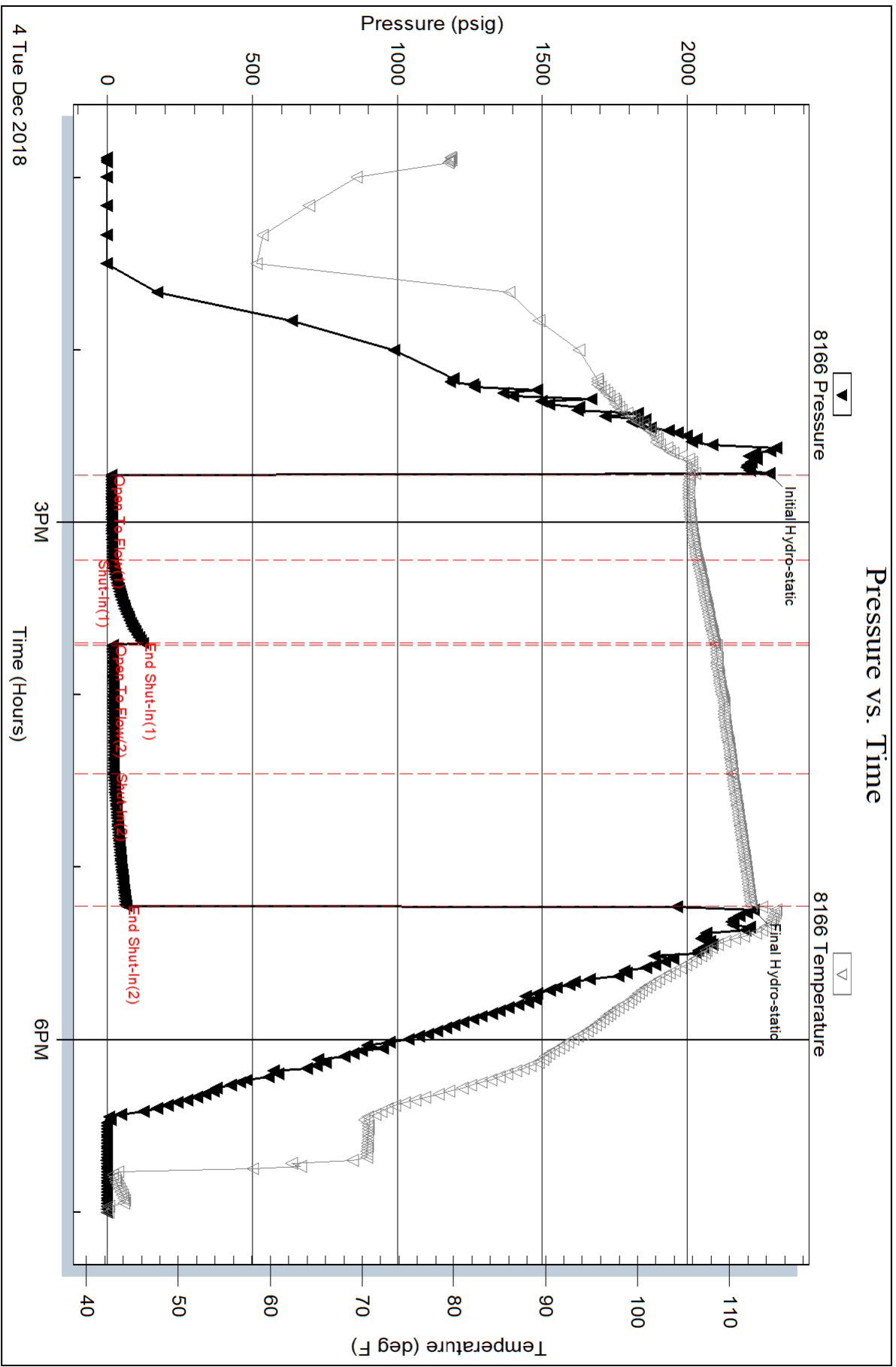
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:





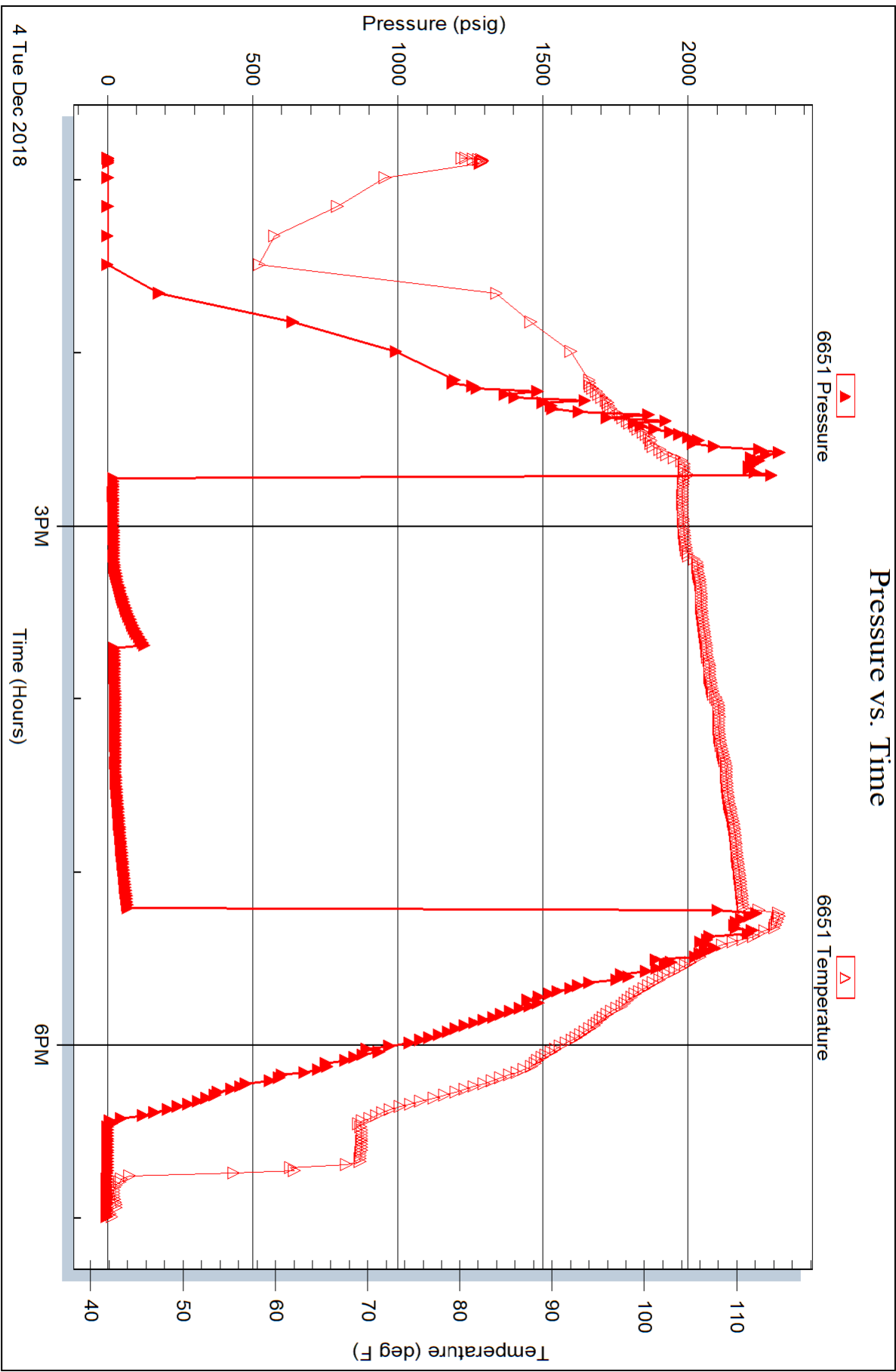
Serial #: 6651

Inside

Northern Lights Oil Co

Keenan #3

DST Test Number: 6





# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64304

Well Name & No. Keenym #3 Test No. 1 Date 11-29-18  
 Company Northern Lights oil co Elevation 2820 KB 2810 GL  
 Address P.O. Box 164 Andover KS 67002  
 Co. Rep / Geo. Jeff Christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Lane State KS

Interval Tested 4050 4086 Zone Tested LKC E-F  
 Anchor Length 36 Drill Pipe Run 4058 Mud Wt. 8.6  
 Top Packer Depth 4045 Drill Collars Run — Vis 55  
 Bottom Packer Depth 4050 Wt. Pipe Run — WL 7.2  
 Total Depth 4086 Chlorides 2400 ppm System LCM 1

Blow Description IF: 3" blow built to 10 1/2"  
IS: No return.  
FF: Surface blow built to 6", slid and opened tool  
FS: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>10</u>	<u>oil</u>	<u>100</u>			
<u>126</u>	<u>ocm</u>	<u>50</u>		<u>50</u>	
<u>378</u>	<u>ocm</u>	<u>10</u>		<u>90</u>	
<u>63</u>	<u>9ocm</u>	<u>10</u>		<u>80</u>	
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 577 BHT 116 Gravity — API RW — @ — °F Chlorides — ppm

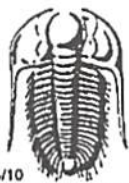
(A) Initial Hydrostatic 1988  Test 1150 T-On Location 11:00  
 (B) First Initial Flow 218  Jars \_\_\_\_\_ T-Started 12:35  
 (C) First Final Flow 257  Safety Joint \_\_\_\_\_ T-Open 15:02  
 (D) Initial Shut-In 968  Circ Sub NIL T-Pulled 17:02  
 (E) Second Initial Flow 263  Hourly Standby \_\_\_\_\_ T-Out 20:20  
 (F) Second Final Flow 286  Mileage 70 - 70 Comments Slide tool  
 (G) Final Shut-In 944  Sampler \_\_\_\_\_ 10" to bottom.  
 (H) Final Hydrostatic 1954  Straddle \_\_\_\_\_

Initial Open 30  Ruined Shale Packer \_\_\_\_\_  
 Initial Shut-In 30  Ruined Packer \_\_\_\_\_  
 Final Flow 30  Extra Copies \_\_\_\_\_  
 Final Shut-In 30  Extra Recorder \_\_\_\_\_ Sub Total 0  
 Day Standby \_\_\_\_\_ Total 1220  
 Accessibility \_\_\_\_\_ MP/DST Disc't \_\_\_\_\_  
 Sub Total 1220

Approved By Jeff Christian Our Representative [Signature]

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. 64305

Well Name & No. Keenan #3 Test No. 2 Date 11-30-18  
 Company Northern Lights oil CO Elevation 2820 KB 2810 GL  
 Address \_\_\_\_\_  
 Co. Rep / Geo. Jeff Christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Lane State KS

Interval Tested 4148 4195 Zone Tested LKC-6  
 Anchor Length \_\_\_\_\_ 47 Drill Pipe Run 4151 Mud Wt. 9.2  
 Top Packer Depth \_\_\_\_\_ 4143 Drill Collars Run \_\_\_\_\_ Vis 58  
 Bottom Packer Depth \_\_\_\_\_ 4148 Wt. Pipe Run \_\_\_\_\_ WL 7.6  
 Total Depth \_\_\_\_\_ 4195 Chlorides 3000 ppm System LCM 1  
 Blow Description IF: 3" Blow BoB in 8 min. 33"  
IS: surface blow built to 1/2.  
FF: BoB 11 min. 27"  
FS: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>2</u>	<u>Free oil</u>	<u>100</u>			
<u>189</u>	<u>90W M</u>	<u>10</u>	<u>10</u>	<u>80</u>	
<u>189</u>	<u>90LW M</u>	<u>10</u>	<u>5</u>	<u>40</u>	<u>45</u>
<u>252</u>	<u>M L W</u>		<u>80</u>	<u>20</u>	

Rec Total 632 BHT 122 Gravity \_\_\_\_\_ API RW .29 @ 40 ° F Chlorides 46,000 ppm  
 Test 1150  
 Jars 250  
 Safety Joint 75  
 Circ Sub NIC  
 Hourly Standby \_\_\_\_\_  
 Mileage 70 - 70  
 Sampler \_\_\_\_\_  
 Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1545

T-On Location 10:00  
 T-Started 11:07  
 T-Open 13:06  
 T-Pulled 15:06  
 T-Out 18:08  
 Comments \_\_\_\_\_  
 Ruined Shale Packer \_\_\_\_\_  
 Ruined Packer \_\_\_\_\_  
 Extra Copies \_\_\_\_\_  
 Sub Total 0  
 Total 1545  
 MP/DST Disc't \_\_\_\_\_

Initial Open 30  
 Initial Shut-In 30  
 Final Flow 30  
 Final Shut-In 30

Approved By Jeff Christian Our Representative \_\_\_\_\_

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64306

Well Name & No. Keenan #3 Test No. 3 Date 12-1-18  
 Company Northern Lights oil co Elevation 2820 KB 2810 GL  
 Address \_\_\_\_\_  
 Co. Rep / Geo. Jeff Christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Lane State KS

Interval Tested 4193 4223 Zone Tested LKC H  
 Anchor Length 30 Drill Pipe Run 4182 Mud Wt. 9.2  
 Top Packer Depth 4188 Drill Collars Run — Vis 58  
 Bottom Packer Depth 4193 Wt. Pipe Run — WL 7.6  
 Total Depth 4223 Chlorides 3000 ppm System LCM 1

Blow Description IF: 1/2 blow built to 1 1/2 died to 3/4.  
IS: No return.  
FF: surface blow that died in 10 min.  
FS: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>1</u>	<u>Mud 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 Total 1 BHT 110 Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic 2113  Test 1150 T-On Location 7:45  
 (B) First Initial Flow 13  Jars 250 T-Started 8:45  
 (C) First Final Flow 14  Safety Joint 75 T-Open 11:08  
 (D) Initial Shut-In 15  Circ Sub \_\_\_\_\_ T-Pulled 13:08  
 (E) Second Initial Flow 13  Hourly Standby \_\_\_\_\_ T-Out 15:02  
 (F) Second Final Flow 15  Mileage 70-70 Comments \_\_\_\_\_  
 (G) Final Shut-In 25  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2028  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_

Initial Open 30  
 Initial Shut-In 30  
 Final Flow 30  
 Final Shut-In 30  
 Sub Total 0  
 Total 1545  
 MP/DST Disc't \_\_\_\_\_  
 Sub Total 1545

Approved By [Signature] Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64307

Well Name & No. Keenm #3 Test No. 4 Date 12-2-18  
 Company Northern Lights oil co Elevation 2820 KB 2810 GL  
 Address \_\_\_\_\_  
 Co. Rep / Geo. Jeff christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Lame State KS

Interval Tested 4290 4301 Zone Tested Middle creek  
 Anchor Length \_\_\_\_\_ Drill Pipe Run 4282 Mud Wt. 9.2  
 Top Packer Depth \_\_\_\_\_ Drill Collars Run \_\_\_\_\_ Vis 56  
 Bottom Packer Depth 4290 Wt. Pipe Run \_\_\_\_\_ WL 6.8  
 Total Depth \_\_\_\_\_ Chlorides 6000 ppm System LCM 1  
 Blow Description IF: 1/4 blow built to 3'  
IS: No return.  
FF: 1/2 blow built to 5 3/4.  
FS: No return.

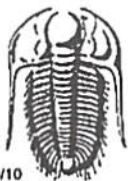
Rec	Feet of	%gas	%oil	%water	%mud
<u>16</u>	<u>Free oil</u>	<u>100</u>			
<u>10</u>	<u>ocm</u>	<u>10</u>		<u>90</u>	
	<u>103 GIP</u>				

Rec Total 20 BHT 114 Gravity 34 API RW - @ - ° F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic <u>2115</u>	<input checked="" type="checkbox"/> Test <u>1150</u>	T-On Location <u>6:30</u>
(B) First Initial Flow <u>12</u>	<input type="checkbox"/> Jars _____	T-Started <u>6:48</u>
(C) First Final Flow <u>16</u>	<input type="checkbox"/> Safety Joint _____	T-Open <u>9:05</u>
(D) Initial Shut-In <u>150</u>	<input checked="" type="checkbox"/> Circ Sub <u>NIC</u>	T-Pulled <u>11:35</u>
(E) Second Initial Flow <u>16</u>	<input type="checkbox"/> Hourly Standby _____	T-Out <u>13:28</u>
(F) Second Final Flow <u>26</u>	<input checked="" type="checkbox"/> Mileage <u>70 - 70</u>	Comments <u>cat walk</u>
(G) Final Shut-In <u>148</u>	<input type="checkbox"/> Sampler _____	<u>is unsafe and</u>
(H) Final Hydrostatic <u>2073</u>	<input type="checkbox"/> Straddle _____	<u>been covered with pipe</u>
	<input type="checkbox"/> Shale Packer _____	<u>every test</u>
Initial Open <u>30</u>	<input type="checkbox"/> Extra Packer _____	<input type="checkbox"/> Ruined Shale Packer _____
Initial Shut-In <u>30</u>	<input type="checkbox"/> Extra Recorder _____	<input type="checkbox"/> Ruined Packer _____
Final Flow <u>45</u>	<input type="checkbox"/> Day Standby _____	Extra Copies _____
Final Shut-In <u>45</u>	<input checked="" type="checkbox"/> Accessibility <u>150.00</u>	Sub Total <u>0</u>
	Sub Total <u>1220</u>	Total <u>1220</u>

Approved By Jeff Christian Our Representative \_\_\_\_\_  
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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64308

Well Name & No. Keen9N #3 Test No. 5 Date 12-3-18  
 Company Northern Lights oil co Elevation 2820 KB 2810 GL  
 Address \_\_\_\_\_  
 Co. Rep / Geo. Jeff Christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Lane State KS

Interval Tested 4394 4430 Zone Tested Altamont  
 Anchor Length 36 Drill Pipe Run 4379 Mud Wt. 9.1  
 Top Packer Depth 4389 Drill Collars Run — Vis 45  
 Bottom Packer Depth 4394 Wt. Pipe Run — WL 6.8  
 Total Depth 4430 Chlorides 2800 ppm System LCM 1  
 Blow Description IF: BoB in 4 mins. 35"  
IS: Weak surface blow never built,  
FF: BoB in 5 min. 26"  
FS: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>272</u>	<u>WCM</u>		<u>30</u>	<u>20</u>	
<u>378</u>	<u>MCW</u>		<u>70</u>	<u>30</u>	
	<u>50 ppm H<sub>2</sub>S</u>				
Rec Total	<u>650</u>	BHT <u>128</u>	Gravity <u>—</u>	API RW <u>.33 @ 35 °F</u>	Chlorides <u>45,000</u> ppm

(A) Initial Hydrostatic 2247  Test 1150 T-On Location 8:30  
 (B) First Initial Flow 30  Jars \_\_\_\_\_ T-Started 6:00  
 (C) First Final Flow 199  Safety Joint \_\_\_\_\_ T-Open 8:45  
 (D) Initial Shut-In 484  Circ Sub NIL T-Pulled 10:30  
 (E) Second Initial Flow 198  Hourly Standby \_\_\_\_\_ T-Out 13:05  
 (F) Second Final Flow 310  Mileage 70 - 70 Comments \_\_\_\_\_  
 (G) Final Shut-In 482  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2141  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1220

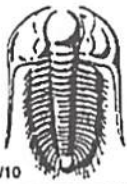
Initial Open 15  
 Initial Shut-In 30  
 Final Flow 15  
 Final Shut-In 45

Sub Total 0  
 Total 1220  
 MP/DST Disc't \_\_\_\_\_

Approved By [Signature] Our Representative [Signature]

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# TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

## Test Ticket

NO. 64309

Well Name & No. Keenan #3 Test No. 6 Date 12-4-18  
 Company Northern Lights oil co Elevation 2820 KB 2810 GL  
 Address \_\_\_\_\_  
 Co. Rep / Geo. Jeff Christian Rig Southwind #1  
 Location: Sec. 3 Twp 19S Rge. 29W Co. Linn State KS

Interval Tested 4536 4587 Zone Tested Johnson  
 Anchor Length \_\_\_\_\_ Drill Pipe Run 4536 Mud Wt. 9.0  
 Top Packer Depth \_\_\_\_\_ Drill Collars Run \_\_\_\_\_ Vis 52  
 Bottom Packer Depth \_\_\_\_\_ Wt. Pipe Run \_\_\_\_\_ WL 7.2  
 Total Depth 4587 Chlorides 2800 ppm System LCM 1

Blow Description IF: 1/4 blow built to 1 1/2.  
IS: No return.  
EF: surface blow built to 1/2.  
FS: No return.

Rec	Feet of	%gas	%oil	%water	%mud
<u>20</u>	<u>OCM</u>	<u>10</u>		<u>90</u>	
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____
Rec _____	Feet of _____	%gas _____	%oil _____	%water _____	%mud _____

Rec Total 20 BHT 112 Gravity \_\_\_\_\_ API RW \_\_\_\_\_ @ \_\_\_\_\_ ° F Chlorides \_\_\_\_\_ ppm

(A) Initial Hydrostatic 2281  Test 1150  
 (B) First Initial Flow 14  Jars \_\_\_\_\_  
 (C) First Final Flow 17  Safety Joint \_\_\_\_\_  
 (D) Initial Shut-In 121  Circ Sub N/C  
 (E) Second Initial Flow 19  Hourly Standby \_\_\_\_\_  
 (F) Second Final Flow 22  Mileage 90 + 2 70+70  
 (G) Final Shut-In 64  Sampler \_\_\_\_\_  
 (H) Final Hydrostatic 2228  Straddle \_\_\_\_\_  
 Shale Packer \_\_\_\_\_  
 Extra Packer \_\_\_\_\_  
 Extra Recorder \_\_\_\_\_  
 Day Standby \_\_\_\_\_  
 Accessibility \_\_\_\_\_  
 Sub Total 1290

T-On Location 12:10  
 T-Started 12:52  
 T-Open 14:41  
 T-Pulled 17:11  
 T-Out 19:00

Comments \_\_\_\_\_  
 Ruined Shale Packer \_\_\_\_\_  
 Ruined Packer 320  
 Extra Copies \_\_\_\_\_  
 Sub Total 320  
 Total 1610  
 MP/DST Disc't \_\_\_\_\_

Approved By Jeff Christian Our Representative [Signature]

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