



DRILL STEM TEST REPORT

Prepared For: **Larson Engineering**

562 W State Rd 4
Olmitz, KS 67564-8561

ATTN: Vern Schrag

Marlin #1-23

23-18s-29w Lane,KS

Start Date: 2014.12.10 @ 16:16:05

End Date: 2014.12.10 @ 21:35:05

Job Ticket #: 59722 DST #: 1

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

Printed: 2014.12.17 @ 13:04:09



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59722

DST#: 1

Test Start: 2014.12.10 @ 16:16:05

GENERAL INFORMATION:

Formation: **LKC I**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 18:20:20

Time Test Ended: 21:35:05

Test Type: Conventional Bottom Hole (Initial)

Tester: Shane McBride

Unit No: 55

Interval: 4192.00 ft (KB) To 4221.00 ft (KB) (TVD)

Reference Elevations: 2796.00 ft (KB)

Total Depth: 4221.00 ft (KB) (TVD)

2787.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Fair

KB to GR/CF: 9.00 ft

Serial #: 6771 Inside

Press@RunDepth: 60.31 psig @ 4193.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2014.12.10

End Date: 2014.12.10

Last Calib.: 2014.12.10

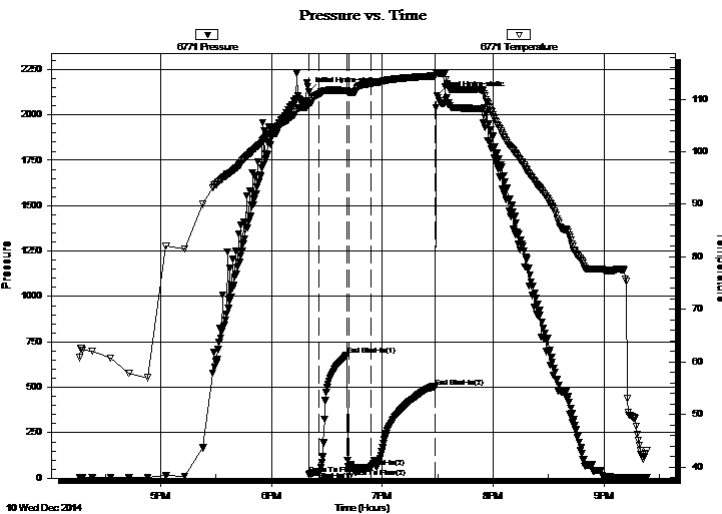
Start Time: 16:16:05

End Time: 21:23:05

Time On Btm: 2014.12.10 @ 18:20:05

Time Off Btm: 2014.12.10 @ 19:29:35

TEST COMMENT: 2" blow
No return
2 3/4" blow
No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2126.15	109.62	Initial Hydro-static
1	19.86	108.84	Open To Flow (1)
6	36.20	111.01	Shut-In(1)
21	678.87	111.68	End Shut-In(1)
22	54.62	111.37	Open To Flow (2)
34	60.31	113.04	Shut-In(2)
69	502.63	114.40	End Shut-In(2)
70	2107.50	115.10	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
40.00	h o c m tr gas 40%o 60%m	0.20
30.00	m c o tr gas 40%m 60%o	0.15

Gas Rates

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



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DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59722

DST#: 1

Test Start: 2014.12.10 @ 16:16:05

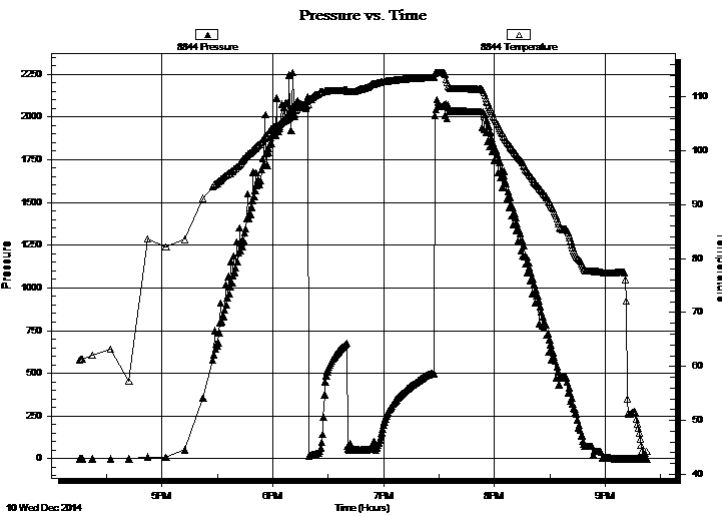
GENERAL INFORMATION:

Formation: **LKC I**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 18:20:20
 Time Test Ended: 21:35:05
 Interval: **4192.00 ft (KB) To 4221.00 ft (KB) (TVD)**
 Total Depth: 4221.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Initial)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 8844 Outside

Press@RunDepth: psig @ 4193.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.10 End Date: 2014.12.10 Last Calib.: 1899.12.30
 Start Time: 16:15:25 End Time: 21:22:25 Time On Btm:
 Time Off Btm:

TEST COMMENT: 2" blow
 No return
 2 3/4" blow
 No return



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
40.00	h o c m tr gas 40%o 60%m	0.20
30.00	m c o tr gas 40%m 60%o	0.15

Gas Rates

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



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59722

DST#: 1

ATTN: Vern Schrag

Test Start: 2014.12.10 @ 16:16:05

Tool Information

Drill Pipe:	Length: 4046.00 ft	Diameter: 3.80 inches	Volume: 56.75 bbl	Tool Weight: 1500.00 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: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 57.36 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	6.00 ft			String Weight: Initial 50000.00 lb
Depth to Top Packer:	4192.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	29.00 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			4165.00	
Shut In Tool	5.00			4170.00	
Hydraulic tool	5.00			4175.00	
Jars	5.00			4180.00	
Safety Joint	3.00			4183.00	
Packer	5.00			4188.00	28.00 Bottom Of Top Packer
Packer	4.00			4192.00	
Stubb	1.00			4193.00	
Recorder	0.00	6771	Inside	4193.00	
Recorder	0.00	8844	Outside	4193.00	
Perforations	23.00			4216.00	
Bullnose	5.00			4221.00	29.00 Bottom Packers & Anchor

Total Tool Length: 57.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59722

DST#: 1

ATTN: Vern Schrag

Test Start: 2014.12.10 @ 16:16:05

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: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.56 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
40.00	h o c m tr gas 40%o 60%m	0.197
30.00	m c o tr gas 40%m 60%o	0.148

Total Length: 70.00 ft Total Volume: 0.345 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

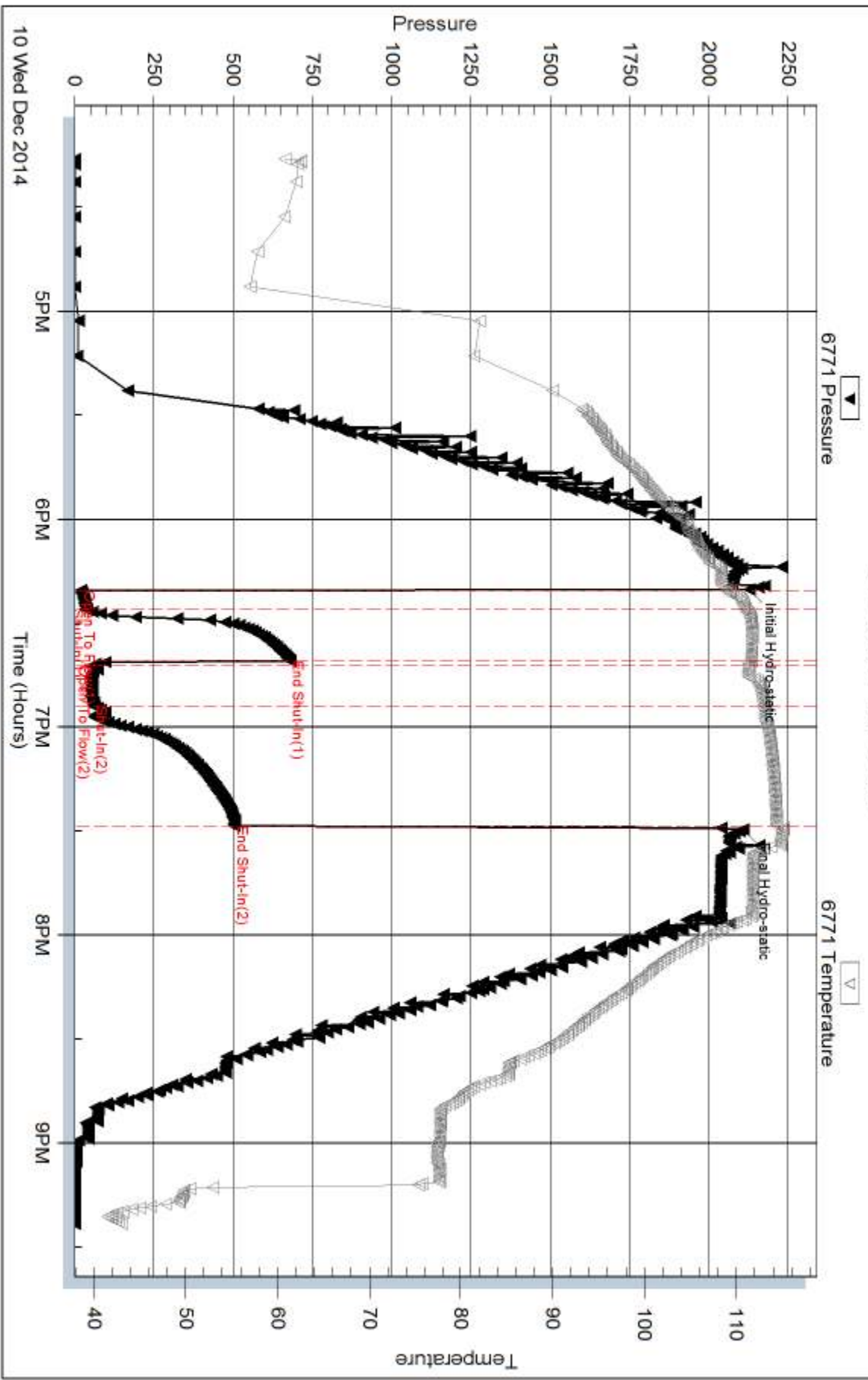
Serial #:

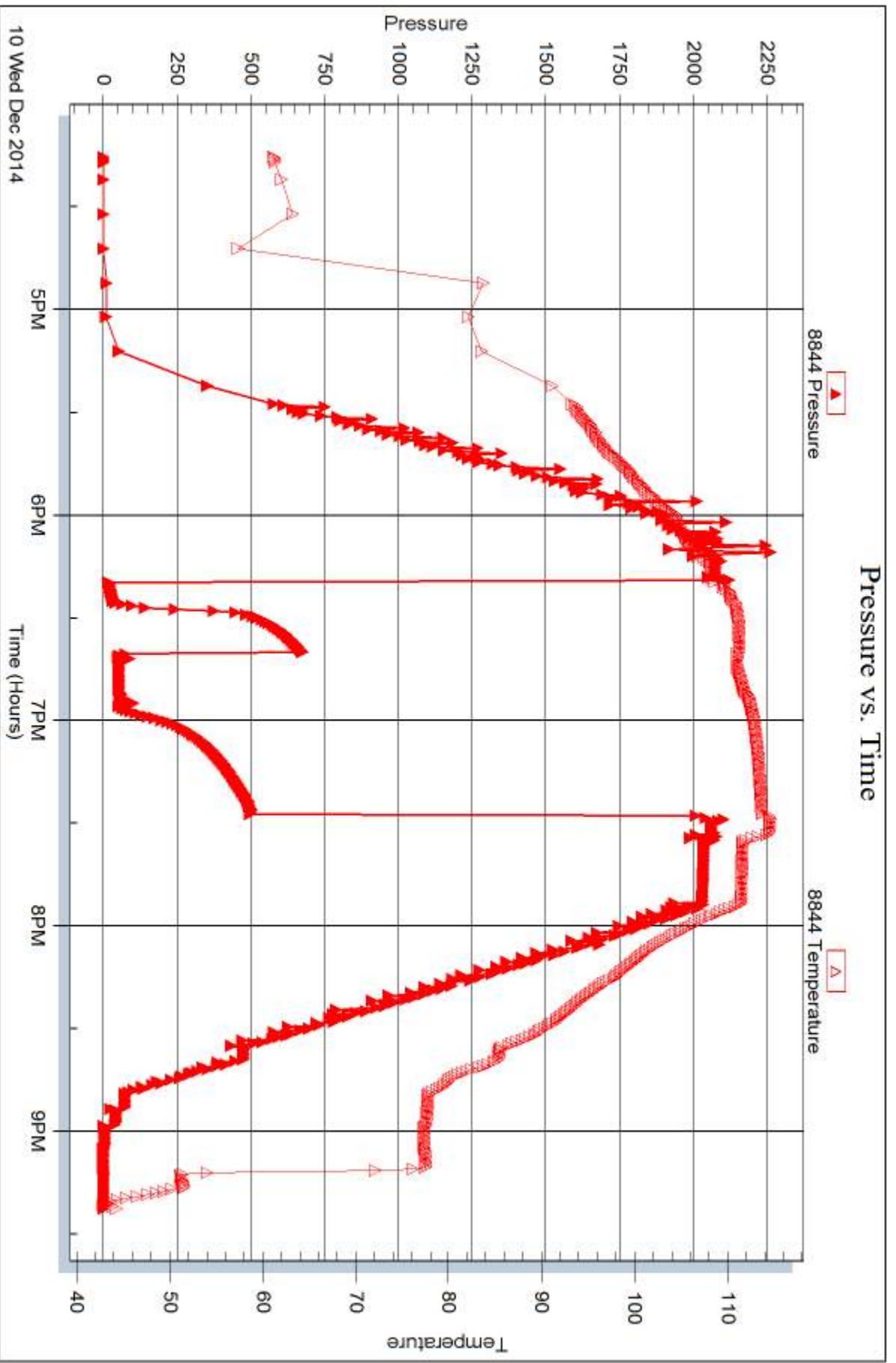
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering**

562 W State Rd 4
Olmitz, KS 67564-8561

ATTN: Vern Schrag

Marlin #1-23

23-18s-29w Lane,KS

Start Date: 2014.12.11 @ 10:25:49

End Date: 2014.12.11 @ 15:35:49

Job Ticket #: 59723 DST #: 2

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

Printed: 2014.12.17 @ 13:02:56



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59723

DST#: 2

Test Start: 2014.12.11 @ 10:25:49

GENERAL INFORMATION:

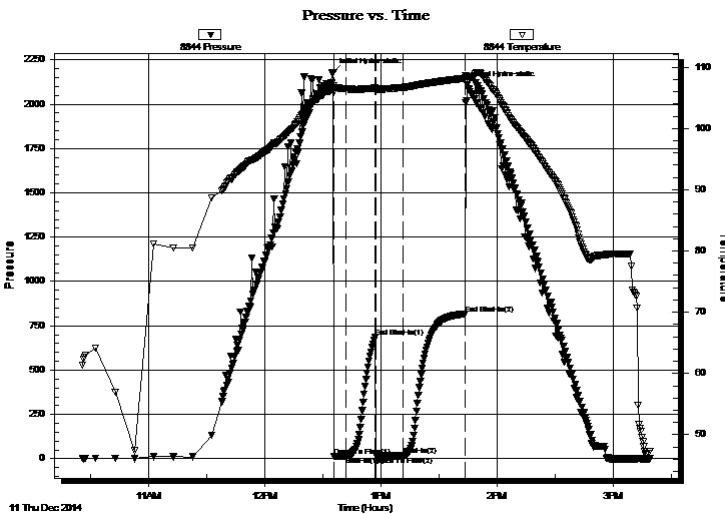
Formation: **LKC K**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:35:34
 Time Test Ended: 15:35:49
 Interval: **4251.00 ft (KB) To 4268.00 ft (KB) (TVD)**
 Total Depth: 4268.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 8844 Outside

Press@RunDepth: 17.02 psig @ 4252.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.11 End Date: 2014.12.11 Last Calib.: 2014.12.11
 Start Time: 10:25:49 End Time: 15:18:49 Time On Btm: 2014.12.11 @ 12:35:19
 Time Off Btm: 2014.12.11 @ 13:44:34

TEST COMMENT: 1/4" blow died back to a surface blow
 No return
 Weak surface blow died in 3 min.
 No return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2179.46	106.95	Initial Hydro-static
1	13.17	105.80	Open To Flow (1)
7	15.61	106.45	Shut-In(1)
22	684.22	106.58	End Shut-In(1)
22	16.08	106.38	Open To Flow (2)
36	17.02	106.70	Shut-In(2)
68	816.31	108.20	End Shut-In(2)
70	2107.97	108.39	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
1.00	mud oil spots on top 100%m	0.00

* Recovery from multiple tests

Gas Rates

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



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DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

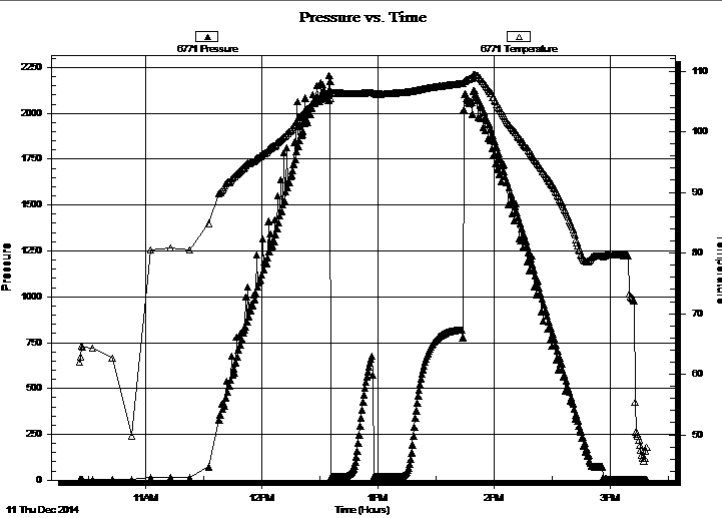
23-18s-29w Lane, KS
Marlin #1-23
Job Ticket: 59723 **DST#: 2**
Test Start: 2014.12.11 @ 10:25:49

GENERAL INFORMATION:

Formation: **LKC K**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 12:35:34
 Time Test Ended: 15:35:49
 Interval: **4251.00 ft (KB) To 4268.00 ft (KB) (TVD)**
 Total Depth: 4268.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 6771 Inside
 Press@RunDepth: psig @ 4252.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.11 End Date: 2014.12.11 Last Calib.: 2014.12.11
 Start Time: 10:25:39 End Time: 15:18:54 Time On Btm:
 Time Off Btm:

TEST COMMENT: 1/4" blow died back to a surface blow
 No return
 Weak surface blow died in 3 min.
 No return



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

Recovery		
Length (ft)	Description	Volume (bbl)
1.00	mud oil spots on top 100%m	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

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59723

DST#: 2

ATTN: Vern Schrag

Test Start: 2014.12.11 @ 10:25:49

Tool Information

Drill Pipe:	Length: 4108.00 ft	Diameter: 3.80 inches	Volume: 57.62 bbl	Tool Weight: 1500.00 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: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose: 65000.00 lb
			<u>Total Volume: 58.23 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	9.00 ft			String Weight: Initial 51000.00 lb
Depth to Top Packer:	4251.00 ft			Final 51000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	17.00 ft			
Tool Length:	45.00 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			4224.00	
Shut In Tool	5.00			4229.00	
Hydraulic tool	5.00			4234.00	
Jars	5.00			4239.00	
Safety Joint	3.00			4242.00	
Packer	5.00			4247.00	28.00 Bottom Of Top Packer
Packer	4.00			4251.00	
Stubb	1.00			4252.00	
Recorder	0.00	6771	Inside	4252.00	
Recorder	0.00	8844	Outside	4252.00	
Perforations	11.00			4263.00	
Bullnose	5.00			4268.00	17.00 Bottom Packers & Anchor

Total Tool Length: 45.00



**TRILOBITE
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DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59723

DST#: 2

ATTN: Vern Schrag

Test Start: 2014.12.11 @ 10:25:49

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: 56.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.56 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
1.00	mud oil spots on top 100%m	0.005

Total Length: 1.00 ft Total Volume: 0.005 bbl

Num Fluid Samples: 0

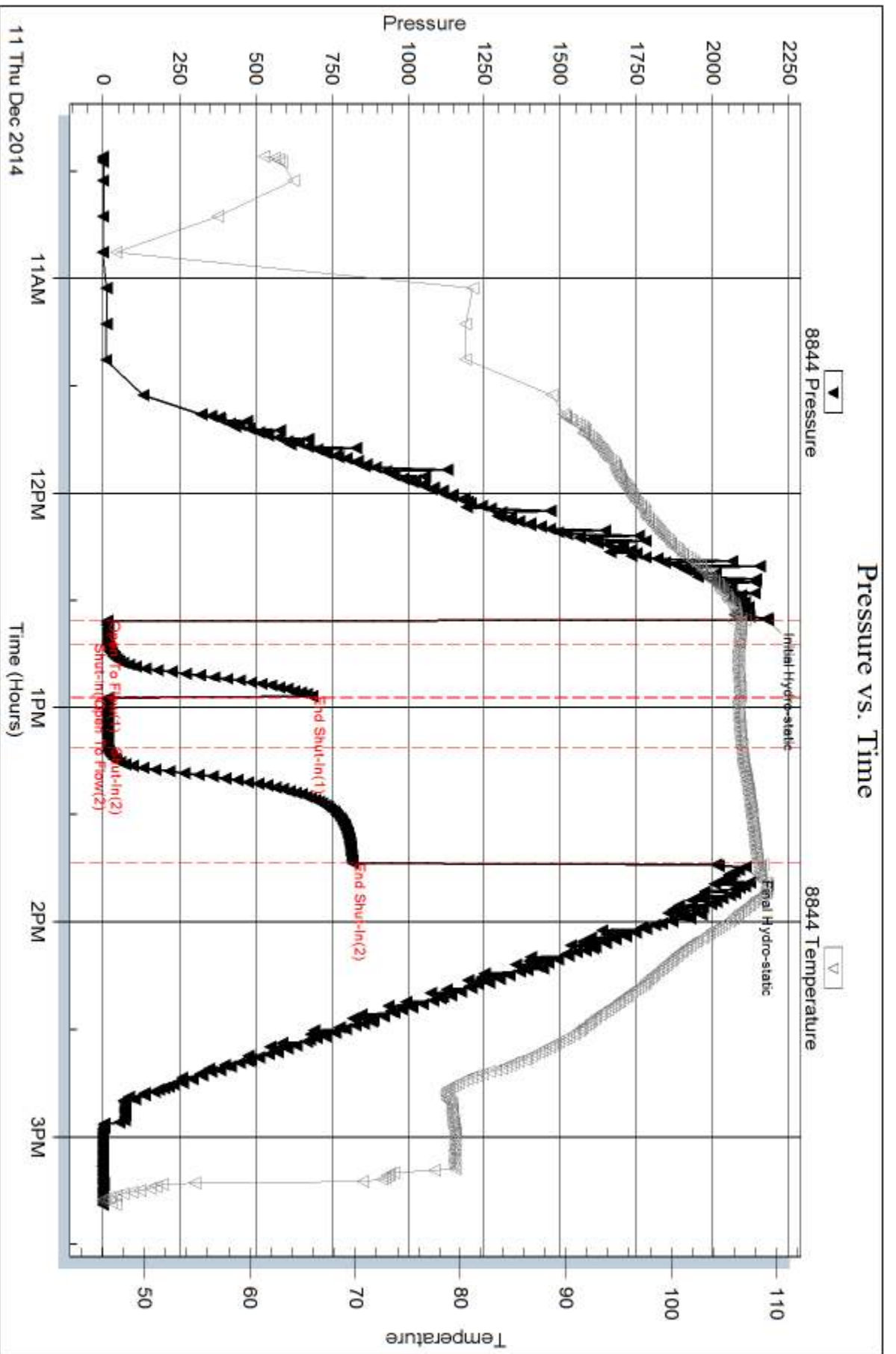
Num Gas Bombs: 0

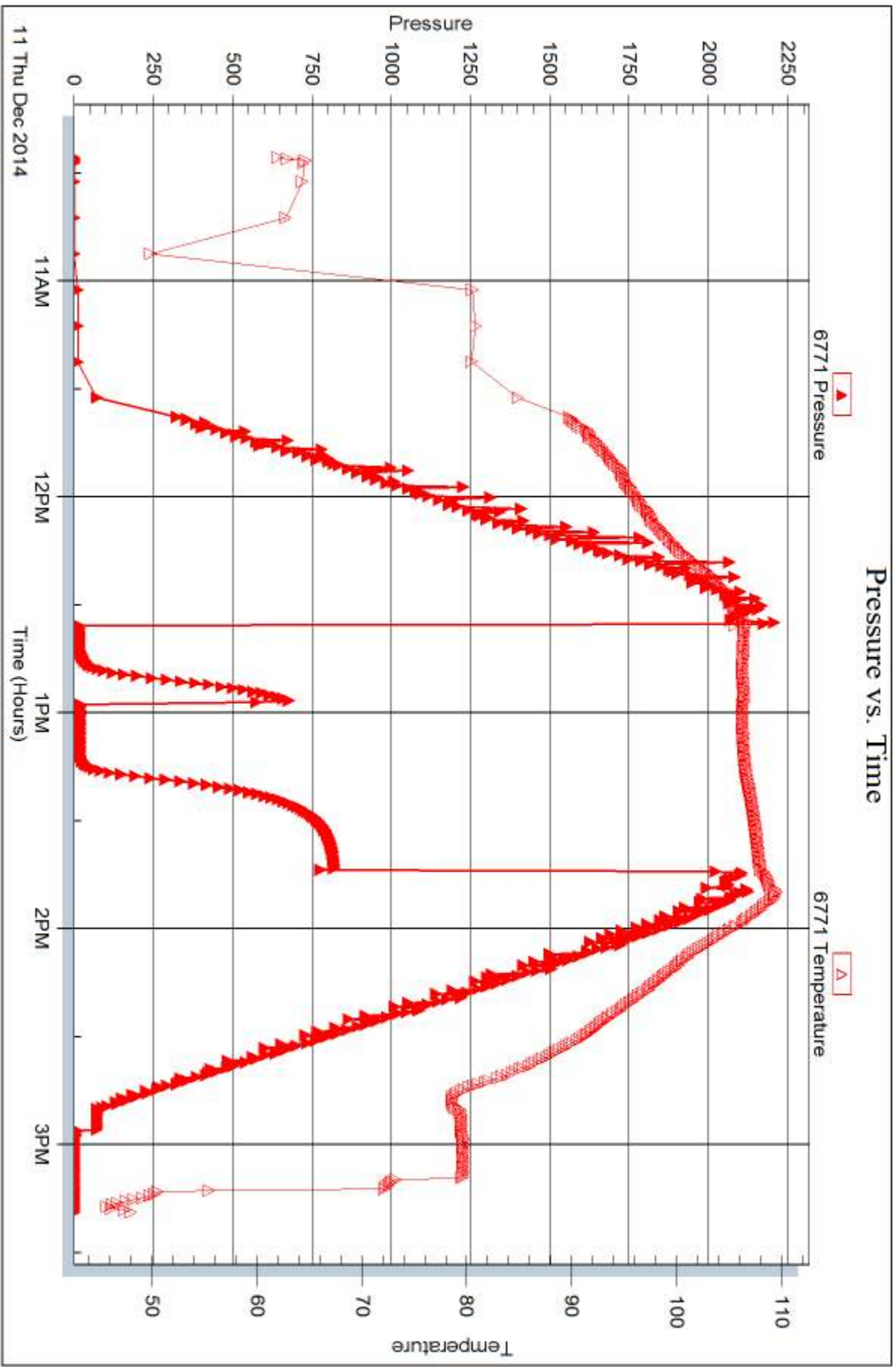
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering**

562 W State Rd 4
Olmitz, KS 67564-8561

ATTN: Vern Schrag

Marlin #1-23

23-18s-29w Lane,KS

Start Date: 2014.12.12 @ 14:01:00

End Date: 2014.12.12 @ 20:12:30

Job Ticket #: 59724 DST #: 3

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

Printed: 2014.12.17 @ 12:01:41



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59724

DST#: 3

Test Start: 2014.12.12 @ 14:01:00

GENERAL INFORMATION:

Formation: **Marmaton**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 16:01:00
 Time Test Ended: 20:12:30
 Interval: **4337.00 ft (KB) To 4430.00 ft (KB) (TVD)**
 Total Depth: 4430.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

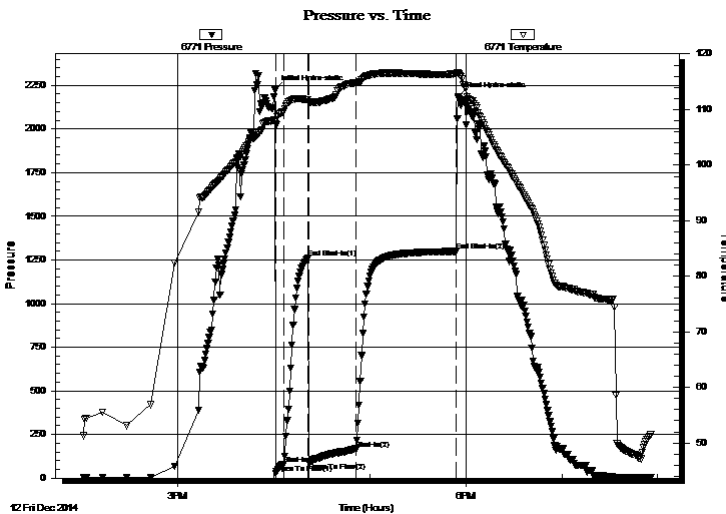
Serial #: 6771

Inside

Press@RunDepth: 167.71 psig @ 4338.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.12 End Date: 2014.12.12 Last Calib.: 2014.12.12
 Start Time: 14:01:00 End Time: 19:55:30 Time On Btm: 2014.12.12 @ 16:00:45
 Time Off Btm: 2014.12.12 @ 17:55:15

TEST COMMENT: 6" blow
 No return
 B.O.B. in 9 min.
 Return blow built to 3 1/2" in 14 min. died back to 1 1/4"

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2223.88	108.11	Initial Hydro-static
1	27.61	107.36	Open To Flow (1)
6	80.54	109.70	Shut-In(1)
21	1259.18	111.77	End Shut-In(1)
21	89.21	111.15	Open To Flow (2)
51	167.71	114.84	Shut-In(2)
114	1299.67	116.46	End Shut-In(2)
115	2185.85	116.44	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
124.00	g m c o 25g 15m 60o	0.61
124.00	g m c o 20g 25m 55o	1.74
92.00	g o c m 20g 15o 65m	1.29
0.00	402' gas in pipe	0.00

Gas Rates

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

* Recovery from multiple tests



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

Larson Engineering
562 W State Rd 4
Olmitz, KS 67564-8561
ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59724

DST#: 3

Test Start: 2014.12.12 @ 14:01:00

GENERAL INFORMATION:

Formation: **Marmaton**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 16:01:00

Time Test Ended: 20:12:30

Test Type: Conventional Bottom Hole (Reset)

Tester: Shane McBride

Unit No: 55

Interval: 4337.00 ft (KB) To 4430.00 ft (KB) (TVD)

Total Depth: 4430.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Fair

Reference Elevations: 2796.00 ft (KB)

2787.00 ft (CF)

KB to GR/CF: 9.00 ft

Serial #: 8844 Outside

Press@RunDepth: psig @ 4338.00 ft (KB)

Start Date: 2014.12.12

End Date: 2014.12.12

Start Time: 14:00:40

End Time: 19:54:55

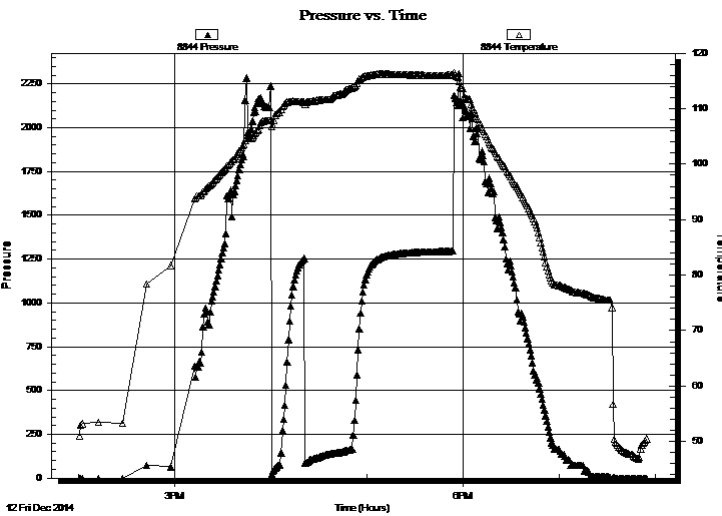
Capacity: 8000.00 psig

Last Calib.: 2014.12.12

Time On Btm:

Time Off Btm:

TEST COMMENT: 6" blow
No return
B.O.B. in 9 min.
Return blow built to 3 1/2" in 14 min. died back to 1 1/4"



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
124.00	g m c o 25g 15m 60o	0.61
124.00	g m c o 20g 25m 55o	1.74
92.00	g o c m 20g 15o 65m	1.29
0.00	402' gas in pipe	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

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59724

DST#: 3

ATTN: Vern Schrag

Test Start: 2014.12.12 @ 14:01:00

Tool Information

Drill Pipe:	Length: 4203.00 ft	Diameter: 3.80 inches	Volume: 58.96 bbl	Tool Weight:	2500.00 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: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose:	75000.00 lb
			<u>Total Volume: 59.57 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	18.00 ft			String Weight: Initial	52000.00 lb
Depth to Top Packer:	4337.00 ft			Final	53000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	93.00 ft				
Tool Length:	121.00 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			4310.00	
Shut In Tool	5.00			4315.00	
Hydraulic tool	5.00			4320.00	
Jars	5.00			4325.00	
Safety Joint	3.00			4328.00	
Packer	5.00			4333.00	28.00 Bottom Of Top Packer
Packer	4.00			4337.00	
Stubb	1.00			4338.00	
Recorder	0.00	6771	Inside	4338.00	
Recorder	0.00	8844	Outside	4338.00	
Perforations	22.00			4360.00	
Change Over Sub	1.00			4361.00	
Drill Pipe	63.00			4424.00	
Change Over Sub	1.00			4425.00	
Bullnose	5.00			4430.00	93.00 Bottom Packers & Anchor

Total Tool Length: 121.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering

23-18s-29w Lane, KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59724

DST#: 3

ATTN: Vern Schrag

Test Start: 2014.12.12 @ 14:01:00

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: 62.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.18 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 3800.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
124.00	g m c o 25g 15m 60o	0.610
124.00	g m c o 20g 25m 55o	1.739
92.00	g o c m 20g 15o 65m	1.291
0.00	402' gas in pipe	0.000

Total Length: 340.00 ft

Total Volume: 3.640 bbl

Num Fluid Samples: 0

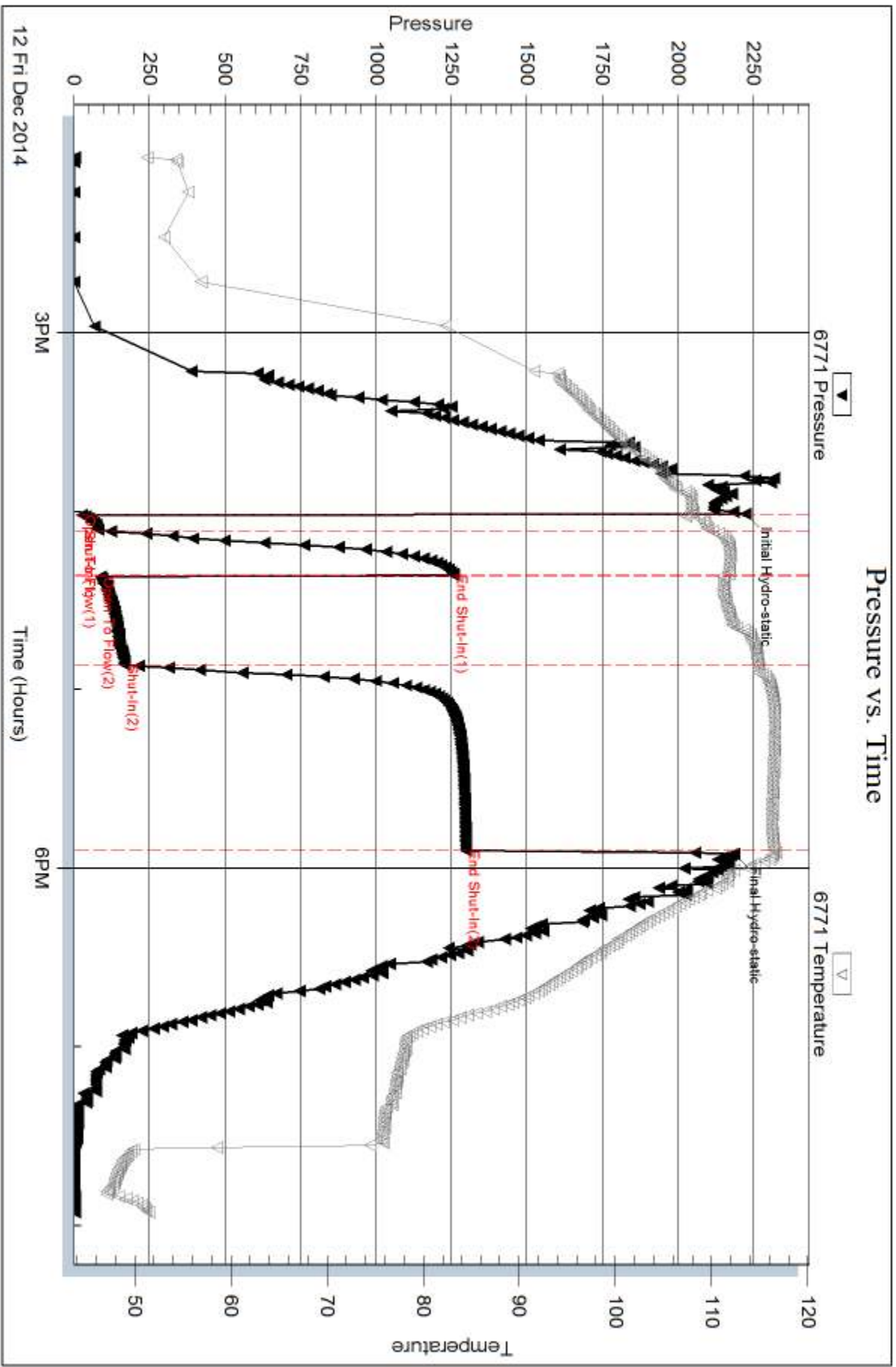
Num Gas Bombs: 0

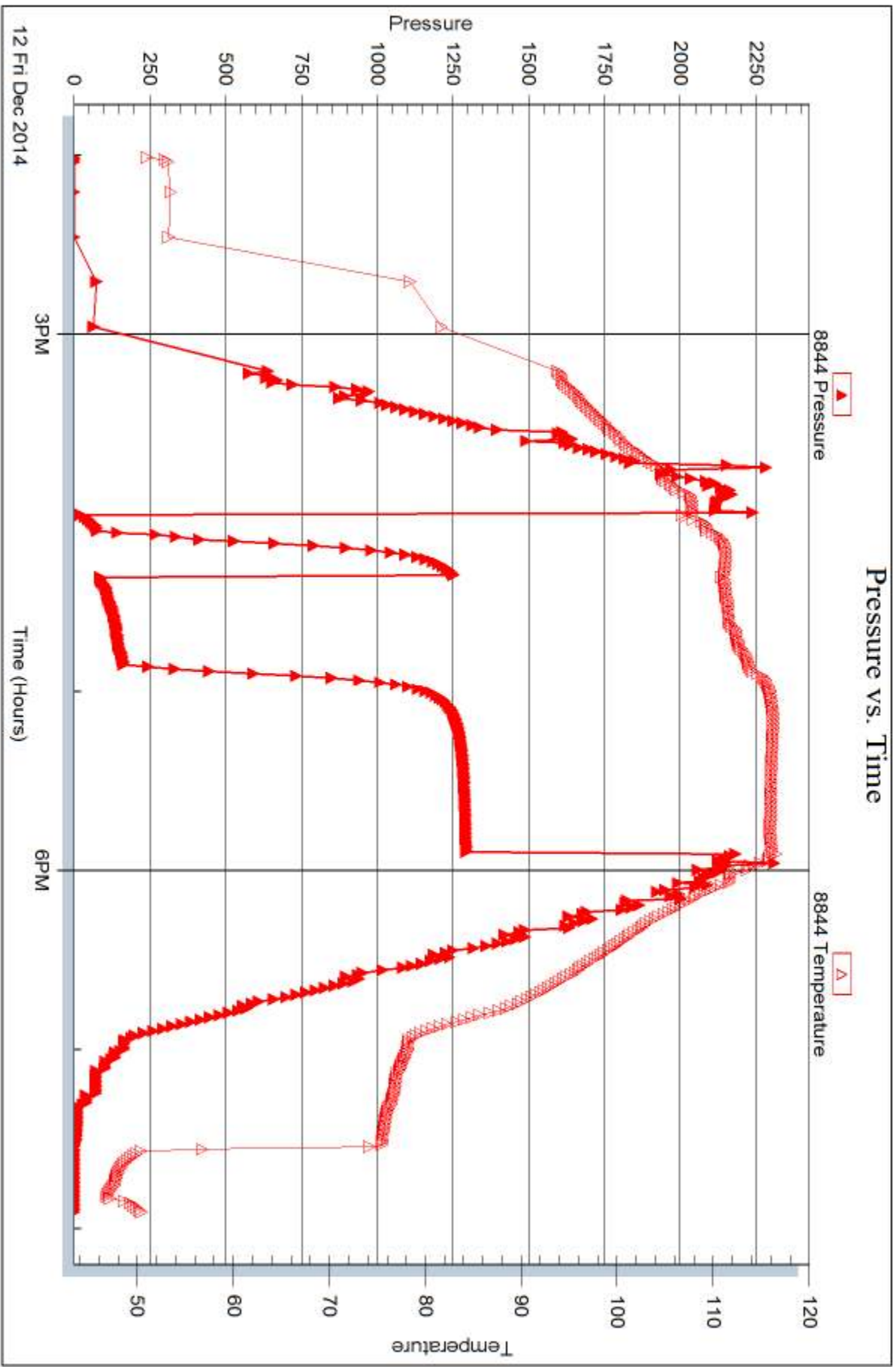
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:







DRILL STEM TEST REPORT

Prepared For: **Larson Engineering**

562 W State Rd 4
Olmitz, KS 67564-8561

ATTN: Vern Schrag

Marlin #1-23

23-18s-29w Lane,KS

Start Date: 2014.12.13 @ 14:50:37

End Date: 2014.12.13 @ 21:05:52

Job Ticket #: 59725 DST #: 4

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

Printed: 2014.12.17 @ 12:00:39



TRILOBITE TESTING, INC

DRILL STEM TEST REPORT

Larson Engineering
 562 W State Rd 4
 Olmitz, KS 67564-8561
 ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59725

DST#: 4

Test Start: 2014.12.13 @ 14:50:37

GENERAL INFORMATION:

Formation: **Johnson**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 16:58:22
 Time Test Ended: 21:05:52
 Interval: **4470.00 ft (KB) To 4590.00 ft (KB) (TVD)**
 Total Depth: 4590.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

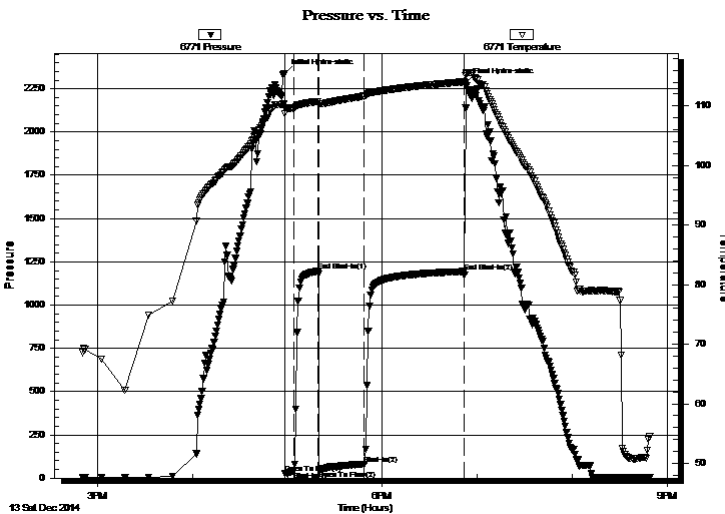
Serial #: 6771

Inside

Press@RunDepth: 81.81 psig @ 4471.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.13 End Date: 2014.12.13 Last Calib.: 2014.12.13
 Start Time: 14:50:37 End Time: 20:48:52 Time On Btm: 2014.12.13 @ 16:58:07
 Time Off Btm: 2014.12.13 @ 18:52:52

TEST COMMENT: 1 3/4" blow
 No return
 11" blow
 No return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2339.49	110.30	Initial Hydro-static
1	24.97	108.77	Open To Flow (1)
6	41.30	109.67	Shut-In(1)
22	1195.92	110.77	End Shut-In(1)
22	46.74	110.28	Open To Flow (2)
51	81.81	111.66	Shut-In(2)
114	1193.82	114.06	End Shut-In(2)
115	2285.64	115.38	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
62.00	s g o c m 3g 32o 65m	0.30
72.00	s g m c o 3g 42m 55o	0.45
20.00	c o tr of gas 100%	0.28
0.00	90' very weak gas in pipe	0.00

* Recovery from multiple tests

Gas Rates

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



DRILL STEM TEST REPORT

Larson Engineering
 562 W State Rd 4
 Olmitz, KS 67564-8561
 ATTN: Vern Schrag

23-18s-29w Lane, KS

Marlin #1-23

Job Ticket: 59725

DST#: 4

Test Start: 2014.12.13 @ 14:50:37

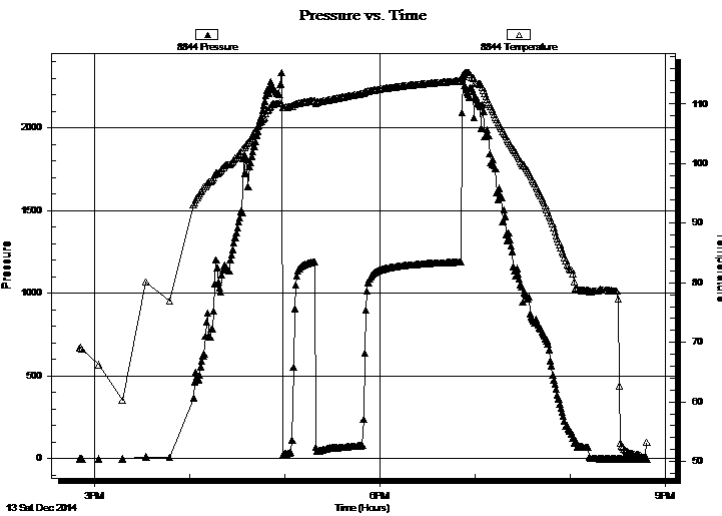
GENERAL INFORMATION:

Formation: **Johnson**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 16:58:22
 Time Test Ended: 21:05:52
 Interval: **4470.00 ft (KB) To 4590.00 ft (KB) (TVD)**
 Total Depth: 4590.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches
 Hole Condition: Fair
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Shane McBride
 Unit No: 55
 Reference Elevations: 2796.00 ft (KB)
 2787.00 ft (CF)
 KB to GR/CF: 9.00 ft

Serial #: 8844 Outside

Press@RunDepth: psig @ 4471.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2014.12.13 End Date: 2014.12.13 Last Calib.: 2014.12.13
 Start Time: 14:50:41 End Time: 20:48:41 Time On Btm:
 Time Off Btm:

TEST COMMENT: 1 3/4" blow
 No return
 11" blow
 No return



PRESSURE SUMMARY

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

Recovery

Length (ft)	Description	Volume (bbl)
62.00	s g o c m 3g 32o 65m	0.30
72.00	s g m c o 3g 42m 55o	0.45
20.00	c o t r of gas 100%o	0.28
0.00	90' very weak gas in pipe	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

Larson Engineering

23-18s-29w Lane,KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59725

DST#: 4

ATTN: Vern Schrag

Test Start: 2014.12.13 @ 14:50:37

Tool Information

Drill Pipe:	Length: 4328.00 ft	Diameter: 3.80 inches	Volume: 60.71 bbl	Tool Weight:	2500.00 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: 124.00 ft	Diameter: 2.25 inches	Volume: 0.61 bbl	Weight to Pull Loose:	70000.00 lb
			<u>Total Volume: 61.32 bbl</u>	Tool Chased	0.00 ft
Drill Pipe Above KB:	10.00 ft			String Weight: Initial	53000.00 lb
Depth to Top Packer:	4470.00 ft			Final	54000.00 lb
Depth to Bottom Packer:	ft				
Interval between Packers:	120.00 ft				
Tool Length:	148.00 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			4443.00	
Shut In Tool	5.00			4448.00	
Hydraulic tool	5.00			4453.00	
Jars	5.00			4458.00	
Safety Joint	3.00			4461.00	
Packer	5.00			4466.00	28.00 Bottom Of Top Packer
Packer	4.00			4470.00	
Stubb	1.00			4471.00	
Recorder	0.00	6771	Inside	4471.00	
Recorder	0.00	8844	Outside	4471.00	
Perforations	19.00			4490.00	
Change Over Sub	1.00			4491.00	
Drill Pipe	93.00			4584.00	
Change Over Sub	1.00			4585.00	
Bullnose	5.00			4590.00	120.00 Bottom Packers & Anchor

Total Tool Length: 148.00



**TRILOBITE
TESTING, INC**

DRILL STEM TEST REPORT

FLUID SUMMARY

Larson Engineering

23-18s-29w Lane,KS

562 W State Rd 4
Olmitz, KS 67564-8561

Marlin #1-23

Job Ticket: 59725

DST#: 4

ATTN: Vern Schrag

Test Start: 2014.12.13 @ 14:50:37

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

31 deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 74.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 7.98 in³

Gas Cushion Type:

Resistivity: 0.00 ohm.m

Gas Cushion Pressure:

psig

Salinity: 4600.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbbl
62.00	s g o c m 3g 32o 65m	0.305
72.00	s g m c o 3g 42m 55o	0.445
20.00	c o tr of gas 100%o	0.281
0.00	90' very weak gas in pipe	0.000

Total Length: 154.00 ft

Total Volume: 1.031 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

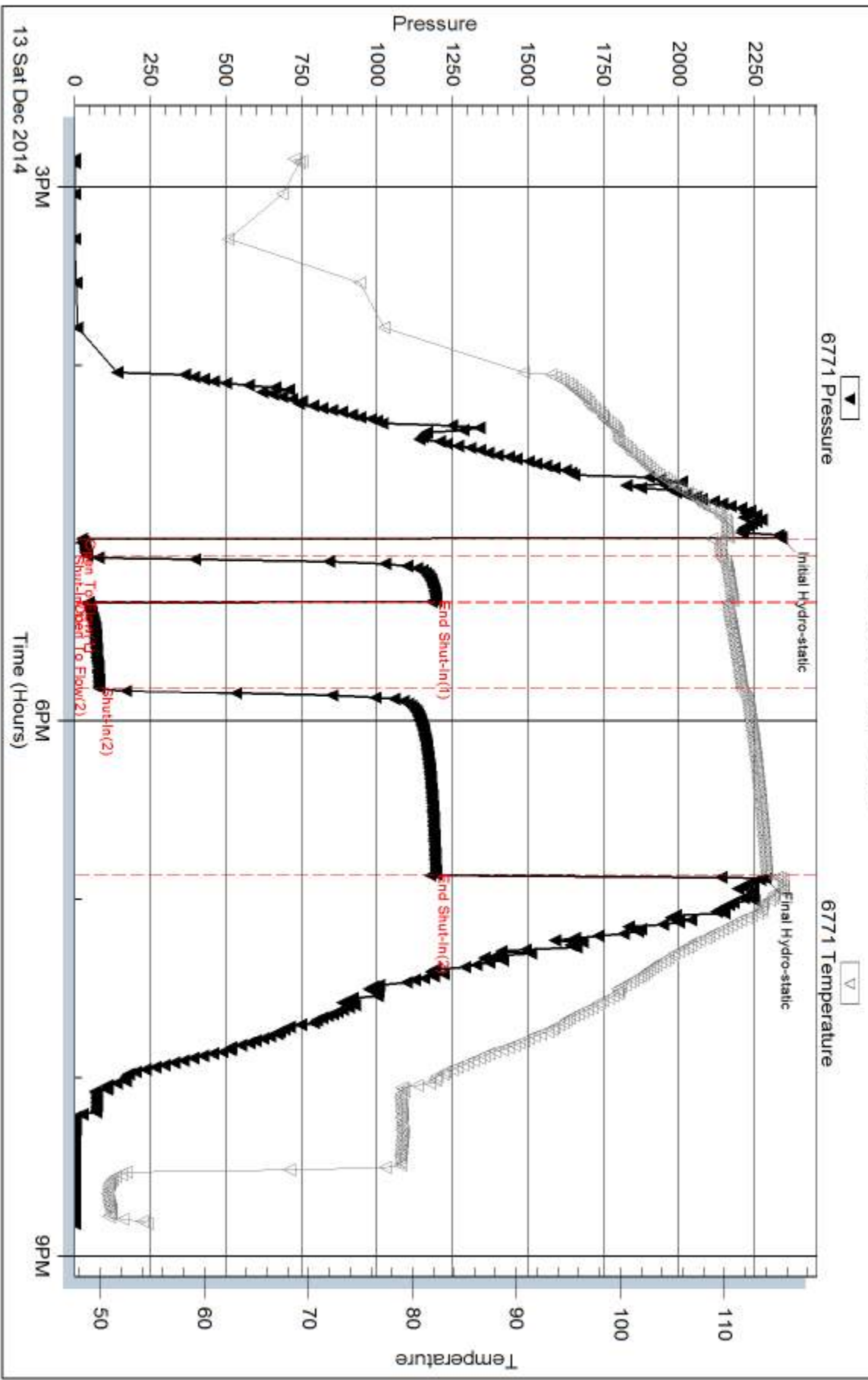
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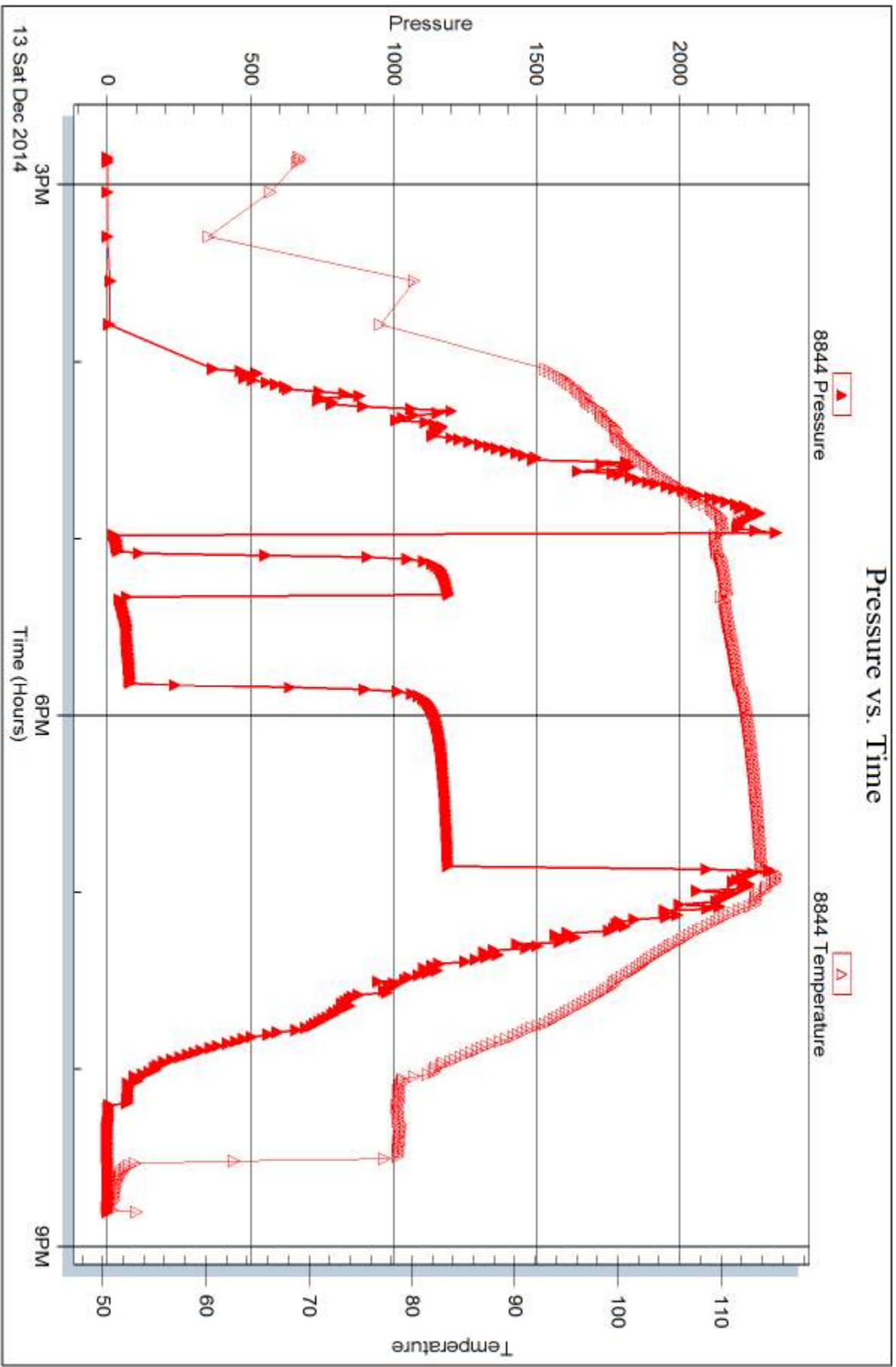
Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time







TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 59722

4/10

Well Name & No. Machin Unit #1-23 Test No. #1 Date 12/10/14
 Company Larson Engineering Inc. Elevation 2796 KB 2787' GL
 Address 562 W State Rd 4 Ohm. Ks, KS 67564-8561
 Co. Rep / Geo. Vern Schrag Rig H.D.#3
 Location: Sec. 23 Twp. 18.5 Rge. 29W Co. Kane State Ks

Interval Tested 4192 4221 Zone Tested F
 Anchor Length 29 Drill Pipe Run 4046 Mud Wt. 9.0
 Top Packer Depth 4187 Drill Collars Run 124' Vis 56
 Bottom Packer Depth 4192 Wt. Pipe Run --- WL 7.4
 Total Depth 4221 Chlorides 3900 ppm System LCM #1

Blow Description 2" in blow
No return
2 3/4" in blow
No return

Rec	Feet of	Tr %gas	%oil	%water	%mud
<u>40</u>	<u>HOCM</u>	<u>40</u>		<u>60</u>	
<u>30</u>	<u>MCO</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 Total 70' BHT 115' Gravity --- API RW --- @ --- F Chlorides --- ppm

(A) Initial Hydrostatic 2126 Test 1250 T-On Location 15:20
 (B) First Initial Flow 19 Jars 250 T-Started 16:15
 (C) First Final Flow 36 Safety Joint 75 T-Open 18:19
 (D) Initial Shut-In 678 Circ Sub N/C T-Pulled 19:24
 (E) Second Initial Flow 54 Hourly Standby _____ T-Out 21:35
 (F) Second Final Flow 60 Mileage 46 RT 71.30 Comments _____
 (G) Final Shut-In 503 Sampler _____
 (H) Final Hydrostatic 2107 Straddle _____ Ruined Shale Packer _____
 Shale Packer _____ Ruined Packer _____

Initial Open 5 Extra Packer _____ Extra Copies _____
 Initial Shut-In 15 Extra Recorder _____ Sub Total 0
 Final Flow 13 Day Standby _____ Total 1646.30
 Final Shut-In 30 Accessibility _____ MP/DST Disc't _____
 Sub Total 1646.30

Approved By Vern Schrag 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. 59723

Well Name & No. Marlin Unit # 1-23 Test No. #2 Date 12/11/14
 Company Jerson Engineering Inc. Elevation 2796 KB 2787 GL
 Address 562 W State Rd 4, Olinitz, Ks 67564-8561
 Co. Rep / Geo. Kevin Schrag Rig H.D.#3
 Location: Sec. 23 Twp. 18S Rge. 29W Co. Lane State Ks

Interval Tested 4251 4268 Zone Tested K
 Anchor Length 17 Drill Pipe Run 4108 Mud Wt. 9.1
 Top Packer Depth 4246 Drill Collars Run 124' Vis 68
 Bottom Packer Depth 4251 Wt. Pipe Run --- WL 7.4
 Total Depth 4268 Chlorides 3900 ppm System LCM #1
 Blow Description 1/4" in dreed back to a Surface blow
No return
Weat Surface blow dreed on 3min.
No return

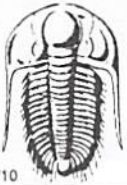
Rec	Feet of	%gas	%oil	%water	%mud
1'	Mud			100	

Rec Total 1' BHT 109° Gravity --- API RW --- @ --- ° F Chlorides --- ppm

(A) Initial Hydrostatic <u>2179</u>	<input checked="" type="checkbox"/> Test <u>1250</u>	T-On Location <u>09:45</u>
(B) First Initial Flow <u>13</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>10:25</u>
(C) First Final Flow <u>15</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>12:36</u>
(D) Initial Shut-In <u>684</u>	<input checked="" type="checkbox"/> Circ Sub <u>N/C</u>	T-Pulled <u>13:41</u>
(E) Second Initial Flow <u>16</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>15:35</u>
(F) Second Final Flow <u>17</u>	<input checked="" type="checkbox"/> Mileage <u>4615</u> 71.30	Comments
(G) Final Shut-In <u>816</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2107</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
	<input type="checkbox"/> Extra Recorder	Sub Total <u>0</u>
	<input type="checkbox"/> Day Standby	Total <u>1656.30</u>
	<input type="checkbox"/> Accessibility	MP/DST Disc't
	Sub Total <u>1646.30</u>	

Approved By Kevin Schrag Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 59724

Well Name & No. March Unit # 1-23 Test No. #3 Date 12/12/14
 Company Larson Engineering Inc Elevation 2796 KB 2787 GL
 Address 562 W. State Rd 4, Okm. 72, Ks 67564-8561
 Co. Rep / Geo. Veral Schwag Rig 17.D.#3
 Location: Sec. 23 Twp. 18S Rge. 29W Co. Lane State Ks

Interval Tested 4337 4430 Zone Tested Marmaton
 Anchor Length 9.3 Drill Pipe Run 4203 Mud Wt. 9.0
 Top Packer Depth 4332 Drill Collars Run 124' Vis 62
 Bottom Packer Depth 4337 Wt. Pipe Run --- WL 7.2
 Total Depth 4430 Chlorides 3800 ppm System LCM #2

Blow Description 6" in blow
No return
B.O.B. in 9 min.
Return blow built to 3 1/2" in died back to 1 1/4" in.

Rec	Feet of	%gas	%oil	%water	%mud
92	gocm	20	15	65	
124	gmco	20	55	25	
124	gmco	25	60	15	
	402' GAS IN PIPE				

Rec Total 340' BHT 117° Gravity --- API RW --- @ --- ° F Chlorides --- ppm

(A) Initial Hydrostatic	<u>2223</u>	<input checked="" type="checkbox"/> Test	<u>1250</u>	T-On Location	<u>13:50</u>
(B) First Initial Flow	<u>27</u>	<input checked="" type="checkbox"/> Jars	<u>250</u>	T-Started	<u>14:00</u>
(C) First Final Flow	<u>80</u>	<input checked="" type="checkbox"/> Safety Joint	<u>75</u>	T-Open	<u>16:03</u>
(D) Initial Shut-In	<u>1259</u>	<input checked="" type="checkbox"/> Circ Sub	<u>N/E</u>	T-Pulled	<u>17:53</u>
(E) Second Initial Flow	<u>89</u>	<input type="checkbox"/> Hourly Standby		T-Out	<u>20:12</u>
(F) Second Final Flow	<u>167</u>	<input checked="" type="checkbox"/> Mileage	<u>2605</u> 71.30	Comments	
(G) Final Shut-In	<u>1299</u>	<input type="checkbox"/> Sampler			
(H) Final Hydrostatic	<u>2185</u>	<input type="checkbox"/> Straddle		<input type="checkbox"/> Ruined Shale Packer	

Initial Open 5
 Initial Shut-In 15
 Final Flow 30
 Final Shut-In 60

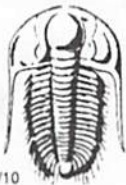
Extra Packer
 Extra Recorder
 Day Standby
 Accessibility

Sub Total 1646.30

Sub Total 1646.30

Approved By Veral Schwag Our Representative [Signature]

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket

NO. 59725

Well Name & No. Marlin Unit #1-23 Test No. #4 Date 12/13/14
 Company Hanson Engineering Inc Elevation 2796 KB 2787 GL
 Address 562 W State Rd 4, Okmütz, KS 67564-8561
 Co. Rep / Geo. Vern Schrag Rig H.D. #3
 Location: Sec. 23 Twp. 18S Rge. 29W Co. lane State KS

Interval Tested 4470 4590 Zone Tested Johnson
 Anchor Length 120 Drill Pipe Run 4328 Mud Wt. 9.3
 Top Packer Depth 4465 Drill Collars Run 124 Vis 74
 Bottom Packer Depth 4470 Wt. Pipe Run --- WL 8.0
 Total Depth 4590 Chlorides 4600 ppm System LCM #1

Blow Description 1 3/4" in blow
No return
11" in blow
No return

Rec	Feet of	Tr	%gas	%oil	%water	%mud
<u>20'</u>	<u>CO</u>			<u>100</u>		
<u>72</u>	<u>sgmco</u>	<u>3</u>		<u>55</u>		<u>42</u>
<u>42</u>	<u>sgocm</u>	<u>3</u>		<u>32</u>		<u>65</u>

Rec Total 154' BHT 116' Gravity 31 API RW --- @ --- °F Chlorides --- ppm

(A) Initial Hydrostatic	<u>2339</u>	<input checked="" type="checkbox"/> Test	<u>1250</u>	T-On Location	<u>14:30</u>
(B) First Initial Flow	<u>24</u>	<input checked="" type="checkbox"/> Jars	<u>250</u>	T-Started	<u>14:50</u>
(C) First Final Flow	<u>41</u>	<input checked="" type="checkbox"/> Safety Joint	<u>75</u>	T-Open	<u>16:57</u>
(D) Initial Shut-In	<u>119.5</u>	<input checked="" type="checkbox"/> Circ Sub	<u>N/C</u>	T-Pulled	<u>18:47</u>
(E) Second Initial Flow	<u>46</u>	<input type="checkbox"/> Hourly Standby		T-Out	<u>21:05</u>
(F) Second Final Flow	<u>81</u>	<input checked="" type="checkbox"/> Mileage	<u>26 RT</u> 142.60	Comments	<u>Loaded Tools</u> <u>Released 12/14/14 10:14 am</u>
(G) Final Shut-In	<u>119.3</u>	<input type="checkbox"/> Sampler			
(H) Final Hydrostatic	<u>228.5</u>	<input type="checkbox"/> Straddle		<input type="checkbox"/> Ruined Shale Packer	

Initial Open 5
 Initial Shut-In 15
 Final Flow 30
 Final Shut-In 60

Sub Total 1717.60

MP/DST Disc't _____

Approved By Vern Schrag Our Representative [Signature]

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