

15-129-21867

15-335-41w

IND



# Weatherford<sup>®</sup> Completion Systems

## DRILL STEM TEST REPORT

Prepared For: **EOG Resources Inc.**

3817 NW Expressway STE 500 OKC, OK  
73112

15-129-21867

ATTN: Preston Heiskell

**15/33/41**

**Grasslands 15-1**

Start Date: 2009.04.28 @ 03:41:07

End Date: 2009.04.28 @ 16:31:16

Job Ticket #: 30857      DST #: 1

**KCC**  
JUL 13 2009  
CONFIDENTIAL

Morgan,

KANSAS CORPORATION COMMISSION

JUL 23 2009  
RECEIVED

ALPINE OIL SERVICES CORPORATION  
2460, 240 - 4 Avenue S.W. Calgary, AB. T2P 4H4  
ph: 263-7800 fax: 264-7260

EOG Resources Inc.

Grasslands 15-1

15/33/41

DST # 1

Morgan

2009.04.28



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# DRILL STEM TEST REPORT

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

ATTN: Preston Heiskell

Job Ticket: 30857

**DST#: 1**

Test Start: 2009.04.28 @ 03:41:07

## GENERAL INFORMATION:

Formation: **Morrow**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 08:45:46

Time Test Ended: 16:31:16

Test Type: Conventional Bottom Hole

Tester: Chris Hagman

Unit No: 34

Interval: **5210.00 ft (KB) To 5268.00 ft (KB) (TVD)**

Reference Elevations: 3428.00 ft (KB)

Total Depth: 5268.00 ft (KB) (TVD)

3416.00 ft (CF)

Hole Diameter: 7.78 inches -ole Condition: Good

KB to GR/CF: 12.00 ft

**Serial #: 6753**

**Inside**

Press@RunDepth: 288.21 psig @ 5212.00 ft (KB)

Capacity: 7000.00 psig

Start Date: 2009.04.28

End Date:

2009.04.28

Last Calib.: 2009.04.28

Start Time: 03:41:07

End Time:

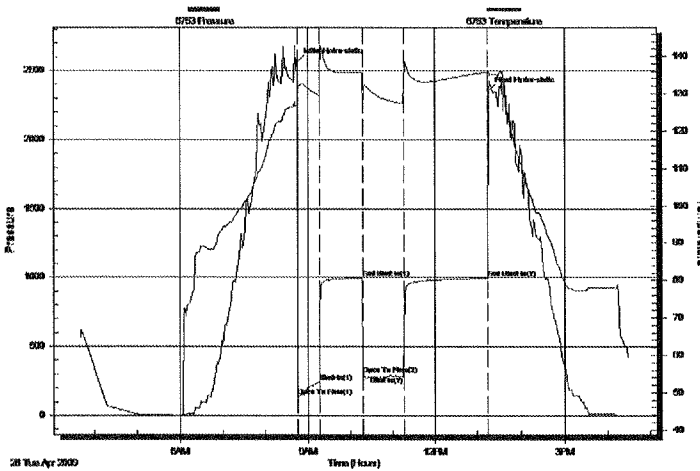
16:31:16

Time On Btm: 2009.04.28 @ 08:44:56

Time Off Btm: 2009.04.28 @ 13:15:46

TEST COMMENT: IF: BOB 10 sec., GTS 5 min., strong building blow  
 IS: No blow back  
 FF: BOB GTS ASAO, strong steady blow  
 FSI: No blow back

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2564.49	127.05	Initial Hydro-static
1	141.29	130.92	Open To Flow (1)
32	241.76	129.51	Shut-In(1)
93	996.79	135.76	End Shut-In(1)
94	300.26	124.92	Open To Flow (2)
151	288.21	127.34	Shut-In(2)
271	995.76	135.79	End Shut-In(2)
271	2355.30	136.12	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
350.00	100%M	1.72

## Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
First Gas Rate	1.00	6.00	586.48
Last Gas Rate	1.00	29.00	1247.70
Max. Gas Rate	1.00	29.00	1247.70





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# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

Job Ticket: 30857

**DST#: 1**

ATTN: Preston Heiskell

Test Start: 2009.04.28 @ 03:41:07

## Tool Information

Drill Pipe:	Length: 4822.00 ft	Diameter: 3.80 inches	Volume: 67.64 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: 368.00 ft	Diameter: 2.25 inches	Volume: 1.81 bbl	Weight to Pull Loose: 90000.00 lb
			<u>Total Volume: 69.45 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	11.00 ft			String Weight: Initial 72000.00 lb
Depth to Top Packer:	5210.00 ft			Final 72000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	58.00 ft			
Tool Length:	89.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			5180.00	
Shut In Tool	5.00			5185.00	
Sampler	3.00			5188.00	
Hydraulic tool	5.00			5193.00	
Jars	5.00			5198.00	
Safety Joint	3.00			5201.00	
Packer	5.00			5206.00	31.00 Bottom Of Top Packer
Packer	4.00			5210.00	
Stubb	1.00			5211.00	
Perforations	1.00			5212.00	
Recorder	0.00	8374	Inside	5212.00	
Recorder	0.00	6753	Inside	5212.00	
Perforations	20.00			5232.00	
Change Over Sub	1.00			5233.00	
Drill Pipe	31.00			5264.00	
Change Over Sub	1.00			5265.00	
Bullnose	3.00			5268.00	58.00 Bottom Packers & Anchor
<b>Total Tool Length:</b>	<b>89.00</b>				



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# DRILL STEM TEST REPORT

**FLUID SUMMARY**

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

Job Ticket: 30857

**DST#: 1**

ATTN: Preston Heiskell

Test Start: 2009.04.28 @ 03:41:07

## 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:

3700 ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbl

Water Loss: 8.78 cm<sup>3</sup>

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

## Recovery Information

Recovery Table

Length ft	Description	Volume bbl
350.00	100%M	1.721

Total Length: 350.00 ft      Total Volume: 1.721 bbl

Num Fluid Samples: 0

Num Gas Bombs: 1

Serial #:

Laboratory Name: Caraw ay

Laboratory Location: Liberal, KS

Recovery Comments: RW=1.480@70F=3700ppm

Sampler=15.0CF Gas @ 900psi



# DRILL STEM TEST REPORT

**GAS RATES**

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EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

ATTN: Preston Heiskell

Job Ticket: 30857

**DST#: 1**

Test Start: 2009.04.28 @ 03:41:07

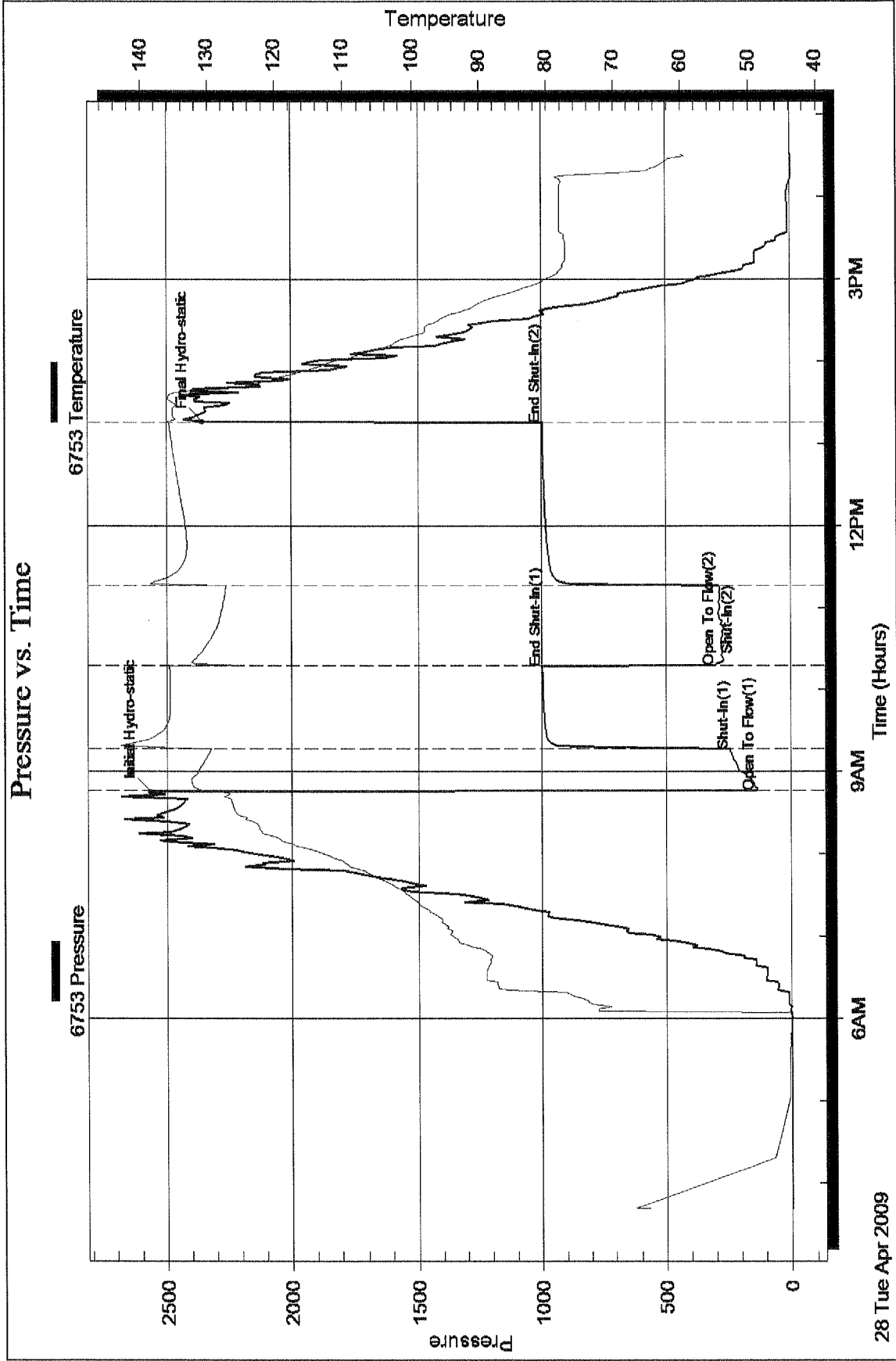
## Gas Rates Information

Temperature: 59 deg C  
Relative Density: 0.65  
Z Factor: 0.8

Gas Rates Table

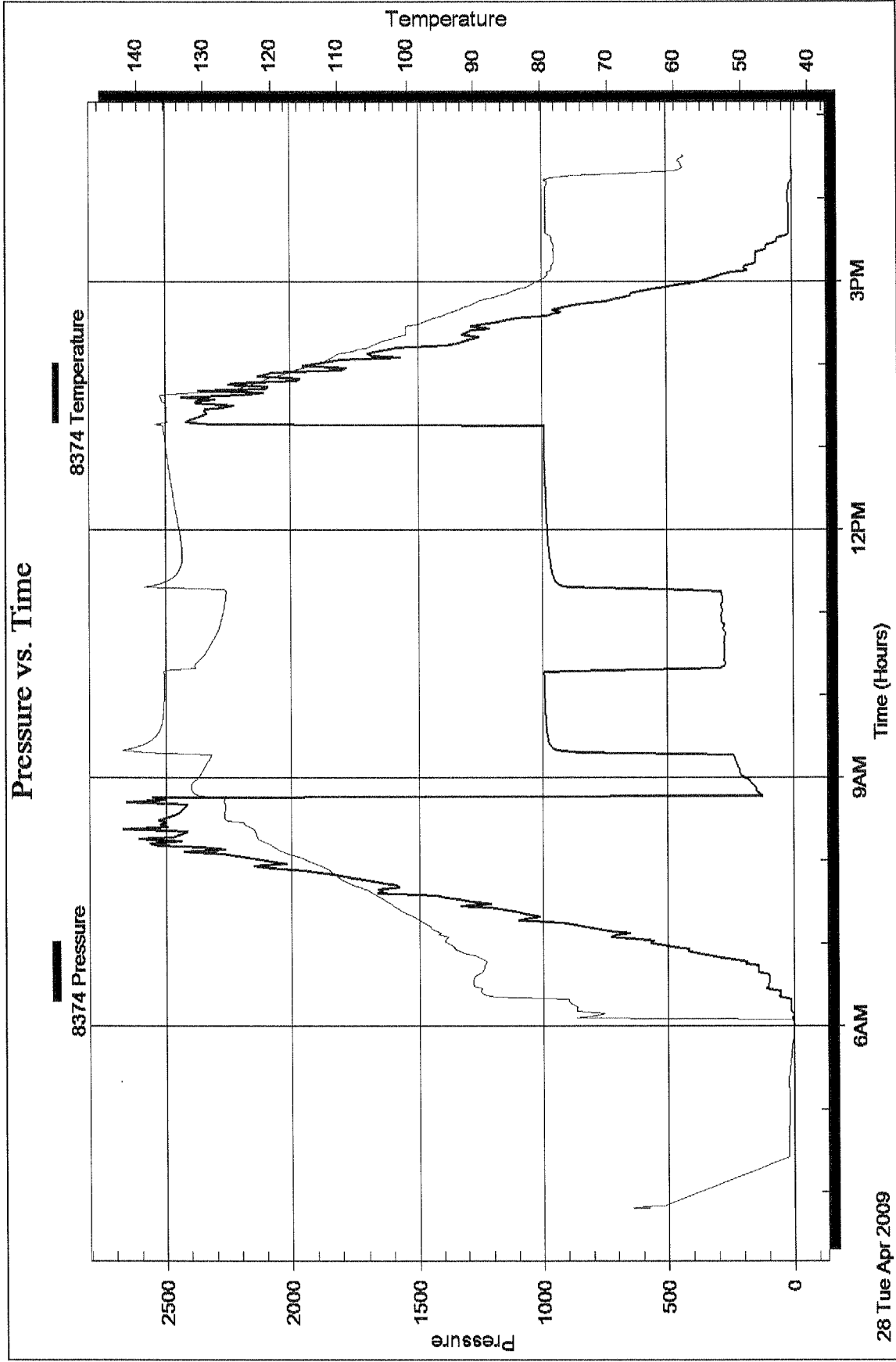
Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m <sup>3</sup> /d)
1	10	1.00	6.00	586.48
1	10	1.00	6.00	586.48
1	20	1.00	11.00	730.22
1	30	1.00	16.00	873.96
2	10	1.00	23.00	1075.21
2	20	1.00	28.00	1218.95
2	30	1.00	28.00	1218.95
2	40	1.00	29.00	1247.70
2	50	1.00	29.00	1247.70
2	60	1.00	29.00	1247.70

### Pressure vs. Time



28 Tue Apr 2009

### Pressure vs. Time





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JUL 13 2009  
CONFIDENTIAL

## DRILL STEM TEST REPORT

Prepared For: **EOG Resources Inc.**

3817 NW Expressway STE 500 OKC,OK  
73112

ATTN: Preston Heiskell

**15/33/41**

**Grasslands 15-1**

Start Date: 2009.04.29 @ 10:10:40

End Date: 2009.04.29 @ 18:52:39

Job Ticket #: 30858                      DST #: 2

EOG Resources Inc.

Grasslands 15-1

15/33/41

DST # 2

St.Louis

2009.04.29

ALPINE OIL SERVICES CORPORATION  
2460, 240 - 4 Avenue S.W. Calgary, AB. T2P 4H4  
ph: 263-7800 fax: 264-7260



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# DRILL STEM TEST REPORT

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

ATTN: Preston Heiskell

Job Ticket: 30858

**DST#: 2**

Test Start: 2009.04.29 @ 10:10:40

## GENERAL INFORMATION:

Formation: **St.Louis**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:44:59

Time Test Ended: 18:52:39

Test Type: Conventional Bottom Hole

Tester: Chris Hagman

Unit No: 34

**Interval: 5565.00 ft (KB) To 5578.00 ft (KB) (TVD)**

Reference Elevations: 3428.00 ft (KB)

Total Depth: 5578.00 ft (KB) (TVD)

3416.00 ft (CF)

Hole Diameter: 7.78 inches -ole Condition: Good

KB to GR/CF: 12.00 ft

## Serial #: 6753

Inside

Press@RunDepth: 43.57 psig @ 5567.00 ft (KB)

Capacity: 7000.00 psig

Start Date: 2009.04.29

End Date: 2009.04.29

Last Calib.: 2009.04.29

Start Time: 10:10:40

End Time: 18:52:39

Time On Btm: 2009.04.29 @ 12:44:39

Time Off Btm: 2009.04.29 @ 15:48:29

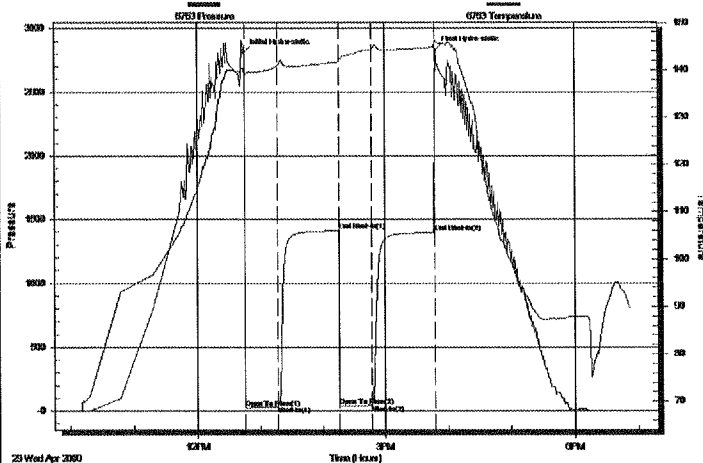
TEST COMMENT: IF: Weak surface blow, died 20 min.

IS: No blow back

FF: No blow

FS: No blow back

Pressure vs. Time



## PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2804.26	140.39	Initial Hydro-static
1	24.20	138.76	Open To Flow (1)
32	34.83	140.95	Shut-In(1)
91	1409.10	141.71	End Shut-In(1)
91	36.91	142.13	Open To Flow (2)
122	43.57	144.30	Shut-In(2)
183	1397.43	144.78	End Shut-In(2)
184	2829.03	146.27	Final Hydro-static

## Recovery

Length (ft)	Description	Volume (bbl)
15.00	w atery mud 10%W,90%M	0.07

## Gas Rates

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





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# DRILL STEM TEST REPORT

**TOOL DIAGRAM**

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

Job Ticket: 30858

**DST#: 2**

ATTN: Preston Heiskell

Test Start: 2009.04.29 @ 10:10:40

**Tool Information**

Drill Pipe:	Length: 5171.00 ft	Diameter: 3.80 inches	Volume: 72.54 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: 368.00 ft	Diameter: 2.25 inches	Volume: 1.81 bbl	Weight to Pull Loose: 100000.0 lb
			<u>Total Volume: 74.35 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	5.00 ft			String Weight: Initial 82000.00 lb
Depth to Top Packer:	5565.00 ft			Final 82000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	13.00 ft			
Tool Length:	44.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Change Over Sub	1.00			5535.00	
Shut In Tool	5.00			5540.00	
Sampler	3.00			5543.00	
Hydraulic tool	5.00			5548.00	
Jars	5.00			5553.00	
Safety Joint	3.00			5556.00	
Packer	5.00			5561.00	31.00 Bottom Of Top Packer
Packer	4.00			5565.00	
Stubb	1.00			5566.00	
Perforations	1.00			5567.00	
Recorder	0.00	8374	Inside	5567.00	
Recorder	0.00	6753	Inside	5567.00	
Perforations	8.00			5575.00	
Bullnose	3.00			5578.00	13.00 Bottom Packers & Anchor

**Total Tool Length: 44.00**



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**DRILL STEM TEST REPORT**

**FLUID SUMMARY**

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC,OK 73112

**15/33/41**

Job Ticket: 30858

**DST#: 2**

ATTN: Preston Heiskell

Test Start: 2009.04.29 @ 10:10:40

**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:	6000 ppm
Viscosity: 52.00 sec/qt	Cushion Volume: bbl		
Water Loss: 8.78 cm <sup>3</sup>	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 800.00 ppm			
Filter Cake: inches			

**Recovery Information**

Recovery Table

Length ft	Description	Volume bbl
15.00	w atery mud 10%W,90%M	0.074

Total Length: 15.00 ft      Total Volume: 0.074 bbl

Num Fluid Samples: 0      Num Gas Bombs: 0      Serial #:

Laboratory Name:      Laboratory Location:

Recovery Comments: RW=.795@91F=6000ppm  
 Sampler=4000ml W @ 150psi



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# DRILL STEM TEST REPORT

**GAS RATES**

EOG Resources Inc.

**Grasslands 15-1**

3817 NW Expressway STE 500 OKC, OK 73112

**15/33/41**

Job Ticket: 30858

**DST#: 2**

ATTN: Preston Heiskell

Test Start: 2009.04.29 @ 10:10:40

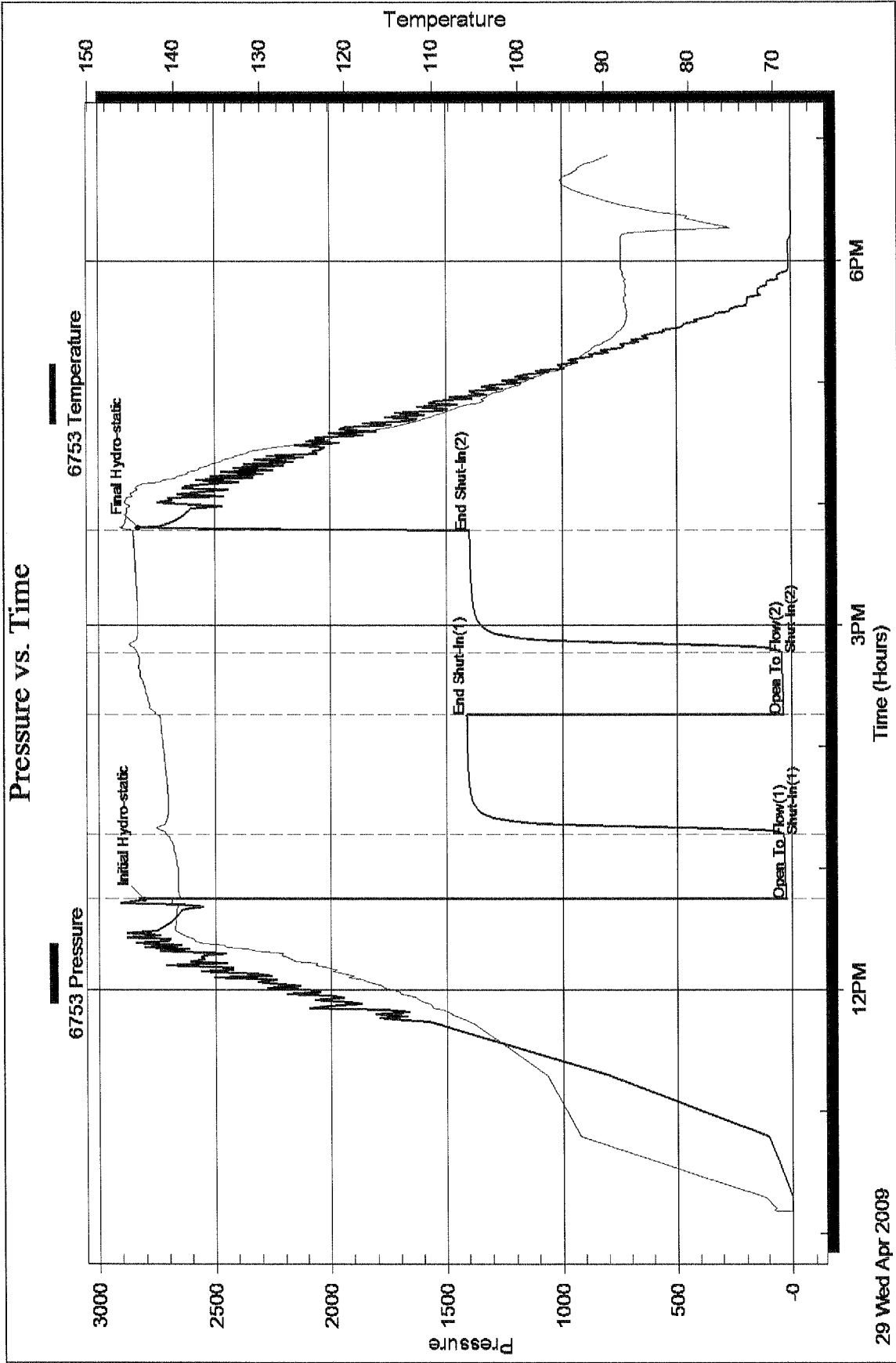
## Gas Rates Information

Temperature: 59 deg C  
Relative Density: 0.65  
Z Factor: 0.8

Gas Rates Table

Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m <sup>3</sup> /d)
		0.00	0.00	0.00

# Pressure vs. Time



29 Wed Apr 2009

12PM

3PM

6PM

DST Test Number: 2

15/33/41

EOG Resources Inc.

Inside

Serial #: 8374

### Pressure vs. Time

