

REPORT NO.  
10588630 #4

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TEST DATE:  
10-Sep-03

**S T A R**

CASE 4: REVISED 30 SEPT 2003

**Schlumberger**

**Schlumberger Transient Analysis Report**

**Based on Model Verified Interpretation  
Of Schlumberger Well Test Data**

<b>COMPANY: EGL RESOURCES</b>	<b>WELL: RIO BLANCO 4 FED #1</b>
<b>TEST IDENTIFICATION</b>	<b>WELL LOCATION</b>
Test Type ..... DST	Field ..... NORTH BELL LAKE
Test No. .... ONE	County ..... LEA
Formation ..... DEVONIAN	State ..... NEW MEXICO
Test Interval (ft) ..... 14,488-14,590	Location .....
<b>SAMPLE CHAMBER DATA</b>	<b>TEST STRING CONFIGURATION</b>
Recovered Gas (c.f.) ..... N/A	Open Hole Size (in) ..... 4.125
Recovered Oil (c.c.) ..... N/A	Gauge Depth (ft) ..... 14,351
Recovered Water (c.c.) ..... N/A	DC Length (ft)/I.D. (in) ..... 439/1.5
Recovered Mud (c.c.) ..... N/A	DP Length Size (in) ..... 9,683/2.764
Sample Chamber Pressure (psig) ..... N/A	DP Length Size (in) ..... 4,188/2.323
Rec. Mud Filtrate ..... NOT REPORTED	<b>TEST CONDITIONS</b>
Rec. Water Filtrate ..... N/A	Tbg / Wellhead Pressure (psi) .....
Oil API Gravity ..... 56.2 @ 60 deg F	
<b>INTERPRETATION RESULTS</b>	<b>ROCK / FLUID / WELLBORE PROPERTIES</b>
Model of Behavior ..... DUAL POROSITY	Gas Gravity (Deg API) ..... 0.602
Fluid Type Used for Analysis ..... GAS	Viscosity (cp) ..... 0.0264
Ext. Reservoir Pressure (psi) ..... 6,139 @ GAUGE	Total Compressibility (1/psi) ..... 7.51E-05
Transmissibility (md.ft/cp) ..... 24,676	Porosity (%) ..... 5.1
Permeability (md) ..... 17.6	Reservoir Temperature (F) ..... 212
Skin ..... 83.3	Water Saturation (%) ..... 20
Pressure Drop Skin (psi) ..... 1,156	Net Pay (ft) (Case 1) ..... 40
Radius of Investigation (ft) ..... 270	
Omega ..... 0.14	
Lambda ..... 3.01E-05	

**PRODUCTION RATE DURING TEST: 4,000 MSCF/D (Operator Reported)**

**SUMMARY:**

This report contains the analysis of the data acquired during a Drill Stem Test of the Devonian zone conducted on the EGL Resources Rio Blanco 4 Fed #1 well in Lea County, New Mexico. This test was performed by Schlumberger's Hobbs New Mexico Testing District (505 393 4107). The zone was isolated from 14,488 feet to 14,590 feet with drill stem test tools and the data was acquired using tandem electronic pressure gauges.

The data was modeled using a two porosity reservoir model with changing wellbore storage and skin. Both semi log and log log type curve matching techniques were used to interpret this data. Agreement between parameters calculated using both methods was excellent. The permeability was calculated to be 17.6 md, using a thickness of 40 feet. The skin was calculated to be 83.3 causing a near wellbore pressure drop of 1,156 psi. The reservoir pressure was extrapolated from the type curve to be 6,139 psi, at gauge depth.

For further discussion of this analysis, please refer to the interpretation discussion on page two of this report. If you have any questions, please call Marc Pearcy or Angie Fenton at 405 840 2781.

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## ANALYSIS DISCUSSION

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### EGL Resources Rio Blanco 4 Fed #1 Interpretation Discussion:

This report contains the analysis of the data acquired during a Drill Stem Test of the Devonian zone conducted on the EGL Resources Rio Blanco 4 Fed #1 well in Lea County, New Mexico. This test was performed by Schlumberger's Hobbs New Mexico Testing District (505 393 4107).

The data was taken using slickline conveyed, electronic pressure gauges. The zone was isolated from 14,488 feet to 14,590 feet with drill stem test tools and a standard drill stem test procedure was followed consisting of two flow periods and two shut in periods.

The data was modeled using a two porosity reservoir model with changing wellbore storage and skin. A two porosity model assumes the reservoir consists of two permeability systems, one with of much greater permeability than the other. The fluid is stored in the lower permeability matrix system and flows through the higher permeability to the wellbore.

The radial flow regime was reached after approximately 6 minutes of build up time and continued for approximately 0.5 hours. The radial flow regime is indicated by the constant pressure derivative on the plot of log-log pressure and pressure derivative versus shut in time (using the pseudopressure function). Since data during the radial flow regime was acquired, both semi log and log log type curve matching techniques were used to interpret this data. Agreement between parameters calculated using both methods was excellent. A comparison of these results is presented in the table below.

	Permeability	Skin	Res. Pressure
Semi Log	17.9 md	84.5	6,137 psi
Log Log	17.6 md	83.3	6,139 psi

Due to the higher permeability system being the primary conduit to the wellbore, a two porosity reservoir in it's natural state, has a skin of negative 3.5. The skin calculated from this analysis would then indicate a highly damaged wellbore.

Deviation from the model after 0.5 hours of buildup is likely caused by changing wellbore storage and phase behavior in the wellbore. This behavior is impossible to predict and difficult to model, however it does not affect the validity of this interpretation.

In order to validate the results of this analysis, a simulation of the test sequence was made using the model constructed from this interpretation. The measured data was then plotted on the same scale as the simulated data. Agreement between the measured data and simulated data is excellent. This plot is presented in the body of this report.

If you have any questions, please call Marc Percy or Angie Fenton at 405 840 2781.

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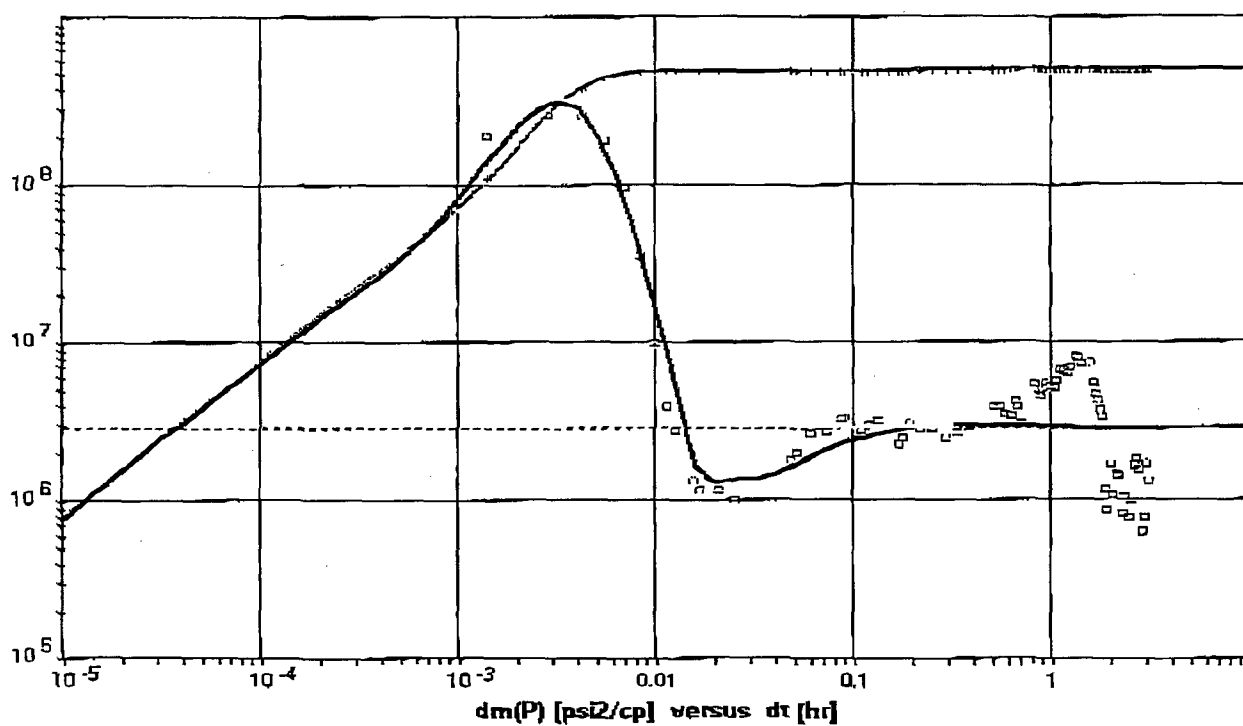
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# INTERPRETATION PLOTS

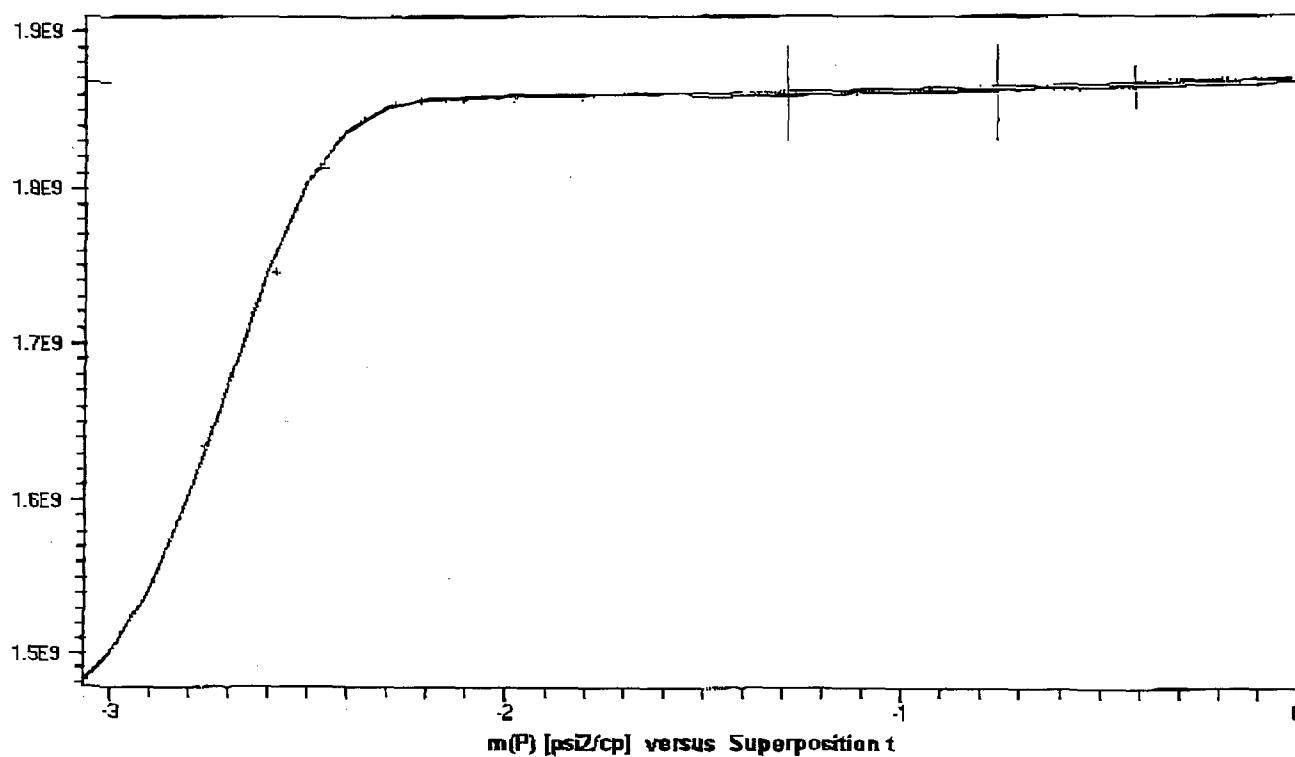
BUILD UP

LOG LOG DIAGNOSTIC PLOT

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SEMI LOG PLOT



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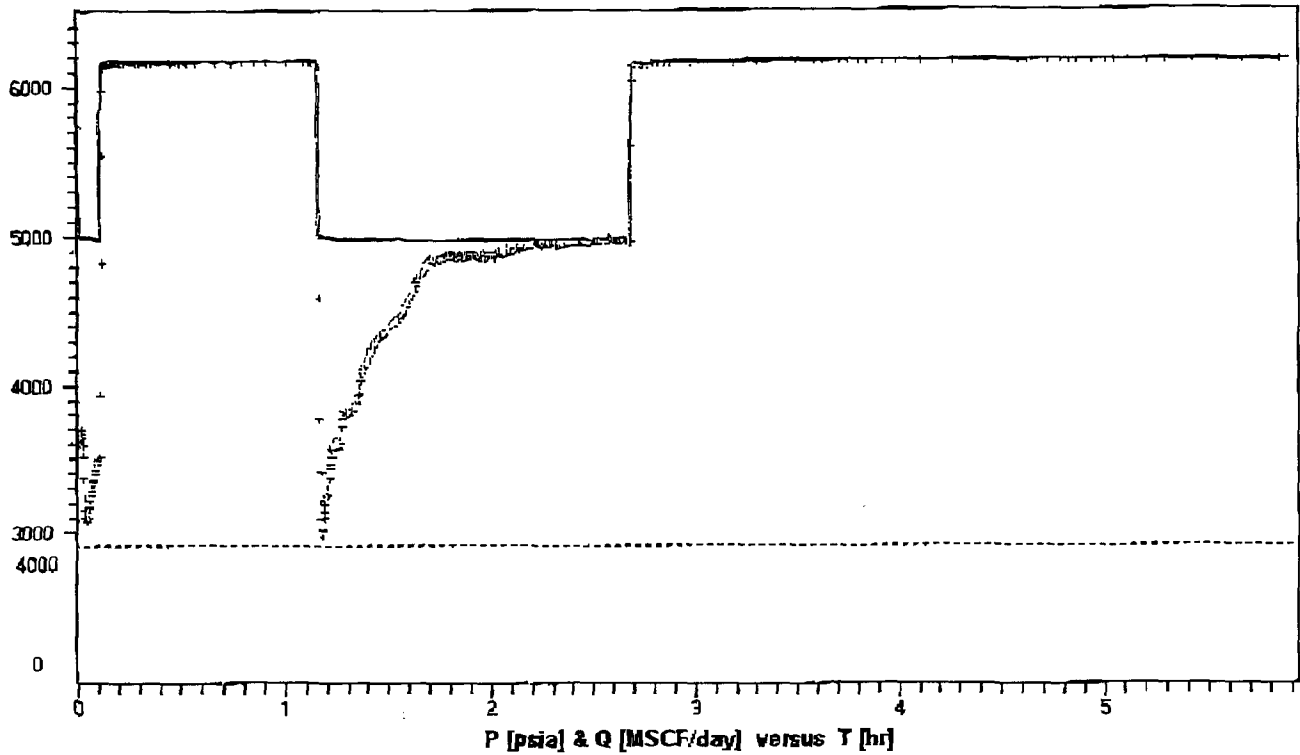
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**INTERPRETATION PLOTS**

**BUILD UP - CONTINUED**

**PRESSURE SIMULATION**



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## FLOWRATE HISTORY

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Flow Period Duration (hrs)	Flow Period Production Rate (MSCFD)
0.10968	4000
1.04583	0
1.52778	4000
3.25371	0

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