

Title: **“Improved Miscible Nitrogen Flood Performance Utilizing
Advanced Reservoir Characterization and Horizontal Laterals
in a Class I Reservoir – East Binger (Marchand) Unit”**

Type of Report: **Quarterly Technical Progress (Report No. 15121R13)**

Reporting Period Start: **April 1, 2003**

Reporting Period End: **June 30, 2003**

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Report Date: **August 19, 2003**

Cooperative Agreement No: **DE-FC26-00BC15121**

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Abstract

Implementation of the work program of Budget Period 2 of the East Binger Unit (“EBU”) DOE Project continues. The drilling of new horizontal well EBU 63-2H, scheduled for this reporting period, was delayed due to a lack of rig availability. This well was spud near the end of the reporting period.

EBU 59-1 was converted to injection service, and injection capacity at the plant was increased from 19 MMscf/d to 22 MMscf/d. Although other factors have temporarily limited the field’s ability to fully utilize the increased capacity, injection in the pilot area has been increased over 2 MMscf/d since the start of the project.

Nitrogen recycle within the pilot area has been reduced with the projects implemented to date. Prior to pilot development, nitrogen production was 56% of nitrogen injected. Currently, nitrogen production is only 26% of injection. Pilot area oil production has increased 90 bpd or 30%, with 160 bpd from new wells offset by a loss of 70 bpd from wells converted to injection.

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Quarterly Technical Progress Report – 2nd Quarter 2003

Introduction

Implementation of the work program of Budget Period 2 of the East Binger Unit (“EBU”) DOE Project is progressing. Only two of the three planned major activities for the period could be completed; the drilling of the second horizontal well in this Budget Period was delayed due to a lack of rig availability.

This quarterly report covers the Second Quarter of 2003. Well EBU 59-1 was converted to injection service and the expansion of injection capacity at the plant was completed, but the drilling of well EBU 63-2H was just started near the end of the reporting period.

Monitoring of the project is underway with the gathering and analysis of gas samples.

Executive Summary

Implementation of the work program of Budget Period 2 of the East Binger Unit (“EBU”) DOE Project continues. The drilling of new horizontal well EBU 63-2H, scheduled for this reporting period, was delayed due to a lack of rig availability. This well was spud near the end of the reporting period.

EBU 59-1 was converted to injection service, and injection capacity at the plant was increased from 19 MMscf/d to 22 MMscf/d. Although other factors have temporarily limited the field’s ability to fully utilize the increased capacity, injection in the pilot area has been increased over 2 MMscf/d since the start of the project.

Nitrogen recycle within the pilot area has been reduced with the projects implemented to date. Prior to pilot development, nitrogen production was 56% of nitrogen injected. Currently, nitrogen production is only 26% of injection. Pilot area oil production has increased 90 bpd or 30%, with 160 bpd from new wells offset by a loss of 70 bpd from wells converted to injection.

Experimental

There were no experimental methods used in the work completed during this reporting period.

Results and Discussion

The following is a detailed review of the work conducted in this reporting period.

Task 1.2.1 – Drill New Horizontal Producing Wells

Figure 1 shows the well work planned for implementation in Budget Period 2. This includes the drilling of at least two horizontal producing wells – EBU 63-2H and EBU 64-3H. EBU 64-3H was drilled and completed in 2002 and is currently on production. EBU 63-2H was expected to have been drilled in this reporting period but was delayed due to a lack of rig availability. The rig scheduled for the work was delayed on another well for another operator, and was not available to Binger until late June. Binger Operations, LLC spud EBU 63-2H on June 23. The well was drilled without any major problems and reached total depth in early August, just prior to the writing of this report. It is expected to be completed and brought on line later this month.

A third horizontal producing well may be drilled later in Budget Period 2. The decision on this will be based on the performances of two horizontal wells mentioned above and EBU 74G-2, a vertical well discussed under Task 1.2.2 below.

Task 1.2.3 – Convert Producers to Injection

The third of five planned conversions to injection was completed in this reporting period. Injection was initiated in EBU 59-1 on May 6. As previously reported, EBU 57-1 and EBU 65-1 were converted in June 2002 and January 2003, respectively.

The fourth and fifth planned conversions, EBU 37-3H and EBU 61-1, are being deferred until the balance of gas inflow to and discharge from the plant is better optimized. The conversion of EBU 59-1 removed over 700 mcf/d of nitrogen from the volume processed and returned for injection. Problems with wells outside the DOE Project Pilot Area have also contributed to a reduction in the inlet gas to the plant. After these problems are corrected and EBU 63-2H is producing, the situation will be reviewed to determine optimum timing of the conversions.

Task 1.2.4 – Construct, Modify, and Upgrade Plant Capacities

The installation of the additional injection compression was completed in May. After ironing out some initial bugs, the added compressor went online May 27. Processing through the plant's air separation unit has increased by about 2 MMscf/d. Since the compressor went online, total injection to the field has been limited by annual preventative maintenance to the other injection compressors, downtime due to other component failures (some of which were weather-related), and other system enhancements. Field injection during the periods when all equipment is operating is up about 2 MMscf/d from where it was prior to the installations of the new compressor. This should increase to an incremental injection rate of 3 MMscf/d – from 19 MMscf/d to 22 MMscf/d.

Task 1.2.5 – Initiate Monitoring of Pilot Area Performance

Gas cycling and total production from the pilot area have been impacted favorably by the implementation of drilling and well conversions in the pilot area. Overall, pilot area production has increased from 300 bopd (projected based on prior decline rate) to 390 bopd, or 30%. The drilling of three new wells has added about 160 bopd, but the conversion of wells from producers to injectors has removed about 70 bopd from production. Additional production increases are expected in wells near the converted wells, but with the low permeability of the Marchand sandstone, production response from new injectors may be seen as a flattening of the decline, rather than an actual rate increase.

Figures 2, 3, and 4 contain production plots for the total pilot area, the pilot area excluding the new wells, and the new wells, respectively. Total nitrogen content of gas produced in the pilot area has decreased from 58% prior to any changes to 50% today (Figure 2). This same reduction has been seen in the production of “existing wells” (those present before the drilling of new wells, Figure 3) – due in part to impacts on existing wells from the new wells and in part to removal of nitrogen-rich gas from production via conversions of wells to injection service.

Overall, nitrogen recycle has decreased from 56% to 26% within the pilot area. Before new wells were drilled, 4.3 MMscf/d of nitrogen was injected in the pilot area, and 4.2 MMscf/d of gas with 58% nitrogen – or 2.4 MMscf/d of nitrogen – was produced. Thus, nitrogen production was 56% of injection. Since the conversion of EBU 59-1 to injection, pilot injection has averaged 6.6 MMscf/d. Production has averaged 3.4 MMscf/d @ 50% nitrogen, or 1.7 MMscf/d of nitrogen – only 26% of the nitrogen injection rate. This will certainly change over time – injection will decrease as the reservoir pressure around the injection wells increases, and nitrogen production will likely increase in offset producing wells. Pilot production and gas cycling will be monitored throughout the project.

Gas sampling also continues in the pilot area. Data collected is presented in Figure 5. There are no significant changes to trends previously established and discussed in prior reports. This will also continue throughout the project.

Task 1.2.6 – Technology Transfer Activities

Additional technical progress reports have been posted on the project web site, www.eastbingerunit.com.

Conclusion

Implementation of the pilot project of the East Binger Unit DOE Project continues. The third of the four planned new wells, EBU 63-2H, was spud near the end of the reporting period and is currently awaiting completion. The third of five planned producer-to-injector conversions was completed during the reporting period, and is now on injection. Plant injection capacity has been increased from 19 MMscf/d to 22 MMscf/d with the startup of a newly installed compressor.

Monitoring of overall performance of the pilot area continues. Initial response of the various projects is very favorable. With over 2 MMscf/d of increased injection and no occurrences of major gas breakthrough, nitrogen recycle within the pilot area has been reduced from 56% to 26%.

References

There are no references for this report.

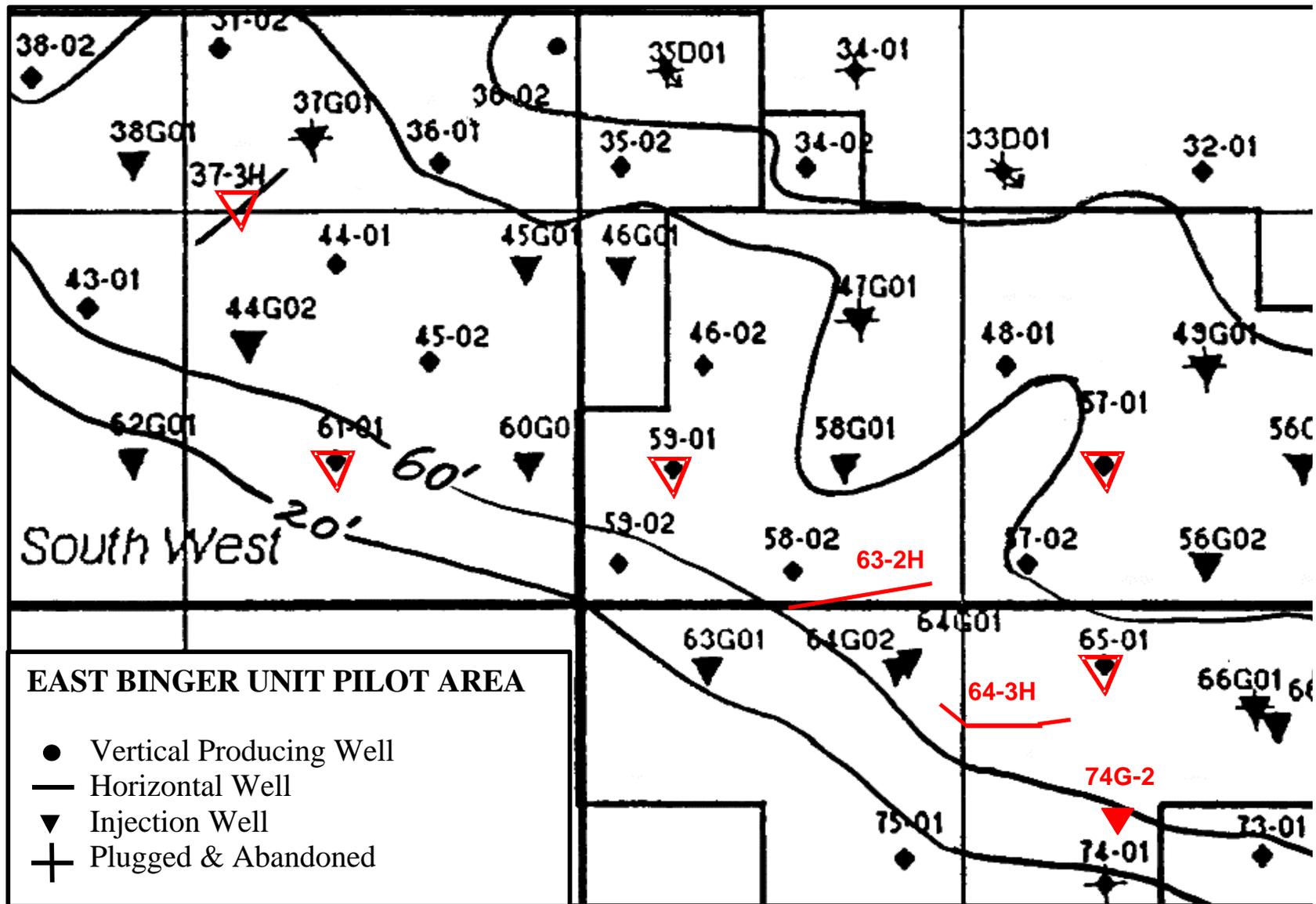


Figure 1. Wellwork planned for the pilot - shown in red.

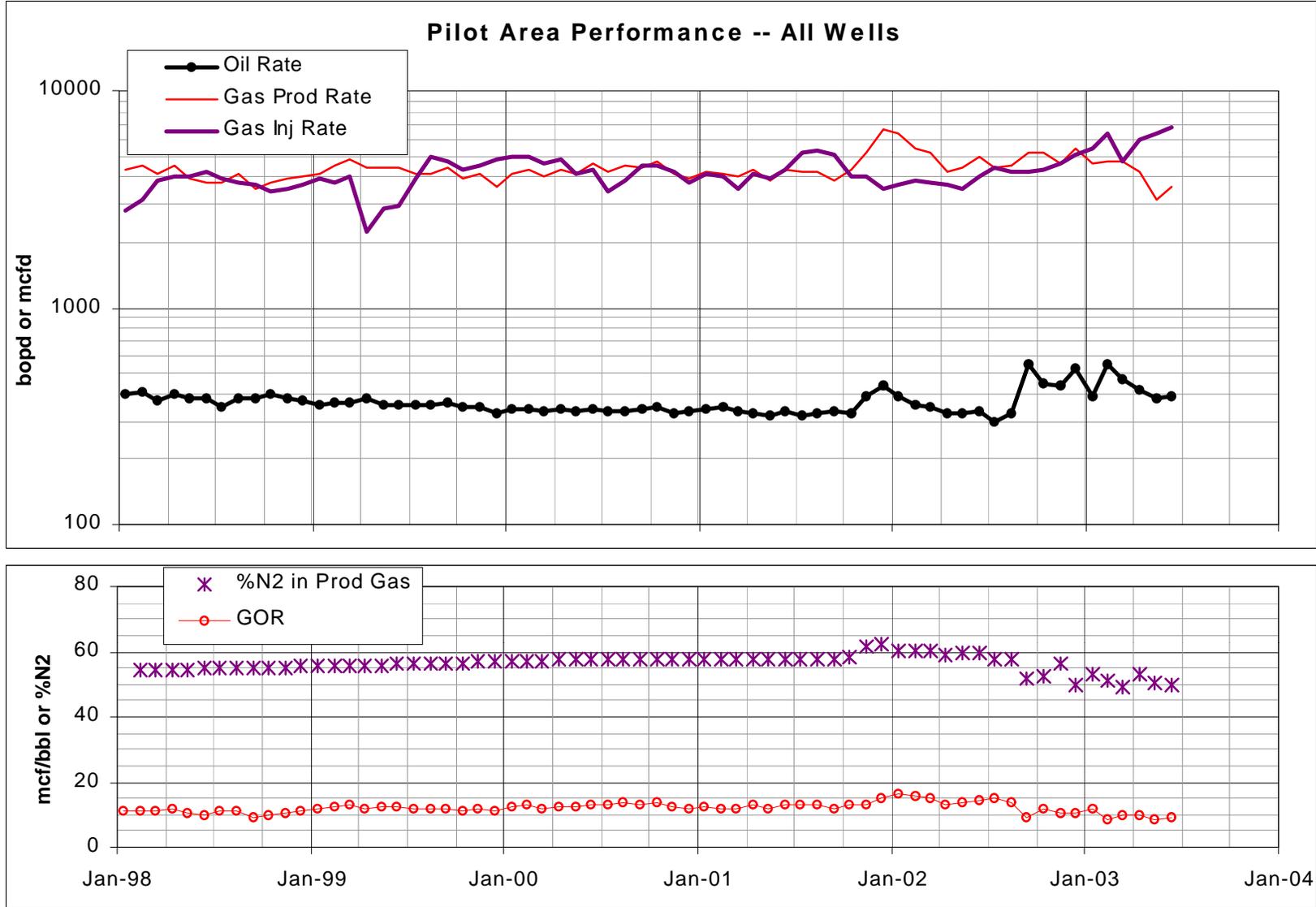


Figure 2. Production data for all wells in the pilot area.

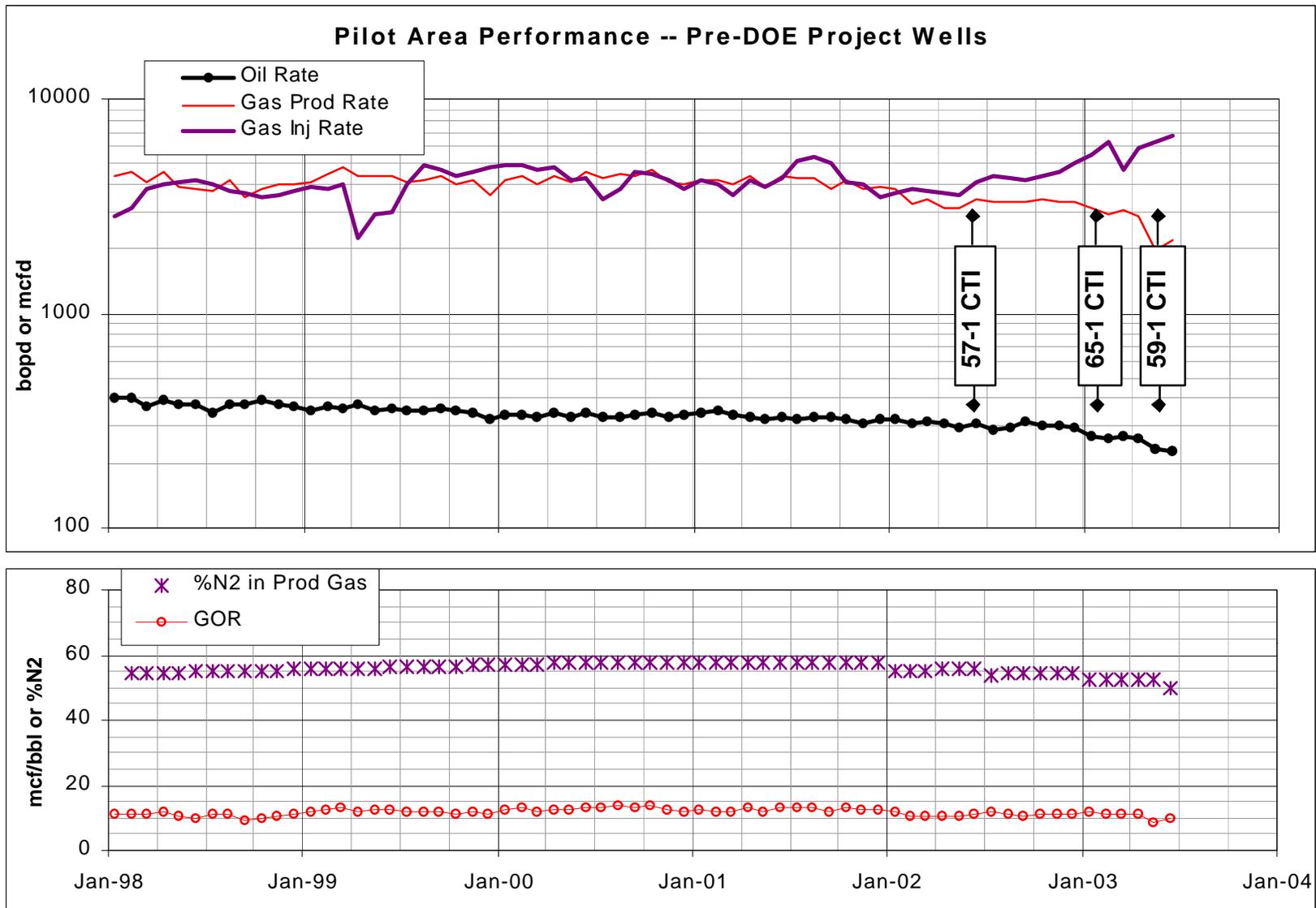


Figure 3. Production data for wells in the pilot area that existed before DOE Project development.

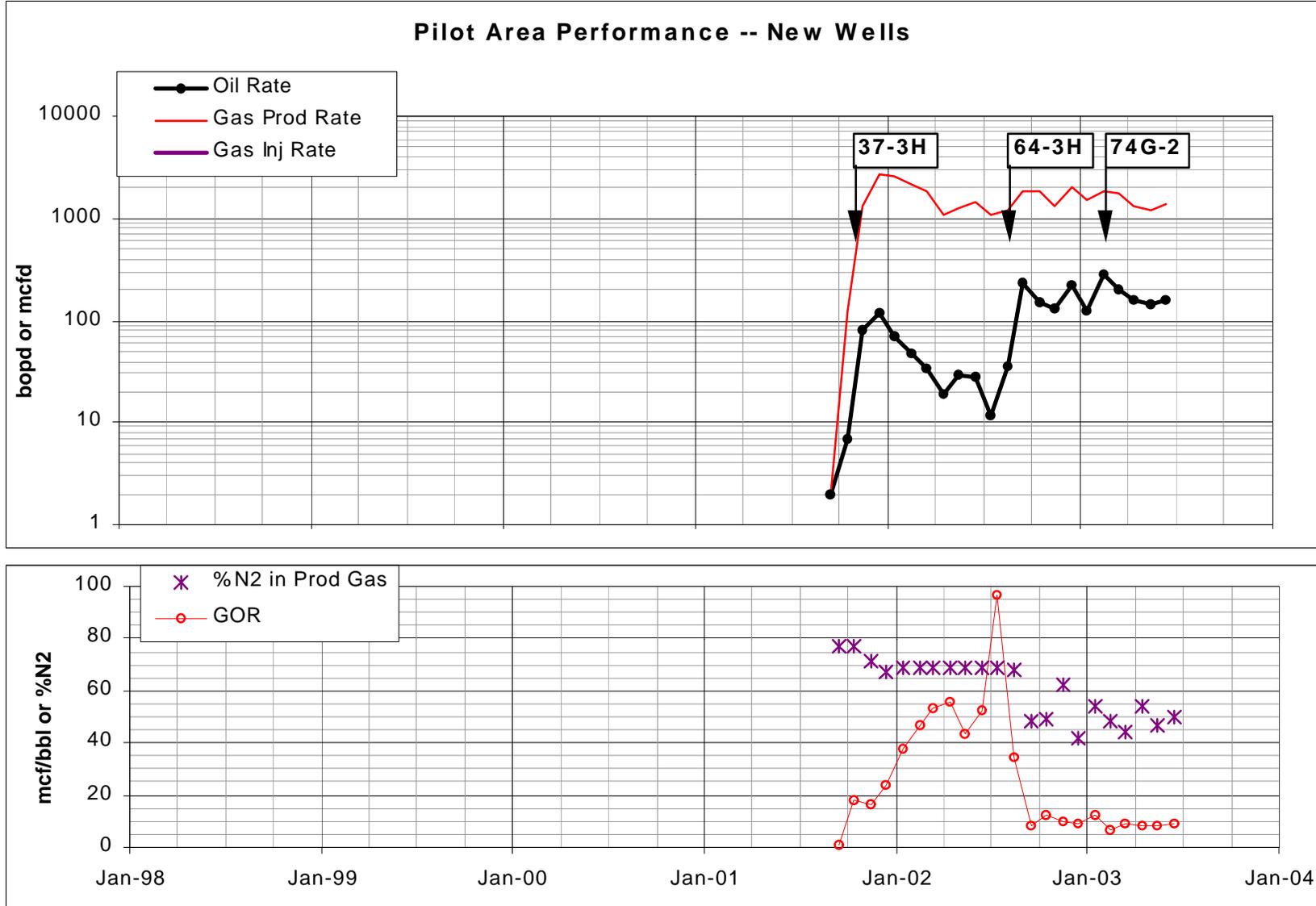


Figure 4. Production data for new wells in the pilot area.

**East Binger Unit Pilot Area
Nitrogen Content in Produced Gas
2nd Quarter 2003 Sample Data**

<u>Well</u>	<u>December 2001 Sample</u>	<u>3rd Qtr 2002 Sample</u>	<u>4th Qtr 2002 Sample</u>	<u>1st Qtr 2003 Sample</u>	<u>2nd Qtr 2003 Sample</u>
35-2	58%	-	61%	-	63%
36-1	65%	50%	49%	46%	47%
36-2	25%	-	29%	-	20%
37-2	83%	77%	79%	80%	79%
37-3H	68%	69%	67%	69%	-
43-1	9%	10%	-	7%	-
44-1	69%	67%	67%	68%	71%
45-2	56%	58%	-	57%	59%
46-2	62%	-	-	68%	64%
48-1	83%	83%	84%	84%	85%
57-2	37%	41%	39%	41%	45%
58-2	8%	5%	-	6%	5%
59-2	44%	-	-	48%	45%
61-1	56%	-	-	-	56%
64-3H	-	23%	18%	17%	16%
73-1	13%	21%	-	21%	-
74G-2	-	-	-	6% - 10%	10%

Figure 5. Pilot Area gas sample data.