Calendar Year 2003 - Kansas Oil and Gas Production: An Examination of the Importance of Stripper Production

Kansas Geological Survey Open-File Report 2004-15

Timothy R. Carr

Introduction

This Open-File report builds on previous open-file reports in an attempt to develop a perspective on the trends in the relative importance of stripper well production to Kansas oil and gas production (Carr 2003, Carr, 1998; Carr and Gerlach, 1997). Stripper wells are economically marginal oil and gas wells that produce at relatively low rates. The definition of stripper wells varies. For oil, stripper production is usually defined as production rates of between 5 and 15 barrels of oil per day (BOPD). Stripper gas production would generally be anything less than 90 thousand cubic feet per day (MCFPD).

Wells that are producing at stripper well rates make up a significant portion of Kansas oil and gas production, and more importantly represent a very large portion of existing well bores. These well bores represent a very large capital investment that is at risk of being plugged and abandoned.

Procedure

We examined the production data from the Kansas Department of Revenue from the calendar year of January 2003 through December 2003. This provides a twelve-month period to average production and to capture leases that report production only on an intermittent basis. All leases that produced any oil or gas during the period were extracted from the oil and gas production database. Lease production was divided by the number of wells listed for each lease and then by 365 days to obtain an estimated average daily production per well.

Results: Oil Production

Oil production in 2003 was reported from 14,828 leases with 41,957 wells (Table 1a). The number of leases is up from to 2002 data (14804 as reported by Carr 2003). The number of oil wells is slightly higher in the present study (41,713 as reported by Carr 2003). This change in well number is interpreted as a result of improved prices.

Total oil production in 2003 was 33,882,624 barrels of oil (Table 1a). This is an increase in production from 2002 (33,322,083 barrels). Average daily per well production in Kansas would be 3.76 barrels of oil. This average daily production is a decrease from the 3.87 barrels of oil per well reported in 2002. Again this is attributed to the improved economics of stripper production.

The number of oil wells grouped by production rate shows that over 96% of the oil wells in Kansas average less than 15 BOPD (Table 1a). Approximately 41,341 wells producing 73.7% of the state's oil would be considered as stripper production. This represents a very large number of well bores and production that are at risk to abandonment due to changes in the oil prices and production costs. Comparing production rates and number of wells between 2002 and 1998 shows that there has been an increase in the number of low production rate wells. In part, this change reflects the continued recovery of oil prices.

Results: Gas Production

Gas production in 2003 was reported from 16,867 leases with 18,461 wells (Table 1b). Total production was 419 billion cubic feet (Bcf). This is a significant increase from 2002 when 16,056 leases with 17,647 wells reported production (Carr, 2003). Average daily per well production would be 62 81 MCF. The reported gas production represents annual decline from 2002, and reflects production declines in the gas fields of southwest Kansas (453 Bcf in 2002).

The number of gas wells grouped by production rate shows that 74.4% of the gas wells in Kansas average less than 90 MCFPD (Table 1b). Approximately 13,740 wells producing 44.2% of the state's gas would be considered as stripper production, a significant increase in stripper gas production since 2002 (33.1% of production and 65.8% of wells, Carr, 2003). This represents a very large number of well bores and production that are at risk to abandonment due to changes in the gas prices and production costs. It also reflects the improved economics resulting from high gas prices.

References Cited

Carr, Timothy R., 2003, Kansas oil and gas production: An examination of the importance of stripper production: Kansas Geological Survey Open-File Report 03-10, 4p. http://www.kgs.ku.edu/PRS/publication/2003/ofr2003-10.pdf

Carr, Timothy R., 1998, Kansas oil and gas production: An examination of the importance of stripper production: Kansas Geological Survey Open-File Report 98-50, 4p. http://www.kgs.ukans.edu/PRS/publication/OFR98_50/index.html

Carr, Timothy R., and Paul M. Gerlach, 1997, Kansas oil and gas production: An examination of the importance of stripper production: Kansas Geological Survey Open-File Report 97-64, 4p. http://www.kgs.ukans.edu/PRS/publication/OFR97_64/index.html

Table 1a -- Kansas Oil Production from January 2003 through December 2003									
	Producing Leases			Producing Wells			Oil Production		
BOPD/Well	Number	% of Total	Cum %	Number	% of Total	Cum %	Barrels	% of Total	Cum %
0-5	12,638	85.2%	85.2%	38,558	91.9%	91.9%	17,184,817	50.7%	50.7%
5.1-10	1,324	8.9%	94.2%	2,300	5.5%	97.4%	5,630,207	16.6%	67.3%
10.1-15	337	2.3%	96.4%	483	1.2%	98.5%	2,161,974	6.4%	73.7%
15.1-20	162	1.1%	97.5%	182	0.4%	99.0%	1,141,336	3.4%	77.1%
20.1-30	167	1.1%	98.7%	198	0.5%	99.4%	1,753,016	5.2%	82.3%
30.1-50	107	0.7%	99.4%	128	0.3%	99.7%	1,730,343	5.1%	87.4%
50.1-75	42	0.3%	99.7%	52	0.1%	99.9%	1,182,909	3.5%	90.9%
75.1-100	20	0.1%	99.8%	23	0.1%	99.9%	737,766	2.2%	93.0%
>100	31	0.2%	100.0%	33	0.1%	100.0%	2,360,254	7.0%	100.0%
Totals	14,828	100.0%		41,957	100.0%		33,882,624	100.0%	

Table 1b -- Kansas Gas Production from January 2003 through December 2003									
	Producing Leases			Producing Wells			Gas Production		
MCFD/Well.	Number	% of Total	Cum %	Number	% of Total	Cum %	MCF	% of Total	Cum %
0-40	7,860	42.6%	42.6%	6,362	37.7%	37.7%	46,051,224	11.0%	11.0%
41-60	2,445	13.2%	55.8%	2,372	14.1%	51.8%	44,839,867	10.7%	21.7%
61-90	3,435	18.6%	74.4%	3,423	20.3%	72.1%	94,439,330	22.5%	44.2%
91-120	2,528	13.7%	88.1%	2,523	15.0%	87.0%	95,872,778	22.9%	67.1%
121-150	1,193	6.5%	94.6%	1,191	7.1%	94.1%	58,052,519	13.9%	81.0%
151-300	896	4.9%	99.4%	892	5.3%	99.4%	62,043,462	14.8%	95.8%
301-450	68	0.4%	99.8%	68	0.4%	99.8%	8,941,040	2.1%	97.9%
451-600	20	0.1%	99.9%	20	0.1%	99.9%	3,765,105	0.9%	98.8%
>600	16	0.1%	100.0%	16	0.1%	100.0%	5,012,620	1.2%	100.0%
Totals	18,461	100.0%		16,867	100.0%		419,017,945	100.0%	