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BULLETIN 78

OIL AND GAS DEVELOPMENTS IN KANSAS
DURING 1948

By

W. A. VER WIEBE, J. M. JEWETT, and E. K. NIXON



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OIL AND GAS DEVELOPMENTS IN KANSAS DURING 1948

By

W. A. VER WIEBE, J. M. JEWETT, AND E. K. NIXON

ABSTRACT

Kansas oil production in 1948 totaled 108,080,654 barrels, which was 4 percent more than the 1947 production, and an all-time high.

In value, the 1948 output increased to \$279,928,450 from \$203,598,000 in the preceding year.

Natural gas production in Kansas reached an all-time high of 240 billion cubic feet (14.65 psia.); the Hugoton field produced 186 billion cubic feet or 77 percent of this amount.

In 1948, 3,285 tests drilled for oil or gas were recorded in the State. These were located in 61 counties, excluding 17 eastern Kansas counties for which records were inadequate. Of the recorded completions, 1,656 were oil wells, 351 were gas wells, and 1,207 were dry holes; 248 of the dry holes were wild-cats. Counting eastern Kansas counties, probably 3,700 tests were drilled for oil or gas in the State during 1948. The number of recorded well completions was 21.5 percent larger in 1948 than in 1947. In the Hugoton field 325 gas wells were completed to make a total of 1,595 gas wells in the field at the end of 1948. The number of gas wells drilled in 1948 was 15 percent less than in 1947.

Barton, with a production of 21.9 million barrels, was the largest oil producer among the counties. Russell County ranked second, with a production of 13.6 million barrels. The Trapp pool of Barton and Russell Counties was the top-ranking pool in the State with a production of 10.4 million barrels of oil in 1948. The Kraft-Prusa, Bemis-Shutts, and Silica pools were second, third, and fourth, respectively.

Secondary oil recovery is increasing rapidly in importance in Kansas. A table shows 168 such operations including approximately 3,800 producing wells at the end of 1948.

INTRODUCTION

Oil and gas activities in Kansas increased markedly during 1948. This was due to continued strong demand both for crude oil and for natural gas, owing to the relatively high prices paid for the oil.

The importance of petroleum in Kansas increased almost 40 per cent if reckoned on the value of natural gas, products, and crude. The increase was much less if calculated only on the stepped-up volume of production.

Although oil and gas development in 1948 occurred in many likely areas in Kansas and 74 pools were opened or revived, no discoveries that are regarded as having really unusual significance were made. The greatest amount of drilling activity occurred in the area of the Central Kansas uplift, mainly in Barton, Rice, Russell, Rooks, and Ellis Counties. However, Butler County, located on the southern end and eastern flank of the Nemaha uplift, was second in number of new wells drilled during the year. Its increase, 18 percent, in new wells over the 1947 figure mainly represents renewed interest in the El Dorado field which since discovery has been the State's largest producer.

One development that may have significance was the drilling of two wells reported as capable of producing modest amounts of distillate at depths of about 5,000 feet at the edge of the Dodge City basin, and near the edge of the producing area of the Hugoton gas field in southwestern Kansas.

Petroleum activity in eastern Kansas consisted rather largely of operations incidental to secondary oil recovery, although there were sporadic occurrences of interesting new primary oil production. One of these was in Woodson County where an extension of "lime" production was found which, after heavy acidizing, gave some wells yielding more than 100 barrels of oil per day.

Activity in the area of the Hugoton gas field in southwestern Kansas consisted largely of drilling interior locations previously omitted, although the field area was extended slightly at several points, for example, in northeastern Morton County, in eastern Stanton and Hamilton Counties, and in northwestern Seward County.

Figure 1 is an index map of the State showing in a very general way the areas within which there is production of oil or gas or both. Obviously, the boundaries are not precise. Only a small fraction of the oil and gas territory is actually in production or included within pools, because there are broad areas of barren country between the pools. However, the map is useful to show county relations, and also to convey to the reader both the location of the oil country and also an idea of how large a percentage of the State may be called "oil and gas territory."

It has seemed desirable as an important part of this bulletin to include a table of condensed petroleum data which at a glance will show two things: (1) the trend of the Kansas industry in its

TABLE 1.—Petroleum data table showing percentage changes for Kansas and for the U.S., 1947-1948

Kansas figures	1947	1948	Kansas percentage change	United States percentage change
1. Crude oil production (barrels)	103,916,169 ¹	108,080,654 ²	+ 4.0	+10.5 ¹
2. Value of crude oil produced	\$203,598,000 ²	\$279,928,450 ²	+37.5	+45.4
3. Kansas crude production as percentage of total U.S.	5.6	5.4	— 3.6	
4. Average price of Kansas crude during year	\$1.93	\$2.59	+34.0	+33.8
5. Rank of Kansas among oil-producing states of U.S.	5th	5th	0	
6. Proven reserves of liquid hydrocarbons (at end of year) barrels	651,490,000	776,739,000 ⁴	+19.2	+ 8.4 ⁴
7. Ratio of proven liquid hydrocarbon reserves to current annual production	6.3:1	7.2:1	+14.8	no change
8. Oil producing area in "western Kansas" counties (acres)		463,920		
9. Natural gas production (M cu. ft.)	205,449,600 ⁷	240,195,558 ⁷	+16.9	+ 6.7 ⁴
10. Value of natural gas produced	\$ 10,230,000 ⁸	\$ 12,840,000 ²	+25.5	+10 (approx.)
11. Natural gasoline and liquefied petroleum production (gallons)	100,195,000	101,645,000	+ 1.4	+ 9.8 ⁹
12. Value of natural gasoline and liquefied petroleum products	\$4,663,000	\$9,466,275 ²	+103.0	"
13. Proven reserves of natural gas (million cubic feet)	14,556,916 ⁴	14,407,832 ⁴	— 1.0	+ 4.8 ⁴
14. Ratio of proven natural gas reserves to current annual production	70:1	60:1	—14.3	— 1.8 ⁴
15. Gas producing area in "western Kansas" counties (acres)		1,965,150		
16. Oil and gas pools newly discovered (and pools revived during the year)	62	72	+16.1	
17. Well completions in "western Kansas" counties:				
Oil	985	1,235	+25.7	+20.1 ⁵
Gas	411	349	—15.0	—12.3 ⁵
Dry	659	910	+38.2	+26.1 ⁵
Salt Water Disposal	25	34	+36.0	
Total new wells	2,080	2,528	+21.6	+20.1 ⁵
Rank Wildcat plus discovery wells (included in above total)	211	265	+25.6	+25.9 ⁶
Total footage drilled	8,690	10,634 ⁵	+22.4	+20.5 ⁵
Number of producing oil and gas wells on record		23,493		
18. Secondary oil recovery projects active	144	166 ¹⁰	+15.6	

¹ Kansas Geological Survey Bulletin 75.² Kansas Corporation Commission figures.³ "Crude Production Tops 2 Billion Barrels for First Time in 1948," by Polly De Armond, Oil and Gas Journal, Vol. 47, No. 39, pp. 184-186.⁴ "A.P.I. and A.G.A. Committees Report Gains in Oil and Gas Proven Reserves," by Charles J. Deegan, Oil and Gas Journal, Vol. 47, No. 45, March 10, 1949, pp. 45-46.⁵ "Nearly 40,000 Wells Completed Despite Material Shortage," by John C. Casper, Oil and Gas Journal, Vol. 47, No. 39, Jan. 27, 1949, pp. 172-175.⁶ Figures furnished by United States Bureau of Mines, Preprint of 1948 Minerals Yearbook.⁷ Kansas Corporation Commission figures calculated to 14.65 psia.⁸ No data available as yet.⁹ "17.7 Million Gallons Daily Light Hydrocarbons Seen for 1949," by John C. Casper, Oil and Gas Journal, Vol. 47, No. 39, Jan. 27, 1949, pp. 196-197.¹⁰ As of mid-year 1948.

TABLE 2.—Largest oil producing counties in Kansas during 1948

Rank	County	Producing acreage	Total production, barrels
1	Barton	80,710	21,897,415
2	Russell	72,410	13,638,374
3	Ellis	35,620	12,742,936
4	Rice	58,860	9,184,652
5	Butler	100,000*	5,911,373

* Approximate.

various phases and (2) a comparison between individual trends in Kansas and corresponding trends in the United States as a whole.

The question of whether or not Kansas is holding its own in respect to the petroleum industry can be answered readily by comparing figures in the two righthand columns in Table 1.

Production and value.—Production of both crude oil and natural gas in Kansas during 1948 set all-time records as to quantity and value. Figures for both are given in Table 1, and annual production in Kansas since 1890 is shown graphically on Figure 2.

The increase in the total value of Kansas crude oil in 1948 (37.5 percent) corresponded roughly with the increase in price (34 percent) but fell well under the figure (45.4 percent) representing the increase in value of crude oil produced for the entire country. This is explained by the fact that the crude production in Texas for 1948, which accounted for about 45 percent of the total United States supply, was up more than 10 percent above the 1947 figure.

During 1948, Barton County was first in oil production in the State with a total of 21,897,415 barrels. Russell County was second with 13,638,374 barrels, and Ellis County was third with a pro-

TABLE 3.—Largest oil producing pools in Kansas during 1948

Rank	Pool	Age years	County	Total production, barrels
1	Trapp	13	Russell-Barton	10,385,385
2	Kraft-Prusa	12	Barton-Ellsworth	6,887,650
3	Bemis-Shutts	14	Ellis	5,739,919
4	Silica	18	Barton-Rice	5,303,821
5	Burnett	11	Ellis-Rooks	3,780,103
6	Hall-Gurney	18	Russell	3,471,386
7	Bloomer	13	Ellsworth-Barton-Rice	3,158,431
8	El Dorado	34	Butler	3,011,660
9	Chase	18	Rice	2,912,765
10	Stoltenberg	17	Ellsworth	2,488,251

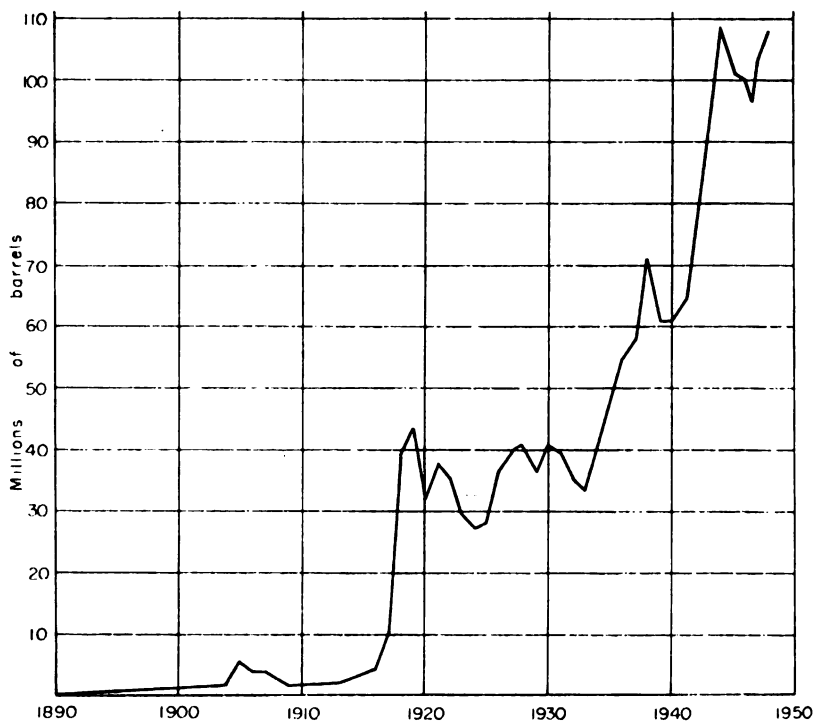


FIG. 2.—Annual oil production in Kansas from 1890 to 1948.

duction of 12,742,936 barrels. Table 2 lists the five counties with largest productions. The 10 Kansas pools with largest oil production during 1948 are listed in Table 3. A summary of oil produced, imported, used, and exported from the State is given in Table 4.

It should be noted that the value of Kansas natural gas production as reported for 1948 was based on the average price *at the wellhead*, about 6 cents per thousand cubic feet, instead of the average consumer price, about 34 cents per thousand cubic feet, at which it has been calculated and reported in former years. This change has been instituted by the U. S. Bureau of Mines, official gatherer of mineral statistics for the entire country, to bring the valuation of natural gas into line with that of other domestic mineral products which commonly are valued at their sources.

Thus, the value of natural gas in Kansas for 1948 is given as \$12,840,000, whereas it was reported as \$62,400,000 for 1947 by Ver Wiebe and others (1948, p. 11). This reduction in published

TABLE 4.—Summary of oil produced, imported, used, and exported in 1948
(From the Conservation Division, Kansas Corporation Commission)

	Barrels of oil
Produced	108,107,024
Imported	13,820,840
Total	121,927,864
Exported	52,178,879
Refined and used in Kansas	69,748,985

value, brought about as explained above merely by changing the point at which the gas was valued, is unrelated to the actual increase of 16.9 percent in Kansas oil production in 1948.

In respect to published gas production figures it should be noted that various agencies, both public and private, use different pressure bases for calculating volumes of natural gas. Without understanding the situation the reader will have difficulty reconciling published figures. The annual reports of the American Petroleum Institute and the American Gas Association, which are commonly recognized as authoritative for proven reserves of petroleum and natural gas, use a pressure base of 14.65 psia. (pounds per square inch absolute) for their calculations. The U. S. Bureau of Mines, at least up to 1946, has used the same base. The Kansas Corporation Commission uses a pressure base of 16.4 psia. and various companies use 16.4, 14.9, or 14.65 psia.

It seems desirable to quote from "Natural Gas Handbook" (Diehl, 1927, p. 66) in respect to the pressure base matter.

Some years ago the late F. H. Oliphant, at that time a member of the United States Geological Survey, considered it advisable that some standard should be adopted as a basis for the measurement of natural gas, and the following definition was proposed: "The standard cubic foot of gas is the quantity which occupies a volume of one cubic foot at a pressure of 14.65 pounds absolute at a temperature of 60 degrees F." An absolute pressure of 14.65 pounds is equal to the sum of 14.4 pounds, the average atmospheric pressure of the natural gas fields, and 0.25 pounds (four ounces), the average pressure existing in low-pressure distribution systems.

The proposed standard has not been generally adopted. The cubic foot at 16.4 pounds absolute, which is the reference standard in many cases, contains approximately 12 percent more gas by weight than a cubic foot at a base pressure of 14.65 pounds absolute. In other cases gas is sold at a base pressure of eight ounces or 14.9 pounds absolute. Eight ounces is probably the average pressure at the entrance of low-pressure natural gas systems. A cubic foot of 14.9 pounds absolute contains 1.7 percent more gas by weight than a cubic foot at 14.65 pounds absolute.

In this bulletin the Kansas Geological Survey, mainly in order to be in agreement with the U. S. Bureau of Mines and the principal agencies making petroleum reserve estimates, has calculated natural gas figures given in Table 1 on a base of 14.65 psia. However, gas production given in Table 5 for the individual fields of the State, except eastern counties, is reported to the Kansas Geological Survey by the State Corporation Commission and is calculated on a pressure base of 16.4 psia. County totals shown herein are on the same base.

The so-called eastern Kansas counties (Dickinson, Marion, Butler, Cowley, and all counties to the east) produced 17.3 percent of the State's oil in 1948. Table 6 gives the oil and gas production for the State by counties. Owing to the variation in the gravity of oil produced in various pools of the State and to the fact that the value of the oil depends on the gravity, it has not as yet been practical to attempt to list the value of oil production in the various counties.

The Hugoton field, which produced 185,872,590 thousand cubic feet (14.65 psia. base) of gas in 1948, supplied 77 percent of the State's production last year. Gas production by fields is shown in Table 5.

In cases where oil fields in western Kansas counties cross county boundaries, 1947 production was prorated on the basis of field areas within the respective counties. Production of these fields in 1948 has been divided according to actual output of leases to obtain more accurate figures for the present bulletin.

Area of production.—An attempt has been made to arrive at accurate figures for the actual area in Kansas pools that was producing oil or gas during 1948. The larger pools were measured by planimeter. Where possible areas producing oil have been segregated from those producing gas and figures are given on both for county units. In cases where pools produce both oil and gas, it has been necessary to make rather arbitrary segregation. In such cases the total area of gas and oil equals the total of the field; no duplication of area is intended.

The total area of oil and gas production during 1948 in the State (where such figures are available) is shown in Table 6.

Readers familiar with the eastern Kansas counties and their petroleum history will recognize that there are large areas in the "stripper" or relatively depleted fields in those counties which

TABLE 5.—Kansas natural gas production in 1947 and 1948
(From records of the Conservation Division, Kansas Corporation
Commission)

Field	1947 M cu. ft. ¹	1948 M cu. ft. ¹
Adams Ranch		162,343
Aetna	141,026	109,654
Alden	39,352	
Belpre	921,521	826,372
Burrton	2,809,205	372,156
Cairo (combined with Cunningham pool)	92,607	79,928
Carmi	38,185	28,430
Chitwood	529,717	661,614
Clara	276,094	441,698
Cunningham (Arbuckle)	178,670	64,321
Cunningham (Viola)	1,891,522	1,656,677
Deerhead	750,149	52,764
Dundee		72,381
Eastern Kansas, miscellaneous ²	2,148,566	2,050,000
Eberhardt	254,459	39,823
Farmington		201,404
Haferman (combined with Chase pool)	100,695	16,040
Hugoton	140,839,734	166,039,208
Krier (Kraft-Prusa)	37,587	47,068
Lake City—see Skinner North		
Liberal	392,762	473,571
Liberal Southeast	656,601	1,743,693
Lyons	107,770	57,620
Macksville	59,981	670,710
Marion County		258,685
McPherson County	619,857	476,374
Merten (combined with Otis-Albert)	109,344	8,880
Medicine Lodge	8,478,694	9,126,152
Orth	83,862	53,304
Otis-Albert	4,475,849	3,586,001
Pawnee Rock-Behrens-Ryan-Ash Creek area	1,618,268	9,875,271
Quivira	142,986	68,258
Rick	17,373	16,500
Schraeder	413,740	391,700
Shady	277,237	1,780,646
Skinner North (formerly Lake City)	7,271,305	4,178,178
Sperling	67,479	76,734
Stoltenberg		18,317
Stucky South	199,216	236,518
Unruh	2,807,726	2,762,529
Whelan	1,802,909	3,536,691
Winfield	245,114	404,718
Yoder	591,424	742,296
Zenith-Peace Creek	1,094,612	699,320
Zook	944,068	401,165
Totals	183,527,266	214,565,712³

¹ Based on 16.4 pounds per square inch absolute pressure.

² Figures on eastern Kansas production assembled by the State Geological Survey indicate a total of 2,110,882.

³ This volume has been converted to a pressure base of 14.65 in Table 1.

TABLE 6.—Amount and area of oil and gas production in Kansas during 1948, by counties

County	Oil, bbls.	Producing oil wells	Oil, acres	Gas*** M cu. ft.	Producing gas wells	Gas, acres
Allen	284,561	215+		*		
Anderson	371,131	255+		*		
Barber	1,405,434	146	6,370	17,445,137	99	15,470
Barton	21,897,415	2,218	80,710	6,200,327	25	8,800
Bourbon	11,188	16+		407		
Brown	5,671	3				
Butler	5,911,373	2,253+				
Chase	19,685	1				
Chautauqua	832,965	1,299+		*		
Coffey	85,172	30+				
Cowley	2,592,991	618+		100,000		
Crawford	67,059	9		357	41	
Dickinson	23,449	7				
Douglas	4,000					
Edwards				826,372	4	460
Eik	211,926	229		514,561	29	
Ellis	12,742,936	1,134	35,620			
Ellsworth	5,227,593	577	21,470	18,317	1	100
Finney	308,263	19	1,280	included with Hugoton		188,480
Hugoton gas field				166,039,208	1,134	
Franklin	233,325	492		27,397		
Graham	1,734,052	119	4,780			
Grant				included with Hugoton		366,640
Greenwood	4,776,611	1,216+		45,000		
Hamilton				included with Hugoton		21,760
Harvey	511,644	142	7,540	406,302	15	456
Haskell				included with Hugoton		234,240
Jefferson	108,652	32		100,000		
Johnson				66,000		
Kearny	38,422	3	200	included with Hugoton		342,400
Kingman	106,052	32	860	310,025	4	740
Kiowa	4,117	1	40			560
Labette	6,528	15+		198,619	102	
Leavenworth	1,266	2		10,000 (See Wyandotte Co. also)		
Linn	60,201	236+		*		
Lyon	187,948	37+				
Marion	643,137	217		670,710		
McPherson	4,182,641	893	38,340	476,374	14	2,560
Meade	347	1	40	162,343	1	5,140
Miami	327,326	850+		180,000		
Montgomery	945,616	1,433+		568,283	85	
Morris	407	1		*		
Morton				included with Hugoton		100,160
Nemaha	1,000					
Neosho	484,753	281+		108,365	79	
Ness	276,969	36	5,560			
Norton	13,276	2	420			
Pawnee	523,065	85	4,380	8,444,182	16	1,326
Phillips	1,951,458	187	7,360			
Pratt	2,559,249	341	14,610	2,180,945	29	4,250
Reno	2,151,810	495	26,090	1,235,482	34	500
Rice	9,184,652	1,361	58,860	195,222	13	2,400
Rooks	3,596,944	442	18,930			
Rush	531,780	82	4,560	3,945,755	54	7,030
Russell	13,638,374	2,246	72,410			

Saline	266,252	53	2,960			
Scott	53,201	9	800			
Sedgwick	665,208	191	6,760			40
Seward	23,908	3	580	2,217,264**	8	88,840
Sheridan	514,564	45	1,340			
Stafford	4,586,702	702	28,830	1,357,354	9	850
Stanton				included with Hugoton		119,360
Stevens				included with Hugoton		451,520
Sumner	1,120,693	314	10,740			1,280
Trego	97,179	17	1,440			
Wilson	69,976	176+			*	
Woodson	441,771	224+		4,809		
Wyandotte	(includes some Leavenworth Co.)			40,000		

- * Figures on gas production in this county are not available.
 ** This figure covers gas not produced in Hugoton field. The total production of Hugoton field is not segregated as to counties.
 *** Calculated on a pressure base of 16.4 psia., the figures being supplied by the Kansas Corporation Commission.

still produce modest quantities of oil and gas. To some it may not seem entirely fair to combine these large areas of small production in eastern Kansas with relatively small areas of large production, both of oil and gas, in western Kansas. However, it seems more practical to combine such areas in order to arrive at totals for the State, than to divide the State into western counties and eastern counties.

New pools.—During 1948, 64 new oil pools and 3 new gas pools were discovered in Kansas. Seven old pools were revived. Rooks County had the largest number, 11, of new pool discoveries. Barton and Stafford Counties, with 10 new pools each, shared second place. New pool discoveries increased 16 percent in 1948 over 1947. Two of the new oil pools were abandoned later in the year. New pools are listed in Table 7.

Abandoned pools.—It has been the custom of the Survey in recent years to omit from the county maps the outlines of abandoned pools. Maps of the western Kansas counties do not show abandoned pools, but the depleted or abandoned parts of pools in eastern Kansas counties are shown in outline.

Wells and dry holes drilled during 1948.—The county descriptions show 3,285 new wells drilled during 1948 in connection with oil and gas production in Kansas counties. As records are incomplete, shallow wells in several eastern Kansas counties are not included in this figure. Of the 3,285 1948 tests reported, 1,656 were oil wells, 351 were gas wells, 71 were salt water disposal wells, and 1,207 were dry and abandoned. New pool discoveries accounted for 72 of the oil and gas wells; 248 of the dry holes were wildcats, the remainder being drilled within or near pools.

TABLE 7.—Oil and gas pools discovered in Kansas during 1948

County, pool, and location of discovery well	Discovery well	Producing zone	Production depth, feet	Month of discovery	Initial production per day, bbls.
Barber County					
Cottonwood Creek 21-30-14W	Great Lakes Carbon Corp. et al. No. 1 Werner	Simpson	4,582-4,594	August	4,500 M cu. ft. gas
DeGeer 2-33-15W	Lion Oil Company No. 1 DeGeer	Viola	5,176-5,178	May	3,000
Barton County					
Bryant 27-20-12W	Alpine Oil & Royalty Co., Inc. No. 1 Bryant	Arbuckle	3,383-3,405	August	170
Hiss Southeast 32-20-13W	Ben F. Brack No. 1 Wright	Arbuckle	3,545-3,561		190
Homestead 22-18-13W	Raymond Gear et al. No. 1 Eveleigh	Arbuckle	3,310-3,319	April	35
Klug North 27-17-13W	Stickle Drilling Co. No. 1 Childs	Arbuckle	3,377-3,381	April	90
Lake Barton 21-18-13W	The Texas Company No. 1 Trester	Arbuckle	3,372-3,389	July	28
Laudick 28-16-12W	Derby Drilling Co. No. 1 Laudick	Arbuckle	3,382-3,392	January	195
Odin (Revived) 3-17-12W	Palmer Oil Corp. No. 1 Stumps	Arbuckle	3,321-3,328	July	182
Rolling Green 36-20-13W	Cardinal Oil Company No. 1 Schartz	K.C.-Lans.	3,257-3,263	June	137
Workman Southeast 34-20-12W	E. H. Adair Oil Co. No. 1 Lanterman	Arbuckle	3,389	October	100
Yeakley 17-18-13W	Sohio Petroleum Co. et al. No. 1 Yeakley	Arbuckle	3,319-3,325	June	100
Butler County					
Combs Northeast 27-29-5E	Veeder Supply & Mid-Plains No. 1 Hampton	"Bartlesville"	2,813-2,838	June	50
Guyot 5-29-5E	Shawver and Graham, Inc. No. 1 Guyot	"Bartlesville"	2,796-2,804	October	30
Towanda 5-26-4E	Adair & Rex & Morris No. 2 Rice	Viola	2,565-2,566	April	40
Cowley County					
Box 28-30-7E	K. T. Wiedemann No. 1 Haydensmith	Mississippian	2,842-2,854		7
Enterprise 35-33-3E	Meade Production No. 1 McMichael	"Bartlesville"	3,282-3,323	July	25
Turner North 18-32-6E	Wolf Creek & General Exploration No. 1 Bynum	"Layton"	2,286-2,292		15
Ellis County					
Canyons 11-12-17W	Cities Service Oil Co. No. 1 "M" Hall	K.C.-Lans.	3,361-3,367	January	170
Madden (revived) 26-15-18W	Jones, Shelburne & Farmer No. 1 "D" Madden	K.C.-Lans.	3,328-3,333	January	75
Polifka 7-13-17W	V. D. Sidey No. 1 Polifka	Arbuckle	3,640-3,671		127
Upper Turkville 9-11-17W	Westgate-Greenland Oil Co. No. 1 Simpson	K.C.-Lans.	3,114-3,124	April	25
Weigel 19-12-16W	J. M. Huber Corp. No. 1 Weigel	K.C.-Lans.	3,368-3,376	April	25
Kiowa County					
Excel 20-30-20W	Drillers Gas Co. No. 1 Lorimor	"Miss. lime"	5,126-5,154	May	219
McPherson County					
Battle Hill North 13-18-1W	Westgate-Greenland Oil Co. No. 1 Ruth	"Miss. lime"	2,811-2,826		317

Burk 7-18-1W	Westgate-Greenland & Mallard No. 1 Burk	Mississippian	2,781-2,784	January	169
Maxwell 17-18-1W	Bay & Anderson-Prichard No. 1 "B" State	"Miss. lime"	2,846-2,871	September	40
Twin Mounds 1-18-2W	Donald T. Ingling No. 1 Miller	"Miss. lime"	2,842-2,851	April	800
Marion County					
Antelope North 28-18-4E	H. H. Schlageck et al. No. 1 Holub	Kansas City	1,840-1,852		35
Lost Springs South- east 10-18-4E	Monroe No. 1 Lueker	Mississippian	2,345-2,387		12
Morton County					
Richfield 17-32-40W	Stanolind Oil & Gas Co. No. 1 Bear	Basal Penn. (Atoka)	4,990-5,017	April	3,900 M cu. ft. gas & 20 bbls. condensate
Nemaha County					
Strahm 27-2-14E	Carter Oil Company No. 1 Strahm	"Hunton"	2,877-2,879	September	54
Pratt County					
Frisble Northeast 4-26-13W	Skelly Oil Company No. 1 Kipp	K.C.-Lans.	3,788-3,800	May	720
Reno County					
Albion 14-26-6W	Helmerich & Payne, Inc. No. 1 Stucky	"Chat"	3,654-3,659	April	51
Rice County					
Bowman North 16-19-10W	C. E. Ash No. 1 "A" Wendel	Arbuckle	3,331-3,336	January	30
Bredfeldt (Revived) 7-18-9W	Palmer Oil Corp. No. 1 Bredfeldt	Arbuckle	3,226-3,235	June	448
Gemeinhardt 18-18-10W	Skelly Oil Co. No. 1 Gemeinhardt	Arbuckle	3,293-3,297	August	282
Haferman East 5-19-9W	Henderson Oil Co. No. 1 Keller This pool is now part of the Chase pool	Arbuckle	3,243-3,246	February	1,496
Prosper (Revived) 6-18-9W	Birmingham-Bartlett Drlg. Co. No. 1 "C" Habiger	Arbuckle	3,232-3,241	July	84
Welch West 6-21-6W	Branine & Holl & Allan No. 1 Turner	"Miss. lime"	3,498-3,507	April	40
Rooks County					
Barry West 4-9-19W	Westgate-Greenland Oil Co. No. 1 McClellan	Arbuckle	3,442-3,444	May	314
Berland 19-10-19W	The Texas Company No. 1 Berland	Arbuckle	3,802-3,807	May	160
Chandler 14-9-19W	Harry Gore No. 1 Ruder	Arbuckle	3,455-3,462	May	3,000
Gra-Rook 30-9-20W	Nadel & Gussman No. 1 Baldwin	Arbuckle	3,869-3,872	October	1,226
Krueger 35-10-16W	Cities Service Oil Co. No. 1 Krueger	K.C.-Lans.	3,552	July	900
Lone Star 4-8-17W	Bay Petroleum Corp. No. 1 Hunter	Arbuckle	3,382-3,386	May	80
McHale 8-9-18W	National Cooperative Refy. Assn. No. 1 Smith	Arbuckle	3,494-3,499		1,480
Marc 18-9-19W	Aylward Drilling Co. No. 1 Marcotte	K.C.-Lans.	3,370-3,374	September	91
Nettle 34-9-17W	Phillips Petroleum Co. No. 1 Nettle	K.C.-Lans.	3,243-3,268	November	170
Northampton 26-9-20W	Nadel & Gussman No. 1 Marcotte	Arbuckle	3,803-3,814	January	3,000
Plainville 31-9-17W	W. L. Hartman No. 1 Westhusin	K.C.-Lans.	3,477-3,488		12

TABLE 7.—Oil and gas pools discovered in Kansas during 1948, concluded

County, pool, and location of discovery well	Discovery well	Producing zone	Production depth, feet	Month of discovery	Initial production per day, bbls.
Russell County					
Meier 30-15-12W	El Dorado Refining Co. No. 1 Meier	Arbuckle	3,325-3,329	August	250
Ney 31-15-12W	Wood River Oil & Refg. Co., Inc. No. 1 "A" & "B" Ney	K.C.-Lans. Arbuckle	3,240-3,250 3,350-3,355	January January	26 222
Parker 18-15-12W	Skally Oil Co. No. 1 "A" Parker	Arbuckle	3,259-3,270	September	23
Saline County					
Hunter North 8-16-1W	Deep Rock & Broswood Oil Co. No. 1 James	"Miss. lime"	2,674-2,690	May	60
Sedgwick County					
Chambers 10-29-2W	Leo V. Wentworth No. 1 Chambers	"Miss. lime"	3,540-3,550		25
Fairview 8-26-2E	J. P. Gaty No. 1 Phillips	"Burgess"	2,960	April	1,173
Fairview North 5-26-2E	J. P. Gaty No. 1 Broers	"Burgess"	2,971		776
White Cotton 30-26-2E	J. P. Gaty No. 1 Brown	"Burgess"	2,957-2,961	August	3,000
Seward County					
Kismet 23-33-31W	Stanolind Oil & Gas Co. No. 1 Wheatley	Marmaton	5,095-5,100		132
Stafford County					
Bradbridge 6-24-15W	Cromwell & Lewis No. 1 Bradbridge	Arbuckle	4,020-4,024		4,350 M cu. ft. gas
Copeland 30-24-13W	Hinkle Oil Co. No. 1 Copeland	K.C.-Lans.	3,752-3,760		168
Fischer Northwest 36-21-13W	Nadel & Gussman No. 1 Fischer	Arbuckle	3,639-3,642	August	3,000
Hildebrand 2-24-12W	Delta Production & B. & R. No. 1 Hildebrand	Viola	3,771-3,780	July	2,000 M cu. ft. gas
Hufford 33-21-13W	Phil-Han Oil Co. No. 1 Hufford	Arbuckle	3,755-3,770	April	368
Kelly 35-23-12W	Delta Production & B. & R. No. 1 Kelly	Arbuckle	3,870-3,875	August	84
Moon 4-22-13W	F. H. Adair Oil Co. No. 1 Moon	K.C.-Lans.	3,530-3,538		75
Nellie 28-22-14W	Huber, Musgrove & C-G No. 1 Symns	K.C.-Lans.	3,696-3,704	April	480
Neola (Revived) 15-25-11W	Derby Oil Co. No. 1 Tarrant	Viola	3,921-3,924	April	30
Rothgarn East 11-21-13W	Atlantic Refining Co. No. 1 McDonald	Arbuckle	3,526-3,532	July	509
Salt Marsh 34-21-11W	Hinkle Oil Co. et al. No. 1 Shepard This pool has been abandoned.	Arbuckle	3,463-3,468	May	Dry
Smallwood 22-22-14W	Robert L. Williams No. 1 Prichard This pool has been abandoned.	K.C.-Lans	3,481-3,487		Dry
Sumner County					
Anson (Revived) 35-30-2W	Consolidated Gas & Anderson-Prichard No. 1 Frantz	"Miss. lime"	3,742-3,749	February	38
Corbin (Revived) 23-34-2W	Alpine Oil & Royalty Co. No. 1 Douglas	Simpson	4,475-4,481	August	50

Barton County led all others in the State in total number of new wells drilled (429) and in number of dry holes (170). Butler County was second with 322 new wells and 105 dry holes.

Test wells drilled within 2 miles of the outside boundaries of producing pools are called "extension wildcats" and are not shown on county maps in this bulletin. Test wells resulting in dry holes drilled outside this 2-mile zone are classed as "wildcat wells" and are shown by a symbol on the county maps. As pool boundaries are rarely exact, the classification of wildcat wells becomes somewhat arbitrary. Hence, the total number of wildcat wells the reader may obtain from various sources is likely to vary somewhat.

For purposes of the tables, wells counted as 1948 completions are those which have been finished within the year and which have been drilled to completion in one operation. Old wells worked over, although they came in as producers, were not counted as 1948 completions. The 1948 wells abandoned as dry and then converted to salt water disposal use have sometimes been classed as dry holes, unless it was plain that they were drilled expressly for salt water disposal.

Secondary recovery.—Secondary recovery has become an important method of oil production in Kansas. Of the methods which include repressuring by air, nitrogen, natural gas, and water, water flooding is by far the most important and is being practiced widely, especially in eastern Kansas counties. In areas in which oil is produced largely or wholly from sandstones of Pennsylvanian age a large part of the production is obtained by water-flooding projects.

Repressuring by water consists of injecting fresh or salt water through input wells into oil-bearing formations under pressure sufficient to displace the oil from pores in the rock and to drive it into producing wells. The oil wells may be pumped or the water pressure may be enough to cause the oil to flow from the wells. The amount of pressure to which water is subjected ranges downward from about 900 pounds per square inch at the wellhead. It is obvious that characteristics of the reservoir rocks and the overlying strata are factors that must be considered in determining the pressure at which water is forced into the oil-bearing rocks.

TABLE 8.—Data on secondary recovery projects in Kansas, 1948

County	Field	Producing zone	Developed acreage	No. wells	Date started	Injection medium	
Allen	Elsmore Shoestring	"Bartlesville"	50	40	1941	Fresh water	
	do	do	60	35	1941	do	
	do	do	15	10	1943	do	
	do	do	15	8	1948	do	
	do	.....	70	12	1944	Salt water
	do	"Bartlesville"	160	13	1940	"Miss. lime" water	
	Humboldt-Chanute	.....	97	53	.....	Fresh & salt water
	do	"Bartlesville"	20	10	1945	Salt water	
	do	do	10	4	1945	do	
	do	do	40	20	1942	do	
Anderson	do	do	30	10	1941	do	
	Bush City Shoestring	.....	315	145	1944	do
	do	.....	237	104	1939	do
	do	.....	170.5	73	1941	do
	Garnett Shoestring	.....	296	169	1936	Garnett city water
Barton	Kincaid	"Bartlesville"	259	42	1946	Salt water	
	Selma	do	60	.....	1941	do
	Silica	Arbuckle	580	33	1946	Nitrogen & natural gas	
Butler	El Dorado	Admire	26	9	1947	Salt water	
	do	Ordovician	680	45	1947	do	
	do	Viola	40	3	1947	do	
	Fox-Bush	.....	120	11	1944	Fresh water
	do	"Bartlesville"	20	10	1947	do	
	do	.....	48	2	1944	Fresh water
	do	"Bartlesville"	360	15	1942	Salt water	
	do	do	360	10	1948	do	
	do	.....	120	6	1945	Fresh water
	do	"Bartlesville"	140	13	1929	Residue gas	
	do	Kramer-Stern	"Leon lime"	50	4	1937	Salt water
	do	Seward	Kansas City	40	3	1945	do
	do	Young	Kansas City	80	7	1946	do
	Chautauqua	Elgin	"Peru"	160	6	1940	Salt water
		do	do	300	53	1940	do
do		"Redd"	140	53	1940	do	
Feru-Sedan		"Peru"	600	38	1935	do	
do		do	420	42	1939	do	
do		do	420	58	1938	do	
do		do	25	5	.....	do
do		do	220	30	1938	do	
do		do	20	3	1944	do	
do		do	640	49	1938	do	
Cowley	do	do	90	15	1938	do	
	Eastman	"Bartlesville"	370	23	1930	Residue gas	
	Hittle	"Layton"	100	3	1945	Salt water	
	Murphy	"Bartlesville"	80	5	1946	do	
	Rainbow Bend	"Burbank"	1,300	95	1933	Gas	
Crawford	Weathered	"Stalnaker"	40	3	1946	Salt water	
	McCune	.....	.....	.....	1941	do
	Walnut	"Bartlesville"	150	27	1941	Salt & fresh water	
Elk	"Gardner"	"Longton"	40	9	1947	Fresh water	
	New Albany	New Albany	113	0	1937	do	
	do	New Albany	116	46	1943	Fresh & salt water	
Franklin	Paola-Rantoul	.....	212	83	1944	Marias des Cygne River water
	do	.....	22	17	1944	do
	do	.....	50	12	1948	Fresh & salt water
	do	.....	40	8	.....	Salt water

Greenwood	Burkett	"Bartlesville"	665	88	1939	do	
	Demalorie-Souder	.....	20	8	1946	do
	Fankhouser	"Bartlesville"	30	6	1944	do	
	Hamilton	do	200	27	1946	Fresh & salt water	
	do	do	40	3	1938	do	
	Lamont	do	70	0	1942	Salt water	
	do	do	90	8	1943	do	
	do	do	100	8	1943	do	
	Pixlee	do	220	20	1947	do	
	Sallyards	.....	10	31	1946	do
	Scott	.....	95	43	1945	do
	Seeley-Wick	"Bartlesville"	23	2	1942	do	
	do	do	147	25	1946	do	
	do	do	540	60	1943	do	
	do	.....	89.5	25	1943	do
	do	"Bartlesville"	123	14	.....	do
	do	do	280	20	1947	do	
	do	do	50	5	1947	do	
	do	do	30	3	1947	do	
	Teeter	do	100	13	1947	do	
	do	.....	160	13	1944	do
	Thrall-Aagard	"Bartlesville"	84	10	1944	do	
	do	.....	100	13	1944	do
	do	.....	44.5	5	1946	do
	do	.....	43.5	5	1945	do
	do	.....	110	17	1942	do
	do	.....	8	2	1945	do
do	.....	47.5	5	1937	do	
do	"Bartlesville"	30	5	1943	do		
do	"Miss. lime"	480	33	1946	do		
Harvey	Hollow-Nikkel	"Hunton"	60	2	1940	do	
	do	do	140	2	1941	do	
	do	do	60	1	1941	do	
	do	Mississippian	20	1	1941	do	
Kingman and Pratt	see Pratt County						
Linn	Centerville	"Squirrel"	94	50	1936	Fresh water	
	Goodrich-Parker	.....	119.6	67	1944	Salt water
Lyon	LaCygne	.....	22.5	13	1942	do
	Atyeo	"Bartlesville"	50	4	1948	do	
Marion	Fankhouser	do	30	9	1943	do	
	Lost Springs	"Chat"	80	4	1943	do	
McPherson	Graber	"Hunton"	240	15	1947	Fresh water	
	Lindsborg	.....	160	33	1947	Salt water
	do	Maquoketa	280	7	1947	do	
	Ritz-Canton	.....	160	10	1947	do
	do	.....	120	9	1947	do
	do	Mississippian	140	1	1941	do	
	do	do	100	6	1946	do	
	do	do	200	7	1942	do	
	do	do	100	6	1941	do	
	do	do	140	0	1946	.....
	do	do	40	2	1947	Salt water	
	do	do	120	3	1947	do	
	do	Voshell	Simpson	70	4	1947	do
	Miami	Paola-Rantoul	"Peru"	37.5	21	1947	do
do		.....	113	27	1944	Fresh & salt water
do		"Peru"	60	40	1941	Fresh water	
do		"Big Lake"	55	200	1945	Salt water	
do		.....	70	26	1941	Fresh water
do		.....	102	24	1944	Salt water

TABLE 8.—Data on secondary recovery projects in Kansas, 1948, concluded

County	Field	Producing zone	Developed acreage	No. wells	Date started	Injection medium	
Montgomery	do	.....	113	26	1945	do
	do	"Peru"	120	18	1938	Fresh water	
	do	do	...	33	1939	do	
	Coffeyville-Cherryvale	do	"Peru"	40	17	1946	do
		do	do	60	22	1948	Arbuckle lime water
	do	.....	.....	.....	1948	"Miss. lime" water
	Jefferson-Sycamore	do	2	1945	Salt water
		do	"Wayside"	60	30	1944	Fresh water
	do	"Bartlesville"	400	66	1945	H ₂ S water	
	do	do	60	8	1945	Fresh water	
	do	do	60	12	1948	"Miss. lime" water	
	do	.....	800	180	1943	Fresh & salt water
	do	.....	.....	30	1944	do
	Sorghum Hollow	.....	.....	2	1944	Salt water
	Wayside-Havana	.....	.....	15	1941	do
	do	.....	.....	25	1946	Fresh water
	do	"Wayside"	75	27	1942	Fresh & salt water	
	do	do	20	10	1945	do	
	do	"Wayside" & "Weiser"	40	15	1945	do	
	do	"Wayside"	25	14	1944	do	
do	do	20	18	1945	do		
do	do	40	19	1948	do		
do	do	56.25	29	1938-39	do		
do	.....	.....	25	1940	do	
do	.....	.....	20	14	1945	Salt water
Neosho	Erie	.....	30	11	1947	Fresh water and produced salt water
Humboldt-Chanute	do	.....	679	250	1937	Fresh water
	do	"Bartlesville"	20	6	1941	do	
Pratt	Cunningham	.....	160	3	1947	Salt water
Pratt and Kingman	do	.....	1,800	49	1936	Gas injection
Reno	Abbyville	.....	160	3	1947	do
Rice	Hilger	Viola	40	3	1946	do	
	Silica	Arbuckle	40	3	1946	do	
	do	do	80	5	1946	.....
do	do	do	120	1	1946	Salt water	
Russell	Smyres	"Chat"	140	6	1945	do	
	Fairport	Sooy	80	3	1948	do	
	Hall-Gurney	.....	.....	3	1948	do
	do	.....	160	1	1944	do
	do	K.C.-Lans.	160	5	1947	do	
	do	.....	80	3	1944	do
Sedgwick	do	K.C.-Lans.	160	4	1947	do	
	Robbins	Mississippian	80	6	1945	Fresh water	
	do	do	250	18	1947	Fresh & salt water	
Stafford	Valley Center	.....	.....	.....	1941	.....
	Kipp	.....	80	2	1946	Salt water
	Zenith-Peace Creek	.....	80	2	.....	do
	do	"Misener"	600	10	1948	do	
do	do	Viola	80	3	1945	do	
do	do	"Misener" Viola	313	9	1945	do	
Sumner	Oxford	.....	160	9	1946	do
Wilson	Vilas	"Bartlesville"	240	11	1943	do	
Woodson	Yates Center	Mississippian	160	3	.....	do

Water-flooding in Kansas has been discussed by Abernathy (1948), Abernathy and Jewett (1946), Grandone (1944), Jewett (1948), Sweeney (1948, 1949), Ver Wiebe and others (1948, pp. 21-27), and Jewett (1949); it is considered only briefly here.

Table 8 shows data concerning reported water-flooding projects in Kansas according to recent surveys. It serves to illustrate the magnitude of this method of oil production in the State.

It is fitting to point out that new projects constantly are being initiated, but that there are many fields and parts of fields that are potential areas for repressuring. Few water-flooding projects in Kansas have been abandoned and many operators expect the average life of an eastern Kansas project to be about 15 years. It is believed that the amount of oil recoverable by this method in most fields will be about the same as that produced by primary methods.

Geologic column.—A rather generalized and incomplete geologic column (Fig. 3) shows the sequence of rock units. The principal oil- and gas-producing zones in Kansas are indicated. Thicknesses are not given because the variation is so great. Names placed in quotation marks are some that are used rather loosely and which are not strictly defined. Some of the rock units shown are not present in western Kansas and others are absent in the eastern part of the State.

Well elevations.—Elevations of many wildcat tests and new discovery wells in the western counties of the State are given in tables or in the text. Actual depths below sea level of stratigraphic horizons have been given in many cases. Well logs usually are obtainable at nominal cost from the Kansas Well Log Bureau in Wichita. In the cases of the eastern counties containing the older fields and in areas of large production, such as Russell, Barton, and Ellis Counties, elevations of wildcat wells have been omitted because in such areas of concentrated activity they should not be difficult to obtain. Publication of elevations of approximately 75 wildcat wells was made possible through the kind cooperation of Laughlin-Simmons and Company of Tulsa, Oklahoma.

The eastern Kansas counties.—Maps of the eastern counties have been drawn in a manner designed to show present conditions as fairly and accurately as possible. The so-called "stripper" oil fields of southeastern Kansas have been shown mainly in outline

Geologic System	Some Subdivisions			
Quaternary	Recent — Alluvium (Pleistocene) glacial sediments			
Tertiary	(Pliocene) Ogallala			
Cretaceous				
----- Jurassic?				
Permian	<table border="0"> <tr> <td> Stone Corral dolomite Herington limestone Winfield limestone Ft. Riley limestone Wreford limestone Indian Cave sandstone </td> <td style="font-size: 3em; vertical-align: middle; padding: 0 10px;">}</td> <td style="vertical-align: middle;">Hugoton gas zones</td> </tr> </table>	Stone Corral dolomite Herington limestone Winfield limestone Ft. Riley limestone Wreford limestone Indian Cave sandstone	}	Hugoton gas zones
Stone Corral dolomite Herington limestone Winfield limestone Ft. Riley limestone Wreford limestone Indian Cave sandstone	}	Hugoton gas zones		
Pennsylvanian	Tarkio limestone Topeka limestone Oread limestone Lansing-Kansas City sequence (limestones) "Wayside sand" "Peru sand" Ft Scott limestone "Squirrel sand" "Bartlesville sand" Sooy conglomerate Atokan rocks			
Mississippian	"Chat" "Mississippi lime" Kinderhook (Chattanooga) "Misener sand"			
Silurian and Devonian	"Hunton limestone"			
Ordovician	Sylvan shale Viola limestone Simpson-St. Peter sandstone Arbuckle dolomite			
Cambrian	Lamotte (Reagan) sandstone			
Pre-Cambrian	Granite and quartzite			

FIG. 3—Generalized geologic column showing rock units commonly used by drillers and petroleum engineers.

and by name as they were known in the past during their days of primary production. As these former fields are now much reduced in size, only the spots, pools, or "leases" that were actually producing oil in 1948 have been given the symbol for "producing area."

Previous publications.—For many years the State Geological Survey has published reviews of oil and gas developments and descriptions of petroleum geology of Kansas. Oil and gas production statistics were included in a series on the "Mineral Resources of Kansas" which were published for the years 1897 to 1903 inclusive (Haworth, 1898, 1899, 1900, 1902, 1903, and 1904). The first comprehensive Survey publication on oil and gas was issued in 1908 as Volume 9 of the Survey publications (Haworth, 1908). The development of shallow oil and gas in eastern Kansas was greatly facilitated by the publication of State Geological Survey of Kansas Bulletin 3 in 1917 (Moore and Haynes). This was followed by Bulletin 6, also on oil and gas resources of Kansas; five parts were published during the interval from 1920 to 1927 (Moore, 1920, 1920a; Moore and Elledge, 1920; Moore and Boughton, 1921; Charles, 1927).

More recently the Survey has published a more continuous series of reviews of oil and gas developments in the State. The first of these was prepared by Kesler and was published in 1928 as Mineral Resources Circular 1. The second was written by Folger (for 1928 and 1929) and Hall (for 1930) and was issued in 1933 as Mineral Resources Circular 2. Koester (1934) is the author of Mineral Resources Circular 3. These three reports review oil and gas developments in all of Kansas. Since 1937, Ver Wiebe has prepared data annually for Survey publications on oil and gas developments in western Kansas counties (Ver Wiebe, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947; Ver Wiebe and others, 1948).

Bulletin 57 (Jewett and Abernathy, 1945) reviews oil and gas developments in eastern Kansas counties up to 1943. Bulletin 75 (Ver Wiebe and others, 1948) treats oil and gas developments in the entire State during 1947, and it is planned to continue publishing yearly bulletins on oil and gas developments in Kansas. Jewett (1949) prepared Bulletin 77, a report on oil and gas production developments in eastern Kansas during 1944, 1945, 1946,

1947, and 1948 which ends the series devoted to eastern Kansas counties.

Oil and gas in several individual eastern Kansas counties has been discussed in several Survey publications. Three parts of Bulletin 6 are county oil and gas reports. Counties treated are: Allen and Neosho (Moore and Elledge, 1920), Wilson and Montgomery (Moore and Boughton, 1921), and Anderson (Charles, 1927). Bulletin 5 (Boughton, 1920) on the Elk City gas field, Bulletin 7 (Fath, 1921) on the geology of the El Dorado oil and gas field, and Bulletin 12 (Bass, 1929) on the geology of Cowley County, Kansas, with special reference to the occurrence of oil and gas, are important contributions and were especially comprehensive at the time of publication. A later series of county oil and gas reports with maps showing locations and stratigraphic depths of drill holes includes reports for Labette County (Abernathy, 1939), Linn County (Jewett, 1940), and Montgomery County (Abernathy, 1940).

In 1935 the State Geological Survey published Bulletin 20 (Ockerman, 1935) on subsurface studies in northeastern Kansas which contains results of studies of samples and logs and information on oil and gas possibilities in Atchison, Brown, Doniphan, Douglas, Jackson, Jefferson, Johnson, Leavenworth, Shawnee, Wabaunsee, and Wyandotte Counties.

Cooperative investigations of the State Geological Survey and the Mineral Fuels Division of the Federal Geological Survey under the supervision of Wallace Lee have yielded several very important contributions to the knowledge of oil and gas geology in Kansas. Of these, State Survey Bulletin 38, part 10 (Lee, 1941) is a preliminary report of the McLouth oil and gas field, Jefferson and Leavenworth Counties. A more extensive report on the same area is Bulletin 53 (Lee and Payne, 1944). Bulletin 51 is on the stratigraphy and structural development of the Forest City basin (Lee, 1943) and Bulletin 74 (Lee, Leatherrock, and Botinelly, 1948) describes the Salina basin.

Recently five subsurface geologic cross sections showing stratigraphy and structural conditions in western Kansas have been prepared by the United States Geological Survey in cooperation with the State Geological Survey (Edson, 1945; Maher, 1946; Edson, 1947, Maher, 1947; Collins, 1947).

Special attention is called also to United States Geological Survey Oil and Gas investigations preliminary map 48 (Lee and others, 1946) which shows the geologic development of the Forest City basin chiefly by means of maps showing thicknesses of various stratigraphic units.

There are many important papers on the geology of Kansas oil fields in various publications other than those of the Geological Survey. References are made elsewhere in this paper to several of them.

Straggler wells.—After the statistical records have been finished for each year, late reports of completed wells continue to come in. These are referred to as stragglers, and are reported in the bulletin for the following year, but are credited to the year in which the wells were completed. These stragglers are shown in Table 9.

Acknowledgements.—T. A. Morgan, J. P. Roberts, D. C. Lilley, and H. A. Beverlin of the Conservation Division of the State Corporation Commission have for a long time cooperated to the fullest extent with the Geological Survey. Without their cooperation this report would not be possible.

TABLE 9.—Wells completed in 1947 but reported in 1948

County	Oil	Gas	Dry	SWD
Barton	4	1	1	....
Butler	8	....	2	4
Chautauqua	3	1	1	....
Dickinson	....	....	1	....
Elk	....	....	1	....
Ellis	1	....	1	1
Ellsworth	1	....	....	....
Graham	....	....	1	....
Greenwood	2	....	....	6
Haskell	....	2	....	....
Linn	....	....	....	8
McPherson	1	....	1	....
Neosho	3	....	....	3
Pawnee	1	....	....	....
Rice	1	....	1	....
Rush	1	....	....	....
Russell	4	....	1	....
Stafford	....	....	1	....
Stanton	....	1	....	....
Stevens	....	1	....	....
Sumner	1	....	....	....
Trego	1	....	....	....
Woodson	1	....	1	....
Total	33	6	13	22

Special thanks are expressed to the officials of the following organizations who are supplying the Geological Survey with monthly reports of oil purchases: Cities Service Oil Company; Continental Oil Company; Cooperative Refinery Association; The El Dorado Refining Company; Joplin Refining Company; K. B. Oil and Gas Company; The Kanotex Refining Company; Kansas City Testing Laboratory; Layton Oil Company; Lynde, Walter, and Darby; Vance Rowe; Sinclair Oil and Refining Company; Sinclair Prairie Oil Company; Skelly Oil Company; Stanolind Oil Purchasing Company; Stekoll Petroleum Company; and White Eagle Purchasing Company, Inc.

Many people engaged in various phases of the petroleum industry in Kansas have been generous in giving us data that have been used in this report. Here should be listed: Gene E. Abernathy, Gene Brinegar, Frank Brooks, H. W. Brown, Wilford S. Cline, Virgil Cole, Roy Cook, Drillers Gas Company, John A. Edwards, Lee Garrett, John M. Hanley, Russell Hayes, R. W. Howard, Thomas W. Lee, W. D. Livengood, Ward A. McGinnis, W. E. McHugh, Charles E. Miller, Eugene P. Philbrick, C. D. Reasor, Harold O. Smedley, M. W. Smith, J. E. Strickler, William L. Stryker, Charles W. Studt, Ross M. Stuntz, E. J. Sturm, Albert Sweeney of Interstate Oil Compact Commission, E. F. Teel, Harold Trager, Harvel White, Earl A. Whitworth, Paul A. Wither- spoon, and Tom Wright.

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Especial thanks are due Laughlin-Simmons and Company of Tulsa for permission to publish certain well elevations, to C. Engstrand and his Kansas Sample Log Service for permission to use data on some rank wildcat tests drilled in counties which do not now produce oil and gas, and to the Independent Oil and Gas Service various phases of whose scouting service have been helpful.

Geological Survey staff members who have assisted in the preparation of this report are Vivian Barnes, Betty Hagerman, Jane Koenig, Grace Muilenburg, Christine Notari, Alfred C. Walker, and Alice M. White.

TABLE 10.—Oil production in Allen County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bronson-Zenia ¹	40+	12,899
Colony West ²	35	6,771
Davis-Bronson ³	4+	33,237
Elsmore Shoestring ¹	16+	41,727
Elsmore West		7,954
Humboldt-Chanute ⁴		119,680
Iola	103+	47,707
Moran	4	1,173
Neosho Falls ⁵	10	5,343
Savonburg ¹	See Bourbon County	
Seibert		478
Miscellaneous	3+	7,592
Total	215+	284,561

- ¹ Field extends into Bourbon County.
- ² Field extends into Anderson County.
- ³ Field extends into Bourbon and Anderson Counties.
- ⁴ Field extends into Neosho, Wilson, and Woodson Counties.
- ⁵ Field extends into Woodson County.

ALLEN COUNTY

Oil production totaled 284,561 barrels. There were 11 active oil fields and 11 secondary recovery operations.

Developments during 1948.—Allen County produced 284,561 barrels of oil and a minor amount of natural gas. A large part of

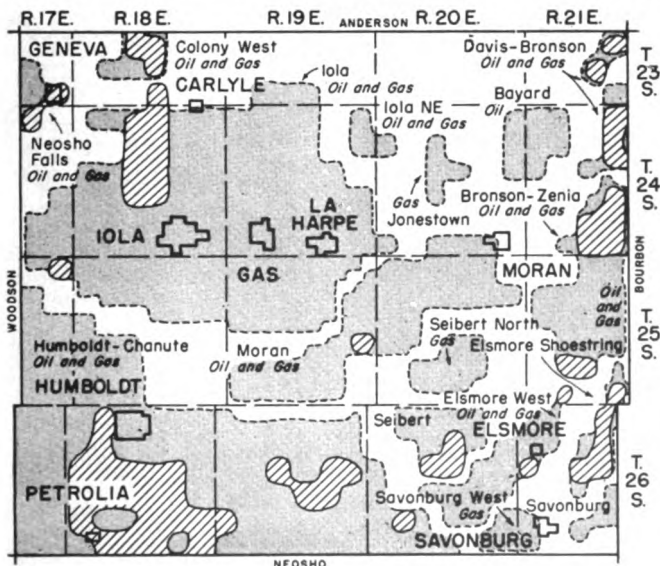


FIG. 4.—Map of Allen County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

the oil was produced from the 11 water-flooding projects operated in the county during the year (Table 8). Most of the drilling activity in Allen County last year was in connection with water-flooding projects and in some expansion of the Neosho Falls field in the northwestern part of the county.

Table 10 shows the production of oil in the various Allen County fields during 1948, and Figure 4 shows the location of the oil and gas fields and the areas that produced oil in the county during the year.

ANDERSON COUNTY

Oil produced in 1948 totaled 371,131 barrels. There were six water-flooding projects reported to be in operation and eight active oil fields in the county.

Developments during 1948.—Most of the 371,131 barrels of oil produced in Anderson County in 1948 was from six water-flood-

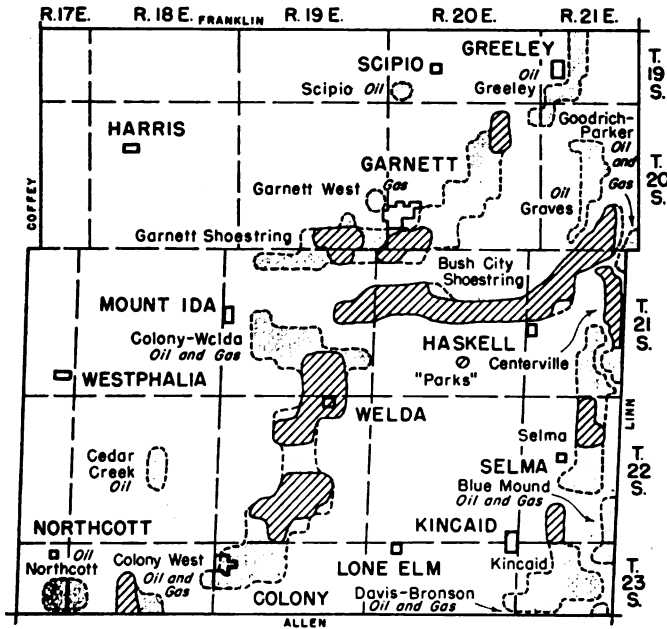


FIG. 5.—Map of Anderson County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

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TABLE 11.—Oil production in Anderson County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bush City Shoestring	47+	224,801
Centerville ¹		1,830
Colony-Welda	147+	11,338
Colony West ²	43	26,610
Garnett Shoestring	18+	58,846
Kincaid		36,375
"Parks" (27-21-20)		547
Selma		10,784
Total	255+	371,131

¹ Field extends into Linn County.

² Field extends into Allen County.

ing projects reported operating in the county. They are in the **Bush City Shoestring, Garnett Shoestring, Kincaid, and Selma** fields. Nearly all the drilling during the year was done in connection with these projects. Very little natural gas was produced commercially in the county last year.

Oil production in the various Anderson County fields in 1948 is shown in Table 11. Figure 5 shows locations of the oil and gas fields in Anderson County and areas that yielded oil in 1948.

BARBER COUNTY

Statistical summary for Barber County, 1948

Oil produced	1,405,434 barrels
Gas produced	17,445,137 thousand cubic feet
Wells drilled: Oil	36
Gas	4
Dry	19
Total	59
Wildcat wells	8 (included in above total)
New pools: Oil	1
Gas	1
Revived or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—The drilling of more than 50 tests in Barber County during 1948 indicates that this county received its share of attention from the oil operators. Two new pools were found by carefully planned wildcat exploration. These are the Cottonwood Creek gas pool and the DeGeer oil pool. The **Cottonwood Creek** pool is in sec. 21, T. 30 S., R. 14 W., about 5 miles east of the Sun City pool and a few miles north of the Skinner. The discovery well in the new pool was drilled by Great Lakes Carbon Corporation et al. on the Werner ranch in the SE¼ sec. 21. The

gas occurs in the "Wilcox" zone of the Simpson formation, producing between 4,582 and 4,594 feet. An initial production of 4.5 million cubic feet per day was assigned to the well.

The new **DeGeer** pool, located 1 mile south of the Deerhead pool, was found when the Lion Oil Company completed their first test on the DeGeer ranch in sec. 2, T. 33 S., R. 15 W. Oil was found in the Viola cherty dolomite between 5,176 and 5,178 feet. A bomb test made by the State Corporation Commission established a potential capacity of 3,000 barrels per day for the initial well. Before the well was completed, drilling was carried down through the Simpson formation, the top of which was reached at 5,267 feet, and into the Arbuckle dolomite the top of which was found at 5,381 feet. The total depth was 5,434 feet.

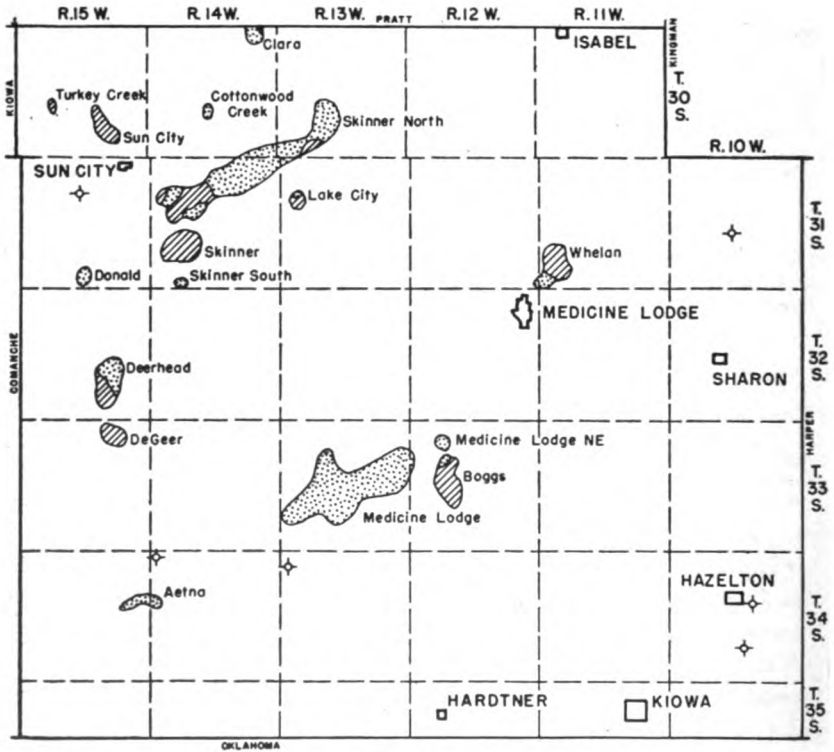


FIG. 6.—Map of Barber County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

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The good recovery from the discovery well led to a rather intensive drilling campaign in the DeGeer area in which 12 oil wells were drilled before the close of the year. All produce from Viola rocks at depths below sea level ranging from 3,188 feet for

TABLE 12.—Oil and gas pools of Barber County

Pool and location of discovery well	Discovery year	Area, 1948 production		Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
		acres	barrels				
Boggs 17-33-12W	1946	1,100	335,170	494,434	25	Simpson	4,806
Clara ¹ 36-29-14W	1948	40	868	868	1	Simpson	4,472
Deerhead 22-32-15W	1943	400	145,776	357,414	14	Viola	4,950
DeGeer 2-33-15W	1948	500	134,740	134,740	11	Viola	5,176
Lake City 7-31-13W	1937	200	29,860	250,381	4	Viola Simpson Arbuckle	4,435 4,530 4,607
Medicine Lodge 13-33-13W	1937	no production reported		45,703		"Misener"	4,845
Skinner 29-31-14W	1943	1,000	422,732	937,193	57	Viola Simpson	4,626 4,422
Skinner North 29-31-14W		1,590	included with Skinner			Viola Arbuckle	
Sun City 35-30-15W	1941	500	138,683	1,238,865	11	K.C.-Lans.	4,344
Turkey Creek 20-30-15W	1943	40	2,403	21,437	1	Simpson	4,438
Whelan 32-31-11W	1934	1,000	195,202	1,897,637	22	"Chat"	4,355
<i>thousand cubic feet</i>							
Aetna 13-34-15W	1935	500	109,654	750,680 est.	2	Viola	5,215
Boggs (gas) 8-33-12W	1947	150	no production reported	none	5	Simpson	4,824
Clara (gas) 2-30-14W	1944	280	441,698	717,792	3	Simpson Viola Arbuckle	4,435 4,509 4,540
Cottonwood Creek 21-30-14W	1948	160	no production reported	none		Simpson	4,582
Deerhead (gas) 26-32-15W	1942	640	52,764	1,693,763	5	Viola	4,931
Donald 33-31-15W	1946	160	no production reported	none		"Miss. lime"	4,697
Lake City (gas) 7-31-13W	1945	40	included with Skinner North				
Medicine Lodge (gas) 13-33-13W	1927	7,200	9,126,152	127,923,023	39	"Chat"	4,455
Medicine Lodge Northeast 8-33-12W	1945	300	included with Medicine Lodge		3	"Douglas sand"	3,812
Skinner North (gas) 17-31-14W		5,200	4,178,178	17,721,914	39	Viola	4,630
Skinner South 32-31-14W	1944	200	included with Skinner North			"Douglas sand"	4,023
Whelan (gas) 32-31-11W	1934	640	3,536,691	6,049,477	3	"Chat"	4,355

¹ Field extends into Pratt County.

TABLE 13.—Dry wildcat tests drilled in Barber County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Vickers Petroleum Co. Inc. No. 1 Carter	SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ 21-31-10W	3,772	4,925	4,990
R. Maguire & Fleet Drlg. No. 1 National Gypsum	Cent. NW $\frac{1}{4}$ SE $\frac{1}{4}$ 9-31-15W	4,000	4,867	4,922
Armer & Lindas No. 1 Pfaff	NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ 15-34-10W	4,144	5,265	5,315
Harbar Drilling Co. No. 1 Knorp	SE cor. NW $\frac{1}{4}$ 27-34-10W	3,878	5,374	5,414
Superior Oil Co. No. 1 Ott	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ 6-34-13W	4,134	5,463	5,502
Bishop Oil Co. No. 1 Davis	Cent. NW $\frac{1}{4}$ 6-34-14W	4,254	5,457	5,568

the highest well to 3,221 feet for the lowest. A dry hole in which the top of the Viola was reached at 3,233 feet below sea level indicated that the water line lies close to 3,222 feet. Two dry holes found the Viola at higher levels suggesting that local porosity conditions control oil occurrence to some extent. The Viola also is the producing zone in the Deerhead pool which lies 1 mile north, but there the Viola lies about 150 feet higher.

In the **Skinner** pools there was considerable activity as indicated by the drilling of 17 new oil wells and 2 new gas wells. The **Clara** pool of Barber County was extended northward into Pratt County (for details see Pratt County). In the **Deerhead** pool, only one new oil well was added. Exploration in the central part of Barber County resulted in one new gas well in the **Medicine Lodge Northeast** pool. It is interesting to note that gas comes from a sandstone in the Pennsylvanian Douglas group. In the **Boggs** pool, which lies less than 1 mile to the south of the Medicine Lodge Northeast pool, six new oil wells were completed during 1948. At present there are 25 producing oil wells and one gas well in this pool.

Figure 6 shows the oil and gas pools of Barber County. These pools and pertinent figures concerning area, production, and producing zones are listed in Table 12.

The dry wildcat tests and some stratigraphic data are listed in Table 13. Several of these holes are of geological interest because of unusual rock sequences. The test drilled by Maguire and Fleet on National Gypsum Company land in sec. 9, T. 31 S., R. 15 W. found 151 feet of Viola and only 57 feet of Simpson rocks below it. In the test drilled by Armer and Lindas on the Pfaff ranch in sec. 15, T. 34 S., R. 10 W. the Mississippian cherty residue

was found at 4,634 feet and the Viola cherty dolomite at 4,998 feet. The Viola in this location is 83 feet thick and the Simpson, the top of which was found at 5,081 feet, is 184 feet thick. The Harbar Drilling Company completed a test well for Fred Schupback on the Knorp farm in sec. 27, T. 34 S., R. 10 W., near Hazelton. Here the Mississippian chert was found at 4,673 feet, and the Viola limestone at 5,083 feet. The total thickness of the Viola is 100 feet and that of the underlying Simpson rocks almost 200 feet. A small show of oil was found at 4,693 feet near the top of the Mississippian. Further testing at this level revealed too much water for a commercial oil well. Two of the wildcat tests were located several miles south of the Medicine Lodge pool. In the one drilled by the Superior Oil Company in sec. 6, T. 34 S., R. 13 W. on the Ott farm the Mississippian chert was found at 4,869 feet. It was exhaustively tested and revealed a mixture of gas, oil, and water. The Viola in this test was found to be 129 feet thick and the Simpson to be nearly 150 feet thick. In the test well drilled by the Bishop Oil Company on the Davis ranch in the NW $\frac{1}{4}$ sec. 6, T. 34 S., R. 14 W. the Mississippian chert was reached at 4,847 feet. It yielded some gas with a little water when tested. The Viola in this well was found to be 133 feet thick, but the Simpson was only 103 feet thick.

BARTON COUNTY

Statistical summary for Barton County, 1948

Oil produced	21,897,415 barrels
Gas produced	6,200,327 thousand cubic feet
Wells drilled: Oil	249
Gas	3
Dry	170
Salt water disposal	7
Total	429
Wildcat wells	24 (included in above total)
New pools: Oil	9
Revived pool	1
Abandoned pools	none
Secondary recovery operations	1

Developments during 1948.—More wells were completed in Barton County during 1948 than in any other Kansas county. Nine wildcats found new oil pools. These are: Bryant, Hiss Southeast, Homestead, Klug North, Lake Barton, Laudick, Rolling Green, Workman Southeast, and Yeakley. The Odin pool, abandoned during 1947, was revived during 1948.

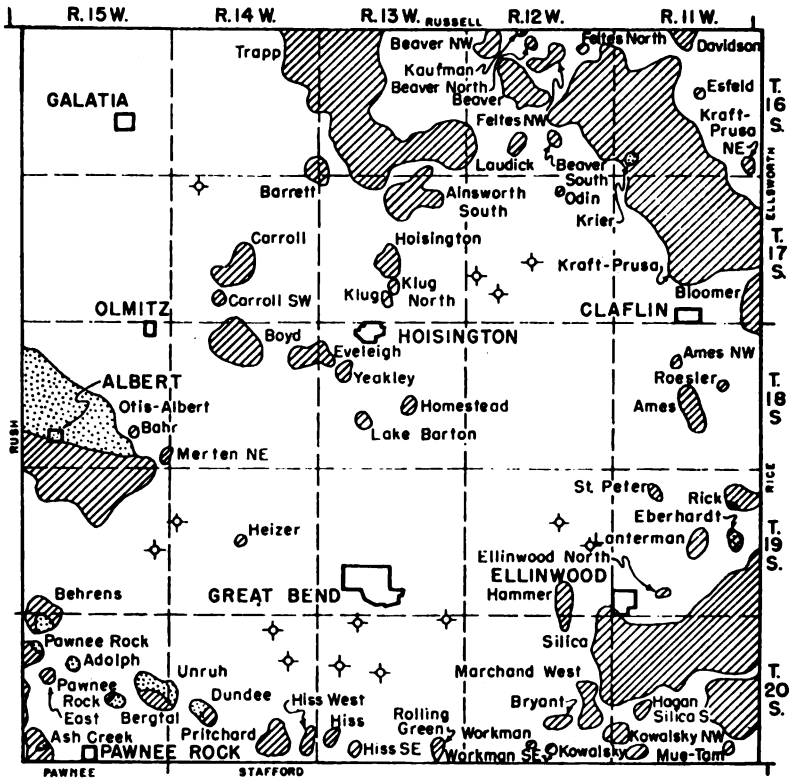


FIG. 7.—Map of Barton County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

New pools are shown on Figure 7. The northernmost is the **Laudick** pool, found by Derby Drilling Company et al. when they completed the first test on the Laudick farm in the SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 16 S., R. 12 W. Several dry holes at present separate the Laudick and Beaver South pools. The producing zone is the Arbuckle dolomite; the capacity of the discovery well was approximately 195 barrels of oil with 50 percent water. Before the end of the year, the Derby Drilling Company completed four additional oil wells in the pool. The **Klug North** pool was found by the Stickle Drilling Company a few miles north of Hoisington, when they completed their Childs No. 1 well in the NW $\frac{1}{4}$ sec. 27, T. 17 S., R. 13 W. The production, 90 barrels per day, is from the Arbuckle dolomite at 3,377 feet, with a penetration of only 4 feet into the zone.

Approximately 6 miles south of the Klug North pool, three new pools were found rather close together. One of these, the **Yeakley** pool, was found by Sohio Petroleum Company et al. when the first test on the Yeakley farm in sec. 17, T. 18 S., R. 13 W. was completed in June. Oil was found in the Arbuckle dolomite at 3,319 feet, just below the top. The hole was completed at a total depth of 3,325 feet and was rated at 100 barrels of oil per day. About 2 miles south of this new pool, The Texas Com-

TABLE 14.—Oil and gas pools of Barton County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Ainsworth South 10-17-13W	1937	1,550	1,727	35,213	1	Arbuckle	3,390
Albert 30-18-15W	1935		combined with Otis				
Ames 22-18-11W	1943	620	231,686	712,369	26	K.C.-Lans. Arbuckle	3,042 3,348
Ames Northwest 9-18-11W	1947	80	5,584	6,319	2	K.C.-Lans. Arbuckle	3,106 3,312
Ash Creek ¹ 31-20-15W	1947	600	220,906	283,172	24	Arbuckle	3,787
Bahr 26-18-15W	1943	40	no production reported	29,925		Reagan	3,495
Barrett 36-16-14W	1943	600	12,271	87,776	3	Arbuckle	3,463
Beaver 16-16-12W	1934	1,300	360,554	2,782,995	56	Oread Arbuckle Reagan	2,885 3,348 3,335
Beaver North 4-16-12W	1937	280	53,217	424,479	6	Arbuckle	3,316
Beaver Northwest 6-16-12W	1942	550	100,346	163,291	10	Shawnee K.C.-Lans. Sooy Arbuckle	3,066
Beaver South 27-16-12W	1945	160	7,453	41,151	3	Sooy Arbuckle	3,359
Behrens 6-20-15W	1944	950	103,208	304,903	19	Arbuckle	3,719
Bergtal 22-20-15W	1941	40	639	1,331	1	Arbuckle	
Bird 33-18-15W	1940		combined with Otis				
Bloomer ² 36-17-11W	1936	1,170	616,376	10,669,053	106	K.C.-Lans. Arbuckle	3,044 3,257
Boyd 4-18-14W	1942	1,700	395,168	1,507,420	34	K.C.-Lans. Arbuckle	3,438
Breford Southwest 23-17-11W	1942		combined with Kraft-Prusa				
Bryant 27-20-12W	1948	300	4,049	4,049	3	Arbuckle	3,383
Carroll 21-17-14W	1944	1,100	284,471	622,764	31	K.C.-Lans. Arbuckle	3,109 3,356
Carroll Southwest 32-17-14W	1947	80	11,342	15,234	2	K.C.-Lans.	3,193
Davidson ³ 4-16-11W	1930	390	10,383	210,758	4	K.C.-Lans. Sooy Arbuckle	3,016 3,317 3,314

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TABLE 14.—Oil and gas pools of Barton County, concluded

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Dundee 29-20-14W	1945	40	1,097	4,962	1	Arbuckle	3,507
Eberhardt 14-19-11W	1935	320	27,257	355,960	8	K.C.-Lans. Arbuckle	3,194 3,311
Ellinwood 33-19-11W	1937	60	3,293	73,947	1	Arbuckle	3,328
Esfeld 15-16-11W	1947	40	2,838	3,409	1	Arbuckle	3,343
Eveleigh 11-18-14W	1943	680	159,579	443,576	20	K.C.-Lans. Arbuckle Pre-Cambrian	3,177 3,339 3,311
Feltes North 2-16-12W	1944	40	included with Feltes Northwest			Arbuckle	3,338
Feltes Northwest 3-16-12W	1945	360	64,651	189,364	7	Arbuckle	3,342
Hagan 20-20-11W	1938	160	39,975	298,853	4	Arbuckle	3,323
Hammer 35-19-12W	1940	320	58,199	237,210	9	Arbuckle	3,348
Helzer 16-19-14W	1935	40	2,468	37,491	1	K.C.-Lans.	3,228
Hiss 31-20-13W	1936	300	179,439	976,749	18	K.C.-Lans.	3,270
Hiss Southeast 32-20-13W	1948	40	587	587	1	Arbuckle	3,545
Hiss West 36-20-14W	1945	400	included with Hiss			K.C.-Lans.	3,250
Holsington 21-17-13W	1938	600	385,993	649,662	31	K.C.-Lans. Arbuckle	3,222 3,440
Homestead 22-18-13W	1948	40	4,098	4,098	1	Arbuckle	3,310
Kaufman ³ 33-15-12W	1947	40	1,588	1,588	1	K.C.-Lans. Arbuckle Pre-Cambrian	3,311
Klug 28-17-13W	1946	80	7,808	23,214	2	Arbuckle	3,414
Klug North 27-17-13W	1948	60	10,675	10,675	2	Arbuckle	3,377
Kowalsky 32-20-11W	1941	200	77,288	89,962	7	Arbuckle	3,378
Kowalsky Northwest 30-20-11W	1947	460	59,263	59,263	9	K.C.-Lans. Arbuckle	3,185 3,381
Kraft-Prusa ⁴ 10-17-11W	1937	24,060	6,887,650	38,159,450	576	Shawnee K.C.-Lans. Gorham Arbuckle Reagan Pre-Cambrian	2,885 3,160 3,335 3,281 3,310
Kraft-Prusa Northeast 36-16-11W	1941	160	12,641	166,791	3	Arbuckle	3,351
Lake Barton 21-18-13W	1948	60	459	459	1	Arbuckle	3,372
Lanterman 15-19-11W	1934	500	36,879	798,950	9	K.C.-Lans. Arbuckle	3,109 3,235
Laudick 28-16-12W	1948	200	29,616	29,616	5	Arbuckle	3,382
Marchand West 24-20-12W	1939	640	included with Silica				
Merten Northeast 36-18-15W	1946	40	2,737	11,106	1	Arbuckle	3,494
Mue-Tam 35-20-11W	1942	40	no production reported	17,731		Arbuckle	3,312

Oil and Gas Developments, 1948

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Odin ⁵ 3-17-12W	1948	40	428	24,843	1	Arbuckle	3,321
Otis-Albert ⁴ 30-18-15W	1935	6,400	1,679,672	2,252,518	97	Reagan	3,601
Pawnee Rock ¹ 13-20-16W	1936	500	13,171	118,336	7	Arbuckle	3,832
Pawnee Rock East 17-20-15W	1941	40	3,969	18,517	1	Arbuckle	3,814
Pritchard 34-20-14W	1944	770	194,032	614,039	18	Arbuckle	3,455
Reif 30-16-12W	1944	combined with Trapp					
Rick ⁷ 1-19-11W	1936	600	40,333	728,277	10	K.C.-Lans. Arbuckle	3,106 3,355
Roesler 14-18-11W	1913	40	2,872	28,928	1	Arbuckle	3,291
Rolling Green 36-20-13W	1948	100	7,034	7,034	3	K.C.-Lans.	3,257
St. Peter 5-19-11W	1944	100	16,683	60,979	2	K.C.-Lans. Arbuckle	3,387 3,268
Silica ⁷ 12-20-11W	1931	13,480	4,580,948	57,856,647	528	K.C.-Lans. Arbuckle	2,955 3,328
Silica South ⁷ 24-20-11W	1935	2,770	included with Silica			K.C.-Lans. Arbuckle	3,035 3,268
Trapp ³ 23-15-14W	1936	13,700	4,838,554	37,567,411	488	Shawnee Dodge K.C.-Lans. Arbuckle	2,889 2,966 3,062 3,252
Unruh 24-20-15W	1945	500	28,540	58,737	9	Arbuckle	3,641
Workman 33-20-12W	1944	40	2,601	15,262	1	Arbuckle	3,407
Workman Southeast 34-20-12W	1948	40	no production reported	none		Arbuckle	3,389
Yeakley 17-18-13W	1948	100	13,120	13,120	2	Arbuckle	3,319

thousand cubic feet

Adolph 16-20-15W	1947	160	no production reported	none		Arbuckle	3,734
Albert (gas) 30-18-15W	1935	combined with Otis					
Ash Creek (gas) ¹ 31-20-15W	1948	50	602,150		1	Arbuckle	3,769
Behrens (gas) 6-20-15W	1944	50	602,150		3		
Bergtal (gas) 22-20-15W	1941	500	no production reported			Arbuckle	3,689
Dundee 29-20-14W	1945	160	72,381	72,381	2	Arbuckle	3,607
Eberhardt (gas) 14-19-11W	1935	300	39,823	294,282	1		
Krier 30-16-11W	1944		47,068	257,217	2		
Otis-Albert (gas) ⁶ 11-18-16W	1930	7,000	1,816,866		10	Neva Reagan	3,507
Pawnee Rock (gas) ¹ 19 & 20-15 & 16W	1936	20	240,860		1		
Rick (gas) ⁷ 11-19-11W	1941	60	16,500	360,722	2	Arbuckle	3,355
Unruh (gas) 24-20-15W	1945	500	2,762,529	6,476,094	3	Arbuckle	3,641

¹ Field extends into Pawnee County.
² Field extends into Ellsworth and Rice Counties.
³ Field extends into Russell County.
⁴ Field extends into Ellsworth County.
⁵ Old name revived.
⁶ Field extends into Rush County.
⁷ Field extends into Rice County.

pany found oil on the Trester farm in sec. 21, also in the Arbuckle dolomite. The discovery well had an initial capacity of 28 barrels per day with 10 percent water. The name of this pool is **Lake Barton**. The **Homestead** pool was discovered in the NE $\frac{1}{4}$ sec. 22, T. 18 S., R. 13 W. with the completion of a well on the Eveleigh farm. Production is in the Arbuckle, reached at 3,307 feet, and penetrated 41 feet. After acidizing, the well was rated at 35 barrels of oil per day. The Yeakley, Lake Barton, and Homestead pools are located about midway between the towns of Hoisington and Great Bend. These discoveries suggest a rather large area to be worthy of exploration.

All the other new pools found during 1948 are located along the southernmost border of the county. The westernmost pool, the **Hiss Southeast**, is in T. 20 S., R. 13 W. It was discovered when the first test on the Wright farm in sec. 32 struck oil in the Arbuckle dolomite at 3,545 feet. Initial production was 190 barrels of oil per day. In sec. 36 of the same township the Cardinal Oil Company completed the No. 1 Scharz well in the Kansas City-Lansing between 3,257 and 3,263 feet for 137 barrels of oil per

TABLE 15.—*Dry wildcat tests drilled in Barton County during 1948*

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Fred Rust No. 1 Jenisch	NW cor. SE $\frac{1}{4}$ 21-17-12W	3,158	3,428	3,460
E. H. Adair Oil Co. No. 1 Senko	SE cor. SW $\frac{1}{4}$ 29-17-12W	3,126	3,386	3,432
Ben F. Brack Oil Co., Inc. No. 1 Demel	NE cor. NW $\frac{1}{4}$ 30-17-12W	3,157	3,394	3,470
C. E. Ash et al. No. 1 "A" Davis	SW cor. NW $\frac{1}{4}$ 5-17-14W	3,250	3,529	3,561
Herndon Drilling Co. No. 1 Scharz	NE cor. NE $\frac{1}{4}$ 15-19-12W	3,136	3,460	3,510
National Coop. Ref. Assn. No. 1 Werner	NW cor. NW $\frac{1}{4}$ 24-19-12W	3,108	not reached	3,400
A B & W Drilling Co. No. 1 Kruckenber	NW cor. NW $\frac{1}{4}$ 18-19-14W	3,270	3,577	3,628
Amerada Petroleum Corp. No. 1 Russell	SE. cor. NW $\frac{1}{4}$ 24-19-15W	3,228	3,542	3,659
W. L. Hartman No. 2 Powell	NE cor. NW $\frac{1}{4}$ 1-20-13W	3,178	3,437	3,463
Ben F. Brack Oil Co., Inc. No. 1 State	SW cor. NE $\frac{1}{4}$ 5-20-13W	3,207	3,660	3,665
Ben F. Brack Oil Co., Inc. No. 1 Ludwig	SW cor. NE $\frac{1}{4}$ 16-20-13W	3,250	3,537	3,590
Westgate-Greenland & Mallard No. 1 Harrison	SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ 18-20-13W	3,246	3,585	3,617
Continental Oil Co. No. 1 Unruh	NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ 2-20-14W	3,230	3,523	3,580
Ed Bradley et al. No. 1 Unruh	SE cor. SE $\frac{1}{4}$ 11-20-14W	3,239	3,550	3,571

day after finding the Arbuckle to be dry. The new pool is called **Rolling Green**.

In the southeastern part of T. 20 S., R. 12 W. two new pools were discovered. One of these is the **Workman Southeast** in sec. 34 and the other is the **Bryant** pool in sec. 27. The **Workman Southeast** pool was found by the E. H. Adair Oil Company on the Lanterman farm in the SE $\frac{1}{4}$ sec. 34. It produces oil from the Arbuckle dolomite. The **Bryant** pool was found by the Alpine Oil and Royalty Company, Inc. with their No. 1 Bryant test in the NE $\frac{1}{4}$ sec. 27. Initial production was 170 barrels per day from the Arbuckle.

In the **Kowalsky Northwest** pool, discovered in 1947, the Kansas City-Lansing became a new producing zone. The Kansas City-Lansing was found to be a new producing zone also in the **Ames Northwest** pool.

Many new wells were completed in other established pools of the county. Fifty-one new oil wells were added to the **Kraft-Prusa** pool. In the **Beaver North** and **Beaver Northwest** pools 14 new oil and gas wells were completed. In the north-central part of the county 11 new oil wells were added in the **Ainsworth South** pool and 23 new oil wells in the **Hoisington** pool. Twelve new oil producers were added to the **Carroll** and **Carroll Southwest** pools.

In the western part of the county 17 new oil wells were added to the **Otis-Albert** pool, formed by combining the **Albert**, **Albert West**, **Bird**, and **Otis** pools. In the southwestern part of the county five new oil wells and two new gas wells were added to the **Unruh** pool. Seven new oil wells were added to the **Ash Creek** pool now joined to the **Ash Creek South** pool in Pawnee County. New additions to the **Silica** and **Silica South** pools consisted of 38 new oil wells in Rice County and 23 in Barton County.

An exhaustive study of the **Kraft-Prusa** pool made by Walters and Price (1948, pp. 249-280) reveals many relationships of rock lithology, rock structure, rock age, and the localized occurrence of petroleum in Barton County. During 1948, the Springer No. 5 So. Oeser test in sec. 30, T. 16 S., R. 11 W. was drilled into Pre-Cambrian quartzite and then plugged back to a productive porous zone in the Topeka limestone. Thus another producing zone was found for the interesting Kraft-Prusa pool. In the next section to the south, sec. 31, the Skelly Oil Company No. 4 Zorn well found commercial production in the Pre-Cambrian quart-

zite between 3,180 and 3,233 feet. This is noteworthy because few occurrences of oil in Pre-Cambrian rocks are on record anywhere in the world. In T. 16 S., R. 12 W., the Delta Production Company No. 1 Riemann well found production in the Topeka limestone at the top of the Shawnee sequence. A second well, D. R. Lauck Oil Company, Inc. No. 6 Oeser, also found oil in the Topeka limestone.

In the **Beaver** and **Beaver Northwest** pools, six 1948 wells were drilled to the Pre-Cambrian quartzite. Three of these were in sec. 5, one in sec. 8, and two in sec. 17, T. 16 S., R. 12 W. Two of the three wells in sec. 5 and the well in sec. 8 are new oil wells producing from the Kansas City-Lansing after being plugged back from greater depths. The third well in sec. 5 was a 5.8 million-cubic-foot gas well (Kansas City-Lansing production), and the two wells in sec. 17 were dry. The Pre-Cambrian surface in these six wells ranged in depth below sea level from 1,405 to 1,471 feet. Near the west line of sec. 5 the depth below sea level to the Pre-Cambrian surface averages about 1,415 feet; in sec. 17 it ranges within about one-quarter mile from 1,412 to 1,471 feet below sea level.

In the **Ainsworth South** pool a well drilled for use as a salt water disposal well found the Arbuckle dolomite to be only 70 feet thick, the Reagan sandstone only 8 feet thick, and ended in quartzite.

One secondary recovery project operated in Barton County during 1948, in the Silica pool. Nitrogen and natural gas were used to increase production.

The oil and gas pools of Barton County are shown on Figure 7. Their production, area, and depth to producing zones are given in Table 14. The dry wildcat tests drilled in the county during 1948 are listed in Table 15.

BOURBON COUNTY

Oil produced totaled 11,188 barrels from five active fields.

Developments during 1948.—Bourbon County produced 11,188 barrels of oil in fields along the western boundary of the county. All oil production was from relatively shallow sandstones of

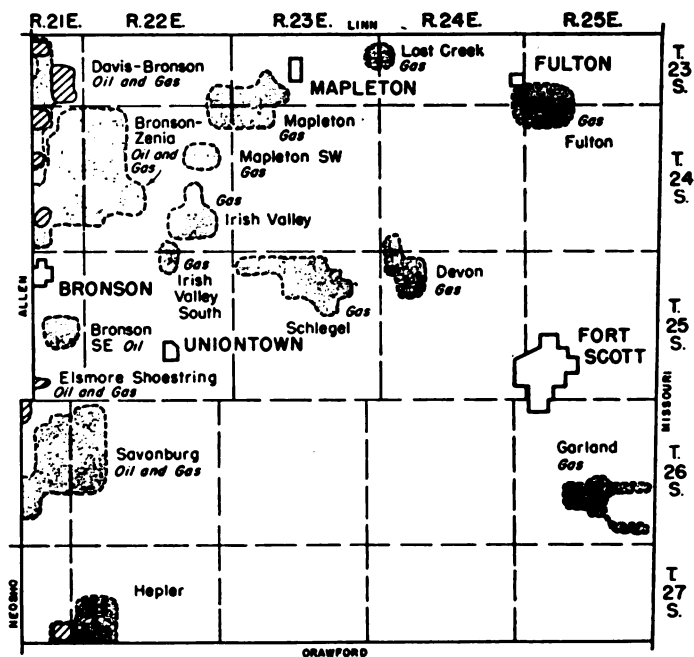


FIG. 8.—Map of Bourbon County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

Pennsylvanian age. The amount of natural gas produced was relatively small. Drilling activities in the county were chiefly in connection with producing areas.

Oil production in the Bourbon County fields is shown in Table 16. Figure 8 shows locations of oil and gas fields in Bourbon County and areas in which oil was produced in 1948.

TABLE 16.—Oil production in Bourbon County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bronson-Zenia ¹	4	375
Davis-Bronson ¹	7+	6,452
Elsmore Shoestring ¹	see Allen County	
Hepler		1,111
Savonburg ^{1, 2}	5	3,250
Total	16+	11,188

¹ Field extends into Allen County.

² Includes Allen County production. Areas of production not definitely located.

BROWN COUNTY

Oil production totaled 5,671 barrels from three wells in the Livengood field. No gas was produced.

Developments during 1948.—Last year the Livengood field in Brown County produced 5,671 barrels of oil. In January 1948 a third well, the Stout and Hahn No. 1 Livengood, was completed in the field in sec. 3, T. 1 S., R. 15 E. The field was opened in 1944. Production is from the "Hunton" limestone at depths ranging from about 2,575 to 2,620 feet. Cumulative production in the field to the end of 1948 was 56,149 barrels of oil.

BUTLER COUNTY

Statistical summary for Butler County, 1948

Oil produced	5,911,373 barrels
Gas produced	none for commerce
Wells drilled: Oil	213
Dry	105
Salt water disposal	4
Total	322
Wildcat wells	18 (included in above total)
New fields: Oil	3
Secondary recovery operations	13

Developments during 1948.—There was considerable activity in Butler County in 1948, 322 wells being drilled. Of these 213 are oil wells and 105 are dry holes. There were 18 wildcat wells, three of which opened new fields. The 1948 discoveries opened: the **Guyot** field, whose discovery well, Shawver and Graham, Inc. No. 1 Guyot, sec. 5, T. 29 S., R. 5 E., had a reported daily production of 30 barrels from the "Bartlesville sand" at 2,796 feet; the **Combs Northeast**, whose discovery well, Veeder Supply and Mid-Plains No. 1 Hampton, sec. 27, T. 29 S., R. 5 E., produced 50 barrels of oil daily from the "Bartlesville" at 2,813 feet; and

TABLE 17.—Oil production in Butler County during 1948

Field	Dis- cov- ery year	Pro- duc- ing wells	1948 produc- tion bbls.	Cumulative production to end of 1948, bbls.	Producing zone	Depth to producing zone, feet
Allen			82,990			
Allen North	1947		36,454	37,164	Miss. "chat"	
Augusta	1914	141+	349,476	35,609,165	K.C.-Lans.	1,700
					Bronson	2,000
					Marmaton	2,200
					Ordovician	2,445
					Arbuckle	2,600

Augusta North	1914	65	82,592	14,125,270	K.C.-Lans. Bronson Ordovician Arbuckle	1,650 1,950 2,380 2,410	
Bausinger		4	5,531		Ordovician	3,050	
Benton		1	1,605		Mississippian	2,765	
Blankenship ¹		25+	43,700	598,828	"Bartlesville"	2,650	
Brandt-Sensebaugh	1936	1+	60,238	1,576,880	Miss. "chat"	2,692	
Combs ²	1947	see Cowley County					
Combs Northeast	1948	production not recorded					
DeMoss		4+	29,951		"Bartlesville" "Burgess"	2,700 2,732	
Dixon (Eckel West)	1946		1,846	5,436	K.C.-Lans.		
Douglass		30	13,848		K.C.-Lans.	1,790	
Dunns Mill		1	933	53,018	Arbuckle	2,951	
Eckel			3,279	51,336			
Elbing ³	1918	59	260,683	1,341,454	Viola	2,530	
El Dorado	1915	1,482+	3,011,660	198,508,809	Admire K.C.-Lans. Bronson Viola Simpson Arbuckle	600 1,700 2,000 2,500 2,510 2,550	
Ferrell ⁴	1939	41	95,259	711,839	"Miss. lime"	2,647	
Fox-Bush	1917	74+	304,948	1,650,842	"Bartlesville"	2,730	
Garden	1928	8+	40,315		"Bartlesville"	2,760	
Gelwick		1	864				
Guyot	1948	production not recorded					
Hannah ³	1945	3	2,915		"Miss. lime"		
Haverhill	1927	43+	71,596	4,120,402	"Bartlesville"	2,700	
Hickory Creek	1946	8+	164,401	439,111	"Bartlesville"		
Joseph	1947	1	998	1,268	"Basal Penn."		
Keighley	1925	12+	27,397		"Bartlesville" Simpson	2,650 3,148	
Kramer-Stern	1928	33+	221,643		Ordovician	3,030-3,088	
Kramer-Stern South		1	179	1,169	Viola		
Leon	1926	20	24,172	2,361,832	"Chat" Viola	2,660 3,050	
Lucas		2	2,704	6,394			
McCullough	1929		3,302	486,094	Ordovician	3,169	
Pierce		26	132,658				
Powell		abandoned					
Potwin	1921	78	140,896	7,005,499	Bronson "Miss. lime"	2,550 2,660	
Reynolds-Schaffer	1926	6+	77,456		"Miss. lime"	2,780	
Salter	1946	21	201,989	312,298	Simpson		
Semisch	1947		10,566	14,826	"Bartlesville"		
Seward		4+	7,696	1,014,108	"Bartlesville"	2,650	
Shinn	1946	10	127,201	210,257	"Miss. lime"		
Smock-Sluss	1918	13+	98,208		"Bartlesville" Ordovician	2,700 3,000	
Snowden-McS'wney	1930	1+	3,551		Mississippian	2,833	
Steinhoff	1926	2	3,073		Mississippian	2,803	
Towanda	1948	4	39,876	39,876	Viola		
Weaver	1929		622		"Bartlesville"	2,690	
Young	1919	28+	122,102		K.C.-Lans. Mississippian	2,190 2,650	
Total		2,253+	5,911,373				

¹ Field extends into Greenwood County.

² Includes Marion County production.

³ Field extends into Cowley County.

⁴ Field extends into Elk County.

the **Towanda** field, opened by Adair and Rex and Morris No. 2 Rice, sec. 5, T. 26 S., R. 4 E. The discovery well was rated at 40 barrels per day from the Viola at 2,565 feet.

Oil production in the various fields in Butler County is shown in Table 17. Figure 9 shows the location of oil fields and former

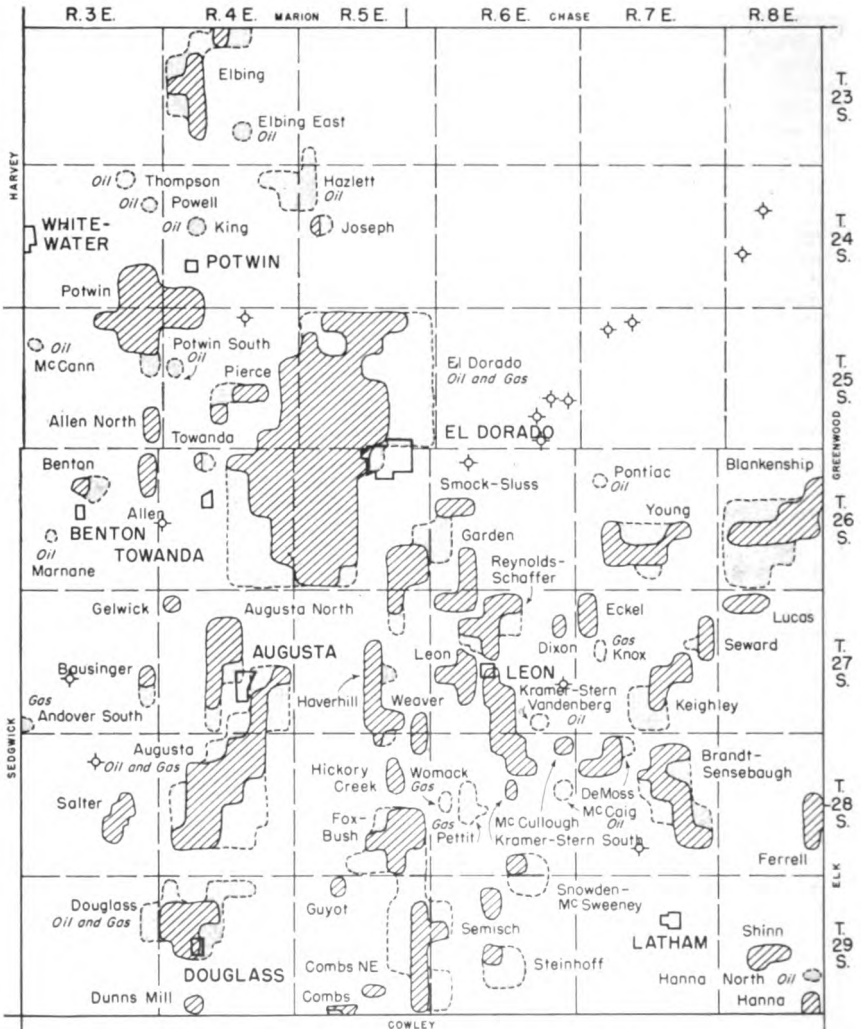


FIG. 9.—Map of Butler County showing oil and gas fields and dry wildcat wells drilled during 1948. Diagonal lines show areas of 1948 oil production.

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TABLE 18.—Dry wildcat wells drilled in Butler County during 1948

Company and farm	Location	Depth to top of Lansing, feet	Depth to top of Mississippian, feet	Total depth, feet
Shell Oil Co., Inc. No. 1 Henley	SE cor. SW $\frac{1}{4}$ 7-24-8E	1,686	2,718	2,730
Shell Oil Co., Inc. No. 1 Vestring	SE cor. Lot 20 19-24-8E	1,710	2,725	2,778
Aladdin Oil Corp. No. 1 Joseph	SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ 3-25-4E	2,297*	2,749	3,073
Shell Oil Co., Inc. No. 1 "A" Brown	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ 23-25-6E	1,794	2,780	2,795
Shell Oil Co., Inc. No. 1 Brown	SW cor. SE $\frac{1}{4}$ 24-25-6E	1,764	2,756	2,784
Shell Oil Co., Inc. No. 1 Mattock	NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ 26-25-6E	1,760	2,730	2,745
Shell Oil Co., Inc. No. 1 Mueller	NW cor. SE $\frac{1}{4}$ 35-25-6E	1,779	2,758	2,768
Shell Oil Co., Inc. No. 1 Williams	NW cor. SW $\frac{1}{4}$ 4-25-7E	1,747	2,761	2,778
Shell Oil Co., Inc. No. 1 Grant	SW cor. SW $\frac{1}{4}$ 5-25-7E	1,737		2,750
W. L. Hartman No. 1 Swindell	NW cor. NW $\frac{1}{4}$ 19-26-4E	1,880	2,702	3,074
Shell Oil Co., Inc. No. 1 Taliaferro	SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ 5-26-6E	1,804	2,752	2,765
D. R. Lauck No. 1 Skaer	NW cor. SW $\frac{1}{4}$ 21-27-3E	2,333*	2,802	3,165
Herman Kaiser No. 1 Stein	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ 25-27-6E	1,780	2,770	3,209
Dilworth S. Hager No. 1 Metzger	SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ 10-28-3E	2,342*	2,860	3,153
The Derby Oil Co. No. 1 Ramp	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ 29-28-7E	1,783	2,835	2,855

* Kansas City.

gas fields in the county and areas that produced oil in 1948. Data on dry wildcat wells drilled in Butler County in 1948 are given in Table 18.

Oil production in Butler County falls into two main divisions; that from fields along the Nemaha anticline, such as the **Augusta** and **El Dorado** fields, where oil was found in Pennsylvanian and deeper rocks (Berry and Harper, 1948; Fath, 1921; Jewett and Abernathy, 1945, pp. 69-76) and from fields farther east in the county where production is largely from Pennsylvanian sandstones (Bass, 1936; Cadman, 1927). The El Dorado field, with cumulative production at the end of 1948 of 198,508,809 barrels, is the most productive field in Kansas.

CHASE COUNTY

Oil production totaled 19,685 barrels. Gas production was at least 42,845 thousand cubic feet. There were two active oil pools and 2 active gas pools.

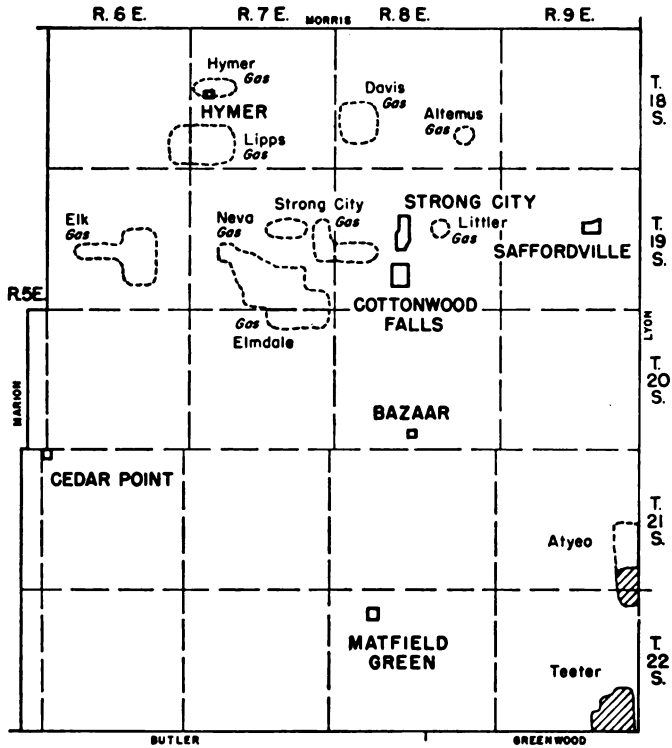


FIG. 10.—Map of Chase County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

Developments during 1948.—One dry wildcat, the K. T. Anderson et al. No. 1 Diggs, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 18 S., R. 9 E., was completed in June 1948 and abandoned in Arbuckle dolomite at 3,340 feet. Two wells were drilled in sec. 13, T. 22 S., R. 9 E. near the Pixlee field in Greenwood County. Two or more wells were drilled in the Atyeo field.

TABLE 19.—Oil production in Chase County during 1948

Field	Producing wells as reported	1948 production, bbls.
Atyeo ¹	1	1,074
Teeter ²	—	18,611
Total	1	19,685

¹ Field extends into Lyon and Greenwood Counties.

² Field extends into Greenwood County.

Oil production in the **Atyeo** and **Teeter** fields which extend from Lyon and Greenwood Counties into Chase County is shown in Table 19, and oil and gas fields in the county and areas of 1948 oil production are shown on Figure 10.

Gas production is from Permian and Pennsylvanian rocks and oil production is from the "Bartlesville sand." In 1948, the Davis and Elmdale gas fields were in commercial production. The Davis field yielded 42,845,000 cubic feet of gas during the year; production in the Elmdale field was much less.

CHAUTAUQUA COUNTY

Oil production totaled 832,965 barrels; gas production figures for 1948 are not available. There were 11 water-flooding projects and 16 active oil fields.

Developments during 1948.—Approximately 75 wells were drilled in Chautauqua County during 1948. No outstanding developments, however, took place in the county during the year. A large part of the total oil production in the county was obtained in water-flooding projects in the **Peru-Sedan** and **Elgin** fields.

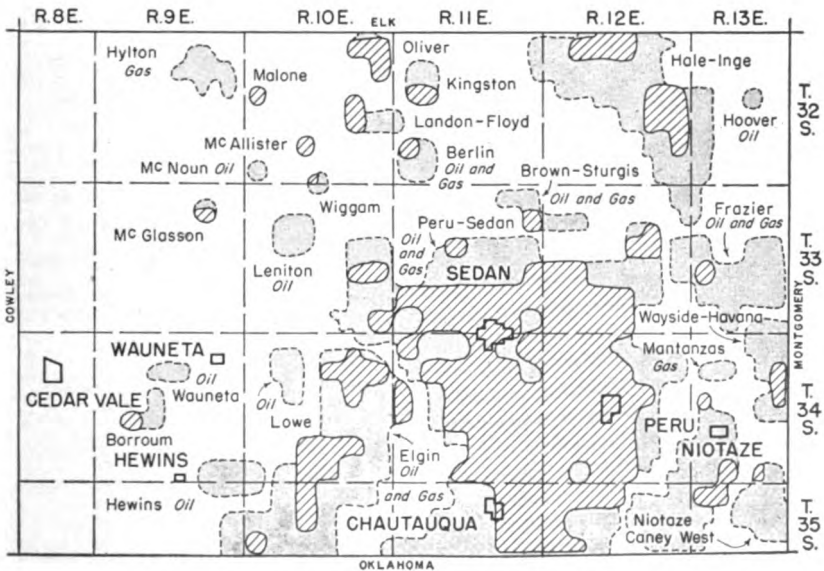


FIG. 11.—Map of Chautauqua County showing oil and gas fields. Diagonal lines show areas of 1948 oil production,

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TABLE 20.—Oil production in Chautauqua County during 1948

Field	Producing wells as reported	1948 ¹ production, bbls.
Berlin	1	2,130
Borroum	5	4,019
Brown-Sturgis	5	521
Caney West	17	4,156
Elgin		37,792
Frazier		424
Hale-Inge ¹	69	15,695
Kingston		2,799
Landon-Floyd	31	39,627
McAllister	6	9,100
McGlasson		5,236
Malone	1	388
Niotaze	12+	890
Oliver ¹	18	12,511
Peru-Sedan	1,106+	691,698
Wayside-Havana ²	21	3,454
Wiggam	6	1,399
Miscellaneous	1+	1,126
Total	1,299+	832,965

¹ Field extends into Elk County.

² Field extends into Montgomery County.

Oil production in Chautauqua County fields during 1948 is shown in Table 20, and oil and gas fields and areas of 1948 production are shown on Figure 11.

COFFEY COUNTY

Oil production totaled 85,172 barrels. There were four active oil fields and no reported water-flood projects. Gas production was not recorded.

Developments during 1948.—Many shallow wells have been drilled in Coffey County but much of the county is untested for stratigraphic traps in older rocks. In 1948 seven small oil wells and one dry hole were drilled in the **Dunaway** field; two oil wells

TABLE 21.—Oil production in Coffey County during 1948

Field	Producing wells as reported	1948 production, bbls.
Dunaway ¹	7+	8,528
Van Noy	23	14,499
Virgil North ²		47,542
Winterscheid ³		14,603
Total	30+	85,172

¹ Field extends into Greenwood County.

² Field extends into Greenwood and Woodson Counties. Some of the production estimated.

³ Field extends into Woodson County.

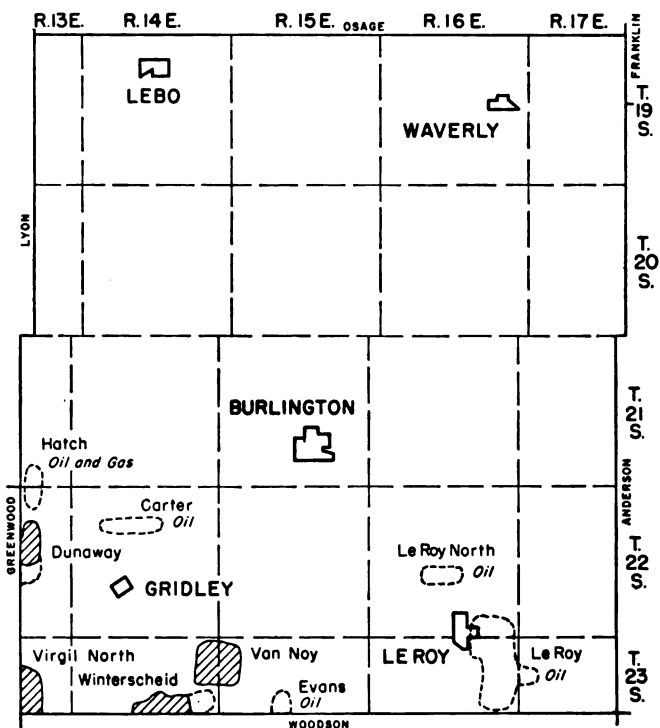


FIG. 12.—Map of Coffey County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

were drilled in the **Van Noy** field. Two dry wildcats were drilled near Gridley and eight oil wells and one dry hole were reported in the **LeRoy** field, but no production is recorded.

Oil production in Coffey County fields during 1948 is shown in Table 21, and oil and gas fields and areas of 1948 production are shown on Figure 12.

COMANCHE COUNTY

Wildcat wells have been drilled in Comanche County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—Two interesting wildcat tests were drilled in Comanche County during 1948. One of these was by the Falcon Seaboard Drilling Company on the Ballet ranch in sec. 36, T. 34 S., R. 16 W. Depths to the tops of principal strati-

graphic zones were reported as: Wellington shale, 1,410 feet; the salt, between 1,620 and 2,040 feet; Fort Riley limestone, 2,500 feet; Florence cherty limestone, 2,625 feet; Kansas City-Lansing limestone, 4,464 feet; Mississippian (Osagian) cherty limestone, 5,142 feet; Kinderhookian grayish-green shale, 5,454 feet; Kinderhookian limestone, 5,520 feet; Chattanooga black shale, 5,536 feet; and the Ordovician cherty dolomite, 5,565 feet. A buff dolomite of probable Simpson age was cut between 5,745 and 5,793 feet and the usual green Simpson shale alternating with sandstone layers was found from 5,793 feet to the top of the Arbuckle dolomite at 5,925 feet. There were no shows of oil or gas.

The second well was drilled by the Gulf Oil Corporation on the Lorimor lease in sec. 36, T. 31 S., R. 20 W. Depths to important stratigraphic zones were reported as: Blaine gypsum, between 350 and 370 feet; many thin layers of salt, between 450 and 950 feet in the redbed section; the marker bed, Stone Corral, here consisting of anhydrite and salt, between 1,115 and 1,175 feet; Wellington shale, 1,640 feet; salt beds, between 1,860 and 2,375 feet; Hollenberg limestone, 2,429 feet; Fort Riley limestone, 2,664 feet; Americus limestone (base), 3,315 feet; Heebner black shale, 4,067 feet; and the Kansas City-Lansing limestone, 4,510 feet. The base of the Kansas City-Lansing limestone was found at 4,903 feet according to the electric log. The Mississippian was found at 5,191 feet, the Osagian cherty limestone at 5,553 feet, and the Fern Glen limestone at 5,867 feet. A very thin zone of sandy black shale with spores began at 5,980 feet (depth from electric log). Below this the Ordovician cherty dolomite began at 5,983 feet (electric log), and coarsely crystalline limestone at 6,094 feet. The Simpson shale and sandstone began at 6,143 feet (electric log), but contained a thick dolomite layer between 6,171 and 6,212 feet. The top of the Arbuckle dolomite was found at 6,304 feet according to the electric log.

COWLEY COUNTY

Statistical summary for Cowley County, 1948

Oil produced	2,592,991 barrels
Gas produced	100,000 thousand cubic feet
Recorded	
wells drilled: Oil	50
Dry	59
Salt water disposal	3
Total	112

Wildcat wells	9 (included in above total)
New pools: Oil	3
Secondary recovery operations	5

Developments during 1948.—Three oil pools were discovered in Cowley County in 1948. They are the Box, Enterprise, and Turner North.

The **Box** field was discovered in February when Mississippian limestone production was found in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 30 S., R. 7 E. The depth of the producing zone is 2,842 feet. During the remainder of the year 17,392 barrels of oil were produced from 10 wells.

The **Enterprise** pool was opened in July when a "Bartlesville

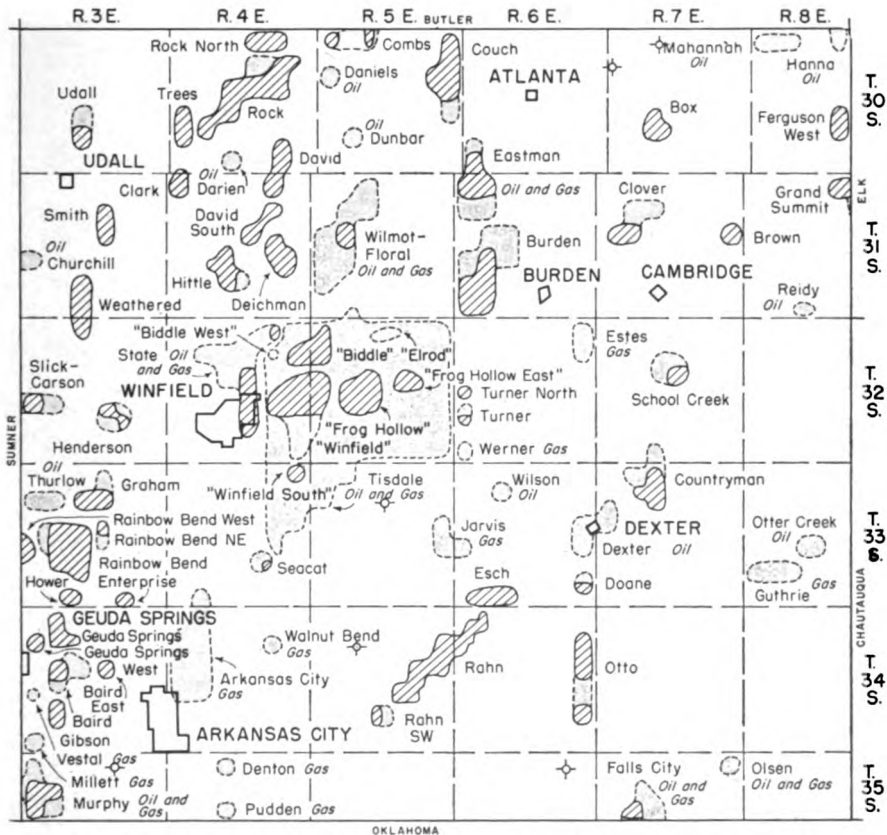


FIG. 13.—Map of Cowley County showing oil and gas fields and dry wildcat wells drilled during 1948. Diagonal lines show areas of 1948 oil production.

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TABLE 22.—Oil production in Cowley County during 1948

Field	Dis- cov- ery year	Pro- duc- ing wells	1948 produc- tion bbls.	Cumulative production to end of 1948, bbls.	Producing zone	Depth to producing zone, feet
Baird		2+	11,628		"Bartlesville"	
Baird East	1940	1	2,460		"Bartlesville"	3,200
Biddle		26	35,597		"Stalnaker"	2,300
					K.C.-Lans.	2,000
					Admire	600
Box	1948	10	17,392	17,392	"Miss. lime"	
Brown	1922		5,208	238,195	K.C.-Lans.	
Burden	1926	27	28,408		"Bartlesville"	2,800
Clark	1914	5	10,031		"Bartlesville"	2,800
Clover		1	1,233	17,715		
Combs ¹	1947	13	117,981	150,471	"Bartlesville"	2,823
Couch	1940	22+	165,555	1,515,885	"Bartlesville"	2,800
Countryman			25,161		"Layton"	1,950
Darlen	1939	abandoned during 1947			Arbuckle	3,300
David	1935	24+	50,963	998,976	"Bartlesville"	2,900
David South	1938	5	5,775	143,344	Arbuckle	3,463
					"Bartlesville"	3,000
Deichman	1941	22	144,982	654,628	"Bartlesville"	2,800
De Mott		combined with Murphy				
Dexter	1914	no production reported			Mississippian	2,750
Doane	1947	2	3,752	5,402	"Miss. lime"	
Eastman	1924	21	45,631		"Bartlesville"	2,800
Enterprise	1948	1	876	876	"Bartlesville"	
Esch		5	105,713			
Falls City	1919		6,208	1,254,994	"Stalnaker"	2,000
Ferguson West	1934	6	4,566		Bronson	2,000
Frog Hollow	1937	50	341,746	3,407,120	"Bartlesville"	3,000
Frog Hollow East	1941	6	19,912	204,736	"Bartlesville"	3,000
Geuda Springs	1936	3+	16,942	464,076	"Bartlesville"	
Geuda Springs West		1	456			
Gibson	1941	9	35,945	287,991	"Bartlesville"	3,300
Graham	1924	8	16,011	2,638,410	Arbuckle	
					"Layton"	3,518
Grand Summit ²	1926	6	1,398		K.C.-Lans.	2,000
Hannah		see Butler County				
Henderson	1942	6	8,799	115,802	K.C.-Lans.	2,690
					Arbuckle	3,419
Hittle	1926	59	489,242	7,779,872	K.C.-Lans.	2,400
					Arbuckle	3,280
Hower	1935	3	5,635	57,535		
Murphy ³	1933	23	110,911		Miss. "chat"	3,300
Otter Creek	1943	no production reported		3,733	K.C.-Lans.	
Otto		1+	5,686		"Chat"	3,017
Rahn	1939	25+	165,900	1,268,613	"Bartlesville"	2,900
Rahn Southwest (Silverdale)	1944	1	590	2,723	"Bartlesville"	3,019
Rainbow Bend	1923	68	216,127	14,963,770	"Burgess"	3,200
Rainbow Bend Northeast	1945	1	2,495	12,485	"Bartlesville"	
Rainbow Bend West ³		3	4,710		"Burgess"	
					Arbuckle	3,500
Rock	1937	24+	105,501	2,854,235	"Bartlesville"	2,800
Rock North	1937	5	5,895	120,609	"Bartlesville"	2,800
Seacat	1945		1,703	10,236	"Miss. lime"	
School Creek	1947	1	1,196	3,236	"Bartlesville"	
Slick-Carson ¹	1925	15	39,012	3,388,326	"Layton"	2,700
					Arbuckle	3,450

Smith	1917	7	3,330		"Bartlesville"	3,000
State	1926	11+	36,036		Arbuckle "Layton"	3,500 2,300
Trees	1934	11	13,756		"Bartlesville"	2,975
Turner	1937	4	7,230	258,693	"Layton"	2,332
Turner North	1948		production not recorded			
Udall		1	1,710			
Weathered	1935	14	48,447	2,554,719	Arbuckle Mississippian K.C.-Lens. "Stalnakcer"	
Wilmot-Floral			552			
Winfield	1914	58	94,678		Admire Arbuckle "Bartlesville" "Layton" "Peacock" "Hoover"	600 3,300 3,050 2,300 1,400
Winfield South	1945	1	2,320	2,320		
Total		618+	2,592,991			

¹ Includes Butler County production.

² Field extends into Elk County.

³ Field extends into Sumner County.

sand" well was discovered in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 33 S., R. 3 E. The depth to the producing zone is 3,282 feet. During the remainder of the year 876 barrels of oil were produced from the discovery well.

The third discovery was in December when the **Turner North** field was opened. The discovery well is in the SW cor. SE $\frac{1}{4}$ sec. 18, T. 32 S., R. 6 E. The initial daily production was 15 barrels of oil in the "Layton sand" at 2,286 feet.

Secondary recovery projects are operating in the **Eastman, Hittle, Murphy, Rainbow Bend, and Weathered** pools (Table 8).

Locations of oil and gas fields and areas that produced oil in 1948 in Cowley County are shown on Figure 13. Oil production in the various fields is shown in Table 22 and data on dry wildcat wells drilled in the county in 1948 are listed in Table 23.

TABLE 23.—Dry wildcat wells drilled in Cowley County during 1948

Company and farm	Location	Depth to top of Kansas City, feet	Depth to top of Mississippian, feet	Total depth, feet
K. T. Weideman No. 1 Lenier	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ 4-30-7E		2,881	2,986
K. T. Weideman No. 1 Haworth	NW cor. SW $\frac{1}{4}$ 7-30-7E	2,180	2,887	2,912
H. H. Blair Drilling Co. No. 1 De Vore	SW cor. NW $\frac{1}{4}$ 10-33-5E			3,252
Morrison Producing Co. No. 1 Brandenburg	NE cor. SE $\frac{1}{4}$ 8-34-5E	2,619	3,183	5,642
Aladdin Oil Corp. & Harbar Drilling Co. No. 1 Brandenburg	SE cor. NE $\frac{1}{4}$ 3-35-3E		3,458	3,510
Kingery & Patterson No. 1 Shepard	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ 2-35-6E		2,990	3,034

CRAWFORD COUNTY

Crawford County produced 67,059 barrels of oil in 1948. Natural gas production during the year is estimated as approximately 357 thousand cubic feet. There were two water-flood projects operating in the county and five active oil fields.

Developments during 1948.—More than 80 percent of the oil produced in Crawford County came from the McCune field which was discovered in 1932 and yields oil from the "Bartlesville sand" at a depth of about 300 feet. Water flooding has been practiced in this field since 1937.

Oil production in Crawford County fields in 1948 is shown in Table 24. The five active oil fields are in the western part of the county; the St. Paul-Walnut field extends into Neosho County. Drilling activities during the year were principally in connection with water-flooding projects.

DECATUR COUNTY

Wildcat wells have been drilled in Decatur County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—Decatur County, located on the southwestern flank of the Central Kansas uplift, has had good shows of oil in previously drilled tests. During the year four additional wildcat tests, listed in Table 25, were completed in this county. A. J. Stormfeltz drilled one test, the Brown No. 1, in sec. 21, T. 3 S., R. 27 W. The depths of important zones not shown in Table 25 were reported as follows: Heebner black shale, 3,522 feet; Kansas City-Lansing limestone sequence (base), 3,742 feet; and

TABLE 24.—Oil production in Crawford County during 1948

Field	Producing wells as reported	1948 production, bbls.
Fair Oak		1,163
Green Elm		2,215
McCune		55,831
St. Paul-Walnut ¹		999
Walnut Southeast ²	9	6,297
Miscellaneous		554
Total	9	67,059

¹ Field extends into Neosho County.

² Areas of production not definitely located.

TABLE 25.—Dry wildcat tests drilled in Decatur County during 1948

Company and farm	Location	Surface elevation, feet	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle feet	Total depth, feet
A. J. Stormfeltz No. 1 Brown	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 21-3-27W	2,599	3,544	4,016	4,075
Lamar Hunt Estate No. 1 Petracek	Sen. NE $\frac{1}{4}$ NE $\frac{1}{4}$ 14-4-27W	2,594	3,471	3,988	4,020
Sohio & Veeder Supply No. 1 Sears	Sen. W $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ 12-5-27W	2,659	3,623	4,032	4,094
The Derby Oil Co. & Shields No. 1 Feely	SE cor. NE $\frac{1}{4}$ 26-5-27W	2,625	3,668	4,113	4,122

Sooy conglomerate, 3,972 feet. There were no shows of either oil or gas.

H. L. Hunt completed the No. 1 Petracek in sec. 14, T. 4 S., R. 27 W. The following tops not shown in Table 25 were reported: Stone Corral dolomite, 2,150 feet; Topeka limestone, 3,265 feet; Heebner black shale, 3,442 feet; and Pennsylvanian basal conglomerate, 3,943 feet.

Farther south in T. 5 S., R. 27 W. two wildcat tests were completed. One, the No. 1 Sears, was drilled in sec. 12 by the Sohio Petroleum Company and the Veeder Supply Company. Here the important "tops" were logged as follows: Morrison clay, 1,580 feet; Cimarron redbeds, 1,785 feet; Stone Corral, 2,245 feet; Herington limestone, 2,700 feet; and Heebner black shale, 3,596 feet. The Pennsylvanian rocks rest upon the Arbuckle dolomite at 4,032 feet.

The other dry wildcat drilled in T. 5 S., R. 27 W. is the No. 1 Feely well in the SE cor. NE $\frac{1}{4}$ sec. 26. The casing was perforated and the well acidized at three levels, but oil shows were reported as slight.

DICKINSON COUNTY

Oil production totaled 23,449 barrels. There were four active oil fields. Eighteen oil wells and eight dry holes were drilled during 1948. No gas was produced.

TABLE 26.—Oil production in Dickinson County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bonaccord	1	2,818
Lost Springs	see Marion County	
Lost Springs North	5	20,321
Lost Springs Northeast	1	310
Total	7	23,449

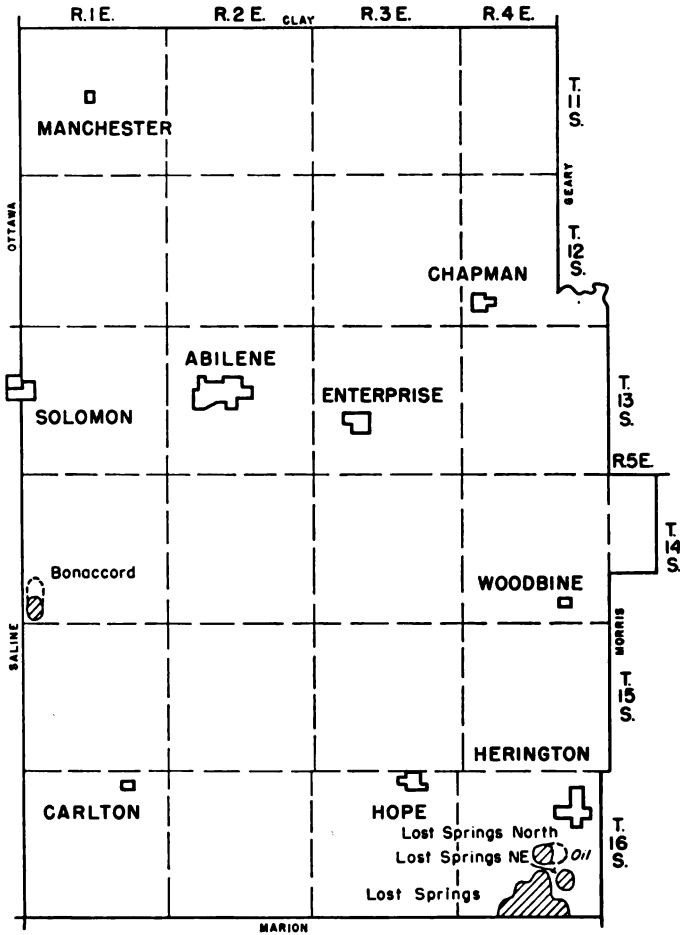


FIG. 14.—Map of Dickinson County showing oil fields. Diagonal lines show areas of 1948 oil production.

Developments during 1948.—The 18 oil wells drilled during the year are in the **Lost Springs** field which extends into Dickinson from Marion County. Of the eight dry holes, six are in the Lost Springs field and two in the **Lost Springs North**. No wildcat drilling was reported.

Oil production in Dickinson County fields in 1948 is shown in Table 26, and locations of oil fields and areas that produced oil in the county during 1948 are shown on Figure 14.

DOUGLAS COUNTY

Oil production is estimated at 4,000 barrels. Natural gas production figures for 1948 are not available.

Developments during 1948.—There was relatively little activity in Douglas County during the year. The 4,000 barrels of oil was produced in the **Baldwin** field in the southeastern part of the county. A few wells were drilled in the Baldwin field.

Gas production was in the **Eudora** and the **Eudora South** fields in the eastern part of the county.

EDWARDS COUNTY

Statistical summary for Edwards County, 1948

Oil produced	none
Gas produced	826,372 thousand cubic feet
Wells drilled: Oil	none
Gas	2
Dry	2
Total	4
Wildcat wells	2 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Drilling activity in Edwards County was on a much reduced scale during 1948. The test well drilled by W. H. Black in sec. 23, T. 24 S., R. 16 W. found the anhydrite (Stone Corral) at 1,030 feet, the Kansas City-Lansing limestone at 3,683 feet, the Mississippian cherty residue at 4,215 feet, the "Misener" sandstone at 4,273 feet, the Viola cherty dolomite at 4,350 feet, and the Simpson at 4,520 feet. The samples show that this well ends in the Simpson at a total depth of 4,593 feet. There were no shows of oil or gas.

The test well drilled by the Cities Service Oil Company on the McLean farm in sec. 31, T. 24 S., R. 17 W. found Topeka limestone at 3,378 feet, Heebner shale at 3,865 feet, Kansas City-Lansing limestone at 3,987 feet, residual Mississippian chert at 4,493 feet, "Misener" sandstone at 4,560 feet, Viola rocks at 4,603 feet, rocks of Simpson age at 4,805 feet, and Arbuckle dolomite at 4,893 feet. Total depth of the hole was 4,951 feet. A show of oil was found in the Mississippian chert between 4,495 and 4,502 feet.

Two gas wells were drilled in the Edwards County part of the new **Bradbridge** pool discovered in Stafford County in 1948. One of these was the No. 1 Bright drilled by Max Cohen and

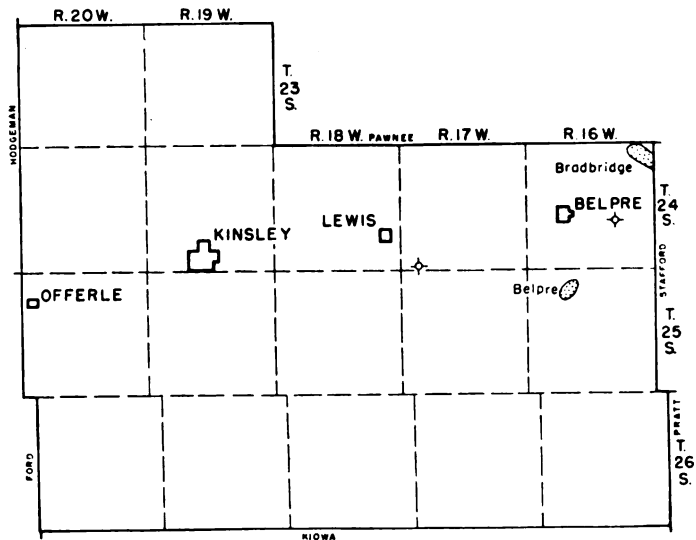


FIG. 15.—Map of Edwards County showing the gas pools and dry wildcat tests drilled during 1948.

Associates in the SW $\frac{1}{4}$ sec. 1, T. 24 S., R. 16 W. This test found a good show of high gravity oil in the Pre-Cambrian granite wash before being plugged back to porous zones in the Kansas City-Lansing limestone. The best zone was found between 3,686 and 3,706 feet. After acidizing, the well was rated at approximately 15 million cubic feet of gas per day. It is reported that the Arbuckle rocks are absent at this location, the weathered granite wash being found at 3,952 feet and Pre-Cambrian at 3,972 feet. The second gas well was drilled one location to the north. This test also was drilled into the Pre-Cambrian rocks before being plugged back to a porous zone in the Kansas City-Lansing limestone. The

TABLE 27.—Gas pools of Edwards County

Pool and location of discovery well	Discovery year	Area, acres	1948 production M cu. ft.	Cumulative production to end of 1948 M cu. ft.	Producing wells	Producing zone	Depth to producing zone, feet
Belpre 8-25-16W	1942	300	826,372	4,789,011	2	K.C.-Lans.	3,800
Bradbridge ¹ 6-24-15W	1948	160	no production reported	none	2	Arbuckle	4,020

¹ Field extends into Stafford County.

well was rated at 4 million cubic feet of gas per day from perforations between 3,740 and 3,745 feet.

The gas pools of Edwards County are shown on Figure 15 and listed in Table 27.

ELK COUNTY

Elk County produced 211,926 barrels of oil and 514,561 thousand cubic feet of gas in 1948. There were 17 active fields and three water-flooding projects.

Developments during 1948.—No important developments were reported in Elk County during the year. Data on the number of wells drilled are not available. Water-flooding projects are operated in the “Gardner” and New Albany fields.

Oil production in Elk County fields is shown in Table 28, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 16. There were 29 active gas wells.

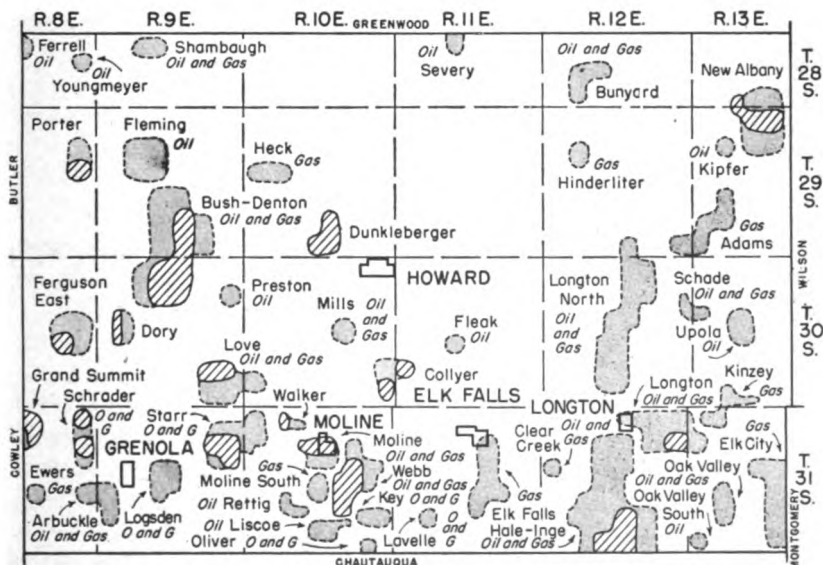


FIG. 16.—Map of Elk County showing oil and gas fields. Diagonal lines show areas of 1948 oil production. The area of production in the Severy field is not definitely located.

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TABLE 28.—Oil production in Elk County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bush-Denton	46	29,241
Collyer	11	12,107
Dory	3	1,746
Dunkleberger	28	27,390
Ferguson East	1	1,205
Ferrell	see Elk County	
"Gardner"	combined with Longton	
Grand Summit ¹	12	14,463
Hale-Inge ²	22	5,035
Longton		870
Love	4	4,515
Moline	12	5,463
New Albany		22,100
Porter	10	4,609
Rettig	no production reported	
Schrader	2	25,036
Severy	see Greenwood County	
Starr	6	5,266
Walker	2	1,456
Webb	70	50,873
Miscellaneous		551
Total	229	211,926

¹ Field extends into Cowley County.

² Field extends into Chautauqua County.

ELLIS COUNTY

Statistical summary for Ellis County, 1948

Oil produced	12,742,936 barrels
Gas produced	none
Wells drilled: Oil	129
Gas	none
Dry	74
Salt water disposal	2
Total	205
Wildcat wells	20 (included in above total)
New pools: Oil	4
Revived pool: Oil	1
Abandoned pool: Oil	1
Secondary recovery operations	none

Developments during 1948.—One of the actively explored counties in Kansas during 1948 was Ellis. The 20 wildcat wells which were drilled found four new oil pools. These are: Canyons, Polifka, Upper Turkville, and Weigel. The old Madden pool, discovered during 1936, was revived.

The most concentrated drilling activity was in T. 11 S., R. 18 W. where the various **Burnett** pools are located. Here good potential recoveries encouraged rapid drilling up of leaseholds by

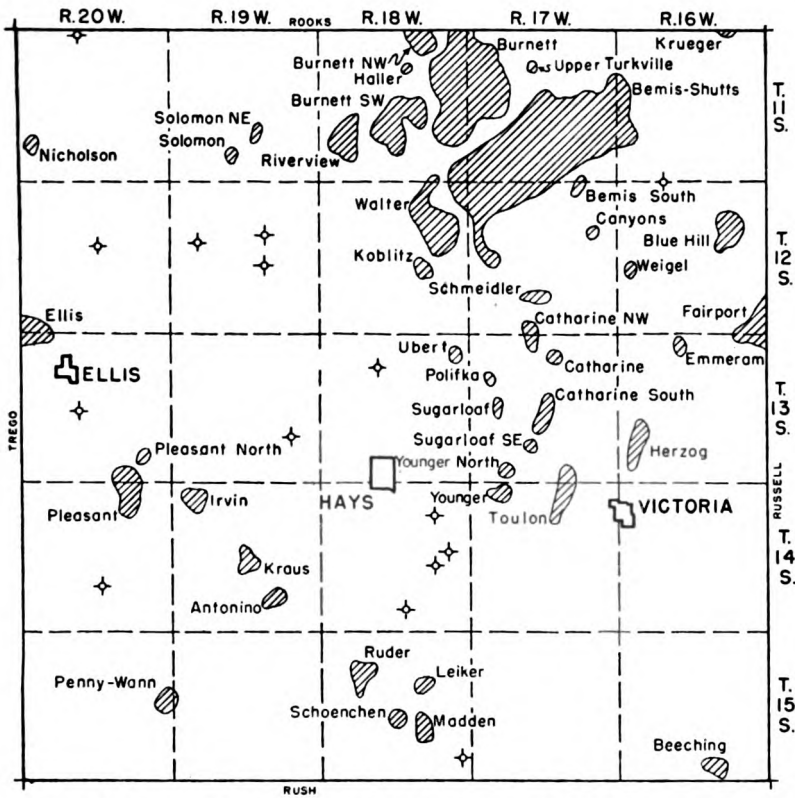


FIG. 17.—Map of Ellis County showing oil pools and dry wildcat tests drilled during 1948.

various companies. Elsewhere in the county there was a little drilling in almost every pool.

The new **Canyons** pool located just southeast of the Bemis South in sec. 11, T. 12 S., R. 17 W. was found by the Cities Service Oil Company with their No. 1 Hall "M" well. Finding the Arbuckle dolomite unproductive, the well was plugged back to test showings at various levels in the Kansas City-Lansing limestone sequence. The best recoveries were obtained between 3,361 and 3,367 feet, 20 or 30 feet below the top of the Kansas City-Lansing, where the well was completed for 170 barrels of oil and 28 percent water.

The new **Polifka** pool was found a short distance east of the Ubert pool by V. D. Sidey with his No. 1 Polifka well in the NW $\frac{1}{4}$

SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T. 13 S., R. 17 W. The potential of 127 barrels per day assigned to the well is from the Arbuckle between 3,640 and 3,671 feet.

The new **Upper Turkville** pool was discovered a short distance east of the Burnett pool by the Westgate-Greenland Oil Company with their No. 1 Simpson in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 9, T. 11 S., R. 17 W. Here also the operators, after testing the Arbuckle dolomite, plugged back to some good showings in the Kansas City-Lansing. The best porosity was found 74 feet below the top of the Kansas City-Lansing limestone between 3,114 and 3,124 feet. After acidizing with 5,000 gallons, the well was rated at 25 barrels of oil per day.

The new **Weigel** pool was found by the J. M. Huber Corporation with a wildcat test in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 19, T. 12 S., R. 16 W. Here again the operators tested the Arbuckle dolomite but found only water. The well was plugged back to a porous zone between 3,368 and 3,376 feet, about 25 feet below the top of the Kansas City-Lansing limestone and there completed. The casing was also perforated between 3,318 and 3,324 feet and acidized

TABLE 29.—Oil pools of Ellis County

Pool and location of discovery well	Discovery year	Area, acres	1948 production nbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Antonino 27-14-19W	1947	200	23,174	32,655	3	Arbuckle Basal sandstone	3,712 3,726
Beeching 34-15-16W	1943	500	14,272	181,406	6	K.C.-Lans.	3,156
Bemis-Shutts 16-11-17W	1935	14,020	5,739,919	54,796,297	524	Arbuckle	3,380
Bemis South 2-12-17W	1938	80	12,498	100,760	1	Arbuckle	3,592
Blue Hill 14-12-16W	1937	1,000	153,748	1,409,674	22	Topeka K.C.-Lans. Gorham Arbuckle	3,030 3,072 3,348 3,360
Burnett ¹ 1-11-18W	1937	6,200	3,691,498	30,901,841	248	K.C.-Lans. Arbuckle	3,093 3,570
Burnett Northwest ¹ 3-11-18W	1946	770	540,233	848,194	23	K.C.-Lans. Arbuckle	3,450 3,617
Burnett Southwest 22-11-18W	1946	1,590	649,788	799,658	59	Shawnee K.C.-Lans. Arbuckle	3,074 3,207 3,633
Canyons 11-12-17W	1948	40	4,446	4,446	1	K.C.-Lans.	3,361
Catharine 3-13-17W	1936	80	4,622	157,617	1	K.C.-Lans.	3,262
Catharine Northwest 4-13-17W	1944	320	67,335	220,003	9	K.C.-Lans. Arbuckle	3,590
Catharine South 15-13-17W	1946	350	173,238	296,173	17	Arbuckle	3,555
Ellis ² 31-12-20W	1942	700	103,335	714,077	12	Arbuckle	3,832

Emmeram 4-13-16W	1937	160	11,975	205,147	5	K.C.-Lans.	3,262
Fairport ² 8-12-15W	1923	700	59,227	1,549,874	13	K.C.-Lans. Gorham Arbuckle Reagan	2,950 3,211 3,312 3,350
Haller 10-11-18W	1936	40	1,028	23,843	1	Topeka	3,045
Herzog 30-13-16W	1940	470	151,709	676,575	13	Arbuckle	3,450
Irvin 6-14-19W	1946	350	99,643	140,748	8	Arbuckle	3,860
Koblitz 23-12-18W	1937	400	73,736	680,672	11	Arbuckle	3,694
Kraus 22-14-19W	1936	100	14,387	99,212	3	Sooy Arbuckle	3,735 3,732
Krueger ¹ 35-10-16W	1948	80	1,054	1,054	1	K.C.-Lans.	3,552
Leiker 14-15-18W	1943	100	12,582	75,296	2	K.C.-Lans. Arbuckle	3,292 3,591
Madden ⁴ 26-15-18W	1948	300	30,445	67,673	6	K.C.-Lans. Arbuckle	3,328 3,584
Nicholson 30-11-20W	1945	250	50,815	152,024	6	Arbuckle	3,842
Penny-Wann 13-15-20W	1936	120	15,080	134,191	3	Sooy	3,653
Pleasant 2-14-20W	1944	1,000	165,062	597,181	18	Arbuckle Reagan	3,833 3,877
Pleasant North 26-13-20W	1946	40	856	1,124	2	Arbuckle	3,798
Polifka 7-13-17W	1948	40	901	901	1	Arbuckle	3,640
Richards 5-11-18W	1938	abandoned during 1948					
Riverview 19-11-18W	1943	940	199,012	1,075,204	18	Arbuckle	3,610
Ruder 17-15-18W	1935	620	30,958	987,619	4	K.C.-Lans. Arbuckle	3,422 3,572
Schmeidler 28-12-17W	1944	400	78,090	180,600	9	Arbuckle	3,625
Schoenchen 21-15-18W	1946	320	62,187	141,366	7	Arbuckle	3,569
Solomon 28-11-19W	1936	160	no production reported	104,608		Arbuckle	3,629
Solomon Northeast 22-11-19W	1946	120	17,387	32,124	3	Arbuckle	3,639
Sugarloaf 17-13-17W	1941	80	24,642	193,644	2	Arbuckle	3,645
Sugarloaf Southeast 28-13-17W	1941	120	12,922	81,254	3	K.C.-Lans.	3,312
Toulon 3-14-17W	1935	680	29,212	378,097	7	K.C.-Lans. Arbuckle	3,298 3,512
Ubert 12-13-18W	1936	160	10,222	251,780	3	K.C.-Lans. Arbuckle	3,707
Upper Turkville 9-11-17W	1948	40	770	770	1	K.C.-Lans.	3,114
Walter 2-12-18W	1936	1,660	379,849	4,252,292	50	Topeka Arbuckle	3,160 3,619
Weigel 19-12-16W	1948	40	1,171	1,171	1	K.C.-Lans.	3,368
Younger 6-14-17W	1944	200	23,307	110,581	5	Arbuckle	3,574
Younger North 32-13-17W	1947	80	6,601	6,601	2	Arbuckle	3,580

¹ Field extends into Rooks County.² Field extends into Trego County.³ Field extends into Russell County.⁴ Old name revived.

with 6,000 gallons. A test by the State Corporation Commission showed the well capable of producing 25 barrels of oil per day with much water.

Some interesting data were obtained in drilling test wells on the fringes of other pools in this county. For instance, in sec. 25, T. 11 S., R. 17 W. on the east side of the Bemis-Shutts pool, the Cities Service Oil Company drilled a salt water disposal well which found the Arbuckle dolomite to be 378 feet thick. Another salt water disposal well drilled by the Sohio Petroleum Company a few miles farther west in the Bemis-Shutts pool in sec. 28, found the Arbuckle dolomite to be almost 500 feet thick and the basal sandstone below to be 42 feet thick. The test ended in Pre-Cambrian granite. In the Blue Hill pool, only 8 miles east of the Bemis-Shutts, a well found the Arbuckle dolomite to be only 27 feet thick.

In the Irvin pool one well drilled by the Stanolind Oil and Gas Company found the Arbuckle dolomite to have a thickness of 95 feet, and the basal sandstone a thickness of 48 feet. A few miles

TABLE 30.—*Dry wildcat tests drilled in Ellis County during 1948*

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Tnos. H. Allan et al. No. 1 Chrysler	SE cor. SE $\frac{1}{4}$ 32-11-16W	3,057	3,430	3,448
Sohio & Continental No. 1 Veatch	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ 4-11-20W	3,439	3,799	3,844
Herndon Drilling Co. No. 1 "A" Bemis	NE cor. NE $\frac{1}{4}$ 15-12-19W	3,542	3,968	4,015
Virginia Drilling Co., Inc. No. 1 Hagan	SW cor. NW $\frac{1}{4}$ 17-12-19W	3,546	3,903	3,935
Aladdin Oil Corp. No. 1 Reeder	SE cor. NE $\frac{1}{4}$ 22-12-19W	3,528	3,956	4,000
The Texas Co. No. 1 Chapman	NW cor. SW $\frac{1}{4}$ 15-12-20W	3,622	4,088	4,160
Brunson Drilling Co. No. 1 Drelling	SE cor. NW $\frac{1}{4}$ 3-13-18W	3,488	3,874	3,886
Virginia Drilling Co., Inc. No. 1 Sack	NE cor. NE $\frac{1}{4}$ 26-13-19W	3,373	3,701	3,739
Continental Oil Co. No. 1 Schumacher	NE cor. NW $\frac{1}{4}$ 21-13-20W	3,464	3,835	3,887
Skelly Oil Co. No. 1 Leiker	SW cor. NE $\frac{1}{4}$ 11-14-18W	3,261	3,580	3,630
The Derby Oil Co. No. 1 Herl	NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 13-14-18W	3,259	3,560	3,610
Hanlon & Boyle No. 1 Binder	SW cor. NE $\frac{1}{4}$ 23-14-18W	3,295	3,620	3,677
Helmerich & Payne Inc. No. 1 Engel	NE cor. NW $\frac{1}{4}$ 34-14-18W	3,339	3,653	3,705
The Derby Oil Co. & Glenn Peel Drig. Co. No. 1 Wann	Cen. W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ 27-14-20W	3,431		3,809
Jones, Shelburne & Farm- er No. 1 Gottschalk	SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ 36-15-18W	3,183	3,482	3,490

southeast of the Irvin pool several wells in the **Antonino** pool were drilled into the basal sandstone without finding Arbuckle dolomite. Still farther southeast, in the **Schoenchen** pool, one well drilled by the Gulf Oil Corporation, No. 3 Engel, found the Arbuckle dolomite 186 feet thick and the basal sandstone 38 feet thick.

During 1948 a new producing zone, Shawnee limestone, was found in the **Burnett Southwest** pool. Previously this pool produced from both the Arbuckle and the Kansas City-Lansing. In the **Burnett Northwest** pool, where only the Arbuckle has been producing oil, one well found production in the Kansas City-Lansing.

The most interesting discovery of a new producing zone was in the **Blue Hill** pool where previously the Arbuckle and the Kansas City-Lansing had been productive. During 1947 a well drilled by V. D. Sidey on the Smith farm in sec. 14, T. 12 S., R. 16 W., unreported in Bulletin 75 (Ver Wiebe and others, 1948) found oil in the Gorham sandstone near the base of the Pennsylvanian System. In the Antonino pool oil was found in the basal sandstone by the Trojan Oil and Gas Company on the Kraus farm in sec. 27, T. 14 S., R. 19 W.

In the **Kraus** pool, producing from the Sooy up to 1948, two wells found production also in the Arbuckle dolomite. Both producers, drilled in the SW $\frac{1}{4}$ sec. 22, T. 14 S., R. 19 W., proved the Arbuckle to have a thickness in excess of 20 feet.

The **Madden** pool, found in June 1936 by the Bridgeport Oil Well Supply Company, had modest production in both the Arbuckle and Kansas City-Lansing. After producing 36,515 barrels of oil, the pool was abandoned. During 1948, Jones, Shelburne, and Farmer, Inc. revived the pool by finding oil in the Kansas City-Lansing rocks on the Madden lease in sec. 26, T. 15 S., R. 18 W. A second test, in adjacent sec. 27, yielded a 50-barrel well between 3,571 and 3,590 feet in the Arbuckle dolomite.

The oil pools of Ellis County are shown on Figure 17. The pools and pertinent facts pertaining to them are tabulated in Table 29. Dry wildcat tests drilled during 1948 are listed in Table 30 and shown on Figure 17.

ELLSWORTH COUNTY

Statistical summary for Ellsworth County, 1948

Oil produced	5,227,593 barrels
Gas produced	18,317 thousand cubic feet
Wells drilled:	
Oil	21
Gas	none
Dry	14
Salt water disposal	3
Total	38
Wildcat wells	3 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—There was but a limited amount of exploration work done in the county during the year.

One wildcat well was drilled by Cities Service Oil Company, the No. 1 Vanek well, in the NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 35, T. 14 S., R. 10 W. According to the log of the well the Topeka limestone was reached at 2,392 feet, the Kansas City-Lansing at 2,746 feet, the Simpson at 3,110 feet, and the Arbuckle at 3,121 feet. Elevation of the well is 1,650 feet and the total depth, 3,155 feet. The test was dry and abandoned.

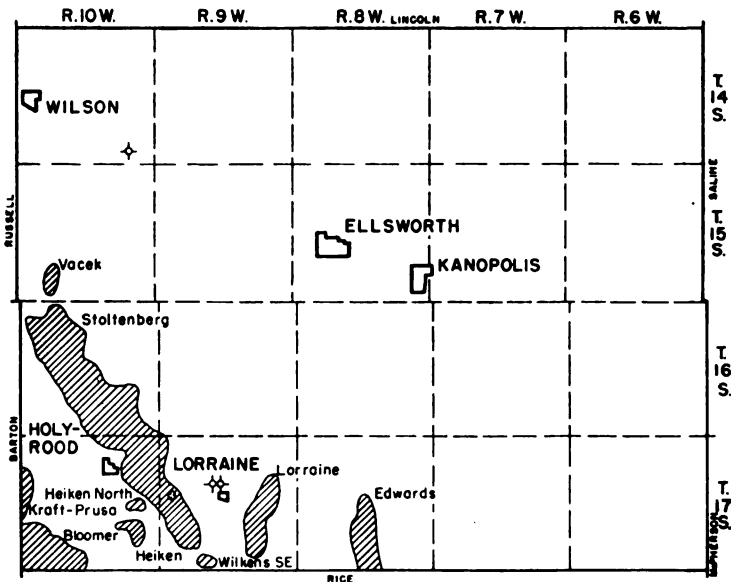


FIG. 18.—Map of Ellsworth County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

TABLE 31.—Oil and gas pools of Ellsworth County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Bloomer ¹ 36-17-11W	1936	2,830	1,363,708	10,093,856	94	K.C.-Lans. Arbuckle	3,044 3,257
Edwards ² 3-18-8W	1936	1,900	1,207,969	10,389,085	101	Arbuckle	3,278
Heiken 25-17-10W	1930	300	2,389	46,285	2	Arbuckle	3,269
Heiken North 24-17-10W	1942	180	17,133	139,068	3	Arbuckle	3,212
Kraft-Prusa ³ 10-17-11W	1937	300 included	under	Barton County		Shawnee K.C.-Lans. Gorham Arbuckle Reagan	2,885 3,160 3,335 3,281 3,310
Lorraine 13-17-9W	1934	2,000	98,548	9,996,754	30	K.C.-Lans. Arbuckle	3,060 3,200
Stoltenberg 22-16-10W	1931	13,500	2,488,251	27,540,678	338	K.C.-Lans. Arbuckle	3,260 3,333
Vacek 32-15-10W	1944	160	11,403	42,862	3	Arbuckle	3,315
Wilkens Southeast 32-17-9W	1942	300	38,192	327,525	6	Arbuckle	3,220
<i>thousand cubic feet</i>							
Stoltenberg (gas) 18-17-9W	1947	100	18,317	18,317	1	Shawnee	2,728

¹ Field extends into Barton and Rice Counties.

² Field extends into Rice County.

³ Field extends into Barton County.

Two wells located about 2 miles from production were drilled in sec. 16, T. 17 S., R. 9 W. seemingly on the strength of showings obtained in a 1946 well, the No. 1 Dabinski located in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$. That well at first was rated at 50 barrels of oil per day with 50 barrels of water, but it did not continue as a regular producer. The new wells, drilled in the same part of the section, found the Kansas City-Lansing at 2,908 feet. Both were dry and abandoned at total depths of 3,030 and 3,035 feet, respectively.

A considerable amount of drilling around the peripheries of the present pools resulted mainly in more definitely defining their present limits.

Some valuable information was gained from three deep salt water disposal wells completed in the **Stoltenberg** pool. One of these was drilled by the Magnolia Petroleum Company on the Skalicky lease in sec. 4, T. 16 S., R. 10 W. Here the thickness of the Arbuckle was found to be 451 feet and that of the basal sandstone 84 feet.

The other two salt water disposal wells drilled in secs. 27 and

28, T. 16 S., R. 10 W., 4 miles south, showed similar thickness for these zones.

The oil pools of the county are shown on Figure 18 and listed in Table 31.

FINNEY COUNTY

Statistical summary for Finney County, 1948

Oil produced	308,263 barrels
Gas produced	166,039,208 thousand cubic feet (entire Hugoton field)*
Wells drilled: Oil	5
Gas	19
Dry	1
Total	25
New, revived, or abandoned pools	none
Secondary recovery operations	none

* County productions not segregated.

Developments during 1948.—Most of the drilling in Finney County during 1948 was in the southwestern part of the county which included a part of the Hugoton gas field. However, there was some drilling in the **Nunn** oil pool in the northwestern part of the county. Here five new oil wells were completed and several old wells worked over to produce from a new zone. Data are available from the No. 1 Aeilts well drilled by the Shallow Water Refining Company in sec. 34, T. 21 S., R. 34 W. Here the Cimarron anhydrite was topped at 1,860 feet, the Wellington shale at 2,245 feet, the Herington limestone at 2,516 feet, the Fort Riley at 2,621 feet, the Kansas City-Lansing limestone at 3,777 feet, and the Marmaton shale at 4,224 feet. Porosity in the Fort Scott limestone was found between 4,306 and 4,313 feet; however, the well was drilled on into the Ste. Genevieve sandy limestone and there completed in a more favorable zone with an initial capacity of 988 barrels of oil per day.

All the other new wells in this pool are producing from the Fort Scott zone in the Marmaton group after testing the deeper but unproductive Mississippian rocks. After plugging back, the new wells were rated at 286 to 988 barrels of oil per day. The No. 3 Nunn well, which was completed as a Mississippian producer late in 1947, was plugged back during 1948 to the porous zone in the Marmaton for a new potential of 1,114 barrels per day. Similarly, the No. 5 Gobleman "A" well was plugged back from the Mississippian to a porous zone in the Marmaton and received a new potential of 1,062 barrels per day. There are now 13 wells

producing from the upper zone, the Marmaton, and six wells producing from the lower zone.

All the other 1948 tests in Finney County are gas wells. Most of them have a capacity of nearly 5 million cubic feet per day, with the wells in the southern part of T. 26 S., R. 34 W. averaging considerably larger. They range from 12 to 25 million cubic feet of gas per day. All the new wells were treated with acid in amounts ranging from 12,000 to 40,000 gallons. Selective acidization has become routine in the Hugoton gas field.

Oil production in Finney County during 1948 consisted of the output of the Nunn pool, 308,263 barrels, making a cumulative total for that pool of 1,045,812 barrels. Production comes from the Marmaton group and the "Mississippi lime."

The Nunn oil pool and gas wells drilled in the Finney County part of the Hugoton gas field are shown on Figure 19.

HUGOTON GAS FIELD

General statement.—The Hugoton gas field, with its extension southward across the Oklahoma "strip" and well into the panhandle of Texas, is regarded as containing the largest reserve of natural gas of which the petroleum industry has knowledge. A recent estimate (Keplinger, Wanenmacher, and Burns, 1948) of the gas reserve of the entire field, and the field areas within the three states is shown in Table 32.

Substantial additions to the present area of the Hugoton field will doubtless be made, but it seems probable that the main area of large gas production has been reasonably well outlined. Careful and generous acidizing and improvements in production techniques are expected to be largely responsible for future field extensions and new pool discoveries in southwestern Kansas and in the panhandle country.

TABLE 32.—*Natural gas reserves and area of Hugoton gas field*

State	Billion cubic feet*	Percent area of field
Kansas	14,051	51.7
Oklahoma	8,034	29.3
Texas	5,372	19.0
Total	27,457	100.0

* Estimated as of October 1948 with pressure base of 14.65 psia. and an abandonment pressure of 25 pounds.

The field is a bit colorless geologically in that its limits are not clearly marked by structural or stratigraphic features. Porosity of the producing members seems to be the main control in respect to productivity. The gas comes from thin, porous, dolomitic rocks of lower Permian age. No oil has as yet been found within the area of the field although a small pool was opened during 1948 on the west boundary of the Hugoton area proper. Origin of the gas is debatable. There is no really important known deposit of oil with which the gas can be related in origin within miles of the Hugoton field. Production may come from one or several zones including the Herington, Krider, Winfield, Fort Riley, and Florence limestones. Most Hugoton gas production comes from a depth of about 2,500 feet.

Wells with initial potentials of less than 1 million cubic feet of gas per day are not likely to be saved by the larger companies; those producing 5 to 15 million cubic feet per day are "usual"; and "big" ones produce 30 million cubic feet or more. The limits of the field are by no means cleancut; production "featheredges" out, making the drawing of boundaries uncertain. A cut-off of 1 million cubic feet per day—a purely arbitrary figure—has been used as a guide in drawing the field boundary on the Hugoton map (Fig. 19). Smaller wells that are located near the field limits have been left outside the boundary line, although such wells might be regarded as rather valuable if located in eastern Kansas. It is significant that there are several old holes, marked dry, which are located within the main Hugoton area of large gas production and which penetrated well beyond the present producing zones. These were drilled a number of years ago—as long ago as the late 1920's. Modern methods and production techniques now are able to save wells that in former years were unsuccessful. By the same token, one may reasonably prophesy that the presence of dry wildcat wells of former years in many parts of western Kansas may not preclude the presence of important oil pools which may in the future be discovered by modern and scientific methods of exploration and production.

In physical appearance, the Hugoton gas field belies its true character. There is no forest of derricks, no profusion of pipe lines and oil country gear one sees in most large oil fields. Drilling is done mainly by portable rotary rigs. A traveler through the area may see little but a white painted 6- by 8-foot "dog house" con-

cealing a well head in the center of each section. The operators are good housekeepers.

The field is under rigid proration by the Corporation Commission, Division of Conservation, of Kansas. Only one well may be drilled in each 640 acres, and allowable production for groups of wells is established on a monthly basis, in a manner designed to conserve the gas reserve.

Gas from the Hugoton field has desirable quality. It carries about 0.4 gallon of gasoline per 1,000 cubic feet. Average analysis of Hugoton gas is given by Keplinger, Wanenmacher, and Burns in Table 33.

What many claim to have been the opening well of the Hugoton field was probably not even regarded as a discovery. That first well was drilled in 1922 by the Defenders and Traders Gas Company on the Boles lease in sec. 3, T. 35 S., R. 34 W. in what is now the Liberal gas field. The well was rated at 5 million cubic feet of gas per day and is credited with drawing attention to the gas possibilities of the general area.

The first well drilled in what is now the Kansas part of the Hugoton field proper, and often referred to as the discovery well, was not drilled until 5 years later, in 1927. It was the No. 1 Crawford well of the Independent Oil and Gas Company, in sec. 31, T. 33 S., R. 37 W. near Hugoton in Stevens County. The well is said to have produced 6 million cubic feet of gas per day. The field developed very slowly, in part because of the distance to consuming centers and in part because of the lack of pipe line facilities. The Argus Pipeline Company is said to have been first in the field with its gas line from Stevens County to Dodge City in 1930 and 1931. After that, drilling picked up somewhat. By 1938, only about 200 wells were in production. At that time, the two largest companies were the Panhandle Eastern Pipeline Company with a gas line to Detroit and other eastern cities, and the Republic

TABLE 33.—Average analysis of natural gas from Hugoton field

Gases	Percent
Methane	74.26
Nitrogen	14.27
Ethane	5.81
Propane	3.52
Butane	1.48
Pentane plus	0.65
Total	99.99

Natural Gas Company supplying gas to communities in Kansas, Nebraska, Iowa, and Minnesota. At that time also, the Argus Pipeline Company of Dodge City and the Central Gas Utilities of Abilene, both somewhat smaller companies, were supplying gas to communities in western Kansas and Colorado. Panhandle Eastern at that time—1938—had a natural gasoline plant at Arkalon producing 80,000 gallons of gasoline per day, and a subsidiary of the Columbian Fuel Corporation was operating a 6-burner carbon black plant near the town of Hickok in Grant County. In 1938 the producing area of the Hugoton field was about 187,300 acres; in 1942 it contained less than 190,000 acres. By the end of 1947 the area of the field had increased to nearly 2 million acres.

In other words, it was 20 years after discovery of the field before real interest in the big gas reserve became general. By the end of 1942 there were 327 gas wells in the field; 10 and 70 wells, respectively, were added in 1943 and 1944. Then came a great surge in the demand for gas, and field development increased accordingly. Greater demand came in part as a result of wartime technologic developments, and in part because of both domestic and industrial consumers' unhappiness over uncertain availability of solid fuel. The number of wells drilled in the Hugoton field in 1945 was 181; in 1946 it nearly doubled, to 286; and in 1947 the number of wells added was 382. During 1948, 325 wells were drilled within the producing area of the field, making a cumulative total of 1,581 wells in the Kansas part of the Hugoton field at the close of 1948.

Developments during 1948.—The 1948 event of greatest interest to Hugoton gas producers and to residents of southwestern Kansas was the announcements* on August 19, 1948, by the Stanolind Oil and Gas Company that they had decided to abandon—or defer until a future time—the building of an 80-million dollar synthetic plant near Garden City. A substantial amount of preliminary work had already been done toward the plant installation. Greatly increased costs, and “unprecedented delay” in obtaining building materials were given by the company as reasons for halting building plans.

Modest extensions of the Hugoton field boundaries were established during 1948 in Stanton, Hamilton, and Kearny Counties along the west and northwest edge of the field, and in Haskell,

* As reported in the Hutchinson News-Herald, issue of Aug. 20, 1948. Article (unsigned) on first page with banner headline, “Stanolind Halts Project.”

TABLE 34.—*Statistical summary of Kansas natural gas production and use, 1948*
(From the Conservation Division, Kansas Corporation Commission)

	During 1948 M cu. ft.*
Natural gas produced in Kansas—1948	240,195,558
Imported from outside of the State	113,400,081
Total to account for	353,595,667
Gas used in Kansas during 1948	
Domestic	66,047,550
Industrial, miscellaneous, and losses	101,339,915
Carbon black	20,819,800
Exported from State	165,388,401
Total	353,595,667

* Gas measurement calculated on a base pressure of 14.4 plus 4 ounces, or 14.65 psia (pounds per square inch absolute).

Seward, and Stevens Counties along the east and southeast edges of the producing area.

Judging by the initial capacities of 1948 wells drilled just within the field boundaries, one receives the general impression that the western edge of the Hugoton field is becoming fairly well established, but that the southeastern edge has not. The more recent wells in T. 34 S., R. 35 W., T. 33., R. 35 W., T. 32 S., R. 34 W., and T. 32 S., R. 33 W. were given initial capacities running from 14 to 25 million cubic feet of gas per day. It is difficult to think that these are edge wells. With one or two exceptions the newer wells along the west edge of the field, such as in T. 30 S., R. 40 W., T. 29 S., R. 40 W., T. 28 S., R. 39 W., T. 27 S., R. 39 W., and T. 26 S., R. 39 W. range from 6 or 7 million cubic feet per day down to less than 1 million. Less favorable "sand" conditions are suggested.

During the year, the Stanolind Oil and Gas Company drilled a well, the No. 1 Bear, in sec. 17, T. 32 S., R. 40 W., about 5 miles east of Richfield in Morton County which was credited with an initial production of 3.9 million cubic feet of gas and 20 barrels of condensate. Production was found between 4,990 and 4,998 feet in sand of Atokan age, Lower Pennsylvanian. The Kansas Nomenclature Committee declared this to be a new pool. It adjoins the Hugoton field boundary on the west, and is the second instance of oil production in close geographic relation to the Hugoton area of gas production. (The Nunn pool was the first instance). What significance this new pool carries remains to be determined.

A summary of Kansas gas production, exports and imports, and use within the State is given in Table 34.

TABLE 35.—Gas wells drilled in Hugoton field by counties

County	During 1948	Total to date
Finney	19	83
Grant	65	338
Hamilton	2	4
Haskell	43	170
Kearny	48	202
Morton	25	86
Seward	20	46
Stanton	30	125
Stevens	73	541
Total	325	1,595

The new wells drilled during 1948 and the cumulative total for the nine counties in the Kansas portion of the Hugoton field are given in Table 35.

FORD COUNTY

Wildcat wells have been drilled in Ford County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—One of two 1948 wildcat tests made in Ford County was drilled by the Midwestern Construction Company on the Carmichael farm in sec. 17, T. 25 S., R. 24 W. The tops of the various zones were recorded as follows: Wellington salt, between 2,045 and 2,370 feet; Herington, 2,557 feet; Neva limestone, 3,113 feet; Topeka limestone, 3,657 feet; and Kansas City-Lansing limestone, 4,147 feet. The total depth was 4,322 feet. Elevation of the hole is 2,486 feet. There were no shows of oil or gas.

A deeper test was drilled by The Texas Company in the SW cor. SE $\frac{1}{4}$ sec. 19, T. 27 S., R. 23 W. Here the named zones were reported as follows: anhydrite, 1,434 feet; Wellington salt, between 2,030 and 2,360 feet; Heebner black shale, 4,170 feet; the "Brown lime" of the Kansas City-Lansing sequence, 4,290 feet; the "White lime" of the Kansas City-Lansing sequence, 4,300 feet; Mississippian rocks, 4,960 feet; Kinderhookian, 5,530 feet; Viola, 5,680 feet; Simpson, 5,820 feet; and Arbuckle dolomite, 5,890 feet. A test of a porous zone in the Arbuckle between 6,047 and 6,056 feet showed only salt water. The hole was abandoned at a total depth of 6,058 feet. Elevation of the well is 2,477 feet.

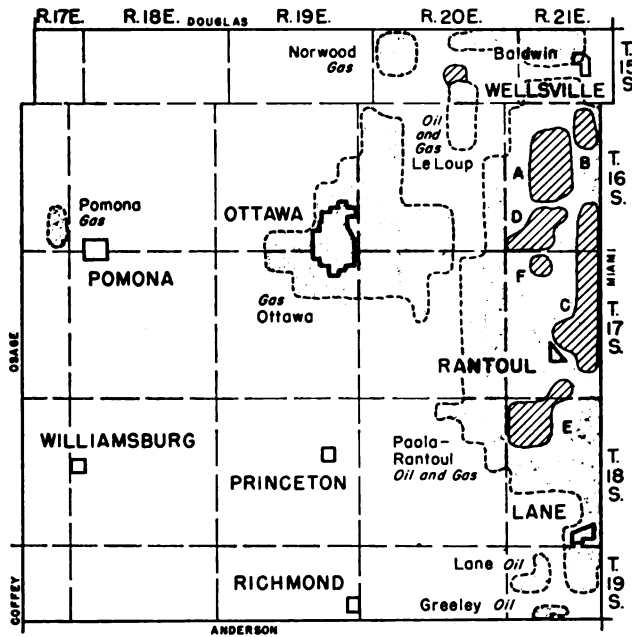


FIG. 20.—Map of Franklin County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

FRANKLIN COUNTY

Oil production totaled 233,325 barrels, and gas production totaled 27,397 thousand cubic feet. Four water-flooding projects were in operation.

Developments during 1948.—Most of the oil produced in Franklin County during 1948 was obtained by water-flooding in fields in the eastern part of the county. Drilling activity was largely in connection with these projects, and no important wildcat wells have been reported. Data on the four water-flooding projects in the county are given in Table 8.

The oil and gas fields of Franklin County are shown on Figure 20. Oil production in the various fields is listed in Table 36.

GOVE COUNTY

Wildcat wells have been drilled in Gove County at intervals through the years, but a producing pool has yet to be discovered.

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TABLE 36.—Oil production in Franklin County during 1948

Field	Producing wells as reported	1948 production, bbls.
Baldwin ¹	see Douglas County	
Le Loup	3	400
Paola-Rantoul ²		
A	115	15,327
B	13	1,112
C	282	204,977
D	46	4,081
E	29	6,671
F	4	757
Total	492	233,325

¹ Franklin County part not producing at present.

² Field extends into Miami County.

Developments during 1948.—One of the two 1948 Gove County wildcats was drilled by Darby and Bothwell, Inc. on the McDowell farm in sec. 36, T. 11 S., R. 30 W. Tops of the important zones were logged as follows: Dakota sandstone, 1,160 feet; Morrison green shale, 1,815 feet; Permian redbeds, 1,890 feet; Stone Corral, 2,393 feet; Topeka, 3,710 feet; Heebner black shale, 3,941 feet; Kansas City-Lansing limestone, 3,978 feet; Mississippian, 4,555 feet; Osagian cherty limestone, between 4,635 and 4,740 feet; a basal detrital zone, 4,835 feet; and Arbuckle dolomite, 4,865 feet. There were no shows of oil or gas, and the hole was abandoned at a total depth of 4,897 feet. The elevation of the well is 2,885 feet.

The second wildcat test, drilled by the Westgate-Greenland Oil Company on the Benson farm in sec. 6, T. 14 S., R. 30 W., revealed tops as follows: Dakota sandstone, 1,040 feet; Morrison shale, 1,630 feet; Permian redbeds, 1,690 feet; Blaine gypsum, 1,760 feet; Stone Corral, 2,210 feet; Topeka limestone, 3,571 feet; Heebner black shale, 3,795 feet; Kansas City-Lansing limestone, 3,842 feet; Mississippian limestone, 4,492 feet; Warsaw dolomite, 4,640 feet; Osagian cherty limestone, 4,730 feet; basal oölitic limestone, 4,792 feet; and Arbuckle dolomite, 4,870 feet. The hole was abandoned at a total depth of 4,946 feet without finding any shows of oil. The elevation of the hole is 2,741 feet.

GRAHAM COUNTY

Statistical summary for Graham County, 1948

Oil produced	1,734,052 barrels
Gas produced	none
Wells drilled: Oil	27
Gas	none
Dry	41

Total	68
Wildcat wells	19 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—The good results obtained in neighboring Rooks County during 1947 are partly responsible for operators searching for new pools in Graham County. Figure 21 shows the 19 rank wildcat tests which were completed in 1948. All were dry holes. One new oil well was drilled in the **Penokee** pool and one in the **Gettysburg**. With these two exceptions, all new oil wells listed in the statistical table above are located in the **Morel** pool.

In spite of the negative results from wildcat drilling valuable information was obtained, which will serve to guide exploration

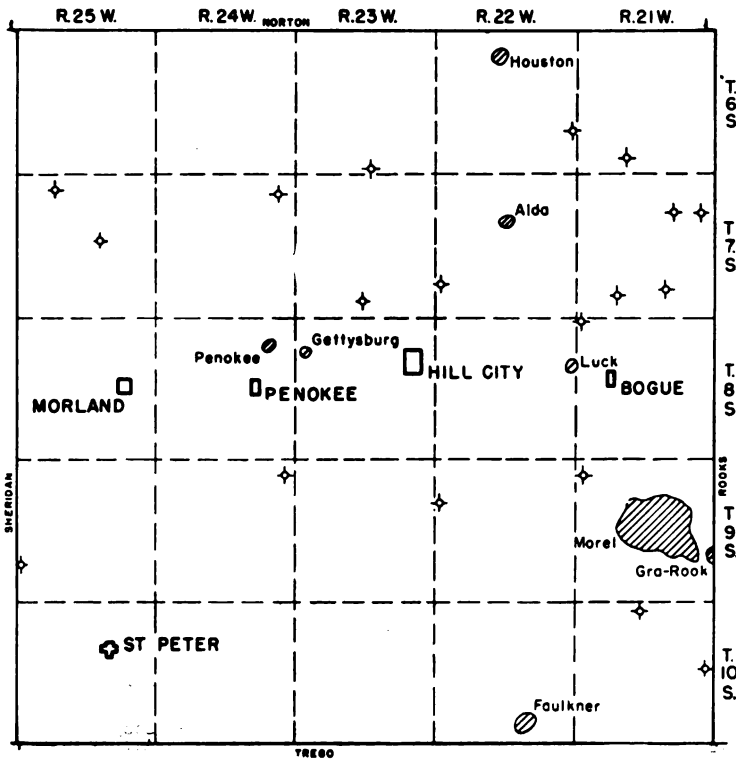


FIG. 21.—Map of Graham County showing oil pools and dry wildcat tests drilled during 1948.

in the future. All the wildcat tests were drilled into the Arbuckle dolomite.

An inspection of the logs of wildcat tests drilled in the northernmost tier of townships shows that no Arbuckle dolomite is present in the Harry Gore et al. No. 1 Thurlow test in sec. 25, T. 6 S., R. 22 W. All other tests in this row of townships found Arbuckle dolomite between 30 and 50 feet thick. In the second row of townships the Arbuckle was also present in every test and in every case it was found directly under the Pennsylvanian basal rubble. The average penetration of the Arbuckle in these wells was between 30 and 50 feet. In one test, The Derby Oil Company and Glenn Peel Drilling Company No. 1 Toll in sec. 15, T. 7 S., R. 25 W., shows of oil were found at several levels resulting in thorough testing. However, the hole was finally abandoned.

The wildcat test in the third row of townships penetrated 33 feet of Arbuckle. In the fourth row of townships several test wells found various amounts of the Mississippian cherty limestone present. The Mississippian had previously been known to occur in the western part of the county.

The three most interesting wildcat tests were the two drilled south of Morland and one drilled south of the Morel pool. A study of the samples of the Wilcox and Bennett and Roberts No. 1 Engleman well, drilled in sec. 1, T. 9 S., R. 24 W., revealed the following tops not shown in Table 38: Topeka limestone, 3,493 feet; Heebner black shale, 3,682 feet; and Toronto limestone,

TABLE 37.—Oil pools of Graham County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Alda 15-7-22W	1944	40	2,080	22,438	1	K.C.-Lans.	3,518
Faulkner 27-10-22W	1945	200	30,257	112,779	4	K.C.-Lans.	3,629
Gettysburg 7-8-23W	1941	80	6,565	34,897	2	K.C.-Lans.	3,725
Gra-Rook ¹ 30-9-20W	1948		no production reported	none		Arbuckle	3,869
Houston 9-6-22W	1947	40	3,087	6,835	1	K.C.-Lans.	3,506
Luck 13-8-22W	1945	40	no production reported	12,765		K.C.-Lans.	3,418
Morel 15-9-21W	1938	4,300	1,684,087	7,420,656	109	Sooy Arbuckle	3,712 3,718
Penokee 11-8-24W	1940	80	7,976	64,498	2	K.C.-Lans.	3,750

¹ Field extends into Rooks County.

TABLE 38.—Dry wildcat tests drilled in Graham County during 1948

Company and farm	Location	Surface elevation, feet	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Bennett & Roberts & Wilcox No. 1 Jenkins	SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ 33-6-21W	2,212	3,453	3,724	3,770
Harry Gore Co. et al. No. 1 Thurlow	NE cor. NE $\frac{1}{4}$ 25-6-22W	2,254	3,496		3,910
Anderson-Prichard Oil Corp. No. 1 Dietz	SW cor. SW $\frac{1}{4}$ 34-6-23W	2,441	3,710	4,102	4,143
N. Appleman Co. No. 1 Napue	NW cor. SW $\frac{1}{4}$ 11-7-21W	2,149	3,386	3,696	3,727
Veeder Supply & N.C.R.A. No. 1 Hibbits	NE cor. SW $\frac{1}{4}$ 12-7-21W	2,144	3,370	3,647	3,700
Harry Gore Co. et al No. 1 Sayers	SE cor. SE $\frac{1}{4}$ 27-7-21W	2,004	3,248	3,570	3,605
Herman Kaiser No. 1 Simpson	NE cor. NE $\frac{1}{4}$ 32-7-21W	2,089	3,307	3,612	3,655
Wood River Oil & Ref. Co., Inc. No. 1 Himes	NW cor. SW $\frac{1}{4}$ 30-7-22W	2,227	3,489	3,873	3,930
Wilcox & Bennett & Roberts No. 1 Sperling	SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ 33-7-23W	2,365	3,647	4,044	4,070
Wilcox & Bennett & Roberts No. 1 Chase	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 1-7-24W	2,482	3,806	4,290	4,320
The Texas Co. No. 1 Lendenman	NE cor. SE $\frac{1}{4}$ 5-7-25W	2,525	3,682	4,175	4,323
The Derby Oil Co. & Glenn Peel Drig. Co. No. 1 Toll	SW cor. SE $\frac{1}{4}$ 15-7-25W	2,549	3,739	4,237	4,252
A. J. Stormfeltz No. 1 Sayers	NW cor. NW $\frac{1}{4}$ 6-8-21W	2,125	3,328	3,667	3,700
M. B. Armer, Inc. No. 1 McShann	NE cor. SW $\frac{1}{4}$ 6-9-21W	2,221	3,449	3,792	3,842
Wilcox & Bennett & Roberts No. 1 Ninemeyer	SW cor. SW $\frac{1}{4}$ 7-9-22W	2,401	3,682	4,087	4,120
Wilcox & Bennett & Roberts No. 1 Engleman	SW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ 1-9-24W	2,435	3,720	4,391	4,455
White Eagle Oil Purchasing Co., Inc. et al. No. 1 Richmeier	SW cor. NW $\frac{1}{4}$ 30-9-25W	2,620	3,875	4,575	4,625
Phillips Petroleum Co. et al. No. 1 Harlan	SE cor. NE $\frac{1}{4}$ 4-10-21W	2,272	3,531	3,972	4,025
Continental Oil Co. No. 1 Holzhauser	NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ 13-10-21W	2,259	3,534	3,883	3,933

3,697 feet. The cherty basal conglomerate at 4,255 feet lies directly upon the residual chert of Mississippian age at 4,305 feet. The St. Joe oölitic limestone, beginning at 4,348 feet, here rests directly upon the Arbuckle dolomite at 4,391 feet. The test had no shows of oil or gas, and was abandoned at 4,455 feet.

White Eagle Oil Purchasing Company, Inc. et al. drilled a test well on the Richmeier farm in sec. 30, T. 9 S., R. 25 W. Here the electric log showed the top of the Heebner black shale at 3,852 feet, the base of the Kansas City at 4,129 feet, the top of the Mississippian rocks at 4,415 feet, the St. Joe oölitic rocks at 4,520 feet, the Viola rocks at 4,530 feet, and the Simpson green shale at 4,552 feet. The total depth was 4,625 feet.

The Continental Oil Company completed a test well on the Holzhauser lease in sec. 13, T. 10 S., R. 21 W. Here the electric log revealed the base of the Fort Hays chalk at 273 feet and tops of other zones as follows: Fairport, 493 feet; Greenhorn limestone, 531 feet; Jetmore, 551 feet; Graneros, 621 feet; Dakota sandstone, 670 feet; Cimarron redbeds, 1,107 feet; Stone Coral anhydrite, between 1,732 and 1,781 feet; Hollenberg limestone, 2,308 feet; Tarkio limestone, 3,120 feet; Emporia limestone, 3,160 feet; Topeka limestone, 3,325 feet; Heebner black shale, 3,498 feet; Toronto limestone, 3,520 feet; Kansas City limestone (base), 3,762 feet; Sooy, 3,845 feet and Arbuckle dolomite, 3,883 feet. There were no shows of oil or gas, and the test was abandoned at a total depth of 3,933 feet.

The largest and most active pool in the county is the Morel. The many new oil wells drilled there during 1948 showed that the Arbuckle surface is slightly undulating. The structurally high wells reached the Arbuckle at depths of approximately 1,460 feet below sea level, and the line between the oil-bearing zone and the water-bearing zone in the Arbuckle dolomite seems to lie somewhere between 1,520 and 1,540 feet below sea level at the present time.

The oil pools of Graham County are listed in Table 37. The dry wildcat wells and their surface elevations are listed in Table 38 and shown on Figure 21.

GRANT COUNTY

No oil was produced in the county during 1948; gas production was not segregated from that of the Hugoton field. There were 65 gas wells drilled, no oil wells or dry holes; no new pools were discovered.

Developments during 1948.—Grant County contains 16 townships, all of which lie within the productive territory of the Hugoton gas field. The average initial production of the 65 new wells drilled in 1948 was about 15 million cubic feet of gas per day. The largest gas well completed during 1948, the No. 1 Sullivan well drilled by the Kansas Natural Gas, Inc. in sec. 12, T. 29 S., R. 38 W., had an initial capacity of more than 39 million cubic feet per day. In this well 30,000 gallons of acid were used to create extended porosity in the various limy layers which produce the gas. The gas wells in Grant County are shown on Figure 19. More

detailed information regarding the Hugoton field is given under Finney County.

TABLE 39.—Oil production in Greenwood County during 1948

Field	Discovery year	Producing wells	1948 production bbls.	Producing zone	Depth to producing zone, feet
Atyeo ¹		11+	15,962		
Beaumont		24	53,177		
Beaumont South		production included with Beaumont			
Blackwell			1,594		
Blankenship ²		9+	8,846		
Brinegar		20+	6,276		
Browning		99+	125,686	"Bartlesville"	2,314
Burkett		128+	504,344	"Bartlesville"	2,000
Climax			16,521	Mississippian	1,900
Demalorie-Souder	1924	2+	178,760	"Bartlesville"	2,150
Dunaway ³			40,920	"Bartlesville"	1,800
Eureka		5+	29,245		
Fankhouser ⁴		7+	38,398		
Gaffney			8,934		
Gilroy		2	906		
Hamilton	1929	55+	418,719	"Bartlesville"	1,765
Hinchman		1+	5,800		
Hollis		2+	3,023		
Jackson		2	1,396		
Jobes		1	380		
Lamont		48+	121,434		
Madison	1921	90+	100,317	"Bartlesville"	1,800
Petterson		1	2,072		
Pixlee	1923	37	67,795	"Bartlesville"	2,327
Polhamus			34,561		
Quincy ⁵	1926	19	8,666	"Bartlesville"	1,420
Reese		19	22,179		
Sallyards	1921	50+	227,157	"Bartlesville"	2,350
Scott		66	70,728		
Seeley-Wick	1922	229+	1,462,496	"Bartlesville"	1,930
Severy ⁶			16,176		
Severy North		no production reported			
Teeter ⁷	1922	128+	158,147	"Bartlesville"	2,400
Teichgraber		17	13,288		
Thrall-Aagard		29+	508,540		
Toronto ⁸		10	2,530		
Virgil	1916	43+	167,921	"Bartlesville" "Miss. lime"	1,550 1,700
Virgil North ⁹		6+	286,670		
Wiggins		41	25,770		
Wilkerson		13	14,659		
Willard		2	5,827		
Miscellaneous			791		
Total		1,216+	4,776,611		

¹ Field extends into Chase and Lyon Counties.

² Field extends into Butler County.

³ Field extends into Coffey County. Includes some Coffey County production.

⁴ Field extends into Lyon County.

⁵ Field extends into Woodson County.

⁶ Includes Elk County production.

⁷ Field extends into Chase County.

⁸ Includes Woodson County production.

⁹ Field extends into Coffey and Woodson Counties. Some of the production estimated.

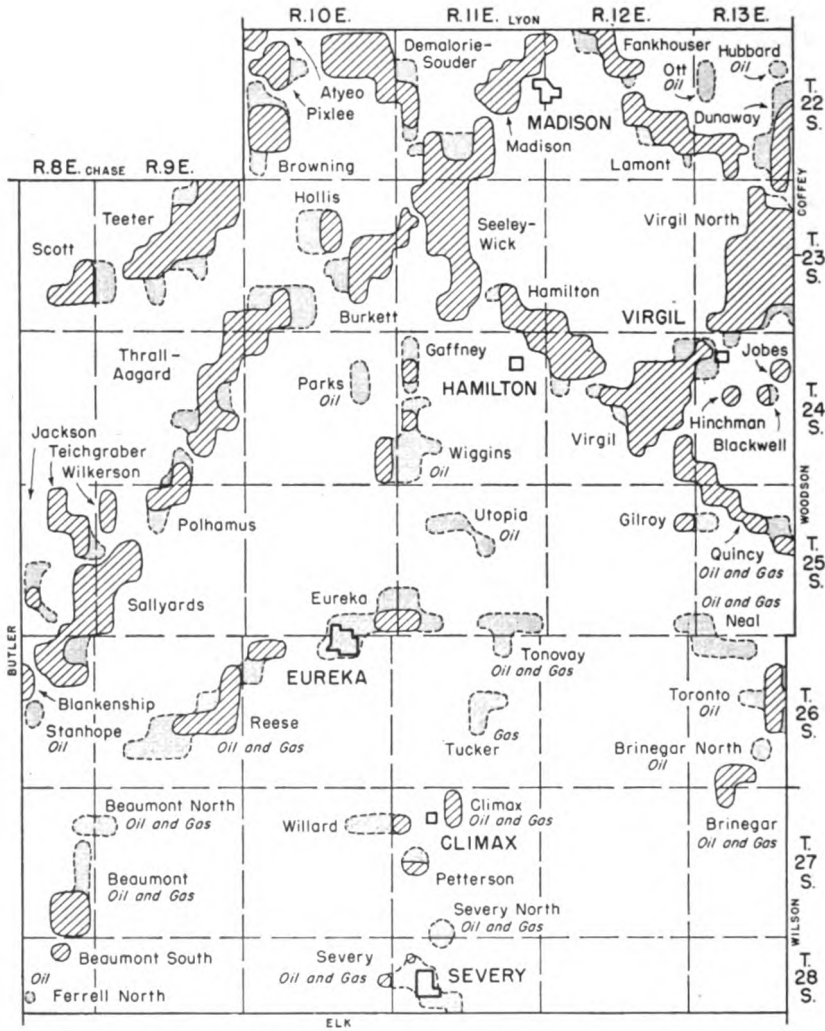


FIG. 22.—Map of Greenwood County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

GREENWOOD COUNTY

Statistical summary for Greenwood County, 1948

Oil produced	4,776,611 barrels
Gas produced	approximately 45,000 thousand cubic feet
Reported	
wells drilled: Oil	59
Gas	1

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Dry	30
Salt water disposal	18
Total	108
New, revived, or abandoned pools	none
Secondary recovery operations	30

Developments during 1948.—No outstanding developments were reported in Greenwood County during the year. Production of oil by water flooding has become well established in the county where 30 projects are in operation. Reported drilling was fairly evenly distributed among various fields.

Oil production in Greenwood County fields is shown in Table 39, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 22.

The only reported gas production during 1948 amounted to approximately 45 million cubic feet; it was obtained in the **Tucker** field in secs. 14 and 15, T. 26 S., R. 11 E. Wells approximately 645 feet deep producing from sandstone in the Douglas group have been yielding about 40 or 50 million cubic feet of gas annually in the last 7 years.

HAMILTON COUNTY

No oil was produced in the county during 1948; gas production was not segregated from that of the Hugoton field. There were two gas wells drilled, no oil wells, and one dry hole; no new pools were discovered.

Developments during 1948.—One of the new gas wells was drilled beyond the gas producing zones to test the possibilities of the lower strata. This was the No. 1 Trussell well drilled by the Stanolind Oil and Gas Company in sec. 28, T. 26 S., R. 39 W. After penetrating all Permian strata without finding any unusual structural conditions, the Kansas City-Lansing limestone was found at 3,904 feet, a barren Pennsylvanian sandstone between 5,154 and 5,161 feet, and the Mississippian rocks at 5,375 feet. Total depth was 5,879 feet; the elevation of the well is 3,291 feet. Some porosity was found in the Mississippian rocks between 5,834 and 5,879 feet. Careful testing of this zone revealed only salt water. The well was plugged back to several porous zones in the lower Permian and there completed for an initial capacity of 1.1 million cubic feet of gas per day.

A wildcat test was drilled by the Shell Oil Company, Inc. on the Scott farm in sec. 28, T. 22 S., R. 43 W. The tops of strati-

graphic zones were recorded as: Dakota sandstone, 360 feet; Morrison shale, 655 feet; Permian redbeds, 870 feet; Day Creek dolomite, 895 feet; Blaine gypsum, 1,307 feet; Stone Corral dolomite, 1,970 feet; Topeka limestone, 3,231 feet; Kansas City-Lansing limestone, 3,728 feet; and the Mississippian rocks, 5,130 feet. According to the electric log, the Viola dolomite was found at 5,732 feet, the Simpson at 5,897 feet, and the Arbuckle dolomite at 5,920 feet. Testing at several levels in the Ordovician rocks revealed only sulfur water. The elevation of the well is 3,546 feet.

HARPER COUNTY

Wildcat wells have been drilled in Harper County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—Only one test well was drilled in Harper County during the year. This was the No. 1 Wingate well completed by the Drillers Gas Company in sec. 7, T. 31 S., R. 8 W. Elevation of the well is 1,648 feet. The tops of important zones were recorded as follows: Permian redbeds, 90 feet; Wellington, 795 feet; salt, between 1,070 and 1,430 feet; Fort Riley limestone, 1,775 feet; Neva limestone, 2,220 feet; Topeka, 2,940 feet; Kansas City-Lansing limestone, 3,635 feet; Mississippian (Osagian) chert, 4,385 feet; Kinderhookian shale, 4,690 feet; Viola cherty dolomite, 4,726 feet; Simpson shale and sandstone, 4,782 feet; and Arbuckle dolomite, 4,905 feet. Some oil was found in the chert at the top of the Mississippian. Between 4,444 and 4,448 feet the well swabbed about 30 barrels of oil per day. Further testing of this zone after acidizing brought water and some gas into the hole. The well was abandoned at a total depth of 4,930 feet.

HARVEY COUNTY

Statistical summary for Harvey County, 1948

Oil produced	511,044 barrels
Gas produced	406,302 thousand cubic feet
Wells drilled: Oil	23
Gas	1
Dry	7
Total	31
Wildcat wells	4 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	4

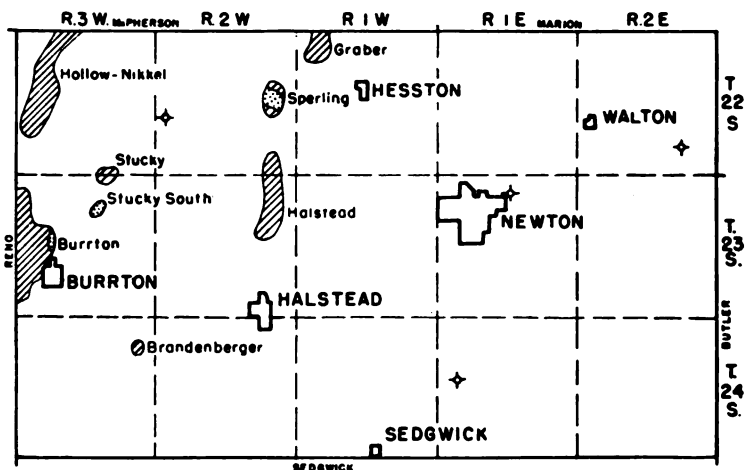


FIG. 23.—Map of Harvey County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

Developments during 1948.—Drilling activity in Harvey County during 1948 was at a low ebb, only four wildcat tests being completed. All 23 new oil wells are located along the eastern side of the **Burrton** pool.

The Mid-Plains Oil Corporation drilled an extension wildcat west of Hesston and south of the Graber pool in sec. 16, T. 22 S., R. 1 W. In this well the following tops on important zones were released by the operators: Mississippian, 2,975 feet; Kinderhookian, 3,318 feet; "Misener," 3,351 feet; "Hunton" limestone, 3,359 feet; Viola, 3,468 feet; Simpson, 3,498 feet; "Wilcox," 3,514 feet; total depth was 3,535 feet.

A wildcat test was completed by the Carl Hipple Oil Company et al. on the Schrag farm in sec. 19, T. 22 S., R. 2 W. Here the depths to the named zones, except those given in Table 41, were reported as follows: Mississippian, 3,145 feet; Kinderhookian, 3,466 feet; "Misener," 3,494 feet; "Hunton," 3,497 feet, Viola dolomite, 3,664 feet; and Simpson formation, 3,721 feet.

In the extreme eastern part of the county an interesting wildcat well was completed by the Bay Petroleum Corporation on the Souder farm in sec. 3, T. 23 S., R. 1 E. Depths to the top of important zones, except those given in Table 41, according to the electric log, are: Hollenberg limestone, 337 feet; Herington limestone, 389 feet; Topeka limestone, 1,675 feet; Heebner black shale, 2,031 feet; Drum limestone, 2,498 feet; Kansas City-Lansing lime-

TABLE 40.—Oil and gas pools of Harvey County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Brandenberger 12-24-3W	1946	40	no production reported	238		Viola	3,875
Burrton ¹ 1-23-4W	1931	3,150	300,000 est. see Reno County		83	Mississippian "Hunton"	3,266 3,583
Graber ² 32-21-1W	1934	560	7,129	128,943	2	"Miaener" "Hunton"	3,323 3,274
Halstead 36-22-2W	1929	1,500	50,209	1,778,051	14	"Chat"	3,005
Hollow-Nikkal ² 30-22-3W	1931	2,000	137,885	20,331,881	37	"Chat" "Hunton" Simpson	3,195 3,507 3,500
Sperling 23-22-2W	1935	250	15,521	548,988	5	"Hunton"	3,279
Stucky 3-23-3W	1942	40	300	1,672	1	"Chat"	3,224
<i>thousand cubic feet</i>							
Burrton (gas) ¹ 23-23-4W	1930	150	93,050		10	Mississippian	3,298
Sperling (gas) 23-22-2W	1935	250	76,734	6,435,121	2	"Chat"	2,955
Stucky South 10-23-3W	1944	200	236,518	435,734	3	Mississippian	3,269

¹ Field extends into Reno County.² Field extends into McPherson County.

stone (base), 2,680 feet; Mississippian chert, 2,950 feet; Kinderhookian shale, 3,253 feet; "Hunton" dolomitic limestone, 3,352 feet; Maquoketa shale, 3,453 feet; Viola cherty dolomite, 3,475 feet; and Simpson shale and sandstone, 3,528 feet.

Another test along the eastern side of the county was drilled on the Steinkirchner farm in sec. 18, T. 24 S., R. 1 E. by D. S. Hager. Depths of the important zones were reported as follows: Topeka limestone, 1,758 feet; Kansas City-Lansing limestone, 2,376 feet; Mississippian, 3,061 feet; Kinderhookian, 3,412 feet; "Miaener," 3,487 feet; "Hunton," 3,496 feet; total depth was 3,520 feet.

In the extreme southwestern part of the county Neal Bogan drilled a test, within 2 miles of the Burrton pool, on the Devenpeck farm in sec. 7, T. 24 S., R. 3 W. The following depths to important zones were reported: Mississippian, 3,349 feet; Viola dolomite, 3,864 feet; Arbuckle dolomite, 3,965 feet; total depth was 3,990 feet.

All new oil wells in the county were drilled along the east and northeast sides of the old Burrton pool, most of which lies in Reno County. All the new wells produce from the Mississippian rocks at depths between 30 and 100 feet below the eroded top of the

TABLE 41.—Dry wildcat tests drilled in Harvey County during 1948

Company and farm	Location	Surface elevation, feet	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
J. E. Palensky No. 1 Kirkpatrick	SE cor. SW¼ 26-22-2E	1,501	2,185	not reached	2,855
The Bay Petrol. Corp. No. 1 Souder	SE¼ SW¼ SW¼ 3-23-1E	1,465	2,273	3,591	3,622
D. S. Hager No. 1 Steinkirchner	SE¼ NE¼ SE¼ 18-24-1E	1,441	2,374	3,496	3,520
G. C. Hipple et al. No. 1 Schrag	NE cor. SW¼ 19-22-2W	1,429	2,450	3,772	3,775

system. The initial potential of most of the new wells was about 50 barrels per day and some of them produce water with the oil.

Data on wildcat tests are given in Table 41. Table 40 lists information on the oil and gas pools in Harvey County. These pools are shown on Figure 23.

HASKELL COUNTY

No oil was produced in the county during 1948, and gas production was not segregated from that of the Hugoton field. Forty-three gas wells were drilled, no oil wells or dry holes.

Developments during 1948.—Western Haskell County was actively drilled for gas during the year. In T. 27 S., R. 32 W. the average production of the new gas wells was 7 million cubic feet. In T. 27 S., R. 34 W. six new gas wells, ranging in initial capacities from 1 to 11 million cubic feet per day, were completed. Six wells averaging about 7 million cubic feet per day were completed in T. 28 S., R. 32 W. One well was completed in T. 28 S., R. 33 W. and 13 wells in T. 28 S., R. 34 W. Here the initial capacity of new wells ranged from 7 to 19 million cubic feet per day. Location of all 1948 wells is shown in Figure 19, which also shows the approximate field boundaries at year's end. The Cities Service Oil Company No. 1 Ungles well in sec. 36, T. 30 S., R. 34 W. with a reported initial capacity of 24.7 million cubic feet per day was one of the largest new gas wells in the county.

Additional information on the Hugoton field is given under Finney County.

JEFFERSON COUNTY

Oil production totaled 108,652 barrels and gas production totaled approximately 100 million cubic feet. There were three active oil pools, all in the McLouth area. The gas production came from the same area.

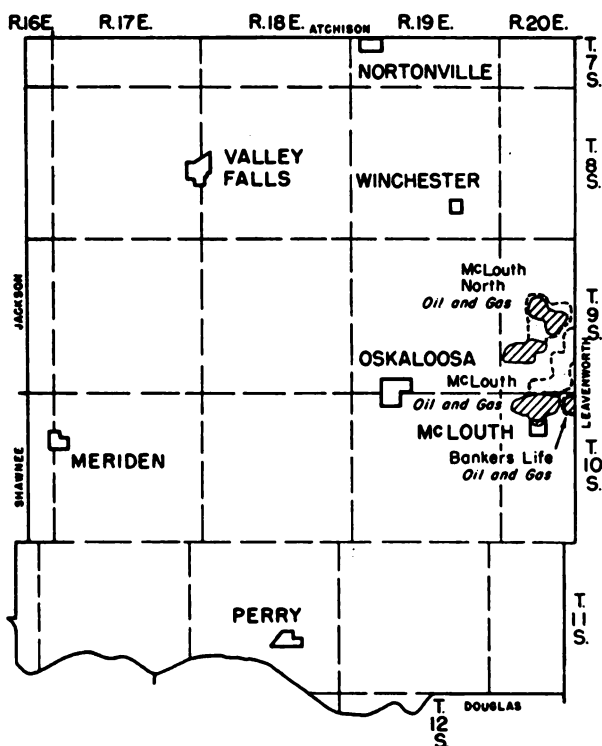


FIG. 24.—Map of Jefferson County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

Developments during 1948.—No important developments were reported during 1948 in Jefferson County where a moderate amount of oil and gas is still being produced.

Oil production in Jefferson County fields is shown in Table 42, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 24.

TABLE 42.—Oil production in Jefferson County during 1948

Field	Producing wells as reported	1948 production, bbls.
Bankers Life	7	11,843
McLouth	19	94,881
McLouth North	6	1,928
Total	32	108,652

JEWELL COUNTY

Wildcat wells have been drilled in Jewell County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—An interesting and informative test was drilled in the southeastern corner of Jewell County. This location is well within the limits of the Salina structural basin (Lee, Leatherock, and Botinelly, 1948) and adds valuable data to the present knowledge of that geological feature. The well was drilled by Halbert and Higgins on the Rank farm in sec. 12, T. 5 S., R. 6 W. The named rock sequences were recorded at the following depths: Kansas City-Lansing limestone, 2,300 feet; Mississippian (Osagian) cherty limestone, 2,949 feet; Kinderhookian greenish-gray shale, 3,072 feet; "Hunton" limestone and dolomite, 3,133 feet; Maquoketa shale, 3,363 feet; and Viola, 3,417 feet. Seemingly four zones are discernable here in the Viola: two cherty dolomite layers and two coarsely crystalline limestone layers. The Simpson, consisting of shales and interbedded sandstones, was found at 3,605 feet, and the Arbuckle at 3,701 feet. There were no shows of oil or gas, and the hole was abandoned at a total depth of 3,740 feet. The elevation of the well is 1,413 feet.

JOHNSON COUNTY

**Gas production amounted to approximately 66 million cubic feet.
No oil was produced.**

Developments during 1948.—A few test wells were drilled in Johnson County during 1948.

One, the G. L. Smith No. 1 Pretz in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 14 S., R. 22 E., was drilled to a depth of 1,560 feet with the top of the St. Peter sandstone at 1,555 feet. This was completed as a gas well in Pennsylvanian rocks between 628 and 645 feet.

KEARNY COUNTY

Statistical summary for Kearny County, 1948

Oil produced	38,422 barrels
Gas produced	not segregated from Hugoton production
Wells drilled: Oil	none
Gas	48
Dry	none
Total	48
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Nearly two-thirds of Kearny County lies within the limits of the Hugoton gas field. Of the 48 new gas wells completed in the county during 1948, three were drilled in the northern row of townships, in T. 23 S., R. 35 W. Their initial productions ranged from 3 to 12 million cubic feet per day after acidizing. In the next row of townships to the south, there were 12 completions, 2 of which are wells rated at less than one million cubic feet per day, indicating that they are close to the edge of the field. Eleven wells, mainly of high initial capacity, were completed in T. 25 S. The Magnolia Petroleum Company No. 1 White "A" well in sec. 23, T. 25 S., R. 35 W. had an initial capacity of 41.8 million cubic feet of gas per day.

In the southernmost row of townships, 22 gas wells were completed. They are wells with high daily capacities with only one exception. That is the well drilled in sec. 18, T. 26 S., R. 38 W. where only 200,000 cubic feet per day was recorded.

The oil and gas wells in Kearny County are plotted on Figure 19. More detailed information on the Hugoton gas field is given under Finney County. The Patterson oil pool, discovered in 1941, produced 38,422 barrels of oil in 1948, making a cumulative total production of 263,016 barrels. The three wells produce oil from

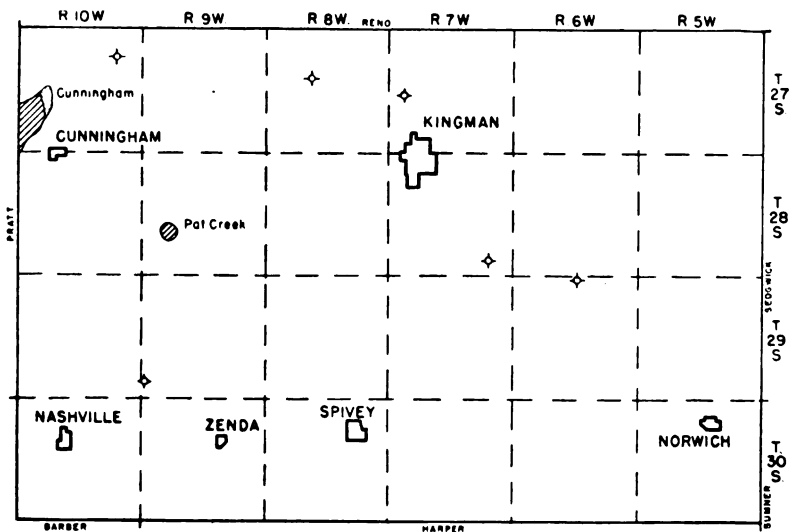


FIG. 25.—Map of Kingman County showing oil and gas pools and dry wild-cat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

the basal sandstone at 4,740 feet and the "Patterson sand" at 4,748 feet.

KINGMAN COUNTY

Statistical summary for Kingman County, 1948

Oil produced	106,052 barrels
Gas produced	310,025 thousand cubic feet
Wells drilled: Oil	none
Gas	none
Dry	7
Total	7
Wildcat wells	6 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	1

extending into Pratt County

Developments during 1948.—Only seven holes were drilled in Kingman County during the year. One of these was located in the **Pat Creek** pool; the rest were dry wildcat wells. Table 44 gives elevations and other data on the wildcat tests, none of which revealed new information of especial significance. Table 43 gives information on the oil and gas pools in Kingman County. These pools are shown on Figure 25.

TABLE 43.—Oil and gas pools of Kingman County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Cunningham ¹ 7-28-11W	1931	740	67,570	1,949,768	29	K.C.-Lans.	3,390
Pat Creek 20-28-9W	1946	120	38,482	74,740	3	Viola	4,406
thousand cubic feet							
Cunningham (gas) ¹ 7-28-11W	1931	740	310,025		4	Viola Arbuckle	4,278 4,094

¹ Field extends into Pratt County.

TABLE 44.—Dry wildcat tests drilled in Kingman County during 1948

Company and farm	Location	Surface elevation, feet	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
A. G. Hill No. 1 Woolridge	SW ¹ / ₄ NW ¹ / ₄ NE ¹ / ₄ 19-27-7W	1,596	3,225	4,430	4,490
Ridgeport Oil Co., Inc. No. 1 "B" Sutton	SW cor. NW ¹ / ₄ 16-27-8W	1,667	3,379	4,489	4,545
Continental Oil Co. No. 1 De Weese	NW ¹ / ₄ SW ¹ / ₄ NE ¹ / ₄ 11-27-10W	1,771	3,497	4,470	4,504
Harbar, Huber, Patton et al. No. 1 Miller	Sen. NE ¹ / ₄ 35-28-7W	1,587	3,273	4,546	4,568
J. A. Aylward, R. E. Ransdell et al. No. 1 Kostner	NW cor. NW ¹ / ₄ 3-29-6W	1,564	3,174	4,609	4,635
Cities Service Oil Co. No. 1 Panek	NW cor. NW ¹ / ₄ 31-29-9W	1,631	3,595	4,582	4,618

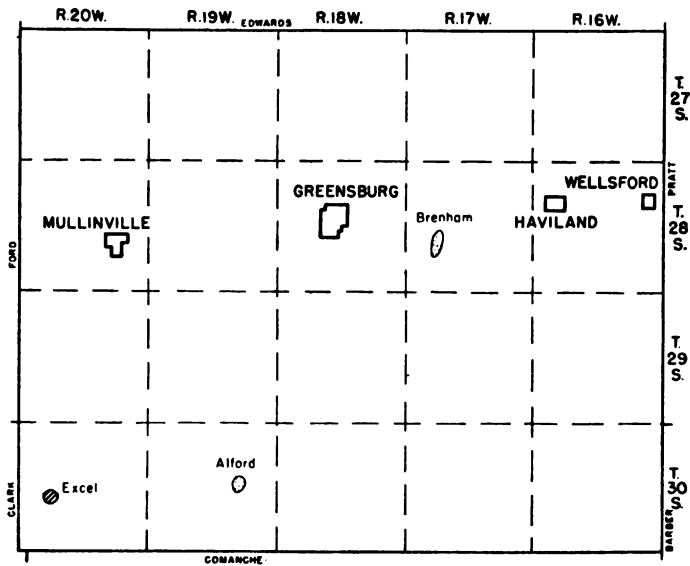


FIG. 26.—Map of Kiowa County showing oil and gas pools. (Gas, dots; oil, diagonal lines.)

KIOWA COUNTY

Statistical summary for Kiowa County, 1948

Oil produced	4,117 barrels
Gas produced	none
Wells drilled: Oil	1
Gas	1
Dry	none
Total	2
Wildcat wells	1 (included in above total)
New pool: Oil	1
Revived or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Kiowa County lies on the southwestern flank of the Central Kansas uplift. Previous drilling has yielded several gas pools, but no oil pools until 1948. The new oil pool, named the **Excel**, was discovered during the year about 10 miles west of the Alford gas pool. It was found when a wildcat test being drilled in sec. 20, T. 30 S., R. 20 W. by the Drillers Gas Company recovered considerable oil between 5,126 and 5,154 feet in the Mississippian (Osagian) chert. Testing showed the well to be capable of producing 219 barrels of oil per day. Elevation of the hole is 2,230 feet. The depths to important zones were

TABLE 45.—Oil and Gas pools of Kiowa County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
barrels							
Excel 20-30-20W	1948	40	4,117	4,117	1	"Miss. lime"	5,126
thousand cubic feet							
Alford 14-30-19W	1944	160	no production reported	none		Spergen	5,040
Brenham 29-28-17W	1947	400	no production reported	none		"Miss. chert"	4,841

logged as follows: Stone Corral dolomite, between 1,280 and 1,305 feet; Wellington gray shale, 1,800 feet; the salt in the Wellington, between 1,990 and 2,390 feet; Kansas City-Lansing limestone, 4,450 feet (probably); Kansas City limestone (base), 4,775 feet (probably); and Mississippian chert, the producing zone, 5,126 feet.

An additional gas well was completed in the **Brenham** gas pool by J. M. Huber Corporation et al. on the Cullins farm in sec. 20, T. 28 S., R. 17 W. This well was assigned an initial capacity of 1.8 million cubic feet of gas per day from the Mississippian (Osagian) chert between 4,836 and 4,842 feet near the top of that zone.

The oil and gas pools in Kiowa County are shown on Figure 26. Other pertinent information concerning them is given in Table 45.

LABETTE COUNTY

Oil production totaled 6,528 barrels from three fields in the western part of the county.

Developments during 1948.—No important developments in Labette County were reported during 1948. There were no reported secondary recovery operations. The small amount of oil produced came from the **Coffeyville-Cherryvale** field, which ex-

TABLE 46.—Oil production in Labette County during 1948

Field	Producing wells as reported	1948 production, bbls.
Coffeyville-Cherryvale ¹	15+	4,006
Mound Valley		286
Price		2,236
Total	15+	6,528

¹ Field extends into Montgomery and Wilson Counties.

tends from Montgomery into Labette County, and from the **Mound Valley** and **Price** fields.

Figures on gas production during 1948 are not available, but the amount obtained is relatively small.

Oil production in Labette County is listed in Table 46.

LANE COUNTY

Wildcat wells have been drilled in Lane County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—One wildcat test was completed in Lane County. Seemingly no samples were saved. According to scout information the Kansas City-Lansing limestone was found at 3,610 feet, the Marmaton varicolored shale at 3,950 feet, and the top of the Mississippian System at 4,354 feet. From an elevation of 2,692 feet, the well was drilled to a total depth of 4,446 feet. The location of the wildcat is Cen. NW¼ SW¼ sec. 8, T. 16 S., R. 30 W. It was drilled by W. H. Black and Associates.

LEAVENWORTH COUNTY

Oil production totaled 1,266 barrels in the Ackerland field. Gas production in Leavenworth and Wyandotte Counties amounted to approximately 50 million cubic feet.

Developments during 1948.—A few shallow test wells were drilled in Leavenworth County during 1948. No important developments were reported.

About 10 million cubic feet of gas was produced in the Linwood field, T. 12 S., R. 21 E., T. 11 S., R. 22 E., and T. 12 S., R. 22 E., and about 40 million cubic feet in the entire Roberts-Maywood field (partially in Wyandotte County).

LINCOLN COUNTY

Wildcat wells have been drilled in Lincoln County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—Two wildcat tests were drilled in Lincoln County during 1948. One of these was by Harry Miller on the Vancura farm in sec. 21, T. 13 S., R. 9 W. The tops of important stratigraphic zones were reported as: Cimarron anhydrite, 585 feet; Wellington gray shale, 735 feet; Wellington salt, between

962 and 1,155 feet; Fort Riley, 1,350 feet; Wreford cherty zone, 1,540 feet; and Foraker limestone, 1,796 feet. The total depth was 1,834 feet. There were no shows of gas or oil. The second well was also a relatively shallow stratigraphic test. It was drilled by Harry Miller on the Buszick farm in sec. 27, T. 12 S., R. 9 W. Here the Fort Riley limestone was found at 1,262 feet, and the hole was abandoned as dry at a total depth of 1,542 feet.

These two holes are located in the southwestern part of the Salina basin which has recently been well described by Lee, Leatherrock, and Botinelly (1948). The wells lie close to a possible pinchout of the Siluro-Devonian rocks of the Salina basin.

LINN COUNTY

Oil production totaled 60,201 barrels in four fields. There were three water-flooding projects in operation.

Developments during 1948.—Seven new oil wells and 11 salt water disposal wells were reported in the Centerville field. Nine

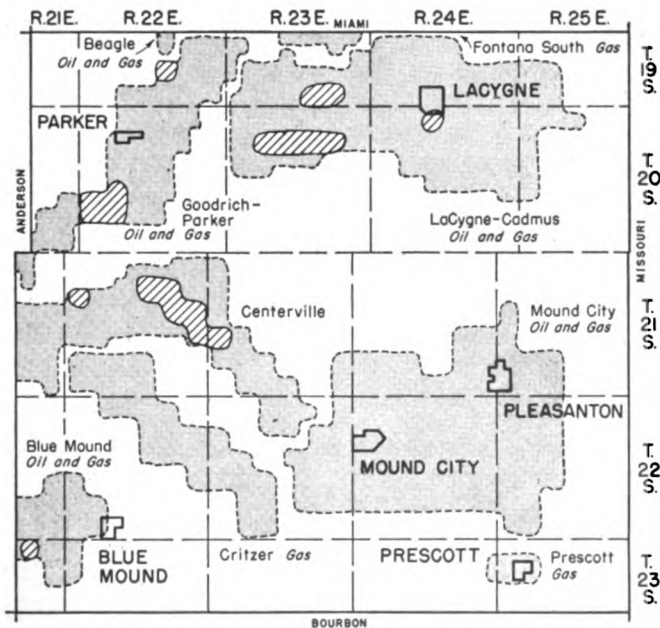


FIG. 27.—Map of Linn County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

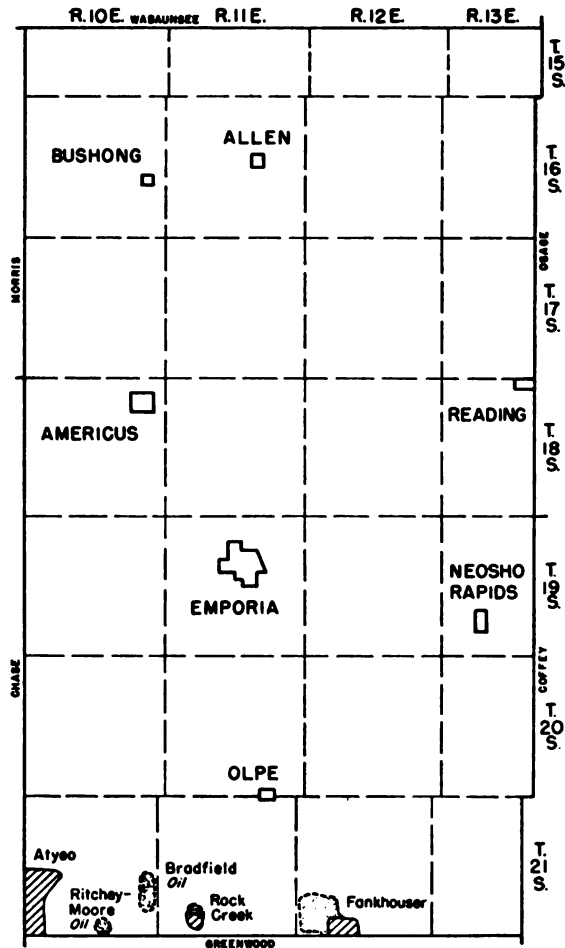


FIG. 28.—Map of Lyon County showing oil fields. Diagonal lines show areas of 1948 oil production.

TABLE 47.—Oil production in Linn County during 1948

Field	Producing wells as reported	1948 production, bbls.
Blue Mound ¹	18	2,640
Centerville ¹	107+	10,803
Goodrich-Parker ¹	46+	32,435
La Cygne-Cadmus	65+	14,323
Total	236+	60,201

¹ Field extends into Anderson County.

TABLE 48.—Oil production in Lyon County during 1948

Field	Producing wells as reported	1948 production, bbls.
Atyeo ¹	33+	159,527
Fankhouser ²		22,877
Rock Creek	4	5,544
Total	37+	187,948

¹ Field extends into Chase and Greenwood Counties.

² Field extends into Greenwood County.

gas wells and two dry holes were reported near Pleasanton and a few new gas wells north and west of Mound City.

Figures on gas production during 1948 are not available. Oil production in Linn County fields is shown in Table 47, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 27.

LYON COUNTY

Oil production totaled 187,948 barrels. There were three active pools and two water-flood operations, all in the extreme southern part of the county. No gas was produced.

Developments during 1948.—Two dry holes were reported in the Atyeo field, one in the Bradfield, and six in the Rock Creek. One salt water disposal well was reported drilled in the Atyeo field. Two dry wildcats were reported. They are the C. L. Sheedy No. 1 Mahr, SE cor. NW¼ sec. 29, T. 20 S., R. 10 E. and the Mendenhall Drilling Company No. 1 Hagan, NW cor. NE¼ sec. 16, T. 19 S., R. 10 E.

Oil production in Lyon County fields is given in Table 48, and locations of oil fields and areas that produced oil in 1948 are shown on Figure 28.

McPHERSON COUNTY

Statistical summary for McPherson County, 1948

Oil produced	4,182,641	barrels
Gas produced	476,374	thousand cubic feet
Wells drilled: Oil	30	
Gas	4	
Dry	36	
Total	70	
Wildcat wells	7	(included in above total)
New pools: Oil	4	
Revived or abandoned pools	none	
Secondary recovery operations	13	

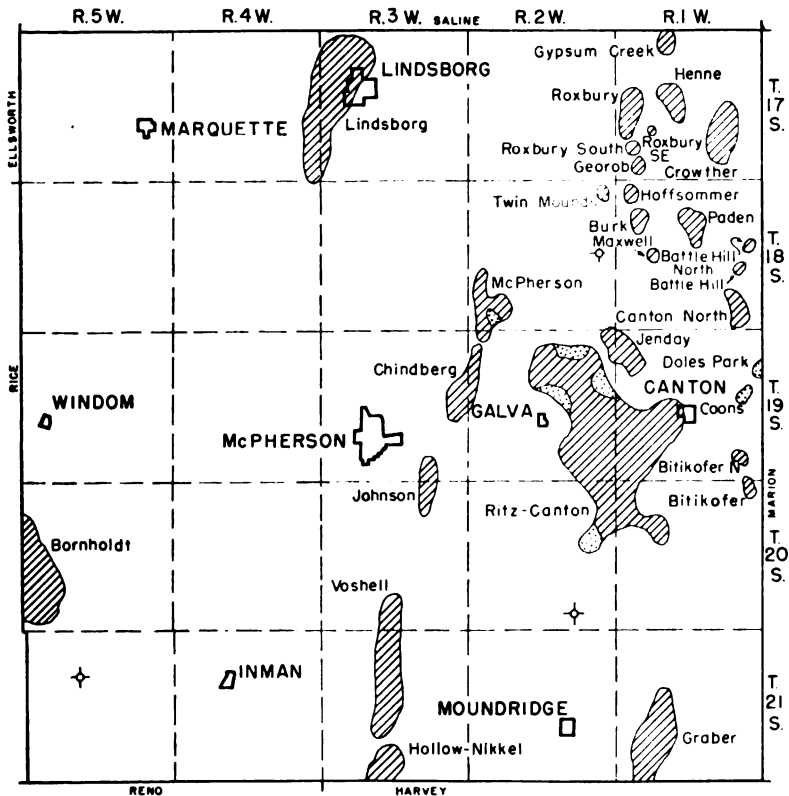


FIG. 29.—Map of McPherson County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

Developments during 1948.—McPherson County was rather actively prospected for petroleum during 1948. In the northeastmost township, T. 17 S., R. 1 W., 11 tests were drilled. Two of these, one each in the **Georob** and **Gypsum Creek** pools, were oil wells; the others were dry holes.

In the next township on the west, T. 17 S., R. 2 W., one dry hole was drilled; and farther west, T. 17 S., R. 3 W., two tests were drilled, both in the **Lindsborg** pool. One is a new oil well.

The most active drilling occurred in the next row of townships farther south. In T. 18 S., R. 1 W., 20 holes were drilled during the year. The results were: Two new oil wells in the **Canton North** pool, one new producer and three dry holes in the **Paden** pool, and the finding of three new oil pools; **Battle Hill North**, **Burk**,

and Maxwell. The new **Burk** pool was found when the Westgate-Greenland Oil Company and Mallard Drilling Company completed the Burk No. 1 well in sec. 7, T. 18 S., R. 1 W. Before the end of the year three additional producers had been added to the pool.

The new **Battle Hill North** pool was discovered by the Westgate-Greenland Oil Company when they worked over a 1945 well, the Ruth No. 1 in sec. 13, T. 18 S., R. 1 W. Later in the year another good oil well was completed in this pool. The new **Maxwell** pool was found by Bay Petroleum and Anderson-Prichard Oil Corporations with their first test on State-owned land in sec. 17, T. 18 S., R. 1 W. This well, rated at 40 barrels per day, produces from the Mississippian cherty limestone as do the new Burk and Battle Hill North pools. One offset producer in sec. 20 was completed before the end of the year.

In T. 18 S., R. 2 W., 10 tests were drilled. One is a new oil well in the old **McPherson** pool; one a dry hole a mile from the **Jenday** pool; three were dry holes, and four are new producers in the **Twin Mounds** pool; and one was a dry wildcat. The first well in the new Twin Mounds pool was drilled by Donald T. Ingling on the Miller farm in sec. 1, T. 18 S., R. 2 W. The well was rated at 800 barrels per day from the Mississippian at 2,842 feet. Three wells drilled later found the producing zone between 1,374 and 1,390 feet below sea level. Three dry holes were also completed in the new pool.

The large **Ritz-Canton** pool area was tested with 13 new holes during the year. Two gas wells, four dry holes, and one oil well were completed in T. 19 S., R. 1 W.; five new oil wells and three dry holes in T. 19 S., R. 2 W.; and one new oil well and one dry hole in T. 20 S., R. 2 W.

One new oil well was completed in the **Bornholdt** pool and one in the **Hollow-Nikkel** pool.

Three dry wildcat wells were drilled in McPherson County. One of these was the Cities Service Oil Company test in the SE cor. NW¼ sec. 35, T. 20 S., R. 2 W. Depths in this hole to important formations were recorded as follows: Kansas City-Lansing limestone, 2,311 feet; Mississippian cherty limestone, 2,950 feet; Kinderhookian shale, 3,236 feet; upper cherty Viola, 3,340 feet; basal coarsely crystalline Viola, 3,410 feet; Simpson, 3,439 feet; and

TABLE 49.—Oil and gas pools of McPherson County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Battle Hill 24-18-1W	1945	40	3,225	28,273	1	"Chat"	2,825
Battle Hill North 13-18-1W	1948	80	10,427	10,427	2	"Miss. lime"	2,811
Bitikofer 1-20-1W	1940	200	13,550	186,234	5	"Chat"	2,885
Bitikofer North 25-19-1W	1946	40	2,379	5,084	1	"Miss. lime"	2,892
Bornholdt ¹ 30-20-5W	1937	3,080	715,023	10,674,620	114	"Chat"	3,292
Burk 7-18-1W	1948	200	20,975	20,975	4	Mississippian	2,781
Canton North 26-18-1W	1936	500	68,341	434,203	14	"Chat"	2,803
Chindberg 18-19-2W	1929	700	34,953	1,681,122	19	K.C.-Lans. "Chat"	2,363 3,007
Crowther 26-17-1W	1942	1,500	406,451	2,119,948	50	"Chat"	2,778
Georob 31-17-1W	1947	400	166,212	222,293	10	"Chat"	2,665
Graber ² 32-21-1W	1934	2,380	199,623	8,727,458	113	"Misener" "Hunton"	3,323 3,274
Gypsum Creek 4-17-1W	1944	400	82,130	219,663	12	"Chat"	2,619
Henne 21-17-1W	1940	900	70,005	1,203,639	22	"Chat"	2,658
Hoffsommer 6-18-1W	1947	200	40,151	54,685	5	"Chat"	2,745
Hollow-Nikkel ² 30-22-3W	1931	640	4,347	*under Harvey County	2	"Chat" "Hunton" Simpson	3,195 3,507 3,500
Jenday 1-19-2W	1944	1,500	73,542	613,994	31	"Chat"	2,984
Johnson 35-19-3W	1932	1,000	39,133	3,119,029	9	"Chat"	3,032
Lindborg 8-17-3W	1938	4,800	561,455	4,774,838	105	Viola Simpson	3,352 3,360
McPherson 29-18-2W	1926	1,500	49,341	1,249,121	24	"Chat" Viola	2,967 3,140
Maxwell 17-18-1W	1948	80	1,367	1,367	1	"Miss. lime"	2,846
Paden 10-18-1W	1943	630	426,026	1,305,552	42	"Chat" Viola	2,752 3,153
Ritz-Canton 1-20-2W	1929	12,500	588,094	40,597,382	197	"Chat" Viola	2,935 3,412
Roxbury 18-17-1W	1938	1,050	141,563	2,598,693	36	"Chat"	2,684
Roxbury South 30-17-1W	1942	320	31,885	251,236	4	"Chat"	2,658
Roxbury Southeast 20-17-1W	1943	40	3,567	20,996	1	"Chat"	2,665
Twin Mounds 1-18-2W	1948	160	38,741	38,741	4	"Miss. lime"	2,842
Voshell 9-21-3W	1929	3,500	390,135	27,288,321	65	"Chat" Viola	3,095 3,301
<i>thousand cubic feet</i>							
Coons 13-19-1W	1940	200	included with Ritz-Canton			"Chat"	2,897

Doles Park ³ 12-19-1W	1947	160	Included with Ritz-Canton	"Chat"	2,843
McPherson (gas) 29-18-2W	1926	200	included with Ritz-Canton	K.C.-Lans.	2,340
				"Chat"	2,967
				Viola	3,140
Ritz-Canton (gas) 12-20-2W	1929	2,000	476,374	14 "Chat"	2,935

¹ Field extends into Rice County.

² Field extends into Harvey County.

³ Field extends into Marion County.

Arbuckle, 3,510 feet. The tops as determined from electric logs differed somewhat from the depths shown above.

In the southwestern part of the county a test was drilled on the Blake farm by Bennett and Roberts in sec. 9, T. 21 S., R. 5 W. This well found the Kinderhookian at 3,658 feet; "Misener," at 3,830 feet; Mississippian limestone at 3,408 feet; Simpson at 3,894 feet; and Arbuckle dolomite at 3,984 feet. Total depth of the hole was 4,001 feet.

Another wildcat well, the No. 1 Tector, was drilled by Westgate-Greenland Oil Company in sec. 13, T. 18 S., R. 2 W. The Mississippian was logged at 2,837 feet, and the total depth was 2,978 feet.

The oil and gas pools in McPherson County and dry wildcat wells drilled during 1948 are shown on Figure 29. The oil and gas pools are listed in Table 49.

MARION COUNTY

Statistical summary for Marion County, 1948

Oil produced	643,137 barrels
Gas produced	670,710 thousand cubic feet
Wells drilled: Oil	34
Gas	none
Dry	38
Total	72
Wildcat wells	9 (included in above total)
New pools: Oil	2
Revived or abandoned pools	none
Secondary recovery operations	1

Developments during 1948.—Two oil pools were discovered in Marion County in 1948. They are the Antelope North and the Lost Springs Southeast.

The **Antelope North** pool was discovered when Kansas City production was found in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28, T. 18 S., R. 4 E. The depth of the producing zone is 1,840 feet. The discovery well produced 650 barrels of oil during 1948.

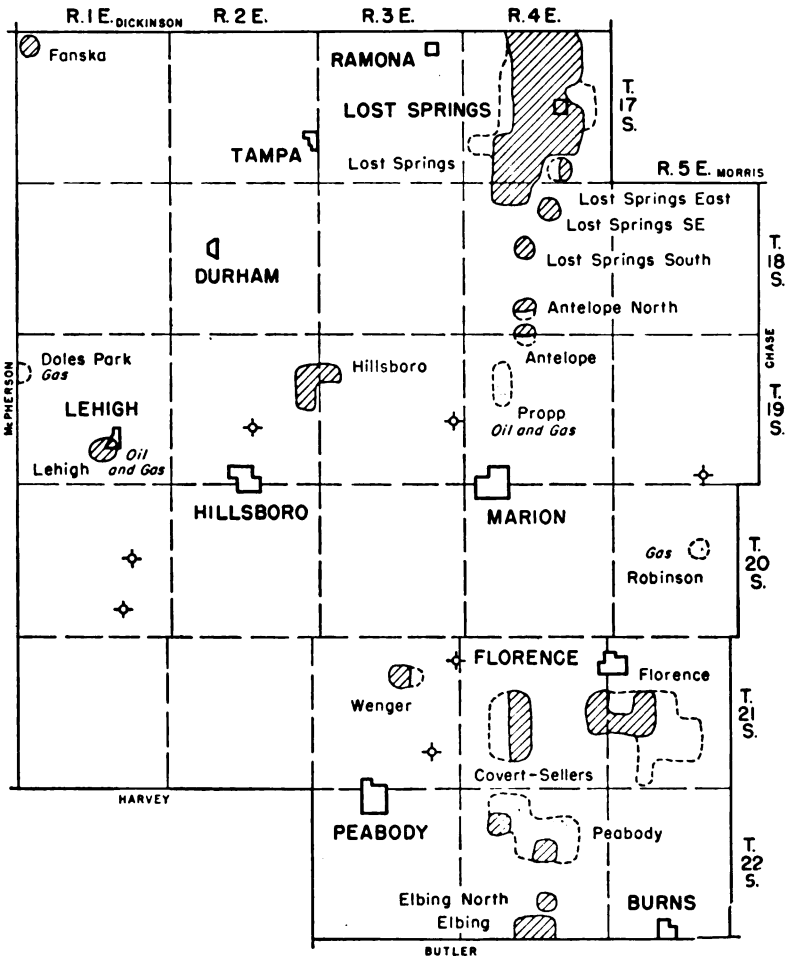


FIG. 30.—Map of Marion County showing oil and gas fields, and dry wildcat wells drilled during 1948. Diagonal lines show areas of 1948 oil production.

The second discovery was the **Lost Springs Southeast** field in the NE cor. NW¼ sec. 10, T. 18 S., R. 4 E. The initial daily production was 12 barrels of oil in the Mississippian at 2,345 feet.

Oil production in the various fields in Marion County is shown in Table 50. Figure 30 shows the location of oil fields and gas fields in the county and areas that produced oil in 1948. Data on dry wildcat wells drilled in Marion County in 1948 are shown in Table 51.

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TABLE 50.—Oil production in Marion County during 1948

Field	Producing wells as reported	1948 production, bbls.
Antelope	1	579
Antelope North	1	650
Covert-Sellers		2,393
Elbing ²	see Butler County	
Elbing North		4,242
Fanska	9	23,640
Florence	5	7,112
Hillsboro	8	25,637
Lehigh	6	18,604
Lost Springs ¹	181	528,119
Lost Springs East	1	986
Lost Springs South	1	957
Lost Springs Southeast	production not recorded	
Peabody	3	19,144
Wenger	1	11,074
Total	217	643,137

¹ Includes Dickinson County production.

² Field extends into Butler County.

TABLE 51.—Dry wildcat wells drilled in Marion County during 1948

Company and farm	Location	Depth to top of Lansing, feet	Depth to top of Mississippian, feet	Total depth, feet
Ingling & Maguire No. 1 Jost	SW ¹ / ₄ NE ¹ / ₄ SW ¹ / ₄ 22-19-2E		2,568	3,010
E. H. Adair Oil Co. No. 1 Buckley	SW cor. NE ¹ / ₄ 24-19-3E	1,805*	2,413	2,708
A. J. Stormfeltz et al. No. 1 Larkin	NE ¹ / ₄ NW ¹ / ₄ SE ¹ / ₄ 34-19-5E	1,665*		2,602
H. J. Uhl et al. No. 1 Duerksen	SE cor. SW ¹ / ₄ 14-20-1E	2,135*	2,829	3,216
J. Pasternak & I. W. Seige No. 1 Schmidt	SW cor. SW ¹ / ₄ 26-20-1E	2,204	2,820	3,280
A. J. Stormfeltz No. 1 Stephens	SE cor. SE ¹ / ₄ 1-21-3E	1,855	2,381	2,718
Branine & Goering No. 1 Lathrop	NE cor. SE ¹ / ₄ 26-21-3E	1,910	2,476	2,769

* Kansas City.

MEADE COUNTY

Statistical summary for Meade County, 1948

Oil produced	347 barrels
Gas produced	162,343 thousand cubic feet
Wells drilled:	none
Oil	
Gas	1
Dry	1
Total	2
Wildcat wells	1 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

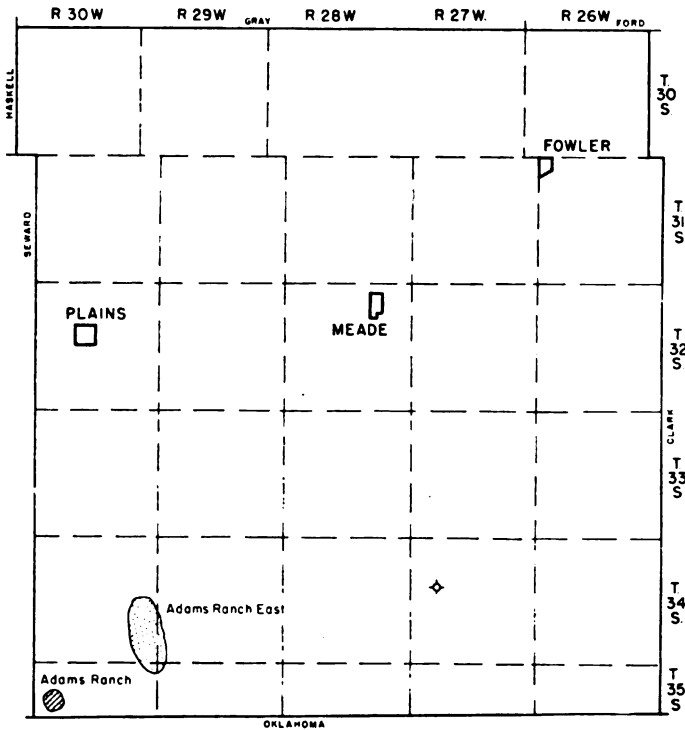


FIG. 31.—Map of Meade County showing oil and gas pools and the dry wildcat test drilled during 1948. (Gas, dots; oil, diagonal lines.)

Developments during 1948.—One of the two wells completed in Meade County during the year was an extension well to the **Adams Ranch East** gas pool which was found during 1947 (Ver Wiebe and others, 1948). The new gas well was drilled by Helmerich and Payne, Inc. on the Adams ranch in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T. 34 S., R. 30 W. It was rated at 5.2 million cubic feet of gas with 24 barrels of oil per day. The gas comes from several zones. One of these is a Morrowan sandstone found in this well at 5,891 feet near the base of the Pennsylvanian. Another producing zone lies close to the top of the Mississippian (Chesterian Series) which here was found at 5,957 feet. The oil comes from Morrowan rocks. From an elevation of 2,622 feet the well was drilled to a total depth of 6,509 feet, about 550 feet below the top of the Mississippian.

TABLE 52.—Oil and gas pools of Meade County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Adams Ranch 8-35-30W	1948	40	347	347	1		
<i>thousand cubic feet</i>							
Adams Ranch (gas) 8-35-30W	1945	640	162,343	162,343	1	Mississippian	5,850
Adams Ranch East 36-34-30W	1947	2,500	no production reported	none		Morrowan ss. Mississippian	5,874 5,904

The other well, drilled by Helmerich and Payne, Inc. and The Texas Company, is in sec. 17, T. 34 S., R. 27 W. From an elevation of 2,270 feet the hole was drilled to a total depth of 6,432 feet. Important zones were found at the following depths: anhydrite, 1,210 feet; Krider, 2,570 feet; Winfield, 2,622 feet; Kansas City-Lansing, 4,394 feet; and Mississippian, 5,830 feet.

Information concerning the two gas pools in Meade County is listed in Table 52. The pools are shown on Figure 31.

MIAMI COUNTY

Oil production totaled 327,326 barrels. Gas production was approximately 180 million cubic feet from about 40 wells. There were nine water-flooding projects in operation.

Developments during 1948.—Activities in Miami County were principally in connection with water-flooding operations. The

TABLE 53.—Oil production in Miami County during 1948

Field	Producing wells as reported	1948 production, bbls.
Louisburg	40	3,834
Paola-Rantoul ¹		
"Paola A"	no production in 1948	
"Paola B"	49	15,345
"Paola C"	63+	30,902
"Paola D"	9	1,212
"Paola E"	12	3,235
"Big Lake"	251	77,743
"Osawatomie"	88+	67,297
"Pressonville"	209+	81,211
"Rantoul"	12	255
"Stanton"	117+	46,292
Total	850+	327,326

¹ Field extends into Franklin County.

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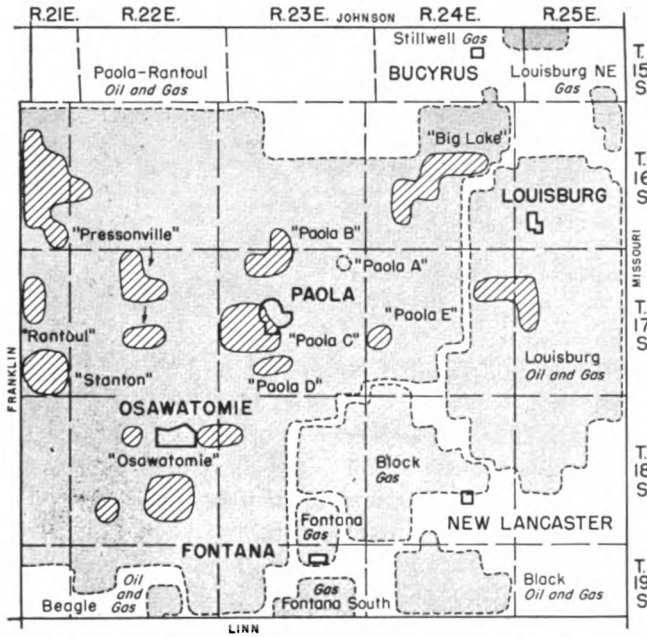


FIG. 32.—Map of Miami County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

complete number of wells drilled in the county is not available, but there were 54 oil wells, 102 water input wells, and 14 dry holes reported. No important wildcat wells were reported.

Oil production in Miami County fields is shown in Table 53, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 32.

The gas production came from about 40 wells scattered in various parts of the county.

MONTGOMERY COUNTY

Oil production totaled 945,616 barrels and gas production was approximately 568,283 thousand cubic feet. There were 22 water-flooding projects and nine active oil fields.

Developments during 1948.—About 150 wells, principally in connection with water-flooding operations, were drilled in the county. One new water-flooding project was started in the **Jefferson-Sycamore** and two in the **Coffeyville-Cherryvale** field.

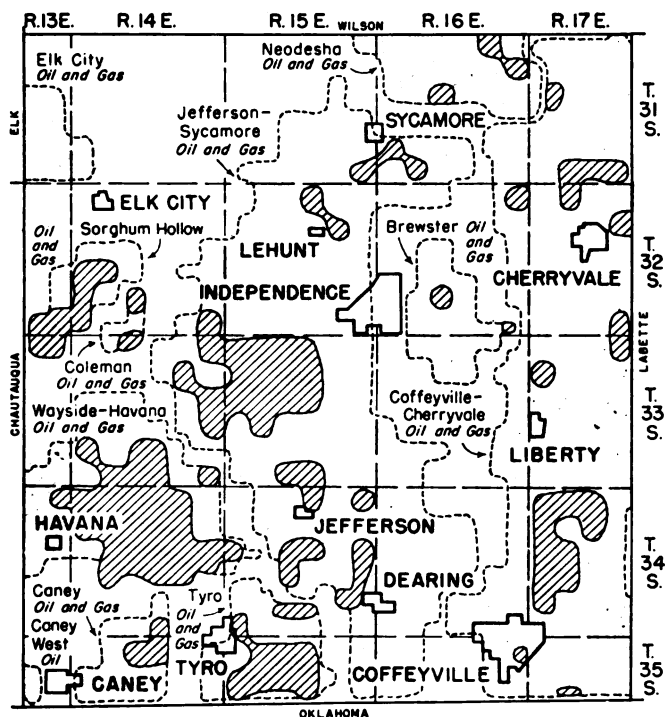


FIG. 33.—Map of Montgomery County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

Oil production in Montgomery County fields is shown in Table 54, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 33.

TABLE 54.—Oil production in Montgomery County during 1948

Field	Producing wells as reported	1948 production, bbls.
Brewster		2,624
Caney	25	7,008
Coffeyville-Cherryvale ^{1, 3}	165+	30,174
Coleman	13+	431
Jefferson-Sycamore ²	265+	721,815
Neodesha ³	20+	2,086
Sorghum Hollow	50	8,379
Tyro	13+	30,063
Wayside-Havana ⁴	882+	141,773
Miscellaneous		1,263
Total	1,433+	945,616

¹ Field extends into Labette County.

² Bolton, Jefferson, and Sycamore pools combined.

³ Field extends into Wilson County.

⁴ Field extends into Chautauqua County.

MORRIS COUNTY

Oil production totaled 407 barrels in the Nelson field. Gas production figures for 1948 are not available.

Developments during 1948.—No important developments were reported in Morris County. The only oil-producing field, the **Nelson**, is in the southwestern part of the county.

MORTON COUNTY

No oil production was reported in the county, and gas production was not segregated from that of the Hugoton field. Twenty-six new gas wells were drilled. One new gas pool was discovered.

Developments during 1948.—Eight of the 26 new gas wells were drilled in T. 31 S., R. 39 W. They had fairly high initial potentials, ranging from 5 to 13 million cubic feet of gas per day. In the next township farther west, T. 31 S., R. 40 W., nine gas wells were completed. They ranged in daily initial capacity from 1 to 16 million cubic feet per day. One new gas well was completed in T. 32 S., R. 39 W., six in T. 32 S., R. 40 W., and one in T. 33 S., R. 39 W. These wells ranged from 4 to 11 million cubic feet of gas per day in initial production. The Panhandle Eastern Pipe Line Company No. 1 Light well, capable of producing 34.5 million cubic feet per day, was the record well in the county for 1948.

Discovery of a new gas pool, called **Richfield**, within the general limits of the Hugoton gas field was announced by the Kansas Nomenclature Committee as a result of the Stanolind Oil and Gas Company bringing in a producing well from a zone much lower than the usual Permian production of the Hugoton area. The well is the No. 1 Bear drilled in sec. 17, T. 32 S., R. 40 W. Depths to important zones were reported as follows: Krider, 2,225 feet; Winfield, 2,268 feet; Fort Riley, 2,397 feet; Kansas City-Lansing, 3,606 feet; Atoka, 4,990 feet; Morrow, 5,124 feet; Mississippian, 5,499 feet; Viola, 6,390 feet; Simpson, 6,500 feet; and Arbuckle, 6,506 feet. The total depth was 6,561 feet. Tests were made at several points and the well finally plugged back and completed at a rated initial capacity of 3.9 million cubic feet of gas and 20 barrels of condensate from lower Pennsylvanian Atokan rocks between 4,990 and 5,017 feet.

The gas wells and dry holes drilled in Morton County are shown on Figure 19. Additional information regarding the Hugoton gas field is given under Finney County.

NEMAHA COUNTY

Oil production totaled approximately 1,000 barrels in the Strahm pool. No gas was produced.

Developments during 1948.—Oil was discovered in the “Hunton” limestone at 2,877 feet in Nemaha County, September 13, 1948, in the Carter Oil Company No. 1 Mamie Strahm well, SW cor. NW¼ sec. 27, T. 2 S., R. 14 E. Initial daily production was reported as 54 barrels of oil. During the remainder of the year approximately 1,000 barrels of oil was produced.

Two dry wildcat wells were drilled in the county during the year. They are the Carter Oil Company No. 1 Dennis Kesler well, NW cor. NE¼ sec. 14, T. 1 S., R. 14 E., total depth 2,773 feet, and the top of the “Hunton” at 2,681 feet; and the Stout and Hahn No. 1 Lamparter well, NW¼ NE¼ SW¼ sec. 3, T. 2 S., R. 14 E., total depth 2,910 feet, and the top of the “Hunton” at 2,828 feet.

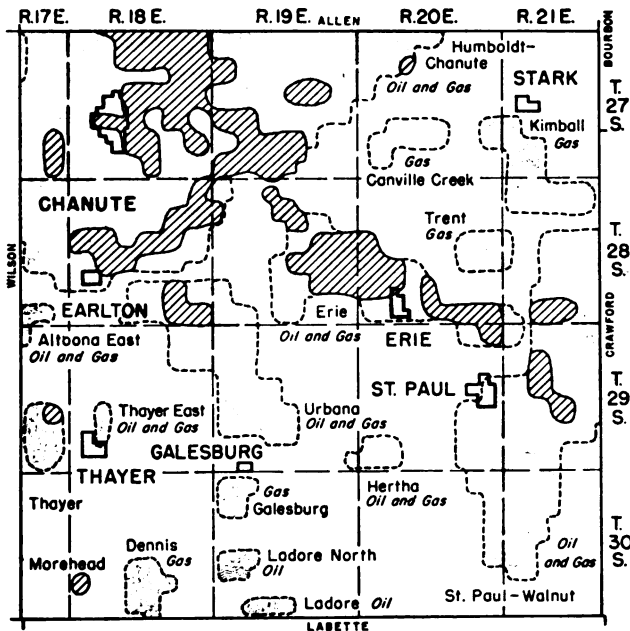


FIG. 34.—Map of Nemaha County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

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TABLE 55.—Oil production in Neosho County during 1948

Field	Producing wells as reported	1948 production, bbls.
Erie	36+	24,092
Humboldt-Chanute ¹	241+	445,468
Morehead		1,615
St. Paul-Walnut ²		9,853
Thayer		351
Urbana		3,002
Miscellaneous	4+	372
Total	281+	484,753

¹ Field extends into Allen, Wilson, and Woodson Counties.

² Field extends into Crawford County.

NEOSHO COUNTY

Oil production totaled 484,753 barrels. Gas production amounted to approximately 108,365 thousand cubic feet. There were three water-flooding projects in operation and six active pools.

Developments during 1948.—About 300 wells, principally in connection with water-flooding operations, were drilled in the county. No important wildcat wells were reported.

Oil production in Neosho County fields is shown in Table 55, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 34.

NESS COUNTY

Statistical summary for Ness County, 1948

Oil produced	276,969 barrels
Gas produced	none
Wells drilled: Oil	9
Gas	none
Dry	5
Total	14
Wildcat wells	3 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—There was more drilling activity in Ness County in 1948 than in 1947. Most of the drilling was in one restricted area. Three wildcat tests were dry.

One dry wildcat well was drilled 3 miles northeast of the Aldrich pool by the Cooperative Refining Association on the McKinley lease in sec. 19, T. 17 S., R. 24 W. It found the "Warsaw" dolomite, the producing zone in the Aldrich pool, at 4,409 feet, about 100 feet lower than the "Warsaw" in the Aldrich pool.

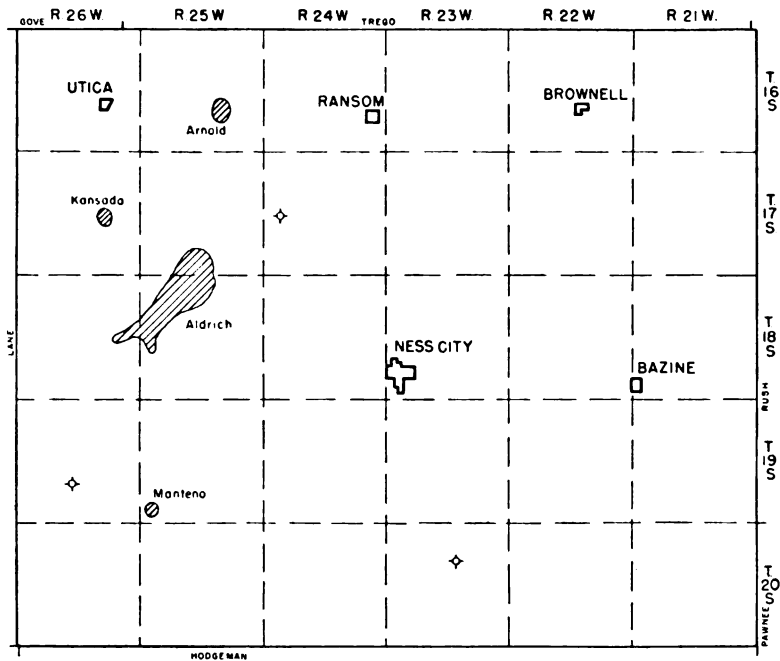


FIG. 35.—Map of Ness County showing oil pools and dry wildcat tests drilled during 1948.

A wildcat test, the McCreight No. 1, was drilled by the Mid-states Oil Corporation in sec. 10, T. 20 S., R. 23 W. The location is about 10 miles south of Ness City. Elevation of the well is 2,273 feet. The depths to tops of important zones were recorded as follows: Kansas City-Lansing limestone, 3,779 feet; "Warsaw" dolomite, 4,445 feet; total depth was 4,500 feet.

The third wildcat test was drilled about 3 miles west of the Manteno pool by the Davon Oil Company in sec. 28, T. 19 S., R.

TABLE 56.—Oil pools of Ness County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Aldrich 7-18-25W	1929	4,900	211,437	1,631,026	28	"Warsaw"	4,428
Arnold 22-16-25W	1943	300	58,554	208,341	5	Fort Scott "Warsaw"	4,436 4,528
Kansada 23-17-26W	1944	200	no production reported	7,581		"Warsaw"	4,450
Manteno 31-19-25W	1945	160	6,978	35,595	3	"Warsaw"	4,549

26 W. The elevation of the well is 2,642 feet. Important zones were logged at the following depths: Stone Corral dolomite, 1,940 feet; Heebner black shale, 3,939 feet; Kansas City-Lansing limestone, 3,966 feet; "Warsaw" dolomite, 4,954 feet; total depth was 4,702 feet. The "Warsaw" dolomite which produces oil in the Manteno pool, was tested after acidizing with 3,000 gallons, but was dry.

All other wells listed in the statistical table with the exception of one dry hole in the **Arnold** pool were drilled in the **Aldrich** pool. This pool is taking on the character of an important oil reserve. Many locations still remain undrilled. It has already produced more than 1.5 million barrels of oil.

Table 56 gives production data on the oil pools of Ness County. These pools are shown on Figure 35.

NORTON COUNTY

Statistical summary for Norton County, 1948

Oil produced	13,276 barrels
Gas produced	none
Wells drilled: Oil	none
Gas	none
Dry	1
Total	1
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Only one test was made in Norton County during the year. This well was drilled by the Cities Service Oil Company on the Kitzke ranch in the SW¼ sec. 25, T. 5 S., R. 21 W. In this edge well of the **Ray** pool the basal sandstone, or Reagan, was found at 3,669 feet, 1,434 feet below sea level. It proved to be 39 feet thick and was completely penetrated before the test was abandoned as a dry hole.

The oil pools in Norton County are listed in Table 57 and shown on Figure 36.

TABLE 57.—Oil pools of Norton County

Pool and location of discovery well	Discovery year	Area, acres	1948 production, bbls.	Cumulative production to end of 1948, bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Hewitt 11-4-21W	1941	40	no production reported	32,054		K.C.-Lans.	3,404
Ray ¹ 32-5-20W	1940	300	see Phillips County			K.C.-Lans. Arbuckle Reagan	3,297 3,575 3,540
Ray West 26-5-21W	1945	80	13,276	51,619	2	Arbuckle	3,650

¹ Field extends into Phillips County.

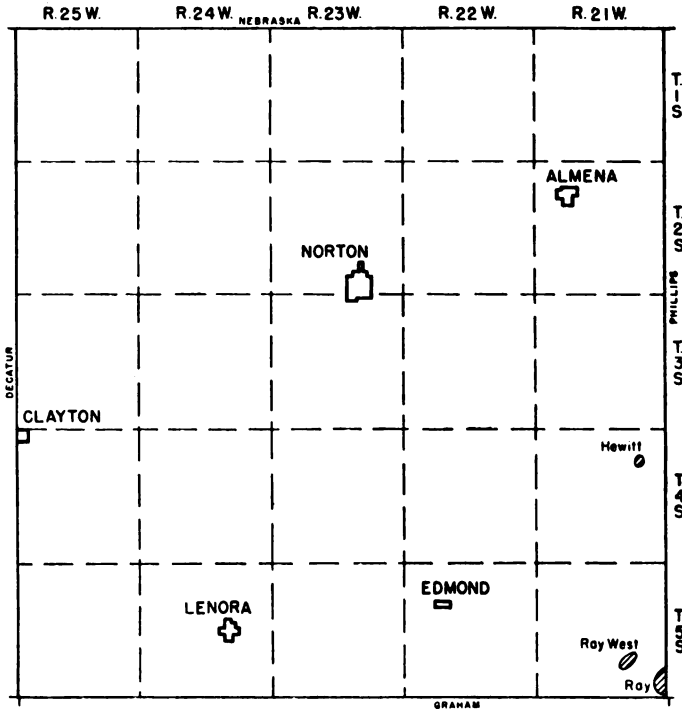


FIG. 36.—Map of Norton County showing oil pools.

OSBORNE COUNTY

Wildcat wells have been drilled in Osborne County at intervals through the years, but a producing pool has yet to be discovered.

Developments during 1948.—Four test wells were completed in Osborne County during the year. One, the McEwen No. 1 well, was drilled by the Westgate-Greenland and Barbara Oil Companies in sec. 27, T. 8 S., R. 15 W. Depths to tops of important zones not shown in Table 58 were reported as: Cimarron anhydrite, 1,220 feet; Topeka limestone, 2,860 feet; and Heebner black shale, 3,111 feet. A zone of almost 100 percent chert, the age of which is in doubt, was found at 3,558 feet. The Viola limestone was encountered at 3,672 feet, and Simpson shale at 3,775 feet. There were no showings of oil or gas. The location of this wildcat is 6 miles northeast of the Laton pool, which is in adjoining Rooks County, and practically on an extension of the Fairport anticline.

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TABLE 58.—*Dry wildcat tests drilled in Osborne County during 1948*

Company and farm	Location	Surface elevation, feet	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Westgate-Greenland Oil Co. et al. No. 1 Dean	SW cor. SW $\frac{1}{4}$ 5-8-14W	1,808	3,038	3,725	3,768
Westgate-Greenland Oil Co. No. 1 Spears	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ 15-8-14W	1,881	3,092	not reached	3,126
Westgate-Greenland Oil Co. No. 2 Spears	SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ 15-8-14W	1,879	3,092	not reached	3,167
Westgate-Greenland Oil Co. & Barbara Oil Co. No. 1 McEwen	NW cor. SE $\frac{1}{4}$ 27-8-15W	1,939	3,168	3,828	3,871

Another wildcat test also drilled by the Westgate-Greenland Oil Company was the Dean No. 1 well in sec. 5, T. 8 S., R. 14 W. The tops of zones in this well not shown in Table 58 were reported as: Dakota, 442 feet; Cimarron redbeds, 798 feet; Stone Corral anhydrite, between 1,070 and 1,115 feet; Wellington shale, 1,300 feet; salt, between 1,430 and 1,590 feet; Fort Riley, 1,795 feet; Topeka, 2,748 feet; Heebner, 2,995 feet; and Sooy conglomerate, 3,490. This basal rubble was found to rest on the Viola cherty dolomite at 3,550 feet; then came coarsely crystalline limestone at 3,610 feet, and Simpson shale at 3,660 feet. The elevation of the hole is 1,808 feet. There was a small show of oil between 3,065 and 3,070 feet.

The other two wells drilled in the county were located in sec. 15 of the same township a few miles southeast of the No. 1 Dean well. They were drilled only into the Kansas City-Lansing limestone, being completed at relatively shallow depths. A show of oil was found in one of these, the No. 1 Spears well.

PAWNEE COUNTY

Statistical summary for Pawnee County, 1948

Oil produced	523,065 barrels
Gas produced	8,444,182 thousand cubic feet
Wells drilled:	
Oil	15
Gas	3
Dry	19
Salt water disposal	2
Total	39
Wildcat wells	11 (included in above total)
New or revived pools	none
Abandoned pools: Gas	1
Secondary recovery operations	none

Developments during 1948.—Considering the limited oil producing area in Pawnee County there was a considerable amount of prospecting for oil. Most interest lay in the northeast part of

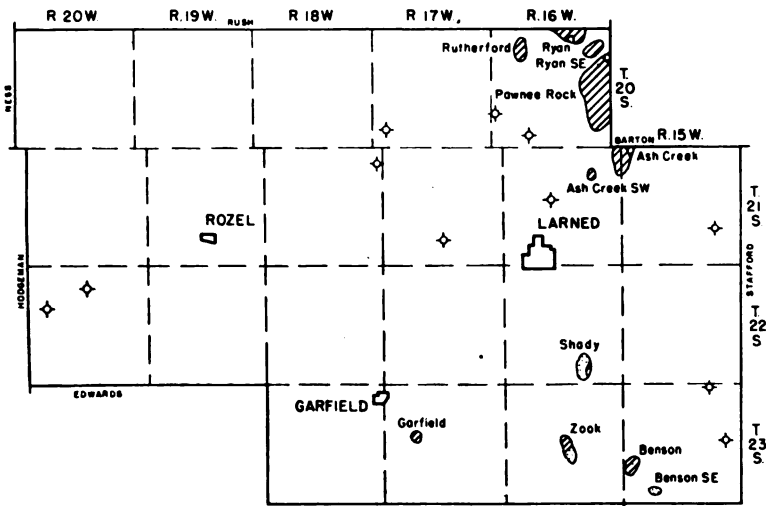


FIG. 37.—Map of Pawnee County showing oil and gas pools and dry wild-cat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

the county around the six producing oil pools. Nine new oil wells were completed in the **Pawnee Rock** pool. The structurally high wells in this pool, as in sec. 12, produce from the Arbuckle dolomite 1,650 feet below sea level. Toward the south the Arbuckle dolomite produces at gradually lower levels until a depth of about 1,730 feet below sea level is reached in sec. 25, formerly **Pawnee Rock South** pool. On the west side of the pool, in sec. 14, the producing zone is also quite low, 1,746 feet below sea level, which is practically at the water line. Dry holes suggest that the water line at present is 1 to 2 feet lower. One interesting well, the Mid-Continent Petroleum Corporation No. 4 Smith in sec. 13, T. 20 S., R. 16 W., which found the Arbuckle about 100 feet lower than expected, was deepened for use as a salt water disposal well. It found the Arbuckle dolomite to be 474 feet thick, then penetrated 31 feet of basal sandstone.

The **Ash Creek** pool, discovered in Barton County, now extends into Pawnee County and includes the **Ash Creek South** pool. Five oil wells and one water disposal well were added to this pool during 1948. One well, the Gulf Oil Corporation No. 3 Gross in sec. 6, T. 21 S., R. 15 W. which found the producing zone, the Arbuckle, quite low structurally, was drilled into the Pre-Cambrian granite to serve as a salt water disposal well. This hole

TABLE 59.—Oil and gas pools of Pawnee County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Ash Creek ¹ 31-20-15W	1947	770	64,479	90,757	11	Arbuckle	3,787
Ash Creek South 12-21-16W	1947	combined with Ash Creek					
Ash Creek Southwest 11-21-16W	1947	100	41,990	43,234	3	Arbuckle	3,779
Benson 30-23-15W	1945	200	30,969	98,802	5	K.C.-Lans.	3,853
Garfield 17-23-17W	1947	40	4,568	5,523	1	Kinderhookian	4,276
Pawnee Rock ¹ 13-20-16W	1936	2,000	226,119	1,852,886	38	Arbuckle	3,832
Pawnee Rock South 25-20-16W	1944	combined with Pawnee Rock					
Rutherford 8-20-16W	1946	300	52,564	139,498	7	Arbuckle	3,815
Ryan ² 35-19-16W	1945	550	45,869	309,528	12	Arbuckle	3,656
Ryan Southeast 12-20-16W	1945	300	56,246	167,393	7	Arbuckle	3,688
Shady 35-22-16W	1948	40	261	261	1	Arbuckle	4,067
Zook 16-23-16W	1942	80	no production reported	7,016		Arbuckle	4,066
thousand cubic feet							
Ash Creek (gas) ¹ 31-20-15W	1948	50	602,150		2	Arbuckle	3,769
Benson Southeast 32-23-15W	1946	160	no production reported	none		Arbuckle	4,048
Pawnee Rock (gas) ¹ 19 & 20-15 & 16W	1936	420	5,058,071		4		
Ryan (gas) ² 35-19-16W		50	602,150		1		
Shady (gas) 34-22-16W	1945	320	1,780,646	2,057,883	5	Arbuckle	4,063
Torrance 19-21-15W	1947	abandoned during 1948					
Zook (gas) 16-23-16W	1942	320	401,165	6,107,428	4	Arbuckle	4,066

¹ Field extends into Barton County.² Field extends into Rush County.

found the Arbuckle at 1,910 feet below sea level as compared to 1,773 feet in producing wells near by. The thickness of the Arbuckle in this deep test is 430 feet and that of the basal sandstone beneath it 82 feet. The granite was found at 4,399 feet. At present the water line in the Ash Creek pool is about 1,800 feet below sea level.

The Ash Creek Southwest pool, only 1½ miles from the Ash Creek, has Arbuckle production below 1,800 feet below sea level, suggesting that the two pools draw from separate reservoirs of oil. One new oil well was added to the Ash Creek Southwest pool

TABLE 60.—Dry wildcat tests drilled in Pawnee County during 1948

Elevation of well	No. 1 Schmidt SW cor. NW ¼ sec. 30, T. 20 S., R. 16 W.	2,037	2,028	2,168	1,954	1,996	2,044	2,090	2,169	2,266	1,997	1,982
Stone Corral dolomite	No. 1 Fox SE cor. NE ¼ sec. 32, T. 20 S., R. 16 W.	1,075	1,059	1,245	903	1,016	1,050	1,145	2,169	1,390	916	920
Topeka limestone	No. 1 Warner NW cor. NE ¼ sec. 26, T. 21 S., R. 15 W.	3,157			3,427	3,466		3,505			3,584	3,500
Heebner black shale	No. 1 Fulton NW cor. NE ¼ sec. 31, T. 20 S., R. 17 W.	3,427	3,391	3,597	3,427	3,476	3,517	3,567	3,782	3,845	3,595	3,613
"Brown lime"	No. 1 Webb NE cor. SW ¼ sec. 16, T. 21 S., R. 16 W.		3,473		3,442	3,476	3,866				3,953	3,950
Lansing limestone	No. 1 Hayes NE cor. SE ¼ sec. 28, T. 21 S., R. 17 W.	3,521	3,481	3,671	3,442	3,476	3,866	3,567	3,782	3,845	3,953	3,950
Sooey conglomerate	No. 1 Webb NE cor. SW ¼ sec. 16, T. 21 S., R. 16 W.	3,851		4,058		3,789			4,429	4,630		3,973
Viola	No. 1 Warner NW cor. NE ¼ sec. 26, T. 21 S., R. 15 W.				3,800	3,794			4,602	4,873		4,044
Simpson	No. 1 Fox SE cor. NE ¼ sec. 32, T. 20 S., R. 16 W.	3,860	3,751		3,828	3,832		3,956	4,615	4,893	4,028	4,082
Arbuckle dolomite	No. 1 Schmidt SW cor. NW ¼ sec. 30, T. 20 S., R. 16 W.	3,863	3,813	4,089	3,902	3,925	3,916	4,040	4,665	4,973	4,125	4,127
Total Depth		3,965	3,870	4,126	3,902	3,925	3,916	4,040	4,665	4,973	4,125	4,127

during 1948. Dry holes drilled in the vicinity suggest that the water line at present is about 1,815 feet below sea level.

In the **Shady** gas pool three additional gas wells were completed during the year, increasing the area of the pool considerably.

The oil and gas pools of Pawnee County are shown on Figure 37, and pertinent information regarding them is given in Table 59. Table 60 lists the dry wildcat tests drilled in the county during 1948.

PHILLIPS COUNTY

Statistical summary for Phillips County, 1948

Oil produced	1,951,458 barrels
Gas produced	none
Wells drilled: Oil	17
Gas	none
Dry	5
Total	22
Wildcat wells	2 (included in above total)
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Most of the drilling done in Phillips County during the year was in or close to established pools. Three of the new oil wells were drilled in the **Dayton North** pool, one in the **Logan** pool, two in the **Hansen** pool, and the others in the **Ray** pool. In the Ray pool five of the 11 new wells produce from the Reagan sandstone and six from the Arbuckle dolomite. In this pool the Arbuckle is a thin wedge ranging from a feather-edge to 33 feet in thickness in the newly drilled wells. One test, the No. 3 "A" Wallgren, in sec. 29, T. 5 S., R. 20 W., went entirely through the Reagan sandstone finding it to be 64 feet thick.

TABLE 61.—Oil pools of Phillips County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Bow Creek 25-5-18W	1939	40	2,077	40,196	1	K.C.-Lans.	3,111
Dayton 36-2-19W	1941	1,600	63,479	808,323	21	K.C.-Lans.	3,430
Dayton North 13-2-19W	1943	1,000	119,659	473,806	22	K.C.-Lans.	3,406
Hansen 14-5-20W	1943	800	288,087	916,458	26	K.C.-Lans. Arbuckle	3,363 3,530
Logan 3-5-20W	1945	420	66,986	148,021	10	K.C.-Lans. Arbuckle	3,149 3,381
Ray ¹ 32-5-20W	1940	3,500	1,411,170	8,410,027	107	K.C.-Lans. Arbuckle Reagan	3,297 3,575 3,540

¹ Field extends into Norton County.

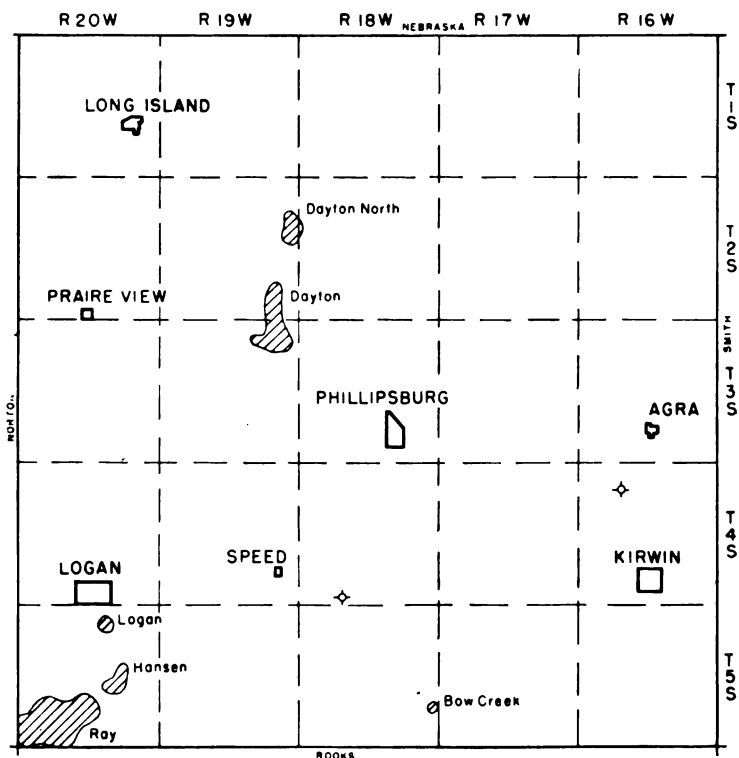


FIG. 38.—Map of Phillips County showing oil pools and dry wildcat tests drilled during 1948.

One of the rank wildcat tests was drilled between Kirwin and Agra by the Flynn Oil Company in the NE cor. NE $\frac{1}{4}$ sec. 8, T. 4 S., R. 16 W. Tops of important zones were logged as follows: Topeka limestone, 3,029 feet; Heebner black shale, 3,047 feet; Kansas City-Lansing limestone, 3,093 feet; Sooy conglomerate, 3,611 feet; Simpson, 3,808 feet; and Arbuckle dolomite, 3,848 feet. The total depth of this test was 3,871 feet and the elevation of the well is 1,801 feet.

The other wildcat test completed by the Iron Drilling Company was the Ashcraft No. 1 in sec. 32, T. 4 S., R. 18 W., a few miles east of Speed. Here the principal zones were recorded as beginning at the following depths: Heebner black shale, 3,025 feet; Kansas City-Lansing limestone, 3,052 feet; and Arbuckle dolomite, 3,418 feet. The total depth was 3,472 feet. No shows of oil or gas were encountered. The elevation is 1,853 feet.

The oil pools of Phillips County and dry wildcat tests drilled during 1948 are shown on Figure 38. Table 61 gives information on the oil pools.

PRATT COUNTY

Statistical summary for Pratt County, 1948

Oil produced	2,559,249 barrels
Gas produced	2,180,945 thousand cubic feet
Wells drilled:	
Oil	25
Gas	none
Dry	16
Total	41
Wildcat wells	6 (included in above total)
New pool: Oil	1
Revived or abandoned pools	none
Secondary recovery operations	2 see Kingman County also

Developments during 1948.—Twenty-two of the 41 new wells were drilled in old pools. Eleven dry holes were drilled around pool borders. Figure 39 shows the location of six wildcat tests, one of which opened a new oil pool. This test was drilled by the Skelly

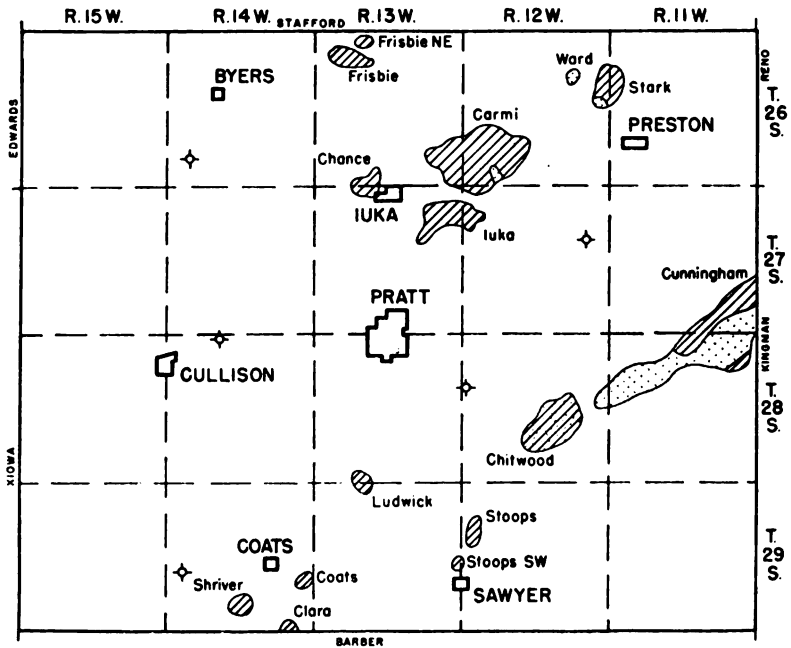


FIG. 39.—Map of Pratt County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

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TABLE 62.—Oil and gas pools of Pratt County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Carmi 29-26-12W	1942	4,400	953,849	7,047,230	95	K.C.-Lans. Simpson Arbuckle	4,271
Chance 4-27-13W	1946	440	47,639	140,814	11	Simpson Arbuckle	4,380 4,432
Chitwood 23-28-12W	1943	1,700	845,755	4,497,157	74	K.C.-Lans. Viola Simpson Arbuckle	4,396
Clara ¹ 36-29-14W	1948	100	10,334	10,334	3	Simpson	4,472
Coats 24-29-14W	1944	400	77,019	270,940	8	Simpson Arbuckle	4,402
Cunningham ² 7-28-11W	1931	3,560	251,318	4,657,098	94	K. C.-Lans.	3,390
Frisbie 5-26-13W	1943	400	35,454	214,890	4	K.C.-Lans.	3,947
Frisbie Northeast 4-26-13W	1948	80	20,766	20,766	4	K.C.-Lans.	3,788
Iuka 11-27-13W	1937	2,000	161,294	1,308,848	21	Simpson Arbuckle	4,292 4,354
Ludwick 4-29-13W	1944	80	1,227	23,953	2	Simpson	4,490
Shriver 33-29-14W	1944	400	94,146	315,022	7	Simpson	4,557
Stark 18-26-11W	1941	850	42,341	749,801	13	K.C.-Lans. Viola	3,601 4,121
Stoops 7-29-12W	1946	160	15,737	58,434	4	Viola	4,446
Stoops Southwest 24-29-13W	1946	40	2,370	8,070	1	Viola	4,483
<i>thousand cubic feet</i>							
Carmi (gas) 29-26-12W	1942	80	28,430	127,339	1	Viola	4,122
Chitwood (gas) 23-28-12W	1943	400	661,614	5,454,522	4	Viola	4,340
Cunningham (gas) ² 7-28-11W	1931	3,560	1,490,901 including Cairo pool production		24	Viola Arbuckle	4,278 4,094
Stark (gas) 13-26-12W	1941	50	included with Carmi			Viola	4,121
Ward 11-26-12W	1941	160	included with Carmi			Viola	4,129

¹ Field extends into Barber County.² Field extends into Kingman County.

Oil Company on the Kipp farm in the NW $\frac{1}{4}$ sec. 4, T. 26 S., R. 13 W. Since it is close to the old Frisbie pool, the new pool has been named the **Frisbie Northeast**. In the discovery, drilled to 4,270 feet, all possible producing zones, including the Arbuckle dolomite, were tested. A drill stem test in the Arbuckle showed only water. The hole was plugged back to test showings first in the Simpson sandstone and later in the Kansas City-Lansing limestone. The well was finally completed with a potential of 720 bar-

TABLE 63.—Dry wildcat tests drilled in Pratt County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Viola, feet	Depth to top of Simpson, feet	Depth to top of Arbuckle, feet	Total depth, feet
* A. D. Allison et al. No. 1 Leroux	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ 17-26-11W	3,642	4,281	4,387	4,454	4,468
Mid Continent Petr. Corp. No. 1 Leonard	SE cor. SE $\frac{1}{4}$ 30-26-14W	3,900	4,421	4,502	4,586	4,643
Phillips Petroleum Co. et al. No 1 Barnes Est.	NW cor. NW $\frac{1}{4}$ 13-27-12W	3,699	4,359	4,440	4,537	4,570
Harbar & Apex No. 1 Banbury	NW cor. NW $\frac{1}{4}$ 18-28-12W	3,833	4,416	4,498	4,621	4,675
*Delta Production & Harbar No 1 Miller	SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ 25-28-12W	3,721	4,389	4,489	4,599	4,636
The Texas Co. No. 1 Quinn	NW cor. NW $\frac{1}{4}$ 4-28-14W	3,956	4,480	4,568	4,698	4,774
**Lion Oil Co. No. 1 Schrepel	NW cor. SE $\frac{1}{4}$ 19-29-14W	4,053	4,552	4,647	4,723	4,761

* Extension wildcat.

** A small show of oil was found in this well between 4,600 and 4,610 feet.

rels in a porous zone between 3,788 and 3,800 feet, about 80 feet below the top of the Kansas City-Lansing. Some oil was also found between 3,842 and 3,852 feet.

During the year, 12 new oil wells were completed in the **Carmi** pool and three in the **Iuka**. In the **Cunningham** pool two new oil wells, which produce from the Kansas City-Lansing limestone, were drilled.

The old **Clara** pool, originally discovered in adjacent Barber County, was extended into southern Pratt County where three new oil wells were completed during 1948. The new wells reached the top of the Simpson sandstone, the producing zone, at depths below sea level differing by as much as 28 feet. No additional drilling was done in the **Chitwood** pool where production has been found in four zones. Of the 74 Chitwood wells still in production 57 produce from Simpson sandstone, 13 from Viola dolomite, 3 from Arbuckle dolomite, and 1 from Kansas City-Lansing limestone.

Data on wildcat wells, including two extension wildcats, are shown in Table 63. The oil and gas pools of Pratt County are shown on Figure 39 and listed in Table 62.

RENO COUNTY

Statistical summary for Reno County, 1948

Oil produced	2,151,810 barrels
Gas produced	1,235,482 thousand cubic feet
Wells drilled: Oil	13
Gas	1
Dry	20

Total	34
Wildcat wells	11 (included in above total)
New pool: Oil	1
Revived or abandoned pools	none
Secondary recovery operations	2

Developments during 1948.—Despite the rather disappointing results obtained by drilling during the last few years, there was a surprising amount of wildcatting in Reno County during 1948. Figure 40 shows that the wildcat tests are well scattered. One of the wildcats found a new oil pool. This test was drilled by Helmerich and Payne, Inc. on the Stucky farm in sec. 14, T. 26 S., R. 6 W. to a total depth of 4,200 feet, or almost 50 feet into the Arbuckle which was dry. Viola dolomite and limestone, tested between 4,042 and 4,054 feet, carried salt water, so the hole was plugged back to test a good showing in the top of the Mississippian, where the well was completed for an initial production of 51 barrels of oil per day. The name of the new pool is the **Albion**. The second test on the Stucky lease by the same operators was abandoned as a dry hole although it had a gas show between 3,655 and 3,665 feet. An offset from the

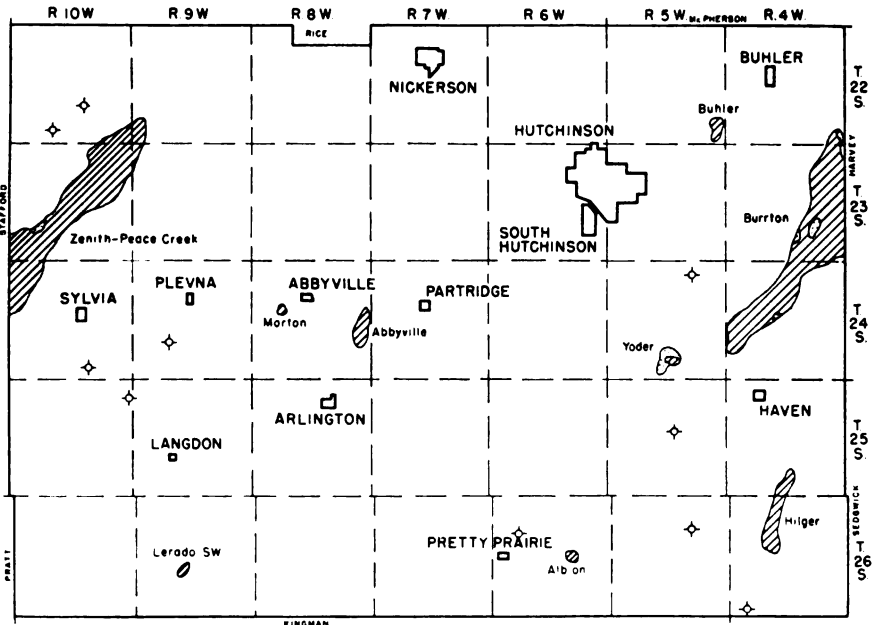


FIG. 40.—Map of Reno County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

TABLE 64.—Oil and gas pools of Reno County

Pool and location of discovery well	Discovery year	Area, 1948 production		Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
		acres	barrels				
Abbyville 24-24-8W	1927	640	16,573	590,360	8	K.C.-Lans.	3,540
Albion 14-26-6W	1948	100	6,154	6,154	3	"Chat"	3,654
Buhler 25-22-5W	1938	500	24,808	597,722	4	Viola Simpson	3,890 3,897
Burrton ¹ 1-23-4W	1931	11,550	1,046,116	43,106,044	253	Mississippian "Hunton" ²	3,266 3,583
Hilger 16-26-4W	1934	1,660	236,834	4,039,639	28	Viola	4,062
Hilger North 34-25-4W	1943	combined with Hilger					
Lerado Southwest 21-26-9W	1944	200	17,503	81,471	4	Viola	4,177
Morton 17-24-8W	1942	40	3,758	29,293	1	K.C.-Lans.	3,180
Yoder 34-24-5W	1935	300	2,744	89,711	5	"Chat"	3,450
Zenith-Peace Creek ² 21-23-10W	1941	11,100	1,097,320	16,436,698	189	Viola	3,773
<i>thousand cubic feet</i>							
Burrton (gas) ¹ 23-23-4W	1930	450	279,106		20	Mississippian	3,298
Yoder (gas) 34-24-5W	1936	200	742,296		10	"Chat"	3,402
Zenith-Peace Creek (gas) ² 23-24-11W	1937	150	214,080		4	Viola	3,860

¹ Field extends into Harvey County.

² Field extends into Stafford County.

discovery well, drilled by the Lion Oil Company on the Schwartz farm, was rated at 10 barrels of oil per day.

A good deal of marginal drilling in some of the older established pools was done during 1948. Four new oil wells were completed in the **Zenith-Peace Creek** pool and two in the **Burrton** pool, both producing from the Mississippian cherty limestone. In the **Lerado Southwest** pool one new oil well was completed.

During the year considerable drilling was done in sec. 4, T. 26 S., R. 4 W. between the **Hilger** and the **Hilger North** pools. The finding of oil in three of these tests proved that the two pools draw from one common underground reservoir so the pools were combined. The oil zone seems to be very thin in this pool, as dry holes have been drilled in which the top of the producing Viola rocks is only a few feet below its level in near-by producers.

Ten dry wildcat tests, shown on Figure 40, were completed in Reno County during 1948. Most of these were drilled deep enough

TABLE 65.—Dry wildcat tests drilled in Reno County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Viola, feet	Depth to top of Arbuckle, feet	Total depth, feet
R. J. Woelk No. 1 Withroeder	NW cor. NE $\frac{1}{4}$ 27-22-10W	3,204	3,553	3,651	3,705
Stag Drilling Co. No. 1 Russell	NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ 33-22-10W	3,208		3,688	3,720
Plains Exploration Co. No. 1 Eales	NE cor. SW $\frac{1}{4}$ 2-24-5W	2,682	3,826	3,937	3,967
Ausherman & Sons No. 1 Cooper	NE cor. NE $\frac{1}{4}$ 29-24-9W	3,368	4,115	4,273	4,316
J. M. Huber Corp. et al. No. 1 Stanley	SE cor. NE $\frac{1}{4}$ 34-24-10W	3,409	4,073	4,252	4,290
J. E. Bauer No. 1 Tonn	SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ 15-25-5W	2,795	3,957	4,054	4,103
Herman Kaiser No. 1 Meyers	SE cor. SE $\frac{1}{4}$ 1-25-10W	3,401	4,164	4,333	4,360
Phillips Petroleum Co. No. 1 Eck	SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ 31-26-4W	2,831	4,021		4,038
Amerada Petroleum Corp. No. 1 Tonn	SW cor. NW $\frac{1}{4}$ 11-26-5W	2,830	4,007	4,118	4,143
Stickle Drilling Co. et al. No. 1 Graham	NE cor. SW $\frac{1}{4}$ 8-26-6W	3,031	4,074	4,199	4,234

to test the Mississippian "chat" and the Viola, the chief producing zones in the county.

The oil and gas pools and dry wildcat tests drilled during 1948 are shown on Figure 40. Information on the oil and gas pools is given in Table 64 and on the dry wildcat tests in Table 65.

RICE COUNTY

Statistical summary for Rice County, 1948

Oil produced	9,184,652 barrels
Gas produced	195,222 thousand cubic feet
Wells drilled:	199
Oil	none
Gas	99
Dry	6
Salt water disposal	304
Total	10 (included in above total)
Wildcat wells	4
New pools: Oil	2
Revived pools	none
Abandoned pools	4
Secondary recovery operations	

Developments during 1948.—The many wells drilled in the county during the year were well scattered over the producing areas. A few "hot spots" developed as a result.

Ten of the many tests drilled were wildcats. Four of these found new pools and two caused revival of old pools. The new pools are: Bowman North, Gemeinhardt, Haferman East, and Welch West; the Bredfeldt and Prosper pools were revived. In

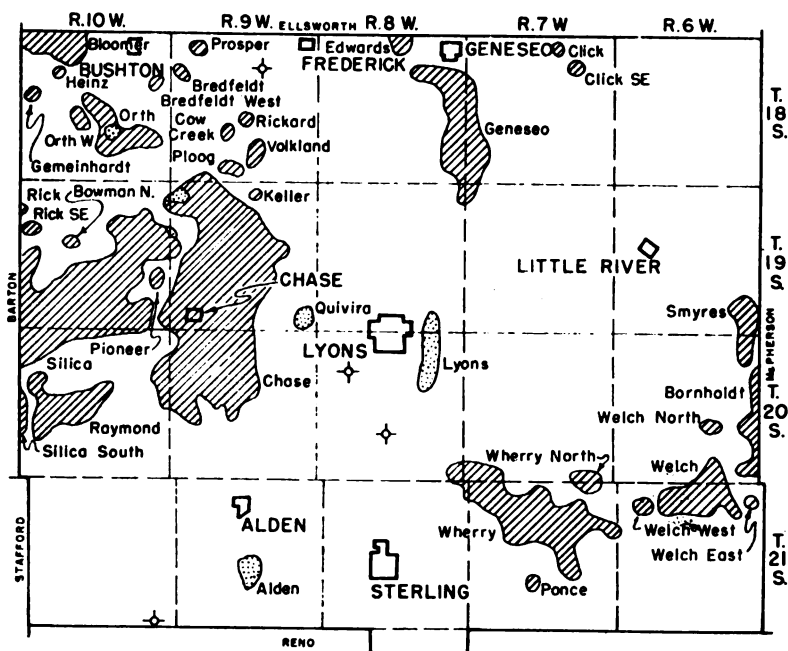


FIG. 41.—Map of Rice County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

some cases these new pools are located relatively close to previous production; however, they are regarded as important discoveries.

The new **Bowman North** pool was found when C. E. Ash completed the first test, rated at 30 barrels initial production, on the "A" lease of the Wendel farm in sec. 16, T. 19 S., R. 10 W. The oil is derived from a porous zone near the top of the Arbuckle dolomite. The **Gemeinhardt** pool was discovered by the Skelly Oil company. The discovery well was drilled on the Gemeinhardt lease in sec. 18, T. 18 S., R. 10 W. to a total depth of 3,297 feet or 4 feet into the Arbuckle dolomite which produces the oil. A potential of 282 barrels per day was assigned to this well.

The **Haferman East** pool was found early in the year when oil was discovered on the Keller farm in sec. 5, T. 19 S., R. 9 W. by The Henderson Oil Company. Here porosity was found in the upper 4 feet of the Arbuckle dolomite and the well was rated at 1,496 barrels per day. The initial success of this new pool encouraged owners of adjacent leases to drill wells in rapid succession. About 20 new oil wells were added before it became evident

that this new pool was a part of the Chase pool. The Nomenclature Committee, therefore, officially joined the Haferman East as well as the older **Haferman** and **Soeken** pools to the large Chase pool.

In Table 41 the production in these pools is included under the Chase pool.

The **Welch West** pool was found by Branine and Holl and Allen when the first successful test on the Turner farm in sec. 6, T. 21 S., R. 6 W. was completed. Here the oil was found in the cherty detritus of the Mississippian (Osagian) limestone. The geological sequence of beds and the underground geology of this part of Rice County is given by Ver Wiebe (1942, p. 82). This material directly underlies the Sooy conglomerate and is sometimes very difficult to distinguish from the Sooy. In the discovery well the Sooy was found at 3,484 feet and the Mississippian chert at 3,498 feet. The oil was found between 3,498 and 3,507. The well had an initial production of 40 barrels per day.

The **Prosper** pool was revived by the Birmingham-Bartlett Drilling Company well drilled on the "C" lease of the Habiger ranch in sec. 6, T. 18 S., R. 9 W. Production of about 84 barrels per day is from the Arbuckle between 3,232 and 3,241 feet. Less than a mile farther southwest oil was found in sec. 7 on the Bredfeldt farm. This revived the **Bredfeldt** pool, the original discovery well having been drilled in April 1937 by the Empire Oil and Refining Company. After producing 13,700 barrels of oil this well was abandoned and the pool name discontinued. The Palmer Oil Corporation which drilled the rediscovery well, with a potential of 448 barrels, later completed a second well with a potential of 557 barrels on the same lease.

There was continued interest in the older pools of this county. Many fringe wells as well as inside locations were drilled. In the **Edwards** pool one, and in the near-by **Geneseo** pool, six new oil wells were drilled.

There was intensive drilling in the area of the **Orth** pools with 26 new oil wells completed of which 12 are Arbuckle wells. Production was found chiefly in the Arbuckle dolomite, which in this pool is very thin and sometimes absent. In one deep salt-water disposal well, the Vickers Petroleum Company, Inc. No. 2 Schoening in sec. 21, T. 18 S., R. 10 W., an unusual thickness, 238 feet, of Arbuckle was found. Where the Arbuckle dolomite is missing,

oil may occur in the overlying Sooy or in the underlying Pre-Cambrian quartzite. Oil production in the Pre-Cambrian is unusual although two wells drilled in Rice County during 1948 derive their oil from these basement rocks. In one well the basal sandstone beneath the Arbuckle was found to contain oil. Two of the new wells produce from the Pennsylvanian basal rubble, called Sooy or Gorham. Another interesting development during 1948 in the Orth pool was the completion of eight producers in the Topeka limestone at the top of the Shawnee sequence. Some of these are old wells which have become exhausted at lower depths and which were worked over and recompleted in this higher zone. Others are new wells drilled only to the Topeka level.

The Chase pool now covers a very large area on account of new fringe wells and the addition of the Haferman, Haferman East,

TABLE 66.—Oil and gas pools of Rice County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Bloomer ¹ 36-17-11W	1936	1,400	1,178,347	9,767,308	77	K.C.-Lans. Arbuckle	3,044 3,257
Bowman 21-19-10W	1936	•	combined with Silica				
Bowman North 16-19-10W	1948	80	4,249	4,249	2	Arbuckle	3,331
Bornholdt ² 30-20-5W	1937	1,180	76,557	1,231,668	20	"Chat"	3,292
Brandenstein 10-19-10W	1933		combined with Silica				
Bredfeldt ³ 7-18-9W	1948	100	12,539	26,260	2	Arbuckle	3,226
Bredfeldt West 12-18-10W	1939	80	2,836	53,076	2	Arbuckle	3,260
Chase 32-19-9W	1931	20,420	2,912,765	50,105,287	476	K.C.-Lans. "Wilcox" Arbuckle	2,942 3,260 3,246
Click 3-18-7W	1943	40	no production reported	5,632		"Misener"	3,182
Click Southeast 11-18-7W	1947	40	3,908	6,011	1	K.C.-Lans.	3,065
Cow Creek 28-18-9W	1946	40	no production reported	765		Arbuckle	3,249
Doran 13-19-10W	1936		combined with Silica				
Doran West 14-19-10W	1944		combined with Silica				
Edwards ⁴ 3-18-8W	1936	530	22,021	63,261	5	Arbuckle	3,278
Gemeinhardt 18-18-10W	1948	40	3,484	3,484	1	Arbuckle	3,293
Geneseo 25-18-8W	1934	5,600	2,326,574	24,169,068	191	K.C.-Lans. Arbuckle	2,787 3,132
Haferman 6-19-9W	1936		combined with Chase				
Haferman East 5-19-9W	1948		combined with Chase				

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Heinz 8-18-10W	1938	80	3,972	85,278	2	K.C.-Lans. Arbuckle	3,000 3,254
Keller 3-19-9W	1943	40	3,465	33,521	1	Sooy	3,240
Orth 27-18-10W	1932	1,500	259,324	1,793,272	42	Shawnee K.C.-Lans. Sooy Pre-Cambrian	2,915 3,187 3,240
Orth West 21-18-10W	1944	360	55,430	65,877	8	Arbuckle	3,235
Pioneer 25-19-10W	1942	160	22,164	90,368	4	Arbuckle	3,281
Ploog 33-18-9W	1930	400	26,368	1,488,934	4	Arbuckle	3,252
Ponce 28-21-7W	1936	40	2,348	50,253	1	Sooy	3,388
Prosper ¹ 6-18-9W	1948	80	3,814	3,814	1	Arbuckle	3,232
Raymond 21-20-10W	1929	2,500	591,390	11,697,856	72	Wabaunsee K.C.-Lans. Arbuckle	2,285 3,130 3,330
Rick ⁵ 1-19-11W	1936	40	1,546	40,635	1	K.C.-Lans. Arbuckle	3,106 3,355
Rick Southeast 18-19-10W	1947	100	25,487	26,191	3	Arbuckle	3,334
Rickard 22-18-9W	1935	200	9,465	161,177	4	Arbuckle	3,324
Silica ⁵ 12-20-11W	1931	11,600	722,873	26,510,216	265	K.C.-Lans. Arbuckle	2,955 3,328
Silica South ⁵ 24-20-11W	1935	280	included	with Silica		K.C.-Lans. Arbuckle	3,035 3,268
Smyres 36-19-6W	1942	1,200	255,861	1,557,822	32	"Chat"	3,339
Soeken 10-19-9W	1937		combined	with Chase			
Volkland 27-18-9W	1943	400	71,630	421,767	7	Arbuckle	3,221
Welch 35-20-6W	1924	2,560	306,230	5,202,696	61	"Chat"	3,370
Welch East 1-21-6W	1941	80	1,341	29,148	2	"Chat"	3,341
Welch North 23-20-6W	1937	160	5,642	85,940	3	"Chat"	3,334
Welch West 6-21-6W	1941	80	4,841	4,841	1	"Miss. lime"	3,498
Wherry 11-21-7W	1933	7,200	190,584	10,253,964	63	Sooy	3,358
Wherry North 35-20-7W	1947	250	77,597	126,097	7	Sooy	3,423

thousand cubic feet

Alden 22-21-9W	1937	400	no production reported	13,801,113		"Misener"	3,317
Chase (gas) 6-19-9W	1936	100	16,040	116,735	2	Arbuckle	3,192
Haferman (gas) 6-19-9W	1936		combined	with Chase			
Lyons 35-19-8W	1888	1,100	57,620	12,257,309	4	Simpson Arbuckle	3,290 3,277
Orth (gas) 27-18-10W	1933	160	53,304		2	K.C.-Lans.	2,906
Quivira 36-19-9W	1947	640	68,253	211,244	5	Tarkio	2,117

¹ Field extends into Barton and Ellsworth Counties.

² Field extends into McPherson County.

³ Old name revived.

⁴ Field extends into Ellsworth County.

⁵ Field extends into Barton County.

and Soeken producing areas. During 1948, 52 new Arbuckle wells were completed in the pool. One of the dry holes, the D. R. Lauck Oil Company, Inc. No. 3 Six well in sec. 27, T. 19 S., R. 9 W., found more than 500 feet of Arbuckle rocks. In certain parts of this pool the Simpson attains considerable thickness and in those parts it may contain oil, as in secs. 18, 19, and 20, T. 20 S., R. 9 W. and along the western sides of secs. 1 and 13, T. 20 S., R. 10 W. During 1948, 13 of the new wells were completed in the sandstone phase of the Simpson and five in the oölitic zones of the Kansas City-Lansing limestone.

The **Raymond** and much of the **Silica**, both important pools, are located in T. 20 S., R. 10 W. The Silica is the fourth largest producing pool in the State. The most interesting development in the Raymond-Silica area was the finding of oil in a sandstone lens of the Wabaunsee group. The sandstone was first found to be productive between 2,285 and 2,290 feet in the J. M. Huber Corporation No. 1 Schurr well in sec. 21, T. 20 S., R. 10 W. In the first reports from the discovery, the producing zone was called the "Indian Cave sand" in the belief that it was the same sandstone which is considered the basal sandstone in the Permian System. Later checking suggests that the sandstone lies within the Wabaunsee group rather than just above that group. The Silica pool now includes the **Bowman**, **Brandenstein**, **Doran**, and **Doran West** pools.

A layer of cherty material left from the solution of the Mississippian limestones is the producing zone in the **Smyres** and the **Bornholdt** pools. It has yielded a large amount of oil (Table 66). Three of the new oil wells listed in the statistical summary were completed in the Smyres pool. Farther south in the **Wherry** pool, where the oil comes from a cherty rubble accumulated with red clay in the early Pennsylvanian seas, five new oil wells were com-

TABLE 67.—*Dry wildcat tests drilled in Rice County during 1948*

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Viola, feet	Depth to top of Arbuckle, feet	Total depth, feet
G. W. Keyes Drilling Co. No. 1 Schroeder	SW cor. NE $\frac{1}{4}$ 10-18-9W	2.886		3.281	3.305
Robert L. Williams No. 1 Cherpitel	NW $\frac{1}{4}$, NE $\frac{1}{4}$, SW $\frac{1}{4}$ 8-20-8W	2.892	3.445	not reached	3.450
Alpine Oil & Royalty Co., Inc. No. 1 Johnson	NE cor. NE $\frac{1}{4}$ 28-20-8W	2.862	3.344	3.445	3.505
Lewis Drilling Co. No. 1 Tyrell	SW cor. SW $\frac{1}{4}$ 36-21-10W	3.077	3.423	3.545	3.594

pleted during 1948. The **Smyres, Bornholdt, Wherry, Ponce and Welch** pools are excellent examples of stratigraphic-type oil pools. Thus they stand in strong contrast to the Geneseo pool of northern Rice County where the oil has accumulated in an anticlinal structure.

A wildcat test drilled between the **Lyons and Quivira** gas pools in sec. 8, T. 20 S., R. 8 W. on the Cherpitel farm by Robert L. Williams found Pennsylvanian rocks lying directly on Kinderhookian shale at 3,248 feet, no Mississippian limestone or chert intervening. No features of especial significance were revealed in the other wildcat wells.

The oil and gas pools of Rice County and the dry wildcat tests drilled during 1948 are shown on Figure 41. The pools are listed in Table 66 and the dry wildcat tests in Table 67.

ROOKS COUNTY

Statistical summary for Rooks County, 1948

Oil produced	3,596,944 barrels
Gas produced	none
Wells drilled:	
Oil	134
Gas	none
Dry	103
Salt water disposal	4
Total	241
Wildcat wells	35 (included in above total)
New pools: Oil	11
Revived or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—The most actively prospected county in western Kansas during 1948 was Rooks. The many new pools found during the previous year stimulated the search for additional pools. A large number of wells, 241, including 35 wildcats, were drilled. The wildcats are well scattered over the county and the percentage of new oil wells was gratifying.

Eleven new pools were discovered in the county during 1948. These are: **Barry West, Berland, Chandler, Gra-Rook, Krueger, Lone Star, McHale, Marc, Nettie, Northampton, and Plainville.** In addition, new producing zones were found in old pools. In the **Barry East** pool the Kansas City-Lansing limestone was found to contain oil. In the **Westhusin** pool the new producing zone is the **Arbuckle dolomite.**

The new **Berland** pool was found by The Texas Company when they completed the first well on the **Berland** lease in sec. 19, T. 10

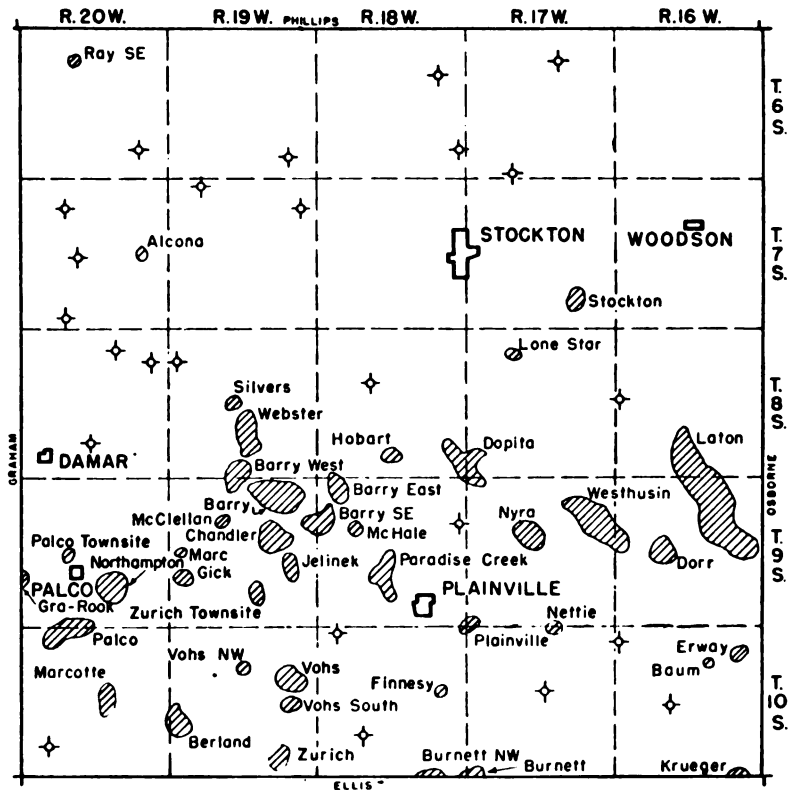


FIG. 42.—Map of Rooks County showing oil pools and dry wildcat tests drilled during 1948.

S., R. 19 W. The initial capacity of this first well was 160 barrels of oil per day. Before the end of the year The Texas Company had completed nine additional wells in the pool. One of these was a dry hole and is being used as a salt-water disposal well. The highest well structurally in this pool reached the productive Arbuckle dolomite at 1,552 feet below sea level while the lowest producing well reached Arbuckle 23 feet lower. Two dry holes reached the producing zone at 1,577 feet below sea level indicating that the water line lies at about that depth. The average producer is drilled about 4 feet into the Arbuckle dolomite. It is interesting to note that rocks of Simpson age, containing some dolomite, are present in this pool. In the discovery well the Simpson was found to be 26 feet thick, the maximum thickness so far found in the pool

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being 40 feet. In the No. 3 Berland well, the Arbuckle, too low to produce oil, was 489 feet thick.

The new **Chandler** pool is located less than a mile south of the Barry pool. The discovery well was drilled by Harry Gore in sec. 14, T. 9 S., R. 19 W. on the Ruder farm. Here the Arbuckle dolomite is the producing zone and the well was rated at 3,000 barrels of oil per day. At present there are 14 oil wells in this pool. The highest structurally produces from 1,370 feet below sea level; the lowest produces from about 1,425 feet below sea level. These depths correspond rather closely to depths in the Barry pool.

The new **Barry West** pool was opened by the Westgate-Greenland Oil Company with their No. 1 McClellan well. Oil occurs in the Arbuckle dolomite and the capacity of the first well was given as 314 barrels per day. Before the end of the year an additional 12 oil wells had been completed in the pool. The highest and lowest wells structurally produce from the Arbuckle dolomite at 1,421 and 1,434 feet, respectively. In November, Petroleum, Inc. drilled a well on the Veverka lease in sec. 34, T. 8 S., R. 19 W. which seems to establish an underground connection between the Barry West and the Webster pools. Therefore, these two are now regarded as a single oil reservoir.

The new **Lone Star** pool was discovered by the Bay Petroleum Corporation with their Hunter No. 1 in sec. 4, T. 8 S., R. 17 W. The discovery well produces about 80 barrels of oil with 60 barrels of water per day from the Arbuckle between 3,382 and 3,386 feet. The depth of the Arbuckle below sea level is about the same here as it is in the Dopita pool in the southwest corner of the same township.

The new **Northampton** pool is located in the western part of the county near Palco. Here Nadel and Gussman got a 3,000 barrel well with their first test on the Marcotte farm in sec. 26, T. 9 S., R. 20 W. Before the end of the year, 15 additional oil wells had been completed in this pool. The structurally highest and lowest wells reached the productive Arbuckle dolomite at depths below sea level of 1,537 and 1,570 feet, respectively. Although the Pennsylvanian basal rubble generally lies on the Arbuckle in this part of the State, a few wells in this pool have found rocks of Simpson age.

The new **Krueger** pool was found by a rank wildcat test drilled by the Cities Service Oil Company on the Krueger farm in sec.

35, T. 10 S., R. 16 W. The Arbuckle dolomite, found at 3,649 feet, contained only water; the hole was plugged back to showings previously noted in the Kansas City-Lansing. Perforations were made in the pipe opposite the Dodge limestone and after considerable testing, the well was completed there for 900 barrels of oil and 135 barrels of water per day. During December, the Cities Service Oil Company completed a second well in the Kansas City-Lansing on the adjacent Gish lease.

A new pool named the **McHale**, located less than 1 mile east of the Barry Southeast pool, was discovered by the National Co-operative Refinery Association with their No. 1 Smith well in sec. 8, T. 9 S., R. 18 W. The first well was rated at 1,480 barrels per day from the Arbuckle dolomite. Two offset wells, one dry and one a producer, were completed before the end of the year. The oil wells produce from depths below sea level ranging from 1,423 to 1,437 feet. The dry hole seemingly penetrated a sinkhole as the Pennsylvanian basal rubble proved to be very thick and no Arbuckle was found before the test was abandoned.

The new **Gra-Rook** pool, located on the extreme western side of the county in sec. 30, T. 9 S., R. 20 W., was found by Nadel and Gussman when their first test on the Baldwin farm was completed in October. The well, producing from the Arbuckle dolomite, had an initial capacity of 1,226 barrels per day.

The new **Marc** pool is located 4 miles east of Palco and about 1 mile north of the Gick pool. The Aylward Drilling Company

TABLE 68.—Oil pools of Rooks County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Alcona 14-7-20W	1946	40	460	3,232	1	Arbuckle	3,499
Barry 11-9-19W	1942	1,280	794,646	3,279,429	40	K.C.-Lans. Arbuckle	3,435
Barry East 6-9-18W	1947	360	101,633	107,907	8	K.C.-Lans. Arbuckle	3,280 3,489
Barry Southeast 13-9-19W	1946	600	303,931	557,271	21	Arbuckle	3,479
Barry West 4-9-19W	1948	640	50,064	50,064	11	Arbuckle	3,442
Baum 10-10-16W	1942	40	2,070	12,272	1	K.C.-Lans.	3,057
Berland 19-10-19W	1948	500	20,910	20,910	9	Arbuckle	3,802
Burnett ¹ 1-11-18W	1937	200	88,605	802,321	7	K.C.-Lans. Arbuckle	3,093 3,570
Burnett Northwest ¹ 3-11-18W	1946	200	80,499	143,778	2	K.C.-Lans. Arbuckle	3,450 3,617

Chandler 14-9-19W	1948	600	64,217	64,217	12	Arbuckle	3,455
Dopita 31-8-17W	1934	820	50,446	535,528	10	K.C.-Lans. Arbuckle	3,212 3,409
Dorr 20-9-16W	1942	600	99,248	313,542	14	K.C.-Lans.	3,230
Erway 2-10-16W	1941	60	7,160	56,313	1	K.C.-Lans.	3,136
Finnesy 14-10-18W	1947	40	4,729	5,162	1	K.C.-Lans.	3,419
Gick 30-9-19W	1947	80	27,414	27,414	2	Arbuckle	3,578
Gra-Rook ² 30-9-20W	1948	80	2,439	2,439	1	Arbuckle	3,869
Hobart 33-8-18W	1944	80	611	36,200	2	K.C.-Lans.	3,209
Jelinek 23-9-19W	1947	340	73,288	73,288	8	Arbuckle	3,537
Krueger ¹ 35-10-16W	1948	120	5,245	5,245	2	K.C.-Lans.	3,552
Laton 11-9-16W	1927	4,350	238,903	3,234,915	104	K.C.-Lans.	3,228
Lone Star 4-8-17W	1948	40	4,138	4,138	1	Arbuckle	3,382
McClellan 9-9-19W	1945	120	6,753	35,369	2	K.C.-Lans.	3,343
McHale 8-9-18W	1948	80	5,141	5,441	2	Arbuckle	3,494
Marc 18-9-19W	1948	40	2,867	2,867	1	K.C.-Lans.	3,370
Marcotte 15-10-20W	1943	540	133,446	633,889	12	Arbuckle	3,752
Nettie 34-9-17W	1948	40	220	220	1	K.C.-Lans.	3,243
Northampton 26-9-20W	1948	640	151,583	151,583	16	Arbuckle	3,803
Nyra 16-9-17W	1946	160	13,617	34,803	4	K.C.-Lans.	3,429
Palco 5-10-20W	1943	640	107,697	304,691	16	Arbuckle	3,824
Palco Townsite 20-9-20W	1945	40	1,956	10,133	1	Arbuckle	3,847
Paradise Creek 21-9-18W	1947	1,000	411,678	628,699	30	Arbuckle	3,576
Plainville 31-9-17W	1948	40	1,534	1,534	1	K.C.-Lans. Arbuckle	3,477 3,613
Ray Southeast 9-6-20W	1942	40	6,213	59,184	1	Reagan	3,600
Silvers 21-8-19W	1947	160	27,918	37,315	6	Arbuckle	3,466
Stockton 35-7-17W	1937	300	15,113	70,609	4	Shawnee K.C.-Lans.	2,692 3,180
Vohs 14-10-19W	1945	900	256,985	702,641	21	K.C.-Lans.	3,365
Vohs Northwest 9-10-19W	1947	80	23,104	33,047	2	K.C.-Lans.	3,446
Vohs South 23-10-19W	1947	40	4,567	6,069	1	K.C.-Lans.	3,303
Webster 27-8-19W	1946	800	238,811	577,875	23	Arbuckle	3,403
Westhusin 11-9-17W	1936	1,300	90,268	1,198,716	26	K.C.-Lans. Arbuckle	3,231 3,408
Zurich 26-10-19W	1935	600	12,606	226,588	7	K.C.-Lans.	3,340
Zurich Townsite 27-9-19W	1944	300	63,907	88,556	7	Arbuckle	3,647

¹ Field extends into Ellis County.² Field extends into Graham County.

drilled the opener on the Marcotte farm in sec. 18, T. 9 S., R. 19 W. Production was found in the Kansas City-Lansing between 3,370 and 3,374 feet, about 90 feet below the top of the sequence. The discovery well produces 91 barrels of oil per day with 40 percent water.

The Nettie pool was discovered when the Phillips Petroleum Company drilled a rank wildcat test in sec. 34, T. 9 S., R. 17 W.

TABLE 69.—Dry wildcat tests drilled in Rooks County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
M. B. Armer, Inc. No. 1 Duncan	SW cor. NE $\frac{1}{4}$ 10-6-17W	3,102	3,588	3,618
Westgate Greenland Oil Co. No. 1 Behrens	SE cor. SE $\frac{1}{4}$ 32-6-17W	2,979	3,295	3,347
Coop. Refinery Corp & Allan No. 1 Bing	SE cor. SE $\frac{1}{4}$ 11-6-18W	3,152	3,495	3,503
The Bay Petroleum Corp. No. 1 McConnell	SW cor. SE $\frac{1}{4}$ 25-6-18W	3,125	3,498	3,550
Bridgeport Oil Co., Inc. No. 1 Hindman	NE cor. NE $\frac{1}{4}$ 35-6-19W	3,265	3,538	3,588
B.&R. & Westgate-Greenland No. 1 Summerheiser	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ 26-6-20W	3,320	3,592	3,677
Coop. Refinery Corp. No. 1 Harlan	SE cor. NW $\frac{1}{4}$ 5-7-19W	3,209	3,474	3,535
R. W. Rine Drilling Co. No. 1 Baxter	NE cor. NW $\frac{1}{4}$ 12-7-19W	3,121	3,454	3,505
Sam Pack No. 1 Felderman	NE cor. NE $\frac{1}{4}$ 8-7-20W	3,419	3,682	3,732
Sam Pack No. 1 Bogart	NE cor. NW $\frac{1}{4}$ 21-7-20W	3,331	3,589	3,660
Sam Pack No. 1 Conyac	NE cor. SE $\frac{1}{4}$ 32-7-20W	3,203	3,476	3,536
Crow Drilling Co. et al. No. 1 Chesney	SW cor. SW $\frac{1}{4}$ 18-8-16W	3,007	3,335	3,365
The Bay Petroleum Corp. & Hinkle Oil Co. No. 1 "A" Dickinson	NW cor. NW $\frac{1}{4}$ 16-8-18W	3,196	3,505	3,560
M. B. Armer, Inc. No. 1 McCormick	SE cor. NW $\frac{1}{4}$ 7-8-19W	3,144	3,421	3,460
Sam Pack No. 1 Miller-Shaw	SE cor. SE $\frac{1}{4}$ 3-8-20W	3,186	3,453	3,470
Continental Oil Co. No. 1 Schneider	SE cor. NW $\frac{1}{4}$ 12-8-20W	3,198	3,455	3,505
Continental Oil Co. No. 1 Berland	NE cor. SE $\frac{1}{4}$ 28-8-20W	3,258	3,548	3,601
National Coop. Ref. Assn. No. 1 Richardson	SW cor. SE $\frac{1}{4}$ 12-9-18W	3,184	3,558	3,578
Herndon Drilling Co. No. 1 Henderson	SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ 6-10-16W	3,222	3,615	3,658
Doley Oil Co. No. 1 Zeigler	NW cor. NW $\frac{1}{4}$ 21-10-16W	3,257	3,737	3,780
Heathman-Honaker et al. No. 1 Bice	NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ 15-10-17W	3,291	3,671	3,721
Vickers Petroleum Co., Inc. No. 1 Hilgers	NE cor. NE $\frac{1}{4}$ 6-10-18W	3,409	3,738	3,747
Birmingham-Bartlett Drig. Co. No. 1 Buell	SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ 29-10-18W	3,319	3,674	3,705
Doley Oil Co. No. 1 Thomas	SW cor. SW $\frac{1}{4}$ 29-10-20W	3,400	3,719	3,724

The test found a good showing of oil in the Kansas City-Lansing, was drilled on to test the Arbuckle, and then was plugged back and completed in a porous zone between 3,243 and 3,268 feet in the Kansas City-Lansing limestone. The well was rated at 170 barrels of oil and 500 barrels of water per day.

The new Plainville pool resulted from the drilling by W. L. Hartman of a well on the Westhusin farm in sec. 31, T. 9 S., R. 17 W. Here the Topeka limestone was reached at 3,045 feet, the Heebner black shale at 3,265 feet, the Kansas City-Lansing limestone at 3,304 feet, the Sooy at 3,547 feet, Simpson shale at 3,581 feet, Simpson dolomite at 3,583 feet, and the Arbuckle dolomite at 3,613 feet. The total depth of this test was 3,615 feet. Only water was found in the Arbuckle dolomite, so the hole was plugged back to 3,516 feet. The casing was perforated between 3,477 and 3,488 feet in the Kansas City-Lansing, the well acidized with 2,500 gallons, and completed with a potential capacity of 12 barrels per day.

There was active prospecting in the older pools of Rooks County during 1948. Oil wells added to the older pools were: **Laton, 13; Webster, 6; Dorr, 3; Westhusin, 5; Barry East, 8; and Barry Southeast, 4.** The Skelly Oil Company found the Arbuckle dolomite at 1,451 feet below sea level in the No. 8 Hilgers well in the Barry Southeast pool. This well, which cut 279 feet of Arbuckle, was drilled to a total depth of 3,804 feet for salt water disposal. The lowest oil well structurally to date in this pool produces from a depth of 1,434 feet below sea level indicating that the water level lies between 1,434 and 1,451 feet below sea level. In the main Barry pool three new oil wells were added, two in the **Paradise Creek** pool, and seven in the **Jelinek** pool. All seven new Jelinek wells produce from the Arbuckle dolomite. Five new wells were added in the **Zurich Townsite** pool, 11 in the **Palco**, and 1 in the **Erway**.

Figure 42 shows that wildcat tests were drilled in nearly every township in this county. Almost without exception these were drilled deep enough to test the Arbuckle dolomite. In most cases this dolomite was penetrated for approximately 50 feet before the test was abandoned. A list of the wildcat wells is given in Table 69. In the Bridgeport Oil Company, Inc. No. 1 Hindman well, sec. 35, T. 6 S., R. 19 W., the Arbuckle dolomite was found to be only 40 feet thick and drilling was stopped in the basal

sandstone which here is the true Reagan or Lamotte sandstone. A few miles farther west in sec. 26, T. 6 S., R. 20 W. the B. and R. Drilling Company and Westgate-Greenland Oil Company found the Arbuckle to be 71 feet thick and the Reagan sandstone present below it.

In general the wildcat tests show that the Pennsylvanian basal rubble lies directly on the Arbuckle dolomite in the upper three rows of townships. In T. 9 S., however, the Simpson rocks are rather commonly present between them. This condition is present especially in the eastern part of the county. In T. 10 S. the Viola dolomite and limestone occasionally are between the Simpson and Pennsylvanian rocks as in sec. 15, T. 10 S., R. 17 W.

Oil pools and dry wildcats are shown on Figure 42. The oil pools are listed in Table 68.

RUSH COUNTY

Statistical summary for Rush County, 1948

Oil produced	531,780	barrels
Gas produced	3,945,755	thousand cubic feet
Wells drilled: Oil	13	
Gas	none	
Dry	19	
Total	32	
Wildcat wells	10	(included in above total)
New or revived pools	none	
Abandoned pool: Oil	1	
Secondary recovery operations	none	

Developments during 1948.—There was about the usual amount of annual drilling in Rush County during the year. Most of it was close to producing areas. Figure 43 shows the location of the 10 wildcat tests, none of which found new pools. They did yield some valuable geological information.

An effort was made to extend the **Loretto** pool in the north-eastern part of the county, but the test well was dry. In the **Weitzel** pool, located in the northwestern part of the county, three tests were made to extend production. All were abandoned.

During 1948 a producer was drilled between the **Albert** and the **Albert West** pools. This well is the Armer Drilling Company, Inc. No. 1 Rodie well in sec. 27, T. 18 S., R. 16 W. Therefore, the Nomenclature Committee officially declared these two pools joined to the **Bird** pool of Barton County and the **Otis** pool. The new name for this large producing area is the **Otis-Albert** pool.

Eleven new oil wells were added in the **Ryan** pool and an im-

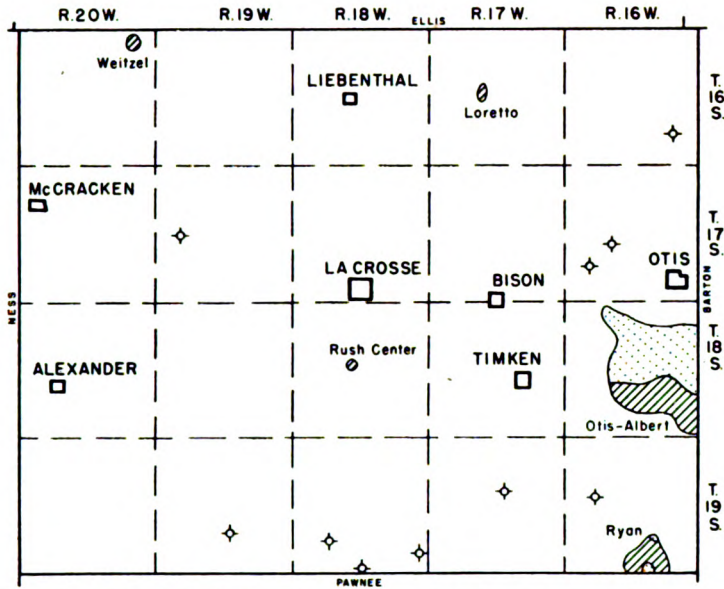


FIG. 43.—Map of Rush County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

portant extension on the northwest side was developed. All the new wells produce from the Arbuckle dolomite. The highest structurally of the new wells produces from 1,675 feet below sea level, and the lowest from about 1,710 feet below sea level. One well drilled by the Champlin Refining Company on the McKinney lease in the SW cor. SW $\frac{1}{4}$ sec. 26, T. 19 S., R. 16 W. was originally reported as producing oil from Simpson rocks. The finding of Simpson rocks in some of the marginal dry holes in this pool was an unexpected development.

A rank wildcat test was drilled by Ben F. Brack Oil Company, Inc. on the Hoffman farm in sec. 26, T. 16 S., R. 16 W. Here the Arbuckle, at 3,576 feet, was dry. Two wildcat tests were drilled about 3 miles northwest of the Otis-Albert pool in T. 17 S., R. 16 W. In one of these, drilled by the Westgate-Greenland Oil Company on the Ochs lease in sec. 21, the Arbuckle, 29 feet thick, was found at 3,720 feet and the Reagan sandstone at 3,749 feet. In the other test, drilled in sec. 29 by Westgate-Greenland and the Drillers Gas Company, both the Arbuckle dolomite and Reagan sandstone were absent. The top of the Pre-Cambrian granite wash was found at 3,559 feet.

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TABLE 70.—Oil and gas pools of Rush County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Albert 30-18-15W	1935	combined with Otis					
Albert West 28-18-16W	1946	combined with Otis-Albert					
Loretto 21-16-17W	1945	40	no production reported	none		K.C.-Lans.	3,280
Otis-Albert ¹ 10-18-16W	1934	3,100	198,200	4,380,183	44	Reagan	3,527
Rush Center 16-18-18W	1947	40	2,936	7,001	1	Arbuckle	3,836
Ryan ² 35-19-16W	1945	1,300	317,635	616,517	35	Arbuckle	3,656
Tammen 24-19-16W	1947	abandoned during 1948					
Weitzel 1-16-20W	1947	80	13,009	22,371	2	Gorham	3,674
<i>thousand cubic feet</i>							
Otis-Albert (gas) ¹ 11-18-16W	1930	6,850	1,778,015		46	Neva Reagan	3,507
Ryan (gas) ² 35-19-16W		180	2,167,740		8		

¹ Field extends into Barton County.

² Field extends into Pawnee County.

A wildcat well drilled by the Cities Service Oil Company on the Kleinsteiber farm in sec. 29, T. 19 S., R. 18 W. found that the basal Pennsylvanian rocks overlie the Arbuckle dolomite. A good sandstone was encountered at 4,010 feet. A second wildcat in this township, drilled in sec. 34 by the Virginia Drilling Company, Inc., also found the Pennsylvanian rocks directly overlying the Arbuckle dolomite in which the hole ended. Two miles farther east, in sec. 36, D. R. Lauck Oil Company, Inc. drilled a dry wildcat test, the No. 1 Conrad, finding the conglomerate at 3,996 feet.

Sohio Petroleum Company et al. drilled a well in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 19 S., R. 16 W. to test the area near the location of a 1931 well which is reported to have come in making 400 barrels of oil per day. The Greenwalt pool thus discovered was later abandoned. No shows were found in the 1948 test, which topped the Arbuckle at 3,831 feet and was abandoned at 3,867 feet.

Table 70 gives information concerning the oil and gas pools and Table 71 gives data regarding the dry wildcat tests drilled during 1948. The oil and gas pools and dry wildcat tests are shown on Figure 43.

TABLE 71.—Dry wildcat tests drilled in Rush County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
Ben F. Brack Oil Co., Inc. No. 1 Hoffman	NE cor. SE $\frac{1}{4}$ 26-16-16W	3,308	3,576	3,660
Westgate-Greenland Oil Co. No. 1 Ochs	SW cor. NW $\frac{1}{4}$ 21-17-16W	3,395	3,720	3,750
Westgate Greenland Oil Co. & Drillers Gas Co. No. 1 Hartung	SW cor. NW $\frac{1}{4}$ 29-17-16W	3,354		3,584
Virginia Drilling Co., Inc. No. 1 Wellman	NW cor. NW $\frac{1}{4}$ 20-17-19W	3,554	3,944	3,974
Sohio Petroleum Co. No. 1 Greenwalt	NE cor. SW $\frac{1}{4}$ 17-19-16W	3,483	3,831	3,867
Magnolia Petroleum Co. No. 1 Raup	SE cor. NW $\frac{1}{4}$ 15-19-17W	3,556	3,954	4,004
Cities Service Oil Co. No. 1 Kleinstieber	NW cor. SE $\frac{1}{4}$ 29-19-18W	3,603	4,061	4,091
Virginia Drilling Co., Inc. No. 1 Tammen	SW cor. SW $\frac{1}{4}$ 34-19-18W	3,606	4,029	4,100
D. R. Lauck Oil Co., Inc. No. 1 Conard	NW cor. NE $\frac{1}{4}$ 36-19-18W	3,633	4,023	4,100
Virginia Drilling Co., Inc. No. 1 Dechant	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ 27-19-19W	3,722	4,309	4,360

RUSSELL COUNTY

Statistical summary for Russell County, 1948

Oil produced	13,638,374 barrels
Gas produced	none
Wells drilled:	
Oil	173
Gas	none
Dry	78
Salt water disposal	8
Total	259
Wildcat wells	9 (included in above total)
New pools: Oil	3
Revived or abandoned pools	none
Secondary recovery operations	6

Developments during 1948.—As usual there was much drilling activity in Russell County. Although thousands of wells have been drilled in this county, there is still some undeveloped acreage. Three new oil pools were found during 1948: Ney, Meier, and Parker.

The new Ney pool is located a mile from the eastern extremity of the Russell County part of the Trapp pool. The discovery well was drilled by the Wood River Oil and Refining Company, Inc. in the NE $\frac{1}{4}$ sec. 31, T. 15 S., R. 12 W. The well has a capacity of 26 barrels of oil per day and produces from the Kansas City-Lansing limestone. The hole was plugged back from the Arbuckle dolomite which contained only salt water. In two offset wells, drilled later, oil was found in the Arbuckle dolomite, giving the

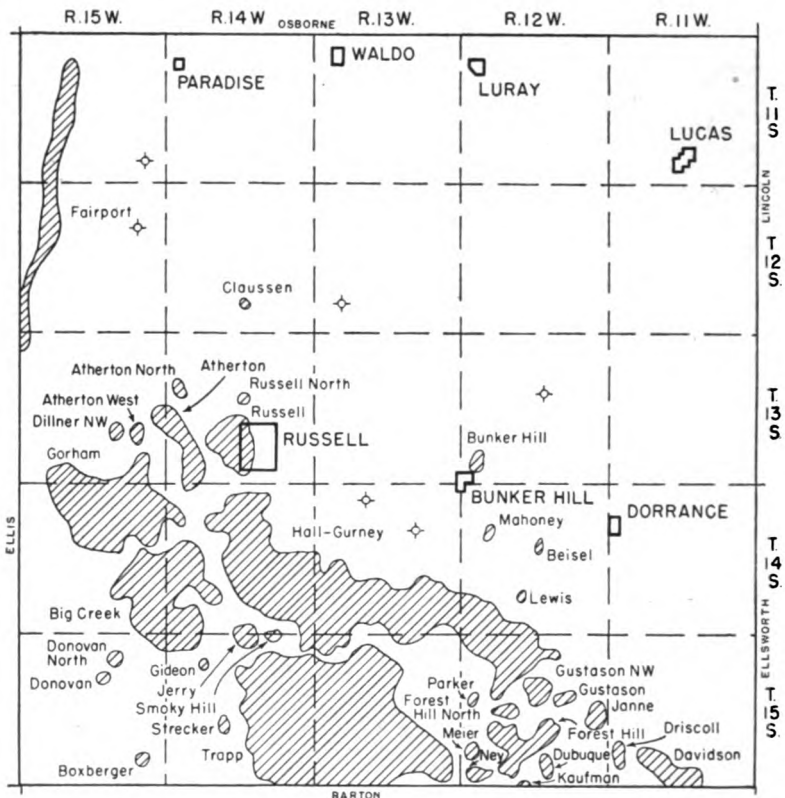


FIG. 44.—Map of Russell County showing oil pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

new pool two producing zones. One salt water disposal well was drilled by the Wood River Oil and Refining Company, Inc. on the Durr lease in the SW $\frac{1}{4}$ sec. 31. Here the Arbuckle is 75 feet thick and the test ended in the Reagan sandstone. One-quarter mile farther west, the same operator completed a well as the No. 3 on the Ney lease. In this test the Arbuckle was absent and the Pre-Cambrian quartzite was found below the Pennsylvanian rocks. The underground relations in this part of Russell County are very similar to conditions described by Walters (1946) in adjacent parts of Barton County. There also quartzite was found on the Prusa Hill and the Krier Hill, features mentioned by Walters, while in near-by areas the Arbuckle dolomite is present and productive.

The **Meier** pool was discovered by The Eldorado Refining Company when the Meier No. 1 well was completed in sec. 30, T. 15 S., R. 12 W. The discovery well was rated at 250 barrels of oil per day from the Arbuckle dolomite at 3,325 feet. Two offset wells were drilled later. One was dry, the other a producer.

The new **Parker** pool is located about 2 miles north of the Meier pool. It was discovered by the Skelly Oil Company with their Parker No. 1 "A" in sec. 18, T. 15 S., R. 12 W. Initial production from the Arbuckle dolomite at 3,259 feet was 23 barrels of oil per day.

Twelve marginal wells were drilled in the old **Fairport** pool in the northwestern part of the county. Several tests were drilled between the Fairport pool and the **Gorham** pool or on the outer margin of the latter. The **Hall-Gurney** pool received 62 additional oil wells and the **Big Creek** pool 14. Two interesting new developments occurred in the Hall-Gurney pool. One was the finding of good production in the Tarkio limestone in six additional wells. The other was the completing of another well, Alva Billings No. 5 Dumler in sec. 24, T. 14 S., R. 14 W., with an initial production of 700 barrels in the basal Permian Indian Cave sandstone. In the Stearns Drilling Company No. 5 Opdycke well in sec. 20,

TABLE 72.—Oil pools of Russell County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Atherton 30-13-14W	1935	1,900	133,468	2,132,096	31	Arbuckle	3,284
Atherton North 7-13-14W	1945	160	8,231	51,403	2	Arbuckle	3,195
Atherton West 23-13-15W	1945	60	no production reported	629		K.C.-Lans.	3,269
Beisel 15-14-12W	1944	40	2,536	14,445	1	Arbuckle	3,266
Big Creek 36-14-15W	1935	6,800	829,340	10,397,159	151	K.C.-Lans. Gorham Arbuckle	2,908 3,152 3,171
Boxberger 36-15-15W	1935	160	9,969	207,063	4	K.C.-Lans.	3,147
Bunker Hill 31-13-12W	1935	200	no production reported	74,828		K.C.-Lans.	2,965
Claussen 27-12-14W	1944	40	2,189	9,081	1	K.C.-Lans.	2,855
Davidson' 4-16-11W	1930	1,150	4,856	144,742	4	K.C.-Lans. Sooy Arbuckle	3,016 3,317 3,314
Dillner Northwest 27-13-15W	1947	80	3,882	3,882	3	Arbuckle	3,318
Donovan 10-15-15W	1935	200	11,642	180,815	3	K.C.-Lans.	3,193

TABLE 72.—Oil pools of Russell County, concluded

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Donovan North 3-15-15W	1945	40	no production reported	none		Arbuckle	3,216
Driscoll 30-15-11W	1940	280	no production reported	65,007		Arbuckle	3,255
Dubuque 34-15-12W	1935	640	44,141	520,976	7	K.C.-Lans. Arbuckle	3,275 3,330
Fairport ² 8-12-15W	1923	4,000	750,609	18,524,952	150	K.C.-Lans. Gorham Arbuckle Reagan	2,950 3,211 3,312 3,350
Forest Hill 29-15-12W	1941	1,800	462,719	1,739,921	42	K.C.-Lans. Shawnee Arbuckle	2,918 2,560 3,320
Forest Hill North 20-15-12W	1947	200	8,867	8,867	3	Arbuckle	3,270
Gideon 8-15-14W	1930	40	no production reported	49,834		Sooy	3,266
Gorham 32-13-15W	1926	7,700	1,665,218	34,481,764	260	Shawnee Arbuckle Reagan	2,765 3,289 3,299
Gustason 14-15-12W	1941	200	13,901	111,471	3	K.C.-Lans.	3,050
Gustason Northwest 15-15-12W	1943	580	103,525	342,512	12	K.C.-Lans. Arbuckle	3,021 3,322
Hall-Gurney 30-14-13W	1931	21,100	3,471,386	37,391,102	696	Indian Cave Wabaunsee Topeka Oread K.C.-Lans. Gorham Arbuckle Pre-Cambrian	1,985 2,400 2,675 2,813 2,985 3,165 3,192 3,156
Janne 24-15-12W	1943	500	9,195	95,652	6	K.C.-Lans. Arbuckle	3,319
Jerry 4-15-14W	1942	320	3,843	46,355	2	Wabaunsee K.C.-Lans. Arbuckle	2,985
Kaufman ¹ 33-15-12W	1947	40	included with Forest Hill			Arbuckle	3,311
Lewis 28-14-12W	1940	40	no production reported	12,753		Wabaunsee	2,317
Mahoney 8-14-12W	1940	40	no production reported	44,489		K.C.-Lans.	2,977
Meier 35-15-12W	1948	60	4,572	4,572	2	Arbuckle	3,325
Ney 31-15-12W	1948	200	29,658	29,658	5	K.C.-Lans. Arbuckle	3,240 3,350
Parker 18-15-12W	1948	40	no production reported	none		Arbuckle	3,259
Russell 22-13-14W	1934	1,740	514,547	7,982,279	62	K.C.-Lans. Arbuckle	3,195 3,280
Russell North 15-13-14W	1942	40	no production reported	21,103		K.C.-Lans.	2,978
Smoky Hill 2-15-14W	1938	100	no production reported	124,429		K.C.-Lans.	2,950
Strecker 21-15-14W	1943	120	4,249	38,719	2	Arbuckle	3,342
Trapp ¹ 23-15-14W	1936	21,800	5,546,831	68,115,358	794	Shawnee Dodge K.C.-Lans. Arbuckle	2,889 2,966 3,062 3,252

¹ Field extends into Barton County.

² Field extends into Ellis County.

TABLE 73.—Dry wildcat tests drilled in Russell County during 1948

Company and farm	Location	Depth to top of K. C.-Lans., feet	Depth to top of Arbuckle, feet	Total depth, feet
H. L. Hunt No. 1 Hartman	Cent. N $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ 36-11-15W	2,961	3,282	3,491
Ben F. Brack Oil Co., Inc. No. 1 Wenger	Cent. S $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 29-12-13W	2,750	3,207	3,257
Stearns Drilling Co. No. 1 Foster	SE cor. SE $\frac{1}{4}$ 11-12-15W	2,949	3,267	3,295
Ben F. Brack Oil Co., Inc. No. 1 Letsch	SE cor. NW $\frac{1}{4}$ 15-13-12W	2,958	3,378	3,455
B. & R. Drilling Co., Inc. No. 1 Shawhan	NW cor. SW $\frac{1}{4}$ 4-14-13W	3,044	3,378	3,390
Koester & Mergen No. 1 Boller	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 11-14-13W	3,010	3,374	3,395

T. 14 S., R. 13 W. oil was found in a lower sandstone at 2,015 feet. The identity of this sandstone has not yet been determined. The thickness of the Arbuckle dolomite in the Hall-Gurney pool was found to be 162 feet when the Gulf Oil Corporation No. 5 Heard well was completed for salt-water disposal. The older formations, present elsewhere in the State, seemingly were never laid down in Russell County. According to Keroher and Kirby (1948, fig. 3), the rocks immediately overlying the Pre-Cambrian in most of Russell County are in the Roubidoux formation.

In the Trapp pool 71 new wells were completed. Forty-nine of these are new oil wells, some being marginal wells and some being inside locations. One of the interesting new developments in this pool is the finding of oil in the Dodge limestone in the Delta Producing Company No. 1 Hefferman well in sec. 4, T. 15 S., R. 13 W. The only other well in the pool which produces from this limestone is the No. 6 Anschutz well of the Sohio Petroleum Company in sec. 10, T. 15 S., R. 13 W. The Cooperative Refinery Association determined the thickness of the Arbuckle dolomite to be 210 feet when they completed their No. 16 Sellens well in the basal sandstone.

The oil pools of Russell County and dry wildcat tests drilled during 1948 are shown on Figure 44. The pools are listed in Table 72 and the dry wildcat tests in Table 73.

SALINE COUNTY

Statistical summary for Saline County, 1948

Oil produced	266,252 barrels
Gas produced	none
Wells drilled: Oil	5
Gas	none

Dry	3
Total	8
Wildcat wells	1 (included in above total)
New pool: Oil	1
Revived or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—A relatively small amount of drilling was done in Saline County during 1948. One new oil pool was found when the Deep Rock Oil Corporation finished the James No. 1 well in sec. 8, T. 16 S., R. 1 W. The new pool derives its oil from the Mississippian rocks between 2,674 and 2,690 feet. The initial potential of the discovery well was 60 barrels of oil and 10 barrels of water. The new pool has been named the **Hunter North**.

In the **Salina** pool, farther north, two new oil wells were added. One was the Jo-Mar Production Company No. 1 Riggs well in the NW¼ sec. 18, T. 14 S., R. 2 W. rated at 25 barrels per day. The oil was found in the coarsely crystalline limestone at the base of the Viola. In the old **Olsson** pool one additional oil well was completed by the Wakeeney Development Company, the Anderson No. 1 well, in sec. 3, T. 16 S., R. 3 W. Here also the oil was found in the coarsely crystalline limestone of the Viola. The well had an initial capacity of 35 barrels per day.

The oil pools are shown on Figure 45 and listed in Table 74.

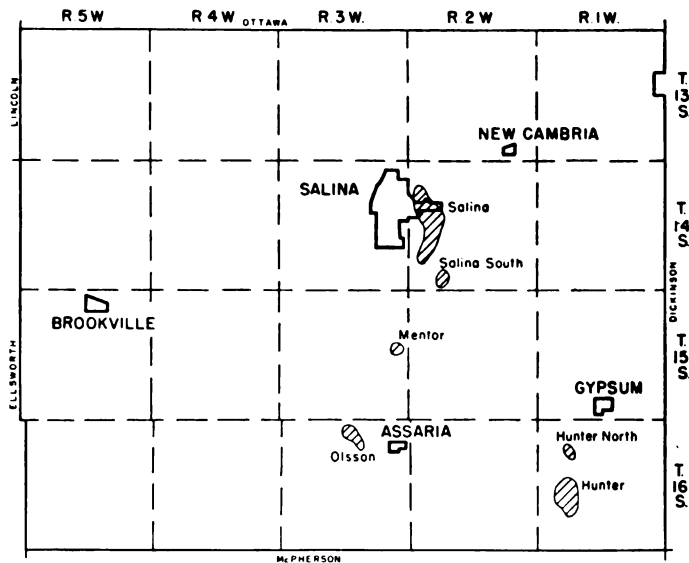


FIG. 45.—Map of Saline County showing oil pools.

TABLE 74.—Oil pools of Saline County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Hunter 20-16-1W	1943	850	89,350	780,817	19	"Chat"	2,681
Hunter North 8-16-1W	1948	40	3,588	3,588	1	"Miss. lime"	2,674
Mentor 13-15-3W	1944	40	2,351	9,067	1	Viola	3,258
Olsson 10-16-3W	1929	320	16,861	81,127	3	Viola	3,303
Salina 30-14-2W	1943	1,410	123,836	510,964	22	Viola	3,223
Salina South 32-14-2W	1946	300	30,266	59,440	7	Viola	3,246

SCOTT COUNTY

Oil production totaled 53,201 barrels; no gas production was reported. No new wells were drilled.

Developments during 1948.—There is only one pool, the **Shallow Water**, that is producing in the county. Previously production has come from the Ste. Genevieve at a depth of 4,670 feet. During 1948, the Pile No. 1 well in the Cen. E $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 14, T. 20 S., R. 33 W. was worked over by the Shallow Water Refining Company. The well was plugged back from the Ste. Genevieve and was given an initial production, after acidizing with 4,000 gallons, of 367 barrels of oil per day from the Marmaton between 4,286 and 4,297 feet.

Figure 19, which shows details of the Hugoton gas field and surrounding country, includes the Shallow Water pool and a corner of Scott County.

SEDGWICK COUNTY

Statistical summary for Sedgwick County, 1948

Oil produced	665,208 barrels
Gas produced	none
Wells drilled: Oil	15
Gas	none
Dry	34
Total	49
Wildcat wells	9 (included in above total)
New pools: Oil	4
Revived or abandoned pools	none
Secondary recovery operations	3

Developments during 1948.—There was a revival in activity in Sedgwick County during 1948, when 49 test wells were drilled.

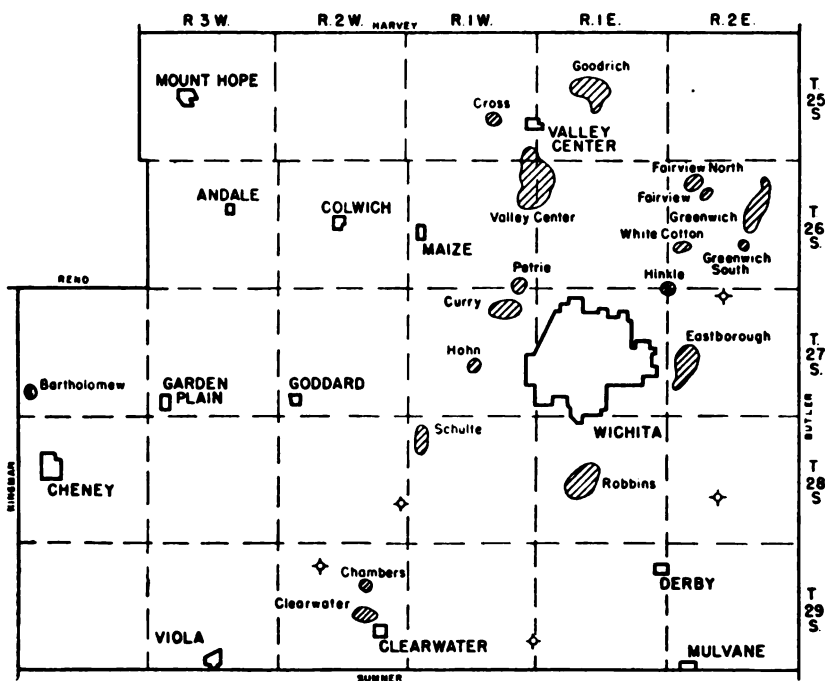


FIG. 46.—Map of Sedgwick County showing oil and gas pools and dry wellcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

The finding of new oil in T. 26 S., R. 2 E., just a few miles northeast of the City of Wichita, markedly stimulated drilling. All the old pools received attention. Extension wells or marginal tests were drilled in the Cross, Goodrich, Petrie, Valley Center, Bartholomew, and Clearwater pools. All these proved to be failures. Extension wells in the Curry, Hohn, Schulte, and Robbins pools were more successful. In each of these, one or more new oil wells were added.

In the drilling northeast of Wichita, three new oil pools were found. They are close together and the producing sandstone is extremely lenticular. The first of these pools to be found was the Fairview where the pool opener was the No. 1 Phillips drilled by J. P. Gaty in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 8, T. 26 S., R. 2 E. The oil was found in a sandstone near the base of the Pennsylvanian System and very close to the underlying Mississippian (Osagian). The Nomenclature Committee has called this sandstone "Burgess." The second pool in which this sandstone was found produc-

TABLE 75.—Oil and gas pools of Sedgwick County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Bartholomew 30-27-4W	1948	40	12,073	12,073	1	"Miss. lime"	3,732
Chambers 10-29-2W	1948	40	4,097	4,097	1	"Miss. lime"	3,540
Clearwater 22-29-2W	1944	200	11,406	71,072	5	K.C.-Lans.	2,913
Cross 29-25-1W	1929	160	3,349	73,042	1	K.C.-Lans.	2,690
Curry 11-27-1W	1947	100	27,194	28,000	3	K.C.-Lans.	2,715
Eastborough 19-27-2E	1929	870	no production reported	8,538,252		"Chat" Viola	2,956 3,238
Fairview 8-26-2E	1948	40	10,293	10,293	1	"Burgess sand"	2,960
Fairview North 5-26-2E	1948	40	5,017	5,017	1	"Burgess sand"	2,971
Goodrich 16-25-1E	1928	780	110,826	4,318,295	29	K.C.-Lans. "Chat" Kinderhookian Arbuckle	2,614 3,010 3,334 3,339
Greenwich 14-26-2E	1929	700	170,103	10,726,278	34	"Chat" Viola	2,885 3,321
Greenwich South 22-26-2E	1945	80	no production reported	9,232		"Chat"	2,896
Hinkle 1-27-1E	1946	80	785	9,877	2	"Burgess"	2,980
Hohn 22-27-1W	1945	80	8,529	14,943	3	K.C.-Lans.	2,779
Petrie 36-26-1W	1945	40	13,266	40,787	1	Viola	3,387
Robbins 20-28-1E	1929	1,000	88,011	3,449,867	48	"Miss. lime"	3,090
Schulte 7-28-1W	1947	300	64,360	105,563	7	Mississippian Simpson	3,349 3,658
Valley Center 1-26-1W	1928	2,150	128,712	21,652,646	51	K.C.-Lans. Kinderhookian Viola	2,860 3,380 3,366
White Cotton 30-26-2E	1948	60	7,187	7,187	3	"Burgess"	2,957
Bartholomew (gas) 30-27-4W	1946	40	no production reported	none		"Miss. lime"	3,732
Derby (gas) 32-28-2E	1937		1			"Stalnaker" K.C.-Lans.	2,215 2,228

¹Pool no longer productive; used for gas storage only.

tive is the **Fairview North** pool, also found by J. P. Gaty with his No. 1 Broers well in the N $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 26 S., R. 2 E. In this well the "Burgess" sandstone was found at 2,971 feet and the initial capacity of the well was 776 barrels per day.

The third pool in which the "Burgess" sandstone was found to contain oil was named the **White Cotton**. The discovery was the No. 1 Brown well drilled by J. P. Gaty in the NE $\frac{1}{4}$ sec. 30, T. 26 S., R. 2 E. This well was given a potential of 3,000 barrels per day. Some unusual features were noted about this local development

in the "Burgess" sandstone. Besides being very lenticular, it is exceedingly loose and unconsolidated. The new wells, if allowed to flow freely, may yield almost as much sand as oil. It has become a problem to separate the water from the oil owing to the sand condition. The Kansas City-Lansing limestone is highest structurally at the north, in the Fairview North pool, and lower toward the south in the area of the White Cotton pool. The "Burgess" sandstone has a depth below sea level of 1,546 feet in the Fairview North pool, 1,551 feet in the Fairview pool, and 1,568 feet in the White Cotton pool. The "Burgess" sandstone was first found productive in this area in the Kechi pool, discovered in May, 1929.

The fourth 1948 pool to be found in Sedgwick County was the **Chambers**. The discovery well was drilled by Leo V. Wentworth in the SE cor. SE $\frac{1}{4}$ sec. 10, T. 29 S., R. 2 W. It was rated at 25 barrels per day from "Mississippi lime" between 3,540 and 3,550 feet. The Lansing limestone was topped at 2,675 feet, the Kansas City limestone at 2,947 feet, and the basal conglomerate or Sooy at 3,538 feet.

Figure 46 shows the location of five dry wildcat wells. One of these, the No. 1 Tobin, was drilled by W. L. Hartman in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 4, T. 27 S., R. 2 E. in the abandoned Eastborough North pool. Here the Kansas City-Lansing sequence was topped at 2,115 feet, Kinderhookian shale at 3,188 feet, and Simpson rocks at 3,272 feet. Other "tops" are given in Table 76. This test is located on the projected trend of the old Greenwich pool which was fully described by Bunte (1939, p. 653).

Another wildcat test was drilled by the E. H. Adair Oil Company in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 25, T. 28 S., R. 2 W. This test was abandoned in the Mississippian (Osagian) limestone at 3,510 feet. The Beech Aircraft Corporation drilled a dry well near the

TABLE 76.—*Dry wildcat tests drilled in Sedgwick County during 1948*

Company and farm	Location	Depth to top of Kansas City, feet	Depth to top of Miss., feet	Depth to top of Arbuckle, feet	Total depth, feet
W. L. Hartman No. 1 Tobin	SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ 4-27-2E	2,472	2,931	3,371	3,390
Beech Aircraft Corp. No. 1 Engel	cen. SW $\frac{1}{4}$ 21-28-2E	2,512	2,995	not reached	3,080
E. H. Adair Oil Co. No. 1 Klausmeyer	NW cor. NE $\frac{1}{4}$ 25-28-2W	2,855	3,456		3,510
E. H. Adair Oil Co. No. 1 Roy	NE cor. SE $\frac{1}{4}$ 25-29-1W	2,778	3,363	3,842	3,875
Aladdin Petroleum Corp. No. 1 Kimel	NE cor. NE $\frac{1}{4}$ 8-29-2W	3,014	3,670	4,208	4,225

old Derby gas pool in sec. 21, T. 28 S., R. 2 E. This test was abandoned in the Mississippian (Osagian) limestone at a total depth of 3,080 feet.

An interesting wildcat, the No. 1 Roy, was drilled by the E. H. Adair Oil Company in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T. 29 S., R. 1 W. Here the Viola limestone was topped at 3,790 feet, and the Simpson at 3,795 feet. The Aladdin Petroleum Corporation drilled a test, the No. 1 Kimel, in sec. 8, T. 29 S., R. 2 W. about 2 miles northwest of the Chambers pool. The hole was abandoned.

Tom Palmer drilled an extension wildcat, the No. 1 Marshall, 1 $\frac{1}{2}$ miles south of the Robbins pool in sec. 32, T. 28 S., R. 1 E. This test was abandoned in the Mississippian (Osagian) limestone at a total depth of 3,187 feet without finding either oil or gas showings.

The dry wildcat tests drilled during 1948 are listed in Table 76 and shown on Figure 46. The oil pools are shown on Figure 46 and listed in Table 75.

SEWARD COUNTY

Statistical summary for Seward County, 1948

Oil produced	23,908 barrels
Gas produced	2,217,264 thousand cubic feet
	(exclusive of Hugoton field production)
Wells drilled: Oil	1
Gas	20
Dry	2
Total	23
Wildcat wells	2 (included in above total)
New pool: Oil	1
Revived or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—All the gas wells completed in Seward County during 1948 were within the area of the Hugoton field. Most of these wells showed initial potentials of approximately 15 million cubic feet per day. The largest one, Cities Service Oil Company No. 1 Adams "E" in sec. 18, T. 21 S., R. 33 W., was rated at 28.5 million cubic feet. The amount of acid used in bringing these wells in seems extremely large. The use of 30,000 gallons per well is not unusual.

One deep wildcat test was drilled in this county by H. L. Hunt about the center of sec. 15, T. 35 S., R. 32 W. about 10 miles west of the Adams Ranch gas pool which is in adjoining Meade County. Tops of important zones were reported as follows: Hollenberg

TABLE 77.—Oil and gas pools of Seward County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Kismet 23-33-31W	1948	160	7,311	7,311	1	Marmaton	5,095
Liberal Southeast 15-35-33W	1947	420	16,597	22,502	2	Penn. sandstone	6,202
<i>thousand cubic feet</i>							
Hugoton	See Finney County						
Liberal 3-35-34W	1947	300	473,571	866,333	7	Permian	2,800±
Liberal Southeast 15-35-33W	1947	860	1,743,693	2,400,294	1	Penn. sandstone	6,202

limestone, 2,590 feet; Herington limestone, 2,670 feet; Krider dolomite, 2,722 feet; Winfield limestone, 2,760 feet; Fort Riley limestone, 2,790 feet; Florence flinty limestone, 2,915 feet; Kansas City-Lansing limestone, 4,405 feet; Morrowan sandstone, 6,109 feet; and Chesterian rocks, 6,174 feet. The total depth was 6,314 feet. Small shows of gas were noted in layers usually productive in the Hugoton field. A small gas show was found in the Chesterian rocks between 6,183 and 6,193 feet, and a larger amount of gas was found between 6,255 and 6,280 feet. The well was temporarily abandoned. Elevation of the well is 2,753 feet.

The first oil pool, named the **Kismet**, for Seward County was discovered during 1948 when the Stanolind Oil and Gas Company completed their No. 1 Wheatley well in sec. 23, T. 33 S., R. 31 W. From an elevation of 2,749 feet the well was drilled to a total depth of 7,340 feet. The tops of important zones were reported as follows: Kansas City-Lansing limestone, 4,314 feet; Morrowan sandstone, 5,552 feet; Chesterian rocks, 5,602 feet; sandstone at the base of the Mississippian which may be the "Misenner" equivalent, 6,842 feet; Viola dolomite, 6,852 feet; Simpson, 7,060 feet; and Arbuckle dolomite, 7,119 feet. Shows of oil were found between 5,865 and 5,890 feet, between 5,910 and 5,940 feet, and at 6,032 feet. The well was rated as having a potential capacity of 132 barrels of oil with 88 barrels of water from the Marmaton group mainly from between 5,095 and 5,100 feet.

Table 77 gives oil and gas production figures for Seward County. The production of the Hugoton field is given under Finney County. The location of wells in Seward County is shown on Figure 19.

SHERIDAN COUNTY

Statistical summary for Sheridan County, 1948

Oil produced	514,564	barrels
Gas produced	none	
Wells drilled: Oil	3	
Gas	none	
Dry	1	
Total	4	
Wildcat wells	1	(included in above total)
New, revived, or abandoned pools	none	
Secondary recovery operations	none	

Developments during 1948.—Only four wells were drilled in Sheridan County during 1948. Three of these are new oil wells in the **Adell** pool and one is a wildcat test. Two of the new oil wells were drilled by the Continental Oil Company and one was drilled by The Derby Oil Company. All produce from the Kansas City-Lansing limestone.

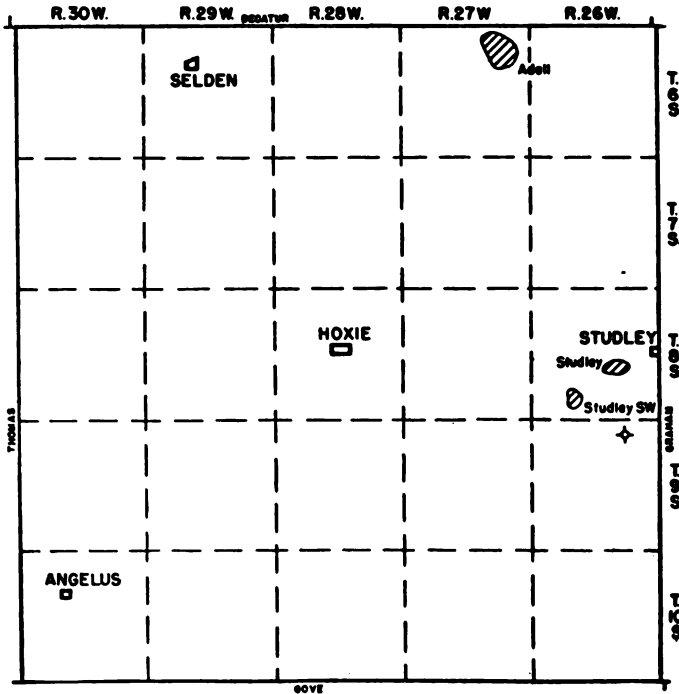


FIG. 47.—Map of Sheridan County showing oil pools and the dry wildcat test drilled during 1948.

TABLE 78.—Oil pools of Sheridan County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Adell 11-6-27W	1944	1,000	476,717	1,230,426	38	K.C.-Lans.	3,755
Studley 23-8-26W	1943	300	32,018	260,159	6	K.C.-Lans.	3,810
Studley Southwest 32-8-26W	1945	40	5,829	25,961	1	K.C.-Lans.	3,758

The wildcat test was drilled by Helmerich and Payne, Inc. in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 9 S., R. 26 W. A good show of oil was found in the Kansas City-Lansing limestone between 3,830 and 3,837 feet. The top of the Kansas City-Lansing was found at 3,772 feet, the Mississippian at 4,320 feet, and the Arbuckle dolomite at 4,455 feet. Total depth of the test was 4,510 feet and elevation of the well is 2,588 feet.

The oil pools of Sheridan County are listed in Table 78. These pools and the dry wildcat well drilled during 1948 are shown on Figure 47.

STAFFORD COUNTY

Statistical summary for Stafford County, 1948

Oil produced	4,586,702 barrels
Gas produced	1,357,354 thousand cubic feet
Wells drilled: Oil	67
Gas	3
Dry	85
Salt water disposal	2
Total	157
Wildcat wells	28 (included in above total)
New pools: Oil	7
Gas	2
Revived pools	1
Abandoned pools	2
Secondary recovery operations	5

Developments during 1948.—Considering the fact that every square mile of Stafford County is prospective oil territory, the drilling of 157 wells during the year is not surprising. Of the 28 wildcat tests, eight found new oil pools, one opened a new gas pool, one revived an abandoned oil pool, and two opened new oil pools which were abandoned later during the year. The new oil pools are: Copeland, Fischer Northwest, Hufford, Kelly, Moon, Nellie, and Rothgarn East.

The new **Rothgarn East** pool was discovered by the Atlantic Refining Company with their McDonald No. 1 well in sec. 11, T.

21 S., R. 13 W. The production of 509 barrels per day is from the Arbuckle dolomite between 3,520 and 3,532 feet.

The new **Hufford** pool was found by the Phil-Han Oil Company when their test well in the NW $\frac{1}{4}$ sec. 33, T. 21 S., R. 13 W. was completed in April. The well was rated at 368 barrels of oil per day from the Arbuckle dolomite at 3,755 feet. Before the close of the year six additional oil wells were completed in the Hufford pool. Production comes from depths of 1,835 to 1,855 feet below sea level. The water line lies somewhere between 1,855 and 1,892 feet below sea level as indicated by one of the two dry holes in the pool. In the Gates pool, which lies a mile to the northeast, the highest and lowest wells structurally produce from about 1,773 and 1,800 feet below sea level, respectively. The water line there lies about 1,837 feet below sea level.

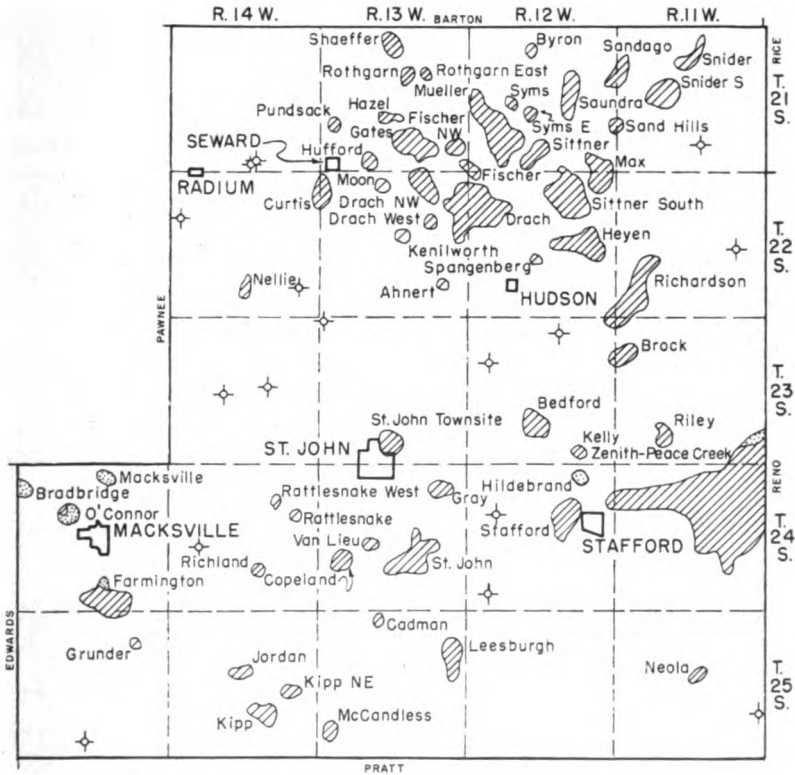


FIG. 48.—Map of Stafford County showing oil and gas pools and dry wild-cat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

The **Fischer Northwest** pool was found by Nadel and Gussman when their Fischer No. 1 was completed for 3,000 barrels in sec. 36, T. 21 S., R. 13 W. Production is from the Arbuckle at 3,639 feet. Four other oil wells were completed in this pool with a structural range of about 20 feet.

The **Nellie** pool, rather isolated from others, was found by a J. M. Huber Corporation, Musgrove Petroleum Corporation, and C-G Drilling Company wildcat in the NE cor. SE $\frac{1}{4}$ sec. 28, T. 22 S., R. 14 W. The well was rated at 480 barrels per day from the Kansas City-Lansing limestone after the operators found only water in the Arbuckle. The Arbuckle here is overlain by 53 feet of Simpson green shale and sandstone and 54 feet of Viola.

The new **Kelly** pool is an Arbuckle producer. The discovery well was drilled by Delta Production Company and B. and R. Drilling, Inc. in the NW cor. SE $\frac{1}{4}$ sec. 35, T. 23 S., R. 12 W. The initial capacity of the discovery well was 84 barrels per day. One hundred fifty feet of Viola and Simpson rocks overlie the Arbuckle at this location.

The new **Bradbridge** gas pool lies in the extreme western part of the county. It was found by Cromwell and Lewis when their well in the SW cor. SW $\frac{1}{4}$ sec. 6, T. 24 S., R. 15 W. was completed in the Arbuckle dolomite between 4,020 and 4,024 feet. The estimated capacity of the well was 4.35 million cubic feet of gas per day. Only 21 feet of Simpson was found at this location and the Arbuckle was found abnormally high.

The well which revived the **Neola** pool was drilled by The Derby Oil Company in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 25 S., R. 11 W. Here production of 30 barrels of oil per day was found in the Viola between 3,921 and 3,924 feet. The original well in the Neola pool was completed in 1934, but was abandoned after pro-

TABLE 79.—Oil and gas pools of Stafford County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Ahnert 26-22-13W	1941	40	2,985	36,522	1	Arbuckle	3,784
Bedford 21-23-12W	1940	850	73,614	1,235,645	14	Arbuckle	3,859
Brock 12-23-12W	1944	640	60,004	239,008	10	Arbuckle	3,680
Byron 4-21-12W	1943	40	no production reported	11,146	1	Arbuckle	3,460

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Cadman 4-25-13W	1944	40	no production reported	4,571	Viola	4,064
Copeland 30-24-13W	1948	60	no production reported	none	K.C.-Lans.	3,752
Curtis 6-22-13W	1942	400	87,424	371,287	9 Arbuckle	3,693
Drach 12-22-13W	1937	2,200	547,609	3,340,403	48 Arbuckle	3,690
Drach Northwest 11-22-13W	1944	200	29,819	44,090	5 Arbuckle	3,738
Drach West 14-22-13W	1938	40	no production reported	100,738	Arbuckle	
Farmington 34-24-15W	1943	650	112,020	744,927	17 Kinderhookian Arbuckle	4,417
Fischer 31-21-12W	1938	160	15,099	306,024	3 Arbuckle	3,641
Fischer Northwest 36-21-13W	1948	160	19,769	19,769	6 Arbuckle	3,639
Gates 27-21-13W	1933	700	159,936	1,562,593	28 Arbuckle	3,679
Gray 11-24-13W	1946	120	6,153	26,764	3 K.C.-Lans.	3,762
Grunder 11-25-15W	1943	40	1,125	16,090	1 K.C.-Lans.	3,945
Hazel 21-21-13W	1942	250	17,021	215,649	6 Arbuckle	3,692
Heyen 24-22-12W	1943	780	83,283	226,392	15 Arbuckle	3,652
Heyen West 23-22-12W	1947		combined with Heyen			
Hufford 33-21-13W	1948	150	41,034	41,034	6 Arbuckle	3,755
Jordan 15-25-14W	1936	300	29,131	641,539	7 K.C.-Lans.	3,722
Kelly 35-23-12W	1948	40	2,321	2,321	1 Arbuckle	3,870
Kenilworth 15-22-13W	1947	200	51,965	58,620	6 K.C.-Lans. Arbuckle	3,505 3,808
Kipp 27-25-14W	1937	500	22,145	544,866	11 K.C.-Lans.	3,827
Kipp Northeast 23-25-14W	1946	120	35,085	100,697	3 K.C.-Lans.	3,844
Leesburgh 12-25-13W	1938	700	140,704	2,124,165	16 Arbuckle	4,153
McCandless 30-25-13W	1944	200	47,563	208,482	4 Simpson	4,251
Max 35-21-12W	1938	700	175,582	1,157,055	16 K.C.-Lans. Arbuckle	3,356 3,570
Moon 4-22-13W	1948	40	370	370	1 K.C.-Lans.	3,530
Mueller 29-21-12W	1938	1,600	included with Sittner		Arbuckle	3,594
Nellie 28-22-14W	1948	40	7,700	7,700	1 K.C.-Lans.	3,696
Neola 15-25-11W	1948	40	4,387	4,387	1 Viola	3,921
O'Connor 8-24-15W	1948	40	1,470	1,470	1 K.C.-Lans.	3,768
Pundsack 19-21-13W	1947	80	21,978	25,366	3 Arbuckle	3,735
Rattlesnake 13-24-14W	1938	40	4,860	89,035	1 K.C.-Lans.	3,608
Rattlesnake West 11-24-14W	1944	40	4,350	17,940	1 K.C.-Lans.	3,759
Richardson 36-22-12W	1930	1,200	787,475	9,340,133	60 Arbuckle	3,537
Richland 27-24-14W	1944	200	25,966	159,097	5 Arbuckle	4,232

TABLE 79.—Oil and gas pools of Stafford County, concluded

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
Riley 28-23-11W	1940	120	8,692	112,521	2	K.C.-Lans.	3,323
Rothgarn 10-21-13W	1943	120	5,756	72,519	2	Arbuckle	3,569
Rothgarn East 11-21-13W	1948	40	4,962	4,962	1	Arbuckle	3,520
St. John 23-24-13W	1935	980	139,200	2,306,660	24	K.C.-Lans. Arbuckle	3,588 4,075
St. John Townsite 33-23-13W	1944	300	24,547	220,955	6	K.C.-Lans. Arbuckle	3,919
Salt Marsh 34-21-11W	1948		abandoned during 1948				
Sandago 12-21-12W	1947	250	45,320	63,624	7	Arbuckle	3,480
Sand Hills 19-21-11W	1944	80	7,178	35,244	2	Arbuckle	3,548
Saundra 14-21-12W	1946	300	26,413	78,561	7	Arbuckle	3,546
Saundra South 22-21-12W	1946		combined with Saundra				
Shaeffer 3-21-13W	1941	300	14,590	280,997	4	K.C.-Lans. Arbuckle	3,404 3,546
Sittner 33-21-12W	1937	400	680,532	2,464,604	56	K.C.-Lans. Arbuckle	3,278 3,600
Sittner South 3-22-12W	1938	1,700	145,895	1,554,914	22	Arbuckle	3,501
Smallwood 22-22-14W	1948		abandoned during 1948				
Snider 3-21-11W	1936	400	25,468	358,899	3	Simpson	3,362
Snider South 16-21-11W	1938	580	109,080	813,461	12	Simpson Arbuckle	3,402
Spangenberg 21-22-12W	1943	40	9,478	62,601	1	Arbuckle	3,691
Stafford 15-24-12W	1940	800	232,176	2,485,196	21	Viola Arbuckle	3,836 3,945
Syms 20-21-12W	1943	120	28,512	99,930	2	Arbuckle	3,580
Syms East 21-21-12W	1947	40	2,418	2,418	1	Arbuckle	3,565
Van Lieu 20-24-13W	1943	120	13,858	174,241	3	Arbuckle	4,069
Zenith-Peace Creek ² 23-24-11W	1937	8,500	442,668	18,593,380	215	Viola	3,860
<i>thousand cubic feet</i>							
Bradbridge ³ 6-24-15W	1948	100	no production reported	none	1	Arbuckle	4,020
Farmington (gas) 27-24-15W	1948	50	201,404	201,404	2	Mississippian	4,207
Hildebrand 2-24-12W	1948	40	no production reported	none		Viola	3,771
Macksville 3-24-15W	1947	160	670,710	730,691	2	K.C.-Lans.	
O'Connor (gas) 16-24-15W	1947	160	no production reported	none	2	Arbuckle	4,061
Zenith-Peace Creek (gas) ² 23-24-11W	1937	340	485,240		2	Viola	3,860

¹ Old name revived.² Field extends into Reno County.³ Field extends into Edwards County.

ducing somewhat more than 5,000 barrels, also from the Viola. A dry extension wildcat was drilled in sec. 28, T. 25 S., R. 11 W. by Northern Ordnance, Inc.

The new **Copeland** pool was opened by the Hinkle Oil Company well in sec. 30, T. 24 S., R. 13 W. producing from the Kansas City-Lansing between 3,752 and 3,760 feet. The well is reported to have swabbed 126 barrels of oil and 26 barrels of water in 16 hours.

The E. H. Adair Oil Company discovered the **Moon** pool in sec. 4, T. 22 S., R. 13 W. with their wildcat test completed the last week of the year. Production of 75 barrels per day after acidizing is from the Kansas City-Lansing between 3,530 and 3,538 feet.

Another new pool, named the **Hildebrand**, was credited to the Delta Production Company and B. and R. as a result of their bringing in a 2-million-foot gas well in the NW cor. SE $\frac{1}{4}$ sec. 2, T. 24 S., R. 12 W. Production comes from the Viola between 3,771 and 3,780 feet.

Two new pools discovered during 1948 were abandoned later in the year. One was the **Salt Marsh** pool in sec. 34, T. 21 S., R. 11 W. and the other, the **Smallwood**, in sec. 22, T. 22 S., R. 14 W. The Hinkle Oil Company et al. No. 1 Shepard well was first reported as a producer from the Arbuckle and as opener for the Salt Marsh pool, but the pool and name were later abandoned. Discovery well of the Smallwood pool was the No. 1 Prichard well drilled by Robert L. Williams. Numerous tests were made and several good shows were noted, but the well was finally abandoned at 3,850 feet, 13 feet below the top of the Arbuckle.

A few additional oil wells were completed in many of the older pools. For instance, in the **Snider South** pool two wells were completed, one producing from the Simpson formation and the other from the Arbuckle dolomite. In the **Mueller** pool five Arbuckle producers were drilled. In addition, one of the dry holes was deepened for use as a salt water disposal well. This is the No. 2 Walters well, drilled by the Midstates Oil Corporation in sec. 20, T. 21 S., R. 12 W. The hole penetrated 303 feet of Arbuckle dolomite and thus furnished some interesting stratigraphic information.

In the **Gates** pool, there was a strong revival of interest. Fifteen new oil wells were completed, all producing from the Arbuckle. Two new producers were added to the **Pundsack** pool,

two to the **Max** pool, and one to the **Sittner South** pool. All are Arbuckle wells. In the area of the **Drach** and the **Drach North-west** pools, six new wells were completed, all producing from the Arbuckle dolomite.

Enough drilling was done to justify combining the **Heyen** and the **Heyen West** pools. The total number of new producers in this area was seven. In the **Kenilworth** pool, where heretofore only the Kansas City-Lansing limestone was producing oil, two oil wells were completed in the Arbuckle dolomite and one in the Kansas City-Lansing. Some exploratory work was done at the south end of the old **Richardson** pool. One new Arbuckle well was added. The Stanolind Oil and Gas Company deepened one dry hole, the No. 4 Brock well in sec. 6, T. 23 S., R. 11 W., for use as a salt water disposal well. The top of the Arbuckle dolomite which was 583 feet thick was at 3,694 feet.

TABLE 80.—Dry wildcat tests drilled in Stafford County during 1948

Company and farm	Location	Depth to top of K.C.-Lans., feet	Depth to top of Sooy, feet	Depth to top of Viola, feet	Depth to top of Arbuckle, feet	Total depth, feet
Hinkle Oil Co. et al. No. 1 White	SE cor. SW¼ 27-21-11W	3,121	3,392	3,398	3,480	3,533
Phillips & Lewis No. 1 Schartz	NE cor. SW¼ 34-21-14W	3,453	3,722	3,754	3,850	3,890
Phillips Petr. Co. No. 1 Schartz	NE cor. SW¼ 34-21-14W					1,793
Thomas H. Allan No. 1 Melone	NE cor. NE¼ 23-22-11W	3,183	3,491	3,517	3,598	3,648
Birmingham-Bartlett Drig. Co. No. 1 "B" Smith	SE cor. SW¼ 7-22-14W	3,495		3,782	3,904	3,935
B. & R. Drilling Co., Inc. No. 1 Ross	SW cor. SW¼ 25-22-14W	3,460	3,742	3,760	3,852	3,942
Shields & Armer No. 1 Dale	SW¼ NW¼ SE¼ 3-23-12W	3,304		3,639	3,710	3,820
The Bay Petr. Corp. No. 1 Juminson	SE cor. SE¼ 7-23-12W	3,402	3,672	3,746	3,854	3,888
J. M. Huber Corp. & C-G Drilling Co. No. 1 Miller	NW cor. NW¼ 6-23-13W	3,487	3,782		3,885	3,935
J. M. Huber Corp. & Harbar Drilling Co. No. 1 Coen	SE cor. SE¼ 15-23-14W	3,549	3,863	3,877	4,013	4,045
J. M. Huber Corp. & Harbar Drilling Co. No. 1 Mann	NW cor. NW¼ 21-23-14W	3,584	3,889	3,902	4,053	4,093
Musgrove Petr. Corp. No. 1 McMillan	NW cor. NW¼ 17-24-12W	3,498	3,853	3,876	4,065	4,115
Plains Exploration Co. No. 1 Jenkins	SE cor. NE¼ 31-24-12W	3,566	3,914	3,979	4,174	4,215
M. B. Armer, Inc. No. 1 Sewing	SW cor. NW¼ 20-24-14W	3,722	4,090	4,204	4,356	4,386
J. M. Huber Corp. & Lewis Drilling Co. No. 1 Bargdill	NE cor. NE¼ 25-25-11W	3,527		4,173	4,353	4,385
Alpine Oil & Royalty Co., Inc. et al. No. 1 Stambaugh	SW cor. NE¼ 33-25-15W	3,836		4,402	4,588	4,622

One new oil well was completed in the **Brock** pool which lies just south of the Richardson. In the extreme southwestern part of the county near Macksville several oil and gas pools have been found. Further exploratory work in the southwestern part of the county resulted in the finding of oil within the Kansas City-Lansing limestone (Cities Service Oil Company No. 1 O'Connor well in sec. 8, T. 24 S., R. 15 W.) in the **O'Connor** pool where previously there had been production only of gas from the Arbuckle. In the **Farmington** pool oil has been found in the sandstone of Kinderhookian age and also in the Arbuckle. During 1948, one new gas well and one new oil well were completed in the Kinderhookian sandstone.

All pertinent information concerning Stafford County wildcats is contained in Table 80. No developments of especial significance occurred in connection with the wildcat drilling which require detailed comment. If zone "tops" other than those included in the table are desired, they can be obtained from the State Geological Survey.

The wildcat tests drilled in Stafford County during 1948 are listed in Table 80. These tests and the oil and gas pools are shown on Figure 48. The pools are listed in Table 79.

STANTON COUNTY

No oil was produced in the county, and gas production was not segregated from that of the Hugoton field. There were 30 gas wells drilled, no oil wells or dry holes, and no new pools were discovered.

Developments during 1948.—In Stanton County, located in southwestern Kansas and on the west side of the Hugoton gas field, 30 gas wells were drilled. Figure 19 shows their location.

The initial production reported for these wells ranged from less than 1 to 14 or 15 million cubic feet of gas per day. There is evidence, for example the light Stanolind Oil and Gas Company No. 1 Holt well, that the western edge of the productive area of the Hugoton field is being outlined. However, there is an occasional edge well, such as the Stanolind Oil and Gas Company No. 1 Brown "C" well, rated at 15 million cubic feet per day, which denies the assumption that it is near the field boundary.

All the new wells produce from zones in the Permian as is the case elsewhere in the Hugoton field.

Detailed information on the Hugoton gas field is given under Finner County. Gas wells and dry tests drilled in Stanton County are shown on Figure 19.

STEVENS COUNTY

No oil was produced in the county and gas production was not segregated from that of the Hugoton field. There were 73 gas wells drilled, no oil wells or dry holes, and no new pools were discovered.

Developments during 1948.—Among the nine counties with acreage in the Hugoton field, Stevens contributed the largest number of new gas wells during the year. Figure 19 shows the locations of the 73 new gas wells. The largest number, 30, of the new wells were drilled in T. 31 S., R. 35 W. and T. 31 S., R. 36 W. The wells have large capacities, ranging from 8 to 38 million cubic feet of gas per day. One well drilled by the Magnolia Petroleum Company in sec. 13, T. 31 S., R. 36 W. had an initial production of 38 million cubic feet per day after being acidized with 28,000 gallons. Large producers were also completed in the southern and southwestern parts of the county.

One interesting deep test, the Shafer No. 1, was completed during 1948 by the Panhandle Eastern Pipe Line Company in sec. 25, T. 32 S., R. 39 W. Although the hole was dry and abandoned, the usual producing gas zones of the Hugoton field were found at the following depths: Herington, 2,424 feet; Krider, 2,445 feet; Winfield, 2,509 feet; and Fort Riley, 2,588 feet. The Kansas City-Lansing limestone was reached at 4,048 feet; Morrowan sandy zone at 5,896 feet; Chesterian rocks at 6,045 feet; and the base of the Mississippian System at 6,886 feet. There the dolomitic and cherty Viola rocks were encountered, resting unconformably under the lowest strata of Mississippian age. Simpson sandstones and shales were topped at 7,016 feet, and the Arbuckle dolomite at 7,086 feet. The total depth was 7,148 feet and the elevation of the well is 3,212 feet.

A complete discussion of the development and production of the Hugoton field is given under Finney County. The gas wells are shown on Figure 19.

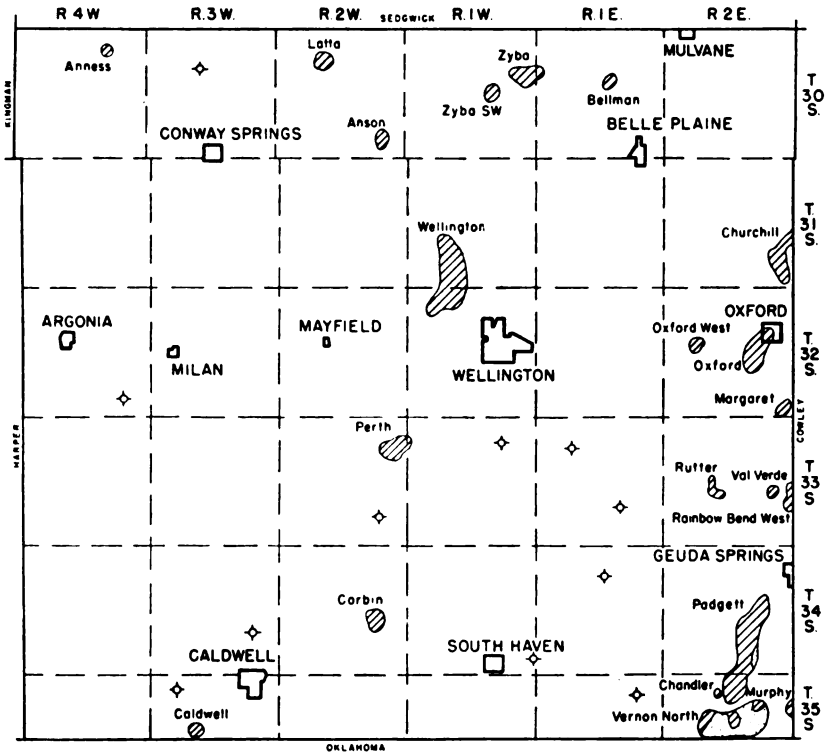


FIG. 49.—Map of Sumner County showing oil and gas pools and dry wildcat tests drilled during 1948. (Gas, dots; oil, diagonal lines.)

SUMNER COUNTY

Statistical summary for Sumner County, 1948

Oil produced	1,120,693 barrels
Gas produced	none
Wells drilled:	
Oil	25
Gas	none
Dry	26
Total	51
Wildcat wells	13 (included in above total)
Revived pools: Oil	2
New or abandoned pools	none
Secondary recovery operations	1

Developments during 1948.—A strong revival of interest in Sumner County was evidenced by the drilling of 51 wells during the year. While most of them are pool wells, there were 13 wildcats, the locations of which are shown on Figure 49. Two of the tests were credited with the revival of abandoned pools. The new **Anson** pool, formerly a gas producer, located about 9 miles north-

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west of Wellington was reopened when the Consolidated Gas Company and Anderson-Prichard Oil Corporation completed their No. 1 Frantz well in sec. 35, T. 30 S., R. 2 W. In this same

TABLE 81.—Oil and gas pools of Sumner County

Pool and location of discovery well	Discovery year	Area, acres	1948 production	Cumulative production to end of 1948	Producing wells	Producing zone	Depth to producing zone, feet
<i>barrels</i>							
Anness 2-30-4W	1937	40	16,773	125,640	1	Simpson	4,394
Anson ¹ 35-30-2W	1948	40	9,499	9,499	3	"Miss. lime"	3,742
Bellman 15-30-1E	1945	300	40,125	158,868	5	Simpson	3,798
Caldwell 17-35-3W	1929	200	37,200	1,316,818	3	Simpson	4,765
Chandler 4-35-2E	1942	40	844	9,301	1	"Miss. lime"	3,450
Churchill ² 25-31-2E	1926	800		16,070,964	41	"Stalnaker" Arbuckle	1,820 2,632
Corbin ¹ 23-34-2W	1948	40	490	490	1	Simpson	4,475
Latta 9-30-2W	1927	500	45,286	1,072,194	12	K.C.-Lans.	3,042
Margaret 36-32-2E	1946	300	20,009	69,376	6	Arbuckle	3,474
Murphy ² 7-35-3E	1933	80	see Cowley County				
Oxford 14-32-2E	1927	800	147,756	15,652,557	39	Hoover "Stalnaker" "Layton" Arbuckle	1,930 2,020 2,510 2,890
Oxford West 17-32-2E	1926	160	9,639	576,384	3	Simpson Arbuckle	3,681
Padgett 22-34-2E	1925	1,700	62,357	1,764,663	23	"Miss. lime" Simpson	3,474 3,744
Perth 12-33-2W	1945	480	177,491	260,767	12	"Wilcox"	4,264
Rainbow Bend West ² 24-33-2E	1925	160	no production reported	453,000		Arbuckle	
Rutter 21-33-2E	1926	80	881	96,734	1	"Miss. lime"	3,315
Val Verde 23-33-2E	1945	40	645	3,271	1	"Bartlesville"	3,280
Vernon North 15-35-2E	1930	1,560	63,513	722,136	23	"Miss. lime"	3,443
Wellington 33-31-1W	1929	2,400	432,672	6,824,826	129	"Chat"	3,655
Zyba 7-30-1E	1937	600	46,266	217,813	8	Simpson	3,866
Zyba Southwest 22-30-1W	1944	120	9,247	44,531	2	Simpson	3,918
<i>thousand cubic feet</i>							
Padgett (gas) 23-34-2E	1924	640	no production reported			"Miss. lime"	3,474
Vernon North (gas) 15-35-2E	1915	640	no production reported				
Wellington (gas) 33-31-1W	1929		^a			'Chat'	3,655

¹ Old name revived.² Field extends into Cowley County.^a Pool no longer productive; used for gas storage only.

area gas was found in 1928 and for a short time four wells produced from the Howard limestone. The new well was rated at 38 barrels of oil in the top of the Mississippian between 3,742 and 3,749 feet. Subsequently two additional oil wells were completed in the same zone.

The second revival is the **Corbin** pool originally discovered by the Gypsy Oil Company in 1927. After producing 30,000 barrels, the one-well pool was abandoned in 1931. During 1948, the Alpine Oil and Royalty Company, Inc. completed a 50-barrel oil well, the Douglas No. 1 in sec. 23, T. 34 S., R. 2 W., finding oil in the "Wilcox" sandstone of the Simpson between 4,475 and 4,481 feet.

One or more wells were drilled in most of the pools in the county during the year. In the **Wellington** pool seven new oil wells were added, all on the northwestern or western side of the pool. Although these new wells are structurally 30 feet lower than other west side wells, they have a fairly promising potential. Several of them are producing some water with the oil. In the **Perth** pool, two new oil wells were completed, both producing from Simpson sandstone.

In the eastern ranges of this county, one new oil well producing from the Arbuckle was completed in the old **Churchill** pool. In the **Oxford** pool two new oil wells were added, one pro-

TABLE 82.—Dry wildcat tests drilled in Sumner County during 1948

Company and farm	Location	Depth to top of Kansas City, feet	Depth to top of Miss., feet	Depth to top of Arbuckle, feet	Total depth, feet
Sterling Drilling Co. No. 1 Miksch	SW cor. NE $\frac{1}{4}$ 8-33-1E	3,111	3,800	4,318	4,343
Earl F. Wakefield No. 1 Potucek	SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ 27-33-1E		3,627	not reached	3,650
Carl Anderson & R. L. Cassingham No. 1 Schnueman	SW cor. NW $\frac{1}{4}$ 10-34-1E		3,701	4,134	4,186
Browes & Gilbert No. 1 Owen	SW cor. SE $\frac{1}{4}$ 2-35-1E		3,507	3,829	3,837
Palmer Oil Corp. No. 1 Leddy	SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ 9-30-3W	3,232	3,835		3,911
Aladdin Oil Corp. No. 1 Birkholz	NW cor. NE $\frac{1}{4}$ 35-32-4W	3,282	3,927	4,433	4,510
The Carter Oil Co. No. 1 Cochran	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ 11-33-1W	3,189	3,868	4,406	4,437
Bridgeport Oil Co., Inc. No. 1 "D" Fox	cen. N $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ 26-33-2W	3,344	3,998	4,537	4,566
W. M. Shaw No. 1 Stahl	SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ 36-34-1W				2,868
Bradley & Weller et al. No. 1 Wedman	SW cor. SE $\frac{1}{4}$ 23-34-3W	3,636	4,322		4,808
Mid Continent Petr. Corp. No. 1 Thompson	NW cor. SW $\frac{1}{4}$ 5-35-3W	3,733	4,454	5,077	5,132

ducing from the "Stalnaker" sandstone and the other from a higher sandstone which has been named the Hoover. This is a new producing zone for the Oxford pool. In the **Oxford West** pool one new oil well was completed in the "Wilcox." In the **Padgett** pool six new oil wells were added, four in the main producing zone, the Mississippian (Osagian), and two at about 3,730 feet in the "Wilcox," a new producing zone for this pool. In the **Vernon North** pool two new oil wells were completed in the Mississippian (Osagian) which is usually productive in the pool. The new production in these old pools, especially as it involves new producing zones, will doubtless stimulate additional drilling during the next few years.

The 11 wildcat tests are listed in Table 82. They are well distributed over the county. Since none of them shows any unusual stratigraphic peculiarities, they will not be further described.

The oil and gas pools in Sumner County are listed in Table 81. The dry wildcats and pools are shown on Figure 49.

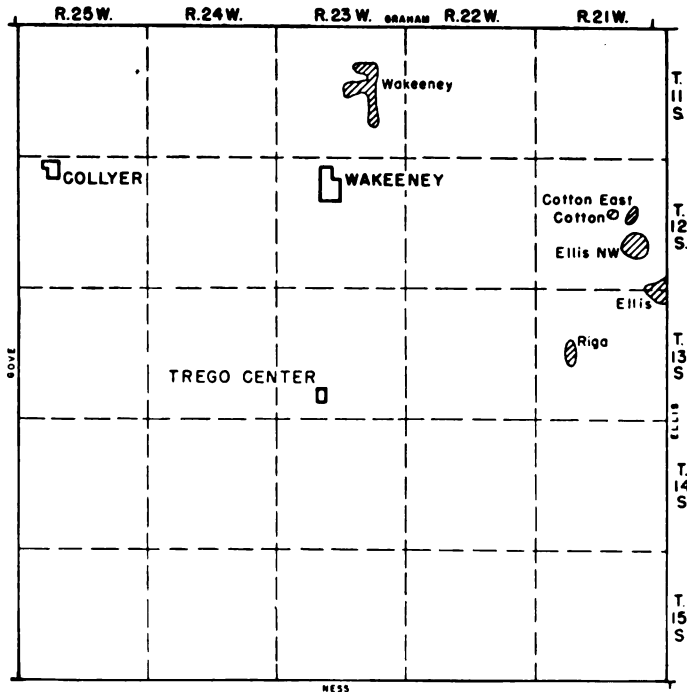


FIG. 50.—Map of Trego County showing oil pools.

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TREGO COUNTY

Statistical summary for Trego County, 1948

Oil produced	97,179 barrels
Gas produced	none
Wells drilled: Oil	none
Gas	none
Dry	2
Total	2
New, revived, or abandoned pools	none
Secondary recovery operations	none

Developments during 1948.—Of the two tests completed in Trego County during the year, one was a dry hole drilled in sec. 23 on the north side of the **Ellis Northwest** pool. Here the top of the Arbuckle was found at 3,989 feet, 1,714 feet below sea level. The other was a dry hole located east of the pool in sec. 25. There the top of the Arbuckle was found at 3,919 feet, 1,679 feet below sea level.

The No. 1 Hamburg well in the Ellis Northwest pool in sec. 24, T. 12 S., R. 21 W. was completed as a producer in December 1947 but not reported until 1948. The producing zone is the Arbuckle which was found at 3,944 feet, 1,671 feet below sea level. The well was assigned a potential capacity of 50 barrels per day.

The oil pools of Trego County are shown on Figure 50 and listed in Table 83.

WABAUNSEE COUNTY

No oil or gas was produced in Wabaunsee County during 1948, but eight wildcat wells were drilled during the year.

TABLE 83.—Oil pools of Trego County

Pool and location of discovery well	Discovery year	Area, acres	1948 production bbls.	Cumulative production to end of 1948 bbls.	Producing wells	Producing zone	Depth to producing zone, feet
Cotton 15-12-21W	1945	40	4,361	18,165	1	Arbuckle	3,958
Cotton East 14-12-21W	1947	80	10,656	14,050	2	Arbuckle	3,942
Ellis ¹ 31-12-20W	1942	390	22,233	88,977	3	Arbuckle	3,832
Ellis Northwest 26-12-21W	1944	250	27,623	128,416	5	Arbuckle	3,925
Riga 20-13-21W	1947	40	no production reported	16,045		Marmaton	3,902
Wakeeney 14-11-23W	1934	640	32,306	703,844	6	K.C.-Lans.	3,619

¹ Field extends into Ellis County.

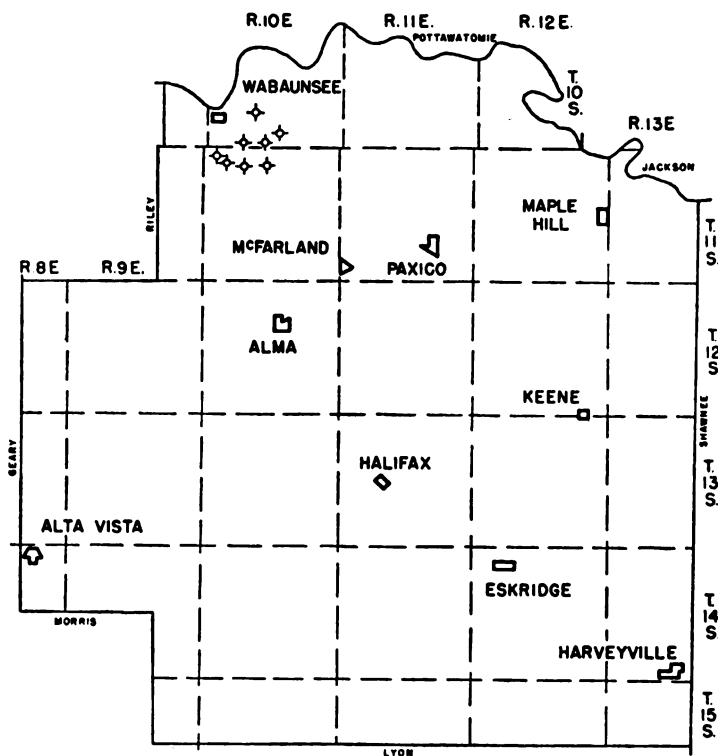


FIG. 51.—Map of Wabaunsee County showing dry wildcat wells drilled during 1948.

TABLE 84.—Dry wildcat wells drilled in Wabaunsee County in 1948

Company and farm	Location	Depth to top of Topeka feet	Depth to top of Viola, feet	Depth to top of Pre-Cambrian, feet	Total depth, feet
Amerada Petr. Corp. No. 1 Morton	SW cor. NW $\frac{1}{4}$ 28-10-10E	348	1,867*		1,918
Amerada Petr. Corp. No. 1 Bolton	SW cor. SE $\frac{1}{4}$ 32-10-10E	328	1,445	1,698	1,720
Amerada Petr. Corp. No. 1 Enlow	SW cor. SE $\frac{1}{4}$ 33-10-10E	539	2,441	2,690	2,705
Amerada Petr. Corp. No. 1 Stewart	SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ 34-10-10E	781	2,338**		2,371
Amerada Petr. Corp. No. 1 Enlow	SE cor. SE $\frac{1}{4}$ 4-11-10E	790	2,347**		2,575
Amerada Petr. Corp. No. 1 Willig	SE cor. SE $\frac{1}{4}$ 5-11-10E	473	2,180	2,475	2,489
Amerada Petr. Corp. No. 2 Willig	NW cor. SW $\frac{1}{4}$ 5-11-10E	355	1,308***	1,508	1,523
Amerada Petr. Corp. No. 1 Mertz	SW cor. NE $\frac{1}{4}$ 6-11-10E	298		1,224	1,234

* Depth to top of Sylvan.

** Depth to top of Mississippian.

*** Depth to top of Simpson.

Developments during 1948.—Data on eight wildcat wells drilled in Waubaussee County during the year are given in Table 84 and shown on Figure 51.

Oil was discovered in Wabaunsee County in April 1949.

WILSON COUNTY

Oil production totaled 69,976 barrels. There was one water-flooding project in operation and 11 producing oil fields.

Developments during 1948.—No important developments were reported in Wilson County during the year. Data on the number of wells drilled are not available.

Oil production in Wilson County fields is shown in Table 85, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 52.

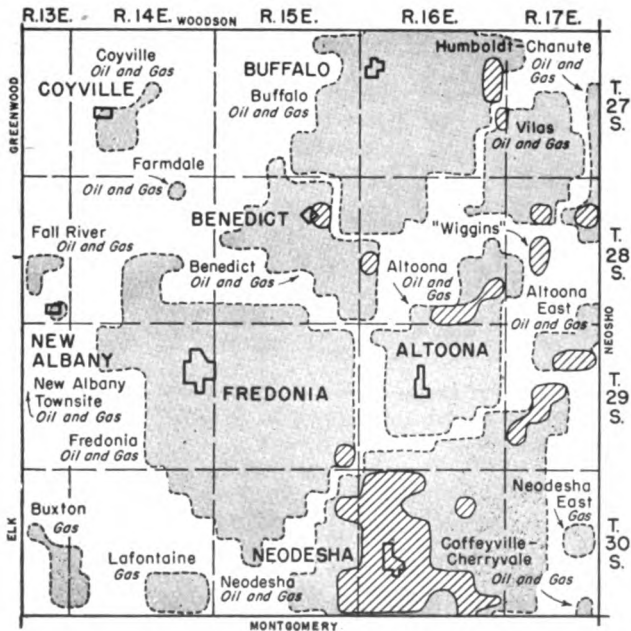


FIG. 52.—Map of Wilson County showing oil and gas fields. Diagonal lines show areas of 1948 oil production. Areas of production in the Coyville field are not definitely located.

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TABLE 85.—Oil production in Wilson County during 1948

Field	Producing wells as reported	1948 production, bbls.
Altoona		2,019
Altoona East		3,876
Benedict		1,246
Buffalo ¹		5,223
Coyville ²		40
Fredonia		6,647
Humboldt-Chanute ³		1,500
Neodesha ⁴	175+	36,466
Vilas	1+	8,668
"Wiggins"		4,291
Total	176+	69,976

¹ Field extends into Woodson County.

² Areas of production not definitely located.

³ Field extends into Allen, Neosho, and Woodson Counties.

⁴ Field extends into Montgomery County.

WOODSON COUNTY

Oil production totaled 441,771 barrels, and gas production amounted to 4,809 thousand cubic feet. There was one water-flooding project in operation and 16 producing oil pools.

Developments during 1948.—Forty-six wells were reported drilled in the county during the year, 24 of which were oil wells in previously discovered pools and two were dry wildcats. Twenty of the new oil wells are in the **Winterscheid** field.

Oil production in Woodson County fields is shown in Table 86, and locations of oil and gas fields and areas that produced oil in 1948 are shown on Figure 53.

WYANDOTTE COUNTY

Gas production in the entire **Roberts-Maywood** field (partially in **Leavenworth** County) amounted to 40 million cubic feet. No oil was produced.

Developments during 1948.—A few shallow test wells were drilled in Wyandotte County during 1948. No important developments were reported.

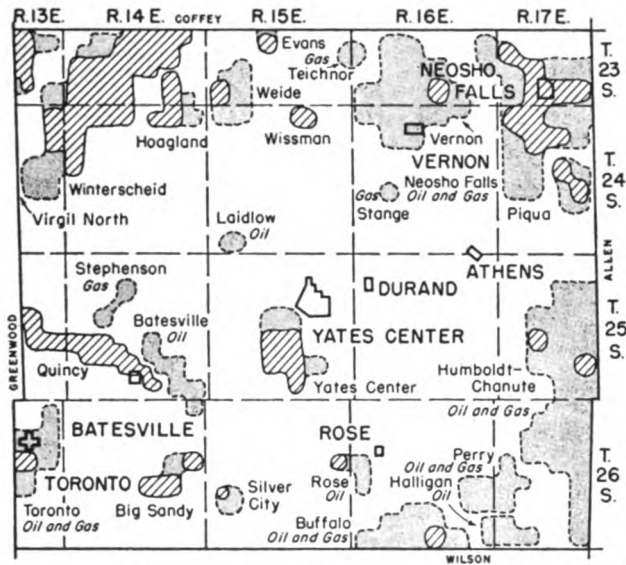


FIG. 53.—Map of Woodson County showing oil and gas fields. Diagonal lines show areas of 1948 oil production.

TABLE 86.—Oil production in Woodson County during 1948

Field	Producing wells as reported	1948 production, bbls.
Big Sandy	1	45,495
Buffalo ¹		1,942
Evans ²	1	1,758
Hoagland	21	15,399
Humboldt-Chanute ²	4+	2,644
Neosho Falls ³	53	17,458
Piqua	25	4,290
Quincy ⁴	79+	124,688
Rose	2+	2,100
Silver City	1+	979
Toronto ⁴	see Greenwood County	
Vernon	2	907
Virgil North ⁵	5+	35,579
Weide	4	3,511
Winterscheid ⁶	18+	165,652
Wissman	8	5,209
Yates Center		12,754
Miscellaneous		1,406
Total	224+	441,771

¹ Field extends into Wilson County.

² Field extends into Allen, Neosho, and Wilson Counties.

³ Field extends into Allen County.

⁴ Field extends into Greenwood County.

⁵ Field extends into Greenwood and Coffey Counties. Some of production estimated.

⁶ Field extends into Coffey County.

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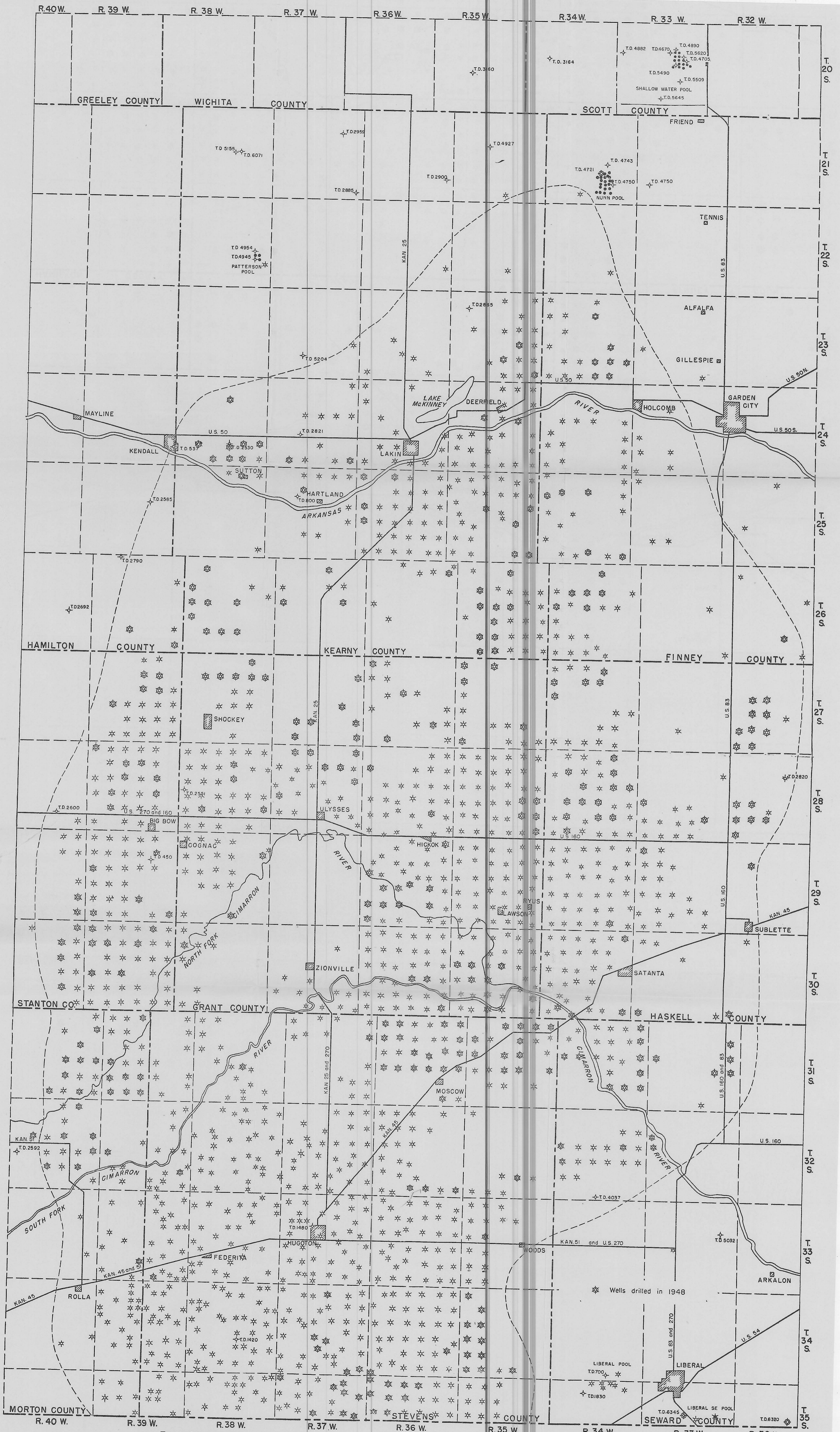


FIG. 19.—Map of the Hugoton gas field showing all oil and gas wells and dry holes. The 1948 wells are marked, and total depth of dry holes is given.