26S-13W

JOHNS AND MAGATHAN
CONSULTING GEOLOGISTS
501 BITTING BUILDING
WICHITA 2, KANSAS

WENDELL S. JOHNS
WILLIS JACK MAGATHAN

FOREST 3-1540

Geological Reports Kansas
26-13W

September 8, 1955

Mr. John W. McKnab
McKnab Drilling Company
605 Union National Bank Building
Wichita 2, Kansas

Dear Sir:

The following report is a rather generalized discussion of the geology and production history of the northwest portion of the Iuka-Carmi Area. This includes the Iuka-Carmi; northwest pool, the Chance, East pool and the northwest-portion of the Iuka-Carmi pool proper. Your Keller, Gobin, Hoener, and Brown leases are in the area covered by this report, as are the Amis and Moore, Gobin, Gobin "A", Hoener and Hoener "A" leases.

The report consists of two maps and a written report. The first map is a small map of Kansas included to help locate the area under discussion. The second map is a geologic structure map showing our interpretation of the structure on top of the Arbuckle. In general this map is self explanatory. Two symbols should be explained, however. One is the diagonal line through some of the producing wells. This indicates that the well has been plugged and abandoned. Since we have no way of checking abandonments except to contact the individual operators, it is probable that some wells shown as still producing have actually been abandoned.

The second symbol which should be explained is the small letter at the upper left of the producing well symbol. This indicates the formation from which the well is producing. Where two letters are separated by a dash the letter on the left indicates the formation in which the original completion was made and the second indicates a formation in which a more recent completion has been made. It is possible that some wells shown as still producing from the original formation have been recompleted in some other formation.

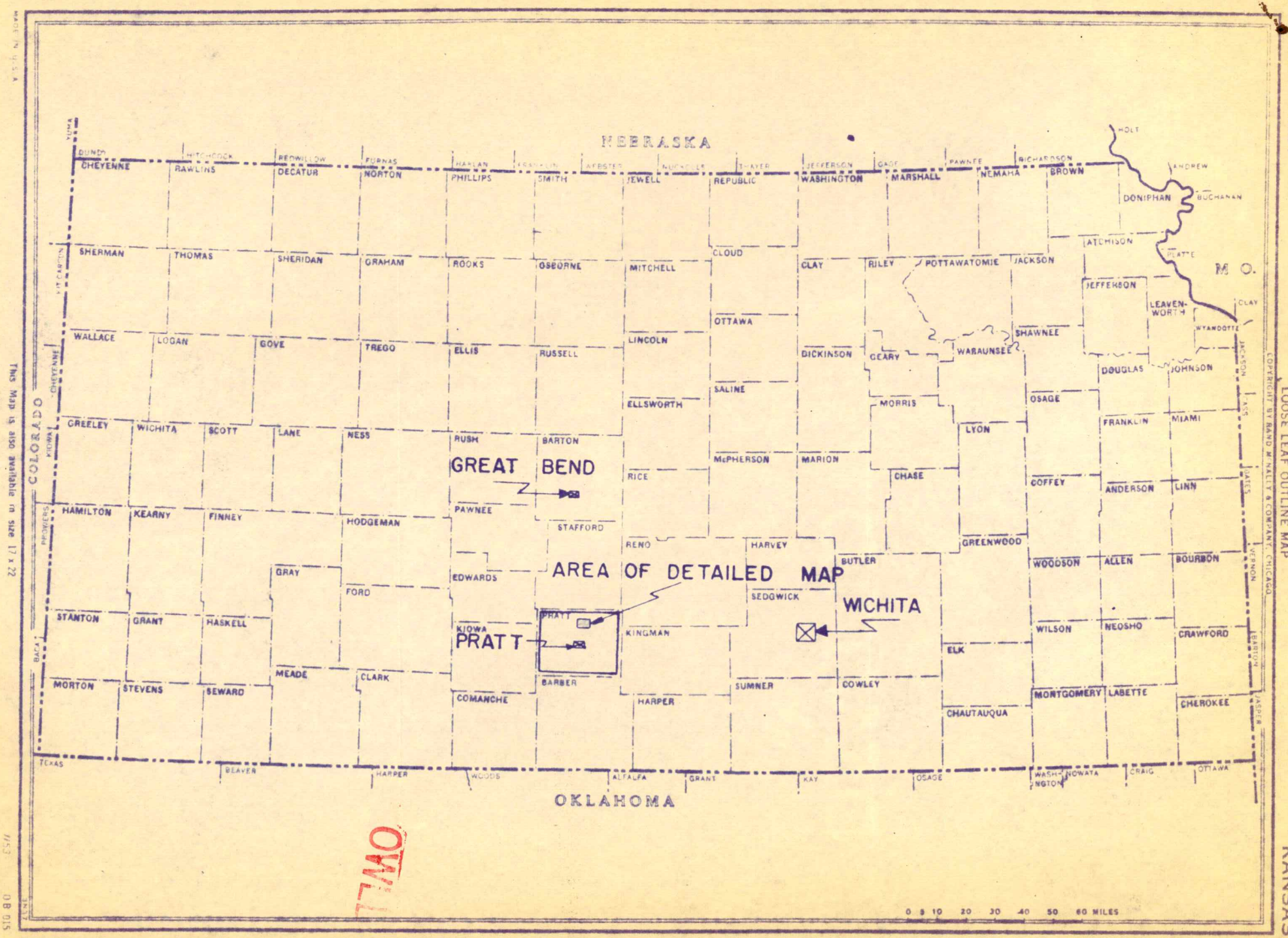
Very truly yours,

OWI

JOHNS and MAGATHAN

By: Wendell S. Johns
Wendell S. Johns

WSJ/gt



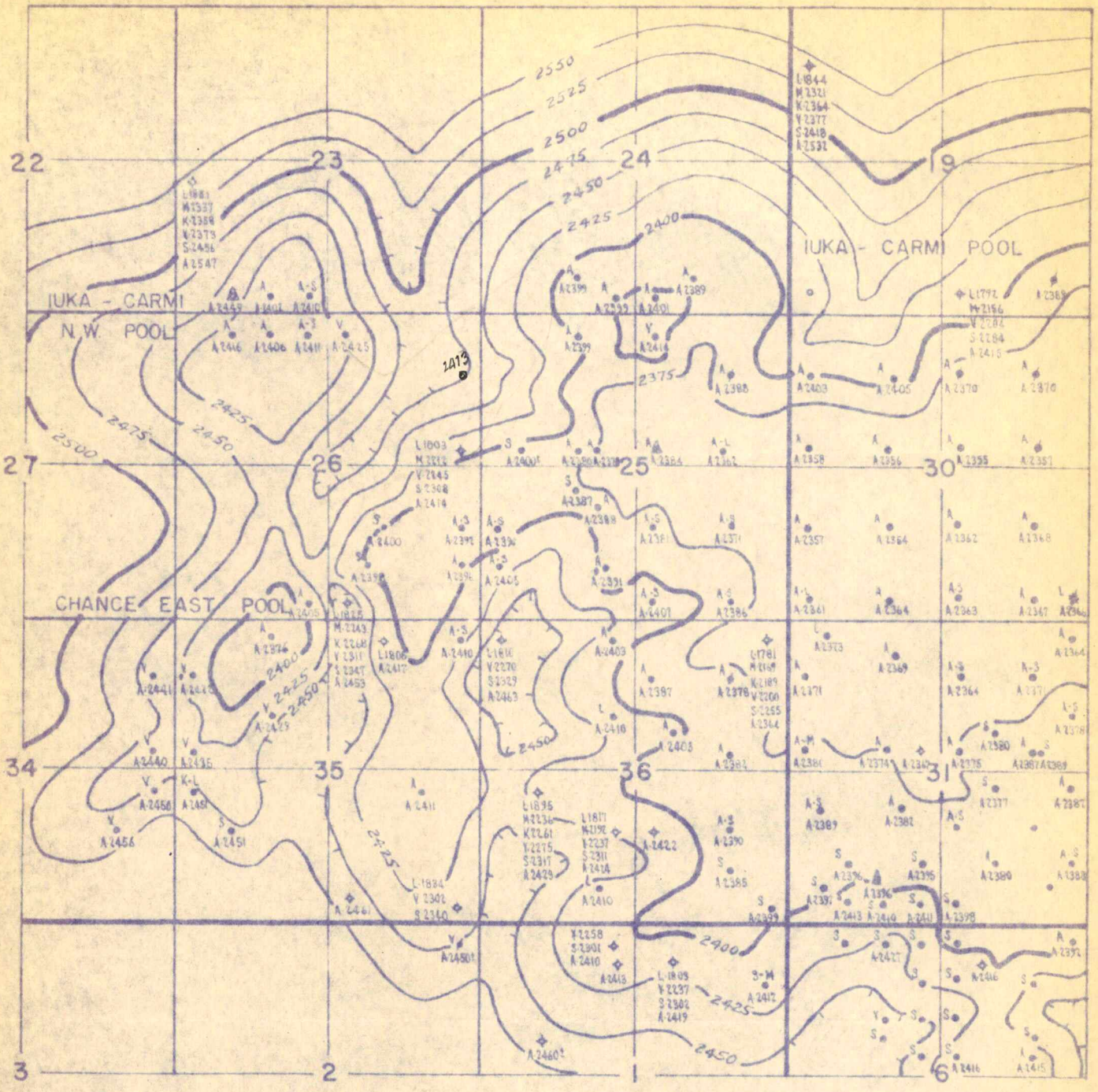
RAND McNALLY

LOOSE LEAF OUTLINE MAP

KANSAS

This Map is also available in size 17 x 22

MADE IN U.S.A.



LEGEND

- L - LANSING
- M - MISSISSIPPI
- K - KINDERHOOK
- V - VIOLA
- S - SIMPSON
- A - ARBUCKLE
- • PRODUCING WELL
- ◇ DRY HOLE
- ▲ SALT WATER DISPOSAL WELL

GEOLOGIC MAP

OF A PORTION OF

IUKA - CARMI AREA

PRATT COUNTY, KANSAS

CONTOURED ON: ARBUCKLE

CONTOUR INTERVAL = 25

DATE: 9 - 7 - 55

GEOLOGIST: Wendell S. Johnson

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Geologic Report: Iuka-Carmi Area
Pratt County, Kansas

Historical Sketch

The Iuka-Carmi Area was discovered in October 1937 by Atlantic Refining Company on their #1 Runyan in section 11-27S-13W. The pay horizon was the Simpson dolomite. Arbuckle production was found at Skelly's #1 Helmke, section 1-27S-13W in 1940. In November 1942 the Hollow Drilling Company completed their #1 Brown "B" in section 29-26S-12W as a 3000 barrel well from the Arbuckle. This was the discovery well in the Carmi pool. The Iuka pool is the second oldest producing area in Pratt County, being exceeded in age only by the Cunningham Area.

The discovery of the Carmi pool caused a drilling boom in this area in 1943 and activity has continued at a rather high rate since that time. Most of the production dates from 1943 or later.

While this area was originally thought to be two pools, subsequent drilling has proven that production at both Carmi and Iuka is on one large domal structure, consequently the two pools have been consolidated.

To date the major part of the production in the Carmi sector of the pool (that lying in township 26 south) has been from the Arbuckle. However, since 1952 many wells in this area have been plugged back to the Simpson and it now appears that production from this formation will be nearly as large as that from the Arbuckle. Production of considerable importance has also been found in the Lansing-Kansas City. Development of this formation has not progressed far at this time and the total production will likely not approach that of either the Simpson or Arbuckle. Some production has been found in the Viola and this formation appears likely to be of some importance around the edge of the area. A little small, and probably inconsequential, production has also been found in the Mississippi Chert.

Carmi

In the Iuka sector (the area lying in township 27 south) the Simpson is by far the most important producer. A little production has been found in the Arbuckle, Viola, Mississippi, and Lansing-Kansas City but the total from all of these formations will be small.

In recent years two small pools have been discovered immediately west of the main Iuka-Carmi structure. These are (1) Iuka-Carmi, Northwest, discovered in June 1953, by the Moore and Amis #1 Hoener, in NE NE NW 26-26S-13W. The original producing zone was the Arbuckle but production has since been found in the Simpson and Viola. There is a possibility that some oil may also be produced from the Lansing-Kansas City.

(2) Chance, East pool discovered in May 1952, by the Rine Drilling Company #1 Briggeman "A" in the NE NE SE 34-26S-13W. This wa s an old dry hole which was reopened on the basis of an electric log study. Production was from the Viola. This formation appears to be the most important producer in the field but oil is now, or has been, produced in commercial quantities from the Arbuckle, Simpson, Kinderhook and Lansing-Kansas City formations.

In general, the Iuka-Carmi pool appears to have been completely developed. However, exploration around the edge of the area will undoubtedly continue and in all likelihood additional small pools such as the Chance, East and Iuka-Carmi, Northwest will be found. A large amount of recompletion work will also be done in the area in the next few years.

Geological Discussion:

The Iuka-Carmi structure is a dome of considerable size. It is faulted along the southeast flank, drops sharply, with possible faulting along the north flank, and slopes gently southwestward on the south and west. The Carmi sector of the pool lies on top of this dome while the Iuka sector lies on the gently sloping southwest flank.

The Chance, East and the Iuka-Carmi, Northwest pools lie on the west flank of this high area but appear to be isolated from the main feature by narrow synclines.

The Iuka-Carmi structure is by far the largest (though not the most abrupt) high area so far discovered in Pratt County. Except for two high dry holes in the Stark pool a few miles northeast, the highest Arbuckle points in Pratt County are found in this pool. From a geologic standpoint it is the controlling feature for all of the production in central Pratt County.

Production Statistics:

The total production of the Iuka-Carmi pool to June 31, 1955 has been 15,876.276 barrels of oil. During June 1955 the area averaged 3657 barrels per day. Dividing this by sectors gives some light on the performance of the Arbuckle and Simpson.

Iuka sector - Total production 4,645,573 barrels oil. Still producing 2000 barrels per day. Approximately 2960 acres are, or have been, productive. This means that the average production to date has been 1570 barrels per acre or a little over 31,000 barrels per well based on the average spacing of 20 acres per well. This is not a very representative picture, however, because the best production is in the south half of the pool where the pay zone consists of sand instead of dolomite and this production dates from about 1953.

The Skelly Katie Beck lease in the Northwest quarter 7-27S-12W is one of the better leases in the older part of the Iuka pool. It has produced 3020 barrels oil per acre to date and it appears likely that 3500 barrels per acre will be the ultimate recovery. This is probably a maximum figure for Simpson recovery in the old part of this pool. However, there are some reasons to believe that the newer sand production at the south end of the field will be somewhat better.

Carmi Sector - Total production 11,230,703 barrels oil. Still producing 1656 barrels oil per day. Approximately 4600 acres are, or have been productive. This means that the Carmi area has produced 2460 barrels per acre or about 86,000 barrels per well based on the average spacing of approximately 35 acres per well which has been used in this field.

While there is no way to tell exactly what proportion of this oil was produced from the Arbuckle, it is certain that the greater part of the oil so far produced has come from that formation. Taking into consideration the fact that the Arbuckle production is quite advance towa rd depletion, it appears that about 3000 barrels per acre can be expected as the ultimate recovery from this formation in the Carmi sector. It is probable that a somewhat better recovery would have been obtained, however, had a 20 acre spacing pattern been used instead of the 40 acre pattern on which most of the Arbuckle was drilled.

While it is doubtful that the Simpson production in the Carmi sector will be as good as that in the Iuka sector, it appears that, with the oil that can be expected from the Viola and Lansing-Kansas City, the total recovery for this part of the pool should approach 7000 barrels per acre.

Discussion of Leases of Special Interest:

The following is a discussion of the leases in the area in which you are especially interested.

McKnab Gobin Lease:

This lease covers the SW¼ of section 24-26S-13W. The original well on this lease, the #1 Gobin, was completed in January 1955 for 104 barrels oil per day from the Arbuckle which was found at 4333 feet. The well is producing from the top nine feet of the Arbuckle. A drill stem test in the Viola indicates the probability of some production from that formation.

The #2 Gobin was completed August 7, 1955 for 210 barrels of oil per day from the Arbuckle. It is producing from a zone between 13 and 20 feet in this formation. Two successful tests in the Viola, one of which flowed oil in 57 minutes, prove that the well will produce from this formation.

These tests indicate that the Viola will probably be productive from 4192 to 4228.

From sample study and electric log analysis, four zones in the Lansing-Kansas City (between 3769 and 4004) appear very prospective for production.

McKnab Keller Lease:

This lease covers the S½ SE¼ of section 24-26S-13W. The #1 well was completed May 19, 1955 in the Arbuckle. The well pumped 119 barrels in 24 hours from a zone lying between 13 and 15 feet below the top of the formation.

A drill stem test in the Viola on the #1 Keller indicates that the well will definitely produce from this section.

Sample study, electric log analysis, and drill stem test data indicate that four zones in the Lansing-Kansas City have fair prospects for production.

The #2 Keller was completed August 29, 1955. No potential has yet been taken but it swabbed oil at the rate of 40 barrels per hour, 2000 feet off bottom. This would indicate that the well should make about 400 barrels per day or perhaps more. The producing zone is an interval from 4349 to 4357 in the Arbuckle formation. The top of this zone is 21 feet below the top of the Arbuckle but it is the same section which produces in the #1 Keller and the #2 Gobin.

A drill stem test in the Viola indicates fair prospects for some production from this zone.

The Lansing-Kansas City is very tight in this well but there is fair prospects for production in four different zones.

The Gobin and Keller leases lie on a broad nose extending northward from the Iuka-Carmi pool. It appears probable that most of the Keller lease will be high enough to produce from the Arbuckle. The Gobin lease, however, is not likely to have more than one more Arbuckle well on it.

The Viola is practically certain to be productive in all of the four wells so far drilled and has a good chance to make wells over all the Keller lease and the south half of the Gobin lease. Some production is practically assured from the Lansing-Kansas City but the importance of this formation is uncertain at this point.

The Simpson appears to be too poorly developed in all of the wells so far drilled to be productive. There is a possibility, however, that it may develop, at a lower structural position, to the point where it might produce commercial amounts of oil.

McKnab Brown Lease:

The Brown lease covers the SE¼ of section 35-26S-13W. It appears to lie on a small, nearly isolated, structure between the Chance, East pool and the Iuka-Carmi pool. At present it is included in the latter field but it is doubtful that this is correct. The lease has two low dry holes along the south line, both of which were completed in 1944.

There is one Arbuckle producer on the lease, the McKnab #1 Brown, which was completed in April 1955 for approximately 100 barrels of oil per day. A drill stem test at 3896 to 3920 in the Lansing-Kansas City recovered 960 feet of oil and 150 feet of muddy oil and assures good production from that formation.

There should be four or five more locations on this lease which will produce from the Arbuckle. While the Lansing-Kansas City production in this area is erratic, several locations on the lease will probably produce from this formation.

The Simpson did not look particularily prospective in this well but there is good production from this formation in the locality and it is likely that some will be found on this lease.

Moore and Amis Hoener Lease:

This lease covers the E½ NW¼ of section 26-26S-13W. The first well on the lease was completed in July 1953 and was the discovery well of the Iuka-Carmi, Northwest pool. It produced 290 barrels of oil per day from the Arbuckle. In the spring of 1955 this well was plugged back and recompleted in the Simpson.

There are three zones in the Lansing-Kansas City in this well which look mildly prospective. The Viola also appears to have fair possibilities for production.

The #2 Hoener was completed in April 1954 in the Arbuckle for 302 barrels of oil per day. Drill stem tests in the Simpson and Viola indicate that both formations should be productive. One zone in the Lansing-Kansas City appears to be mildly prospective.

Moore and Amis Gobin Lease:

This lease covers the E½ SW¼ and the W½ SE¼ of section 23-26S-13W. The first well, which offset the Moore and Amis #2 Hoener, was completed in March 1954. The test made 410 barrels of oil per day from the Arbuckle.

A successful drill stem test in the Viola and two good drill stem tests in the Simpson indicate that these formations will definitely be productive.

The #2 Gobin was completed in September 1954. It was an Arbuckle producer with an initial potential of 124 barrels oil per day. Early in 1955 this well was plugged back and recompleted in the Simpson.

The Viola appears to have some chance to produce in the #2 Gobin but is not highly prospective.

The Moore and Amis Hoener and Gobin leases are situated in the Iuka-Carmi, Northwest pool. This area appears to be completely cut off from the Iuka-Carmi pool by a narrow syncline.

There appears to be only one additional prospective location on the Gobin lease but there should be at least four more prospective locations on the Hoener lease.

It appears likely that the Viola will produce in most, and possibly all, of the wells in this pool. The Simpson is almost certain to produce at all locations.

Some Lansing-Kansas City production will probably be developed in this pool but it is not likely to be of much importance.

Moore and Amis Hoener "A" Lease:

This lease covers the SW¼ of section 26-26S-13W. The one well on the lease was drilled in July 1954. It was completed as an Arbuckle producer with an initial potential of 149 barrels of oil per day.

Two successful drill stem tests in the Simpson indicate certain production from this formation.

Two zones in the Lansing-Kansas City have some possibilities for production but are not overly prospective. The Viola appears to be too tight to have much chance to produce.

This lease is at the north end of the Chance, East pool. There appears to be a fair chance that one or two more locations might produce from the Arbuckle. However, several more locations are prospective for Simpson production.

Actually there is no subsurface control to justify the saddle which we map between the Chance, East pool and the Iuka-Carmi, Northwest pool. This saddle is based on a slight seismic indication and may not exist. If these two pools should develop into one pool, the Moore and Amis Hoener and Hoener "A" lease would become a very valuable property.

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