

GRAPHIC STUDY OIL AND GAS INDUSTRY

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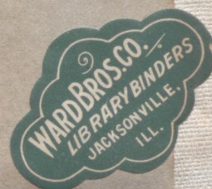
MASTER'S THESIS

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W. C. EYL, E. M., 1922

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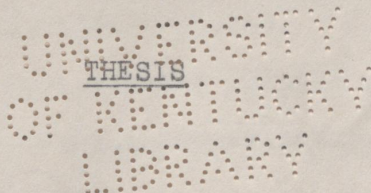
A GRAPHIC STUDY

of the

OIL AND GAS INDUSTRY OF KENTUCKY

Illustrated by a New Map of the State

Compiled by the Author



Presented to the Faculty of the Graduate  
School of the University of Kentucky in  
Partial Fulfilment of the Requirements  
For the Degree of Mining Engineer

By

William Christopher Eyl

Lexington, Kentucky

1922

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T H E S I S

It is the purpose of this Thesis to provide an originally compiled map of the State of Kentucky in great detail and to show on this map, in a graphic manner, the areal and geologic distribution of oil and gas pools in the State; the location of every known geologic fault; the location of every oil and gas pipeline, refinery, gas-gasoline plant and carbon black plant; and to properly name each of these features.

On the map are also printed graphic geologic sections giving the following information concerning each of the main producing areas:-

Character of the surface,

Gravity of the oil,

General pertinent information,

Geologic names and ages of the rocks exposed on the surface,

Geologic names and ages of the rocks penetrated by the drill,

Local and accepted names of formations and "pay sands",

Character of "pay-sands" and of intervening formations,

Showing whether the "sand" produces oil or gas or both,

Thicknesses of formations and of "pays",

Drilling depths to "pays" and to "key" formations.

In addition to these key sections there is printed a table of miscellaneous pools, giving essentially the same information on the many scattered and small pools of the State, as is given in the detail sections for the main pools.

There is also printed a graphic geologic table showing the names and subdivisions, thicknesses and character of every exposed formation in the State and also the locations - in the vertical section - of disconformities. A feature of this table is the listing of all producing "sands" in the State, showing their vertical geologic range.

#### Construction of Map

The map was primarily compiled for the purpose of providing the most complete and accurate base map of the State, in one sheet, which can be made from existing data.

The meridians and parallels were located from precise figures furnished by the United State Geological Survey. The compilation was accomplished with a precise metal pantograph. Great care was used to properly adjust and reproduce each bit of data. To the meridians and parallels were first adjusted the best of the United States Geological Survey quadrangles and to these were "tied in" all other maps and data; first using the best, then the less dependable maps.

Approximately four (400) hundred separate maps were used in this compilation which represent practically all

of the available maps on all parts of the State. About one-half of the maps used are not generally available.

The data for the map were collected through a period of five years and the actual construction of it required a year's time. The data were collected from all available sources and include the results of much original work by the author.

It is the author's intent that the map be a graphic representation of the oil and gas industry in Kentucky and to so design and construct it as to make unnecessary written explanations: It is herewith offered as such.

However, a brief history of the industry in Kentucky may be of interest and a fitting supplement to the map itself, so a summary of the industry's history in the State is herewith attached.

#### A BRIEF HISTORY OF KENTUCKY'S OIL AND GAS INDUSTRY

Oil and gas were known to exist in Kentucky from its original occupation, and in fact, it is reported by tradition, that the North American Indian collected crude petroleum from the surface of "oil springs" in Kentucky before the advent of the "pale-face". They accomplished this by holding a blanket on the surface of the oil covered water and then squeezing from the blanket the oil which it had absorbed. The oil was used for medicinal purposes.

During this very early history of Kentucky oil and gas they were known only from natural "springs" and "seepages".

The first oil in Kentucky, liberated from its subterranean reservoir by the works of man, was from a well drilled in the year 1819 by Martin Beatty of Virginia, who, while drilling for "sault" in the valley of the Big South Fork of the Cumberland River in what was then Wayne County, but now is McCreary County, struck a flowing well of the then almost unknown "rock oil", at a depth of about two hundred feet. With the possible exception of several similar wells, drilled in the valley of the Kanawha River in West Virginia about this time, this "1819 well" probably represents America's first oil well. The well was abandoned as worthless for no specific use was then known for this strange tarry substance.

About ten years later, in 1829, the famous "Old American" or "Burksville" well was drilled in Cumberland County on Renox Creek. This well represented another "failure" for, like the driller of the "1819 well", the drillers of this well were looking for brine from which to make salt. The well came in as a "gusher" and flowed for many days covering the surface of the Cumberland river for many miles with its black fluid. It is reported that, on the river forty miles below the well, the oil was ignited and burnt its way upstream to the well, which unique phenomenon, a "burning river" was heralded as one of the "seven wonders of America". The oil was later bailed from the well, bottled and sold for medicinal purposes under the name "American Oil" until about 1860. The depth of the well was about one hundred and seventy-five (175) feet.



The product of the well, totaling about fifty (50,000) thousand barrels (estimated) - only part of which was utilized - probably represents the extent of Kentucky's commercial oil and gas industry up to the year 1860, although, there is some evidence that oil may have been collected and sold from a "spring" in Allen County previous to the year 1850.

The third discovery of oil in Kentucky was in a well, also drilled for brine, on Little Richland Creek, Knox County, in the year 1840. This well flowed "probably 100 barrels a day" from a shallow depth. Twenty-seven years later an attempt was made to open up a pool in the vicinity of this well; oil was encountered at a depth of four (400) hundred feet, but the tools were lost in the hole and the project abandoned. In 1901 a small pool was developed near these old wells.

In 1858 gas was discovered in Meade County, near Rock Haven and the first commercial gas well drilled on the Moreman farm in the year 1863. In 1872 gas from this district was used in the manufacture of salt from brine. In 1888 a pipeline (eight inch) was laid from the field to Louisville, which line is still (1922) in use and the field furnishing 250,000 cu. ft. of gas a day.

✓ The first successful well, drilled for oil, in Kentucky, was put down on Saltlick Creek, Clinton County, in 1861. It is known as the "Old Gabbert" well and is estimated to have produced 50,000 barrels of oil. Several other success-

ful wells were drilled about this time but operations were soon suspended because of the breaking out of the Civil war.

Immediately after the war the "oil fever" broke out anew and wells were drilled near nearly every oil and gas seepage in the State but with only comparatively slight success. Most of the activity was in the valley of the Cumberland river, in and near Cumberland County. Other developments were as follows:-

In 1865 the Oskamp pool in Barren County was discovered and probably in the same year oil was struck on Long Falls Creek in McLean County. In 1866 the Bakerton pool of Cumberland County and the Halfway pool of Allen County were first discovered. In 1867 the second Little Richland Creek well, in Knox County, mentioned hereinbefore, was drilled. The activity of this period, during the late sixties, marked Kentucky's first "oil boom".

The next notable discovery of oil or gas in Kentucky was the drilling in of the famous "Warfield" gas well, by Chas. Dulin, Sr., in 1881. This is probably the largest gas well ever drilled in Kentucky. It is on the Tug Fork of the Big Sandy river, near Warfield, Martin County. The well was drilled at the location because of the bubbling up of natural gas from the bed of Tug Fork in the vicinity. The well was allowed to "blow" into the air for about eight years before being capped and the gas utilized.

The second period of very active drilling in the State began about the year 1887. This was principally a gas "boom", occasioned by the discovery of gas in the Trenton Limestone in the northern parts of Ohio and Indiana in the

years 1885 and 1886. This activity was confined almost exclusively to Western Kentucky and was wide-spread in extent. The pools discovered during the period were as follows:-

In 1887 the Jordan and Emery oil pools of Barren County and probably the Cloverport gas pool in Breckinridge County. In 1889 (?) the Oil City and Steffy oil pools and the Glasgow gas field in Barren County. In 1890(?) the Gas Hollow oil pool of Barren County and gas in small quantities at Leitchfield in Grayson County. All of these pools were small although the Barren County oil pools proved to be persistent producers. It was during this period that the old Rock Haven gas field was redrilled and developed into an important producer. An eight inch pipeline was laid from this field to Louisville in 1888. About the same time gas was piped to Cloverport from the Cloverport field and to towns along the Ohio River, near the mouth of the Big Sandy, from the Inez or Warfield field.

The year 1892 witnesses the discovery of two widely separated and important oil fields. In this year the Slickford pool in Wayne County was discovered which was thus the first of the many pools in the County to be discovered. Oil from this pool was wagoned to Rowena, on the Cumberland river, and shipped by boat to Nashville, Tennessee. In the same year Louis H. Gormley, of Prestonsburg, drilled the discovery well in the Beaver pool, Floyd County.

In 1893 the active development of the Inez gas field, in Martin County, was begun although the production was not

utilized to a great extent until the year 1905.

Renewed activity in Wayne County in 1895 resulted in the discovery of the Cooper pool. The following year (1886) the small and unimportant Stinking Creek pool in Knox County was opened.

Activity in Wayne County died down after the discovery of the Oil Valley pool in 1897.

The year 1900 ushered in a period of activity without precedence in the State/and which resulted in the discovery of many new pools and added several more counties to the list of oil and gas producers. The "excitement" continued for a period of ten years. It began early in the year, with the discovery of oil on the Tommy Hagland farm, in the Valley of the Licking river, southeast of Saltlick, in Bath County. In the same year the unique "Parnel" well in Wayne County was drilled; the old Sewell pool in Cumberland County was redrilled and at about the same time the shallow well near Beech Grove, McLean County, was drilled.

The next year (1901) the following pools were discovered:-

Ellington, in Cumberland County; Sunnybrook, in Wayne County; Menefee (gas), in Menefee County( which proved to be one of the largest gas pools in the State); Elk Fork, in Morgan County; Ravenna, in Estill County; and the Barbourville and Little Richland Creek (redrilled), in Knox County.

In 1902 the Parmleysville and Dry Fork pools in Wayne County; the Williamsburg in Whitley County and the Clover Creek in Cumberland County were discovered.

The peak of the development for the period was reached in 1903 with the discovery of the following pools:-

The Camp-  
ton in Wolfe County; Steubenville and Young in Wayne County; Mize (small gas) in Morgan County; Irish Bottom, Heard, Aratt, Small and Bear Creek in Cumberland County; and the Fallsburg and Bussyville in Lawrence County. The last two pools ( in Lawrence County) were not actively developed until 1912. The development of the Campton Pool continued until 1909 and the Steubenville until about 1910.

In 1905 three more pools were found in Wayne County, the Sinking, Barrier(?) and Turkey Rock. In Knott County the Dry Creek pool was discovered. In this year a ten inch gas line was laid from the Menefee gas field to Lexington and the main of the United Fuel Gas Company was laid up the Big Sandy River to the Inez gas field.

In 1906 the Sulphur Creek pool in Cumberland County; and the Jim Cooper pool in Wayne County, the Corder in McCreary County and probably the Bradley in Floyd County and Upchurch in Wayne County were discovered.

In 1907 the twelve inch gas main from Inez to Louisville was laid and connected. During this year the small Bratcher Hollow pool in Wayne County was discovered.

In 1908 the Monticello (gas), Johnson Fork (stray) and Mt. Pisgah (stray) pools in Wayne County were opened.

In 1909 the Stillwater pool in Wolfe County and the small, stray sand, Rock Creek pool in McCreary County were opened.

This period closed in 1910 with the discovery of the Gibson, Griffin and Patton pools in Wayne County; the Diamond Springs pool in Logan County and Central City (gas) pool in Muhlenberg County which were also discovered about this time.

In 1912 the important Cannel City pool in Morgan County was discovered as also was the Hartford pool in Ohio County; and the Rodemer and Petroleum pools in Allen County. In this year the east extension of the Central Kentucky Natural Gas Company's main to Inez was laid. The laying of this extension was necessitated because of the rapid decline of the Menefee pool. The active development of the Fallsburg and Bussyville pools in Lawrence County, which were discovered in 1903, was begun in this year.

In March, 1913 the first shipment of oil from Allen County was made from the Petroleum pool.

In 1914 the prolific Irvine pool in Estill County was discovered, although its development did not take place until two years later, in 1916.

In 1916 began the greatest and by far the most productive oil "boom" which Kentucky has ever seen. The peak of the "boom" was probably reached during the years 1918 and 1919, however, interest in all parts of the State is still (1922) very great. The year 1916 witnessed the beginning of the intensive development of the Irvine pool. New pools discovered during this year were the Fisher, Miller, Hooten, Adolphus, and Gainesville of Allen County; the Hiseville in Barren County; the Ashley in Powell County; the Bolyn (gas) in

Knott County; and the Miller and Station Camp in Estill County. During this year 1074 wells were drilled in Kentucky, 878 of which were producers of oil and 17 gas wells. During the year a total of 1,202,569 bbls. of oil were produced which represent an increase of 175% over the production of 1915.

By 1917, and spurred on by war-time demands, interest had spread to nearly all parts of the State, which resulted in the discovery of about twenty new pools during the year as follows:-

The Tucker in Allen County; Green River in Taylor and Green Counties; Meredith (gas) and Leitchfield (gas) in Grayson County; Gaddie and Tobey (both unimportant) in Metcalfe County; Emberton in Monroe; Buck Creek (gas) and Buck Creek (oil) in Lincoln County; Lanhart in Jackson; Olympia in Bath County; Newcombe Creek in Elliott County; Flat Gap (gas) in Johnson County; Bull Creek (gas) in Floyd County; and probably the Holly Creek in Wolfe; the Williams, Jackson, Staggner and Stahl pools in Warren; the Buck Creek pool and Ross Creek pool in Estill County.

In 1918 Kentucky's largest and most prolific oil pool was discovered, namely, the Big Sinking pool of Lee County. The oil in this pool is secured from the "Corniferous" "sand" at an average depth of about 1050 feet. Many of the wells in the pool came in at several hundred barrels capacity a day and some were reported at 1000 barrels per day. In September, 1918 the Big Sinking pool assumed first place among the producing pools of Kentucky and has easily held this position since. In April 1918 the pool produced about

10,000 barrels of oil; in December of the same year the production had mounted to about 250,000 barrels for that month or more than all of the other pools of the State combined.

During the same year there were also discovered the Short Creek pool in Grayson County; the Sam Martin pool in Warren County; the Hunt, Meador, Sledge, Scottsville, and Duke pools in Allen County; the South Fork pool in Barren County; the Green River in Lincoln County; the Mariba pool in Meffee County; the Linemans Creek pool in Lee County; the Travelers Rest pool (gas) in Owsley County; the Little Frozen and Froken Creek (gas) in Breathitt County; the Burning Springs (gas) in Clay County; the Denton pool in Carter County; the Win (gas) in Johnson County; and the Prestonsburg (gas) in Floyd County.

In 1919 Kentucky's peak production was attained. During the year 9,226,472 barrels of oil were produced and sold for \$24,459,016.00. Activity in all sections of the State continued unabated during the year. The most important discovery of the year was that of the Davenport pool in Warren County. This pool was developed into one which rivals the Big Sinking pool in areal extent, although it is not so prolific. The discovery well was drilled in on November 3rd on the farm of Chas. Davenport. The pool was developed largely during the year 1920; the production coming from two "pays", one below the Ohio Black shale and the other above it. The "deep" pay averages about 900 feet in drilling depth and the "shallow" pay about 450 feet. During this year the following pools also were discovered:-

Spencer Heirs in Wolfe



County; Sturgeon Creek pool in Lee County; Louisa (?) pool in Lawrence County; Neals Creek pool in Lincoln; Susie pool in Wayne; Mine Fork and Ivyton pools in Magoffin County; Mt. Aerial, Justice, Wheat, Stamps, Johnson and W.G.Oliver pools in Allen County; Temple Hill(gas) in Barren County; Beech Bottom pool in Clinton County; Hawesville pool in Hancock County; Gott and Moulder in Warren County; Stringer, Reeder (?) and Flatrock (?) in Simpson County; and probably the Hell Creek pool in Lee County.

The most important find in the year 1920 was the discovery and development of the "Wier" sand production in Johnson County. The "Wier" pools discovered in this County during the year were the Keaton, Red Bush and Oil Branch. Two other pools discovered in the County in 1920, the Fugate and the Staffordsville, derive their production from the "Berea" sand. Other pools discovered in 1920 are:-

The Pellville in Hancock County; the Wilhelm, Nourse, Olmstead, and Mose Wall in Logan County; the Mitchell in Warren County; the Hunt, Buchanan and Keen in Allen County; the Bear Creek (redrilled) and Coops pools in Cumberland County; the Windy City pool in Wayne County; the Oneide (gas) pool in Clay County; the Bolts Fork pool in Boyd County; the Walbridge pool in Lawrence County; and probably the Hurt, Roundtree and Effie Skaggs pools in Warren County; the Jewell, Ayers and Hinton pools in Allen County; and the Maloney pool in Lee County.

In 1921 interest seemed to center largely in the Warren and Johnson-Magoffin Districts. No new pools were discovered

either in Johnson or Magoffin county but several were located in Warren County as follows:-

The Sandidge, Belcher, Simmons, Shanks, Gaines, Vance-Potter, and Weaver. Other pools discovered in the year were the Grin (gas) in Rowan; the Satterfield, Alonzo, and Calvert in Allen County; the Penrod in Muhlenberg County; the Rochester in Butler; the Powell and Beauchamp in Logan; the Pugh and Pert in Simpson; and probably the Guston in Meade County and Rockfield in Warren County.

In 1922 "wild-cattling" was curtailed to a considerable extent because of the continued business depression and resulting low price of oil as compared with the prices of the several previous years. However, several new pools, all of them small, were discovered as follows:-

The Pine Ridge and Cable pools in Wolfe County; the Dyson pool in Allen County; the Procter pool in Union County and the Penner and Rocky Hill pools in Warren County.

Respectfully submitted this seventh day of November, 1922

.....*W. C. Egl.*.....

Graduated in 1917 from the University of Kentucky, Department of Mining Engineering, with the degree of B.E.M.

ACKNOWLEDGMENTS

Special acknowledgments are due Prof. C.J. Norwood, Head of the Mining Engineering Department, University of Kentucky, for the loan of necessary mechanical equipment and for kindly advice and criticism; and to Prof. A.M. Miller, Head of the Department of Geology, University of Kentucky, for the loan of many rare maps and for a manifest spirit of cooperation which was ever an inspiration to the author.

Due acknowledgment is given Prof. T.J. Barr, of the University of Kentucky, for numerous helpful suggestions; to the Kentucky Geological Survey, the United State Geological Survey, the United States Agricultural Department, the United States War Department and the United States Post Office Department whose maps were freely used; to Mr. J.B. Hoeing, of Lexington, Ky. for several rare maps; and to all others, who, in any way, contributed to the success of the work.

*W. C. Egl*

Lexington, Ky.  
November 7, 1922

FORMAL ACCEPTANCE OF THESIS

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As Professor in charge of this candidate's  
major study, I hereby accept this thesis.

Date Dec. 1, 1922. W E Freeman.

As Chairman of the Graduate School Committee,  
I hereby accept this thesis in completion of all  
requirements for the Master's degree.

Date \_\_\_\_\_



