

REPORT OF THE DEPARTMENT OF CONSERVATION

October 1, 1932, to June 30, 1933

EXECUTIVE OFFICE

VIRGIL M. SIMMONS, Commissioner

STAFF

KENNETH M. KUNKEL, Assistant Commissioner.
BLODGETT E. BRENNAN, Secretary.
MARTHA EAST, Secretary-Stenographer.
MARC WAGGONER, Information Clerk.
E. W. GALLAGHER, Accountant.
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J. W. BOEHNING, Second Assistant Accountant.
IRENE McANDREWS, Clerk-Bookkeeper.
MARGARET HARMON, File Clerk.

The session of the Indiana General Assembly in 1919 created the present Department of Conservation. Before this time a number of boards and commissions had control of the management of the natural resources of the state.

This arrangement placed under one head the following departments: Fish and Game, Lands and Waters, Forestry, Geology, Entomology and Engineering. By close co-operation the several departments have not only become more efficient but a great amount of duplication of effort and expensive overhead has been eliminated.

The Conservation Department probably comes in direct contact with more citizens of Indiana than any other department of the state government. In our busy, every-day life, very little thought is given to the absolute necessity of our natural resources. Without land, water, forests and minerals, health, business, progress and prosperity would be impossible.

The business of this department is to safeguard the natural resources of our state and prevent the destruction and abuse of the things that are so essential to the existence and happiness of the three million people living in Indiana.

With the active, intelligent and enthusiastic assistance of the thousands of interested conservationists in the state, the department can make Indiana a healthier, happier and better place in which to live.

REPORT OF THE DIVISION OF GEOLOGY

(Fifty-eighth Annual Report of the State Geologist)

W. N. LOGAN, State Geologist.
PAUL F. SIMPSON, Supervisor of Natural Gas.
VERNE PATTY, Curator of Museum.
MARY E. LIVENGOOD, Clerk and Stenographer.

Members of the division who acted in an official, technical, or advisory capacity during the year were: W. N. Logan, State Geologist;

E. R. Cumings, stratigraphic geology; C. A. Malott, physiographic geology; J. J. Galloway, paleontology; S. S. Visher, geography; J. E. Switzer, geography; Ralph E. Esarey, economic geology; and Howard Legge, preparator.

Members of the field party included Paul Kerr, Phillip Myers, Yadon Spencer, Richard Freed, W. P. Von Osinski, Richard Perry, Robert Yoho, Herbert Hudson, Courtney Boone.

Members of the natural gas inspection force include O. H. Hughes, Sharpville; John Ersinger, Sullivan; Fred E. Harrer, Tell City; J. P. Horton, Montpelier; Wm. F. Connors, Vincennes; Herschell Ringo, Muncie; Howard Legge, Bloomington; A. C. Ford, Bryant; Marion Brown, Loogootee; and Herman Chanley, Laconia. Only members of the office force draw compensation for services from the division funds regularly.

GEOLOGICAL FIELD INVESTIGATIONS

Because of the fact that the fiscal year was shortened to nine months for the period ending June 30, 1933, the complete report of the field investigations carried on by the summer field party can not be included. This work is usually begun at the close of school in June and is completed during the first part of August. The following reports cover the work completed before June 30, but a final report can not be made until the next year.

Various investigations were conducted in many counties of the state at the request of citizens who were desirous of learning whether petroleum, gas, coal, or other mineral products were present on their lands. Separate reports on research or field examinations were made to more than ninety companies and individuals. The more important of these investigations are listed below.

THE SULLIVAN COUNTY AREA

During the first three weeks of the field season an investigation of the coal resources of Cass Township in Sullivan County was made. The area studied comprised about 2,000 acres of prospective coal-bearing land. A portion of the area is underlain by Coal VI and the remainder of the area by Coal VII.

These coals lie at depths which make it possible to remove the overburden and the coal by stripping. The lands under which the coals lie have been assessed as farm lands at from five to ten dollars per acre or less. As coal lands they have a much higher value per acre and should be assessed at a much higher figure. The increased valuation should be \$200,000 or \$250,000 for the area, thus adding greatly to the taxable value of the land.

The map which has been prepared to accompany the report shows by the use of contours the thickness of rock overlying the coal in all parts of the area surveyed. This contour map makes it possible for the coal operator to see at a glance the amount of rock which it will be necessary to remove in order to reach the coal beds. In no part of the area was the overburden of rock found to be too thick for profitable mining operations.

The number VI and the number VII coals which underlie the area are of good quality, as they have been well protected from the weathering agents by the overlying rocks.

The number VII coal has been reached in only a few of the stream courses of the area, and the number VI coal has not been exposed at all. The thickness of this coal is rarely less than four feet and in some places it reaches a thickness of seven feet or more. For reasons mentioned above, the mining of the two coals should be profitable.

The coal-bearing area lies in Cass Township, Sullivan County, in sections 20, 21, 22, 27, 28, and 29. The following members of the field party were engaged in the work: W. N. Logan, Paul Kerr, Phillip Myers, Yadon Spencer, Richard Freed, W. P. Von Osinski, Richard Perry, Robert Yoho, Herbert Hudson, Courtney Boone.

THE SWITZERLAND COUNTY AREA

A portion of the field season was used in the determination of structural conditions in an area in Switzerland County. The purpose of the investigation was to determine the presence of structural conditions favorable to the accumulation of petroleum or natural gas.

The investigation was a continuation of one which was inaugurated in the summer field work of 1932. It was impossible to complete the work in one field season, so it was continued during the present year.

The key horizon which was used for the determination of the structural conditions of the area was the base of the *Platystrophia ponderosa* zone. In some parts of the area the key horizon could be found only in the creek beds, but in some areas by very careful work it was found on some of the hillsides. In our first season the greater part of our time was consumed in searching for the key horizon in the stream beds. During the present field season many locations of the key horizon were made on the hill slopes and our information regarding the structural conditions of the area was greatly increased.

The structural map which is being prepared will exhibit the most favorable areas for drilling for oil or gas.

The geological formations examined during the field season extended from the Brassfield division of the Silurian to the Trenton limestone of Mohawkian age. The highest formation was the Brassfield of the Silurian; then came the Richmond group, including the Elkhorn, Whitewater, Saluda, Liberty, Waynesville, and Arnheim.

The following formations of the Maysville group were recognized: Mt. Auburn, Corryville, Bellevue, and Mt. Hope. The following divisions of the Eden were recognized in outcrops or in drillings: McMicken, Southgate, and Economy. The Trenton was recognized in drillings from wells.

The key horizon of the area was found as high as 742 feet above sea level and as low as 602 feet above sea. This produces a structural difference of 140 feet within the area surveyed and indicates that by future drilling, wells of larger production should be obtained. The structural map of the area is being prepared and will be available to those interested in development within the area.

PUBLICATIONS

At the beginning of the fiscal year the 3,000 copies of Publication No. 112, the "Geological Map of Indiana," were delivered to the office. This map was printed on two sheets of map paper and pasted by the printer, making a map four by six feet in size. The scale is four miles to the inch. Railroads, postoffices, section lines, drainage, and geology are represented, the latter by a series of colors.

Publication No. 123, "The Clay Resources of Indiana," was written as a doctor's thesis by George I. Whitlatch, under the direction of the head of the division. The report contains a summary of the work carried on by Dr. Whitlatch over a period of four or five years, and contains not only a detailed account of Indiana's clay plants, but also a description of many clay deposits which are not at present being used.

Work is also being done at Indiana University on the compilation of much information on the water resources of the state which has been collected by the summer survey during the field work of the last three years. If possible this report will be published.

Shorter reports have been written for publication, including a summary of the oil and gas drilling developments during 1932 for the American Institute of Mining and Metallurgical Engineers, and several notices for the *Journal* of the American Association of State Geologists. Information was furnished an author for incorporation in his report on placer gold mining.

The division has added to its stock of sale publications copies of a number of separates of papers presented before the Indiana Academy of Science and dealing with Indiana geology.

A revision has been printed for the list of publications available, and these revised lists have been sent to persons on our mailing list.

MINERAL AND ROCK DETERMINATIONS

A total of 2,647 samples and specimens were submitted to the laboratory and office by collectors, students, well drillers, and other interested citizens. Many of the rocks and minerals were identified, while in some instances analyses and a report on the possible commercial value were furnished. The drilling samples were received from operators, at the request of members of the division and represented the formations for several wildcat areas in the state.

OFFICE WORK

The routine work of the office force of the division has consisted largely of answering correspondence, receiving callers, preparing maps and geological reports, and tabulating information concerning oil and gas developments. Reading and correcting proof and checking the preparation of the cuts for the publication, "Clay Resources of Indiana," has been a lengthy task. After the completion of the report, the required number of copies was furnished to the State Library and a number of the reports were mailed to the state geologists on our exchange list. These exchanges also received copies of the fourteenth annual report, and of the large geological map. A complete new list

of publications was sent to all persons on our exchange and oil and gas mailing lists.

Several other state governments requested information on Indiana's policy of regulating oil and gas production. Other state geological surveys were notified of a change in policy concerning reports which are mailed out on exchange. In the future two copies of each of Indiana's reports will only be mailed to those states which request them. Another new policy is that of making available for sale copies of short papers dealing with Indiana's geology, which are published in the *Proceedings* of the Indiana Academy of Science. Copies of such papers in the past have not been available from any source, though there has at times been a demand for some of these reports. It will be much cheaper to purchase a few copies of these papers as needed than to have them reprinted.

At the request of an author who is preparing a report on the Great Lakes area, information was supplied for the region of the smaller lakes in Indiana and the natural resources of this section. At the request of the Governor, an examination was made of the outcropping formations on the state farm at Putnamville, to determine whether or not cement could be made at the farm. After complete analyses of the samples had been received, a report was written which advised that the shales and limestones outcropping on the farm are very well suited to the manufacture of cement. At the request of other officials a short report was furnished to explain the value and use of the geologic map of the state.

Efforts were made to have Indiana included in the states which would have topographic mapping started as part of the national relief program. Officials in the Highway and Conservation Departments were consulted in an effort to learn which maps in Indiana would be of greatest value.

A number of persons were assisted in determining what supplies of potable water would be available in their respective sections of the state. Several citizens requested data on the fall of the Salamonie River as a result of some effort to develop hydro-electric power at Dora. Residents of Huntington were offered assistance in locating deposits of suitable clay for use in a brick plant which was contemplated. An engineer who is attempting on a small scale to recover gold by mechanical methods in Brown County has been assisted in determining whether or not these deposits will warrant operations on a larger scale.

Many other citizens have been assisted with information concerning the minerals which might be commercially valuable on their land. A number of requests concerning the value of Indiana coal were answered. Kaolin, mineral water, and several other minerals of minor importance were the subjects of reports to various persons. An increasing interest in the construction of rock gardens has brought many questions concerning the various localities where certain types of rock specimens may be found.

The division has assisted the Boy Scout movement in a number of ways, partly by furnishing them information for certain tests and requirements. Several talks have been given before schools and clubs

on geology or mineralogy. One local school was given a set of samples of representative Indiana rocks. Several select specimens were also sent to a museum in Italy at the request of the local Italian Consular.

STATE MUSEUM

The year has brought many additional contributions to the museum, embracing all lines of exhibits and enhancing the interest. New cases have been added and the attendance has shown a material increase. Many visitors from other states, as well as added attendance in visitors from Indiana are noted.

Some of the acquisitions are of great worth and are attracting much attention. The exhibit has grown so large that a building to house the museum is almost a necessity, if we are to keep up the interest and create a great educational factor in the state. About 300 donations and loans were received during the year, a list of which is preserved in the catalogue of the museum, in the office of the curator.

NATURAL GAS SUPERVISION

The duties of the State Gas Supervisor and his deputies include the enforcement of the conservation laws, the supervision of the plugging of abandoned wells, the inspection of wells and equipment, and the collection of geological data.

Two changes have been made in the list of deputy gas supervisors, after resignations from Mr. C. N. Brown, of Geneva, and Mr. C. E. Noble, of Princeton. Mr. J. P. Horton, of Montpelier, has again taken charge of the Blackford County area, and Adams County has been added to the territory of Mr. A. C. Ford, of Bryant. Mr. William Connors succeeds Mr. Noble, whose area included Pike, Gibson, Vanderburgh, and Warrick counties.

The information in the office files on the progress of drilling wells has been kept up to date through the assistance of drillers, operators, and other observers. A card file keeps this information in usable form, and from it comes the *Indiana Oil and Gas News*, which is mimeographed and mailed out on the first of each month. Our mailing list for this news letter has been revised to include only those who are actively interested in Indiana developments; it now contains about 215 addresses. The most valuable function of the *Oil and Gas News* is the contact it gives between the division and drillers and operators throughout the state.

Sample sacks have been furnished in a number of instances to contractors who were willing to furnish drilling samples from their wells, and much valuable information has been obtained in this manner. The last sample sacks purchased by the division came with blank labels which were printed on the museum printing press.

A number of land owners were given advice concerning leasing practices in wildcat areas. Examinations were made of a number of abandoned gas wells, and records were kept of each of these wells until they were satisfactorily repaired or plugged. The Greene County well

which had been wasting gas for some time was finally plugged. At the request of several Indianapolis men a recently completed gas well in Jay County was examined and a report completed.

During the nine months ending June 30, 1933, 109 abandoned and dry wells were plugged by the supervisor and deputies.

OIL AND GAS OPERATIONS IN INDIANA IN 1932-1933

Since the present report is for the nine months' period comprising the fiscal year from October 1, 1932, to June 30, 1933, inclusive, the total number of oil, gas, and test wells completed in Indiana has been lower than for the previous twelve months. Proration orders and the very low prices for crude petroleum have caused a further reduction in the number of wells drilled in oil territory, although gas territories have been normally active. The trend of this drilling is shown in the fact that last year 52 per cent of the producers were oil wells, while in the present year only 38 per cent of the commercially valuable completions produced oil. Partly due to the fact that no important new discoveries have been made recently, the percentage of total completions which were producers was 52 per cent, as compared to 56 per cent for the previous year. The greater part of the drilling has been in Sullivan, Pike, Gibson, Vanderburgh, Spencer, and Perry counties.

The demand for gas in the southwestern counties, where the larger cities and towns are using natural gas for domestic consumption, has furnished a market for practically all of the gas which can be located in this area. In other sections, however, conflicting economic conditions have caused good gas pools to be shut in without any market, while nearby towns continue to use the less efficient artificial gas, for which they pay higher rates. It is hoped that some plan can be worked out whereby this valuable resource can be used to best advantage. Several new wells have been completed in the Francisco gas pool in Columbia Township, Gibson County. These wells show the highest open flow production of any in the state, and have considerable pressure. The newer wells have extended the producing territory to the south and east, while the older wells have been troubled with water and oil. Drilling has also been active in the northeast extension to the Alford pool, in Washington Township, Pike County. Though a few locations remain to be drilled, the extent of the pool has been fairly well outlined.

A shallow gas area in Curry Township, Sullivan County, is without a market as yet, although the production would probably justify the laying of a pipe line, for there are other locations to be drilled which appear to be in proven territory. Very little additional drilling has been done in the Unionville field in Monroe County, which is another of the gas pools shut in for want of a market. The Oaktown pool in Busseron Township, Knox County, has had one new gas well completed, but it also remains without a market.

Just south of Huntington, Indiana, several test wells have been drilled near those which showed gas when completed two years ago. Although this drilling is being carried on in the hope of finding oil, it has not been located in commercial quantities as yet. A test for oil

southeast of Portland in Jay County was completed a gas well last year, and this has led to further drilling with the hope that sufficient gas can be obtained to supply industries in that section of the state with the natural fuel which they enjoyed many years ago. Several wells have been drilled in Harrison County south of Corydon to bolster the supplies of the companies which are at present producing in this area. In southern Daviess County two new gas wells were completed in the Harrison Township pool, which as yet has no market. No new drilling has been started near Lyons in Greene County, where a good showing of gas was recently plugged off because of water. This production came from the corniferous limestone. The few small gas wells which have been drilled in the southern part of the old Trenton field were completed by local companies already operating in these counties.

The most active oil development has been in Vanderburgh County, where additional wells have been drilled in the Center Township pool on either side of U. S. Road 41. Scattered test wells have been drilled in other parts of this county, and one in Perry Township proved to be a commercial producer. Whether or not this will be the discovery well of a new pool remains to be seen. Several additional producers have been completed in the Bristow pool in Perry County. A pool was also found south of Bristow which proved to be of very small extent. In the Troy pool at the edge of Spencer County several wells have been drilled which extend the productive area to the south.

Pipe line officials have announced that all collecting lines are to be removed from the old Trenton oil fields of northeastern Indiana, and that no price will be posted for this oil. Much of the pipe has already been taken up. It is probable that most of the producers will be able to find a market locally for their oil, and also obtain better prices than those which have been paid by the pipe lines. Posted prices have discriminated against Indiana oil in the past.

A number of scattered wells were drilled for oil in Sullivan County, but these were unsuccessful. A number of other dry holes have been scattered throughout the state, some of them being relatively close to production, while others had but little chance; some were merely promotion schemes.

Among the dry holes were two in Dearborn County, both of which went some distance below the Trenton. One of these contained a good showing of oil in a formation which had not been identified. Three dry holes completed in the Trenton in Laporte, Starke and Tippecanoe counties condemned these local areas.

The following statistics showing the production of crude oil in Indiana were released by the Bureau of Mines, United States Department of Commerce:

	1931	1932	First Quarter 1933
Northeastern Indiana	37,000	28,000	3,000
Southwestern Indiana	803,000	776,000	143,000
Total Indiana (barrels)	840,000	804,000	146,000