

**OKLAHOMA GEOLOGICAL SURVEY**

**Chas. N. Gould, Director**

**Circular No. 17**

**PRELIMINARY REPORT  
ON  
ROAD MATERIALS  
OF  
WESTERN OKLAHOMA**

**By  
O. F. Evans**

**NORMAN  
AUGUST, 1928**

## CONTENTS

	Page
INTRODUCTION .....	5
SAMPLES TESTED BY OKLAHOMA STATE HIGHWAY LABOR- ATORIES TO DATE .....	9

---

### Illustrations

Plate	Page
I. Map of southwestern Oklahoma showing important deposits of road material .....	at Back

**Figure**

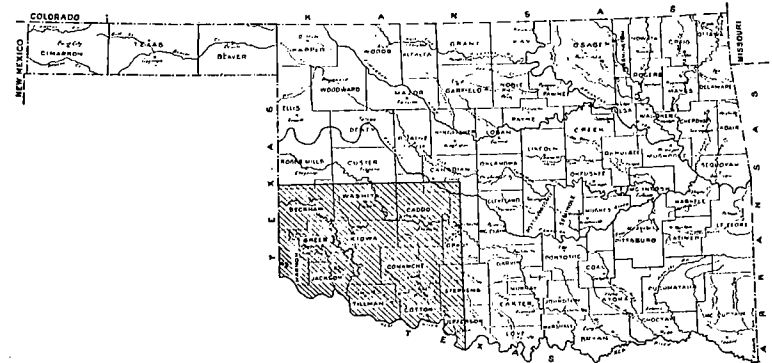
1. Map of Oklahoma showing location of area covered by this report	5
--	---

# PRELIMINARY REPORT ON ROAD MATERIALS OF SOUTHWESTERN OKLAHOMA

By  
O. F. Evans

## INTRODUCTION

This survey was carried on during a period of ten weeks from June 6 to August 13, 1927 in co-operation with the Oklahoma State Highway Commission. The field party consisted of the writer, representing the Oklahoma Geological Survey, and Mr. Carl Barnhart, for the State Highway Department. Eight weeks of this time were used in a rather detailed study of the area of southwestern Oklahoma covering about 150 townships west of Cache Creek, and south of a line drawn east and west from Texola to Anadarko (See map, Plate I). The other two weeks were used in a rather hurried survey of the northwestern part of the State. The purpose of the investigation was to locate deposits of material that might be used in road construction either as surfacing material or in concrete work.



Index map of Oklahoma showing area covered by this report.

Four classes of material were found in considerable quantities:

1. *Gravel*, consisting of pebbles or small rounded pieces of rock such as are found commonly in stream beds when the material has been carried some distance. As such material gets finer it grades gradually into sand.

2. *Angular material*, about the size of gravel, locally called "wash". This material consists of broken rock that has been carried only a short distance, so that it has not yet been rounded by wear.

3. *Sedimentary rock*, chiefly limestone, that might be crushed for road use.

4. *Igneous rock*, chiefly granite, that might be crushed for road use.

With the exception of a thin capping of the Permian hills in the far western part of the State, all the rock of the area is found in the Wichita Mountains, and consists chiefly of granite and limestone. Most of the limestone and practically all of the granite of the area would make good road material if crushed. At present crushed rock is being produced at only one place. A quarry near Richards Spur, Oklahoma, is well located and equipped to furnish various grades of crushed limestone in large quantities.

There are several commercial gravel and sand pits in this region. Perhaps the largest and best equipped are those near the towns of Granite and Cache. Most of the rock of the Wichita Mountains is too far from a railroad to be of anything more than local value because of transportation costs. It is possible that in many places the limestone or granite could be crushed with a portable crusher and distributed locally on the roads cheaper than it could be purchased from the established crushers and hauled from the railroad. In the case of granite this could not be done economically, if at all, except where the material is already quarried, as around the quarries where monumental stone is produced or where boulders are easily obtained. There are a number of places where such material could be produced in considerable amounts.

Gravel and the angular "wash" are present in large amounts in the region although there are only a few places where enough material is found to pay for working on a large scale. Some of the material will pass the Oklahoma State Highway Department specifications and some will not. There is a great amount which will not quite meet the requirements yet might well be used locally for surfacing especially where the traffic is light. It would not wear as well as the better material but this may be more than made up by the saving in transportation charges.

In considering the results of tests on samples of gravel it is well to keep in mind the limitations of sampling. It is extremely difficult to obtain from a gravel pit covering several acres a 25 or 30 pound sample which is representative of condi-

tions in the whole pit. There is the physical difficulty of obtaining material from the top and bottom and all parts of the pit with pick and shovel and added to this is the great differences in the material due to variation in deposition. This is especially true where water deposition has occurred as is the case with most of the gravel deposits in the area studied. For this reason any deposit large enough to be of economic importance, which the tests show to be somewhere near to standard, could well receive a much more intensive study than was possible for our small party to give with the limited time at its disposal. The complete estimate of a quarter section of this kind would require the time of a geologist and three or four men for several days.

Everywhere in the area studied gravel deposits of two geologic ages are found and these vary in nature and composition according to the source of the material.

The gravel of Recent age is found in the present stream beds or in the immediate banks of the streams at the same level. An excellent example of this is found in West Cache and Post Oak creeks. The nearer the heads of such streams are approached the coarser and more angular the material becomes until it cannot be classified as true gravel but is known locally as "wash".

Many deposits of gravel of Pleistocene age are found overlying the Permian beds at elevations of 40 to 75 feet above the present streams. In most cases this material was deposited in Pleistocene times by the present streams. An uplift of the region has probably occurred since the deposition of this gravel, causing the streams to cut down to their present levels. Occasionally a stream has changed its course so that the old stream beds may be far from the present streams. The Pleistocene deposits range in thickness from a few inches up to perhaps 20 feet. They frequently occur as cappings of gravel or conglomerate from two to five feet thick on a line of low hills.

The gravel deposits between the Wichita Mountains and Red River were mostly laid down by streams from the Wichita Mountains so are made up largely of granite with some quartz pebbles. The higher ones sometimes contain clay, and the materials in the stream beds are more apt to be mixed with sand.

The same can be said of the deposits immediately north of the Wichita Mountains except where the drainage comes or has come from the limestone. In that case a great deal of limestone gravel is present and, unless too coarse, adds to the value of the deposits.

The material along the streams west of the mountains does not come from the Wichitas but from the foothills of the Rocky Mountains. These deposits have been carried so far that the pebbles are, for the most part, the most resistant material, such as quartz and quartzite, and the value of the gravel deposits are very much lessened by the presence of great quantities of sand. The layers of sand and gravel alternate; and it is usually necessary to move a great deal of sand in order to get out the layers of gravel.

Somewhat the same conditions are found in the northwestern part of the State except that in some cases, as in the Pleistocene deposits east of Vici and also northeast of Camargo, the quartzite pebbles were laid down in beds 3 to 5 feet thick and quite free from sand. Also the deposits of the same age and thickness near Lookout came from Cretaceous beds to the northwest and so contain a great deal of oyster shell with the gravel. In the vicinity of Granite, Oklahoma, are very large deposits of granite "wash" different from anything found anywhere else of Pleistocene age. Because of the peculiar texture and composition of the granite of this area it weathers down rapidly to material from one-eighth to three-fourths inch in diameter, and is fairly resistant to further weathering. Consequently the material remains as beds of "wash" extending out a mile or so from the Wichita Mountains and having a thickness in some places of at least twenty feet. Everywhere else in the Wichita Mountains the granite is of such a nature that it weathers down very quickly to a fine clay-like material.

In the course of the summer's work eighty-one samples were collected and sent into the State Highway Department Testing Laboratories.

The results of the testing of the samples have not all been reported from the testing laboratories at the time of the writing of this report (Dec. 15, 1927) but enough has been given to show something of the possibilities of the region.

It is probable that in working an area as large as this some deposits of good material were overlooked. In searching for new gravel pits the method of deposition in the area should be kept in mind. Bottoms of streams, of course, should be examined for Recent gravel deposits. In searching for the older deposits of Pleistocene age it is well to examine both sides of the streams from 40 to 75 feet above the present stream beds and especially to examine any rounded knolls or small hills lying along the edge of the upland near the streams. Also the higher ridges extending a considerable distance across the country even though they are not now near a stream may, in some cases, be old stream beds as is the case at Frederick, Oklahoma.

**SAMPLES TESTED BY OKLAHOMA STATE HIGHWAY LABORATORIES  
TO DATE (Dec. 15, 1927)**

Wherever quantities have been estimated care has been taken to underestimate rather than overestimate.

**SAMPLE No. 1--SAND**

*Location*—Near middle of west side, sec. 30, T. 2 N., R. 13 W..

*Estimated Amount*—About 10 acres, 2½ feet thick, with overburden of one to five feet of gravel.

*Result of Test*—Satisfactory sand can be produced if the material is thoroughly washed. Has 10.6 per cent too much clay.

*Remarks*—This sand is within one mile of railroad and near main highway.

**SAMPLE No. 2--GRAVEL**

*Location*—W. ½ sec. 30, T. 2 N., R. 13 W.

*Estimated Amount*—About 100 acres, 3 feet thick.

*Result of Test*—Too much passes the 14 inch screen and there is an excessive amount of clay.

*Remarks*—when used as surfacing this material makes good roads except they become a little soft in wet weather. Is near a main highway.

**SAMPLE No. 3--SAND**

*Location*—NE. ¼, sec. 25, T. 2 N., R. 14 W., on Squaw Creek.

*Estimated Amount*—At least three acres, six feet deep, on bank of stream. Considerable material can be obtained from the stream bed.

*Result of Test*—Too coarse for our use but could be used by adjusting the mixture in the various classes of concrete.

*Remarks*—Some material was shipped from here in former years but the pit is not worked now. About 1½ miles from railroad.

**SAMPLE No. 5--SAND**

*Location*—Boulder Creek near road, SW. ¼, sec. 29, T. 2 N., R. 13 W.

*Estimated Amount*—At least several hundred yards can be obtained from this place. More is also available above and below in the stream bed.

*Result of Test*—Too coarse. Would serve excellently for mixing with sands which are too fine. This would correct the grading to comply with our requirements.

**SAMPLE No. 6--SAND**

*Location*—West Cache Creek SE.  $\frac{1}{4}$  sec. 36, T. 2 N., R. 14 W.

*Estimated Amount*—Several thousand yards could be obtained here and probably much more of the same material is available in the bed of the stream above and below.

*Results of Test*—Too coarse. Would serve excellently for mixing with the fine sands sometimes furnished by some of the sand and gravel companies.

*Remarks*—This coarse sand, when spread on the clay roads of this region, prevents their being slippery in wet weather and makes a smooth road bed. Does not wear as well as coarse material.

**SAMPLE No. 7--GRAVEL**

*Location*—SE.  $\frac{1}{4}$  sec. 31, T. 2 N., R. 13 W., on highway.

*Estimated Amount*—About one-half acre, five feet thick.

*Result of Test*—Does not meet requirements for decomposed granite. Recommended for maintenance of sand-clay roads.

*Remarks*—This deposit rather uniform in grading. Such deposits are of value for surfacing and maintaining side roads having light traffic.

**SAMPLE No. 8--GRAVEL**

*Location*—NE.  $\frac{1}{4}$  sec. 30, T. 2 N., R. 12 W., on highway about 400 feet west of stream.

*Estimated Amount*—Perhaps one thousand cubic yards.

*Result of Test*—Satisfactory as decomposed granite surfacing in accord with our specification requirements.

*Remarks*—On south bank of stream is another deposit which contains more clay.

**SAMPLE No. 17--GRAVEL**

*Location*—SW.  $\frac{1}{4}$  sec. 20, T. 2 N., R. 14 W., on highway west of stream.

*Estimated Amount*—About 1,500 cubic yards.

*Result of Test*—Suitable for sand-clay surfacing. Does not comply with any of our standard specifications.

*Remarks*—This material makes a good surface where it has

been used. About one-fourth mile west is another deposit of the same kind of material containing about the same amount.

**SAMPLE No. 18--SAND**

*Location*—Taken from bed of stream where Highway No. 7 crosses Post Oak Creek.

*Estimated Amount*—A great quantity, several thousand yards at least, is available. Not far from railroad.

*Result of Test*—May be used if mixed with finer graded sands such as are usually produced by some of the sand and gravel companies. It is too coarse to be used alone as fine aggregate for concrete.

*Remarks*—Any grade of material, up to 2 inches in diameter, could be obtained here by screening and washing. May be used for surfacing clay roads where traffic is not too heavy. Similar material is being dredged and shipped from stream bed where Frisco R. R. crosses Post Oak Creek.

**SAMPLE No. 21--GRAVEL**

*Location*—From Thompson and Kohler pit southeast of Lawton.

*Estimated Amount*—About 40 acres, 10 feet deep; but is made up of lenses of sand, gravel, and clay.

*Result of Test*—This gravel is not acceptable for state work. Does not meet our grading requirements in any respect.

**SAMPLE No. 22--GRAVEL**

*Location*—From same pit as sample No. 21 but screened through  $\frac{1}{4}$  inch screen.

*Result of Test*—This material will meet our specifications after passing over 2-inch screen.

*Remarks*—The material from the Thompson and Kohler pit has been used for surfacing on the streets of Lawton.

Result of the testing of samples 21 and 22 illustrates the difficulty in sampling gravel deposits. Both were taken as representative samples but No. 22 was screened over 1-4-inch screen at time of sampling. This deposit is of commercial size, but is stream deposited and therefore is made up of lenses of gravel, sand, and some clay. Acceptable material probably can be obtained by proper grading.

**SAMPLE No. 29--GRAVEL**

*Location*—SE.  $\frac{1}{4}$  sec. 17, T. 1 N., R. 17 W.

*Estimated Amount*—Equivalent to one acre, two feet deep.

*Result of Test*—Material does not meet the grading requirement of the State Highway Department. However, with slight addition of binder, it should be very effective in maintenance work.

*Remarks*—Has been used on roads near Manitou with fairly good results.

**SAMPLE No. 30—GRAVEL**

*Location*—On Deep Fork of Red River 4½ miles east of Manitou, Oklahoma.

*Estimated Amount*—Sixty to 100 feet wide with 2 to 10 feet deep.

Gravel is found one mile or more along stream.

*Result of Test*—Acceptable for maintenance work only.

*Remarks*—The material is easily obtained from stream, and has been used locally with good results.

**SAMPLE No. 33—GRAVEL**

*Location*—SW. ¼ sec. 20, T. 2 N., R. 14 W. Same location as sample No. 17, but from different parts of deposit.

*Result of Test*—This material is equal in grade and equality to that which has been used on State Aid Project 227 under decomposed granite surfacing specifications and is giving satisfactory results.

**SAMPLE No. 39—GRAVEL**

*Location*—Sec. 15, T. 4 N., R. 17 W.

*Estimated Amount*—About 10,000 cubic yards. Covers an area of about 2 acres, 6 feet deep.

*Result of Test*—Rejected, but usable with addition of considerable amount of coarser material.

*Remarks*—This material is a disintegrated gabbro and would probably break down rapidly under traffic. The deposit is a considerable distance from the highway.

**SAMPLE No. 46—GRAVEL**

*Location*—About 1 mile northwest of Mountain View, Oklahoma.

*Estimated Amount*—About 35,000 cubic yards. This might be increased by crushing some conglomerate and also a 1½ foot layer of limestone that is in the same vicinity.

*Remarks*—This material has been used satisfactorily in road surfacing and in concrete.

**SAMPLE No. 48—SAND**

*Location*—N. ½ sec. 20, T. 5 N., R. 15 W., from branch of Sugar Creek.

*Estimated Amount*—At least several hundred yards could be obtained.

*Result of Test*—Grading on sand good. A little too much fine material present; also contains enough foreign material to necessitate washing.

*Remarks*—This material is used locally in road surfacing and in cement work.

**SAMPLE No. 50—GRAVEL**

*Location*—NW. ¼ sec. 5, T. 5 N., R. 13 W.

*Estimated Amount*—Covers about six acres from 2 to 6 feet thick.

*Result of Test*—Rejected, too coarse.

*Remarks*—This is a limestone gravel that could easily be made finer with a small crusher. It makes a rather satisfactory road surface where used locally on the roads. There are several other large deposits of the same material in this region.

**SAMPLE No. 53—GRAVEL**

*Location*—SE. ¼ sec. 7, T. 6 N., R. 14 W., on highway.

*Estimated Amount*—Covers one-half acre at least, 5 feet deep.

*Result of Test*—Material is granite and limestone, too fine to meet our gravel specifications. Could be used with an additional 25 per cent of material passing 1-inch screen and retained of ¼-inch screen.

*Remarks*—This material is used locally on the roads and makes a very good surface.

**SAMPLE No. 57—GRAVEL**

*Location*—Three miles north of Randlett on north bank of Deep Fork, of Red River.

*Estimated Amount*—At least one-half acre, three feet deep with three feet overburden.

*Remarks*—This material has been used locally for surfacing material with good results.

**SAMPLE No. 59—GRAVEL**

*Location*—NE.  $\frac{1}{4}$  sec. 34, T. 6 N., R. 21 W.

*Estimated Amount*—Is found in lenses covering at least 160 acres. Varies in depth up to 12 or 15 feet and has about two feet overburden.

*Result of Test*—Meets our grading requirements of disintegrated granite. Will need slight addition of binder.

*Remarks*—Much material has been shipped by railroad from this pit. It has been used satisfactorily for both road surfacing and for concrete work. Other deposits of this same kind of material are being worked in this vicinity near the town of Granite, Oklahoma. There are also large unopened pits. This is one of the best localities in Oklahoma for gravel and granite wash. In secs. 17, 20, and 21, T. 5 N., R. 20 W., to the west and south of the mountains are deposits of granite "wash" and gravel which are probably present in greater amount and of as good quality as those which are being worked near the town of Granite. These deposits could be developed but at present have the disadvantage of being some distance from a railroad.

There are also deposits of the same kind of material in secs. 14 and 15, T. 6 N., R. 21 W., which might be developed, but are likewise a considerable distance from a railroad.

**SAMPLE No. 74—SAND**

*Location*—Sec. 6, T. 15 N., R. 13 W., where road crosses Post Oak creek.

*Estimated Amount*—Probably several thousand yards could be obtained from the creek bed.

*Results of Test*—Rejected, too coarse.

*Remarks*—Where this coarse sand is applied on clay roads it gives a good surface although it will probably not wear well if the traffic is heavy.

**SAMPLE No. 75—GRAVEL**

*Location*—Sec. 28, T. 3 N., R. 26 W.

*Estimated Amount*—Covers three or four acres, one to four feet deep. A ridge extending northwest three or four miles.

*Result of Test*—Material meets O. 19 H. C. specifications for gravel grading only on material passing 1 inch screen.

*Remarks*—This material is found in a region where good gravel is rather scarce. It is mostly quartzite but contains some granite. It is apparently an old Pleistocene river or lake deposit.

Samples of gravel collected but not yet tested by Highway Laboratories (Dec. 15, 1927) but which may be suitable for road material.

**SAMPLE No. 24—SAND AND GRAVEL WASH**

*Location*—NE.  $\frac{1}{4}$  sec. 36, T. 3 N., R. 17 W. An area of about one acre, 6 to 8 feet deep, with an overburden of 2 to 3 feet. There are some boulders two to three inches in diameter mixed with the finer material.

Where this material is used on the streets of Mountain Park it seems to be giving fairly good service.

**SAMPLE No. 25—GRANITE "WASH"**

*Location*—In bed of stream on east side sec. 25, T. 3 N., R. 17 W. This is a deposit of sand and gravel containing boulders up to two or three inches in diameter. Although it has very little binder, it might be used for surfacing clay roads. If washed and screened the material may be suitable for concrete work. A thousand yards or more is available in this deposit.

**SAMPLE No. 40—GRAVEL**

*Location*—W.  $\frac{1}{2}$  sec. 25, T. 5 N., R. 15 W., on east side of road north of creek. Probably area of an acre,  $1\frac{1}{2}$  feet deep with two feet overburden. Makes good surface on local roads.

**SAMPLE No. 42—GRAVEL AND SAND**

*Location*—West side sec. 8, T. 4 N., R. 19 W. One thousand yards or more of granite "wash" could be obtained from the creek bed. There is also a bed in bank of stream, two feet thick with five feet overburden. This material should be good for surfacing clay roads locally.

**SAMPLE No. 44—GRAVEL**

*Location*—Sec. 10, T. 6 N., R. 16 W.

About two acres,  $2\frac{1}{2}$  feet thick, with one foot of overburden. There are said to be other deposits of a similar kind on the stream within one-half mile.

The deposit contains some clay cementing material and should be of value for surfacing local roads.

**SAMPLE No. 45—LIMESTONE**

*Location*—Sec. 30, T. 7 N., R. 15 W., about  $2\frac{1}{4}$  miles from railroad and about three miles from Gotebo, Oklahoma. The outcrop is about 40 feet high, and covers  $1\frac{1}{2}$  acres. The material is not very uniform but might be crushed for local use on the roads.



**SAMPLE No. 47--GRAVEL**

*Location*—E.  $\frac{1}{2}$  sec. 17, T. 6 N., R. 15 W.

Consists of several knolls of weathered granite on highland along creek valley. There is at least an area of two acres, 4 feet deep. Contains some clay and should be of use for local surfacing.

**SAMPLE No. 49--GRAVEL**

*Location*—N.  $\frac{1}{2}$  sec. 18, T. 5 N., R. 13 W.

Two or three acres, 2 to 4 feet deep, with one to four feet of overburden. This is broken up limestone material which is rather too coarse for road use in its natural state. Where it occurs in the road it makes a fairly good surface. There are other deposits of the same nature in this region and a small portable crusher could be used for crushing it to smaller sizes.

**SAMPLE No. 52--LIMESTONE CONGLOMERATE**

*Location*—Sec. 34, T. 5 N., R. 13 W.

This conglomerate averages from three to 50 feet thick. This material could be easily crushed, and several million yards could be obtained in this vicinity. It is, however, many miles from a railroad, so can be utilized for local use only.

**SAMPLE No. 55--LIMESTONE GRAVEL**

*Location*—SW.  $\frac{1}{4}$  sec. 30, T. 5 N., R. 11 W., and SE.  $\frac{1}{4}$  sec. 25, T. 5 N., R. 12 W.

This is a bed of limestone gravel from 1 to 5 feet thick, covering about two acres. There is not much overburden. Although rather coarse this material could be used locally as surfacing. Other deposits of a similar nature are also found in this region.

**SAMPLE No. 65--LIMESTONE GRAVEL**

*Location*—About two miles southwest of Mangum. This is a Pleistocene river deposit about 75 feet above the present stream bed. There is a great deal of sand present and the gravel is found in comparatively thin layers interstratified with it. This deposit is rather typical of most of the deposits along the streams west of the North Fork of Red River. The gravel is mostly quartzite but contains some granite and mica-schist material. Where this material has been used it makes a fairly good road. It does not look as though it would pack but it does become hard after a few weeks. Probably there is a small amount of river silt and clay in it.

Deposits somewhat similar to the above were found in the following places:

1.  $4\frac{1}{2}$  miles north of Reed, Oklahoma; about 2 feet thick, covering about two acres.

2. Sec. 14, T. 4 N., R. 26 W. A deposit of a few acres of sand and gravel. After screening it has been used in cement work at Hollis. Contains a great deal of sand. Near here, on SW.  $\frac{1}{4}$  sec. 10, T. 4 N., R. 26 W., is about an acre 6 feet deep of coarse quartz sand that might be of value in cement work.

3. One mile south and four miles west of Texola on bank of North Elm creek is a considerable pit of sand and gravel that has been operated for local concrete work.

4. One mile west and 4 miles north of Erick is a sand pit containing small amount of gravel.

**SAMPLE No. 67--GRAVEL**

*Location*— $1\frac{1}{2}$  miles south and  $4\frac{1}{2}$  west of Ft. Cobb, Oklahoma, on the farm of Kiowa Charley, is a pit of broken down hard sandstone. There is some conglomerate that could be crushed. It is from one to four feet thick and covers perhaps two or three acres. Has been used on road for surfacing with fair success.

**SAMPLE No. 68--LIMESTONE**

Limestone from near Creta, Oklahoma. This sample is from a layer of sandy limestone from three to five feet in thickness which has a layer of pure limestone about 3 inches to 12 inches thick at its base. It forms the capping to the flat topped hills in the region and might be crushed and used on the roads locally. The location of this material is such that quarrying and crushing could be carried on cheaply.

**SAMPLE No. 70--GRAVEL**

*Location*—NW  $\frac{1}{4}$  sec. 15, T. 1 S., R. 16 W. Deposit about  $1\frac{1}{2}$  feet thick, and an acre in extent. Might be of local value.

**SAMPLE No. 71--CONGLOMERATE**

*Location*—N.  $\frac{1}{2}$  sec. 20, T. 2 S., R. 15 W., on north side of Deep Red. A layer 4 feet thick, an area of  $\frac{1}{4}$  acre on top of hill. Might be crushed for surfacing material.

On SW.  $\frac{1}{4}$ , SE.  $\frac{1}{4}$ , sec. 12, T. 2 S., R. 15 W., on north side of road, is about 1,000 cu. yards of granite gravel. To the north about 200 feet is another small deposit which also contains some conglomerate.

Further search along the banks of the streams in this vicinity should result in finding additional deposits of the same material.

Along Jack Creek, on secs. 25 and 26, T. 2 S., R. 15 W., are hills of gravel of considerable extent. This gravel contains quartzite, granite, and some concretions. In some places it has been cemented to make a conglomerate. It contains clay enough for binder. It runs from 2 to 5 feet in thickness without much overburden.

On the north side of sec. 12, T. 3 S., R. 14 W., are about 1½ acres of gravel, 4 feet deep with very little overburden.

Also on NW. ¼ sec. 14, T. 3 S., R. 14 W. are about 2 acres, 2 feet deep.

Between secs. 20 and 21, T. 1 N., R. 14 W., is a small deposit of gravel and sand of 2 to 3 acres in extent, and about 2 feet deep.

In sec. 9, T. 1 S., R. 13 W., is a deposit of several acres of granite gravel containing boulders. The ridge extends a mile or more, and material is up to 14 feet deep. It would need screening and some crushing.

In sec. 3 and 4, T. 6 N., R. 14 W., are deposits of gravel of considerable size laid down by Pleistocene streams near the banks of the present streams. These gravels are interlaid with sand and contain granite, limestone, and quartzite gravels.

**Description of Deposits Examined in the Northwestern Part of the State.**  
(Not Shown on Map)

**SAMPLE No. 76--GRAVEL**

*Location*—Sec. 13, T. 10 N., R. 13 W.

About ¾ acre, 5 feet deep. Consists of concretions with quartzite and some sand. Varies in thickness up to 10 feet, not much overburden. Also on sec. 29, T. 10 N., R. 13 W., is about ¼ acre, 4 feet deep, of same kind of material as described above. Has been used with good results. Further search in this vicinity will probably show other small deposits of similar nature.

**SAMPLE No. 77--GRAVEL**

*Location*—Sec. 35, T. 14 N., R. 12 W.

About 5 acres, 6 feet deep, of quartzite and quartz pebbles with some sand on hills above creek. Pebbles grade up to about one-half inch in diameter. There are a few 2 inches to 3 inches in diameter. This deposit could possibly be worked with profit.

**SAMPLE No. 78--GRAVEL**

*Location*—Sec. 22, T. 26 N., R. 11 W. About five acres, 4 feet deep; consists of rather fine gravel with some larger quartzites. Has been used on county road and cements well.

**SAMPLE No. 79--GRAVEL**

*Location*—Sec. 33, T. 28 N., R. 10 W. 2½ miles south of Byron on farm of Mr. Anderson. Pit said to have been tested and said to be 80 acres, 20 feet deep. Gravel is mostly quartzite pebbles. Is probably too fine to meet the state specifications. Is on flat plain with water not far below surface. Might be profitably worked.

In NE ¼ sec. 25, T. 26 N., R. 14 W. is a deposit on first creek bottom. Consists of layers of gravel, clay, and sand, about 3 feet thick over an area of 4 to 5 acres. Has been used successfully in Alfalfa County for surfacing.

**SAMPLE No. 80--GRAVEL**

*Location*—Sec. 21, T. 28 N., R. 17 W.

About one-fourth acre, 3 feet deep; gravel contains many cretaceous shells and some flat pieces of sandstone. Has lime enough to give gray color to the mass. Makes an excellent road surface. Found on tops of the hills. More of same material is reported farther northeast. One-half mile north of Lookout, Oklahoma, is another considerable deposit of above material.

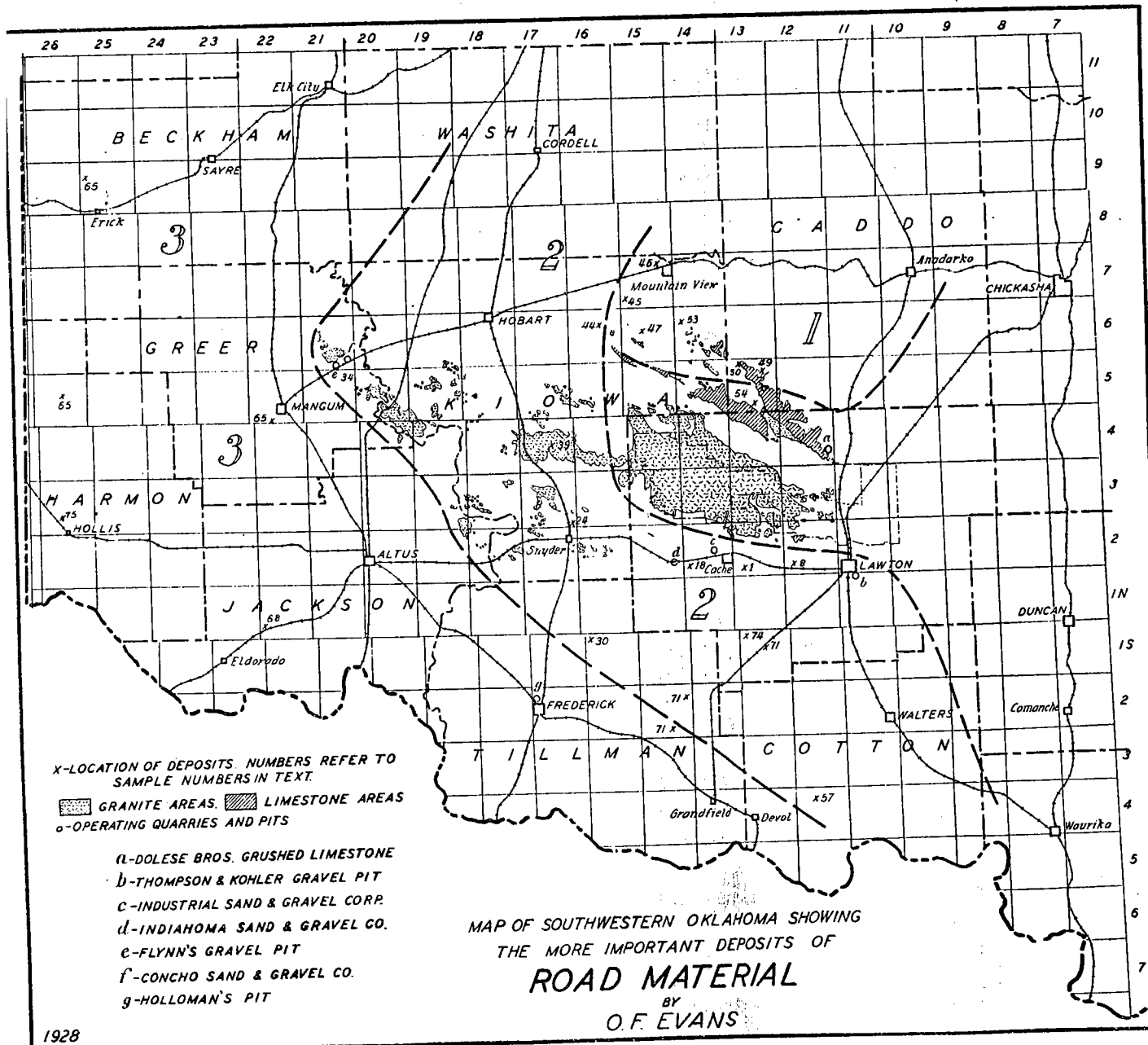
**SAMPLE No. 81--GRAVEL**

*Location*—Sec. 6, T. 19 N., R. 19 W.

Capping several small hills is a deposit of perhaps 5 acres 4 deep feet. This is nearly all quartzite. The gravel appears well graded and of about the right size for concrete work. Contains some sand and a little clay.

About 3 miles northeast of Camargo are similar deposits of considerable area on tops of the hills.

About one mile northwest of Clinton, Oklahoma there is a deposit of gravel averaging about 6 feet deep and covering about 25 acres that might be worked with profit. It contains some sand and would need to be screened.



x-LOCATION OF DEPOSITS. NUMBERS REFER TO SAMPLE NUMBERS IN TEXT.  
 [Stippled Area] GRANITE AREAS. [Hatched Area] LIMESTONE AREAS  
 o-OPERATING QUARRIES AND PITS

- (A)-DOLESE BROS. GRUSHED LIMESTONE
- (B)-THOMPSON & KOHLER GRAVEL PIT
- (C)-INDUSTRIAL SAND & GRAVEL CORP.
- (d)-INDIAHOMA SAND & GRAVEL CO.
- (e)-FLYNN'S GRAVEL PIT
- (f)-CONCHO SAND & GRAVEL CO.
- (g)-HOLLOMAN'S PIT

MAP OF SOUTHWESTERN OKLAHOMA SHOWING  
 THE MORE IMPORTANT DEPOSITS OF  
**ROAD MATERIAL**  
 BY  
**O.F. EVANS**