

SOUTH DAKOTA
GEOLOGICAL AND NATURAL HISTORY SURVEY
E. P. Rothrock, State Geologist

REPORT OF INVESTIGATIONS

No. 11

Part I

SAND AND GRAVEL DEPOSITS

IN

POTTER AND FAULK COUNTIES

Part I--Geology of the Area and the
Gravels of Potter County

Part II--Gravels of Faulk County

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March, 1932

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SAND AND GRAVEL DEPOSITS

IN

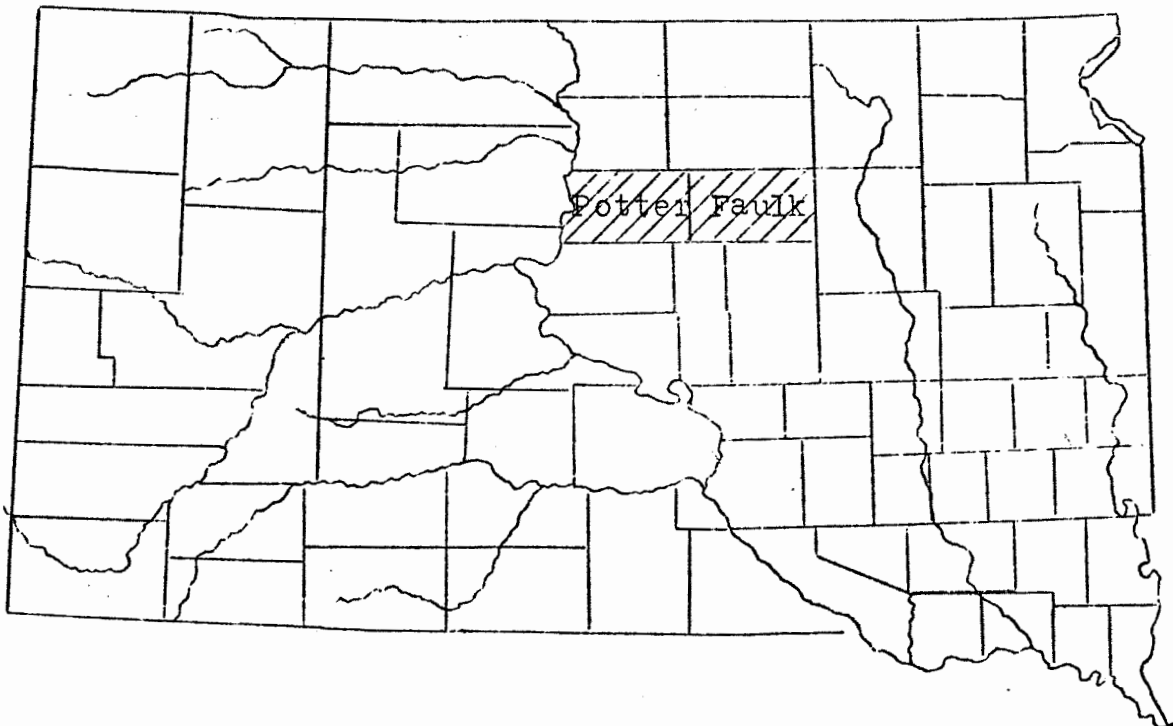
POTTER AND FAULK COUNTIES

INTRODUCTION

Foreword

The surfacing of the state and county highways which cross Potter and Faulk Counties has been hampered because of the scarcity of gravel over much of the area. The survey, here reported was undertaken in the hope of finding deposits which would greatly lessen the cost of construction by eliminating the long hauls necessary as much as possible. The work was done by a party from the State Geological Survey in cooperation with the State Highway Commission during the summer of 1926.

Location and Area



Potter and Faulk are adjacent counties lying a little north-east of the center of South Dakota. The Missouri River forms the western boundary of Potter County while the eastern boundary of Faulk lies some 78 miles to the east on the line between ranges 65 and 66 west. These two counties cover fifty entire townships and parts of four others. Thirty-eight of the total fifty-four were covered by this survey making an area of 1323 square miles. The fourteen townships not surveyed lie so far from the present highways that their deposits could not be used for immediate projects.

The area surveyed includes all of Potter County except the breaks in the extreme northwest corner, one township in the extreme northeast and another in the extreme southeast. In Potter County a strip twelve miles wide across the middle of the county and three townships in the northeast corner were mapped.

Methods of Work

The party consisted of a geologist, an engineer, and two assistants. The area was scouted by the geologist who examined each section, locating sand and gravel deposits and mapping geological features which might throw light on the location of other deposits. The deposits thus located were visited by the engineer who sampled them either in open pits or from test holes drilled with a well auger and made estimates of volume of materials each contained. The samples were analyzed in the laboratory of the Civil Engineering Department of the State University at Vermillion.

Locations were determined by odometers which were checked as frequently as possible on section corners. Details were added by sketching. This accuracy was maintained well within one tenth of a mile.

The estimation of volumes is always attended with some uncertainties due to covered features such as irregularities in the floor on which the deposits rest and included masses of clay. The figures given in this report, however, are conservative estimates and are intended only to give an idea of the size of the deposit. The amount of material contained in a deposit and the amount that may be excavated often differ considerably because of the nature of the deposit and the methods employed in excavation. The effort has been made to give only figures which could reasonably be expected as a minimum production for each deposit.

Former Work

In 1896, James E. Todd, first state geologist, published a description of the moraines in the eastern part of Potter County and also included descriptions of some topographic features west

of the moraine.¹ His Survey was a very hasty reconnaissance, however, his main object being to trace the "Altamont Moraine". He paid little attention to sand and gravel deposits. In 1909 he published a detailed account of the geology of the Aberdeen-Redfield region.² The area covered in this report extended into the eastern part of Faulk County for about twelve miles.

The present report, therefore, is offered as a contribution in that it presents a more accurate mapping and different interpretation of the glacial features, and an accurate location and description of the sand and gravel deposits.

Acknowledgements

The authors wish to express their appreciation of the cooperation of the members of the Highway Commission both in the matter of financial and moral support given by the commissioners and engineers alike. They wish especially to thank Mr. J. W. Parmley, as it was through his efforts as a member of the Highway Commission that the cooperation was made possible.

The work of Mr. Elmer E. Meleen and Mr. Donald Parker, students of the University of South Dakota, who acted as field assistants, did much to make the successful completion of the work possible.

The citizens of the two counties extended many courtesies which made the work pleasant and gave information which materially aided in making the survey.

1. Todd, J. E., Moraines of the Missouri Coteau and Their Attendant Deposits. U. S. Geol. Survey Bulletin 144, p. 24-27, 1896:
2. Todd, J. E., Aberdeen-Redfield Folio, U. S. Geol. Survey, 165, 1909.

G E O L O G Y

by

E. P. Rothrock

The connection between graveled highways and glaciers is not as remote as might seem at first thought for it is largely because of such great sheets of ice that we can have our present graveled highways in eastern South Dakota. Quite recently in the geologic history of the earth, ice sheets moved out from centers in Canada spreading over the northern part of the United States, and bringing with them vast quantities of soil and rock waste which they had scraped from this northern country. When the ice melted this material was left, most of it forming the boulder clay (till) so abundant in our northern states. Large amounts of debris, however, were washed off the glaciers by waters from the melting ice, and were sorted into gravels, sands, and clays which were deposited where they are found today.

Parts of these great ice sheets invaded eastern South Dakota and the story of the gravels of Potter and Faulk counties is the story of the events in these counties during the advances and retreats of the ice. In this story will be found the reasons for the locations of the deposits, their volumes, and also the character of the gravels. Variations in the bed rock, in the volumes of water discharged and in the channels through which the waters escaped, all played a part in determining the amounts and sorts of material that went into the deposits and in placing them where they now lie.

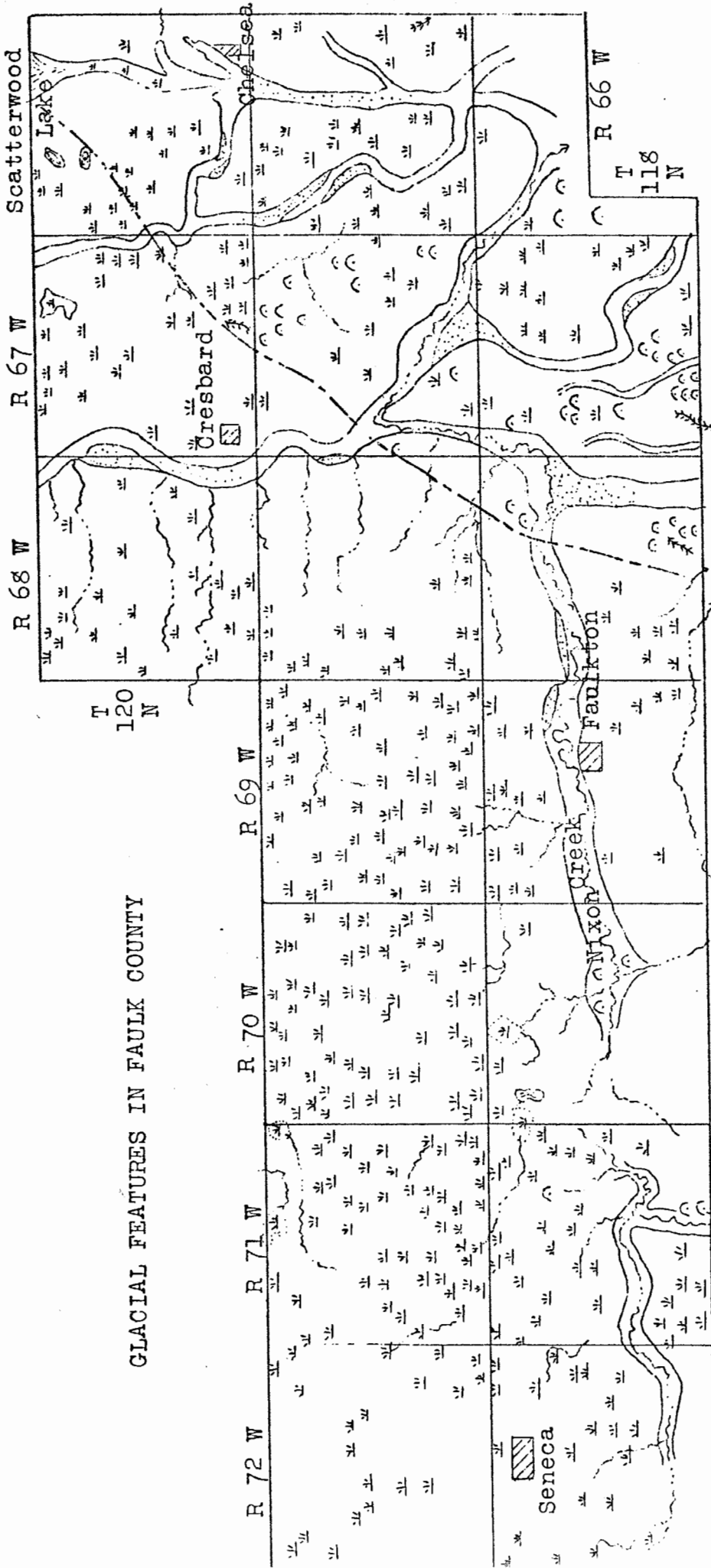
The Older Drift Region

The deposits of two different ice sheets occur in this area, the older covering most of Potter County and the younger, part of Potter and all of Faulk County.

Topography

The topography of Potter County differs markedly from that of Faulk in that it is well drained. Long smooth slopes from the hills drain into stream valleys which eventually drain into the Missouri by way of the Little Cheyenne and Artichoke Creek. The swamps and lake beds which dot the surface of Faulk County so abundantly are almost entirely missing in Potter County. The few that do occur lie on the divides such as those south of Gettysburg in T. 117 N., R. 76 E. and T. 119 N., R. 77 E. Near the breaks of the Missouri and the Little Cheyenne and the valleys

GLACIAL FEATURES IN FAULK COUNTY



(Scale: 1 inch = 4 miles)

LEGEND

- Glacial Drainage Channels
- Present Drainage Channels
- Swamps and Undrained Depressions
- Eastern Boundary of Rockham Moraine
- Sand and gravel terraces and valley fills
- Eskers
- Kames
- Lakes

are deep, their slopes abrupt and their tributaries so numerous that the country is very rough. Away from these, however, the valleys are broad and shallow, and toward the divides, not very definite. None of them contain permanent streams and even the channels are not marked in many.

Several conspicuous hills which rise abruptly above their surroundings form excellent landmarks. One such is Eagle Butte, three miles north of Gettysburg and another a nameless butte in Catron township (T. 119 N., R. 78 W.).

In the north central part of the county are several long narrow troughs with swamps or lakes in their bottoms, very conspicuous exceptions to the drainage characteristic of the rest of the country.

The Drift

The debris left by the earlier ice sheet is boulder clay, which is spread in a thin sheet over hills and valleys alike. It is so thin that the underlying shales of the bedrock can be seen in the road cuts in many places. Its average thickness is not more than 15 feet. In the breaks of the Missouri and the Little Cheyenne the clays have been entirely washed away, but boulders strewn over the hills indicate that the till sheet once covered the entire area.

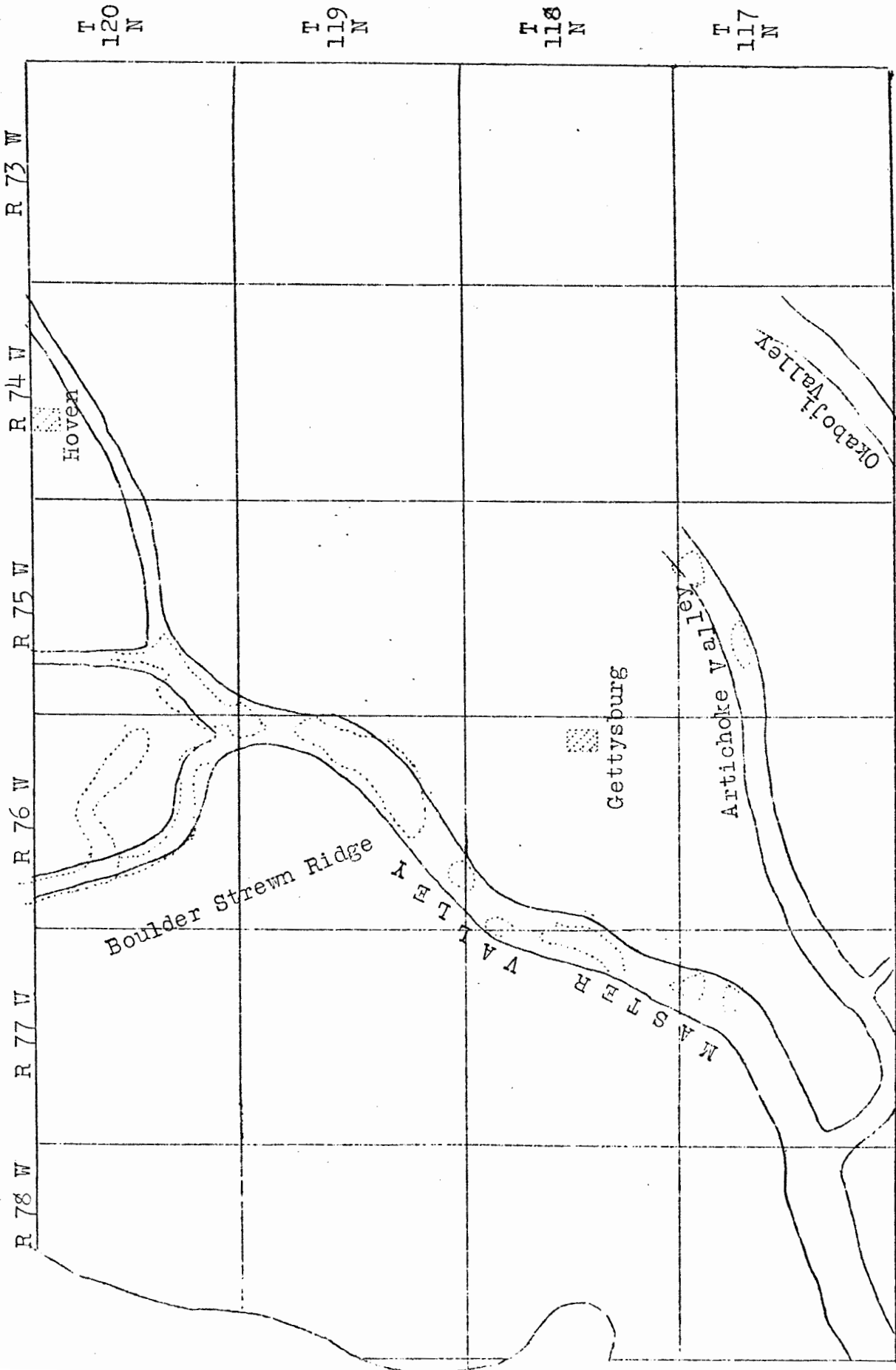
The till is a stiff clay with pebbles of various sizes scattered through it. The clay matrix when deposited was grey or blue-grey but is now yellow due to the oxidation of the iron it contains. In places, however, it is dark grey to black in color because of the quantity of underlying black shales which was worked into it by the glacier.

The coarse material of the till consists of sand grains, pebbles and cobbles, and it is from these that the sand and gravel deposits were formed. Boulders up to two or three feet in diameter occur but they are not abundant except in places such as the breaks where the clays have been washed away and left them. In undisturbed till the material is predominantly clay with some sand, pebbles, up to 3 or 4 inches in diameter. Most of the pebbles are composed of hard rocks of igneous and metamorphic origin, or of shale. It differs from the coarse materials found in the drifts of the eastern and southern parts of the state in the marked absence of chalk pebbles.

The Bedrock Surface

Two important phases of the geology from the standpoint of present investigation are (1) the condition of the surface before the coming of the ice sheets, and (2) the changes wrought on it by these glaciers.

The first is of importance because the pre-glacial topography determined the direction of movement of the ice to a considerable



PRE-GLACIAL DRAINAGE OF POTTER COUNTY

Legend
 Pre-Glacial Valleys
 Present Sloughs

extent. Furthermore, the pre-glacial drainage directed in some measure the gravel-forming waters from the melting ice. Moreover, it is evident from the thickness of the drift, location of bed-rock outcrops, and an inspection of the topography that the large features of the present surface are governed by the bed rock surface and outline the ancient topography over which the ice rode. Thus, the gentle slopes of the present valleys are the sides of the pre-glacial valleys modified by the waring of the ice as it passed over them. Indeed, Eagle Butte and the nameless butte in Catron Township (T. 117 N., R. 78 W.) are merely remnants of larger buttes which occupied these positions before the ice over-rode them. The pre-glacial topography was perhaps rougher than that today because the ancient hill tops were eroded and the ancient valleys partly filled with drift. It doubtless resembled the present topography west of the Missouri River.

The major drainage of the area was a valley which trended northeast-southwest. It entered the county in the vicinity of Hoven, passed about six miles west of Gettysburg and left the county near its southwestern corner. Its course can be traced by the wide valley running west from Hoven into the string of big sloughs which takes it within twelve miles of the point where it leaves the county.

Tributaries flowed into this master valley. There were two large ones, the northern one being distinctly traceable as it contained the big slough in T. 120 N., R. 76 W. The second was the valley of Artichoke Creek. The Okaboji valley may have belonged to this system but it does not join the main stream in this county. It is probable that the northwestern part of the county drained into the valley since the Little Cheyenne is evidently a pirate stream which has cut its valley since glacial times. Since the tributaries made an acute angle with the master valley, pointing southwestward, the drainage must have been in that direction.

The general slope, therefore, was toward the southwest over the entire county and so few were the obstructions that the ice followed this slope almost unhindered to its limits somewhere southwest of the county. The only obstacle appears to have been a high rock ridge north of Gettysburg and west of the major valley. It trends southward along the western side of T. 120 N., R. 76 W. and ends in Sec. 28, T. 119 N., R. 76 W., just north of the end of the big slough. Boulders and stony till cover this ridge and a gravel deposit lies at the end of it. With the exception of the pause at this place there seems to have been little halting of the ice front as it retreated, and consequently but few sand and gravel deposits were formed.

The changes which the ice brought about were largely the plugging of the master valleys. This plugging is especially noticeable in the northern part of their course, where a series of long narrow sloughs was formed. An interesting succession of events is indicated in the forked channel in T. 120 N., R. 76 W. While the ice was held up against the boulder strewn ridge, previously described, a plug of drift was deposited in the valley in

the northeast corner of Section 17. Later waters which came through the valley were forced up a tributary and flowed over the divide at its head into the main channel. Thus, the valley now occupied by the big slough in sections 9, 10, 14, and 24 was cut. Before emptying into the main valley the waters spread out like a fan over the upland. In so doing they spread a coat of sticky black clay over section 24 and parts of the sections east and south of it.

Age of the Drift

It is evident, that this drift was spread by an earlier ice sheet which came and went before the one which deposited the drift over Faulk County, from the difference in erosion which the two drifts have undergone. As previously pointed out, with the exception of the big sloughs and a few small swamps, the region is well drained. Swamps and lakes do not occur because sufficient time has elapsed since their formation to allow stream erosion to drain them. If the two drifts were of the same age, the same swamps which cover the surface of Faulk County would be found in Potter County. On this evidence, therefore, the western drift is considerably older than the eastern drift.

In Illinois and Iowa four drift sheets have been determined, the time between the ice advances being longer than the time elapsed since the last ice left. They are arranged in the following order with the oldest at the bottom:-

Wisconsin*
Illinoian
Kansan
Nebraskan

*Note: The Iowan glacial epoch which was formerly placed between the Illinoian and Wisconsin has been found to be early Wisconsin.
(Leighton, M. M., Bulletin Geol. Soc. America.)

With the information at hand it is impossible to correlate the Potter County drift with any of these with certainty. It has not been so maturely dissected as the Kansan drifts in the eastern part of South Dakota, and it is certainly considerably older than the Wisconsin drift in eastern Potter County and all of Faulk County. It must be remembered, however, that climatic conditions since glacial times has been different in this region than in regions farther east. Erosion by streams probably has not been as active, because of less abundant rainfall. Allowing for this, however, it is safe to say that the drift is older than the late Wisconsin and probably younger than Kansan. OK

Early Gravels

Large deposits of gravel do not occur in the region of the older drift. Either melting was not rapid enough to form gravels

abundantly or most of the deposits formed have been destroyed by subsequent erosion. As the edge of the ice must have been in the vicinity of the present Missouri Valley, the latter is more probable.

Deposits in the Sloughs:

1. Terrace Gravels:

The largest single deposit in this area is found in a terrace at the southern end of the big slough in T. 119 N., R. 76 W. It occurs as a low terrace lying 30 feet above the present floor of the slough, at the southern end of the boulder ridge mentioned above. The deposit appears to have been formed by waters melted from ice that lay in the valley. These waters swirling, between the ice front and the boulder ridge, washed the gravels out of the drift and deposited them in a terrace about two thousand feet long and 300 feet wide. The high percentage of clay in the gravel and a two foot bed of clay near the bottom, show that the water action was not very vigorous or of long duration. This terrace contained about 130,000 yards but about a third of it has been removed by stream erosion.

Two smaller deposits of similar character occur on the eastern side of this slough. They were evidently formed in the same manner as the large terrace, i. e., between the ice front and the east wall of the valley, because there is no relation between the elevations of the three.

2. Beach gravels:

Two gravel deposits were formed by waves of the lakes which once filled the big sloughs. One in Sec. 19, T. 120 N., R. 75 W., and the other in Sec. 24, T. 120 N., R. 76 W., a mile northwest of the first. The first of these was formed across a little bay on the north side of a slough north of that occupied by the terraces just described, and the second at the eastern end of another slough known as the north fork mentioned above. Both beaches are crescent shaped, concave away from the lake that formed them. They are level topped, and have the gently sloping sides characteristic of wave-formed bars and beaches. The depth of the deposits at the top of the ridge is about 15 feet and their greatest width 100 to 150 feet.

The sorting of materials by the waves has been poor leaving the beaches made of a mixture of pebbles and clays. The southern beach has a very high percentage in a stiff, black clay such as that which lies on the upland north of it. It was evidently poured into the valley from a tributary stream and has been mixed into the gravels by the waves of the lake. This clay makes such a large proportion of the material that it cannot be used for gravel except where a very poor grade will suffice. The northern beach contains much less clay, but it has too much to make it a first class gravel for most purposes. This clay is lighter in color, being buff to light grey. Neither of these deposits will yield large amounts of gravel but they are interesting because they are formed by a process that is not usual in glaciated regions.

Little Cheyenne Sand Deposits:

A few deposits of sand are to be found in the valley of the Little Cheyenne which, because of a similarity of materials, probably had a common origin. The most easterly lies high on the divide between tributaries of the Little Cheyenne near the center of section 8, T. 118 N., R. 77 W., and is exposed in the Rosa Pit. The deposit is composed of 10 feet of fine white sand with a few streaks of gravel, containing pebbles less than an inch in diameter, and streaks of grey till one to four inches thick, near the top. This is overlaid by three to six feet of till containing some gravel pockets.

A second deposit known as the Slachter deposit lies well down in the valley in the center of the N. W. $\frac{1}{4}$, of Sec. 11, T. 118 N., R. 78 W. The deposits lie on little spurs projecting into the valley, whose tops are about 100 feet above the present valley bottom. Considerable slumping has carried sand masses much lower down, one below the Schlacter house is large enough to be worked as a pit. The material in this deposit is a medium to coarse grained clean sand. Pebbles are scattered through it, forming one to five per cent of the deposit.

A third locality lies at the mouth of the Little Cheyenne near Medicine Rock. Just north of Highway 212 in the top of the hill at the junction of the Little Cheyenne, the Missouri, and a small tributary lies a small deposit of sand very much like that at the Slachter pit. Similar materials also occur north of this hill in four small shoulders on the bluffs of the Little Cheyenne.

Another sand deposit lies in the head of the small valley used by Highway 212 in the S. W. $\frac{1}{4}$, Sec. 22, T. 118 N., R. 78 W. at about the same elevation as the Slachter deposits. It is also composed of white and brown sands with pebbles sprinkled through it.

These deposits are evidently glacial sands which have been worked over by the Little Cheyenne and its tributaries. The deposits follow roughly the gradient of the Little Cheyenne which has cut its valley since the retreat of the ice. There has been but 15 or 20 feet of valley cutting at the mouth of the Little Cheyenne since the deposits were formed there. The abundance of boulders at the edge of the breaks in this region suggests that a terminal moraine may have existed there, which has since been entirely eroded. These sands must have been kame-like deposits or large pockets in the drift of which the Rosa deposit and the sand deposit in Section 22 are remnants. The Slachter deposit and those at the mouth of the Little Cheyenne are small remnants of a great deposit which must have filled the valley at one time.

The Younger Drift (Wisconsin)

After the early ice sheet had receded there was a period in which much the same conditions existed as exist in the region today. Judging from the evidence farther east, the climate was temperate, the rain fell and streams eroded the older drift sheet. Then the last ice sheet overrode the country, covering Faulk County and extending a few miles into Potter County. This sheet made the most profound changes in the topography and formed the largest gravel and sand deposits of the area.

On reaching its westernmost extension, this ice front stood a while, discharging large quantities of debris which formed the Lebanon Moraine. The front then retreated, leaving a sheet of drift as it went, and took a second stand to form the Rockham Moraine. The gravels left by this sheet were formed for the most part while the two moraines were forming. Therefore, their origin can best be described by describing the formation of the moraines.

The Lebanon Moraine

The Lebanon Moraine is a very conspicuous ridge lying in the eastern part of Potter County and trending in a north-south direction. It enters the county just east of Hoven and leaves it near its southeastern corner. It is broad-backed and varies in width from two to five miles. Its crest lies a little west of the axis along most of its length. The western face is much the steeper and rises abruptly above its surroundings. The eastern side, however, slopes more gently till it merges with the ground moraine.

The terminal moraine can be distinguished from the surrounding ground moraines because its surface is much more rough. Knobby hills which rise 25 to 50 feet above their bases, cover it. Between these lie bowl-like, undrained depressions which are filled with lakes or swamps in times of wet weather. These knobs and kettles, as they are called, are typical of terminal moraines and are very characteristically developed in this one. They are most pronounced at the crest, but become less marked to the east until they die away into the swells and sags of the ground moraine. Along most of its length it is impossible to draw sharp line between terminal and ground moraines.

Origin:--This moraine represents the farthest advance of the Wisconsin ice sheet. Beyond this line it could not go because the ice was melting at the same rate as that at which it was advancing. The pressure farther north and east constantly urged fresh ice to this point. New debris was brought with it and deposited as the ice melted, thus making the conspicuous ridge like form of the moraine. Since the debris carried by a glacier is not distributed evenly through the ice, therefore, it was piled unequally along the moraine, making it higher in some places than in others forming the rough surface mentioned above. There is no way

determine how long the ice stood here but it must have remained for a considerable time in order to build so large a ridge of drift.

Outwash Sands and Gravels:

The melting of the ice produced great volumes of water which ran away in great torrents from the ice front, carrying debris from the ice with it, and sorting it into sands and gravels. These it deposited on the face of the moraine and in the channels through which the waters were escaping.

1. Esker and Kame Fields

During the last stages of ice melting when there was little forward movement, some of these streams fell into great holes in the ice called moulins. These were filled with sands and gravels which were left as rounded hills much like the till hills of the moraine in shape. In other cases the waters flowed through tunnels in the ice before leaving it. Debris was caught and piled up in the tunnel. When the supporting walls of the ice melted, these remained along serpentine ridges with undulating crest lines, where the tunnels and crevices had been. These forms are called eskers.

Kame and esker deposits are local and, in most cases, they occur in groups. Groups containing kames only and groups containing eskers only are abundant, but fields in which both kames and eskers occur are more common. This is the condition of most of the fields along the Lebanon Moraine in Potter County.

The largest fields are on the western face of the Terminal Moraine between Lebanon and Hoven. Their location is indicated on the accompanying map.

The materials in kames and eskers depend on the volume and velocity of the water which formed them. Where waters were swift, volumes were large, the finer materials were washed out leaving a deposit composed of cobbles or boulders. Less amounts of water produced less sorting, and left correspondingly more fine material in the deposit. Thus the materials grade from boulders to clays. Most of the eskers and kames of this region are made of the finer materials. Sands and fine gravels predominate. They are very "patchy", changing abruptly from pockets of gravel to pockets of sand or masses of till (boulder clay). Most of them, therefore, are not as profitable to work as are the large outwashes near by.

2. The Outwash Plains

The waters leaving the ice, spread aprons of sand and gravel in three places along the morainic front, one at its northern end on which Hoven is located, one near its center on which Lebanon is located and one at the south end in the valley of Okaboji Creek. These will be referred to for convenience as the Hoven, Lebanon and Okaboji Outwashes.

1. Hoven Outwash:

The waters at the northern end of the moraine escaped northward along the morainic front into a channel in Selby County in which Swan Lake and Lowery are located, and thence into the Missouri River. The head of this drainage was probably at the gap in the moraine, six miles south of Hoven, since the apex of a triangular sheet of sand and gravel which was spread in front of the moraine lies at this point. From its apex at the gap, this sheet increases to a width of four miles at the County line. The total area is about 14 square miles.

The depth of the deposit is unknown but it is safe to assume that the average is more than 10 feet, since that depth was encountered in several test holes and pit faces. Though much of the gravel in this outwash is covered with a wash of silt and clay which might make excavation impracticable, at least 35,000,000 cubic yards are available as is shown in the detailed descriptions of the deposits later in this report.

2. The Lebanon Outwash:

This deposit forms the floor of a basin known as the Blue Blanket Valley, a depression covering 111 square miles. Its outer edge lies 3 miles west of the morainic front. Its surface slopes westward to the town of Lebanon beyond which it is nearly flat. The only possible outlet for waters was to the north, but no channel which such waters could have carved, lies in that direction. It is probable, therefore, that the deposit was formed by washing of sand into a lake. The fineness of materials shows that no large torrents of water were responsible for it. If there was an overflow, it must have drained into the Hoven basin.

The materials of this outwash are almost entirely fine sands and sandy silts. Gravels are very few and fine grained. Some pockets of gravel occur around the edges of the deposit, but none are large enough to be of commercial importance.

3. The Okaboji Outwash:

A high drift divide separates the Lebanon Outwash from the Okaboji Outwash. The water which formed the latter drained southward and westward down the valley of the present Okaboji Creek. The outwash is, therefore, triangular in shape, the apex of the triangle being the northern end about in section 1, T. 117 N., R. 75 W., and the widest part at the southern boundary of the county. It thus covers an area of 16 square miles in Potter County. In the northern part it forms a sheet but only a short distance away from the moraine it takes the form of a series of large terraces. These terraces are due to erosion of the deposits by later torrents from the melting ice.

The materials are coarser, as a whole, than those of the two other outwashes, though there is a great amount of variation in different parts of the deposit. Large area of

fairly clean sands and gravels occur in many places, (See descriptions of Gravel Samples No. 142, 143, 145, 147.), but in other large areas the gravels are "patchy", (See description of gravel sample No. 144). It is impossible to estimate accurately the total volume of the material in this outwash without more testing than was possible in this survey. That enormous amounts are available, however, is certain. An estimate of 50,000,000 to 60,000,000 cubic yards of usable material from the parts of the deposit which was sampled, is conservative. The total, therefore, should exceed this figure considerably.

The Wisconsin Ground Moraine

East of the Lebanon Moraine lies a sheet of drift formed as the ice front slowly but steadily withdrew. This ground moraine is sufficiently thick to mantle the pre-glacial topography completely, thus filling the old valleys and covering the ancient hills so that no suggestion of them has been left. The only exception is the valley running east-west south of Seneca. It was apparently the master valley of the region for it is the only one large enough to escape obliteration. The position of the two swamps which form its head and the southern bend in T. 118 N., R. 72 W., together with the general southerly slope of the surface, indicates that this drainage was toward the southeast, nearly at right angles to the pre-glacial drainage in Potter County. The Lebanon Moraine, therefore, seems to have been located on an ancient divide. The valley of Nixon Creek between the south bend and Faulkton is evidently a channel shaped by glacial waters, though it may have been the site of a pre-glacial valley.

The surface has the gently rolling topography of typical ground moraine with low rounded hills which rise above broad shallow depressions, and most of which contain little lakes or swamps in wet weather. No stream made valleys cut the surface except the spillway channels mentioned above. Near the Lebanon Moraine relief is greatest. Hills rise to heights of 20-40 feet above their bases, and the country is so rough that there has been little attempt to build roads across it. The relief decreases to the east, however, until near Faulkton it is only about 5 to 10 feet.

Over a large area, in the northern part of Faulk County, embracing T. 119 N., R. 68, 69, and 70 W., the surface is almost as flat as a floor. Variations in the surface relief are not easy to catch with the eye. The same holds true south and west of Faulkton, though here there is a pronounced slope toward the south.

The Rockham Moraine

The Rockham Moraine left by the second halt of the ice front is not so distinctly marked as the first, but is traceable across the eastern end of Faulk County. The southern end is a characteristic terminal moraine of a ridge-like shape marked by knobs and kettles. This moraine occupies a belt three miles wide, the western edge of which is one mile west of Rockham. The northern end is represented by the rough topography east of Scatterwood Lake in the extreme northeastern part of the County.

Between these two areas of typical terminal moraine, the halt of the ice front is marked only by groups of knobs which rise abruptly above topography, much like that of the ground moraine immediately west of it. Most of the hills are kame-like in form

and origin for the till of which they are composed is stony and pockets of sand and gravel are abundant in most of them. Three groups of these hills are especially conspicuous. One is in the south-central part of Lafoon Township (T. 118-68) in Sections 27, 28, 34, and 35. A second lies northeast of Miranda in Centerville Township (T. 118-67), most of the hills being in Sections 32 and 33. The third group lies in Sections 11 and 2, Devoe Township, T. 119 N., R. 67 W., and section 34 in Fairview Township (T. 120-67). Between these groups lie some scattered knobs, the largest of which have been indicated on the geological map. Their kame-like character shows that they were formed in ice that was nearly if not entirely stagnant. This, therefore, represents part of the moraine where the halt was not long enough to permit the building of a typical terminal moraine.

Drainage:

Apparently no such great volumes of water were discharged during the Rockham stand of the ice as during the stand along the line of the Lebanon moraine. Instead of flowing away in great torrents and forming much outwash, the waters escaped through a series of relatively small channels which now form a network of valleys over the eastern part of Faulk County.

The slope underlying the ice sheet was toward the southeast, for when not forced to take another course, the streams tended to flow in that direction. Due to the position of the ice front, however, the channels in which gravel and sand deposits were formed, discharged to the south. Later torrents originating somewhere north of the county followed the southeast channels and cut the courses of the present streams.

The first drainage line developed was evidently along the north fork of Nixon Valley and south through the unnamed valley in the east side of T. 118 N., R. 68 W. about seven miles west of Faulkton. This route is shown as route No. 1 on the accompanying drawing. A point of unusual discharge of debris-laden waters must have occurred on the ice near the northwest corner of T. 118 N., R. 67 E. A great amount of sand and gravel was poured into the channel here forming the deposit in the southern end of this drainage, and possibly backing up the west fork of Nixon River to form terraces in the valley east of Faulkton.

The deposits are of coarse sands and gravels near the head of the deposit, coarse enough to make good road gravel in the S.E. $\frac{1}{4}$, Sec. 11, T. 118 N., R. 68 W.

From this point, however, they become finer both to the south and west. Most of the material in the west fork of Nixon River is sand and silt, while the gravels grade into sands and silts down the south channel within about two miles of the source. This southern channel was so filled with debris that it diverted the waters of present Nixon River to the north instead of discharging it south as the glacial waters had done.

A second and later drainage is indicated as route 2. The point of copious discharge of water and debris had been moved to the vicinity of Section 27, T. 119 N., R. 67 W. Torrents poured south from this point through the valley shown on the map and deposited gravels over more than a square mile of territory. The deposit was tested around the outside of Section 34 and found to be composed of medium to coarse gravels containing some sand. Where the channel narrows about two miles from its source, it seems to have been swept clean. The only deposits found in it are two terraces four miles south of this narrow point, which judging from their materials, are of local origin. Subsequent torrents have eroded the valley of Nixon River deeply, leaving the big gravel deposit in Section 34, T. 119 N., R. 67 W. high up on the south bluffs of the valley.

A third stand of ice occurred farther east, during which time waters discharged along the route marked number 3. These waters drained south into Nixon valley. Sands and gravels were deposited in this valley in T. 119 N., R. 66 W., probably by waters discharging into the valley near the present location of the deposits.

When the ice left this position it opened a lower outlet so that later waters did not use the spillway south of section 30, T. 120 N., R. 66 W., but flowed west and south into the Scatterwood Lake outlet.

The Scatterwood Lake outlet (route 4) is the last of the channels to be considered in this area. The rough topography east of it indicates that ice stood here longer than along the other routes described. At any rate waters poured down this channel discharging into Nixon Valley, and carried debris into it along the northern half of its course in Faulk County. Gravels are to be found in its northern end about the southern tip of Scatterwood Lake, but for a distance of about six miles south of the Lake the channel is filled with a swamp which prevents prospecting. It is safe to assume, however, that gravels underlie this portion of the channel, also. South of the swamp the valley is filled with deposits, for its entire length. In the northern three miles of this section, gravel terraces occur which become lower and lower until finally the deposits form the floor of the valley. They also increase in fineness toward the south. The terraces are composed in part of gravel, but they become progressively finer down the valley until the fill is entirely sand. At the mouth of the valley in Sec. 33, T. 119 N., R. 66 W. The deposits are composed entirely of fine sandy silts.

Kames and Eskers:

These features rise as distinct hills and if it were not for the greater volumes of material in the channel deposits they would be valuable as gravel deposits. They can only be considered as of secondary importance, in this region, however because they are small, for the most part, and their materials are very patchy. The largest esker mapped is in the S. W. corner of Section 32, T. 118 N., R. 67 W. This is not over half mile long. Most of the kames are not more than 10 feet in height. They appear to have been formed in holes and tunnels in the ice through

which only little water flowed, or through which water flowed only intermittently, for they contain considerable quantities of fine material, most of them are made of stony till with pockets of sand and gravel.

Good clean material can be obtained for local use from some of the pockets, but quantities sufficient for commercial exploitation are not available. With very careful prospecting pockets, might be found which would yield 10,000 to 15,000 yards, but in most kames and eskers pockets containing a few thousand yards are the rule.

DETAILED DESCRIPTIONS OF GRAVEL DEPOSITS

Potter County, Sec. 35, T. 118 N., R. 75 W.

Dirty Deposits in Old Stream Bed

The deposits in the N. W. $\frac{1}{4}$, Section 35, has been opened and a few yards of gravel removed for use around barn and house. Probably about 1000 cubic yards left.

Deposit in S. W. $\frac{1}{4}$, Section 35 tested with 6 holes; two feet of cover and six foot vein of gravel. Material was about half dirt and of little use except low grade material for road surfacing purposes. 3000 cubic yards.

Deposits occur as mounds in valley of old stream, rising from six to ten feet above floor.

Potter County, Sec. 2, T. 117 N., R. 75 W.

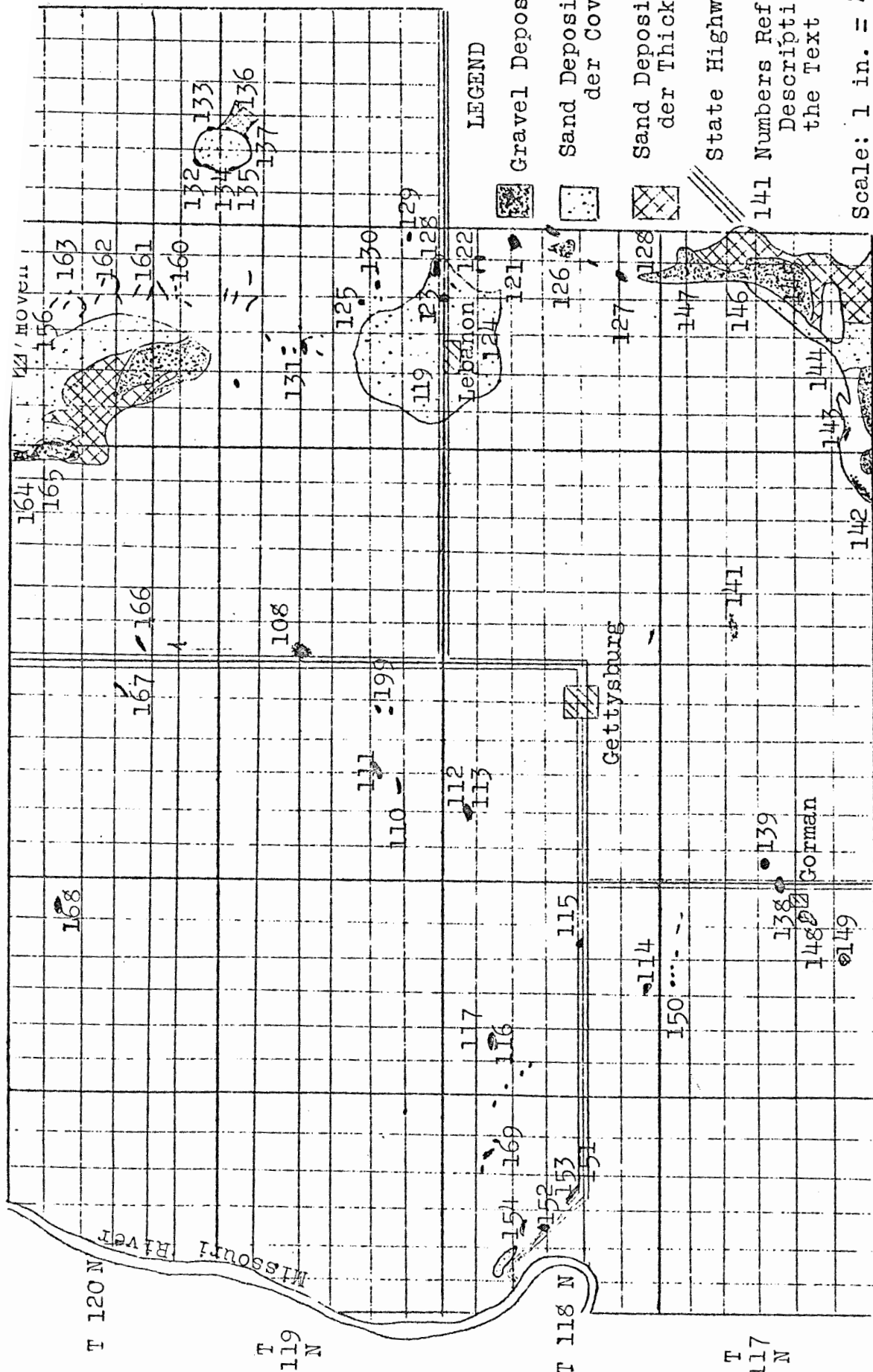
Deposit in N. W. $\frac{1}{4}$, Sec. 2. Two foot cover and 5 feet of gravel. Gravel half dirt and of little use except as low grade material for road surfacing purposes. 3500 cubic yards.

Deposits occur as mounds in valley of old stream, rising from six to ten feet above floor.





EXPLANATION OF TABLES

Wt.-----Weight per cu. ft.
 S.Gr.----Specific Gravity
 P. C.----Per Cent
 M.-----Mesh
 P.C.V.---Per Cent Voids

P.C.P.----Per Cent Passing
 P.C.S.----Per Cent Soft
 P.C.M.----Per Cent Medium
 P.C.H.----Per Cent Hard
 Character of Material-- $\frac{1}{4}$ in.---
 ---Character of Material Re-
 tained on $\frac{1}{4}$ in.



LEGEND

-  Gravel Deposits
-  Sand Deposits Under Cover
-  Sand Deposits Under Thick Cover
-  State Highways

141 Numbers Refer to Descriptions in the Text

Scale: 1 in. = 4 mi.

GRAVEL DEPOSITS IN POTTER COUNTY, SOUTH DAKOTA

POTTER COUNTY

N-108

Sec.7,T.119 N., R. 75 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110.0	2.36	25.2	93.5	82	47.4	13.3	4.8	7.3

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit, in Feet.	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
28.1	45	33.9	1.5	5	5000

Shoulders occur on either side of small stream up to about center of Sec. 13. The larger deposits are toward the lower end of the stream. Material is very dirty, and will run more fines. All right for use as road gravel, but must be washed if used for concrete.

POTTER COUNTY

N-109

Sec.26, T.119 N., R. 76 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105.5	2.48	31.6	84	73.5	49.7	18.4	6.8	5.4

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit, in Feet.	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
28.1	34.6	37.3	2	4	500

Deposits occur as sort of shoulders about 25 to 30 feet above lake level in N. E. $\frac{1}{4}$, of Section. Thus shoulders are small and the accessibility is poor, the road being very rough and hilly. The material is much cleaner than others found in this vicinity. An old pit has been opened in these deposits and some 30 or 40 loads removed.

POTTER COUNTY

#N110

Sec. 28, T.119 N., R. 76 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
99.8	2.23	28.0	96.1	88	38.6	4	3	6.6

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit, Feet	Volume in cubic yards
P.C.S.	P.C.M.	P.C.H.			
24.4	35.8	39	1.5	8 to 10	5000

A typical esker and kame field occurs in S. E. $\frac{1}{4}$ of Section. The esker is covered with large boulders, but has large pockets of material as represented by this sample.

There are plenty of rocks in the vicinity for crushing.

A half mile to the north and on the south slope of the ridge some gravel shoulders occur.

POTTER COUNTY

N-111

Sec. 27 & 28, T.119 N., R. 76 W.

WT.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
117.5	2.44	23.1	78.5	67.1	56.5	3.3	2.5	8.1

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.4	30.1	58.5	182.5	10	33,000

This deposit occurs as a terrace above old drainage, lake, floor. Its level corresponds with that of shoulders of Sample 110. The gravel is well sized and adapted for road surfacing purposes. The deposit is about 10 feet thick. At 4 feet above bottom of deposit there is a streak of silt one foot in thickness. Under this silt is a clean well sized gravel very suitable for concrete purposes.

On east side of road in Section 27, the terrace should easily yield 24,000 cu. yds. and the west side of road in Section 28, the terrace should yield 9,000 cu. yds. This same drainage should be watched at same elevation for similar deposits.

POTTER COUNTY

N-112

Sec. 5, T. 118 N., R. 76 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 H.	P.C.P. 100 M.	P. C. Silt
122.2	2.51	21.8	81.8	65.7	25.5	10.5	6.8	5.5

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit, in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.3	35.8	51.9	1.5	3.5	9,000

Sample 112 is gravel taken from a large terrace deposit in S. E. $\frac{1}{4}$, of Section 5. The entire deposit is about $8\frac{1}{2}$ feet thick, there being $3\frac{1}{2}$ feet of gravel as per sample, overlying 5 feet of sand. The gravel is about as clean gravel as may be found in the vicinity. There are about 1000 yards of dirty material in a very small terrace near farm house on quarter section line. Do not use any of sand of this deposit for road surfacing material--the sand is too fine.

POTTER COUNTY

N-113

Sec. 5, T. 118 N., R. 76 W.

Wt.	S. Gr.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	P.C.V.	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
94.1	2.26		100	33.4	96.2	68.8	12.4	5.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			1.5' Earth 3.5' Gravel	5	12,000

Sample 113 is sand taken from large terrace deposit in S. E. $\frac{1}{4}$ of Section 5. Entire deposit is about $8\frac{1}{2}$ feet thick. the sand is about 5 feet thick overlaid by vein of gravel $3\frac{1}{2}$ feet thick.

The top layer of sand is clean, but very fine in size. The deeper into the sand, the dirtier and finer it becomes. Sand is not much good for ordinary uses of the present time.

Potter County, Sec. 20, T. 119 N., R. 76 W.

These deposits might indicate that there is a large terrace here with vein of six or seven feet of gravel--but if so the gravel is covered with about twelve of soil.

A hole was drilled down 5 feet on top of bench--all loess soil, and damp at depth of 3 feet, which would tend to discourage the idea that gravel might be underneath. Another probability for these deposits is that they are small shoulders occurring at about 10 feet from bottom of valley floor.

The gravel is very dirty and mostly sand. There is a probable 2000 yards of material in the entire vicinity.

Potter County, Sec. 7, T. 118 N., R. 76 W.

A small kame deposit occurring on road at S. E. $\frac{1}{4}$, of Section 7. Cover of $2\frac{1}{2}$ feet. Vein of six feet. Material is a dirty fine gravel--too fine to be a good road surfacing material.

Use would be a possible pocket of clean sand for local purposes. 3000 cubic yards.

Potter County, Sec. 2, T. 118 N., R. 77 W.

A small kame deposit lying in road.

Best use for the material would be for maintenance of gravel roads.

Thickness of Cover-- $2\frac{1}{2}$ feet; Depth of Deposit--8 feet; 5000 cubic yards.

Potter County, Sec. 17 and 18, T. 118 N., R. 77 W.

Deposit is an outstanding long ridge in Section 17. A five-foot test hole revealed $\frac{1}{2}$ foot of cover--3 feet dirty gravel-- $1\frac{1}{2}$ feet oxidized gravel--then large flat stones and till.

Material could hardly be called a good road surfacing material, but in the absence of better, could be used. Accessibility is good. Volume about 5000 cubic yards.

A kame deposit occurs on west side of Section 18, one quarter of a mile south of northwest corner. Volume of about 500 yards.

POTTER COUNTY

N-114

Sec. 34, T. 118 N., R. 77 W.

Weight	Specific Gravity	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.52	33.3	91.5	73.9	15.7	4.6	2.8	11.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.4	29.7	60.9	1 to 5	4 $\frac{1}{2}$	29,000

The deposit in general is a low terrace mainly on the east side. The cover will vary from 1' on the front edge to 5' on the back edge. The material is good for road surfacing material, but too dirty for use in concrete. Accessibility is good. Probable estimate of volume would be 25,000 yds. in big terrace; 3000 yds. in terrace on point; and 1000 yds. in shoulder on north. The bump on the west side of road in Section 33 was plugged, but found to contain mostly dirt, with a little gravel mixed in. At 5' in depth the material was very dry which would suggest that there might be sand or gravel at a lower depth, but not in very great quantities.

POTTER COUNTY

N-115

Sec. 23, T. 118 N., R. 77 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.47	22.7	69.3	61.9	34.1	10.6	7.1	6.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.1	21.2	72.7	1 to 3	3 $\frac{1}{2}$	700

A small deposit showing up alongside of road where ditch crosses at S. $\frac{1}{4}$, Sec. 23. A sample was taken there thinking that a large terrace deposit had been formed, but test holes proved deposit to be very small in extent.

Material can be used for local purposes.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
116	2.49	19.4	92.8	85.5	48.8	15.2	94.8	6.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in feet	Depth of Deposit in feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
13.5	33.8	52.7	1 to 4	2 $\frac{1}{2}$ to 3	600

Known as the Rosa Pit. A good sand pit. On the west side of deposit is found material as per sample 116, and on N. E. side same as sample 117. Would say that most of this deposit is sand.

A number of holes were bored on north and west sides and results would indicate the deposit to be a pocket. Cross section of pit revealed 1 to 4' of cover; 2 $\frac{1}{2}$ feet as per #116; then 5 feet of sand as per #117; then 4 feet of dirty coarse sand.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh.	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
104	2.55	34.6			93.8	42.2	9.5	3.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			1 to 4	8	12,000

Known as Rosa sand pit.

About 1500 cu. yds. of material have been removed from this deposit. Would say that some 8000 yds. yet remain in this deposit--and 4000 yds in ridge to the south.

Sand is very clean, but fine in size. Deposit occurs under 1 to 4 feet of cover; then 2 $\frac{1}{2}$ feet of gravel as per # 116; then 8 feet of sand as per sample; then 4 feet of dirty coarse sand.

POTTER COUNTY

N-118

Sec. 5, T. 118 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.47	27.1	99.4	91.4	17.1	6.6	2.1	3.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in feet	Depth of Deposit in feet	Volume in Cubic Yards
P. C.S.	P.C.M.	P.C.H.			
18.4	30.6	51.0	3	3	1000

This deposit is a small shoulder.

Gravel is well suited for either road surfacing or concrete work.

Most of this deposit lies under road so it would probably not pay to open up a pit here.

POTTER COUNTY

N-119

Sec. 32, T. 119 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
102	2.41	32		100	79.2	30.1	7.9	3.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			$2\frac{1}{2}$	10 to 12	Given under #120.

This sample is typical of material in big wash from moraine to the east.

Good concrete sand. Is clean and fairly coarse.

See Sample 120 for further data.

POTTER COUNTY

N-120

Sec. 35, T.119 N., R. 74 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.42	39.2	89.9	84.8	71.1	23.8	6.8	9.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in feet	Volume in Cubic Yards
P. C.S.	P.C.M.	P.C.H.			
22.3	29.8	47.9	1 to 3	10	500,000

This immense deposit was first detected by means of the railroad cut.

The material as a whole can be classed as coarse sand and pockets will be found which will make excellent concrete sand.

Accessibility is excellent either by road or railroad.

POTTER COUNTY

N- 121

Sec. 13, T. 118 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P. C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
121	2.54	23.2	93.4	82.9	45.8	16.7	6.4	2.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P. C. S.	P.C.M.	P.C.H.			
17.6	21.4	61.0	1.5	10	40,000

John Knott Pit

About 2500 yds. have been removed from this pit for concrete and plaster purposes.

The coarser material is found on the east side of the deposit; the finer material on the west side.

Test pits show no material north of drainage and the road about marks boundary.

A good material for either road surfacing or concrete purposes.

POTTER COUNTY

N-122 Sec. 2 , T. 118 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
130	2.54	18.4	71.3	58.3	50.1	26.6	14.6	5.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.7	22.4	69.9	1	5	3000

This deposit occurs .7 miles east of S. W. $\frac{1}{4}$, Section 2. It is a flat topped ridge and appears as if it might contain a great deal of gravel, but test holes only prove about 3000.

Gravel is of good quality for road surfacing purposes but care must be exercised in using for concrete on account of various pockets of dirty material.

The small bumps to the east and north have more or less gravel in them, but no other exceptionally large deposits are evident in this vicinity.

POTTER COUNTY

N-123 Sec. 34, T.119 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.38	28.2	100	94.4	70.7	21.0	5.4	4.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in feet	Depth of Deposit in feet	Volume in Cubic Yards
P. C. S.	P.C.M.	P.C.H.			
14.9	26.6	58.5	1	8	23,000

Lunde Sand Pit

About 2000 to 2500 yds. have been removed and used locally and at Lebanon.

An outwash deposit below that of sample #120. Pit is easy of access and may be worked readily.

The deposit continues on through railroad tracks. All right for concrete use, but silt content must be watched as this sand has a tendency to be a little dirty.

POTTER COUNTY

N-124

Sec. 10, T. 118 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Silt	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.38	26.2	90.8	85.5	69.1	23.2	7.2	3.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.6	19.0	73.4	2 to 4	8 to 10	Given with # 123

The sand is continuation of sand deposit in flats. It was tested at this point because there was a ten-foot raise and it was thought that there might be some gravel.

The sand found here on east side of Lebanon flats is coarser than that found on west side, which is as it should be.

POTTER COUNTY

N-125

Sec. 22, T. 118 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ In. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
106	2.33	27.4	93.6	88.6	59.9	15.6	4.4	7.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
25.7	19.8	54.5	1.5	6	2000

This is a kame deposit in a large area of small kames and eskers. The majority of these kames and eskers are composed of rock and till, but occasionally one is found that will contain material as # 125.

To the north of the kame sampled is a low lying esker that should contain pockets of material. Material only good for road surfacing purposes, because of large amount of silt contained.

POTTER COUNTY

N-126

Sec. 24, T. 118 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
123	2.58	23.6	72.3	64.9	64.9	24.3	6.9	8.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.1	17.7	78.2	1	7	250,000

This deposit lies along west side of small lake, evidently an outwash. Would say that the gravel area is about 800' wide and 4000' long. Depth of deposit will vary from 4 to 8 feet.

Material is a fine gravel and rather dirty. All right for road purposes.

The kame at the south end of this area is a very very dirty gravel--almost till.

POTTER COUNTY

N-127

Sec. 26, T. 118 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
118	2.46	23.4	79.9	71.4	52.2	19.3	7.7	3.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.7	25.2	63.1	1.25	4	9000

This is a terrace deposit and resembles #126.. (Both have same source). About 7000 yds. in terrace. There is a string of terraces following down the drainage as mapped. A small shoulder to the south and on the east side of the drainage contains about 2000 yds.

Silt content will have to be carefully watched for any use except road surfacing purposes.

Accessibility is good.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.41	26.6	92.9	86.9	64.8	16.7	6.4	3.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
24.8	23.2	52.0	1.5	9	65,000

This is a large terrace deposit. The sample was taken from a pit on the south side of the road. Cross section of deposit shows: $1\frac{1}{2}$ feet of cover; 2 feet of gravel; and 7 feet of sand. The sample is of the sand only.

The estimate of volume given under this sample is for that part of the terrace lying in section 35 on north side of road. There are 3,000,000 yds. of material lying south in twp. 117.

Good material and good accessibility.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P. C. P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
125	2.46	19	84.6	74.5	48.6	16.9	7.0	4.5

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.6	20.4	69	2 varies	8	3600

A kame deposit on top of the moraine, and was exposed by railroad cut. Access O. K.

A rather fine gravel and fairly dirty because of fine streaks of silt throughout deposit.

All right for road surfacing purposes, but hardly enough in it to pay for opening a pit here.

Wt.	S.Gr.	P.C.V.	P.C.P. ½ in. Mesh	P. C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
117	2.55	26.8	88.3	79	57.6	18.0	6.0	6.4

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
17	31.9	51.1	1.5	10	16,000

Deposit occurs as a long esker starting at about N.W. Corner of Section 26 and running east. There are about 6,000 yds. in the one hill.

Another parallel ridge about 200' south, which also contains gravel. Three other eskers run east to the quarter line. Gravel pockets may be found in any of these.

Gravel is patchy and highly oxidized. Suitable for road surfacing purposes. Probably not a desirable place to start road surfacing operations from until thorough tests are made for volumes of the various deposits.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P. C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.57	25.6	91.2	83.4	61.9	16.9	5.9	4.1

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.6	23.0	67.4	1.5	6 to 12	34,000

A series of kame deposits. A pit has been opened in one of these deposits and about 5000 yds. removed.

A 12' to 15' face has been exposed, showing from 1 to 2 feet of cover; 3 to 4 feet of gravel, then alternate layers of coarse sand, fine gravels, gravels.

About 15,000 yds. left in deposit with pit. The one 300' to N.E. contains 7000 yds. The low lying bump to south and east of pit will contain 7000 cu. yds.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
114	2.55	29.2	98.1	88.9	62.7	8.8	3.9	10.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.7	11.4	83.9	1	2 to 3	6000

This deposit is a small neck that runs out into the lake bed at a point a little west from the S $\frac{1}{4}$, Sec. 32.

The deposit is shallow and narrow and perhaps of little value except for local use.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
115	2.56	28.1	90.6	82.3	50.9	7.2	1.9	3.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.2	19	68.8	$\frac{1}{2}$	5 to 10	1,500,000

Excellent material.

Deposit in bottom of old lake bed. This sample was taken near edge at N. E. corner.

The best materials in this lake will be found toward east side. This material can be used for anything.

POTTER COUNTY

N-134 Sec. 5, T. 119 N., R. 73 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
99	2.60	38.9		100	98	17.9	1.6	1.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P. C. H.			
			2	10	15,000

Deposit occurs on south bank of lake and just west of ranch houses. Deposit is a shoulder running back some 100 feet and is 600 feet long.

The material is clean, fine, brown sand. Its chief value is that it is clean, but is objectionable because of its fineness.

POTTER COUNTY

N-135 Sec. 5, T. 119 N., R. 73 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
106	2.50	32.1	98	97.2	74.4	30.4	9.9	4.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.5	16.3	72.2	1	7	see sample # 133

Sample taken in old lake bed near S.W. Corner.
Material in lake gets a little finer--more dirty--and more cover toward west side.

Excellent material---see sample 133.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
111	2.49	28.4	92.8	75.8	33.7	8.2	5.1	8.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.1	12.9	78	2.5	5	8000

A terrace deposit in Gorman Creek series. A pit has been opened alongside road and about 400 yds. removed.

A rather dirty pea gravel with but very little oversize. Unless washed material would be of little value in concrete work. A good road surfacing material.

Small pockets can be found along shoulders of creek at various points but of little commercial value.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
114	2.60	29.6	89.3	76.6	30	9.8	7.1	13.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.1	23.9	71	2 to 4	6' plus	14,000

A terrace deposit in Gorman Creek series. Sample taken from a test hole near $N\frac{1}{4}$ corner.

Extent of the deposit will cover an area along road of 1000 feet east of $\frac{1}{4}$ corner to 300 feet south of fence.

Gravel is found in entire valley, but with so much cover that it is not economical to recover.

At this point, however, a pit might be opened and material obtained for road surfacing purposes.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.51	31.8	93.1	79.7	22.4	3.5	1.9	7.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S;	P.C.M.	P. C. H.			
8.2	13.1	78.7	3 to 4	4	100,000

A large terrace deposit. Test hole was made in road about 250 ft. north of school house.

The shallow cover will be found near edge of terrace and it will be economical to use gravel near the edge.

Because of thick cover and correspondingly thin vein of gravel, the terrace may not find an extensive use. It is a large one, the cover will vary in thickness and gravel will be found to be thicker nearer the edge.

Material is good for highway purposes.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
108	2.47	30.3	75.3	58.1	24.6	4.8	2.7	7.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.6	12.8	79.6	4	4.5	25,000

This is a large terrace deposit on upper drainage belonging to the same series as samples 138, 139, 140. The formation is typical, 4 feet of cover and $4\frac{1}{2}$ feet of gravel.

The lightest cover and deepest gravel will occur on face of terrace.

Terrace runs east of road 3 or 4 hundred feet but is narrow. The terrace widens out on west side of road.

Accessibility is good and material is good, but cover is quite thick.

Wt.	S.Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
114	2.55	28.8	92.5	79.3	31.4	4.8	2.7	4.7

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
15.6	12.9	71.5	1.5	15	800,000

A large terrace in Okaboji Valley occurring some 25 feet above valley floor. A pit has been opened in this deposit and about 1500 yds. of material removed.

Cover is light, about 1 1/2 feet, then 2 or 3 feet of coarse gravel, then 12 feet plus of material as per sample.

Terrace has good shape and can be easily traced. The 800,000 yds. is for volume of terrace in sections 35 and 36.

Ideal for opening and stripping. Very little oversize. Good accessibility.

Wt.	S. Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P. C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
118	2.44	22.4	72.5	63	53.2	11.3	4.3	5.26

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
25.1	18.6	56.3	5	3 of Sand 4 of Gravel	550,000

This deposit is a low lying terrace running along South 1/16 of Sec. 32 and 33. It is about 15 feet above valley floor.

To this estimate of 550,000 yds. can be added 40,000 yds. lying in S. W. corner of Section 31.

Material is good road gravel and deposit can most economically be worked near front edge because of thick cover.

POTTER COUNTY

N-144

Sec. 34, T. 117 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
118	2.58	26.7	90.1	78.1	55.9	10.4	4.7	4.18

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
16.2	14.4	69.4	2.5	8	3,500,000

This deposit is the big outwash in Section 34 and Section 35. Test hole revealed 2 feet of brown rather coarse gravel; then 6 feet plus of a rather clean coarse sand.

This sample is a pretty fair indicator of the material in the area. About 2,000,000 yards in Section 34 and 1,500,000 yds. in Section 35.

POTTER COUNTY

N-145

Sec. 26, T. 117 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105	2.44	30.9	91.6	82.9	66.3	6.2	2.1	6.25

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.8	14.4	72.8	1.5	8 plus	40,000,000

This area is a big channel outwash. Underneath $1\frac{1}{2}$ feet of cover lies $1\frac{1}{2}$ feet of gravel, then 6 feet plus of clean coarse sand. Excellent concrete sand.

Good road surfacing material if but a four foot depth were used. A greater depth than this would run percentage of sand too high.

POTTER COUNTY

N-146

Sec. 13, T. 117 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P.	P.C.P.	P.C.P.	P. C.
99	2.37	33.1	84.5	64.5	22.2	5.0	2.6	5.45

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.6	14.3	75.1	Varies	7	3000

Note: Sieve analysis is only approximate as a number of finer particles were cemented together.

A small kame deposit which is quite local.

Has been opened and about 50 loads removed.

Material is pockety, perhaps good material could be obtained in spots.

Use would be for local purposes.

POTTER COUNTY

N-147

Sec. 14, T. 117 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
103	2.33	29.5	93.1	87.5	49.4	10.3	3.7	5.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
31.2	13.4	55.4	1.5	8	18,000,000

The place at which this terrace was sampled was in a small pit near the front edge. Section of pit revealed $1\frac{1}{2}$ feet of cover, 2 feet of dirty gravel, then 6 feet of sand and gravel as per sample.

Sand may be used for concrete but should be taken below 4 foot level from top on account of dirty conditions of top material.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
111	2.49	28.4	93.2	79.0	45.1	7.2	3.7	10.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
3.9	5.6	90.5	1 to 4	10 to 12	28,000 plus

This is a terrace deposit near entrance to large deposit. Pit has been opened and about 300 yds. removed.

The top 5 or 6 feet of gravel is clean and well sized, but bottom part has a great deal of silt.

The top 5 or 6 feet of material is O. K. for concrete use.

The entire face may be used for highway surfacing material.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.45	30.0	93.7	77.5	25.6	4.7	2.5	13.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.8	37.8	53.5	4	6 plus	26,000

A low terrace deposit lying under 4 to 5 feet of cover. A small pit has been opened and few yards removed. This terrace is not definitely outlined so that an estimate of volume is hard to make.

The top 3 feet of gravel is fairly clean, then 3 feet of dirty gravel, then gravel seems to be a little cleaner.

It is quite safe to say that gravel may be found under 4 to 6 feet of cover at any place along valley.

Wt.	S.Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105	2.36	29.5	88.0	77.4	47.6	17.4	7.4	7.1

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
16.3	17.7	66.0	1	9 plus	4000

This deposit is a series of 4 bumps near center of section with light cover then 2 1/2 feet gravel, then 2 feet dirty coarse sand, then 2 feet clean gravel, then 2 feet plus of sand.

Deposits would make good road surfacing material and are accessible.

Wt.	S. Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
95	2.66	42.7	100	100	99.3	9.3	3.0	3.3

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2 to 6	12	4000

Deposits occurring in the gulch alongside of highway have doubtful origin. It seems as if they were laid in narrow valley and high banks on either side slumped over them.

This deposit occurs just to east of old windmill.
Material for concrete use.

POTTER COUNTY

N-152

Sec. 16, T. 118 N., R. 78 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.61	31.2	99.2	94.9	46.4	1.8	0.6	2.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11	10.1	78.9	Varies	20 plus	57,000

This deposit is a high bump in Cheyenne Valley just east of bridge on highway. About 10,000 yards removed from this deposit.

Sample 152 is the top 10 feet of this deposit, which seems to be more coarse and dirty than the under layer. (See sample 153).

Separating these two deposits is a 2 foot layer of fine silt and sand.

Pit at present has been worked down only to silt layer. There is the probability that the deposit will run much deeper than estimated.

POTTER COUNTY

N-153

Sec. 16, T. 118 N., R. 78 W.

Wt.	S.Gr.	P.C.V.	P.C. Sand	P.C. P. $\frac{1}{2}$ in.	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
105	2.60	35.1	100	100	91.7	8.4	1.7	2.0

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			

For particulars of deposit see sample 152.

This sample is the under layer which so far has not been exploited commercially.

POTTER COUNTY

N-154

Sec. 16, T. 118 N., R. 78 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
115	2.63	29.9	88.5	84.6	37.0	3.3	1.7	5.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.6	8.2	79.2	0	9 to 12	6000

These three bumps are remains of a terrace put down by Cheyenne Creek.

Material is a clean coarse sand to fine gravel with some shales mixed in.

If used as road surfacing material some silt should be added as a binder.

POTTER COUNTY

N-155

Sec. 20, T. 120 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
111	2.44	27.4	90.8	79.5	33.0	9.9	3.1	4.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
15.7	10.5	73.8	1.5	10 plus	2,200,000

This sample was taken from a pit opened alongside small stream near $S\frac{1}{4}$ of Section 20. About 1200 yds. removed from pit.

Material is good and with proper selection may be used for either concrete or road surfacing purposes. Log of deposit is as follows: 2 feet coarse gravel and pebbles; then 5 feet fine gravel; then 3 feet plus of coarse sand.

POTTER COUNTY, Sec. 36, T. 117 N., R. 75 W.

This deposit is a terrace lying on east side of valley. Two test holes were put down, one at $S\frac{1}{4}$, and one at S.1/16.

The one at $S\frac{1}{4}$, is on a lower level, some 6 or 8 feet and gravel at top of deposit is much coarser than at S. 1/16.

The material corresponds to Sample # 142.

Thickness of Cover in Feet: 4; Depth of Deposit: 10 feet;
Volume: 500,000 Cubic Yards.

POTTER COUNTY, Sec. 8, T. 118 N., R. 78 W.

These shoulders are high up on east bank of Missouri to east of new bridge location. The shoulders are quite distinct.

Material is mostly shale mixed with large gravel and dirty sands.

It is not good road surfacing material, but in absence of better could be used if materials of entire deposit were crushed together. There is probably enough sand and gravel to make right mixture with shale.

POTTER COUNTY, Sec. 26, T. 118 N., R. 77 W.

The gravel in Section 26 occurs in very small kames near East 1/16 corner. The material is dirty and shallow.

POTTER COUNTY

N-156

Sec. 8, T. 120 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.51	26.1	85.9	71.0	48.2	19.9	7.0	5.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.7	11.3	76.0	3	12 to 20	17,000,000

This sample was taken near the Hoven end of the big outwash. The northern end of the outwash is probably quite like the sample. There is a low depression or old channel about $\frac{1}{2}$ mile to the west where the gravel will probably be covered to quite a depth with silt and muck.

Good road surfacing material but because of silt content should be carefully checked for use in concrete.

POTTER COUNTY

N-157

Sec. 22, T. 120 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
101	2.22	27.3	99.4	95.4	74.5	40.8	12.0	3.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
38.3	30.9	30.8	3	4 plus	6,000,000

At this point of the outwash a fine rather dirty sand was found. It is quite probable that gravel and coarse sand are at a deeper level but sand was so fine in test hole that it could not be lifted out with auger and depth of test hole thus limited.

POTTER COUNTY

N-158

Sec. 28, T. 120 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
107	2.39	28.7	82.2	72.1	50.9	9.5	2.9	7.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
20.4	10.7	68.9	6		7,000,000

At this point there was about 6 feet of cover, then gravel as per sample. The line of gravel seems to be about $\frac{1}{2}$ mile back. Laboratory tests showed quite a bit of shale in material.

POTTER COUNTY

N-159

Sec. 33, T. 120 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
102	2.35	30.6	78.3	70.7	52.5	7.7	2.1	8.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
33.9	11.0	55.1	1.5	8	2,800,000

This sample was taken from face exposed by road cut. 2' coarse gravels, then 5' coarse sand and fine gravels as per sample.

This deposit is part of the Hoven outwash and toward the south edge.

Laboratory tests show considerable quantity of shale in the material.

POTTER COUNTY

N-160

Sec. 26, T. 120 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
98	23.8	34.2	100	100	84.3	36.6	14.2	6.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2 $\frac{1}{2}$	6 plus	45,000

A molding sand.

Test hole was made toward east end of long esker paralleling road. Esker is about 90 feet wide at bottom and 12 feet wide at top.

There are a few pebbles in material which will necessitate screening of material before using as a molding sand.

POTTER COUNTY

#N-161

Sec. 27, T. 120 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
122	2.58	23.2	80.8	60.7	73.2	36.6	22.9	6.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
21.6	12.2	66.2	1.5	12	44,000

This esker is the one crossing road. Material in this esker contains more pebbles and also of a reddish color denoting iron content.

Use--molding sand.

About $\frac{1}{4}$ mile north there is another esker of about same material.

POTTER COUNTY

N-162

Sec. 22, T. 120 N., R. 74 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Silt	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.50	29.4	98.0	95.4	62.3	20	5.1	3.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.4	5.5	82.1	1.5	15	115,000

This sample was taken from pit opened on esker at N.W. Corner of Section 22.

It is a clean sand.

An abundance of this material in vicinity. First few feet on top is generally a fine sand with pebbles mixed in, then material as per sample.

POTTER COUNTY

#N-163

Sec. 10, T. 120 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.48	29.0	96.7	94.2	63.0	20.9	5.9	4

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.6	5.3	83.1	1 to 2	12	85,000

Sample was taken from a small pit at S $\frac{1}{4}$ of Section 10.

This deposit has stretches of silt in it. Not as coarse or as well washed as Sample 162.

POTTER COUNTY

#N-164

Sec. 6, T. 120 N., R. 74 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
102	2.34	29.6	95.7	85.3	54.9	10.6	2.7	2.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
23.4	9.6	67.0	1.5	10 plus	3,500,000

This sample was taken from a small pit opened on edge of big terrace on west side of valley. Wells in this vicinity would indicate that sand and gravel is some 20 feet deep. This would make a great deal of material in this vicinity, but estimate was made on conservative depth.

Sand seems to get more coarse toward the south.

POTTER COUNTY

N-165

Sec. 12, T. 120 N., R. 75 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
111	2.42	23.4	95.1	82.7	43.6	7.5	2.3	7.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
20.5	7.5	72.0	2	3.5	2,700,000

This sample was taken from west side of terrace. This sample was of 3.5 feet of gravel overlying deposit as per sample 164.

If used for road surfacing purposes, a five foot face could be used, 3 feet gravel and 2 feet sand.

Too much dirt for concrete use.

Main part of terrace will have deeper cover, possibly 4 feet.

POTTER COUNTY

N-168

Sec. 12, T. 120 N., R. 77 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
108	2.52	31.2	97	90	37.8	11.9	5.9	6.89

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
14.3	8.6	77.1	1.5	15 to 20	45,000

Hanson's Pit

Deposit occurs high on top of edge of "breaks". Appears as ridge sticking up, from road. Material is streaky, a layer of gravel, a layer of silt, of sand, of gravel, etc.

Two or three small pit have been opened up but only about 150 yds. have been removed from the group.

POTTER COUNTY

N-169

Sec. 11, T. 118 N., R. 78 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.52	36	96.4	93.2	28.8	5.2	2.0	6.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover In Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.1	2.3	93.6	2	12 to 20	63,000

Schleeter Pit

Deposit occurs as a series of noses along little Cheyenne Creek with sand as samples 152, 153 and 154. These noses occur about 100 feet above stream.

The conspicuous terraces at 80 feet above stream are only shale. The high noses are the ones that contain the material.

SOUTH DAKOTA

GEOLOGICAL AND NATURAL HISTORY SURVEY

E. P. Rothrock, State Geologist

REPORT OF INVESTIGATIONS

No. 11

Part II

SAND AND GRAVEL DEPOSITS

IN

POTTER AND FAULK COUNTIES

Part I--Geology of the Area and the
Gravels of Potter County

Part II--Gravels of Faulk County

Geology by E. P. Rothrock

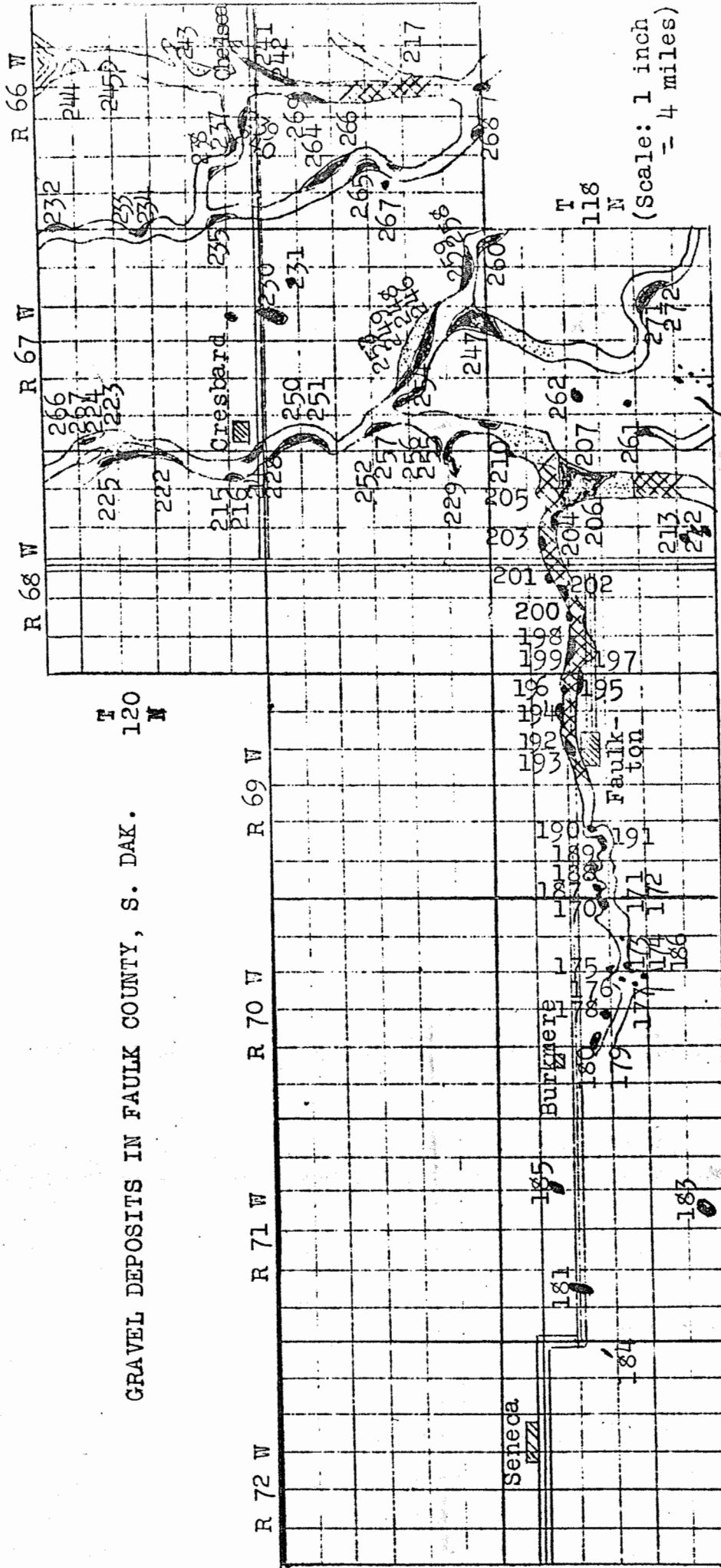
Gravel Tests by R. V. Newcomb

University of South Dakota
Vermillion, S. Dak.

March, 1932

GRAVEL DEPOSITS IN FAULK COUNTY, S. DAK.


T 120
M




(Scale: 1 inch = 4 miles)

LEGEND

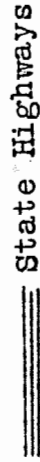
 Gravel Deposits

 Sand Deposits

 Sand Deposits Under Deep Cover



Glacial Drainage Channels



State Highways

192 Numbers refer to the descriptions in the text.

FAULK COUNTY

N-170

Sec. 13, T. 118 N., R. 70 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
118	2.53	25.3	95.5	87.7	51.2	12.4	5.2	8.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
19.8	10.2	70.0	2.5	6	35,000

Series of deposits appearing as bumps in badly washed second flood plain in S. E. Quarter of Section. About 2 to 2 $\frac{1}{2}$ feet of cover composed of dirty gravels; fine sand and silt. Then 6 feet of material as per sample.

Can be used for road surfacing material, but must be washed if used for concrete.

FAULK COUNTY

N-171

Sec. 23, T. 118 N., R. 70 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
125	2.54	21.4	77.4	60.8	44.5	8.6	3.7	5.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
14.3	7.1	78.6	1	5	2000

This deposit has been plastered up against the right bank. A small pit has been opened up in this deposit and about 150 loads removed. The deposit may extend east around the bend, but it is not probable.

May be used for concrete but silt content must be watched.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
100	2.49	35.4	99.2	94.2	69.3	12.8	3.3	3.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
17.3	8.7	74	1.5	5	3000

This deposit occurs high up on south bank slope. Highway department has put down test holes here so that extent of deposit was well determined. The material is mostly sand. Cover will vary from 1 to 2 feet, then $2\frac{1}{2}$ feet of sand mixed with fine gravels, then $2\frac{1}{2}$ feet of clean gray sand which can be used in either plaster or concrete.

The sample taken was average of entire face.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.46	27.2	84	75.3	65.6	6.8	4.0	5.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.8	2.9	92.3	1.5	7	5000

Sample was taken from what appears to be a small field of low kames and eskers in creek bottom in N. W. $\frac{1}{4}$, Section 23.

Material is stony and coarse for about 2 feet, then material as per sample.

Not good for road gravel as it is too clean and fine. Would be O. K. if coarser material and dirt were crushed in with fines, but size of deposit would not warrant this treatment.

FAULK COUNTY

N-174

Sec. 23, T. 118 N., R. 70 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.58	27.9	96.1	94.3	39.8	24.6	4.5	4.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
3.1	2.3	94.6	1	3.5	3000

This gravel occurs on north end of knoll upon which sets the white house near the center of Section 23. A small pit has been opened.

Can be used for concrete.

Gravel shoulder on north side of same material and occurs at the same height.

FAULK COUNTY

N-175

Sec. 22, T. 118 N., R. 70 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.56	25.6	76.4	68.3	52.2	20.7	10.4	6.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
18.2	12.8	69.0			13,500

By going about 150' west from N. E. corner of Section 22, an old small pit may be found. Material for vicinity was sampled here.

A rather dirty and coarse gravel, with 5 or 6% oversize. Gravels are oxidized and will pack well in road.

Probably of kame origin, parts of it being washed away. All of bumps in immediate vicinity contain gravel.

Cover on west side is light, while in middle and at east side the cover will vary from 2 to 4 feet.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.53	28.4	92.3	78.4	42.2	9.3	4.0	6.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
2.6	4.0	93.4	1.5	3	2800

Sample was taken from small terrace in stream up towards center of section. It was taken to show relationship of material with that of sample # 174.

The terraces here are about 12' above stream, they are small and of no great consequence.

If this material could be found in a large deposit, it would make an excellent road surfacing material.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
121	2.60	26.7	76.6	67.7	48.2	13.6	6.7	7.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.5	7.8	82.7	1	4	27,000

A fairly well defined terrace in N. E. corner of section. It lies about 25 feet above stream and is the second terrace.

About 2 feet of cover were found, then a foot of stone, then 4 feet of gravel as per sample. At this depth coarse stone was run up against making it impossible to dig deeper with the tools at hand. Deposit may be 8 feet thick. Estimate of deposit, however, was made for 4 feet thickness.

A good road gravel but dirty for concrete.

FAULK COUNTY

N-178

Sec. 22, T. 118 N., R. 70 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.52	29.5	93.9	88.7	55.2	8.6	4.0	6.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
16.3	11.6	72.1	$\frac{1}{2}$	12	72,000

This deposit is a high terrace of sand and gravel. Hole as opened showed $\frac{1}{2}$ ' of cover, 3 feet of gravel and 9 feet plus of sand as per sample. The gravel is well sized.

Toward the center of Section 21 a large cut bank on the south side of the stream shows up the lower terrace (15') as till. Some gravels are exposed but they are probably but small shoulders.

FAULK COUNTY

N-179

Sec. 17, T. 118 N., R. 70 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
106	2.54	33.3	94.5	89.1	79.0	5.4	1.5	4.0

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
19.4	18.5	62.1	3.5	8	42,000

This deposit is a terrace on the north side of the creek. There is a lot of material here. Sand can be used for concrete purposes.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
117	2.51	25.4	95.0	86.8	54.0	8.9	3.8	3.3

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.4	7.4	83.2	1	5	10,000

This deposit is a terrace near the south $\frac{1}{4}$ corner of Section 17. It sets up about 6 or 8 feet above the ground. There is one foot of cover, then 5 feet plus of gravel as per sample.

The material is a coarse sand with some gravels mixed in with it.

Can possibly be used for both road and concrete.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
109	2.50	30.1	86.2	77.7	52.2	10.0	4.6	5.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
23.4	8.2	68.4	1	6	4500

This is a small pocket occurring alongside and under road. Limit of this deposit was marked with small piles of rock at short intervals.

The best part of this deposit underlies the road. Only about 2000 yds. of this deposit could be used. Would make good maintenance deposit.

FAULK COUNTY

N-182

Sec. 34, T. 118 N., R. 71 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.66	30.1	80	70.4	31.0	4.7	1.8	3.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.3	7.3	84.4	1.5	3	12,000

This deposit in center of Section 34 is probably a pocket but may be part of a delta from the esker to the east. There is from 1 to 2 feet of cover, then 3 feet of gravels as per sample, then 12 feet plus of sand as per sample 183.

A pit has been opened on the face of this deposit, and about 1500 yards of material removed. Material was hauled for use in Seneca.

This deposit should be worked northward from the pit opened and the deposit extends in that direction.

FAULK COUNTY

N-183

Sec. 34, T. 118 N., R. 71 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
100	2.55	37.5	100	100				1.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2	12	48,000

This same deposit as sample 182 except this is sand portion of deposit. A clean sand.

FAULK COUNTY

N-184

Sec. 13, T. 118 N., R. 72 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
103	2.54	35.2	99.4	98.1	77.1	10.9	5.8	15.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
60.2	30.8	9.0	2	2	500

This is a small pocket of dirty sand on east edge of old lake; about 50 or 60 loads, have been removed from a pit here.

FAULK COUNTY

N-185

Sec. 11, T. 118 N., R. 71 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
124	2.61	23.9	80.6	60.3	42.0	11.8	5.0	5.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.2	3.2	92.6	1	3.5	1200

This is a small kame deposit and is exposed by railroad cut on north side of track at road crossing. Excellent material, but of small volume.

The small knob just 150 ft. north was tested but showed about 2 feet of dirty sands and gravel, then till.

Wt.	S. Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C.P. Silt
124	2.56	22.5	65.0	52.0	52.4	15.8	8.5	5.8

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
3.6	2.8	93.6	.5	2	6000

This deposit occurs as gravels plastered over old terrace at S. E. corner of Section 22. Good material. The gravel is only about 2' thick with 3% oversize. Highway department has put down a number of test pits over this area and probably abandoned the deposit because of the fact that the gravel vein was too thin.

There is a possibility that gravels occur again at a greater depth underneath till floor. Test was made through about 2 1/2 feet of this till floor.

Wt.	S. Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
114	2.50	26.9	97.5	87.6	36.9	8.0	3.9	3.1

Character of Material--1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.1	6.0	81.9	1 to 3	4	1600

This deposit is probably a kame. There is about 1 foot of cover, then 3' of dirty fine sands and stone mixed, then 3' plus of gravels as per sample. This is an excellent concrete material, clean, sharp and well graded.

Good for local use and will yield about 1600 yards.

There is a possibility that this may be part of the high terrace, that is found in the township to the west, in which case there would be a great deal of this material in the various high spots in the immediate vicinity.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.51	23.6	73.3	62.4	47.8	14.1	7.5	4.7

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
3.2	2.1	94.7	1.5	7	11,000

This is the terrace immediately northeast from the north end of bridge over creek. Would say that it was 180' in length and 6 to 8' in depth.

A small rise may be seen in this terrace, a short distance to the east. This is probably an old till terrace which permitted the formation of this deposit. There is a possibility that gravels might be found some 5 or 6' beneath this till terrace.

There is another terrace of about same size just east of till knob which should contain material same as sample. This terrace is about 20 feet above stream bed.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
117	2.49	25.0	91.2	84.3	49.7	7.2	2.0	2.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
20.3	13.0	66.7	2.5	8	29,000

Deposit from which sample was taken is a well formed terrace about 25 feet above stream. Two pits have been opened in this deposit, one at west edge and one at Southeast corner. Sample was taken from west pit.

A very good material--about 18,000 yds. still left in the deposit.

Terrace deposits of same material along east edge of section will total about 11,000 yds.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
115	2.55	27.6	92.8	80.4	19.9	6.2	3.6	3.3

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.6	3.1	92.3	1.5	6	27,000

Terrace is 30' above stream occurring in southwest corner of Section 17. Test pits have been dug toward east end of productive terrace. This deposit continues on east of test pits but runs a very heavy cover. The big yardage of this deposit will be found west from the test pits on higher position of terrace.

Excellent material with about 1% oversize. A good pit to work, but should be worked west of test holes.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
125	2.54	15.1	77.5	70.5	55.7	17.4	8.2	6.2

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.0	8.7	81.3	2	6	22,000

A terrace deposit. Material differs from 189 to 190, being a sand with some few stones in it. Test hole was put down in west edge of terrace N.W.¼, S.E.¼. Showed 1' cover, 1' gravel, 3" silt, then 5' plus of sand as per sample.

The deeper down the test hole went, the cleaner and better quality the sand.

West edge of terrace should contain thickest vein of material.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
126	2.60	22.2	80.3	71.8	49.6	7.1	2.2	2.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.2	7.1	85.7	1.5	9	16,000

PLANT'S PIT

There is a pit opened in this deposit just east of the entrance to the park. Streaks of coarse gravel occur in this deposit making a possible oversize of about 2%.

It is believed that the deposit will extend at least 100 yards west and about 40 yards south.

Because of layout of Park, only about 1/3 of this deposit can be used.

About 400 yards of material have been removed from this pit for use in Faulkton.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
82.5	2.04	35.3	100	100	77.4	36.7	19.2	23.3

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			4	5	60,000

Molding Sand---PLANT'S PARK

This sample was taken from the terrace upon which Plant's race track is built.

Test hole was put down to depth of 9'--at bottom of hole the sand became dirty and mixed with clay. Mr. Plant said that there was gravel 10 to 12' down.

All of this material has a thick cover, making its recovery rather expensive.

Wt.	S.Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.50	27.5	91.3	83.0	48.7	6.5	2.5	2.3

Character of Material--¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.8	8.5	80.7	1 to 4	2 to 5	10,000

A terrace about 20 feet above creek at southeast corner of section. Gravels in this deposit are very patchy with numerous till plugs.

A pit has been opened in this deposit and about 1500 yards removed.

Pockets of good material can be picked out and used for any kind of work.

The small terrace just across the creek to the south contains the same kind of material.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.39	24.8	86.5	78.6	51.9	11.3	7.2	5.8

Character of Material--¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.4	5.0	83.6	.5	4	1500

This deposit is a small terrace about 500' northwest of red barn set down in stream bottom. Gravels show on top.

Other terraces to south and west have only a foot or two of gravel.

Gravel is a dirty brown and probably only good for road maintenance.

FAULK COUNTY

N-196

Sec. 13, T. 118 N., R. 69 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.33	24.6	89.5	81.7	49.5	9.4	3.4	2.7

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.5	7.8	81.7	1	8	70,000

A large terrace deposit, the southeast corner of which is exposed by a pit. There is about 1' of cover, 4' of gravel, 4' of sand, then clay. Top of terrace occurs about 12 feet above stream.

There is also a bump to the northeast of pit which was tested by the highway department. It is the same terrace as sample 195. (Just a light vein of gravels plastered on top of till terrace.)

Sample 196 is average of entire 8' of vein of both sand and gravel.

To the east in the middle of field, ~~are~~ remains of 12' terrace, containing 9000 yds of same material as 196.

FAULK COUNTY

N-197

Sec. 18, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.62	28.8	95.1	88.1	48.8	3.6	1.2	1.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.4	6.2	87.4	9	8	Valley Train

VALLEY SAND--JAMES LANCASTER PLACE

This sand was taken from valley train which probably underlies entire lower terrace. Log of test hole was--2' silt, 3' sandy silt, 2' silt, 2' sandy silt, 2' of sand as per sample to water level, then 6' more of sand as per sample underneath water.

This sand is an excellent material being clean and sharp. Think cover is greatest difficulty. The valley train can be used, however, by looking along creek bank where cover might not be so thick.

See gravel map for valley limits.

FAULK COUNTY

N-198

Sec. 18, T. 118 N., R. 68 W!

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.48	29	93.8	82.9	23.2	5.6	2.5	4.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.0	5.5	83.5	3		26,000

LANCASTER GRAVEL PIT

This sample was taken from the pit as opened by Mr. Lancaster. About 2000 yds. have been removed.

The good part of this terrace is about 300 feet to the east of the pit as opened. This is the terrace about 12' to 15' above the stream.

Material is clean but some chunks of red oxide appear throughout.

FAULK COUNTY

N-199

Sec. 18, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.51	24.0	88.1	78.5	44.8	9.9	3.6	2.7

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.1	5.5	82.4	1 to 3		13,000

LANCASTER'S EAST PIT

This is another deposit of the 12 to 15' above stream terrace. A small pit has been opened here, and some 700 yds. removed. The cover here varies from 1 to 3 feet due to the wash from the hills.

The deposit is rather patchy--large veins of till occur unexpectedly also the floor varies--tipping this way and that.

FAULK COUNTY

N-200

Sec. 27, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
98	2.50	37.2	100	100	87.8	18.4	7.8	8.3

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			4		Valley Train

VALLEY SAND

This sample was taken from the valley train where valley is very narrow. Test hole revealed 4' silty loam, 5' dirty brown sand as per sample, then clay muck.

It was found, however, in N. W. $\frac{1}{4}$, S. E. $\frac{1}{4}$, Section 18, under 7' of cover.

FAULK COUNTY

N-201

Sec. 16, T. 118 N., R. 68 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.46	22.1	81.3	72.4	50	11.2	3.7	2.6

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
13.5	3.4	81.1	2. to 4	6	9,000

This deposit is a bar deposit. Patchy sand, till and gravel. Cover will vary from 2 to 4 feet and deposit itself is about 6 feet in depth.

A pit has been opened along its face from which about 300 loads have been taken.

The top of the bar is about 3 feet above valley floor. Access is rather difficult.

Wt.	S.Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
87.5	2.47	42.7	100	98.3	83.9	30.5	13.3	10.2

Character of Material--¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2	4	Valley train

Molding Sand--Valley Train.

This is a continuation of valley train. Found 2 feet of cover, then 4 feet of material as per sample, then 3 feet sandy clay and muck, then white sand as per sample 197.

Test hole made in southwest corner of Section 10.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
115	2.52	26.7	95.2	88.1	54.1	7.9	3.4	3.5

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
13.3	4.9	81.8	1	8	19,000

This deposit is on the terrace occurring 25' above stream and near the northeast corner of S.W.¼ of S.W.¼, Sec. 10. A small pit has been opened and perhaps 100 loads removed.

Material is an excellent coarse clean sand with some fine gravels mixed in. Highway Superintendent looked at pit and said it was too patchy for use. It is very probable that this fact is true. But would say that it was a very usable deposit, nevertheless.

This pit should be tested out thoroughly with idea of using it when Road #45 is graveled.

Access is good.

FAULK COUNTY

N-204

Sec. 11, T. 118 N., R. 68 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
115	2.56	28.1	83.9	77.1	77.0	14.8	5.9	4.7

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.3	4.0	83.7	3	6	28,000

This is beginning of large outwash terraces. At this point there is about 3 feet of cover, then 6 feet of material as per sample. It is a fine sand with pebbles mixed in. Would not do well for road gravel because of fine sand.

Top of terrace is 10 to 12 feet above stream. There is another terrace of same sort $\frac{1}{2}$ mile east and against north bank.

FAULK COUNTY

N-205

Sec. 11, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C.	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
99.5	2.33	31.0	97.9	92.9	51.3	6.8	2.3	6.0

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
23.1	6.2	70.7	4	5	1000

This sample was taken from the biggest bump about 800 feet south and west from the farm house in the northeast corner of section 11.

Material is dirty and not well graded.

FAULK COUNTY

N-206

Sec. 11, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
125	2.56	21.8	82	72.8	49.9	9.5	2.3	2.9

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.2	3.6	88.2	1.5	8	Large Terrace

This sample was taken from the large pit opened by the highway department in graveling the Faulkton road. Sample was taken from north face toward east end of pit which material seemed to be the most representative.

Would estimate oversize to be about 1 1/2%.

About 25,000 yds. have been removed. This deposit occurs in the large terrace.

FAULK COUNTY

N-207

Sec. 11, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
113	2.55	28.9	95.1	90.7	66.9	12.9	3.9	2.7

Character of Material--1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
4.8	2.6	92.6	1 to 3	8	Large Terrace

This sample was taken from the east pit occurring alongside the road.

About 8000 yds. have been removed.

This deposit seems to run mostly sand with occasional shallow streaks of gravel.

FAULK COUNTY

N-208

Sec. 12, T. 118 N., R. 68 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
83	2.28	41.5	100	100	84.7	73.1	30.9	18.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			1	7	Valley Train

Molding Sand from Valley Train.

Taken from test hole in valley terrace on north side of stream near $W\frac{1}{4}$ of Section 12.

Log of hole was 1 foot cover, 7' molding sand as per sample 208, then 3' of white sand as per sample 209, then water.

FAULK COUNTY

N-209

Sec. 12, T. 118 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105	2.46	31.7	93.8	89	53.5	12.6	3.0	3.8

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
21.7	17.5	60.8	8	3	Valley Train

Clean White Sand--Valley Train

Taken from test hole in valley terrace on north side of stream near $W\frac{1}{4}$ of Section 12.

Log of hole was 1 foot of cover, 7 feet of molding sand, then 3 feet of white sand to water as per sample.

FAULK COUNTY

N-210

Sec.1,T.118 N.,R.68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
97.5	2.54	38.3	100	100	93.2	34.0	9.5	4.1

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			4	7	Valley Train

Plastering Sand

This sand sample was taken from the Valley Terrace near where small drainage leads from slough. There is 2' of cover, 2' of molding sand, then 6' plus of sand as per sample.

It is clean and good for plaster sand.

About 2000 feet north where small drainage crosses road there are some coarse sands and fine gravels plastered along face of south bank. The cover is light, $1\frac{1}{2}$ feet and would say about 10,000 cu. yds. could be obtained here.

FAULK COUNTY

N-211

Sec.14,T.118 N., R.68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
110	2.53	30.3	92.9	89.3	68.8	13.8	4.0	2.2

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
14.2	7.0	78.8	1.5	6	Valley train

This sand sample is from the big wash.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
112	2.49	27.7	90.8	78.0	43.4	10.0	4.4	2.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.1	5.0	86.9	1.5	10	1500

The sample is from a kame deposit from which kame about 300 yards of material have been removed.

Material is patchy, on south side is a bed of pebbles and boulders, on north side is sand in center and on west side is material as per sample.

To the west a short distance are two small kames which will contain a few hundred yards each.

To the north, along the road, another small kame has been tapped. Material is a dirty sand and probably 500 yds. left.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
103	2.38	30.1	100	100	80.0	45.3	23.2	10.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
				8	16,000

Molding sand.

This sample was taken from the esker lying in northeast corner of section.

There are small pockets of gravel occurring but not in large quantities.

The best kames in this area seem to be the ones lying low in the bottom.

If gravel is needed in this vicinity, try the low lying kames.

FAULK COUNTY

N-214

Sec. 36, T. 120 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.52	23.6	78.5	64.0	44.0	12.7	7.0	4.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.8	3.8	86.4	1.5	6	88,000

This gravel sample was taken from a small pit opened on face of terrace, about $\frac{1}{4}$ mile north from the road. Terrace is well defined at about 12 feet above stream. The valley floor is about 6 feet above stream.

Material good for both roads and concrete.

The material seems to resemble sample 206, which would indicate that the samples 206 and 214 are from same source.

FAULK COUNTY

N-215

Sec. 36, T. 120 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
128	2.54	19.5	75.2	66.2	63.7	14.9	5.0	3.1

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.2	9.4	78.4	1.5	3.5	150,000

Gravel.

Drainage coming in from northwest at this point has evidently caused valley here to be filled with sand and gravel deposit.

Cover varies from 1 to 3 feet, then $3\frac{1}{2}$ feet of gravels as per sample, then 2 feet of good plaster sand as per sample 216.

FAULK COUNTY

N-216

Sec. 36, T.120 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
104	2.53	34.1	100	100	87	33.8	9.5	4.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			1.5 Silt 3.5 Gravel	2	95,000

Plaster Sand

Cover varies from 1 to 3 feet, then $3\frac{1}{2}$ feet of gravel as sample 215, then 2 feet of good plaster sand as per sample.

There are some veins of silt in this plaster sand which would make selection necessary.

FAULK COUNTY

N-217

Sec. 27, T.119 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
94	2.56	41.2	100	100	100	41.1	7.6	2.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2	8	Not determined

Fills Perry Creek valley for a length of approximately three miles.

FAULK COUNTY

N-218

Sec. 34, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
	2.49		95.8	92.2	55.2	10.1	3.8	5.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
13.8	12.4	73.8	2	4	Not determined

On a little rise in the shallow channel heading from big creek valley channel, swamp to west and east of it. 0.4 mile east of South west corner of Sec. 33, on north side of road.
 2' medium gravels averaging $\frac{1}{4}$ to $\frac{1}{2}$ " , considerable fines mixed with it; 1 to 5 % oversize. 2' coarse sand with some pebbles.
 Too dry for auger and too deep for shovel.

FAULK COUNTY

#N-219

Sec.35,T.119 N.,R.67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
101	2.43	33.5	97.7	90.6	57.9	7.4	4.0	3.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
13.8	3.8	82.4	$\frac{1}{2}$		

Sample taken from same deposit as Sample No. 247.

FAULK COUNTY, Sec. 18, T. 118 N., R. 70 W.

A small pocket of gravel occurs on top of hill at Grimm's Ranch about 1350 feet south of North Quarter Corner of Section 18. This deposit was exposed when erecting a new windmill, also digging cellar for the house. It is under 4 feet of cover and lays under farm buildings. Test holes were dug around this deposit which gave evidence that the deposit was only local in extent. Volume: 2000 cu. yds; Cover: 4 ft.; Depth of Deposit: 4 ft.

FAULK COUNTY, Sec. 34, T. 118 N., R. 71 W.

A kame deposit occurring in N.E. $\frac{1}{4}$ of N.E. $\frac{1}{4}$ of Section 34 about one-fourth mile from farm house.

Material is dirty. Could be used perhaps as maintenance gravel.

Volume: 340 cubic yards.

FAULK COUNTY, Sec. 24, T. 120 N., R. 67 W.

A small pit has been opened in kame occurring at S. W. Corner of Section 24. This deposit has been pretty well worked out, possibly 200 loads remain around on edges.

Material is typical kame material, dirty and patchy.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.49	30.9	96.7	93.2	55.2	12.2	4.1	3.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.O.S.	P.C.M.	P.C.H.			
14.3	5.7	80.0	2.5	6	

There are 3 terraces in this region: (1) highest is floor of channel heading south; (2) next is about 10' below the highest and 5' above the lowest; and (3) is 4' to 5' above stream.

Six feet of sand and gravel, fine at top becoming coarser with depth, like a coarse sand. Bottom not reached, probably 10' to 15' fill at a minimum.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105	2.49	32.2	93.7	88.2	47.9	4.2	1.7	2.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
15.4	3.2	81.4		10	

Pit opened in bluff of terrace and worked locally. This is part of a big outwash.

Gravels on top medium to fine, with very little oversize, probably less than 1%. This top shelf should make good road gravel. Lower down there seems to be coarse sand. The pit is evidently near the bottom of the deposit and the floor has holes filled with sand. The total depth of gravels back on the terrace should be about 10 ft.

FAULK COUNTY

N-222

Sec. 24, T. 120 N., R. 68 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
118	2.54	25.7	82.6	68.6	43.0	15.8	9.3	7.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.3	5.0	85.7	1 to 2	7	82,000

Terrace 20 ft. above stream. Material is a dirty gravel and best use is for road surfacing purposes. Occurs on west side of stream.

FAULK COUNTY

N-223

Sec. 18, T. 120 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
107	2.53	32.2	100	96.7	72.5	9.0	2.4	2.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.2	3.6	88.2	2		140,000

This is a large terrace deposit of sand. Cover will vary from 2 to 3 feet, then 2 ft. of gravel, then 5 ft. of medium sand.

A pit has been opened in this deposit and about 1500 yds. removed.

The farther north on this deposit, the better the quality of sand and the deeper the deposit.

The low terraces will contain material as 223, the higher terraces will contain material as 224.

FAULK COUNTY

N-224

Sec. 18, T. 120 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.49	25.1	97.5	92.8	49.9	12.7	3.6	2.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.1	2.3	92.6	1.5	16	1,500,000

This sample was taken near the farm house in N.W. $\frac{1}{4}$, Sec. 18. There is about 1.5 feet of cover, then 2 feet dirty fine gravel, then 16 feet of sand as per sample.

This sand is sharp and clean.

There is a high spot in this terrace some 15' to 20' above the rest of terrace. This is the till bank that probably caused formation of this deposit.

FAULK COUNTY

N-225

Sec. 18, T. 120 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.54	25.1	95.4	93.8	53.1	13.6	1.9	4.3

Character of Material -- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.2	6.3	86.5	1.5	4	200,000

This deposit is a wash on the west side of hill. The gravel is fine and just fairly clean. It can be found all along the little drainage area following the road. The higher part to the east is sand as per sample # 224.

FAULK COUNTY

N-226

Sec. 7, T. 120 N., R. 67 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
120	2.54	24.0	89.8	75.2	49.6	14.2	6.5	3.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.2	6.3	83.5	0.5	6	300,000

This deposit is a large terrace occurring on east side of creek. There is but little cover, $\frac{1}{2}$ ', then 6' of gravel as per sample 226, then 6' of sand as per sample 227.

This is a large terrace and one that would work up well for a road surfacing job. As an entrance to this deposit, could open up trail from N $\frac{1}{4}$ corner, Section 7.

Material would make excellent road surfacing, also for concrete.

FAULK COUNTY

N-227

Sec. 7, T. 120 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
98	2.50	34.9	100	100	90.4	65.1	21.0	6.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			$\frac{1}{2}$	6	250,000

MOLDING SAND

This deposit underlies sample 226 in large terrace on east side of creek. $\frac{1}{2}$ ' of cover, then 6' of gravel as per sample 226, then 6' plus of sand as per sample 227.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
115	2.49	25.8	94.4	84.7	35.1	7.7	3.3	3.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.2	5.1	83.7	1.5	8	24,000

This terrace is 12 to 15 ft. above stream level.

A large pit has been opened in this terrace and about 6000 yds. removed. There is 1.5 ft. of cover, then 8 ft. of uniform material as per sample.

This material is being used at Cresbard for concrete and other purposes.

Access is good and would make an easy pit to work.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
100	2.48	35.5	100	100	93.8	19.8	4.3	1.9

Character of Material--- $\frac{1}{4}$ inch			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2	6	4,000

This deposit is a shoulder on south bank of drainage. A pit has been opened here and 200 yds. material removed. There is 2' of cover, then 3' of gravels, then 5' plus of sand as per sample.

This same material follows east along south bank across road and to a point north of the farm buildings. Material good for plaster sand. The gravel on top of this sand would make very good material for road surfacing and perhaps concrete.

FAULK COUNTY

N-230

Sec. 3, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
123	2.61	24.5	84.8	74.4	50.1	11.2	5.2	3.0

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.3.	3.3	90.4	1	9	9000

This is an esker deposit and occurs right at road. A small pit has been opened in the north end and 500 yds. removed.

The face of this pit stands vertical which might indicate good packing qualities for road surfacing material. Should perhaps be well selected for cleanliness if used for concrete purposes.

Access is excellent--should be used when road is graveled.

Esker appears as two bumps, each of which are about 200' long and 100' wide.

FAULK COUNTY

N-231

Sec. 2, T.119 N.,R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.54	24.0	94.4	84.1	49.4	14.3	6.4	5.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.3	4.1	88.6	1.5	9	1500

This is a small kame deposit lying just north of the grove. It is not a prominent bump and would not have been noticed except for a pit that has been opened on the north side.

Material is a coarse dirty sand with a few pebbles in it.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
103	2.38	30.3	100	100	52.8	10.4	4.3	4.0

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			$\frac{1}{2}$	5	8000

This is a small terrace deposit occurring on east side about 12' above stream.

Toward the bottom of the test hole the sand became much cleaner and if the terrace were opened up--no doubt usable deposits of concrete sand would be encountered.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
108	2.49	30.3	93.1	88.3	35.7	6.9	3.0	3.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
21.7	12.4	65.9	1	8	16,000

There is a well defined terrace of gravel with a pit at the north end. About 1200 yds. removed.

Terrace occurs 20' to 25' above stream, is 400' long and 120' wide.

Material is good for road surfacing. Soft material in particles over $\frac{1}{4}$ " in size, would have to be carefully checked if used for concrete materials.

Access is good.

The lower terrace a little farther to the south might also be prospected for sand if more sand is desired in this vicinity.

FAULK COUNTY

N-234

Sec. 18, T. 120 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
108	2.41	28.0	74.6	65.1	44.8	8.0	4.6	4.0

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
18.8	5.6	75.6	1	8	14,000

This is a continuation of series of terraces occurring 20' above stream bed. There is 1' of cover, then 3' of coarse pebbles and stone, then 3' plus of coarse sand to gravel. In this 6 feet oversize would probably run to 5%.

The deposit should be about 8' deep with the better gravels below the top 4' vein.

Access is good.

Good road surfacing material. If used for concrete watch soft percentage of material.

FAULK COUNTY

N*235

Sec. 30, T. 120 N., R. 66 W. ✓

Wt.	S. Gr.	P.C.V.	P.C.P. 1/2 in. Mesh	P.C. Sand	Material Passing 1/4 in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
117	2.51	25.4	82.1	67.4	19.0	4.3	2.2	2.3

Character of Material---1/4 in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12.2	4.7	83.1	1.5	6	30,000

Terrace occurs about 12' above stream bed. About 1/3 of this deposit is covered by farm buildings.

Access is good and pit could be easily worked.

The top 4' is very dirty--the lower vein is clean and by selection could be used for concrete purposes. Entire face would make a good road surfacing gravel.

FAULK COUNTY

N-236

Sec. 25, T. 120 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
121	2.59	21.9	88.8	78.4	38.7	20.4	13.6	9.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C. .	P.C.H.			
6.3	2.8	90.9	1	3	11,000

This is a shallow terrace that has been plastered back in the entrance of a small drainage.

Deposit is rather shallow for economical usage but would make good road surfacing material.

FAULK COUNTY

N-237

Sec. 33, T. 120 N., R. 66 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
114	2.50	26.9	84.2	70.4	25.6	4.8	2.0	2.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.7	3.1	91.2	$1\frac{1}{2}$	6	70,000

A large terrace deposit occurring about 10' above stream. A pit has been opened alongside the road just north of bridge and about 700 yards removed.

Access to pit is ideal.

Good for concrete use or road surfacing.

FAULK COUNTY

N-238

Sec. 29, T. 120 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
100	2.24	28.6	96.8	91.6	43.4	8.9	4.0	4.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
20.1	6.2	73.7	2	8	30,000

This is a high terrace 25' above stream on west side. Good for road surfacing purposes.

There is also a terrace below high terrace about 10' above stream which has same material, but more dirty. There is 3' of cover on this lower terrace.

FAULK COUNTY

N-239

Sec. 33, T. 120 N., R. 66 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.57	29.3	83.3	71.2	32.4	10.6	6.5	5.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.9	3.4	89.7	1.5	8	65,000

This is a large terrace occurring about 12' above stream. It is 900 ft. long and 300 ft. wide. Has 1 ft. cover on front edge and 2 ft. cover on back.

Materials from test hole on face were rather dirty but would suggest that materials farther back in deposit would be much cleaner. An excellent road material. Can be used for concrete. Access is fair--about 3% oversize.

FAULK COUNTY

N-240

Sec. 33, T. 120 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
105	2.37	29.0	97.3	90.2	52.2	9.6	4.4	3.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
15.5	3.2	81.3	1.5	6	50,000

Terrace occurs about 10' to 12' above stream. Material seems to be much different from sample # 239. Test hole showed 1.5 feet of cover, 2 feet of dirty fine gravels, then 4 feet plus of material as per sample.

At depth of 5 feet the sand became brown and clean and could be used in concrete.

Too fine for good road surfacing gravel.

FAULK COUNTY

N-241

Sec. 2, T. 119 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
114	2.47	25.5	91.0	84.6	47.8	8.5	4.0	3.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.1	5.0	83.9	2.5		120,000

This is a large terrace crossing highway about 1 mile west of Chelsea. Terrace is 2800' long and 400' wide. Test hole was made toward north end and about half way back on terrace. Cover here was 2 $\frac{1}{2}$ ', then 5' material as per sample 241, then 4' plus of material as per sample 242.

Water was struck at 12' from top of terrace.

A pit has been opened on west face of terrace which showed very coarse material.

FAULK COUNTY

N-242

Sec. 2, T. 119 N., R. 66 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
99.5	2.41	33.6	100	99.6	86.4	13.1	3.5	2.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			2.5	5	150,000

Large terrace crossing highway 1 mile west of Chelsea.
 Sand underlies $2\frac{1}{2}$ feet of cover, 5 feet of gravel as per sample
 241, then 5 feet of sand as per sample 242.
 Sand is clean, but has some indications of containing shale.

FAULK COUNTY

N-243

Sec. 26, T. 120 N., R.66 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P. C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.47	26.6	88.7	81.9	47.1	4.3	1.6	2.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.1	2.5	92.4	4	6	125,000

A large terrace about 12' above stream. Road cut through this
 terrace shows 4' of cover. Test hole was dry some 1000 ft. to the
 south and 4 feet of cover found here.

Material is coarse sand and fine gravels. O. K. for concrete.
 A very valuable deposit if it were not for the 4' cover.

FAULK COUNTY

N-244

Sec. 2, T.120 N., R.66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
113	2.59	29.8	97.9	93.5	54.3	3.2	1.3	1.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
12	2.1	85.9	$\frac{1}{2}$	6	60,000

This is probably a beach deposit.

A test hole was put down on north side of road about 300 ft. east of bridge. There was practically no cover, then 3 ft. dirty gravels, then 6 ft. of clean coarse sand as per sample, then water and muck.

The ditch that has been cut through from bridge to lake shows same material.

This is excellent material and good for any use.

FAULK COUNTY

N-245

Sec. 11, T. 120 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
99	2.46	35.2	100	100	93.2	53.9	19.4	6.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
				5' plus	

Molding Sand

FAULK COUNTY

N-246

Sec. 27, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C.	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
116	2.50	25.6	94.5	90.9	62.2	18.1	5.7	4.3

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
17.6	4.2	78.2	8	5	

Nixon Creek Fill

From cut bank at northwest corner of bridge. 8' silt, over 5' sands, some clay streaks. Seems coarse and pebbly in streaks, especially at bottom.

FAULK COUNTY

N-247

Sec. 34, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
113	2.49	27.1	92.1	86.6	64.2	9.9	3.0	3.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.1	7.6	83.3	2	6	Not determined

Sample taken from deposit which is located on the same flat as the deserted house to the south. Slight drop to west and east, making a flat ridge between.

Log of hole: 2' black sandy soil; 2' medium gravel with considerable sand; 2' medium brown sand with pebbles; 1' gravel; 1' fine white (plaster) sand. (Bottom not reached). 10' approximate minimum depth.

FAULK COUNTY

N-248

Sec. 27, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.53	26.6	95.7	86.8	48.5	10.1	5.1	2.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.8	3.2	90.0	1.5	4	

Nixon Valley Fill (Terrace B)

Fine gravel and sand, fairly well mixed. A few boulders in it, but they probably make very small per cent of volume. Average material is like the sample.

Appears to be good material for road work, although it runs a little fine. As a sand for blocks, it is probably good.

FAULK COUNTY

N-249

Sec. 28, T. 119 N., R. 67 W.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
113	2.44	25.6	91.3	83.8	39.6	6.3	2.7	2.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
11.4	5.9	82.7	1.5	6	

Nixon Valley Fill (Terrace C)

Log of Hole: $1\frac{1}{2}$ ' soil; 1' gravel with dirt; 5' coarse sand with pebbles. Oversize pebbles about 1%.

Looks fair for use on road, but adheres as though clayey.

FAULK COUNTY

N-250

Sec. 7, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
115	2.46	25.3	96.2	89.5	63.5	19.3	7.3	3.8

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.4	4.1	85.5	2	8	

The terrace here is a slope rather than a flat, probably due to wash from hill.

Log: 2 ft. Soil cover; 1 ft. pea gravel; 1 ft. sand, medium fine brown; 2 ft. coarse sand or fine gravel. Bottom not reached, because of many big pebbles. Cover will probably increase toward the back of terrace but should not exceed 4 to 5 ft. Total depth probably about 8 ft.

FAULK COUNTY

N-251

Sec. 6, T. 119 N., R. 67 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
125	2.62	23.3	92.1	79.1	47.1	11.5	3.7	

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.2	5.2	85.6	1	5	10,000

Low terrace on west side of valley. Old pit located there.

Log: 1 ft. Soil cover; 5 ft. fine gravel and sand, fairly uniform, though a little coarser in the bottom. Maximum pebbles 2", no oversize. Sand runs 60 to 70%.

FAULK COUNTY

N-252

Sec. 19, T.119 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
120	2.51	23.6	79.4	67.8	35.8	12.2	6.8	3.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.5	9.0	81.5		10	42,000

Terrace on west side of valley, 12 to 15 ft. above stream channel.

Log: 6 ft. medium gravels, largest pebbles 2" and average $\frac{1}{2}$ to $\frac{3}{4}$ "; 1 ft. coarse gravel made almost entirely of cobbles; 3 ft. medium to coarse gravels, pebbles up to 3" but averaging $\frac{3}{4}$ ".
Appears to be usable for roads.

FAULK COUNTY

N-253

Sec. 20, T.119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
118	2.60	27.2	77.8	69.3	36.2	9.9	5.6	2.4

Character of Material--- $\frac{1}{4}$ In.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.2	6.8	85.0	3.5		130,000

This terrace contains coarse gravels like those on ridge half a mile to the north. The sample was taken about the middle of the terrace from a trench dug down the face.

In general it is a medium gravel, but is conspicuous for the amount of oversize.

This should make a usable material if screened. Much better than the dirty fine stuff of most of the terraces.

FAULK COUNTY

N-254

Sec. 29, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in.	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
106	2.53	32.9	100	97.6	80.6	13.5	4.9	3.6

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.4	3.6	88.0	1.5	5.5	

Sample taken from flat alongside of Nixon Valley. Sand in the road and in a house cellar gave clue to deposit. Test hole about half way between depression about 300 ft. south of house, and the bluffs of the valley.

Log: $1\frac{1}{2}$ ft. sandy till, $5\frac{1}{2}$ ft. fine sand with scattered pebbles. Hole stopped by breaking of auger on a layer of pebbles.

FAULK COUNTY

N-255

Sec. 31, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
119	2.52	24.2	93.3	84.7	32.6	11.4	5.0	4.0

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.8	5.0	86.2		6	4356

Sample taken from small terrace 10 ft. above stream channel along north side of stream emptying into Nixon River. Hole located 0.3 mi. east of Northwest Corner of Section 31 on south side of road in roadway.

Material a very uniform gravel with small proportion of pebbles up to $1\frac{1}{2}$ " to 2".

Good material for road stuff but deposit is not large.

Wt.	S.Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
113	2.45	26.1	90.8	84.9	57.1	11.5	4.4	3.1

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.1	3.8	86.1	1.5	8	

Sample taken from terrace on west bank of stream, about 0.7 mi. east of Northwest Corner of Section 30.

Log: 1½ ft. Cover of soil; 3½ ft. very fine gravels (coarse sand); 1 ft. fine clean white sand; 2 ft. fine clean grey sand. Bottom not reached, probably 8 or 10 ft. of gravel.

Wt.	S. Gr.	P.C.V.	P.C.P. ½ in. Mesh	P.C. Sand	Material Passing ¼ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
109	2.42	27.8	93.9	89.9	46.0	8.3	3.5	3.0

Character of Material---¼ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.1	5.6	85.3	1.5	6	1,200,000

This is the north end of the big sand terrace on west side of valley.

Section: 1½ ft. soil cover; 8" real coarse gravel (3" to 4" cobbles); 2 ft. dirty sand with about 1% of 2" to 3" pebbles; 4 ft. medium sand with pebbles 1" to 2". Sand fairly clean.

Bottom of sand not reached.

Rather fine for road gravel, but such material has been used. Might be used as a concrete or a filter sand.

FAULK COUNTY

#N-258

Sec. 36, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.60	28.4	89.6	78.1	36.8	9.4	4.6	2.2

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.5	2.8	90.7	3	4	

The valley here presents no terraces, but is a solid flat broken by stream channel. Sample taken in stream cut.

Section: $2\frac{1}{2}$ ft. to 3 ft. soil cover; 1 ft. coarse gravel, pebbles 1" to 2"; $\frac{3}{4}$ ft. medium gravel and sand.

FAULK COUNTY

N-259

Sec. 35, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
124	2.61	23.9	86.2	75.2	47.4	15.8	7.3	3.7

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.8	6.5	86.7	4	5	

Sample taken 150 ft. north of center of section, and 15 ft. west of quarter line.

Section: 2 ft. silty soil; 2 ft. light grey silt; 2 ft. gravels. Material dry at bottom of hole, therefore gravels must be deep. Can figure on 5 ft, with possibilities of 6 ft. to 10 ft.

Top gravels are none too clean, being medium with pebbles 1" to 2" averaging about $\frac{1}{2}$ ". Lower gravels are probably finer.

FAULK COUNTY

N-260

Sec. 36, T. 119 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
120	2.62	26.4	96.6	88.2	44.0	8.7	3.7	3.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.9	6.1	88.0	4	6	1,200,000

Sample taken on valley train 0.2 mile north of South $\frac{1}{4}$ corner. Section: 4 ft. silt; 4 ft. medium gravels with considerable sand much like that taken further west.

Volume of terrace in Sec. 35 and 36 is a minimum of 1,200,000 cubic yards, with a probable 2,000,000 cubic yards.

FAULK COUNTY

N-261

Sec. 19, T. 118 N., R. 67 W. ✓

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.47	24.2	90.7	80.1	46.4	10.0	5.1	4.4

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
5.5	3.1	91.4	0--3	4	10,000

Terrace on west side of small valley, just east of South $\frac{1}{4}$ corner of Section. Terrace also runs across the road to the south about 100 ft. into Section 30. Sample was taken 400 ft. east of $\frac{1}{4}$ corner.

Medium gravels with very little oversize and 50 to 60% sand. The top half is rather dirty, but the lower half is fairly clean. Material usable for road purposes.

FAULK COUNTY

N-262

Sec. 17, T. 119 N., R. 67 W. ✓

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
114	2.46	26.0	80.2	66.0	44.2	12.6	5.6	4.3

Character of Material--- $\frac{1}{2}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P. C.S.	P.C.M.	P.C.H.			
17.4	7.6	75.0			12,000

Two kames, rather elongated, stand sharply above the plains around them. East kame, from which sample was taken, has medium gravels with some dirt. Good for road material. West kame contains fine sand; not good for roads.

FAULK COUNTY

N-263

Sec. 6, T. 119 N., R. 66 ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
118	2.52	24.8	85.3	75.8	29.6	7.5	3.0	3.4

Character of Material---- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P. C.S.	P.C.M.	P.C.H.			
5.6	2.8	91.6	1	16	76,000

A large terrace of excellent road surfacing material. But very little oversize. $\frac{1}{2}$ ft. cover, 3 ft. medium coarse gravel, 9 ft. medium fine gravels, 4 ft. sand.

Access good--about $\frac{1}{2}$ mile to highway if entered along quarter line.

A small pit has been opened in about center of deposit.

All right for concrete purposes.

FAULK COUNTY

N-264

Sec. 7, T. 119 N., R. 66 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
110	2.42	27.1	88.3	75.3	30.0	8.0	3.8	5.5

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.0	7.7	82.3	3.5	6	50,000

This sample was taken from lower terrace occurring about 10 ft. above stream. $2\frac{1}{2}$ ft. cover, 3 ft. of gravel as per sample, 3 ft. of dirty sand, then shale.

Higher terrace about 20 ft. above stream contains the big deposit. Material is same as sample # 263.

Access is good. Cover is 1 to 2 ft. About 1,100,00 yds. of material.

FAULK COUNTY

N-265

Sec. 20, T. 119 N., R. 66 W. ✓

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
93	2.46	39.6	100	100	96.9	70.3	31.9	18.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
			3	4	125,000

A Molding Sand.

Seems to be sort of wash over old till terrace.

Gravel is found on the 10 ft. terrace on east edge of sand deposit.

FAULK COUNTY

N-266

Sec. 20, T.119 N., R. 66 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
119	2.54	25.1	69.8	61.3	38.4	14.7	7.5	3.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.1	4.2	87.7	$\frac{1}{2}$	4	30,000

Part of series of 10 ft. terrace.

This material good only for road surfacing purposes. This seems to be about the end of this deposit.

Sample taken at Northeast corner of Section 20.

Another deposit same as 266 in Southwest Quarter of Southeast Quarter.

FAULK COUNTY

N-267

Sec. 20, T. 119 N., R. 66 W. ✓

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
123	2.58	23.6	78.5	72.4	73.2	31.5	4.1	4.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
6.4	3.0	90.6	3	10	6,000

A kame deposit near center of Section.

A very patchy deposit, streak of sand, then streak of gravel.

Access is good, and could be used locally.

A pit has been opened in this deposit, and about 500 yards removed.

FAULK COUNTY

N-268

Sec. 4, T.119 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
116	2.53	26.5	96.8	89.6	40.5	10.5	5.5	3.9

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
7.7	3.1	89.2	1	4.5	10,000

A terrace deposit with very little oversize.

Can be used for road purposes or concrete.

FAULK COUNTY

N-269

Sec. 3, T. 119 N., R. 66 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
112	2.47	27.3	91.4	83.5	36.8	7.9	3.5	2.8

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.2	4.2	85.6	1	9	

A terrace deposit occurring about 10 ft. above stream. A pit has been opened and about 3700 yds. removed. Materials seem to be about same as sample 241.

Can be used for road purposes, also concrete.

FAULK COUNTY

N-270

Sec. 23, T.118 N., R.67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
116	2.50	25.7	92.6	85.3	66.2	20.5	9.6	4.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
10.7	2.2	87.1	4	4	

Whole valley is one fill. No terraces. Old channels cross fill so surface is not perfectly flat. All exposures show a fine sand like that in sample. Some patches of gravelly stuff show at intervals. Sample seems characteristic of field.

Hole showed: 4 ft. sandy silt cover; 4 ft. sand, medium to fine, with pebbles up to 1 in. uniformly scattered through it.

FAULK COUNTY

N-271

Sec. 23, T. 118 N., R. 67 W.

Wt.	S.Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Mesh	P.C. Sand	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P.C. Silt
119	2.52	24.2	80.9	73.6	69.1	13.4	5.8	3.1

Character of Material--- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
8.1	4.2	87.7	2"	5	

Section: 2" soil; 5 ft. coarse gravel, not entirely clean. Few cobbles, but many pebbles up to 2". Lower $1\frac{1}{2}$ ft. more sandy and finer, but still gravel.

Wt.	S. Gr.	P.C.V.	P.C.P. $\frac{1}{2}$ in. Sand	P.C.	Material Passing $\frac{1}{4}$ in. (Sand)			
					P.C.P. 20 M.	P.C.P. 50 M.	P.C.P. 100 M.	P. C. Silt
114	2.52	27.4	85.7	73.9	17.6	6.6	3.3	3.9

Character of Material-- $\frac{1}{4}$ in.			Thickness of Cover in Feet	Depth of Deposit in Feet	Volume in Cubic Yards
P.C.S.	P.C.M.	P.C.H.			
9.1	2.2	88.7	$\frac{1}{2}$	10	120,000

Deposit is divided by road, about half lying south of road and the other half north of it.

Section exposed in road cut: 1 ft. soil, pebbles fill half of this zone, leaving only 6 in. pure soil; 8 ft. gravel, medium, with 1% or less oversize. Some clay, but apparently not excessive. Auger stopped by large pebbles so probably 10 ft. of gravels at least.