

STATE OF SOUTH DAKOTA
George S. Mickelson, Governor

DEPARTMENT OF WATER AND NATURAL RESOURCES
John J. Smith, Secretary

GEOLOGICAL SURVEY
Merlin J. Tipton, State Geologist

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SAND AND GRAVEL RESOURCES IN
KINGSBURY COUNTY, SOUTH DAKOTA

by

Dennis W. Tomhave

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Science Center
University of South Dakota
Vermillion, South Dakota

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CONTENTS

	Page
INTRODUCTION	1
GEOLOGIC OVERVIEW	1
Glacial till	1
Glacial outwash	2
Alluvium	2
Terrace deposits	2
EXPLANATION OF TABLES	2
EXPLANATION OF MAP	2
Sand and gravel	3
ECONOMIC CONSIDERATIONS	4

TABLES

1. List of test holes in Kingsbury County, South Dakota, which contain sand or gravel within 25 feet of the land surface	5
2. List of sand and gravel pits in Kingsbury County, South Dakota, on file at the Department of Transportation, Division of Highways, in Pierre, South Dakota	57

ILLUSTRATION

Map showing test holes, sand and gravel pits and sand and gravel deposits in Kingsbury County	Following 63
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INTRODUCTION

This pamphlet is one of a series of reports describing the geology and water resources of Kingsbury County. It is designed to be an uncomplicated, non-technical aid in the search for sand and gravel deposits.

Other reports in the series include:

- a. Major aquifers in Kingsbury and Brookings Counties, South Dakota: South Dakota Geological Survey Information Pamphlet, Hamilton, Louis, U.S. Geological Survey (in preparation).
- b. Water resources of Kingsbury and Brookings Counties, South Dakota: U.S. Geological Survey Water Resources Investigations Report, Hamilton, Louis, (in preparation).
- c. Geology of Kingsbury and Brookings Counties, South Dakota: South Dakota Geological Survey Bulletin, Lehr, J. D. and Johnson, Gary (in preparation).

Report (a.) describes the availability, quality, and location of major aquifers (water-bearing deposits) in a short, easy to read pamphlet. Report (b.) is a more technical and somewhat more exhaustive investigation of the water resources of the Counties. Report (c.) is a scientific investigation of the geology of Kingsbury and Brookings Counties.

GEOLOGIC OVERVIEW

Most of the sand and gravel deposits found in Kingsbury County were deposited by glacial ice or meltwater, which covered the region thousands of years ago. Some sand and gravel has been deposited by streams since the retreat of the glaciers. A short description of geologic terms used in this text follows.

Glacial Till

The glaciers were large masses of ice that thousands of years ago, originated from snow accumulations to the north. These glaciers flowed southward to the area that is now Kingsbury County, picking up earth debris as they went. Some of this debris, a mixture of clay, silt, sand, gravel, and boulders was redeposited directly from the ice. Till, the term used to describe this mixture, is also often called "blue clay" or "boulder clay." In the Kingsbury County area the till is made up of primarily clay and is not considered a source of sand and gravel. However, small isolated sand and gravel hills or lenses may occur.

Glacial Outwash

Glacial outwash is the term used to describe any deposit of glacial debris that has been washed and sorted by water flowing from melting glacier ice. The grain size of these deposits depends upon the velocity of the water during deposition and the type of material. Deposits left by slow flowing streams are made up of primarily silts and clays. Very fast flowing streams may have left streambeds composed entirely of boulders. Most glacial outwash, however, is made up of an assortment of sand and gravel, with minor amounts of finer and coarser materials. Deposits of glacial outwash are the major sources of sand and gravel in Kingsbury County.

Alluvium

Alluvium is the term used to describe the material deposited by streams since the retreat of the glaciers. Grain size of the alluvial deposits is determined by the same factors that determine grain size of glacial outwash. Alluvium is found in the valleys of present-day streams and can often be a good source of sand and gravel.

Terrace Deposits

Terrace deposits are flat-topped alluvial or outwash deposits that are remnants of former flood plains. The streams that formed them have since cut their channels deeper and developed new flood plains at lower levels. Some of the sand and gravel found in Kingsbury County occurs in this type of deposit.

EXPLANATION OF TABLES

Table 1 is a list of only those test holes in which sand or gravel was encountered within 25 feet of the land surface. This table gives the location of the test hole, and the depth and description of the sand and gravel deposits. The complete logs of all the test holes drilled in Kingsbury County are on file at the South Dakota Geological Survey in Vermillion, South Dakota.

Table 2 is a list of sand and gravel pits on file with the South Dakota Department of Transportation, Division of Highways, in Pierre, South Dakota. Where possible, this table gives the landowner and location of the pit, the thickness of overburden, the thickness of sand and gravel being mined, and the type of aggregate deposit. The actual thickness of a deposit may be greater than that listed in the table as being mined.

EXPLANATION OF MAP

The map shows the location of the test holes and sand and gravel pits. It also shows the towns, major highways, and major

lakes, rivers, and creeks.

Test-hole data are shown on the map using three types of map symbols. A dot (•) represents a test hole in which sand or gravel was found within 25 feet of the land surface, with 0 to 5 feet of overburden. A square (■) indicates that sand or gravel was found within 25 feet of the land surface but greater than 5 feet of overburden was encountered. These two types of symbols are numbered and the pertinent test-hole information is listed in table 1. The third symbol is an open circle (◦), which indicates that no sand or gravel was found within 25 feet of the land surface. Logs of these test holes are available at the South Dakota Geological Survey in Vermillion, South Dakota. Locations of the sand and gravel pits are indicated by a crossed pick and shovel (⌘). The pits which are numbered are listed in table 2, and additional information is on file at the Department of Transportation, Division of Highways, in Pierre, South Dakota. No attempt was made to distinguish the inactive pits from the actively mined pits.

To aid in the delineation of the most promising areas of finding sand and gravel, the map has been divided into three area types, "good," "fair," and "poor." These three types of areas were differentiated using test hole data, sand and gravel pit locations, soil survey information, topographic map and aerial photograph interpretation, and field observations. Areas with "good" and "fair" probability of finding sand and gravel have been assigned a letter on the map and are discussed further in the following section.

Sand and gravel deposits found in the "good" areas are generally thick, have very little overburden, and cover a broad area. In these areas, much mining for sand and gravel has already occurred and is occurring at the present time. Sand and gravel deposits found in the "fair" areas are generally thinner, have more overburden, or are laterally discontinuous. There are sand and gravel deposits in the "poor" areas, but a very expensive and exhaustive exploration program would be needed to locate all of these deposits.

Sand and Gravel

Area "A," designated as "good," is a very large continuous body of outwash sand and gravel, encompassing about 45 square miles within the drainage area of the East Fork Vermillion River. The thickness of the deposit exceeds 50 feet in many spots along the western edge of the area. Overall, Area "A" averages about 30 feet in thickness for all the test holes drilled. The amount of overburden is quite variable over the area, but averages about 3 feet in thickness for all the test holes drilled. A great deal of mining for sand and gravel has occurred and is occurring in this area.

Areas "B" and "D," designated as "fair," are northwest-southeast trending ridges of discontinuous sand and gravel. Isolated

knobs might contain as much as 30 feet of sand and gravel. A fair amount of mining for sand and gravel has occurred in these areas but there are many of the isolated knobs that remain untouched.

Area "C," designated as "fair," represents sand and gravel deposits within the Rock Creek valley. The outwash deposits here remain as thin terrace remnants along the valley walls. Several old exhausted gravel pits are located in this area.

Area "E," designated as "fair," contains sand and gravel deposits within the Redstone Creek valley. The outwash deposits here are very thin and discontinuous. Terrace remnants are found along the valley walls and a thin deposit of sand and gravel occupies the valley floor. The southern end of the area contains many gravel pits and is the most promising portion of the area.

Area "F," designated as "fair," represents outwash deposits within the South Fork Pearl Creek valley. The sand and gravel is found as isolated terrace remnants along the valley walls. Thin and discontinuous deposits are also found along the valley floor. Very little mining for sand and gravel has occurred in this area.

Area "G," designated as "fair," contains sand and gravel deposits within the valley of an intermittent unnamed creek, which connects Lake Albert and Lake Preston. The outwash deposits are thin and discontinuous in the southern portion of the area, but become thicker and more continuous to the north. Several test holes encountered in excess of 15 feet of sand and gravel, with little overburden.

Area "H," designated as "good," is a thick, continuous terrace deposit. Sand and gravel thicknesses of up to 26 feet were encountered in the test holes drilled. A great deal of mining for sand and gravel has occurred in this area.

Area "I," designated as "fair," is a small portion of an area which was mapped in the Clark County and Hamlin County sand and gravel pamphlets. Very isolated terrace remnants are all that occur in Kingsbury County.

ECONOMIC CONSIDERATIONS

It should be emphasized that this study is quite general and should be used only as a guide to further exploration and development of the sand and gravel resources. The development of a specific site will depend upon material specifications for the desired use, development costs, transportation costs, and future markets.

TABLE 1. LIST OF TEST HOLES IN KINGSBURY COUNTY, SOUTH DAKOTA, WHICH CONTAIN SAND OR GRAVEL WITHIN 25 FEET OF THE LAND SURFACE.

LITHOLOGIC DESCRIPTIONS, AS LISTED, HAVE BEEN CONDENSED FROM DATA CONTAINED IN LOGS ON FILE AT THE SOUTH DAKOTA GEOLOGICAL SURVEY OFFICE, VERMILLION, SOUTH DAKOTA, AND CONTAIN ONLY INFORMATION WHICH HAS BEEN DEEMED MOST USEFUL FOR THIS STUDY. NUMERICAL VALUES INDICATE DEPTH IN FEET BELOW LAND SURFACE.

TEST HOLE NUMBER: 1
 LOCATION: 109N-54W-34AABA
 LEGAL LOCATION: NE NW NE NE SEC. 34, T. 109 N., R. 54 W.
 PRELIMINARY LOG -- SUBJECT TO CHANGE

1 - 8 SAND

* * * *

TEST HOLE NUMBER: 2
 LOCATION: 109N-55W-07CDCD
 LEGAL LOCATION: SE SW SE SW SEC. 07, T. 109 N., R. 55 W.

0 - 7 GRAVEL, BROWN, MEDIUM TO COARSE, SANDY;
 OXIDIZED, DRY
 7 - 14 SAND, BROWN, FINE, SILTY; OXIDIZED, DRY
 14 - 31 SAND, BROWN, VERY FINE, SILTY; OXIDIZED,
 MOIST

* * * *

TEST HOLE NUMBER: 3
 LOCATION: 109N-55W-08CCCC
 LEGAL LOCATION: SW SW SW SW SEC. 08, T. 109 N., R. 55 W.

0 - 5 GRAVEL, LIGHT-BROWN, MEDIUM TO COARSE,
 SANDY; OXIDIZED, DRY
 5 - 10 SAND, BROWN, MEDIUM, PEBBLY; OXIDIZED,
 MOIST, SOME GRAVEL

* * * *

TEST HOLE NUMBER: 4
 LOCATION: 109N-55W-16AAAA
 LEGAL LOCATION: NE NE NE NE SEC. 16, T. 109 N., R. 55 W.

0 - 10 SAND, LIGHT-BROWN, MEDIUM, VERY CLAYEY,
 SILTY; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 5
LOCATION: 109N-55W-18DDAD
LEGAL LOCATION: SE NE SE SE SEC. 18, T. 109 N., R. 55 W.

2 - 5 GRAVEL, BROWN, MEDIUM TO COARSE, SANDY;
OXIDIZED, DRY
5 - 10 GRAVEL, BROWN, FINE, SANDY; OXIDIZED,
DRY, SOME COBBLES
10 - 26 SAND, BROWN, VERY FINE, SILTY; OXIDIZED,
MOIST

* * * *

TEST HOLE NUMBER: 6
LOCATION: 109N-55W-20ABBA
LEGAL LOCATION: NE NW NW NE SEC. 20, T. 109 N., R. 55 W.

0 - 1 SAND, BROWN, FINE; DRY, OXIDIZED
1 - 5 SAND, ORANGISH-YELLOW, FINE;
MOIST, OXIDIZED
8 - 33 SAND, GRAY, CLAYEY, FINE, WELL-SORTED;
SATURATED, UNOXIDIZED

* * * *

TEST HOLE NUMBER: 7
LOCATION: 109N-55W-21AAAA
LEGAL LOCATION: NE NE NE NE SEC. 21, T. 109 N., R. 55 W.

0 - 1 SAND, BROWN, FINE TO MEDIUM, SILTY; DRY,
OXIDIZED
4 - 7 SAND, REDDISH-BROWN, MEDIUM, SATURATED,
OXIDIZED
8 - 12 SAND, GRAY, MEDIUM; SATURATED,
UNOXIDIZED

* * * *

TEST HOLE NUMBER: 8
LOCATION: 109N-55W-21BABA
LEGAL LOCATION: NE NW NE NW SEC. 21, T. 109 N., R. 55 W.

0 - 1 SAND, REDDISH-BROWN, FINE, WELL-
SORTED; DRY, OXIDIZED
1 - 4 SAND, BROWN, FINE, CLAYEY, MODERATELY
SORTED; MOIST, OXIDIZED
4 - 11 SAND, BROWN, MEDIUM, MODERATELY
SORTED; MOIST, SATURATED AT 6 FEET,
OXIDIZED

* * * *

TEST HOLE NUMBER: 9
LOCATION: 109N-55W-21CCCC
LEGAL LOCATION: SW SW SW SW SEC. 21, T. 109 N., R. 55 W.

4 - 12 SAND, BROWN, MEDIUM, SILTY; OXIDIZED,
MOIST, SATURATED AT 7 FEET
12 - 23 SAND, GRAY, FINE, CLAYEY, SILTY;
UNOXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 10
LOCATION: 109N-55W-27CDCC
LEGAL LOCATION: SW SW SE SW SEC. 27, T. 109 N., R. 55 W.

3 - 5 SAND, REDDISH-BROWN, MEDIUM; MOIST,
OXIDIZED

* * * *

TEST HOLE NUMBER: 11
LOCATION: 109N-55W-33BABA
LEGAL LOCATION: NE NW NE NW SEC. 33, T. 109 N., R. 55 W.

5 - 12 SAND, BROWN, MEDIUM, SILTY; OXIDIZED,
SATURATED
12 - 20 SAND, GRAY, MEDIUM, CLAYEY, SILTY;
UNOXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 12
LOCATION: 109N-55W-34BBBB
LEGAL LOCATION: NW NW NW NW SEC. 34, T. 109 N., R. 55 W.

2 - 11 SAND, DARK-BROWN, SILTY, GRAVELLY, POORLY
SORTED; MOIST, SATURATED AT 11 FEET,
OXIDIZED
11 - 12 SAND, BROWN, MEDIUM, MODERATELY SORTED;
SATURATED, OXIDIZED
12 - 21 SAND, GRAY, MEDIUM, MODERATELY SORTED;
SATURATED, UNOXIDIZED

* * * *

TEST HOLE NUMBER: 13

LOCATION: 109N-55W-36BBBB
LEGAL LOCATION: NW NW NW NW SEC. 36, T. 109 N., R. 55 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

14 - 18 SAND, FINE TO COARSE

* * * *

TEST HOLE NUMBER: 14
LOCATION: 109N-56W-03CDCD
LEGAL LOCATION: SE SW SE SW SEC. 03, T. 109 N., R. 56 W.

16 - 19 SAND, BROWN, MEDIUM, WELL-SORTED;
OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 15
LOCATION: 109N-56W-10AAAB
LEGAL LOCATION: NW NE NE NE SEC. 10, T. 109 N., R. 56 W.

5 - 7 GRAVEL, REDDISH-BROWN, MEDIUM, CLAYEY,
POORLY SORTED; DRY, OXIDIZED

* * * *

TEST HOLE NUMBER: 16
LOCATION: 109N-56W-10DDCD
LEGAL LOCATION: SE SW SE SE SEC. 10, T. 109 N., R. 56 W.

14 - 43 GRAVEL, DARK-BROWN, VERY CLAYEY WITH
PEBBLES, SANDY, POORLY SORTED;
OXIDIZED, MOIST, SATURATED AT 22 FEET

* * * *

TEST HOLE NUMBER: 17
LOCATION: 109N-56W-11CCDD
LEGAL LOCATION: SE SE SW SW SEC. 11, T. 109 N., R. 56 W.

0 - 5 SAND, BROWN, MEDIUM, SILTY; OXIDIZED
DRY

* * * *

TEST HOLE NUMBER: 18
LOCATION: 109N-56W-12AADA
LEGAL LOCATION: NE SE NE NE SEC. 12, T. 109 N., R. 56 W.

3 - 11 SAND, BROWN, MEDIUM; OXIDIZED, DRY, SOME
GRAVEL

* * * *

TEST HOLE NUMBER: 19
LOCATION: 109N-56W-23BABB
LEGAL LOCATION: NW NW NE NW SEC. 23, T. 109 N., R. 56 W.

5 - 10 SAND, BROWN, MEDIUM, SILTY; OXIDIZED,
DRY
10 - 44 GRAVEL, BROWN, COARSE, SANDY; OXIDIZED,
DRY, SATURATED AT 26 FEET

* * * *

TEST HOLE NUMBER: 20
LOCATION: 109N-56W-23DCDC
LEGAL LOCATION: SW SE SW SE SEC. 23, T. 109 N., R. 56 W.

4 - 8 SAND, BROWN, FINE, VERY CLAYEY,
POORLY SORTED; MOIST, OXIDIZED
8 - 10 GRAVEL, BROWN, COARSE; MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 21
LOCATION: 109N-56W-24CCCD
LEGAL LOCATION: SE SW SW SW SEC. 24, T. 109 N., R. 56 W.

2 - 3 SAND, LIGHT-BROWN, MEDIUM, CLAYEY,
POORLY SORTED; DRY, OXIDIZED
3 - 6 SAND, REDDISH-BROWN, FINE, CLAYEY,
POORLY SORTED; DRY, OXIDIZED
6 - 7 GRAVEL, DARK-BROWN, MEDIUM, VERY
CLAYEY, POORLY SORTED; MOIST, OXIDIZED
7 - 17 GRAVEL, BROWN, MEDIUM, CLAYEY, MODERATELY
SORTED; SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 22
LOCATION: 109N-56W-26DDCC
LEGAL LOCATION: SW SW SE SE SEC. 26, T. 109 N., R. 56 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

2 - 32 SAND, FINE TO MEDIUM; MINOR GRAVEL

* * * *

TEST HOLE NUMBER: 23
LOCATION: 109N-56W-28CCCC 1
LEGAL LOCATION: SW SW SW SW SEC. 28, T. 109 N., R. 56 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

18 - 21 GRAVEL, FINE

* * * *

TEST HOLE NUMBER: 24
LOCATION: 109N-56W-35AAAA
LEGAL LOCATION: NE NE NE NE SEC. 35, T. 109 N., R. 56 W.

4 - 7 GRAVEL, DARK-BROWN, COARSE, POORLY
SORTED; DRY, OXIDIZED
7 - 9 GRAVEL, REDDISH-BROWN, MEDIUM, CLAYEY,
POORLY SORTED; MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 25
LOCATION: 109N-56W-35DDDD
LEGAL LOCATION: SE SE SE SE SEC. 35, T. 109 N., R. 56 W.

4 - 10 GRAVEL, LIGHT-BROWN, FINE, VERY
CLAYEY; SATURATED, OXIDIZED
10 - 13 GRAVEL, DARK-BROWN, COARSE, CLAYEY;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 26
LOCATION: 109N-57W-08DDCC
LEGAL LOCATION: SW SW SE SE SEC. 08, T. 109 N., R. 57 W.

4 - 11 GRAVEL, MEDIUM-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 27
LOCATION: 109N-57W-17DDCD
LEGAL LOCATION: SE SW SE SE SEC. 17, T. 109 N., R. 57 W.

1 - 5 SAND, CLAYEY, POORLY SORTED; WITH PEBBLES
5 - 10 SAND AND GRAVEL, COARSE SAND, RED-BROWN,
MEDIUM GRAVEL; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 28
LOCATION: 109N-57W-20DDCC
LEGAL LOCATION: SW SW SE SE SEC. 20, T. 109 N., R. 57 W.

10 - 14 SAND AND GRAVEL, BROWN, COARSE SAND,
MEDIUM GRAVEL, CLAYEY; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 29
LOCATION: 109N-57W-27DDDD
LEGAL LOCATION: SE SE SE SE SEC. 27, T. 109 N., R. 57 W.

1 - 4 SAND, BROWN, MEDIUM, CLAYEY
6 - 8 SAND, BROWN, MEDIUM-COARSE, VERY CLAYEY;
OXIDIZED

* * * *

TEST HOLE NUMBER: 30
LOCATION: 109N-57W-29ADDD
LEGAL LOCATION: SE SE SE NE SEC. 29, T. 109 N., R. 57 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

4 - 6 SAND, BROWN, MEDIUM, GRAVELLY FROM
5 TO 6 FEET; MOIST
9 - 11 SAND, DARK-BROWN, MEDIUM, CLAYEY;
SATURATED

* * * *

TEST HOLE NUMBER: 31
LOCATION: 109N-57W-32AAAA
LEGAL LOCATION: NE NE NE NE SEC. 32, T. 109 N., R. 57 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

0 - 4 GRAVEL, COARSE; AND COBBLES

* * * *

TEST HOLE NUMBER: 32
LOCATION: 109N-57W-33BBBB
LEGAL LOCATION: NW NW NW SW SEC. 33, T. 109 N., R. 57 W.

4 - 11 SAND AND GRAVEL, BROWN, COARSE SAND,
MEDIUM GRAVEL, CLAYEY; OXIDIZED

* * * *

TEST HOLE NUMBER: 33
LOCATION: 109N-57W-33CDDC
LEGAL LOCATION: SW SE SE SW SEC. 33, T. 109 N., R. 57 W.

6 - 15 SAND, BROWN, COARSE, VERY SILTY;
SATURATED, GETTING MORE GRAVELLY
WITH DEPTH

* * * *

TEST HOLE NUMBER: 34
LOCATION: 109N-58W-21DCDC
LEGAL LOCATION: SW SE SW SE SEC. 21, T. 109 N., R. 58 W.

0 - 2 GRAVEL, COARSE, CLAYEY; OXIDIZED, MOIST
(ROADFILL?)

* * * *

TEST HOLE NUMBER: 35
LOCATION: 110N-53W-01BACD
LEGAL LOCATION: SE SW NE NW SEC. 01, T. 110 N., R. 53 W.

6 - 8 SAND, BROWN, FINE, SILTY; OXIDIZED

* * * *

TEST HOLE NUMBER: 36
LOCATION: 110N-53W-19ABDC
LEGAL LOCATION: SW SE NW NE SEC. 19, T. 110 N., R. 53 W.

0 - 1 SAND, BROWN, MEDIUM, SILTY; MOIST,
OXIDIZED, SOME PEBBLES
3 - 15 SAND, DARK-BROWN, FINE, VERY SILTY, VERY
CLAYEY, PEBBLY; MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 37
LOCATION: 110N-53W-28BCCB
LEGAL LOCATION: NW SW SW NW SEC. 28, T. 110 N., R. 53 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

17 - 19 SAND, MEDIUM

* * * *

TEST HOLE NUMBER: 38
LOCATION: 110N-54W-04CBBB

LEGAL LOCATION: NW NW NW SW SEC. 04, T. 110 N., R. 54 W.

0 - 1 GRAVEL, BROWN, MEDIUM, SANDY; MOIST,
OXIDIZED

* * * *

TEST HOLE NUMBER: 39
LOCATION: 110N-55W-07BCCB
LEGAL LOCATION: NW SW SW NW SEC. 07, T. 110 N., R. 55 W.

8 - 11 SAND, YELLOWISH-BROWN, MEDIUM; FAIRLY
CLEAN, SATURATED
11 - 14 SAND, GRAY, MEDIUM; SATURATED

* * * *

TEST HOLE NUMBER: 40
LOCATION: 110N-55W-08CCCC
LEGAL LOCATION: SW SW SW SW SEC. 08, T. 110 N., R. 55 W.

1 - 5 SAND, RED-BROWN, FINE, CLAYEY; OXIDIZED

* * * *

TEST HOLE NUMBER: 41
LOCATION: 110N-55W-17DCCD
LEGAL LOCATION: SE SW SW SE SEC. 17, T. 110 N., R. 55 W.

0 - 7 SAND, MEDIUM, VERY CLAYEY; DRY
7 - 9 SAND, BROWN, MEDIUM, CLAYEY; DRY
9 - 11 SAND, YELLOWISH-BROWN, MEDIUM, CLAYEY
11 - 20 SAND, YELLOWISH-BROWN, FINE; MUCH CLAY,
SATURATED

* * * *

TEST HOLE NUMBER: 42
LOCATION: 110N-55W-19DDBB
LEGAL LOCATION: NW NW SE SE SEC. 19, T. 110 N., R. 55 W.

0 - 5 SAND, RED-BROWN, COARSE, CLAYEY, PEBBLY,
MODERATELY SORTED; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 43
LOCATION: 110N-55W-20ABAA

LEGAL LOCATION: NE NE NW NE SEC. 20, T. 110 N., R. 55 W.

0 - 3 GRAVEL, LIGHT-GRAY, SANDY, PEBBLY; DRY
(ROADFILL?)

* * * *

TEST HOLE NUMBER: 44
LOCATION: 110N-55W-20BCCD
LEGAL LOCATION: SE SW SW NW SEC. 20, T. 110 N., R. 55 W.

5 - 13 SAND, YELLOWISH-BROWN, GRAVELLY, VERY
CLAYEY; DRY
13 - 23 SAND, BROWN, MEDIUM; SOME CLAY, SATURATED
23 - 30 SAND, GRAY, COARSE; MUCH CLAY, AMOUNT OF
CLAY INCREASED WITH DEPTH

* * * *

TEST HOLE NUMBER: 45
LOCATION: 110N-55W-20BDAC
LEGAL LOCATION: SW NE SE NW SEC. 20, T. 110 N., R. 55 W.

0 - 16 SAND AND GRAVEL, RED-BROWN, FINE GRAVEL;
OXIDIZED, MOIST, MOSTLY CLEAN
16 - 20 SAND AND GRAVEL, GRAYISH, COARSE SAND,
FINE GRAVEL; SATURATED AT 20 FEET

* * * *

TEST HOLE NUMBER: 46
LOCATION: 110N-55W-20BDBB
LEGAL LOCATION: NW NW SE NW SEC. 20, T. 110 N., R. 55 W.

1 - 7 SAND, BROWN, MEDIUM; DRY
7 - 17 SAND, BROWN, MEDIUM; SOME PEBBLES, SOME
COBBLES, DRY
17 - 22 SAND, BROWN, MEDIUM; FAIRLY CLEAN,
SATURATED
22 - 40 SAND, BROWN, MEDIUM TO COARSE; SOME CLAY,
SATURATED

* * * *

TEST HOLE NUMBER: 47
LOCATION: 110N-55W-30BBBB
LEGAL LOCATION: NW NW NW NW SEC. 30, T. 110 N., R. 55 W.

- 1 - 5 GRAVEL, LIGHT-BROWN, MEDIUM, VERY CLAYEY; DRY, OXIDIZED
- 5 - 7 GRAVEL, REDDISH-BROWN, FINE TO MEDIUM, SANDY, POORLY SORTED; MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 48
 LOCATION: 110N-56W-01DCDC
 LEGAL LOCATION: SW SE SW SE SEC. 01, T. 110 N., R. 56 W.

- 12 - 24 SAND, YELLOWISH-BROWN, MEDIUM; SATURATED
- 24 - 34 SAND, GRAY, MEDIUM; MUCH CLAY, SATURATED

* * * *

TEST HOLE NUMBER: 49
 LOCATION: 110N-56W-02BAAA
 LEGAL LOCATION: NE NE NE NW SEC. 02, T. 110 N., R. 56 W.

- 3 - 5 GRAVEL, BROWN, FINE, SANDY; DRY, OXIDIZED

* * * *

TEST HOLE NUMBER: 50
 LOCATION: 110N-56W-03AAAA
 LEGAL LOCATION: NE NE NE NE SEC. 03, T. 110 N., R. 56 W.

- 2 - 13 SAND, BROWN, FINE, WELL-SORTED; MOIST, OXIDIZED (OUTWASH)
- 13 - 14 SAND, DARK-BROWN, FINE; VERY MOIST, SLIGHTLY OXIDIZED
- 14 - 21 SAND, DARK-BROWN, FINE, VERY SILTY; VERY MOIST, SATURATED AT 16 FEET, OXIDIZED

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TEST HOLE NUMBER: 51
 LOCATION: 110N-56W-03BBBB
 LEGAL LOCATION: NW NW NW NW SEC. 03, T. 110 N., R. 56 W.

- 5 - 16 SAND, GRAY, MEDIUM TO COARSE, CLAYEY, MODERATELY SORTED; SATURATED, UNOXIDIZED

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TEST HOLE NUMBER: 52
 LOCATION: 110N-56W-03CAAD

LEGAL LOCATION: SE NE NE SW SEC. 03, T. 110 N., R. 56 W.

22 - 57 SAND AND GRAVEL, GRAY, FINE; SOME CLAY,
SATURATED

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TEST HOLE NUMBER: 53
LOCATION: 110N-56W-03DAAA
LEGAL LOCATION: NE NE NE SE SEC. 03, T. 110 N., R. 56 W.

0 - 5 GRAVEL, YELLOWISH-BROWN, MEDIUM; DRY
5 - 25 SAND AND GRAVEL, YELLOWISH-BROWN, FINE;
DRY
25 - 48 SAND, YELLOWISH-BROWN, VERY FINE; MUCH
CLAY, VISCOUS, SATURATED

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TEST HOLE NUMBER: 54
LOCATION: 110N-56W-04BABB
LEGAL LOCATION: NW NW NE NW SEC. 04, T. 110 N., R. 56 W.

0 - 9 GRAVEL, BROWN, MEDIUM, VERY SANDY; DRY
OXIDIZED

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TEST HOLE NUMBER: 55
LOCATION: 110N-56W-09AAAA
LEGAL LOCATION: NE NE NE NE SEC. 09, T. 110 N., R. 56 W.

1 - 3 SAND, BROWN, FINE, CLAYEY, POORLY SORTED;
MOIST, OXIDIZED
3 - 19 GRAVEL, BROWN, COARSE, CLAYEY, MODERATELY
SORTED; MOIST, OXIDIZED

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TEST HOLE NUMBER: 56
LOCATION: 110N-56W-10AAAA
LEGAL LOCATION: NE NE NE NE SEC. 10, T. 110 N., R. 56 W.

5 - 7 GRAVEL, YELLOWISH-BROWN, COBBLY; DRY
10 - 11 SAND, YELLOWISH-BROWN, VERY FINE; MOIST
15 - 19 SAND, YELLOWISH-BROWN, VERY FINE;
SLIGHTLY MOIST, COMPACT
19 - 35 SAND, YELLOWISH-BROWN, MEDIUM; SOME CLAY,

SATURATED

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TEST HOLE NUMBER: 57
LOCATION: 110N-56W-10ADDD
LEGAL LOCATION: SE SE SE NE SEC. 10, T. 110 N., R. 56 W.

15 - 20 SAND, GRAY, FINE; VISCOUS, SATURATED
20 - 55 SAND, GRAY, COARSE, GRAVELLY; SOME CLAY,
SOME COAL, SATURATED

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TEST HOLE NUMBER: 58
LOCATION: 110N-56W-10BBBB
LEGAL LOCATION: NW NW NW NW SEC. 10, T. 110 N., R. 56 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

1 - 8 SAND AND GRAVEL, RUSTY-BROWN SAND, MEDIUM
TO COARSE (OUTWASH)
8 - 21 SAND AND GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 59
LOCATION: 110N-56W-11AAAD
LEGAL LOCATION: SE NE NE NE SEC. 11, T. 110 N., R. 56 W.

1 - 4 SAND, LIGHT-BROWN, MEDIUM, MODERATELY
SORTED; MOIST, OXIDIZED
4 - 6 GRAVEL, BROWN, COARSE, CLAYEY; MOIST,
OXIDIZED

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TEST HOLE NUMBER: 60
LOCATION: 110N-56W-11BAAA
LEGAL LOCATION: NE NE NE NW SEC. 11, T. 110 N., R. 56 W.

9 - 16 SAND, YELLOWISH-BROWN, VERY FINE; MOIST
16 - 24 SAND, DARK-BROWN, FINE; MUCH CLAY, SOME
COAL, SATURATED
24 - 46 SAND, GRAY, FINE; SOME CLAY, SOME COAL,
SATURATED

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TEST HOLE NUMBER: 61
LOCATION: 110N-56W-11BBCB

LEGAL LOCATION: NW SW NW NW SEC. 11, T. 110 N., R. 56 W.

0 -	1	SAND, BROWN, FINE, WELL-SORTED; MOIST, OXIDIZED
3 -	11	SAND, REDDISH-BROWN, FINE, WELL-SORTED; MOIST, OXIDIZED
11 -	15	GRAVEL, BROWN, FINE TO MEDIUM, SANDY, POORLY SORTED; MOIST, OXIDIZED
15 -	20	SAND, BROWN, MEDIUM, MODERATELY SORTED; MOIST, OXIDIZED
20 -	33	GRAVEL, BROWN, MEDIUM, SANDY, POORLY SORTED; MOIST, OXIDIZED, ABANDONED HOLE

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TEST HOLE NUMBER: 62
LOCATION: 110N-56W-11CCCC
LEGAL LOCATION: SW SW SW SW SEC. 11, T. 110 N., R. 56 W.

0 -	13	SAND AND GRAVEL, YELLOWISH-BROWN; DRY
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TEST HOLE NUMBER: 63
LOCATION: 110N-56W-11CDDD
LEGAL LOCATION: SE SE SE SW SEC. 11, T. 110 N., R. 56 W.

1 -	5	SAND, REDDISH-BROWN, FINE, MODERATELY SORTED; DRY, OXIDIZED
7 -	17	SAND, BROWN, VERY FINE, SILTY WELL-SORTED; MOIST, OXIDIZED
17 -	18	GRAVEL, BROWN, MEDIUM; DRY, OXIDIZED
18 -	19	SAND, DARK-BROWN, FINE, WELL-SORTED; MOIST, OXIDIZED
19 -	28	SAND, DARK-BROWN, MEDIUM, MODERATELY SORTED; SATURATED, OXIDIZED

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TEST HOLE NUMBER: 64
LOCATION: 110N-56W-11DDDD
LEGAL LOCATION: SE SE SE SE SEC. 11, T. 110 N., R. 56 W.

4 -	10	SAND, YELLOWISH-BROWN; MUCH CLAY, DRY
10 -	14	SAND, YELLOWISH-BROWN, FINE; MUCH CLAY, MOIST, SATURATED AT 12 FEET

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TEST HOLE NUMBER: 65
LOCATION: 110N-56W-12AAAAB
LEGAL LOCATION: NW NE NE NE SEC. 12, T. 110 N., R. 56 W.

3 - 13 SAND, RED-BROWN, FINE, CLAYEY, MODERATELY
TO POORLY SORTED; OXIDIZED, MOIST, WITH
PEBBLES, VERY CLAYEY AT 10 FEET

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TEST HOLE NUMBER: 66
LOCATION: 110N-56W-12ABAB
LEGAL LOCATION: NW NE NW NE SEC. 12, T. 110 N., R. 56 W.

1 - 14 SAND, RED-BROWN, MEDIUM, CLAYEY, POORLY
SORTED; OXIDIZED, MOIST, SATURATED AT
10 FEET
14 - 21 SAND, RED-BROWN, COARSE, POORLY SORTED;
OXIDIZED

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TEST HOLE NUMBER: 67
LOCATION: 110N-56W-12CACD
LEGAL LOCATION: SE SW NE SW SEC. 12, T. 110 N., R. 56 W.

0 - 10 SAND, BROWN, FINE; MOIST, SATURATED AT 8
FEET

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TEST HOLE NUMBER: 68
LOCATION: 110N-56W-12DBBB
LEGAL LOCATION: NW NW NW SE SEC. 12, T. 110 N., R. 56 W.

0 - 7 SAND AND GRAVEL, YELLOWISH-BROWN, FINE TO
MEDIUM SAND, VERY CLAYEY; DRY
7 - 24 SAND, YELLOWISH-BROWN, MEDIUM, CLAYEY;
SOME FINE GRAVEL, SATURATED
24 - 36 SAND, GRAY, MEDIUM, CLAYEY; SATURATED

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TEST HOLE NUMBER: 69
LOCATION: 110N-56W-12DCCD
LEGAL LOCATION: SE SW SW SE SEC. 12, T. 110 N., R. 56 W.

4 - 9 SAND AND GRAVEL, YELLOWISH-BROWN, VERY

CLAYEY; DRY
 9 - 15 SAND, BROWN, FINE TO MEDIUM; MUCH CLAY,
 SATURATED
 15 - 20 SAND, BROWN, MEDIUM, CLAYEY; FAIRLY
 CLEAN, SATURATED
 20 - 29 SAND, GRAY, MEDIUM, CLAYEY; AMOUNT OF
 CLAY INCREASES WITH DEPTH, SATURATED

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TEST HOLE NUMBER: 70
 LOCATION: 110N-56W-13CCCC
 LEGAL LOCATION: SW SW SW SW SEC. 13, T. 110 N., R. 56 W.

0 - 8 SAND AND GRAVEL, BROWN; DRY
 8 - 16 SAND, YELLOW, FINE; CLEAN, DRY
 16 - 23 GRAVEL, BROWN, COARSE, SANDY
 23 - 32 SAND, BROWN, MEDIUM; SOME CLAY, SATURATED

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TEST HOLE NUMBER: 71
 LOCATION: 110N-56W-14BBBB
 LEGAL LOCATION: NW NW NW NW SEC. 14, T. 110 N., R. 56 W.

2 - 20 SAND AND GRAVEL, MEDIUM TO COARSE
 20 - 25 SAND, FINE

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TEST HOLE NUMBER: 72
 LOCATION: 110N-56W-14DDDD
 LEGAL LOCATION: SE SE SE SE SEC. 14, T. 110 N., R. 56 W.

1 - 5 GRAVEL, BROWN, FINE TO MEDIUM, SANDY;
 OXIDIZED, DRY
 5 - 27 SAND, BROWN, VERY FINE, SILTY; OXIDIZED,
 MOIST, SATURATED AT 21 FEET, CONTAINS
 CLAY LENSES

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TEST HOLE NUMBER: 73
 LOCATION: 110N-56W-15ABAA
 LEGAL LOCATION: NE NE NW NE SEC. 15, T. 110 N., R. 56 W.

15 - 18 SAND, BROWN, MEDIUM, PEBBLY;
 OXIDIZED, DRY
 25 - 39 GRAVEL, BROWN, MEDIUM, SANDY; OXIDIZED,

DRY

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TEST HOLE NUMBER: 74
LOCATION: 110N-56W-15CDDC
LEGAL LOCATION: SW SE SE SW SEC. 15, T. 110 N., R. 56 W.

1 - 19 GRAVEL, BROWN, COARSE, CLAYEY, POORLY
SORTED; DRY, OXIDIZED

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TEST HOLE NUMBER: 75
LOCATION: 110N-56W-15DDDD
LEGAL LOCATION: SE SE SE SE SEC. 15, T. 110 N., R. 56 W.

4 - 7 SAND, YELLOW, MEDIUM, GRAVELLY, CLAYEY;
DRY
7 - 14 SAND, BROWN, COARSE, GRAVELLY, VERY
CLAYEY; DRY
14 - 57 SAND, YELLOWISH-BROWN, VERY CLAYEY; TURNS
GRAY AT 30 FEET, FAIRLY CLEAN FROM 40
TO 50 FEET, SATURATED

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TEST HOLE NUMBER: 76
LOCATION: 110N-56W-22ADDD
LEGAL LOCATION: SE SE SE NE SEC. 22, T. 110 N., R. 56 W.

1 - 6 GRAVEL, BROWN, COARSE, CLAYEY, POORLY
SORTED; DRY, OXIDIZED
6 - 11 SAND, REDDISH-BROWN, MEDIUM, MODERATELY
SORTED; DRY, OXIDIZED
11 - 15 GRAVEL, BROWN, COARSE, MODERATELY SORTED;
DRY, OXIDIZED
15 - 17 SAND, BROWN, MEDIUM, MODERATELY SORTED;
DRY, OXIDIZED
19 - 20 SAND, LIGHT-BROWN, FINE, WELL-SORTED;
VERY MOIST, OXIDIZED

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TEST HOLE NUMBER: 77
LOCATION: 110N-56W-24BADA
LEGAL LOCATION: NE SE NE NW SEC. 24, T. 110 N., R. 56 W.

0 - 8 SAND, BROWN, MEDIUM; CLEAN, DRY

8 - 10 SAND, BROWN; SOME GRAVEL, DRY
10 - 32 SAND, YELLOWISH-BROWN, FINE; SOME GRAVEL,
SOME CLAY, SATURATED, VISCOUS, BECOMES
GRAY AND VERY CLAYEY AFTER 25 FEET

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TEST HOLE NUMBER: 78
LOCATION: 110N-56W-24CCCC
LEGAL LOCATION: SW SW SW SW SEC. 24, T. 110 N., R. 56 W.

0 - 5 SAND AND GRAVEL, YELLOWISH-BROWN; DRY
5 - 15 SAND, YELLOW, VERY FINE; CLEAN, DRY,
SATURATED AFTER 12 FEET
15 - 52 SAND, BROWN, VERY FINE, CLAYEY; TURNS TO
GRAY AT 20 FEET, FAIRLY CLEAN FROM 35
TO 45 FEET, VERY CLAYEY AFTER 45 FEET,
SATURATED

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TEST HOLE NUMBER: 79
LOCATION: 110N-56W-25BAAA
LEGAL LOCATION: NE NE NE NW SEC. 25, T. 110 N., R. 56 W.

1 - 5 GRAVEL
5 - 17 SAND, COARSE
17 - 30 SAND, MEDIUM; SAMPLED AT 20 FEET

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TEST HOLE NUMBER: 80
LOCATION: 110N-56W-26ABAA
LEGAL LOCATION: NE NE NW NE SEC. 26, T. 110 N., R. 56 W.

2 - 11 SAND, BROWN, MEDIUM, PEBBLY; OXIDIZED,
MOIST

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TEST HOLE NUMBER: 81
LOCATION: 110N-56W-26BBBB
LEGAL LOCATION: NW NW NW NW SEC. 26, T. 110 N., R. 56 W.

1 - 7 SAND, BROWN, MEDIUM, GRAVELLY;
OXIDIZED, DRY
7 - 12 GRAVEL, BROWN, COARSE, SANDY; OXIDIZED,
DRY
12 - 20 GRAVEL, BROWN, MEDIUM, SANDY; OXIDIZED,

DRY

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TEST HOLE NUMBER: 82
LOCATION: 110N-56W-26CDGD
LEGAL LOCATION: SE SW SE SW SEC. 26, T. 110 N., R. 56 W.

1 -	4	GRAVEL, BROWN, COARSE, MODERATELY SORTED; MOIST, OXIDIZED
5 -	7	SAND, BROWN, MEDIUM, WELL-SORTED; MOIST, OXIDIZED
7 -	11	GRAVEL, BROWN, COARSE, MODERATELY SORTED; MOIST, OXIDIZED
11 -	15	SAND, BROWN, MEDIUM TO COARSE, MODERATELY SORTED; MOIST, OXIDIZED
25 -	29	GRAVEL, REDDISH-BROWN, MEDIUM, VERY CLAYEY, SANDY, POORLY SORTED; MOIST, OXIDIZED

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TEST HOLE NUMBER: 83
LOCATION: 110N-56W-26DDDD
LEGAL LOCATION: SE SE SE SE SEC. 26, T. 110 N., R. 56 W.

0 -	10	GRAVEL, MEDIUM TO COARSE, SANDY; OXIDIZED, DRY
10 -	45	SAND, LIGHT-BROWN, VERY FINE; OXIDIZED, DRY, MOIST AT 14 FEET, SOME CLAY LENSES AFTER 23 FEET

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TEST HOLE NUMBER: 84
LOCATION: 110N-56W-26DDDD 1
LEGAL LOCATION: SE SE SE SE SEC. 26, T. 110 N., R. 56 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

0 -	15	SAND AND GRAVEL, FINE SAND TO COARSE GRAVEL
24 -	32	SAND, FINE

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TEST HOLE NUMBER: 85
LOCATION: 110N-56W-30BAAB
LEGAL LOCATION: NW NE NE NW SEC. 30, T. 110 N., R. 56 W.

1 -	6	SAND, COARSE, POORLY SORTED; OXIDIZED,
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MOIST, CLEAN

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TEST HOLE NUMBER: 86
LOCATION: 110N-56W-32CCCD
LEGAL LOCATION: SE SW SW SW SEC. 32, T. 110 N., R. 56 W.

1 - 5 SAND, REDDISH-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, MOIST

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TEST HOLE NUMBER: 87
LOCATION: 110N-56W-35ADDA
LEGAL LOCATION: NE SE SE NE SEC. 35, T. 110 N., R. 56 W.

1 - 5 GRAVEL, COARSE
5 - 11 SAND, FINE TO COARSE, POORLY SORTED;
SOME MEDIUM GRAVEL
24 - 31 SAND, VERY FINE, WELL-SORTED

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TEST HOLE NUMBER: 88
LOCATION: 110N-56W-35DDDD
LEGAL LOCATION: SE SE SE SE SEC. 35, T. 110 N., R. 56 W.

0 - 3 SAND, BROWN, MEDIUM TO COARSE; MOIST,
SOME FINE GRAVEL
3 - 7 SAND, LIGHT-BROWN, MEDIUM; MOIST, SOME
PEBBLES
7 - 10 SAND AND GRAVEL, BROWN, MEDIUM SAND,
COARSE GRAVEL, POORLY SORTED; MOIST

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TEST HOLE NUMBER: 89
LOCATION: 110N-57W-08CDDD
LEGAL LOCATION: SE SE SE SW SEC. 08, T. 110 N., R. 57 W.

0 - 1 GRAVEL, SANDY (ROADFILL)
5 - 8 SAND AND GRAVEL, RED-BROWN, COARSE, VERY
CLAYEY; OXIDIZED

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TEST HOLE NUMBER: 90
LOCATION: 110N-57W-12ABBA

LEGAL LOCATION: NE NW NW NE SEC. 12, T. 110 N., R. 57 W.

1 - 3 GRAVEL, BROWN, COARSE, SUBROUNDED, WELL-SORTED; DRY

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TEST HOLE NUMBER: 91
LOCATION: 110N-57W-13AAAA
LEGAL LOCATION: NE NE NE NE SEC. 13, T. 110 N., R. 57 W.

2 - 3 GRAVEL, REDDISH, MEDIUM; OXIDIZED

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TEST HOLE NUMBER: 92
LOCATION: 110N-57W-17CDDD
LEGAL LOCATION: SE SE SE SW SEC. 17, T. 110 N., R. 57 W.

5 - 16 SAND, DARK-BROWN, COARSE, CLAYEY, POORLY SORTED; OXIDIZED, SATURATED

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TEST HOLE NUMBER: 93
LOCATION: 110N-57W-20DDCD
LEGAL LOCATION: SE SW SE SE SEC. 20, T. 110 N., R. 57 W.

4 - 8 SAND, BROWN, FINE, VERY CLAYEY; SATURATED AT 5 FEET

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TEST HOLE NUMBER: 94
LOCATION: 110N-57W-29BAAA
LEGAL LOCATION: NE NE NE NW SEC. 29, T. 110 N., R. 57 W.

6 - 8 GRAVEL, LIGHT-BROWN, COARSE, CLAYEY, POORLY SORTED; OXIDIZED

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TEST HOLE NUMBER: 95
LOCATION: 110N-57W-29DCCC
LEGAL LOCATION: SW SW SW SE SEC. 29, T. 110 N., R. 57 W.

6 - 22 SAND, BROWN, COARSE, VERY CLAYEY, POORLY

SORTED; OXIDIZED, SATURATED

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TEST HOLE NUMBER: 96
LOCATION: 110N-57W-32AAAA
LEGAL LOCATION: NE NE NE NE SEC. 32, T. 110 N., R. 57 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

0 - 3 SAND AND GRAVEL; COVERED BY SOIL

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TEST HOLE NUMBER: 97
LOCATION: 110N-58W-06BAAB
LEGAL LOCATION: NW NE NE NW SEC. 06, T. 110 N., R. 58 W.

7 - 9 GRAVEL, RED-BROWN, SILTY, SANDY

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TEST HOLE NUMBER: 98
LOCATION: 110N-58W-26CCDD
LEGAL LOCATION: SE SE SW SW SEC. 26, T. 110 N., R. 58 W.

0 - 1 GRAVEL, COARSE, CLAYEY; MOIST (ROADFILL?)

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TEST HOLE NUMBER: 99
LOCATION: 110N-59W-12DDDD
LEGAL LOCATION: SE SE SE SE SEC. 12, T. 110 N., R. 59 W.

11 - 20 GRAVEL, FINE TO MEDIUM, ANGULAR;
SATURATED

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TEST HOLE NUMBER: 100
LOCATION: 111N-53W-09AADD
LEGAL LOCATION: SE SE NE NE SEC. 09, T. 111 N., R. 53 W.

2 - 4 SAND, BROWN, COARSE, GRAVELLY; DRY,
OXIDIZED
4 - 7 SAND, BROWN, FINE, WELL-SORTED; MOIST,
OXIDIZED
7 - 10 SAND, DARK-BROWN, MEDIUM TO COARSE,
CLAYEY; SATURATED, OXIDIZED, LENSES OF
CLAY

16 - 26 GRAVEL, GRAY, FINE, SANDY; SATURATED,
UNOXIDIZED

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TEST HOLE NUMBER: 101
LOCATION: 111N-53W-10BABA
LEGAL LOCATION: NE NW NE NW SEC. 10, T. 111 N., R. 53 W.

1 - 5 SAND, BROWN, COARSE, GRAVELLY, POORLY
SORTED; DRY, OXIDIZED
14 - 17 SAND, BROWN, MEDIUM, WELL-SORTED; MOIST,
OXIDIZED
19 - 22 SAND, REDDISH-BROWN, COARSE, GRAVELLY,
MODERATELY SORTED; SATURATED, OXIDIZED

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TEST HOLE NUMBER: 102
LOCATION: 111N-53W-19ADAD
LEGAL LOCATION: SE NE SE NE SEC. 19, T. 111 N., R. 53 W.

10 - 16 SAND, GRAY-BROWN, FINE, CLAYEY; SATURATED

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TEST HOLE NUMBER: 103
LOCATION: 111N-55W-12CCCC
LEGAL LOCATION: SW SW SW SW SEC. 12, T. 111 N., R. 55 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

11 - 21 SAND, FINE TO MEDIUM

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TEST HOLE NUMBER: 104
LOCATION: 111N-56W-04BBBB
LEGAL LOCATION: NW NW NW NW SEC. 04, T. 111 N., R. 56 W.

2 - 6 SAND, LIGHT-BROWN, MEDIUM
6 - 10 SAND, BROWN, SILTY
10 - 18 SAND, BROWN, COARSE, SILTY
18 - 34 GRAVEL, GRAY, FINE TO MEDIUM, SILTY

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TEST HOLE NUMBER: 105
LOCATION: 111N-56W-04BCCC
LEGAL LOCATION: SW SW SW NW SEC. 04, T. 111 N., R. 56 W.

6 - 11 SAND, LIGHT-BROWN, MEDIUM, CLAYEY

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TEST HOLE NUMBER: 106
LOCATION: 111N-56W-04DCCC
LEGAL LOCATION: SW SW SW SE SEC. 04, T. 111 N., R. 56 W.

1 - 4 GRAVEL, BROWN, FINE, CLAYEY, POORLY
SORTED; DRY, OXIDIZED
4 - 5 SAND, DARK-BROWN, MEDIUM, CLAYEY, POORLY
SORTED; MOIST, OXIDIZED
5 - 16 GRAVEL, BROWN, MEDIUM, CLAYEY, POORLY
SORTED; MOIST, SATURATED AT 6 FEET,
OXIDIZED
16 - 26 SAND, BROWN, COARSE, WELL SORTED;
SATURATED, OXIDIZED

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TEST HOLE NUMBER: 107
LOCATION: 111N-56W-05ABAA
LEGAL LOCATION: NE NE NW NE SEC. 05, T. 111 N., R. 56 W.

4 - 7 GRAVEL, REDDISH-BROWN, MEDIUM, SANDY,
POORLY SORTED; MOIST, OXIDIZED
7 - 11 GRAVEL, REDDISH-BROWN, MEDIUM, CLAYEY,
SANDY, POORLY SORTED; VERY MOIST,
OXIDIZED

* * * *

TEST HOLE NUMBER: 108
LOCATION: 111N-56W-05ACCC
LEGAL LOCATION: SW SW SW NE SEC. 05, T. 111 N., R. 56 W.

22 - 31 SAND AND GRAVEL, BROWN

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TEST HOLE NUMBER: 109
LOCATION: 111N-56W-05BAAA
LEGAL LOCATION: NE NE NE NW SEC. 05, T. 111 N., R. 56 W.

1 - 7 SAND, LIGHT-BROWN, FINE, SILTY
7 - 9 SAND, BROWN, FINE, SILTY
14 - 23 SAND, BROWN, MEDIUM TO COARSE, SILTY,
PEBBLY

* * * *

TEST HOLE NUMBER: 110
LOCATION: 111N-56W-05BCAB
LEGAL LOCATION: NW NE SW NW SEC. 05, T. 111 N., R. 56 W.

2 -	5	SAND, BROWN, FINE, SILTY
5 -	13	GRAVEL, BROWN, SANDY, SILTY
13 -	28	SAND, BROWN, MEDIUM TO COARSE, SILTY

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TEST HOLE NUMBER: 111
LOCATION: 111N-56W-05BCCC
LEGAL LOCATION: SW SW SW NW SEC. 05, T. 111 N., R. 56 W.

5 -	10	SAND, BROWN, COARSE, SILTY, PEBBLY
10 -	16	SAND, BROWN, VERY SILTY
16 -	24	SAND, BROWN, MEDIUM, VERY SILTY
24 -	27	SAND, GRAY, COARSE; SOME FINE GRAVEL

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TEST HOLE NUMBER: 112
LOCATION: 111N-56W-05CCBB
LEGAL LOCATION: NW NW SW SW SEC. 05, T. 111 N., R. 56 W.

1 -	12	SAND, BROWN, MEDIUM TO COARSE; SOME GRAVEL
12 -	17	SAND, BROWN, COARSE; SOME GRAVEL
17 -	21	SAND, BROWN, COARSE, SILTY; SOME GRAVEL

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TEST HOLE NUMBER: 113
LOCATION: 111N-56W-06BAAA
LEGAL LOCATION: NE NE NE NW SEC. 06, T. 111 N., R. 56 W.

2 -	7	SAND, FINE, SILTY
7 -	10	SAND, LIGHT-BROWN, MEDIUM, GRAVELLY
10 -	13	GRAVEL, COARSE; SOME MEDIUM SAND, HIT ROCK, ABANDONED HOLE

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TEST HOLE NUMBER: 114
LOCATION: 111N-56W-06BAAA 2
LEGAL LOCATION: NE NE NE NW SEC. 06, T. 111 N., R. 56 W.

5 -	25	GRAVEL AND SAND, BROWN
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TEST HOLE NUMBER: 115
LOCATION: 111N-56W-06BBBB
LEGAL LOCATION: NW NW NW NW SEC. 06, T. 111 N., R. 56 W.

11 - 29 SAND, BROWN, MEDIUM, VERY SILTY

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TEST HOLE NUMBER: 116
LOCATION: 111N-56W-06DBBB
LEGAL LOCATION: NW NW NW SE SEC. 06, T. 111 N., R. 56 W.

21 - 25 SAND, MEDIUM TO COARSE, CLAYEY
25 - 88 GRAVEL AND SAND

* * * *

TEST HOLE NUMBER: 117
LOCATION: 111N-56W-06DBDD
LEGAL LOCATION: SE SE NW SE SEC. 06, T. 111 N., R. 56 W.

1 - 4 SAND, LIGHT-BROWN, FINE
4 - 20 GRAVEL, BROWN, MEDIUM TO COARSE, SILTY;
SOME FINE SAND
20 - 42 GRAVEL, BROWN, FINE TO MEDIUM, CLAYEY

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TEST HOLE NUMBER: 118
LOCATION: 111N-56W-06DCCC
LEGAL LOCATION: SW SW SW SE SEC. 06, T. 111 N., R. 56 W.

12 - 13 GRAVEL, BROWN, MEDIUM TO COARSE, CLAYEY,
SANDY, POORLY SORTED; MOIST
25 - 28 GRAVEL, GRAY, COARSE; ROCK, ABANDONED
HOLE

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TEST HOLE NUMBER: 119
LOCATION: 111N-56W-06DDDD
LEGAL LOCATION: SE SE SE SE SEC. 06, T. 111 N., R. 56 W.

3 - 9 SAND, RED-BROWN, MEDIUM; OXIDIZED, WITH
SOME PEBBLES

9 - 27 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
CLAYEY; SATURATED AT 20 FEET

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TEST HOLE NUMBER: 120
LOCATION: 111N-56W-07ADDD
LEGAL LOCATION: SE SE SE NE SEC. 07, T. 111 N., R. 56 W.

1 - 4 SAND, LIGHT-BROWN, FINE
4 - 7 SAND, BROWN, MEDIUM, SILTY, PEBBLY
7 - 10 SAND, BROWN, MEDIUM; CLEAN
17 - 23 SAND, BROWN, MEDIUM, CLAYEY

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TEST HOLE NUMBER: 121
LOCATION: 111N-56W-08ADAA
LEGAL LOCATION: NE NE SE NE SEC. 08, T. 111 N., R. 56 W.

0 - 19 SAND, BROWN, FINE, SILTY; OXIDIZED, DRY,
BECOMING LESS SILTY AT 4 FEET
19 - 24 SAND AND GRAVEL, PEA-SIZE GRAVEL

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TEST HOLE NUMBER: 122
LOCATION: 111N-56W-08BABA
LEGAL LOCATION: NE NW NE NW SEC. 08, T. 111 N., R. 56 W.

4 - 9 SAND, GRAY, MEDIUM TO COARSE, SILTY
9 - 36 SAND, GRAY, COARSE; SOME FINE GRAVEL

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TEST HOLE NUMBER: 123
LOCATION: 111N-56W-08BBBA
LEGAL LOCATION: NE NW NW NW SEC. 08, T. 111 N., R. 56 W.

5 - 49 SAND, MEDIUM TO COARSE, PEBBLY; SOME
GRAVEL

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TEST HOLE NUMBER: 124
LOCATION: 111N-56W-08BBBB
LEGAL LOCATION: NW NW NW NW SEC. 08, T. 111 N., R. 56 W.

3 - 12 SAND, LIGHT-BROWN, FINE, SILTY, PEBBLY
17 - 28 SAND, BROWN, SILTY, PEBBLY

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TEST HOLE NUMBER: 125
LOCATION: 111N-56W-08BCAD
LEGAL LOCATION: SE NE SW NW SEC. 08, T. 111 N., R. 56 W.

2 - 8 SAND, LIGHT-BROWN, FINE, GRAVELLY
8 - 14 SAND, BROWN, MEDIUM, SILTY, GRAVELLY
14 - 21 SAND, BROWN, MEDIUM, SILTY, VERY GRAVELLY
21 - 37 SAND, DARK-BROWN, MEDIUM TO COARSE,
SILTY, GRAVELLY

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TEST HOLE NUMBER: 126
LOCATION: 111N-56W-08BDCC
LEGAL LOCATION: SW SW SE NW SEC. 08, T. 111 N., R. 56 W.

2 - 18 SAND, BROWN, FINE TO MEDIUM
18 - 35 GRAVEL, BROWN, MEDIUM TO COARSE, SANDY

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TEST HOLE NUMBER: 127
LOCATION: 111N-56W-08CDCD
LEGAL LOCATION: SE SW SE SW SEC. 08, T. 111 N., R. 56 W.

23 - 28 SAND, LIGHT-BROWN, CLAYEY

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TEST HOLE NUMBER: 128
LOCATION: 111N-56W-08DDCC
LEGAL LOCATION: SW SW SE SE SEC. 08, T. 111 N., R. 56 W.

6 - 12 SAND, GRAY, FINE TO MEDIUM, SILTY
12 - 23 SAND, GRAY, MEDIUM TO COARSE, SILTY
23 - 36 SAND, MEDIUM, SLIGHTLY SILTY; SOME FINE
GRAVEL

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TEST HOLE NUMBER: 129
LOCATION: 111N-56W-08DDDD
LEGAL LOCATION: SE SE SE SE SEC. 08, T. 111 N., R. 56 W.

1 - 30 SAND, REDDISH-BROWN, FINE, BECOMES COARSE
WITH DEPTH, WELL-SORTED; OXIDIZED,
MOIST, SATURATED AT 15 FEET

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TEST HOLE NUMBER: 130
LOCATION: 111N-56W-08DDDD 1
LEGAL LOCATION: SE SE SE SE SEC. 08, T. 111 N., R. 56 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

1 - 30 SAND, FINE TO MEDIUM; SOME COARSE SAND
AND FINE GRAVEL, AND LENSE OF TILL
AT ABOUT 22 FEET

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TEST HOLE NUMBER: 131
LOCATION: 111N-56W-09BBBB
LEGAL LOCATION: NW NW NW NW SEC. 09, T. 111 N., R. 56 W.

0 - 10 SAND, BROWN, SILTY
10 - 22 SAND, BROWN, COARSE, SILTY
22 - 29 SAND, GRAY, COARSE, SILTY

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TEST HOLE NUMBER: 132
LOCATION: 111N-56W-09CBBB
LEGAL LOCATION: NW NW NW SW SEC. 09, T. 111 N., R. 56 W.

3 - 11 SAND, BROWN, MEDIUM, GRAVELLY
11 - 16 SAND, BROWN, MEDIUM TO COARSE, GRAVELLY
16 - 21 SAND, BROWN, MEDIUM, SILTY
21 - 26 SAND, GRAY, MEDIUM, SILTY

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TEST HOLE NUMBER: 133
LOCATION: 111N-56W-09CCCC
LEGAL LOCATION: SW SW SW SW SEC. 09, T. 111 N., R. 56 W.

1 - 17 SAND, BROWN, SILTY
17 - 20 SAND, BROWN, COARSE, SILTY
20 - 28 SAND, GRAY, COARSE, SILTY, CLAYEY

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TEST HOLE NUMBER: 134
LOCATION: 111N-56W-10CCCC

LEGAL LOCATION: SW SW SW SW SEC. 10, T. 111 N., R. 56 W.

1 -	6	SAND, BROWN, COARSE, SILTY
6 -	11	SAND, BROWN, SILTY, PEBBLY
11 -	12	GRAVEL, BROWN, SANDY, SILTY
12 -	21	SAND, BROWN, COARSE, SILTY
21 -	42	SAND, CLAYEY

* * * *

TEST HOLE NUMBER: 135
LOCATION: 111N-56W-15CBBB
LEGAL LOCATION: NW NW NW SW SEC. 15, T. 111 N., R. 56 W.

0 -	8	SAND, REDDISH-BROWN, MEDIUM, PEBBLY
8 -	14	SAND, REDDISH-BROWN, MEDIUM TO COARSE, CLAYEY

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TEST HOLE NUMBER: 136
LOCATION: 111N-56W-15DDDD
LEGAL LOCATION: SE SE SE SE SEC. 15, T. 111 N., R. 56 W.

1 -	24	SAND, BROWN, FINE TO COARSE, CLAYEY WITH DEPTH, WELL-SORTED; OXIDIZED, MOIST, SATURATED AT 15 FEET
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TEST HOLE NUMBER: 137
LOCATION: 111N-56W-16AAAA
LEGAL LOCATION: NE NE NE NE SEC. 16, T. 111 N., R. 56 W.

4 -	12	SAND, REDDISH-BROWN, MEDIUM, WELL-SORTED; MOIST, OXIDIZED
12 -	26	GRAVEL, REDDISH-BROWN, FINE, MODERATELY SORTED; MOIST, OXIDIZED

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TEST HOLE NUMBER: 138
LOCATION: 111N-56W-16BCCC
LEGAL LOCATION: SW SW SW NW SEC. 16, T. 111 N., R. 56 W.

3 -	5	SAND, BROWN, VERY FINE, SILTY
5 -	7	SAND, BROWN, MEDIUM, VERY SILTY
7 -	11	SAND, GRAY, COARSE, SILTY

11 - 15 SAND, SLIGHTLY SILTY; SOME FINE GRAVEL
15 - 30 SAND, MEDIUM TO COARSE; CLEAN

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TEST HOLE NUMBER: 139
LOCATION: 111N-56W-17DDDD
LEGAL LOCATION: SE SE SE SE SEC. 17, T. 111 N., R. 56 W.

0 - 11 GRAVEL, RED-BROWN, COARSE, SANDY, SILTY;
OXIDIZED, MOIST, SOME COBBLES
14 - 20 GRAVEL, RED-BROWN, COARSE
23 - 60 SAND, COARSE, WELL-SORTED; UNOXIDIZED

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TEST HOLE NUMBER: 140
LOCATION: 111N-56W-20AAAA
LEGAL LOCATION: NE NE NE NE SEC. 20, T. 111 N., R. 56 W.

0 - 6 GRAVEL, BROWN, COARSE, SANDY
6 - 9 SAND, BROWN, COARSE, GRAVELLY
9 - 36 SAND AND GRAVEL, BROWN

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TEST HOLE NUMBER: 141
LOCATION: 111N-56W-22BBBC
LEGAL LOCATION: SW NW NW NW SEC. 22, T. 111 N., R. 56 W.

0 - 21 SAND AND GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 142
LOCATION: 111N-56W-22BBBC 1
LEGAL LOCATION: SW NW NW NW SEC. 22, T. 111 N., R. 56 W.

4 - 6 SAND, BROWN, SILTY
6 - 11 SAND, DARK-BROWN, SILTY
11 - 16 SAND, DARK-BROWN; SOME FINE GRAVEL
16 - 21 SAND, GRAY, FINE TO MEDIUM; CLEAN
21 - 36 SAND, GRAY, MEDIUM TO COARSE; CLEAN

* * * *

TEST HOLE NUMBER: 143
LOCATION: 111N-56W-22CBCB
LEGAL LOCATION: NW SW NW SW SEC. 22, T. 111 N., R. 56 W.

5 - 9 SAND, BROWN, MEDIUM TO COARSE, SILTY
9 - 11 SAND, GRAY, MEDIUM TO VERY COARSE, SILTY
11 - 35 SAND, GRAY, COARSE, SILTY; SOME GRAVEL

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TEST HOLE NUMBER: 144
LOCATION: 111N-56W-27AAAA
LEGAL LOCATION: NE NE NE NE SEC. 27, T. 111 N., R. 56 W.

9 - 27 SAND, GRAY, MEDIUM; SATURATED, WITH CLAY

* * * *

TEST HOLE NUMBER: 145
LOCATION: 111N-56W-27BBBA
LEGAL LOCATION: NE NW NW NW SEC. 27, T. 111 N., R. 56 W.

0 - 9 SAND, BROWN, COARSE, CLAYEY, MODERATELY
SORTED; OXIDIZED, MOIST
9 - 17 SAND, REDDISH-BROWN, FINE, WELL-SORTED;
OXIDIZED, MOIST, SATURATED AT 14 FEET
17 - 45 SAND, LIGHT-GRAY, COARSE, WELL-SORTED;
PARTIALLY OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 146
LOCATION: 111N-56W-28BBBB
LEGAL LOCATION: NW NW NW NW SEC. 28, T. 111 N., R. 56 W.

1 - 4 GRAVEL, DARK-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, MOIST
18 - 55 GRAVEL, GRAY, COARSE, CLAYEY, POORLY
SORTED; UNOXIDIZED

* * * *

TEST HOLE NUMBER: 147
LOCATION: 111N-56W-33BAAA
LEGAL LOCATION: NE NE NE NW SEC. 33, T. 111 N., R. 56 W.

17 - 20 GRAVEL, MEDIUM
20 - 24 SAND, RED-BROWN, MEDIUM, WELL-SORTED;
OXIDIZED
24 - 25 GRAVEL, COARSE, CLAYEY; ABANDONED HOLE

* * * *

TEST HOLE NUMBER: 148
LOCATION: 111N-56W-34AABA
LEGAL LOCATION: NE NW NE NE SEC. 34, T. 111 N., R. 56 W.

1 - 3 SAND, LIGHT-BROWN, FINE, CLAYEY, WELL-SORTED; OXIDIZED

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TEST HOLE NUMBER: 149
LOCATION: 111N-56W-34ACAD
LEGAL LOCATION: SE NE SW NE SEC. 34, T. 111 N., R. 56 W.

0 - 5 SAND, BROWN, VERY FINE; DRY

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TEST HOLE NUMBER: 150
LOCATION: 111N-56W-34CBCC
LEGAL LOCATION: SW SW NW SW SEC. 34, T. 111 N., R. 56 W.

10 - 46 SAND, GRAY, FINE, MODERATELY SORTED;
SATURATED, CLEAN, PROGRESSES TO COARSE
SAND AT 26 FEET

* * * *

TEST HOLE NUMBER: 151
LOCATION: 111N-56W-34CDDD
LEGAL LOCATION: SE SE SE SW SEC. 34, T. 111 N., R. 56 W.

4 - 17 SAND AND GRAVEL, FINE; MUCH CLAY, DRY
17 - 20 SAND, YELLOWISH-BROWN, FINE; SOME CLAY,
VERY MOIST
20 - 64 SAND AND GRAVEL, YELLOWISH-BROWN, FINE;
SOME CLAY, FAIRLY CLEAN, TURNS TO GRAY
AT 50 FEET

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TEST HOLE NUMBER: 152
LOCATION: 111N-56W-34DBBD
LEGAL LOCATION: SE NW NW SE SEC. 34, T. 111 N., R. 56 W.

4 - 16 SAND, MEDIUM; SAMPLED AT 12 FEET

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TEST HOLE NUMBER: 153
LOCATION: 111N-56W-34DBCC
LEGAL LOCATION: SW SW NW SE SEC. 34, T. 111 N., R. 56 W.

- 0 - 5 SAND, LIGHT-BROWN, VERY FINE; DRY
- 5 - 8 SAND, BROWN, VERY FINE; SOME CLAY,
SLIGHTLY MOIST
- 8 - 24 SAND, YELLOWISH-BROWN, FINE; SOME CLAY,
FAIRLY CLEAN, SLIGHTLY MOIST

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TEST HOLE NUMBER: 154
LOCATION: 111N-56W-34DDDD
LEGAL LOCATION: SE SE SE SE SEC. 34, T. 111 N., R. 56 W.

- 9 - 20 SAND, BROWN, FINE, VERY CLAYEY; MOIST,
SATURATED AT 16 FEET
- 20 - 25 SAND, GRAY, FINE, VERY CLAYEY; SATURATED

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TEST HOLE NUMBER: 155
LOCATION: 111N-56W-36CCCB
LEGAL LOCATION: NW SW SW SW SEC. 36, T. 111 N., R. 56 W.

- 1 - 6 SAND, REDDISH-BROWN, COARSE, MODERATELY
SORTED; OXIDIZED, MOIST, LITTLE CLAY

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TEST HOLE NUMBER: 156
LOCATION: 111N-56W-36CCCC
LEGAL LOCATION: SW SW SW SW SEC. 36, T. 111 N., R. 56 W.

- 10 - 19 SAND, GRAY, FINE TO MEDIUM, UNSORTED,
VERY CLAYEY; VISCOUS, SATURATED

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TEST HOLE NUMBER: 157
LOCATION: 111N-57W-04DCCD
LEGAL LOCATION: SE SW SW SE SEC. 04, T. 111 N., R. 57 W.

- 4 - 5 GRAVEL, FINE, VERY CLAYEY, SANDY, POORLY
SORTED; OXIDIZED
- 13 - 21 GRAVEL, BROWN, COARSE, CLAYEY, POORLY
SORTED; SATURATED

23 - 28 SAND, GRAY, FINE TO MEDIUM, MODERATELY
WELL-SORTED; SATURATED

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TEST HOLE NUMBER: 158
LOCATION: 111N-57W-16AABB
LEGAL LOCATION: NW NW NE NE SEC. 16, T. 111 N., R. 57 W.

3 - 5 GRAVEL, MEDIUM TO COARSE, VERY CLAYEY;
SOME SAND
5 - 7 SAND, BROWN, MEDIUM, VERY CLAYEY; MOIST,
SOME GRAVEL
7 - 24 GRAVEL, COARSE, VERY CLAYEY, SANDY;
OXIDIZED, MOIST, SATURATED AT 14 FEET
24 - 34 SAND, GRAY, FINE TO MEDIUM; SATURATED

* * * *

TEST HOLE NUMBER: 159
LOCATION: 111N-57W-16ABBA
LEGAL LOCATION: NE NW NW NE SEC. 16, T. 111 N., R. 57 W.

3 - 5 SAND, BROWN, FINE; MOIST
9 - 13 SAND, BROWN, MEDIUM, CLAYEY; SATURATED

* * * *

TEST HOLE NUMBER: 160
LOCATION: 111N-57W-16DDDA
LEGAL LOCATION: NE SE SE SE SEC. 16, T. 111 N., R. 57 W.

5 - 6 GRAVEL, MEDIUM TO COARSE, VERY CLAYEY,
POORLY SORTED; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 161
LOCATION: 111N-57W-25DDAA
LEGAL LOCATION: NE NE SE SE SEC. 25, T. 111 N., R. 57 W.

2 - 4 GRAVEL, BROWN, MEDIUM; OXIDIZED

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TEST HOLE NUMBER: 162
LOCATION: 111N-57W-25DDDD
LEGAL LOCATION: SE SE SE SE SEC. 25, T. 111 N., R. 57 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

1 - 7 SAND AND GRAVEL, MEDIUM TO COARSE, CLAYEY

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TEST HOLE NUMBER: 163
LOCATION: 111N-57W-27DDDD
LEGAL LOCATION: SE SE SE SE SEC. 27, T. 111 N., R. 57 W.

4 - 8 SAND, BROWN, FINE, CLAYEY, MODERATELY
SORTED; OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 164
LOCATION: 111N-57W-27DDDD 1
LEGAL LOCATION: SE SE SE SE SEC. 27, T. 111 N., R. 57 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

3 - 14 SAND AND GRAVEL, MEDIUM TO COARSE, CLAYEY

* * * *

TEST HOLE NUMBER: 165
LOCATION: 111N-57W-31AAAB
LEGAL LOCATION: NW NE NE NE SEC. 31, T. 111 N., R. 57 W.

5 - 6 SAND, DARK-BROWN, MEDIUM, CLAYEY, SILTY;
OXIDIZED, SATURATED

6 - 9 SAND AND GRAVEL, DARK-BROWN, COARSE SAND,
MEDIUM GRAVEL, VERY CLAYEY; OXIDIZED

* * * *

TEST HOLE NUMBER: 166
LOCATION: 111N-57W-32CBBB
LEGAL LOCATION: NW NW NW SW SEC. 32, T. 111 N., R. 57 W.

16 - 20 SAND, GRAY, FINE, CLAYEY, POORLY SORTED;
UNOXIDIZED, MOIST

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TEST HOLE NUMBER: 167
LOCATION: 111N-58W-06ABBB
LEGAL LOCATION: NW NW NW NE SEC. 06, T. 111 N., R. 58 W.

19 - 24 GRAVEL, BROWN, MEDIUM, CLAYEY, SANDY,
POORLY SORTED; OXIDIZED, MOIST

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TEST HOLE NUMBER: 168
LOCATION: 111N-58W-06CDD
LEGAL LOCATION: SE SW SE SW SEC. 06, T. 111 N., R. 58 W.

- 1 - 11 GRAVEL, LIGHT-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, DRY, REDDISH-
BROWN COLOR AFTER 3 FEET
- 11 - 22 SAND, REDDISH-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 169
LOCATION: 111N-58W-07ABBB
LEGAL LOCATION: NW NW NW NE SEC. 07, T. 111 N., R. 58 W.

- 8 - 13 SAND, BROWN, MEDIUM, SILTY, POORLY
SORTED; OXIDIZED
- 13 - 21 GRAVEL, BROWN, MEDIUM; OXIDIZED, MOIST,
WITH CLAY

* * * *

TEST HOLE NUMBER: 170
LOCATION: 111N-58W-07DCCD
LEGAL LOCATION: SE SW SW SE SEC. 07, T. 111 N., R. 58 W.

- 1 - 6 SAND, BROWN, COARSE, CLAYEY, POORLY
SORTED; DRY, MOIST AT 5 FEET, WITH
PEBBLES
- 8 - 17 GRAVEL, GRAY, MEDIUM, POORLY SORTED;
UNOXIDIZED, SATURATED, CLEAN

* * * *

TEST HOLE NUMBER: 171
LOCATION: 111N-58W-23DCCD
LEGAL LOCATION: SE SW SW SE SEC. 23, T. 111 N., R. 58 W.

- 1 - 3 SAND AND GRAVEL, LIGHT-BROWN, FINE SAND,
POORLY SORTED; OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 172
LOCATION: 111N-58W-26CDD
LEGAL LOCATION: SE SW SE SW SEC. 26, T. 111 N., R. 58 W.

1 - 3 SAND AND GRAVEL, LIGHT-BROWN, FINE SAND,
CLAYEY; POORLY SORTED, OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 173
LOCATION: 111N-58W-30BABA
LEGAL LOCATION: NE NW NE NW SEC. 30, T. 111 N., R. 58 W.

25 - 30 SAND, GRAY, MEDIUM, MODERATELY SORTED;
CLEAN

* * * *

TEST HOLE NUMBER: 174
LOCATION: 111N-58W-30CCDD
LEGAL LOCATION: SE SE SW SW SEC. 30, T. 111 N., R. 58 W.

15 - 16 GRAVEL

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TEST HOLE NUMBER: 175
LOCATION: 111N-58W-30CDDD
LEGAL LOCATION: SE SE SE SW SEC. 30, T. 111 N., R. 58 W.

1 - 5 SAND, RED-BROWN, COARSE, CLAYEY, POORLY
SORTED; SOME FINE GRAVEL
5 - 11 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
MEDIUM GRAVEL, CLAYEY; OXIDIZED,
SATURATED AT 7 FEET

* * * *

TEST HOLE NUMBER: 176
LOCATION: 111N-58W-31BDAA
LEGAL LOCATION: NE NE SE NW SEC. 31, T. 111 N., R. 58 W.

5 - 11 GRAVEL, MEDIUM GRADING TO SAND

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TEST HOLE NUMBER: 177
LOCATION: 111N-58W-31BDDD
LEGAL LOCATION: SE SE SE NW SEC. 31, T. 111 N., R. 58 W.

5 - 9 GRAVEL, MEDIUM GRADING TO FINE, SANDY

* * * *

TEST HOLE NUMBER: 178
LOCATION: 112N-53W-02CAAD
LEGAL LOCATION: SE NE NE SW SEC. 02, T. 112 N., R. 53 W.

2 - 3 GRAVEL, BROWN, MEDIUM; OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 179
LOCATION: 112N-53W-12CCCC
LEGAL LOCATION: SW SW SW SW SEC. 12, T. 112 N., R. 53 W.

10 - 14 SAND, MEDIUM

* * * *

TEST HOLE NUMBER: 180
LOCATION: 112N-53W-12CCDD
LEGAL LOCATION: SE SE SW SW SEC. 12, T. 112 N., R. 53 W.

6 - 20 GRAVEL, REDDISH-BROWN, MEDIUM, CLAYEY,
SANDY, POORLY SORTED; SATURATED,
OXIDIZED
23 - 27 GRAVEL, COARSE, MODERATELY SORTED;
SATURATED

* * * *

TEST HOLE NUMBER: 181
LOCATION: 112N-53W-12CDDD
LEGAL LOCATION: SE SE SE SW SEC. 12, T. 112 N., R. 53 W.

2 - 19 SAND, REDDISH-BROWN, FINE, WELL SORTED;
DRY, OXIDIZED

* * * *

TEST HOLE NUMBER: 182
LOCATION: 112N-53W-25BAAA
LEGAL LOCATION: NE NE NE NW SEC. 25, T. 112 N., R. 53 W.

5 - 7 SAND, BROWN, FINE TO MEDIUM, CLAYEY;
MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 183
LOCATION: 112N-53W-25CBAC

LEGAL LOCATION: SW NE NW SW SEC. 25, T. 112 N., R. 53 W.

17 - 19 SAND, BROWN, MEDIUM, CLAYEY; SATURATED,
OXIDIZED
19 - 23 GRAVEL, BROWN, COARSE, CLAYEY; SATURATED,
OXIDIZED

* * * *

TEST HOLE NUMBER: 184
LOCATION: 112N-53W-28DCDC
LEGAL LOCATION: SW SE SW SE SEC. 28, T. 112 N., R. 53 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

7 - 12 SAND, FINE TO COARSE

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TEST HOLE NUMBER: 185
LOCATION: 112N-53W-34CCDC
LEGAL LOCATION: SW SE SW SW SEC. 34, T. 112 N., R. 53 W.

1 - 4 SAND, BROWN, FINE, GRAVELLY, POORLY
SORTED; OXIDIZED
4 - 7 GRAVEL, REDDISH-BROWN, COARSE, CLAYEY,
SANDY, POORLY SORTED; MOIST, OXIDIZED
7 - 11 SAND, BROWN, FINE, WELL-SORTED; MOIST,
OXIDIZED
11 - 14 GRAVEL, BROWN, COARSE; MOIST, OXIDIZED,
ABANDONED HOLE

* * * *

TEST HOLE NUMBER: 186
LOCATION: 112N-53W-35BCCC
LEGAL LOCATION: SW SW SW NW SEC. 35, T. 112 N., R. 53 W.

2 - 10 GRAVEL, BROWN, COARSE, CLAYEY; DRY,
OXIDIZED, ABANDONED HOLE

* * * *

TEST HOLE NUMBER: 187
LOCATION: 112N-53W-35CDBA
LEGAL LOCATION: NE NW SE SW SEC. 35, T. 112 N., R. 53 W.

4 - 21 SAND, GRAYISH-BROWN, FINE, VERY SILTY;
SATURATED, CLAY LAYER FROM 10 TO 11
FEET

* * * *

TEST HOLE NUMBER: 188
LOCATION: 112N-54W-02BBCB
LEGAL LOCATION: NW SW NW NW SEC. 02, T. 112 N., R. 54 W.

9 - 11 SAND, BROWN, FINE, VERY CLAYEY; SATURATED
11 - 19 GRAVEL, BROWN, MEDIUM, MODERATELY SORTED;
SATURATED, OXIDIZED
19 - 35 GRAVEL, BROWN, COARSE, MODERATELY SORTED;
CLEAN, SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 189
LOCATION: 112N-54W-02CBBC
LEGAL LOCATION: SW NW NW SW SEC. 02, T. 112 N., R. 54 W.

4 - 29 GRAVEL, BROWN, MEDIUM TO COARSE, CLAYEY,
MODERATELY SORTED; SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 190
LOCATION: 112N-54W-08DCCC
LEGAL LOCATION: SW SW SW SE SEC. 08, T. 112 N., R. 54 W.

25 - 26 SAND, BROWN, FINE, CLAYEY; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 191
LOCATION: 112N-54W-09ADAD
LEGAL LOCATION: SE NE SE NE SEC. 09, T. 112 N., R. 54 W.

5 - 10 GRAVEL, BROWN, MEDIUM, SILTY, VERY SANDY;
OXIDIZED, DRY
10 - 17 GRAVEL, BROWN, COARSE, SILTY, VERY SANDY;
OXIDIZED, DRY, ABANDONED HOLE

* * * *

TEST HOLE NUMBER: 192
LOCATION: 112N-54W-09CADD
LEGAL LOCATION: SE SE NE SW SEC. 09, T. 112 N., R. 54 W.

- 4 - 6 GRAVEL, BROWN, FINE TO MEDIUM, SANDY;
DRY, OXIDIZED
6 - 8 GRAVEL, BROWN, COARSE; DRY, OXIDIZED,
ABANDONED HOLE

* * * *

TEST HOLE NUMBER: 193
LOCATION: 112N-54W-09DCCD
LEGAL LOCATION: SE SW SW SE SEC. 09, T. 112 N., R. 54 W.

- 6 - 7 SAND, DARK-BROWN, FINE, SILTY; OXIDIZED,
DRY

* * * *

TEST HOLE NUMBER: 194
LOCATION: 112N-54W-10ABBB
LEGAL LOCATION: NW NW NW NE SEC. 10, T. 112 N., R. 54 W.

- 0 - 9 GRAVEL, BROWN, FINE, SANDY; DRY, OXIDIZED
9 - 15 GRAVEL, BROWN, COARSE, SANDY; MOIST,
OXIDIZED

* * * *

TEST HOLE NUMBER: 195
LOCATION: 112N-56W-01ABBB
LEGAL LOCATION: NW NW NW NE SEC. 01, T. 112 N., R. 56 W.

- 3 - 15 GRAVEL, REDDISH-BROWN, COARSE, COBBLY,
POORLY SORTED; WITH SAND AND CLAY

* * * *

TEST HOLE NUMBER: 196
LOCATION: 112N-56W-07CBCB
LEGAL LOCATION: NW SW NW SW SEC. 07, T. 112 N., R. 56 W.

- 4 - 16 SAND, BROWN; COARSE, CLAYEY, POORLY
SORTED; OXIDIZED, SATURATED, COARSENS
WITH DEPTH

* * * *

TEST HOLE NUMBER: 197
LOCATION: 112N-56W-30AABD
LEGAL LOCATION: SE NW NE NE SEC. 30, T. 112 N., R. 56 W.

1 - 15 SAND, BROWN, COARSE, CLAYEY, MODERATELY
SORTED; OXIDIZED, MOIST, SATURATED AT
10 FEET
15 - 65 SAND, BROWN, FINE, WELL-SORTED; PARTIALLY
OXIDIZED, OXIDIZED AT 24 FEET, CLEAN,
BECOMES COARSE WITH DEPTH

* * * *

TEST HOLE NUMBER: 198
LOCATION: 112N-56W-30BADB
LEGAL LOCATION: NW SE NE NW SEC. 30, T. 112 N., R. 56 W.

0 - 12 SAND AND GRAVEL, RED-BROWN, COARSE,
POORLY SORTED SAND, COARSE GRAVEL;
OXIDIZED, COBBLES AT SURFACE
12 - 26 SAND AND GRAVEL, BROWN, COARSE SAND,
FINE GRAVEL, CLAYEY; SATURATED AT 11
FEET

* * * *

TEST HOLE NUMBER: 199
LOCATION: 112N-56W-31ABBB
LEGAL LOCATION: NW NW NW NE SEC. 31, T. 112 N., R. 56 W.

0 - 11 SAND, MEDIUM TO COARSE
11 - 26 SAND, COARSE

* * * *

TEST HOLE NUMBER: 200
LOCATION: 112N-56W-31ACDB
LEGAL LOCATION: NW SE SW NE SEC. 31, T. 112 N., R. 56 W.

2 - 12 GRAVEL, MEDIUM TO COARSE, SANDY
12 - 21 GRAVEL, BROWN, FINE, SILTY, SANDY
21 - 23 GRAVEL, COARSE
23 - 26 GRAVEL, BROWN, MEDIUM, CLAYEY

* * * *

TEST HOLE NUMBER: 201
LOCATION: 112N-56W-31BBAB
LEGAL LOCATION: NW NE NW NW SEC. 31, T. 112 N., R. 56 W.

11 - 45 SAND, MEDIUM TO COARSE, GRAVELLY,
SLIGHTLY CLAYEY

* * * *

TEST HOLE NUMBER: 202
LOCATION: 112N-56W-31BBBB
LEGAL LOCATION: NW NW NW NW SEC. 31, T. 112 N., R. 56 W.

2 - 17 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO FINE GRAVEL
17 - 51 GRAVEL, BROWN, MEDIUM

* * * *

TEST HOLE NUMBER: 203
LOCATION: 112N-56W-31BDCC
LEGAL LOCATION: SW SW SE NW SEC. 31, T. 112 N., R. 56 W.

6 - 11 GRAVEL AND SAND, MEDIUM TO COARSE GRAVEL,
MEDIUM TO COARSE SAND
11 - 36 SAND AND GRAVEL, COARSE

* * * *

TEST HOLE NUMBER: 204
LOCATION: 112N-56W-31CBBC
LEGAL LOCATION: SW NW NW SW SEC. 31, T. 112 N., R. 56 W.

5 - 9 SAND, BROWN, FINE TO MEDIUM
9 - 12 GRAVEL, BROWN, COARSE

* * * *

TEST HOLE NUMBER: 205
LOCATION: 112N-56W-31CDBB
LEGAL LOCATION: NW NW SE SW SEC. 31, T. 112 N., R. 56 W.

13 - 14 GRAVEL, COARSE
14 - 34 SAND, MEDIUM TO COARSE

* * * *

TEST HOLE NUMBER: 206
LOCATION: 112N-56W-31CDDC
LEGAL LOCATION: SW SE SE SW SEC. 31, T. 112 N., R. 56 W.

0 - 1 SAND, LIGHT-BROWN, SILTY; OXIDIZED, DRY
1 - 25 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
MEDIUM GRAVEL; OXIDIZED

* * * *

TEST HOLE NUMBER: 207
LOCATION: 112N-56W-31DBCC
LEGAL LOCATION: SW SW NW SE SEC. 31, T. 112 N., R. 56 W.

1 -	3	SAND, LIGHT-BROWN, GRAVELLY
3 -	5	SAND AND GRAVEL, BROWN, SILTY
5 -	18	SAND, BROWN, COARSE, GRAVELLY
18 -	23	SAND, DARK-BROWN, COARSE, GRAVELLY
23 -	27	SAND, BROWN, COARSE, SILTY

* * * *

TEST HOLE NUMBER: 208
LOCATION: 112N-56W-31DDDD
LEGAL LOCATION: SE SE SE SE SEC. 31, T. 112 N., R. 56 W.

1 -	15	GRAVEL, LIGHT-BROWN, COARSE, CLAYEY, SANDY, MODERATELY SORTED; OXIDIZED, DRY, WITH COBBLES
15 -	41	SAND, REDDISH-BROWN, COARSE, CLAYEY, MODERATELY SORTED; OXIDIZED, MOIST, SATURATED AT 21 FEET

* * * *

TEST HOLE NUMBER: 209
LOCATION: 112N-56W-31DDDD 1
LEGAL LOCATION: SE SE SE SE SEC. 31, T. 112 N., R. 56 W.

3 -	5	GRAVEL, GRAY, SILTY
5 -	24	SAND AND GRAVEL, BROWN
24 -	34	SAND, BROWN, COARSE, GRAVELLY, SILTY

* * * *

TEST HOLE NUMBER: 210
LOCATION: 112N-56W-32BBBB
LEGAL LOCATION: NW NW NW NW SEC. 32, T. 112 N., R. 56 W.

6 -	18	SAND AND GRAVEL, RED-BROWN, COARSE SAND, MEDIUM GRAVEL; OXIDIZED
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* * * *

TEST HOLE NUMBER: 211
LOCATION: 112N-56W-32BBBB 1
LEGAL LOCATION: NW NW NW NW SEC. 32, T. 112 N., R. 56 W.

7 - 11 SAND AND GRAVEL, BROWN, SILTY
11 - 18 SAND, BROWN, SILTY, CLAYEY
18 - 22 SAND, BROWN, SILTY; SOME FINE GRAVEL
22 - 25 SAND, GRAY, SILTY; SOME FINE GRAVEL

* * * *

TEST HOLE NUMBER: 212
LOCATION: 112N-56W-32BDBB
LEGAL LOCATION: NW NW SE NW SEC. 32, T. 112 N., R. 56 W.

1 - 4 SAND, BROWN, MEDIUM, PEBBLY
4 - 12 SAND, BROWN, MEDIUM TO COARSE, SILTY,
PEBBLY
12 - 18 SAND, BROWN, MEDIUM TO COARSE, PEBBLY
24 - 32 SAND, GRAY, VERY FINE, VERY SILTY

* * * *

TEST HOLE NUMBER: 213
LOCATION: 112N-56W-32BDDA
LEGAL LOCATION: NE SE SE NW SEC. 32, T. 112 N., R. 56 W.

6 - 9 SAND, BROWN, COARSE, SILTY
9 - 12 SAND, GRAY, COARSE, SILTY
12 - 13 GRAVEL, SANDY, SILTY

* * * *

TEST HOLE NUMBER: 214
LOCATION: 112N-56W-32CBBB
LEGAL LOCATION: NW NW NW SW SEC. 32, T. 112 N., R. 56 W.

1 - 20 SAND, COARSE; SOME FINE GRAVEL

* * * *

TEST HOLE NUMBER: 215
LOCATION: 112N-56W-32DDDD
LEGAL LOCATION: SE SE SE SE SEC. 32, T. 112 N., R. 56 W.

4 - 7 GRAVEL
7 - 9 SAND, MEDIUM
9 - 12 GRAVEL
12 - 45 SAND, FINE TO MEDIUM, SAMPLED AT 18 FEET

* * * *

TEST HOLE NUMBER: 216

LOCATION: 112N-57W-01CDDD

LEGAL LOCATION: SE SE SE SW SEC. 01, T. 112 N., R. 57 W.

- 1 - 5 GRAVEL, LIGHT-BROWN, CLAYEY, SANDY,
POORLY SORTED; OXIDIZED, DRY, WITH
COBBLES
- 5 - 13 SAND, REDDISH-BROWN, COARSE, CLAYEY,
MODERATELY SORTED; OXIDIZED, DRY, WITH
SMALL PEBBLES
- 15 - 32 GRAVEL, BROWN, MEDIUM TO COARSE, CLAYEY,
POORLY SORTED; SATURATED

* * * *

TEST HOLE NUMBER: 217

LOCATION: 112N-57W-02AABA

LEGAL LOCATION: NE NW NE NE SEC. 02, T. 112 N., R. 57 W.

PRELIMINARY LOG -- SUBJECT TO CHANGE

- 1 - 5 SAND, MEDIUM TO COARSE, VERY PEBBLY
- 5 - 30 SAND, MEDIUM TO COARSE, SILTY, VERY
PEBBLY; SATURATED

* * * *

TEST HOLE NUMBER: 218

LOCATION: 112N-57W-05BBBA

LEGAL LOCATION: NE NW NW NW SEC. 05, T. 112 N., R. 57 W.

- 3 - 9 SAND, RED-BROWN, MEDIUM; WELL-SORTED;
OXIDIZED, MOIST, SATURATED AT 7 FEET

* * * *

TEST HOLE NUMBER: 219

LOCATION: 112N-57W-08BAAA

LEGAL LOCATION: NE NE NE NW SEC. 08, T. 112 N., R. 57 W.

- 1 - 12 GRAVEL, LIGHT-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, DRY, WITH
COBBLES
- 12 - 28 GRAVEL, BROWN, COARSE, CLAYEY, POORLY
SORTED; PARTIALLY OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 220

LOCATION: 112N-57W-11DDDD

LEGAL LOCATION: SE SE SE SE SEC. 11, T. 112 N., R. 57 W.

16 - 18 SAND; WITH COBBLES

* * * *

TEST HOLE NUMBER: 221
LOCATION: 112N-57W-13BDCC 1
LEGAL LOCATION: SW SW SE NW SEC. 13, T. 112 N., R. 57 W.

0 - 30 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO FINE GRAVEL; OXIDIZED

* * * *

TEST HOLE NUMBER: 222
LOCATION: 112N-57W-13BDCC 2
LEGAL LOCATION: SW SW SE NW SEC. 13, T. 112 N., R. 57 W.

0 - 30 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO FINE GRAVEL; OXIDIZED

* * * *

TEST HOLE NUMBER: 223
LOCATION: 112N-57W-17ABAB
LEGAL LOCATION: NW NE NW NE SEC. 17, T. 112 N., R. 57 W.

13 - 26 GRAVEL, DARK-BROWN, COARSE, CLAYEY,
POORLY SORTED; OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 224
LOCATION: 112N-57W-17DDCD
LEGAL LOCATION: SE SW SE SE SEC. 17, T. 112 N., R. 57 W.

1 - 8 SAND, FINE, WELL-SORTED; DRY
13 - 20 SAND, GRAY, FINE, VERY SILTY; UNOXIDIZED,
SATURATED AT 13 FEET

* * * *

TEST HOLE NUMBER: 225
LOCATION: 112N-57W-25AADA
LEGAL LOCATION: NE SE NE NE SEC. 25, T. 112 N., R. 57 W.

0 - 5 GRAVEL, COARSE, SANDY
5 - 10 SAND, LIGHT-BROWN, MEDIUM, PEBBLY
10 - 15 GRAVEL, SILTY

15 - 20 SAND, COARSE, SILTY; SOME FINE GRAVEL
20 - 26 SAND, MEDIUM TO COARSE, SILTY

* * * *

TEST HOLE NUMBER: 226
LOCATION: 112N-57W-25DAAA
LEGAL LOCATION: NE NE NE SE SEC. 25, T. 112 N., R. 57 W.

5 - 8 SAND, MEDIUM, SILTY
8 - 16 SAND, BROWN, MEDIUM TO COARSE, SILTY
16 - 32 SAND, BROWN, COARSE, VERY SILTY

* * * *

TEST HOLE NUMBER: 227
LOCATION: 112N-57W-25DCCC
LEGAL LOCATION: SW SW SW SE SEC. 25, T. 112 N., R. 57 W.

4 - 11 SAND, MEDIUM TO COARSE; SOME COARSE
GRAVEL

* * * *

TEST HOLE NUMBER: 228
LOCATION: 112N-57W-28BBCB
LEGAL LOCATION: NW SW NW NW SEC. 28, T. 112 N., R. 57 W.

0 - 12 GRAVEL, BROWN, MODERATELY COARSE, SANDY,
POORLY SORTED; DRY, MOIST AT 3 FEET,
VERY COARSE 7 TO 12 FEET

* * * *

TEST HOLE NUMBER: 229
LOCATION: 112N-57W-29DAAA
LEGAL LOCATION: NE NE NE SE SEC. 29, T. 112 N., R. 57 W.

1 - 8 GRAVEL, BROWN, MEDIUM TO COARSE, VERY
SANDY; MOIST
8 - 11 SAND, BROWN, COARSE; MOIST, SOME GRAVEL

* * * *

TEST HOLE NUMBER: 230
LOCATION: 112N-57W-33CDDD
LEGAL LOCATION: SE SE SE SW SEC. 33, T. 112 N., R. 57 W.

3 - 12 GRAVEL, BROWN, COARSE, SANDY, CLAYEY;
MOIST, SATURATED AT 11 FEET
14 - 21 GRAVEL, BROWN, COARSE, SANDY, CLAYEY;
SATURATED

* * * *

TEST HOLE NUMBER: 231
LOCATION: 112N-57W-36AAAA
LEGAL LOCATION: NE NE NE NE SEC. 36, T. 112 N., R. 57 W.

3 - 18 SAND, BROWN, GRAVELLY

* * * *

TEST HOLE NUMBER: 232
LOCATION: 112N-57W-36AADD
LEGAL LOCATION: SE SE NE NE SEC. 36, T. 112 N., R. 57 W.

1 - 9 GRAVEL, VERY COARSE

* * * *

TEST HOLE NUMBER: 233
LOCATION: 112N-58W-01CCCC
LEGAL LOCATION: SE SW SW SW SEC. 01, T. 112 N., R. 58 W.
PRELIMINARY LOG -- SUBJECT TO CHANGE

1 - 3 SAND, TAN, FINE, CLAYEY, POORLY SORTED;
OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 234
LOCATION: 112N-58W-02AAAB
LEGAL LOCATION: NW NE NE NE SEC. 02, T. 112 N., R. 58 W.

5 - 7 SAND, BROWN, COARSE, SLIGHTLY CLAYEY,
MODERATELY SORTED; SATURATED AT 5 FEET
7 - 11 SAND AND GRAVEL, BROWN, COARSE SAND, FINE
GRAVEL, VERY CLAYEY; OXIDIZED

* * * *

TEST HOLE NUMBER: 235
LOCATION: 112N-58W-05CDDC
LEGAL LOCATION: SE SW SE SW SEC. 05, T. 112 N., R. 58 W.

1 - 7 SAND AND GRAVEL, LIGHT-BROWN, FINE SAND,

CLAYEY, POORLY SORTED; OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 236
LOCATION: 112N-58W-08CCDD
LEGAL LOCATION: SE SE SW SW SEC. 08, T. 112 N., R. 58 W.

1 - 6 SAND AND GRAVEL, LIGHT-BROWN, FINE SAND,
COARSE GRAVEL, PEBBLY; OXIDIZED, DRY,
COLOR CHANGES TO REDDISH-BROWN WITH
DEPTH

* * * *

TEST HOLE NUMBER: 237
LOCATION: 112N-58W-12DCDC
LEGAL LOCATION: SW SE SW SE SEC. 12, T. 112 N., R. 58 W.

6 - 7 SAND, COARSE, VERY CLAYEY, POORLY SORTED;
OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 238
LOCATION: 112N-58W-13DCCC
LEGAL LOCATION: SW SW SW SE SEC. 13, T. 112 N., R. 58 W.

1 - 5 SAND, BROWN, FINE, CLAYEY, MODERATELY
SORTED; OXIDIZED, MOIST

* * * *

TEST HOLE NUMBER: 239
LOCATION: 112N-58W-17CDCC
LEGAL LOCATION: SW SW SE SW SEC. 17, T. 112 N., R. 58 W.

0 - 3 GRAVEL, MEDIUM TO COARSE, SANDY, SUB-
ANGULAR; DRY

* * * *

TEST HOLE NUMBER: 240
LOCATION: 112N-58W-18DDDD
LEGAL LOCATION: SE SE SE SE SEC. 18, T. 112 N., R. 58 W.

0 - 4 GRAVEL, REDDISH-BROWN, MEDIUM TO COARSE,
SILTY, SANDY, POORLY SORTED,

SUBROUNDED; OXIDIZED, DRY

* * * *

TEST HOLE NUMBER: 241
LOCATION: 112N-58W-20BCCC
LEGAL LOCATION: SW SW SW NW SEC. 20, T. 112 N., R. 58 W.

7 - 9 GRAVEL, BROWN, FINE TO MEDIUM, POORLY
SORTED; SATURATED, SOME COARSE SAND
13 - 21 GRAVEL, BROWN, FINE; SATURATED, SOME
COARSE SAND

* * * *

TEST HOLE NUMBER: 242
LOCATION: 112N-58W-30ABBA
LEGAL LOCATION: NE NW NW NE SEC. 30, T. 112 N., R. 58 W.

15 - 21 GRAVEL, FINE TO MEDIUM, SILTY; SATURATED,
SOME COARSE SAND

* * * *

TEST HOLE NUMBER: 243
LOCATION: 112N-58W-30DDDD
LEGAL LOCATION: SE SE SE SE SEC. 30, T. 112 N., R. 58 W.

15 - 21 GRAVEL, BROWN, FINE, VERY CLAYEY, POORLY
SORTED; SATURATED

* * * *

TEST HOLE NUMBER: 244
LOCATION: 112N-58W-36ADDD
LEGAL LOCATION: SE SE SE NE SEC. 36, T. 112 N., R. 58 W.

10 - 20 GRAVEL, TAN, COARSE, VERY CLAYEY, POORLY
SORTED; OXIDIZED, SATURATED

* * * *

TABLE 2. List of sand and gravel pits in Kingsbury County, South Dakota, on file at Department of Transportation, Division of Highways, in Pierre, South Dakota.

EXPLANATION:

- a. Landowner and address
- b. Location - given as half and quarter sections, section number, township, and range
- c. Aggregate type
- d. Average thickness of deposits in feet
- e. Average thickness of overburden in feet

Pit 1

- a. Landowner: Gene Gruenhagen - DeSmet
- b. Location: NW 1/4 sec. 7, T. 109 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.08
- e. Overburden thickness (ft): 1.33

Pit 2

- a. Landowner: Gene Gruenhagen - DeSmet
- b. Location: W 1/2 NW 1/4 sec. 7, T. 109 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 3

- a. Landowner: Roy Bitner - DeSmet
- b. Location: E 1/2 NW 1/4 sec. 18, T. 109 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 5.4
- e. Overburden thickness (ft): 2.6

Pit 4

- a. Landowner: John O'Hara - DeSmet
- b. Location: NE 1/4 sec. 12, T. 109 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8.25
- e. Overburden thickness (ft): 1.68

Pit 5

- a. Landowner: Green and Green, Attorneys - DeSmet
- b. Location: NE 1/4 sec. 20, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 6

- a. Landowner: James Driscoll - Carthage
- b. Location: SW 1/4 NE 1/4 sec. 29, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 5.6
- e. Overburden thickness (ft): 2.3

Pit 7

- a. Landowner: Unknown
- b. Location: SW 1/4 sec. 32, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 8

- a. Landowner: Mrs. C. E. Bartlett
- b. Location: SE 1/4 sec. 32, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 9

- a. Landowner: E. J. Vanderanick - Carthage
- b. Location: NW 1/4 sec. 33, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 10

- a. Landowner: Dept. of Game, Fish & Parks - Pierre
- b. Location: SW 1/4 sec. 33, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 11

- a. Landowner: Miner County
- b. Location: SW 1/4 sec. 34, T. 109 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 12

- a. Landowner: Ethol B. Warren - DeSmet
- b. Location: SW 1/4 sec. 3, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 9.64
- e. Overburden thickness (ft): 1.37

Pit 13

- a. Landowner: Joe M. Braun - DeSmet
- b. Location: SE 1/4 sec. 3, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11.9
- e. Overburden thickness (ft): 1.8

Pit 14

- a. Landowner: Richard Halverson - DeSmet
- b. Location: NE 1/4 sec. 10, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 7.1
- e. Overburden thickness (ft): 1.4

Pit 15

- a. Landowner: Roy Johnson - DeSmet
- b. Location: SE 1/4 sec. 22, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11.2
- e. Overburden thickness (ft): 1.5

Pit 16

- a. Landowner: Ralph Schriner - DeSmet
- b. Location: SW 1/4 sec. 24, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10.4
- e. Overburden thickness (ft): 2.0

Pit 17

- a. Landowner: Dale C. Johnson and Ralph Schriner - DeSmet
- b. Location: SW 1/4 sec. 26, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8.2
- e. Overburden thickness (ft): 1.9

Pit 18

- a. Landowner: Elmer Forsburg - DeSmet
- b. Location: SE 1/4 sec. 26, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 7.13
- e. Overburden thickness (ft): 1.13

Pit 19

- a. Landowner: O. C. Johnson - DeSmet
- b. Location: NE 1/4 sec. 35, T. 110 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 20

- a. Landowner: Unknown
- b. Location: NW 1/4 sec. 5, T. 110 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 21

- a. Landowner: LaVerve Converse - Badger
- b. Location: NW 1/4 sec. 3, T. 111 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11.7
- e. Overburden thickness (ft): 4.3

Pit 22

- a. Landowner: Selmer Stenson - Badger
- b. Location: E 1/2 SW 1/4 sec. 9, T. 111 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.29
- e. Overburden thickness (ft): 2.66

Pit 23

- a. Landowner: Kingsbury County
- b. Location: NW 1/4 sec. 10, T. 111 N., R. 53 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 24

- a. Landowner: Unknown
- b. Location: NW 1/4 sec. 3, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 25

- a. Landowner: Unknown
- b. Location: NE 1/4 SE 1/4 sec. 4, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel and sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 26

- a. Landowner: Elmer Stubbe - DeSmet
- b. Location: NW 1/4 sec. 5, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 12.0
- e. Overburden thickness (ft): 1.11

Pit 27

- a. Landowner: Charles Cummings - DeSmet
- b. Location: NE 1/4 sec. 21, T. 111 N., R. 56 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 28

- a. Landowner: Robert Cummings - DeSmet
- b. Location: NW 1/4 sec. 21, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 12.6
- e. Overburden thickness (ft): 1.3

Pit 29

- a. Landowner: Kingsbury County
- b. Location: NE 1/4 sec. 28, T. 111 N., R. 56 W.
- c. Aggregate type: Sand and gravel
- d. Deposit thickness (ft): 8.1
- e. Overburden thickness (ft): 2.8

Pit 30

- a. Landowner: Kingsbury County
- b. Location: NE 1/4 sec. 28, T. 111 N., R. 56 W.
- c. Aggregate type: Sand and gravel
- d. Deposit thickness (ft): 7.0
- e. Overburden thickness (ft): 2.0

Pit 31

- a. Landowner: Andy Close - DeSmet
- b. Location: NW 1/4 sec. 28, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8.8
- e. Overburden thickness (ft): 2.0

Pit 32

- a. Landowner: Jarvis Wallum - DeSmet
- b. Location: NW 1/4 sec. 28, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 14.0
- e. Overburden thickness (ft): 2.0

Pit 33

- a. Landowner: Unknown
- b. Location: NE 1/4 SE 1/4 sec. 28, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 34

- a. Landowner: Cyril (Vaughan) Johnson - DeSmet
- b. Location: NW 1/4 sec. 30, T. 111 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 35

- a. Landowner: Lloyd Halverson - DeSmet
- b. Location: SW 1/4 NW 1/4 sec. 35, T. 111 N., R. 56 W.
- c. Aggregate type: Clay
- d. Deposit thickness (ft): 5.0
- e. Overburden thickness (ft): 0.8

Pit 36

- a. Landowner: LaVerve Converse - Badger
- b. Location: SW 1/4 sec. 34, T. 112 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 37

- a. Landowner: Donald Smith - Badger
- b. Location: E 1/2 NE 1/4 sec. 9, T. 112 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 5.9+
- e. Overburden thickness (ft): 3.2

Pit 38

- a. Landowner: Donald Smith - Badger
- b. Location: SW 1/4 NE 1/4 sec. 9, T. 112 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 39

- a. Landowner: Mrs. Minnie Mohres - Erwin
- b. Location: NW 1/4 NE 1/4 sec. 10, T. 112 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10.15
- e. Overburden thickness (ft): 2.3

Pit 40

- a. Landowner: Mrs. Mary Stolpe - Erwin
- b. Location: NW 1/4 sec. 10, T. 112 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10.0
- e. Overburden thickness (ft): 4.0

Pit 41

- a. Landowner: Cyril Vaughan - Brookings
- b. Location: NW 1/4 sec. 30, T. 112 N., R. 56 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 42

- a. Landowner: Oliver Seefeldt - DeSmet
- b. Location: SW 1/4 sec. 12, T. 112 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 7.9
- e. Overburden thickness (ft): 1.7

Pit 43

- a. Landowner: Otto Poppen
- b. Location: NW 1/4 sec. 13, T. 112 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 44

- a. Landowner: Harold Stemple - Lake Benton, Minnesota
- b. Location: W 1/2 NE 1/4 sec. 17, T. 112 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 45

- a. Landowner: Shermon Williams - DeSmet
- b. Location: W 1/2 NW 1/4 sec. 35, T. 112 N., R. 57 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 46

- a. Landowner: A. M. Wibur - Brookings
- b. Location: SE 1/4 SE 1/4 sec. 18, T. 112 N., R. 58 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----



Good probability of finding sand or gravel deposits.



Fair probability of finding sand or gravel deposits.



Poor probability of finding sand or gravel

Letters A through I designate areas described in the text.

- 117. Test hole containing sand or gravel within 25 feet of the land surface with 0-5 feet of overburden.
 - 118. Test hole containing sand or gravel within 25 feet of the land surface with greater than 5 feet of overburden.
- } Number refers to table 1.

- o Test hole containing no sand or gravel within 25 feet of the land surface.

(7)✕ Sand and gravel pits--those with a number are listed in Table 2.



Index map of South Dakota showing location of Kingsbury County

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Sectionized township

Map showing test holes, sand and gravel pits, and sand and gravel deposits in Kingsbury County.

