United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

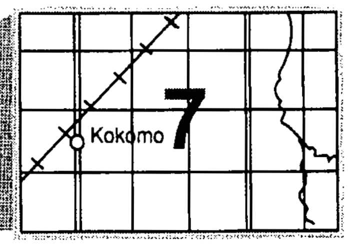
Soil Survey of Woodford County, Illinois

How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

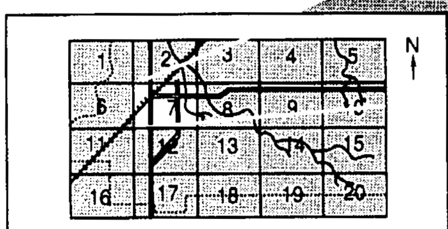
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.



MAP SHEET

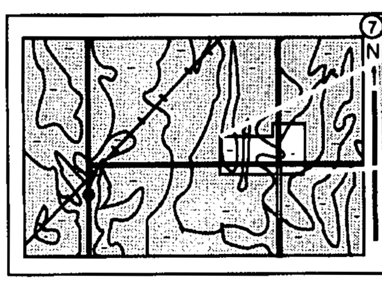
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

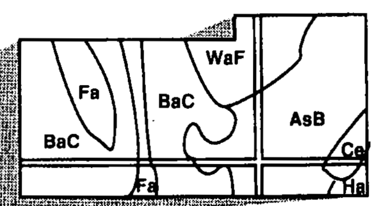


INDEX TO MAP SHEETS

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

Locate your area of interest on the map sheet. Note the map units symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1992. Soil names and descriptions were approved in 1993. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1992. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Woodford County Soil and Water Conservation District. The Woodford County Board and the Illinois Department of Agriculture provided financial assistance.

This soil survey is Illinois Agricultural Experiment Station Soil Report 143.

Cover: Harvested corn in an area of Ross silt loam, occasionally flooded. The trees in the background are in an area of Miami-Hennepin complex, 25 to 35 percent slopes.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Issued 1999

Foreword

This soil survey contains information that can be used in land-planning programs in Woodford County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

William J. Gradle
State Conservationist
Natural Resources Conservation Service

Soil Survey of Woodford County, Illinois

By William M. Teater, Natural Resources Conservation Service

Soils surveyed by L.L. Merkel, W.M. Teater, and T.R. Ziegler, Natural Resources Conservation Service, and L.L. Gramm, J.K. Hornickel, D.E. Liniger, and S.W. Wegman, Woodford County Soil and Water Conservation District

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Illinois Agricultural Experiment Station

WOODFORD COUNTY is in central Illinois (fig. 1). It has an area of 347,410 acres, or about 543 square miles. It is bordered on the north by Marshall and La Salle Counties, on the east by Livingston County, on the south by McLean and Tazewell Counties, and on the west by the Illinois River. In 1990, the population of the county was 32,653. Eureka, the county seat, had a population of 4,435 (Woodford County Sesquicentennial History Committee, 1968).

This soil survey updates the survey of Woodford County published in 1927 (Smith and others, 1927) and the survey of the Tri-County area published in 1972 (Hudelson and Bushue, 1972). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides general information about Woodford County. It describes history and development, transportation facilities, and climate.

History and Development

The survey area at one time was characterized by large herds of buffalo. The original inhabitants were the Potawatomi, Fox, Sac, and Ottawa tribes. The Indians were primarily hunters and gatherers. The first European settlement in the county was established in the fall of 1822 near the Illinois River in what is now Spring Bay Township. Many of the later settlers built along Partridge and Walnut Creeks, where the land was being offered by the government at $1.25 an acre (Woodford County Sesquicentennial History Committee, 1968).

The county was organized in 1841 under the supervision of Thomas Bullock and was annexed from parts of Livingston, McLean, and Tazewell Counties. It was named for Woodford County, Kentucky, the previous home of Mr. Bullock. The first county seat was in Versailles, which was 3 miles south and east of the present-day courthouse in Eureka. In 1843, the county seat was moved to Hanover, which was later renamed Metamora (Le Baron, 1878). It remained there until 1896, when it was moved to its present location in Eureka (Drury, 1955).

Throughout the development of Woodford County, agriculture has been the main industry. The 1990 census reported 1,103 farms, making up approximately 298,270 acres. The principal crops were corn, 127,400 acres; soybeans, 105,000 acres; wheat, 5,400 acres; and hay, 15,700 acres. Livestock production included 16,900 head of cattle, 97,400 head of hogs, and 4,000 head of sheep (Illinois Agricultural Statistics, 1989).

Another important land use in Woodford County is the County Public Hunting and Fishing Grounds, which is an area of almost 3,000 acres used for duck hunting and fishing. It is near the north end of Peoria Lake.

Transportation Facilities

The county's transportation system includes stretches of two Interstate highways, three Federal

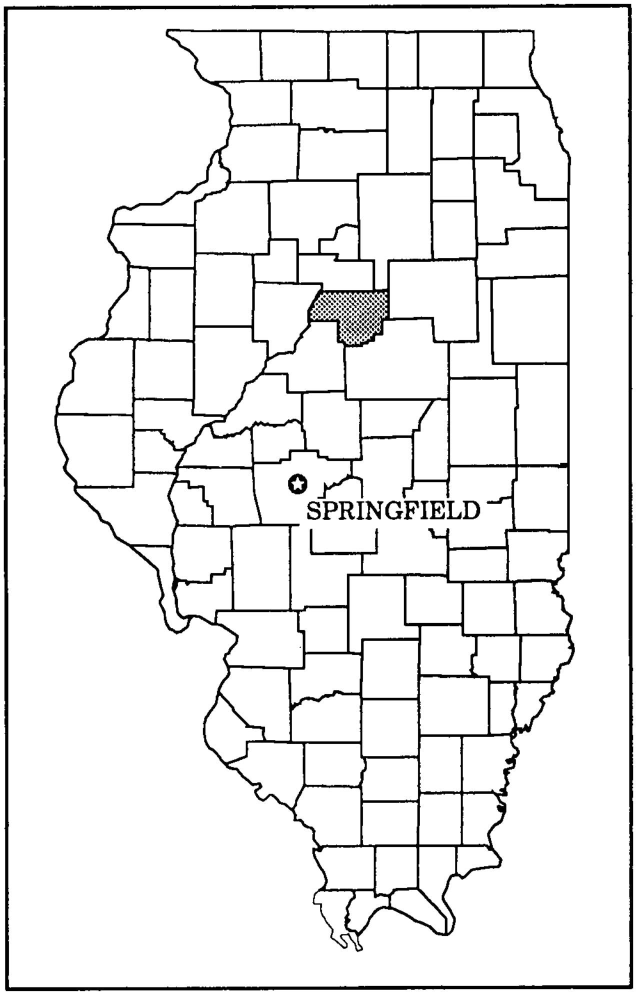


Figure 1.—Location of Woodford County in Illinois.

routes, five State routes, and various county highways and roads. The Illinois River accommodates recreational boating. By the late 1800's, there were four railroad systems in the county; by the early 1990's, however, only two railroads were in operation.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Minonk in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 25 degrees F and the average daily minimum temperature is 16 degrees. The lowest temperature on record, which occurred at Minonk on February 13, 1905, is -28 degrees. In summer, the average temperature is 72 degrees and the average daily maximum temperature is 85 degrees. The highest recorded temperature, which occurred at Minonk on July 15, 1936, is 111 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 36.70 inches. Of this, 21.99 inches, or 60 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall on record was 5.01 inches at Minonk on August 3, 1943. Thunderstorms occur on about 48 days each year, and most occur in June.

The average seasonal snowfall is 27.5 inches. The greatest snow depth at any one time during the period of record was 23 inches. On the average, 8 days of the year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 12 inches.

The average relative humidity in midafternoon is about 61 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 67 percent of the time possible in summer and 46 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 12 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Nearly Level to Moderately Sloping, Poorly Drained to Moderately Well Drained Soils on Uplands

1. Ipava-Sable-Tama Association

Nearly level to gently sloping, poorly drained to moderately well drained, silty soils that formed in loess

This association makes up 21 percent of the county. It is about 43 percent Ipava soils, 36 percent Sable soils, 9 percent Tama soils, and 12 percent soils of minor extent (fig. 2).

The somewhat poorly drained Ipava soils are above the Sable soils and below the Tama soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 9 inches—black silt loam

Subsurface layer:
9 to 14 inches—black silty clay loam

Subsoil:
14 to 27 inches—brown silty clay loam
27 to 45 inches—light olive brown silt loam
45 to 52 inches—mottled light olive brown and light brownish gray silt loam

Substratum:
52 to 60 inches—mottled light olive brown and light brownish gray silt loam

The poorly drained Sable soils are in landscape positions below those of the Ipava and Tama soils. The typical profile is as follows:

Surface layer:
0 to 16 inches—black silty clay loam

Subsoil:
16 to 33 inches—grayish brown silty clay loam
33 to 45 inches—grayish brown silt loam

Substratum:
45 to 60 inches—light gray silt loam

The moderately well drained Tama soils are in landscape positions above those of the Sable and Ipava soils. The typical profile is as follows:

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 31 inches—dark yellowish brown silty clay loam
31 to 53 inches—yellowish brown silt loam

Substratum:
53 to 70 inches—yellowish brown silt loam

Of minor extent in this association are Catlin, Elkhart, Peotone, and Sawmill soils. The moderately well drained Elkhart and Catlin soils are in landscape positions similar to those of the Tama soils and above those of the Sable and Ipava soils. The poorly drained Peotone and Sawmill soils are below the Ipava, Sable, and Tama soils on the landscape.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

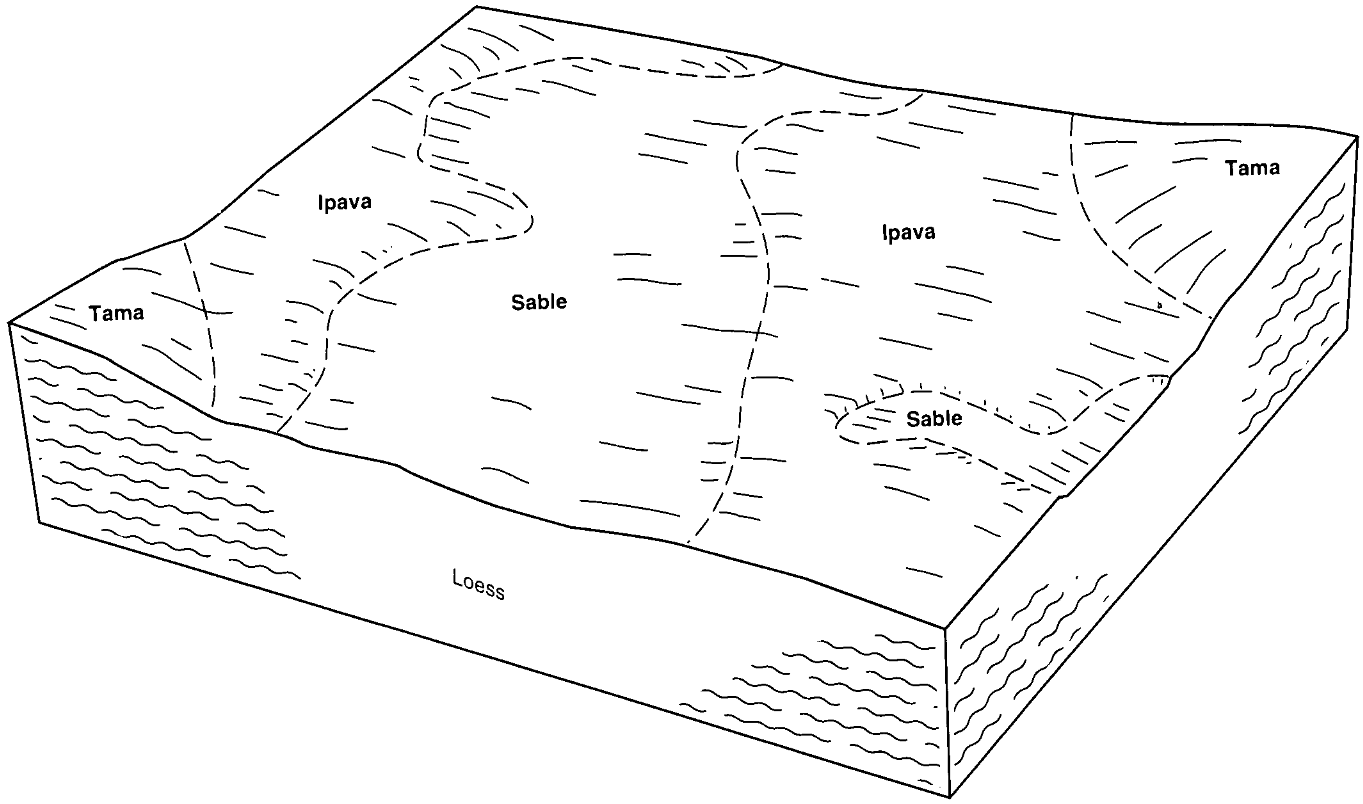


Figure 2.—Typical pattern of soils and parent material in the Ipava-Sable-Tama association.

2. Harco-Sable-Elkhart Association

Nearly level to gently sloping, poorly drained to moderately well drained, silty soils that formed in loess

This association makes up 3 percent of the county. It is about 49 percent Harco soils, 30 percent Sable soils, 11 percent Elkhart soils, and 10 percent soils of minor extent.

The somewhat poorly drained Harco soils are above the Sable soils and below the Elkhart soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 11 inches—black silty clay loam

Subsurface layer:
11 to 15 inches—dark brown silty clay loam

Subsoil:
15 to 34 inches—brown silty clay loam
34 to 40 inches—brown silt loam
40 to 60 inches—yellowish brown silt loam

The poorly drained Sable soils are in landscape positions below those of the Harco and Tama soils. The typical profile is as follows:

Surface layer:
0 to 16 inches—black silty clay loam

Subsoil:
16 to 33 inches—grayish brown silty clay loam
33 to 45 inches—grayish brown silt loam

Substratum:
45 to 60 inches—light gray silt loam

The moderately well drained Elkhart soils are in landscape positions above those of the Sable and Harco soils. The typical profile is as follows:

Surface layer:
0 to 9 inches—black silt loam

Subsurface layer:
9 to 13 inches—very dark brown silty clay loam

Subsoil:
13 to 22 inches—dark yellowish brown silty clay loam
22 to 37 inches—yellowish brown silty clay loam
37 to 52 inches—yellowish brown silt loam

Substratum:
52 to 60 inches—yellowish brown silt loam

Of minor extent in this association are Catlin, Harpster, Ipava, Sawmill, and Tama soils. The moderately well drained Catlin and Tama soils are in landscape positions similar to those of the Elkhart soils and are above the Sable and Harco soils on the landscape. The poorly drained Harpster and Sawmill soils are below the Harco, Sable, and Elkhart soils on the landscape. Ipava soils are in landscape positions similar to those of the Harco soils, below those of the Elkhart soils, and above those of the Sable soils.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

3. Streator-Rutland-Wenona Association

Nearly level to moderately sloping, poorly drained to moderately well drained, silty and clayey soils that formed in loess and in the underlying silty clay till

This association makes up 10 percent of the county. It is about 49 percent Streator soils, 23 percent Rutland soils, 11 percent Wenona soils, and 17 percent soils of minor extent.

The poorly drained Streator soils are in landscape positions below those of the Rutland and Wenona soils. The typical profile is as follows:

Surface layer:
0 to 7 inches—black silty clay loam

Subsurface layer:
7 to 13 inches—very dark gray silty clay loam

Subsoil:
13 to 43 inches—grayish brown silty clay loam
43 to 47 inches—grayish brown silty clay

Substratum:
47 to 60 inches—grayish brown silty clay

The somewhat poorly drained Rutland soils are above the Streator soils and below the Wenona soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 14 inches—black silty clay loam

Subsoil:
14 to 20 inches—brown silty clay
20 to 36 inches—olive brown silty clay loam
36 to 44 inches—mottled yellowish brown and light brownish gray silt loam
44 to 52 inches—olive brown silty clay

Substratum:
52 to 60 inches—olive brown clay

The moderately well drained Wenona soils are in landscape positions above those of the Streator and Rutland soils. The typical profile is as follows:

Surface layer:
0 to 9 inches—very dark grayish brown silt loam

Subsoil:
9 to 14 inches—brown silty clay loam
14 to 19 inches—dark yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam
29 to 42 inches—yellowish brown silt loam
42 to 52 inches—olive brown silty clay

Substratum:
52 to 60 inches—olive brown silty clay

Of minor extent in this association are Chatsworth, Peotone, and Swygert soils. The moderately well drained Chatsworth soils are above the Rutland, Streator, and Wenona soils on the landscape. The very poorly drained Peotone soils are below the Rutland, Streator, and Wenona soils on the landscape. The somewhat poorly drained Swygert soils are in landscape positions similar to those of the Rutland soils, below those of the Wenona soils, and above those of the Streator soils.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

4. Chenoa-Elpaso-Graymont Association

Nearly level to moderately sloping, poorly drained to moderately well drained, silty and clayey soils that formed in loess and in the underlying silty clay loam till

This association makes up 18 percent of the county. It is about 40 percent Chenoa soils, 27 percent Elpaso soils, 15 percent Graymont soils, and 18 percent soils of minor extent.

The somewhat poorly drained Chenoa soils are above the Elpaso soils and below the Graymont soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 14 inches—black silty clay loam

Subsoil:
14 to 25 inches—olive brown silty clay
25 to 34 inches—olive brown silty clay loam
34 to 40 inches—light olive brown silty clay loam
40 to 49 inches—olive brown silty clay loam

Substratum:
49 to 70 inches—olive brown silty clay loam

The poorly drained Elpaso soils are below the Chenoa and Graymont soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 7 inches—very dark gray silty clay loam

Subsurface layer:
7 to 21 inches—black silty clay loam

Subsoil:
21 to 44 inches—dark grayish brown silty clay loam
44 to 53 inches—dark grayish brown silt loam
53 to 69 inches—dark grayish brown and olive brown silty clay loam

Substratum:
69 to 80 inches—olive brown silty clay loam

The moderately well drained Graymont soils are above the Elpaso and Chenoa soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 14 inches—brown silty clay loam
14 to 18 inches—dark yellowish brown silty clay loam
18 to 25 inches—yellowish brown silty clay
25 to 34 inches—yellowish brown silty clay loam
34 to 46 inches—olive brown silty clay loam
46 to 58 inches—light olive brown silty clay loam

Substratum:
58 to 60 inches—light olive brown silty clay loam

Of minor extent in this association are Catlin, Drummer, and Varna soils. The moderately well drained Catlin and Varna soils are in landscape positions similar to those of the Graymont soils and above those of the Elpaso and Chenoa soils. The poorly drained Drummer soils are in landscape positions similar to those of the Elpaso soils and below those of the Chenoa and Graymont soils.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

5. Drummer-Flanagan Association

Nearly level to gently sloping, poorly drained and somewhat poorly drained, silty soils that formed in outwash or that formed in loess and in the underlying silty clay loam or silt loam till

This association makes up 12 percent of the county. It is about 41 percent Drummer soils, 41 percent Flanagan soils, and 18 percent soils of minor extent.

The poorly drained Drummer soils are below the Flanagan soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 11 inches—black silty clay loam

Subsoil:
11 to 32 inches—dark grayish brown silty clay loam
32 to 47 inches—grayish brown silty clay loam
47 to 57 inches—mottled light olive gray and yellowish brown, stratified silt loam and loam

Substratum:
57 to 70 inches—mottled light olive gray and yellowish brown, stratified loam and sandy loam

The somewhat poorly drained Flanagan soils are above the Drummer soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 18 inches—black silt loam

Subsoil:
18 to 38 inches—olive brown silty clay loam
38 to 59 inches—light olive brown silt loam

Substratum:
59 to 65 inches—light olive brown silt loam

Of minor extent in this association are Catlin, Graymont, Peotone, and Saybrook soils. The moderately well drained Catlin, Graymont, and Saybrook soils are in landscape positions above those of the Drummer and Flanagan soils. The very poorly drained Peotone soils are below the Drummer and Flanagan soils on the landscape.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

6. Saybrook-Catlin-Tama Association

Nearly level to moderately sloping, somewhat poorly drained and moderately well drained, silty soils that formed in loess and in the underlying silt loam till

This association makes up 4 percent of the county. It is about 27 percent Saybrook soils, 23 percent Catlin soils, 12 percent Tama soils, and 38 percent soils of minor extent (fig. 3).

The moderately well drained Saybrook soils are in landscape positions similar to those of the Catlin and Tama soils. The typical profile is as follows:

Surface layer:
0 to 7 inches—very dark grayish brown silt loam

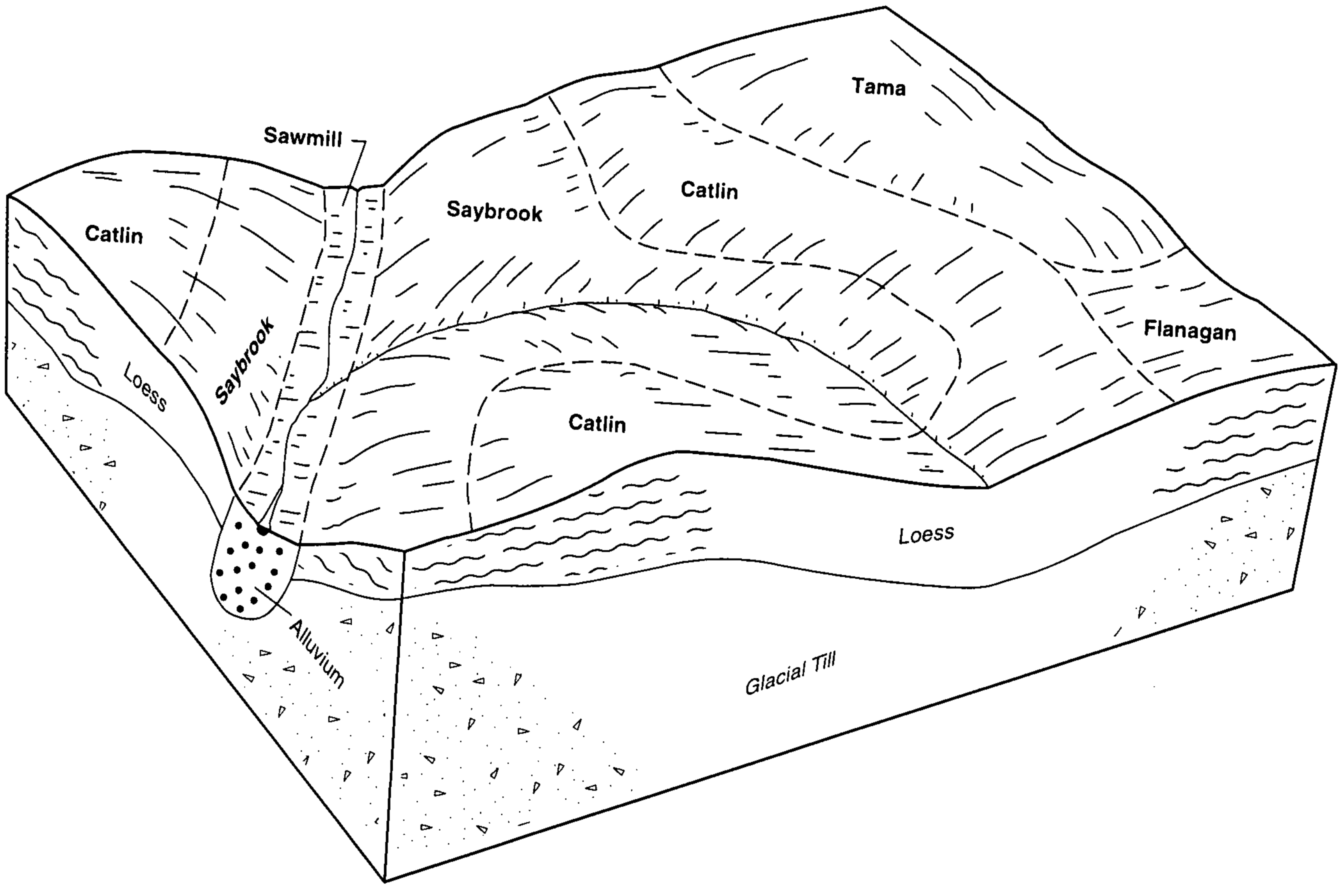


Figure 3.—Typical pattern of soils and parent material in the Saybrook-Catlin-Tama association.

Subsoil:
7 to 17 inches—brown silty clay loam
17 to 26 inches—dark yellowish brown silt loam
26 to 30 inches—yellowish brown silt loam
30 to 42 inches—light olive brown silt loam

Substratum:
42 to 60 inches—light olive brown silt loam

The moderately well drained Catlin soils are in landscape positions similar to those of the Tama and Saybrook soils. The typical profile is as follows:

Surface layer:
0 to 10 inches—very dark brown silt loam

Subsurface layer:
10 to 18 inches—very dark grayish brown silt loam

Subsoil:
18 to 26 inches—dark yellowish brown silty clay loam
26 to 40 inches—yellowish brown silty clay loam
40 to 50 inches—yellowish brown silt loam
50 to 55 inches—light olive brown silty clay loam

Substratum:
55 to 65 inches—light olive brown silty clay loam

The moderately well drained Tama soils are in landscape positions similar to those of the Catlin and Saybrook soils. The typical profile is as follows:

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 31 inches—dark yellowish brown silty clay loam
31 to 53 inches—yellowish brown silt loam

Substratum:
53 to 70 inches—yellowish brown silt loam

Of minor extent in this association are Flanagan, Ipava, Lawson, Radford, and Sawmill soils. The somewhat poorly drained Flanagan, Ipava, Lawson, and Radford soils and the poorly drained Sawmill soils are below the Saybrook, Catlin, and Tama soils on the landscape. Lawson, Radford, and Sawmill soils are also on flood plains.

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

Nearly Level to Very Steep, Somewhat Poorly Drained to Well Drained Soils on Uplands

7. Keomah-Rozetta Association

Nearly level to gently sloping, somewhat poorly drained and moderately well drained, silty soils that formed in loess or that formed in loess and in the underlying silty clay loam or silt loam till

This association makes up 9 percent of the county. It is about 41 percent Keomah soils, 37 percent Rozetta soils, and 22 percent soils of minor extent (fig. 4).

The somewhat poorly drained Keomah soils are below the Rozetta soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 9 inches—dark grayish brown silt loam

Subsurface layer:
9 to 15 inches—dark grayish brown silt loam

Subsoil:
15 to 24 inches—brown silty clay
24 to 32 inches—grayish brown silty clay loam
32 to 49 inches—mottled light olive gray and yellowish brown silt loam

Substratum:
49 to 60 inches—mottled light olive gray and brownish yellow silt loam

The moderately well drained Rozetta soils are above the Keomah soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 10 inches—yellowish brown silty clay loam
10 to 20 inches—dark yellowish brown silty clay loam

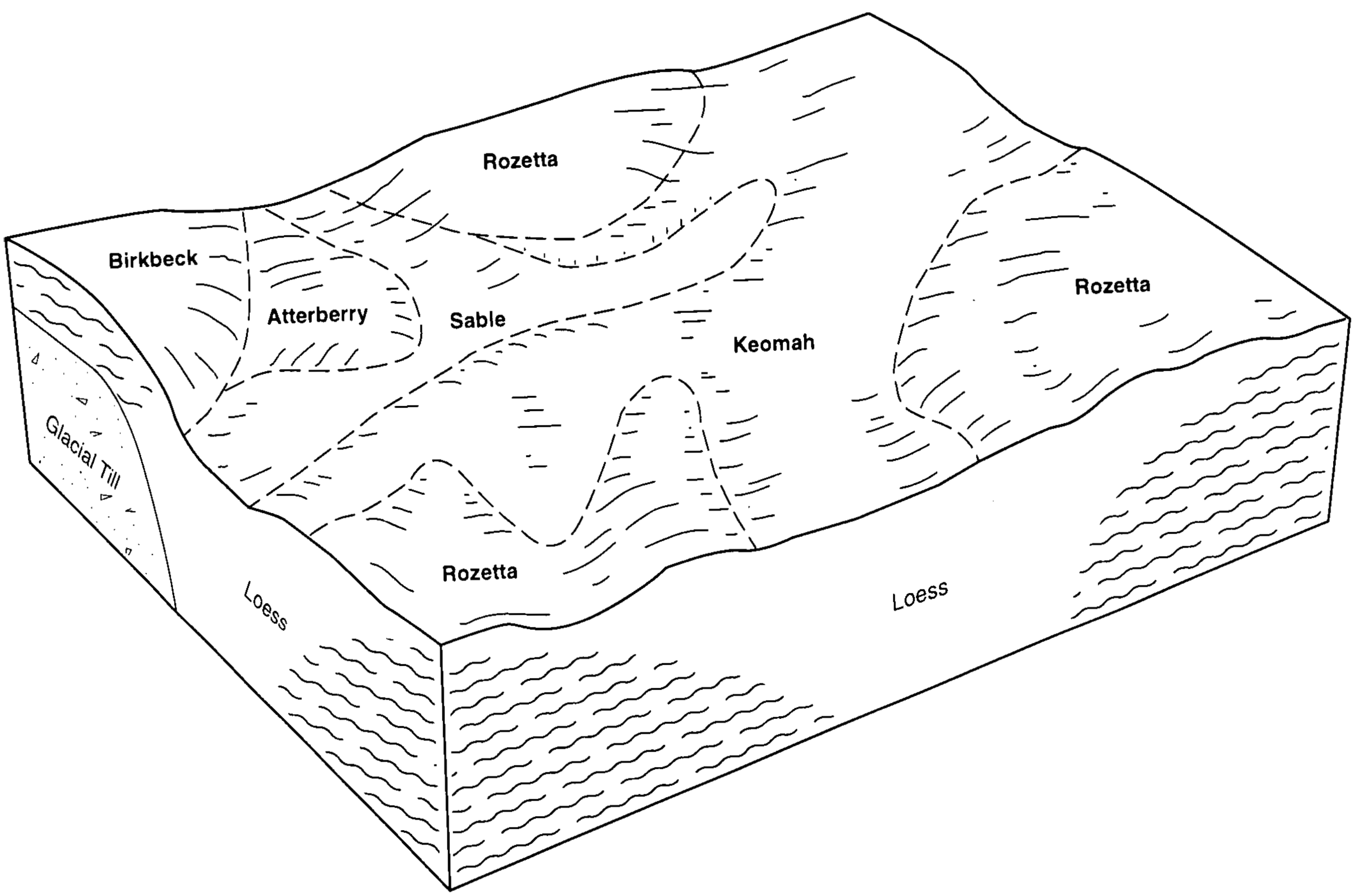


Figure 4.—Typical pattern of soils and parent material in the Keomah-Rozetta association.

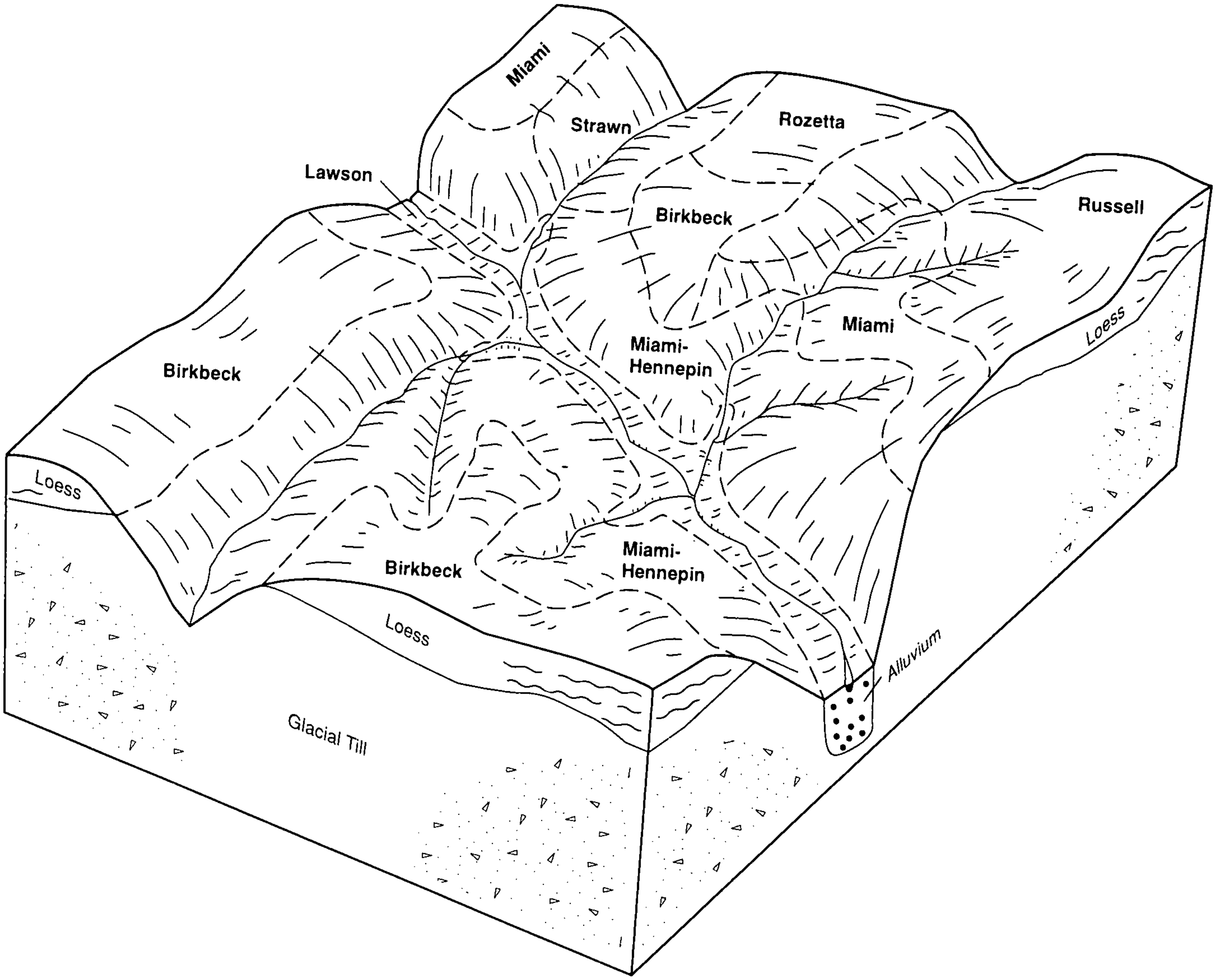


Figure 5.—Typical pattern of soils and parent material in the Miami-Birkbeck-Hennepin association.

20 to 31 inches—yellowish brown silty clay loam
31 to 43 inches—yellowish brown silt loam
43 to 52 inches—light olive brown silt loam

Substratum:
52 to 60 inches—light olive brown silt loam

Of minor extent in this association are Atterberry, Birkbeck, Hennepin, Miami, and Sable soils. The somewhat poorly drained Atterberry soils are in landscape positions similar to those of the Keomah soils and below those of the Rozetta soils. The moderately well drained Birkbeck soils, the well drained Hennepin and Miami soils, and the poorly drained Sable soils are in landscape positions below those of the Keomah and Rozetta soils.

Most areas of this association are cultivated. The soils are well suited to the crops commonly grown in the county.

8. Miami-Birkbeck-Hennepin Association

Moderately sloping to very steep, well drained and moderately well drained, silty and loamy soils that formed in till or that formed in loess and in the underlying till

This association makes up 15 percent of the county. It is about 30 percent Miami soils, 23 percent Birkbeck soils, 19 percent Hennepin soils, and 28 percent soils of minor extent (fig. 5).

The well drained Miami soils are in landscape positions below those of the Birkbeck soils and similar to those of the Hennepin soils. The typical profile is as follows:

Surface layer:
0 to 9 inches—dark brown silty clay loam

Subsoil:
9 to 16 inches—dark yellowish brown silty clay loam
16 to 22 inches—olive brown silty clay loam
22 to 42 inches—light olive brown clay loam

Substratum:
42 to 60 inches—light olive brown silt loam

The moderately well drained Birkbeck soils are above the Miami and Hennepin soils on the landscape. The typical profile is as follows:

Surface layer:
0 to 9 inches—brown silty clay loam

Subsoil:
9 to 60 inches—yellowish brown silty clay loam

The well drained Hennepin soils are in landscape positions below those of the Birkbeck soils and similar to those of the Miami soils. The typical profile is as follows:

Surface layer:
0 to 3 inches—dark brown silt loam

Subsoil:
3 to 6 inches—dark yellowish brown silty clay loam
6 to 9 inches—dark yellowish brown clay loam
9 to 15 inches—yellowish brown clay loam
15 to 24 inches—yellowish brown loam

Substratum:
24 to 60 inches—yellowish brown loam

Of minor extent in this association are Lawson, Morley, Rozetta, Russell, and Strawn soils. The somewhat poorly drained Lawson soils are on flood plains below the Miami, Birkbeck, and Hennepin soils. The moderately well drained Morley and well drained Russell and Strawn soils are in landscape positions below those of the Birkbeck soils. They are commonly above the Miami and Hennepin soils on the landscape. The moderately well drained Rozetta soils are in landscape positions above those of the Miami, Birkbeck, and Hennepin soils.

Most areas of this association consist of woodland, pasture, or cropland.

Nearly Level, Poorly Drained, Somewhat Poorly Drained, and Well Drained Soils on Flood Plains

9. Ross-Lawson-Sawmill Association

Nearly level, poorly drained, somewhat poorly drained, and well drained, silty soils that formed in alluvium

This association makes up 4 percent of the county. It is about 32 percent Ross soils, 30 percent Lawson soils, 10 percent Sawmill soils, and 28 percent soils of minor extent.

The well drained Ross soils are in landscape positions similar to those of the Sawmill and Lawson soils. The typical profile is as follows:

Surface layer:
0 to 9 inches—dark brown silt loam

Subsurface layer:
9 to 19 inches—dark brown and brown, stratified silt loam

Subsoil:
19 to 30 inches—very dark grayish brown loam
30 to 39 inches—dark brown loam
39 to 50 inches—dark yellowish brown loam
50 to 60 inches—brown sandy loam

The somewhat poorly drained Lawson soils are in landscape positions similar to those of the Sawmill and Ross soils. The typical profile is as follows:

Surface layer:
0 to 22 inches—black silt loam

Subsurface layer:
22 to 40 inches—very dark grayish brown silt loam

Subsoil:
40 to 48 inches—brown silt loam
48 to 54 inches—dark yellowish brown loam

Substratum:
54 to 60 inches—brown, stratified sandy loam and loamy sand

The poorly drained Sawmill soils are in landscape positions similar to those of the Lawson and Ross soils. The typical profile is as follows:

Surface layer:
0 to 21 inches—black silty clay loam

Subsurface layer:
21 to 26 inches—very dark gray silty clay loam

Subsoil:
26 to 58 inches—light olive gray silty clay loam

Figure 6.—Areas of the Slacwater-Raveenwash association are frequently flooded by the Illinois River.

Substratum:
58 to 60 inches—light olive gray loam

Of minor extent in this association are Camden, Landes, Martinsville, and St. Charles soils. The well drained Camden, Martinsville, and St. Charles soils are above the Ross, Lawson, and Sawmill soils on the landscape. The well drained Landes soils are in landscape positions similar to those of the Ross, Lawson, and Sawmill soils.

Most areas of this association are cultivated. The soils are well suited to the crops commonly grown in the county.

10. Slacwater-Raveenwash Association

Nearly level, poorly drained and somewhat poorly drained, silty soils that formed in alluvium

This association makes up 2 percent of the county. It is about 49 percent Slacwater soils, 23 percent Raveenwash soils, and 28 percent soils of minor extent.

The poorly drained Slacwater soils are in landscape positions similar to those of the Raveenwash soils. They are adjacent to Peoria Lake. The typical profile is as follows:

Surface layer:
0 to 6 inches—very dark grayish brown and dark grayish brown silt loam

Substratum:
6 to 15 inches—dark grayish brown and light brownish gray silt loam
15 to 22 inches—grayish brown, pale olive, and light olive brown silt loam
22 to 60 inches—olive gray, pale olive, and light olive brown silty clay loam

The somewhat poorly drained Raveenwash soils are in landscape positions similar to those of the

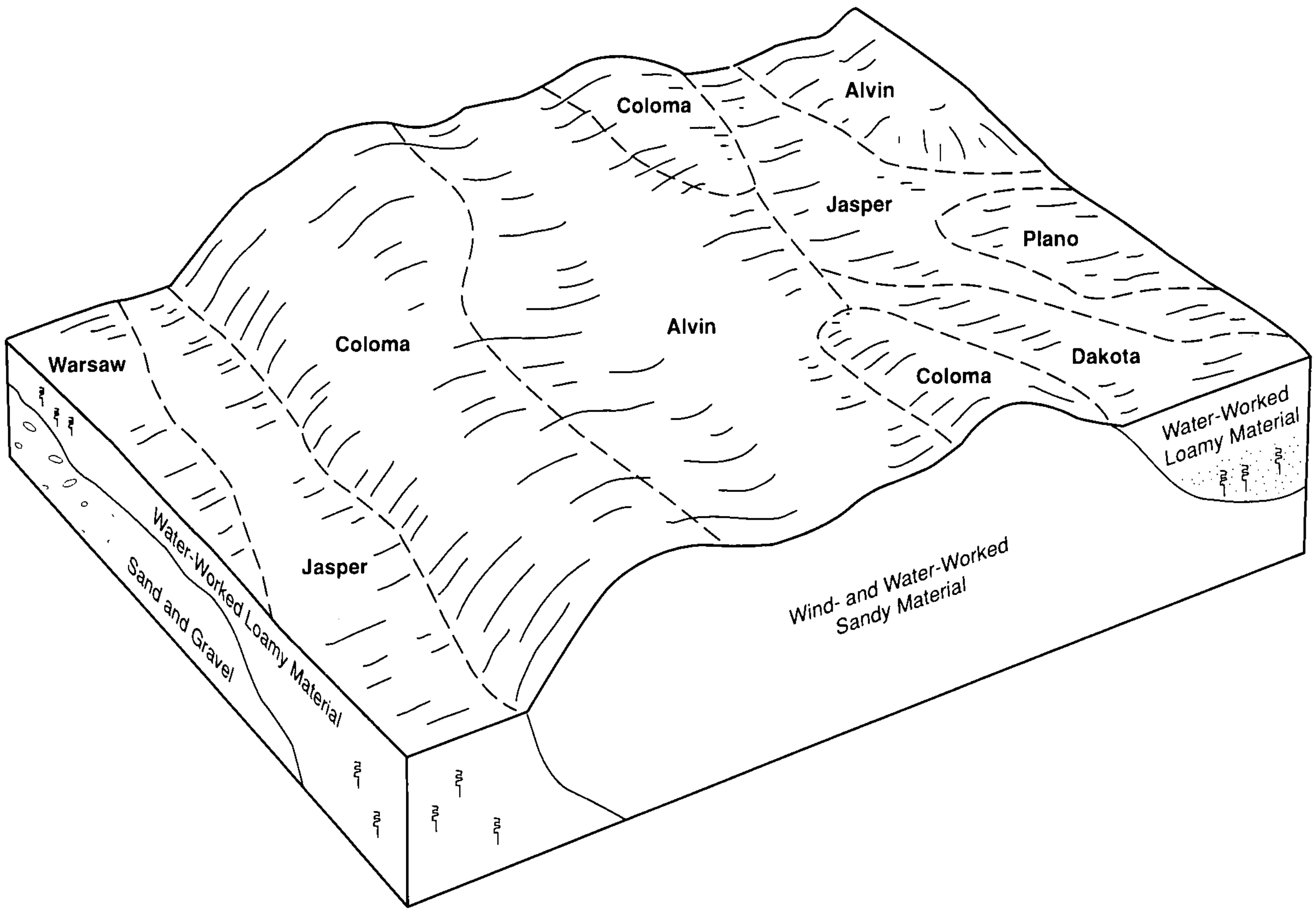


Figure 7.—Typical pattern of soils and parent material in the Alvin-Coloma-Jasper association.

Slacwater soils but are farther from Peoria Lake. The typical profile is as follows:

Surface layer:
0 to 6 inches—brown silt loam

Substratum:
6 to 17 inches—brown and dark brown silt loam with strata of very fine sandy loam
17 to 27 inches—yellowish brown and brown loam with strata of fine sand
27 to 34 inches—brown and dark grayish brown loam with strata of sandy loam
34 to 45 inches—dark grayish brown loam and dark yellowish brown sandy loam
45 to 60 inches—yellowish brown, brown, and grayish brown, stratified sand, sandy loam, and silt loam

Of minor extent in this association are Calco, Palms, and Sarpy soils. The poorly drained Calco soils are in landscape positions similar to those of the Slacwater and Raveenwash soils and are commonly adjacent to creeks in areas where they leave the Illinois River bluffs. The poorly drained Palms soils are in landscape positions similar to those of the Slacwater and Raveenwash soils and are adjacent to the Illinois River bluffs. The excessively drained Sarpy soils are in landscape positions similar to those of the Slacwater and Raveenwash soils and are commonly near the mouths of creeks draining into the Illinois River (fig. 6).

Most areas are cultivated. The soils are well suited to the crops commonly grown in the county.

Nearly Level to Strongly Sloping, Well Drained and Excessively Drained Soils on Stream Terraces

11. Alvin-Coloma-Jasper Association

Nearly level to steep, well drained and excessively *drained, loamy and sandy soils that formed in outwash*

This association makes up 2 percent of the county. It is about 20 percent Alvin soils, 20 percent Coloma soils, 14 percent Jasper soils, and 46 percent soils of minor extent (fig. 7).

The well drained Alvin soils are in landscape positions above those of the Jasper soils and below those of the Coloma soils. The typical profile is as follows:

Surface layer:

0 to 10 inches—brown sandy loam

Subsoil:

10 to 16 inches—dark yellowish brown loam

16 to 25 inches—dark yellowish brown sandy loam

25 to 47 inches—strong brown sandy loam

47 to 60 inches—strong brown sand and strong brown loamy sand

The excessively drained Coloma soils are above the Jasper and Alvin soils on the landscape. The typical profile is as follows:

Surface layer:

0 to 10 inches—brown sand

Subsurface layer:

10 to 27 inches—yellowish brown sand

Subsoil:

27 to 42 inches—yellowish brown sand with lamellae of dark brown loamy sand about 4 inches thick

42 to 60 inches—yellowish brown sand with lamellae of dark yellowish brown loamy sand about 1.75 inches thick

The well drained Jasper soils are below the Alvin and Coloma soils on the landscape. The typical profile is as follows:

Surface layer:

0 to 14 inches—dark brown silt loam

Subsoil:

14 to 20 inches—brown loam

20 to 30 inches—dark yellowish brown clay loam

30 to 58 inches—dark yellowish brown silty clay loam

58 to 60 inches—dark yellowish brown silt loam

Of minor extent in this association are Dakota, Plano, and Warsaw soils. The well drained Dakota and Warsaw soils and the moderately well drained Plano soils are in landscape positions similar to those of the Jasper soils and below those of the Alvin and Coloma soils.

Most areas are cultivated. The soils range from well suited to poorly suited to the crops commonly grown in the county.

Detailed Soil Map Units

The map units on the detailed soil maps in this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the substratum. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Camden silt loam, 2 to 5 percent slopes, is a phase of the Camden series.

Some map units are made up of two or more major soils. These map units are called soil complexes.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Miami-Hennepin complex, 25 to 35 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

17A—Keomah silt loam, 0 to 2 percent slopes

Composition

Keomah soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow or moderately slow
Parent material: Loess
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—dark grayish brown silt loam

Subsurface layer:
9 to 15 inches—dark grayish brown silt loam

Subsoil:
15 to 24 inches—brown silty clay loam
24 to 32 inches—grayish brown silty clay
32 to 49 inches—mottled light olive gray and yellowish brown silty clay loam

Substratum:
49 to 60 inches—mottled light olive gray and brownish yellow silt loam

Minor Components

Similar soils:
• Soils that have a darker surface layer
• Soils that have a seasonal high water table at a lower depth
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Birkbeck soils on side slopes in landscape positions above those of the Keomah soil
• The poorly drained Sable soils on flats and in slightly depressional areas below the Keomah soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Windbreak planting group: 1
Woodland planting group: 1
Hydrologic soil group: C

17B2—Keomah silt loam, 2 to 5 percent slopes, eroded

Composition

Keomah soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow or moderately slow
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 43 inches—yellowish brown silty clay loam
43 to 50 inches—yellowish brown silt loam

Substratum:
50 to 60 inches—mottled yellowish brown and light brownish gray silt loam

Minor Components

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have a seasonal high water table at a lower depth
- Soils that are less sloping

Contrasting inclusions:
- The moderately well drained Birkbeck soils on side slopes in landscape positions above those of the Keomah soil
- The poorly drained Sable soils on flats and in slightly depressional areas below the Keomah soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil losses within tolerable limits (fig. 8).
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
- Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: C

27C2—Miami silty clay loam, 5 to 10 percent slopes, eroded

Composition

Miami soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Figure 8.—Planting winter wheat in corn stubble is an example of a conservation tillage system. This practice helps to control erosion in an area of Keomah silt loam, 2 to 5 percent slopes, eroded.

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—dark brown silty clay loam

Subsoil:
9 to 16 inches—dark yellowish brown silty clay loam
16 to 22 inches—olive brown silty clay loam
22 to 42 inches—light olive brown clay loam

Substratum:
42 to 60 inches—light olive brown silt loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that are deeper to till
• Soils that have a seasonal high water table closer to the surface

Contrasting inclusions:
• The moderately well drained Birkbeck soils on side

slopes in landscape positions above those of the Miami soil
• The poorly drained Sawmill soils on bottom land in landscape positions below those of the Miami soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

27D2—Miami silty clay loam, 10 to 15 percent slopes, eroded

Composition

Miami soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark brown silty clay loam

Subsoil:
5 to 20 inches—brown silty clay loam
20 to 37 inches—brown clay loam

Substratum:
37 to 60 inches—yellowish brown clay loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that are deeper to till
• Soils that have a thinner surface layer

Contrasting inclusions:
• The moderately well drained Birkbeck soils on side slopes in landscape positions above those of the Miami soil

• The somewhat poorly drained Radford soils on bottom land in landscape positions below those of the Miami soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The slope and the restricted permeability are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.
• The slope is a limitation. Cutting, filling, and shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 4e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

36B—Tama silt loam, 2 to 5 percent slopes

Composition

Tama soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 31 inches—dark yellowish brown silty clay loam
31 to 53 inches—yellowish brown silt loam

Substratum:
53 to 70 inches—yellowish brown silt loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have a thinner surface layer
• Soils that have a seasonal high water table closer to the surface

Contrasting inclusions:
• The well drained Saybrook soils, which contain

glacial till; on the steeper side slopes in landscape positions below those of the Tama soil
• The poorly drained Sable soils on flats or in slightly depressional areas below the Tama soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

43A—Ipava silt loam, 0 to 2 percent slopes

Composition

Ipava soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—black silt loam

Subsurface layer:
9 to 14 inches—black silty clay loam

Subsoil:
14 to 27 inches—brown silty clay loam
27 to 45 inches—light olive brown silty clay loam
45 to 52 inches—mottled light olive brown and light brownish gray silt loam

Substratum:
52 to 60 inches—mottled light olive brown and light brownish gray silt loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that have a seasonal high water table closer to the surface
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Catlin soils on the steeper slopes in landscape positions above those of the Ipava soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

43B—Ipava silt loam, 2 to 5 percent slopes

Composition

Ipava soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—black silt loam

Subsurface layer:
8 to 14 inches—black silty clay loam

Subsoil:
14 to 34 inches—brown silty clay loam
34 to 58 inches—brown silt loam

Substratum:
58 to 60 inches—mottled grayish brown and yellowish brown silt loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are deeper to a seasonal high water table
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Catlin and well drained Saybrook soils on side slopes in landscape positions above those of the Ipava soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

60C2—La Rose silt loam, 5 to 10 percent slopes, eroded

Composition

La Rose soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Parent material: Glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silt loam

Subsoil:
8 to 16 inches—brown silty clay loam
16 to 31 inches—brown clay loam

Substratum:
31 to 60 inches—brown loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer

Contrasting inclusions:
• The moderately well drained Catlin soils on side

slopes in landscape positions above those of the La Rose soil
• The poorly drained Sawmill soils on bottom land in landscape positions below those of the La Rose soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

60C3—La Rose silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

La Rose soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Parent material: Glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe or very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—mixed dark brown and olive brown silty clay loam

Subsoil:
6 to 10 inches—olive brown silty clay loam
10 to 24 inches—light olive brown silt loam

Substratum:
24 to 60 inches—light olive brown silt loam

Minor Components

Similar soils:
• Soils that have a thicker dark surface layer

Contrasting inclusions:
• The moderately well drained Catlin soils on side slopes in landscape positions above those of the La Rose soil

• The poorly drained Sawmill soils on bottom land in landscape positions below those of the La Rose soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 4e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

61A—Atterberry silt loam, 0 to 2 percent slopes

Composition

Atterberry soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loess
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silt loam

Subsurface layer:
7 to 10 inches—dark grayish brown silt loam

Subsoil:
10 to 35 inches—dark yellowish brown silty clay loam
35 to 54 inches—dark yellowish brown silt loam

Substratum:
54 to 60 inches—yellowish brown silt loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The moderately well drained Rozetta soils on side

slopes in landscape positions above those of the Atterberry soil
• The poorly drained Sable soils in nearly level areas below the Atterberry soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland (where drained)
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

67—Harpster silty clay loam

Composition

Harpster soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Reworked loess
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 21 inches—black silty clay loam

Subsoil:
21 to 30 inches—dark gray silty clay loam
30 to 46 inches—light brownish gray silty clay loam
46 to 60 inches—grayish brown silt loam

Minor Components

Similar soils:
• Soils that are deeper to carbonates
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The somewhat poorly drained Ipava soils in landscape positions above those of the Harpster soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or

interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the surface, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The seasonal high water table and the ponding are concerns. Providing open ditches, which remove excess water, and raising the roadbed by applying proper fill material help to overcome these limitations.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2L
Hydrologic soil group: B

68—Sable silty clay loam

Composition

Sable soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Loess
Runoff: Slow to ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 16 inches—black silty clay loam

Subsoil:
16 to 33 inches—grayish brown silty clay loam
33 to 45 inches—grayish brown silt loam

Substratum:
45 to 60 inches—light gray silt loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that have carbonates closer to the surface
• Soil that have more clay in the subsoil

Contrasting inclusions:
• The moderately well drained Tama soils on side slopes in landscape positions above those of the Sable soil
• The somewhat poorly drained Keomah soils in landscape positions above those of the Sable soil

Use and Management

Cropland

Suitability: Well suited

Management considerations:
• Ponding is a hazard (fig. 9). Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the site, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The seasonal high water table and the ponding are concerns. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

91A—Swygert silty clay loam, 0 to 2 percent slopes

Composition

Swygert soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow over very slow
Parent material: Loess over glacial till
Runoff: Slow or medium
Available water capacity: Low
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight or moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—black silty clay loam

Subsoil:
10 to 15 inches—brown silty clay
15 to 42 inches—olive brown silty clay

Substratum:
42 to 60 inches—olive brown silty clay

Minor Components

Similar soils:
• Soils that are deeper to glacial till

Contrasting inclusions:
• The moderately well drained Wenona soils on side slopes in landscape positions above those of the Swygert soil
• The poorly drained Streator soils in nearly level areas below the Swygert soil on the landscape

Figure 9.—Ponding is a hazard in depressional areas of Sable silty clay loam.

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains can reduce the wetness if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of

absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland
Woodland planting group: 3
Windbreak planting group: 4L
Hydrologic soil group: C

91B2—Swygert silty clay loam, 2 to 5 percent slopes, eroded

Composition

Swygert soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow over very slow
Parent material: Loess over glacial till
Runoff: Slow to rapid
Available water capacity: Low
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Moderate or severe
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silty clay loam

Subsoil:
8 to 15 inches—brown silty clay loam
15 to 21 inches—olive brown silty clay
21 to 36 inches—light olive brown silty clay

Substratum:
36 to 60 inches—light olive brown silty clay

Minor Components

Similar soils:
• Soils that are deeper to glacial till
• Soils that have carbonates closer to the surface

Contrasting inclusions:
• The moderately well drained Wenona soils on side slopes in landscape positions above those of the Swygert soil
• The poorly drained Streator soils in nearly level areas below the Swygert soil on the landscape

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains can reduce the wetness if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 3
Windbreak planting group: 4L
Hydrologic soil group: C

100—Palms muck

Composition

Palms soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Low terrace depressions
Ponding duration: November through June
Major use: Woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Moderate
Parent material: Organic soil material
Runoff: Ponded
Available water capacity: Very high
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: Very high
Erosion hazard: None
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 15 inches—black sapric material

Subsurface layer:
15 to 41 inches—black sapric material

Substratum:
41 to 60 inches—gray, stratified loam and sandy loam

Minor Components

Similar soils:
• Soils that are shallower over glacial outwash

Contrasting inclusions:
• The well drained Warsaw and excessively drained Coloma soils on side slopes in landscape positions above those of the Palms soil

Use and Management

Cropland

Suitability: Unsuited because of frequent ponding or a very high water table

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Woodland

Suitability: Poorly suited
Management considerations:
• Wetness is a limitation. Because of ponding, flooding, or a seasonal high water table during the period from November through May, accessibility with equipment is hindered. Using machinery only when the soil is firm enough to support the equipment helps to prevent the formation of ruts and minimizes surface compaction. The wetness also increases the seedling mortality rate. Using good site preparation methods, planting seedlings that are tolerant of wet conditions, and creating drainageways to remove surface water reduce the seedling mortality rate and eliminate undesirable competition.

Dwellings

Suitability: Unsuited because of subsidence, ponding, and low bearing strength

Septic tank absorption fields

Suitability: Unsuited because of subsidence and ponding

Roads and streets

Suitability: Unsuited because of subsidence and ponding

Interpretive Groups

Land capability classification: 5w
Farmland classification: None
Woodland planting group: 2
Windbreak planting group: 2(2)
Hydrologic soil group: A/D

125—Selma loam

Composition

Selma soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Nearly level terraces
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Slow to ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 12 inches—very dark brown loam

Subsoil:
12 to 22 inches—dark grayish brown sandy loam
22 to 32 inches—dark grayish brown clay loam
32 to 46 inches—olive gray clay loam
46 to 51 inches—olive gray loam

Substratum:
51 to 60 inches—olive gray, stratified clay loam and silty clay loam

Minor Components

Similar soils:
• Soils that have less sand in the subsoil
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The well drained Warsaw and excessively drained Coloma soils on side slopes in landscape positions above those of the Selma soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the site, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The seasonal high water table and ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B/D

131A—Alvin loamy sand, 0 to 2 percent slopes

Composition

Alvin soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Eolian deposits
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—brown loamy sand
9 to 17 inches—dark brown loamy sand

Subsoil:
17 to 25 inches—brown loamy sand
25 to 33 inches—dark yellowish brown loam

Substratum:
33 to 60 inches—dark yellowish brown sand

Minor Components

Similar soils:
• Soils that have more clay
• Soils that have a darker surface layer

Contrasting inclusions:
• The well drained Jasper soils, which have more clay than the Alvin soil and have a darker surface layer; in nearly level areas below the Alvin soil on the landscape

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Soil blowing and the moderate available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is

needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 2s
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 5
Hydrologic soil group: B

131B—Alvin sandy loam, 2 to 5 percent slopes

Composition

Alvin soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Eolian deposits
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 10 inches—brown sandy loam

Subsoil:
10 to 16 inches—dark yellowish brown loam
16 to 25 inches—dark yellowish brown sandy loam
25 to 47 inches—strong brown sandy loam
47 to 60 inches—strong brown sand and loamy sand

Minor Components

Similar soils:
• Soils that have more clay in the subsoil
• Soils that have a darker surface layer

Contrasting inclusions:
• The well drained Jasper soils, which have more clay than the Alvin soil and have a darker surface layer; in nearly level areas below the Alvin soil on the landscape

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 5
Hydrologic soil group: B

131C—Alvin sandy loam, 5 to 10 percent slopes

Composition

Alvin soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Eolian deposits
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—brown sandy loam

Subsoil:
9 to 19 inches—dark yellowish brown loam
19 to 32 inches—dark yellowish brown sandy loam
32 to 60 inches—dark yellowish brown loamy sand and sandy loam and yellowish brown sand

Minor Components

Similar soils:
• Soils that have more clay in the subsoil
• Soils that have a darker surface layer

Contrasting inclusions:
• The well drained Jasper soils, which have more clay than the Alvin soil, are deeper to sandy material, and have a darker surface layer; in nearly level areas below the Alvin soil on the landscape
• The well drained Martinsville soils, which have more clay than the Alvin soil and are deeper to sandy material; in nearly level areas below the Alvin soil on the landscape

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Well suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 5
Hydrologic soil group: B

131D—Alvin sandy loam, 10 to 15 percent slopes

Composition

Alvin soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Eolian deposits
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe or very severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark brown sandy loam

Subsurface layer:
5 to 14 inches—brown sandy clay loam

Subsoil:
14 to 25 inches—brown sandy clay loam
25 to 33 inches—strong brown sandy loam

Substratum:
33 to 60 inches—strong brown loamy sand

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a darker surface layer

Contrasting inclusions:
• The well drained Miami soils, which contain glacial till; on side slopes in landscape positions above those of the Alvin soil
• The well drained Martinsville soils, which are deeper than the Alvin soil over sandy material; in nearly level areas below the Alvin soil on the landscape

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer

help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Moderately suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. The slope is also a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 5
Hydrologic soil group: B

131F—Alvin sandy loam, 25 to 35 percent slopes

Composition

Alvin soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Parent material: Eolian deposits
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—brown sandy loam

Subsurface layer:
8 to 22 inches—dark yellowish brown sandy loam

Subsoil:
22 to 35 inches—dark yellowish brown sandy loam
35 to 40 inches—strong brown sandy loam

Substratum:
40 to 60 inches—strong brown loamy sand

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a darker surface layer

Contrasting inclusions:
• The well drained Miami soils, which contain glacial till; on side slopes in landscape positions above those of the Alvin soil
• The well drained Martinsville soils, which are deeper than the Alvin soil over sandy material; in nearly level areas below the Alvin soil on the landscape

Use and Management

Cropland

Suitability: Poorly suited

Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Poorly suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. The slope is also a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 6e
Farmland classification: None
Woodland planting group: 1
Windbreak planting group: 5
Hydrologic soil group: B

134A—Camden silt loam, 0 to 2 percent slopes

Composition

Camden soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsurface layer:
8 to 12 inches—brown silt loam

Subsoil:
12 to 32 inches—yellowish brown silty clay loam
32 to 54 inches—yellowish brown, stratified loam and silt loam
54 to 60 inches—yellowish brown and dark yellowish brown, stratified loam and silt loam

Minor Components

Similar soils:
- Soils that are deeper to glacial outwash
- Soils that have more sand in the subsoil

Contrasting inclusions:
- The well drained Huntsville and somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Camden soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- No major limitations affect the use of this soil for crops.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

134B—Camden silt loam, 2 to 5 percent slopes

Composition

Camden soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—brown silt loam

Subsurface layer:
10 to 14 inches—dark yellowish brown silt loam

Subsoil:
14 to 30 inches—yellowish brown silty clay loam
30 to 40 inches—dark yellowish brown loam
40 to 59 inches—dark yellowish brown sandy loam and loam

Substratum:
59 to 79 inches—dark yellowish brown loam and clay loam with strata of gravelly loam and gravelly clay loam

Minor Components

Similar soils:
- Soils that have a thinner surface layer
- Soils that have more sand in the subsoil
- Soils that are deeper to glacial outwash

Contrasting inclusions:
- The well drained Huntsville and somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Camden soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

134C2—Camden silt loam, 5 to 10 percent slopes, eroded

Composition

Camden soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Rapid
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Subsoil:
7 to 28 inches—dark yellowish brown silty clay loam
28 to 39 inches—yellowish brown silt loam
39 to 52 inches—yellowish brown, stratified loam and sandy loam
52 to 60 inches—light olive brown, stratified silt loam and silty clay loam

Minor Components

Similar soils:
• Soils that are shallower over glacial outwash
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The well drained Huntsville soils on bottom land in landscape positions below those of the Camden soil
• The moderately well drained Birkbeck soils on side slopes in landscape positions above those of the Camden soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes

forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

145B—Saybrook silt loam, 2 to 5 percent slopes

Composition

Saybrook soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark gray silt loam

Subsurface layer:
10 to 13 inches—very dark grayish brown silt loam

Subsoil:
13 to 17 inches—brown silty clay loam
17 to 27 inches—yellowish brown silty clay loam
27 to 38 inches—light olive brown silty clay loam

Substratum:
38 to 60 inches—olive brown silt loam

Minor Components

Similar soils:
• Soils that are deeper to glacial till
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Saybrook soil
• The moderately well drained Tama soils on side slopes in landscape positions above those of the Saybrook soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface

compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

145B2—Saybrook silt loam, 2 to 5 percent slopes, eroded

Composition

Saybrook soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silt loam

Subsoil:
7 to 17 inches—brown silty clay loam
17 to 26 inches—dark yellowish brown silt loam
26 to 30 inches—yellowish brown silt loam
30 to 42 inches—light olive brown silt loam

Substratum:
42 to 60 inches—light olive brown silt loam

Minor Components

Similar soils:
• Soils that are deeper to glacial till
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Saybrook soil
• The moderately well drained Tama soils on side slopes in landscape positions above those of the Saybrook soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface

compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

145C2—Saybrook silty clay loam, 5 to 10 percent slopes, eroded

Composition

Saybrook soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silty clay loam

Subsoil:
10 to 21 inches—dark yellowish brown silty clay loam
21 to 30 inches—yellowish brown silty clay loam
30 to 42 inches—light olive brown silty clay loam

Substratum:
42 to 60 inches—light olive brown silty clay loam

Minor Components

Similar soils:
• Soils that are deeper over glacial till
• Soils that are shallower over glacial till
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Lawson and Radford soils on bottom land in landscape positions below those of the Saybrook soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.

• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

148A—Proctor silt loam, 0 to 2 percent slopes

Composition

Proctor soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level terraces and outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 13 inches—very dark grayish brown silt loam

Subsoil:
13 to 23 inches—brown silty clay loam
23 to 37 inches—dark yellowish brown silty clay loam
37 to 46 inches—dark yellowish brown loam

Substratum:
46 to 60 inches—light olive brown, stratified silt loam and loam

Minor Components

Similar soils:
• Soils that are deeper to glacial outwash

Contrasting inclusions:
• The somewhat poorly drained Ipava and poorly drained Drummer soils in landscape positions lower than those of the Proctor soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation.

Installing tile drains around the footings helps to lower the water table in areas used for dwellings with basements.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

148B—Proctor silt loam, 2 to 5 percent slopes

Composition

Proctor soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Side slopes on terraces and outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 16 inches—brown silty clay loam
16 to 24 inches—dark yellowish brown silty clay loam
24 to 30 inches—dark yellowish brown silt loam
30 to 42 inches—dark yellowish brown, stratified silt loam and loam
42 to 58 inches—stratified dark yellowish brown silt loam and yellowish brown loam

Substratum:
58 to 60 inches—yellowish brown, stratified silt loam and sandy loam

Minor Components

Similar soils:
• Soils that are deeper to glacial outwash

Contrasting inclusions:
• The moderately well drained Catlin and Tama soils on side slopes in landscape positions above those of the Proctor soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited

Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

152—Drummer silty clay loam

Composition

Drummer soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level uplands
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Slow to ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 11 inches—black silty clay loam

Subsoil:
11 to 32 inches—dark grayish brown silty clay loam
32 to 47 inches—grayish brown silty clay loam
47 to 57 inches—mottled light olive gray and yellowish brown, stratified silt loam and loam

Substratum:
57 to 70 inches—mottled light olive gray and yellowish brown, stratified loam and sandy loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The moderately well drained Catlin soils on side slopes in landscape positions above those of the Drummer soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the site, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Because of the variability of soil

properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The seasonal high water table and ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

154A—Flanagan silt loam, 0 to 2 percent slopes

Composition

Flanagan soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 18 inches—black silt loam

Subsoil:
18 to 38 inches—olive brown silty clay loam
38 to 59 inches—light olive brown silt loam

Substratum:
59 to 65 inches—light olive brown silt loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Tama soils on side slopes in landscape positions above those of the Flanagan soil
• The poorly drained Sable soils in nearly level areas lower than the Flanagan soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

154B—Flanagan silt loam, 2 to 5 percent slopes

Composition

Flanagan soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—black silt loam

Subsurface layer:
10 to 17 inches—black silty clay loam

Subsoil:
17 to 30 inches—dark yellowish brown silty clay loam
30 to 42 inches—yellowish brown silty clay loam
42 to 53 inches—light olive brown silty clay loam

Substratum:
53 to 60 inches—light olive brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallow over glacial till

Contrasting inclusions:
• The moderately well drained Graymont and Varna soils on side slopes in landscape positions above those of the Flanagan soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited

Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

171B—Catlin silt loam, 2 to 5 percent slopes

Composition

Catlin soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: High
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark brown silt loam

Subsurface layer:
10 to 18 inches—very dark grayish brown silt loam

Subsoil:
18 to 26 inches—dark yellowish brown silty clay loam
26 to 40 inches—yellowish brown silty clay loam
40 to 50 inches—yellowish brown silt loam
50 to 55 inches—light olive brown silty clay loam

Substratum:
55 to 65 inches—light olive brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallower to glacial till

Contrasting inclusions:
• The poorly drained Sable and somewhat poorly drained Ipava soils in the more nearly level, lower positions on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

171B2—Catlin silt loam, 2 to 5 percent slopes, eroded

Composition

Catlin soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—mixed very dark grayish brown and dark yellowish brown silt loam

Subsoil:
8 to 32 inches—dark yellowish brown silty clay loam
32 to 45 inches—yellowish brown silty clay loam

Substratum:
45 to 60 inches—yellowish brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that are shallower over glacial till

Contrasting inclusions:
• The poorly drained Sable and somewhat poorly drained Ipava soils in the more nearly level, lower positions on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited

Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

171C2—Catlin silt loam, 5 to 10 percent slopes, eroded

Composition

Catlin soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 51 inches—dark yellowish brown silty clay loam
51 to 60 inches—brown loam

Minor Components

Similar soils:
• Soils that are shallower over glacial till

Contrasting inclusions:
• The moderately well drained Varna soils on side slopes in landscape positions below those of the Catlin soil
• The poorly drained Sawmill soils in nearly level areas on bottom land

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited

Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

194C2—Morley silty clay loam, 5 to 10 percent slopes, eroded

Composition

Morley soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow over slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 7 inches—dark brown silty clay loam

Subsoil:
7 to 10 inches—dark yellowish brown silty clay loam
10 to 36 inches—olive brown silty clay loam

Substratum:
36 to 60 inches—olive brown silty clay loam

Minor Components

Similar soils:
• Soils that are deeper to glacial till
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Birkbeck soils, which are deeper to glacial till than the Morley soil; in landscape positions similar to those of the Morley soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 4L
Hydrologic soil group: C

198A—Elburn silt loam, 0 to 2 percent slopes

Composition

Elburn soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level terraces and outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate over moderately rapid
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 15 inches—very dark gray silt loam

Subsoil:
15 to 23 inches—brown silty clay loam
23 to 30 inches—olive brown silty clay loam
30 to 37 inches—mottled dark yellowish brown and grayish brown silty clay loam
37 to 50 inches—mottled grayish brown and yellowish brown silty clay loam
50 to 58 inches—mottled grayish brown, yellowish brown, and brown, stratified silt loam, loam, and sandy loam

Substratum:
58 to 70 inches—mottled light brownish gray and light olive brown, stratified silt loam, silt, and sandy loam

Minor Components

Similar soils:
• Soils that have more clay
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The somewhat poorly drained Flanagan soils, which contain glacial till; in landscape positions similar to those of the Elburn soil
• The poorly drained Sawmill soils on bottom land in landscape positions below those of the Elburn soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

199A—Plano silt loam, 0 to 2 percent slopes

Composition

Plano soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level terraces and outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 15 inches—black silt loam

Subsurface layer:
15 to 20 inches—very dark grayish brown silt loam

Subsoil:
20 to 31 inches—dark yellowish brown silty clay loam
31 to 42 inches—dark yellowish brown silt loam
42 to 53 inches—yellowish brown silt loam
53 to 60 inches—dark yellowish brown sandy loam

Minor Components

Similar soils:
• Soils that are shallower over glacial outwash

Contrasting inclusions:
• The well drained Jasper soils, which are shallow to loamy outwash, and the well drained Dakota soils, which are moderately deep over sand; in landscape positions similar to those of the Plano soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• No major limitations affect the use of this soil for crops.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table in areas used for dwellings with basements.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited

Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

199B—Plano silt loam, 2 to 5 percent slopes

Composition

Plano soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Side slopes on terraces and outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark gray silt loam

Subsurface layer:
8 to 14 inches—black silt loam

Subsoil:
14 to 20 inches—brown silty clay loam
20 to 31 inches—dark yellowish brown silty clay loam
31 to 43 inches—yellowish brown silty clay loam
43 to 55 inches—yellowish brown silty clay loam and sandy loam
55 to 60 inches—brown silt loam and light olive brown silt loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallower over glacial outwash

Contrasting inclusions:
• The moderately well drained Catlin soils, which contain glacial till; on side slopes in landscape positions above those of the Elburn soil
• The poorly drained Drummer soils in nearly level areas below the Elburn soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

210—Lena muck

Composition

Lena soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Toeslopes on low terraces
Ponding duration: November through June
Major uses: Marsh and woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Moderately rapid
Parent material: Organic soil material
Runoff: Ponded
Available water capacity: Very high
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: Very high
Erosion hazard: None
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface tier:
0 to 60 inches—black sapric material

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallower over glacial outwash

Contrasting inclusions:
• The somewhat poorly drained, mineral Raveenwash soils in nearly level areas above the Lena soil on the landscape
• The poorly drained, mineral Calco soils in landscape positions similar to those of the Lena soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Subsidence is a hazard. Avoiding drainage during dry periods can minimize subsidence.
• Soil blowing is a hazard. Field windbreaks and a conservation tillage system that leaves crop residue on the surface can minimize the effects of soil blowing.
• Tilling when the soil is wet causes surface compaction and cloddiness.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Unsuited because of subsidence and ponding

Septic tank absorption fields

Suitability: Unsuited because of subsidence and ponding

Roads and streets

Suitability: Unsuited because of subsidence and ponding

Interpretive Groups

Land capability classification: 5w
Farmland classification: None
Woodland planting group: 2
Windbreak planting group: 2(2)
Hydrologic soil group: A/D

221B2—Parr silt loam, 2 to 5 percent slopes, eroded

Composition

Parr soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown silt loam

Subsoil:
9 to 50 inches—olive brown clay loam

Substratum:
50 to 64 inches—light olive brown loam

Minor Components

Similar soils:
- Soils that have carbonates closer to the surface
- Soils that are deeper to glacial till

Contrasting inclusions:
- The moderately well drained Catlin soils, which are deep to till; in landscape positions similar to those of the Parr soil
- The moderately well drained Tama soils, which do not contain glacial till; in landscape positions similar to those of the Parr soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
- The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

221C2—Parr silt loam, 5 to 10 percent slopes, eroded

Composition

Parr soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid

Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silt loam

Subsoil:
7 to 16 inches—olive brown silty clay loam
16 to 32 inches—olive brown clay loam
32 to 49 inches—light olive brown clay loam

Substratum:
49 to 60 inches—light olive brown loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that are deeper to glacial till

Contrasting inclusions:
• The moderately well drained Catlin soils, which are deep to till; in landscape positions similar to those of the Parr soil
• The poorly drained Sawmill soils on bottom land in landscape positions below those of the Parr soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

223B2—Varna silty clay loam, 2 to 5 percent slopes, eroded

Composition

Varna soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow over slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface

Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silty clay loam

Subsoil:
7 to 16 inches—yellowish brown silty clay loam
16 to 23 inches—olive brown silty clay
23 to 40 inches—light olive brown silty clay loam

Substratum:
40 to 60 inches—light olive brown silty clay loam

Minor Components

Similar soils:
- Soils that have less clay in the subsoil
- Soils that are deeper to glacial till

Contrasting inclusions:
- The moderately well drained Catlin soils, which are deeper over glacial till than the Varna soil; in landscape positions similar to those of the Varna soil
- The somewhat poorly drained Chenoa soils in landscape positions below those of the Varna soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 3
Windbreak planting group: 4L
Hydrologic soil group: C

223C2—Varna silty clay loam, 5 to 10 percent slopes, eroded

Composition

Varna soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow over slow
Parent material: Loess over glacial till

Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silty clay loam

Subsoil:
7 to 17 inches—brown silty clay loam
17 to 28 inches—olive brown silty clay loam
28 to 44 inches—light olive brown silty clay loam

Substratum:
44 to 60 inches—light olive brown silty clay loam

Minor Components

Similar soils:
- Soils that have less clay in the subsoil
- Soils that are deeper to glacial till

Contrasting inclusions:
- The moderately well drained Catlin soils, which are deeper over glacial till than the Varna soil; in landscape positions similar to those of the Varna soil
- The somewhat poorly drained Chenoa soils in landscape positions below those of the Varna soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 3
Windbreak planting group: 4L
Hydrologic soil group: C

223D—Varna silty clay loam, 10 to 15 percent slopes

Composition

Varna soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow over slow
Parent material: Loess over glacial till
Runoff: Rapid

Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown silty clay loam

Subsoil:
12 to 20 inches—dark yellowish brown silty clay
20 to 26 inches—olive brown silty clay
26 to 61 inches—light olive brown silty clay loam

Substratum:
61 to 69 inches—light olive brown silty clay loam

Minor Components

Similar soils:
- Soils that have less clay in the subsoil
- Soils that are deeper to glacial till

Contrasting inclusions:
- The moderately well drained Catlin soils, which are deeper over glacial till than the Varna soil; in landscape positions similar to those of the Varna soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.
- The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 4e
Farmland classification: Important farmland
Woodland planting group: 3
Windbreak planting group: 4L
Hydrologic soil group: C

224D2—Strawn silt loam, 10 to 15 percent slopes, eroded

Composition

Strawn soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Parent material: Glacial till
Runoff: Rapid

Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 15 inches—dark yellowish brown silty clay loam
15 to 21 inches—dark yellowish brown clay loam

Substratum:
21 to 60 inches—light olive brown clay loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have carbonates at a lower depth

Contrasting inclusions:
• The moderately well drained Birkbeck soils, which are deeper over glacial till than the Strawn soil; in landscape positions similar to those of the Strawn soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

224E—Strawn silt loam, 15 to 25 percent slopes

Composition

Strawn soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Upland side slopes
Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate in the upper part and moderately slow in the lower part
Parent material: Glacial till
Runoff: Very rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown silt loam

Subsoil:
6 to 14 inches—dark yellowish brown silty clay loam
14 to 24 inches—olive brown clay loam

Substratum:
24 to 60 inches—olive brown loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have carbonates at a lower depth
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Radford soils on bottom land in landscape positions below those of the Strawn soil

Use and Management

Cropland

Suitability: Unsuited because of the slope

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• The slope is a limitation. Special equipment and techniques are needed for planting or for applying chemicals and fertilizer. The very steep areas are unsuitable for hay because of equipment limitations affecting harvesting.

Woodland

Suitability: Moderately suited
Management considerations:
• Water erosion is a hazard. Building logging roads and skid trails on or nearly on the contour and diverting surface water from these areas help to control erosion.
• Soil blowing is a hazard. Seeding bare areas to grass or to a grass-legume mixture after logging has been completed reduces the hazard of soil blowing.
• The slope is a limitation. In steep areas the logs should be skidded uphill with a cable and winch.

Dwellings

Suitability: Poorly suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 6e
Farmland classification: None
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

224E2—Strawn silt loam, 15 to 30 percent slopes, eroded

Composition

Strawn soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Upland side slopes
Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Parent material: Glacial till
Runoff: Very rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown silt loam

Subsoil:
5 to 18 inches—dark yellowish brown silty clay loam
18 to 20 inches—yellowish brown, calcareous clay loam

Substratum:
20 to 60 inches—yellowish brown, calcareous loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have carbonates at a lower depth
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Radford soils on bottom land in landscape positions below those of the Strawn soil

Use and Management

Cropland

Suitability: Unsuited because of the slope

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• The slope is a limitation. Special equipment and techniques are needed for planting or for applying chemicals and fertilizer. The very steep areas are unsuitable for hay because of equipment limitations affecting harvesting.

Woodland

Suitability: Moderately suited
Management considerations:
• Water erosion is a hazard. Building logging roads and skid trails on or nearly on the contour and diverting surface water from these areas help to control erosion.
• Soil blowing is a hazard. Seeding bare areas to grass or to a grass-legume mixture after logging has been completed reduces the hazard of soil blowing.
• The slope is a limitation. In steep areas the logs should be skidded uphill with a cable and winch.

Dwellings

Suitability: Poorly suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 6e
Farmland classification: None
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

233B2—Birkbeck silt loam, 2 to 5 percent slopes, eroded

Composition

Birkbeck soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 60 inches—yellowish brown silty clay loam

Minor Components

Similar soils:
- Soils that have a thicker surface layer
- Soils that are deeper to glacial till
- Soils that have more clay in the subsoil

Contrasting inclusions:
- The well drained Miami soils, which are shallow over glacial till; on side slopes in landscape positions below those of the Birkbeck soil
- The somewhat poorly drained Keomah soils, which do not contain glacial till; in landscape positions below those of the Birkbeck soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

233C2—Birkbeck silty clay loam, 5 to 10 percent slopes, eroded

Composition

Birkbeck soil and similar soils: 85 to 90 percent

Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—brown silty clay loam

Subsoil:
9 to 60 inches—yellowish brown silty clay loam

Minor Components

Similar soils:
- Soils that are shallower over glacial till
- Soils that are deeper over glacial till
- Soils that have more clay in the subsoil

Contrasting inclusions:
- The well drained Miami soils, which are shallow over glacial till; on side slopes in landscape positions below those of the Birkbeck soil
- The somewhat poorly drained Keomah soils, which do not contain glacial till; in landscape positions below those of the Birkbeck soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

233D2—Birkbeck silt loam, 10 to 15 percent slopes, eroded

Composition

Birkbeck soil and similar soils: 75 to 80 percent

Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Upland side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Subsoil:
7 to 13 inches—dark yellowish brown silt loam
13 to 34 inches—dark yellowish brown silty clay loam
34 to 46 inches—yellowish brown silt loam
46 to 53 inches—brown loam

Substratum:
53 to 60 inches—brown loam

Minor Components

Similar soils:
- Soils that have a thinner surface layer
- Soils that are shallower over glacial till
- Soils that have more clay in the subsoil

Contrasting inclusions:
- The well drained Miami and Hennepin soils, which are shallow over glacial till; on side slopes in landscape positions below those of the Birkbeck soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.
- The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability, the seasonal high water table, and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.
- The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland

Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

236A—Sabina silt loam, 0 to 2 percent slopes

Composition

Sabina soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess over glacial till
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown silt loam

Subsurface layer:
6 to 11 inches—dark grayish brown silt loam

Subsoil:
11 to 34 inches—dark yellowish brown silty clay loam
34 to 47 inches—dark yellowish brown silt loam
47 to 60 inches—olive brown clay loam

Minor Components

Similar soils:
- Soils that are deeper to glacial till
- Soils that have less clay in the subsoil

Contrasting inclusions:
- The well drained Miami soils on side slopes in landscape positions above those of the Sabina soil
- The poorly drained Sable soils, which have a dark surface layer; in nearly level areas below the Sabina soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited

Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: C

241C2—Chatsworth silty clay loam, 4 to 7 percent slopes, eroded

Composition

Chatsworth soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: Low
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark brown silty clay loam

Subsoil:
6 to 31 inches—olive silty clay

Substratum:
31 to 60 inches—olive silty clay

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are deeper to glacial till

Contrasting inclusions:
• The moderately well drained Wenona soils, which are deep to glacial till; in landscape positions similar to those of the Chatsworth soil
• The somewhat poorly drained Rutland soils, which are deep to glacial till; in landscape positions below those of the Chatsworth soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Unsuited because of restricted permeability

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 6e
Farmland classification: None
Hydrologic soil group: D

243A—St. Charles silt loam, 0 to 2 percent slopes

Composition

St. Charles soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Subsoil:
9 to 19 inches—dark yellowish brown silt loam
19 to 26 inches—dark yellowish brown silty clay loam
26 to 39 inches—yellowish brown silty clay loam
39 to 52 inches—yellowish brown silt loam
52 to 60 inches—stratified, yellowish brown silt loam and loam

Minor Components

Similar soils:
- Soils that are shallower over glacial outwash

Contrasting inclusions:
- The well drained Fox soils, which are shallow over loamy material; on side slopes adjacent to the St. Charles soil
- The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the St. Charles soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- No major limitations affect the use of this soil for crops.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
- The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

243B—St. Charles silt loam, 2 to 5 percent slopes

Composition

St. Charles soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial outwash
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Subsoil:
7 to 15 inches—dark yellowish brown silty clay loam
15 to 35 inches—yellowish brown silty clay loam
35 to 41 inches—yellowish brown silt loam
41 to 55 inches—yellowish brown loam

Substratum:
55 to 60 inches—yellowish brown silt loam and loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallower over glacial outwash

Contrasting inclusions:
• The well drained Fox soils, which are shallow over loamy material; on side slopes adjacent to the St. Charles soil
• The moderately well drained Birkbeck soils on side slopes in landscape positions above those of the St. Charles soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion. Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

279B2—Rozetta silt loam, 2 to 5 percent slopes, eroded

Composition

Rozetta soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 10 inches—yellowish brown silty clay loam
10 to 20 inches—dark yellowish brown silty clay loam
20 to 31 inches—yellowish brown silty clay loam
31 to 43 inches—yellowish brown silt loam
43 to 52 inches—light olive brown silt loam

Substratum:
52 to 60 inches—light olive brown silt loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The well drained Russell soils, which contain glacial till; on side slopes in landscape positions above those of the Rozetta soil
• The poorly drained Sable soils in nearly level areas below the Rozetta soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

290A—Warsaw sandy loam, 0 to 2 percent slopes

Composition

Warsaw soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Side slopes on the lower terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Parent material: Glacial outwash
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown sandy loam

Subsurface layer:
8 to 15 inches—very dark brown loam

Subsoil:
15 to 24 inches—dark yellowish brown loam
24 to 35 inches—dark yellowish brown gravelly clay loam

Substratum:
35 to 48 inches—dark yellowish brown very gravelly sandy loam and very gravelly loamy sand
48 to 60 inches—yellowish brown very gravelly sand

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that have less gravel in the subsoil

Contrasting inclusions:
• The excessively drained Coloma soils, which have more sand than the Warsaw soil; on side slopes in landscape positions above those of the Warsaw soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• The restricted available water capacity is a limitation. Field windbreaks and a conservation tillage system that leaves crop residue on the surface conserve soil moisture. Irrigation can also help to overcome the restricted available water capacity.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Well suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 2s
Farmland classification: Prime farmland
Woodland planting group: 1

Windbreak planting group: 6G
Hydrologic soil group: B

322C2—Russell silt loam, 5 to 10 percent slopes, eroded

Composition

Russell soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown silt loam

Subsoil:
7 to 11 inches—dark yellowish brown silty clay loam
11 to 25 inches—yellowish brown silty clay loam
25 to 33 inches—dark yellowish brown silty clay loam
33 to 49 inches—dark yellowish brown clay loam

Substratum:
49 to 60 inches—yellowish brown clay loam

Minor Components

Similar soils:
- Soils that have carbonates closer to the surface
- Soils that are shallower over glacial till
- Soils that are deeper over glacial till

Contrasting inclusions:
- The moderately well drained Rozetta soils, which do not contain glacial till; on side slopes in landscape positions above those of the Russell soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
- The restricted permeability is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

322D2—Russell silt loam, 10 to 15 percent slopes, eroded

Composition

Russell soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Pasture and hay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Very severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Subsoil:
7 to 31 inches—dark yellowish brown silty clay loam
31 to 40 inches—light olive brown clay loam
40 to 49 inches—light olive brown loam

Substratum:
49 to 60 inches—light olive brown loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are shallower over glacial till
• Soils that have carbonates closer to the surface

Contrasting inclusions:
• The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Russell soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• The restricted permeability and the slope are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 4e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

327C2—Fox silty clay loam, 5 to 10 percent slopes, eroded

Composition

Fox soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Parent material: Glacial outwash
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—brown silty clay loam

Subsoil:
5 to 14 inches—dark yellowish brown silty clay loam
14 to 20 inches—dark yellowish brown clay loam
20 to 35 inches—dark yellowish brown very gravelly clay loam

Substratum:
35 to 60 inches—yellowish brown sand and gravel

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that are deeper to gravel

Contrasting inclusions:
• The moderately well drained and well drained St. Charles soils, which are deep to loamy material; in the more level areas below the Fox soil on the landscape

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Erosion and the restricted available water capacity are management concerns. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and conserve soil moisture. Irrigation also helps to overcome the restricted available water capacity.
• Adding organic material minimizes crusting and improves tilth and fertility.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 6G
Hydrologic soil group: B

330—Peotone silty clay loam

Composition

Peotone soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland depressions
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Colluvial sediments
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 26 inches—black silty clay loam

Subsoil:
26 to 53 inches—dark gray silty clay loam

Substratum:
53 to 60 inches—gray silty clay loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The somewhat poorly drained Ipava and Chenoa soils in landscape positions above those of the Peotone soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Unsuited because of the ponding

Septic tank absorption fields

Suitability: Unsuited because of the ponding and very slow percolation

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

356—Elpaso silty clay loam

Composition

Elpaso soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level uplands
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate over moderately slow
Parent material: Loess over glacial till
Runoff: Slow to ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark gray silty clay loam

Subsurface layer:
7 to 21 inches—black silty clay loam

Subsoil:
21 to 44 inches—dark grayish brown silty clay loam
44 to 53 inches—dark grayish brown silt loam
53 to 69 inches—dark grayish brown and olive brown silty clay loam

Substratum:
69 to 80 inches—olive brown silty clay loam

Minor Components

Similar soils:
• Soils that have carbonates at a lower depth
• Soils that are deeper to glacial till
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The moderately well drained Catlin and Graymont soils on side slopes in landscape positions above those of the Elpaso soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the site, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the ponding are management concerns. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove

excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

369A—Waupecan silt loam, 0 to 2 percent slopes

Composition

Waupecan soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over very rapid
Parent material: Loess over glacial outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 14 inches—very dark grayish brown silt loam

Subsoil:
14 to 23 inches—dark yellowish brown silt loam
23 to 34 inches—dark yellowish brown silty clay loam
34 to 46 inches—dark yellowish brown clay loam

Substratum:
46 to 51 inches—dark yellowish brown sandy loam
51 to 60 inches—dark yellowish brown sand and gravel

Minor Components

Similar soils:
• Soils that are shallower over gravel

Contrasting inclusions:
• The somewhat poorly drained Elburn and poorly drained Drummer soils in nearly level areas below the Waupecan soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• No major limitations affect the use of this soil for crops.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

369B—Waupecan silt loam, 2 to 5 percent slopes

Composition

Waupecan soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Side slopes on outwash plains
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate over very rapid
Parent material: Loess over glacial outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 16 inches—black silt loam

Subsoil:
16 to 20 inches—very dark grayish brown silt loam
20 to 36 inches—dark yellowish brown silty clay loam
36 to 54 inches—dark yellowish brown sandy clay loam

Substratum:
54 to 60 inches—dark yellowish brown gravelly sandy loam

Minor Components

Similar soils:
- Soils that are shallower over gravel
- Soils that have a thinner surface layer

Contrasting inclusions:
- The somewhat poorly drained Elburn and poorly drained Drummer soils in nearly level areas below the Waupecan soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

375A—Rutland silty clay loam, 0 to 2 percent slopes

Composition

Rutland soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 14 inches—black silty clay loam

Subsoil:
14 to 20 inches—brown silty clay
20 to 36 inches—olive brown silty clay loam
36 to 44 inches—mottled yellowish brown and light brownish gray silt loam
44 to 52 inches—olive brown silty clay

Substratum:
52 to 60 inches—olive brown clay

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a seasonal high water table closer to the surface

Contrasting inclusions:
• The somewhat poorly drained Swygert soils, which are shallower over glacial till than the Rutland soil; in landscape positions similar to those of the Rutland soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: C

375B—Rutland silt loam, 2 to 5 percent slopes

Composition

Rutland soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 14 inches—black silt loam

Subsoil:
14 to 22 inches—dark brown silty clay
22 to 33 inches—grayish brown silty clay loam
33 to 44 inches—grayish brown silty clay

Substratum:
44 to 60 inches—light olive brown silty clay

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a thinner surface layer

Contrasting inclusions:
• The somewhat poorly drained Swygert soils, which are shallower over glacial till than the Rutland soil; in landscape positions similar to those of the Rutland soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: C

375B2—Rutland silty clay loam, 2 to 5 percent slopes, eroded

Composition

Rutland soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes

Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silty clay loam

Subsoil:
7 to 28 inches—olive brown silty clay loam
28 to 37 inches—olive brown silt loam
37 to 61 inches—olive silty clay

Substratum:
61 to 70 inches—olive silty clay

Minor Components

Similar soils:
- Soils that have less clay in the subsoil
- Soils that have a thicker surface layer

Contrasting inclusions:
- The somewhat poorly drained Swygert soils, which are shallower over glacial till than the Rutland soil; in landscape positions similar to those of the Rutland soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength, the shrink-swell potential, and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: C

379A—Dakota loam, 0 to 2 percent slopes

Composition

Dakota soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Nearly level high terraces

Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and rapid in the lower part
Parent material: Glacial outwash
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 14 inches—very dark grayish brown loam

Subsoil:
14 to 21 inches—dark yellowish brown loam
21 to 31 inches—brown clay loam
31 to 34 inches—brown sandy loam

Substratum:
34 to 60 inches—brown loamy sand

Minor Components

Similar soils:
- Soils that have less sand in the subsoil
- Soils that have less clay in the subsoil

Contrasting inclusions:
- The well drained Alvin and excessively drained Coloma soils, which have more sand than the Dakota soil; on side slopes in landscape positions above those of the Dakota soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- No major limitations affect the use of this soil for crops.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
- Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2s
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 6G
Hydrologic soil group: B

386B—Downs silt loam, 2 to 5 percent slopes

Composition

Downs soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark brown silt loam

Subsoil:
8 to 22 inches—dark yellowish brown silty clay loam
22 to 48 inches—yellowish brown silt loam

Substratum:
48 to 54 inches—yellowish brown silt loam
54 to 60 inches—light olive brown silt loam

Minor Components

Similar soils:
- Soils that have a thicker surface layer
- Soils that have carbonates closer to the surface

Contrasting inclusions:
- The moderately well drained Birkbeck soils, which contain glacial till; on side slopes in landscape positions below those of the Downs soil
- The poorly drained Sable soils in nearly level areas below the Downs soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

387A—Ockley silt loam, 0 to 2 percent slopes

Composition

Ockley soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Parent material: Glacial outwash
Runoff: Very slow
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 16 inches—dark yellowish brown silty clay loam
16 to 33 inches—dark yellowish brown clay loam
33 to 42 inches—brown sandy loam
42 to 52 inches—brown, stratified gravelly sandy loam and gravelly loamy sand

Substratum:
52 to 60 inches—yellowish brown very gravelly loamy sand

Minor Components

Similar soils:
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Landes soils on bottom land in landscape positions below those of the Ockley soil
• The poorly drained Selma soils in landscape positions similar to those of the Ockley soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• No major limitations affect the use of this soil for crops.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

388B2—Wenona silt loam, 2 to 5 percent slopes, eroded

Composition

Wenona soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown silt loam

Subsoil:
9 to 14 inches—brown silty clay loam
14 to 19 inches—dark yellowish brown silty clay loam
19 to 29 inches—yellowish brown silty clay loam
29 to 42 inches—yellowish brown silt loam
42 to 52 inches—olive brown silty clay

Substratum:
52 to 60 inches—olive brown silty clay

Minor Components

Similar soils:
• Soils that are shallower over glacial till
• Soils that are deeper over glacial till
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The somewhat poorly drained Swygert soils in landscape positions similar to or more level than those of the Wenona soil
• The poorly drained Streator soils in nearly level areas below the Wenona soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 4L
Hydrologic soil group: C

388C2—Wenona silty clay loam, 5 to 10 percent slopes, eroded

Composition

Wenona soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown silty clay loam

Subsoil:
6 to 38 inches—dark yellowish brown silty clay loam
38 to 45 inches—dark yellowish brown silty loam
45 to 54 inches—olive brown clay loam

Substratum:
54 to 60 inches—olive brown silty clay

Minor Components

Similar soils:
- Soils that are shallower over glacial till
- Soils that have a thinner surface layer

Contrasting inclusions:
- The somewhat poorly drained Swygert soils in landscape positions similar to or more level than those of the Wenona soil
- The poorly drained Streator soils in nearly level areas below the Wenona soil on the landscape

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 4L
Hydrologic soil group: C

435—Streator silty clay loam

Composition

Streator soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level uplands
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow over very slow
Parent material: Loess over glacial till
Runoff: Slow to ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—black silty clay loam

Subsurface layer:
7 to 13 inches—very dark gray silty clay loam

Subsoil:
13 to 43 inches—grayish brown silty clay loam
43 to 47 inches—grayish brown silty clay

Substratum:
47 to 60 inches—grayish brown silty clay

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that are deeper to glacial till
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The moderately well drained Wenona soils on side slopes in landscape positions above those of the Streator soil
• The poorly drained Drummer soils, which do not contain glacial till; in landscape positions similar to those of the Streator soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Poorly suited
Management considerations:
• Ponding is a hazard. Adding several feet of suitable loamy material to the site, installing tile drains around the footings, and using surface drains increase the depth to the water table. Suitable tile outlets may be needed. Grading and land shaping help to divert surface water away from the dwellings.
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the ponding are management concerns. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B/D

440A—Jasper silt loam, 0 to 2 percent slopes

Composition

Jasper soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Slight

Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 14 inches—dark brown silt loam

Subsoil:
14 to 20 inches—brown loam
20 to 30 inches—dark yellowish brown clay loam
30 to 58 inches—dark yellowish brown silty clay loam
58 to 60 inches—dark yellowish brown silt loam

Minor Components

Similar soils:
- Soils that have less sand in the subsoil
- Soils that have more sand in the substratum

Contrasting inclusions:
- The moderately well drained Plano soils, which are deeper over loamy glacial outwash than the Jasper soil; in landscape positions similar to those of the Jasper soil
- The well drained Alvin soils, which are shallow over sand; in landscape positions above those of the Jasper soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- No major limitations affect the use of this soil for crops.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

440B—Jasper silt loam, 2 to 5 percent slopes

Composition

Jasper soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—dark brown silt loam

Subsurface layer:
8 to 16 inches—very dark grayish brown loam

Subsoil:
16 to 40 inches—dark yellowish brown clay loam
40 to 60 inches—dark yellowish brown loamy sand and sandy loam

Minor Components

Similar soils:
- Soils that have a thinner surface layer

• Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Plano soils, which are deeper over loamy glacial outwash than the Jasper soil; in landscape positions similar to those of the Jasper soil
• The well drained Alvin soils, which are shallow over sand; in landscape positions similar to or higher than those of the Jasper soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

440C2—Jasper silt loam, 5 to 10 percent slopes, eroded

Composition

Jasper soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Rapid
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silt loam

Subsoil:
8 to 17 inches—dark yellowish brown silty clay loam
17 to 28 inches—dark yellowish brown clay loam
28 to 50 inches—dark yellowish brown sandy clay loam

Substratum:
50 to 54 inches—olive brown silt loam
54 to 60 inches—light olive brown sandy loam and silty loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Camden soils, which contain less organic matter in the surface layer than the Jasper soil and are deeper over loamy glacial outwash; in landscape positions similar to those of the Jasper soil
• The well drained Alvin soils, which are shallow over sand; in landscape positions similar to or higher than those of the Jasper soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

484A—Harco silty clay loam, 0 to 2 percent slopes

Composition

Harco soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loess
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 11 inches—black silty clay loam

Subsurface layer:
11 to 15 inches—dark brown silty clay loam

Subsoil:
15 to 34 inches—brown silty clay loam
34 to 40 inches—brown silt loam

Substratum:
40 to 60 inches—yellowish brown silt loam

Minor Components

Similar soils:
• Soils that have carbonates at a lower depth
• Soils that have a seasonal high water table closer to the surface
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The moderately well drained Tama soils on side slopes in landscape positions above those of the Harco soil
• The poorly drained Harpster soils, which contain carbonates throughout; in slightly depressional areas below the Harco soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available.

Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

533—Urban land

Composition

Urban land: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

General Description

• This map unit consists of areas covered by buildings, roads, and parking lots.

536—Dumps, mine

Soil Properties and Qualities

Drainage class: Well drained
Parent material: Shale, siltstone, and coal fragments
Runoff: Rapid or very rapid
Erosion hazard: Severe

541B2—Graymont silt loam, 2 to 5 percent slopes, eroded

Composition

Graymont soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Subsoil:
10 to 14 inches—brown silty clay loam
14 to 18 inches—dark yellowish brown silty clay loam
18 to 25 inches—yellowish brown silty clay
25 to 34 inches—yellowish brown silty clay loam
34 to 46 inches—olive brown silty clay loam
46 to 58 inches—light olive brown silty clay loam

Substratum:
58 to 60 inches—light olive brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that are deeper to glacial till

• Soils that have more clay in the subsoil

Contrasting inclusions:
• The poorly drained Elpaso soils in nearly level areas below the Graymont soil on the landscape
• The somewhat poorly drained Flanagan soils, which are deeper over glacial till than the Graymont soil; in landscape positions similar to or lower than those of the Graymont soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

541C2—Graymont silt loam, 5 to 10 percent slopes, eroded

Composition

Graymont soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate over slow
Parent material: Loess over glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silt loam

Subsoil:
8 to 24 inches—dark yellowish brown silty clay loam
24 to 34 inches—yellowish brown silty clay loam
34 to 39 inches—olive brown silty clay loam
39 to 57 inches—light olive brown silty clay loam

Substratum:
57 to 65 inches—light olive brown silty clay loam

Minor Components

Similar soils:
• Soils that are shallow over glacial till
• Soils that have more clay

Contrasting inclusions:
• The somewhat poorly drained Flanagan soils, which are deeper over glacial till than the Graymont soil; in landscape positions below those of the Graymont soil
• The moderately well drained Morley soils, which have less organic matter in the surface layer than the Graymont soil and are shallower over glacial till; in landscape positions similar to those of the Graymont soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

567B—Elkhart silt loam, 2 to 5 percent slopes

Composition

Elkhart soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: Very high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—black silt loam

Subsurface layer:
9 to 13 inches—very dark brown silty clay loam

Subsoil:
13 to 22 inches—dark yellowish brown silty clay loam
22 to 37 inches—yellowish brown silty clay loam
37 to 52 inches—yellowish brown silt loam

Substratum:
52 to 60 inches—yellowish brown silt loam

Minor Components

Similar soils:
- Soils that have a thinner surface layer
- Soils that have carbonates at a lower depth

Contrasting inclusions:
- The moderately well drained Catlin soils, which contain glacial till; in landscape positions similar to those of the Elkhart soil
- The poorly drained Sable soils in nearly level areas below the Elkhart soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
- The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- The seasonal high water table is a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
- The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 33
Hydrologic soil group: B

570A—Martinsville silt loam, 0 to 2 percent slopes

Composition

Martinsville soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level terraces
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsurface layer:
8 to 17 inches—yellowish brown silt loam

Subsoil:
17 to 26 inches—yellowish brown silty clay loam
26 to 31 inches—strong brown sandy clay loam
31 to 45 inches—strong brown sandy loam

Substratum:
45 to 60 inches—strong brown sandy loam

Minor Components

Similar soils:
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Alvin soils, which are shallow over sand; in landscape positions above those of the Martinsville soil
• The poorly drained Selma soils in nearly level areas below the Martinsville soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• No major limitations affect the use of this soil for crops.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
• The low bearing strength and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 1
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

570B—Martinsville sandy loam, 2 to 5 percent slopes

Composition

Martinsville soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark brown sandy loam

Subsoil:
5 to 24 inches—dark yellowish brown sandy clay loam
24 to 57 inches—dark yellowish brown sandy loam

Substratum:
57 to 60 inches—dark yellowish brown sandy loam and silt loam

Minor Components

Similar soils:
- Soils that have a thinner surface layer
- Soils that have less sand in the subsoil

Contrasting inclusions:
- The well drained Alvin soils, which are shallow over sand; in landscape positions above those of the Martinsville soil
- The well drained Miami soils, which contain glacial till; on steep side slopes in landscape positions above those of the Martinsville soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
- Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
- Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
- The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
- The low bearing strength and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

570C2—Martinsville loam, 5 to 10 percent slopes, eroded

Composition

Martinsville soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial outwash
Runoff: Rapid
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark yellowish brown loam

Subsoil:
6 to 15 inches—yellowish brown loam
15 to 60 inches—yellowish brown, stratified loam and sandy loam

Minor Components

Similar soils:
- Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Alvin soils, which are shallow over sand; in landscape positions above those of the Martinsville soil
• The well drained Miami soils, which contain glacial till; on steep side slopes in landscape positions above those of the Martinsville soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.

Woodland

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Roads and streets

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 3e
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 3
Hydrologic soil group: B

614A—Chenoa silty clay loam, 0 to 2 percent slopes

Composition

Chenoa soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Nearly level uplands
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate over slow
Parent material: Loess over glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Erosion hazard: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 14 inches—black silty clay loam

Subsoil:
14 to 25 inches—olive brown silty clay loam
25 to 34 inches—olive brown silty clay loam
34 to 40 inches—light olive brown silty clay loam
40 to 49 inches—olive brown silty clay loam

Substratum:
49 to 70 inches—olive brown silty clay loam

Minor Components

Similar soils:
• Soils that are deeper to glacial till
• Soils that have less clay in the subsoil
• Soils that have a seasonal high water table closer to the surface

Contrasting inclusions:
• The moderately well drained Varna soils, which are shallower over glacial till than the Chenoa soil; on side

slopes in landscape positions above those of the Chenoa soil
• The very poorly drained Peotone soils in slightly depressional areas below the Chenoa soil on the landscape

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• The seasonal high water table is a limitation. Wetness may delay planting or interfere with harvesting in many years. Subsurface tile drains function satisfactorily if suitable outlets are available. Measures that maintain the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

614B2—Chenoa silty clay loam, 2 to 5 percent slopes, eroded

Composition

Chenoa soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Upland side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate over slow
Parent material: Loess over glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown silty clay loam

Subsoil:
8 to 28 inches—dark yellowish brown silty clay loam
28 to 56 inches—olive brown silty clay loam

Substratum:
56 to 60 inches—olive brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thicker surface layer
• Soils that are deeper to glacial till
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The moderately well drained Varna soils, which are shallower over glacial till than the Chenoa soil; on side slopes in landscape positions above those of the Chenoa soil
• The moderately well drained Catlin soils, which are deeper over glacial till than the Chenoa soil; on side

slopes in landscape positions above those of the Chenoa soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Erosion is a hazard. A crop rotation that includes forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, stripcropping, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
• Tilling when the soil is wet causes surface compaction and cloddiness, which may result in increased runoff and erosion.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and minimize compaction.

Dwellings

Suitability: Moderately suited
Management considerations:
• The shrink-swell potential is a limitation. Reinforcing the foundation and extending it below the subsoil help to prevent the structural damage caused by shrinking and swelling.
• The seasonal high water table is a limitation. Installing tile drains around the footings helps to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• The restricted permeability and the seasonal high water table are limitations. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Poorly suited
Management considerations:
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2e
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

689B—Coloma sand, 1 to 7 percent slopes

Composition

Coloma soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Excessively drained
Permeability: Rapid
Parent material: Eolian deposits
Runoff: Very slow or slow
Available water capacity: Low
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Slight
Shrink-swell potential: Low
Potential for frost action: Low

Typical Profile

Surface layer:
0 to 10 inches—brown sand

Subsurface layer:
10 to 27 inches—yellowish brown sand

Subsoil:
27 to 42 inches—yellowish brown sand with lamellae of dark brown loamy sand about 4 inches thick
42 to 60 inches—yellowish brown sand with lamellae of dark yellowish brown loamy sand about 1.75 inches thick

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The well drained Jasper and Dakota soils, which have more clay than the Coloma soil; in landscape positions below those of the Coloma soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate.

Dwellings

Suitability: Well suited

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. Because of the variability of soil properties in different delineations of the unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Well suited

Interpretive Groups

Land capability classification: 4s (3e, irrigated)
Farmland classification: Important farmland
Woodland planting group: 5
Windbreak planting group: 7
Hydrologic soil group: A

689D—Coloma sand, 7 to 15 percent slopes

Composition

Coloma soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Terrace side slopes
Major use: Row crops

Soil Properties and Qualities

Drainage class: Excessively drained
Permeability: Rapid
Parent material: Eolian deposits
Runoff: Slow or medium
Available water capacity: Low
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Low
Erosion hazard: Moderate
Shrink-swell potential: Low
Potential for frost action: Low

Typical Profile

Surface layer:
0 to 12 inches—dark brown sand

Subsurface layer:
12 to 25 inches—brown sand

Subsoil:
25 to 56 inches—yellowish brown sand and dark brown loamy sand and sandy loam

Substratum:
56 to 60 inches—yellowish brown sand

Minor Components

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The well drained Jasper and Dakota soils, which have more clay than the Coloma soil; in landscape positions below those of the Coloma soil

Use and Management

Cropland

Suitability: Poorly suited or unsuited
Management considerations:
• Water erosion, soil blowing, and the restricted available water capacity are limitations. Field windbreaks and a conservation tillage system that leaves crop residue on the surface help to control erosion and soil blowing and conserve soil moisture. Irrigation helps to overcome the restricted available water capacity.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• Soil blowing is a hazard. Maintaining a thick and healthy plant cover can minimize the effects of soil blowing.
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Moderately suited
Management considerations:
• Droughtiness is a limitation. Planting in furrows, mulching, and selecting seedlings that are tolerant of dry conditions reduce the seedling mortality rate.

Dwellings

Suitability: Moderately suited
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Because of the poor filtering capacity of this soil, the pollution of ground water by septic tank effluent is a concern. The slope is also a limitation. Because of the variability of soil properties in different delineations of this unit, onsite investigation is needed. The design of absorption fields should meet local and State guidelines.

Roads and streets

Suitability: Moderately suited
• The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Interpretive Groups

Land capability classification: 6s
Farmland classification: None
Woodland planting group: 5
Windbreak planting group: 7
Hydrologic soil group: A

802—Orthents, loamy

General Description

• These soils generally are in cut-and-fill areas. In the cut areas, the topsoil has been removed and the subsoil or underlying material has been exposed. In the fill areas, additional loamy material has been placed on the original surface layer and in many cases has been mixed with the original soil.

Soil Properties and Qualities

Drainage class: Poorly drained to well drained
Permeability: Slow to rapid
Parent material: Commonly glacial till
Runoff: Slow to rapid
Available water capacity: Low
Organic matter content: Low
Erosion hazard: Moderate

Typical Profile

Surface layer:
0 to 4 inches—mixed yellowish brown and dark brown silt loam

Substratum:
4 to 13 inches—yellowish brown and dark brown silt loam
13 to 21 inches—light olive brown loam
21 to 60 inches—light olive brown clay loam

Use and Management

• Because these soils are so variable, intensive onsite investigation is needed to determine the suitability for most uses.

865—Pits, gravel

Setting

Landform: Stream terraces and outwash plains

General Description

• This map unit consists of areas from which gravel, sand, or both have been removed. It includes the surrounding area, in which the mining by-products have been placed.

Properties and Qualities of the Soil Material

Permeability: Moderate to rapid
Parent material: Outwash
Runoff: Slow to medium
Available water capacity: Low
Organic matter content: Low
Erosion hazard: Moderate

Use and Management

• Because the soil material in this unit is so variable, intensive onsite investigation is needed to determine the suitability for most uses.

935F—Miami-Hennepin complex, 25 to 35 percent slopes

Composition

Miami and similar soils: 45 percent
Hennepin and similar soils: 40 percent
Contrasting inclusions: 15 percent

Setting

Landform position: Upland side slopes
Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Parent material: Glacial till
Runoff: Very rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Very severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile of the Miami Soil

Surface layer:
0 to 6 inches—very dark grayish brown loam

Subsoil:
6 to 11 inches—brown clay loam
11 to 21 inches—dark yellowish brown clay loam
21 to 39 inches—yellowish brown clay loam

Substratum:
39 to 60 inches—yellowish brown clay loam

Typical Profile of the Hennepin Soil

Surface layer:
0 to 6 inches—very dark grayish brown loam

Subsoil:
6 to 11 inches—brown clay loam
11 to 20 inches—dark yellowish brown clay loam
20 to 42 inches—yellowish brown clay loam

Substratum:
42 to 60 inches—yellowish brown clay loam

Minor Components

Similar soils:
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The moderately well drained Birkbeck soils, which are deep to glacial till; in landscape positions above those of the Miami and Hennepin soils
• The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Miami and Hennepin soils

Use and Management

Cropland

Suitability: Unsuited because of the slope

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Overgrazing reduces forage yields and causes surface compaction, which results in excessive runoff and increases the susceptibility to erosion. Deferred grazing, rotation grazing, and applications of fertilizer help to keep the plants in good condition and reduce the hazard of erosion.
• The slope is a limitation. Special equipment and techniques are needed for planting or for applying chemicals and fertilizer. The very steep areas are unsuitable for hay because of equipment limitations affecting harvesting.

Woodland

Suitability: Moderately suited
Management considerations:
• Water erosion is a hazard. Building logging roads and skid trails on or nearly on the contour and

diverting surface water from these areas help to control erosion.
• Soil blowing is also a hazard. Seeding bare areas to grass or to a grass-legume mixture after logging has been completed reduces the hazard of soil blowing.
• The slope is a limitation. In steep areas the logs should be skidded uphill with a cable and winch.

Dwellings

Suitability: Unsuited because of the slope

Septic tank absorption fields

Suitability: Unsuited because of the slope

Roads and streets

Suitability: Unsuited because of the slope

Interpretive Groups

Land capability classification: 7e
Farmland classification: None
Woodland planting group: 1
Windbreak planting group: 8
Hydrologic soil group: B

935G—Miami-Hennepin complex, 35 to 60 percent slopes

Composition

Miami and similar soils: 45 percent
Hennepin and similar soils: 40 percent
Contrasting inclusions: 15 percent

Setting

Landform position: Upland side slopes
Major use: Woodland (fig. 10)

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Parent material: Glacial till
Runoff: Very rapid
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Very severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile of the Miami Soil

Surface layer:
0 to 3 inches—dark brown silt loam

Subsurface layer:
3 to 12 inches—brown silt loam

Subsoil:
12 to 29 inches—dark yellowish brown clay loam
29 to 60 inches—yellowish brown loam

Typical Profile of the Hennepin Soil

Surface layer:
0 to 3 inches—dark brown silt loam

Subsoil:
3 to 6 inches—dark yellowish brown silty clay loam
6 to 9 inches—dark yellowish brown clay loam
9 to 15 inches—yellowish brown clay loam
15 to 24 inches—yellowish brown loam

Substratum:
24 to 60 inches—yellowish brown loam

Minor Components

Similar soils:
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The moderately well drained Birkbeck soils, which are deep to glacial till; in landscape positions above those of the Miami and Hennepin soils
• The somewhat poorly drained Lawson soils on bottom land in landscape positions below those of the Miami and Hennepin soils

Use and Management

Cropland

Suitability: Unsuited because of the slope

Pasture and hay

Suitability: Unsuited because of the slope

Woodland

Suitability: Poorly suited
Management considerations:
• Water erosion is a hazard. Building logging roads and skid trails on or nearly on the contour and diverting surface water from these areas help to control erosion.
• Soil blowing also is a hazard. Seeding bare areas to grass or to a grass-legume mixture after logging has been completed reduces the hazard of soil blowing.
• The slope is a limitation. In steep areas the logs should be skidded uphill with a cable and winch.

Dwellings

Suitability: Unsuited because of the slope

Figure 10.—A typical area of Miami-Hennepin complex, 35 to 60 percent slopes, in a ravine in the bluffs along the Illinois and Mackinaw Rivers.

Septic tank absorption fields

Suitability: Unsuited because of the slope

Roads and streets

Suitability: Unsuited because of the slope

Interpretive Groups

Land capability classification: 7e
Farmland classification: None
Woodland planting group: 1
Windbreak planting group: 8
Hydrologic soil group: B

3092—Sarpy loamy fine sand, frequently flooded

Composition

Sarpy soil and similar soils: 75 to 80 percent
Contrasting inclusions: 20 to 25 percent

Setting

Landform position: Flood plains
Frequency of flooding: Frequent from November through June
Flooding duration: Long
Major use: Woodland

Soil Properties and Qualities

Drainage class: Excessively drained

Permeability: Rapid
Parent material: Sandy alluvium
Runoff: Slow
Available water capacity: Low
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Low
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Low
Potential for frost action: Low

Typical Profile

Surface layer:
0 to 10 inches—brown loamy fine sand

Substratum:
10 to 19 inches—yellowish brown and brown fine sand
19 to 60 inches—yellowish brown fine sand

Minor Components

Similar soils:
• Soils that have more clay in the subsoil

Contrasting inclusions:
• The poorly drained Slacwater soils, which contain less sand than the Sarpy soil; in landscape positions similar to those of the Sarpy soil
• The somewhat poorly drained Raveenwash soils in the slightly higher areas on the landscape

Use and Management

Cropland

Suitability: Unsuited because of frequent flooding

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Ponding and flooding are hazards. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Woodland

Suitability: Moderately suited
Management considerations:
• Wetness is a limitation. The ponding, the flooding, and the seasonal high water table result in equipment limitations. Using machinery only when the soil is firm enough to support the equipment helps to prevent the formation of ruts and minimizes surface compaction. The wetness also increases the seedling mortality rate. Using good site preparation methods, planting seedlings that are tolerant of wet conditions, and creating drainageways to remove surface water reduce the seedling mortality rate and eliminate undesirable competition.

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.

Interpretive Groups

Land capability classification: 4w
Farmland classification: None
Woodland planting group: 5
Windbreak planting group: 1L
Hydrologic soil group: A

3107—Sawmill silty clay loam, frequently flooded

Composition

Sawmill soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Flood plains
Frequency of flooding: Frequent from March through June
Flooding duration: Brief
Ponding duration: February through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—black silty clay loam

Subsurface layer:
8 to 27 inches—black and very dark gray silty clay loam

Subsoil:
27 to 33 inches—gray silty clay loam
33 to 52 inches—olive gray silty clay loam

Substratum:
52 to 60 inches—olive gray silty clay loam

Minor Components

Similar soils:
• Soils that have more sand in the subsoil
• Soils that have a seasonal high water table at a lower depth

Contrasting inclusions:
• The well drained Miami soils on steep side slopes in landscape positions above those of the Sawmill soil
• The well drained Huntsville soils in landscape positions similar to those of the Sawmill soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Woodland

Suitability: Moderately suited
Management considerations:
• Wetness is a limitation. The ponding, the flooding, and the seasonal high water table result in equipment limitations. Using machinery only when the soil is firm enough to support the equipment helps to prevent the formation of ruts and minimizes surface compaction. The wetness also increases the seedling mortality rate. Using good site preparation methods, planting seedlings that are tolerant of wet conditions, and creating drainageways to remove surface water reduce the seedling mortality rate and eliminate undesirable competition.

Dwellings

Suitability: Unsuited because of the flooding and the ponding

Septic tank absorption fields

Suitability: Unsuited because of the flooding and the ponding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The low bearing strength, the potential for frost action, and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome this limitation.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 3w
Farmland classification: Prime farmland (where drained and either protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

3304—Landes fine sandy loam, frequently flooded

Composition

Landes soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Frequent from February through June
Flooding duration: Brief
Major uses: Row crops and woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid in the upper part and rapid in the lower part
Parent material: Loamy and sandy alluvium
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Organic matter content: Moderately low
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 19 inches—dark brown fine sandy loam

Subsoil:
19 to 39 inches—dark yellowish brown fine sandy loam

Substratum:
39 to 60 inches—dark yellowish brown fine sandy loam and loam

Minor Components

Similar soils:
• Soils that have less sand in the subsoil
• Soils that have less clay in the subsoil

Contrasting inclusions:
• The well drained Huntsville soils, which contain less sand than the Landes soil; in landscape positions similar to those of the Landes soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• The restricted available water capacity is a limitation. Field windbreaks and a conservation tillage system that leaves crop residue on the surface conserve soil moisture. Irrigation can also help to overcome the restricted available water capacity.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material to the soil increases the available water capacity and improves fertility.

Pasture and hay

Suitability: Poorly suited
Management considerations:
• Droughtiness is a limitation. A plant cover can be established by planting drought-resistant grasses and legumes. Deferred grazing, rotation grazing, irrigation, and applications of fertilizer help to maintain plant quality.

Woodland

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.

Interpretive Groups

Land capability classification: 3w
Farmland classification: Prime farmland (where protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

3360—Slacwater silt loam, frequently flooded

Composition

Slacwater soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Flood plains
Frequency of flooding: Frequent from November through June
Flooding duration: Very long or long

Ponding duration: November through June
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: Moderately low
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown and dark grayish brown silt loam

Substratum:
6 to 15 inches—dark grayish brown and light brownish gray silt loam
15 to 22 inches—grayish brown, pale olive, and light olive brown silt loam
22 to 60 inches—olive gray, pale olive, and light olive brown silty clay loam

Minor Components

Similar soils:
- Soils that have more sand in the subsoil

Contrasting inclusions:
- The excessively drained Sarpy soils, which contain more sand than the Slacwater soil; in landscape positions similar to those of the Slacwater soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
- Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
- Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
- Tilling when the soil is wet causes surface compaction and cloddiness.
- Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
- Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Woodland

Suitability: Moderately suited
Management considerations:
- Wetness is a limitation. The ponding, the flooding, and the seasonal high water table result in equipment limitations. Using machinery only when the soil is firm enough to support the equipment helps to prevent the formation of ruts and minimizes surface compaction. The wetness also increases the seedling mortality rate. Using good site preparation methods, planting seedlings that are tolerant of wet conditions, and creating drainageways to remove surface water reduce the seedling mortality rate and eliminate undesirable competition.

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding and the ponding

Roads and streets

Suitability: Poorly suited
Management considerations:
- Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
- The potential for frost action and the shrink-swell potential are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: None
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B/D

8073—Ross silt loam, occasionally flooded

Composition

Ross soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from March through June
Flooding duration: Brief
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loamy alluvium
Runoff: Slow
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderate
Type of erosion hazard: Streambank erosion (fig. 11)
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—dark brown silt loam

Subsurface layer:
9 to 19 inches—dark brown and brown, stratified silt loam

Subsoil:
19 to 30 inches—very dark grayish brown loam
30 to 39 inches—dark brown loam
39 to 50 inches—dark yellowish brown loam
50 to 60 inches—brown sandy loam

Minor Components

Similar soils:
• Soils that have carbonates closer to the surface
• Soils that have less sand in the subsoil

Contrasting inclusions:
• The well drained Miami soils on steep side slopes in landscape positions above those of the Ross soil
• The somewhat poorly drained Lawson soils, which contain less sand than the Ross soil; in landscape positions similar to those of the Ross soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 11
Hydrologic soil group: B

8074—Radford silt loam, occasionally flooded

Composition

Radford soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from March through June

Figure 11.—Streambank erosion in an area of Ross silt loam, occasionally flooded, along Richland Creek. This erosion removes much of the Ross soil on bottom land and deposits it as sediment in the Upper Peoria lakes.

Flooding duration: Brief
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Silty alluvium over buried soil
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderate
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—very dark grayish brown silt loam

Substratum:
10 to 31 inches—very dark grayish brown silt loam with dark grayish brown and brown strata

Buried surface layer:
31 to 40 inches—black silty clay loam
40 to 51 inches—very dark gray silty clay loam

Buried subsoil:
51 to 60 inches—dark grayish brown silty clay loam

Minor Components

Similar soils:
• Soils that have a thinner surface layer

Contrasting inclusions:
• The well drained Miami and Hennepin soils on steep side slopes in landscape positions above those of the Radford soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

8077—Huntsville silt loam, occasionally flooded

Composition

Huntsville soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from March through June
Flooding duration: Brief
Major use: Row crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderate
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 18 inches—very dark grayish brown silt loam

Subsurface layer:
18 to 54 inches—very dark gray silt loam

Substratum:
54 to 60 inches—dark brown silt loam and loam

Minor Components

Similar soils:
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The well drained Landes soils, which have more sand than the Huntsville soil; in landscape positions similar to those of the Huntsville soil
• The poorly drained Sawmill soils in landscape positions similar to those of the Huntsville soil

Use and Management

Cropland

Suitability: Moderately suited

Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

8107—Sawmill silty clay loam, occasionally flooded

Composition

Sawmill soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from March through June
Flooding duration: Brief
Ponding duration: March through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: High
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 21 inches—black silty clay loam

Subsurface layer:
21 to 26 inches—very dark gray silty clay loam

Subsoil:
26 to 58 inches—light olive gray silty clay loam

Substratum:
58 to 60 inches—light olive gray loam

Minor Components

Similar soils:
• Soils that have more sand in the subsoil
• Soils that have a thicker surface layer

Contrasting inclusions:
• The well drained Miami and Hennepin soils on steep side slopes in landscape positions above those of the Sawmill soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.

• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Woodland

Suitability: Moderately suited
Management considerations:
• Wetness is a limitation. The ponding, the flooding, and the seasonal high water table result in equipment limitations. Using machinery only when the soil is firm enough to support the equipment helps to prevent the formation of ruts and minimizes surface compaction. The wetness also increases the seedling mortality rate. Using good site preparation methods, planting seedlings that are tolerant of wet conditions, and creating drainageways to remove surface water reduce the seedling mortality rate and help to control competition from undesirable species.

Dwellings

Suitability: Unsuited because of the flooding and the ponding

Septic tank absorption fields

Suitability: Unsuited because of the flooding and the ponding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome this limitation.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained and either protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B/D

8368—Raveenwash silt loam, occasionally flooded

Composition

Raveenwash soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from November through June
Flooding duration: Brief or long
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately rapid
Parent material: Loamy and sandy alluvium
Runoff: Slow
Available water capacity: Moderately low
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: Moderately low
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—brown silt loam

Substratum:
6 to 17 inches—brown and dark brown silt loam with strata of very fine sandy loam
17 to 27 inches—yellowish brown and brown loam with strata of fine sand
27 to 34 inches—brown and dark grayish brown loam with strata of sandy loam
34 to 45 inches—dark grayish brown loam and dark yellowish brown sandy loam
45 to 60 inches—yellowish brown, brown, and grayish brown, stratified sand, sandy loam, and silt loam

Minor Components

Similar soils:
• Soils that have more clay in the subsoil

• Soils that have more sand in the subsoil

Contrasting inclusions:
• The excessively drained Sarpy soils, which have more sand than the Raveenwash soil; in landscape positions similar to those of the Raveenwash soil
• The poorly drained Slacwater soils, which have less clay than the Raveenwash soil; in landscape positions similar to those of the Raveenwash soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• The restricted available water capacity is a limitation. Field windbreaks and a conservation tillage system that leaves crop residue on the surface can conserve soil moisture. Irrigation can also help to overcome the restricted available water capacity.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material minimizes crusting and improves tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding and the seasonal high water table

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Important farmland
Woodland planting group: 1
Windbreak planting group: 1L
Hydrologic soil group: A

8400—Calco silty clay loam, occasionally flooded

Composition

Calco soil and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from February through June
Flooding duration: Long
Ponding duration: November through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot to 1.0 foot below the surface
Organic matter content: High
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—black silty clay loam

Subsurface layer:
8 to 27 inches—black silty clay loam

Subsoil:
27 to 36 inches—very dark gray silty clay loam
36 to 60 inches—dark gray silty clay loam

Minor Components

Similar soils:
• Soils that have more sand in the subsoil
• Soils that have a thinner surface layer

Contrasting inclusions:
• The somewhat poorly drained Raveenwash soils, which have more sand than the Calco soil; in the slightly higher positions on the landscape
• The very poorly drained, organic Lena soils in slightly depressional areas below the Calco soil on the landscape

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Unsuited because of the flooding and the ponding

Septic tank absorption fields

Suitability: Unsuited because of the flooding and the ponding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.

Interpretive Groups

Land capability classification: 3w
Farmland classification: Prime farmland (where drained and either protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B/D

8402—Colo silt loam, occasionally flooded

Composition

Colo soil and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from October through June
Flooding duration: Brief
Ponding duration: March through June
Major use: Row crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot to 1.0 foot below the surface
Organic matter content: High
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark gray silt loam

Subsurface layer:
8 to 30 inches—black silty clay loam

Subsoil:
30 to 37 inches—black silty clay loam
37 to 44 inches—very dark gray silty clay loam
44 to 60 inches—dark gray silty clay loam

Minor Components

Similar soils:
• Soil that have a thinner surface layer

Contrasting inclusions:
• The well drained Miami and Hennepin soils on steep side slopes in landscape positions above those of the Colo soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Ponding is a hazard. Wetness may delay planting or interfere with harvesting in many years. Surface ditches, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. This soil is sufficiently drained for the commonly grown crops. Measures that maintain or improve the drainage system are needed.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Moderately suited
Management considerations:
• Ponding is a hazard. Wetness may interfere with the harvesting of hay. Deferring grazing during wet periods helps to keep the plants in good condition, minimizes compaction, and helps to prevent the formation of ruts.

Dwellings

Suitability: Unsuited because of the flooding and the ponding

Septic tank absorption fields

Suitability: Unsuited because of the flooding and the ponding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The seasonal high water table and the ponding are limitations. Providing open ditches, which remove excess water, and raising the roadbed by adding proper fill material help to overcome these limitations.
• The low bearing strength and the potential for frost action are limitations. Strengthening or replacing the base material helps to overcome these limitations.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland (where drained and either protected from flooding or not frequently flooded during the growing season)
Woodland planting group: 2
Windbreak planting group: 2
Hydrologic soil group: B

8451—Lawson silt loam, occasionally flooded

Composition

Lawson soil and similar soils: 80 to 85 percent
Contrasting inclusions: 15 to 20 percent

Setting

Landform position: Flood plains
Frequency of flooding: Occasional from March through June
Flooding duration: Brief
Major use: Row crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: High
Type of erosion hazard: Streambank erosion
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 22 inches—black silt loam

Subsurface layer:
22 to 40 inches—very dark grayish brown silt loam

Subsoil:
40 to 48 inches—brown silt loam
48 to 54 inches—dark yellowish brown loam

Substratum:
54 to 60 inches—brown, stratified sandy loam and loamy sand

Minor Components

Similar soils:
• Soils that have more sand in the subsoil

Contrasting inclusions:
• The well drained Ross and Landes soils, which have more sand than the Lawson soil; in

landscape positions similar to those of the Lawson soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding is a hazard. It may delay planting or interfere with harvesting. Adequately constructed and maintained levees help to protect the cropland from flooding.
• Tilling when the soil is wet causes surface compaction and cloddiness.
• Adding organic material can help to maintain or improve tilth and fertility.

Pasture and hay

Suitability: Well suited

Woodland

Suitability: Well suited

Dwellings

Suitability: Unsuited because of the flooding

Septic tank absorption fields

Suitability: Unsuited because of the flooding

Roads and streets

Suitability: Poorly suited
Management considerations:
• Flooding is a hazard. Raising the roadbed by adding several feet of fill material to a height above the maximum flood stage helps to overcome the flooding.
• The potential for frost action is a limitation. Strengthening or replacing the base material helps to overcome this limitation.

Interpretive Groups

Land capability classification: 2w
Farmland classification: Prime farmland
Woodland planting group: 1
Windbreak planting group: 1
Hydrologic soil group: B

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

The map units in Woodford County that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that are have a seasonal high water table and all soils that are frequently flooding during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures. In Woodford County most of the naturally wet soils have been adequately drained.

Additional farmland of statewide importance is identified in the map unit descriptions as "important farmland." The soils that are assigned to this category are nearly prime farmland. They produce good yields of crops in an economic manner when treated and managed according to acceptable farming methods.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1989, about 298,000 acres in Woodford County was used as cropland. The soils have good potential for the production of crops, particularly corn, soybeans, wheat, and hay.

The main management needs in the county are measures that control erosion, lower the seasonal high water table, and improve fertility and tilth. Erosion is a potential problem on more than 38 percent of the cropland. It is a hazard in areas where the slope is more than 2 percent if the surface is not protected.

Erosion is damaging for three main reasons. First, most of the organic matter is in the upper 6 to 9 inches of the soil profile. The content of organic matter is an important feature affecting the ability of the soil to provide nutrients and moisture. If erosion occurs, this part of the soil is lost and the less productive subsoil is incorporated into the plow layer. Second, severe erosion reduces the rate of water infiltration and increases the runoff rate. Third, erosion allows sediment to enter waterways, ponds, streams, lakes, ditches, and rivers. Removing this sediment is expensive. Management that controls erosion minimizes the pollution caused by sediment and improves the quality of water for municipal and recreational uses and for fish and wildlife.

Several conservation practices can be used to control erosion and runoff and increase the rate of water infiltration. Examples are terraces, contour farming, and a system of conservation tillage that leaves crop residue on the surface after planting.

Terraces, contour farming, and conservation tillage help to control erosion by decreasing the rate of runoff. Terraces are effective on slopes that are uniform and are not broken by drainageways. Contour farming, which involves tilling and planting on the contour, is most effective on slopes of 7 percent or less. It is commonly used in combination with terraces. Land smoothing helps to align the terraces and facilitates cultivating on the contour. A conservation tillage system is one in which crop residue is left on the surface throughout the planting season. The crop residue protects the soil from erosion, helps to maintain good soil structure, minimizes surface compaction, and improves tilth. A no-till or minimum tillage system helps to control erosion, reduces the runoff rate, and increases the rate of water infiltration. Conservation tillage is suitable on most of the soils in the county but is less successful on severely eroded soils and soils where wetness is a problem.

Sandy soils are susceptible to soil blowing. Maintaining a cover of plants or mulch and keeping the surface rough through proper tillage help to control soil blowing. Windbreaks also are effective in controlling soil blowing.

Further information about measures that control erosion is available at the local office of the Natural Resources Conservation Service.

Some type of artificial drainage system has been installed on most of the poorly drained and somewhat poorly drained soils in the county. The seasonal high water table has been effectively lowered in most areas where it was a limitation. Measures that maintain the drainage system are needed.

Maintaining soil fertility and tilth is important for crop production and pasture. Additions of lime, nitrogen, phosphorus, and potassium are needed on most soils to maintain fertility. Applications of fertilizer should be based on the results of soil tests. Soil tilth influences the germination of seeds, the rate of runoff, and the rate of water infiltration. Poor tilth is a problem in soils that have a light colored surface layer and a low content of organic matter. Including grasses or legumes in the crop rotation and adding manure can improve tilth in these areas.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (Fehrenbacher and others, 1978). Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management (USDA, 1961). The criteria used in grouping the soils do not include major and generally expensive land shaping that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Woodland Management and Productivity

In 1985, about 28,000 acres in Woodford County was used as woodland (Hahn, 1987). Most of the trees have been cleared from the soils that are suitable for cultivated crops. As a result, much of the remaining woodland is in areas that are too steep for cultivation.

The largest area of woodland is in association 8, which is described under the heading "General Soil Map Units." The most common trees on the uplands are white oak, red oak, hickory, ash, maple, boxelder, and walnut. The most common trees on the flood plains are cottonwood, sycamore, willow, white oak, and hickory.

Many of the existing woodland can be improved by thinning out mature trees and trees of low value. Measures that protect the woodland from fire and grazing are needed. Logging trails and access roads are commonly on steep slopes. Shaping and seeding these trails and roads and applying fertilizer immediately after harvest help to control erosion. Interplanting is needed for maximum woodland production. Control or removal of competing vegetation is needed if seedlings are planted. A grass cover is needed if seedlings are planted on bare, sloping land.

The map units in the survey area are assigned to woodland planting groups. These groups are listed in the map unit descriptions under the heading "Detailed Soil Map Units." The characteristics of each group are described in the Technical Guide, which is available in the local office of the Natural Resources Conservation Service.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol,* a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; and *L*, low strength. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and L.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen trees and shrubs, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens.

The map units in the survey area are assigned to windbreak planting groups. These groups are listed in the map unit descriptions under the heading "Detailed Soil Map Units." The characteristics of each group are described in the Technical Guide, which is available in the local office of the Natural Resources Conservation Service.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Kent Boyles, private lands wildlife biologist, Illinois Department of Conservation, helped prepare this section.

Woodford County has a diversity of wildlife habitat, ranging from the wooded uplands of Panther Creek and the Mackinaw and Illinois River corridors to the vast row-cropped openland of the old prairie (fig. 12). This mixture of habitat types results in a wide variety of wildlife in the county during part or all of the year. Wild turkey, white-tailed deer, pheasant, bobwhite quail, Canada geese, bald eagle, and various ducks are examples of the numerous wildlife species in different parts of the county.

Soils affect the type of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The abundance of wildlife depends largely on the amount and distribution of food, cover, and water. Wildlife habitat can be established or enhanced by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable species.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of hardwood trees beneficial to wildlife are oak, walnut, ash, and hickory. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, silky dogwood, American plum, hazelnut, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, and slope. Examples of wetland plants are smartweed, wild millet, cordgrass, buttonbush, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are cattail marshes, green-tree reservoirs (flooded timber areas), and ponds.

Figure 12.—This woodland in an area of Miami-Hennepin complex, 25 to 35 percent slopes, produces hardwood lumber and provides habitat for deer and other species.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, American kestrel, field sparrow, and cottontail rabbit.

Habitat for woodland wildlife consists of areas of woody deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, fox, coyote, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent. Large stones interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. Large stones, a high water table, and slope affect the ease of excavation. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a seasonal high water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the

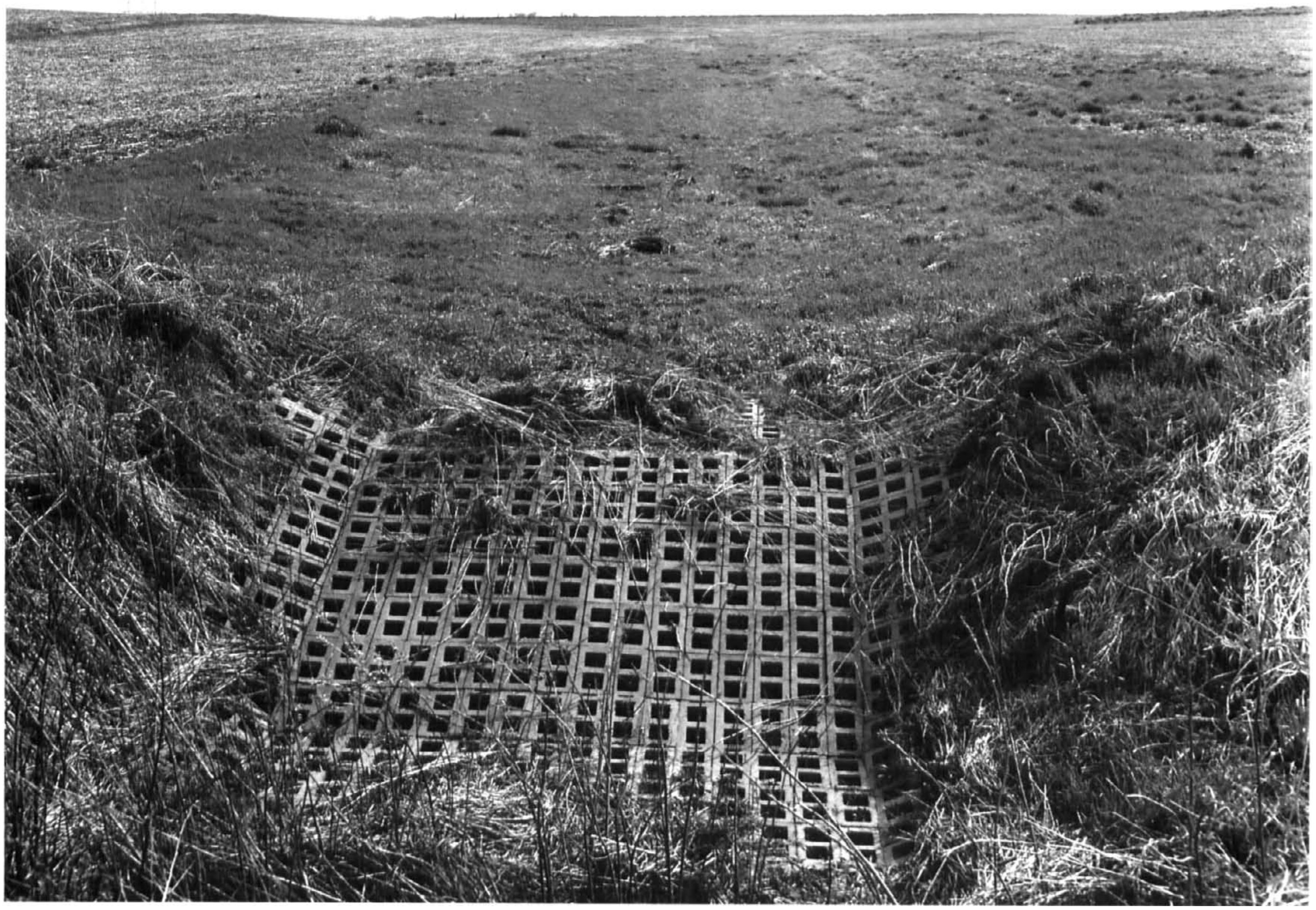


Figure 13.—A block chute helps to dissipate the erosive energy of flowing water at the end of a grassed waterway in an area of Sable silty clay loam.

salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity (fig. 13). Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

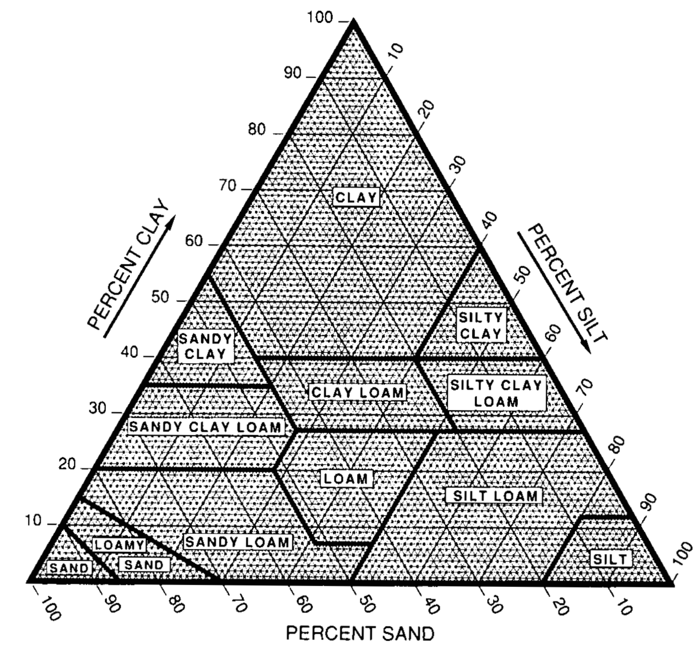


Figure 14.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 14). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Cation-exchange capacity is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. It is a measurement of the nutrient-holding capacity of the soil.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils generally are not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams that have more than 5 percent finely divided calcium carbonate. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils have less than 5 percent finely divided calcium carbonate. They are very slightly erodible.

Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 17, the first letter is for drained areas and the second is for undrained areas.

The hydrologic soil groups are also given in the map unit descriptions under the heading "Detailed Soil Map Units."

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udoll (*Ud*, meaning humid, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argiudolls (*Argi*, meaning argillic horizon, plus *udoll*, the suborder of the Mollisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Argiudolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, mesic Typic Argiudolls.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alvin Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid
Landform position: Nearly level areas and side slopes on terraces

Parent material: Eolian deposits
Slope range: 0 to 15 percent and 25 to 35 percent

Typical Pedon

Alvin sandy loam, 2 to 5 percent slopes, 2,472 feet south and 147 feet east of the northwest corner of sec. 36, T. 27 N., R. 4 W.

Ap—0 to 10 inches; brown (10YR 4/3) sandy loam, brown (10YR 5/3) dry; weak fine granular structure; very friable; common very fine and fine roots; neutral; abrupt smooth boundary.

Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) loam; moderate fine and medium subangular blocky structure; friable; few very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt2—16 to 25 inches; dark yellowish brown (10YR 4/6) sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt3—25 to 47 inches; strong brown (7.5YR 5/6) sandy loam; weak medium and coarse subangular blocky structure; very friable; few distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

E&Bt—47 to 60 inches; strong brown (7.5YR 5/6) sand (E); single grain; loose; strong brown (7.5YR 4/6) loamy sand (Bt); weak coarse subangular blocky structure; very friable; slightly acid.

Range in Characteristics

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture of the fine-earth fraction—loamy sand or sandy loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—sandy loam, loam, or clay loam

E&Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—sand, loamy sand, sandy loam, or loam

Atterberry Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform position: Nearly level uplands
Parent material: Loess
Slope range: 0 to 2 percent

Typical Pedon

Atterberry silt loam, 0 to 2 percent slopes, 2,942 feet south and 2,005 feet east of the northwest corner of sec. 4, T. 28 N., R. 2 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—7 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thin platy structure parting to weak fine subangular blocky; friable; many fine roots; many distinct dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—10 to 21 inches; dark yellowish brown (10YR 4/6) silty clay loam; few fine distinct grayish brown (2.5Y 5/2) mottles; moderate fine subangular blocky structure; friable; many fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—21 to 35 inches; dark yellowish brown (10YR 4/6) silty clay loam; few fine distinct grayish brown (2.5Y 5/2) mottles; moderate fine and medium subangular blocky structure; friable; common fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt3—35 to 54 inches; dark yellowish brown (10YR 4/6) silt loam; common fine distinct grayish brown (2.5Y 5/2) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

C—54 to 60 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct grayish brown (2.5Y 5/2) mottles; massive; friable; common fine accumulations of iron and manganese oxide; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 35 to more than 60 inches; average 39 inches

Thickness of the dark surface layer: 6 to 10 inches; average 9 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silt loam

Birkbeck Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate and moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 15 percent

Typical Pedon

Birkbeck silt loam, 2 to 5 percent slopes, eroded, 1,230 feet north and 1,570 feet west of the southeast corner of sec. 3, T. 25 N., R. 1 E.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

Bt1—9 to 17 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt2—17 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt3—30 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few very fine roots; few distinct very pale brown (10YR 7/3 dry) silt coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt4—39 to 52 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and common medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure; few medium concretions of iron and manganese oxide; slightly acid; diffuse wavy boundary.

2Bk—52 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure; firm; few fine accumulations of calcium carbonate; few medium concretions of iron and manganese oxide; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 32 to 55 inches; average 44 inches

Thickness of the loess: 40 to 60 inches; average 45 inches

Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2Bk horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture of the fine-earth fraction—silty clay loam

Calco Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Calco silty clay loam, occasionally flooded, 1,800 feet north and 2,600 feet west of the southeast corner of sec. 21, T. 28 N., R. 3 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak very fine granular structure; friable; common very fine and fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.

A1—8 to 17 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate very fine angular blocky structure; friable; common very fine and fine roots; strongly effervescent; moderately alkaline; diffuse wavy boundary.

A2—17 to 27 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine angular blocky structure; friable; common very fine and fine roots; strongly effervescent; moderately alkaline; diffuse wavy boundary.

Bg1—27 to 36 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; strongly effervescent; moderately alkaline; diffuse wavy boundary.

Bg2—36 to 44 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; strongly effervescent; moderately alkaline; diffuse wavy boundary.

Bg3—44 to 57 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium and coarse prismatic structure parting to weak medium and coarse subangular blocky; friable; few very fine roots; strongly effervescent; moderately alkaline; diffuse wavy boundary.

Bkg—57 to 60 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; massive; friable; common medium soft masses of carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Carbonates: At the surface
Thickness of the mollic epipedon: 17 to 36 inches; average 28 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1
Texture of the fine-earth fraction—silt loam or silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 or 4
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam, loam, or silty clay loam

Camden Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Nearly level areas and side slopes on terraces
Parent material: Loess over glacial outwash
Slope range: 0 to 10 percent

Typical Pedon

Camden silt loam, 2 to 5 percent slopes, 1,530 feet south and 2,680 feet west of the northeast corner of sec. 3, T. 25 N., R. 1 W.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine and medium roots; slightly acid; abrupt wavy boundary.

EB—10 to 14 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium angular blocky structure; friable; common fine roots; slightly acid; clear wavy boundary.

Bt1—14 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear wavy boundary.

Bt2—19 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; friable; few fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; gradual wavy boundary.

2Bt3—30 to 40 inches; dark yellowish brown (10YR 4/6) loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; gradual wavy boundary.

2BCt—40 to 59 inches; dark yellowish brown (10YR 4/6), stratified sandy loam and loam; weak coarse and medium prismatic structure; friable; few fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; gradual wavy boundary.

2C—59 to 60 inches; dark yellowish brown (10YR 4/4), stratified loam and clay loam with strata of gravelly loam and gravelly clay loam; massive; friable; few fine roots; 10 percent gravel; strongly acid.

Range in Characteristics

Depth to glacial outwash: 28 to 40 inches; average 33 inches

Ap horizon:
Hue—10YR
Value—4
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

EB horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture of the fine-earth fraction—sandy loam, loam, clay loam, or silt loam

Catlin Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 10 percent
Taxadjunct features: Catlin silt loam, 2 to 5 percent slopes, eroded, and Catlin silt loam, 5 to 10 percent slopes, eroded, do not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Catlin silt loam, 2 to 5 percent slopes, 220 feet south and 1,180 feet west of the northeast corner of sec. 1, T. 26 N., R. 1 E.

Ap—0 to 10 inches; very dark brown (10YR 2/2) silt loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; many very fine and fine roots; neutral; clear wavy boundary.

Bt1—18 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine concretions of iron and manganese oxide; neutral; gradual wavy boundary.

Bt2—26 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium prismatic structure; friable; common very fine and fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine concretions of iron and manganese oxide; neutral; gradual wavy boundary.

Bt3—40 to 50 inches; yellowish brown (10YR 5/4) silt loam; few fine grayish brown (2.5Y 5/2) mottles; moderate coarse prismatic structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine concretions of iron and manganese oxide; neutral; abrupt smooth boundary.

2BC—50 to 55 inches; light olive brown (2.5Y 5/4) silty clay loam; few fine grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure; firm; few very fine roots; 2 percent pebbles; slightly effervescent; slightly alkaline; gradual wavy boundary.

2C—55 to 65 inches; light olive brown (2.5Y 5/4) silty clay loam; massive; firm; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 40 to 60 inches; average 46 inches
Thickness of the mollic epipedon: 9 to 18 inches; average 12 inches
Thickness of the loess: 40 to 60 inches; average 48 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—3 or 4
Texture of the fine-earth fraction—silt loam or silty clay loam

2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam, clay loam, silt loam, or silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—loam, clay loam, silt loam, or silty clay loam

Chatsworth Series

Depth class: Shallow over silty clay till
Drainage class: Moderately well drained
Permeability: Very slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 4 to 7 percent

Typical Pedon

Chatsworth silty clay loam, 4 to 7 percent slopes, eroded, 260 feet north and 60 feet west of the southeast corner of sec. 33, T. 28 N., R. 2 E.

Ap—0 to 6 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 5/3) dry; moderate fine and medium subangular blocky structure; firm; many fine and very fine roots; slightly alkaline; abrupt smooth boundary.

2Bt1—6 to 9 inches; olive (5Y 4/3) silty clay; common fine and medium distinct greenish gray (5G 5/1) and common fine and medium prominent light olive brown (2.5Y 5/4) mottles; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine concretions of iron and manganese oxide; 1 percent pebbles; slightly alkaline; gradual wavy boundary.

2Bt2—9 to 16 inches; olive (5Y 4/3) silty clay; common fine and medium distinct greenish gray (5G 5/1) and common fine and medium prominent light olive brown (2.5Y 5/4) mottles; weak fine and medium prismatic structure parting to weak medium subangular blocky; extremely firm; few fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine soft masses of carbonate; 1 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

2Btk—16 to 31 inches; olive (5Y 4/3) silty clay; common medium and coarse distinct greenish gray (5G 5/1) and common fine and medium prominent olive brown (2.5Y 4/4) mottles; weak coarse prismatic structure; extremely firm; very few distinct dark gray (10YR 4/1) pressure faces on faces of peds; common medium soft masses of carbonate; 1 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

2C—31 to 60 inches; olive (5Y 4/3) silty clay; common medium and coarse distinct greenish gray (5G 5/1) mottles; massive; extremely firm; common fine concretions of calcium carbonate; 1 percent pebbles; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 6 to 15 inches; average 10 inches
Thickness of the mollic epipedon: 6 to 8 inches; average 7 inches
Thickness of the loess: 6 to 8 inches; average 7 inches

Ap horizon:
Hue—10YR
Value—3
Chroma—2 or 3
Texture of the fine-earth fraction—silty clay loam

2Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silty clay

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay

Chenoa Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate over slow
Landform position: Upland side slopes or nearly level areas
Parent material: Loess over glacial till
Slope range: 0 to 5 percent
Taxadjunct features: Chenoa silty clay loam, 2 to 5 percent slopes, eroded, does not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Typical Pedon

Chenoa silty clay loam, 0 to 2 percent slopes, 120 feet north and 1,613 feet east of the southwest corner of sec. 6, T. 28 N., R. 1 E.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

A—9 to 14 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate very fine granular structure; friable; common very fine roots; neutral; clear wavy boundary.

Bt1—14 to 25 inches; olive brown (2.5Y 4/4) silty clay loam; many fine faint dark grayish brown (2.5Y 4/2) mottles; moderate very fine subangular blocky structure; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine concretions of iron and manganese oxide; neutral; clear wavy boundary.

Bt2—25 to 34 inches; olive brown (2.5Y 4/4) silty clay loam; many fine faint grayish brown (2.5Y 5/2) mottles; moderate very fine and fine prismatic structure parting to moderate very fine and fine subangular blocky; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine concretions of iron and manganese oxide; neutral; clear wavy boundary.

2Bt3—34 to 40 inches; light olive brown (2.5Y 5/4) silty clay loam; many fine faint light olive brown (2.5Y 5/6) and common fine faint grayish brown (2.5Y 5/2) mottles; moderate medium prismatic structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine concretions of iron and manganese oxide; slightly alkaline; gradual wavy boundary.

2BC—40 to 49 inches; olive brown (2.5Y 4/4) silty clay loam; common fine faint light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure; firm; few very fine roots; common fine concretions of iron and manganese oxide; strongly effervescent; slightly alkaline; diffuse wavy boundary.

2C—49 to 70 inches; olive brown (2.5Y 4/4) silty clay loam; common fine faint light brownish gray (2.5Y 6/2) mottles; massive; firm; common fine concretions of iron and manganese oxide; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 46 inches; average 35 inches
Thickness of the mollic epipedon: 7 to 19 inches; average 11 inches
Thickness of the loess: 24 to 40 inches; average 32 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay loam or silty clay

2Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam

Colo Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Colo silt loam, occasionally flooded, 1,754 feet south and 180 feet west of the northeast corner of sec. 20, T. 27 N., R. 1 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
A1—8 to 18 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common very fine roots; neutral; gradual wavy boundary.
A2—18 to 30 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; common very fine roots; neutral; gradual wavy boundary.
Bg1—30 to 37 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; friable; few very fine roots; neutral; gradual wavy boundary.
Bg2—37 to 44 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; many fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; neutral; gradual wavy boundary.
Bg3—44 to 57 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly alkaline; diffuse wavy boundary.
BCg—57 to 60 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: More than 36 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 4
Chroma—1
Texture of the fine-earth fraction—silty clay loam

BCg horizon:
Hue—5Y
Value—3 to 5
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam

Coloma Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform position: Terrace side slopes
Parent material: Eolian deposits
Slope range: 1 to 15 percent

Typical Pedon

Coloma sand, 7 to 15 percent slopes, 1,400 feet north and 2,080 feet west of the southeast corner of sec. 26, T. 27 N., R. 4 E.

Ap—0 to 12 inches; dark brown (10YR 3/3) sand, brown (10YR 5/3) dry; single grain; loose; few very fine roots; strongly acid; abrupt smooth boundary.
E—12 to 25 inches; brown (10YR 4/3) sand; single grain; loose; slightly acid; gradual smooth boundary.
E&Bt1—25 to 37 inches; yellowish brown (10YR 5/6) sand (E); single grain; loose; lamellae of dark brown (7.5YR 3/4) loamy sand (Bt); weak fine subangular blocky structure; very friable; wavy and discontinuous lamellae 1/4 to 3/4 inch thick, totaling 4 inches; slightly acid; gradual smooth boundary.
E&Bt2—37 to 56 inches; yellowish brown (10YR 5/6)

sand (E); single grain; loose; lamellae of dark brown (7.5YR 3/4) sandy loam (Bt); weak fine subangular blocky structure; very friable; wavy and discontinuous lamellae 1/4 to 3/4 inch thick, totaling 1 3/4 inches; slightly acid; gradual smooth boundary.

C—56 to 60 inches; yellowish brown (10YR 5/6) sand; single grain; loose; slightly alkaline.

Range in Characteristics

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture of the fine-earth fraction—sand or loamy sand

E horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—sand

E&Bt horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—4 to 6
Texture of the fine-earth fraction—loamy sand, sandy loam, or sand

C horizon:
Hue—10YR
Value—5 or 6
Chroma—4 to 6
Texture of the fine-earth fraction—sand

Dakota Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part and rapid in the lower part
Landform position: Nearly level high terraces
Parent material: Glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Dakota loam, 0 to 2 percent slopes, 2,463 feet north and 510 feet east of the southwest corner of sec. 25, T. 27 N., R. 4 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; few very fine roots; moderately acid; clear smooth boundary.

A—9 to 14 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak fine granular structure; very friable; few very fine roots; moderately acid; gradual smooth boundary.

Bt1—14 to 21 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; very friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; gradual smooth boundary.

Bt2—21 to 31 inches; brown (7.5YR 4/4) clay loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; moderately acid; gradual smooth boundary.

2Bt3—31 to 34 inches; brown (7.5YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; clay bridging between sand grains in many places; few very fine roots; moderately acid; gradual smooth boundary.

2C—34 to 60 inches; brown (7.5YR 4/4) loamy sand; single grain; loose; few very fine roots; 2 percent gravel; moderately acid.

Range in Characteristics

Depth to sandy material: 25 to 40 inches; average 30 inches
Thickness of the mollic epipedon: 10 to 16 inches; average 13 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture of the fine-earth fraction—sandy loam or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4
Texture of the fine-earth fraction—loam or clay loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4
Texture of the fine-earth fraction—sandy loam or loamy sand

2C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6

Texture of the fine-earth fraction—loamy sand or sand

Downs Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform position: Upland side slopes
Parent material: Loess
Slope range: 2 to 5 percent
Taxadjunct features: The Downs soils in this survey area have a seasonal high water table closer to the surface than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Downs silt loam, 2 to 5 percent slopes, 2,036 feet south and 1,859 feet east of the northwest corner of sec. 4, T. 27 N., R. 2 W.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; many fine and very fine roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; many fine and very fine roots; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt2—14 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt3—22 to 32 inches; yellowish brown (10YR 5/4) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine and fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt4—32 to 40 inches; yellowish brown (10YR 5/4) silt loam; few fine prominent light brownish gray (2.5Y 6/2) mottles; moderate medium and coarse prismatic structure; friable; few very fine and fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; gradual wavy boundary.

Bt5—40 to 48 inches; yellowish brown (10YR 5/4) silt loam; few fine and medium prominent light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure; friable; few very fine and fine roots; strongly effervescent; slightly alkaline; gradual wavy boundary.

BCk—48 to 54 inches; yellowish brown (10YR 5/4) silt loam; common fine and medium prominent light olive gray (5Y 6/2) mottles; massive; friable; few fine soft masses of carbonates; strongly effervescent; slightly alkaline; gradual wavy boundary.

C—54 to 60 inches; light olive brown (2.5Y 5/4) silt loam; common fine and medium prominent light olive gray (5Y 6/2) mottles; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 40 to more than 60 inches; average 49 inches
Thickness of the mollic epipedon: 5 to 10 inches; average 8 inches

Ap horizon:
Hue—10YR
Value—3
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt and BCk horizons:
Hue—10YR
Value—4 or 5
Chroma—4
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam

Drummer Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Nearly level uplands
Parent material: Loess over glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Drummer silty clay loam, 2,482 feet north and 1,222 feet west of the southeast corner of sec. 21, T. 28 N., R. 1 W.

Ap—0 to 11 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine granular structure; friable; few very fine roots; few fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg1—11 to 22 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many prominent very dark gray (10YR 3/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

Bg2—22 to 32 inches; dark grayish brown (2.5Y 4/2) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure; friable; few very fine roots; many prominent very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

Bg3—32 to 47 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few very fine roots; common prominent very dark gray (10YR 3/1) organic coatings on faces of peds and lining pores; few fine accumulations of iron and manganese oxide; slightly alkaline; gradual wavy boundary.

2BCg—47 to 57 inches; mottled light olive gray (5Y 6/2) and yellowish brown (10YR 5/6), stratified silt loam and loam; weak coarse prismatic structure; friable; few very fine roots; few prominent very dark grayish brown (2.5Y 3/2) organic coatings lining pores; few fine accumulations of iron and manganese oxide; 4 percent gravel; slightly alkaline; gradual wavy boundary.

2Cg—57 to 70 inches; mottled light olive gray (5Y 6/2) and yellowish brown (10YR 5/6), stratified loam and sandy loam; massive; friable; few prominent very dark grayish brown (2.5Y 3/2) organic coatings lining pores; few fine accumulations of iron and manganese oxide; 4 percent gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 40 to 65 inches; average 57 inches

Thickness of the mollic epipedon: 10 to 22 inches; average 16 inches

Thickness of the loess: 40 to 60 inches; average 46 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1
Texture of the fine-earth fraction—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 to 4
Texture of the fine-earth fraction—silty clay loam

2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—loam, silt loam, or silty clay loam

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—sandy loam, loam, silt loam, or silty clay loam

Elburn Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate over moderately rapid
Landform position: Nearly level terraces and outwash plains
Parent material: Loess over glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Elburn silt loam, 0 to 2 percent slopes, 1,417 feet north and 126 feet east of the southwest corner of sec. 24, T. 27 N., R. 2 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

A—7 to 15 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many fine roots; neutral; clear wavy boundary.

Bt1—15 to 23 inches; brown (10YR 4/3) silty clay loam; common fine distinct dark grayish brown (2.5Y 4/2) mottles; strong very fine subangular blocky structure; friable; many fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings and many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine accumulations of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt2—23 to 30 inches; olive brown (2.5Y 4/4) silty clay loam; common fine distinct grayish brown (2.5Y

5/2) and dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to strong fine and medium subangular blocky; friable; common fine and medium roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine accumulations of iron and manganese oxide; moderately acid; gradual wavy boundary.

Bt3—30 to 37 inches; mottled dark yellowish brown (10YR 4/6) and grayish brown (2.5Y 5/2) silty clay loam; strong medium prismatic structure; friable; common fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine accumulations of iron and manganese oxide; moderately acid; gradual wavy boundary.

Btg—37 to 50 inches; mottled grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/6) silty clay loam; moderate medium and weak coarse prismatic structure; friable; few fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine accumulations of iron and manganese oxide; slightly acid; clear wavy boundary.

2BCg—50 to 58 inches; mottled grayish brown (2.5Y 5/2), yellowish brown (10YR 5/6), and brown (10YR 4/3), stratified silt loam, loam, and sandy loam; weak coarse prismatic structure; friable; few fine roots; common fine accumulations of iron and manganese oxide; neutral; clear wavy boundary.

2C—58 to 70 inches; mottled light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/6), stratified silt loam, silt, and sandy loam; massive; friable; few fine roots; few medium accumulations of iron and manganese oxide; slightly alkaline.

Range in Characteristics

Depth to carbonates: 45 to 60 inches
Thickness of the mollic epipedon: 11 to 16 inches; average 13 inches
Thickness of the loess: 40 to 60 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay loam

2BCg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—sandy loam, loam, silt loam, or silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—sandy loam, loam, silt, silt loam, or silty clay loam

Elkhart Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform position: Upland side slopes
Parent material: Loess
Slope range: 2 to 5 percent
Taxadjunct features: The Elkhart soils in this survey area have a seasonal high water table closer to the surface than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Elkhart silt loam, 2 to 5 percent slopes, 540 feet south and 114 feet west of the northeast corner of sec. 19, T. 28 N., R. 1 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, very dark grayish brown (10YR 3/2) dry; moderate medium granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—9 to 13 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate medium granular structure; very friable; few very fine roots; neutral; clear smooth boundary.

Bt1—13 to 22 inches; dark yellowish brown (10YR 3/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; neutral; gradual wavy boundary.

Bt2—22 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium prismatic structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt3—37 to 52 inches; yellowish brown (10YR 5/6) silt loam; few fine distinct light brownish gray (10YR

6/2) mottles; weak coarse prismatic structure; friable; few very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; strongly effervescent; slightly alkaline; diffuse wavy boundary.

C—52 to 60 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) and few fine distinct yellowish brown (10YR 5/8) mottles; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 20 to 40 inches; average 34 inches

Thickness of the mollic epipedon: 5 to 13 inches; average 11 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR
Value—3 to 5
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam

Elpaso Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate over moderately slow
Landform position: Nearly level uplands
Parent material: Loess over glacial till
Slope range: 0 to 2 percent

Typical Pedon

Elpaso silty clay loam, 210 feet north and 320 feet west of the southeast corner of sec. 30, T. 27 N., R. 2 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak very fine granular structure; firm; many fine and very fine roots; moderately acid; abrupt smooth boundary.

A—7 to 21 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; firm; many very fine roots; moderately acid; gradual wavy boundary.

Bg—21 to 35 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/4) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; many fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

Btg1—35 to 44 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent brown (10YR 5/6) and few fine distinct light olive brown (2.5Y 5/4) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

2Btg2—44 to 53 inches; dark grayish brown (2.5Y 4/2) silt loam; common medium prominent yellowish brown (10YR 5/6) and common fine light olive brown (2.5Y 5/4) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common fine accumulations of iron and manganese oxide; 5 percent pebbles; slightly alkaline; clear wavy boundary.

2Btg3—53 to 69 inches; dark grayish brown (2.5Y 4/2) and olive brown (2.5Y 4/4) silty clay loam; many medium prominent yellowish brown (10YR 5/6) and common fine distinct olive gray (5Y 5/2) mottles; weak medium and coarse prismatic structure; firm; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine accumulations of iron and manganese oxide; 4 percent pebbles; slightly effervescent starting at a depth of 63 inches; slightly alkaline; diffuse wavy boundary.

2C—69 to 80 inches; olive brown (2.5Y 4/4) silty clay loam; many medium yellowish brown (10YR 5/6) and few fine olive gray (5Y 5/2) mottles; massive; firm; few fine accumulations of iron and manganese oxides; 4 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 30 to 70 inches; average 52 inches

Thickness of the mollic epipedon: 10 to 24 inches; average 17 inches
Thickness of the loess: 40 to 60 inches; average 54 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1
Texture of the fine-earth fraction—silty clay loam

Bg and Btg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam, silty clay loam, or silty clay

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture of the fine-earth fraction—loam, clay loam, silt loam, or silty clay loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam

Flanagan Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate or moderately slow
Landform position: Upland side slopes or nearly level areas
Parent material: Loess over glacial till
Slope range: 0 to 5 percent

Typical Pedon

Flanagan silt loam, 0 to 2 percent slopes, 120 feet north and 2,850 feet west of the southeast corner of sec. 19, T. 27 N., R. 1 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, very dark grayish brown (10YR 3/2) dry; weak fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
A—9 to 18 inches; black (10YR 2/1) silt loam, very dark grayish brown (10YR 3/2) dry; moderate fine granular structure; friable; common very fine roots; slightly acid; gradual wavy boundary.
Bt1—18 to 27 inches; olive brown (2.5Y 4/4) silty clay loam; common fine distinct grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; friable; common very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films and common distinct very dark brown (10YR 2/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.
Bt2—27 to 38 inches; olive brown (2.5Y 4/4) silty clay loam; common fine distinct grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 4/6) mottles; strong fine and medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.
Bt3—38 to 51 inches; light olive brown (2.5Y 5/4) silt loam; common fine prominent light brownish gray (2.5Y 6/2) and common fine distinct dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; friable; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine accumulations of iron and manganese oxide; neutral; clear wavy boundary.
2BC—51 to 59 inches; light olive brown (2.5Y 5/4) silt loam; few fine faint light brownish gray (2.5Y 6/2) and common fine faint light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure; firm; few very fine roots; 2 percent pebbles; very slightly effervescent; neutral; clear wavy boundary.
2C—59 to 65 inches; light olive brown (2.5Y 5/4) silt loam; few fine faint light brownish gray (2.5Y 6/2) and many medium faint light olive brown (2.5Y 5/6) mottles; massive; firm; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 40 to 51 inches; average 45 inches
Thickness of the mollic epipedon: 7 to 23 inches; average 14 inches
Thickness of the loess: 40 to 60 inches; average 44 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y

Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam, silty clay loam, or silty clay

2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—loam, silt loam, or silty clay loam

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—loam, silt loam, or silty clay loam

Fox Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform position: Terraces on side slopes
Parent material: Glacial outwash
Slope range: 5 to 10 percent

Typical Pedon

Fox silty clay loam, 5 to 10 percent slopes, eroded, 1,702 feet north and 276 feet west of the southeast corner of sec. 25, T. 26 N., R. 1 W.

Ap—0 to 5 inches; brown (10YR 4/3) silty clay loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine and fine roots; moderately acid; abrupt smooth boundary.

Bt1—5 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

2Bt2—14 to 20 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 10 percent pebbles; strongly acid; gradual wavy boundary.

2Bt3—20 to 29 inches; dark yellowish brown (10YR 4/4) very gravelly clay loam; weak medium subangular blocky structure; friable; few very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 40 percent pebbles; strongly acid; gradual wavy boundary.

2Bt4—29 to 35 inches; dark yellowish brown (10YR 3/4) very gravelly clay loam; weak medium subangular blocky structure; very friable; few very fine and fine roots; 60 percent pebbles; moderately acid; gradual wavy boundary.

2C—35 to 60 inches; yellowish brown (10YR 5/4) sand and gravel; single grain; loose; 60 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 13 to 35 inches; average 24 inches
Thickness of the loess: 10 to 24 inches; average 17 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture of the fine-earth fraction—loam, clay loam, or silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4
Chroma—4 or 5
Texture of the fine-earth fraction—sandy loam, clay loam, or silty clay loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—4
Texture of the fine-earth fraction—sandy loam, clay loam, or the gravelly or very gravelly analogs of these textures

2C horizon:
Hue—10YR
Value—4 or 5
Chroma—4
Texture of the fine-earth fraction—gravel, sand, loamy sand, gravelly sand, or gravelly loamy sand

Graymont Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate over slow
Landform position: Upland side slopes
Parent material: Loess over glacial till

Slope range: 2 to 10 percent
Taxadjunct features: Graymont silt loam, 5 to 10 percent slopes, eroded, does not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Typical Pedon

Graymont silt loam, 2 to 5 percent slopes, eroded, 905 feet north and 100 feet east of the southwest corner of sec. 6, T. 26 N., R. 2 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
Bt1—10 to 14 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear wavy boundary.
Bt2—14 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear wavy boundary.
Bt3—18 to 25 inches; yellowish brown (10YR 5/4) silty clay; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear wavy boundary.
Bt4—25 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; common very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear wavy boundary.
2Bt5—34 to 46 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct grayish brown (2.5Y 5/2) and few fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few very fine roots; common distinct dark yellowish brown (10YR 4/4) and common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; clear wavy boundary.
2Bt6—46 to 58 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine distinct olive gray (5Y 5/2) and light olive gray (5Y 6/2) mottles and few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; few distinct olive brown (2.5Y 4/4) clay films on faces of peds; strongly effervescent; slightly alkaline; diffuse wavy boundary.
2C—58 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine distinct light olive gray (5Y 6/2) mottles; few fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 46 inches; average 36 inches
Thickness of the mollic epipedon: 6 to 20 inches; average 10 inches
Thickness of the loess: 20 to 40 inches; average 30 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture of the fine-earth fraction—silty clay loam or silty clay

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam, loam, or clay loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam

Harco Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform position: Nearly level uplands
Parent material: Loess

Slope range: 0 to 2 percent

Typical Pedon

Harco silty clay loam, 0 to 2 percent slopes, 2,000 feet north and 168 feet east of the southwest corner of sec. 3, T. 26 N., R. 1 W.

Ap—0 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

AB—11 to 15 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 5/3) dry; moderate medium granular structure; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—15 to 24 inches; brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct black (10YR 2/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt2—24 to 34 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct black (10YR 2/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btk—34 to 40 inches; brown (10YR 5/3) silt loam; many fine faint grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct black (10YR 2/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; few fine concretions of calcium carbonate; slightly effervescent; slightly alkaline; clear smooth boundary.

C—40 to 60 inches; yellowish brown (10YR 5/6) silt loam; many fine distinct grayish brown (10YR 5/2) mottles; massive; friable; few very fine roots; few fine accumulations of iron and manganese oxide; common fine and medium concretions of calcium carbonate; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 32 to 40 inches; average 37 inches
Thickness of the mollic epipedon: 10 to 20 inches; average 14 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt and Btk horizons:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 to 4
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam

Harpster Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Nearly level uplands
Parent material: Reworked loess
Slope range: 0 to 2 percent

Typical Pedon

Harpster silty clay loam, 200 feet south and 2,100 feet west of the northeast corner of sec. 6, T. 27 N., R. 1 E.

Apk—0 to 10 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; many fine pieces of snail shells; violently effervescent; moderately alkaline; clear smooth boundary.

Ak—10 to 21 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; few very fine roots; many fine pieces of snail shells; common fine concretions of calcium carbonate; violently effervescent; moderately alkaline; clear wavy boundary.

Bkg1—21 to 30 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; many fine pieces of snail shells; many fine concretions of calcium carbonate; violently effervescent; moderately alkaline; clear wavy boundary.

Bkg2—30 to 46 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common prominent black (10YR 2/1) organic coatings on faces of peds and common prominent gray (10YR 5/1) clay films on faces of peds; common fine pieces of snail shells; few fine accumulations of iron and manganese oxide; many fine concretions and accumulations of calcium carbonate; violently effervescent; moderately alkaline; clear wavy boundary.

Bkg3—46 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; few very fine roots; common fine accumulations of calcium carbonate; few fine accumulations of iron and manganese oxide; strongly effervescent; moderately alkaline.

Range in Characteristics

Carbonates: At the surface
Thickness of the mollic epipedon: 11 to 21 inches; average 17 inches

Apk and Ak horizons:
Hue—10YR
Value—2
Chroma—1
Texture of the fine-earth fraction—silty clay loam

Bkg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

Hennepin Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform position: Upland side slopes
Parent material: Glacial till
Slope range: 25 to 60 percent

Typical Pedon

Hennepin silt loam, in an area of Miami-Hennepin complex, 35 to 60 percent slopes, 2,045 feet east and 1,780 feet south of the northwest corner of sec. 32, T. 27 N., R. 3 W.

A—0 to 3 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate very fine granular structure; friable; many fine and very fine roots; neutral; clear wavy boundary.

Bt1—3 to 6 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; many very fine and fine roots; many distinct dark brown (10YR 3/3) organic coatings and common faint brown (10YR 4/3) clay films on faces of peds; neutral; clear wavy boundary.

2Bt2—6 to 9 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common fine and medium roots; many faint brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Bt3—9 to 15 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium prismatic structure parting to weak fine and medium subangular blocky; friable; common very fine and fine roots; common faint brown (10YR 5/3) clay films on faces of peds; 2 percent pebbles; strongly effervescent; slightly alkaline; diffuse wavy boundary.

2BC—15 to 24 inches; yellowish brown (10YR 5/4) loam; weak medium and coarse prismatic structure; firm; few very fine and fine roots; 2 percent pebbles; strongly effervescent; moderately alkaline; diffuse wavy boundary.

2C—24 to 60 inches; yellowish brown (10YR 5/4) loam; massive; firm; few very fine and fine roots; many light gray (10YR 7/1) coatings of lime or carbonate on pressure faces; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 15 inches
Thickness of the loess: 0 to 6 inches

A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3

Texture of the fine-earth fraction—loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam, clay loam, or silty clay loam

2Bt and 2BC horizons:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam, clay loam, or silty clay loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture of the fine-earth fraction—loam or clay loam

Huntsville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Huntsville silt loam, occasionally flooded, 132 feet north and 2,483 feet east of the southwest corner of sec. 34, T. 26 N., R. 1 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.
A1—8 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common fine roots; neutral; diffuse wavy boundary.
A2—18 to 54 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure; friable; common fine roots; neutral; diffuse wavy boundary.
C—54 to 60 inches; dark brown (10YR 3/3) silt loam and loam, grayish brown (10YR 5/2) dry; massive; friable; few fine roots; neutral.

Range in Characteristics

Depth to loamy strata: 40 to 70 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

C horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam or silt loam

Ipava Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform position: Upland side slopes or nearly level areas
Parent material: Loess
Slope range: 0 to 5 percent

Typical Pedon

Ipava silt loam, 0 to 2 percent slopes, 1,578 feet north and 1,000 feet west of the southeast corner of sec. 2, T. 25 N., R. 2 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.
A—9 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear wavy boundary.
Bt1—14 to 18 inches; brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.
Bt2—18 to 27 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct black (10YR 2/1) organic coatings lining pores; few fine accumulations of

iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt3—27 to 39 inches; light olive brown (2.5Y 5/4) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and many fine faint grayish brown (2.5Y 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few distinct black (10YR 2/1) organic coatings lining pores; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt4—39 to 45 inches; light olive brown (2.5Y 5/4) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and many fine faint grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure; friable; few very fine roots; very few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few distinct black (10YR 2/1) organic coatings lining pores; common fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

BC—45 to 52 inches; mottled light olive brown (2.5Y 5/6) and light brownish gray (2.5Y 6/2) silt loam; weak coarse prismatic structure; friable; few very fine roots; very few distinct dark grayish brown (10YR 4/2) coatings lining pores; common fine accumulations of iron and manganese oxide; very slightly effervescent; slightly alkaline; gradual smooth boundary.

C—52 to 60 inches; mottled light olive brown (2.5Y 5/6) and light brownish gray (2.5Y 6/2) silt loam; massive; friable; few very fine roots; very few distinct dark grayish brown (10YR 4/2) coatings lining pores; common fine accumulations of iron and manganese oxide; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 40 to more than 60 inches; average 47 inches

Thickness of the mollic epipedon: 8 to 21 inches; average 13 inches

Ap and A horizons:

Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt and BC horizons:

Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:

Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 to 6
Texture of the fine-earth fraction—silt loam

Jasper Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Nearly level areas and side slopes on terraces
Parent material: Glacial outwash
Slope range: 0 to 10 percent

Typical Pedon

Jasper silt loam, 0 to 2 percent slopes, 240 feet west and 860 feet north of the southeast corner of sec. 13, T. 27 N., R. 4 W.

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

A—7 to 14 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; many very fine and fine roots; neutral; gradual smooth boundary.

Bt1—14 to 20 inches; brown (10YR 4/3) loam; moderate fine subangular blocky structure; friable; many very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; neutral; gradual smooth boundary.

Bt2—20 to 30 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; many very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—30 to 41 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; friable; many very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt4—41 to 58 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse prismatic structure; friable; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt5—58 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse prismatic structure; friable; few very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 22 inches; average 17 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—sandy loam, loam, clay loam, silt loam, or silty clay loam

C horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—sand, loamy sand, sandy loam, loam, or silt loam

Keomah Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow or moderately slow
Landform position: Upland side slopes or nearly level areas
Parent material: Loess
Slope range: 0 to 5 percent

Typical Pedon

Keomah silt loam, 0 to 2 percent slopes, 1,248 feet west and 114 feet south of the northeast corner of sec. 2, T. 27 N., R. 3 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

E—9 to 15 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; few very fine roots; neutral; clear wavy boundary.

Bt—15 to 24 inches; brown (10YR 4/3) silty clay loam; many fine prominent strong brown (7.5YR 5/6) and common fine distinct light brownish gray (2.5Y 6/2) mottles; strong fine subangular blocky structure; friable; few very fine roots; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; many fine and medium accumulations of iron and manganese oxide; strongly acid; gradual wavy boundary.

Btg1—24 to 32 inches; grayish brown (2.5Y 5/2) silty clay; many fine distinct light olive gray (5Y 6/2) and many fine prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine and medium accumulations of iron and manganese oxide; slightly acid; gradual wavy boundary.

Btg2—32 to 49 inches; mottled light olive gray (5Y 6/2) and yellowish brown (10YR 5/6) silty clay loam; weak medium and coarse subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; many fine and medium accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

Cg—49 to 60 inches; mottled light olive gray (5Y 6/2) and brownish yellow (10YR 6/6) silt loam; massive; friable; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 42 to more than 60 inches; average 50 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt and Btg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, silty clay loam, or silty clay

Cg horizon:
Hue—10YR, 2.5Y, or 5Y

Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam

Landes Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately rapid or rapid
Landform position: Flood plains
Parent material: Loamy and sandy alluvium
Slope range: 0 to 2 percent

Typical Pedon

Landes fine sandy loam, frequently flooded, 1,960 feet north and 2,440 feet west of the southeast corner of sec. 19, T. 25 N., R. 1 W.

Ap—0 to 9 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine and fine roots; very slightly effervescent; slightly alkaline; abrupt smooth boundary.

A—9 to 19 inches; dark brown (10YR 3/3) fine sandy loam, brown (10YR 5/3) dry; weak fine subangular blocky structure; friable; few very fine and fine roots; very slightly effervescent; slightly alkaline; gradual wavy boundary.

Bw1—19 to 28 inches; dark yellowish brown (10YR 3/4) fine sandy loam; weak fine and medium subangular blocky structure; few very fine and fine roots; many continuous distinct dark brown (10YR 3/3) organic coatings on faces of peds; slightly effervescent; slightly alkaline; gradual wavy boundary.

Bw2—28 to 39 inches; dark yellowish brown (10YR 3/4) fine sandy loam; weak medium prismatic structure parting to weak medium and coarse subangular blocky; friable; few very fine and fine roots; common continuous distinct dark brown (10YR 3/3) organic coatings on faces of peds; slightly effervescent; slightly alkaline; gradual wavy boundary.

C—39 to 60 inches; dark yellowish brown (10YR 4/4) fine sandy loam and loam; massive; friable; slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 0 to 50 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—loamy sand, sandy loam, fine sandy loam, or loam

Bw horizon:
Hue—10YR
Value—3 or 4
Chroma—3 or 4
Texture of the fine-earth fraction—sandy loam or fine sandy loam

C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture of the fine-earth fraction—sand, sandy loam, fine sandy loam, or loam

La Rose Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform position: Upland side slopes
Parent material: Glacial till
Slope range: 5 to 10 percent
Taxadjunct features: La Rose silty clay loam, 5 to 10 percent slopes, severely eroded, does not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Typical Pedon

La Rose silty clay loam, 5 to 10 percent slopes, severely eroded, 128 feet north and 1,788 feet east of the southwest corner of sec. 23, T. 28 N., R. 2 W.

Ap—0 to 6 inches; mixed dark brown (10YR 3/3) and olive brown (2.5Y 4/4) silty clay loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common fine roots; 1 percent pebbles; neutral; abrupt smooth boundary.

Bt1—6 to 10 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to fine and medium subangular blocky; firm; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; slightly acid; clear wavy boundary.

Bt2—10 to 24 inches; light olive brown (2.5Y 5/4) silt loam; weak medium and coarse prismatic structure; firm; few very fine roots; few distinct light olive brown (2.5Y 4/4) clay films on faces of peds; 2 percent pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.

C—24 to 60 inches; light olive brown (2.5Y 5/4) silt loam; massive; firm; 2 percent pebbles; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 10 to 24 inches; average 19 inches
Thickness of the surface layer: 5 to 12 inches; average 8 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—1 to 4
Texture of the fine-earth fraction—loam, silt loam, or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—clay loam, silty clay loam, or silt loam

C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture of the fine-earth fraction—loam or silt loam

Lawson Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Lawson silt loam, occasionally flooded, 1,100 feet north and 1,100 feet east of the southwest corner of sec. 4, T. 25 N., R. 1 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.
A1—9 to 22 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium granular structure; friable; few very fine roots; neutral; gradual wavy boundary.
A2—22 to 33 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; gradual wavy boundary.
A3—33 to 40 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; few fine faint dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; friable; few very fine roots; slightly acid; clear wavy boundary.
AC1—40 to 48 inches; brown (10YR 4/3) silt loam; common fine faint dark grayish brown (10YR 4/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; gradual wavy boundary.
AC2—48 to 54 inches; dark yellowish brown (10YR 4/4) loam; common fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; few distinct dark brown (10YR 3/3) organic coatings lining pores; few fine accumulations of iron and manganese oxide; slightly acid; gradual wavy boundary.
C—54 to 60 inches; brown (10YR 5/3), stratified sandy loam and loamy sand; common fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; massive; very friable; few very fine roots; few distinct dark brown (10YR 3/3) organic coatings lining pores; few fine accumulations of iron and manganese oxide; 1 percent gravel; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 40 inches; average 30 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

C horizon:
Hue—10YR or 2.5Y
Value—3 to 6
Chroma—1 to 3
Texture of the fine-earth fraction—loamy sand, sandy loam, loam, silt loam, or silty clay loam

Lena Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately rapid
Landform position: Toeslopes on low terraces
Parent material: Organic soil material
Slope range: 0 to 2 percent

Typical Pedon

Lena muck, 1,100 feet south and 1,200 feet west of the northeast corner of sec. 15, T. 28 N., R. 3 W.

Oa1—0 to 9 inches; sapric material, black (N 2/0) broken face and rubbed; about 20 percent fiber, none rubbed; moderate fine granular structure; friable; common snail shells; violently effervescent; moderately alkaline; gradual wavy boundary.
Oa2—9 to 17 inches; sapric material, black (N 2/0) broken face and rubbed; about 25 percent fiber, none rubbed; weak medium subangular blocky structure; friable; common snail shells; violently effervescent; moderately alkaline; gradual wavy boundary.
Oa3—17 to 27 inches; sapric material, black (N 2/0) broken face and rubbed; 28 percent fiber, none rubbed; weak medium subangular blocky structure; friable; common snail shells; strongly effervescent; moderately alkaline; gradual wavy boundary.
Oa4—27 to 60 inches; sapric material, black (N 2/0) broken face and rubbed; 25 percent fiber, none rubbed; weak medium prismatic structure; friable; common snail shells; slightly effervescent; moderately alkaline.

Range in Characteristics

Carbonates: At the surface
Thickness of the organic material: More than 51 inches

Oa horizon:
Hue—neutral or 10YR
Value—2 or 3
Chroma—0 to 2

Martinsville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Nearly level areas and side slopes on terraces
Parent material: Glacial outwash
Slope range: 0 to 10 percent

Typical Pedon

Martinsville silt loam, 0 to 2 percent slopes, 420 feet east and 2,180 feet south of the northwest corner of sec. 6, T. 27 N., R. 3 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; very friable; neutral; abrupt smooth boundary.
BE—8 to 17 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; very friable; moderately acid; gradual smooth boundary.
Bt1—17 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.
Bt2—26 to 31 inches; strong brown (7.5YR 4/6) sandy clay loam; common fine and medium faint strong brown (7.5YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few distinct grayish brown (10YR 5/2) clay films and few distinct grayish brown (10YR 5/2) silt coatings on faces of peds; slightly acid; gradual smooth boundary.
Bt3—31 to 45 inches; strong brown (7.5YR 4/6) sandy loam; common fine and medium faint strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; very friable; slightly acid; gradual smooth boundary.
C—45 to 60 inches; strong brown (7.5YR 5/6) sandy loam; common fine and medium faint strong brown (7.5YR 4/6) and few fine prominent grayish brown (10YR 5/2) mottles; massive; friable; slightly alkaline.

Range in Characteristics

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—loam, sandy loam, or silt loam

BE and Bt horizons:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—sandy loam, loam, clay loam, sandy clay loam, silt loam, or silty clay loam

C horizon:
Hue—7.5YR or 10YR

Value—4 to 6
Chroma—4 to 6
Texture of the fine-earth fraction—sand, sandy loam, loam, clay loam, or silt loam

Miami Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 5 to 15 percent and 25 to 60 percent
Taxadjunct features: The Miami soils in this survey area have a seasonal high water table at a lower depth than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Miami silty clay loam, 5 to 10 percent slopes, eroded, 900 feet south and 1,550 feet east of the northwest corner of sec. 21, T. 25 N., R. 1 E.

Ap—0 to 9 inches; dark brown (10YR 3/3) silty clay loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; few very fine and fine roots; neutral; abrupt smooth boundary.

2Bt1—9 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; 3 percent pebbles; slightly acid; gradual wavy boundary.

2Bt2—16 to 22 inches; olive brown (2.5Y 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine and fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 3 percent pebbles; moderately acid; gradual smooth boundary.

2Bt3—22 to 33 inches; light olive brown (2.5Y 5/4) clay loam; moderate medium and coarse prismatic structure; firm; common very fine and fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 3 percent pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.

2BC—33 to 42 inches; light olive brown (2.5Y 5/4) clay loam; weak coarse prismatic structure; firm; few very fine and fine roots; 3 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

2C—42 to 60 inches; light olive brown (2.5Y 5/4) silt loam; massive; firm; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 40 inches; average 26 inches
Thickness of the loess: 0 to 18 inches; average 12 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, loam, or silty clay loam

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silty clay loam, loam, or clay loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6
Chroma—3 or 4
Texture of the fine-earth fraction—loam, clay loam, silt loam, or silty clay loam

Morley Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow over slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 5 to 10 percent

Typical Pedon

Morley silty clay loam, 5 to 10 percent slopes, eroded, 250 feet north and 1,537 feet east of the southwest corner of sec. 23, T. 26 N., R. 1 W.

Ap—0 to 7 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 5/3) dry; weak fine subangular blocky structure; friable; many very fine and fine roots; moderately acid; abrupt smooth boundary.

Bt1—7 to 10 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate very fine and fine subangular blocky structure; friable; many very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

2Bt2—10 to 17 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate fine and medium subangular blocky structure; firm; many very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; neutral; gradual smooth boundary.

2Bt3—17 to 26 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct light olive brown (2.5Y 5/4) and few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate fine and medium subangular blocky; firm; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; slightly alkaline; gradual smooth boundary.

2Bt4—26 to 36 inches; olive brown (2.5Y 4/4) silty clay loam; few fine distinct grayish brown (2.5Y 5/2) and few fine prominent yellowish brown (10YR 5/6) mottles; weak fine and medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; slightly alkaline; gradual smooth boundary.

2C—36 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; common fine and medium distinct grayish brown (2.5Y 5/2) and common fine and medium prominent yellowish brown (10YR 5/6) mottles; massive; firm; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 45 inches
Thickness of the loess: 0 to 15 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—clay loam or silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silty clay loam

Ockley Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform position: Nearly level terraces
Parent material: Glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Ockley silt loam, 0 to 2 percent slopes, 390 feet north and 1,280 feet east of the southwest corner of sec. 23, T. 27 N., R. 4 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

Bt1—8 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds and few distinct dark brown (10YR 3/3) organic coatings on faces of peds; moderately acid; clear wavy boundary.

2Bt2—16 to 33 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 8 percent pebbles; moderately acid; gradual wavy boundary.

2Bt3—33 to 42 inches; brown (7.5YR 4/3) sandy loam; weak fine and medium prismatic structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 12 percent pebbles; slightly acid; gradual wavy boundary.

2BCt—42 to 52 inches; brown (7.5YR 4/3), stratified gravelly sandy loam and gravelly loamy sand; weak medium prismatic structure; friable; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; 18 percent pebbles; neutral; clear wavy boundary.

3C—52 to 60 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; single grain; loose; 50 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 45 to 60 inches
Depth to sand and gravel: 45 to 60 inches

Ap horizon:
Hue—10YR
Value—4
Chroma—3 or 4
Texture of the fine-earth fraction—loam or silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—loam, silt loam, or silty clay loam

2Bt horizon:
Hue—10YR or 7.5YR
Value—4
Chroma—3 or 4
Texture of the fine-earth fraction—loamy sand, sandy loam, or clay loam

3C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—gravelly loamy sand, very gravelly loamy sand, or gravelly sand

Palms Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderate
Landform position: Low terrace depressions
Parent material: Organic soil material
Slope range: 0 to 2 percent

Typical Pedon

Palms muck, 2,100 feet north and 2,600 feet west of the southeast corner of sec. 35, T. 27 N., R. 4 W.

Oa1—0 to 15 inches; sapric material, black (10YR 2/1) rubbed; about 5 percent fiber rubbed; moderate fine granular structure; slightly sticky; common very fine and fine roots; neutral; diffuse wavy boundary.
Oa2—15 to 26 inches; sapric material, black (10YR 2/1) rubbed; about 5 percent fiber rubbed; weak medium subangular blocky structure; slightly sticky; common very fine and fine roots; neutral; diffuse wavy boundary.
Oa3—26 to 41 inches; sapric material, black (10YR 2/1) rubbed; about 2 percent fiber rubbed; weak coarse subangular blocky structure; slightly sticky; common very fine and fine roots; neutral; gradual wavy boundary.
2C—41 to 60 inches; gray (5Y 5/1), stratified loam and sandy loam; massive; slightly sticky; few very fine and fine roots; slightly alkaline.

Range in Characteristics

Thickness of the organic material: 25 to 51 inches

Oa horizon:
Hue—10YR or neutral
Value—2
Chroma—0 or 1
Texture of the fine-earth fraction—sapric material

2C horizon:
Hue—5Y
Value—4 to 6
Chroma—0 to 2
Texture of the fine-earth fraction—sandy loam or loam

Parr Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate or moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 10 percent
Taxadjunct features: The Parr soils in this survey area do not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Parr silt loam, 5 to 10 percent slopes, eroded, 708 feet north and 1,904 feet west of the southeast corner of sec. 19, T. 25 N., R. 1 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate very fine and fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
Bt1—7 to 16 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; gradual wavy boundary.
2Bt2—16 to 32 inches; olive brown (2.5Y 4/4) clay loam; few fine and medium yellowish brown (10YR 5/8) mottles; moderate fine and medium

subangular blocky structure; firm; few very fine roots; common prominent dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; gradual wavy boundary.

2Bt3—32 to 49 inches; light olive brown (2.5Y 5/4) clay loam; few fine and medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C—49 to 60 inches; light olive brown (2.5Y 5/4) loam; few fine gray (5Y 5/1) and few fine and medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 24 to 44 inches; average 30 inches

Thickness of the mollic epipedon: 6 to 12 inches; average 8 inches

Thickness of the loess: 0 to 18 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—4 to 6
Texture of the fine-earth fraction—clay loam or loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam

Peotone Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Landform position: Upland depressions
Parent material: Colluvial sediments
Slope range: 0 to 2 percent

Typical Pedon

Peotone silty clay loam, 198 feet south and 540 feet east of the northwest corner of sec. 34, T. 28 N., R. 1 W.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

A—9 to 17 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; neutral; gradual smooth boundary.

Bg1—17 to 26 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; neutral; clear smooth boundary.

Bg2—26 to 40 inches; dark gray (10YR 4/1) silty clay loam; few fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg3—40 to 53 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate medium prismatic structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Cg—53 to 60 inches; gray (10YR 5/1) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; few very fine roots; few distinct dark gray (10YR 4/1) coatings along vertical cleavage planes and lining pores; few fine accumulations of iron and manganese oxide; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 30 inches

Ap and A horizons:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 or 1
Texture of the fine-earth fraction—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Plano Series

Depth class: Very deep
Drainage class: Moderately well drained and well drained
Permeability: Moderate
Landform position: Nearly level areas and side slopes on terraces and outwash plains
Parent material: Loess over glacial outwash
Slope range: 0 to 5 percent

Typical Pedon

Plano silt loam, 0 to 2 percent slopes, 1,450 feet west and 2,230 feet south of the northeast corner of sec. 24, T. 27 N., R. 2 W.

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; friable; moderate fine granular structure; many very fine and fine roots; neutral; abrupt smooth boundary.
A1—7 to 15 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine and fine roots; neutral; gradual wavy boundary.
A2—15 to 20 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; many very fine and fine roots; neutral; gradual wavy boundary.
Bt1—20 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.
Bt2—31 to 42 inches; dark yellowish brown (10YR 4/4) silt loam; few fine dark yellowish brown (10YR 4/6), few fine yellowish brown (10YR 5/6), and few fine grayish brown (2.5Y 5/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; neutral; gradual wavy boundary.
Bt3—42 to 53 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct grayish brown (2.5Y 5/2) and few medium dark yellowish brown (10YR 4/6) mottles; weak medium and coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; neutral; clear wavy boundary.
2Bt4—53 to 60 inches; dark yellowish brown (10YR 4/6) sandy loam; weak coarse subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; common medium concretions of iron and manganese oxide; 3 percent pebbles; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 20 inches; average 15 inches
Thickness of the loess: 40 to 60 inches; average 50 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silt loam or silty clay loam

2Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—loamy sand, sandy loam, loam, or silt loam

2C horizon (if it occurs):
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—3 to 6
Texture of the fine-earth fraction—sand, loamy sand, sandy loam, loam, or silt loam

Proctor Series

Depth class: Very deep
Drainage class: Moderately well drained and well drained

Permeability: Moderate
Landform position: Nearly level areas and side slopes on terraces and outwash plains
Parent material: Loess over glacial outwash
Slope range: 0 to 5 percent

Typical Pedon

Proctor silt loam, 2 to 5 percent slopes, 724 feet south and 156 feet west of the northeast corner of sec. 26, T. 27 N., R. 2 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; many very fine and fine roots; slightly acid; abrupt smooth boundary.

Bt1—10 to 16 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; many very fine and fine roots; many distinct dark brown (10YR 3/3) clay films and common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; gradual wavy boundary.

Bt2—16 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine prismatic structure; friable; common very fine and fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

2Bt3—24 to 30 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium prismatic structure; friable; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear wavy boundary.

2BCt1—30 to 42 inches; dark yellowish brown (10YR 4/4), stratified silt loam and loam; moderate medium and coarse prismatic structure; friable; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual wavy boundary.

2BCt2—42 to 58 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4), stratified silt loam and loam; moderate coarse and very coarse prismatic structure; friable; few very fine and fine roots; very few distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear wavy boundary.

2C—58 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam and sandy loam; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 8 to 16 inches; average 11 inches

Thickness of the loess: 20 to 40 inches; average 27 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silty clay loam or silt loam

2Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture of the fine-earth fraction—loam, silt loam, clay loam, or sandy loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture of the fine-earth fraction—sandy loam, loamy sand, loam, or silt loam

Radford Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium over buried soil
Slope range: 0 to 2 percent

Typical Pedon

Radford silt loam, occasionally flooded, 255 feet north and 2,236 feet east of the southwest corner of sec. 14, T. 25 N., R. 1 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

C1—10 to 22 inches; very dark grayish brown (10YR 3/2) silt loam with thin strata of dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam; dark grayish brown (10YR 4/2) dry; massive; friable; common very fine roots; neutral; gradual smooth boundary.

C2—22 to 31 inches; very dark grayish brown (10YR

3/2) silt loam with few thin strata of dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam; dark grayish brown (10YR 4/2) dry; massive; friable; common very fine roots; neutral; gradual smooth boundary.

Ab1—31 to 40 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate very fine and fine subangular blocky structure; friable; common very fine roots; neutral; gradual wavy boundary.

Ab2—40 to 51 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; neutral; gradual wavy boundary.

Bgb—51 to 60 inches; dark grayish brown (2.5Y 4/2) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; very dark grayish brown (10YR 3/2) krotovina; slightly alkaline.

Range in Characteristics

Depth to the buried soil: 20 to 40 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

C horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam

Ab horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 or 1
Texture of the fine-earth fraction—silty clay loam or silt loam

Bgb horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam

Raveenwash Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately rapid
Landform position: Flood plains
Parent material: Loamy and sandy alluvium
Slope range: 0 to 2 percent

Typical Pedon

Raveenwash silt loam, occasionally flooded, 960 feet east and 1,120 feet north of the southwest corner of sec. 29, T. 28 N., R. 3 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak very fine granular structure; friable; many very fine and fine roots; strongly effervescent; moderately alkaline; abrupt smooth boundary.

C1—6 to 17 inches; brown (10YR 4/3 and 5/3) and dark brown (10YR 3/3) silt loam with very thin strata of very fine sandy loam; thin bedding planes along strata; massive; friable; common very fine and fine roots; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—17 to 27 inches; yellowish brown (10YR 5/4) and brown (10YR 4/3) loam with thin strata of fine sand; thin bedding planes along strata; massive; friable; few very fine and fine roots; few fine faint brown (7.5YR 4/4) iron concretions and few fine distinct light brownish gray (10YR 6/2) iron depletions; strongly effervescent; moderately alkaline; gradual smooth boundary.

C3—27 to 34 inches; brown (10YR 5/3) and dark grayish brown (2.5Y 4/2) loam with very thin strata of sandy loam; thin bedding planes along strata; massive; friable; few very fine and fine roots; few prominent dark brown (7.5YR 3/4) iron stains in root channels and pores; few fine distinct light brownish gray (2.5Y 6/2) iron depletions; strongly effervescent; moderately alkaline; diffuse smooth boundary.

C4—34 to 45 inches; dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 4/4), stratified loam and sandy loam; massive; friable; few fine distinct light brownish gray (2.5Y 6/2) iron depletions; strongly effervescent; moderately alkaline; diffuse smooth boundary.

C5—45 to 60 inches; yellowish brown (10YR 5/4), brown (10YR 4/3), and grayish brown (2.5Y 5/2), stratified sand, sandy loam, and silt loam; massive; friable; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 0 to 10 inches

Ap horizon:
Hue—10YR
Value—3 or 4

Chroma—2 or 3
Texture of the fine-earth fraction—silt loam, loam, or sandy loam

C horizon:
Hue—10YR, 2.5Y, and 5Y
Value—2 to 7
Chroma—1 to 8
Texture of the fine-earth fraction—stratified silt loam, loam, sandy loam, loamy sand, and sand

Ross Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Loamy alluvium
Slope range: 0 to 2 percent

Typical Pedon

Ross silt loam, occasionally flooded, 700 feet north and 92 feet west of the southeast corner of sec. 23, T. 28 N., R. 3 W.

Ap—0 to 9 inches; dark brown (10YR 3/3) silt loam, brown (10YR 4/3) dry; weak very fine granular structure; friable; common very fine and fine roots; slightly alkaline; clear smooth boundary.

A—9 to 19 inches; stratified dark brown (10YR 3/3) and brown (10YR 4/3) silt loam, brown (10YR 4/3) dry; weak fine subangular blocky structure; friable; common very fine and fine roots; slightly alkaline; clear wavy boundary.

Bw1—19 to 30 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine and fine roots; slightly alkaline; gradual wavy boundary.

Bw2—30 to 39 inches; dark brown (10YR 3/3) loam, brown (10YR 4/3) dry; weak fine and medium prismatic structure parting to weak fine subangular blocky; friable; common fine roots; slightly alkaline; gradual wavy boundary.

Bw3—39 to 50 inches; dark yellowish brown (10YR 3/4) loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; slightly alkaline; gradual wavy boundary.

BC—50 to 60 inches; brown (10YR 4/3) sandy loam; weak medium prismatic structure; very friable; few very fine roots; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 40 inches; average 27 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam, loam, or sandy loam

Bw and BC horizons:
Hue—10YR
Value—3 or 4
Chroma—1 to 4
Texture of the fine-earth fraction—loam, sandy loam, or silt loam

C horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam, loamy sand, sand, or gravel

Rozetta Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform position: Upland side slopes
Parent material: Loess
Slope range: 2 to 5 percent
Taxadjunct features: The Rozetta soils in this survey area have a seasonal high water table closer to the surface than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Rozetta silt loam, 2 to 5 percent slopes, eroded, 1,700 feet north and 1,600 feet east of the southwest corner of sec. 24, T. 28 N., R. 3 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

Bt1—6 to 10 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 5/3) clay films on faces of peds; slightly acid; clear wavy boundary.

Bt2—10 to 20 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to strong fine and medium subangular blocky; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt3—20 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt4—31 to 35 inches; yellowish brown (10YR 5/4) silt loam; weak medium and coarse prismatic structure; friable; few distinct brown (10YR 5/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt5—35 to 43 inches; yellowish brown (10YR 5/4) silt loam; few fine prominent light brownish gray (2.5Y 6/2) mottles; weak medium and coarse prismatic structure; friable; few distinct brown (10YR 5/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

BC—43 to 52 inches; light olive brown (2.5Y 5/4) silt loam; common fine prominent light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure; friable; moderately acid; gradual smooth boundary.

C—52 to 60 inches; light olive brown (2.5Y 5/4) silt loam; common fine prominent light brownish gray (2.5Y 6/2) mottles; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 40 to more than 60 inches; average 50 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—3
Texture of the fine-earth fraction—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4
Chroma—3
Texture of the fine-earth fraction—silt loam

Bt and BC horizons:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

Russell Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 5 to 15 percent

Typical Pedon

Russell silt loam, 5 to 10 percent slopes, eroded, 450 feet north and 2,200 feet east of the southwest corner of sec. 19, T. 26 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—7 to 11 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt2—11 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—16 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few medium concretions of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt4—25 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few medium concretions of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt5—33 to 40 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine concretions of iron and manganese oxide; 2 percent pebbles; neutral; clear smooth boundary.

2Bt6—40 to 49 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse prismatic structure; firm; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine concretions of iron and manganese oxide; 2 percent pebbles; very slightly effervescent; slightly alkaline; gradual wavy boundary.

2C—49 to 60 inches; yellowish brown (10YR 5/4) clay loam; massive; firm; few very fine roots; few fine concretions of iron and manganese oxide; 2 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 16 to 46 inches; average 34 inches

Thickness of the loess: 20 to 40 inches; average 28 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silty clay loam or silt loam

2Bt horizon and 2BC horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—clay loam or loam

2C horizon:
Hue—10YR or 2.5Y
Value—5
Chroma—3 or 4
Texture of the fine-earth fraction—loam or clay loam

Rutland Series

Depth class: Moderately deep or deep to silty clay till
Drainage class: Somewhat poorly drained
Permeability: Moderately slow over very slow
Landform position: Nearly level areas and side slopes on uplands
Parent material: Loess over glacial till
Slope range: 0 to 5 percent

Typical Pedon

Rutland silty clay loam, 0 to 2 percent slopes, 168 feet north and 480 feet east of the southwest corner of sec. 34, T. 28 N., R. 2 E.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak very fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

A—8 to 14 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine granular structure; friable; common fine roots; moderately acid; clear wavy boundary.

Bt1—14 to 20 inches; brown (10YR 4/3) silty clay; common fine prominent dark yellowish brown (10YR 4/6) and few fine prominent grayish brown (2.5Y 5/2) mottles; strong fine subangular blocky structure; friable; common fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt2—20 to 28 inches; olive brown (2.5Y 4/4) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and common fine prominent grayish brown (2.5Y 5/2) mottles; moderate fine prismatic structure parting to strong fine subangular blocky; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; gradual wavy boundary.

Bt3—28 to 36 inches; olive brown (2.5Y 4/4) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and common fine prominent grayish brown (2.5Y 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; gradual wavy boundary.

Bt4—36 to 44 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) silt loam; moderate medium and coarse prismatic structure; firm; few very fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; neutral; clear wavy boundary.

2Bk—44 to 52 inches; olive brown (2.5Y 4/4) silty clay; moderate coarse prismatic structure; very firm; many distinct light brownish gray (2.5Y 6/2) calcium carbonate coatings along vertical cleavage planes; common medium accumulations of calcium carbonate; 1 percent pebbles; strongly effervescent; moderately alkaline; diffuse wavy boundary.

2C—52 to 60 inches; olive brown (2.5Y 4/4) clay; massive; very firm; many distinct light brownish gray (2.5Y 6/2) calcium carbonate coatings along vertical cleavage planes; 1 percent pebbles; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 29 to 58 inches; average 38 inches

Thickness of the mollic epipedon: 7 to 18 inches; average 13 inches

Thickness of the loess: 35 to 55 inches; average 42 inches

Ap horizon:

Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:

Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay loam, silt loam, or silty clay

2Bk horizon:

Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay

2C horizon:

Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay or clay

Sabina Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform position: Nearly level uplands
Parent material: Loess over glacial till
Slope range: 0 to 2 percent

Typical Pedon

Sabina silt loam, 0 to 2 percent slopes, 72 feet south and 804 feet east of the center of sec. 21, T. 28 N., R. 2 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—6 to 11 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thin and medium platy structure; friable; many fine roots; neutral; clear smooth boundary.

Bt1—11 to 23 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate fine and medium subangular blocky structure; friable; many fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—23 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; neutral; gradual wavy boundary.

Bt3—34 to 47 inches; dark yellowish brown (10YR 4/4) silt loam; many fine faint dark yellowish brown (10YR 4/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

2Bt4—47 to 54 inches; olive brown (2.5Y 4/4) clay loam; common fine distinct grayish brown (2.5Y 5/2), dark yellowish brown (10YR 4/6), and yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of calcium carbonate; 2 percent pebbles; slightly effervescent; moderately alkaline; gradual smooth boundary.

2Bt5—54 to 60 inches; olive brown (2.5Y 4/4) clay loam; common fine distinct grayish brown (2.5Y 5/2), dark yellowish brown (10YR 4/6), and yellowish brown (10YR 5/8) mottles; weak medium and coarse subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; common fine accumulations of calcium carbonate; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 35 to 55 inches; average 45 inches
Thickness of the loess: 35 to 55 inches; average 46 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2
Texture of the fine-earth fraction—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silty clay loam, silty clay, or silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—clay loam or loam

2C horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—loam, clay loam, silt loam, or silty clay loam

Sable Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Nearly level uplands
Parent material: Loess
Slope range: 0 to 2 percent

Typical Pedon

Sable silty clay loam, 144 feet north and 2,260 feet east of the southwest corner of sec. 3, T. 26 N., R. 1 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

A—8 to 16 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few very fine roots; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

Bg—16 to 22 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine concretions of iron and manganese oxide; neutral; clear smooth boundary.

Btg1—22 to 33 inches; grayish brown (2.5Y 5/2) silty clay loam; few medium prominent dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure; friable; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings lining pores; few fine accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—33 to 45 inches; grayish brown (2.5Y 5/2) silt loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; friable; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few fine accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Cg—45 to 60 inches; light gray (5Y 6/1) silt loam; many medium prominent brownish yellow (10YR 6/8) mottles; massive; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings lining pores; few fine accumulations of iron and manganese oxide; very slightly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 34 to more than 60 inches; average 56 inches

Thickness of the mollic epipedon: 11 to 24 inches; average 18 inches

Ap and A horizons:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 to 2
Texture of the fine-earth fraction—silty clay loam or silt loam

Bg and Btg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam or silt loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Sarpy Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landform position: Flood plains
Parent material: Sandy alluvium
Slope range: 0 to 2 percent

Typical Pedon

Sarpy loamy fine sand, frequently flooded, 700 feet north and 640 feet west of the southeast corner of sec. 22, T. 27 N., R. 4 W.

A—0 to 10 inches; brown (10YR 5/3) loamy fine sand, pale brown (10YR 6/3) dry; weak very fine and fine subangular blocky structure; very friable; common very fine and fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.
C1—10 to 19 inches; stratified yellowish brown (10YR 5/4) and brown (10YR 5/3) fine sand; single grain; loose; few very fine and fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.
C2—19 to 60 inches; yellowish brown (10YR 5/4) fine sand; single grain; loose; few very fine and fine roots; 10 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Carbonates: At the surface

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture of the fine-earth fraction—loamy fine sand or fine sand

C horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 4
Texture of the fine-earth fraction—loamy fine sand or fine sand

Sawmill Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Sawmill silty clay loam, occasionally flooded, 520 feet south and 820 feet west of the northeast corner of sec. 2, T. 28 N., R. 2 W.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; weak very fine granular structure; friable; many very fine roots; neutral; abrupt smooth boundary.
A1—9 to 21 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; common very fine roots; neutral; clear wavy boundary.
A2—21 to 26 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine subangular blocky structure; friable; few very fine roots; few pebbles; neutral; clear wavy boundary.
Btg1—26 to 38 inches; light olive gray (5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate very fine and fine prismatic structure parting to moderate very fine subangular blocky; friable; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; gradual wavy boundary.
Btg2—38 to 50 inches; light olive gray (5Y 6/2) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; moderate medium and coarse prismatic structure; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; gradual wavy boundary.

Bg—50 to 58 inches; light olive gray (5Y 6/2) silty clay loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak very coarse prismatic structure; friable; few very fine roots; few medium accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Cg—58 to 60 inches; light olive gray (5Y 6/2) loam; many medium prominent yellowish brown (10YR 5/6) mottles; massive; friable; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 34 inches; average 26 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Btg and Bg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam or silt loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam, silt loam, or loam

Saybrook Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate over moderately slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 10 percent
Taxadjunct features: Saybrook silt loam, 2 to 5 percent slopes, eroded, does not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Typical Pedon

Saybrook silt loam, 2 to 5 percent slopes, eroded, 177 feet north and 1,599 feet west of the southeast corner of sec. 23, T. 28 N., R. 2 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many fine roots; slightly acid; clear smooth boundary.

Bt1—7 to 17 inches; brown (10YR 4/3) silty clay loam; moderate medium prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt2—17 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings and common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; slightly acid; clear wavy boundary.

2Bt3—26 to 30 inches; yellowish brown (10YR 5/4) silt loam; moderate medium prismatic structure; friable; few fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; 2 percent pebbles; very slightly effervescent; neutral; clear wavy boundary.

2BC—30 to 42 inches; light olive brown (2.5Y 5/4) silt loam; weak coarse prismatic structure; friable; few very fine roots; 2 percent pebbles; strongly effervescent; moderately alkaline; clear wavy boundary.

2C—42 to 60 inches; light olive brown (2.5Y 5/4) silt loam; massive; friable; 2 percent pebbles; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 19 to 41 inches; average 32 inches
Thickness of the mollic epipedon: 5 to 14 inches; average 9 inches
Thickness of the loess: 20 to 40 inches; average 30 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay loam or silt loam

2Bt horizon:
Hue—10YR or 2.5Y

Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—loam, clay loam, silty clay loam, or silt loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture of the fine-earth fraction—loam or silt loam

Selma Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Nearly level terraces
Parent material: Glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Selma loam, 480 feet south and 2,280 feet west of the northeast corner of sec. 26, T. 27 N., R. 4 W.

Ap—0 to 7 inches; very dark brown (10YR 2/2) loam; weak fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

A—7 to 12 inches; very dark brown (10YR 2/2) loam; weak fine granular structure; friable; many very fine and fine roots; neutral; clear wavy boundary.

Bg1—12 to 22 inches; dark grayish brown (2.5Y 4/2) sandy loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; few very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual wavy boundary.

Bg2—22 to 32 inches; dark grayish brown (2.5Y 4/2) clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak fine and medium prismatic structure parting to weak fine subangular blocky; friable; few very fine and fine roots; neutral; gradual wavy boundary.

Bg3—32 to 46 inches; olive gray (5Y 5/2) clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few very fine and fine roots; neutral; gradual wavy boundary.

BCg—46 to 51 inches; olive gray (5Y 5/2) loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; slightly acid; diffuse wavy boundary.

Cg—51 to 60 inches; olive gray (5Y 5/2 and 4/2), stratified clay loam and silty clay loam; massive; friable; many medium and coarse soft masses of iron and manganese oxide; 3 percent pebbles; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches; average 21 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—loam, silt loam, silty clay loam, or clay loam

Bg and BCg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 or 2
Texture of the fine-earth fraction—clay loam, sandy loam, loam, or silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—loamy sand, sandy loam, clay loam, or silty clay loam

Slacwater Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform position: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Typical Pedon

Slacwater silt loam, frequently flooded, 1,440 feet west and 1,660 feet north of the southeast corner of sec. 30, T. 28 N., R. 3 W.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) and dark grayish brown (2.5Y 4/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine and fine roots; strongly effervescent; slightly alkaline; abrupt smooth boundary.

Cg1—6 to 15 inches; dark grayish brown (2.5Y 4/2) and light brownish gray (2.5Y 6/2) silt loam; massive; friable; many very fine and fine roots; few patchy prominent strong brown (7.5YR 4/6) iron stains; few fine soft masses of iron; strongly effervescent; slightly alkaline; gradual smooth boundary.

Cg2—15 to 22 inches; grayish brown (2.5Y 5/2), pale olive (5Y 6/3), and light olive brown (2.5Y 5/4) silt loam; massive; friable; common very fine and fine roots; few patchy prominent strong brown (7.5YR 4/6) iron stains; few fine soft masses of iron; strongly effervescent; slightly alkaline; gradual smooth boundary.

Cg3—22 to 60 inches; olive gray (5Y 4/2), pale olive (5Y 6/3), and light olive brown (2.5Y 5/6) silty clay loam; massive; friable; common very fine and fine roots; few prominent strong brown (7.5YR 4/6) iron stains; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to carbonates: 0 to 10 inches

A horizon:
Hue—10YR or 2.5Y
Value—2 to 4
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 7
Chroma—1 to 6
Texture of the fine-earth fraction—loamy fine sand, fine sandy loam, loam, silt loam, or silty clay loam

St. Charles Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform position: Nearly level areas and side slopes on uplands
Parent material: Loess over glacial outwash
Slope range: 0 to 5 percent

Typical Pedon

St. Charles silt loam, 0 to 2 percent slopes, 80 feet north and 2,440 feet east of the southwest corner of sec. 17, T. 25 N., R. 1 W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

Bt1—9 to 19 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual smooth boundary.

Bt2—19 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt3—26 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt4—39 to 52 inches; yellowish brown (10YR 5/4) silt loam; moderate medium prismatic structure; friable; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; gradual wavy boundary.

2BCt—52 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam and loam; weak medium and coarse prismatic structure; friable; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches; average 51 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—3
Texture of the fine-earth fraction—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—3
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silty clay loam or silt loam

2BCt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—loam, silt loam, sandy loam, or clay loam

2C horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—3 to 6

Texture of the fine-earth fraction—sandy loam, loam, or silt loam

Strawn Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate or moderately slow
Landform position: Upland side slopes
Parent material: Glacial till
Slope range: 10 to 30 percent

Typical Pedon

Strawn silt loam, 15 to 25 percent slopes, 490 feet east and 2,480 feet north of the southwest corner of sec. 9, T. 25 N., R. 1 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; many very fine and fine roots; neutral; abrupt smooth boundary.

2Bt1—6 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 1 percent pebbles; slightly alkaline; gradual wavy boundary.

2Bt2—14 to 24 inches; olive brown (2.5Y 4/4) clay loam; few fine prominent light olive brown (2.5Y 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; few prominent brown (10YR 4/3) clay films on faces of peds; few fine concretions of iron and manganese oxide; 2 percent pebbles; moderately alkaline; gradual wavy boundary.

2C—24 to 60 inches; olive brown (2.5Y 4/4) loam; massive; friable; few fine concretions of iron and manganese oxide; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 14 to 24 inches; average 17 inches
Thickness of the loess: 0 to 6 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture of the fine-earth fraction—silt loam, clay loam, or loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silty clay loam, loam, or clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—loam or clay loam

Streator Series

Depth class: Deep to silty clay till
Drainage class: Poorly drained
Permeability: Moderately slow over very slow
Landform position: Nearly level uplands
Parent material: Loess over glacial till
Slope range: 0 to 2 percent

Typical Pedon

Streator silty clay loam, 1,210 feet north and 180 feet east of the southwest corner of sec. 1, T. 28 N., R. 2 E.

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak very fine granular structure; firm; many very fine roots; neutral; abrupt smooth boundary.

A—7 to 13 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium angular blocky structure; firm; neutral; gradual wavy boundary.

Bg1—13 to 23 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/4) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few fine concretions of iron and manganese oxide; neutral; gradual wavy boundary.

Bg2—23 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few fine concretions of iron and manganese oxide; slightly alkaline; gradual wavy boundary.

Bg3—35 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/6) mottles; moderate medium and coarse prismatic structure; firm; few very fine roots; common fine concretions of iron and manganese oxide; slightly alkaline; clear wavy boundary.

2Bg4—43 to 47 inches; grayish brown (2.5Y 5/2) silty clay; common fine prominent light olive brown (2.5Y 5/6) mottles; weak medium and coarse prismatic structure; extremely firm; common medium concretions of iron and manganese oxide; 1 percent pebbles; slightly effervescent; moderately alkaline; gradual wavy boundary.

2C—47 to 60 inches; grayish brown (2.5Y 5/2) silty clay; common fine prominent light olive brown (2.5Y 5/6) mottles; massive; extremely firm; common medium concretions of iron and manganese oxide; 1 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 36 to 60 inches; average 47 inches

Thickness of the mollic epipedon: 10 to 24 inches; average 16 inches

Thickness of the loess: 40 to 60 inches; average 50 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1
Texture of the fine-earth fraction—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam, silty clay, or silt loam

2Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay or silty clay loam

2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay

Swygert Series

Depth class: Shallow to silty clay till
Drainage class: Somewhat poorly drained
Permeability: Slow over very slow
Landform position: Nearly level areas and side slopes on uplands
Parent material: Loess over glacial till
Slope range: 0 to 5 percent

Taxadjunct features: Swygert silty clay, 2 to 5 percent slopes, eroded, does not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soil.

Typical Pedon

Swygert silty clay loam, 0 to 2 percent slopes, 2,354 feet north and 168 feet west of the southeast corner of sec. 12, T. 28 N., R. 2 E.

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak medium granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

Bt1—10 to 15 inches; brown (10YR 4/3) silty clay; common fine distinct yellowish brown (10YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; moderate fine and very fine subangular blocky structure; friable; few very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear wavy boundary.

2Bt2—15 to 21 inches; olive brown (2.5Y 4/4) silty clay; few fine distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; strong medium and fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common distinct black (10YR 2/1) organic coatings on faces of peds; 2 percent pebbles; neutral; gradual wavy boundary.

2Bt3—21 to 32 inches; olive brown (2.5Y 4/4) silty clay; few fine distinct yellowish brown (10YR 5/6) and common medium distinct light gray (5Y 6/1) mottles; moderate medium prismatic structure; very firm; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; strongly effervescent; 2 percent pebbles; moderately alkaline; diffuse wavy boundary.

2BC—32 to 42 inches; olive brown (2.5Y 4/4) silty clay; common medium distinct light gray (5Y 6/1) mottles; weak coarse prismatic structure; very firm; strongly effervescent; 1 to 2 percent pebbles; moderately alkaline; diffuse wavy boundary.

2C—42 to 60 inches; olive brown (2.5Y 4/4) silty clay; common medium distinct light gray (5Y 6/1) mottles; massive; very firm; 2 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 40 inches; average 24 inches

Thickness of the mollic epipedon: 6 to 12 inches; average 9 inches
Thickness of the loess: 10 to 30 inches; average 23 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silty clay loam or silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay or silty clay loam

2Bt and 2BC horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture of the fine-earth fraction—silty clay

Tama Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform position: Upland side slopes
Parent material: Loess
Slope range: 2 to 5 percent
Taxadjunct features: The Tama soils in this survey area have a seasonal high water table closer to the surface than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Tama silt loam, 2 to 5 percent slopes, 2,893 feet south and 1,053 feet east of the northwest corner of sec. 3, T. 25 N., R. 2 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.
Bt1—10 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; moderately acid; gradual smooth boundary.
Bt2—18 to 31 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.
Bt3—31 to 43 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.
Bt4—43 to 53 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct yellowish brown (10YR 5/6) and common fine distinct light brownish gray (2.5Y 6/2) mottles; moderate coarse prismatic structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline; diffuse wavy boundary.
C—53 to 70 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; massive; friable; few very fine roots; slightly alkaline.

Range in Characteristics

Depth to carbonates: 41 to more than 60 inches; average 53 inches
Thickness of the mollic epipedon: 7 to 19 inches; average 11 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silty clay loam or silt loam

C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam

Varna Series

Depth class: Very deep
Drainage class: Moderately well drained and well drained
Permeability: Moderately slow or slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 15 percent
Taxadjunct features: Varna silty clay loam, 2 to 5 percent slopes, eroded, and Varna silty clay loam, 5 to 10 percent slopes, eroded, do not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Varna silty clay loam, 2 to 5 percent slopes, eroded, 1,498 feet north and 129 feet east of the southwest corner of sec. 29, T. 28 N., R. 1 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam, brown (10YR 4/3) dry; weak very fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

Bt1—7 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to moderate very fine and fine subangular blocky; friable; few very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear wavy boundary.

2Bt2—16 to 23 inches; olive brown (2.5Y 4/4) silty clay; strong fine prismatic structure parting to moderate fine subangular blocky; firm; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 2 percent pebbles; neutral; clear wavy boundary.

2Bt3—23 to 32 inches; light olive brown (2.5Y 5/4) silty clay loam; strong fine and medium prismatic structure; firm; few very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many distinct olive brown (2.5Y 4/4) clay films on faces of peds; 3 percent pebbles; strongly effervescent; slightly alkaline; gradual wavy boundary.

2BC—32 to 40 inches; light olive brown (2.5Y 5/4) silty clay loam; few fine yellowish brown (10YR 5/6) and few fine grayish brown (2.5Y 5/2) mottles; weak medium and coarse prismatic structure; firm; few medium accumulations of calcium carbonate; 3 percent pebbles; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C—40 to 60 inches; light olive brown (2.5Y 5/4) silty clay loam; few fine grayish brown (2.5Y 5/2) mottles; massive; firm; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 20 to 42 inches; average 27 inches
Thickness of the mollic epipedon: 6 to 13 inches; average 8 inches
Thickness of the loess: 0 to 20 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture of the fine-earth fraction—silty clay loam

2Bt and 2BC horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture of the fine-earth fraction—silty clay or silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture of the fine-earth fraction—silty clay loam

Warsaw Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform position: Low terrace side slopes
Parent material: Glacial outwash
Slope range: 0 to 2 percent

Typical Pedon

Warsaw sandy loam, 0 to 2 percent slopes, 3,050 feet north and 3,820 feet west of the southeast corner of sec. 26, T. 27 N., R. 4 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak fine granular; friable; many fine roots; moderately acid; abrupt smooth boundary.

A—8 to 15 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak medium and coarse subangular blocky structure; friable; many fine roots; 2 percent pebbles; moderately acid; clear wavy boundary.

Bt1—15 to 24 inches; dark yellowish brown (10YR 3/4) loam; moderate fine and medium subangular blocky structure; friable; common fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; 5 percent pebbles; moderately acid; gradual wavy boundary.

2Bt2—24 to 35 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 25 percent pebbles; slightly acid; gradual wavy boundary.

2C1—35 to 48 inches; dark yellowish brown (10YR 4/4), stratified very gravelly sandy loam and very gravelly loamy sand; massive; friable; 45 percent pebbles; neutral; gradual wavy boundary.

2C2—48 to 60 inches; yellowish brown (10YR 5/4) very gravelly sand; single grain; loose; 60 percent pebbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Depth to gravelly material: 20 to 40 inches; average 30 inches

Thickness of the mollic epipedon: 12 to 24 inches; average 19 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—sandy loam, loam, or silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—3 or 4
Texture of the fine-earth fraction—loam or clay loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4
Chroma—3 or 4
Texture of the fine-earth fraction—gravelly clay loam, gravelly loam, or gravelly sandy loam

2C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—very gravelly sand, very gravelly loamy sand, or very gravelly sandy loam

Waupecan Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate over very rapid
Landform position: Nearly level areas and side slopes on outwash plains
Parent material: Loess over glacial outwash
Slope range: 0 to 5 percent

Typical Pedon

Waupecan silt loam, 2 to 5 percent slopes, 2,588 feet north and 1,075 feet west of the southeast corner of sec. 24, T. 27 N., R. 2 W.

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

A—7 to 16 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; many very fine and fine roots; neutral; gradual wavy boundary.

AB—16 to 20 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure parting to weak medium granular; friable; many fine roots; neutral; gradual wavy boundary.

Bt1—20 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; many fine roots; continuous common distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt2—28 to 36 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint yellowish brown (10YR 5/4 and 5/6) mottles; moderate fine and medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; many continuous distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear wavy boundary.

2Bt3—36 to 54 inches; dark yellowish brown (10YR 4/4) sandy clay loam; common fine faint yellowish brown (10YR 5/4) and few fine faint yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; firm; common fine roots; few continuous distinct brown (10YR 4/3) clay films on faces of peds; 5 percent pebbles; neutral; gradual wavy boundary.

2C—54 to 60 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam; massive; very friable; few fine roots; common fine and medium concretions of calcium carbonate; 25 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 11 to 18 inches; average 14 inches
Thickness of the loess: 30 to 45 inches; average 36 inches

Ap and A horizons:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—clay loam, loam, or sandy clay loam

2C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture of the fine-earth fraction—gravelly sand, gravelly loamy sand, or gravelly sandy loam

Wenona Series

Depth class: Moderately deep or deep to silty clay till
Drainage class: Moderately well drained
Permeability: Moderately slow over very slow
Landform position: Upland side slopes
Parent material: Loess over glacial till
Slope range: 2 to 10 percent
Taxadjunct features: The Wenona soils in this survey area do not have a mollic epipedon, which is definitive for the series. This difference, however, does not significantly affect the use or behavior of the soils.

Typical Pedon

Wenona silt loam, 2 to 5 percent slopes, eroded, 132 feet south and 1,940 feet east of the northwest corner of sec. 2, T. 27 N., R. 2 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bt1—9 to 14 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings and many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; neutral; clear smooth boundary.

Bt2—14 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint brown (10YR 5/3) mottles; weak fine prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; clear wavy boundary.

Bt3—19 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine accumulations of iron and manganese oxide; slightly acid; gradual wavy boundary.

Bt4—29 to 42 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (2.5Y 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse prismatic structure; friable; few fine roots; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine accumulations of iron and manganese oxide; very slightly effervescent at a depth of 39 inches; neutral; clear wavy boundary.

2Bk—42 to 52 inches; olive brown (2.5Y 4/4) silty clay; weak coarse prismatic structure; very firm; few very fine roots; many prominent light gray (5Y 7/1) calcium carbonate coatings along vertical cleavage planes; common fine accumulations of calcium carbonate; 2 percent pebbles; violently effervescent; moderately alkaline; gradual wavy boundary.

2C—52 to 60 inches; olive brown (2.5Y 4/4) silty clay; massive; very firm; 2 percent pebbles; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 30 to 55 inches; average 38 inches
Thickness of the mollic epipedon: 6 to 12 inches; average 9 inches
Thickness of the loess: 35 to 55 inches; average 38 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture of the fine-earth fraction—silt loam or silty clay loam

Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture of the fine-earth fraction—silt loam, silty clay loam, or silty clay

2Bk horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay

2C horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—2 to 6
Texture of the fine-earth fraction—silty clay

Formation of the Soils

Soil forms through processes that act on deposited or accumulated geologic material. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material (Jenny, 1941).

Climate and plant and animal life are active factors of soil formation. They act on the parent material that has accumulated through weathering and through relocation by water, glaciers, or the wind. The effects of climate and plant and animal life are conditioned by relief. The type of parent material affects the kind of soil that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for the transformation of the parent material into a soil. The length of time affects the degree of profile development and the type of soil horizons. Usually, a long time is required for the development of distinct horizons.

The soil-forming factors can vary in importance from place to place. The effects of any one factor are modified by the effects of the others.

Parent Material

Parent material determines the limits of the chemical and mineralogical composition of the soil. The soils in Woodford County formed in materials that were deposited by wind, water, glaciers, or meltwater from the glaciers. Some of the materials were reworked and redeposited by the subsequent actions of water and wind.

The soils in almost one-third of the county formed in loess, or windblown silty material. The wind picked up the silty material in the valleys of the Mississippi and Illinois Rivers and redeposited it on uplands in the county. The maximum thickness of the loess in the county ranges from 10 to 20 feet. The thickness generally decreases with increasing slope. It also generally decreases toward the east from the Illinois River.

The soils in a small area of the county formed in glacial outwash of sand, gravel, and loamy material. These soils are in the western part of the county near the Illinois River.

The soils in about 6 percent of the county formed in alluvium, or material deposited in recent time by streams and rivers. Soil material in floodwater settles and is deposited in still or slowly moving water. The alluvial soils in the county are mainly on bottom land along the Illinois and Mackinaw Rivers. These soils are silty, clayey, or loamy, depending on the speed of the floodwater during deposition.

The soils in about 60 percent of the county are a combination of loess over glacial till. The till consists of compacted, calcareous, loamy material containing rock fragments of various sizes. It is close enough to the surface to be the sole parent material in only a few scattered areas.

Plant and Animal Life

Living organisms influence soil formation mainly through the effects of plants on the soils. The native vegetation in Woodford County was dominantly deciduous hardwoods and prairie grasses. Soils that formed under forest vegetation have a thin, relatively light colored surface layer that has a low content of organic matter. Soils that formed under prairie grasses have a thick, dark surface layer that has a higher content of organic matter. Plant roots provide channels for the downward movement of water through the soil and add organic matter as they decay. Plants extract nutrients, alter the pH, increase the extent of weathering, and affect the physical structure of the soils.

Micro-organisms, fungi, snails, earthworms, insects, crawfish, and burrowing animals help to decompose organic matter and mix and chemically alter the soils.

Human activities also can alter the soils. The effects of cultivation on soil formation differ from the effects of the native vegetation. Soils that formed under native prairie vegetation no longer receive large annual additions of organic matter from the prairie grasses. Tilling the soil increases the runoff rate and the hazard of erosion. Chemical additions affect soil pH, fertility, and the numbers and kinds of organisms inhabiting the soils. Levees and drainage tile alter natural drainage and create a drier soil climate.

Climate

Climate is an important factor of soil formation. It restricts the kind of plant and animal life on and in the soils. It determines the amount of water available for the weathering of minerals and for the translocation of soil material. Temperatures help to determine the rate of chemical processes in the soils.

Relief

Relief has markedly influenced the soils in Woodford County through its effects on natural drainage, erosion, plant cover, and soil temperature. Slopes in the county range from 0 to 60 percent. Natural soil drainage ranges from excessively drained on sandy dunes to very poorly drained in depressions.

Relief influences soil formation by affecting runoff and drainage. Drainage, in turn, affects aeration of the soil and determines the color of the soil. The runoff rate is highest on the steepest slopes. In many low areas water is temporarily ponded. Water and air move freely through excessively drained to well drained soils and slowly through poorly drained and very poorly drained soils. In Jasper soils and other well drained, well aerated soils, the iron and aluminum compounds that give most soils their color are yellowish brown and oxidized. Sable soils and other poorly drained, poorly aerated soils are dull gray or olive.

Slope affects the degree of profile development. Nearly level soils commonly are more strongly developed than the more sloping soils because the slope affects the amount of water that penetrates the surface.

Time

Time affects the degree of profile development in the soils. The deposition of material and the topography can modify the effects of time. Soils that formed in redeposited material, such as alluvium on flood plains, have weakly expressed horizons and appear to be young. The degree of profile development tends to decrease as the slope increases. As a result, the steeper soils appear to be younger than the less sloping soils.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity.

The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4

Strongly alkaline .... 8.5 to 9.0
Very strongly alkaline .... 9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a footslope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Minonk, Illinois)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	29.7	12.3	21.0	57	-19	0	1.59	0.68	2.36	4	8.0
February---	34.9	17.1	26.0	63	-13	0	1.70	.70	2.55	4	7.0
March------	47.7	28.6	38.2	78	5	29	3.10	1.44	4.53	6	3.6
April------	62.6	39.1	50.9	87	19	135	3.89	2.03	5.51	7	.6
May--------	73.9	48.9	61.4	93	29	366	3.94	2.13	5.53	6	.0
June-------	84.1	58.5	71.3	97	42	638	3.36	1.71	4.81	6	.0
July-------	86.4	62.0	74.2	99	46	749	4.05	2.55	5.41	6	.0
August-----	84.2	59.1	71.7	98	43	665	3.06	1.31	4.55	5	.0
September--	78.3	52.2	65.3	95	32	461	3.69	1.54	5.51	5	.0
October----	65.8	40.9	53.4	87	21	180	2.70	1.07	4.06	5	.1
November---	49.5	31.0	40.3	74	8	31	3.04	1.28	4.54	5	1.3
December---	34.7	18.2	26.5	63	-13	2	2.59	1.21	3.77	5	6.9
Yearly:											
Average---	61.0	39.0	50.0	---	---	---	---	---	---	---	---
Extreme---			---	102	-20	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,256	36.70	24.25	43.99	64	27.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Minonk, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 20	Apr. 30	May 13
2 years in 10 later than--	Apr. 14	Apr. 25	May 7
5 years in 10 later than--	Apr. 3	Apr. 16	Apr. 27
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 19	Oct. 5	Sept. 25
2 years in 10 earlier than--	Oct. 24	Oct. 10	Sept. 30
5 years in 10 earlier than--	Nov. 2	Oct. 22	Oct. 9

Table 3.--Growing Season

(Recorded in the period 1961-90 at Minonk, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	190	167	142
8 years in 10	197	174	150
5 years in 10	211	188	164
2 years in 10	226	201	179
1 year in 10	233	208	186

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
17A	Keomah silt loam, 0 to 2 percent slopes	6,321	1.8
17B2	Keomah silt loam, 2 to 5 percent slopes, eroded	3,956	1.1
27C2	Miami silty clay loam, 5 to 10 percent slopes, eroded	1,932	0.6
27D2	Miami silty clay loam, 10 to 15 percent slopes, eroded	3,945	1.1
36B	Tama silt loam, 2 to 5 percent slopes	9,002	2.6
43A	Ipava silt loam, 0 to 2 percent slopes	30,961	8.9
43B	Ipava silt loam, 2 to 5 percent slopes	5,421	1.6
60C2	La Rose silt loam, 5 to 10 percent slopes, eroded	664	0.2
60C3	La Rose silty clay loam, 5 to 10 percent slopes, severely eroded	43	*
61A	Atterberry silt loam, 0 to 2 percent slopes	1,540	0.4
67	Harpster silty clay loam	789	0.2
68	Sable silty clay loam	30,357	8.7
91A	Swygert silty clay loam, 0 to 2 percent slopes	1,771	0.5
91B2	Swygert silty clay loam, 2 to 5 percent slopes, eroded	2,185	0.6
100	Palms muck	51	*
125	Selma loam	209	*
131A	Alvin loamy sand, 0 to 2 percent slopes	365	0.1
131B	Alvin sandy loam, 2 to 5 percent slopes	485	0.1
131C	Alvin sandy loam, 5 to 10 percent slopes	30	*
131D	Alvin sandy loam, 10 to 15 percent slopes	332	*
131F	Alvin sandy loam, 25 to 35 percent slopes	275	*
134A	Camden silt loam, 0 to 2 percent slopes	408	0.1
134B	Camden silt loam, 2 to 5 percent slopes	347	*
134C2	Camden silt loam, 5 to 10 percent slopes, eroded	270	*
145B	Saybrook silt loam, 2 to 5 percent slopes	5	*
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded	2,823	0.8
145C2	Saybrook silty clay loam, 5 to 10 percent slopes, eroded	1,821	0.5
148A	Proctor silt loam, 0 to 2 percent slopes	34	*
148B	Proctor silt loam, 2 to 5 percent slopes	273	*
152	Drummer silty clay loam	23,401	6.7
154A	Flanagan silt loam, 0 to 2 percent slopes	28,573	8.2
154B	Flanagan silt loam, 2 to 5 percent slopes	3,970	1.1
171B	Catlin silt loam, 2 to 5 percent slopes	9,200	2.6
171B2	Catlin silt loam, 2 to 5 percent slopes, eroded	84	*
171C2	Catlin silt loam, 5 to 10 percent slopes, eroded	1,995	0.6
194C2	Morley silty clay loam, 5 to 10 percent slopes, eroded	1,666	0.5
198A	Elburn silt loam, 0 to 2 percent slopes	667	0.2
199A	Plano silt loam, 0 to 2 percent slopes	450	0.1
199B	Plano silt loam, 2 to 5 percent slopes	275	*
210	Lena muck	433	0.1
221B2	Parr silt loam, 2 to 5 percent slopes, eroded	57	*
221C2	Parr silt loam, 5 to 10 percent slopes, eroded	139	*
223B2	Varna silty clay loam, 2 to 5 percent slopes, eroded	1,314	0.4
223C2	Varna silty clay loam, 5 to 10 percent slopes, eroded	1,421	0.4
223D	Varna silty clay loam, 10 to 15 percent slopes	219	*
224D2	Strawn silt loam, 10 to 15 percent slopes, eroded	1,378	0.4
224E	Strawn silt loam, 15 to 25 percent slopes	1,339	0.4
224E2	Strawn silt loam, 15 to 30 percent slopes, eroded	16	*
233B2	Birkbeck silt loam, 2 to 5 percent slopes, eroded	5,292	1.5
233C2	Birkbeck silty clay loam, 5 to 10 percent slopes, eroded	6,573	1.9
233D2	Birkbeck silt loam, 10 to 15 percent slopes, eroded	734	0.2
236A	Sabina silt loam, 0 to 2 percent slopes	253	*
241C2	Chatsworth silty clay loam, 4 to 7 percent slopes, eroded	293	*
243A	St. Charles silt loam, 0 to 2 percent slopes	321	*
243B	St. Charles silt loam, 2 to 5 percent slopes	296	*
279B2	Rozetta silt loam, 2 to 5 percent slopes, eroded	9,389	2.7
290A	Warsaw sandy loam, 0 to 2 percent slopes	293	*
322C2	Russell silt loam, 5 to 10 percent slopes, eroded	6,247	1.8
322D2	Russell silt loam, 10 to 15 percent slopes, eroded	1,345	0.4
327C2	Fox silty clay loam, 5 to 10 percent slopes, eroded	60	*

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
330	Peotone silty clay loam	1,387	0.4
356	Elpaso silty clay loam	13,542	3.9
369A	Waupecan silt loam, 0 to 2 percent slopes	28	*
369B	Waupecan silt loam, 2 to 5 percent slopes	44	*
375A	Rutland silty clay loam, 0 to 2 percent slopes	8,367	2.4
375B	Rutland silt loam, 2 to 5 percent slopes	96	*
375B2	Rutland silty clay loam, 2 to 5 percent slopes, eroded	769	0.2
379A	Dakota loam, 0 to 2 percent slopes	399	0.1
386B	Downs silt loam, 2 to 5 percent slopes	1,151	0.3
387A	Ockley silt loam, 0 to 2 percent slopes	86	*
388B2	Wenona silt loam, 2 to 5 percent slopes, eroded	3,121	0.9
388C2	Wenona silty clay loam, 5 to 10 percent slopes, eroded	276	*
435	Streator silty clay loam	15,650	4.5
440A	Jasper silt loam, 0 to 2 percent slopes	912	0.3
440B	Jasper silt loam, 2 to 5 percent slopes	138	*
440C2	Jasper silt loam, 5 to 10 percent slopes, eroded	253	*
484A	Harco silty clay loam, 0 to 2 percent slopes	4,969	1.4
533	Urban land	199	*
536	Dumps, mine	35	*
541B2	Graymont silt loam, 2 to 5 percent slopes, eroded	11,401	3.3
541C2	Graymont silt loam, 5 to 10 percent slopes, eroded	2,357	0.7
567B	Elkhart silt loam, 2 to 5 percent slopes	4,127	1.2
570A	Martinsville silt loam, 0 to 2 percent slopes	299	*
570B	Martinsville sandy loam, 2 to 5 percent slopes	401	0.1
570C2	Martinsville loam, 5 to 10 percent slopes, eroded	274	*
614A	Chenoa silty clay loam, 0 to 2 percent slopes	5,732	1.6
614B2	Chenoa silty clay loam, 2 to 5 percent slopes, eroded	2,096	0.6
689B	Coloma sand, 1 to 7 percent slopes	791	0.2
689D	Coloma sand, 7 to 15 percent slopes	397	0.1
802	Orthents, loamy	898	0.3
865	Pits, gravel	306	*
935F	Miami-Hennepin complex, 25 to 35 percent slopes	6,015	1.7
935G	Miami-Hennepin complex, 35 to 60 percent slopes	12,963	3.7
3092	Sarpy loamy fine sand, frequently flooded	445	0.1
3107	Sawmill silty clay loam, frequently flooded	239	*
3304	Landes fine sandy loam, frequently flooded	1,300	0.4
3360	Slacwater silt loam, frequently flooded	2,479	0.7
8073	Ross silt loam, occasionally flooded	3,225	0.9
8074	Radford silt loam, occasionally flooded	843	0.2
8077	Huntsville silt loam, occasionally flooded	1,146	0.3
8107	Sawmill silty clay loam, occasionally flooded	5,915	1.7
8368	Raveenwash silt loam, occasionally flooded	1,376	0.4
8400	Calco silty clay loam, occasionally flooded	465	0.1
8402	Colo silt loam, occasionally flooded	851	0.2
8451	Lawson silt loam, occasionally flooded	5,175	1.5
	Water	10,164	2.9
	Total	347,410	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
17A	Keomah silt loam, 0 to 2 percent slopes (where drained)
17B2	Keomah silt loam, 2 to 5 percent slopes, eroded
36B	Tama silt loam, 2 to 5 percent slopes
43A	Ipava silt loam, 0 to 2 percent slopes
43B	Ipava silt loam, 2 to 5 percent slopes
61A	Atterberry silt loam, 0 to 2 percent slopes (where drained)
67	Harpster silty clay loam (where drained)
68	Sable silty clay loam (where drained)
91A	Swygert silty clay loam, 0 to 2 percent slopes
91B2	Swygert silty clay loam, 2 to 5 percent slopes, eroded
125	Selma loam (where drained)
131A	Alvin loamy sand, 0 to 2 percent slopes
131B	Alvin sandy loam, 2 to 5 percent slopes
131C	Alvin sandy loam, 5 to 10 percent slopes
134A	Camden silt loam, 0 to 2 percent slopes
134B	Camden silt loam, 2 to 5 percent slopes
145B	Saybrook silt loam, 2 to 5 percent slopes
145B2	Saybrook silt loam, 2 to 5 percent slopes, eroded
148A	Proctor silt loam, 0 to 2 percent slopes
148B	Proctor silt loam, 2 to 5 percent slopes
152	Drummer silty clay loam (where drained)
154A	Flanagan silt loam, 0 to 2 percent slopes
154B	Flanagan silt loam, 2 to 5 percent slopes
171B	Catlin silt loam, 2 to 5 percent slopes
171B2	Catlin silt loam, 2 to 5 percent slopes, eroded
198A	Elburn silt loam, 0 to 2 percent slopes
199A	Plano silt loam, 0 to 2 percent slopes
199B	Plano silt loam, 2 to 5 percent slopes
221B2	Parr silt loam, 2 to 5 percent slopes, eroded
223B2	Varna silty clay loam, 2 to 5 percent slopes, eroded
233B2	Birkbeck silt loam, 2 to 5 percent slopes, eroded
236A	Sabina silt loam, 0 to 2 percent slopes (where drained)
243A	St. Charles silt loam, 0 to 2 percent slopes
243B	St. Charles silt loam, 2 to 5 percent slopes
279B2	Rozetta silt loam, 2 to 5 percent slopes, eroded
290A	Warsaw sandy loam, 0 to 2 percent slopes
330	Peotone silty clay loam (where drained)
356	Elpaso silty clay loam (where drained)
369A	Waupecan silt loam, 0 to 2 percent slopes
369B	Waupecan silt loam, 2 to 5 percent slopes
375A	Rutland silty clay loam, 0 to 2 percent slopes
375B	Rutland silt loam, 2 to 5 percent slopes
375B2	Rutland silty clay loam, 2 to 5 percent slopes, eroded
379A	Dakota loam, 0 to 2 percent slopes
386B	Downs silt loam, 2 to 5 percent slopes
387A	Ockley silt loam, 0 to 2 percent slopes
388B2	Wenona silt loam, 2 to 5 percent slopes, eroded
435	Streator silty clay loam (where drained)
440A	Jasper silt loam, 0 to 2 percent slopes
440B	Jasper silt loam, 2 to 5 percent slopes
484A	Harco silty clay loam, 0 to 2 percent slopes
541B2	Graymont silt loam, 2 to 5 percent slopes, eroded
567B	Elkhart silt loam, 2 to 5 percent slopes
570A	Martinsville silt loam, 0 to 2 percent slopes
570B	Martinsville sandy loam, 2 to 5 percent slopes
614A	Chenoa silty clay loam, 0 to 2 percent slopes
614B2	Chenoa silty clay loam, 2 to 5 percent slopes, eroded

Table 5.--Prime Farmland--Continued

Map symbol	Soil name
3107	Sawmill silty clay loam, frequently flooded (where drained and protected from flooding or not frequently flooded during the growing season)
3304	Landes fine sandy loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
8073	Ross silt loam, occasionally flooded
8074	Radford silt loam, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
8077	Huntsville silt loam, occasionally flooded (where protected from flooding or not frequently flooded during the growing season)
8107	Sawmill silty clay loam, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
8400	Calco silty clay loam, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
8402	Colo silt loam, occasionally flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
8451	Lawson silt loam, occasionally flooded

Table 6.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
17A-------------- Keomah	2w	131	44	---	72	---	8.8
17B2------------- Keomah	2e	124	42	---	68	---	8.3
27C2------------- Miami	3e	110	36	46	62	3.1	5.0
27D2------------- Miami	4e	104	34	44	58	2.6	4.5
36B-------------- Tama	2e	153	46	61	88	---	9.7
43A-------------- Ipava	1	163	52	66	91	---	---
43B-------------- Ipava	2e	161	51	65	90	---	---
60C2------------- La Rose	3e	112	37	47	67	4.5	7.5
60C3------------- La Rose	4e	93	31	40	56	4.2	7.0
61A-------------- Atterberry	1	149	44	60	85	5.6	9.3
67--------------- Harpster	2w	136	44	52	74	---	---
68--------------- Sable	2w	156	51	61	85	---	---
91A-------------- Swygert	2w	114	39	51	73	4.5	7.5
91B2------------- Swygert	2e	107	37	48	69	4.2	7.1
100-------------- Palms	5w	---	---	---	---	---	---
125-------------- Selma	2w	136	44	53	76	---	---
131A------------- Alvin	2s	99	37	47	67	4.3	7.2
131B------------- Alvin	2e	98	37	47	66	4.3	7.1
131C------------- Alvin	3e	96	36	46	65	4.0	6.7

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
131D-------------- Alvin	3e	92	34	44	62	4.0	6.7
131F-------------- Alvin	6e	---	---	---	---	3.1	5.3
134A-------------- Camden	1	125	39	55	72	5.0	8.3
134B-------------- Camden	2e	124	39	54	71	5.0	8.2
134C2------------- Camden	3e	117	37	52	68	4.7	7.8
145B-------------- Saybrook	2e	138	46	59	83	5.5	9.2
145B2------------- Saybrook	2e	133	44	58	81	5.4	8.9
145C2------------- Saybrook	3e	131	43	56	79	5.3	8.7
148A-------------- Proctor	1	144	44	59	88	5.5	9.2
148B-------------- Proctor	2e	143	44	58	87	5.4	9.1
152--------------- Drummer	2w	154	51	61	83	---	9.2
154A-------------- Flanagan	1	162	52	67	92	6.1	10.2
154B-------------- Flanagan	2e	160	51	66	91	6.0	10.1
171B-------------- Catlin	2e	149	46	60	86	5.7	9.6
171B2------------- Catlin	2e	144	44	59	84	5.6	9.3
171C2------------- Catlin	3e	141	43	57	82	5.5	9.1
194C2------------- Morley	3e	97	33	44	60	4.0	6.7
198A-------------- Elburn	1	161	50	63	94	6.1	10.2
199A-------------- Plano	1	151	45	60	90	---	9.7
199B-------------- Plano	2e	150	45	59	89	---	9.6

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
210-------------- Lena	5w	---	---	---	---	---	---
221B2------------ Parr	2e	121	41	54	73	3.8	6.5
221C2------------ Parr	3e	117	40	52	72	3.4	6.0
223B2------------ Varna	2e	116	39	50	70	4.7	7.8
223C2------------ Varna	3e	112	37	39	54	4.5	7.5
223D------------- Varna	4e	112	37	39	54	4.2	7.0
224D2------------ Strawn	3e	94	28	37	51	3.6	6.0
224E------------- Strawn	6e	---	---	---	---	3.5	5.8
224E2------------ Strawn	6e	---	---	---	---	2.9	4.8
233B2------------ Birkbeck	2e	118	39	53	67	4.8	8.0
233C2------------ Birkbeck	3e	116	39	52	66	4.7	7.8
233D2------------ Birkbeck	3e	109	36	49	62	4.5	7.4
236A------------- Sabina	2w	133	42	56	75	5.2	8.7
241C2------------ Chatsworth	6e	---	---	---	---	---	1.6
243A------------- St. Charles	1	127	40	56	73	---	8.5
243B------------- St. Charles	2e	126	39	55	72	---	8.1
279B2------------ Rozetta	2e	129	40	53	72	5.1	8.5
290A------------- Warsaw	2s	115	40	53	74	3.1	---
322C2------------ Russell	3e	118	39	52	65	4.5	7.6
322D2------------ Russell	4e	112	37	50	62	4.2	7.3

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
327C2------------ Fox	3e	96	30	42	58	3.9	6.5
330-------------- Peotone	2w	123	42	43	58	---	---
356-------------- Elpaso	2w	146	49	58	82	---	---
369A------------- Waupecan	1	149	50	62	81	5.3	---
369B------------- Waupecan	2e	148	49	61	80	5.2	---
375A------------- Rutland	2w	132	45	59	84	5.3	8.8
375B------------- Rutland	2e	131	45	58	83	5.2	8.7
375B2------------ Rutland	2e	131	45	58	83	5.2	8.7
379A------------- Dakota	2s	107	36	51	67	---	---
386B------------- Downs	2e	147	43	58	82	---	9.2
387A------------- Ockley	1	126	42	51	75	3.6	---
388B2------------ Wenona	2e	119	40	53	76	5.0	8.4
388C2------------ Wenona	3e	117	39	52	74	7.4	7.9
435-------------- Streator	2w	129	45	54	77	---	---
440A------------- Jasper	1	138	42	57	88	---	---
440B------------- Jasper	2e	137	42	56	87	5.2	8.5
440C2------------ Jasper	2e	130	39	54	83	5.0	8.0
484A------------- Harco	1	154	47	62	87	5.6	9.3
533. Urban land							
536. Dumps, mine							

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
541B2------------ Graymont	2e	125	41	55	76	5.1	8.4
541C2------------ Graymont	3e	130	43	55	78	5.3	8.7
567B------------- Elkhart	2e	131	39	52	72	5.0	8.4
570A------------- Martinsville	1	121	37	51	66	4.0	---
570B------------- Martinsville	2e	120	37	50	65	3.8	6.5
570C2------------ Martinsville	3e	114	35	48	62	3.4	6.0
614A------------- Chenoa	2w	135	45	61	85	---	9.3
614B2------------ Chenoa	2e	134	44	60	84	---	9.2
689B------------- Coloma	4s	58	20	28	40	2.4	---
689D------------- Coloma	6s	---	---	---	---	2.2	---
802. Orthents							
865. Pits, gravel							
935F------------- Miami-Hennepin	7e	---	---	---	---	---	---
935G------------- Miami-Hennepin	7e	---	---	---	---	---	---
3092------------- Sarpy	4w	---	13	17	24	---	---
3107------------- Sawmill	3w	74	24	27	38	---	---
3304------------- Landes	3w	50	17	45	31	---	5.6
3360------------- Slacwater	2w	75	22	---	---	---	---
8073------------- Ross	2w	109	35	45	66	---	---

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
8074-------------- Radford	2w	107	35	46	63	---	7.4
8077-------------- Huntsville	2w	114	36	48	64	4.1	6.8
8107-------------- Sawmill	2w	110	35	40	57	---	---
8368-------------- Raveenwash	2w	70	22	30	42	---	---
8400-------------- Calco	3w	99	33	39	54	---	---
8402-------------- Colo	2w	112	36	40	56	---	7.0
8451-------------- Lawson	2w	120	36	46	64	---	---

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
17A, 17B2:										
Keomah	3A	Slight	Slight	Slight	Slight	Moderate	White oak	65	43	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	70	57	
27C2, 27D2:										
Miami	5A	Slight	Slight	Slight	Slight	Moderate	White oak	90	73	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Sweetgum	---	---	
							Black walnut	---	---	
61A:										
Atterberry	4A	Slight	Slight	Slight	Slight	Moderate	White oak	70	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Bur oak	---	---	
							Green ash	---	---	
100:										
Palms	2W	Slight	Severe	Severe	Severe	Severe	Red maple	51	30	Swamp white oak, bur oak, baldcypress, green ash, pin oak.
							Black willow	---	---	
							Quaking aspen	---	---	
							White ash	---	---	
							Silver maple	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
131A, 131B, 131C, 131D:										
Alvin	4A	Slight	Slight	Slight	Slight	Moderate	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Black walnut	---	---	
131F:										
Alvin	4R	Moderate	Moderate	Slight	Slight	Moderate	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Black walnut	---	---	
134A, 134B, 134C2:										
Camden	7A	Slight	Slight	Slight	Slight	Severe	Tuliptree	95	101	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Sweetgum	---	---	
							Green ash	---	---	
							White oak	---	---	
194C2:										
Morley	4A	Slight	Slight	Slight	Slight	Moderate	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Bur oak	---	---	
							Shagbark hickory	---	---	
							Black walnut	---	---	
224D2:										
Strawn	4A	Slight	Slight	Slight	Slight	Moderate	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Shagbark hickory	---	---	
							Black walnut	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
224E:										
Strawn----------	4R	Moderate	Moderate	Moderate	Slight	Moderate	White oak-----------	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak----	---	---	
							Shagbark hickory----	---	---	
							Black walnut--------	---	---	
224E2:										
Strawn----------	4R	Moderate	Moderate	Moderate	Slight	Moderate	White oak-----------	80	57	Black walnut, eastern white pine, northern red oak, white ash, white oak.
							Northern red oak----	---	---	
							Black walnut--------	---	---	
							Shagbark hickory----	---	---	
233B2:										
Birkbeck--------	5A	Slight	Slight	Slight	Slight	Moderate	White oak-----------	86	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak----	---	---	
							Shagbark hickory----	---	---	
233C2, 233D2:										
Birkbeck--------	5A	Slight	Slight	Slight	Slight	Moderate	White oak-----------	86	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak----	---	---	
							White ash-----------	---	---	
236A:										
Sabina----------	4A	Slight	Slight	Slight	Slight	Moderate	White oak-----------	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak----	---	---	
							Black walnut--------	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
243A, 243B:										
St. Charles	7A	Slight	Slight	Slight	Slight	Severe	Tuliptree	95	101	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Green ash	---	---	
							White oak	---	---	
279B2:										
Rozetta	4A	Slight	Slight	Slight	Slight	Moderate	White oak	80	57	Basswood, bur oak, eastern white pine, northern red oak, white ash, white oak.
							Northern red oak	---	---	
							White ash	---	---	
							Black walnut	---	---	
322C2, 322D2:										
Russell	5A	Slight	Slight	Slight	Slight	Moderate	White oak	90	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Sweetgum	---	---	
327C2:										
Fox	4A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							White oak	---	---	
							Black cherry	---	---	
							White ash	---	---	
							Sugar maple	---	---	
386B:										
Downs	4A	Slight	Slight	Slight	Slight	Moderate	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Black walnut	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
387A:										
Ockley	5A	Slight	Slight	Slight	Slight	Moderate	White oak	90	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Sweetgum	---	---	
							White ash	---	---	
570A, 570B, 570C2:										
Martinsville	4A	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Black oak	---	---	
							Shagbark hickory	---	---	
935F:										
Miami	5R	Moderate	Moderate	Slight	Slight	Moderate	White oak	90	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Shagbark hickory	---	---	
							Sweetgum	---	---	
Hennepin	5R	Moderate	Moderate	Slight	Slight	Moderate	Northern red oak	85	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							White oak	---	---	
935G:										
Miami	5R	Severe	Severe	Slight	Slight	Moderate	White oak	90	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Northern red oak	---	---	
							Sweetgum	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
935G:										
Hennepin--------	5R	Severe	Severe	Slight	Slight	Moderate	Northern red oak----	85	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							White oak-----------	---	---	
							Shagbark hickory----	---	---	
3092:										
Sarpy-----------	3S	Slight	Slight	Severe	Slight	Slight	Silver maple--------	90	43	Swamp white oak, bur oak, baldcypress, green ash, pin oak.
							Eastern cottonwood--	---	---	
3107:										
Sawmill---------	5W	Slight	Moderate	Moderate	Moderate	Severe	Pin oak-------------	90	72	Swamp white oak, bur oak, baldcypress, green ash, pin oak.
							Bur oak-------------	---	---	
							White oak-----------	---	---	
							Eastern cottonwood--	---	---	
							American sycamore---	---	---	
3304:										
Landes----------	7A	Slight	Slight	Slight	Slight	Severe	Tuliptree-----------	95	101	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Green ash-----------	---	---	
							Bur oak-------------	---	---	
							Eastern cottonwood--	---	---	
							American sycamore---	---	---	
3360:										
Slacwater-------	11W	Slight	Severe	Severe	Severe	Severe	Eastern cottonwood--	110	161	Swamp white oak, bur oak, baldcypress, green ash, pin oak.
							Silver maple--------	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
8073:										
Ross	5A	Slight	Slight	Slight	Slight	Moderate	Northern red oak	86	72	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							White oak	---	---	
							White ash	---	---	
							Black walnut	---	---	
							Sugar maple	---	---	
8077:										
Huntsville	7A	Slight	Slight	Slight	Slight	Severe	Tuliptree	98	101	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Eastern cottonwood	---	---	
							American sycamore	---	---	
							Green ash	---	---	
							Cherrybark oak	---	---	
8107:										
Sawmill	5W	Slight	Moderate	Moderate	Moderate	Severe	Pin oak	90	72	Swamp white oak, bur oak, baldcypress, green ash, pin oak.
							Bur oak	---	---	
							White oak	---	---	
							Eastern cottonwood	---	---	
							American sycamore	---	---	
8368:										
Raveenwash	11W	Slight	Slight	Moderate	Slight	Moderate	Eastern cottonwood	110	161	White oak, northern red oak, pecan, black walnut, cherrybark oak, green ash, baldcypress.
							Silver maple	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
8451:										
Lawson----------	2A	Slight	Slight	Slight	Slight	Severe	Silver maple--------	70	32	American sycamore, bur oak, silver maple, white ash, white spruce.
							Bur oak-------------	---	---	
							American sycamore---	---	---	
							White ash-----------	---	---	
							White oak-----------	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 8.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
17A, 17B2: Keomah	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
27C2, 27D2: Miami	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
36B: Tama	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
43A, 43B: Ipava	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
60C2, 60C3: La Rose	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
61A: Atterberry	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
67: Harpster	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, cockspur hawthorn, nannyberry, shadbush, silky dogwood.	Eastern redcedar, northern whitecedar, tamarack.	Baldcypress, green ash, hackberry, northern red oak.	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
68: Sable	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
91A: Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
91B2: Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood.
100: Palms	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American holly, blackhaw, nannyberry, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	---
125: Selma	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
131A: Alvin	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
131B: Alvin	American holly, American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Blackhaw, hazelnut, prairie crabapple, shadbush, witchhazel.	Baldcypress, eastern redcedar, green ash, northern red oak, northern whitecedar.	Norway spruce, eastern white pine, hackberry, pin oak.	Eastern cottonwood.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
131C, 131D, 131F: Alvin	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
134A, 134B, 134C2: Camden	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
145B, 145B2, 145C2: Saybrook	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
148A, 148B: Proctor	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
152: Drummer	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
154A, 154B: Flanagan	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
171B, 171B2, 171C2: Catlin	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
194C2: Morley	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
198A: Elburn	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
199A, 199B: Plano	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
210: Lena	Black chokeberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American holly, blackhaw, nannyberry, shadbush, silky dogwood.	Alternateleaf dogwood, northern whitecedar, tamarack.	Baldcypress, eastern cottonwood.	---
221B2, 221C2: Parr	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
223B2, 223C2, 223D: Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	Washington hawthorn, blackhaw, hazelnut, nannyberry, shadbush.	Baldcypress, eastern redcedar, green ash, northern whitecedar.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
224D2, 224E: Strawn	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
224E2:					
Strawn----------	Coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry.	Eastern cottonwood, eastern white pine, pin oak.
233B2, 233C2, 233D2:					
Birkbeck-------	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
236A:					
Sabina----------	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
241C2:					
Chatsworth------	Common lilac------	---	Eastern redcedar	Virginia pine-----	---
243A, 243B:					
St. Charles-----	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
279B2:					
Rozetta---------	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
290A:					
Warsaw----------	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
322C2, 322D2: Russell	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
327C2: Fox	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
330: Peotone	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
356: Elpaso	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
369A, 369B: Waupecan	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
375A, 375B, 375B2: Rutland	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
379A:					
Dakota	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
386B:					
Downs	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
387A:					
Ockley	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
388B2, 388C2:					
Wenona	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
435:					
Streator	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
440A, 440B, 440C2:					
Jasper	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
484A:					
Harco	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
541B2, 541C2:					
Graymont	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
567B:					
Elkhart	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
570A, 570B, 570C2:					
Martinsville	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
614A, 614B2:					
Chenoa	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
689B, 689D:					
Coloma	American plum, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	Alternateleaf dogwood, hazelnut, nannyberry, shadbush, witchhazel.	Blue spruce, eastern redcedar, green ash, northern whitecedar.	Eastern white pine	---
935F:					
Miami	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
Hennepin	American holly, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern whitecedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
935G:					
Miami	American holly, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood.	Blackhaw, hazelnut, possumhaw, shadbush, witchhazel.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	Norway spruce	Eastern white pine.
Hennepin	American holly, coralberry, gray dogwood, redosier dogwood, roughleaf dogwood, silky dogwood.	Blackhaw, hazelnut, possumhaw, shadbush, witchhazel.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	Norway spruce	Eastern white pine.
3092:					
Sarpy	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, downy arrowwood, shadbush.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	---	---
3107:					
Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
3304:					
Landes	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Alternateleaf dogwood, eastern redcedar, hazelnut, nannyberry, northern whitecedar, prairie crabapple, shadbush.	Eastern white pine, green ash.	---	---
3360:					
Slacwater	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, cockspur hawthorn, nannyberry, shadbush, silky dogwood.	Eastern redcedar, northern whitecedar, tamarack.	Baldcypress, green ash, hackberry, northern red oak.	---
8073:					
Ross	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
8074: Radford	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
8077: Huntsville	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
8107: Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.
8368: Raveenwash	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, downy arrowwood, shadbush.	Eastern redcedar, green ash, hackberry, nannyberry, northern red oak, northern whitecedar.	---	---
8400: Calco	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, cockspur hawthorn, nannyberry, shadbush, silky dogwood.	Eastern redcedar, northern whitecedar, tamarack.	Baldcypress, green ash, hackberry, northern red oak.	---
8402: Colo	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood, prairie crabapple.	American plum, blackhaw, nannyberry, roughleaf dogwood.	Eastern redcedar, hackberry, northern whitecedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak.	Eastern cottonwood, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
8451:					
Lawson----------	American holly, black chokeberry, blackhaw, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern whitecedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 9.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
17A:					
Keomah----------	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Slight.
17B2:					
Keomah----------	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Moderate: wetness.	Slight.
27C2:					
Miami-----------	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly, slope.	Severe: erodes easily.	Moderate: droughty.
27D2:					
Miami-----------	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly, slope.	Severe: erodes easily.	Moderate: droughty, slope.
36B:					
Tama------------	Slight-----------	Slight-----------	Moderate: slope.	Slight-----------	Slight.
43A:					
Ipava-----------	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
43B:					
Ipava-----------	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: wetness.
60C2, 60C3:					
La Rose---------	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight-----------	Slight.
61A:					
Atterberry------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
67:					
Harpster--------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
68:					
Sable-----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
91A, 91B2:					
Swygert---------	Severe: percs slowly, wetness.	Severe: percs slowly.	Severe: percs slowly, wetness.	Severe: erodes easily.	Moderate: droughty, wetness.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
100:					
Palms	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
125:					
Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
131A:					
Alvin	Slight	Slight	Slight	Slight	Slight.
131B:					
Alvin	Slight	Slight	Moderate: slope.	Slight	Slight.
131C:					
Alvin	Slight	Slight	Severe: slope.	Slight	Slight.
131D:					
Alvin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
131F:					
Alvin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
134A:					
Camden	Slight	Slight	Slight	Slight	Slight.
134B:					
Camden	Slight	Slight	Moderate: slope.	Slight	Slight.
134C2:					
Camden	Slight	Slight	Severe: slope.	Slight	Slight.
145B, 145B2:					
Saybrook	Slight	Slight	Moderate: slope.	Slight	Slight.
145C2:					
Saybrook	Slight	Slight	Severe: slope.	Slight	Slight.
148A:					
Proctor	Slight	Slight	Slight	Slight	Slight.
148B:					
Proctor	Slight	Slight	Moderate: slope.	Slight	Slight.
152:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
154A:					
Flanagan	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
154B:					
Flanagan	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
171B, 171B2:					
Catlin	Slight	Slight	Moderate: slope.	Slight	Slight.
171C2:					
Catlin	Slight	Slight	Severe: slope.	Slight	Slight.
194C2:					
Morley	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
198A:					
Elburn	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
199A:					
Plano	Slight	Slight	Slight	Slight	Slight.
199B:					
Plano	Slight	Slight	Moderate: slope.	Slight	Slight.
210:					
Lena	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.
221B2:					
Parr	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
221C2:					
Parr	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
223B2:					
Varna	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Moderate: large stones.
223C2:					
Varna	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Moderate: large stones.
223D:					
Varna	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Slight	Moderate: large stones, slope.
224D2:					
Strawn	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
224E, 224E2:					
Strawn	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
233B2:					
Birkbeck	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
233C2:					
Birkbeck	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
233D2:					
Birkbeck	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
236A:					
Sabina	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
241C2:					
Chatsworth	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: droughty.
243A:					
St. Charles	Slight	Slight	Slight	Severe: erodes easily.	Slight.
243B:					
St. Charles	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
279B2:					
Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
290A:					
Warsaw	Slight	Slight	Moderate: small stones.	Slight	Slight.
322C2:					
Russell	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
322D2:					
Russell	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
327C2:					
Fox	Slight	Slight	Severe: slope.	Slight	Moderate: droughty.
330:					
Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
356:					
Elpaso	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
369A:					
Waupecan	Slight	Slight	Slight	Slight	Slight.
369B:					
Waupecan	Slight	Slight	Moderate: slope.	Slight	Slight.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
375A, 375B, 375B2: Rutland	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
379A: Dakota	Slight	Slight	Slight	Slight	Slight.
386B: Downs	Slight	Slight	Moderate: slope.	Slight	Slight.
387A: Ockley	Slight	Slight	Slight	Slight	Slight.
388B2: Wenona	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
388C2: Wenona	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
435: Streator	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
440A: Jasper	Slight	Slight	Slight	Slight	Slight.
440B, 440C2: Jasper	Slight	Slight	Moderate: slope.	Slight	Slight.
484A: Harco	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
533: Urban land.					
536: Dumps, mine.					
541B2: Graymont	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
541C2: Graymont	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
567B: Elkhart	Slight	Slight	Moderate: slope.	Slight	Slight.
570A: Martinsville	Slight	Slight	Moderate: small stones.	Slight	Slight.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
570B:					
Martinsville----	Slight-----------	Slight-----------	Moderate: slope, small stones.	Slight-----------	Slight.
570C2:					
Martinsville----	Slight-----------	Slight-----------	Severe: slope.	Severe: erodes easily.	Slight.
614A, 614B2:					
Chenoa----------	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
689B:					
Coloma----------	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
689D:					
Coloma----------	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
802:					
Orthents.					
865:					
Pits, gravel.					
935F, 935G:					
Miami-----------	Severe: percs slowly, slope.	Severe: percs slowly, slope.	Severe: percs slowly, slope.	Severe: erodes easily, slope.	Severe: slope.
Hennepin--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
3092:					
Sarpy-----------	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3107:					
Sawmill---------	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
3304:					
Landes----------	Severe: flooding.	Moderate: flooding.	Slight-----------	Moderate: flooding.	Severe: flooding.
3360:					
Slacwater-------	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
8073:					
Ross------------	Severe: flooding.	Slight-----------	Moderate: flooding.	Slight-----------	Moderate: flooding.
8074:					
Radford---------	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8077: Huntsville	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
8107: Sawmill	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8368: Raveenwash	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
8400: Calco	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8402: Colo	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8451: Lawson	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: flooding, wetness.

Table 10.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
17A, 17B2:										
Keomah----------	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair.
27C2:										
Miami-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27D2:										
Miami-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
36B:										
Tama------------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
43A:										
Ipava-----------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
43B:										
Ipava-----------	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
60C2, 60C3:										
La Rose---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
61A:										
Atterberry------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
67:										
Harpster--------	Fair	Fair	Good	Fair	Fair	Good	Fair	Fair	Fair	Fair.
68:										
Sable-----------	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
91A, 91B2:										
Swygert---------	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
100:										
Palms-----------	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
125:										
Selma-----------	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
131A, 131B:										
Alvin-----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
131C, 131D:										
Alvin-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
131F:										
Alvin-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
134A, 134B:										
Camden----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
134C2: Camden	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
145B, 145B2: Saybrook	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
145C2: Saybrook	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
148A, 148B: Proctor	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
152: Drummer	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
154A: Flanagan	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
154B: Flanagan	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
171B, 171B2: Catlin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
171C2: Catlin	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
194C2: Morley	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
198A: Elburn	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
199A, 199B: Plano	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
210: Lena	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
221B2: Parr	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
221C2: Parr	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
223B2: Varna	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C2, 223D: Varna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
224D2, 224E: Strawn----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
224E2: Strawn----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
233B2: Birkbeck--------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
233C2, 233D2: Birkbeck--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
236A: Sabina----------	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair.
241C2: Chatsworth------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
243A, 243B: St. Charles-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
279B2: Rozetta---------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
290A: Warsaw----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
322C2: Russell---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
322D2: Russell---------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
327C2: Fox-------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
330: Peotone---------	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
356: Elpaso----------	Fair	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
369A, 369B: Waupecan--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
375A: Rutland---------	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
375B, 375B2: Rutland---------	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
379A:										
Dakota----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
386B:										
Downs-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
387A:										
Ockley----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
388B2, 388C2:										
Wenona----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
435:										
Streator--------	Good	Good	Good	Good	Good	Good	Good	Good	Good	Fair.
440A, 440B, 440C2:										
Jasper---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
484A:										
Harco-----------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
533:										
Urban land.										
536:										
Dumps, mine.										
541B2, 541C2:										
Graymont--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
567B:										
Elkhart---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
570A, 570B:										
Martinsville----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
570C2:										
Martinsville----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
614A, 614B2:										
Chenoa----------	Good	Good	Good	Good	Good	Fair	Fair	Good	Poor	Fair.
689B:										
Coloma----------	Fair	Fair	Fair	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
689D:										
Coloma----------	Poor	Fair	Fair	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
802:										
Orthents.										

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
865:										
Pits, gravel.										
935F, 935G:										
Miami	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Hennepin	Very poor.	Poor	Good	Good	Fair	Very poor.	Very poor.	Poor	Good	Very poor.
3092:										
Sarpy	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
3107:										
Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3304:										
Landes	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
3360:										
Slacwater	Poor	Fair	Fair	Poor	Poor	Good	Good	Good	Good	Good.
8073:										
Ross	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8074:										
Radford	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
8077:										
Huntsville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
8107:										
Sawmill	Good	Good	Good	Fair	Fair	Good	Fair	Good	Fair	Fair.
8368:										
Raveenwash	Poor	Fair	Fair	Poor	Poor	Good	Good	Good	Good	Good.
8400:										
Calco	Good	Fair	Good	Poor	Very poor.	Good	Good	Fair	Poor	Fair.
8402:										
Colo	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good.
8451:										
Lawson	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.

Table 11.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
17A, 17B2:						
Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness.	Severe: shrink-swell.	Severe: frost action, low strength, shrink-swell.	Slight.
27C2:						
Miami	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Moderate: droughty.
27D2:						
Miami	Slight	Moderate: shrink-swell, slope.	Slight	Severe: slope.	Severe: low strength, slope.	Moderate: droughty, slope.
36B:						
Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
43A, 43B:						
Ipava	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
60C2, 60C3:						
La Rose	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell, frost action.	Slight.
61A:						
Atterberry	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action, low strength.	Moderate: wetness.
67:						
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
68:						
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
91A, 91B2:						
Swygert	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: droughty, wetness.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
100:						
Palms-----------	Unsuited: excess humus, ponding.	Unsuited: ponding, subsides, low strength.	Unsuited: ponding, subsides, low strength.	Unsuited: ponding, subsides, low strength.	Unsuited: ponding, subsides.	Severe: excess humus, ponding.
125:						
Selma-----------	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, ponding.	Severe: ponding.
131A, 131B:						
Alvin-----------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
131C:						
Alvin-----------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
131D:						
Alvin-----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
131F:						
Alvin-----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
134A, 134B:						
Camden----------	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
134C2:						
Camden----------	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
145B, 145B2:						
Saybrook--------	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Severe: frost action, low strength.	Slight.
145C2:						
Saybrook--------	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Severe: frost action, low strength.	Slight.
148A:						
Proctor---------	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
148B:						
Proctor---------	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
152: Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
154A, 154B: Flanagan	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
171B, 171B2: Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
171C2: Catlin	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: frost action, low strength.	Slight.
194C2: Morley	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
198A: Elburn	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
199A: Plano	Moderate: wetness, cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
199B: Plano	Moderate: wetness, cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
210: Lena	Unsuited: excess humus, ponding.	Unsuited: ponding, subsides.	Unsuited: ponding, subsides.	Unsuited: ponding, subsides.	Unsuited: ponding, subsides.	Severe: excess humus, ponding.
221B2: Parr	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell, frost action.	Slight.
221C2: Parr	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell, frost action.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
223B2:						
Varna-----------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Moderate: large stones.
223C2:						
Varna-----------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: frost action, low strength.	Moderate: large stones.
223D:						
Varna-----------	Moderate: slope, too clayey	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Moderate: large stones, slope.
224D2:						
Strawn----------	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope.	Severe: slope.	Moderate: frost action, low strength, slope.	Moderate: slope.
224E, 224E2:						
Strawn----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
233B2:						
Birkbeck--------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
233C2:						
Birkbeck--------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
233D2:						
Birkbeck--------	Moderate: slope, wetness.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope, wetness.	Severe: slope.	Severe: frost action, low strength, slope.	Moderate: slope.
236A:						
Sabina----------	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
241C2:						
Chatsworth------	Moderate: dense layer, too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: droughty.
243A:						
St. Charles-----	Moderate: wetness, cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
243B:						
St. Charles-----	Moderate: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
279B2:						
Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
290A:						
Warsaw	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
322C2:						
Russell	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
322D2:						
Russell	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
327C2:						
Fox	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: frost action, shrink-swell.	Moderate: droughty.
330:						
Peotone	Severe: ponding.	Unsuited: ponding.	Unsuited: ponding.	Unsuited: ponding.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
356:						
Elpaso	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
369A:						
Waupecan	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
369B:						
Waupecan	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
375A, 375B, 375B2:						
Rutland	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Moderate: wetness.
379A:						
Dakota	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action, low strength.	Slight.
386B:						
Downs	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
387A:						
Ockley----------	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
388B2, 388C2:						
Wenona----------	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
435:						
Streator--------	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: frost action, low strength, shrink-swell.	Severe: wetness.
440A, 440B, 440C2:						
Jasper---------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action, low strength.	Slight.
484A:						
Harco-----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
533: Urban land.						
536: Dumps, mine.						
541B2:						
Graymont--------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
541C2:						
Graymont--------	Moderate: wetness.	Moderate: shrink-swell.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: frost action, low strength.	Slight.
567B:						
Elkhart---------	Moderate: wetness.	Moderate: shrink-swell.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
570A, 570B:						
Martinsville----	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
570C2:						
Martinsville----	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: slope.	Moderate: frost action, shrink-swell.	Slight.
614A, 614B2:						
Chenoa----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
689B:						
Coloma	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
689D:						
Coloma	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
802:						
Orthents.						
865:						
Pits, gravel.						
935F, 935G:						
Miami	Severe: slope.	Unsuited: slope.	Unsuited: slope.	Unsuited: slope.	Unsuited: low strength, slope.	Severe: slope.
Hennepin	Severe: slope.	Unsuited: slope.	Unsuited: slope.	Unsuited: slope.	Unsuited: slope.	Severe: slope.
3092:						
Sarpy	Severe: cutbanks cave.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3107:						
Sawmill	Severe: wetness.	Unsuited: flooding, ponding.	Unsuited: flooding, ponding.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, ponding.
3304:						
Landes	Severe: cutbanks cave.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3360:						
Slacwater	Severe: ponding.	Unsuited: flooding, ponding.	Unsuited: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, ponding.
8073:						
Ross	Moderate: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
8074:						
Radford	Severe: wetness.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding, wetness.	Severe: flooding, frost action, low strength.	Moderate: flooding, wetness.
8077:						
Huntsville	Moderate: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding.	Severe: flooding, frost action, low strength.	Moderate: flooding.

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
8107:						
Sawmill----------	Severe: wetness.	Unsuited: flooding, ponding.	Unsuited: flooding, ponding.	Severe: flooding, wetness.	Severe: frost action, flooding, low strength.	Severe: ponding.
8368:						
Raveenwash-------	Severe: cutbanks cave, wetness.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.
8400:						
Calco------------	Severe: wetness.	Unsuited: flooding, ponding.	Unsuited: flooding, ponding.	Severe: flooding, wetness.	Severe: frost action, flooding, low strength.	Severe: ponding.
8402:						
Colo-------------	Severe: wetness.	Unsuited: flooding, ponding.	Unsuited: flooding, ponding.	Severe: flooding, wetness.	Severe: frost action, flooding, low strength.	Severe: ponding.
8451:						
Lawson-----------	Severe: wetness.	Unsuited: flooding.	Unsuited: flooding.	Severe: flooding, wetness.	Severe: flooding, frost action.	Moderate: flooding, wetness.

Table 12.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
17A, 17B2:					
Keomah	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
27C2:					
Miami	Severe: percs slowly.	Severe: slope.	Moderate: wetness.	Slight	Good.
27D2:					
Miami	Severe: percs slowly.	Severe: slope.	Moderate: slope, wetness.	Moderate: slope.	Fair: slope.
36B:					
Tama	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
43A, 43B:					
Ipava	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
60C2, 60C3:					
La Rose	Severe: percs slowly.	Severe: slope.	Slight	Slight	Good.
61A:					
Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
67:					
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
68:					
Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
91A:					
Swygert	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey, wetness.
91B2:					
Swygert	Severe: percs slowly, wetness.	Severe: wetness, slope.	Severe: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey, wetness.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
100:					
Palms	Unsuited: ponding, subsides.	Unsuited: excess humus, ponding, seepage.	Unsuited: excess humus, ponding.	Unsuited: ponding, seepage.	Unsuited: excess humus, ponding.
125:					
Selma	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
131A, 131B:					
Alvin	Moderate: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
131C:					
Alvin	Moderate: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
131D:					
Alvin	Moderate: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage.
131F:					
Alvin	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, slope.
134A:					
Camden	Slight	Moderate: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
134B:					
Camden	Slight	Moderate: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
134C2:					
Camden	Slight	Severe: slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
145B, 145B2:					
Saybrook	Severe: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey.
145C2:					
Saybrook	Severe: wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey.
148A:					
Proctor	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Fair: too clayey, wetness.
148B:					
Proctor	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
152:					
Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: ponding, too clayey.
154A, 154B:					
Flanagan	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey.
171B, 171B2:					
Catlin	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
171C2:					
Catlin	Severe: wetness.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
194C2:					
Morley	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
198A:					
Elburn	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
199A:					
Plano	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Moderate: seepage.	Fair: too clayey, wetness.
199B:					
Plano	Slight	Severe: seepage.	Severe: seepage.	Moderate: seepage.	Fair: too clayey.
210:					
Lena	Unsuited: ponding, subsides.	Unsuited: excess humus, ponding, seepage.	Unsuited: excess humus, ponding, seepage.	Unsuited: ponding, seepage.	Unsuited: excess humus, ponding.
221B2:					
Parr	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
221C2:					
Parr	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
223B2:					
Varna	Severe: percs slowly, wetness.	Moderate: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
223C2:					
Varna	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
223D:					
Varna-----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
224D2:					
Strawn----------	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, small stones, too clayey.
224E, 224E2:					
Strawn----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
233B2:					
Birkbeck--------	Severe: percs slowly, wetness.	Moderate: wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
233C2:					
Birkbeck--------	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
233D2:					
Birkbeck--------	Severe: percs slowly, wetness.	Severe: slope, wetness.	Moderate: too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey, wetness.
236A:					
Sabina----------	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey.
241C2:					
Chatsworth------	Unsuited: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight------------	Poor: hard to pack, too clayey.
243A:					
St. Charles-----	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Moderate: seepage, wetness.	Fair: too clayey, wetness.
243B:					
St. Charles-----	Slight-----------	Severe: seepage, slope.	Moderate: too clayey.	Moderate: seepage.	Fair: too clayey.
279B2:					
Rozetta---------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
290A:					
Warsaw----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
322C2:					
Russell	Moderate: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
322D2:					
Russell	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
327C2:					
Fox	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
330:					
Peotone	Unsuited: ponding.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
356:					
Elpaso	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
369A:					
Waupecan	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Fair: thin layer, too clayey, wetness.
369B:					
Waupecan	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, too clayey.
375A:					
Rutland	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
375B, 375B2:					
Rutland	Severe: percs slowly, wetness.	Severe: wetness, slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
379A:					
Dakota	Moderate: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, small stones, too sandy.
386B:					
Downs	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
387A:					
Ockley	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
388B2:					
Wenona----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
388C2:					
Wenona----------	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
435:					
Streator--------	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
440A:					
Jasper----------	Slight-----------	Moderate: seepage.	Moderate: too clayey.	Severe: seepage.	Fair: thin layer, too clayey.
440B, 440C2:					
Jasper----------	Slight-----------	Moderate: seepage, slope.	Moderate: too clayey.	Severe: seepage.	Fair: thin layer, too clayey.
484A:					
Harco-----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
533:					
Urban land.					
536:					
Dumps, mine.					
541B2:					
Graymont--------	Severe: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.	Poor: too clayey, hard to pack.
541C2:					
Graymont--------	Severe: percs slowly, wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness.	Poor: too clayey, hard to pack.
567B:					
Elkhart---------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Fair: wetness.
570A:					
Martinsville----	Slight-----------	Moderate: seepage.	Moderate: too clayey.	Moderate: seepage.	Fair: thin layer, too clayey.
570B:					
Martinsville----	Slight-----------	Moderate: seepage, slope.	Moderate: too clayey.	Severe: seepage.	Fair: thin layer, too clayey.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
570C2:					
Martinsville----	Slight-----------	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, thin layer.
614A:					
Chenoa----------	Severe: percs slowly, wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
614B2:					
Chenoa----------	Severe: percs slowly, wetness.	Severe: wetness, slope.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
689B, 689D:					
Coloma----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
802: Orthents.					
865: Pits, gravel.					
935F, 935G:					
Miami-----------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Hennepin--------	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
3092:					
Sarpy-----------	Unsuited: flooding.	Severe: flooding, seepage.	Unsuited: flooding.	Unsuited: flooding.	Poor: seepage, too sandy.
3107:					
Sawmill---------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: wetness.
3304:					
Landes----------	Unsuited: flooding.	Severe: flooding, seepage.	Unsuited: flooding.	Unsuited: flooding, seepage.	Poor: seepage, too sandy.
3360:					
Slacwater-------	Unsuited: flooding.	Severe: flooding, ponding.	Unsuited: flooding.	Unsuited: flooding.	Poor: ponding.
8073:					
Ross------------	Unsuited: flooding.	Severe: flooding, seepage.	Unsuited: flooding.	Unsuited: flooding.	Good.

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
8074:					
Radford----------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: wetness.
8077:					
Huntsville------	Unsuited: flooding.	Severe: flooding.	Unsuited: flooding.	Unsuited: flooding.	Good.
8107:					
Sawmill----------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: wetness.
8368:					
Raveenwash------	Unsuited: flooding.	Severe: flooding, seepage, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: wetness.
8400:					
Calco------------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding, wetness.	Poor: hard to pack, wetness.
8402:					
Colo-------------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: hard to pack, wetness.
8451:					
Lawson-----------	Unsuited: flooding.	Severe: flooding, wetness.	Unsuited: flooding.	Unsuited: flooding.	Poor: wetness.

Table 13.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
17A, 17B2:				
Keomah----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
27C2:				
Miami-----------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
27D2:				
Miami-----------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope, too clayey.
36B:				
Tama------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
43A, 43B:				
Ipava-----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
60C2, 60C3:				
La Rose---------	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
61A:				
Atterberry------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
67:				
Harpster--------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
68:				
Sable-----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
91A, 91B2:				
Swygert---------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
100:				
Palms-----------	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
125:				
Selma-----------	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
131A, 131B, 131C, 131D: Alvin	Good	Probable	Improbable: too sandy.	Poor: too sandy.
131F: Alvin	Poor: slope.	Probable	Improbable: too sandy.	Poor: slope, too sandy.
134A, 134B, 134C2: Camden	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
145B: Saybrook	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
145B2, 145C2: Saybrook	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
148A, 148B: Proctor	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
152: Drummer	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
154A, 154B: Flanagan	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
171B: Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
171B2, 171C2: Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
194C2: Morley	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
198A: Elburn	Fair: wetness, shrink-swell.	Probable	Improbable: too sandy.	Good.
199A, 199B: Plano	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
210: Lena	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
221B2:				
Parr	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey.
221C2:				
Parr	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
223B2, 223C2:				
Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
223D:				
Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
224D2:				
Strawn	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
224E, 224E2:				
Strawn	Fair: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
233B2, 233C2:				
Birkbeck	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
233D2:				
Birkbeck	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
236A:				
Sabina	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
241C2:				
Chatsworth	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
243A, 243B:				
St. Charles	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279B2:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
290A:				
Warsaw	Good	Probable	Probable	Poor: small stones.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
322C2: Russell	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
322D2: Russell	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, too clayey.
327C2: Fox	Fair: shrink-swell.	Probable	Probable	Poor: small stones.
330: Peotone	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
356: Elpaso	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
369A, 369B: Waupecan	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim.
375A, 375B, 375B2: Rutland	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
379A: Dakota	Good	Probable	Probable	Good.
386B: Downs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
387A: Ockley	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim, small stones.
388B2, 388C2: Wenona	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
435: Streator	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
440A, 440B, 440C2: Jasper	Good	Improbable: excess fines.	Improbable: excess fines.	Good.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
484A:				
Harco	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
533:				
Urban land.				
536:				
Dumps, mine.				
541B2:				
Graymont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
541C2:				
Graymont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
567B:				
Elkhart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
570A, 570B, 570C2:				
Martinsville	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
614A, 614B2:				
Chenoa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
689B, 689D:				
Coloma	Good	Probable	Improbable: too sandy.	Poor: small stones, too sandy.
802:				
Orthents.				
865:				
Pits, gravel.				
935F, 935G:				
Miami	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Hennepin	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope, small stones.
3092:				
Sarpy	Good	Probable	Improbable: too sandy.	Poor: too sandy.
3107:				
Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
3304:				
Landes----------	Good-------------------	Probable---------------	Improbable: too sandy.	Fair: small stones, thin layer, too sandy.
3360:				
Slacwater-------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8073:				
Ross------------	Good-------------------	Improbable: excess fines.	Improbable: excess fines.	Good.
8074:				
Radford---------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
8077:				
Huntsville------	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
8107:				
Sawmill---------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8368:				
Raveenwash------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too sandy.
8400:				
Calco-----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8402:				
Colo------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8451:				
Lawson----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

Table 14.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
17A: Keomah	Slight	Moderate: wetness.	Severe: slow refill.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
17B2: Keomah	Moderate: slope.	Moderate: wetness.	Severe: slow refill.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
27C2: Miami	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Droughty, slope, wetness.	Erodes easily, wetness.	Droughty, erodes easily.
27D2: Miami	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Droughty, slope, wetness.	Erodes easily, slope, wetness.	Droughty, erodes easily, slope.
36B: Tama	Moderate: seepage, slope.	Slight	Moderate: deep to water, slow refill.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
43A: Ipava	Slight	Moderate: wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
43B: Ipava	Moderate: slope.	Moderate: wetness.	Severe: slow refill.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
60C2, 60C3: La Rose	Moderate: slope.	Moderate: piping.	Severe: no water, slow refill.	Deep to water	Rooting depth, slope.	Favorable	Rooting depth.
61A: Atterberry	Moderate: seepage.	Moderate: wetness.	Moderate: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
67:							
Harpster	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
68:							
Sable	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
91A:							
Swygert	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Frost action, percs slowly.	Droughty, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
91B2:							
Swygert	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Frost action, percs slowly, slope.	Droughty, slope, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
100:							
Palms	Severe: seepage.	Severe: excess humus, ponding.	Slight	Frost action, ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.	Rooting depth, wetness.
125:							
Selma	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Ponding	Wetness.
131A:							
Alvin	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Fast intake	Favorable	Favorable.
131B, 131C:							
Alvin	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
131D, 131F:							
Alvin	Severe: seepage, slope.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope	Slope	Slope.
134A:							
Camden	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
134B, 134C2: Camden	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
145B, 145B2: Saybrook	Moderate: seepage, slope.	Moderate: piping.	Moderate: deep to water, slow refill.	Deep to water	Slope	Erodes easily	Erodes easily.
145C2: Saybrook	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
148A: Proctor	Severe: seepage.	Moderate: piping, thin layer.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
148B: Proctor	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
152: Drummer	Moderate: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Ponding	Wetness.
154A: Flanagan	Moderate: seepage.	Moderate: wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
154B: Flanagan	Moderate: seepage, slope.	Moderate: wetness.	Severe: slow refill.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
171B, 171B2, 171C2: Catlin	Moderate: seepage, slope.	Slight	Moderate: deep to water, slow refill.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
194C2: Morley	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Percs slowly, rooting depth, slope.	Erodes easily	Erodes easily, rooting depth.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
198A: Elburn	Severe: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
199A: Plano	Moderate: seepage.	Moderate: piping, thin layer.	Moderate: deep to water, slow refill.	Deep to water	Favorable	Erodes easily	Erodes easily.
199B: Plano	Severe: seepage.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
210: Lena	Severe: seepage.	Severe: excess humus, ponding.	Slight	Frost action, ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
221B2, 221C2: Parr	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Percs slowly, slope.	Favorable	Percs slowly, rooting depth.
223B2, 223C2: Varna	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Frost action, slope.	Percs slowly, slope, wetness.	Wetness	Favorable.
223D: Varna	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
224D2, 224E, 224E2: Strawn	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
233B2, 233C2: Birkbeck	Moderate: seepage, slope.	Moderate: piping, thin layer.	Severe: slow refill.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
233D2: Birkbeck	Severe: slope.	Moderate: piping, thin layer.	Severe: slow refill.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
236A: Sabina	Slight	Moderate: wetness.	Severe: slow refill.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily.
241C2: Chatsworth	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Droughty, percs slowly, slope.	Erodes easily, percs slowly.	Droughty, erodes easily.
243A: St. Charles	Moderate: seepage.	Moderate: piping, thin layer.	Moderate: deep to water, slow refill.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
243B: St. Charles	Moderate: seepage, slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
279B2: Rozetta	Moderate: seepage, slope.	Slight	Moderate: deep to water, slow refill.	Frost action, slope.	Erodes easily, slope, wetness.	Erodes easily, wetness.	Erodes easily.
290A: Warsaw	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Soil blowing	Soil blowing, too sandy.	Favorable.
322C2: Russell	Moderate: seepage, slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
322D2: Russell	Severe: slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
327C2: Fox	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Droughty, slope.	Erodes easily, too sandy.	Droughty, erodes easily.
330: Peotone	Slight	Severe: ponding.	Slight	Frost action, ponding.	Ponding	Ponding	Wetness.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
356:							
Elpaso	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Ponding	Wetness.
369A:							
Waupecan	Severe: seepage.	Moderate: thin layer.	Severe: cutbanks cave.	Deep to water	Rooting depth	Erodes easily	Erodes easily, rooting depth.
369B:							
Waupecan	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Rooting depth, slope.	Erodes easily	Erodes easily, rooting depth.
375A:							
Rutland	Slight	Moderate: wetness.	Severe: slow refill.	Frost action	Percs slowly, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
375B, 375B2:							
Rutland	Moderate: slope.	Moderate: wetness.	Severe: slow refill.	Frost action, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
379A:							
Dakota	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Too sandy	Favorable.
386B:							
Downs	Moderate: seepage, slope.	Slight	Moderate: deep to water, slow refill.	Deep to water	Slope	Erodes easily	Erodes easily.
387A:							
Ockley	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
388B2, 388C2:							
Wenona	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope.	Favorable	Percs slowly.
435:							
Streator	Slight	Severe: wetness.	Moderate: slow refill.	Frost action	Percs slowly, wetness.	Wetness	Wetness.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
440A:							
Jasper----------	Moderate: seepage.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Favorable------	Favorable------	Favorable.
440B, 440C2:							
Jasper----------	Moderate: seepage, slope.	Moderate: piping, thin layer.	Severe: no water.	Deep to water	Slope----------	Favorable------	Favorable.
484A:							
Harco-----------	Moderate: seepage.	Moderate: thin layer, wetness.	Moderate: slow refill.	Frost action---	Wetness--------	Wetness--------	Wetness.
533:							
Urban land.							
536:							
Dumps, mine.							
541B2:							
Graymont--------	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: slow refill.	Deep to water	Slope----------	Favorable------	Favorable.
541C2:							
Graymont--------	Moderate: seepage, slope.	Moderate: hard to pack, piping.	Severe: slow refill.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, rooting depth.
567B:							
Elkhart---------	Moderate: seepage, slope.	Moderate: piping.	Moderate: deep to water, slow refill.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily.
570A:							
Martinsville----	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Favorable------	Favorable.
570B:							
Martinsville----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing---	Favorable.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
570C2:							
Martinsville----	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Erodes easily	Erodes easily.
614A:							
Chenoa----------	Moderate: seepage.	Moderate: wetness.	Severe: slow refill.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
614B2:							
Chenoa----------	Moderate: seepage, slope.	Moderate: wetness.	Severe: slow refill.	Frost action, percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
689B:							
Coloma----------	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Soil blowing, too sandy.	Droughty.
689D:							
Coloma----------	Severe: seepage, slope.	Severe: piping, seepage.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, soil blowing, too sandy.	Droughty, slope.
802:							
Orthents.							
865:							
Pits, gravel.							
935F, 935G:							
Miami-----------	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Droughty, slope, wetness.	Erodes easily, slope, wetness.	Droughty, erodes easily, slope.
Hennepin--------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, slope.	Slope----------	Rooting depth, slope.
3092:							
Sarpy-----------	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Droughty, fast intake.	Soil blowing, too sandy.	Droughty.
3107:							
Sawmill---------	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action	Flooding, wetness.	Wetness--------	Wetness.

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
3304:							
Landes	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Soil blowing, too sandy.	Favorable.
3360:							
Slacwater	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
8073:							
Ross	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Flooding	Favorable	Favorable.
8074:							
Radford	Moderate: seepage.	Moderate: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
8077:							
Huntsville	Moderate: seepage.	Moderate: piping, thin layer.	Moderate: deep to water, slow refill.	Deep to water	Flooding	Erodes easily	Erodes easily.
8107:							
Sawmill	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
8368:							
Raveenwash	Severe: seepage.	Severe: piping, seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave, flooding, frost action.	Flooding, wetness.	Too sandy, wetness.	Wetness.
8400:							
Calco	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
8402:							
Colo	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
8451:							
Lawson	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Erodes easily, wetness.	Erodes easily, wetness.

Table 15.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
17A:												
Keomah----------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	9-15	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	15-49	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
	49-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-30
17B2:												
Keomah----------	0-8	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	8-43	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
	43-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-30
27C2:												
Miami-----------	0-9	Silty clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	85-100	60-100	30-50	12-32
	9-42	Clay loam, silty clay loam.	CL	A-6, A-7-6	0-1	0-3	90-98	85-98	85-95	55-85	30-50	11-31
	42-60	Loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-98	85-98	65-95	40-70	15-37	NP-22
27D2:												
Miami-----------	0-5	Silty clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	85-100	60-100	30-50	12-32
	5-37	Clay loam, silty clay loam.	CL	A-6, A-7-6	0-1	0-3	90-98	85-98	85-95	55-85	30-50	11-31
	37-60	Loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-98	85-98	65-95	40-70	15-37	NP-22
36B:												
Tama------------	0-10	Silt loam------	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-45	10-20
	10-31	Silty clay loam	CL	A-7	0	0	100	100	100	95-100	40-50	15-25
	31-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
43A:												
Ipava-----------	0-9	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	9-45	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-70	25-40
	45-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
43B:												
Ipava-----------	0-8	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	8-34	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-70	25-40
	34-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
60C2:												
La Rose---------	0-8	Silt loam------	CL	A-4, A-6	0	0	100	95-100	90-100	60-95	30-40	8-15
	8-31	Clay loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	90-100	85-100	60-85	30-45	15-25
	31-60	Loam, silt loam	CL	A-6	0	0-5	95-100	85-100	75-95	50-80	25-40	10-20
60C3:												
La Rose---------	0-6	Silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	85-100	75-90	30-45	15-25
	6-10	Clay loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	90-100	85-100	60-85	30-45	15-25
	10-60	Loam, silt loam	CL	A-6	0	0-5	95-100	85-100	75-95	50-80	25-40	10-20
61A:												
Atterberry------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
	7-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	25-35	5-15
	10-35	Silt loam, silty clay loam.	CH, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-55	15-30
	35-60	Silt loam, loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
67:												
Harpster--------	0-21	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-60	20-35
	21-46	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	40-60	20-35
	46-60	Silty clay loam, silt loam, loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	70-100	35-55	20-35

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
68:												
Sable-----------	0-16	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	16-33	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	33-60	Silty clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	95-100	40-55	20-35
91A:												
Swygert---------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	10-15	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	15-32	Silty clay, clay.	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	32-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
91B2:												
Swygert---------	0-8	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	8-21	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	21-60	Silty clay, clay.	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
100:												
Palms-----------	0-41	Muck-----------	PT		0	0	0	0	0	0	---	NP
	41-60	Clay loam, silty clay loam, fine sandy loam.	CL, CL-ML	A-4, A-6	0	0	85-100	80-100	70-95	50-90	25-40	5-20
125:												
Selma-----------	0-12	Loam-----------	CL	A-4, A-6	0	0	100	95-100	80-100	55-85	25-35	7-17
	12-51	Sandy loam, loam, silty clay loam.	CL, SC	A-6	0	0	100	95-100	80-95	38-85	24-36	11-19
	51-60	Stratified sand to silt loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	90-100	85-100	60-90	30-70	15-35	5-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
131A:												
Alvin-----------	0-17	Loamy sand-----	SM	A-2	0	0	100	100	50-75	15-30	0-20	NP-4
	17-33	Very fine sandy loam, sandy loam, loam.	CL, ML, SC, SM	A-2, A-4, A-6	0	0	100	100	70-100	20-80	15-40	NP-15
	33-60	Very fine sand, fine sandy loam, loamy fine sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-95	4-35	0-20	NP-4
131B:												
Alvin-----------	0-10	Sandy loam-----	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	10-47	Very fine sandy loam, sandy loam, loam.	CL, ML, SC, SM	A-2, A-4, A-6	0	0	100	100	70-100	20-80	15-40	NP-15
	47-60	Very fine sand, fine sandy loam, loamy fine sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-95	4-35	0-20	NP-4
131C:												
Alvin-----------	0-9	Sandy loam-----	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	9-32	Very fine sandy loam, sandy loam, loamy fine sand.	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	32-60	Very fine sandy loam, sandy loam, loam.	CL, ML, SC, SM	A-2, A-4, A-6	0	0	100	100	70-100	20-80	15-40	NP-15
131D:												
Alvin-----------	0-5	Sandy loam-----	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	5-33	Very fine sandy loam, sandy loam, loam.	CL, ML, SC, SM	A-2, A-4, A-6	0	0	100	100	70-100	20-80	15-40	NP-15
	33-60	Very fine sand, fine sandy loam, loamy fine sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-95	4-35	0-20	NP-4

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
131F:												
Alvin-----------	0-8	Sandy loam-----	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	8-40	Very fine sandy loam, sandy loam, loamy fine sand.	ML, SM	A-2, A-4	0	0	100	100	80-95	30-60	0-25	NP-4
	40-60	Very fine sand, fine sandy loam, loamy fine sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	90-100	45-95	4-35	0-20	NP-4
134A:												
Camden----------	0-12	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	12-32	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	90-100	90-100	25-40	15-25
	32-60	Clay loam, sandy loam, silt loam.	CL, ML, SC, SM	A-4, A-6	0	0-5	95-100	90-100	60-100	35-85	20-40	3-15
134B:												
Camden----------	0-14	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	14-30	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	90-100	90-100	25-40	15-25
	30-60	Clay loam, sandy loam, silt loam.	CL, ML, SC, SM	A-4, A-6	0	0-5	95-100	90-100	60-100	35-85	20-40	3-15
134C2:												
Camden----------	0-7	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	7-39	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	90-100	90-100	25-40	15-25
	39-60	Clay loam, sandy loam, silt loam.	CL, ML, SC, SM	A-4, A-6	0	0-5	95-100	90-100	60-100	35-85	20-40	3-15
145B:												
Saybrook--------	0-13	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	13-38	Silty clay loam, silt loam.	CH, CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	35-55	15-30
	38-60	Loam, silt loam, clay loam.	CL	A-4, A-6	0	0	95-100	85-100	80-95	60-85	20-40	8-25

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
145B2:												
Saybrook--------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	7-26	Silty clay loam, silt loam.	CH, CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	35-55	15-30
	26-60	Loam, silt loam, clay loam.	CL	A-4, A-6	0	0	95-100	85-100	80-95	60-85	20-40	8-25
145C2:												
Saybrook--------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	11-25
	10-30	Silt loam, silty clay loam.	CH, CL	A-6, A-7	0	0	100	100	90-100	85-100	35-55	15-30
	30-60	Clay loam, loam, silt loam.	CL	A-4, A-6	0	0	95-100	85-100	80-95	60-85	20-40	8-25
148A:												
Proctor---------	0-13	Silt loam------	CL	A-6	0	0	100	100	95-100	85-100	25-40	10-20
	13-37	Silty clay loam	CL	A-6, A-7	0	0	95-100	90-100	85-100	85-100	25-50	10-25
	37-46	Clay loam, sandy loam, silty clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	90-100	85-100	75-100	30-80	20-45	5-25
	46-60	Stratified sand to sandy loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	85-100	80-100	50-100	25-80	20-40	5-20
148B:												
Proctor---------	0-10	Silt loam------	CL	A-6	0	0	100	100	95-100	85-100	25-40	10-20
	10-24	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	98-100	98-100	95-100	90-100	25-50	10-25
	24-58	Clay loam, sandy loam, loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	90-100	90-100	75-100	30-85	20-45	5-25
	58-60	Stratified loam to sand.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	85-100	85-100	50-100	25-85	20-40	5-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
152:												
Drummer---------	0-11	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	30-50	15-30
	11-47	Silty clay loam, silt loam, silty clay.	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	30-50	15-30
	47-57	Silt loam, clay loam, sandy loam.	CL, SC	A-6, A-7	0	0-5	95-100	90-100	75-95	40-85	30-50	15-30
	57-60	Stratified loamy sand to silty clay loam.	CL, SC	A-2-4, A-4, A-6	0	0-5	95-100	75-95	75-95	15-80	20-35	7-20
154A:												
Flanagan--------	0-18	Silt loam------	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-30
	18-51	Silty clay loam, silty clay, silt loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	15-30
	51-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0	0	85-100	80-100	70-95	50-85	20-45	5-30
154B:												
Flanagan--------	0-10	Silt loam------	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-30
	10-42	Silty clay loam, silty clay, silt loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	15-30
	42-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0	0	85-100	80-100	70-95	50-85	20-45	5-30
171B:												
Catlin----------	0-18	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	18-50	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	90-100	80-100	30-50	15-30
	50-60	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0-3	90-100	90-100	85-100	60-100	25-45	10-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
171B2:												
Catlin----------	0-8	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	8-45	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	90-100	80-100	30-50	15-30
	45-60	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0-3	90-100	90-100	85-100	60-100	25-45	10-20
171C2:												
Catlin----------	0-10	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	10-44	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	90-100	90-100	80-100	30-50	15-30
	44-60	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0-3	90-100	90-100	85-100	60-100	25-45	10-20
194C2:												
Morley----------	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	90-100	85-95	80-90	30-45	15-25
	7-10	Silty clay, clay loam, clay.	CH, CL	A-7	0-1	0-10	95-100	90-100	85-95	80-90	40-60	15-35
	10-36	Silty clay loam, clay loam, silty clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	90-100	85-95	80-90	30-60	15-35
	36-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	90-100	85-95	80-90	30-50	15-30
198A:												
Elburn----------	0-15	Silt loam------	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-25
	15-50	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-35
	50-60	Loam, sandy loam, clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	90-100	85-100	60-90	30-85	20-40	5-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
199A:												
Plano-----------	0-20	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	20-30	5-15
	20-53	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	95-100	25-45	10-25
	53-60	Stratified sandy loam to silt loam.	CL, ML, SC, SM	A-2, A-4	0	0-5	90-100	85-95	60-90	30-70	0-25	NP-10
199B:												
Plano-----------	0-14	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-30	5-15
	14-43	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-25
	43-60	Clay loam, loam, sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0	0-1	90-100	85-95	60-90	35-75	20-45	5-25
210:												
Lena------------	0-9	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	9-60	Sapric material	PT	A-8	0	0	0	0	0	0	---	NP
221B2:												
Parr------------	0-9	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	80-100	50-90	15-30	4-15
	9-50	Clay loam, loam, silty clay loam.	CL	A-4, A-6	0	0	90-100	90-100	75-100	50-95	25-35	9-15
	50-60	Loam-----------	CL, CL-ML, ML	A-4	0	0-3	85-95	85-95	75-85	50-65	0-25	3-8
221C2:												
Parr------------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	80-100	50-90	15-30	4-15
	7-49	Clay loam, loam, silty clay loam.	CL	A-4, A-6	0	0	90-100	90-100	75-100	50-95	25-35	9-15
	49-60	Loam-----------	CL, CL-ML, ML	A-4	0	0-3	85-95	85-95	75-85	50-65	0-25	3-8
223B2:												
Varna-----------	0-7	Silty clay loam	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-95	30-50	12-25
	7-32	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-100	35-56	15-29
	32-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-95	30-45	13-26

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
223C2:												
Varna-----------	0-7	Silty clay loam	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-95	30-50	12-25
	7-28	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-100	35-56	15-29
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-100	80-95	30-45	13-26
223D:												
Varna-----------	0-12	Silty clay loam	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-98	80-95	30-50	12-25
	12-26	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	85-98	80-98	35-56	15-29
	26-60	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	85-98	80-95	30-45	13-26
224D2:												
Strawn----------	0-5	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	5-21	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	21-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20
224E:												
Strawn----------	0-6	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	6-14	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-23
	14-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-18
224E2:												
Strawn----------	0-5	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	90-100	20-40	3-20
	5-18	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-5	90-100	80-100	75-95	50-95	25-45	10-25
	18-60	Loam, silt loam, clay loam.	CL, SC	A-4, A-6	0-1	0-5	75-100	70-100	60-95	40-95	20-35	7-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
233B2:												
Birkbeck--------	0-9	Silt loam------	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	28-45	5-15
	9-52	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	10-25
	52-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	85-100	70-100	55-85	20-40	5-20
233C2:												
Birkbeck--------	0-9	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-20
	9-52	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	10-25
	52-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	85-100	70-100	55-85	20-40	5-20
233D2:												
Birkbeck--------	0-7	Silt loam------	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	28-45	5-15
	7-46	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	10-25
	46-60	Loam, silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0-1	0-5	95-100	85-100	70-100	55-85	20-40	5-20
236A:												
Sabina----------	0-11	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	11-47	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	20-40
	47-60	Clay loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0-1	0-5	95-100	85-100	70-100	55-75	20-50	5-30
241C2:												
Chatsworth------	0-6	Silty clay loam	CH, CL	A-6, A-7	0	0	100	95-100	85-95	70-90	30-55	10-30
	6-16	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-75	20-45
	16-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	90-100	85-95	45-65	20-35

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	> 10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
243A:												
St. Charles-----	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	22-35	7-15
	9-52	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	52-60	Sandy loam, silt loam, clay loam.	CL, SC	A-4, A-6	0	0	90-100	75-100	75-90	35-80	20-35	8-20
243B:												
St. Charles-----	0-7	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	22-35	7-15
	7-41	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	41-55	Clay loam, silt loam, sandy loam.	CL, SC	A-4, A-6	0	0	90-100	75-100	75-95	40-80	20-35	8-20
	55-60	Stratified gravelly sandy loam to silt loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0-1	0-5	90-100	70-90	60-90	30-70	15-35	5-15
279B2:												
Rozetta---------	0-6	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	6-31	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-30
	31-60	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-40	7-20
290A:												
Warsaw----------	0-8	Sandy loam-----	SC, SC-SM	A-2-4, A-4	0	0	85-100	85-100	50-70	25-40	0-25	4-10
	8-24	Sandy clay loam, loam, clay loam.	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-3	90-100	85-100	60-90	30-70	20-35	6-15
	24-35	Gravelly sandy clay loam, gravelly clay loam, gravelly sandy loam.	CL, GC, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-5	70-90	60-85	55-70	30-60	20-35	6-15
	35-60	Stratified sand to very gravelly coarse sand.	GP, GP-GM, SP, SP-SM	A-1	0	1-5	30-70	22-55	7-20	2-10	0-20	NP

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
322C2:												
Russell---------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	5-15
	7-33	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	33-60	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	35-45	15-25
322D2:												
Russell---------	0-7	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	5-15
	7-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	31-40	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	35-45	15-25
	40-60	Loam-----------	CL, CL-ML	A-4, A-6	0	0-3	85-95	80-90	75-85	50-65	20-30	5-12
327C2:												
Fox-------------	0-5	Silty clay loam	CL	A-4, A-6	0	0	95-100	95-100	70-100	55-90	25-40	9-20
	5-14	Silty clay loam, silt loam.	CL	A-6, A-7	0-1	0	95-100	85-100	60-100	50-90	22-50	10-25
	14-35	Clay loam, sandy clay loam, gravelly loam.	CL, GC, SC	A-2, A-6, A-7	0-1	0-5	65-100	55-100	30-100	15-80	22-45	10-25
	35-60	Sand and gravel, sand, coarse sand.	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
330:												
Peotone---------	0-17	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	80-100	40-65	15-35
	17-53	Silty clay loam, silty clay.	CH, CL	A-7	0	0-5	100	95-100	90-100	85-100	40-70	15-40
	53-60	Silty clay loam, silt loam, silty clay.	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-98	30-60	15-30

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
356:												
Elpaso----------	0-21	Silty clay loam	CH, CL, MH, ML	A-7	0	0	100	100	95-100	95-100	41-65	15-35
	21-44	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	95-100	30-45	10-25
	44-60	Silty clay loam, silt loam, loam.	CL	A-6	0	0	100	95-100	85-100	75-100	25-40	10-20
369A:												
Waupecan--------	0-14	Silt loam------	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-15
	14-34	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	34-51	Clay loam, gravelly clay loam, loam.	CL, ML, SC, SM	A-2, A-4	0	0	90-100	65-90	50-70	25-65	0-20	NP-10
	51-60	Sand and gravel, very gravelly sandy loam, sand.	GP, GP-GM, SP, SP-SM	A-1	0-5	10-35	40-95	30-85	30-50	0-15	0-14	NP
369B:												
Waupecan--------	0-16	Silt loam------	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-15
	16-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-25
	36-54	Sandy clay loam, gravelly clay loam, loam.	CL, ML, SC, SM	A-2, A-4	0	0	90-100	65-100	50-70	25-65	0-20	NP-10
	54-60	Sand and gravel, very gravelly sandy loam, sand.	GP, GP-GM, SP, SP-SM	A-1	0-5	10-35	40-95	30-85	30-50	0-15	0-14	NP
375A:												
Rutland---------	0-14	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	14-44	Silty clay loam, silty clay.	CH, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-55	15-35
	44-60	Silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	20-35

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
375B:												
Rutland---------	0-14	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	30-40	8-15
	14-44	Silty clay loam, silty clay.	CH, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-55	15-35
	44-60	Silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	20-35
375B2:												
Rutland---------	0-7	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	7-37	Silty clay loam, silty clay.	CH, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-55	15-35
	37-60	Silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	20-35
379A:												
Dakota----------	0-14	Loam-----------	CL	A-4, A-6	0	0	95-100	85-100	75-95	50-75	25-35	7-15
	14-31	Loam, sandy clay loam, clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	35-80	25-40	9-20
	31-34	Sandy loam, loamy sand, gravelly loamy coarse sand.	GM, GP, SM, SP	A-1, A-2, A-3, A-4	0-1	0-5	55-100	45-100	20-75	2-40	0-21	NP-4
	34-60	Sand, gravelly coarse sand, loamy sand.	GM, GP, SM, SP	A-1, A-2, A-3	0-1	0-5	50-100	45-100	20-75	2-30	0-14	NP
386B:												
Downs-----------	0-8	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	8-40	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	40-60	Silt loam------	CL	A-6	0	0	100	100	100	95-100	30-40	10-20

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
387A:												
Ockley----------	0-8	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	95-100	85-100	70-100	50-90	23-40	3-15
	8-33	Silt loam, clay loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7-6	0	0-1	90-100	85-100	70-100	30-95	20-50	5-35
	33-52	Sandy clay loam, gravelly sandy loam, clay loam.	CL, ML, SC, SM	A-2, A-4, A-6, A-7-6	0	0-2	70-85	45-85	25-75	15-60	10-50	NP-35
	52-60	Gravelly loamy coarse sand, very gravelly coarse sand.	GP, GW-GM, SP-SM, SW	A-1	0-2	1-10	30-70	20-55	10-30	2-10	---	NP
388B2:												
Wenona----------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	95-100	90-100	30-40	8-15
	9-42	Silty clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	17-35
	42-60	Silty clay, clay.	CH, CL	A-7	0-1	0-5	100	100	90-100	85-95	40-60	17-35
388C2:												
Wenona----------	0-6	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-47	15-25
	6-54	Silty clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	17-35
	54-60	Silty clay, clay.	CH, CL	A-7	0-1	0-5	100	100	90-100	85-95	40-60	17-35
435:												
Streator--------	0-13	Silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	30-40	8-16
	13-43	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	95-100	40-55	20-35
	43-60	Silty clay, clay.	CH, CL	A-7	0-1	0-5	100	100	90-100	85-95	40-55	20-35
440A:												
Jasper----------	0-14	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
	14-41	Sandy clay loam, clay loam, silty clay loam.	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	41-60	Fine sandy loam, loam, sandy clay loam.	SC, SC-SM	A-2-4, A-4	0	0	100	85-100	60-70	30-40	20-30	5-10

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
440B:												
Jasper----------	0-16	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
	16-40	Sandy clay loam, clay loam, silty clay loam.	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	40-60	Fine sandy loam, loam, sandy clay loam.	SC, SC-SM	A-2-4, A-4	0	0	100	85-100	60-70	30-40	20-30	5-10
440C2:												
Jasper----------	0-8	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
	8-50	Sandy clay loam, clay loam, silty clay loam.	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	50-60	Fine sandy loam, loam, sandy clay loam.	SC, SC-SM	A-2-4, A-4	0	0	100	85-100	60-70	30-40	20-30	5-10
484A:												
Harco-----------	0-15	Silty clay loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-13
	15-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	14-27
	34-60	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	95-100	90-100	20-35	2-13
533:												
Urban land.												
536:												
Dumps, mine.												
541B2:												
Graymont--------	0-10	Silt loam------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	75-95	25-40	5-15
	10-34	Silty clay loam, silt loam.	CH, CL	A-6, A-7	0	0	100	100	95-100	85-95	35-55	15-30
	34-60	Silty clay loam	CL	A-6, A-7	0-1	0-5	90-100	85-100	80-100	70-95	30-50	11-26

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
541C2: Graymont--------	0-8	Silt loam------	CL-ML, ML	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	28-47	6-17
	8-34	Silty clay loam, silty clay, silt loam.	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	34-60	Silty clay loam, silt loam.	CH, CL	A-4, A-6, A-7	0	0-5	90-100	85-95	80-95	70-95	25-53	9-27
567B: Elkhart---------	0-9	Silt loam------	CL	A-4, A-6	0	0	100	100	100	95-100	25-35	8-15
	9-37	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	18-30
	37-60	Silt loam, silt	CL	A-4, A-6	0	0	100	100	95-100	95-100	20-37	8-20
570A: Martinsville----	0-8	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	85-100	70-100	50-90	23-40	3-20
	8-26	Clay loam, silty clay loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	95-100	85-100	70-100	30-90	20-50	5-35
	26-31	Clay loam, loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	95-100	85-100	70-100	30-75	20-50	5-30
	31-45	Loam, sandy clay loam, sandy loam.	CL-ML, SC, SC-SM, SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	85-100	50-95	25-70	10-40	NP-20
	45-60	Stratified silt loam to sand.	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0	95-100	85-100	40-95	20-75	0-30	NP-10
570B: Martinsville----	0-5	Sandy loam-----	SC, SC-SM, SM	A-2-4, A-4	0	0	100	85-100	50-85	25-45	0-25	NP-10
	5-24	Clay loam, silty clay loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	95-100	85-100	70-100	30-90	20-50	5-35
	24-57	Loam, sandy clay loam, sandy loam.	CL-ML, SC, SC-SM, SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	85-100	50-95	25-70	10-40	NP-20
	57-60	Stratified silt loam to sand.	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0	95-100	85-100	40-95	20-75	0-30	NP-10

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
570C2:												
Martinsville----	0-6	Loam-----------	CL, CL-ML, ML	A-4	0	0	100	85-100	75-100	65-90	0-25	3-8
	6-30	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-2-4, A-2-6, A-4, A-6	0	0	95-100	85-100	70-100	30-95	25-40	7-15
	30-60	Sandy loam, loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	85-100	55-95	30-95	20-30	5-11
614A:												
Chenoa----------	0-14	Silty clay loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	32-48	8-21
	14-34	Silty clay loam, silty clay.	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	34-60	Silty clay loam, silt loam.	CH, CL	A-4, A-6, A-7	0	0-5	90-100	85-95	80-95	70-95	30-53	9-27
614B2:												
Chenoa----------	0-8	Silty clay loam	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	32-48	8-21
	8-28	Silty clay loam, silty clay.	MH, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	33-58	8-27
	28-60	Silty clay loam, silt loam.	CH, CL	A-4, A-6, A-7	0	0-5	90-100	85-95	80-95	70-95	30-53	9-27
689B:												
Coloma----------	0-10	Sand-----------	SM, SP, SP-SM	A-2, A-3	0-1	0-7	75-100	75-100	50-70	2-15	0-14	NP
	10-27	Sand, loamy sand.	SM, SP, SP-SM	A-2, A-3	0-1	0-7	75-100	75-100	50-75	2-30	0-14	NP
	27-60	Stratified sand to sandy loam.	SM, SP, SP-SM	A-2, A-3, A-4	0-1	0-7	75-100	75-100	50-100	2-40	0-14	NP
689D:												
Coloma----------	0-12	Sand-----------	SM, SP, SP-SM	A-2, A-3	0-1	0-7	75-100	75-100	50-70	2-15	0-14	NP
	12-25	Sand, loamy sand.	SM, SP, SP-SM	A-2, A-3	0-1	0-7	75-100	75-100	50-75	2-30	0-14	NP
	25-60	Stratified sand to sandy loam.	SM, SP, SP-SM	A-2, A-3, A-4	0-1	0-7	75-100	75-100	50-100	2-40	0-14	NP
802:												
Orthents.												

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
865: Pits, gravel.												
935F: Miami	0-6	Loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	20-37	NP-17
	6-30	Clay loam, silty clay loam.	CL	A-6, A-7-6	0-1	0-3	90-98	85-98	85-95	55-85	30-50	11-31
	30-60	Loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-98	85-98	65-95	40-70	15-37	NP-22
Hennepin	0-6	Loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-5	90-100	85-100	70-100	60-95	25-45	5-20
	6-20	Loam, clay loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0-1	0-5	85-100	75-100	65-100	35-95	20-50	5-25
	20-60	Loam, clay loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0-1	0-5	85-100	75-100	65-100	35-95	20-50	5-25
935G: Miami	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	20-37	NP-17
	12-29	Clay loam, silty clay loam.	CL	A-6, A-7-6	0-1	0-3	90-98	85-98	85-95	55-85	30-50	11-31
	29-60	Loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-98	85-98	65-95	40-70	15-37	NP-22
Hennepin	0-3	Silt loam	CL, CL-ML	A-4, A-6, A-7	0-1	0-5	90-100	85-100	70-100	60-95	25-45	5-20
	3-15	Loam, clay loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0-1	0-5	85-100	75-100	65-100	35-95	20-50	5-25
	15-60	Loam, clay loam, silt loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-7	0-1	0-5	85-100	75-100	65-100	35-95	20-50	5-25
3092: Sarpy	0-10	Loamy fine sand	SM	A-2-4	0	0	100	100	60-80	15-35	0-14	NP
	10-60	Fine sand, loamy fine sand, sand.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	60-80	2-35	0-14	NP
3107: Sawmill	0-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	17-27	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	27-60	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7	0	0	100	100	85-100	70-95	25-50	8-25

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: > 10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
3304:												
Landes----------	0-19	Fine sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	100	70-100	70-95	20-50	5-25	NP-10
	19-39	Loam, very fine sandy loam, loamy fine sand.	CL-ML, SC, SC-SM, SM	A-2-4, A-4	0	0	100	85-100	70-100	15-60	0-25	NP-15
	39-60	Stratified sand to silt loam.	SC, SC-SM, SM, SP-SM	A-2-4, A-4	0	0	100	85-100	70-85	10-50	0-30	NP-15
3360:												
Slacwater--------	0-6	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	80-100	15-35	3-15
	6-60	Silt loam, silt, silty clay loam.	CL	A-6	0	0	100	95-100	90-100	85-100	25-40	10-25
8073:												
Ross------------	0-19	Silt loam------	CL, CL-ML, ML	A-4, A-6	0	0	90-100	90-100	80-100	65-95	20-35	NP-12
	19-50	Loam, silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	0	90-100	85-100	70-100	55-95	22-45	3-20
	50-60	Stratified gravelly sandy loam to silt loam.	CL, GM, ML, SM	A-2, A-4, A-6	0	0-5	65-100	45-100	30-100	25-80	0-30	NP-12
8074:												
Radford---------	0-10	Silt loam------	CL, ML	A-4, A-6	0	0	100	100	95-100	80-100	30-40	5-15
	10-31	Silt loam------	CL, ML	A-4, A-6	0	0	100	100	95-100	80-100	25-35	5-15
	31-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	0	0	100	100	95-100	80-95	35-50	15-25
8077:												
Huntsville------	0-54	Silt loam------	CL	A-6	0	0	100	98-100	90-100	85-100	25-40	10-25
	54-60	Silt loam, loam, sandy loam.	CL, ML, SC, SM	A-4, A-6	0	0	90-100	80-100	55-95	45-85	20-35	NP-15
8107:												
Sawmill---------	0-21	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	21-26	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	26-60	Silty clay loam, clay loam, loam.	CL	A-4, A-6, A-7	0	0	100	100	85-100	70-95	25-50	8-25

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	> 10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
8368:												
Raveenwash-------	0-17	Silt loam-------	CL-ML, ML	A-4	0	0	100	90-100	80-100	50-75	25-35	4-10
	17-60	Silt loam, loam, loamy sand.	CL-ML, ML, SC, SM	A-2-4, A-4, A-6	0	0	100	90-100	80-100	10-70	20-30	3-13
8400:												
Calco------------	0-36	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
	36-60	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	15-30
8402:												
Colo-------------	0-8	Silt loam-------	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
	8-44	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	44-60	Silty clay loam, clay loam, silt loam.	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
8451:												
Lawson-----------	0-22	Silt loam-------	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-40	5-20
	22-40	Silt loam, silty clay loam.	CL, CL-ML	A-4	0	0	100	100	90-100	85-100	20-30	5-10
	40-54	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	90-100	60-100	20-45	10-25
	54-60	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	60-100	35-85	20-35	5-20

Table 16.--Physical and Chemical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
17A:												
Keomah----------	0-9	16-26	1.30-1.40	0.60-2.00	0.22-0.24	15.0-20.0	4.5-7.3	Low------	1.0-3.0	0.37	3	6
	9-15	16-26	1.35-1.45	0.20-0.60	0.18-0.20	15.0-20.0	4.5-7.3	Low------	0.2-1.0	0.37		
	15-49	35-42	1.30-1.45	0.06-0.60	0.18-0.20	25.0-30.0	4.5-7.3	High-----	0.0-0.5	0.37		
	49-60	24-38	1.40-1.55	0.20-0.60	0.18-0.20	15.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
17B2:												
Keomah----------	0-8	16-26	1.30-1.40	0.60-2.00	0.22-0.24	15.0-20.0	4.5-7.3	Low------	1.0-3.0	0.37	3	6
	8-43	35-42	1.30-1.45	0.06-0.60	0.18-0.20	25.0-30.0	4.5-7.3	High-----	0.0-0.5	0.37		
	43-60	24-38	1.40-1.55	0.20-0.60	0.18-0.20	15.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
27C2:												
Miami-----------	0-9	27-35	1.30-1.70	0.60-2.00	0.17-0.23	10.0-21.0	5.6-7.3	Moderate	0.5-2.0	0.37	3	6
	9-42	27-35	1.40-1.70	0.60-2.00	0.07-0.21	9.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
	42-60	15-25	1.60-1.80	0.20-0.60	0.07-0.17	4.0-11.0	6.6-8.4	Low------	0.0-0.5	0.37		
27D2:												
Miami-----------	0-5	27-35	1.30-1.70	0.60-2.00	0.17-0.23	10.0-21.0	5.6-7.3	Moderate	0.5-2.0	0.37	3	6
	5-37	27-35	1.40-1.70	0.60-2.00	0.07-0.21	9.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
	37-60	15-25	1.60-1.80	0.20-0.60	0.07-0.17	4.0-11.0	6.6-8.4	Low------	0.0-0.5	0.37		
36B:												
Tama------------	0-10	20-26	1.25-1.30	0.60-2.00	0.22-0.24	20.0-26.0	5.1-7.3	Moderate	3.0-4.0	0.28	5	6
	10-31	27-35	1.30-1.35	0.60-2.00	0.18-0.20	20.0-27.0	5.1-6.5	Moderate	0.5-1.0	0.43		
	31-60	20-30	1.35-1.40	0.60-2.00	0.18-0.20	14.0-22.0	5.6-7.8	Moderate	0.0-0.5	0.43		
43A:												
Ipava-----------	0-9	20-27	1.15-1.35	0.60-2.00	0.22-0.24	20.0-27.0	5.6-7.3	Moderate	4.0-5.0	0.28	5	6
	9-45	35-43	1.25-1.50	0.20-0.60	0.11-0.20	22.0-27.0	5.6-7.8	High-----	0.5-1.0	0.43		
	45-60	20-30	1.30-1.55	0.20-0.60	0.20-0.22	12.0-19.0	6.1-8.4	Moderate	0.0-0.5	0.43		
43B:												
Ipava-----------	0-8	20-27	1.15-1.35	0.60-2.00	0.22-0.24	20.0-27.0	5.6-7.3	Moderate	4.0-5.0	0.28	5	6
	8-34	35-43	1.25-1.50	0.20-0.60	0.11-0.20	22.0-27.0	5.6-7.8	High-----	0.5-1.0	0.43		
	34-60	20-30	1.30-1.55	0.20-0.60	0.20-0.22	12.0-19.0	6.1-8.4	Moderate	0.0-0.5	0.43		
60C2:												
La Rose---------	0-8	18-27	1.10-1.35	0.60-2.00	0.20-0.24	15.0-24.0	6.1-7.8	Moderate	2.0-4.0	0.28	3	6
	8-31	27-35	1.35-1.55	0.60-2.00	0.15-0.20	16.0-22.0	6.1-7.8	Moderate	0.0-0.5	0.32		
	31-60	15-25	1.30-1.90	0.20-0.60	0.09-0.11	11.0-17.0	7.4-8.4	Moderate	0.0-0.5	0.32		
60C3:												
La Rose---------	0-6	27-35	1.30-1.50	0.60-2.00	0.16-0.20	17.0-23.0	6.1-7.8	Moderate	0.5-1.0	0.28	2	7
	6-10	27-35	1.35-1.55	0.60-2.00	0.15-0.20	16.0-22.0	6.1-7.8	Moderate	0.0-0.5	0.32		
	10-60	15-25	1.30-1.90	0.20-0.60	0.09-0.11	11.0-17.0	7.4-8.4	Moderate	0.0-0.5	0.32		
61A:												
Atterberry------	0-7	20-26	1.35-1.55	0.60-2.00	0.22-0.25	16.0-24.0	5.6-7.3	Low------	2.0-4.0	0.32	5	6
	7-10	15-26	1.40-1.60	0.60-2.00	0.21-0.24	10.0-18.0	5.1-7.3	Low------	0.5-1.0	0.32		
	10-35	25-35	1.40-1.60	0.60-2.00	0.14-0.24	15.0-22.0	5.1-7.3	Moderate	0.1-0.5	0.43		
	35-60	18-27	1.40-1.65	0.60-2.00	0.14-0.24	11.0-17.0	5.6-8.4	Low------	0.1-0.5	0.43		
67:												
Harpster--------	0-21	27-35	1.05-1.25	0.60-2.00	0.21-0.24	26.0-33.0	7.4-8.4	Moderate	5.0-6.0	0.28	5	4L
	21-46	27-35	1.20-1.50	0.60-2.00	0.18-0.22	17.0-23.0	7.4-8.4	Moderate	0.5-1.0	0.28		
	46-60	22-35	1.25-1.55	0.60-2.00	0.17-0.22	13.0-22.0	7.4-8.4	Moderate	0.0-0.5	0.28		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
68:												
Sable-----------	0-16	27-35	1.15-1.35	0.60-2.00	0.21-0.23	26.0-33.0	5.6-7.3	Moderate	5.0-6.0	0.28	5	7
	16-33	27-35	1.20-1.40	0.60-2.00	0.18-0.20	20.0-30.0	5.6-7.3	Moderate	2.0-4.0	0.28		
	33-60	24-35	1.30-1.50	0.60-2.00	0.18-0.20	15.0-23.0	5.6-7.8	Moderate	0.2-1.0	0.28		
91A:												
Swygert---------	0-10	27-40	1.25-1.50	0.20-0.60	0.18-0.22	25.0-30.0	5.6-7.3	Moderate	3.0-5.0	0.37	5	7
	10-15	30-45	1.30-1.55	0.20-0.60	0.08-0.16	20.0-30.0	5.6-7.3	High-----	1.0-3.0	0.28		
	15-32	45-50	1.40-1.70	0.06-0.20	0.05-0.12	15.0-25.0	5.6-8.4	High-----	0.5-1.0	0.28		
	32-60	38-60	1.40-1.75	0.01-0.06	0.03-0.05	20.0-30.0	7.4-8.4	High-----	0.0-0.5	0.28		
91B2:												
Swygert---------	0-8	27-40	1.25-1.50	0.20-0.60	0.18-0.22	25.0-30.0	5.6-7.3	Moderate	3.0-5.0	0.37	5	7
	8-21	30-45	1.30-1.55	0.06-0.20	0.08-0.16	20.0-30.0	5.6-7.3	High-----	1.0-3.0	0.28		
	21-60	38-60	1.40-1.70	0.01-0.06	0.05-0.12	15.0-25.0	5.6-8.4	High-----	0.0-0.5	0.28		
100:												
Palms-----------	0-41	---	0.25-0.45	0.20-6.00	0.35-0.45	150-180	5.1-7.8	Low------	75-99	---	2	2
	41-60	7-35	1.45-1.75	0.20-2.00	0.14-0.22	2.0-15.0	6.1-8.4	Low------	---	0.37		
125:												
Selma-----------	0-12	20-27	1.40-1.60	0.60-2.00	0.20-0.24	20.0-28.0	6.1-7.8	Low------	4.0-6.0	0.28	5	6
	12-51	18-30	1.40-1.60	0.60-2.00	0.15-0.19	11.0-22.0	6.1-8.4	Moderate	0.0-2.0	0.28		
	51-60	7-18	1.60-1.90	2.00-6.00	0.07-0.19	7.0-20.0	5.6-8.4	Low------	0.0-1.0	0.28		
131A:												
Alvin-----------	0-17	5-10	1.45-1.65	6.00-20.00	0.09-0.12	4.0-8.0	4.5-7.3	Low------	0.5-1.0	0.17	5	2
	17-33	15-22	1.40-1.65	2.00-6.00	0.14-0.18	9.0-14.0	4.5-7.3	Low------	0.0-0.5	0.24		
	33-60	3-10	1.45-1.65	2.00-6.00	0.10-0.15	2.0-5.0	5.1-8.4	Low------	0.0-0.5	0.24		
131B:												
Alvin-----------	0-10	8-15	1.45-1.65	2.00-6.00	0.14-0.17	4.0-11.0	4.5-7.3	Low------	0.5-2.0	0.24	5	3
	10-47	15-22	1.40-1.65	2.00-6.00	0.14-0.18	9.0-14.0	4.5-7.3	Low------	0.0-0.5	0.24		
	47-60	3-10	1.45-1.65	2.00-6.00	0.10-0.15	2.0-5.0	5.1-8.4	Low------	0.0-0.5	0.24		
131C:												
Alvin-----------	0-9	8-15	1.45-1.65	2.00-6.00	0.14-0.17	4.0-11.0	4.5-7.3	Low------	0.5-2.0	0.24	5	3
	9-32	10-15	1.45-1.65	2.00-6.00	0.10-0.17	6.0-10.0	4.5-7.3	Low------	0.0-0.5	0.24		
	32-60	15-22	1.40-1.65	2.00-6.00	0.14-0.18	9.0-14.0	5.1-8.4	Low------	0.0-0.5	0.24		
131D:												
Alvin-----------	0-5	8-15	1.45-1.65	2.00-6.00	0.14-0.17	4.0-11.0	4.5-7.3	Low------	0.5-2.0	0.24	5	3
	5-33	15-22	1.40-1.65	2.00-6.00	0.14-0.18	9.0-14.0	4.5-7.3	Low------	0.0-0.5	0.24		
	33-60	3-10	1.45-1.65	2.00-6.00	0.10-0.15	2.0-5.0	5.1-8.4	Low------	0.0-0.5	0.24		
131F:												
Alvin-----------	0-8	8-15	1.45-1.65	2.00-6.00	0.14-0.17	4.0-11.0	4.5-7.3	Low------	0.5-2.0	0.24	5	3
	8-40	10-15	1.45-1.65	2.00-6.00	0.10-0.17	6.0-10.0	4.5-7.3	Low------	0.0-0.5	0.24		
	40-60	3-10	1.45-1.65	2.00-6.00	0.10-0.15	2.0-5.0	5.1-8.4	Low------	0.0-0.5	0.24		
134A:												
Camden----------	0-12	14-27	1.35-1.55	0.60-2.00	0.21-0.25	10.0-20.0	5.1-7.3	Low------	1.0-2.0	0.37	5	6
	12-32	22-35	1.40-1.60	0.60-2.00	0.14-0.24	13.0-22.0	5.1-7.3	Moderate	0.1-0.5	0.37		
	32-60	18-30	1.45-1.65	0.60-2.00	0.11-0.22	10.0-19.0	5.1-7.3	Low------	0.0-0.5	0.32		
134B:												
Camden----------	0-14	14-27	1.35-1.55	0.60-2.00	0.21-0.25	10.0-20.0	5.1-7.3	Low------	1.0-2.0	0.37	5	6
	14-30	22-35	1.40-1.60	0.60-2.00	0.14-0.24	13.0-22.0	5.1-7.3	Moderate	0.1-0.5	0.37		
	30-60	18-30	1.45-1.65	0.60-2.00	0.11-0.22	10.0-19.0	5.1-7.3	Low------	0.0-0.5	0.32		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
134C2:												
Camden----------	0-7	14-27	1.35-1.55	0.60-2.00	0.21-0.25	10.0-20.0	5.1-7.3	Low------	1.0-2.0	0.37	5	6
	7-39	22-35	1.40-1.60	0.60-2.00	0.14-0.24	13.0-22.0	5.1-7.3	Moderate	0.1-0.5	0.37		
	39-60	18-30	1.45-1.65	0.60-2.00	0.11-0.22	10.0-19.0	5.1-7.3	Low------	0.0-0.5	0.32		
145B:												
Saybrook--------	0-13	20-26	1.10-1.30	0.60-2.00	0.22-0.24	18.0-24.0	5.6-7.3	Low------	3.0-4.0	0.32	5	6
	13-38	25-35	1.20-1.40	0.60-2.00	0.18-0.20	17.0-23.0	5.6-7.3	Moderate	0.5-1.0	0.43		
	38-60	24-35	1.50-1.70	0.20-0.60	0.15-0.21	14.0-22.0	5.6-8.4	Low------	0.2-0.5	0.37		
145B2:												
Saybrook--------	0-7	20-26	1.10-1.30	0.60-2.00	0.22-0.24	18.0-24.0	5.6-7.3	Low------	3.0-4.0	0.32	5	6
	7-26	25-35	1.20-1.40	0.60-2.00	0.18-0.20	17.0-23.0	5.6-7.3	Moderate	0.5-1.0	0.43		
	26-60	24-35	1.50-1.70	0.20-0.60	0.15-0.21	14.0-22.0	5.6-8.4	Low------	0.2-0.5	0.37		
145C2:												
Saybrook--------	0-10	27-29	1.15-1.35	0.60-2.00	0.21-0.23	18.0-24.0	5.6-7.3	Moderate	1.0-3.0	0.32	5	7
	10-30	27-35	1.20-1.40	0.60-2.00	0.18-0.20	17.0-23.0	5.6-7.3	Moderate	0.5-1.0	0.43		
	30-60	24-35	1.50-1.60	0.20-0.60	0.15-0.21	14.0-22.0	6.1-8.4	Low------	0.0-0.5	0.32		
148A:												
Proctor---------	0-13	18-27	1.10-1.30	0.60-2.00	0.22-0.24	15.0-24.0	5.1-7.8	Low------	2.0-4.0	0.32	5	6
	13-37	25-35	1.20-1.45	0.60-2.00	0.18-0.20	16.0-25.0	5.6-7.3	Moderate	0.5-2.0	0.43		
	37-46	15-32	1.30-1.55	0.60-2.00	0.13-0.19	9.0-20.0	5.6-7.3	Moderate	0.2-1.0	0.32		
	46-60	10-20	1.40-1.70	0.60-2.00	0.07-0.19	4.0-12.0	5.6-7.8	Low------	0.2-0.5	0.17		
148B:												
Proctor---------	0-10	18-27	1.10-1.30	0.60-2.00	0.22-0.24	15.0-24.0	5.1-7.8	Low------	2.0-4.0	0.32	5	6
	10-24	25-35	1.20-1.45	0.60-2.00	0.18-0.20	16.0-25.0	5.6-7.3	Moderate	0.5-2.0	0.43		
	24-58	22-35	1.30-1.55	0.60-2.00	0.13-0.16	15.0-23.0	5.6-7.3	Moderate	0.2-1.0	0.32		
	58-60	10-20	1.40-1.70	0.60-2.00	0.07-0.19	4.0-12.0	6.1-7.8	Low------	0.2-0.5	0.17		
152:												
Drummer---------	0-11	27-35	1.10-1.30	0.60-2.00	0.21-0.23	26.0-53.0	5.6-7.3	Moderate	5.0-7.0	0.28	5	7
	11-47	20-35	1.20-1.45	0.60-2.00	0.21-0.24	12.0-23.0	5.6-7.8	Moderate	0.0-1.0	0.28		
	47-57	15-33	1.30-1.55	0.60-2.00	0.17-0.20	13.0-21.0	6.1-8.4	Moderate	0.0-0.5	0.28		
	57-60	10-32	1.40-1.70	0.60-2.00	0.11-0.19	9.0-19.0	6.6-8.4	Low------	0.0-0.5	0.28		
154A:												
Flanagan--------	0-18	20-27	1.20-1.40	0.60-2.00	0.22-0.24	20.0-26.0	5.1-7.3	Moderate	4.0-5.0	0.28	5	6
	18-51	25-42	1.25-1.45	0.60-2.00	0.15-0.22	21.0-26.0	5.6-7.3	High-----	0.0-1.0	0.43		
	51-60	20-30	1.45-1.70	0.20-0.60	0.15-0.22	12.0-18.0	6.1-8.4	Low------	0.0-0.5	0.37		
154B:												
Flanagan--------	0-10	20-27	1.20-1.40	0.60-2.00	0.22-0.24	20.0-26.0	5.1-7.3	Moderate	4.0-5.0	0.28	5	6
	10-42	25-42	1.25-1.45	0.60-2.00	0.15-0.22	21.0-26.0	5.6-7.3	High-----	0.0-1.0	0.43		
	42-60	20-30	1.45-1.70	0.20-0.60	0.15-0.22	12.0-18.0	6.1-8.4	Low------	0.0-0.5	0.37		
171B:												
Catlin----------	0-18	18-27	1.25-1.45	0.60-2.00	0.23-0.26	17.0-24.0	5.1-7.3	Low------	3.0-4.0	0.32	5	6
	18-50	27-35	1.25-1.55	0.60-2.00	0.18-0.20	16.0-23.0	5.1-7.3	Moderate	0.0-1.0	0.43		
	50-60	20-30	1.40-1.70	0.20-0.60	0.07-0.11	12.0-19.0	6.1-8.4	Low------	0.0-0.5	0.43		
171B2:												
Catlin----------	0-8	18-27	1.25-1.45	0.60-2.00	0.23-0.26	17.0-24.0	5.1-7.3	Low------	3.0-4.0	0.32	5	6
	8-45	27-35	1.25-1.55	0.60-2.00	0.18-0.20	16.0-23.0	5.1-7.3	Moderate	0.0-1.0	0.43		
	45-60	20-30	1.40-1.70	0.20-0.60	0.07-0.11	12.0-19.0	6.1-8.4	Low------	0.0-0.5	0.43		
171C2:												
Catlin----------	0-10	18-27	1.25-1.45	0.60-2.00	0.23-0.26	17.0-24.0	5.1-7.3	Low------	3.0-4.0	0.32	5	6
	10-44	27-35	1.25-1.55	0.60-2.00	0.18-0.20	16.0-23.0	5.1-7.3	Moderate	0.0-1.0	0.43		
	44-60	20-30	1.40-1.70	0.20-0.60	0.07-0.11	12.0-19.0	6.1-8.4	Low------	0.0-0.5	0.43		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
194C2:												
Morley----------	0-7	27-35	1.40-1.60	0.20-0.60	0.18-0.22	18.0-27.0	5.1-7.3	Moderate	1.0-3.0	0.37	5	7
	7-10	30-50	1.55-1.70	0.20-0.60	0.11-0.15	18.0-30.0	5.6-7.8	Moderate	0.5-1.0	0.32		
	10-36	27-50	1.60-1.80	0.06-0.20	0.07-0.12	16.0-30.0	6.1-8.4	Moderate	0.2-0.5	0.43		
	36-60	27-40	1.60-1.80	0.06-0.20	0.07-0.12	16.0-24.0	6.1-8.4	Moderate	0.2-0.5	0.43		
198A:												
Elburn----------	0-15	22-27	1.10-1.30	0.60-2.00	0.22-0.24	20.0-30.0	5.6-7.3	Low------	4.0-5.0	0.28	5	6
	15-50	25-35	1.20-1.40	0.60-2.00	0.18-0.20	15.0-25.0	5.6-7.3	Moderate	0.5-2.0	0.43		
	50-60	15-30	1.50-1.70	0.60-6.00	0.12-0.18	9.0-15.0	6.1-8.4	Low------	0.0-0.2	0.43		
199A:												
Plano-----------	0-20	18-27	1.10-1.30	0.60-2.00	0.22-0.24	17.0-26.0	6.1-7.3	Low------	3.0-5.0	0.32	5	6
	20-53	25-35	1.20-1.40	0.60-2.00	0.18-0.20	15.0-23.0	5.1-7.3	Moderate	0.2-1.0	0.43		
	53-60	10-20	1.50-1.70	0.60-2.00	0.11-0.22	6.0-13.0	5.6-7.8	Low------	0.1-0.5	0.37		
199B:												
Plano-----------	0-14	18-27	1.10-1.30	0.60-2.00	0.22-0.24	17.0-26.0	6.1-7.3	Low------	3.0-5.0	0.32	5	6
	14-43	20-35	1.20-1.40	0.60-2.00	0.18-0.20	15.0-23.0	5.1-7.3	Moderate	0.2-1.0	0.43		
	43-60	15-32	1.30-1.55	0.60-6.00	0.09-0.16	9.0-20.0	5.6-7.8	Low------	0.1-0.5	0.37		
210:												
Lena------------	0-9	---	0.15-0.45	2.00-6.00	0.35-0.45	120-180	7.4-8.4	Low------	60-99	---	3	2
	9-60	---	0.15-0.45	2.00-6.00	0.35-0.45	120-180	7.4-8.4	Low------	60-99	---		
221B2:												
Parr------------	0-9	12-22	1.30-1.45	0.60-2.00	0.20-0.24	8.0-22.0	5.6-7.3	Low------	2.0-4.0	0.32	4	5
	9-50	22-32	1.40-1.55	0.60-2.00	0.15-0.19	8.0-21.0	5.6-8.4	Moderate	0.0-0.5	0.32		
	50-60	10-20	1.70-1.90	0.20-0.60	0.05-0.10	4.0-13.0	7.4-8.4	Low------	0.0-0.2	0.32		
221C2:												
Parr------------	0-7	12-22	1.30-1.45	0.60-2.00	0.20-0.24	8.0-22.0	5.6-7.3	Low------	2.0-4.0	0.32	4	5
	7-49	22-32	1.40-1.55	0.60-2.00	0.15-0.19	8.0-21.0	5.6-8.4	Moderate	0.0-0.5	0.32		
	49-60	10-20	1.70-1.90	0.20-0.60	0.05-0.10	4.0-13.0	7.4-8.4	Low------	0.0-0.2	0.32		
223B2:												
Varna-----------	0-7	27-35	1.20-1.40	0.60-2.00	0.20-0.22	20.0-27.0	5.6-7.8	Moderate	2.0-3.0	0.32	5	7
	7-32	35-50	1.30-1.60	0.20-0.60	0.09-0.19	22.0-30.0	5.6-7.8	Moderate	0.5-1.0	0.32		
	32-60	27-40	1.65-1.90	0.06-0.60	0.01-0.09	16.0-25.0	6.6-8.4	Low------	0.2-0.5	0.37		
223C2:												
Varna-----------	0-7	27-35	1.20-1.40	0.60-2.00	0.20-0.22	20.0-27.0	5.6-7.8	Moderate	2.0-3.0	0.32	5	7
	7-28	35-50	1.30-1.60	0.20-0.60	0.09-0.19	22.0-30.0	5.6-7.8	Moderate	0.5-1.0	0.32		
	28-60	27-40	1.65-1.90	0.06-0.60	0.01-0.09	16.0-25.0	6.6-8.4	Low------	0.2-0.5	0.37		
223D:												
Varna-----------	0-12	27-35	1.20-1.40	0.60-2.00	0.20-0.22	20.0-27.0	5.6-7.8	Moderate	2.0-3.0	0.32	5	7
	12-26	35-48	1.30-1.60	0.20-0.60	0.09-0.19	22.0-32.0	5.6-7.8	Moderate	0.5-1.0	0.32		
	26-60	25-35	1.50-1.70	0.06-0.60	0.14-0.20	15.0-22.0	6.6-8.4	Low------	0.2-0.5	0.32		
224D2:												
Strawn----------	0-5	18-27	1.15-1.45	0.60-2.00	0.20-0.24	13.0-22.0	6.1-7.3	Low------	1.0-3.0	0.37	5	6
	5-21	27-35	1.35-1.55	0.60-2.00	0.15-0.20	16.0-23.0	5.6-7.8	Moderate	0.2-1.0	0.37		
	21-60	22-30	1.50-1.70	0.20-0.60	0.08-0.12	12.0-19.0	7.4-8.4	Low------	0.2-0.5	0.32		
224E:												
Strawn----------	0-6	18-27	1.15-1.45	0.60-2.00	0.20-0.24	13.0-22.0	6.1-7.3	Low------	1.0-3.0	0.37	5	6
	6-14	27-35	1.35-1.55	0.60-2.00	0.15-0.20	16.0-23.0	5.6-7.8	Moderate	0.2-1.0	0.37		
	14-60	22-30	1.50-1.70	0.20-0.60	0.08-0.12	12.0-19.0	7.4-8.4	Low------	0.2-0.5	0.32		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
224E2:												
Strawn----------	0-5	18-27	1.15-1.45	0.60-2.00	0.20-0.24	13.0-22.0	6.1-7.3	Low------	1.0-3.0	0.37	5	6
	5-18	27-35	1.35-1.55	0.60-2.00	0.15-0.20	16.0-23.0	5.6-7.8	Moderate	0.2-1.0	0.37		
	18-60	22-30	1.50-1.70	0.20-0.60	0.08-0.12	12.0-19.0	7.4-8.4	Low------	0.2-0.5	0.32		
233B2:												
Birkbeck--------	0-9	15-27	1.30-1.50	0.60-2.00	0.22-0.25	11.0-23.0	5.1-7.3	Low------	1.0-3.0	0.37	5	6
	9-52	25-35	1.35-1.55	0.60-2.00	0.14-0.24	16.0-23.0	4.5-7.3	Moderate	0.5-1.0	0.37		
	52-60	17-30	1.55-1.90	0.20-0.60	0.05-0.19	10.0-19.0	6.6-8.4	Low------	0.0-0.5	0.37		
233C2:												
Birkbeck--------	0-9	27-35	1.35-1.55	0.60-2.00	0.14-0.19	17.0-23.0	5.1-7.3	Moderate	0.5-1.0	0.37	5	7
	9-52	25-35	1.35-1.55	0.60-2.00	0.14-0.24	16.0-23.0	4.5-7.3	Moderate	0.5-1.0	0.37		
	52-60	17-30	1.55-1.90	0.20-0.60	0.05-0.19	10.0-19.0	6.6-8.4	Low------	0.0-0.5	0.37		
233D2:												
Birkbeck--------	0-7	15-27	1.30-1.50	0.60-2.00	0.22-0.25	11.0-23.0	5.1-7.3	Low------	1.0-3.0	0.37	5	6
	7-46	25-35	1.35-1.55	0.60-2.00	0.14-0.24	16.0-23.0	4.5-7.3	Moderate	0.5-1.0	0.37		
	46-60	17-30	1.55-1.90	0.20-0.60	0.05-0.19	10.0-19.0	6.6-8.4	Low------	0.0-0.5	0.37		
236A:												
Sabina----------	0-11	20-27	1.25-1.45	0.60-2.00	0.22-0.24	14.0-22.0	5.1-7.3	Low------	1.0-3.0	0.37	5	6
	11-47	35-42	1.35-1.55	0.20-0.60	0.11-0.20	21.0-27.0	5.6-7.3	High-----	0.0-1.0	0.37		
	47-60	20-35	1.50-1.75	0.20-0.60	0.11-0.18	12.0-23.0	6.6-8.4	Low------	0.0-1.0	0.32		
241C2:												
Chatsworth------	0-6	27-40	1.40-1.60	0.20-0.60	0.14-0.19	14.0-22.0	5.6-8.4	Moderate	0.5-1.0	0.43	3	4
	6-16	35-60	1.50-1.70	0.00-0.06	0.05-0.07	18.0-30.0	6.1-8.4	Moderate	0.0-0.5	0.32		
	16-60	35-50	1.60-1.85	0.00-0.06	0.04-0.06	18.0-25.0	7.4-8.4	Moderate	0.0-0.5	0.32		
243A:												
St. Charles-----	0-9	20-27	1.15-1.30	0.60-2.00	0.22-0.24	14.0-22.0	5.1-7.8	Low------	1.0-3.0	0.37	5	6
	9-52	24-35	1.30-1.50	0.60-2.00	0.18-0.20	15.0-23.0	4.5-7.3	Moderate	0.2-1.0	0.37		
	52-60	15-30	1.30-1.50	0.60-2.00	0.11-0.16	9.0-19.0	5.1-7.3	Low------	0.2-0.5	0.24		
243B:												
St. Charles-----	0-7	20-27	1.15-1.30	0.60-2.00	0.22-0.24	14.0-22.0	5.1-7.8	Low------	1.0-3.0	0.37	5	6
	7-41	25-35	1.30-1.50	0.60-2.00	0.18-0.20	15.0-22.0	4.5-7.3	Moderate	0.0-0.5	0.37		
	41-55	15-30	1.30-1.50	0.60-2.00	0.11-0.16	9.0-19.0	5.1-7.3	Low------	0.0-0.5	0.32		
	55-60	10-25	1.55-1.75	0.60-2.00	0.11-0.16	6.0-16.0	5.6-8.4	Low------	0.0-0.5	0.24		
279B2:												
Rozetta---------	0-6	15-27	1.20-1.40	0.60-2.00	0.22-0.24	10.0-22.0	5.1-7.3	Low------	1.0-3.0	0.37	5	6
	6-31	27-35	1.35-1.55	0.60-2.00	0.18-0.22	16.0-22.0	4.5-6.5	Moderate	0.2-0.5	0.37		
	31-60	20-30	1.40-1.60	0.60-2.00	0.20-0.22	12.0-17.0	5.6-7.8	Low------	0.2-0.5	0.37		
290A:												
Warsaw----------	0-8	12-20	1.35-1.60	0.60-2.00	0.13-0.15	8.0-22.0	5.6-7.3	Low------	2.0-5.0	0.20	4	3
	8-24	17-30	1.35-1.60	0.60-2.00	0.16-0.19	7.0-22.0	5.1-6.5	Low------	0.5-2.0	0.28		
	24-35	18-30	1.40-1.65	0.60-2.00	0.13-0.16	9.0-22.0	6.1-8.4	Low------	0.5-2.0	0.28		
	35-60	2-8	1.40-1.65	>20.00	0.02-0.04	1.0-7.0	6.6-8.4	Low------	0.0-1.0	0.10		
322C2:												
Russell---------	0-7	11-25	1.30-1.45	0.60-2.00	0.21-0.24	5.0-19.0	5.1-7.3	Low------	0.5-2.0	0.37	5	5
	7-33	25-33	1.40-1.60	0.60-2.00	0.18-0.20	11.0-22.0	4.5-6.5	Moderate	0.5-1.0	0.37		
	33-60	23-33	1.40-1.60	0.20-0.60	0.15-0.19	9.0-22.0	5.1-7.3	Moderate	0.0-1.0	0.37		
322D2:												
Russell---------	0-7	11-25	1.30-1.45	0.60-2.00	0.21-0.24	5.0-19.0	5.1-7.3	Low------	0.5-2.0	0.37	5	5
	7-31	25-33	1.40-1.60	0.60-2.00	0.18-0.20	11.0-22.0	4.5-6.5	Moderate	0.5-1.0	0.37		
	31-40	23-33	1.40-1.60	0.60-2.00	0.15-0.19	9.0-22.0	5.1-7.3	Moderate	0.0-1.0	0.37		
	40-60	14-27	1.60-1.80	0.20-0.60	0.05-0.19	5.0-18.0	7.4-8.4	Low------	0.0-0.5	0.37		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
327C2:												
Fox-------------	0-5	20-35	1.55-1.65	0.60-2.00	0.14-0.23	5.0-30.0	5.1-7.3	Moderate	0.5-2.0	0.32	4	6
	5-14	18-35	1.55-1.65	0.60-2.00	0.10-0.22	4.0-30.0	5.1-6.5	Moderate	0.0-0.5	0.43		
	14-35	18-35	1.55-1.65	0.60-2.00	0.10-0.19	4.0-30.0	5.1-7.8	Moderate	0.0-0.5	0.32		
	35-60	0-2	1.30-1.70	6.00-60.00	0.02-0.07	0.0-3.0	7.4-8.4	Low------	0.0-0.5	0.10		
330:												
Peotone---------	0-17	33-40	1.20-1.40	0.20-0.60	0.21-0.23	29.0-38.0	5.6-7.8	High-----	5.0-7.0	0.28	5	4
	17-53	35-45	1.30-1.60	0.20-0.60	0.11-0.20	22.0-33.0	6.1-7.8	High-----	0.5-3.0	0.28		
	53-60	25-42	1.40-1.65	0.20-0.60	0.18-0.20	15.0-26.0	6.6-8.4	High-----	0.2-0.5	0.28		
356:												
Elpaso----------	0-21	27-35	1.15-1.35	0.60-2.00	0.21-0.23	25.0-30.0	5.6-7.3	Moderate	5.0-7.0	0.28	5	7
	21-44	23-35	1.20-1.40	0.60-2.00	0.22-0.24	14.0-20.0	6.1-7.3	Moderate	0.2-0.5	0.32		
	44-60	15-30	1.30-1.50	0.20-0.60	0.18-0.22	10.0-20.0	6.6-8.4	Moderate	0.2-0.5	0.32		
369A:												
Waupecan--------	0-14	15-27	1.15-1.30	0.60-2.00	0.22-0.24	17.0-26.0	6.1-7.8	Low------	4.0-5.0	0.32	4	6
	14-34	25-35	1.30-1.50	0.60-2.00	0.18-0.22	16.0-23.0	5.6-7.3	Moderate	0.5-1.0	0.43		
	34-51	10-25	1.55-1.75	2.00-6.00	0.08-0.18	6.0-16.0	5.6-7.3	Low------	0.2-0.5	0.10		
	51-60	3-10	1.60-1.80	>20.00	0.02-0.04	2.0-8.0	6.6-8.4	Low------	0.2-0.5	0.10		
369B:												
Waupecan--------	0-16	15-27	1.15-1.30	0.60-2.00	0.22-0.24	17.0-26.0	6.1-7.8	Low------	4.0-5.0	0.32	4	6
	16-36	25-35	1.30-1.50	0.60-2.00	0.18-0.22	16.0-23.0	5.6-7.3	Moderate	0.5-1.0	0.43		
	36-54	10-25	1.55-1.75	2.00-6.00	0.08-0.18	6.0-16.0	5.6-7.3	Low------	0.2-0.5	0.10		
	54-60	3-10	1.60-1.80	>20.00	0.02-0.04	2.0-8.0	6.6-8.4	Low------	0.2-0.5	0.10		
375A:												
Rutland---------	0-14	27-30	1.20-1.40	0.60-2.00	0.22-0.24	24.0-28.0	5.6-7.3	Moderate	4.0-5.0	0.28	5	7
	14-44	35-45	1.35-1.55	0.20-0.60	0.18-0.20	22.0-29.0	5.1-8.4	High-----	0.5-1.0	0.43		
	44-60	40-55	1.45-1.70	0.01-0.06	0.08-0.12	24.0-34.0	6.6-8.4	High-----	0.0-0.5	0.32		
375B:												
Rutland---------	0-14	20-27	1.20-1.40	0.60-2.00	0.22-0.24	20.0-26.0	5.6-7.3	Moderate	4.0-5.0	0.28	5	6
	14-44	35-45	1.35-1.55	0.20-0.60	0.18-0.20	22.0-29.0	5.1-8.4	High-----	0.5-1.0	0.43		
	44-60	40-55	1.45-1.70	0.01-0.06	0.08-0.12	24.0-34.0	6.6-8.4	High-----	0.0-0.5	0.32		
375B2:												
Rutland---------	0-7	27-30	1.20-1.40	0.60-2.00	0.22-0.24	24.0-28.0	5.6-7.3	Moderate	4.0-5.0	0.28	5	7
	7-37	35-45	1.35-1.55	0.20-0.60	0.18-0.20	22.0-29.0	5.1-8.4	High-----	0.5-1.0	0.43		
	37-60	40-55	1.45-1.70	0.01-0.06	0.08-0.12	24.0-34.0	6.6-8.4	High-----	0.0-0.5	0.32		
379A:												
Dakota----------	0-14	14-27	1.40-1.50	0.60-2.00	0.20-0.22	7.0-30.0	5.1-7.3	Low------	2.0-5.0	0.24	4	5
	14-31	18-32	1.30-1.55	0.60-2.00	0.15-0.19	5.0-30.0	5.1-7.3	Low------	0.5-2.0	0.32		
	31-34	4-11	1.55-1.65	2.00-6.00	0.02-0.14	1.0-10.0	5.1-7.3	Low------	0.0-0.5	0.24		
	34-60	1-4	1.55-1.65	6.00-20.00	0.02-0.10	0.0-4.0	5.1-7.8	Low------	0.0-0.5	0.15		
386B:												
Downs-----------	0-8	15-25	1.25-1.30	2.00-6.00	0.21-0.23	20.0-25.0	5.1-7.3	Low------	2.0-3.0	0.32	5	6
	8-40	26-35	1.30-1.35	0.60-2.00	0.18-0.20	20.0-25.0	5.1-7.3	Moderate	0.5-1.0	0.43		
	40-60	22-26	1.35-1.45	0.60-2.00	0.18-0.20	15.0-20.0	5.1-7.8	Moderate	0.0-0.5	0.43		
387A:												
Ockley----------	0-8	11-22	1.30-1.60	0.60-2.00	0.16-0.24	3.0-15.0	5.6-7.3	Low------	1.0-3.0	0.32	4	5
	8-33	22-34	1.40-1.60	0.60-2.00	0.13-0.20	5.0-15.0	4.5-6.5	Moderate	0.5-1.0	0.32		
	33-52	10-32	1.40-1.70	0.60-6.00	0.05-0.20	2.0-15.0	5.1-7.3	Moderate	0.5-1.0	0.10		
	52-60	2-5	1.60-1.80	>20.00	0.02-0.04	1.0-3.0	7.4-8.4	Low------	0.0-0.5	0.02		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
388B2:												
Wenona----------	0-9	20-27	1.10-1.30	0.20-0.60	0.22-0.24	18.0-24.0	5.1-7.3	Moderate	3.0-4.0	0.32	5	6
	9-42	35-42	1.35-1.55	0.20-0.60	0.13-0.18	21.0-26.0	5.1-7.3	High-----	0.2-1.0	0.32		
	42-60	40-55	1.45-1.70	0.01-0.06	0.05-0.08	24.0-28.0	7.4-8.4	High-----	0.2-0.5	0.32		
388C2:												
Wenona----------	0-6	35-40	1.20-1.40	0.20-0.60	0.13-0.18	23.0-28.0	5.1-7.3	High-----	1.0-2.0	0.32	5	4
	6-54	35-42	1.35-1.55	0.20-0.60	0.13-0.18	21.0-26.0	5.1-7.3	High-----	0.2-1.0	0.32		
	54-60	40-55	1.45-1.70	0.01-0.06	0.05-0.08	24.0-28.0	7.4-8.4	High-----	0.2-0.5	0.32		
435:												
Streator--------	0-13	30-40	1.20-1.40	0.20-0.60	0.21-0.23	28.0-36.0	6.1-7.8	Moderate	5.0-6.0	0.28	5	7
	13-43	35-45	1.35-1.55	0.20-0.60	0.13-0.18	22.0-29.0	6.1-7.8	High-----	0.5-1.0	0.28		
	43-60	40-55	1.45-1.70	0.01-0.06	0.05-0.08	24.0-34.0	7.4-8.4	High-----	0.2-0.5	0.28		
440A:												
Jasper----------	0-14	10-22	1.30-1.45	0.60-2.00	0.20-0.24	10.0-24.0	5.1-7.3	Low------	3.0-5.0	0.28	5	5
	14-41	20-32	1.40-1.60	0.60-2.00	0.17-0.19	8.0-21.0	5.1-7.3	Low------	0.5-1.0	0.28		
	41-60	12-20	1.40-1.60	0.60-2.00	0.14-0.16	4.0-12.0	5.6-7.8	Low------	0.0-0.5	0.28		
440B:												
Jasper----------	0-16	10-22	1.30-1.45	0.60-2.00	0.20-0.24	10.0-24.0	5.1-7.3	Low------	3.0-5.0	0.28	5	5
	16-40	20-32	1.40-1.60	0.60-2.00	0.16-0.18	8.0-21.0	5.1-7.3	Low------	0.5-1.0	0.28		
	40-60	12-20	1.40-1.60	0.60-2.00	0.14-0.16	4.0-12.0	5.6-7.8	Low------	0.0-0.5	0.28		
440C2:												
Jasper----------	0-8	10-22	1.30-1.45	0.60-2.00	0.20-0.24	10.0-24.0	5.1-7.3	Low------	3.0-5.0	0.28	5	5
	8-50	20-32	1.40-1.60	0.60-2.00	0.17-0.19	8.0-21.0	5.1-7.3	Low------	0.5-1.0	0.28		
	50-60	12-20	1.40-1.60	0.60-2.00	0.14-0.16	4.0-12.0	5.6-7.8	Low------	0.0-0.5	0.28		
484A:												
Harco-----------	0-15	20-30	1.20-1.35	0.60-2.00	0.22-0.24	18.0-26.0	6.1-7.3	Low------	3.0-5.0	0.32	5	6
	15-34	24-35	1.25-1.45	0.60-2.00	0.18-0.20	15.0-23.0	6.1-7.3	Moderate	0.5-1.0	0.32		
	34-60	20-27	1.30-1.50	0.60-2.00	0.20-0.22	13.0-18.0	7.4-8.4	Low------	0.5-1.0	0.32		
533:												
Urban land.												
536:												
Dumps, mine.												
541B2:												
Graymont--------	0-10	15-24	1.10-1.30	0.60-2.00	0.22-0.24	15.0-23.0	5.6-7.3	Low------	3.0-4.0	0.32	5	6
	10-34	23-35	1.30-1.55	0.60-2.00	0.18-0.20	17.0-23.0	5.1-7.3	Moderate	0.5-1.0	0.32		
	34-60	27-35	1.45-1.70	0.06-0.20	0.14-0.20	16.0-22.0	6.6-8.4	Moderate	0.2-0.5	0.32		
541C2:												
Graymont--------	0-8	22-27	1.10-1.30	0.60-2.00	0.22-0.24	21.0-24.0	6.1-7.3	Low------	4.0-5.0	0.32	4	6
	8-34	25-35	1.25-1.45	0.60-2.00	0.16-0.20	16.0-27.0	5.6-7.3	Moderate	0.0-1.0	0.43		
	34-60	22-40	1.50-1.75	0.06-0.20	0.14-0.18	10.0-24.0	6.6-8.4	Moderate	0.0-0.4	0.28		
567B:												
Elkhart---------	0-9	20-27	1.15-1.35	0.60-2.00	0.22-0.24	16.0-24.0	5.6-7.8	Low------	2.0-4.0	0.32	5	6
	9-37	25-35	1.25-1.45	0.60-2.00	0.18-0.20	15.0-22.0	5.6-8.4	Moderate	0.0-0.5	0.43		
	37-60	20-27	1.35-1.55	0.60-2.00	0.20-0.22	12.0-21.0	7.4-8.4	Low------	0.0-0.1	0.43		
570A:												
Martinsville----	0-8	8-20	1.30-1.60	0.60-2.00	0.18-0.24	5.0-16.0	5.1-7.3	Low------	1.0-3.0	0.28	5	5
	8-26	15-33	1.40-1.60	0.60-2.00	0.15-0.21	6.0-17.0	5.1-7.3	Moderate	0.0-1.0	0.28		
	26-31	20-33	1.40-1.60	0.60-2.00	0.15-0.19	6.0-17.0	5.1-7.3	Moderate	0.0-0.5	0.28		
	31-45	15-25	1.40-1.65	0.60-2.00	0.10-0.19	2.0-12.0	5.6-7.8	Low------	0.0-0.5	0.20		
	45-60	5-20	1.50-1.70	0.60-2.00	0.08-0.17	1.0-10.0	7.4-8.4	Low------	0.0-0.5	0.28		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
570B:												
Martinsville----	0-5	5-15	1.40-1.60	2.00-6.00	0.13-0.18	4.0-13.0	5.1-7.3	Low------	1.0-2.0	0.24	5	3
	5-24	15-33	1.40-1.60	0.60-2.00	0.15-0.21	6.0-17.0	5.1-7.3	Moderate	0.0-1.0	0.28		
	24-57	15-25	1.40-1.65	0.60-2.00	0.10-0.19	2.0-12.0	5.6-7.8	Low------	0.0-0.5	0.20		
	57-60	5-20	1.50-1.70	0.60-2.00	0.08-0.17	1.0-10.0	7.4-8.4	Low------	0.0-0.5	0.28		
570C2:												
Martinsville----	0-6	12-20	1.35-1.45	0.60-2.00	0.20-0.22	5.0-16.0	5.1-7.3	Low------	0.5-2.0	0.37	5	5
	6-30	20-33	1.40-1.60	0.60-2.00	0.16-0.20	8.0-21.0	5.1-6.5	Moderate	0.0-0.5	0.37		
	30-60	15-25	1.40-1.60	0.60-2.00	0.12-0.17	6.0-15.0	5.1-6.5	Low------	0.0-0.2	0.24		
614A:												
Chenoa----------	0-14	27-32	1.10-1.30	0.60-2.00	0.21-0.23	24.0-29.0	5.6-7.3	Moderate	4.0-5.0	0.28	4	7
	14-34	27-45	1.25-1.45	0.60-2.00	0.16-0.20	16.0-29.0	5.6-7.3	Moderate	0.0-1.0	0.43		
	34-60	25-40	1.50-1.75	0.06-0.20	0.12-0.20	15.0-25.0	7.4-8.4	Moderate	0.0-0.5	0.28		
614B2:												
Chenoa----------	0-8	27-32	1.10-1.30	0.60-2.00	0.21-0.23	24.0-29.0	5.6-7.3	Moderate	4.0-5.0	0.28	4	7
	8-28	27-45	1.25-1.45	0.60-2.00	0.16-0.20	16.0-29.0	5.6-7.3	Moderate	0.0-1.0	0.43		
	28-60	25-40	1.50-1.75	0.06-0.20	0.14-0.20	15.0-25.0	7.4-8.4	Moderate	0.0-0.5	0.28		
689B:												
Coloma----------	0-10	0-10	1.35-1.65	6.00-20.00	0.05-0.09	1.0-12.0	4.5-7.3	Low------	0.5-2.0	0.15	5	1
	10-27	0-10	1.35-1.65	6.00-20.00	0.05-0.12	0.0-9.0	4.5-7.3	Low------	0.0-0.5	0.15		
	27-60	2-12	1.50-1.65	2.00-20.00	0.03-0.08	0.0-11.0	4.5-7.8	Low------	0.0-0.5	0.15		
689D:												
Coloma----------	0-12	0-10	1.35-1.65	6.00-20.00	0.05-0.09	1.0-12.0	4.5-7.3	Low------	0.5-2.0	0.15	5	1
	12-25	0-10	1.35-1.65	6.00-20.00	0.05-0.12	0.0-9.0	4.5-7.3	Low------	0.0-0.5	0.15		
	25-60	2-12	1.50-1.65	2.00-20.00	0.03-0.08	0.0-11.0	4.5-7.8	Low------	0.0-0.5	0.15		
802:												
Orthents.												
865:												
Pits, gravel.												
935F:												
Miami-----------	0-6	11-22	1.20-1.65	0.60-2.00	0.17-0.26	7.0-17.0	5.6-7.3	Low------	1.0-3.0	0.37	4	5
	6-30	27-35	1.40-1.70	0.60-2.00	0.07-0.21	9.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
	30-60	15-25	1.60-1.80	0.20-0.60	0.07-0.17	4.0-11.0	6.6-8.4	Low------	0.0-0.5	0.37		
Hennepin--------	0-6	20-30	1.20-1.40	0.60-2.00	0.18-0.24	14.0-22.0	6.1-7.8	Low------	1.0-2.0	0.28	5	6
	6-20	18-30	1.30-1.60	0.20-0.60	0.14-0.22	11.0-19.0	6.1-8.4	Low------	0.0-0.5	0.32		
	20-60	18-30	1.70-1.85	0.20-0.60	0.10-0.15	11.0-18.0	7.4-8.4	Low------	0.0-0.5	0.32		
935G:												
Miami-----------	0-12	11-22	1.20-1.65	0.60-2.00	0.17-0.26	7.0-17.0	5.7-7.3	Low------	1.0-3.0	0.37	4	5
	12-29	27-35	1.40-1.70	0.60-2.00	0.07-0.21	9.0-20.0	5.1-8.4	Moderate	0.0-0.5	0.37		
	29-60	15-25	1.60-1.80	0.20-0.60	0.07-0.17	4.0-11.0	6.6-8.4	Low------	0.0-0.5	0.37		
Hennepin--------	0-3	20-30	1.20-1.40	0.60-2.00	0.18-0.24	14.0-22.0	6.1-7.8	Low------	1.0-2.0	0.28	5	6
	3-15	18-30	1.30-1.60	0.20-0.60	0.14-0.22	11.0-19.0	6.1-8.4	Low------	0.0-0.5	0.32		
	15-60	18-30	1.70-1.85	0.20-0.60	0.10-0.15	11.0-18.0	7.4-8.4	Low------	0.0-0.5	0.32		
3092:												
Sarpy-----------	0-10	2-5	1.20-1.50	6.00-20.00	0.05-0.09	2.0-8.0	6.6-8.4	Low------	0.5-1.0	0.17	5	2
	10-60	2-5	1.20-1.50	6.00-20.00	0.05-0.09	2.0-8.0	7.4-8.4	Low------	0.0-0.5	0.15		

Table 16.--Physical and Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Cation- exchange capacity	Soil reaction	Shrink- swell potential	Organic matter	Erosion factors K	Erosion factors T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in	meq/100g	pH		Pct			
3107:												
Sawmill----------	0-17	27-35	1.20-1.40	0.60-2.00	0.21-0.23	24.0-31.0	6.1-7.8	Moderate	4.0-5.0	0.28	5	7
	17-27	27-35	1.20-1.40	0.60-2.00	0.21-0.23	17.0-27.0	6.1-7.8	Moderate	1.0-3.0	0.28		
	27-60	25-35	1.30-1.45	0.60-2.00	0.17-0.20	16.0-25.0	6.1-7.8	Moderate	0.0-2.0	0.28		
3304:												
Landes-----------	0-19	7-20	1.40-1.60	2.00-6.00	0.13-0.20	6.0-16.0	5.6-8.4	Low-------	1.0-2.0	0.20	4	3
	19-39	5-18	1.60-1.70	2.00-6.00	0.10-0.15	3.0-15.0	5.6-8.4	Low-------	0.0-2.0	0.24		
	39-60	5-18	1.60-1.80	6.00-20.00	0.05-0.15	3.0-15.0	5.6-8.4	Low-------	0.0-2.0	0.15		
3360:												
Slacwater--------	0-6	15-30	1.35-1.65	0.60-2.00	0.20-0.24	10.0-20.0	7.4-8.4	Low-------	1.0-2.0	0.32	5	4L
	6-60	8-35	1.35-1.55	0.60-2.00	0.17-0.20	5.0-22.0	7.4-8.4	Low-------	0.0-0.5	0.32		
8073:												
Ross-------------	0-19	15-27	1.20-1.45	0.60-2.00	0.19-0.24	12.0-26.0	6.1-7.8	Low-------	3.0-5.0	0.32	5	5
	19-50	18-32	1.20-1.50	0.60-2.00	0.16-0.22	8.0-20.0	6.1-8.4	Low-------	1.0-3.0	0.32		
	50-60	5-25	1.35-1.60	0.60-6.00	0.05-0.18	2.0-15.0	6.1-8.4	Low-------	0.5-2.0	0.32		
8074:												
Radford----------	0-10	18-27	1.40-1.60	0.60-2.00	0.22-0.24	13.0-22.0	5.6-7.8	Low-------	2.0-4.0	0.28	5	6
	10-31	18-27	1.40-1.60	0.60-2.00	0.20-0.22	10.0-16.0	6.1-7.8	Low-------	0.0-2.0	0.28		
	31-60	24-35	1.35-1.55	0.60-2.00	0.18-0.20	12.0-19.0	6.6-7.8	Moderate	0.0-1.0	0.28		
8077:												
Huntsville-------	0-54	18-27	1.15-1.35	0.60-2.00	0.22-0.24	17.0-24.0	6.1-7.3	Moderate	3.0-4.0	0.28	5	6
	54-60	15-25	1.20-1.50	0.60-2.00	0.12-0.21	9.0-17.0	6.1-7.8	Low-------	0.2-1.0	0.43		
8107:												
Sawmill----------	0-21	27-35	1.20-1.40	0.60-2.00	0.21-0.23	24.0-31.0	6.1-7.8	Moderate	4.0-5.0	0.28	5	7
	21-26	27-35	1.20-1.40	0.60-2.00	0.21-0.23	17.0-27.0	6.1-7.8	Moderate	1.0-3.0	0.28		
	26-60	25-35	1.30-1.45	0.60-2.00	0.17-0.20	16.0-25.0	6.1-7.8	Moderate	0.0-2.0	0.28		
8368:												
Raveenwash-------	0-17	5-20	1.15-1.40	0.60-6.00	0.20-0.24	4.0-16.0	7.4-8.4	Low-------	0.5-2.0	0.28	5	4L
	17-60	3-18	1.50-1.70	2.00-20.00	0.12-0.19	2.0-12.0	7.4-8.4	Low-------	0.2-0.5	0.28		
8400:												
Calco------------	0-36	28-33	1.25-1.30	0.60-2.00	0.21-0.23	36.0-41.0	7.4-8.4	Moderate	5.0-7.0	0.28	5	4L
	36-60	30-35	1.25-1.30	0.60-2.00	0.21-0.23	36.0-41.0	7.4-8.4	Moderate	3.0-5.0	0.28		
8402:												
Colo-------------	0-8	20-26	1.25-1.30	0.60-2.00	0.22-0.24	25.0-30.0	5.6-7.3	Moderate	3.0-5.0	0.28	5	6
	8-44	30-35	1.25-1.35	0.60-2.00	0.18-0.20	36.0-41.0	5.6-7.3	Moderate	3.0-4.0	0.28		
	44-60	25-35	1.35-1.45	0.60-2.00	0.18-0.20	30.0-36.0	6.1-7.8	Moderate	1.0-2.0	0.32		
8451:												
Lawson-----------	0-22	10-27	1.20-1.55	0.60-2.00	0.22-0.24	11.0-28.0	6.1-7.8	Low-------	3.0-7.0	0.28	5	5
	22-40	10-30	1.20-1.55	0.60-2.00	0.18-0.22	11.0-29.0	6.1-7.8	Low-------	3.0-7.0	0.28		
	40-54	18-30	1.55-1.65	0.60-2.00	0.18-0.20	11.0-23.0	6.1-7.8	Moderate	1.0-4.0	0.43		
	54-60	18-30	1.50-1.70	0.60-2.00	0.11-0.15	9.0-17.0	6.1-7.8	Moderate	0.1-1.0	0.43		

Table 17.--Soil and Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
17A, 17B2:										
Keomah	C	---	---	---	1.0-2.0	Apparent	Nov-Jul	High	High	Moderate.
27C2, 27D2:										
Miami	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
36B:										
Tama	B	---	---	---	2.0-4.0	Apparent	Nov-Jun	High	Moderate	Moderate.
43A, 43B:										
Ipava	B	---	---	---	1.0-2.0	Apparent	Mar-Jun	High	High	Moderate.
60C2, 60C3:										
La Rose	B	---	---	---	>6.0	---	---	Moderate	Moderate	Low.
61A:										
Atterberry	B	---	---	---	1.0-2.0	Apparent	Mar-Jun	High	High	Moderate.
67:										
Harpster	B	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Low.
68:										
Sable	B	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Low.
91A, 91B2:										
Swygert	C	---	---	---	1.0-2.0	Apparent	Feb-May	High	High	Low.
100:										
Palms	A/D	---	---	---	+1.0-1.0	Apparent	Nov-Jun	High	High	Moderate.
125:										
Selma	B/D	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Low.
131A, 131B, 131C, 131D, 131F:										
Alvin	B	---	---	---	>6.0	---	---	Moderate	Low	High.
134A, 134B, 134C2:										
Camden	B	---	---	---	>6.0	---	---	High	Low	Moderate.
145B, 145B2, 145C2:										
Saybrook	B	---	---	---	2.0-4.0	Apparent	Mar-Jun	High	High	Moderate.
148A:										
Proctor	B	---	---	---	4.0-6.0	Apparent	Jan-May	High	Moderate	Moderate.
148B:										
Proctor	B	---	---	---	>6.0	---	---	High	Moderate	Moderate.
152:										
Drummer	B	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Moderate.
154A, 154B:										
Flanagan	B	---	---	---	1.0-2.0	Apparent	Mar-Jun	High	High	Moderate.

Table 17.--Soil and Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
171B, 171B2, 171C2:										
Catlin	B	---	---	---	2.0-4.0	Apparent	Feb-May	High	High	Moderate.
194C2:										
Morley	C	---	---	---	2.0-4.0	Apparent	Mar-May	Moderate	High	Moderate.
198A:										
Elburn	B	---	---	---	1.0-2.0	Apparent	Feb-Jun	High	High	Moderate.
199A:										
Plano	B	---	---	---	4.0-6.0	Apparent	Mar-May	High	Moderate	Low.
199B:										
Plano	B	---	---	---	>6.0	---	---	High	Moderate	Low.
210:										
Lena	A/D	---	---	---	+1.0-1.0	Apparent	Nov-Jun	High	High	Low.
221B2, 221C2:										
Parr	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
223B2, 223C2:										
Varna	C	---	---	---	2.0-4.0	Apparent	Feb-Jun	High	Moderate	Moderate.
223D:										
Varna	C	---	---	---	>6.0	---	---	High	Moderate	Moderate.
224D2, 224E, 224E2:										
Strawn	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
233B2, 233C2, 233D2:										
Birkbeck	B	---	---	---	2.0-4.0	Apparent	Mar-May	High	High	Moderate.
236A:										
Sabina	C	---	---	---	1.0-2.0	Apparent	Mar-Jun	High	High	Moderate.
241C2:										
Chatsworth	D	---	---	---	>6.0	---	---	Moderate	High	Low.
243A:										
St. Charles	B	---	---	---	4.0-6.0	Apparent	Feb-Jun	High	Moderate	Moderate.
243B:										
St. Charles	B	---	---	---	>6.0	---	---	High	Moderate	Moderate.
279B2:										
Rozetta	B	---	---	---	2.0-4.0	Apparent	Mar-Jun	High	Moderate	Moderate.
290A:										
Warsaw	B	---	---	---	>6.0	---	---	Moderate	Low	Moderate.
322C2, 322D2:										
Russell	B	---	---	---	>6.0	---	---	High	Moderate	Moderate.
327C2:										
Fox	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
330:										
Peotone	B	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Moderate.

Table 17.--Soil and Water Features--Continued

Map symbol and soil name	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Water table depth	High water table: Kind of water table	High water table: Months	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft					
356:										
Elpaso	B	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Moderate.
369A:										
Waupecan	B	---	---	---	4.0-6.0	Apparent	Mar-May	High	Moderate	Moderate.
369B:										
Waupecan	B	---	---	---	>6.0	---	---	High	Moderate	Moderate.
375A, 375B, 375B2:										
Rutland	C	---	---	---	1.0-2.0	Apparent	Mar-May	High	High	Moderate.
379A:										
Dakota	B	---	---	---	>6.0	---	---	Moderate	Low	Moderate.
386B:										
Downs	B	---	---	---	2.0-4.0	Apparent	Mar-Jun	High	Moderate	Moderate.
387A:										
Ockley	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
388B2:										
Wenona	C	---	---	---	2.0-4.0	Apparent	Mar-Jun	Moderate	High	Moderate.
388C2:										
Wenona	C	---	---	---	2.0-4.0	Perched	Mar-Jun	Moderate	High	Moderate.
435:										
Streator	B/D	---	---	---	+0.5-1.0	Apparent	Feb-Jun	High	High	Low.
440A, 440B, 440C2:										
Jasper	B	---	---	---	>6.0	---	---	Moderate	Moderate	High.
484A:										
Harco	B	---	---	---	1.0-2.0	Apparent	Feb-Apr	High	High	Low.
533:										
Urban land.										
536:										
Dumps, mine.										
541B2, 541C2:										
Graymont	B	---	---	---	2.0-4.0	Apparent	Mar-Jun	High	High	Moderate.
567B:										
Elkhart	B	---	---	---	2.0-4.0	Apparent	Mar-May	High	Moderate	Moderate.
570A, 570B, 570C2:										
Martinsville	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
614A, 614B2:										
Chenoa	B	---	---	---	1.0-2.0	Apparent	Mar-Jun	High	High	Moderate.
689B, 689D:										
Coloma	A	---	---	---	>6.0	---	---	Low	Low	Moderate.
802:										
Orthents.										

Table 17.--Soil and Water Features--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Water table depth	Kind of water table	Months		Uncoated steel	Concrete
					Ft					
865:										
Pits, gravel.										
935F, 935G:										
Miami-----------	B	---	---	---	>6.0	---	---	Moderate	Moderate	Moderate.
Hennepin--------	B	---	---	---	>6.0	---	---	Moderate	Low------	Low.
3092:										
Sarpy-----------	A	Frequent	Long------	Nov-Jun	4.0-6.0	Apparent---	Mar-May	Low------	Low------	Low.
3107:										
Sawmill---------	B	Frequent	Brief-----	Mar-Jun	+0.5-1.0	Apparent---	Feb-Jun	High-----	High-----	Low.
3304:										
Landes----------	B	Frequent	Brief-----	Feb-Jun	>6.0	---	---	Moderate	Low------	Low.
3360:										
Slacwater-------	B/D	Frequent	Very long or long.	Nov-Jun	+0.5-1.0	Apparent---	Nov-Jun	High-----	High-----	Low.
8073:										
Ross------------	B	Occasional	Brief-----	Mar-Jun	4.0-6.0	Apparent---	Feb-Apr	Moderate	Low------	Low.
8074:										
Radford---------	B	Occasional	Brief-----	Mar-Jun	1.0-2.0	Apparent---	Mar-Jun	High-----	High-----	Low.
8077:										
Huntsville------	B	Occasional	Brief-----	Mar-Jun	4.0-6.0	Apparent---	Mar-Jun	High-----	Low------	Low.
8107:										
Sawmill---------	B/D	Occasional	Brief-----	Mar-Jun	+0.5-1.0	Apparent---	Mar-Jun	High-----	High-----	Low.
8368:										
Raveenwash------	A	Occasional	Brief or long.	Nov-Jun	1.0-2.0	Apparent---	Nov-Jun	Moderate	Low------	Low.
8400:										
Calco-----------	B/D	Occasional	Long------	Feb-Jun	+0.5-1.0	Apparent---	Nov-Jun	High-----	High-----	Low.
8402:										
Colo------------	B	Occasional	Brief-----	Oct-Jun	+0.5-1.0	Apparent---	Mar-Jun	High-----	High-----	Moderate.
8451:										
Lawson----------	B	Occasional	Brief-----	Mar-Jun	1.0-2.0	Apparent---	Nov-May	High-----	Moderate	Low.

Table 18.--Classification of the Soils

(This classification does not include recent amendments to soil taxonomy for cation-exchange activity, particle-size modifier, and dual mineralogy for strongly contrasting classes. For more detailed information, contact the local or State office of the Natural Resources Conservation Service. An asterisk in the first column indicates that some or all of the map units of that soil name are taxadjuncts. See text for a description of those characteristics that are outside the range for the series)

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
Atterberry	Fine-silty, mixed, mesic Udollic Ochraqualfs
Birkbeck	Fine-silty, mixed, mesic Typic Hapludalfs
Calco	Fine-silty, mixed (calcareous), mesic Cumulic Haplaquolls
Camden	Fine-silty, mixed, mesic Typic Hapludalfs
Catlin	Fine-silty, mixed, mesic Typic Argiudolls
Chatsworth	Fine, illitic, mesic Typic Eutrochrepts
*Chenoa	Fine, illitic, mesic Aquic Argiudolls
Colo	Fine-silty, mixed, mesic Cumulic Haplaquolls
Coloma	Mixed, mesic Argic Udipsamments
Dakota	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
*Downs	Fine-silty, mixed, mesic Mollic Hapludalfs
Drummer	Fine-silty, mixed, mesic Typic Haplaquolls
Elburn	Fine-silty, mixed, mesic Aquic Argiudolls
*Elkhart	Fine-silty, mixed, mesic Typic Argiudolls
Elpaso	Fine-silty, mixed, mesic Typic Haplaquolls
Flanagan	Fine, montmorillonitic, mesic Aquic Argiudolls
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Hapludalfs
*Graymont	Fine-silty, mixed, mesic Typic Argiudolls
Harco	Fine-silty, mixed, mesic Aquic Argiudolls
Harpster	Fine-silty, mesic Typic Calciaquolls
Hennepin	Fine-loamy, mixed, mesic Typic Eutrochrepts
Huntsville	Fine-silty, mixed, mesic Cumulic Hapludolls
Ipava	Fine, montmorillonitic, mesic Aquic Argiudolls
Jasper	Fine-loamy, mixed, mesic Typic Argiudolls
Keomah	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
*La Rose	Fine-loamy, mixed, mesic Typic Argiudolls
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Lena	Euic, mesic Typic Medisaprists
Martinsville	Fine-loamy, mixed, mesic Typic Hapludalfs
*Miami	Fine-loamy, mixed, mesic Typic Hapludalfs
Morley	Fine, illitic, mesic Typic Hapludalfs
Ockley	Fine-loamy, mixed, mesic Typic Hapludalfs
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
*Parr	Fine-loamy, mixed, mesic Typic Argiudolls
Peotone	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Plano	Fine-silty, mixed, mesic Typic Argiudolls
Proctor	Fine-silty, mixed, mesic Typic Argiudolls
Radford	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Raveenwash	Coarse-loamy, mixed (calcareous), mesic Aquic Udifluvents
Ross	Fine-loamy, mixed, mesic Cumulic Hapludolls
*Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Russell	Fine-silty, mixed, mesic Typic Hapludalfs
Rutland	Fine, montmorillonitic, mesic Aquic Argiudolls
Sabina	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sarpy	Mixed, mesic Typic Udipsamments
Sawmill	Fine-silty, mixed, mesic Cumulic Haplaquolls
*Saybrook	Fine-silty, mixed, mesic Typic Argiudolls
Selma	Fine-loamy, mixed, mesic Typic Haplaquolls
Slacwater	Coarse-silty, mixed, calcareous, mesic Typic Fluvaquents
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Strawn	Fine-loamy, mixed, mesic Typic Hapludalfs
Streator	Fine, montmorillonitic, mesic Typic Haplaquolls

Table 18.--Classification of the Soils--Continued

Soil name	Family or higher taxonomic class
*Swygert	Fine, mixed, mesic Aquic Argiudolls
*Tama	Fine-silty, mixed, mesic Typic Argiudolls
*Varna	Fine, illitic, mesic Typic Argiudolls
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Typic Argiudolls
Waupecan	Fine-silty, mixed, mesic Typic Argiudolls
*Wenona	Fine, montmorillonitic, mesic Typic Argiudolls

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