



United States
Department of
Agriculture



Natural
Resources
Conservation
Service

In cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Schuyler County, Illinois



How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, 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.

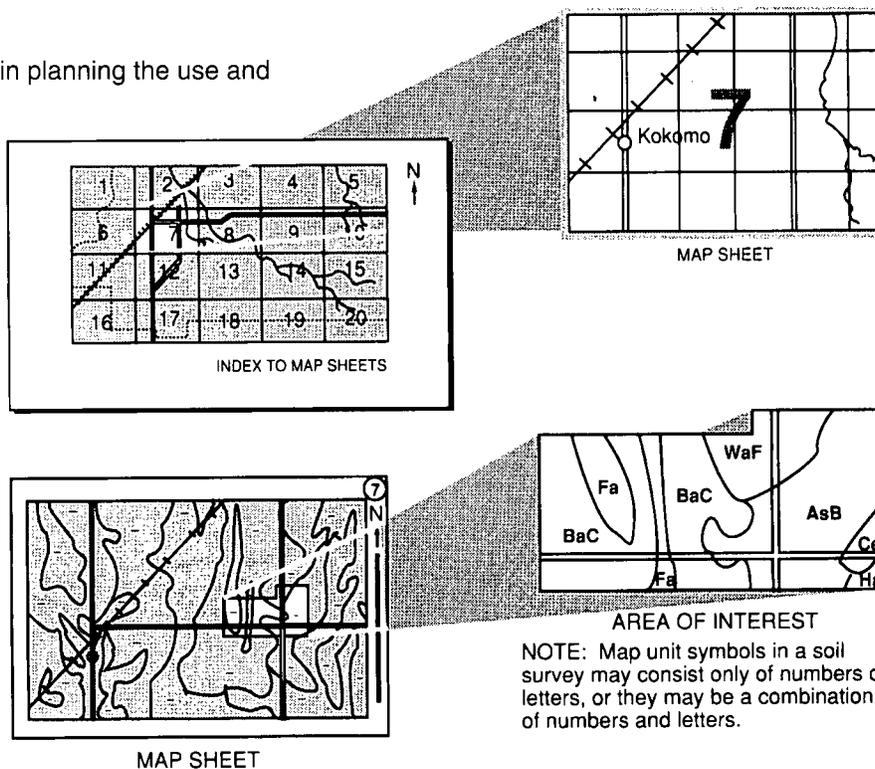
Detailed Soil Maps

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

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

Locate your area of interest on the map sheet. Note the map unit 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 (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1990. Soil names and descriptions were approved in 1991. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1991. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Schuyler County Soil and Water Conservation District. The cost of the survey was shared by the Schuyler County Board and the Illinois Department of Agriculture.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: A pastured area of the moderately steep to very steep Hickory and Gosport soils.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is <http://www.nrcs.usda.gov>.

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, 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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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.

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Soil Survey of Schuyler County, Illinois

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

SCHUYLER COUNTY is in the west-central part of Illinois (fig. 1). It has a total area of 281,920 acres, or about 440 square miles. It is an irregularly shaped county, bounded on the north by McDonough and Fulton Counties, on the west by Hancock and Adams Counties, on the southwest by Brown County and the La Moine River, and on the southeast by the Illinois River. Rushville is the county seat and the largest town. It has a population of 3,343 (Schuyler County Extension Office, 1990).

This soil survey updates the survey of Schuyler County published in 1934 (Norton et al., 1934). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information about Schuyler County. It describes history and development; relief, physiography, and drainage; transportation facilities; natural resources; and climate.

History and Development

The area now known as Schuyler County was originally part of the Indiana Territory. Later, it was included as part of the Illinois Territory, which was established in 1809.

The first settlers arrived in the area in 1823, and within 2 years the area had sufficient population to become a county. Schuyler County was established on January 13, 1825. It was named in honor of Philip Schuyler, a soldier of the French and Indian Wars, a

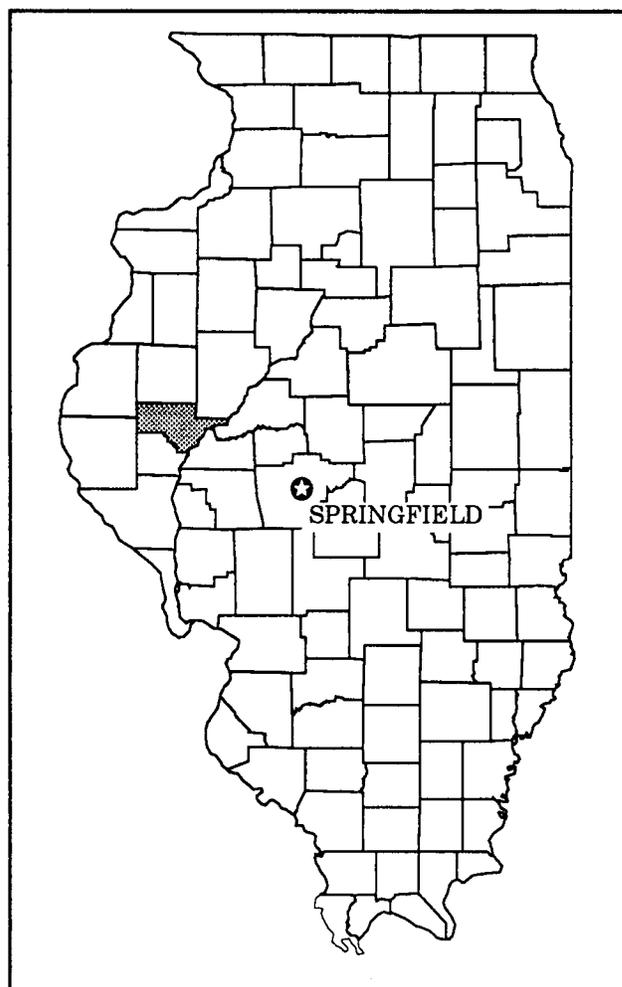


Figure 1.—Location of Schuyler County in Illinois.

Major General in the American Revolution, a member of the Continental Congress, and a United States Senator from New York (W.R. Brink & Co., 1882). At this time, the county included the areas now known as Schuyler and Brown Counties. Brown County was later established as a separate county in 1839 (W.R. Brink & Co., 1882). The population of Schuyler County grew rapidly after its founding until 1900, when it peaked at 16,129 (Illinois Cooperative Reporting Service, 1969). The population has steadily decreased since 1900. It was 8,365 in 1990 (Schuyler County Extension Office, 1990).

Agriculture is the principal land use and industry in the county. Most other industries are related to agriculture. In 1890, the county had 2,162 farms averaging 121 acres in size (Illinois Cooperative Reporting Service, 1969). By 1987, the number of farms had been reduced to 594 and the average size had increased to 393 acres (Illinois Agricultural Statistics Service, 1989).

Livestock production has always been an important part of the agricultural activity in Schuyler County. The number of animals on farms peaked in 1900, when the county had about 27,260 cattle and 63,300 hogs (Illinois Cooperative Reporting Service, 1969). Livestock numbers have since steadily declined. In 1980, the number of cattle was 16,100 and the number of hogs was 38,000 (Illinois Agricultural Statistics Service, 1989).

In 1925, a total of 41,951 acres in the county was used for corn or soybeans (Illinois Cooperative Reporting Service, 1969). By 1988, the acreage used for these crops had increased to 100,900 acres. Most of this change resulted from a decrease in the acreage of small grain crops and the conversion of pasture to cropland.

Coal mining began in Schuyler County in 1883. The early mines were either small drift mines or vertical shaft mines. Strip mining started in 1935 (Illinois Department of Energy and Natural Resources, 1987). According to the Schuyler County NRCS Field Office, the county has 3,867 acres of strip-mined land that has not been returned to agricultural production except as pasture or wildlife habitat. About 1,438 acres has been reclaimed to its original productive capacity. The county currently has about 35,925 acres of stripable coal reserves.

Relief, Physiography, and Drainage

The topography of Schuyler County is rugged, by Illinois standards, in all but the north-central part, where slopes level to form a rich fertile plain. Elevation ranges from 425 feet above sea level on the flood plain

along the Illinois River, near the mouth of the La Moine River, to 750 feet above sea level directly south of the village of Pleasant View.

The upland features in Schuyler County are derived from the dissected Illinoian glacial till plain, which is covered by Wisconsin loess. Pennsylvanian and Mississippian bedrock is exposed on some of the steeper slopes. Water-laid deposits of Cahokia Alluvium and the Equality Formation form the valleys in the county.

The area southeast of U.S. Route 24 and northeast of U.S. Route 67 is drained directly into the Illinois River through small tributaries. The rest of the county is drained into the La Moine River before this river enters the Illinois River.

Flood control on the flood plain along the Illinois River and land treatment on the cropland in the uplands are provided by the Coal and Crane Creek PL-566 Watershed. The watershed encompasses 29,600 acres of highly erodible land.

The Corp of Engineers has constructed levees along the Illinois River. Private levees have been constructed along part of the La Moine River. Flooding along the La Moine River affects as much as 8,000 acres of cropland. Annual damage approaches \$1.5 million, according to the Schuyler County NRCS Field Office.

Transportation Facilities

Two major highways meet in Rushville. These are U.S. Route 67, which crosses the county from north to south, and U.S. Route 24, which crosses the county from southwest to northeast. Illinois Route 103 connects U.S. Route 67 and U.S. Route 24 in the southern part of the county. Illinois Route 100 starts at the junction of Illinois Route 103 and U.S. Route 67 and runs northeast along the Illinois River. Illinois Route 101 runs west from U.S. Route 67 in the northern part of the county. Illinois Route 99 runs in a north-south direction in the western part of the county from .

The county has a docking facility for barges on the Illinois River. The Burlington Northern Railroad runs in a north-south direction along the eastern side of the county.

Natural Resources

Soil is a major natural resource in Schuyler County. It supports agricultural production, which is the main industry in the county. Other major natural resources are timber and deposits of sand, gravel, and coal. Also, the county has several oil and gas wells.

Climate

Prepared by the National Water and Climate Center, Natural Resources Conservation Service, Portland, Oregon.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Rushville 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 the length of the growing season.

In winter, the average temperature is 27.0 degrees F and the average daily minimum temperature is 17.9 degrees. The lowest temperature on record, which occurred at Rushville on January 15, 1979, is -26 degrees. In summer, the average temperature is 74.6 degrees and the average daily maximum temperature is 86.3 degrees. The highest temperature, which occurred at Rushville on August 19, 1983, is 106 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 the spring and the first freeze in fall.

The total annual precipitation is 40 inches. Of this, nearly 25 inches, or more than 60 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.35 inches at Rushville on May 20, 1984. Thunderstorms occur on about 48 days each year, and most occur in June.

The average seasonal snowfall is 24.4 inches. The greatest snow depth at any one time during the period of record was 20 inches on January 28, 1979. On the average, 30 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 10.5 inches on January 19, 1987.

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, 12.1 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area.

The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; 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 and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area 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-vegetation-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 soil 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. Soil taxonomy, 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 all of 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.

General Soil Map Units

The general soil map in 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 or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of 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.

Because of differences in the extent of the major soils, the names of the associations on the general soil map of Schuyler County do not completely agree with those on the published general soil maps of Adams and Brown Counties. These differences do not affect broad land use planning because the soils and parent materials are similar in terms of use and behavior.

Soil Associations in Schuyler County

1. Ipava-Virden Association

Nearly level and gently sloping, somewhat poorly drained and poorly drained, silty soils that formed in loess; on uplands

This association consists of soils on rises; broad, low ridges; and broad flats. These soils have a dark surface layer. Slopes range from 0 to 5 percent.

This association makes up about 12 percent of the county. The association is about 80 percent Ipava and similar soils, 12 percent Virden soils, and 8 percent soils of minor extent (fig. 2).

The nearly level and gently sloping, somewhat

poorly drained Ipava soils are on the crest of broad rises. The typical profile of these soils is as follows:

Surface layer:

0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:

9 to 12 inches—very dark grayish brown, friable silt loam

Subsoil:

12 to 24 inches—brown, mottled, friable and firm silty clay loam

24 to 50 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

50 to 60 inches—light brownish gray, mottled, firm silty clay loam

The nearly level, poorly drained Virden soils are in low areas on broad flats. The typical profile of these soils is as follows:

Surface layer:

0 to 9 inches—very dark gray, firm silty clay loam

Subsurface layer:

9 to 15 inches—very dark gray, firm silty clay loam

Subsoil:

15 to 21 inches—very dark gray, mottled, firm silty clay loam

21 to 33 inches—dark grayish brown and grayish brown, mottled, firm silty clay loam

33 to 53 inches—light olive gray, mottled, firm silty clay loam

Substratum:

53 to 60 inches—light olive gray, mottled, friable silt loam

Of minor extent in this association are the somewhat poorly drained Keller and moderately well drained Tama soils on the more sloping parts of the landscape.

In most areas the major soils in this association are used for cultivated crops. These soils are well suited to the cultivated crops commonly grown in the county. The main management concerns are maintaining or

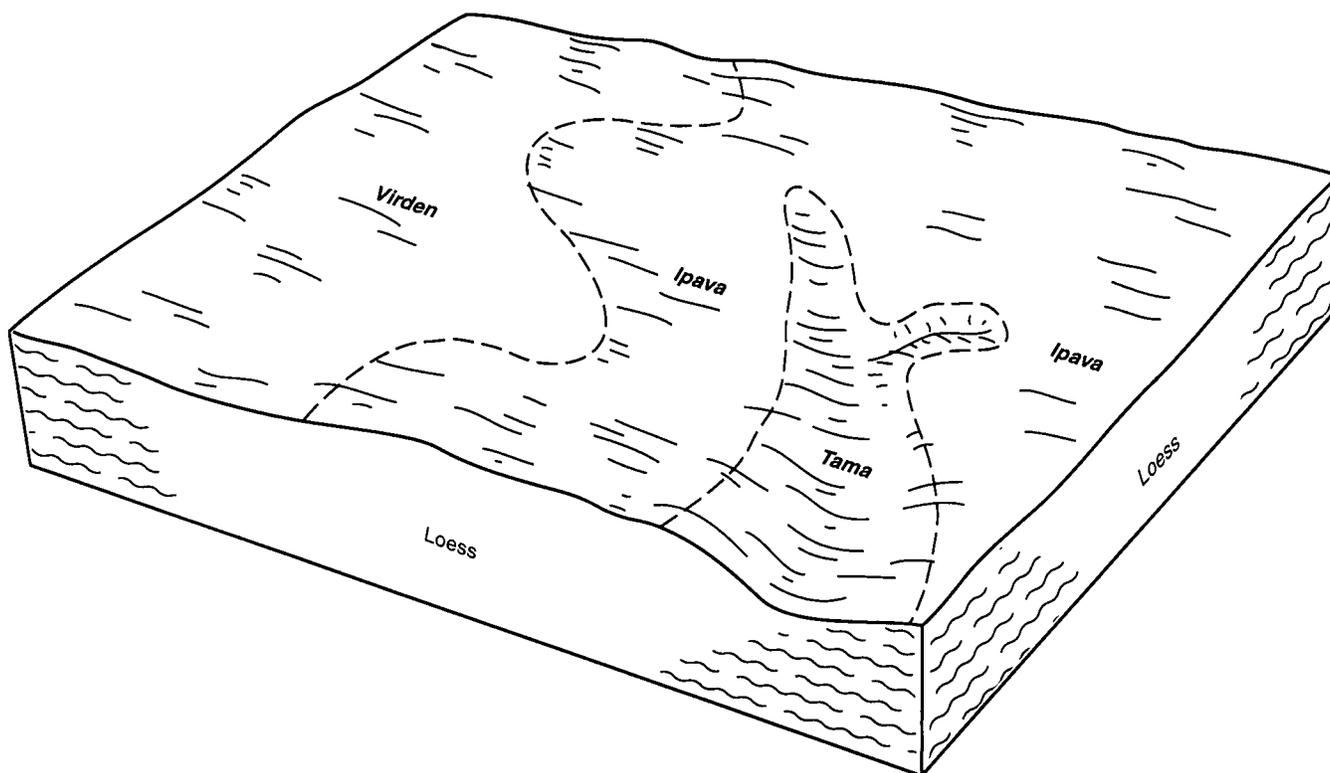


Figure 2.—Typical pattern of soils and underlying material in the Ipava-Virden association.

upgrading the drainage system, controlling erosion in the more sloping areas, and maintaining tilth and fertility.

The Ipava soils are poorly suited to development as sites for dwellings and septic tank absorption fields. The seasonal high water table, the shrink-swell potential, and moderately slow permeability are limitations. The Virden soils are generally unsuited to these uses because of ponding.

2. Keomah-Rozetta-Fishhook Association

Nearly level to moderately sloping, somewhat poorly drained and moderately well drained, silty soils that formed in loess or in loess and a paleosol, which formed in glacial till; on uplands

This association consists of soils on the crest of broad ridges and side slopes. These soils have a light colored surface layer that tends to crust after hard rains. Closed depressions occur in some of the nearly level areas. Slopes range from 0 to 10 percent.

This association makes up about 23 percent of the county. The association is about 39 percent Keomah soils, 32 percent Rozetta soils, 14 percent Fishhook soils, and 15 percent soils of minor extent (fig. 3).

The nearly level and gently sloping, somewhat poorly drained Keomah soils are on the crest of broad

ridges and on head slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:

6 to 10 inches—brown, friable silt loam

Subsoil:

10 to 28 inches—brown, mottled, firm silty clay loam

28 to 40 inches—grayish brown, mottled, firm silty clay loam

40 to 58 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

58 to 60 inches—light brownish gray, mottled, friable silt loam

The gently sloping and moderately sloping, moderately well drained Rozetta soils are on the crest and shoulders of ridges and on shoulder slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 7 inches—brown, friable silt loam

Subsurface layer:

7 to 11 inches—brown, friable silt loam

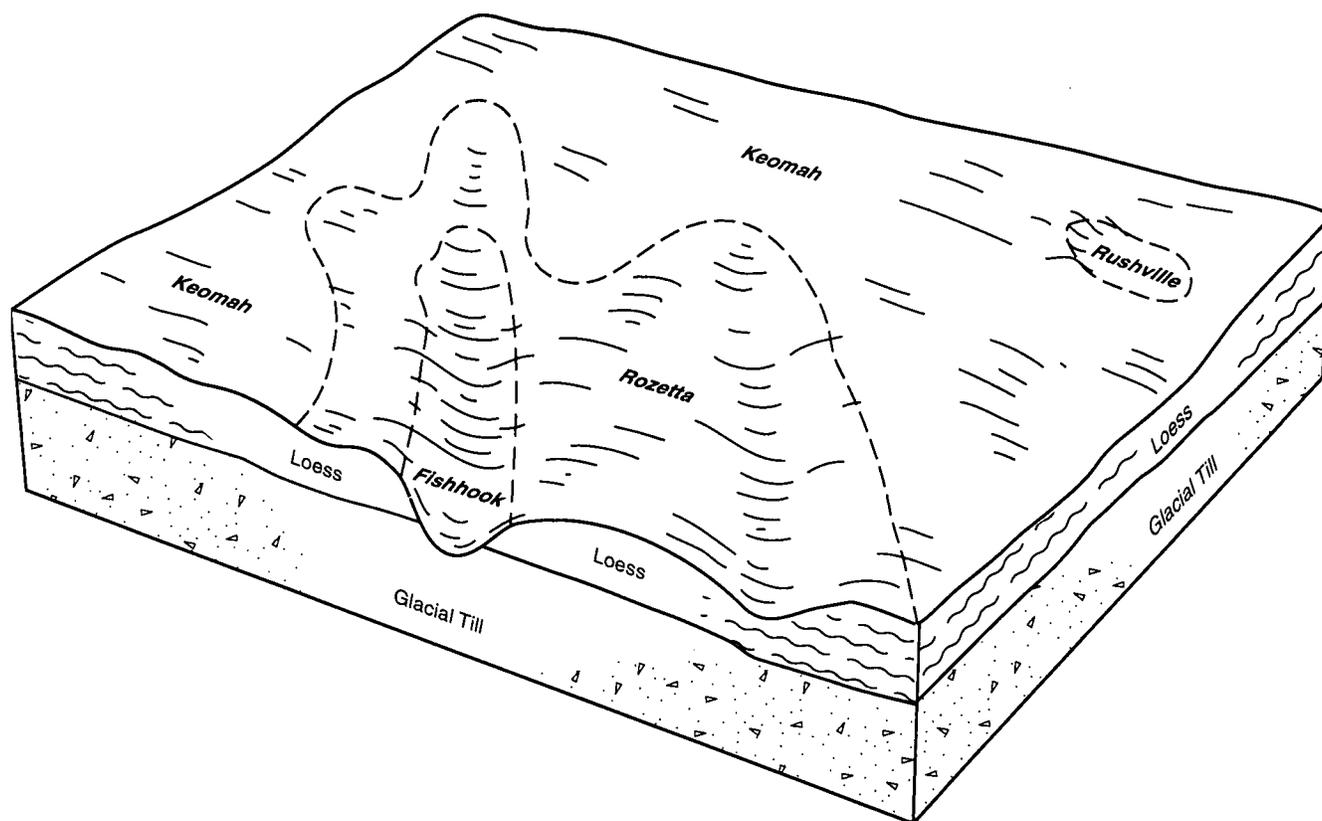


Figure 3.—Typical pattern of soils and underlying material in the Keomah-Rozetta-Fishhook association.

Subsoil:

- 11 to 25 inches—yellowish brown, firm silty clay loam
- 25 to 48 inches—yellowish brown, mottled, firm silty clay loam
- 48 to 60 inches—light yellowish brown, mottled, firm silty clay loam

The moderately sloping, somewhat poorly drained Fishhook soils are on shoulder slopes. The typical profile of these soils is as follows:

Surface layer:

- 0 to 4 inches—mixed dark grayish brown and brown, friable silt loam

Subsoil:

- 4 to 31 inches—brown and light gray, mottled, firm silty clay loam
- 31 to 60 inches—gray and light gray, mottled, very firm silty clay

Of minor extent in this association are Clarksdale, Rushville, and Ursa soils. The somewhat poorly drained Clarksdale soils are on the crest and shoulders of broad ridges. They have a thin dark

surface layer. The poorly drained Rushville soils are in depressions. The well drained Ursa soils formed in loess and the underlying glacial till. They are on side slopes along drainageways.

In most areas the major soils in this association are used for cultivated crops. Many of the steeper areas are used for hay and pasture. The major soils are well suited to the cultivated crops commonly grown in the county and to hay and pasture. The main management concerns are maintaining or upgrading the drainage system and controlling erosion. Measures that improve tilth and fertility also are needed.

The Fishhook and Keomah soils are poorly suited to development as sites for dwellings and septic tank absorption fields, and the Rozetta soils are moderately suited to these uses. The seasonal high water table, the shrink-swell potential, and moderate to slow permeability are limitations.

3. Fayette-Hickory-Seaton Association

Strongly sloping to very steep, well drained, silty and loamy soils that formed in loess or in loess and glacial till; on uplands

This association consists of soils on side slopes.

Shale and sandstone escarpments are adjacent to the bottom land in some steep areas. These soils have a light colored surface layer that tends to crust after hard rains. Slopes range from 10 to 60 percent.

This association makes up about 12 percent of the county. The association is about 39 percent Fayette soils, 25 percent Hickory soils, 20 percent Seaton soils, and 16 percent soils of minor extent (fig. 4).

The strongly sloping, well drained Fayette soils formed in more than 60 inches of loess. They are on shoulder and back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 8 inches—brown, friable silt loam

Subsoil:

8 to 53 inches—dark yellowish brown, friable and firm silty clay loam

53 to 60 inches—dark yellowish brown, firm silt loam

The steep and very steep, well drained Hickory soils formed in less than 15 inches of loess and in the

underlying glacial till. They are on back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 4 inches—very dark grayish brown, friable loam

Subsurface layer:

4 to 6 inches—brown, friable loam

Subsoil:

6 to 34 inches—yellowish brown, friable and firm clay loam

34 to 54 inches—yellowish brown and pale brown, mottled, firm clay loam

Substratum:

54 to 60 inches—light yellowish brown, mottled, friable loam

The steep, well drained Seaton soils formed in more than 60 inches of loess. They are on back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 5 inches—very dark grayish brown, friable silt loam

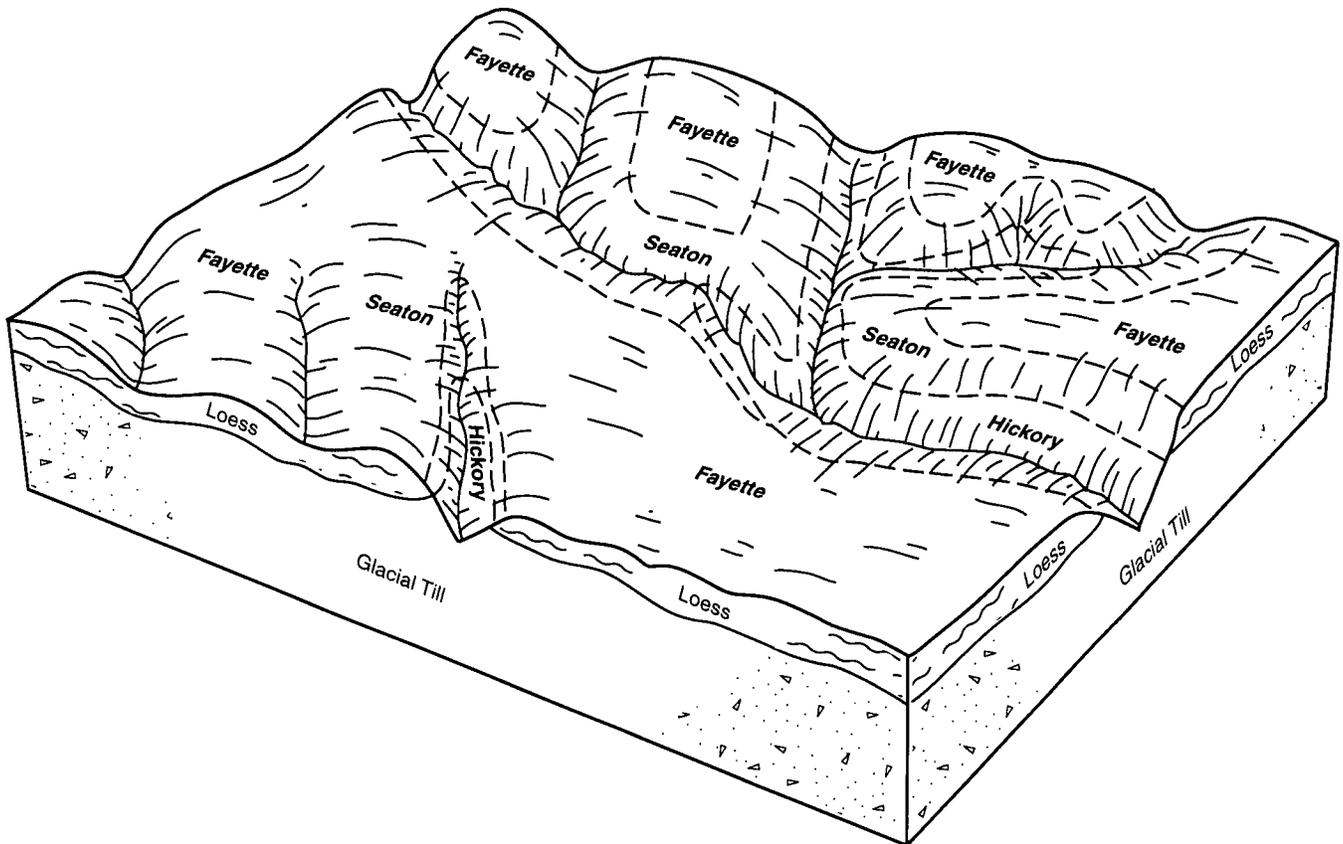


Figure 4.—Typical pattern of soils and underlying material in the Fayette-Hickory-Seaton association.

Subsurface layer:

5 to 10 inches—dark grayish brown, friable silt loam

Subsoil:

10 to 19 inches—brown and yellowish brown, friable silt loam

19 to 45 inches—yellowish brown, firm silt loam

45 to 52 inches—brown, mottled, firm silt loam

Substratum:

52 to 60 inches—pale brown, mottled, friable silt loam

Of minor extent in this association are the somewhat poorly drained Wakeland and moderately well drained Wilbur soils on narrow flood plains.

In most areas the major soils in this association are used as woodland. Some areas are used for hay and pasture. Some of the less sloping areas are used for cultivated crops. The major soils are well suited or moderately suited to woodland in the strongly sloping to steep areas. The strongly sloping areas are well suited to hay and pasture, and the steep areas are moderately suited. The strongly sloping areas are moderately suited to the cultivated crops commonly grown in the county. The main management concerns are controlling erosion and improving tilth and fertility.

The strongly sloping Fayette soils are moderately suited to development as sites for dwellings and septic tank absorption fields, and the steep Hickory and Seaton soils are poorly suited to these uses. The slope and the shrink-swell potential are limitations. The very steep Hickory soils are generally unsuited to these uses because of the excessive slope.

4. Fayette-Sylvan Association

Gently sloping to strongly sloping, well drained, silty soils that formed in loess; on uplands

This association consists of soils on convex ridges and side slopes. These soils have a light colored surface layer that tends to crust after hard rains. Slopes range from 2 to 18 percent.

This association makes up about 5 percent of the county. The association is about 64 percent Fayette soils, 22 percent Sylvan soils, and 14 percent soils of minor extent (fig. 5).

The gently sloping to strongly sloping, well drained Fayette soils formed in more than 60 inches of loess. They are on the crest and shoulders of ridges and on shoulder and back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 8 inches—brown, friable silt loam

Subsoil:

8 to 53 inches—dark yellowish brown, friable and firm silty clay loam

53 to 60 inches—dark yellowish brown, firm silt loam

The moderately sloping and strongly sloping, well drained Sylvan soils are on back and shoulder slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 6 inches—dark yellowish brown, friable silty clay loam

Subsoil:

6 to 11 inches—dark yellowish brown, firm silty clay loam

11 to 22 inches—yellowish brown, mottled, firm silty clay loam

22 to 29 inches—yellowish brown, mottled, friable silt loam

Substratum:

29 to 52 inches—yellowish brown, mottled, friable silt loam

52 to 60 inches—grayish brown, mottled, friable silt loam

Of minor extent in this association are Downs, Keomah, and Rozetta soils. The moderately well drained Downs soils are on the crest of ridges. They have a thin dark surface layer. The somewhat poorly drained Keomah and moderately well drained Rozetta soils are on the crest of broad ridges.

In most areas the major soils in this association are used for cultivated crops. Some areas are used for hay and pasture. The nearly level and gently sloping areas are well suited to the cultivated crops commonly grown in the county and to hay and pasture. The moderately eroded, moderately sloping and strongly sloping areas are moderately suited to cultivated crops and well suited to hay and pasture. The severely eroded, moderately sloping and strongly sloping areas are poorly suited to cultivated crops and moderately suited to hay and pasture. The main management concerns are controlling erosion and improving tilth and fertility.

The major soils are moderately suited to development as sites for dwellings. The gently sloping and moderately sloping areas of these soils are well suited septic tank absorption fields, and the strongly sloping areas of the soils are moderately suited. The slope and the shrink-swell potential are limitations.

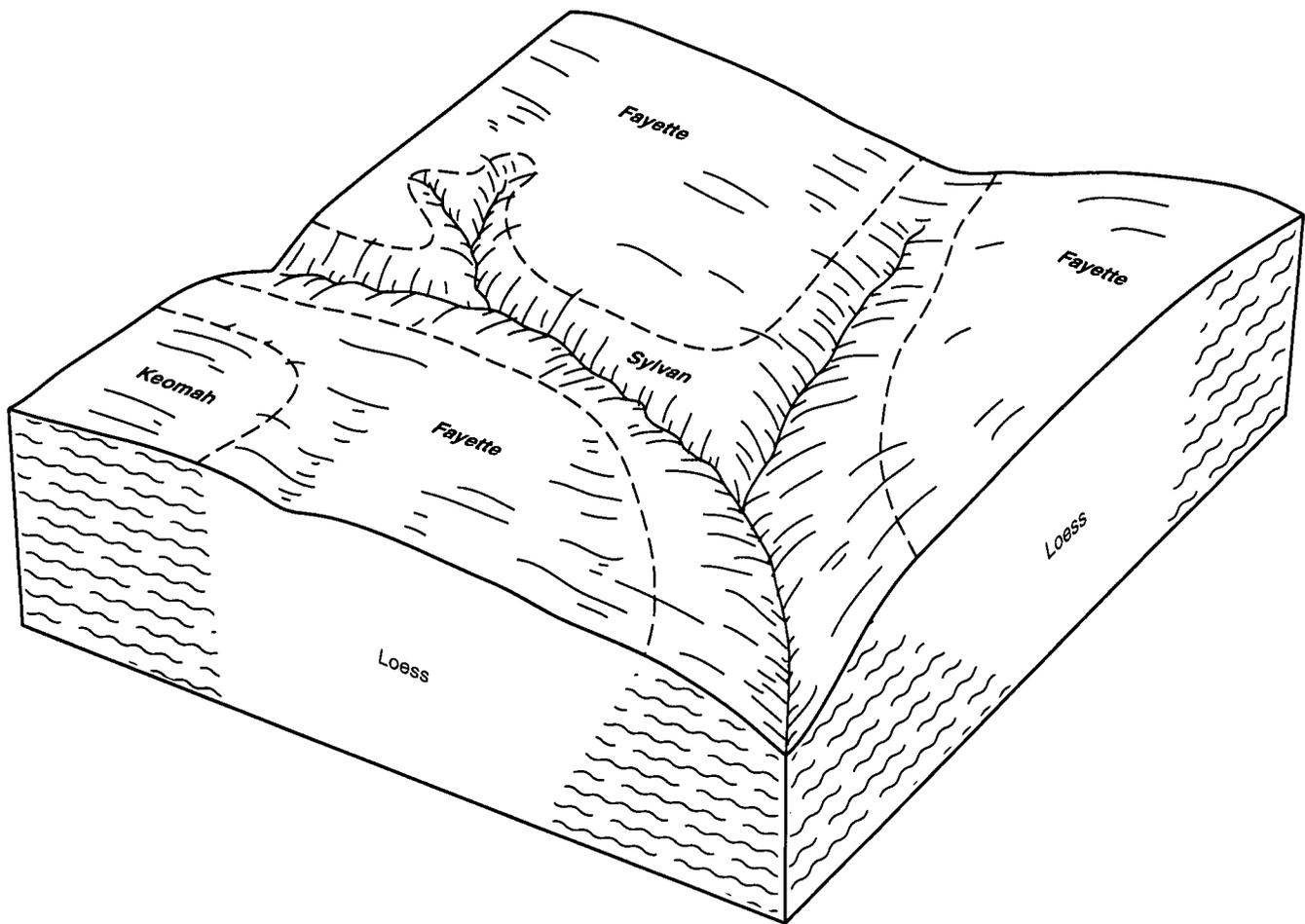


Figure 5.—Typical pattern of soils and underlying material in the Fayette-Sylvan association.

5. Hickory-Rozetta-Gosport Association

Gently sloping to very steep, well drained and moderately well drained, silty and loamy soils that formed in loess and glacial till, loess, or shale residuum; on uplands

This association consists of soils on side slopes and ridges. Shale and sandstone escarpments are adjacent to the bottom land in some steep areas. These soils have a light colored surface layer that tends to crust after hard rains. Slopes range from 2 to 60 percent.

This association makes up about 30 percent of the county. The association is about 52 percent Hickory soils, 25 percent Rozetta soils, 7 percent Gosport soils, and 16 percent soils of minor extent (fig. 6).

The steep and very steep, well drained Hickory soils formed in less than 15 inches of loess and in the underlying glacial till. They are on back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 4 inches—very dark grayish brown, friable loam

Subsurface layer:

4 to 6 inches—brown, friable loam

Subsoil:

6 to 34 inches—yellowish brown, friable and firm clay loam

34 to 54 inches—yellowish brown and pale brown, mottled, firm clay loam

Substratum:

54 to 60 inches—light yellowish brown, mottled, friable loam

The gently sloping and moderately sloping, moderately well drained Rozetta soils formed in more than 60 inches of loess. They are on the crest and shoulders of ridges and on shoulder slopes. The typical profile of these soils is as follows:

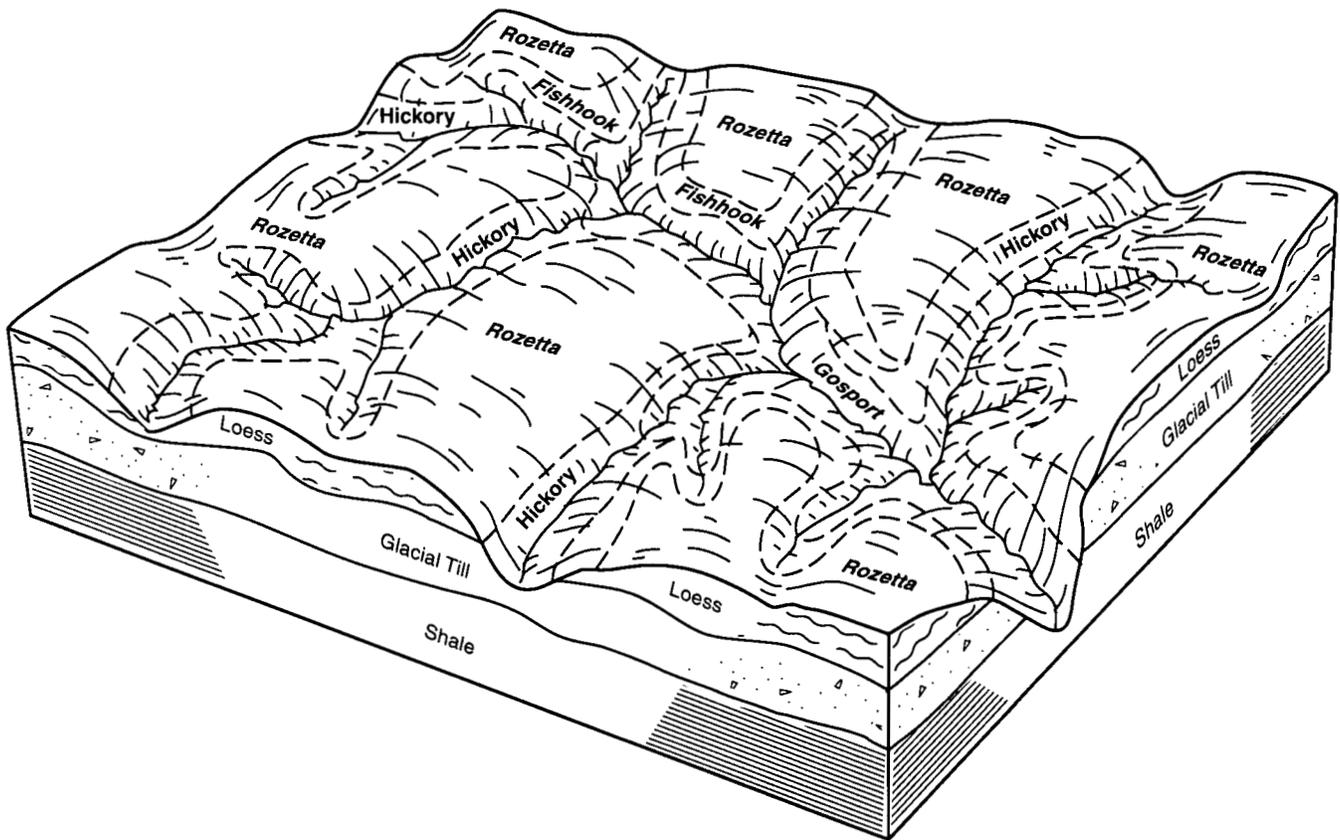


Figure 6.—Typical pattern of soils and underlying material in the Hickory-Rozetta-Gosport association.

Surface layer:

0 to 7 inches—brown, friable silt loam

Subsurface layer:

7 to 11 inches—brown, friable silt loam

Subsoil:

- 11 to 25 inches—yellowish brown, firm silty clay loam
- 25 to 48 inches—yellowish brown, mottled, firm silty clay loam
- 48 to 60 inches—light yellowish brown, mottled, firm silty clay loam

The steep and very steep, moderately well drained, moderately deep Gosport soils are formed in shale residuum. They are on back slopes downslope from the Hickory soils. The typical profile of the Gosport soils is as follows:

Surface layer:

0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:

4 to 7 inches—brown, friable silty clay loam

Subsoil:

- 7 to 10 inches—yellowish brown, firm silty clay
- 10 to 16 inches—light olive brown, mottled, firm silty clay
- 16 to 21 inches—light yellowish brown, mottled, firm silty clay
- 21 to 27 inches—light brownish gray, mottled, very firm silty clay

Bedrock:

27 to 60 inches—grayish brown, very firm clay shale

Of minor extent in this association are Fishhook, Ursa, and Wakeland soils. The somewhat poorly drained Fishhook and well drained Ursa soils are on side slopes along drainageways and are upslope from the Hickory and Gosport soils. The somewhat poorly drained Wakeland soils are on narrow flood plains.

In most areas the major soils in this association are used as woodland. Some areas are used for hay and pasture. Some of the less sloping areas are used for cultivated crops. The Hickory and Rozetta soils are

well suited to woodland, and the Gosport soils are poorly suited. The Hickory and Rozetta soils are well suited, moderately suited, or poorly suited to hay and pasture, and the Gosport soils are generally unsuited. The Rozetta soils are well suited, moderately suited or poorly suited to the cultivated crops commonly grown in the county. The main management concerns are controlling erosion and improving tilth and fertility.

The steep Hickory soils are poorly suited development as sites for dwellings and septic tank absorption fields, and the Rozetta soils are moderately suited to these uses. The slope and the shrink-swell potential are limitations. The very steep Hickory and Gosport soils are generally unsuited to these uses because of the excessive slope.

6. Wakeland-Wilbur Association

Nearly level, somewhat poorly drained and moderately well drained, silty soils that formed in alluvium; on frequently flooded flood plains

This association consists of soils on narrow creek bottom land and in areas where creeks empty into

major tributaries. Old channel scars and silted-in oxbows are on some creek bottoms. These soils have a light colored surface layer that tends to crust after hard rains. Slopes range from 0 to 2 percent.

This association makes up about 6 percent of the county. The association is about 60 percent Wakeland soils, 31 percent Wilbur soils, and 9 percent soils of minor extent and water (fig. 7).

The nearly level, somewhat poorly drained Wakeland soils are on flood plains. The typical profile of these soils is as follows:

Surface layer:

0 to 9 inches—dark grayish brown, friable silt loam

Underlying material:

9 to 52 inches—dark grayish brown and brown, mottled, friable silt loam

52 to 60 inches—strata of dark grayish brown and brown, mottled, friable silt loam

The nearly level, moderately well drained Wilbur soils are on flood plains. The typical profile of these soils is as follows:

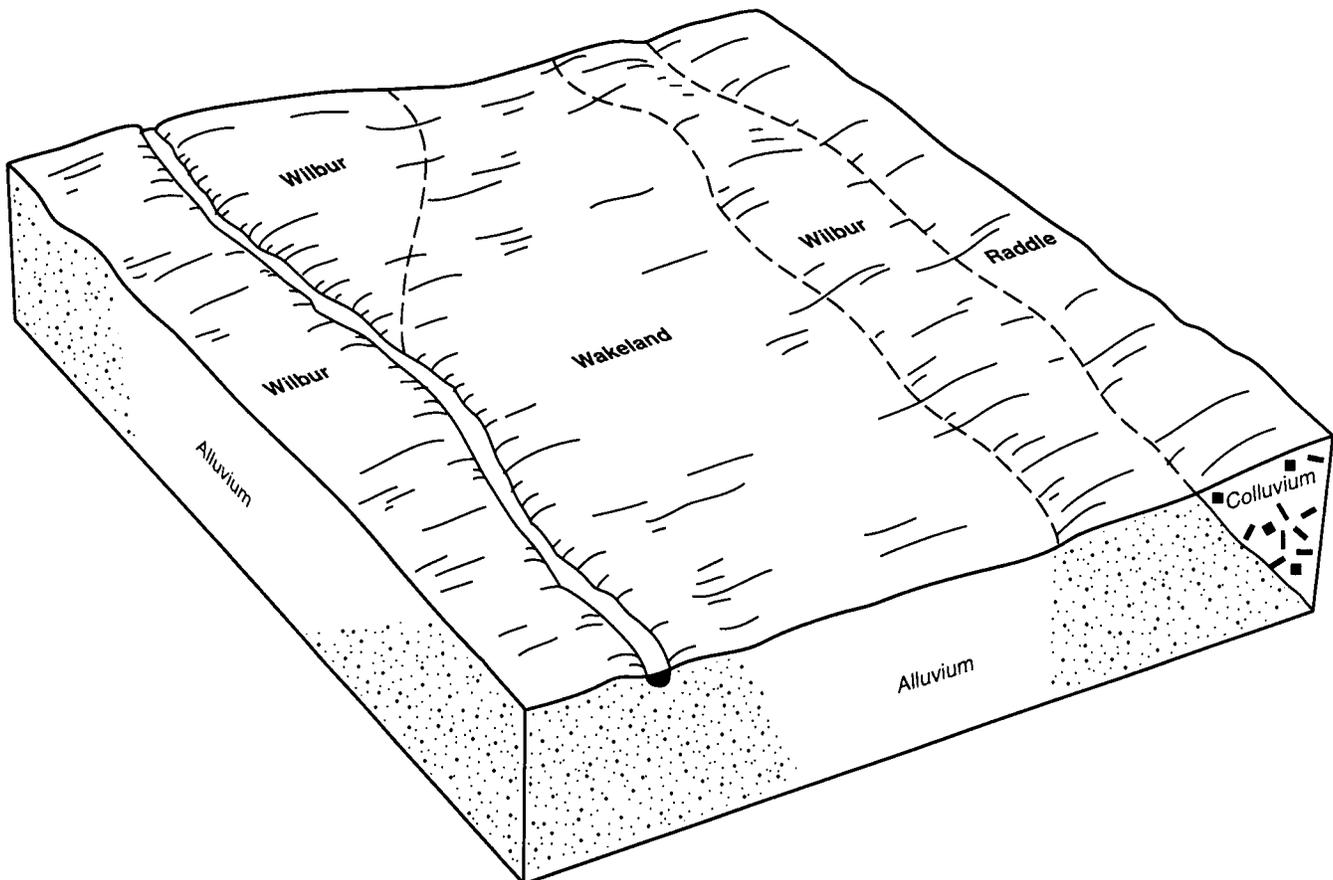


Figure 7.—Typical pattern of soils and underlying material in the Wakeland-Wilbur association.

Surface layer:

0 to 6 inches—brown, friable silt loam

Underlying material:

6 to 38 inches—brown, mottled, friable silt loam

38 to 60 inches—grayish brown, mottled, friable, stratified silt loam and loam

Of minor extent in this association are Kendall, Raddle, and St. Charles soils. The well drained, rarely flooded Raddle soils and are on foot slopes adjacent to bluffs. They have a dark surface layer. The somewhat poorly drained Kendall and well drained St. Charles soils are on stream terraces and are not subject to flooding.

In most areas the major soils in this association are used for cultivated crops. Some areas remain wooded. These soils are well suited to the cultivated crops commonly grown in the county. The main management concerns are protecting the soils from flooding, maintaining or upgrading the drainage system, and improving tilth and fertility.

Because of the hazard of flooding, the major soils

generally are not suited to development as sites for dwellings and septic tank absorption fields.

7. **Beaucoup-Darwin-Tice Association**

Nearly level, poorly drained, very poorly drained, and somewhat poorly drained, silty and clayey soils that formed in alluvium; on occasionally flooded flood plains

This association consists of soils on broad flood plains along the Illinois River. Shallow depressions and remnants of old ponds and lakebeds are common. These soils have a dark surface layer. Slopes range from 0 to 2 percent.

This association makes up about 7 percent of the county. The association is about 35 percent Beaucoup and similar soils, 23 percent Darwin soils, 13 percent Tice soils, and 29 percent soils of minor extent and water (fig. 8).

The nearly level, poorly drained Beaucoup soils are slightly higher on the flood plains than the Darwin soils and slightly lower on the flood plains than the Tice

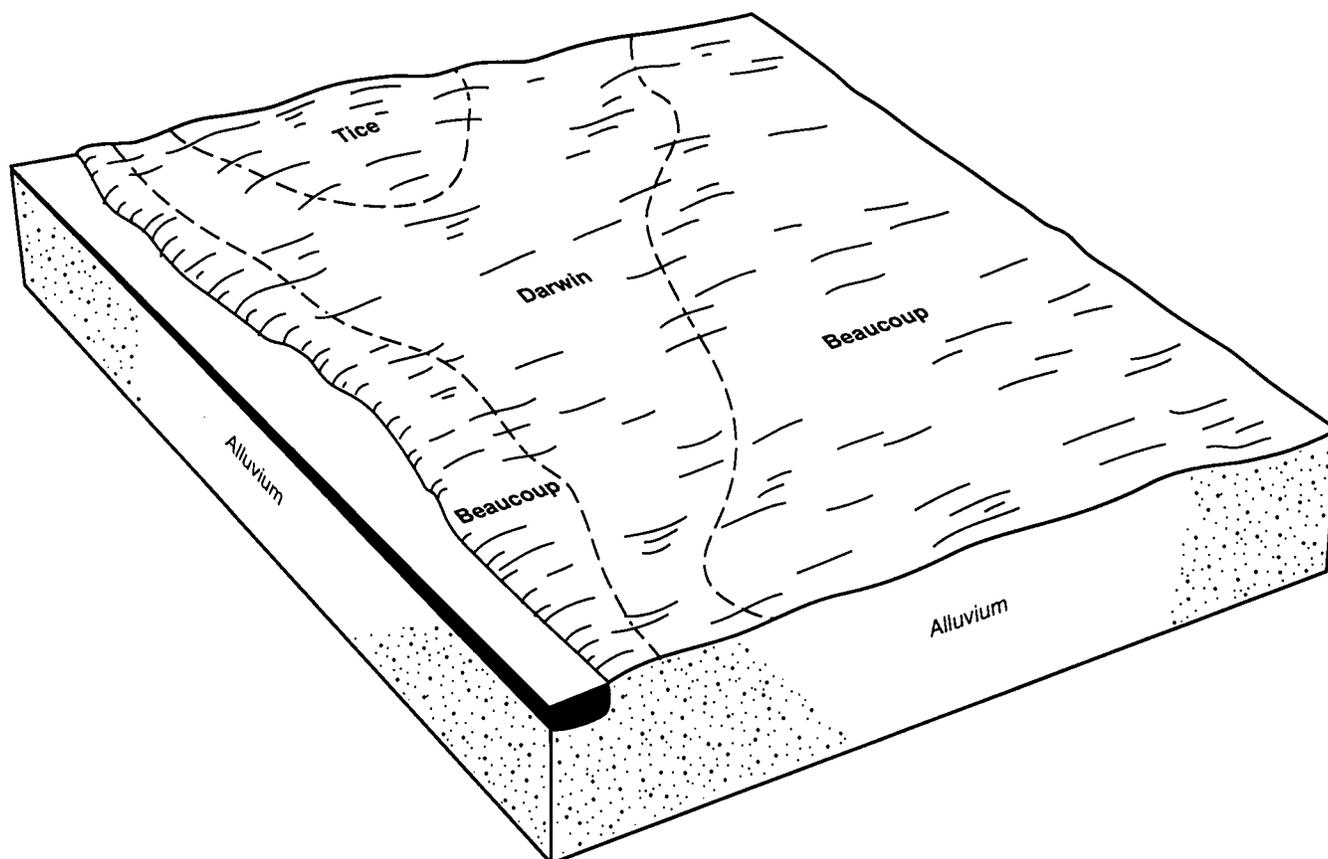


Figure 8.—Typical pattern of soils and underlying material in the Beaucoup-Darwin-Tice association.

soils. The typical profile of the Beaucoup soils is as follows:

Surface layer:

0 to 7 inches—very dark grayish brown, friable silty clay loam

Subsurface layer:

7 to 13 inches—very dark grayish brown, friable silty clay loam

Subsoil:

13 to 45 inches—dark olive gray and dark gray, mottled, firm silty clay loam

45 to 60 inches—dark gray, mottled, friable silty clay loam

The nearly level, very poorly drained Darwin soils are in the lowest positions on the flood plains. The typical profile of these soils is as follows:

Surface layer:

0 to 7 inches—very dark gray, firm silty clay

Subsurface layer:

7 to 12 inches—very dark gray, very firm silty clay

Subsoil:

12 to 27 inches—very dark gray and dark gray, mottled, very firm silty clay

27 to 40 inches—gray, mottled, firm silty clay

40 to 50 inches—gray, mottled, firm silty clay loam

Substratum:

50 to 60 inches—gray and dark gray, mottled, firm silty clay loam

The nearly level, somewhat poorly drained Tice soils are on broad, low rises on the flood plains. The typical profile of these soils is as follows:

Surface layer:

0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:

7 to 11 inches—very dark grayish brown friable silt loam

Subsoil:

11 to 35 inches—dark grayish brown, mottled, friable and firm silty clay loam

35 to 51 inches—grayish brown, mottled, firm silty clay loam

51 to 60 inches—grayish brown, mottled, firm silt loam

Of minor extent in this association are the somewhat poorly drained Orion and moderately well drained Wilbur soils. These soils are slightly higher on the flood plains than the major soils.

In most areas the major soils in this association are used for cultivated crops. The Beaucoup and Tice soils are well suited to the cultivated crops commonly grown in the county, and the Darwin soils are moderately suited. The main management concerns are maintaining or upgrading the drainage system and improving tilth.

Because of the hazard of flooding, the major soils generally are not suited to development as sites for dwellings and septic tank absorption fields.

8. Tice-Beaucoup Association

Nearly level, somewhat poorly drained and poorly drained, silty soils that formed in alluvium; on frequently flooded flood plains

This association consists of soils on flood plains along the major rivers. Shallow depressions are common. These soils have a dark surface layer. Slopes range from 0 to 2 percent.

This association makes up about 4 percent of the county. The association is about 51 percent Tice soils, 20 percent Beaucoup soils, and 29 percent soils of minor extent and water (fig. 9).

The nearly level, somewhat poorly drained Tice soils are on broad, low rises. The typical profile of Tice silty clay loam, frequently flooded, is as follows:

Surface layer:

0 to 11 inches—very dark grayish brown, firm silty clay loam

Subsurface layer:

11 to 15 inches—very dark grayish brown, firm silty clay loam

Subsoil:

15 to 24 inches—dark grayish brown, mottled, firm silty clay loam

24 to 37 inches—brown and dark yellowish brown, mottled, firm silty clay loam

37 to 60 inches—dark yellowish brown, mottled, friable loam and fine sandy loam

The nearly level, poorly drained Beaucoup soils are in low areas. The typical profile of Beaucoup silty clay loam, frequently flooded, is as follows:

Surface layer:

0 to 8 inches—very dark gray, firm silty clay loam

Subsurface layer:

8 to 16 inches—very dark grayish brown, mottled, firm silty clay loam

Subsoil:

16 to 60 inches—dark olive gray, mottled, firm silty clay loam

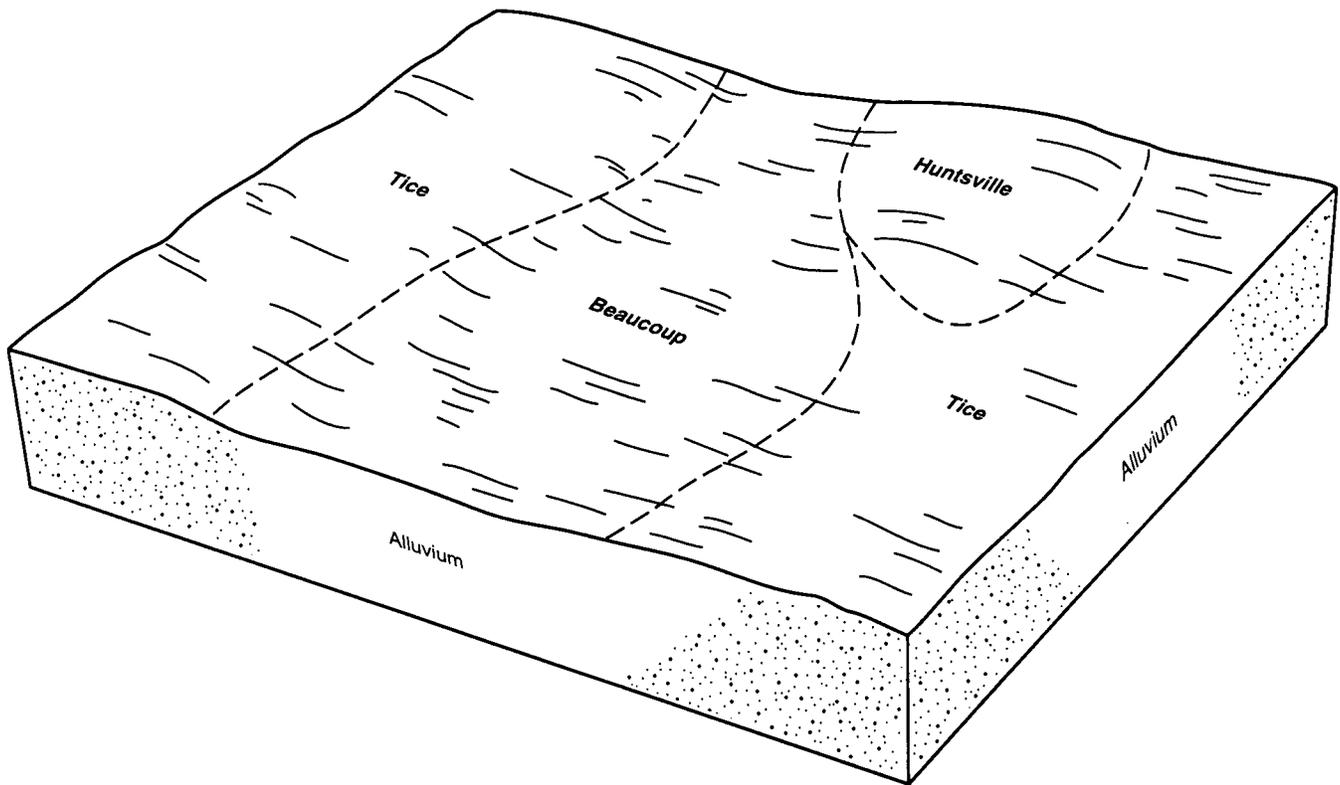


Figure 9.—Typical pattern of soils and underlying material in the Tice-Beaucoup association.

Of minor extent in this association are Huntsville and Wakeland soils. The moderately well drained Huntsville soils are slightly higher on the landscape than the major soils. The somewhat poorly drained Wakeland soils are in positions on the landscape similar to those of the Tice soils and are slightly higher on the landscape than the Beaucoup soils.

In most areas the major soils in this association are used for cultivated crops. These soils are well suited to the cultivated crops commonly grown in the county. The main management concerns are protecting the soils from flooding and maintaining or upgrading the drainage system.

Because of the hazard of flooding, the major soils generally are not suited to development as sites for dwellings and septic tank absorption fields.

9. Lenzburg-Swanwick-Rapatee Association

Gently sloping to very steep, well drained and moderately well drained, silty soils that formed in cast overburden or in replaced topsoil over subsoil and underlying material over cast overburden from strip-mining operations; on uplands

This association consists of soils in unreclaimed areas on prominent, narrow ridges with steep side

slopes and in reclaimed areas on broad ridges. Slopes range from 1 to 60 percent.

This association makes up about 1 percent of the county. The association is about 55 percent Lenzburg soils, 21 percent Swanwick soils, 19 percent Rapatee soils, and 5 percent soils of minor extent.

The very steep, well drained Lenzburg soils formed in unreclaimed cast overburden. They are on the crest of prominent, narrow ridges and on back slopes. The typical profile of these soils is as follows:

Surface layer:

0 to 5 inches—very dark grayish brown, very firm silty clay loam

Substratum:

5 to 16 inches—brown and dark yellowish brown, mottled, very firm silty clay loam

16 to 23 inches—brown and grayish brown, mottled, firm clay loam

23 to 27 inches—gray, mottled, firm silty clay loam

27 to 60 inches—yellowish brown, mottled, friable and very friable clay loam

The gently sloping, moderately well drained Swanwick soils formed in replaced topsoil over a mixture of subsoil and underlying material over cast

overburden. They are on the crest and shoulders of broad reconstructed ridges. The typical profile of these soils is as follows:

Surface layer:

0 to 11 inches—mixed dark grayish brown and pale brown, friable silt loam

Subsurface layer:

11 to 14 inches—mixed brown, light yellowish brown, and yellowish brown, friable silt loam

Substratum:

14 to 20 inches—mixed yellowish brown, brown, and strong brown, firm silty clay loam

20 to 33 inches—mixed yellowish brown, brown, strong brown, and light brownish gray, firm silty clay loam

33 to 49 inches—yellowish brown, firm clay loam

49 to 60 inches—mixed dark yellowish brown, yellowish brown, and light brownish gray, firm clay loam

The gently sloping, moderately well drained Rapatee soils formed in replaced topsoil over a mixture of subsoil and underlying material over cast overburden. They are on the crest and shoulders of broad reconstructed ridges. The typical profile of these soils is as follows:

Surface layer:

0 to 6 inches—black, friable silty clay loam

Underlying material:

6 to 15 inches—very dark grayish brown, friable silty clay loam

15 to 60 inches—yellowish brown and brown, mottled, firm and very firm silty clay loam

Of minor extent in this association are well drained and moderately well drained Orthents in areas where borrow material, mainly components of glacial till and loess, has been leveled during road construction. The properties of these soils vary.

Most areas where the major soils in this association have been reclaimed are used for cultivated crops.

Unreclaimed areas are used for pasture or are idle. The reclaimed soils are well suited to the cultivated crops commonly grown in the county. The main management concerns are controlling erosion and improving tilth and fertility.

Broad Land Use Considerations

The soils in Schuyler County vary widely in their suitability for major land uses. Most of the acreage is used for cultivated crops, dominantly corn and soybeans. This acreage is primarily in areas of associations 1, 2, 4, 6, 7, and 8. The seasonal high water table is a major limitation in associations 1, 2, 6, 7, and 8. Also, flooding is a hazard in associations 6, 7, and 8. It occurs mainly in spring. The floodwater can delay planting and can cause slight or moderate crop damage. Erosion is the main hazard in associations 3 and 4.

A small acreage in the county is used for pasture or hay. The pastured areas are primarily in associations 2, 3, 4, and 5. Erosion is the major hazard in these associations. The very steep Hickory soils in associations 3 and 5 and the Gosport soils in association 5 generally are not suited to pasture and hay.

A moderate acreage in the county is used as woodland. The wooded areas are primarily on side slopes adjacent to creeks and streams in associations 3 and 5. Erosion is a hazard during periods when seedlings are becoming established and during logging periods. Equipment limitations and seedling mortality are management concerns on some of the soils.

A few areas in the county are developed or built up for urban uses. The soils in association 4 are best suited to building site development. In most of the other associations, low strength, the potential for frost action, the seasonal high water table, the shrink-swell potential, or a combination of these can limit building site development. The soils in associations 6, 7, and 8 are generally not suitable as building sites because of the hazard of flooding.

Detailed Soil Map Units

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

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. 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 other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties 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, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in

the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit 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, 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, slope, stoniness, salinity, 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, Fayette silt loam, 5 to 10 percent slopes, eroded, is a phase of the Fayette series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Seaton-Hickory complex, 30 to 60 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such

areas have little or no soil material and support little or no vegetation. An example is Pits, quarries.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables 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 or miscellaneous areas.

6C2—Fishhook silt loam, 5 to 10 percent slopes, eroded

Setting

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 80 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate in the upper part of the soil and slow in the lower part

Parent material: Loess and the underlying paleosol, which formed in glacial till

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 4 inches—mixed dark grayish brown and brown, friable silt loam

Subsoil:

4 to 31 inches—brown and light gray, mottled, firm silty clay loam

31 to 60 inches—gray and light gray, mottled, very firm silty clay

Composition

Fishhook and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a surface layer of silty clay loam

- Soils that formed entirely in silty material
- Soils that have silty clay within a depth of 20 inches

Contrasting inclusions:

- The well drained Hickory and Ursa soils in the more sloping areas

Use and Management

Cropland

Management concerns: Erosion and wetness

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Hillside seeps are common. Because of these seeps, the soil dries slowly in spring. Tile drains help to overcome this limitation.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition and windthrow

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to

prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.

- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing subsurface interceptor tile drains upslope from the absorption field reduces the wetness.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 4C

6C3—Fishhook silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 40 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate in the upper part of the soil and slow in the lower part

Parent material: Loess and the underlying paleosol, which formed in glacial till

Runoff: Moderate

Available water capacity: High

Seasonal high-water table: 1 to 3 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Severe

Tilth: The soil can be easily tilled only within a very narrow range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 5 inches—mixed brown and yellowish brown, friable silty clay loam

Subsoil:

5 to 22 inches—light olive brown and grayish brown, mottled, friable silty clay loam

22 to 40 inches—gray, mottled, firm silty clay

40 to 60 inches—dark gray, mottled, firm silty clay loam

Composition

Fishhook and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a surface layer of silt loam
- Soils that formed entirely in silty material

Contrasting inclusions:

- The well drained Hickory and Ursa soils in the more sloping areas

Use and Management

Cropland

Management concerns: Erosion, tilth, and wetness

Management measures:

- The hazard of further erosion can be reduced by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, a crop rotation that is dominated by forage crops, or a combination of these.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake and results in excessive runoff and erosion. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Hillside seeps are common. Because of these seeps, the soil dries slowly in spring. Tile drains help to overcome this limitation.
- Returning crop residue to the soil and regularly

adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and tilth

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition and windthrow

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by

elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing subsurface interceptor tile drains upslope from the absorption field reduces the wetness.

Interpretive Groups

Land capability classification: IVe

Woodland ordination symbol: 4C

7D2—Atlas silt loam, 10 to 15 percent slopes, eroded

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 50 acres

Major use: Pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Very slow

Parent material: Loess and the underlying paleosol, which formed in glacial till

Runoff: Rapid

Available water capacity: Moderate

Seasonal high water table: 1 to 2 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 5 inches—mixed very dark grayish brown, dark grayish brown, and brown, friable silt loam

Subsoil:

5 to 16 inches—brown, mottled, friable and firm silty clay loam

16 to 31 inches—dark grayish brown and grayish brown, mottled, very firm silty clay and clay

31 to 60 inches—light brownish gray, mottled, very firm clay

Composition

Atlas and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a surface layer of silty clay loam or clay loam
- Soils with less sand or clay in the upper part of the subsoil

Contrasting inclusions:

- The moderately well drained, moderately permeable Rozetta soils on the crest of ridges upslope from the Atlas soil
- The well drained, moderately permeable Hickory soils in the more sloping areas
- Wet, seepy areas on hillsides

Use and Management

Cropland

Management concerns: Erosion and wetness

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Hillside seeps are common. Because of these seeps, the soil dries slowly in spring. Tile drains help to overcome this limitation.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition, seedling mortality, and windthrow

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The seedling mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential, slope, and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Cutting, filling, and land shaping help to overcome the slope.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability, slope, and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.
- Installing subsurface interceptor tile drains upslope from the absorption field reduces the wetness.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 4C

7D3—Atlas silty clay loam, 10 to 15 percent slopes, severely eroded

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 30 acres

Major use: Pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Very slow

Parent material: A paleosol that formed in glacial till

Runoff: Rapid

Available water capacity: Moderate

Seasonal high water table: 1 to 2 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 4 inches—grayish brown, mottled, firm silty clay loam

Subsoil:

4 to 13 inches—grayish brown, mottled, firm clay

13 to 60 inches—olive gray, gray, and dark gray, mottled, very firm clay

Composition

Atlas and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a subsoil at a depth of more than 20 inches
- Soils with a surface layer of silt loam

Contrasting inclusions:

- The moderately well drained, moderately permeable Rozetta soils in the less sloping areas upslope from the Atlas soil
- The well drained, moderately permeable Hickory soils in the more sloping areas
- Wet, seepy areas on hillsides

Use and Management

Cropland

Management concerns: Erosion

- Because of the severe erosion, this soil is generally unsuitable for crops.

Pasture and hay

Management concerns: Erosion and tith

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tith.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition, seedling mortality, and windthrow

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The seedling mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential, slope, and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or

reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

- Cutting, filling, and land shaping help to overcome the slope.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability, slope, and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.
- Installing subsurface interceptor tile drains upslope from the absorption field reduces the wetness.

Interpretive Groups

Land capability classification: VIe

Woodland ordination symbol: 4C

8F—Hickory loam, 18 to 30 percent slopes

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 350 acres

Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Glacial till

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 6 inches—dark grayish brown, friable loam

Subsurface layer:

6 to 10 inches—yellowish brown, friable loam

Subsoil:

10 to 17 inches—yellowish brown, friable loam

17 to 24 inches—yellowish brown, firm clay loam

24 to 60 inches—yellowish brown, mottled, firm clay loam

Composition

Hickory and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that are calcareous within a depth of 40 inches
- Soils that formed in more than 20 inches of silty material and in the underlying glacial till

Contrasting inclusions:

- The somewhat poorly drained, very slowly permeable Atlas soils in the less sloping areas
- The moderately well drained Gosport soils, which have shale bedrock within a depth of 40 inches and are downslope from the Hickory soil
- Rock outcrops at the base of some slopes
- The well drained, moderately slowly permeable Ursa soils in the less sloping areas
- The moderately well drained Wilbur and somewhat poorly drained Wakeland soils on flood plains downslope from the Hickory soil

Use and Management

Pasture and hay (fig. 10)

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding helps to control erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Erosion, equipment limitations, and plant competition

Management measures:

- Establishing logging roads and skid trails on or



Figure 10.—Pasture in an area of Hickory loam, 18 to 30 percent slopes.

nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.

- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and slope

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Slope

Management measures:

- Onsite investigation is needed.

- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: VIe

Woodland ordination symbol: 5R

8G—Hickory loam, 30 to 60 percent slopes

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 1,000 acres

Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Glacial till

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 4 inches—very dark grayish brown, friable loam

Subsurface layer:

4 to 6 inches—brown, friable loam

Subsoil:

6 to 34 inches—yellowish brown, friable and firm clay loam

34 to 54 inches—yellowish brown and pale brown, mottled, firm clay loam

Substratum:

54 to 60 inches—light yellowish brown, mottled, friable loam

Composition

Hickory and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that are calcareous within a depth of 40 inches

- Soils that formed in more than 20 inches of silty material and in the underlying glacial till

Contrasting inclusions:

- The well drained, moderately slowly permeable Ursa soils on the less sloping, upper back slopes
- The moderately well drained Gosport soils, which have shale bedrock within a depth of 40 inches
- Rock outcrops at the base of some slopes
- The moderately well drained Wilbur and somewhat poorly drained Wakeland soils on flood plains downslope from the Hickory soil

Use and Management

Woodland

Management concerns: Erosion, equipment limitations, and plant competition

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Slope

- Because of the very steep slope, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Slope

- Because of the very steep slope, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: VIIe

Woodland ordination symbol: 5R

16—Rushville silt loam

Setting

Slope: 0 to 2 percent

Landform position: Depressions on the crest of broad ridges

Frequency of flooding: None

Ponding: Occasional, for brief periods

Shape of areas: Circular

Size of areas: 3 to 10 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Very slow

Parent material: Loess

Runoff: Slow to ponded

Available water capacity: High

Seasonal high water table: 1 foot above to 1 foot below the surface

Content of organic matter: Moderately low

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—grayish brown, friable silt loam

Subsurface layer:

8 to 12 inches—light gray, friable silt loam

Subsoil:

12 to 30 inches—grayish brown, mottled, firm silty clay loam and silty clay

30 to 50 inches—light gray, mottled, firm silty clay loam

50 to 60 inches—gray, mottled, friable silt loam

Composition

Rushville and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the slightly higher areas

Use and Management

Cropland

Management concerns: Wetness

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Wetness

Management measures:

- The seasonal high water table and ponding of surface water restrict the growth of some forage crops. Surface drains and subsurface tile help to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Canarygrass, alsike clover, and ladino clover are suited to this soil. Suitable warm-season grasses include big bluestem, indiangrass, and switchgrass.

Dwellings

Management concerns: Ponding

- Because of the ponding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Ponding

- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw

Woodland ordination symbol: None assigned

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

Setting

Landform position: The crest of broad ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 3 to 375 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 2 to 4 feet below the surface
Content of organic matter: Moderately low
Hazard of erosion: None or slight
Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
 0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:
 6 to 10 inches—brown, friable silt loam

Subsoil:
 10 to 28 inches—brown, mottled, firm silty clay loam
 28 to 40 inches—grayish brown, mottled, firm silty clay loam
 40 to 58 inches—light brownish gray, mottled, firm silty clay loam

Substratum:
 58 to 60 inches—light brownish gray, mottled, friable silt loam

Composition

Keomah and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer
- Soils that have less clay in the subsoil

Contrasting inclusions:

- The well drained Fayette and moderately well drained Rozetta soils in the more sloping areas
- The poorly drained Rushville soils in shallow depressions

Use and Management

Cropland

Management concerns: Wetness
Management measures:

- Surface drains and subsurface tile can function satisfactorily if suitable outlets are available.
- Applying a conservation tillage system that leaves

crop residue on the surface after planting and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Wetness

Management measures:

- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or

replacing the soil with more permeable material helps to overcome the restricted permeability.

- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: 11w

Woodland ordination symbol: 3A

17B—Keomah silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest of broad ridges and head slopes

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 3 to 100 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Slow

Available water capacity: High

Seasonal high water table: 2 to 4 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:

6 to 11 inches—mixed dark grayish brown and grayish brown, friable silt loam

Subsoil:

11 to 28 inches—brown, mottled, friable and firm silty clay loam

28 to 60 inches—grayish brown, mottled, firm and friable silty clay loam

Composition

Keomah and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer

- Soils that have less clay in the subsoil

Contrasting inclusions:

- The well drained Fayette and moderately well drained Rozetta soils on the crest of ridges
- The poorly drained Rushville soils in shallow depressions

Use and Management

Cropland

Management concerns: Erosion and wetness

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Surface drains and subsurface tile can function satisfactorily if suitable outlets are available.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and wetness

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 3A

19C3—Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded**Setting**

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 30 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: Very high

Content of organic matter: Low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled only within a very narrow range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—brown, friable silty clay loam

Subsoil:

7 to 23 inches—dark yellowish brown, mottled, firm silty clay loam

23 to 34 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

34 to 60 inches—light brownish gray, mottled, friable silt loam

Composition

Sylvan and similar soils: 85 to 90 percent

Similar Inclusions

- Soils with a surface layer of silt loam
- Soils with a subsoil that extends below a depth of 40 inches

Use and Management**Cropland**

Management concerns: Erosion and tilth

Management measures:

- The hazard of further erosion can be reduced by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, a crop rotation that is dominated by forage crops, or a combination of these.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Returning crop residue to the soil and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and tilth

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred

grazing when the soil is wet help to keep the pasture in good condition.

- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

Management measures:

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IVe

Woodland ordination symbol: 6A

19D3—Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform position: Back and shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 30 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Rapid

Available water capacity: Very high

Content of organic matter: Low

Hazard of erosion: Severe

Tilth: The soil can be easily tilled only within a very narrow range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—dark yellowish brown, friable silty clay loam

Subsoil:

6 to 11 inches—dark yellowish brown, firm silty clay loam

11 to 22 inches—yellowish brown, mottled, firm silty clay loam

22 to 29 inches—yellowish brown, mottled, friable silt loam

Substratum:

29 to 52 inches—yellowish brown, mottled, friable silt loam

52 to 60 inches—grayish brown, mottled, friable silt loam

Composition

Sylvan and similar soils: 95 to 98 percent

Similar Inclusions

- Soils with a surface layer of silt loam
- Soils with a subsoil that extends below a depth of 40 inches
- Soils with a slope of more than 18 percent

Use and Management

Cropland

Management concerns: Erosion and tilth

Management measures:

- The hazard of further erosion can be reduced by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, a crop rotation that is dominated by forage crops, or a combination of these.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Returning crop residue to the soil and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and tillth

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tillth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and slope

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: IVe

Woodland ordination symbol: 6A

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

Setting

Landform position: The shoulders and crest of ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 4 to 6 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: Slight

Tillth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—very dark brown, friable silt loam

Subsurface layers:

6 to 11 inches—very dark brown, friable silt loam

11 to 15 inches—very dark grayish brown, friable silt loam

Subsoil:

15 to 26 inches—brown, friable silty clay loam

26 to 56 inches—dark yellowish brown and yellowish brown, mottled, friable silty clay loam

56 to 60 inches—yellowish brown, mottled, friable silt loam

Composition

Tama and similar soils: 85 to 90 percent

Similar Inclusions

- Soils with a seasonal high water table within a depth of 4 feet
- Soils with a dark surface layer that is less than 10 inches thick
- Soils that have more sand in the lower part of the subsoil

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness in dwellings with basements.

Septic tank absorption fields

Management concerns: Wetness

Management measures:

- Onsite investigation is needed.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: None assigned

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

Landform position: The crest of broad rises

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 10 to more than 2,000 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile*Surface layer:*

0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:

9 to 12 inches—very dark grayish brown, friable silt loam

Subsoil:

12 to 24 inches—brown, mottled, friable and firm silty clay loam

24 to 50 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

50 to 60 inches—light brownish gray, mottled, firm silty clay loam

Composition

Ipava and similar soils: 90 to 95 percent

Inclusions*Similar inclusions:*

- Soils with a surface layer that is less than 10 inches thick
- Soils with a subsurface layer that has less clay and is lighter in color

Contrasting inclusions:

- Soils that have a water table less than 1 foot below the surface and are subject to ponding
- The poorly drained Virden soils in low areas

Use and Management**Cropland**

Management concerns: Wetness

Management measures:

- No major limitations affect the use of this soil for corn, soybeans, or small grain.
- The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available.
- A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: 1

Woodland ordination symbol: None assigned

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

Setting

Landform position: The crest of broad, low ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: High

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layers:

8 to 11 inches—very dark grayish brown, friable silt loam

11 to 15 inches—dark grayish brown, friable silt loam

Subsoil:

15 to 39 inches—dark grayish brown, mottled, friable silty clay loam

39 to 48 inches—grayish brown, mottled, firm silty clay loam

Substratum:

48 to 60 inches—grayish brown, mottled, firm silty clay loam

Composition

Ipava and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with a surface layer that is less than 10 inches thick

Contrasting inclusions:

- The somewhat poorly drained Keller soils, which have less clay in the upper part of the subsoil than the Ipava soil and are in the more sloping areas

Use and Management

Cropland

Management concerns: Erosion and wetness

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available.
- Returning crop residue to the soil and adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.

- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: None assigned

46A—Herrick silt loam, 0 to 2 percent slopes

Setting

Landform position: The crest of broad rises

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 200 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 11 inches—very dark gray, very friable silt loam

Subsurface layer:

11 to 17 inches—dark gray, very friable silt loam

Subsoil:

17 to 25 inches—yellowish brown, mottled, friable silty clay loam

25 to 55 inches—brown, mottled, friable silty clay loam

Substratum:

55 to 60 inches—light brownish gray, mottled, friable silt loam

Composition

Herrick and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a dark surface layer that is less than 10 inches thick
- Soils with a subsurface layer that has more clay and is darker

Contrasting inclusions:

- Soils that have a water table less than 1 foot below the surface and are subject to ponding
- The poorly drained Virden soils in low areas

Use and Management

Cropland

Management concerns: Wetness

Management measures:

- Surface drains and subsurface tile can function satisfactorily if suitable outlets are available.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: None assigned

50—Virden silty clay loam**Setting**

Landform position: Low areas on broad flats

Frequency of flooding: None

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 3 to 450 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Slow to ponded

Available water capacity: High

Seasonal high water table: 0.5 foot above to 2.0 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—very dark gray, firm silty clay loam

Subsurface layer:

9 to 15 inches—very dark gray, firm silty clay loam

Subsoil:

15 to 21 inches—very dark gray, mottled, firm silty clay loam

21 to 33 inches—dark grayish brown and grayish brown, mottled, firm silty clay loam

33 to 53 inches—light olive gray, mottled, firm silty clay loam

Substratum:

53 to 60 inches—light olive gray, mottled, friable silt loam

Composition

Virden and similar soils: 95 to 99 percent

Inclusions

Similar inclusions:

- Soils that have less clay in the subsoil or are browner in the upper part of the subsoil
- Soils with a surface layer of silt loam
- Soils with a water table that is more than 2 feet below the surface

Contrasting inclusions:

- The moderately well drained Tama soils in the more sloping areas

Use and Management**Cropland**

Management concerns: Wetness and tilth

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Ponding

- Because of the ponding, this soil is unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Ponding

- Because of the ponding, this soil is unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: None assigned

53F—Bloomfield loamy fine sand, 18 to 40 percent slopes**Setting**

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Linear

Size of areas: 15 to 90 acres

Major use: Woodland

Soil Properties and Qualities

Drainage class: Somewhat excessively drained

Permeability: Rapid

Parent material: Sandy eolian material

Runoff: Moderate

Available water capacity: Low

Content of organic matter: Low

Hazard of erosion: Severe

Shrink-swell potential: Low

Potential for frost action: Low

Typical Profile

Surface layer:

0 to 4 inches—dark grayish brown, very friable loamy fine sand

Subsurface layers:

4 to 15 inches—brown and dark yellowish brown, loose loamy fine sand

15 to 24 inches—dark yellowish brown, loose loamy sand

24 to 29 inches—strong brown, loose sand

Subsoil:

29 to 57 inches—brown, very friable loamy sand and strong brown, loose sand

57 to 65 inches—brown, very friable loamy fine sand and strong brown, loose fine sand

Composition

Bloomfield and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have no bands of loamy fine sand or that have bands with a total thickness of less than 6 inches
- Soils that have less sand throughout the solum

Contrasting inclusions:

- Soils that contain more clay in the subsoil

Use and Management

Woodland

Management concerns: Erosion, equipment limitations, plant competition, and seedling mortality

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.

- The seedling mortality rate can be reduced if drought-tolerant species are planted, if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated, and if older and larger stock is planted.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Rapid permeability and slope

Management measures:

- Onsite investigation is needed.
- Filling or mounding with suitable material increases the filtering capacity of the soil and thus helps to overcome the rapid permeability.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: VIe

Woodland ordination symbol: 4R

75C—Drury silt loam, 5 to 10 percent slopes

Setting

Landform position: Foot slopes

Frequency of flooding: None

Shape of areas: Elongated

Size of areas: 3 to 50 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Local alluvium

Runoff: Moderate

Available water capacity: Very high

Content of organic matter: Moderately low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled throughout a wide

range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—dark brown, very friable silt loam

Subsurface layer:

8 to 12 inches—brown, very friable silt loam

Subsoil:

12 to 31 inches—brown, friable silt loam

Substratum:

31 to 60 inches—dark yellowish brown, friable silt loam

Composition

Drury and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer
- Soils that have more clay in the subsoil

Contrasting inclusions:

- The moderately well drained Wilbur soils on flood plains downslope from the Drury soil
- Areas at the base of slopes that are subject to flooding

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet

reduces forage production and causes surface compaction, excessive runoff, and poor tilth.

- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Flooding

Management measures:

- The base of some slopes is subject to rare flooding. Onsite investigation is needed.

Septic tank absorption fields

Management concerns: Flooding

Management measures:

- The base of some slopes is subject to rare flooding. Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 7A

206—Thorp silt loam

Setting

Slope: 0 to 2 percent

Landform position: Depressions on terraces

Frequency of flooding: None

Ponding: Frequent, for brief periods

Shape of areas: Oval or oblong

Size of areas: 3 to 100 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Slow

Parent material: Loess and the underlying outwash

Runoff: Slow

Available water capacity: High

Seasonal high water table: 0 to 2 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 10 inches—very dark grayish brown, friable silt loam

Subsurface layer:

10 to 18 inches—grayish brown, mottled, friable silt loam

Subsoil:

18 to 24 inches—grayish brown, mottled, firm silty clay loam

24 to 31 inches—olive gray, mottled, firm silty clay loam

31 to 54 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

54 to 60 inches—light brownish gray, mottled friable silt loam

Composition

Thorp and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with a dark surface layer that is less than 10 inches thick

Contrasting inclusions:

- The somewhat poorly drained Kendall soils in the slightly higher areas

Use and Management

Cropland

Management concerns: Ponding and wetness

Management measures:

- Surface drains and subsurface tile can function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness in dwellings with basements.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Subsurface tile drains reduce the wetness.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: 1lw

Woodland ordination symbol: None assigned

242A—Kendall silt loam, 0 to 2 percent slopes

Setting

Landform position: The crest of broad, low ridges on high stream terraces

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 90 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate

Parent material: Loess and the underlying stratified outwash

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: None or slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—dark grayish brown, very friable silt loam

Subsurface layer:

9 to 16 inches—light brownish gray, very friable silt loam

Subsoil:

16 to 44 inches—brown and grayish brown, mottled, friable silty clay loam

44 to 60 inches—light brownish gray, mottled, friable silt loam

Composition

Kendall and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more sand in the subsoil
- Soils that have a dark surface layer

Contrasting inclusions:

- The well drained Martinsville and St. Charles soils in the more sloping areas
- The frequently flooded, somewhat poorly drained Wakeland and frequently flooded, moderately well drained Wilbur soils in the lower positions on flood plains

Use and Management

Cropland

Management concerns: Wetness

Management measures:

- Surface drains and subsurface tile can function satisfactorily if suitable outlets are available.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Wetness

Management measures:

- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.

- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Wetness

Management measures:

- Onsite investigation is needed.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: 1lw

Woodland ordination symbol: 4A

243B—St. Charles silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest and shoulders of ridges on high stream terraces

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 4 to 40 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess and the underlying stratified outwash

Runoff: Moderate

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—dark grayish brown, friable silt loam

Subsoil:

9 to 47 inches—dark yellowish brown, firm silty clay loam

47 to 60 inches—dark yellowish brown and brown, firm, stratified loam, sandy clay loam, and sandy loam

Composition

St. Charles and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more sand in the subsoil

Contrasting inclusions:

- The somewhat poorly drained Kendall soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the

susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.

- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: None

Management measures:

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 7A

257A—Clarksdale silt loam, 0 to 2 percent slopes

Setting

Landform position: The crest of broad ridges

Frequency of flooding: None

Size of areas: 4 to 125 acres

Shape of areas: Irregular

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: None or slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:

7 to 10 inches—dark grayish brown, friable silt loam

Subsoil:

10 to 29 inches—yellowish brown and brown, mottled, firm silty clay loam

29 to 48 inches—light brownish gray, mottled, firm silty clay loam

48 to 60 inches—light gray, mottled, firm silty clay loam

Composition

Clarksdale and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have a lighter colored surface layer
- Soils with a dark surface layer that is more than 10 inches thick

Contrasting inclusions:

- The moderately well drained Downs and well drained Fayette soils in the more sloping areas
- Soils that have a water table less than 1 foot below the surface and are subject to ponding

Use and Management

Cropland

Management concerns: Wetness

Management measures:

- The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available.

- A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tilth and fertility.

Pasture and hay

Management concerns: Wetness

Management measures:

- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or

replacing the soil with more permeable material helps to overcome the restricted permeability.

- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: 1

Woodland ordination symbol: 4A

257B—Clarksdale silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest and shoulders of broad ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 50 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—very dark grayish brown, friable silt loam

Subsoil:

8 to 20 inches—yellowish brown, mottled, friable and firm silty clay loam

20 to 59 inches—light brownish gray, mottled, firm silty clay loam

Substratum:

59 to 60 inches—light brownish gray, mottled, friable silt loam

Composition

Clarksdale and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils that have a lighter colored surface layer
- Soils with a dark surface layer that is more than 10 inches thick

Contrasting inclusions:

- The moderately well drained Downs and well drained Fayette soils in the more sloping areas

Use and Management

Cropland

Management concerns: Erosion and wetness

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- The seasonal high water table can delay planting in some years. Subsurface tile drains function satisfactorily if suitable outlets are available.
- Returning crop residue to the soil and adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management concerns: Wetness

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.

- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 4A

274F—Seaton silt loam, 18 to 30 percent slopes

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 100 acres

Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Rapid

Available water capacity: Very high

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 5 inches—very dark grayish brown, friable silt loam

Subsurface layer:

5 to 10 inches—dark grayish brown, friable silt loam

Subsoil:

10 to 19 inches—brown and yellowish brown, friable silt loam

19 to 45 inches—yellowish brown, firm silt loam

45 to 52 inches—brown, mottled, firm silt loam

Substratum:

52 to 60 inches—pale brown, mottled, friable silt loam

Composition

Seaton and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils that have calcareous silt loam within 40 inches of the surface
- Soils with a subsoil of silty clay loam
- Soils that have more sand in the subsoil

Contrasting inclusions:

- Exposed bedrock at the base of slopes

Use and Management

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding helps to control erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Erosion, equipment limitations, plant competition, and seedling mortality

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with

a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.

- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The seedling mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: VIe

Woodland ordination symbol: 6R

279B—Rozetta silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest and shoulders of ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 3 to 600 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: Very high

Seasonal high water table: 4 to 6 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—brown, friable silt loam

Subsurface layer:

7 to 11 inches—brown, friable silt loam

Subsoil:

11 to 25 inches—yellowish brown, firm silty clay loam

25 to 48 inches—yellowish brown, mottled, firm silty clay loam

48 to 60 inches—light yellowish brown, mottled, firm silty clay loam

Composition

Rozetta and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer
- Soils with no mottles in the upper 30 inches of the solum
- Soils with more sand and clay in the lower part of the solum

Contrasting inclusions:

- The poorly drained Rushville soils in shallow depressions

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland*Management concerns:* Plant competition*Management measures:*

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings*Management concerns:* The shrink-swell potential and wetness*Management measures:*

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness in dwellings with basements.

Septic tank absorption fields*Management concerns:* Wetness*Management measures:*

- Onsite investigation is needed.
- Subsurface tile drains reduce the wetness.

Interpretive Groups*Land capability classification:* IIe*Woodland ordination symbol:* 4A**279C2—Rozetta silt loam, 5 to 10 percent slopes, eroded****Setting***Landform position:* Shoulder slopes*Frequency of flooding:* None*Shape of areas:* Long and narrow*Size of areas:* 3 to 80 acres*Major use:* Cropland**Soil Properties and Qualities***Drainage class:* Moderately well drained*Permeability:* Moderate*Parent material:* Loess*Runoff:* Moderate*Available water capacity:* Very high*Seasonal high water table:* 4 to 6 feet below the surface*Content of organic matter:* Moderately low*Hazard of erosion:* Moderate*Tilth:* The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.*Shrink-swell potential:* High*Potential for frost action:* Moderate**Typical Profile***Surface layer:*

0 to 6 inches—brown, friable silt loam

Subsoil:

6 to 9 inches—brown, friable silt loam

9 to 19 inches—dark yellowish brown, firm silty clay loam

19 to 52 inches—yellowish brown and pale brown, mottled, firm silty clay loam

Substratum:

52 to 60 inches—pale brown, firm silt loam

Composition

Rozetta and similar soils: 85 to 90 percent

Inclusions*Similar inclusions:*

- Soils that have a surface layer of silty clay loam
- Soils that have calcareous silt loam within a depth of 40 inches
- Soils that have more sand and clay in the subsoil

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the less sloping areas

- The somewhat poorly drained Atlas soils on side slopes downslope from the Rozetta soil

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or

reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

- Installing subsurface tile drains near the foundations reduces the wetness in dwellings with basements.

Septic tank absorption fields

Management concerns: Wetness

Management measures:

- Onsite investigation is needed.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 4A

280B—Fayette silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest and shoulders of ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 300 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: Very high

Content of organic matter: Moderately low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—brown, friable silt loam

Subsoil:

8 to 53 inches—dark yellowish brown, friable and firm silty clay loam

53 to 60 inches—dark yellowish brown, firm silt loam

Composition

Fayette and similar soils: 95 to 99 percent

Inclusions

Similar inclusions:

- Soils with a darker surface layer

- Soils with gray mottles within a depth of 30 inches

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.

- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 4A

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded

Setting

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 125 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 10 inches—dark grayish brown and brown, friable silt loam mixed with dark yellowish brown subsoil material

Subsoil:

10 to 40 inches—dark yellowish brown, firm silty clay loam

40 to 51 inches—dark yellowish brown, mottled, friable silty clay loam

51 to 60 inches—dark yellowish brown, mottled, friable silt loam

Composition

Fayette and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils that have calcareous silt loam within a depth of 40 inches
- Soils that have a surface layer of silty clay loam
- Soils with gray mottles within a depth of 30 inches

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young

and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 4A

280C3—Fayette silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 80 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Content of organic matter: Low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled only within a very narrow range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 4 inches—mixed brown and dark yellowish brown, friable silty clay loam

Subsoil:

4 to 14 inches—mixed brown and dark yellowish brown, friable silty clay loam

14 to 54 inches—dark yellowish brown and yellowish brown, friable silty clay loam

54 to 60 inches—yellowish brown, mottled, friable silt loam

Composition

Fayette and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have calcareous silt loam within a depth of 40 inches
- Soils that have a surface layer of silt loam
- Soils with gray mottles within a depth of 30 inches

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion and tilth

Management measures:

- The hazard of further erosion can be reduced by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, a crop rotation that is dominated by forage crops, or a combination of these.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Returning crop residue to the soil and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and tilth

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IVE

Woodland ordination symbol: 4A

280D2—Fayette silt loam, 10 to 18 percent slopes, eroded

Setting

Landform position: Shoulder and back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 50 acres

Major use: Pasture

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:

0 to 5 inches—brown, friable silt loam

Subsoil:

5 to 11 inches—dark yellowish brown, friable silty clay loam

11 to 35 inches—yellowish brown, firm silty clay loam

35 to 48 inches—yellowish brown, firm silt loam

Substratum:

48 to 60 inches—yellowish brown, friable silt loam

Composition

Fayette and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a surface layer of silty clay loam
- Soils with more sand or less clay in the solum
- Soils that have calcareous silt loam within a depth of 40 inches

Contrasting inclusions:

- The well drained, slowly permeable Ursa soils downslope from the Fayette soil

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.

- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Equipment limitations and plant competition

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and slope

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 4A

280D3—Fayette silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform position: Shoulder and back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 50 acres

Major use: Pasture

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Rapid

Available water capacity: High

Content of organic matter: Low

Hazard of erosion: Severe

Tilth: The soil can be easily tilled only within a very narrow range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 5 inches—brown, friable silty clay loam

Subsoil:

5 to 34 inches—dark yellowish brown, firm silty clay loam

34 to 47 inches—dark yellowish brown, friable silty clay loam

47 to 53 inches—yellowish brown, friable silt loam

Substratum:

53 to 60 inches—yellowish brown, friable silt loam

Composition

Fayette and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a surface layer of silt loam
- Soils with more sand or less clay in the solum
- Soils that have calcareous silt loam within a depth of 40 inches

Contrasting inclusions:

- The well drained, slowly permeable Ursa soils downslope from the Fayette soil

Use and Management

Cropland

Management concerns: Erosion and tilth

Management measures:

- The hazard of further erosion can be reduced by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, a crop rotation that is dominated by forage crops, or a combination of these.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Returning crop residue to the soil and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion and tilth

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. Seedbed preparation is difficult on side slopes because of surface crusting and cloddiness. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Erosion, equipment limitations, and plant competition

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.

- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential and slope

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Slope

Management measures:

- Onsite investigation is needed.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: IVe

Woodland ordination symbol: 4R

386B—Downs silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest of ridges

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 90 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate

Parent material: Loess

Runoff: Moderate

Available water capacity: High

Content of organic matter: Moderate

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—very dark grayish brown, friable silt loam

Subsoil:

9 to 20 inches—brown and dark yellowish brown, friable silty clay loam

20 to 60 inches—yellowish brown, mottled, firm silty clay loam

Composition

Downs and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils with a thinner dark surface layer
- Soils with mottles in the upper part of the subsoil
- Soils with a lighter colored surface layer

Contrasting inclusions:

- The somewhat poorly drained Keomah soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or

reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

Management measures:

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 4A

470C2—Keller silt loam, 5 to 10 percent slopes, eroded

Setting

Landform position: Shoulder slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 80 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate in the upper part of the soil and slow in the lower part

Parent material: Loess and the underlying paleosol, which formed in glacial till

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—mixed very dark grayish brown and yellowish brown, friable silt loam

Subsoil:

9 to 28 inches—yellowish brown, mottled, friable silty clay loam

28 to 39 inches—brown, mottled, firm clay loam

39 to 60 inches—grayish brown and gray, mottled, firm clay loam

Composition

Keller and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have a surface layer of silty clay loam

Contrasting inclusions:

- The somewhat poorly drained Ipava and Herrick soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material improve tilth and fertility and increase the rate of water intake.

Dwellings

Management concerns: The shrink-swell potential and wetness

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains near the foundations reduces the wetness. Also, on sites for dwellings without basements, the wetness can be overcome by elevating the ground floor above the surrounding ground level, grading, and diverting surface water.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing subsurface interceptor tile drains upslope from the absorption field reduces the wetness.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: None assigned

551F—Gosport silt loam, 18 to 30 percent slopes

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 300 acres

Major use: Woodland

Soil Properties and Qualities

Depth class: Moderately deep

Drainage class: Moderately well drained

Permeability: Very slow

Parent material: A thin silty mantle over shale residuum

Runoff: Rapid

Available water capacity: Low

Seasonal high water table: 1.5 to 3.0 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: High

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:

4 to 7 inches—brown, friable silty clay loam

Subsoil:

7 to 10 inches—yellowish brown, firm silty clay

10 to 16 inches—light olive brown, mottled, firm silty clay

16 to 21 inches—light yellowish brown, mottled, firm silty clay

21 to 27 inches—light brownish gray, mottled, very firm silty clay

Bedrock:

27 to 60 inches—grayish brown, very firm clay shale

Composition

Gosport and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with shale bedrock at a depth of less than 20 inches or more than 40 inches

Contrasting inclusions:

- The moderately well drained Rozetta soils in the less sloping areas upslope from the Gosport soil

- The well drained Hickory soils upslope from the Gosport soil
- The moderately well drained Wilbur and somewhat poorly drained Wakeland soils on flood plains adjacent to the Gosport soil

Use and Management

Woodland

Management concerns: Erosion, equipment limitations, plant competition, seedling mortality, and windthrow

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The seedling mortality rate can be reduced by planting species that can tolerate excessive moisture.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Depth to bedrock

- Because of the depth to bedrock, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Depth to bedrock

- Because of the depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: VIIe

Woodland ordination symbol: 2R

551G—Gosport silt loam, 30 to 60 percent slopes

Setting

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 5 to 200 acres

Major use: Woodland

Soil Properties and Qualities

Depth class: Moderately deep

Drainage class: Moderately well drained

Permeability: Very slow

Parent material: A thin silty mantle over shale residuum

Runoff: Rapid

Available water capacity: Low

Seasonal high water table: 1.5 to 3.0 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: High

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 5 inches—dark grayish brown, friable silt loam

Subsurface layer:

5 to 10 inches—grayish brown, friable silt loam

Subsoil:

10 to 14 inches—light olive brown, firm silty clay loam

14 to 19 inches—grayish brown, mottled, very firm silty clay loam

19 to 32 inches—grayish brown, mottled, extremely firm silty clay

Bedrock:

32 to 60 inches—grayish brown, extremely firm clay shale

Composition

Gosport and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils with shale bedrock at a depth of less than 20 inches or more than 40 inches

Contrasting inclusions:

- The well drained Hickory soils upslope from the Gosport soil

- The moderately well drained Rozetta soils in the less sloping areas upslope from the Gosport soil
- The moderately well drained Wilbur and somewhat poorly drained Wakeland soils on flood plains below the Gosport soil

Use and Management

Woodland

Management concerns: Erosion, equipment limitations, plant competition, seedling mortality, and windthrow

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The seedling mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Depth to bedrock and slope

- Because of the depth to bedrock and very steep slope, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Depth to bedrock and slope

- Because of the depth to bedrock and very steep slope, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: VIIe

Woodland ordination symbol: 2R

570C2—Martinsville loam, 5 to 10 percent slopes, eroded

Setting

Landform position: Shoulder slopes on terraces

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 40 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Loamy outwash

Runoff: Moderate

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 9 inches—dark grayish brown, very friable loam

Subsoil:

9 to 15 inches—dark yellowish brown, friable clay loam

15 to 31 inches—dark yellowish brown, firm clay loam

31 to 39 inches—dark yellowish brown, firm sandy clay loam

39 to 46 inches—dark yellowish brown, mottled, firm sandy clay loam

46 to 52 inches—yellowish brown, mottled, firm clay loam

52 to 60 inches—yellowish brown and dark yellowish brown, mottled, stratified loam, loamy sand, and sandy loam

Composition

Martinsville and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have less sand in the upper part of the solum
- Soils that have a surface layer of clay loam

Contrasting inclusions:

- The somewhat poorly drained Kendall soils in the less sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: No major concerns

Management measures:

- Onsite investigation is needed.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: 4A

605D2—Ursa loam, 10 to 15 percent slopes, eroded**Setting**

Landform position: Back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 3 to 80 acres

Major use: Pasture

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderately slow

Parent material: A paleosol that formed in glacial till

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 6 inches—brown, friable loam

Subsoil:

6 to 15 inches—dark yellowish brown, firm clay loam

15 to 26 inches—dark yellowish brown, mottled, firm clay loam

26 to 60 inches—yellowish brown, mottled, firm clay loam

Composition

Ursa and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more sand in the solum
- Soils that have less clay in the upper part of the subsoil

Contrasting inclusions:

- The moderately well drained, moderately deep Gosport soils downslope from the Ursa soil

Use and Management**Cropland**

Management concerns: Erosion

Management measures:

- A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, contour farming, or a combination of these can help to keep soil loss within tolerable limits.
- Returning crop residue to the soil and regularly adding other organic material help to prevent compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the hazard of further erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

- Cutting, filling, and land shaping help to overcome the slope.

Septic tank absorption fields

Management concerns: Restricted permeability and slope

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Installing the filter lines on the contour or cutting and land shaping help to overcome the slope.

Interpretive Groups

Land capability classification: IVe

Woodland ordination symbol: 4A

802B—Orthents loamy, undulating

Setting

Landform position: Leveled borrow areas

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 3 to 20 acres

Major use: Idle land

Soil Properties and Qualities

Drainage class: Well drained and moderately well drained

Permeability: Variable

Parent material: Mixed glacial till and loess

Runoff: Moderate

Available water capacity: Moderate

Seasonal high water table: 4 to 6 feet below the surface

Content of organic matter: Low

Hazard of erosion: Slight

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—dark yellowish brown, friable silt loam

Underlying material:

6 to 32 inches—dark yellowish brown, firm, layered silt loam and silty clay loam

32 to 60 inches—yellowish brown, firm, layered silt loam and silty clay loam

Composition

Orthents and similar soils: 100 percent

Similar Inclusions

- Soils with a slope of more than 7 percent

Use and Management

Onsite investigation is needed to determine the limitations and suitability for specific uses.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: None assigned

824B—Swanwick silt loam, 2 to 5 percent slopes

Setting

Landform position: The crest and shoulders of broad reconstructed ridges

Frequency of flooding: None

Shape of areas: Rectangular

Size of areas: 10 to 175 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderately slow in the upper part of the soil and very slow in the lower part

Parent material: Replaced topsoil over a mixture of subsoil and underlying material over cast overburden

Runoff: Moderate

Available water capacity: High

Seasonal high water table: 4 to 6 feet below the surface

Content of organic matter: Low

Hazard of erosion: Moderate

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 11 inches—mixed dark grayish brown and pale brown, friable silt loam

Subsurface layer:

11 to 14 inches—mixed brown, light yellowish brown, and yellowish brown, friable silt loam

Substratum:

14 to 20 inches—mixed yellowish brown, brown, and strong brown, firm silty clay loam

20 to 33 inches—mixed yellowish brown, brown,

strong brown, and light brownish gray, firm silty clay loam

33 to 49 inches—yellowish brown, firm clay loam

49 to 60 inches—mixed dark yellowish brown, yellowish brown, and light brownish gray, firm clay loam

Composition

Swanwick and similar soils: 95 to 98 percent

Inclusions

Similar inclusions:

- Soils that have a thinner surface layer
- Soils that have a darker surface layer
- Soils that contain more sand throughout the solum
- Soils that have a surface layer of silty clay loam

Contrasting inclusions:

- The well drained Lenzburg soils in the more sloping areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay

Management concerns: Erosion

Management measures:

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Dwellings

Management concerns: Wetness

Management measures:

- Onsite investigation is needed.

- Installing subsurface tile drains near the foundations reduces the wetness in dwellings with basements.

Septic tank absorption fields

Management concerns: Restricted permeability and wetness

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.
- Subsurface tile drains reduce the wetness.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: None assigned

864—Pits, quarries

This map unit consists of excavations and spoil piles in areas where limestone has been mined for use in road construction and for agricultural and industrial uses. The quarries consist mainly of nearly level and gently sloping basins and the accompanying nearly vertical sidewalls.

This map unit is poorly suited to most uses. Areas that are no longer mined can be used for recreational development and wildlife habitat. Plants generally do not grow well because the spoil material is shallow, rocky, and limy. The feasibility of reclamation depends on the conditions at the site and the desired use.

No land capability classification or woodland ordination symbol is assigned.

871G—Lenzburg silty clay loam, 30 to 60 percent slopes

Setting

Landform position: Back slopes (fig. 11)

Frequency of flooding: None

Shape of areas: Irregular

Size of areas: 5 to 1,500 acres

Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderately slow

Parent material: Cast overburden

Runoff: Rapid

Available water capacity: Moderate

Content of organic matter: Moderately low

Hazard of erosion: Severe



Figure 11.—A typical area of Lenzburg silty clay loam, 30 to 60 percent slopes.

Shrink-swell potential: High

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 5 inches—very dark grayish brown, very firm silty clay loam

Substratum:

5 to 16 inches—brown and dark yellowish brown, mottled, very firm silty clay loam

16 to 23 inches—brown and grayish brown, mottled, firm clay loam

23 to 27 inches—gray, mottled, firm silty clay loam

27 to 60 inches—yellowish brown, mottled, friable and very friable clay loam

Composition

Lenzburg and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils that have fewer rock fragments

Contrasting inclusions:

- Areas with pockets of extremely acid material
- Small areas of water between ridges

Use and Management

Woodland

Management concerns: Erosion, equipment limitations, and plant competition

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings*Management concerns:* Slope

- Because of the very steep slope, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields*Management concerns:* Slope

- Because of the very steep slope, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups*Land capability classification:* VIIe*Woodland ordination symbol:* 5R**872B—Rapatee silty clay loam, 1 to 7 percent slopes****Setting***Landform position:* The crest and shoulders of ridges*Frequency of flooding:* None*Shape of areas:* Irregular*Size of areas:* 10 to 500 acres*Major use:* Cropland**Soil Properties and Qualities***Drainage class:* Well drained*Permeability:* Moderately slow in the upper part of the soil and very slow in the lower part*Parent material:* Replaced topsoil over a mixture of subsoil and underlying material over cast overburden*Runoff:* Moderate*Available water capacity:* Moderate*Content of organic matter:* Moderate*Hazard of erosion:* Slight*Tilth:* The soil can be easily tilled only within a limited range in moisture content.*Shrink-swell potential:* Moderate*Potential for frost action:* High**Typical Profile**

The profile was described immediately after reclamation.

Surface layer:

0 to 6 inches—black, friable silty clay loam

Underlying material:

6 to 15 inches—very dark grayish brown, friable silty clay loam

15 to 52 inches—yellowish brown, mottled, firm silty clay loam

52 to 60 inches—brown, mottled, very firm silty clay loam

Composition

Rapatee and similar soils: 85 to 90 percent

Inclusions*Similar inclusions:*

- Soils that have a thinner surface layer
- Soils that have a lighter colored surface layer
- Soils that contain more sand throughout the solum

Contrasting inclusions:

- The well drained Lenzburg soils in the more sloping areas

Use and Management**Cropland***Management concerns:* Erosion*Management measures:*

- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Pasture and hay*Management concerns:* Erosion*Management measures:*

- Establishing pasture plants or hay by a no-till method of pasture renovation or seeding reduces the susceptibility to erosion. The plants should not be grazed or clipped until they are sufficiently established.

- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiagrass, switchgrass, and little bluestem.

Dwellings

Management concerns: The shrink-swell potential

Management measures:

- Onsite investigation is needed.
- Extending the footings below the subsoil or reinforcing the foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Restricted permeability

Management measures:

- Onsite investigation is needed.
- Increasing the size of the absorption field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: None assigned

937G—Seaton-Hickory complex, 30 to 60 percent slopes

Setting

Landform position: Seaton—upper back slopes;

Hickory—lower back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 10 to 150 acres

Major use: Woodland

Soil Properties and Qualities

Seaton

Drainage class: Well drained

Permeability: Moderate

Parent material: Loess

Runoff: Rapid

Available water capacity: Very high

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Low

Potential for frost action: High

Hickory

Drainage class: Well drained

Permeability: Moderate

Parent material: Glacial till

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Typical Profile

Seaton

Surface layer:

0 to 5 inches—dark brown, friable silt loam

Subsurface layer:

5 to 12 inches—brown, friable silt loam

Subsoil:

12 to 20 inches—dark yellowish brown, friable silt loam

20 to 41 inches—yellowish brown, friable silt loam

41 to 60 inches—yellowish brown, mottled, friable silt loam

Hickory

Surface layer:

0 to 2 inches—very dark grayish brown, brown, and yellowish brown, friable silt loam

Subsurface layer:

2 to 6 inches—brown, dark grayish brown, and yellowish brown, friable silt loam

Subsoil:

6 to 10 inches—yellowish brown, friable silty clay loam

10 to 14 inches—yellowish brown, mottled, firm silty clay loam

14 to 60 inches—yellowish brown, mottled, firm clay loam

Composition

Seaton, Hickory, and similar soils: 95 to 98 percent

Seaton soil: 50 to 60 percent

Hickory soil: 40 to 50 percent

Inclusions

Similar inclusions:

- Soils that are calcareous within a depth of 40 inches

Contrasting inclusions:

- Exposed shale or limestone bedrock at the base of slopes

Use and Management**Woodland**

Management concerns: Erosion, equipment limitations, plant competition, and seedling mortality

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soils are firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Seedling mortality is a major concern on the Seaton soil. The mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soils, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Slope

- Because of the very steep slope, these soils are generally unsuitable as sites for dwellings.

Septic tank absorption fields

Management concerns: Slope

- Because of the very steep slope, these soils are generally unsuitable as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Seaton and Hickory—VIIe

Woodland ordination symbol: Seaton—6R; Hickory—5R

967G—Hickory-Gosport complex, 30 to 50 percent slopes**Setting**

Landform position: Hickory—upper back slopes;

Gosport—lower back slopes

Frequency of flooding: None

Shape of areas: Long and narrow

Size of areas: 10 to 200 acres

Major use: Woodland

Soil Properties and Qualities**Hickory**

Drainage class: Well drained

Permeability: Moderate

Parent material: Glacial till

Runoff: Rapid

Available water capacity: High

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: Moderate

Potential for frost action: Moderate

Gosport

Drainage class: Moderately well drained

Permeability: Very slow

Parent material: A thin silty mantle over shale residuum

Runoff: Rapid

Available water capacity: Moderate

Content of organic matter: Moderately low

Hazard of erosion: Severe

Shrink-swell potential: High

Potential for frost action: Moderate

Typical Profile**Hickory**

Surface layer:

0 to 4 inches—very dark grayish brown, friable loam

Subsurface layer:

4 to 8 inches—yellowish brown, friable loam

Subsoil:

8 to 11 inches—light yellowish brown, firm clay loam

11 to 35 inches—yellowish brown, firm clay loam

35 to 60 inches—yellowish brown, mottled, firm clay loam

Gosport*Surface layer:*

0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:

4 to 7 inches—grayish brown, friable silt loam

Subsoil:

7 to 13 inches—yellowish brown, firm silty clay

13 to 19 inches—yellowish brown, firm clay

19 to 29 inches—light yellowish brown, mottled, firm clay

Bedrock:

29 to 60 inches—grayish brown, mottled, very firm clay shale

Composition

Hickory, Gosport, and similar soils: 95 to 98 percent

Hickory soil: 60 to 70 percent

Gosport soil: 30 to 40 percent

Inclusions*Similar inclusions:*

- Soils in which the shale bedrock is at a depth more than 40 inches

Contrasting inclusions:

- The somewhat poorly drained Atlas soils in the less sloping areas
- The well drained, moderately slowly permeable Ursa soils on the less sloping, upper back slopes
- Rock outcrops at the base of some slopes (fig. 12)

Use and Management**Woodland**

Management concerns: Erosion, equipment limitations, seedling mortality, plant competition, and windthrow

Management measures:

- Establishing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, establishing grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging operations have been completed help to control erosion.
- Equipment should be used only during periods when the soils are firm enough to support the equipment.
- Seedling mortality is a major concern on the Gosport soil. The mortality rate can be reduced if all vegetation within 2 feet of the naturally occurring or planted seedlings is eliminated and if older and larger stock is planted.
- The competition from undesirable vegetation in

openings created by timber harvesting can be controlled by chemical or mechanical means.

- Windthrow is a major concern on the Gosport soil. The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soils, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Slope

- Because of the very steep slope, these soils are generally unsuitable as sites for dwellings.

Septic tank absorption fields

Management concerns: Slope

- Because of the very steep slope, these soils are generally unsuitable as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: Hickory and Gosport—Vlle

Woodland ordination symbol: Hickory—5R; Gosport—2R

3070—Beaucoup silty clay loam, frequently flooded**Setting**

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Frequent

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 10 to 1,500 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Moderately slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: High



Figure 12.—Bedrock outcrop in an area of Hickory-Gosport complex, 30 to 50 percent slopes.

Seasonal high water table: 0.5 foot above to 1.0 foot below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—very dark gray, mottled, firm silty clay loam

Subsurface layer:

8 to 16 inches—very dark grayish brown, mottled, firm silty clay loam

Subsoil:

16 to 60 inches—dark gray, mottled, firm silty clay loam

Composition

Beaucoup and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches
- Soils with a surface layer of silt loam
- Soils that have more clay in the subsoil

Contrasting inclusions:

- The moderately well drained Huntsville soils in the higher areas

Use and Management

Cropland

Management concerns: Wetness, flooding, and tillage

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tillage and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw

Woodland ordination symbol: 5W

3077—Huntsville silt loam, frequently flooded

Setting

Slope: 0 to 2 percent

Landform position: Broad rises on valley flats

Frequency of flooding: Frequent

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 3 to 50 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: Very high

Content of organic matter: Moderate

Hazard of erosion: None

Tillage: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 10 inches—very dark gray, friable silt loam

Subsurface layers:

10 to 30 inches—very dark grayish brown, friable silt loam

30 to 37 inches—dark brown, friable silt loam

Subsoil:

37 to 60 inches—brown and dark yellowish brown, friable silt loam

Composition

Huntsville and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have a thinner surface layer
- Soils with a seasonal high water table that is less than 6 feet from the surface

Contrasting inclusions:

- The poorly drained Beaucoup soils in the lower areas

Use and Management

Cropland

Management concerns: Flooding

Management measures:

- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- A conservation tillage system that leaves crop residue on the surface after planting helps to maintain tillage and fertility.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 1lw

Woodland ordination symbol: 7A

3107—Sawmill silty clay loam, frequently flooded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Frequent

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 3 to 200 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: High

Seasonal high water table: 0 to 2 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 8 inches—very dark gray, friable silty clay loam

Subsurface layer:

8 to 28 inches—very dark gray, friable silty clay loam; mottled in the lower part

Subsoil:

28 to 45 inches—dark gray, mottled, friable silty clay loam

45 to 57 inches—light brownish gray, mottled, friable silty clay loam

Substratum:

57 to 60 inches—light brownish gray, mottled, friable silty clay loam

Composition

Sawmill and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have less clay in the solum

- Soils that have a seasonal high water table at a depth of 1 to 3 feet during spring
- Soils that have more clay in the subsoil

Contrasting inclusions:

- Beaucoup soils, in which the total thickness of dark surface layer and subsurface layer is less than 24 inches

Use and Management

Cropland

Management concerns: Wetness, flooding, and tilth

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available.
- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw

Woodland ordination symbol: 5W

3284—Tice silty clay loam, frequently flooded

Setting

Slope: 0 to 2 percent

Landform position: Broad, low rises on valley flats

Frequency of flooding: Frequent

Duration of flooding: Brief

Shape of areas: Irregular
Size of areas: 5 to 1,000 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Alluvium
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1.5 to 3.0 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: None
Tilth: The soil can be easily tilled throughout a wide range in moisture content.
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
 0 to 11 inches—very dark gray, firm silty clay loam

Subsurface layer:
 11 to 15 inches—very dark grayish brown, firm silty clay loam

Subsoil:
 15 to 24 inches—dark grayish brown, mottled, firm silty clay loam
 24 to 37 inches—brown and dark yellowish brown, mottled, firm silty clay loam
 37 to 60 inches—dark yellowish brown, mottled, friable loam and fine sandy loam

Composition

Tice and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches
- Soils that have more clay in the surface layer
- Soils that have a seasonal high water table more than 3 feet below the surface

Contrasting inclusions:

- The poorly drained Beaucoup soils in the lower areas

Use and Management

Cropland

Management concerns: Wetness and flooding
Management measures:

- Surface drains, subsurface tile, and surface inlet

tile function satisfactorily if suitable outlets are available.

- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 5A

3333—Wakeland silt loam, frequently flooded

Setting

Slope: 0 to 2 percent
Landform position: Broad, low rises on valley flats
Frequency of flooding: Frequent
Duration of flooding: Brief
Shape of areas: Irregular
Size of areas: 5 to 200 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderately low
Hazard of erosion: None
Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

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

Underlying material:

9 to 52 inches—dark grayish brown and brown, mottled, friable silt loam

52 to 60 inches—strata of dark grayish brown and brown, mottled, friable silt loam

Composition

Wakeland and similar soils: 90 to 95 percent

Inclusions*Similar inclusions:*

- Soils that have more sand throughout the solum
- Soils with a darker surface layer

Contrasting inclusions:

- The somewhat poorly drained Kendall soils on stream terraces that are not flooded
- Soils that are in sloughs, are ponded for brief periods, and have a seasonal high water table less than 1 foot below the surface

Use and Management**Cropland**

Management concerns: Wetness and flooding

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available.
- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 11w

Woodland ordination symbol: 5A

3336—Wilbur silt loam, frequently flooded**Setting**

Slope: 0 to 2 percent

Landform position: Broad rises on valley flats

Frequency of flooding: Frequent

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 5 to 200 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: Very high

Seasonal high water table: 1.5 to 3.0 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—brown, friable silt loam

Underlying material:

6 to 38 inches—brown, mottled, friable silt loam

38 to 60 inches—grayish brown, mottled, friable, stratified silt loam and loam

Composition

Wilbur and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more sand throughout the solum

- Soils with a darker surface layer

Contrasting inclusions:

- The somewhat poorly drained Kendall soils on stream terraces that are not flooded
- Soils that are in sloughs, are ponded for brief periods, and have a seasonal high water table less than 1 foot below the surface

Use and Management

Cropland

Management concerns: Flooding

Management measures:

- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Woodland

Management concerns: Plant competition

Management measures:

- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees.
- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: 8A

3404—Titus silty clay loam, frequently flooded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Frequent

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 5 to 350 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: High

Seasonal high water table: 0.5 foot above to 2.0 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—very dark gray, firm silty clay loam

9 to 14 inches—very dark gray, mottled, firm silty clay loam

Subsoil:

14 to 60 inches—dark gray, mottled, firm silty clay loam

Composition

Titus and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more or less clay in the subsoil
- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches

Contrasting inclusions:

- The somewhat poorly drained Tice soils in the higher areas

Use and Management

Cropland

Management concerns: Wetness, flooding, and till

Management measures:

- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Levees or diversions can reduce the extent of the crop damage caused by floodwater.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve till and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 1Vw

Woodland ordination symbol: 2W

4071—Darwin silty clay, ponded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Frequent

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 10 to 250 acres

Major use: Wetland wildlife habitat

Soil Properties and Qualities

Drainage class: Very poorly drained

Permeability: Very slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: Moderate

Seasonal high water table: 1 foot above to 2 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Shrink-swell potential: Very high

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 6 inches—very dark grayish brown, firm silty clay

6 to 15 inches—very dark gray, mottled, firm silty clay

Subsoil:

15 to 20 inches—very dark gray, mottled, very firm silty clay

20 to 60 inches—dark gray, mottled, very firm silty clay

Composition

Darwin and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches
- Soils with less clay in the subsoil

Contrasting inclusions:

- The poorly drained Beaucoup soils in the slightly higher areas

Use and Management

Woodland

Management concerns: Equipment limitations, plant competition, seedling mortality, and windthrow

Management measures:

- Equipment should be used only during periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means.
- The seedling mortality rate can be reduced by planting species that can tolerate excessive moisture, by eliminating all vegetation within 2 feet of the naturally occurring or planted seedlings, and by planting older and larger stock.
- The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. Only high-value trees should be removed from a 50-foot-wide strip along the west and south edges of the woodland.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of

the soil, and damage to tree roots and to desirable young trees.

- Protection from fire is needed to keep both young and old trees from being killed or permanently injured and to prevent destruction of the leaf mulch.

Wildlife habitat

Management concerns:

- The soil naturally supports wetland plants.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding and ponding

- Because of the flooding and ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: Vw

Woodland ordination symbol: 4W

7087B—Dickinson sandy loam, 1 to 7 percent slopes, rarely flooded

Setting

Landform position: The crest and shoulders of dunelike ridges

Frequency of flooding: Rare

Shape of areas: Irregular

Size of areas: 10 to 150 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat excessively drained

Permeability: Moderately rapid in the upper part of the soil and rapid in the lower part

Parent material: Wind-worked sandy alluvial sediments

Runoff: Slow

Available water capacity: Moderate

Content of organic matter: Moderately low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Low

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 9 inches—very dark gray, friable sandy loam

Subsurface layers:

9 to 15 inches—very dark gray, friable fine sandy loam

15 to 20 inches—very dark grayish brown, friable fine sandy loam

Subsoil:

20 to 37 inches—brown, friable fine sandy loam

37 to 43 inches—brown, very friable sandy loam

43 to 60 inches—dark yellowish brown, loose sand with brown bands

Composition

Dickinson and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils with a thinner dark surface layer
- Soils that have more clay in the subsoil

Contrasting inclusions:

- The excessively drained Oakville soils in positions on the landscape similar to those of the Dickinson soil

Use and Management

Cropland

Management concerns: Low fertility, a limited moisture supply, soil blowing, and water erosion

Management measures:

- This soil is protected from flooding by levees.
- Low fertility can be corrected by frequent applications of a small amount of fertilizer. One application of a large amount can result in excessive loss of plant nutrients through leaching.
- Irrigation can supply the moisture needed for crops.
- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and regularly adding other organic material improve tilth and productivity, conserve moisture, and help to control soil blowing.

Dwellings

Management concerns: Flooding

- Because of the rare flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Rapid permeability and flooding

Management measures:

- Onsite investigation is needed.
- Filling or mounding with suitable material increases the filtering capacity of the soil and thus helps to overcome the rapid permeability.

- Adding suitable fill material can raise the absorption field above the level of flooding.

Interpretive Groups

Land capability classification: IIIe

Woodland ordination symbol: None assigned

7430B—Raddle silt loam, 1 to 5 percent slopes, rarely flooded

Setting

Landform position: Foot slopes

Frequency of flooding: Rare

Shape of areas: Long and narrow

Size of areas: 3 to 40 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained

Permeability: Moderate

Parent material: Local alluvium

Runoff: Moderate

Available water capacity: Very high

Content of organic matter: Moderate

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:

7 to 15 inches—dark brown, friable silt loam

Subsoil:

15 to 22 inches—brown, friable silt loam

22 to 52 inches—brown, mottled, friable silt loam

52 to 60 inches—brown, mottled, firm silt loam

Composition

Raddle and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have sand throughout the solum
- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches

Contrasting inclusions:

- The somewhat poorly drained Tice and Wakeland soils in the lower areas

Use and Management

Cropland

Management concerns: Erosion

Management measures:

- This soil is protected from flooding by levees.
- Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, or by terraces.
- Returning crop residue to the soil and adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: Flooding

- Because of the rare flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

Management measures:

- Onsite investigation is needed.
- Adding suitable fill material can raise the absorption field above the level of flooding.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: None assigned

7741B—Oakville loamy fine sand, 1 to 7 percent slopes, rarely flooded

Setting

Landform position: The crest and shoulders of dunelike ridges

Frequency of flooding: Rare

Shape of areas: Irregular

Size of areas: 20 to 150 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Excessively drained

Permeability: Rapid

Parent material: Wind-worked sandy alluvium

Runoff: Slow

Available water capacity: Low

Content of organic matter: Low

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Low

Potential for frost action: Low

Typical Profile

Surface layer:

0 to 10 inches—dark brown, friable loamy fine sand

Subsurface layer:

10 to 14 inches—dark brown, friable loamy fine sand

Subsoil:

14 to 19 inches—brown, very friable fine sand

19 to 38 inches—dark yellowish brown, very friable fine sand

Substratum:

38 to 54 inches—yellowish brown, loose fine sand

54 to 60 inches—dark yellowish brown, loose fine sand

Composition

Oakville and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils that have less sand throughout the solum
- Soils with a darker surface layer

Contrasting inclusions:

- The somewhat excessively drained Dickinson soils in positions on the landscape similar to those of the Oakville soil

Use and Management

Cropland

Management concerns: Low fertility, a limited moisture supply, and soil blowing

Management measures:

- This soil is protected from flooding by levees.
- Low fertility can be corrected by frequent applications of a small amount of fertilizer. One application of a large amount can result in excessive loss of plant nutrients through leaching.
- Irrigation can supply the moisture needed for crops.
- Applying a conservation tillage system that leaves crop residue on the surface after planting, returning crop residue to the soil, and regularly adding other organic material improve tilth and productivity, conserve moisture, and help to control soil blowing.

Dwellings

Management concerns: Flooding

- Because of the rare flooding, this soil is unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Rapid permeability and flooding

Management measures:

- Onsite investigation is needed.
- Filling or mounding with suitable material increases the filtering capacity of the soil and thus helps to overcome the rapid permeability.
- Adding suitable fill material can raise the absorption field above the level of flooding.

Interpretive Groups

Land capability classification: IVs

Woodland ordination symbol: 4S

8070—Beaucoup silty clay loam, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Occasional

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 10 to 1,500 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Moderately slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: High

Seasonal high water table: 0.5 foot above to 1.0 foot below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—very dark grayish brown, friable silty clay loam

Subsurface layer:

7 to 13 inches—very dark grayish brown, friable silty clay loam

Subsoil:

13 to 45 inches—dark olive gray and dark gray, mottled, firm silty clay loam

45 to 60 inches—dark gray, mottled, friable silty clay loam

Composition

Beaucoup and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have a surface layer of silt loam
- Soils in which the surface layer is silt loam and the total thickness of the dark surface layer and subsurface layer is more than 24 inches
- Soils that have more clay throughout the solum

Contrasting inclusions:

- The poorly drained Darwin soils in the lower areas

Use and Management

Cropland

Management concerns: Wetness and tilth

Management measures:

- This soil is protected from flooding by levees.
- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 1lw

Woodland ordination symbol: 5W

8071—Darwin silty clay, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Occasional

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 200 to 2,000 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Very slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: Moderate

Seasonal high water table: 1 foot above to 2 feet below the surface

Content of organic matter: High

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: Very high

Potential for frost action: Moderate

Typical Profile

Surface layer:

0 to 7 inches—very dark gray, firm silty clay

Subsurface layer:

7 to 12 inches—very dark gray, very firm silty clay

Subsoil:

12 to 27 inches—very dark gray and dark gray, mottled, very firm silty clay

27 to 40 inches—gray, mottled, firm silty clay

40 to 50 inches—gray, mottled, firm silty clay loam

Substratum:

50 to 60 inches—gray and dark gray, mottled, firm silty clay loam

Composition

Darwin and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have less clay in the subsoil
- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches

Contrasting inclusions:

- The somewhat poorly drained Orion soils, which have less clay in the subsoil than the Darwin soil and are in the higher areas

Use and Management**Cropland**

Management concerns: Wetness and tilth

Management measures:

- This soil is protected from flooding by levees.
- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains and surface inlet tile function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw

Woodland ordination symbol: 4W

8104A—Virgil silt loam, 0 to 3 percent slopes, occasionally flooded**Setting**

Landform position: The crest on broad, low ridges on terraces

Frequency of flooding: Occasional

Duration of flooding: Brief

Size of areas: 5 to 80 acres

Shape of areas: Irregular

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate

Parent material: Silty material over stratified, loamy outwash

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: Slight

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:

9 to 15 inches—grayish brown, mottled, friable silt loam

Subsoil:

15 to 20 inches—grayish brown and brown, mottled, firm silty clay loam

20 to 34 inches—brown, mottled, firm silty clay loam

34 to 52 inches—light brownish gray, mottled, firm silty clay loam

52 to 60 inches—light brownish gray, mottled, firm clay loam

Composition

Virgil and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have a thinner dark surface layer
- Soils that have more sand in the subsoil
- Soils that have a thicker dark surface layer and have a seasonal high water table more than 3 feet below the surface

Contrasting inclusions:

- The well drained Martinsville soils in the more sloping areas

Use and Management**Cropland**

Management concerns: Wetness

Management measures:

- This soil is protected from flooding by levees.
- Installing surface drains and subsurface tile helps to remove excess water.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material improve tilth and fertility.

Pasture and hay*Management concerns:* Wetness*Management measures:*

- Installing surface drains and subsurface tile helps to remove excess water.
- Overgrazing or grazing when the soil is too wet reduces forage production and causes surface compaction, excessive runoff, and poor tilth.
- Proper stocking rates, rotation grazing, and deferred grazing when the soil is wet help to keep the pasture in good condition.
- Bromegrass, orchardgrass, tall fescue, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, and little bluestem.

Dwellings*Management concerns:* Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields*Management concerns:* Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups*Land capability classification:* 1lw*Woodland ordination symbol:* None assigned**8206—Thorp silt loam, occasionally flooded****Setting***Slope:* 0 to 2 percent*Landform position:* Depressions on terraces*Frequency of flooding:* Occasional*Duration of flooding:* Brief*Shape of areas:* Oval or oblong*Size of areas:* 10 to 50 acres*Major use:* Cropland**Soil Properties and Qualities***Drainage class:* Poorly drained*Permeability:* Slow*Parent material:* Loess and the underlying outwash*Runoff:* Slow*Available water capacity:* High*Seasonal high water table:* 0 to 2 feet below the surface*Content of organic matter:* Moderate*Hazard of erosion:* None*Tilth:* The soil can be easily tilled throughout a wide range in moisture content.*Shrink-swell potential:* Moderate*Potential for frost action:* High**Typical Profile***Surface layer:*

0 to 6 inches—very dark grayish brown, friable silt loam

Subsurface layers:

6 to 12 inches—very dark grayish brown, friable silt loam

12 to 22 inches—grayish brown, mottled, friable silt loam

Subsoil:

22 to 40 inches—dark gray, mottled, firm silty clay loam

40 to 65 inches—dark grayish brown and grayish brown, mottled, firm silty clay loam

Composition

Thorp and similar soils: 85 to 90 percent

Inclusions*Similar inclusions:*

- Soils that have more clay in the subsoil
- Soils that have a lighter colored surface layer
- Soils with a darker colored subsurface layer

Contrasting inclusions:

- The somewhat poorly drained Kendall soils in the slightly higher areas

Use and Management**Cropland***Management concerns:* Wetness*Management measures:*

- This soil is protected from flooding by levees.
- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available.
- Applying a conservation tillage system that leaves

crop residue on the surface after planting and regularly adding other organic material improve tilth and fertility.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: None assigned

8284—Tice silt loam, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Broad, low rises on flood plains

Frequency of flooding: Occasional

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 5 to 400 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: High

Seasonal high water table: 1.5 to 3.0 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Moderate

Potential for frost action: High

Typical Profile

Surface layer:

0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:

7 to 11 inches—very dark grayish brown, friable silt loam

Subsoil:

11 to 35 inches—dark grayish brown, mottled, friable and firm silty clay loam

35 to 51 inches—grayish brown, mottled, firm silty clay loam

51 to 60 inches—grayish brown, mottled, firm silt loam

Composition

Tice and similar soils: 85 to 90 percent

Inclusions

Similar inclusions:

- Soils that have less clay throughout the solum
- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches

Contrasting inclusions:

- The well drained Raddle soils in the higher areas
- The poorly drained Beaucoup soils in the lower areas

Use and Management

Cropland

Management concerns: Wetness

Management measures:

- This soil is protected from flooding by levees
- Surface drains, subsurface tile, and surface inlet tile function satisfactorily if suitable outlets are available.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: 5A

8336—Wilbur silt loam, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Broad rises on valley flats

Frequency of flooding: Occasional

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 40 to 1,000 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: Very high

Seasonal high water table: 1.5 to 3.0 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content, but it tends to crust after hard rains.

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—brown, friable silt loam

Underlying material:

6 to 38 inches—brown, mottled, friable silt loam

38 to 60 inches—grayish brown, mottled, friable, stratified silt loam and loam

Composition

Wilbur and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more sand throughout the solum
- Soils with a darker surface layer
- Soils with a seasonal high water table less than 2 feet below the surface

Contrasting inclusions:

- The somewhat poorly drained Kendall soils on stream terraces that are not flooded
- Soils that are in sloughs, are ponded for brief periods, and have a water table less than 1 foot below the surface

Use and Management

Cropland

Management concerns: Flooding

Management measures:

- This soil is protected from flooding by levees.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 1lw

Woodland ordination system: 8A

8404—Titus silty clay, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Low areas on flood plains

Frequency of flooding: Occasional

Duration of flooding: Brief

Ponding: Frequent, for brief periods

Shape of areas: Irregular

Size of areas: 5 to 350 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Slow

Parent material: Alluvium

Runoff: Slow to ponded

Available water capacity: High

Seasonal high water table: 0.5 foot above to 2.0 feet below the surface

Content of organic matter: Moderate

Hazard of erosion: None

Tilth: The soil can be easily tilled only within a limited range in moisture content.

Shrink-swell potential: High

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—very dark gray, mottled, firm silty clay

Subsurface layer:

6 to 11 inches—very dark gray, mottled, firm silty clay

Subsoil:

11 to 24 inches—very dark gray and dark gray, mottled, firm silty clay

24 to 57 inches—light brownish gray and light olive gray, mottled, firm silty clay loam and silt loam

Substratum:

57 to 60 inches—light olive gray, firm silty clay loam

Composition

Titus and similar soils: 90 to 95 percent

Inclusions*Similar inclusions:*

- Soils that have more clay in the subsoil
- Soils in which the total thickness of the dark surface layer and subsurface layer is more than 24 inches

Contrasting inclusions:

- The somewhat poorly drained Orion soils in the higher areas

Use and Management**Cropland**

Management concerns: Wetness and tilth

Management measures:

- This soil is protected from flooding by levees (fig. 13).
- Most areas of this soil are sufficiently drained for corn, soybeans, and small grain, but measures that maintain or improve the drainage system are needed. Surface drains function satisfactorily if suitable outlets are available. Land grading helps to control ponding.
- Tilling when the soil is too wet causes surface compaction, which reduces the rate of water intake. As it dries, the soil becomes hard and cloddy. Tilling when



Figure 13.—An area of Titus silty clay, occasionally flooded. This soil is protected by levees along the Illinois River.

the soil is too dry increases the cloddiness. Because of the cloddiness, preparing a seedbed is difficult.

- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material help to prevent surface compaction and crusting, improve tilth and fertility, and increase the rate of water intake.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIw

Woodland ordination system: 2W

8415—Orion silt loam, occasionally flooded

Setting

Slope: 0 to 2 percent

Landform position: Broad rises on flood plains

Frequency of flooding: Occasional

Duration of flooding: Brief

Shape of areas: Irregular

Size of areas: 5 to 200 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderate

Parent material: Alluvium

Runoff: Slow

Available water capacity: Very high

Seasonal high water table: 1 to 3 feet below the surface

Content of organic matter: Moderately low

Hazard of erosion: None

Tilth: The soil can be easily tilled throughout a wide range in moisture content.

Shrink-swell potential: Low

Potential for frost action: High

Typical Profile

Surface layer:

0 to 6 inches—brown, friable silt loam

Underlying material:

6 to 29 inches—brown, mottled, friable silt loam

29 to 54 inches—very dark gray, mottled, friable silt loam

54 to 60 inches—grayish brown, mottled, friable silt loam

Composition

Orion and similar soils: 90 to 95 percent

Inclusions

Similar inclusions:

- Soils that have more clay in the underlying material

Contrasting inclusions:

- The poorly drained Titus soils in the lower areas
- Soils that are in sloughs, are ponded for brief periods, and have a seasonal high water table less than 1 foot below the surface

Use and Management

Cropland

Management concerns: Wetness and flooding

Management measures:

- This soil is protected from flooding by levees.
- Installing surface drains and subsurface tile helps to remove excess water.
- Applying a conservation tillage system that leaves crop residue on the surface after planting and regularly adding other organic material improve tilth and fertility.

Dwellings

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for dwellings.

Septic tank absorption fields

Management concerns: Flooding

- Because of the flooding, this soil is generally unsuitable as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIw

Woodland ordination symbol: 2W

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 behavioral characteristics 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 all or part of 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 estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the

Natural Resources Conservation Service is explained, and prime farmland is described.

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 1988, about 138,000 acres in Schuyler County was cultivated and 50,000 acres was pastured (Illinois Agricultural Statistics Service, 1989). The climatic conditions and the soils are well suited to the production of grain and forage crops. The soils in the county have good potential for increased production of crops and pasture, particularly as the latest crop management techniques are applied. This soil survey can greatly facilitate the application of such techniques.

Water erosion is the major management concern on about 54 percent of the cropland and 28 percent of the pasture in Schuyler County (Illinois Conservation Needs Committee, 1970). Erosion is a hazard if slopes are more than 2 percent. It also is a hazard in areas where slopes are long and less than 2 percent.

Loss of the surface layer through sheet and rill erosion is damaging for three reasons. First, the content of organic matter and natural fertility level are lowered as the surface layer is lost and part of the subsoil is incorporated into the plow layer. As a result, soil productivity is reduced.

Second, severe erosion on sloping soils results in deterioration of tilth in the surface layer and thus reduces the rate of water intake. A surface layer that is mixed with subsoil material tends to become cloddy if it is tilled when wet. As a result of the cloddiness, preparing a good seedbed is more difficult. Also, the surface tends to crust after hard rains. This crusting increases the amount of runoff.

Third, sediment from erosion enters road ditches, rivers, streams, lakes, and ponds. Deposition of sediment reduces the ability of these water systems to accommodate floodwater. Removal of the sediment is expensive. Water quality is impaired by herbicides,

pesticides, and fertilizers that are carried into the water along with the soil particles.

A good management system maintains or improves natural fertility, removes excess water, controls erosion, maintains good tilth, and increases the rate of water infiltration. A cropping system that keeps a cover of plants and crop residue on the surface for extended periods reduces the hazard of erosion and helps to maintain the productive capacity of the soils. Including grasses and legumes in the crop rotation helps to prevent excessive crusting, improves tilth, and provides nitrogen for the following crop.

Conservation tillage systems that leave crop residue on the surface after planting are becoming more common in Schuyler County. These systems, such as chisel plowing, no-till farming, and ridge planting, help to prevent excessive soil loss. They also reduce the runoff rate and increase the rate of water infiltration.

Chisel plowing is suitable on all of the tillable soils in the county. No-till farming is best suited to well drained or moderately well drained soils, such as Fayette, Rozetta, Downs, and Tama soils. Ridge planting is a suitable tillage system on most of the nearly level soils, such as Ipava and Virden soils.

Crop rotations that include oats, wheat, other small grain crops, and hay are needed to control erosion on the moderately sloping to steep Atlas, Fayette, Ursa, and Sylvan soils. These rotations, in addition to reducing soil losses, increase the amount of organic matter and the nitrogen supply, improve the ability of the soil to retain water, and improve tilth. Because of the changing soil environment, the crop rotations also help to control crop-damaging weeds and soil insects.

Terraces, diversions, and contour farming help to control erosion. By reducing the length of slopes, these systems reduce the runoff rate and increase the rate of water intake. They are best suited to soils that have smooth, uniform slopes, such as Rozetta and Fayette soils. Soils in areas of short slopes and irregular topography, such as Ursa, Fishhook, and Sylvan soils, are best managed by conservation tillage systems and/or crop rotations.

Grassed waterways help to carry excess rainwater safely downslope to the nearest stream or other watercourse. These waterways are generally used in conjunction with other conservation practices, such as terraces, diversions, conservation tillage systems, and contour farming, to manage runoff effectively.

Drainage systems have been installed in many of the poorly drained and somewhat poorly drained soils in Schuyler County (fig. 14). Virden, Beaucoup, and other poorly drained soils require some kind of drainage system if the more common crops in the

county are to be grown. The wetness of Ipava, Tice, and other somewhat poorly drained soils can delay planting in some years and thus can reduce yields.

The design of the drainage system varies with the kind of soil. On some poorly drained and very poorly drained soils, a combination of surface ditches and tile drains is needed to improve crop production.

The natural fertility level of the soils in Schuyler County ranges from low in some soils, such as Keomah soils, to high in other soils, such as Ipava soils. On most of the soils in the county, crops respond well to applications of nitrogen, phosphorus, and potassium fertilizer. Legumes, which take nitrogen from the air and fix it in the soil, help to maintain the supply of nitrogen.

Reaction in the root zone ranges from strongly acid to neutral in most of the soils in the county. Before the best plant growth and production can be achieved on acidic soils, applications of limestone are needed to raise the pH level.

On all soils, additions of lime, nitrogen, phosphorus, potassium, or any other element needed for optimum yields should be based on the results of soil tests and the needs of the crop. After tests have been made, the Cooperative Extension Service can help in determining the amount of lime and fertilizer to be applied.

Soil tilth is an important factor affecting the germination of seeds, the amount of runoff, and the rate of water intake. Poor tilth is a problem in most soils that are low in content of organic matter and have a light colored surface layer, such as Keomah soils. Generally, the structure of such soils is weak, and intensive rainfall causes surface crusting. The crust is hard when dry and is nearly impervious to water. It decreases the rate of water infiltration and increases the runoff rate. Regular incorporation of crop residue, manure, and other organic material into the surface layer improves soil structure. Crop residue on the surface helps to control crusting by absorbing the impact of falling raindrops.

Poor tilth also is a problem in poorly drained and very poorly drained soils that have a surface layer of silty clay loam or silty clay, such as Beaucoup, Titus, and Darwin soils. In most years these soils stay wet until late in spring. The opportunity for primary spring tillage is limited. If tilled when wet, the surface layer tends to form clods, which make preparing a good seedbed difficult. On these nearly level soils, chisel tillage in the fall results in a better seedbed in the spring.

The major crops grown in the county are corn and soybeans. Small grain and forage crops also are grown. Growing the small grain and forage crops on



Figure 14.—A drainage ditch that removes excess surface water and provides an outlet for subsurface drains.

the more sloping cropland helps to control erosion and improves soil productivity.

Suitable pasture and hay plants in the county include several legumes, cool-season grasses, and warm-season native grasses. Alfalfa and red clover are the most common legumes grown for hay. They also are grown in mixtures with bromegrass, orchardgrass, and tall fescue for hay and pasture.

The suitable warm-season grasses in the county are big bluestem, little bluestem, indiagrass, and switchgrass. These grasses grow well in the summer. They require different management techniques for establishment and grazing than cool-season grasses.

Alfalfa is best suited to deep, moderately well drained and well drained soils, such as Downs, Rozetta, Fayette, and Sylvan soils. The other legumes and grasses grow well on these and on other upland soils that are somewhat poorly drained, such as Clarksdale, Fishhook, and Keomah soils. On poorly drained soils, moisture-tolerant plants, such as reed canarygrass and ladino clover, should be selected.

Well managed forage stands are effective in controlling erosion. Overgrazing and the need for adequate lime and fertilizer are common management concerns. The amount of lime and fertilizer added should be based on the results of soil tests, the needs of the plants, and the expected level of production.

Overgrazing reduces the vigor and productivity of pasture. It also allows the extent of weedy and brushy species to increase. It can be prevented by deferred grazing, by rotation grazing, and by reducing the number of animals on the pasture. Deferred grazing gives the forage species a rest period and allows them to build up carbohydrate reserves. Rotation grazing among several areas of pasture gives each area a rest period. The information in table 5 can be helpful in estimating the number of animals that can be carried in a pasture. Some soils in the county have a high water table in the spring. Where possible, grazing on these soils should be avoided when the surface layer is wet. Delayed grazing during wet periods tends to minimize surface compaction. Pasture renovation

helps to prevent surface compaction. Frost heaving of alfalfa and red clover is a more serious hazard on soils that have a high water table than on soils without a high water table. Leaving stubble, 4 to 6 inches in height, on the surface over winter and growing grass-legume mixtures help to prevent excessive frost heaving.

The latest information about crop and forage production can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

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 5. 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 map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are 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 5 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. The criteria used in grouping the soils do not include major and generally expensive landforming 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 rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII 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, IIe. The letter *e* shows that the main hazard is the 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 I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the

soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

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 meeting 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 land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. 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.

About 156,700 acres in the survey area, or nearly 56 percent of the total land area, meets the soil requirements for prime farmland. Most of the prime farmland is used for crops. The crops grown on this land, mainly corn and soybeans, account for most of the county's income each year.

A recent trend in land use has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible,

droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 7. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding and wetness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. 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."

Woodland Management and Productivity

Before settlement, hardwood forest covered much of the acreage in Schuyler County. As the county became populated, the woodland was gradually cleared for farming. Today, the majority of the woodland is in relatively small, privately owned woodlots. Much of this woodland is in areas of soils that generally are not suited to cultivation because of wetness or excessive slope. These soils have fair or good potential for the production of high-quality trees.

The woodland in Schuyler County is mostly in areas of associations 3 and 5, which are described under the heading "General Soil Map Units." Red oak, white oak, black walnut, and shagbark hickory are the dominant species in areas of these associations. Silver maple, cottonwood, American elm, and black ash grow well on the soils on bottom land in association 6.

Much of the woodland can be improved by harvesting mature trees and by removing the nonmerchantable trees that retard the growth of desirable species. Protecting the woodland from fire, excluding livestock from the woodland, and controlling disease and insects increase productivity. Tree planting is needed unless stocking is adequate. Control of competing vegetation is needed if seedlings are planted. Seeding grass or grass-legume mixtures between rows of the planted seedlings helps to control erosion. If erosion is excessive or the slope is more than 15 percent, runoff should be diverted away from haul roads and skid trails. Machinery should be used only when the soil is firm enough to support the weight of the machinery.

Table 8 can help woodland owners or forest managers plan 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 in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 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; and *F*, a high content of rock fragments in the soil. 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, and F.

In table 8, *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 also are 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.

The *potential productivity* of merchantable or common trees on a soil is expressed as a *site index* and as a *productivity class*. 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 *productivity class*, a number, indicates the yield likely to be produced by the most important trees. This number indicates the yield in cubic meters per hectare per year calculated at culmination of the mean annual increment for fully stocked, natural stands.

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 shrubs and trees, 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 9 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 9 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. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

The demand for land and facilities for boating, swimming, picnicking, fishing, hunting, hiking, camping, and other forms of outdoor recreation is increasing throughout the county. Facilities for these activities are available in city and State parks, on county conservation district lands, and on a few privately owned tracts.

The potential for further recreational development is good throughout the county. The soils having the best potential are on uplands along the Illinois and La Moine Rivers and their major tributaries. These soils are in areas where a hilly terrain, wooded slopes, and

numerous streams provide a variety of opportunities for recreation.

Schuyler County has two public parks. Weinberg-King State Park, about 671 acres in size, is along the west side of the county. Schuy-Rush Park, about 150 acres in size, is owned and operated by the city of Rushville. Both parks provide a variety of outdoor recreational opportunities. The Illinois Department of Conservation owns and operates the Anderson Lake Conservation Area, which borders the Illinois River in the northeast corner of the county.

The soils of the survey area are rated in table 10 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 also are important. Soils that are 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 10, 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.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

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 or boulders 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

The kind and abundance of wildlife in Schuyler County reflect the soil types, land use, and vegetation. Native woodland originally made up about 85 percent of the county. About 15 percent of the soils in the county formed under native plant communities dominated by tall prairie grasses. The wildlife species that were formerly abundant in the areas of prairie included prairie chickens, grassland birds, and mammals. After the county was settled, drainage systems were installed, trees were cleared, and the acreage of cultivated crops increased rapidly. These changes altered the wildlife communities, favoring the more adaptable species and those that are more tolerant of human settlements, such as horned lark, cardinal, mourning dove, raccoon, and white-tailed deer.

Areas used as wildlife habitat are not necessarily set aside for this purpose. Wildlife habitat commonly is

a secondary use in areas used for other purposes, such as farming. For example, many of the nearly level to sloping soils used for crops and pasture in Schuyler County generally are well suited to habitat for openland wildlife species. Habitat for woodland wildlife generally is in areas of soils that are too steep for cultivation, in small dissected areas along streams, and in areas of soils that are not suitable for farming because of poor drainage. Habitat for wetland wildlife is in open shallow water areas.

Good management can improve the habitat for wildlife. Leaving crop residue on the surface during fall and winter, for example, not only helps to control erosion but also greatly improves the habitat for openland wildlife. Deferred mowing of grassed waterways, roadsides, and fence rows until early in August, after the nesting season, can significantly increase the annual production of pheasants, meadowlarks, rabbits, and other wildlife species that nest on the ground. Measures that exclude livestock from woodland, wetland, and streambanks markedly improve the habitat.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, 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 also are 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 also are considerations. Examples of grasses and legumes are fescue, lovegrass, 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 also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

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 these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive, autumn-olive, 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, salinity, slope, and surface stoniness. Examples of

wetland plants are smartweed, wild millet, cordgrass, 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 depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

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, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, 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 data in the tables described under the heading "Soil Properties."

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. 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 12 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, or 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 13 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 13 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, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan 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 13 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, bedrock, and cemented pans 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 13 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, rock 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 14 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 table 14, 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.

The ease of excavation is affected by large stones, a high water table, and slope. 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 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 14, 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 content of organic matter. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 15 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 and for embankments, dikes, and levees. 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.

Table 15 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 table 15, 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.

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, and 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. 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, such toxic substances 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.

Engineering Index Properties

Table 16 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. 15). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt,

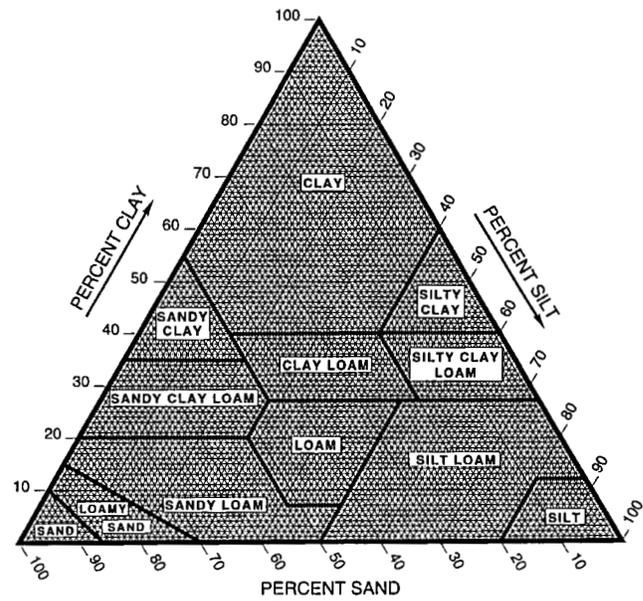


Figure 15.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

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, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

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 content of organic matter. 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 oven-dry 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 17 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.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 17, 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 earth-moving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $\frac{1}{3}$ -bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In table 17, 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 retention of water and 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.

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 the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to roads, buildings, 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; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

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. Other factors being equal, 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. The soils assigned to group 1 are the most susceptible to soil blowing, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine

sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, 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.

Soil and Water Features

Table 18 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, 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 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 18, the first letter is for drained areas and the second is for undrained areas.

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, and water standing in swamps and marshes is considered ponding rather than flooding.

Table 18 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, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (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, and *long* if more than 7 days. 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 observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles in the soil.

Indicated in table 18 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 18.

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.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is determined on the basis of many soil borings and observations during soil mapping. In table 18, bedrock within a depth of 5 feet is described as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential for 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 (Soil Survey Staff, 1999). 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 19 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 Alfisol.

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 Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

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; type of saturation; 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 Hapludalfs (*Hapl*, meaning minimal horization, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. 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 Hapludalfs.

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, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. 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" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Atlas Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Very slow

Landscape: Uplands

Parent material: Loess and the underlying paleosol, which formed in glacial till

Slope range: 10 to 15 percent

Taxonomic class: Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs

Typical Pedon

Atlas silt loam, 10 to 15 percent slopes, eroded, 300 feet south and 165 feet east of the center of sec. 5, T. 2 N., R. 4 W.

Ap—0 to 5 inches; mixed very dark grayish brown (10YR 3/2), dark grayish brown (10YR 4/2), and brown (10YR 5/3) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common very fine and few fine roots; very strongly acid; clear smooth boundary.

BE—5 to 9 inches; brown (10YR 5/3) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak very fine and fine subangular blocky structure; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) channel fillings; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

Bt—9 to 16 inches; brown (10YR 5/3) silty clay loam; few fine prominent yellowish brown (10YR 5/8) and few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; firm; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds and as linings in pores; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

2Btg1—16 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds and as linings in pores; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

2Btg2—25 to 31 inches; grayish brown (2.5Y 5/2) clay; common fine distinct light olive brown (2.5Y 5/6) and common fine distinct gray (5Y 5/1) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds and as linings in pores; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

2Btg3—31 to 41 inches; light brownish gray (2.5Y 6/2) clay; common fine prominent olive yellow (2.5Y 6/6), few fine prominent yellowish brown (10YR 5/6), and common fine distinct light gray (5Y 6/1) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm;

few very fine roots; few distinct dark gray (10YR 4/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); less than 2 percent fine gravel; moderately acid; clear smooth boundary.

2Btg4—41 to 60 inches; light brownish gray (2.5Y 6/2) clay; few fine prominent olive yellow (2.5Y 6/6), few fine prominent yellowish brown (10YR 5/6), and common medium distinct light gray (5Y 6/1) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; few distinct dark gray (10YR 4/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); less than 2 percent fine gravel; slightly acid.

Range in Characteristics

Thickness of the loess: 0 to 20 inches

Ap horizon:

Value—3 to 5

Chroma—2 or 3

Texture—silt loam or silty clay loam

Bt horizon:

Value—4 to 6

Chroma—2 to 4

Texture—silty clay loam or clay loam

2Btg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—4 to 6

Chroma—0 to 2

Texture—silty clay, clay, or silty clay loam

Beaucoup Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Moderately slow

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic
Fluvaquentic Haplaquolls

Typical Pedon

Beaucoup silty clay loam, occasionally flooded, 80 feet south and 150 feet west of the northeast corner of sec. 19, T. 1 N., R. 1 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common very

fine, common fine, and few medium roots; neutral; abrupt smooth boundary.

A—7 to 13 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak medium prismatic structure; friable; common very fine, few fine, and few medium roots; neutral; clear smooth boundary.

Bg1—13 to 22 inches; dark olive gray (5Y 3/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine and few fine roots; few prominent very dark grayish brown (10YR 3/2) organic coatings as linings in pores and few prominent dark gray (10YR 4/1) pressure faces; slightly alkaline; clear smooth boundary.

Bg2—22 to 34 inches; dark gray (5Y 4/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots; common distinct dark gray (10YR 4/1) pressure faces; few medium irregular accumulations (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Bg3—34 to 45 inches; dark gray (5Y 4/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark gray (10YR 4/1) pressure faces; few medium irregular concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Bg4—45 to 55 inches; dark gray (5Y 4/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/4) and common fine distinct grayish brown (2.5Y 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; many distinct dark gray (10YR 4/1) pressure faces; few medium irregular accumulations (iron and manganese oxides); slightly alkaline; clear smooth boundary.

BCg—55 to 60 inches; dark gray (5Y 4/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/4) and few fine distinct grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; common distinct dark gray (10YR 4/1) pressure faces; few medium irregular accumulations (iron and manganese oxides); slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 or 2

Bg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—3 to 6

Chroma—0 to 2

Bloomfield Series

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Rapid

Landscape: Uplands

Parent material: Sandy eolian material

Slope range: 18 to 40 percent

Taxonomic class: Sandy, mixed, mesic Psammentic Hapludalfs

Typical Pedon

Bloomfield loamy fine sand, 18 to 40 percent slopes, 580 feet east and 2,380 feet north of the southwest corner of sec. 32, T. 1 N., R. 1 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) loamy fine sand, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; many very fine roots; slightly acid; clear smooth boundary.

E1—4 to 8 inches; brown (10YR 4/3) loamy fine sand; single grain; loose; common very fine roots; strongly acid; clear smooth boundary.

E2—8 to 15 inches; dark yellowish brown (10YR 4/4) loamy fine sand; single grain; loose; few very fine roots; less than 5 percent fine gravel; moderately acid; clear smooth boundary.

E3—15 to 24 inches; dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; less than 5 percent fine gravel; moderately acid; clear smooth boundary.

E4—24 to 29 inches; strong brown (7.5YR 4/6) sand; single grain; loose; less than 5 percent fine gravel; moderately acid; clear smooth boundary.

Bt and E1—29 to 57 inches; brown (7.5YR 4/4) loamy sand (Bt part); weak coarse subangular blocky structure; very friable; clay bridging between sand grains; a 3-inch band of strong brown (7.5YR 4/6) sand (E part) that is single grain and loose; less than 5 percent fine gravel; strongly acid; clear smooth boundary.

Bt and E2—57 to 65 inches; brown (7.5YR 4/4) loamy fine sand (Bt part); weak coarse subangular

blocky structure; very friable; clay bridging between sand grains; bands of strong brown (7.5YR 4/6) fine sand (E part) that is single grain and loose; strongly acid.

Range in Characteristics

A horizon:

Value—3 or 4
Chroma—2 or 3

E horizon:

Hue— 10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—loamy fine sand, fine sand, loamy sand, or sand

Bt part of the Bt and E horizon:

Hue—10YR or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—loamy fine sand, loamy sand, or fine sand

E part of the Bt and E horizon:

Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—loamy fine sand, fine sand, loamy sand, or sand

Clarksdale Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landscape: Uplands

Parent material: Loess

Slope range: 0 to 5 percent

Taxonomic class: Fine, montmorillonitic, mesic Udollic Ochraqualfs

Typical Pedon

Clarksdale silt loam, 0 to 2 percent slopes, 162 feet north and 126 feet west of the southeast corner of sec. 24, T. 3 N., R. 3 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; few very fine and common fine roots; neutral; clear smooth boundary.

E—7 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak thin platy structure; friable; few very fine and common fine roots; few fine irregular

concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt1—10 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt2—13 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and as linings in pores; few fine irregular concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt3—19 to 29 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and few fine faint light brownish gray (10YR 6/2) mottles; moderate medium and coarse subangular blocky structure; firm; many faint dark grayish brown (10YR 4/2) clay films on faces of peds and as linings in pores; common medium irregular concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg1—29 to 38 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/6) and few fine distinct grayish brown (2.5Y 5/2) mottles; moderate medium and coarse subangular blocky structure; firm; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular concretions and accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg2—38 to 48 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular concretions and accumulations (iron and manganese oxides); neutral; clear smooth boundary.

BCg—48 to 60 inches; light gray (10YR 6/1) silty clay loam; many coarse prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); neutral.

Range in Characteristics*Ap horizon:*

Value—2 or 3

Chroma—1 or 2

E horizon:

Value—4 to 6

Chroma—1 or 2

Bt and Btg horizons:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—1 to 4

Texture—silty clay loam or silty clay

Darwin Series*Depth class:* Very deep*Drainage class:* Poorly drained or very poorly drained*Permeability:* Very slow*Landscape:* Flood plains*Parent material:* Alluvium*Slope range:* 0 to 2 percent**Taxonomic class:** Fine, montmorillonitic, mesic Vertic Haplaquolls**Typical Pedon**

Darwin silty clay, occasionally flooded, 297 feet west and 462 feet north of the center of sec. 11, T. 2 N., R. 2 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; firm; many very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; very firm; many very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

Bg1—12 to 18 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; many medium prominent dark yellowish brown (10YR 4/6) and few medium distinct brown (10YR 4/3) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm; common very fine roots; few fine and medium concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Bg2—18 to 27 inches; dark gray (10YR 4/1) silty clay; common medium distinct brown (10YR 4/3) and few fine prominent dark yellowish brown (10YR

4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; common very fine roots; common faint very dark gray (10YR 3/1) pressure faces; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Bg3—27 to 40 inches; gray (10YR 5/1) silty clay; many medium distinct brown (10YR 4/3) and common fine prominent dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common faint very dark gray (10YR 3/1) pressure faces; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Bg4—40 to 45 inches; gray (10YR 5/1) silty clay loam; many medium distinct brown (10YR 4/3) and common fine prominent brownish yellow (10YR 6/8) mottles; weak coarse prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common faint very dark gray (10YR 3/1) pressure faces and few faint very dark gray (10YR 3/1) organic coatings as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

BCg—45 to 50 inches; gray (10YR 5/1) silty clay loam; many medium distinct brown (10YR 4/3) and few fine prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; firm; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Cg1—50 to 56 inches; gray (10YR 5/1) silty clay loam; many medium distinct brown (10YR 4/3) and common fine prominent brownish yellow (10YR 6/8) mottles; massive; firm; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings as linings in pores; few fine rounded concretions (iron and manganese oxides); 1 percent fine gravel; slightly alkaline; clear smooth boundary.

Cg2—56 to 60 inches; dark gray (10YR 4/1) silty clay loam; many medium faint light gray (10YR 6/1) and common fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly alkaline.

Range in Characteristics*Thickness of the mollic epipedon:* 10 to 24 inches

Ap and A horizons:

Hue—10YR, 2.5Y, or neutral
 Value—2 or 3
 Chroma—0 to 2

Bg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral
 Value—3 to 6
 Chroma—0 to 2
 Texture—silty clay, clay, or silty clay loam in the lower part

Cg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral
 Value—4 to 6
 Chroma—0 to 2
 Texture—silty clay loam, silty clay, or clay

Dickinson Series*Depth class:* Very deep*Drainage class:* Somewhat excessively drained*Permeability:* Moderately rapid in the upper part of the soils and rapid in the lower part*Landscape:* Terraces*Parent material:* Wind-worked sandy alluvial sediments*Slope range:* 1 to 7 percent

Taxonomic class: Coarse-loamy, mixed, mesic Typic Hapludolls

Typical Pedon

Dickinson sandy loam, 1 to 7 percent slopes, rarely flooded, 108 feet east and 242 feet south of the center of sec. 5, T. 1 S., R. 1 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) sandy loam, gray (10YR 5/1) dry; weak fine granular structure; friable; common fine and very fine roots; neutral; clear smooth boundary.

A1—9 to 15 inches; very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1) dry; weak very fine and fine subangular blocky structure; friable; common very fine roots; slightly acid; clear smooth boundary.

A2—15 to 20 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw1—20 to 25 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; common very fine roots; few distinct very dark gray (10YR 3/1) and many faint very dark

grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw2—25 to 31 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw3—31 to 37 inches; brown (10YR 4/3) fine sandy loam; weak fine subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 1 percent fine gravel; moderately acid; clear smooth boundary.

Bw4—37 to 43 inches; brown (10YR 4/3) sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; less than 5 percent fine gravel; moderately acid; clear smooth boundary.

E and Bt—43 to 60 inches; dark yellowish brown (10YR 4/4) sand (E part); ³/₄-inch lamella of brown (10YR 4/3) loamy sand (Bt part); single grain; loose; less than 5 percent fine gravel; moderately acid.

Range in Characteristics*Thickness of the mollic epipedon:* 12 to 20 inches*Ap and A horizons:*

Value—2 or 3
 Chroma—1 to 3
 Texture—fine sandy loam or sandy loam

Bw horizon:

Value—3 or 4
 Chroma—2 or 3
 Texture—fine sandy loam or sandy loam

E and Bt horizon:

Value—4 or 5
 Chroma—3 to 6

Downs Series*Depth class:* Very deep*Drainage class:* Moderately well drained*Permeability:* Moderate*Landscape:* Uplands*Parent material:* Loess*Slope range:* 2 to 5 percent

Taxonomic class: Fine-silty, mixed, mesic Mollic Hapludalfs

Typical Pedon

Downs silt loam, 2 to 5 percent slopes, 1,540 feet west and 1,460 feet south of the northeast corner of sec. 2, T. 1 S., R. 2 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine roots; neutral; clear smooth boundary.

Bt1—9 to 14 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; many very fine roots; common faint dark yellowish brown (10YR 3/4) clay films as linings in pores and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; neutral; clear smooth boundary.

Bt2—14 to 20 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; common very fine roots; common distinct dark yellowish brown (10YR 3/4) clay films on faces of peds and as linings in pores and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt3—20 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint yellowish brown (10YR 5/6) and few fine distinct brown (10YR 5/3) mottles; moderate fine subangular blocky structure; firm; few very fine roots; many faint dark yellowish brown (10YR 3/4) clay films and very few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt4—27 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint yellowish brown (10YR 5/6) and common fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark yellowish brown (10YR 3/4) clay films on faces of peds and as linings in pores; common fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt5—40 to 51 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct brown (10YR 5/3), common fine distinct yellowish brown (10YR 5/6), and few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; many faint dark yellowish brown (10YR 3/4) clay films on faces of peds and as linings in pores and common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine rounded concretions

(iron and manganese oxides); moderately acid; clear smooth boundary.

BCt—51 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6), common fine distinct brown (10YR 5/3), and few fine distinct light brownish gray (10YR 6/2) mottles; weak coarse subangular blocky structure; firm; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and few distinct dark yellowish brown (10YR 3/4) clay films as linings in pores; common fine rounded concretions (iron and manganese oxides); moderately acid.

Range in Characteristics

Ap horizon:

Chroma—1 or 2

Bt horizon:

Value—4 or 5

Chroma—3 to 6

Drury Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Alluvium

Slope range: 5 to 10 percent

Taxonomic class: Fine-silty, mixed, mesic Dystric Eutrochrepts

Typical Pedon

Drury silt loam, 5 to 10 percent slopes, 1,478 feet east and 950 feet south of the northwest corner of sec. 24, T. 1 N., R. 1 W.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, yellowish brown (10YR 5/4) dry; weak fine granular structure; very friable; few very fine roots; 2 percent fine gravel; slightly acid; abrupt smooth boundary.

E—8 to 12 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; very friable; 2 percent fine gravel and 3 percent medium gravel; 8 percent sand; slightly acid; clear smooth boundary.

Bw1—12 to 23 inches; brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few faint dark yellowish brown (10YR 3/4) organic coatings on faces of peds; 2 percent fine gravel, 3 percent medium gravel, and 2 percent coarse gravel; slightly acid; gradual smooth boundary.

Bw2—23 to 31 inches; brown (7.5YR 4/4) silt loam;

moderate medium subangular blocky structure; friable; few distinct dark yellowish brown (10YR 3/4) organic coatings on faces of peds; 2 percent fine gravel, 3 percent medium gravel, and 3 percent coarse gravel; neutral; clear smooth boundary.

C—31 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; massive; friable; few fine irregular accumulations (iron and manganese oxides); 2 percent medium gravel; neutral.

Range in Characteristics

Content of gravel: 2 to 8 percent

Ap horizon:

Value—3 or 4

Chroma—2 to 4

E horizon:

Value—4 or 5

Chroma—3 or 4

Bw horizon:

Hue—10YR or 7.5YR

Value—4 or 5

Chroma—3 to 6

C horizon:

Value—3 to 6

Chroma—2 to 4

Fayette Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Loess

Slope range: 2 to 18 percent

Taxonomic class: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Fayette silt loam, 2 to 5 percent slopes, 1,716 feet east and 99 feet south of the northwest corner of sec. 31, T. 2 N., R. 1 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine and few medium roots; moderately acid; abrupt smooth boundary.

Bt1—8 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—14 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine roots; very few faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—21 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides) and few fine irregular accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt4—28 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular structure; firm; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt5—40 to 53 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt6—53 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; strongly acid.

Range in Characteristics

Ap horizon:

Value—2 to 4

Chroma—2 or 3

Texture—silt loam or silty clay loam

Bt horizon:

Value—4 or 5

Chroma—3 to 6

Texture—silty clay loam or silt loam

Fishhook Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate in the upper part of the soils and slow in the lower part

Landscape: Uplands

Parent material: Loess and the underlying paleosol, which formed in glacial till

Slope range: 5 to 10 percent

Taxonomic class: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Fishhook silt loam, 5 to 10 percent slopes, eroded, 2,508 feet east and 600 feet south of the northwest corner of sec. 33, T. 3 N., R. 2 W.

Ap—0 to 4 inches; mixed dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

Bt1—4 to 9 inches; brown (10YR 5/3) silty clay loam; many fine and medium distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

Bt2—9 to 13 inches; brown (10YR 5/3) silty clay loam; few fine faint light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

Bt3—13 to 18 inches; brown (10YR 5/3) silty clay loam; common fine faint light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

Bt4—18 to 25 inches; brown (10YR 5/3) silty clay loam; common fine faint light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; very few faint dark grayish brown (10YR 4/2) clay films on faces of peds and few distinct dark gray (10YR 4/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); a 1-inch band of very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) material at the lower horizon boundary; very strongly acid; clear smooth boundary.

2Btg1—25 to 31 inches; light gray (10YR 6/1) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint gray (10YR 5/1) and few distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 15 percent sand; strongly acid; clear smooth boundary.

2Btg2—31 to 39 inches; gray (10YR 5/1) and light gray (10YR 6/1) silty clay; few fine prominent brownish yellow (10YR 6/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine roots; few distinct very dark gray (10YR 3/1) and common faint gray (10YR 5/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 15 percent sand; moderately acid; clear smooth boundary.

2Btg3—39 to 45 inches; gray (10YR 5/1) and light gray (10YR 6/1) silty clay; common fine prominent brownish yellow (10YR 6/6) and few fine prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm; common faint gray (10YR 5/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 15 percent sand; slightly acid; clear smooth boundary.

2Btg4—45 to 60 inches; gray (10YR 5/1) and light gray (10YR 6/1) silty clay; few fine prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; weak medium prismatic structure parting to moderate medium angular blocky; very firm; common faint gray (10YR 5/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 15 percent sand; slightly acid.

Range in Characteristics

Thickness of the loess: 20 to 40 inches

Ap horizon:

Value—3 to 5

Chroma—2 to 4

Texture—silt loam or silty clay loam

Bt horizon:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

2Btg horizon:

Hue—10YR, 2.5Y, or 5Y

Value—2 to 6

Chroma—1 or 2

Texture—silty clay loam, silty clay, or clay

Gosport Series

Depth class: Moderately deep

Drainage class: Moderately well drained

Permeability: Very slow

Landscape: Uplands

Parent material: A thin silty mantle over residuum

Slope range: 18 to 60 percent

Taxonomic class: Fine, illitic, mesic Typic
Dystrochrepts

Typical Pedon

Gosport silt loam, 18 to 30 percent slopes, 172 feet east and 2,237 feet south of the northwest corner of sec. 18, T. 2 N., R. 4 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common very fine, common fine, and few medium roots; slightly acid; abrupt smooth boundary.

E—4 to 7 inches; brown (10YR 5/3) silty clay loam; weak moderately thick platy structure parting to weak very fine angular blocky; friable; few very fine and few fine roots; moderately acid; clear smooth boundary.

Bw1—7 to 10 inches; yellowish brown (10YR 5/4) silty clay; moderate fine angular blocky structure; firm; few very fine roots; few fine rounded concretions (iron and manganese oxides); 4 percent soft shale fragments; strongly acid; clear smooth boundary.

Bw2—10 to 16 inches; light olive brown (2.5Y 5/4) silty clay; few fine distinct yellowish brown (10YR 5/4) mottles; moderate fine angular blocky structure; firm; few very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 6 percent soft shale fragments; strongly acid; clear smooth boundary.

Bw3—16 to 21 inches; light yellowish brown (2.5Y 6/4) silty clay; few fine prominent yellowish brown (10YR 5/6) and few fine distinct light brownish gray (2.5Y 6/2) mottles; weak fine angular blocky structure; firm; very few faint brown (10YR 5/3) clay films on faces of peds; 8 percent soft shale fragments; very strongly acid; clear smooth boundary.

Bw4—21 to 27 inches; light brownish gray (2.5Y 6/2) silty clay; few medium distinct light yellowish brown (2.5Y 6/4) and few fine distinct yellowish brown (10YR 5/6) mottles; weak fine angular

blocky structure; very firm; very few distinct brown (10YR 5/3) clay films on faces of peds; 30 to 35 percent soft shale fragments; very strongly acid; gradual smooth boundary.

Cr—27 to 60 inches; grayish brown (2.5Y 5/2) clay shale; very firm; very strongly acid.

Range in Characteristics

Depth to bedrock: 20 to 40 inches

A horizon:

Value—3 or 4

Chroma—1 or 2

E horizon:

Value—4 or 5

Chroma—2 to 4

Texture—silty clay loam or silt loam

Bw horizon:

Hue—10YR or 2.5Y

Value—5 or 6

Chroma—2 to 4

Texture—silty clay or clay

Herrick Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landscape: Uplands

Parent material: Loess

Slope range: 0 to 2 percent

Taxonomic class: Fine, montmorillonitic, mesic Aquic
Argiudolls

Typical Pedon

Herrick silt loam, 0 to 2 percent slopes, 145 feet south and 185 feet west of the center of sec. 5, T. 3 N., R. 4 W.

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; very friable; common very fine and few medium roots; neutral; clear smooth boundary.

E—11 to 17 inches; dark gray (10YR 4/1) silt loam; weak thick platy structure parting to moderate fine subangular blocky; very friable; few very fine and few medium roots; many faint very dark gray (10YR 3/1) organic coatings and many distinct light gray (10YR 7/1 dry) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—17 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct dark grayish brown (10YR 4/2) and common medium distinct brown (10YR 4/3) mottles; moderate medium

subangular blocky structure; friable; few medium and few very fine roots; few distinct dark grayish brown (10YR 4/2) and few distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt2—25 to 34 inches; brown (10YR 5/3) silty clay loam; common medium prominent yellowish brown (10YR 5/8), few fine faint light brownish gray (10YR 6/2), and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) and common distinct very dark gray (10YR 3/1) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt3—34 to 55 inches; brown (10YR 5/3) silty clay loam; many medium distinct yellowish brown (10YR 5/6), many medium prominent yellowish brown (10YR 5/8), and common fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure; friable; common faint dark grayish brown (10YR 4/2) and few fine distinct very dark gray (10YR 3/1) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

C—55 to 60 inches; light brownish gray (10YR 6/2) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; massive; friable; few medium rounded concretions (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

Ap horizon:

Value—2 or 3

Chroma—1 or 2

E horizon:

Value—3 or 4

Chroma—1 or 2

Bt horizon:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 6

Texture—silty clay loam or silty clay

C horizon:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 6

Hickory Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Glacial till

Slope range: 18 to 60 percent

Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Hickory loam, 30 to 60 percent slopes, 1,003 feet south and 369 feet west of the northeast corner of sec. 7, T. 1 N., R. 1 W.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, brown (10YR 4/3) dry; weak fine granular structure; friable; common very fine and common medium roots; neutral; clear smooth boundary.

E—4 to 6 inches; brown (10YR 5/3) loam; weak fine subangular blocky structure; friable; common very fine roots; slightly acid; clear smooth boundary.

Bt1—6 to 11 inches; yellowish brown (10YR 5/4) clay loam; weak fine subangular blocky structure; friable; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 3 percent fine gravel and 2 percent medium gravel; 18 percent sand; slightly acid; clear smooth boundary.

Bt2—11 to 22 inches; yellowish brown (10YR 5/6) clay loam; moderate fine subangular blocky structure; firm; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; 2 percent fine gravel and 2 percent medium gravel; moderately acid; clear smooth boundary.

Bt3—22 to 34 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; many distinct yellowish brown (10YR 5/4) clay films on faces of peds; few medium irregular concretions (iron and manganese oxides); 2 percent fine gravel and 2 percent medium gravel; slightly acid; clear smooth boundary.

Bt4—34 to 47 inches; yellowish brown (10YR 5/4) clay loam; few fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm; common faint brown (10YR 4/3) and many faint yellowish brown (10YR 5/4) clay films on faces of peds; common coarse irregular concretions (iron and manganese oxides); 4 percent fine gravel and 5 percent medium gravel; neutral; abrupt smooth boundary.

Bt5—47 to 54 inches; pale brown (10YR 6/3) clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint brown (10YR 4/3) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); 2 percent fine gravel and 2 percent medium gravel; neutral; abrupt smooth boundary.

C—54 to 60 inches; light yellowish brown (10YR 6/4) loam; common medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/4) mottles; massive; friable; few fine irregular concretions (iron and manganese oxides); 2 percent medium gravel and 2 percent coarse gravel; neutral.

Range in Characteristics

Thickness of the loess: 0 to 15 inches

A horizon:

Value—2 to 4

Chroma—2 or 3

E horizon:

Value—4 to 6

Chroma—2 to 4

Bt horizon:

Value—4 to 6

Chroma—3 to 6

Texture—clay loam or silty clay loam

C horizon:

Value—5 or 6

Chroma—2 to 6

Texture—loam or clay loam

Huntsville Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic Cumulic Hapludolls

Typical Pedon

Huntsville silt loam, frequently flooded, 1,122 feet west and 330 feet south of the northeast corner of sec. 5, T. 2 N., R. 3 W.

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular

structure; friable; common very fine roots; strongly acid; clear smooth boundary.

A1—10 to 21 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; moderately acid; clear smooth boundary.

A2—21 to 30 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; moderately acid; clear smooth boundary.

A3—30 to 37 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear smooth boundary.

Bw1—37 to 44 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bw2—44 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few very fine roots; few faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 40 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 to 3

Bw horizon:

Value—4 or 5

Chroma—3 or 4

Ipava Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landscape: Uplands

Parent material: Loess

Slope range: 0 to 5 percent

Taxonomic class: Fine, montmorillonitic, mesic Aquic Argiudolls

Typical Pedon

Ipava silt loam, 0 to 2 percent slopes, 1,074 feet east and 1,284 feet south of the northwest corner of sec. 21, T. 2 N., R. 1 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A—9 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

Bt1—12 to 17 inches; brown (10YR 4/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—17 to 24 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6), few fine distinct dark yellowish brown (10YR 4/6), and few fine faint light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct very dark grayish brown (10YR 3/2) clay films as linings in pores and common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg1—24 to 33 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine distinct light brownish gray (10YR 6/2), many fine prominent yellowish brown (10YR 5/6), and common fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many prominent very dark grayish brown (10YR 3/2) clay films as linings in pores and common prominent dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg2—33 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium distinct light olive brown (2.5Y 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium and coarse subangular blocky structure; firm; few very fine roots; many prominent very dark grayish brown (10YR 3/2) clay films as

linings in pores and very few prominent dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides) and few fine irregular accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

BCg—40 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium prominent light olive brown (2.5Y 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few faint grayish brown (2.5Y 5/2) and few prominent very dark grayish brown (10YR 3/2) clay films on faces of peds; few medium irregular accumulations (iron and manganese oxides) and few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—50 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent light olive brown (2.5Y 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; massive; firm; few fine irregular accumulations (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 or 2

Texture—silt loam or silty clay loam

Bt and Btg horizons:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

Texture—silty clay loam or silty clay

Cg horizon:

Hue—10YR or 2.5Y

Value—5 or 6

Chroma—1 to 4

Texture—silty clay loam or silt loam

Keller Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate in the upper part of the soils and slow in the lower part

Landscape: Uplands

Parent material: Loess over a paleosol, which formed in glacial till

Slope range: 5 to 10 percent

Taxonomic class: Fine-silty, mixed, mesic Aquic Argiudolls

Typical Pedon

Keller silt loam, 5 to 10 percent slopes, eroded, 120 feet north of the southwest corner of sec. 33, T. 3 N., R. 4 W.

Ap—0 to 9 inches; mixed very dark grayish brown (10YR 3/2) and yellowish brown (10YR 5/4) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine and fine roots; few fine rounded concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

Bt1—9 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; friable; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bt2—16 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt3—22 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; many fine faint grayish brown (10YR 5/2) and many fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds and common distinct very dark gray (10YR 3/1) organic coatings as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

2Bt4—28 to 39 inches; brown (10YR 5/3) clay loam; many fine distinct yellowish brown (10YR 5/6) and common fine distinct gray (10YR 5/1) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; less than 1 percent gravel; neutral; clear smooth boundary.

2Btg1—39 to 52 inches; grayish brown (2.5Y 5/2) clay loam; common fine prominent yellowish brown (10YR 5/4) and few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine

roots; few distinct dark gray (5Y 4/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); 1 percent gravel; neutral; clear smooth boundary.

2Btg2—52 to 60 inches; gray (5Y 5/1) clay loam; common fine prominent yellowish brown (10YR 5/4) and common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few faint dark gray (5Y 4/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very dark gray (10YR 3/1) krotovinas; 1 percent gravel; neutral.

Range in Characteristics

Thickness of the dark surface layer: 7 to 10 inches

Thickness of the loess: 20 to 40 inches

Ap horizon:

Value—2 or 3

Chroma—1 or 2

Bt horizon:

Value—4 to 6

Chroma—2 to 4

2Bt and 2Btg horizons:

Hue—10YR, 2.5Y, or 5Y

Value—4 to 6

Chroma—1 to 3

Texture—clay loam or silty clay loam

Taxadjunct feature:

The Keller soils in Schuyler County have a thinner dark surface soil than is definitive for the series. This difference, however, does not significantly affect the usefulness or behavior of the soils. The soils classify as fine-silty, mixed, mesic Aquollic Hapludalfs.

Kendall Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landscape: Terraces

Parent material: Loess and the underlying outwash

Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic Aeric Ochraqualfs

Typical Pedon

Kendall silt loam, 0 to 2 percent slopes, 96 feet south and 48 feet west of the center of sec. 12, T. 3 N., R. 4 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt

loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; common very fine and common fine roots; slightly acid; abrupt smooth boundary.

E—9 to 16 inches; light brownish gray (10YR 6/2) silt loam; weak thin platy structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

Bt1—16 to 20 inches; brown (10YR 5/3) silty clay loam; common fine faint grayish brown (10YR 5/2) and few fine distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable; common distinct white (10YR 8/1 dry) silt coatings and many faint grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt2—20 to 33 inches; brown (10YR 4/3) silty clay loam; many medium distinct grayish brown (10YR 5/2) and few fine faint brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few distinct white (10YR 8/1 dry) silt coatings and common faint grayish brown (10YR 5/2) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt3—33 to 44 inches; grayish brown (10YR 5/2) silty clay loam; few fine faint brown (10YR 5/3) and common fine distinct brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; common faint grayish brown (10YR 5/2) clay films on faces of peds; common fine irregular and common coarse irregular concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

2Bt4—44 to 50 inches; light brownish gray (10YR 6/2) silt loam; many fine prominent brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; few faint grayish brown (10YR 5/2) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); 12 percent very fine sand; neutral; clear smooth boundary.

2BCt—50 to 60 inches; light brownish gray (10YR 6/2) silt loam; many fine prominent brown (7.5YR 5/4) and many fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few faint grayish brown (10YR 5/2) clay films as linings in pores; common medium irregular concretions (iron and manganese oxides); 12 percent fine sand; neutral.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:

Value—4 or 5

Chroma—1 to 3

E horizon:

Value—4 to 6

Chroma—2 or 3

Bt horizon:

Value—4 to 6

Chroma—2 to 6

2Bt horizon:

Value—4 to 6

Chroma—2 to 6

Keomah Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderately slow

Landscape: Uplands

Parent material: Loess

Slope range: 0 to 5 percent

Taxonomic class: Fine, montmorillonitic, mesic Aeric Ochraqualfs

Typical Pedon

Keomah silt loam, 0 to 2 percent slopes, 2,580 feet south and 1,200 feet east of the northwest corner of sec. 3, T. 1 N., R. 2 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.

E—6 to 10 inches; brown (10YR 5/3) silt loam; moderate thick platy structure; friable; common very fine roots; few fine and medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bt1—10 to 14 inches; brown (10YR 5/3) silty clay loam; few fine faint grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; firm; common very fine roots; many distinct dark grayish brown (10YR 4/2) and few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); very strongly acid; clear smooth boundary.

Bt2—14 to 28 inches; brown (10YR 5/3) silty clay loam; many fine distinct yellowish brown (10YR 5/6) and common fine faint brown (10YR 5/2) mottles; moderate medium subangular blocky

structure; firm; common very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Btg—28 to 40 inches; grayish brown (10YR 5/2) silty clay loam; many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium and coarse subangular blocky structure; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

BCg—40 to 58 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine distinct brown (10YR 5/3) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few prominent dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Cg—58 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; many fine distinct brown (10YR 5/3) and many fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few fine rounded concretions (iron and manganese oxides); neutral.

Range in Characteristics

Ap horizon:

Chroma—1 or 2

E horizon:

Value—4 or 5

Chroma—1 to 3

Bt and Btg horizons:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

Texture—silty clay loam or silty clay

C horizon:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

Texture—silty clay loam or silt loam

Lenzburg Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow

Landscape: Uplands

Parent material: Cast overburden

Slope range: 30 to 60 percent

Taxonomic class: Fine-loamy, mixed (calcareous), mesic Typic Udorthents

Typical Pedon

Lenzburg silty clay loam, 30 to 60 percent slopes, 50 feet south and 1,420 feet west of the northeast corner of sec. 36, T. 2 N., R. 1 W.

A—0 to 5 inches; very dark grayish brown (2.5Y 3/2) silty clay loam, gray (10YR 5/1) dry; weak fine subangular blocky structure; very firm; many fine and very fine roots; few fine rounded concretions (iron and manganese oxides); 12 percent coal fragments; 12 percent sand; slightly alkaline; abrupt smooth boundary.

C1—5 to 16 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; massive; firm; many fine and many very fine roots; few fine rounded concretions (iron and manganese oxides); a 1-inch band with 20 percent coal fragments; 12 percent sand; neutral; clear smooth boundary.

C2—16 to 23 inches; brown (10YR 4/3) and grayish brown (10YR 5/2) clay loam; many medium distinct dark yellowish brown (10YR 4/4) and few fine faint brown (10YR 4/3) mottles; massive; firm; common fine and common very fine roots; few fine rounded concretions (iron and manganese oxides); pockets of structured B material; neutral; clear smooth boundary.

C3—23 to 27 inches; gray (10YR 5/1) silty clay loam; common medium distinct brown (10YR 4/3), common medium prominent yellowish brown (10YR 5/6), and few fine faint grayish brown (10YR 5/2) mottles; massive; firm; few fine and few very fine roots; 15 percent sand; slightly alkaline; clear smooth boundary.

C4—27 to 38 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; slightly alkaline; clear smooth boundary.

C5—38 to 60 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct gray (10YR 5/1) and common medium distinct yellowish brown (10YR 5/6) mottles; massive; very friable; few very fine roots; slightly alkaline.

Range in Characteristics

A horizon:

Hue—10YR or 2.5Y

Value—2 to 5
 Chroma—1 to 6
 Texture—silty clay loam, silt loam, clay loam, or loam

C horizon:

Value—4 to 6
 Chroma—1 to 4
 Texture—silty clay loam, silt loam, clay loam, or loam

Taxadjunct feature:

The Lenzburg soils in Schuyler County are more acid in the upper part of the series control section than is definitive for the series. This difference, however, does not significantly affect the usefulness or behavior of the soils. The soils classify as fine-loamy, mixed (nonacid), mesic Typic Udorthents.

Martinsville Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Terraces
Parent material: Loamy outwash
Slope range: 5 to 10 percent

Taxonomic class: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Martinsville loam, 5 to 10 percent slopes, eroded, 2,400 feet west and 160 feet south of the northeast corner of sec. 14, T. 1 S., R. 2 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam, pale brown (10YR 6/3) dry; weak fine granular structure; very friable; common very fine and few fine roots; moderately acid; abrupt smooth boundary.

Bt1—9 to 15 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine and few fine roots; common faint brown (10YR 4/3) and few faint dark brown (10YR 3/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—15 to 25 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common very fine and few fine roots; common faint brown (10YR 4/3) and few faint dark brown (10YR 3/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt3—25 to 31 inches; dark yellowish brown (10YR 4/4)

clay loam; moderate medium subangular blocky structure; firm; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds and few faint dark brown (10YR 3/3) clay films as linings in pores; moderately acid; clear smooth boundary.

Bt4—31 to 39 inches; dark yellowish brown (10YR 4/4) sandy clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt5—39 to 46 inches; dark yellowish brown (10YR 4/4) sandy clay loam; few fine faint brown (10YR 5/3) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt6—46 to 52 inches; yellowish brown (10YR 5/4) clay loam; few fine faint brown (10YR 5/3) and few fine faint yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; few faint dark yellowish brown (10YR 4/4) and very few faint brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

BC—52 to 60 inches; yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4), stratified loam, loamy sand, and sandy loam; common fine faint brown (10YR 5/3) and common fine distinct dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; friable; very few faint dark yellowish brown (10YR 4/4) and very few faint brown (10YR 4/3) clay films on faces of peds; moderately acid.

Range in Characteristics

Ap horizon:
 Value—3 or 4
 Chroma—2 to 4

Bt horizon:
 Value—4 to 6
 Chroma—3 to 6
 Texture—clay loam, sandy clay loam, or loam

Oakville Series

Depth class: Very deep
Drainage class: Excessively drained
Permeability: Rapid
Landscape: Terraces
Parent material: Wind-worked sandy alluvium

Slope range: 1 to 7 percent

Taxonomic class: Mixed, mesic Typic Udipsamments

Typical Pedon

Oakville loamy fine sand, 1 to 7 percent slopes, rarely flooded, 468 feet east and 642 feet north of the center of sec. 5, T. 1 S., R. 1 W.

Ap—0 to 10 inches; dark brown (10YR 3/3) loamy fine sand, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

AB—10 to 14 inches; dark brown (10YR 3/3) loamy fine sand, pale brown (10YR 6/3) dry; weak very fine and fine subangular blocky structure; friable; few very fine roots; neutral; clear smooth boundary.

Bw1—14 to 19 inches; brown (10YR 4/3) fine sand; weak fine and medium subangular blocky structure; very friable; few very fine roots; few fine faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw2—19 to 28 inches; dark yellowish brown (10YR 4/4) fine sand; weak fine and medium subangular blocky structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

Bw3—28 to 38 inches; dark yellowish brown (10YR 4/6) fine sand; weak medium subangular blocky structure; very friable; few very fine roots; slightly acid; clear smooth boundary.

C1—38 to 54 inches; yellowish brown (10YR 5/6) fine sand; single grain; loose; slightly acid; clear smooth boundary.

C2—54 to 60 inches; dark yellowish brown (10YR 4/4) fine sand; single grain; loose; slightly acid.

Range in Characteristics

A horizon:

Value—3 or 4

Chroma—1 to 3

Texture—loamy fine sand, loamy sand, or fine sand

Bw horizon:

Value—4 to 6

Chroma—3 to 6

Texture—fine sand or loamy fine sand

C horizon:

Hue—10YR or 7.5YR

Value—4 to 7

Chroma—3 to 6

Texture—fine sand or sand

Orion Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents

Typical Pedon

Orion silt loam, occasionally flooded, 1,107 feet east and 660 feet north of the southwest corner of sec. 18, T. 1 N., R. 1 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine and common fine roots; slightly acid; abrupt smooth boundary.

C1—6 to 19 inches; brown (10YR 4/3) silt loam with a few thin bands of very dark gray (10YR 3/1) material; many fine faint dark grayish brown (10YR 4/2) mottles; massive; friable; few fine and common very fine roots; few medium irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

C2—19 to 29 inches; brown (10YR 4/3) silt loam with a few thin bands of very dark grayish brown (10YR 3/2) material; few fine distinct dark yellowish brown (10YR 4/4) and many fine distinct dark grayish brown (10YR 4/2) mottles; massive; friable; few very fine roots; few fine irregular accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

Ab1—29 to 38 inches; very dark gray (10YR 3/1) silt loam; few fine distinct dark yellowish brown (10YR 4/4) and common medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Ab2—38 to 54 inches; very dark gray (10YR 3/1) silt loam; common fine distinct dark yellowish brown (10YR 4/4) and few fine faint dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Bgb—54 to 60 inches; grayish brown (10YR 5/2) silt loam; few fine distinct very dark gray (10YR 3/1) and dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure; friable; few very fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular concretions and accumulations (iron and manganese oxides); neutral.

Range in Characteristics

Depth to a dark colored buried soil: 20 to 40 inches

Ap horizon:

Value—4 or 5

Chroma—2 or 3

C horizon:

Value—4 or 5

Chroma—2 or 3

Ab horizon:

Value—2 or 3

Chroma—1 or 2

Bgb horizon:

Value—4 to 6

Chroma—1 or 2

Raddle Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Foot slopes

Parent material: Alluvium

Slope range: 1 to 5 percent

Taxonomic class: Fine-silty, mixed, mesic Typic Hapludolls

Typical Pedon

Raddle silt loam, 1 to 5 percent slopes, rarely flooded, 792 feet east and 198 feet north of the center of sec. 18, T. 1 N., R. 1 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; few very fine and few fine roots; slightly alkaline; abrupt smooth boundary.

A—7 to 15 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak medium granular structure; friable; few very fine and few fine roots; neutral; clear smooth boundary.

BA—15 to 22 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; few fine and few very fine roots; few faint very dark

grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw1—22 to 32 inches; brown (10YR 4/3) silt loam; common medium faint yellowish brown (10YR 5/4) mottles; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; friable; few very fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds and very few distinct light gray (10YR 7/2 dry) silt coatings as linings in pores; neutral; clear smooth boundary.

Bw2—32 to 52 inches; brown (10YR 4/3) silt loam; common medium faint yellowish brown (10YR 5/4) mottles; weak medium prismatic structure parting to moderate coarse subangular blocky; friable; few very fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds and few distinct light gray (10YR 7/2 dry) silt coatings as linings in pores; few coarse and common fine irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Bw3—52 to 60 inches; brown (10YR 4/3) silt loam; common faint yellowish brown (10YR 5/4) and pale brown (10YR 6/3) mottles; strong coarse subangular blocky structure; firm; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds and common faint very dark grayish brown (10YR 3/2) organic coatings along vertical cleavage planes; few coarse irregular accumulations (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 to 3

Bw horizon:

Value—3 to 6

Chroma—3 or 4

Rapatee Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately slow in the upper part of the soils and very slow in the lower part

Landscape: Uplands

Parent material: Replaced topsoil over a mixture of subsoil and underlying material over cast overburden

Slope range: 1 to 7 percent

Taxonomic class: Fine-silty, mixed, nonacid, mesic
Typic Udorthents

Typical Pedon

Rapatee silty clay loam, 1 to 7 percent slopes, 117 feet south and 600 feet west of the center of sec. 23, T. 2 N., R. 4 W.

Ap—0 to 6 inches; black (10YR 2/1) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; many faint black (10YR 2/1) organic coatings on faces of peds; 3 percent medium gravel; slightly acid; clear smooth boundary.

C1—6 to 15 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; massive; friable; many faint black (10YR 2/1) organic coatings on faces of remnant peds; slightly acid; abrupt smooth boundary.

C2—15 to 60 inches; yellowish brown (10YR 5/4) and brown (10YR 5/3) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/4) mottles; massive; very firm; common distinct yellowish brown (10YR 5/6) clay films on faces of remnant peds; few fine and medium irregular concretions (iron and manganese oxides); pockets of structured B material; 3 percent medium gravel in the upper 30 inches; neutral.

Range in Characteristics

Depth to the base of the mixed subsoil and underlying material: 48 to more than 60 inches

Ap and C1 horizons:

Value—2 or 3

Chroma—1 to 3

Texture—silty clay loam or silt loam

C horizons beneath the replaced topsoil:

Hue—10YR, 2.5Y, or 5Y

Value—4 to 6

Chroma—1 to 8

Texture—silty clay loam, clay loam, silt loam, or loam below a depth of 48 inches in some pedons

Rozetta Series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Loess

Slope range: 2 to 10 percent

Taxonomic class: Fine-silty, mixed, mesic Typic
Hapludalfs

Typical Pedon

Rozetta silt loam, 2 to 5 percent slopes, 594 feet west and 231 feet north of the center of sec. 1, T. 1 N., R. 2 W.

Ap—0 to 7 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.

E—7 to 11 inches; brown (10YR 4/3) silt loam; weak thin platy structure parting to weak very fine granular; friable; common very fine roots; few fine rounded concretions (iron and manganese oxides); slightly acid; abrupt smooth boundary.

BE—11 to 17 inches; yellowish brown (10YR 5/4) silty clay loam; moderate very fine subangular blocky structure; firm; common very fine roots; common distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt1—17 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; many faint dark yellowish brown (10YR 4/4) clay films and few distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—25 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—34 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct light brownish gray (10YR 6/2), few fine faint brown (10YR 5/3), and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt4—40 to 48 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint brown (10YR 5/3), common fine distinct light brownish gray (10YR

6/2), and common fine distinct yellowish brown (10YR 5/6) mottles; firm; few very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

BC—48 to 60 inches; light yellowish brown (10YR 6/4) silty clay loam; few fine faint brown (10YR 5/3), many fine distinct light brownish gray (10YR 6/2), and many fine distinct yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots; common fine and medium rounded concretions (iron and manganese oxides); moderately acid.

Range in Characteristics

Ap horizon:

Value—3 or 4

Chroma—2 or 3

Texture—silt loam or silty clay loam

E horizon:

Value—4 or 5

Chroma—2 or 3

Bt horizon:

Value—4 to 6

Chroma—3 to 6

Rushville Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Very slow

Landscape: Uplands

Parent material: Loess

Slope range: 0 to 2 percent

Taxonomic class: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Rushville silt loam, 975 feet west and 580 feet north of the center of sec. 11, T. 2 N., R. 3 W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate fine granular structure; friable; common very fine roots; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; common fine rounded concretions (iron and manganese oxides); moderately acid; abrupt smooth boundary.

Eg—8 to 12 inches; light gray (10YR 6/1) silt loam; moderate thin platy structure; friable; few very fine roots; few faint white (10YR 8/1 dry) silt coatings

on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg1—12 to 16 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; few prominent white (10YR 8/1 dry) silt coatings and common distinct light brownish gray (10YR 6/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg2—16 to 22 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent yellowish brown (10YR 5/8) and few fine distinct brown (10YR 5/3) mottles; moderate medium angular blocky structure; firm; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg3—22 to 30 inches; grayish brown (2.5Y 5/2) silty clay; common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm; few very fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg4—30 to 50 inches; light gray (5Y 6/1) silty clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common prominent dark gray (10YR 4/1) clay films on faces of peds and as linings in pores; common medium rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Btg5—50 to 60 inches; gray (10YR 5/1) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common distinct dark gray (10YR 4/1) clay films on faces of peds; few medium rounded concretions (iron and manganese oxides); slightly acid.

Range in Characteristics

Ap horizon:

Value—4 or 5

Chroma—1 or 2

E horizon:

Value—5 or 6

Chroma—1 or 2

Btg horizon:

Hue—10YR, 2.5Y, or 5Y
 Value—4 to 6
 Chroma—1 or 2

Sawmill Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landscape: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic Cumulic
 Haplaquolls

Typical Pedon

Sawmill silty clay loam, frequently flooded, 1,400 feet north and 1,850 feet west of the southeast corner of sec. 29, T. 7 N., R. 1 W. (McDonough County):

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common very fine and few fine roots; neutral; clear smooth boundary.

A1—8 to 19 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; few very fine roots; few fine concretions (iron and manganese oxides); neutral; clear smooth boundary.

A2—19 to 28 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; few fine prominent yellowish brown (10YR 5/8) mottles; moderate fine angular blocky structure; friable; few very fine roots; few fine concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—28 to 36 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent gray (5Y 5/1) and strong brown (7.5YR 5/8) mottles; weak fine prismatic structure parting to moderate fine and medium subangular blocky; friable; few very fine roots; common faint very dark gray (10YR 3/1) clay films on faces of peds; common fine and medium concretions and accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg2—36 to 45 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent light olive gray (5Y 6/2) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; common fine and

medium concretions (iron and manganese oxides); neutral; abrupt smooth boundary.

BCg—45 to 57 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure; friable; few very fine roots; few prominent dark gray (10YR 4/1) clay films on faces of peds; common fine concretions and accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Cg—57 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent strong brown (7.5YR 5/8) mottles; massive; friable; few very fine roots; dark gray (10YR 4/1) krotovinas; common fine concretions (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches

Ap and A horizons:

Hue—10YR, 2.5Y, or neutral
 Value—2 or 3
 Chroma—0 to 2

Btg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral
 Value—3 to 6
 Chroma—0 to 2
 Texture—in some pedons strata of clay loam, loam, silt loam, or sandy loam in the lower part of the horizon

Cg horizon:

Hue—10YR, 2.5Y, or 5Y
 Value—5 or 6
 Chroma—1 or 2
 Texture—silty clay loam or silt loam; stratified in some pedons

Seaton Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Uplands
Parent material: Loess
Slope range: 18 to 30 percent

Taxonomic class: Fine-silty, mixed, mesic Typic
 Hapludalfs

Typical Pedon

Seaton silt loam, 18 to 30 percent slopes, 1,660 feet south and 720 feet west of the northeast corner of sec. 32, T. 2 N., R. 1 E.

- A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
- E—5 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak thin platy structure parting to moderate very fine granular; friable; common very fine and few fine roots; neutral; clear smooth boundary.
- Bt1—10 to 14 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; friable; few fine and very fine roots; many faint brown (10YR 4/3) clay films on faces of peds and as linings in pores; neutral; clear smooth boundary.
- Bt2—14 to 19 inches; yellowish brown (10YR 5/4) silt loam; weak very fine subangular blocky structure; friable; few very fine and few fine roots; common faint dark yellowish brown (10YR 4/4) clay films and common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds and few faint brown (10YR 4/3) clay films as linings in pores; moderately acid; clear smooth boundary.
- Bt3—19 to 31 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; firm; few very fine and few fine roots; common faint dark yellowish brown (10YR 4/4) clay films and light gray (10YR 7/2 dry) silt coatings on faces of peds and few faint brown (10YR 4/3) clay films as linings in pores; slightly acid; clear smooth boundary.
- Bt4—31 to 45 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; firm; few very fine roots; few faint yellowish brown (10YR 5/4) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds and few distinct brown (10YR 4/3) clay films as linings in pores; neutral; clear smooth boundary.
- BC—45 to 52 inches; brown (10YR 5/3) silt loam; few medium faint pale brown (10YR 6/3) and few fine distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear smooth boundary.
- C—52 to 60 inches; pale brown (10YR 6/3) silt loam; common medium faint yellowish brown (10YR 5/4) and few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; slightly alkaline; slightly effervescent.

Range in Characteristics

A horizon:

- Value—2 to 4
Chroma—2 or 3

E horizon:

- Value—4 to 6
Chroma—2 to 4

Bt horizon:

- Value—4 or 5
Chroma—3 to 6

C horizon:

- Value—4 to 6
Chroma—3 to 6

St. Charles Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Terraces

Parent material: Loess and the underlying outwash

Slope range: 2 to 5 percent

Taxonomic class: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

St. Charles silt loam, 2 to 5 percent slopes, 871 feet east and 845 feet north of the southwest corner of sec. 20, T. 2 N., R. 1 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; many very fine roots; few fine irregular concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bt1—9 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine roots; many faint brown (10YR 4/3) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine irregular concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt2—18 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint brown (10YR 4/3) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine irregular concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—27 to 36 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films and few distinct

light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine irregular concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt4—36 to 47 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few faint brown (10YR 4/3) clay films and few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine irregular concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

2BC—47 to 60 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3), stratified loam, sandy clay loam, and sandy loam; few fine faint brown (10YR 5/3) mottles; weak coarse subangular blocky structure; firm; few fine irregular concretions (iron and manganese oxides); moderately acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:

Value—3 to 5

Chroma—1 to 3

Bt horizon:

Value—4 or 5

Chroma—3 or 4

2BC horizon:

Value—4 to 6

Chroma—3 to 6

Texture—stratified sandy clay loam, clay loam, sandy loam, loam, or silt loam

Swanwick Series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderately slow in the upper part of the soils and very slow in the lower part

Landscape: Uplands

Parent material: Replaced topsoil over a mixture of subsoil and underlying material over cast overburden

Slope range: 2 to 5 percent

Taxonomic class: Fine-silty, mixed, nonacid, mesic Typic Udorthents

Typical Pedon

Swanwick silt loam, 2 to 5 percent slopes, 400 feet east and 1,880 feet north of the southwest corner of sec. 22, T. 2 N., R. 3 W.

Ap—0 to 11 inches; mixed dark grayish brown (10YR 4/2) and pale brown (10YR 6/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; many very fine and few fine roots; slightly acid; abrupt smooth boundary.

AC—11 to 14 inches; mixed brown (10YR 5/3), light yellowish brown (10YR 6/4), and yellowish brown (10YR 5/6) silt loam; moderate fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

C1—14 to 20 inches; mixed yellowish brown (10YR 5/6), brown (10YR 5/3), and strong brown (7.5YR 5/6) silty clay loam; massive; firm; common fine rounded concretions (iron and manganese oxides); less than 1 percent gravel; slightly acid; gradual smooth boundary.

C2—20 to 33 inches; mixed yellowish brown (10YR 5/6), brown (10YR 5/3), strong brown (7.5YR 5/8), and light brownish gray (10YR 6/2) silty clay loam; massive; firm; many medium rounded concretions (iron and manganese oxides); 1 percent gravel; moderately acid; gradual smooth boundary.

C3—33 to 49 inches; mixed yellowish brown (10YR 5/4, 5/6, and 5/8) clay loam; massive; firm; many medium rounded concretions (iron and manganese oxides); 3 percent gravel; slightly acid; gradual smooth boundary.

C4—49 to 60 inches; mixed dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/8), and light brownish gray (10YR 6/2) clay loam; massive; firm; common fine rounded concretions (iron and manganese oxides); 1 percent gravel; moderately acid.

Range in Characteristics

Thickness of the replaced topsoil: 10 to 18 inches

Depth to the base of the mixed subsoil and underlying material: More than 48 inches

Ap horizon:

Value—4 or 5

Chroma—2 to 4

C horizon:

Hue—10YR or 7.5YR

Value—4 to 6

Chroma—1 to 8

Texture—silty clay loam, clay loam, silty clay, or silt loam

Sylvan Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Loess

Slope range: 5 to 18 percent

Taxonomic class: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded, 409 feet east and 1,109 feet south of the center of sec. 6, T. 1 N., R. 1 E.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) silty clay loam, brownish yellow (10YR 6/6) dry; weak fine granular structure; friable; many very fine and common fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings and common faint brown (10YR 4/3) clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt1—6 to 11 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—11 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; common medium faint brown (10YR 5/3) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bt3—22 to 29 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common faint brown (10YR 4/3) clay films on faces of peds; common medium irregular concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

C1—29 to 52 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/6) and common fine distinct light brownish gray (10YR 6/2) mottles; massive; friable; common medium irregular concretions (iron and manganese oxides); slightly alkaline; strongly effervescent; gradual smooth boundary.

C2—52 to 60 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; few medium

irregular concretions (iron and manganese oxides); slightly alkaline; strongly effervescent.

Range in Characteristics

Depth to carbonates: 22 to 40 inches

Ap horizon:

Value—4 to 6

Chroma—2 to 4

Bt horizon:

Hue—10YR or 7.5YR

Value—4 or 5

Chroma—3 to 6

C horizon:

Value—4 to 6

Chroma—2 to 6

Texture—silt loam or silt

Tama Series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderate

Landscape: Uplands

Parent material: Loess

Slope range: 2 to 5 percent

Taxonomic class: Fine-silty, mixed, mesic Typic Argiudolls

Typical Pedon

Tama silt loam, 2 to 5 percent slopes, 426 feet east and 132 feet north of the southwest corner of sec. 31, T. 2 N., R. 4 W.

Ap—0 to 6 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.

A1—6 to 11 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; friable; common very fine roots; slightly acid; gradual smooth boundary.

A2—11 to 15 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common very fine roots; strongly acid; gradual smooth boundary.

Bt1—15 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) clay films

on faces of peds; strongly acid; gradual smooth boundary.

Bt2—19 to 26 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt3—26 to 38 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint brown (10YR 4/3) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

Bt4—38 to 56 inches; yellowish brown (10YR 5/4) silty clay loam; common medium faint brown (10YR 4/3) and common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine irregular accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

BC—56 to 60 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (10YR 5/2) and common fine faint brown (10YR 5/3) mottles; weak coarse prismatic structure; friable; few very fine roots; very few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 or 2

Bt horizon:

Value—4 or 5

Chroma—3 or 4

Thorp Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Slow

Landscape: High flood plains and terraces

Parent material: Loess and the underlying outwash

Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic Argiaquic Argialbolls

Typical Pedon

Thorp silt loam, occasionally flooded, 138 feet west and 2,059 feet north of the center of sec. 5, T. 1 S., R. 1 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine and few fine roots; neutral; abrupt smooth boundary.

A—6 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few very fine and few fine roots; neutral; abrupt smooth boundary.

Eg—12 to 22 inches; grayish brown (10YR 5/2) silt loam; common fine faint brown (10YR 4/3) and few fine distinct dark yellowish brown (10YR 4/4) mottles; weak thin platy structure; friable; few very fine roots; very few distinct dark gray (10YR 4/1) coatings on the surface of plates; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—22 to 26 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct brown (10YR 4/3) mottles; weak medium prismatic structure parting to weak fine subangular blocky; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) and few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common fine and medium rounded concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Btg2—26 to 40 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine and medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many faint very dark gray (10YR 3/1) and dark gray (10YR 4/1) clay films on faces of peds; common fine and medium rounded concretions (iron and manganese oxides); neutral; gradual smooth boundary.

Btg3—40 to 52 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4), few fine distinct yellowish brown (10YR 5/6), and common medium faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many faint very dark gray (10YR 3/1) and dark gray

(10YR 4/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg4—52 to 62 inches; grayish brown (2.5Y 5/2) silty clay loam; few medium prominent yellowish brown (10YR 5/6), common fine prominent yellowish brown (10YR 5/4), and common medium distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; very few distinct dark gray (10YR 4/1) clay films along vertical faces of peds and many distinct very dark gray (10YR 3/1) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides) and few medium and coarse irregular accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

2BCtg—62 to 65 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; very few distinct dark gray (10YR 4/1) clay films along vertical cleavage planes; few fine rounded concretions (iron and manganese oxides); 12 percent sand; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 14 inches

Thickness of the loess: 50 to 72 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 to 3

Eg horizon:

Value—4 to 6

Chroma—1 or 2

Btg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—4 to 6

Chroma—0 to 2

2Btg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—4 to 6

Chroma—0 to 4

Tice Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Fine-silty, mixed, mesic
Fluvaquentic Hapludolls

Typical Pedon

Tice silt loam, occasionally flooded, 1,308 feet north and 1,118 feet east of the southwest corner of sec. 18, T. 1 N., R. 1 W.

Ap—0 to 7 inches; very dark grayish (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine and common fine roots; neutral; abrupt smooth boundary.

A—7 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure parting to weak fine subangular blocky; friable; common very fine and few fine roots; neutral; clear smooth boundary.

BA—11 to 17 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; common very fine and few fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded nodules (iron and manganese oxides); neutral; clear smooth boundary.

Bw1—17 to 35 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6), many medium faint brown (10YR 4/3), and common medium faint dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine irregular nodules (iron and manganese oxides); neutral; clear smooth boundary.

Bw2—35 to 41 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6), many medium faint brown (10YR 4/3), and few medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine roots; very few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine irregular nodules (iron and manganese oxides); neutral; clear smooth boundary.

Bw3—41 to 51 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common medium faint brown (10YR 4/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; very few faint very dark grayish brown (10YR 3/2) coatings along vertical cleavage planes; few fine irregular

nodules (iron and manganese oxides); neutral; clear smooth boundary.

BCg—51 to 60 inches; grayish brown (2.5Y 5/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few very fine roots; very few distinct very dark grayish brown (10YR 3/2) coatings along vertical cleavage planes; few fine irregular nodules (iron and manganese oxides) and few fine accumulations (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches

Ap and A horizons:

Value—2 or 3

Chroma—1 or 2

Texture—silty clay loam or silt loam

Bw horizon:

Hue—10YR or 2.5Y

Value—4 or 5

Chroma—2 to 4

Texture—mainly silty clay loam or silt loam; loam or fine sandy loam below a depth of 30 inches in some pedons

Taxadjunct feature:

The Tice soil in map unit 8284 is a taxadjunct because it does not have the fluventic properties that are definitive for the series. This difference, however, does not significantly affect the usefulness or behavior of the soil. The soil classifies as a fine-silty, mixed, mesic Aquic Hapludoll.

Titus Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Slow

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Fine, montmorillonitic, mesic
Fluvaquentic Haplaquolls

Typical Pedon

Titus silty clay, occasionally flooded, 138 feet west and 963 feet north of the southeast corner of sec. 8, T. 1 S., R. 1 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; few fine distinct dark yellowish brown (10YR 3/4) mottles; weak fine

granular structure; firm; common very fine roots; slightly alkaline; clear smooth boundary.

A—6 to 11 inches; very dark gray (N 3/0) silty clay, gray (10YR 5/1) dry; common fine prominent dark yellowish brown (10YR 3/4) mottles; moderate very fine and fine subangular blocky structure; firm; common very fine roots; neutral; clear smooth boundary.

Bg1—11 to 19 inches; dark gray (5Y 4/1) silty clay, gray (10YR 5/1) dry; common fine prominent dark yellowish brown (10YR 3/4) and few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct very dark gray (N 3/0) pressure faces; neutral; clear smooth boundary.

Bg2—19 to 24 inches; dark gray (5Y 4/1) silty clay; common fine prominent dark yellowish brown (10YR 4/4), common fine prominent yellowish brown (10YR 5/4), and few fine distinct light brownish gray (2.5Y 6/2) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few faint very dark gray (N 3/0) pressure faces and very dark gray (5Y 3/1) krotovinas; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg3—24 to 31 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/4) and few fine prominent dark yellowish brown (10YR 4/4) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark gray (5Y 4/1) pressure faces and very dark gray (5Y 3/1) krotovinas; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg4—31 to 39 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/4) and few fine prominent dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark gray (5Y 4/1) clay films as linings in pores and very few distinct dark gray (5Y 4/1) pressure faces; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Bg5—39 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/4) and few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; common

distinct dark gray (5Y 4/1) clay films as linings in pores and very dark gray (5Y 3/1) krotovinas; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

- Bg6—47 to 57 inches; light olive gray (5Y 6/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/4) and few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; common distinct dark gray (5Y 4/1) clay films as linings in pores and dark olive gray (5Y 3/1) krotovinas; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.
- Cg—57 to 60 inches; light olive gray (5Y 6/2) silty clay loam; many medium prominent yellowish brown (10YR 5/4) mottles; massive; firm; few fine rounded concretions (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the mollic epipedon: 11 to 23 inches

Ap and A horizons:

Hue—10YR, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay or silty clay loam

Bg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay, silty clay loam, or silt loam

Cg horizon:

Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2

Ursa Series

Depth class: Very deep

Drainage class: Well drained

Permeability: Slow

Landscape: Uplands

Parent material: A paleosol that formed in glacial till

Slope range: 10 to 15 percent

Taxonomic class: Fine, montmorillonitic, mesic Typic Hapludalfs

Typical Pedon

Ursa loam, 10 to 15 percent slopes, eroded, 1,155 feet west and 1,485 feet south of the northeast corner of sec. 14, T. 3 N., R. 4 W.

A—0 to 6 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine and few fine roots; about 3 percent fine gravel; moderately acid; clear smooth boundary.

Bt1—6 to 15 inches; dark yellowish brown (10YR 4/6) clay loam; moderate fine and medium subangular blocky structure; firm; common very fine and few fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; about 3 percent fine gravel; strongly acid; clear smooth boundary.

Bt2—15 to 26 inches; dark yellowish brown (10YR 4/6) clay loam; few fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine and fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); about 4 percent fine gravel; strongly acid; clear smooth boundary.

Bt3—26 to 38 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine irregular concretions (iron and manganese oxides); about 5 percent fine gravel; strongly acid; clear smooth boundary.

Bt4—38 to 50 inches; yellowish brown (10YR 5/6) clay loam; few fine distinct grayish brown (10YR 5/2) and common fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; about 5 percent fine gravel; strongly acid; clear smooth boundary.

BC—50 to 60 inches; yellowish brown (10YR 5/6) clay loam; few fine distinct grayish brown (10YR 5/2) and common medium distinct brown (10YR 5/3) mottles; moderate coarse subangular blocky structure; firm; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); about 3 percent fine gravel; slightly acid.

Range in Characteristics

Thickness of the loess: Less than 20 inches

A or Ap horizon:

Value—4 or 5
Chroma—2 to 4
Texture—loam

Bt horizon:

Value—4 to 6

Chroma—3 to 8

Texture—clay loam, silty clay loam, clay, or silty clay

Virden Series*Depth class:* Very deep*Drainage class:* Poorly drained*Permeability:* Moderately slow*Landscape:* Uplands*Parent material:* Loess*Slope range:* 0 to 2 percent**Taxonomic class:** Fine, montmorillonitic, mesic Typic Argiaquolls**Typical Pedon**

Virden silty clay loam, 198 feet east and 108 feet north of the southwest corner of sec. 16, T. 2 N., R. 1 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine granular structure; firm; few very fine roots; neutral; clear smooth boundary.

A—9 to 15 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine distinct dark grayish brown (2.5Y 4/2) mottles; moderate very fine subangular blocky structure; firm; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—15 to 21 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine prominent dark yellowish brown (10YR 4/6) and grayish brown (2.5Y 5/2) mottles; moderate fine subangular blocky structure; firm; few very fine roots; many faint very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg2—21 to 28 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6) and common fine distinct light olive brown (2.5Y 5/6) mottles; weak fine prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg3—28 to 33 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6), common fine distinct light olive brown

(2.5Y 5/6), and common fine faint light brownish gray (2.5Y 6/2) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds and many prominent very dark gray (10YR 3/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg4—33 to 41 inches; light olive gray (5Y 6/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few prominent dark grayish brown (2.5Y 4/2) clay films on faces of peds and common distinct very dark gray (10YR 3/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

BCg—41 to 53 inches; light olive gray (5Y 6/2) silty clay loam; common fine prominent light olive brown (2.5Y 5/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few distinct grayish brown (2.5Y 5/2) and very few prominent dark grayish brown (2.5Y 4/2) clay films on faces of peds and few prominent very dark gray (10YR 3/1) clay films as linings in pores; few fine rounded concretions (iron and manganese oxides); slightly alkaline; clear smooth boundary.

Cg—53 to 60 inches; light olive gray (5Y 6/2) silt loam; common fine and medium prominent light olive brown (2.5Y 5/6) mottles; massive; friable; few fine rounded concretions (iron and manganese oxides); slightly alkaline.

Range in Characteristics*Thickness of the mollic epipedon:* 15 to 24 inches*Ap and A horizons:*

Value—2 or 3

Chroma—1 or 2

Btg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—2 to 6

Chroma—0 to 2

Texture—silty clay loam or silty clay

Cg horizon:

Hue—10YR, 2.5Y, 5Y, or neutral

Value—4 to 6

Chroma—0 to 2

Texture—silt loam or silty clay loam

Virgil Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landscape: Low terraces

Parent material: Loess and the underlying outwash

Slope range: 0 to 3 percent

Taxonomic class: Fine-silty, mixed, mesic Udollic Ochraqualls

Typical Pedon

Virgil silt loam, 0 to 3 percent slopes, occasionally flooded, 1,340 feet south and 480 feet east of the center of sec. 6, T. 1 S., R. 1 W.

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 very fine roots; neutral; clear smooth boundary.

E—9 to 15 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak very thin platy structure; friable; few very fine roots; few fine irregular concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

BE—15 to 20 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium platy structure parting to weak very fine subangular blocky; firm; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films and common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; common fine irregular concretions (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt1—20 to 29 inches; brown (10YR 5/3) silty clay loam; few fine faint grayish brown (10YR 5/2) and common fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark grayish brown (10YR 4/2) clay films as linings in pores and on faces of peds; common fine irregular concretions (iron and manganese oxides); moderately acid; clear smooth boundary.

Bt2—29 to 34 inches; brown (10YR 5/3) silty clay loam; common fine faint grayish brown (10YR 5/2), common fine prominent dark yellowish brown (10YR 4/6), and common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds and dark grayish brown

(10YR 4/2) clay films as linings in pores; common fine and few coarse irregular concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg1—34 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) and common fine prominent yellowish brown (10YR 5/8) mottles; moderate coarse subangular blocky structure; firm; few very fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds and few distinct dark grayish brown (10YR 4/2) clay films as linings in pores; common fine irregular concretions (iron and manganese oxides); neutral; clear smooth boundary.

Btg2—41 to 52 inches; light brownish gray (10YR 6/2) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) and common fine prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few faint grayish brown (10YR 5/2) clay films as linings in pores; common fine irregular concretions (iron and manganese oxides); neutral; clear smooth boundary.

2Btg3—52 to 60 inches; light brownish gray (10YR 6/2) clay loam; common fine distinct dark yellowish brown (10YR 4/6) and common fine prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots; few faint grayish brown (10YR 5/2) clay films as linings in pores; common fine irregular concretions (iron and manganese oxides); neutral.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:

Value—2 or 3

Chroma—1 or 2

E horizon:

Value—4 to 6

Chroma—1 or 2

Bt and Btg horizons:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

2Btg horizon:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 6

Texture—clay loam or silty clay loam

Wakeland Series

Depth class: Very deep

Drainage class: Somewhat poorly drained

Permeability: Moderate

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Coarse-silty, mixed, nonacid, mesic
Aeric Fluvaquents

Typical Pedon

Wakeland silt loam, frequently flooded, 3,140 feet east and 102 feet north of the southwest corner of sec. 4, T. 1 N., R. 1 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; few very fine and few fine roots; neutral; clear smooth boundary.

C1—9 to 19 inches; dark grayish brown (10YR 4/2) and brown (10YR 4/3) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; massive; friable; few very fine and few fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

C2—19 to 33 inches; dark grayish brown (10YR 4/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and few fine faint brown (10YR 5/3) mottles; massive; friable; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; gradual smooth boundary.

C3—33 to 52 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; massive with thin bedding planes evident; friable; few very fine roots; few fine rounded concretions (iron and manganese oxides); neutral; clear smooth boundary.

C4—52 to 60 inches; dark grayish brown (10YR 4/2) silt loam with thin strata of brown (10YR 4/3) material; few fine distinct dark yellowish brown (10YR 4/6) mottles; massive with thin bedding planes evident; friable; few fine rounded concretions (iron and manganese oxides); slightly alkaline.

Range in Characteristics

Ap horizon:

Value—4 or 5

Chroma—2 or 3

C horizon:

Value—4 to 6

Chroma—1 to 4

Wilbur Series

Depth class: Very deep

Drainage class: Moderately well drained

Permeability: Moderate

Landscape: Flood plains

Parent material: Alluvium

Slope range: 0 to 2 percent

Taxonomic class: Coarse-silty, mixed, nonacid, mesic
Aquic Udifluvents

Typical Pedon

Wilbur silt loam, frequently flooded, 2,400 feet east and 541 feet north of the center of sec. 13, T. 1 N., R. 1 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few very fine roots; neutral; clear smooth boundary.

C1—6 to 16 inches; brown (10YR 5/3) silt loam; few fine faint light yellowish brown (10YR 6/4) and common fine distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; few very fine roots; few fine irregular concretions (iron and manganese oxides); neutral; gradual smooth boundary.

C2—16 to 38 inches; brown (10YR 5/3) silt loam; common medium faint light yellowish brown (10YR 6/4), few fine faint yellowish brown (10YR 5/6), and common fine faint light brownish gray (10YR 6/2) mottles; weak fine granular structure; friable; few medium irregular concretions (iron and manganese oxides); neutral; gradual smooth boundary.

Cg—38 to 60 inches; grayish brown (2.5Y 5/2), stratified silt loam and loam; few medium faint yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; common medium irregular concretions and accumulations (iron and manganese oxides); neutral.

Range in Characteristics

Ap horizon:

Value—4 or 5

Chroma—2 to 4

C and Cg horizons:

Hue—10YR or 2.5Y

Value—4 to 6

Chroma—2 to 4

Formation of the Soils

The soils in Schuyler County exhibit a wide range of properties. This variety can be attributed to differences in the major factors of soil formation (Jenny, 1941). The characteristics of the soil at any given time and place are determined by (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil formed and has existed since the parent material has been exposed at the land surface, (3) the plant and animal life on and in the soil, (4) the topography, and (5) the length of time that the processes of soil formation have acted on the parent material. Each factor modifies the effects of the other four. The importance of the individual factors differs from place to place.

Parent Material

Parent material is the unconsolidated mass in which the soils have formed. It affects the mineralogical and chemical composition of the soil and, to a large extent, determines the rate at which soil-forming processes take place.

The soils in Schuyler County formed in a variety of parent materials—loess, alluvium, glacial till, lacustrine sediments, and material weathered from bedrock. Figure 16 shows the relationship of parent material to some of the major soils in the county.

Loess, a wind-deposited silty material, is the most extensive parent material in the county. It is the youngest deposit in the uplands, and it blankets most of the other parent materials. The loess in Schuyler County has been deposited in increments and can be subdivided on the basis of age, color, texture, and composition. The upper part is known as Peoria Loess, and the lower part is known as Roxana Silt. Where the layer of loess is thin, the soil formed in and through the loess and in the underlying deposits. The loess is about 20 to 30 feet thick near the valley of the Illinois River and is thinner toward the west and north. Seaton and Fayette soils are the dominant soils that formed on the loess-covered bluffs north of the Illinois River. In the strongly sloping and steep areas in this part of the county, the loess is thin or has been removed by erosion. In these areas the slopes are dominated by Hickory soils, which formed in Illinoian

glacial till commonly covered by a thin layer of silty material.

In the sloping areas in the northern part of the county, Illinoian glacial till and material weathered from Mississippian- and Pennsylvanian-age bedrock are the dominant kinds of parent material. Soils that formed in less than 40 inches of loess over a Sangamon soil that formed in glacial deposits are generally confined to the sides and heads of drainageways. The major soils in these positions are Fishhook, Atlas, Ursa, and Keller soils. The strongly sloping and steep side slopes along drainageways are dominated by soils that formed in a thin layer of silty colluvium and in the underlying clayey material weathered from Pennsylvanian-age shale. Gosport soils are common on these slopes. In many areas the shale on these steeper slopes is covered with a thin remnant of Illinoian glacial till, in which Hickory soils formed.

Water-laid deposits of Cahokia Alluvium and the Equality Formation form the bottom lands and terraces in the valleys of Schuyler County. The flood plains along the smaller creeks in the county are generally underlain by silty alluvium. Wilbur and Wakeland soils are dominant in these areas. On the flood plain along the Illinois River, the alluvium is dominantly silty and Wilbur, Tice, and Beaucoup soils are dominant. Many old river-bottom lakes that are drained are occupied by fine textured alluvial material. Titus and Darwin soils are dominant in these areas. A few terraces along the Illinois and La Moine Rivers formed in silty to sandy deposits of the Equality Formation and are overlain by silty loessal or colluvial material. The colluvium has accumulated as a result of gravitational action and is the parent material of Raddle soils.

Climate

Schuyler County has a temperate, humid, continental climate. The climate is essentially uniform throughout the county and has not caused any obvious differences among the soils within the county. It has differentiated those soils, however, from the soils in other broad regions.

Climate, primarily temperature and precipitation, affects soil formation through its effect on the rate at

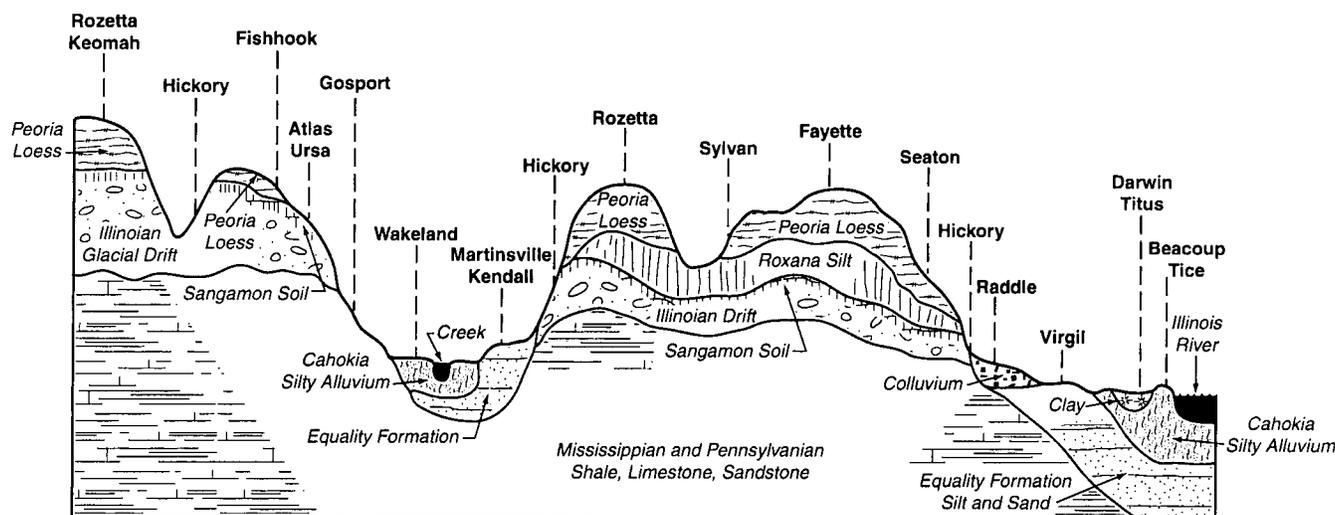


Figure 16.—Typical cross section showing the relationship of parent materials to soils in Schuyler County.

which organic matter decomposes and minerals weather and through its effect on the removal or accumulation of material in the different soil horizons. When water from rains and melting snow seeps slowly downward through the soils, it causes physical and chemical changes. It weathers the parent material, reducing the size of soil particles. Also, through the decomposition of plants, organic acids that aid in the formation and movement of clay are produced. In many of the soils in the county, the percolating water has moved clay from the surface layer into the subsoil. It has also dissolved minerals and moved them downward through the profile. As a result, most of the upland soils in the county have considerably more clay in the subsoil than in the surface layer. In addition, free calcium carbonate has been removed from the upper layers of many of the soils, leaving these layers slightly acid or moderately acid.

Climate also affects soil formation by stimulating the growth of living organisms, particularly plants. The climate of Schuyler County has favored the vigorous growth of hardwood trees and prairie grasses.

Plant and Animal Life

Living organisms, such as plants, insects, micro-organisms, and burrowing animals, affect soil formation. These organisms are responsible for additions of organic matter and nitrogen, nutrient cycling, the structural stability of the soil, and the mixing of developing soil horizons. Plant roots provide channels for the movement of water and air through the soil. As they die and decay, they add organic matter to the soil. Insects and burrowing animals, such

as earthworms, help to keep the soil open and porous and incorporate organic matter into the soil. Micro-organisms, such as bacteria and fungi, break down the organic matter into forms that growing plants can use. In Schuyler County vegetation generally influences soil formation more than animals. No major soil features are attributed solely to animal activity.

The soils that formed under native prairie grasses generally have a thick, dark surface layer. The dark color reflects a high content of organic matter. Ipava and Tama soils are examples of soils that formed under prairie vegetation. Soils that formed under forest vegetation typically contain less organic matter than the prairie soils and therefore have a lighter colored surface layer. Rozetta and Keomah soils are examples.

Humans have altered the soils in the county by mining coal, clearing vegetation, harvesting timber, and cultivating the soils. These activities influence soil formation.

Topography

Topography, or shape of the land, affects soil formation through its influence on the rate of surface runoff, the infiltration rate, the extent of erosion, and natural drainage of the soil.

A comparison between soils that formed in similar parent material but under different drainage conditions indicates the effect of slope on soil formation. Tama and Virden soils, for example, formed in loess. Tama soils are gently sloping and moderately well drained and have a brownish subsoil. Virden soils are nearly level and poorly drained and have a grayish subsoil.

The difference in the color of the subsoil is the result of the degree of oxidation of certain mineral compounds, mainly iron. In areas of the gently sloping Tama soils, the seasonal high water table is lower and some of the rainfall runs off the surface. As a result, these soils are drier than the Virden soils and have more air in their pores. Under these conditions, the iron in the subsoil of the Tama soils is oxidized and the subsoil is dominantly brown. In Virden and other nearly level, poorly drained soils, the seasonal high water table is close to the surface in most years. The water in the soil pores restricts the circulation of air. Under these conditions, the iron is poorly oxidized and the soils are dominantly gray.

Topography also affects the susceptibility to and intensity of erosion. Soils on the steeper slopes and soils on long slopes are more susceptible to erosion than soils in the less sloping areas or on short slopes. For example, cultivated areas of the strongly sloping Fayette soils generally are moderately eroded or severely eroded. In contrast, the gently sloping Fayette soils generally are either uneroded or slightly eroded.

The slope gradient affects the rate of water infiltration into the soils. As the gradient increases, the runoff rate increases and the infiltration rate decreases. As a result, water moves less clay downward into the subsoil of the more sloping soils. The steep Seaton soils, for example, have less clay in the subsoil than the nearly level Keomah soils. As the runoff rate increases, the extent of erosion increases, resulting in more deposition of sediment at the base of slopes.

Time

All soil-forming factors are interrelated, and the degree of profile development in a soil is dependent on the length of time that these factors have been interacting. Generally, the longer the soil is subject to a soil-forming factor, the stronger its profile development. The influence of time, however, can be modified by erosion, deposition of material, topography, and kind of parent material.

On some of the steeper slopes, where erosion removes the surface soil material at nearly the same rate as soil formation and the weathering of parent material, soil formation and erosion proceed simultaneously. Even though the slopes have been exposed to weathering for thousands of years, the soils in these areas are immature. Immature soils show little or no evidence of the alteration of parent material and lack horizon development. Many of the soils on flood plains also are considered immature. These soils often receive alluvial material during periods of flooding. This repeated deposition slows soil formation. Wakeland soils are an example of soils that formed in alluvial material.

The soils that are considered mature are those in which the parent material has been most altered. These soils have horizons that are distinctly different in color, structure, texture, reaction, or other properties. Mature soils generally are in stable positions on the landscape. Keomah soils are an example.

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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.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

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.

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

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

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.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

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.

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.

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.

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 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.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

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.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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.

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 oven-dry 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.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. 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.

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. The sizes of pebbles, in centimeters, are as follows:

Fine	0.2 to 0.5
Medium	0.5 to 2.0
Coarse	2.0 to 7.6

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.

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.

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.

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).

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.

Parent material. The unconsolidated organic and mineral material in which soil forms.

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 downward 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:

Very slow	less than 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:

Extremely acid	below 4.5
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.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts 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.

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.
- Silica**. A combination of silicon and oxygen. The mineral form is called quartz.
- 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.
- 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.
- Slickensides**. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.
- 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. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Moderately sloping	5 to 10 percent
Strongly sloping	10 to 18 percent
Steep	18 to 30 percent
Very steep	30 to 60 percent

- Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.
- Slow intake** (in tables). The slow movement of water into 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.
- Sodicity**. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

- 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.
- 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.
- Stripcropping**. Growing crops in a systematic arrangement of strips or bands that provide

vegetative barriers to soil blowing and water erosion.

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.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

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.

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.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

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 oven-dry 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 Rushville, Illinois)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average growing degree days*	2 years in 10 will have--			Average number of days with 0.10 inch or more	Average snowfall In
				Maximum temperature higher than--	Minimum temperature lower than--		Average	Less than--	More than--		
°F	°F	°F	°F	°F	Units	In	In	In		In	
January-----	32.7	14.5	23.6	63	-17	1	1.53	0.53	2.36	3	6.4
February-----	37.5	19.3	28.9	68	-11	3	1.64	0.86	2.32	4	5.9
March-----	50.8	30.4	40.6	81	5	43	3.39	1.88	4.72	6	4.2
April-----	64.8	41.8	53.3	87	22	174	4.02	2.12	5.68	6	0.8
May-----	75.0	51.0	63.0	92	32	406	4.47	2.65	6.09	7	0.0
June-----	83.9	60.4	72.2	96	38	660	4.07	2.12	5.77	6	0.0
July-----	88.0	64.8	76.4	99	49	814	4.23	1.89	6.23	5	0.0
August-----	85.6	62.0	73.8	98	47	730	3.75	2.07	5.23	5	0.0
September---	78.9	54.6	66.7	94	33	503	4.37	1.89	6.48	6	0.0
October-----	66.3	43.2	54.8	87	23	96	3.26	1.41	4.83	5	0.0
November----	52.0	32.5	42.2	76	9	44	2.75	1.22	4.06	5	1.5
December----	37.4	20.4	28.9	67	-10	4	2.52	1.23	3.63	5	5.6
Yearly:											
Average---	62.8	41.2	52.0	---	---	---	---	---	---	---	---
Extreme---	103	-21	---	100	-17	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,478	40.00	31.27	47.13	63	24.4

* 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 Rushville, 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-----	April	8	April	23	May	1
2 years in 10 later than-----	April	4	April	18	April	26
5 years in 10 later than-----	March	28	April	8	April	26
First freezing temperature in fall:						
1 year in 10 earlier than---	October	23	October	16	September	29
2 years in 10 earlier than---	October	28	October	20	October	5
5 years in 10 earlier than---	November	6	October	28	October	15

Table 3.--Growing Season
(Recorded in the period 1961-90 at Rushville, 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	209	183	159
8 years in 10	214	190	166
5 years in 10	224	203	180
2 years in 10	233	216	194
1 year in 10	238	222	201

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
6C2	Fishhook silt loam, 5 to 10 percent slopes, eroded-----	10,050	3.6
6C3	Fishhook silty clay loam, 5 to 10 percent slopes, severely eroded-----	1,975	0.7
7D2	Atlas silt loam, 10 to 15 percent slopes, eroded-----	825	0.3
7D3	Atlas silty clay loam, 10 to 15 percent slopes, severely eroded-----	390	0.1
8F	Hickory loam, 18 to 30 percent slopes-----	25,440	9.0
8G	Hickory loam, 30 to 60 percent slopes-----	19,920	7.1
16	Rushville silt loam-----	415	0.1
17A	Keomah silt loam, 0 to 2 percent slopes-----	16,765	5.9
17B	Keomah silt loam, 2 to 5 percent slopes-----	10,225	3.6
19C3	Sylvan silty clay loam, 5 to 10 percent slopes, severely eroded-----	1,970	0.7
19D3	Sylvan silty clay loam, 10 to 18 percent slopes, severely eroded-----	1,175	0.4
36B	Tama silt loam, 2 to 5 percent slopes-----	1,570	0.6
43A	Ipava silt loam, 0 to 2 percent slopes-----	13,145	4.7
43B	Ipava silt loam, 2 to 5 percent slopes-----	4,965	1.8
46A	Herrick silt loam, 0 to 2 percent slopes-----	7,110	2.5
50	Virden silty clay loam-----	4,055	1.4
53F	Bloomfield loamy fine sand, 18 to 40 percent slopes-----	140	<0.1
75C	Drury silt loam, 5 to 10 percent slopes-----	1,020	0.4
206	Thorp silt loam-----	305	0.1
242A	Kendall silt loam, 0 to 2 percent slopes-----	705	0.3
243B	St. Charles silt loam, 2 to 5 percent slopes-----	1,120	0.4
257A	Clarksdale silt loam, 0 to 2 percent slopes-----	5,800	2.1
257B	Clarksdale silt loam, 2 to 5 percent slopes-----	3,875	1.4
274F	Seaton silt loam, 18 to 30 percent slopes-----	3,495	1.2
279B	Rozetta silt loam, 2 to 5 percent slopes-----	28,965	10.3
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded-----	12,905	4.6
280B	Fayette silt loam, 2 to 5 percent slopes-----	7,480	2.7
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded-----	7,645	2.7
280C3	Fayette silty clay loam, 5 to 10 percent slopes, severely eroded-----	1,465	0.5
280D2	Fayette silt loam, 10 to 18 percent slopes, eroded-----	2,905	1.0
280D3	Fayette silty clay loam, 10 to 18 percent slopes, severely eroded-----	2,735	1.0
386B	Downs silt loam, 2 to 5 percent slopes-----	1,210	0.4
470C2	Keller silt loam, 5 to 10 percent slopes, eroded-----	440	0.2
551F	Gosport silt loam, 18 to 30 percent slopes-----	1,195	0.4
551G	Gosport silt loam, 30 to 60 percent slopes-----	2,410	0.9
570C2	Martinsville loam, 5 to 10 percent slopes, eroded-----	380	0.1
605D2	Ursa loam, 10 to 15 percent slopes, eroded-----	6,720	2.4
802B	Orthents loamy, undulating-----	165	0.1
824B	Swanwick silt loam, 2 to 5 percent slopes-----	755	0.3
864	Pits, quarries-----	225	0.1
871G	Lenzburg silty clay loam, 30 to 60 percent slopes-----	1,940	0.7
872B	Rapatee silty clay loam, 1 to 7 percent slopes-----	660	0.2
937G	Seaton-Hickory complex, 30 to 60 percent slopes-----	6,220	2.2
967G	Hickory-Gosport complex, 30 to 50 percent slopes-----	6,485	2.3
3070	Beaucoup silty clay loam, frequently flooded-----	2,695	1.0
3077	Huntsville silt loam, frequently flooded-----	760	0.3
3107	Sawmill silty clay loam, frequently flooded-----	210	0.1
3284	Tice silty clay loam, frequently flooded-----	5,855	2.1
3333	Wakeland silt loam, frequently flooded-----	12,510	4.4
3336	Wilbur silt loam, frequently flooded-----	5,900	2.1
3404	Titus silty clay loam, frequently flooded-----	265	0.1
4071	Darwin silty clay, ponded-----	715	0.3
7087B	Dickinson sandy loam, 1 to 7 percent slopes, rarely flooded-----	375	0.1
7430B	Raddle silt loam, 1 to 5 percent slopes, rarely flooded-----	1,620	0.6
7741B	Oakville loamy fine sand, 1 to 7 percent slopes, rarely flooded-----	265	0.1
8070	Beaucoup silty clay loam, occasionally flooded-----	5,185	1.8
8071	Darwin silty clay, occasionally flooded-----	4,540	1.6
8104A	Virgil silt loam, 0 to 3 percent slopes, occasionally flooded-----	440	0.2
8206	Thorp silt loam, occasionally flooded-----	560	0.2
8284	Tice silt loam, occasionally flooded-----	2,570	0.9
8336	Wilbur silt loam, occasionally flooded-----	1,450	0.5
8404	Titus silty clay, occasionally flooded-----	1,790	0.6
8415	Orion silt loam, occasionally flooded-----	1,295	0.5
	Water-----	759	0.3
	Total-----	281,920	100.0

Table 5.--Land Capability Classification and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass- alfalfa hay	Brome-grass- alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
6C2----- Fishhook	IIIe	69	20	22	42	2.4	3.9
6C3----- Fishhook	IVe	58	17	18	35	2.0	3.3
7D2----- Atlas	IVe	49	15	18	41	---	3.4
7D3----- Atlas	VIe	---	---	15	34	---	2.9
8F----- Hickory	VIe	---	---	---	---	2.4	4.0
8G----- Hickory	VIIe	---	---	---	---	---	3.0
16----- Rushville	IIIw	114	36	47	64	---	7.0
17A----- Keomah	IIw	129	39	52	72	5.1	8.5
17B----- Keomah	IIe	128	39	51	71	5.0	8.4
19C3----- Sylvan	IVe	97	30	46	57	4.3	7.2
19D3----- Sylvan	IVe	93	29	44	55	4.1	6.9
36B----- Tama	IIe	153	46	61	88	---	---
43A----- Ipava	I	163	52	66	91	---	---
43B----- Ipava	IIe	161	51	65	90	---	---
46A----- Herrick	IIw	141	45	61	78	---	---
50----- Virden	IIw	138	46	57	72	---	---
53F----- Bloomfield	VIe	---	---	---	---	---	4.5
75C----- Drury	IIIe	122	39	55	75	4.9	7.3
206----- Thorp	IIw	126	42	51	69	---	---

See footnote at end of table.

Table 5.--Land Capability Classification and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass- alfalfa hay	Bromegrass- alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
242A----- Kendall	IIw	135	41	55	75	5.2	8.7
243B----- St. Charles	IIe	126	40	55	72	5.0	8.3
257A----- Clarksdale	I	140	43	57	79	5.3	8.8
257B----- Clarksdale	IIe	139	43	56	78	5.2	8.7
274F----- Seaton	VIe	---	---	---	---	3.8	6.4
279B----- Rozetta	IIe	130	40	53	72	5.1	8.6
279C2----- Rozetta	IIIe	123	38	51	69	4.9	8.2
280B----- Fayette	IIe	128	39	52	72	5.1	8.6
280C2----- Fayette	IIIe	121	37	50	69	4.9	8.2
280C3----- Fayette	IVe	112	34	45	63	4.5	7.6
280D2----- Fayette	IIIe	116	35	48	66	4.7	7.8
280D3----- Fayette	IVe	---	---	---	---	4.3	7.2
386B----- Downs	IIe	147	43	58	82	5.5	9.2
470C2----- Keller	IIIe	86	30	40	54	3.6	6.0
551F, 551G----- Gospport	VIIe	---	---	---	---	---	---
570C2----- Martinsville	IIIe	113	35	48	62	3.4	7.5
605D2----- Ursa	IVe	54	15	19	32	2.1	3.4
802B----- Orthents	IIe	85	27	30	---	---	---
824B----- Swanwick	IIIe	77	28	30	---	3.2	5.3
864. Pits, quarries							

See footnote at end of table.

Table 5.--Land Capability Classification and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass- alfalfa hay	Bromegrass- alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
871G----- Lenzburg	VIIe	---	---	---	---	---	---
872B----- Rapatee	IIe	97	33	45	61	4.0	6.6
937G----- Seaton-Hickory	VIIe	---	---	---	---	---	3.9
967G----- Hickory-Gosport	VIIe	---	---	---	---	---	---
3070----- Beaucoup	IIIw	124	41	50	68	---	---
3077----- Huntsville	IIw	137	43	58	77	---	---
3107----- Sawmill	IIIw	132	42	49	68	---	---
3284----- Tice	IIIw	138	42	55	76	---	---
3333----- Wakeland	IIw	122	41	51	67	---	---
3336----- Wilbur	IIw	121	40	50	66	---	---
3404----- Titus	IVw	113	38	47	61	---	---
4071----- Darwin	Vw	---	---	---	---	---	---
7087B----- Dickinson	IIIe	98	37	45	76	---	---
7430B----- Raddle	IIe	148	45	58	82	---	---
7741B----- Oakville	IVs	61	23	32	47	---	---
8070----- Beaucoup	IIw	138	46	55	75	---	---
8071----- Darwin	IIIw	99	35	47	63	---	---
8104A----- Virgil	IIw	148	45	60	84	5.6	9.3
8206----- Thorp	IIw	126	42	51	69	---	---
8284----- Tice	IIw	153	47	61	84	---	---

See footnote at end of table.

Table 5.--Land Capability Classification and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Oats	Orchardgrass- alfalfa hay	Bromegrass- alfalfa
		Bu	Bu	Bu	Bu	Tons	AUM*
8336----- Wilbur	IIw	134	44	55	73	---	---
8404----- Titus	IIIw	125	42	52	68	---	---
8415----- Orion	IIw	125	43	52	72	---	---

* 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 6.--Capability Classes and Subclasses

(Miscellaneous areas are excluded. Absence of an entry indicates no acreage.)

Class	Major management concerns (Subclass)			
	Total acreage	Erosion (e) Acres	Wetness (w) Acres	Soil problem (s) Acres
I	19,385	---	---	---
II	121,025	61,855	59,170	---
III	49,075	33,570	15,505	---
IV	18,015	17,035	715	265
V	265	---	265	---
VI	32,200	32,200	---	---
VII	38,170	38,170	---	---
VIII	---	---	---	---

Table 7.--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
16	Rushville silt loam (where drained)
17A	Keomah silt loam, 0 to 2 percent slopes (where drained)
17B	Keomah silt loam, 2 to 5 percent slopes
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
46A	Herrick silt loam, 0 to 2 percent slopes
50	Viriden silty clay loam (where drained)
206	Thorp silt loam (where drained)
242A	Kendall silt loam, 0 to 2 percent slopes (where drained)
243B	St. Charles silt loam, 2 to 5 percent slopes
257A	Clarksdale silt loam, 0 to 2 percent slopes (where drained)
257B	Clarksdale silt loam, 2 to 5 percent slopes
279B	Rozetta silt loam, 2 to 5 percent slopes
280B	Fayette silt loam, 2 to 5 percent slopes
386B	Downs silt loam, 2 to 5 percent slopes
824B	Swanwick silt loam, 2 to 5 percent slopes
872B	Rapatee silty clay loam, 1 to 7 percent slopes
3070	Beaucoup silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3077	Huntsville silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3107	Sawmill silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3284	Tice silty clay loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3333	Wakeland silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3336	Wilbur silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3404	Titus silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
7087B	Dickinson sandy loam, 1 to 7 percent slopes, rarely flooded
7430B	Raddle silt loam, 1 to 5 percent slopes, rarely flooded
8070	Beaucoup silty clay loam, occasionally flooded (where drained)
8071	Darwin silty clay, occasionally flooded (where drained)
8104A	Virgil silt loam, 0 to 3 percent slopes, occasionally flooded (where drained)
8206	Thorp silt loam, occasionally flooded (where drained)
8284	Tice silt loam, occasionally flooded
8336	Wilbur silt loam, occasionally flooded
8404	Titus silty clay, occasionally flooded (where drained)
8415	Orion silt loam, occasionally flooded

Table 8.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available.)

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
6C2, 6C3----- Fishhook	4C	Slight	Slight	Slight	Moderate	White oak----- Northern red oak---- Green ash----- Bur oak-----	70 70 --- ---	4 4 --- ---	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
7D2, 7D3----- Atlas	4C	Slight	Slight	Moderate	Moderate	White oak----- Northern red oak---- Bur oak----- Green ash-----	70 70 70 ---	4 4 4 ---	Green ash, pin oak, red maple, Austrian pine.
8F----- Hickory	5R	Moderate	Moderate	Slight	Slight	White oak----- Northern red oak---- Black oak----- Green ash----- Bitternut hickory--- Yellow-poplar-----	85 85 --- --- --- 95	5 5 --- --- --- 7	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
8G----- Hickory	5R	Severe	Severe	Slight	Slight	White oak----- Northern red oak---- Black oak----- Green ash----- Bitternut hickory--- Yellow-poplar-----	85 85 --- --- --- 95	5 5 --- --- --- 7	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
17A, 17B----- Keomah	3A	Slight	Slight	Slight	Slight	White oak----- Northern red oak----	65 70	3 4	Eastern white pine, white oak, red pine, northern red oak, black walnut, sugar maple.
19C3, 19D3----- Sylvan	6A	Slight	Slight	Slight	Slight	Yellow-poplar----- White oak----- Northern red oak---- Black walnut-----	90 80 80 ---	6 4 4 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
53F----- Bloomfield	4R	Moderate	Moderate	Moderate	Slight	Black oak----- White oak----- Scarlet oak----- Shagbark hickory----	70 --- --- ---	4 --- --- ---	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
75C----- Drury	7A	Slight	Slight	Slight	Slight	Yellow-poplar----- White oak----- Northern red oak---- Sweetgum----- Green ash-----	95 85 85 --- ---	7 5 5 --- ---	Yellow-poplar, white oak, northern red oak, sweetgum, black walnut, eastern white pine, loblolly pine, shortleaf pine.
242A----- Kendall	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak---- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine.
243B----- St. Charles	7A	Slight	Slight	Slight	Slight	Yellow-poplar----- White oak----- Northern red oak---- Sweetgum----- Green ash-----	95 85 85 --- ---	7 5 5 --- ---	White oak, black walnut, sugar maple, eastern white pine, red pine.
257A, 257B----- Clarksdale	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak---- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Black walnut, American sycamore, yellow-poplar, white oak, green ash.
274F----- Seaton	6R	Moderate	Moderate	Moderate	Slight	Yellow-poplar----- White oak----- Northern red oak---- Black walnut-----	90 90 80 ---	6 5 4 ---	White oak, northern red oak, black walnut, green ash, red pine, sugar maple.
279B, 279C2----- Rozetta	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak---- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Eastern white pine, northern red oak, green ash, Scotch pine, yellow- poplar.
280B----- Fayette	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak---- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Eastern white pine, northern red oak, green ash, yellow- poplar.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
280C2----- Fayette	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak--- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Northern red oak, yellow- poplar, eastern white pine, green ash.
280C3----- Fayette	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak--- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Eastern white pine, northern red oak, green ash, yellow- poplar.
280D2----- Fayette	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak--- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Northern red oak, yellow- poplar, eastern white pine, green ash.
280D3----- Fayette	4R	Moderate	Moderate	Slight	Slight	White oak----- Northern red oak--- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Eastern white pine, northern red oak, green ash, yellow- poplar.
386B----- Downs	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak--- Yellow-poplar----- Black walnut-----	80 80 90 ---	4 4 6 ---	Northern red oak, yellow- poplar, eastern white pine, green ash.
551F----- Gosport	2R	Moderate	Moderate	Severe	Severe	White oak-----	45	2	Eastern white pine, red pine, Norway spruce, Scotch pine, white spruce, cottonwood.
551G----- Gosport	2R	Severe	Severe	Severe	Severe	White oak-----	45	2	Eastern white pine, red pine, Norway spruce, Scotch pine, white spruce, cottonwood.
570C2----- Martinsville	4A	Slight	Slight	Slight	Slight	White oak----- Yellow-poplar----- Sweetgum-----	80 98 76	4 7 5	Eastern white pine, red pine, white ash, yellow- poplar, black walnut.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
605D2----- Urza	4A	Slight	Slight	Slight	Slight	White oak----- Northern red oak---- Black oak----- Green ash-----	70 70 70 ---	4 4 4 ---	Green ash, Austrian pine, red maple, eastern redcedar, pin oak.
802B----- Orthents	---	---	---	---	---	---	---	---	Black walnut, white oak, northern red oak, yellow- poplar.
824B----- Swanwick	---	---	---	---	---	---	---	---	Black walnut, eastern white pine, green ash, loblolly pine, northern red oak, white ash, white oak.
871G----- Lenzburg	5R	Severe	Severe	Slight	Slight	Sweetgum----- Black walnut----- Eastern cottonwood--	76 73 ---	5 --- ---	Black walnut, eastern cottonwood, green ash, white ash.
872B----- Rapatee	---	---	---	---	---	---	---	---	Black walnut, green ash, white ash, eastern cottonwood, black locust, American sycamore, eastern white pine.
937G: Seaton-----	6R	Severe	Severe	Severe	Slight	Yellow-poplar----- White oak----- Northern red oak---- Black walnut-----	90 90 80 ---	6 5 4 ---	White oak, northern red oak, black walnut, green ash, red pine, sugar maple.
Hickory-----	5R	Severe	Severe	Slight	Slight	White oak----- Northern red oak---- Black oak----- Green ash----- Bitternut hickory--- Yellow-poplar-----	85 85 --- --- --- 95	5 5 --- --- --- 7	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
967G: Hickory-----	5R	Severe	Severe	Slight	Slight	White oak----- Northern red oak---- Black oak----- Green ash----- Bitternut hickory--- Yellow-poplar-----	85 85 --- --- --- 95	5 5 --- --- --- 7	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
Gosport-----	2R	Severe	Severe	Severe	Severe	White oak-----	45	2	Eastern white pine, red pine, Norway spruce, Scotch pine, white spruce, cottonwood.
3070----- Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak----- Eastern cottonwood-- Sweetgum----- Cherrybark oak----- American sycamore---	90 100 --- --- ---	5 9 --- --- ---	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
3077----- Huntsville	7A	Slight	Slight	Slight	Slight	Yellow-poplar----- Eastern cottonwood-- American sycamore--- Cherrybark oak----- Sweetgum----- Green ash-----	98 110 --- --- --- ---	7 11 --- --- --- ---	Eastern cottonwood, American sycamore, green ash, black walnut, red maple, sugar maple, hackberry.
3107----- Sawmill	5W	Slight	Moderate	Moderate	Moderate	Pin oak----- Eastern cottonwood-- Sweetgum----- Cherrybark oak----- American sycamore---	90 --- --- --- ---	5 --- --- --- ---	American sycamore, black spruce, hackberry, European larch, green ash, pin oak, red maple, swamp white oak.
3284----- Tice	5A	Slight	Slight	Slight	Slight	Pin oak----- Sweetgum----- Yellow-poplar----- Virginia pine----- Eastern cottonwood-- White ash-----	96 86 90 90 --- ---	5 7 6 9 --- ---	Yellow-poplar, eastern cottonwood, American sycamore, green ash, red maple, cherrybark oak.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
3333----- Wakeland	5A	Slight	Slight	Slight	Slight	Pin oak----- Sweetgum----- Yellow-poplar----- Virginia pine-----	90 88 90 85	5 7 6 9	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
3336----- Wilbur	8A	Slight	Slight	Slight	Slight	Yellow-poplar-----	100	8	Yellow-poplar, eastern white pine, black walnut.
3404----- Titus	2W	Slight	Severe	Severe	Moderate	Silver maple----- Eastern cottonwood-- White ash-----	80 99 51	2 9 2	Silver maple, eastern cottonwood, pin oak, swamp white oak, green ash, water tupelo, American sycamore, hackberry, red maple.
4071----- Darwin	4W	Slight	Severe	Severe	Moderate	Pin oak----- Swamp white oak---- Eastern cottonwood-- Green ash----- American sycamore---	80 --- --- --- ---	4 --- --- --- ---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.
7741B----- Oakville	4S	Slight	Moderate	Moderate	Slight	White oak----- Red pine----- Eastern white pine-- Jack pine-----	70 78 85 68	4 10 14 7	Eastern white pine, red pine, jack pine.
8070----- Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak----- Eastern cottonwood-- Sweetgum----- Cherrybark oak----- American sycamore---	90 100 --- --- ---	5 9 --- --- ---	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
8071----- Darwin	4W	Slight	Severe	Severe	Moderate	Pin oak----- Swamp white oak---- Eastern cottonwood-- Green ash----- American sycamore---	80 --- --- --- ---	4 --- --- --- ---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.

See footnote at end of table.

Table 8.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Ordi- nation symbol	Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Wind- throw hazard	Common trees	Site index	Produc- tivity class*	
8284----- Tice	5A	Slight	Slight	Slight	Slight	Pin oak----- Sweetgum----- Yellow-poplar----- Virginia pine----- Eastern cottonwood-- White ash-----	96 86 90 90 --- ---	5 7 6 9 --- ---	Yellow-poplar, eastern cottonwood, American sycamore, green ash, red maple, cherrybark oak.
8336----- Wilbur	8A	Slight	Slight	Slight	Slight	Yellow-poplar-----	100	8	Yellow-poplar, eastern white pine, black walnut.
8404----- Titus	2W	Slight	Severe	Severe	Moderate	Silver maple----- Eastern cottonwood-- White ash-----	80 99 51	2 9 2	Silver maple, eastern cottonwood, pin oak, swamp white oak, green ash, water tupelo, American sycamore, hackberry, red maple.
8415----- Orion	2W	Slight	Moderate	Slight	Slight	Silver maple----- Red maple----- White ash-----	80 --- ---	2 --- ---	White spruce, silver maple, white ash, eastern cottonwood.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked, natural stands.

Table 9.--Windbreaks and Environmental Plantings

(The symbol > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil.)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
6C2, 6C3----- Fishhook	American cranberrybush, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
7D2, 7D3----- Atlas	American cranberrybush, silky dogwood, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
8F, 8G----- Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
16----- Rushville	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
17A, 17B----- Keomah	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
19C3, 19D3----- Sylvan	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
36B----- Tama	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern whitecedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
43A, 43B----- Ipava	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
46A----- Herrick	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

Table 9.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
50----- Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
53F----- Bloomfield	Radiant crabapple, eastern redcedar, autumn olive, Washington hawthorn, Amur honeysuckle, lilac.	Austrian pine, jack pine, red pine.	Eastern white pine----	---
75C----- Drury	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
206----- Thorp	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
242A. Kendall				
243B----- St. Charles	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
257A, 257B----- Clarksdale	American cranberrybush, Amur honeysuckle, silky dogwood, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Eastern white pine, pin oak.
274F----- Seaton	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
279B, 279C2----- Rozetta	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
280B, 280C2, 280C3, 280D2, 280D3----- Fayette	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
386B----- Downs	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 9.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
470C2----- Keller	American cranberrybush, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Eastern white pine, pin oak.	---
551F, 551G. Gosport				
570C2----- Martinsville	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
605D2----- Ursa	American cranberrybush, silky dogwood, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
802B----- Orthents	American cranberrybush, Amur privet, silky dogwood, Amur honeysuckle.	Blue spruce, northern whitecedar, white fir, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
824B----- Swanwick	Eastern redcedar, American cranberrybush, Amur privet, Washington hawthorn, Amur honeysuckle, autumn olive.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
864. Pits, quarries				
871G----- Lenzburg	Eastern redcedar, jack pine, Russian-olive, Washington hawthorn, Osage-orange.	Honeylocust, northern catalpa.	---	---
872B----- Rapatee	Eastern redcedar, jack pine, Washington hawthorn, Osage- orange, Russian- olive.	Honeylocust, northern catalpa.	---	---
937G: Seaton-----	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 9.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
937G: Hickory-----	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
967G: Hickory-----	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Gosport.				
3070----- Beaucoup	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
3077----- Huntsville	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3107----- Sawmill	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
3284----- Tice	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3333----- Wakeland	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Northern whitecedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3336----- Wilbur	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3404----- Titus	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
4071. Darwin				

Table 9.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
7087B----- Dickinson	Eastern redcedar, radiant crabapple, Washington hawthorn, autumn olive, Amur honeysuckle, lilac.	Eastern white pine, Austrian pine, red pine, jack pine.	---	---
7430B----- Raddle	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
7741B----- Oakville	Eastern redcedar, lilac, radiant crabapple, autumn olive, Washington hawthorn, Amur honeysuckle.	Red pine, Austrian pine, jack pine.	Eastern white pine----	---
8070----- Beaucoup	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
8071----- Darwin	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, blue spruce, Washington hawthorn, white fir.	Eastern white pine, Norway spruce.	Pin oak.
8104A----- Virgil	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir, Austrian pine.	Norway spruce-----	Pin oak, eastern white pine.
8206----- Thorp	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
8284----- Tice	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
8336----- Wilbur	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
8404----- Titus	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.

Table 9.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
8415----- Orion	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

Table 10.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
6C2, 6C3----- Fishhook	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
7D2, 7D3----- Atlas	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness, droughty, slope.
8F----- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8G----- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
16----- Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
17A----- Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight-----	Slight.
17B----- Keomah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight-----	Slight.
19C3----- Sylvan	Slight-----	Slight-----	Severe: slope.	Severe: erodes easily.	Slight.
19D3----- Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
36B----- Tama	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
43A, 43B----- Ipava	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
46A----- Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
50----- Viriden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53F----- Bloomfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
75C----- Drury	Slight-----	Slight-----	Severe: slope.	Severe: erodes easily.	Slight.
206----- Thorp	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
242A----- Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
243B----- St. Charles	Slight-----	Slight-----	Moderate: slope.	Severe: erodes easily.	Slight.
257A, 257B----- Clarksdale	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
274F----- Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
279B----- Rozetta	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
279C2----- Rozetta	Slight-----	Slight-----	Severe: slope.	Slight-----	Slight.
280B----- Fayette	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
280C2, 280C3----- Fayette	Slight-----	Slight-----	Severe: slope.	Severe: erodes easily.	Slight.
280D2, 280D3----- Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
386B----- Downs	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
470C2----- Keller	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
551F----- Gosport	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
551G----- Gosport	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.
570C2----- Martinsville	Slight-----	Slight-----	Severe: slope.	Severe: erodes easily.	Slight.
605D2----- Ursa	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
802B----- Orthents	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
824B----- Swanwick	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight-----	Slight.
864. Pits, quarries					
871G----- Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
872B----- Rapatee	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight-----	Moderate: droughty.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
937G:					
Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
967G:					
Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Gosport-----	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, erodes easily.	Severe: slope.
3070-----					
Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3077-----					
Huntsville	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3107-----					
Sawmill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
3284-----					
Tice	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
3333-----					
Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3336-----					
Wilbur	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
3404-----					
Titus	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
4071-----					
Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, flooding.	Severe: ponding, too clayey.	Severe: ponding, flooding, too clayey.
7087B-----					
Dickinson	Severe: flooding.	Slight-----	Moderate: slope.	Slight-----	Slight.
7430B-----					
Raddle	Severe: flooding.	Slight-----	Moderate: slope.	Slight-----	Slight.
7741B-----					
Oakville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
8070-----					
Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 10.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8071----- Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
8104A----- Virgil	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
8206----- Thorp	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8284----- Tice	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
8336----- Wilbur	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
8404----- Titus	Severe: flooding, ponding, too clayey.	Severe: ponding, too clayey.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
8415----- Orion	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.

Table 11.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
6C2, 6C3----- Fishhook	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7D2, 7D3----- Atlas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8F----- Hickory	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
8G----- Hickory	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
16----- Rushville	Poor	Fair	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
17A, 17B----- Keomah	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair.
19C3, 19D3----- Sylvan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	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.
46A----- Herrick	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
50----- Virden	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
53F----- Bloomfield	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
75C----- Drury	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
206----- Thorp	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good.
242A----- Kendall	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
243B----- St. Charles	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
257A----- Clarksdale	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
257B----- Clarksdale	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
274F----- Seaton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
279B----- Rozetta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
279C2----- Rozetta	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280B----- Fayette	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
280C2, 280C3, 280D2, 280D3----- Fayette	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
386B----- Downs	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
470C2----- Keller	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
551F, 551G----- Gosport	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
570C2----- Martinsville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
605D2----- Ursa	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
802B----- Orthents	Good	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
824B----- Swanwick	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
864 Pits, quarries										
871G----- Lenzburg	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
872B----- Rapatee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
937G: Seaton-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Hickory-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
967G: Hickory-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Gosport-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
3070----- Beaucoup	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 11.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
3077----- Huntsville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3107----- Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3284----- Tice	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
3333----- Wakeland	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
3336----- Wilbur	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3404----- Titus	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
4071----- Darwin	Poor	Poor	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
7087B----- Dickinson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7430B----- Raddle	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7741B----- Oakville	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
8070----- Beaucoup	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good.
8071----- Darwin	Poor	Poor	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
8104A----- Virgil	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
8206----- Thorp	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good.
8284----- Tice	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
8336----- Wilbur	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
8404----- Titus	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
8415----- Orion	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Good.

Table 12.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
6C2, 6C3----- Fishhook	Severe: wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
7D2, 7D3----- Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, droughty, slope.
8F, 8G----- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
16----- Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
17A, 17B----- Keomah	Severe: wetness.	Severe: shrink-swell.	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, low strength, frost action.	Slight.
19C3----- Sylvan	Slight-----	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
19D3----- Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
36B----- Tama	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
43A, 43B----- Ipava	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
46A----- Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
50----- Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
53F----- Bloomfield	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
75C----- Drury	Slight-----	Slight-----	Slight-----	Moderate: slope.	Severe: low strength, frost action.	Slight.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
206----- Thorp	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
242A----- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
243B----- St. Charles	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
257A, 257B----- Clarksdale	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
274F----- Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
279B----- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
279C2----- Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
280B----- Fayette	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
280C2, 280C3----- Fayette	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
280D2, 280D3----- Fayette	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
386B----- Downs	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
470C2----- Keller	Severe: wetness.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
551F, 551G----- Gospport	Severe: wetness, slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
570C2----- Martinsville	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.	Slight.
605D2----- Ursa	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
802B----- Orthents	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
824B----- Swanwick	Moderate: dense layer, wetness.	Slight-----	Moderate: wetness.	Slight-----	Severe: low strength, frost action.	Slight.
864. Pits, quarries						
871G----- Lenzburg	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
872B----- Rapatee	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Moderate: droughty.
937G: Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
967G: Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Gosport-----	Severe: wetness, slope.	Severe: shrink-swell, slope.	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
3070----- Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3077----- Huntsville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
3107----- Sawmill	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
3284----- Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
3333----- Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.

Table 12.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
3336----- Wilbur	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
3404----- Titus	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, flooding.
4071----- Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, flooding, too clayey.
7087B----- Dickinson	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
7430B----- Raddle	Slight-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: frost action.	Slight.
7741B----- Oakville	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
8070----- Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.
8071----- Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.
8104A----- Virgil	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
8206----- Thorp	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
8284----- Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
8336----- Wilbur	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Moderate: wetness, flooding.
8404----- Titus	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.
8415----- Orion	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.

Table 13.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
6C2, 6C3----- Fishhook	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
7D2, 7D3----- Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
8F, 8G----- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
16----- Rushville	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
17A, 17B----- Keomah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
19C3----- Sylvan	Slight-----	Severe: slope.	Slight-----	Slight-----	Good.
19D3----- Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
36B----- Tama	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
43A, 43B----- Ipava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
46A----- Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
50----- Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
53F----- Bloomfield	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
75C----- Drury	Slight	Severe: slope.	Slight-----	Slight-----	Good.
206----- Thorp	Severe: wetness, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
242A----- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
243B----- St. Charles	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
257A, 257B----- Clarksdale	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
274F----- Seaton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
279B----- Rozetta	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
279C2----- Rozetta	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
280B----- Fayette	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
280C2, 280C3----- Fayette	Slight	Severe: slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
280D2, 280D3----- Fayette	Moderate: slope	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
386B----- Downs	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
470C2----- Keller	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
551F, 551G----- Gosport	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
570C2----- Martinsville	Slight-----	Severe: seepage, slope.	Severe: seepage.	Slight-----	Fair: thin layer.
605D2----- Ursa	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
802B----- Orthents	Severe: percs slowly.	Moderate: slope, wetness.	Moderate: too clayey.	Slight-----	Fair: too clayey.
824B----- Swanwick	Severe: percs slowly.	Moderate: slope, wetness.	Moderate: too clayey.	Slight-----	Fair: too clayey.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
864. Pits, quarries					
871G----- Lenzburg	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
872B----- Rapatee	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, small stones.
937G: Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
967G: Hickory-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Gosport-----	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
3070----- Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3077----- Huntsville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
3107----- Sawmill	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3284----- Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.
3333----- Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3336----- Wilbur	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
3404----- Titus	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
4071----- Darwin	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.

Table 13.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7087B----- Dickinson	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
7430B----- Raddle	Moderate: flooding.	Moderate: seepage, slope.	Moderate: flooding.	Moderate: flooding.	Good.
7741B----- Oakville	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
8070----- Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
8071----- Darwin	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
8104A----- Virgil	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
8206----- Thorp	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
8284----- Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.
8336----- Wilbur	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
8404----- Titus	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
8415----- Orion	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

Table 14.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
6C2, 6C3----- Fishhook	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
7D2, 7D3----- Atlas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
8F----- Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
8G----- Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
16----- Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
17A, 17B----- Keomah	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
19C3----- Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
19D3----- Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
36B----- Tama	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
43A, 43B----- Ipava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
46A----- Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
50----- Viriden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
53F----- Bloomfield	Poor: slope.	Probable-----	Improbable: too sandy.	Poor: too sandy, slope.
75C----- Drury	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
206----- Thorp	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
242A----- Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
243B----- St. Charles	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
257A, 257B----- Clarksdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
274F----- Seaton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
279B, 279C2----- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280B, 280C2, 280C3---- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
280D2, 280D3----- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
386B----- Downs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
470C2----- Keller	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
551F----- Gosport	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
551G----- Gosport	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
570C2----- Martinsville	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
605D2----- Ursa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
802B----- Orthents	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
824B----- Swanwick	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
864. Pits, quarries				
871G----- Lenzburg	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
872B----- Rapatee	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
937G: Seaton-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
937G: Hickory-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
967G: Hickory-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Gosport-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
3070----- Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3077----- Huntsville	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
3107----- Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3284----- Tice	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
3333----- Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3336----- Wilbur	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3404----- Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
4071----- Darwin	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
7087B----- Dickinson	Good-----	Probable-----	Improbable: too sandy.	Fair: thin layer.
7430B----- Raddle	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
7741B----- Oakville	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
8070----- Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8071----- Darwin	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 14.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
8104A----- Virgil	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
8206----- Thorp	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8284----- Tice	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
8336----- Wilbur	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
8404----- Titus	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
8415----- Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

Table 15.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
6C2, 6C3----- Fishhook	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
7D2, 7D3----- Atlas	Severe: slope.	Severe: hard to pack.	Percs slowly, frost action, slope.	Slope, wetness, droughty.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
8F, 8G----- Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
16----- Rushville	Slight-----	Severe: ponding, hard to pack.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
17A----- Keomah	Slight-----	Moderate: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
17B----- Keomah	Moderate: slope.	Moderate: wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
19C3----- Sylvan	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
19D3----- Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
36B----- Tama	Moderate: seepage, slope.	Slight-----	Deep to water	Slope-----	Erodes easily	Erodes easily.
43A----- Ipava	Slight-----	Severe: wetness.	Frost action--	Wetness-----	Erodes easily, wetness.	Wetness, erodes easily.
43B----- Ipava	Moderate: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Wetness, erodes easily.
46A----- Herrick	Slight-----	Severe: wetness.	Frost action--	Wetness-----	Erodes easily, wetness.	Wetness, erodes easily.
50----- Virden	Slight-----	Severe: ponding.	Ponding, frost action.	Ponding-----	Ponding-----	Wetness.
53F----- Bloomfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
75C----- Drury	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
206----- Thorp	Severe: seepage.	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
242A----- Kendall	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
243B----- St. Charles	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
257A----- Clarksdale	Slight-----	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
257B----- Clarksdale	Moderate: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
274F----- Seaton	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
279B, 279C2----- Rozetta	Moderate: seepage, slope.	Slight-----	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280B----- Fayette	Moderate: seepage, slope.	Slight-----	Deep to water	Slope-----	Erodes easily	Erodes easily.
280C2, 280C3----- Fayette	Moderate: seepage, slope.	Slight-----	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280D2, 280D3----- Fayette	Severe: slope.	Slight-----	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
386B----- Downs	Moderate: seepage, slope.	Slight-----	Deep to water	Slope-----	Erodes easily	Erodes easily.
470C2----- Keller	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
551F, 551G----- Gosport	Severe: slope.	Slight-----	Percs slowly, depth to rock, slope.	Slope, wetness, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
570C2----- Martinsville	Severe: seepage.	Severe: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.
605D2----- Ursa	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily.
802B----- Orthents	Moderate: slope.	Moderate: piping.	Deep to water	Slope, rooting depth, erodes easily.	Erodes easily	Erodes easily, rooting depth.
824B----- Swanwick	Moderate: slope.	Severe: piping.	Deep to water	Percs slowly, rooting depth, slope.	Erodes easily	Erodes easily, rooting depth.
864. Pits, quarries						

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
871G----- Lenzburg	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
872B----- Rapatee	Moderate: slope.	Severe: piping.	Deep to water	Slope, droughty, percs slowly.	Erodes easily, percs slowly.	Erodes easily, droughty.
937G: Seaton-----	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Hickory-----	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
967G: Hickory-----	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Gosport-----	Severe: slope.	Slight-----	Percs slowly, depth to rock, slope.	Slope, wetness, percs slowly.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
3070----- Beaucoup	Slight-----	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding-----	Wetness.
3077----- Huntsville	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Flooding-----	Favorable-----	Favorable.
3107----- Sawmill	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness-----	Wetness.
3284----- Tice	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness-----	Wetness-----	Favorable.
3333----- Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
3336----- Wilbur	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
3404----- Titus	Slight-----	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
4071----- Darwin	Slight-----	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
7087B----- Dickinson	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.	Favorable.
7430B----- Raddle	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----	Erodes easily	Erodes easily.

Table 15.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
7741B----- Oakville	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
8070----- Beaucoup	Slight-----	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding-----	Wetness.
8071----- Darwin	Slight-----	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
8104A----- Virgil	Severe: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
8206----- Thorp	Slight-----	Severe: wetness.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
8284----- Tice	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness-----	Wetness-----	Favorable.
8336----- Wilbur	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
8404----- Titus	Slight-----	Severe: ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
8415----- Orion	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness-----	Erodes easily, wetness.	Wetness, erodes easily.

Table 16.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
6C2----- Fishhook	0-4	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-15
	4-25	Silty clay loam.	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	25-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-1	0-5	95-100	90-100	80-90	75-85	40-60	20-35
6C3----- Fishhook	0-5	Silty clay loam.	ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-20
	5-22	Silty clay loam.	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	22-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-1	0-5	95-100	90-100	80-90	75-85	40-60	20-35
7D2----- Atlas	0-5	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	75-95	25-35	5-15
	5-31	Silty clay loam, clay, silty clay	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	31-60	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
7D3----- Atlas	0-4	Silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	75-100	40-60	25-40
	4-25	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	25-60	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
8F----- Hickory	0-17	Loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	17-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
8G----- Hickory	0-6	Loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	6-54	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	54-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
16----- Rushville	0-8	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	NP-15
	8-12	Silt loam, silt.	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	20-40	NP-15
	12-30	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-35
	30-50	Silty clay loam, silty clay.	CH, CL, ML, MH	A-7-6, A-7-5	0	0	100	100	95-100	95-100	45-60	15-30
	50-60	Silt loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	30-45	8-20
17A----- Keomah	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	6-10	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	10-40	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
	40-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-30
17B----- Keomah	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	6-11	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	4-15
	11-60	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	100	95-100	45-60	30-45
19C3----- Sylvan	0-7	Silty clay loam.	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	20-30
	7-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	34-60	Silt loam, silt.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	20-40	5-20
19D3----- Sylvan	0-6	Silty clay loam.	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	20-30
	6-29	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	29-60	Silt loam, silt.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	20-40	5-20
36B----- Tama	0-15	Silt loam-----	ML, CL	A-6, A-7	0	0	100	100	100	95-100	35-45	10-20
	15-56	Silty clay loam.	CL	A-7	0	0	100	100	100	95-100	40-50	15-25
	56-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
43A----- Ipava	0-12	Silt loam-----	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	12-50	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-70	25-40
	50-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-40	5-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
43B----- Ipava	0-15	Silt loam-----	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	15-48	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-70	25-40
	48-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-40	5-20
46A----- Herrick	0-17	Silt loam-----	CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	30-40	5-15
	17-25	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-60	25-40
	25-55	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-50	20-35
	55-60	Silt loam, loam, clay loam.	CL	A-6	0	0	100	100	90-100	80-100	30-40	10-20
50----- Virden	0-15	Silty clay loam.	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-25
	15-41	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	40-55	15-30
	41-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	30-45	10-20
53F----- Bloomfield	0-4	Loamy fine sand.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	70-100	4-35	---	NP
	4-29	Loamy sand, loamy fine sand, sand.	SP, SM, SP-SM	A-2-4, A-3	0	0	100	100	70-100	4-35	---	NP
	29-65	Fine sand, loamy fine sand, sand, loamy sand.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	65-100	4-35	<20	NP-3
75C----- Drury	0-12	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	95	95-100	95-100	90-100	20-35	NP-15
	12-31	Silt loam-----	CL	A-6, A-4	0	0	95	80-100	75-100	90-100	25-35	8-15
	31-60	Silt loam, loam, very fine sandy loam.	CL-ML, CL	A-4, A-6	0	0	95	80-100	95-100	55-95	20-30	5-15
206----- Thorp	0-10	Silt loam-----	CL	A-6, A-4	0	0	95-100	95-100	90-100	75-95	20-40	8-19
	10-18	Silt loam-----	CL	A-4, A-6	0	0	95-100	95-100	90-100	75-95	25-35	7-15
	18-54	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	95-100	95-100	90-100	75-95	35-50	13-27
	54-60	Silt loam, clay loam, sandy clay loam.	CL	A-6, A-4, A-7	0	0	90-100	90-100	90-100	70-90	20-50	8-26
242A----- Kendall	0-16	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	16-44	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	44-60	Stratified sandy loam to silt loam.	CL, CL-ML, SC-SM, SC	A-2, A-4	0	0-5	90-100	80-95	60-90	30-70	<25	4-10

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
243B----- St. Charles	0-9	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	95-100	22-35	7-15
	9-47	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	47-60	Stratified gravelly sandy loam to silt loam.	SC, CL, CL-ML, SC-SM	A-2, A-4, A-6	0-1	0-5	90-100	70-90	60-90	30-70	15-35	5-15
257A----- Clarksdale	0-7	Silt loam-----	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	7-10	Silt loam-----	CL	A-6, A-4	0	0	100	100	95-100	90-100	20-35	8-18
	10-48	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	25-40
	48-60	Silt loam, silty clay loam.	CL	A-6	0	0	95-100	95-100	95-100	90-100	25-40	10-25
257B----- Clarksdale	0-8	Silt loam-----	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	8-59	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	25-40
	59-60	Silt loam, silty clay loam.	CL	A-6	0	0	95-100	95-100	95-100	90-100	25-40	10-25
274F----- Seaton	0-10	Silt loam-----	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	100	100	95-100	20-45	5-20
	10-52	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-40	5-20
	52-60	Silt loam, silt.	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-20
279B----- Rozetta	0-7	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	7-11	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	20-30	5-15
	11-60	Silty clay loam.	CL	A-7, A-6	0	0	100	100	95-100	95-100	35-50	15-30
279C2----- Rozetta	0-9	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	95-100	24-35	8-15
	9-52	Silty clay loam.	CL	A-7, A-6	0	0	100	100	95-100	95-100	35-50	15-30
	52-60	Silt loam-----	CL	A-6, A-4	0	0	100	100	95-100	85-100	25-40	7-20
280B----- Fayette	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	8-53	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	53-60	Silt loam-----	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
280C2----- Fayette	0-10	Silt loam-----	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	10-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
280C3----- Fayette	0-4	Silty clay loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	4-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
280D2----- Fayette	0-5	Silt loam----	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-25
	5-48	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	48-60	Silt loam----	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
280D3----- Fayette	0-5	Silty clay loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	5-53	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	35-45	15-25
	53-60	Silt loam----	CL	A-6	0	0	100	100	100	95-100	30-40	10-20
386B----- Downs	0-9	Silt loam----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	9-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	100	95-100	35-45	15-25
470C2----- Keller	0-9	Silt loam----	CL, ML	A-6, A-4	0	0	100	100	95-100	90-100	30-40	5-15
	9-28	Silty clay loam.	CL, ML	A-7, A-6	0	0	100	100	95-100	90-100	35-50	10-25
	28-60	Silty clay loam, clay loam, clay.	CH, CL	A-7, A-6	---	0-5	95-100	90-100	80-95	75-90	35-55	15-30
551F----- Gosport	0-4	Silt loam----	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	70-100	25-40	5-15
	4-27	Clay, silty clay, silty clay loam.	CH	A-7	0	0	100	90-100	90-100	85-100	50-65	35-50
	27-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
551G----- Gosport	0-10	Silt loam----	CL, CL-ML	A-4, A-6	0	0	100	90-100	90-100	70-100	25-40	5-15
	10-32	Clay, silty clay, silty clay loam.	CH	A-7	0	0	100	90-100	90-100	85-100	50-65	35-50
	32-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
570C2----- Martinsville	0-9	Loam-----	ML, CL-ML, CL	A-4	0	0	100	85-100	75-100	65-90	<25	3-8
	9-52	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
	52-60	Stratified sand to silt loam.	SM, SC-SM, ML, CL-ML	A-1, A-2-4, A-4	0	0	95-100	85-100	45-95	10-75	<25	NP-8
605D2----- Ursa	0-6	Loam-----	CL, CL-ML	A-6, A-4	0	0	100	95-100	90-100	80-100	20-40	5-20
	6-60	Clay loam, loam, clay.	CL, CH	A-6, A-7	0-1	0-5	95-100	90-95	80-90	60-85	35-55	20-35
802B----- Orthents	0-6	silt loam----	CL	A-6	0-1	0-5	95-100	90-100	85-95	60-90	20-40	10-20
	6-60	Loam, silt loam, silty clay loam.	CL	A-6	0-1	0-5	95-100	90-100	85-95	60-90	20-40	10-20

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
3070----- Beaucoup	0-16	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-25
	16-60	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-30
3077----- Huntsville	0-37	Silt loam-----	CL	A-6	0	0	100	95-100	90-100	85-100	25-40	10-20
	37-60	Silt loam-----	CL	A-6	0	0	100	95-100	90-100	85-100	20-35	10-20
3107----- Sawmill	0-28	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	28-57	Silty clay loam, clay loam, loam.	CL	A-6, A-7, A-4	0	0	100	100	85-100	70-95	25-50	8-25
	57-60	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6, A-7	0	0	100	100	75-100	65-95	20-50	8-30
3284----- Tice	0-15	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	15-37	Silty clay loam, silt loam.	CL, CH	A-7	0	0	100	100	95-100	85-95	40-55	15-30
	37-60	Stratified silty clay loam, fine sandy loam, loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	60-95	55-80	25-45	5-20
3333----- Wakeland	0-9	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
	9-60	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
3336----- Wilbur	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	70-95	20-35	4-15
	6-38	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	80-95	20-35	4-15
	38-60	Silt loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-95	20-35	4-15
3404----- Titus	0-14	Silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	14-60	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
4071----- Darwin	0-15	Silty clay----	CH, CL	A-7	0	0	100	100	100	90-100	45-85	25-55
	15-60	Silty clay, clay.	CH, CL	A-7	0	0	100	100	100	85-100	45-85	25-55
7087B----- Dickinson	0-9	Sandy loam----	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	9-20	Fine sandy loam, sandy loam.	SM, SC, SC-SM	A-4, A-2	0	0	100	100	85-95	30-50	15-30	NP-10
	20-43	Fine sandy loam, sandy loam.	SM, SC, SC-SM	A-4	0	0	100	100	85-95	35-50	15-30	NP-10
	43-60	Sand, loamy fine sand, loamy sand.	SM, SP-SM	A-3, A-2	0	0	100	100	70-90	5-20	---	NP
7430B----- Raddle	0-15	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	8-15
	15-60	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-100	20-30	4-14

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments >10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
7741B----- Oakville	0-14	Loamy fine sand.	SM	A-2	0	0	100	90-100	55-80	15-35	---	NP
	14-38	Fine sand, loamy fine sand.	SM, SP-SM	A-2	0	0	100	95-100	65-95	10-35	---	NP
	38-60	Sand, fine sand.	SP-SM, SM	A-2, A-3	0	0	100	90-100	50-80	10-35	---	---
8070----- Beaucoup	0-13	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-25
	13-60	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-30
8071----- Darwin	0-12	Silty clay----	CH, CL	A-7	0	0	100	100	100	90-100	45-85	25-55
	12-40	Silty clay, clay.	CH, CL	A-7	0	0	100	100	100	85-100	45-85	25-55
	40-60	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	0	100	100	95-100	90-100	35-70	20-45
8104A----- Virgil	0-9	Silt loam----	CL	A-4, A-6	0	0	100	100	90-100	85-95	20-35	8-20
	9-15	Silt loam----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-95	20-35	5-20
	15-52	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30
	52-60	Loam, sandy loam, silty clay loam.	CL, SC, SC-SM, CL-ML	A-6, A-4, A-2-4, A-2-6	0	0-5	90-100	85-100	70-100	30-90	20-35	5-15
8206----- Thorp	0-12	Silt loam----	CL	A-6, A-4	0	0	100	100	95-100	85-95	25-40	8-20
	12-22	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	30-50	10-25
	22-62	Silty clay, silt loam, clay loam.	CL	A-6, A-4, A-7	0	0	90-100	90-100	90-100	70-90	30-45	8-20
	62-65	Stratified silty clay loam, silt loam, clay loam.	CL	A-6, A-4, A-7	0	0	85-100	75-95	65-85	20-60	<25	NP-15
8284----- Tice	0-11	Silt loam----	CL	A-6, A-7	0	0	100	100	90-100	80-95	30-45	10-20
	11-60	Silty clay loam, silt loam.	CL, CH	A-7	0	0	100	100	95-100	85-95	40-55	15-30
8336----- Wilbur	0-6	Silt loam----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	70-95	20-35	4-15
	6-38	Silt loam----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	80-95	20-35	4-15
	38-60	Silt loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-95	20-35	4-15
8404----- Titus	0-11	Silty clay----	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	11-31	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	31-60	Silty clay loam, silt loam, loam.	CL	A-6	0	0	100	90-100	70-90	55-85	20-40	10-25

Table 16.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments >10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
8415----- Orion	0-6	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-35	4-12
	6-29	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	0	100	100	90-100	70-80	20-30	4-10
	29-54	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	85-100	85-100	20-40	4-18
	54-60	Stratified silt loam to sand.	CL, CL-ML	A-4	0	0	80-100	80-100	80-100	80-100	20-30	4-10

Table 17.--Physical and Chemical Properties of the Soils

(The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.)

Soil name and map symbol	Depth		Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct						K	T		
6C2----- Fishhook	0-4	20-27	1.30-1.50	0.6-2.0	0.22-0.24	5.1-7.3	Low-----	0.37	4	6	1-3
	4-25	27-35	1.40-1.60	0.6-2.0	0.18-0.20	4.5-7.3	Moderate----	0.37			
	25-60	35-45	1.55-1.75	0.06-0.2	0.09-0.16	4.5-7.8	High-----	0.37			
6C3----- Fishhook	0-5	27-35	1.35-1.55	0.6-2.0	0.20-0.22	5.1-7.3	Moderate----	0.37	3	7	.5-1
	5-22	27-35	1.40-1.60	0.6-2.0	0.18-0.20	4.5-7.3	Moderate----	0.37			
	22-60	35-45	1.55-1.75	0.06-0.2	0.09-0.16	4.5-7.8	High-----	0.37			
7D2----- Atlas	0-5	20-27	1.30-1.50	0.2-0.6	0.20-0.25	4.5-7.3	Moderate----	0.43	3	6	1-3
	5-31	35-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.3	High-----	0.32			
	31-60	30-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.8	High-----	0.32			
7D3----- Atlas	0-4	30-40	1.35-1.55	0.06-0.2	0.14-0.19	4.5-7.3	High-----	0.43	2	7	.5-1
	4-25	35-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.3	High-----	0.32			
	25-60	30-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.8	High-----	0.32			
8F----- Hickory	0-17	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----	0.37	5	6	1-2
	17-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate----	0.28			
8G----- Hickory	0-6	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----	0.37	5	6	1-2
	6-54	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate----	0.28			
	54-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----	0.28			
16----- Rushville	0-8	15-27	1.25-1.45	0.6-2.0	0.22-0.24	4.5-7.3	Low-----	0.43	3	6	1-3
	8-12	10-22	1.30-1.50	0.06-0.2	0.15-0.20	4.5-7.3	Low-----	0.43			
	12-30	35-45	1.30-1.50	<0.06	0.09-0.20	4.5-6.5	High-----	0.43			
	30-50	30-42	1.40-1.60	<0.02	0.11-0.20	4.5-7.8	High-----	0.43			
	50-60	18-30	1.40-1.55	0.06-0.2	0.16-0.21	5.6-8.4	Moderate----	0.43			
17A----- Keomah	0-6	16-26	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low-----	0.37	3	6	1-3
	6-10	16-26	1.35-1.45	0.2-0.6	0.18-0.20	4.5-7.3	Low-----	0.37			
	10-40	35-42	1.30-1.45	0.2-0.6	0.18-0.20	4.5-5.5	High-----	0.37			
	40-60	24-38	1.40-1.55	0.2-0.6	0.18-0.20	5.1-7.3	Moderate----	0.37			
17B----- Keomah	0-6	16-26	1.30-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low-----	0.37	3	6	1-3
	6-11	16-26	1.35-1.45	0.2-0.6	0.18-0.20	4.5-7.3	Low-----	0.37			
	11-60	35-42	1.30-1.45	0.2-0.6	0.18-0.20	4.5-5.5	High-----	0.37			
19C3----- Sylvan	0-7	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate----	0.37	4	7	<1
	7-34	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate----	0.37			
	34-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low-----	0.37			
19D3----- Sylvan	0-6	27-32	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Moderate----	0.37	4	7	<1
	6-29	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate----	0.37			
	29-60	10-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low-----	0.37			
36B----- Tama	0-15	20-26	1.25-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate----	0.28	5	6	3-4
	15-56	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.5	Moderate----	0.43			
	56-60	20-30	1.35-1.40	0.6-2.0	0.18-0.20	5.6-7.3	Moderate----	0.43			
43A----- Ipava	0-12	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate----	0.28	5	6	4-5
	12-40	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High-----	0.43			
	40-60	20-30	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate----	0.43			
43B----- Ipava	0-15	20-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Moderate----	0.28	5	6	4-5
	15-48	35-43	1.25-1.50	0.2-0.6	0.11-0.20	5.6-7.8	High-----	0.43			
	48-60	20-30	1.30-1.55	0.2-0.6	0.20-0.22	6.1-8.4	Moderate----	0.43			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Moist	Permeability	Available	Soil	Shrink-swell potential	Erosion		Wind erodi- bility group	Organic matter Pct
	In	Pct	bulk density g/cc		In/hr	water reaction capacity		pH	factors		
46A----- Herrick	0-17	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.28	5	6	3-4
	17-25	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.5	High	0.43			
	25-55	25-40	1.20-1.40	0.2-0.6	0.16-0.20	5.6-7.3	Moderate	0.43			
	55-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate	0.43			
50----- Viriden	0-15	27-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate	0.28	5	7	4-6
	15-41	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High	0.28			
	41-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate	0.28			
53F----- Bloomfield	0-4	5-10	1.45-1.65	6.0-20	0.09-0.13	5.1-7.8	Low	0.15	5	2	.5-2
	4-29	2-10	1.45-1.65	6.0-20	0.08-0.12	5.1-7.3	Low	0.15			
	29-65	5-13	1.60-1.80	2.0-20	0.08-0.12	5.1-7.8	Low	0.15			
75C----- Drury	0-12	10-20	1.20-1.40	0.6-2.0	0.20-0.24	5.6-8.4	Low	0.43	5	5	1-2
	12-31	18-25	1.25-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.43			
	31-60	15-20	1.30-1.50	0.6-2.0	0.12-0.21	6.1-7.8	Low	0.43			
206----- Thorp	0-10	20-27	1.15-1.35	0.2-0.6	0.22-0.24	5.1-7.8	Low	0.37	5	6	4-6
	10-18	18-25	1.30-1.50	0.2-0.6	0.20-0.22	5.1-7.3	Low	0.37			
	18-54	22-35	1.35-1.55	0.06-0.2	0.18-0.20	5.1-7.3	Moderate	0.37			
	54-60	20-30	1.40-1.60	0.06-0.2	0.15-0.22	5.6-7.8	Moderate	0.37			
242A----- Kendall	0-16	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	6	1-3
	16-44	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate	0.37			
	44-60	10-25	1.55-1.70	0.6-2.0	0.11-0.22	5.6-8.4	Low	0.37			
243B----- St. Charles	0-9	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.8	Low	0.37	5-4	6	1-3
	9-47	25-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate	0.37			
	47-60	10-25	1.55-1.75	0.6-2.0	0.11-0.16	5.6-8.4	Low	0.24			
257A----- Clarksdale	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.25	5.1-7.3	Moderate	0.37	5	6	2-3
	7-10	15-27	1.25-1.50	0.2-0.6	0.20-0.22	5.1-6.5	Low	0.37			
	10-48	35-45	1.30-1.50	0.2-0.6	0.11-0.20	5.1-7.3	High	0.37			
	48-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.37			
257B----- Clarksdale	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.25	5.1-7.3	Moderate	0.37	5	6	2-3
	8-59	35-45	1.30-1.50	0.2-0.6	0.11-0.20	5.1-7.3	High	0.37			
	59-60	20-30	1.40-1.60	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.37			
274F----- Seaton	0-10	10-22	1.10-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	10-52	18-27	1.20-1.60	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
	52-60	10-25	1.20-1.50	0.6-2.0	0.20-0.22	5.6-8.4	Low	0.37			
279B----- Rozetta	0-7	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	6	1-3
	7-11	12-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low	0.37			
	11-60	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate	0.37			
279C2----- Rozetta	0-9	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.37	5	6	1-3
	9-52	27-35	1.35-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate	0.37			
	52-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
280B----- Fayette	0-8	15-27	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low	0.32	5	6	2-3
	8-53	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.5	Moderate	0.43			
	53-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate	0.43			
280C2----- Fayette	0-10	25-27	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.37	5	6	1-2
	10-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate	0.43			
280C3----- Fayette	0-4	27-32	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.43	4	7	.5-2
	4-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate	0.43			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth		Moist bulk density	Permeability	Available water capacity	Soil reaction pH	Shrink-swell potential	Erosion factors		Wind erodi- bility group	Organic matter Pct
	In	Pct						K	T		
280D2----- Fayette	0-5	25-27	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.37	5	6	1-2
	5-48	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate	0.43			
	48-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate	0.43			
280D3----- Fayette	0-5	27-32	1.35-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.43	4	7	.5-2
	5-53	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate	0.43			
	53-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate	0.43			
386B----- Downs	0-9	18-26	1.25-1.30	0.6-2.0	0.21-0.23	5.1-7.3	Low	0.32	5	6	2-3
	9-60	26-35	1.30-1.35	0.6-2.0	0.18-0.20	4.5-7.3	Moderate	0.43			
470C2----- Keller	0-9	20-27	1.30-1.40	0.6-2.0	0.22-0.24	5.6-7.8	Low	0.37	4	6	3-5
	9-28	27-35	1.35-1.50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate	0.37			
	28-60	30-42	1.50-1.70	0.06-0.2	0.10-0.19	5.1-7.8	High	0.37			
551F----- Gosport	0-4	18-27	1.30-1.40	0.2-0.6	0.18-0.20	5.1-6.5	Low	0.43	3	6	2-3
	4-27	36-60	1.50-1.60	<0.06	0.12-0.14	3.6-5.5	High	0.32			
	27-60	---	---	<0.06	---	---	-----	----			
551G----- Gosport	0-10	18-27	1.30-1.40	0.2-0.6	0.18-0.20	5.1-6.5	Low	0.43	3	6	2-3
	10-32	36-60	1.50-1.60	<0.06	0.12-0.14	3.6-5.5	High	0.32			
	32-60	---	---	<0.06	---	---	-----	----			
570C2----- Martinsville	0-9	12-20	1.35-1.45	0.6-2.0	0.20-0.22	5.1-7.3	Low	0.37	5	5	.5-2
	9-52	20-33	1.40-1.60	0.6-2.0	0.16-0.20	5.1-6.5	Moderate	0.37			
	52-60	2-20	1.50-1.70	0.6-2.0	0.08-0.17	5.1-8.4	Low	0.24			
605D2----- Ursa	0-6	15-27	1.30-1.50	0.6-2.0	0.20-0.24	4.5-7.3	Low	0.43	3	6	1-3
	6-60	25-45	1.55-1.75	0.2-0.6	0.08-0.18	5.6-7.8	Moderate	0.32			
802B----- Orthents	0-6	22-30	1.70-1.75	0.2-0.6	0.18-0.22	5.6-7.8	Moderate	0.43	5	4	.5-2
	6-60	22-30	1.70-1.80	0.2-0.6	0.16-0.20	5.6-7.8	Moderate	0.43			
824B----- Swanwick	0-14	18-27	1.30-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low	0.43	5	6	.5-1
	14-33	27-35	1.60-1.90	<0.06	0.05-0.12	4.5-8.4	Moderate	0.43			
	33-60	18-35	1.50-1.70	<0.06	0.15-0.19	4.5-8.4	Low	0.43			
864. Pits, quarries											
871G----- Lenzburg	0-5	27-35	1.30-1.60	0.6-2.0	0.17-0.22	6.6-8.4	Moderate	0.37	5	4L	.5-4
	5-16	20-35	1.30-1.60	0.2-0.6	0.15-0.18	6.6-8.4	Moderate	0.37			
	16-60	20-35	1.40-1.70	0.2-0.6	0.11-0.17	6.6-8.4	Moderate	0.37			
872B----- Rapatee	0-6	27-35	1.30-1.60	0.2-0.6	0.10-0.20	6.1-7.3	Moderate	0.37	3	7	3-5
	6-60	15-35	1.50-1.90	0.06-0.6	0.08-0.15	6.6-8.4	Moderate	0.37			
937G: Seaton											
Hickory-----	0-12	10-22	1.10-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	12-60	18-27	1.20-1.60	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37			
Hickory-----	0-6	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37	5	6	1-2
	6-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate	0.28			
967G: Hickory											
Gosport-----	0-8	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low	0.37	5	6	1-2
	8-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate	0.28			
Gosport-----	0-7	18-27	1.30-1.40	0.2-0.6	0.18-0.20	5.1-6.5	Low	0.43	3	6	2-3
	7-29	36-60	1.50-1.60	<0.06	0.12-0.14	3.6-5.5	High	0.32			
	29-60	---	---	<0.06	---	---	-----	----			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction pH	Shrink-swell potential	Erosion factors		Wind erodi- bility group	Organic matter Pct
								K	T		
	In	Pct	g/cc	In/hr	In/in						
3070----- Beaucoup	0-16	27-35	1.15-1.35	0.2-0.6	0.15-0.20	5.6-7.8	Moderate	0.32	5	7	5-6
	16-60	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate	0.32			
3077----- Huntsville	0-37	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.8	Moderate	0.28	5	6	3-4
	37-60	18-27	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.8	Moderate	0.28			
3107----- Sawmill	0-28	27-35	1.20-1.40	0.6-2.0	0.21-0.23	6.1-7.8	Moderate	0.28	5	7	4-5
	28-57	25-35	1.30-1.45	0.6-2.0	0.17-0.20	6.1-7.8	Moderate	0.28			
	57-60	18-35	1.35-1.50	0.6-2.0	0.15-0.19	6.1-8.4	Moderate	0.28			
3284----- Tice	0-15	27-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate	0.32	5	7	2-3
	15-37	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate	0.32			
	37-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.1-7.8	Moderate	0.32			
3333----- Wakeland	0-9	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	9-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
3336----- Wilbur	0-6	10-26	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	6-38	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
	38-60	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
3404----- Titus	0-14	35-40	1.30-1.50	0.06-0.2	0.18-0.22	6.1-7.3	High	0.32	5	4	2-4
	14-60	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.1-7.8	High	0.32			
4071----- Darwin	0-15	40-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high	0.28	5	4	4-5
	15-60	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high	0.28			
7087B----- Dickinson	0-9	10-18	1.50-1.55	2.0-6.0	0.12-0.15	5.6-7.3	Low	0.20	4	3	1-2
	9-20	10-18	1.50-1.55	2.0-6.0	0.12-0.15	5.6-7.3	Low	0.20			
	20-43	10-15	1.45-1.55	2.0-6.0	0.12-0.15	5.1-6.5	Low	0.24			
	43-60	4-10	1.60-1.70	6.0-20	0.02-0.04	5.6-6.5	Low	0.15			
7430B----- Raddle	0-15	18-24	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.32	5	6	2-4
	15-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low	0.43			
7741B----- Oakville	0-14	2-14	1.30-1.55	6.0-20	0.09-0.12	4.5-7.3	Low	0.17	5	2	5-2
	14-38	0-10	1.30-1.65	6.0-20	0.06-0.10	4.5-7.3	Low	0.15			
	38-60	0-10	1.40-1.65	6.0-20	0.05-0.07	5.6-7.3	Low	0.15			
8070----- Beaucoup	0-13	27-35	1.15-1.35	0.2-0.6	0.15-0.20	5.6-7.8	Moderate	0.32	5	7	5-6
	13-60	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate	0.32			
8071----- Darwin	0-12	40-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high	0.28	5	4	4-5
	12-40	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high	0.28			
	40-60	30-55	1.40-1.60	0.06-0.2	0.10-0.20	6.6-8.4	High	0.28			
8104A----- Virgil	0-9	15-27	1.15-1.35	0.6-2.0	0.22-0.24	6.1-7.8	Low	0.32	5	6	2-4
	9-15	15-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low	0.43			
	15-52	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-7.8	Moderate	0.43			
	52-60	15-30	1.45-1.75	0.6-6.0	0.05-0.11	5.6-8.4	Low	0.28			
8206----- Thorp	0-12	18-27	1.30-1.50	0.2-0.6	0.22-0.24	5.1-7.3	Low	0.37	5	6	3-5
	12-22	27-35	1.35-1.55	0.06-0.2	0.18-0.20	5.6-6.5	Moderate	0.37			
	22-62	20-30	1.40-1.60	0.06-0.2	0.15-0.22	5.6-7.3	Low	0.37			
	62-65	5-20	1.50-1.70	2.0-6.0	0.08-0.19	7.4-8.4	Low	0.32			
8284----- Tice	0-11	22-27	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate	0.32	5	6	2-3
	11-60	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate	0.32			
8336----- Wilbur	0-6	10-26	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	6-38	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
	38-60	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			

Table 17.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion		Wind erodi- bility group	Organic matter
								factors	K		
	In	Pct	g/cc	In/hr	In/in	pH					
8404----- Titus	0-11	40-45	1.30-1.50	0.06-0.2	0.11-0.18	6.1-7.3	High-----	0.32	5	4	2-4
	11-31	35-45	1.30-1.60	0.06-0.2	0.11-0.22	6.1-7.8	High-----	0.32			
	31-60	20-30	1.45-1.75	0.2-0.6	0.10-0.20	6.1-7.8	Moderate----	0.32			
8415----- Orion	0-6	10-18	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low-----	0.37	5	5	1-3
	6-29	10-18	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.8	Low-----	0.37			
	29-54	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Low-----	0.37			
	54-60	10-18	1.20-1.40	0.6-2.0	0.18-0.22	5.6-7.8	Low-----	0.37			

Table 18.--Soil and Water Features

("Flooding," "water table," and such terms as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock		Potential for frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
6C2, 6C3----- Fishhook	D	None-----	---	---	1.0-3.0	Perched	Mar-Jun	>60	---	High-----	High-----	High.
7D2, 7D3----- Atlas	D	None-----	---	---	1.0-2.0	Perched	Apr-Jun	>60	---	High-----	High-----	Moderate.
8F, 8G----- Hickory	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
16----- Rushville	D	None-----	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High-----	High-----	High.
17A, 17B----- Keomah	C	None-----	---	---	2.0-4.0	Apparent	Nov-Jul	>60	---	High-----	High-----	Moderate.
19C3, 19D3----- Sylvan	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
36B----- Tama	B	None-----	---	---	4.0-6.0	Apparent	Nov-Jun	>60	---	High-----	Moderate	Moderate.
43A, 43B----- Ipava	B	None-----	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
46A----- Herrick	B	None-----	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
50----- Virden	B/D	None-----	---	---	+ .5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
53F----- Bloomfield	A	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	High.
75C----- Drury	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
206----- Thorp	C/D	None-----	---	---	0.0-2.0	Apparent	Feb-Jun	>60	---	High-----	High-----	Moderate.

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential for frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
242A----- Kendall	B	None-----	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
243B----- St. Charles	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
257A, 257B----- Clarksdale	C	None-----	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
274F----- Seaton	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Low-----	Moderate.
279B, 279C2----- Rozetta	B	None-----	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High-----	Moderate	Moderate.
280B, 280C2, 280C3, 280D2, 280D3----- Fayette	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
386B----- Downs	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
470C2----- Keller	C	None-----	---	---	1.0-3.0	Perched	Mar-Jun	>60	---	High-----	High-----	Moderate.
551F, 551G----- Gosport	C	None-----	---	---	1.5-3.0	Perched	Jan-Apr	20-40	Soft	Moderate	High-----	High.
570C2----- Martinsville	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
605D2----- Ursa	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	High-----	Moderate.
802B----- Orthents	B	None-----	---	---	4.0-6.0	Perched	Jan-May	>60	---	Moderate	Moderate	Moderate.
824B----- Swanwick	D	None-----	---	---	4.0-6.0	Perched	Feb-May	>60	---	High-----	Moderate	High.
864. Pits, quarries												

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential for frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
871G----- Lenzburg	B	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Low.
872B----- Rapatee	D	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Low.
937G: Seaton-----	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Low-----	Moderate.
Hickory-----	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
967G: Hickory-----	C	None-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Gospport-----	C	None-----	---	---	1.5-3.0	Perched	Jan-Apr	20-40	Soft	Moderate	High-----	High.
3070----- Beaucoup	B/D	Frequent----	Brief-----	Mar-Jun	+ 5-1.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
3077----- Huntsville	B	Frequent----	Brief-----	Jan-Jun	>6.0	---	---	>60	---	High-----	Low-----	Low.
3107----- Sawmill	B/D	Frequent----	Brief-----	Mar-Jun	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
3284----- Tice	B	Frequent----	Brief-----	Jan-Jun	1.5-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
3333----- Wakeland	C	Frequent----	Brief-----	Jan-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.
3336----- Wilbur	B	Frequent----	Brief-----	Oct-Jun	1.5-3.0	Apparent	Mar-Apr	>60	---	High-----	Moderate	Moderate.
3404----- Titus	B/D	Frequent----	Brief-----	Mar-Jun	+ 5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
4071----- Darwin	D	Frequent----	Brief-----	Jan-Jun	+1-2.0	Apparent	Jan-Jun	>60	---	Moderate	High-----	Low.
7087B----- Dickinson	B	Rare-----	---	---	>6.0	---	---	>60	---	Moderate	Low-----	Moderate.

Table 18.--Soil and Water Features--Continued

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock		Potential for frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					<i>Ft</i>			<i>In</i>				
7430B----- Raddle	B	Rare-----	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
7741B----- Oakville	A	Rare-----	---	---	>6.0	---	---	>60	---	Low-----	Low-----	Moderate.
8070----- Beaucoup	B/D	Occasional--	Brief-----	Mar-Jun	+ .5-1.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
8071----- Darwin	D	Occasional--	Brief-----	Jan-Jun	+1-2.0	Apparent	Jan-Jun	>60	---	Moderate	High-----	Low.
8104A----- Virgil	B	Occasional--	Brief-----	Feb-May	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
8206----- Thorp	C/D	Occasional--	Brief-----	Mar-Jun	0-2.0	Apparent	Feb-Jun	>60	---	High-----	High-----	Moderate.
8284----- Tice	B	Occasional--	Brief-----	Jan-Jun	1.5-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
8336----- Wilbur	B	Occasional--	Brief-----	Oct-Jun	1.5-3.0	Apparent	Mar-Apr	>60	---	High-----	Moderate	Moderate.
8404----- Titus	B/D	Occasional--	Brief-----	Mar-Jun	+ .5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
8415----- Orion	C	Occasional--	Brief-----	Mar-Nov	1.0-3.0	Apparent	Nov-May	>60	---	High-----	High-----	Low.

Table 19.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Atlas-----	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
Beaucoup-----	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Bloomfield-----	Sandy, mixed, mesic Psammentic Hapludalfs
Clarksdale-----	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Darwin-----	Fine, montmorillonitic, mesic Vertic Haplaquolls
Dickinson-----	Coarse-loamy, mixed, mesic Typic Hapludolls
Downs-----	Fine-silty, mixed, mesic Mollic Hapludalfs
Drury-----	Fine-silty, mixed, mesic Dystric Eutrochrepts
Fayette-----	Fine-silty, mixed, mesic Typic Hapludalfs
Fishhook-----	Fine-silty, mixed, mesic Aquic Hapludalfs
Gospport-----	Fine, illitic, mesic Typic Dystrochrepts
Herrick-----	Fine, montmorillonitic, mesic Aquic Argiudolls
Hickory-----	Fine-loamy, mixed, mesic Typic Hapludalfs
Huntsville-----	Fine-silty, mixed, mesic Cumulic Hapludolls
Ipava-----	Fine, montmorillonitic, mesic Aquic Argiudolls
*Keller-----	Fine-silty, mixed, mesic Aquic Argiudolls
Kendall-----	Fine-silty, mixed, mesic Aeric Ochraqualfs
Keomah-----	Fine, montmorillonitic, mesic Aeric Ochraqualfs
*Lenzburg-----	Fine-loamy, mixed (calcareous), mesic Typic Udorthents
Martinsville-----	Fine-loamy, mixed, mesic Typic Hapludalfs
Oakville-----	Mixed, mesic Typic Udipsamments
Orion-----	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Orthents-----	Fine-loamy, mixed, mesic Typic Udorthents
Raddle-----	Fine-silty, mixed, mesic Typic Hapludolls
Rapatee-----	Fine-silty, mixed, nonacid, mesic Typic Udorthents
Rozetta-----	Fine-silty, mixed, mesic Typic Hapludalfs
Rushville-----	Fine, montmorillonitic, mesic Typic Albaqualfs
Sawmill-----	Fine-silty, mixed, mesic Cumulic Haplaquolls
Seaton-----	Fine-silty, mixed, mesic Typic Hapludalfs
St. Charles-----	Fine-silty, mixed, mesic Typic Hapludalfs
Swanwick-----	Fine-silty, mixed, nonacid, mesic Typic Udorthents
Sylvan-----	Fine-silty, mixed, mesic Typic Hapludalfs
Tama-----	Fine-silty, mixed, mesic Typic Argiudolls
Thorp-----	Fine-silty, mixed, mesic Argiaquic Argialbolls
*Tice-----	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Titus-----	Fine, montmorillonitic, mesic Fluvaquentic Haplaquolls
Ursa-----	Fine, montmorillonitic, mesic Typic Hapludalfs
Virden-----	Fine, montmorillonitic, mesic Typic Argiaquolls
Virgil-----	Fine-silty, mixed, mesic Udollic Ochraqualfs
Wakeland-----	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Wilbur-----	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents

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