United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

# Soil Survey of Franklin and Jefferson Counties, 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.

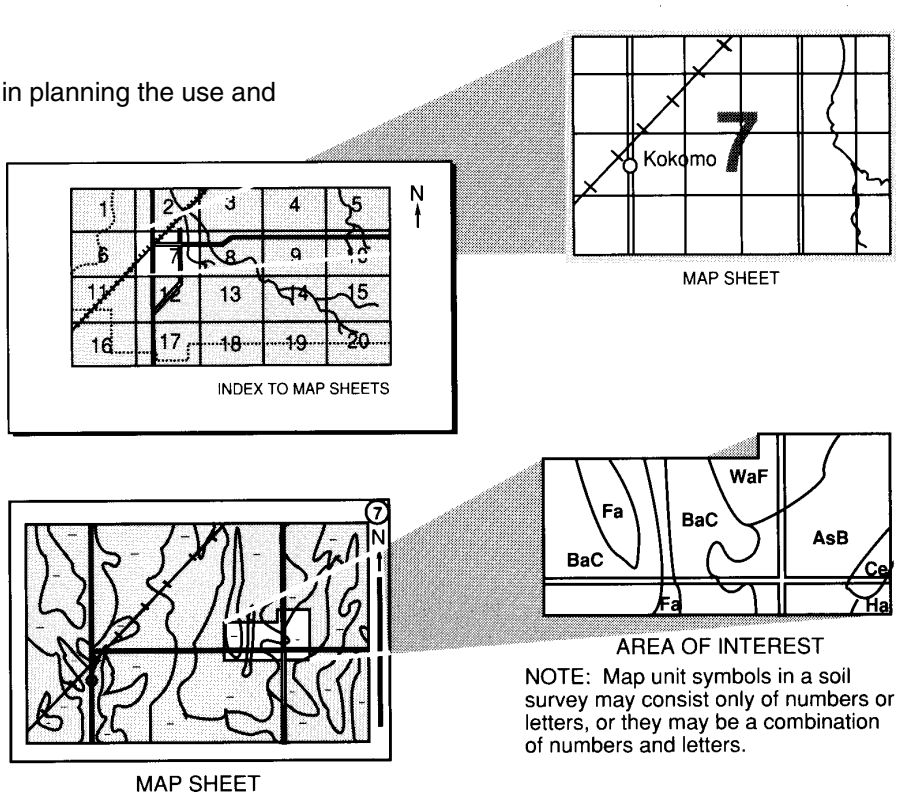
### Detailed Soil Maps

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.




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

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 1995. Soil names and descriptions were approved in 1997. Most statements in this publication refer to conditions in the survey area in 1995, but in areas that were subsided by longwall mining, they refer to conditions that were recorded at the time of mapping. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Soil and Water Conservation Districts of Franklin and Jefferson Counties. The cost was shared by the Franklin and Jefferson County Boards 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.



**Cover: A typical landscape and land use pattern in the survey area.**

*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.*

# Contents

Issued 2002

# Foreword

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

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

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

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

William J. Gradle
State Conservationist
Natural Resources Conservation Service

# Soil Survey of
# Franklin and Jefferson Counties, Illinois

By David E. Preloger, Natural Resources Conservation Service

Soils surveyed by Bryan C. Fitch, Natural Resources Conservation Service, and Rick L. Miller, Franklin and Jefferson Counties

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

Franklin and Jefferson Counties are in southern Illinois (fig. 1).

Franklin County has an area of about 276,300 acres, or 432 square miles. It is bounded on the north by Jefferson County, on the east by Hamilton and Saline Counties, on the south by Williamson County, and on the west by Jackson and Perry Counties. In 1990, the population of the county was 40,319. Benton is the county seat.

Jefferson County has an area of about 373,520 acres, or 584 square miles. It is bounded on the south by Franklin County, on the east by Hamilton and Wayne Counties, on the north by Marion County, and on the west by Perry and Washington Counties. In 1990, the population of the county was 37,020. Mt. Vernon is the county seat.

## General Nature of the Survey Area

This section provides general information about the survey area. It describes climate; history; natural resources; relief, physiography, and drainage; and transportation facilities and industry.

### Climate

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

In winter, the average temperature is 32 degrees F and the average daily minimum temperature is 22 degrees. The lowest temperature on record is -20 degrees. In summer, the average temperature is 76 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature is 104 degrees.

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

The total annual precipitation is about 42 inches. Of this total, 23 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 12 inches.

Snowfall is rare. In 50 percent of the winters, there is no measurable snowfall. In 20 percent, the snowfall, usually of short duration, is more than 1 inch.

### History

Rick L. Miller, soil scientist, Franklin and Jefferson Counties, helped prepare this section.

**History of Franklin County.**—In the 1700's and 1800's, the inhabitants of the area that is now Franklin County were the Shawnee Indians, who settled east of

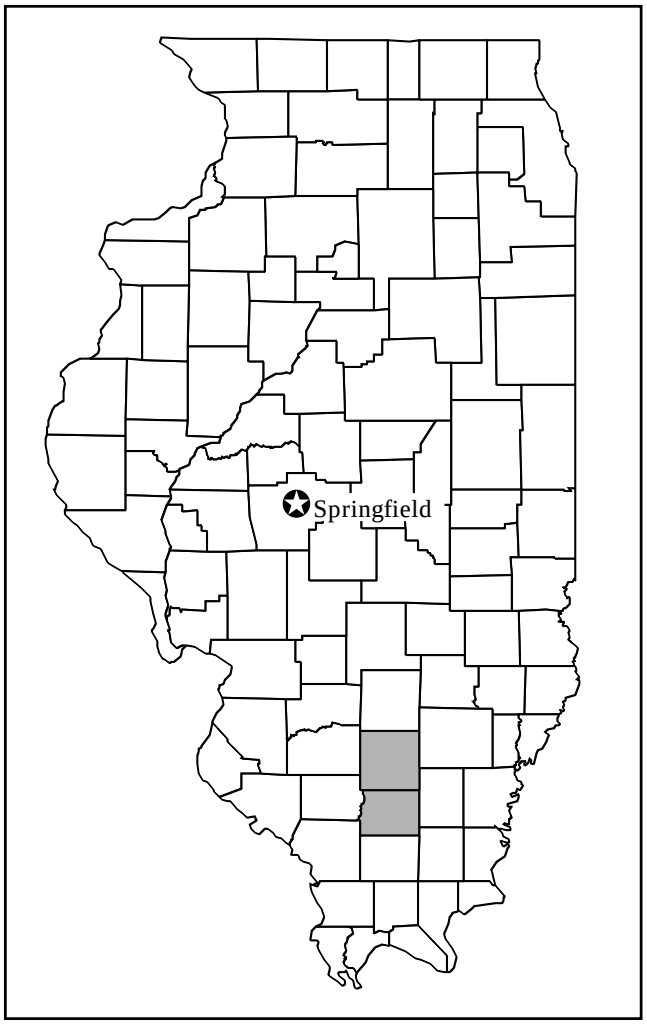



**Figure 1.—Location of the survey area in Illinois.**

the Big Muddy, and the Kaskaskia Indians, who settled west of the Big Muddy. In 1802, a battle between the two tribes all but exterminated the Kaskaskia tribe. Two years later the first white inhabitants, Frenchmen who came to the area from the south, settled near Liberty church, 2½ miles southeast of Thompsonville.

Francis Jordan's Fort was a refuge from Indians in the southern part of the county. It was later called Frank's Fort and, now, Frankfort. The Indians were driven out of the area, and by 1832 none were left in Franklin County.

Three-quarters of the county was forested, and the rest was prairie. The first important crops were Indian corn, tobacco, and pumpkins. Many wildlife species were harvested, including buffalo, deer, and squirrel.

The original county was created in 1818 and named for Benjamin Franklin. It was the 15th county in the State of Illinois. In 1839, Franklin County was divided into Williamson and Franklin Counties and Benton became the county seat. By 1850, Franklin County had 29,003 improved acres and a population of 5,681. In that year, 268,000 bushels of Indian corn was grown. In 1880, more than 1,000,000 bushels of Indian corn was grown.

**History of Jefferson County.**—Jefferson County, named for Thomas Jefferson, was organized on March 26, 1819. It became the 26th county in Illinois and was formed from parts of Edwards and White Counties. The original county extended as far north as the northern line of Clinton County. Marion County was later created from parts of Jefferson and Fayette Counties.

Andrew Moore and his family were the first European settlers in the area. They arrived in 1810. Mr. Moore built a log cabin in what is now Moores Prairie Township. Mt. Vernon, named for George Washington's home, became the permanent county seat.

The first store in Jefferson County was operated by Daniel Crenshaw in Moores Prairie. Spring Garden claims the first township high school in Jefferson County. In 1938, oil was discovered in Jefferson County. The first coal mine in the county, which opened in 1901, was northeast of Mt. Vernon.

## Natural Resources

Bryan Fitch, soil scientist, Natural Resources Conservation Service, helped prepare this section.

Soil is a valuable natural resource in Franklin and Jefferson Counties. In Franklin County, an estimated 538 farms make up 58 percent of the total acreage. In 1992, Jefferson County had an estimated 880 farms. The acreage used for farms in Jefferson County makes up about 58 percent of the total land area.

Both counties produce similar crops. Soybeans are grown on about 120,888 acres in the survey area, corn on 86,029 acres, grain sorghum on 42,373 acres, and winter wheat on 29,370 acres. Smaller acreages are used for pasture and hay or fruit crops. In 1992, the total number of livestock farms was 838. The counties had 21,539 head of cattle, which includes a small number of dairy cattle. The counties also had 47,995 head of hogs. Other livestock includes poultry, sheep and goats, and horses.

About 32,380 acres of both counties is woodland. Much of this acreage is unimproved land along the major drainageways, in the steeper areas, or in areas that are close to bedrock. Deer, quail, raccoons, coyote, songbirds, and other wildlife inhabit these

areas. Some of the hardwoods are selectively cut by local sawmills.

Several manmade lakes are in both counties. The largest, Rend Lake, is 18,900 acres in size at normal pool and 24,800 acres at flood-control pool. Rend Lake is along the Franklin and Jefferson county line. Franklin County has four other lakes that are 100 acres or larger. These are Lake Benton-Hamilton, which is approximately 100 acres; Lake Moses, about 115 acres; West Frankfort City Lake, 206 acres; and West Frankfort Reservoir, 134 acres. Miller Lake in Jefferson County is about 100 acres. Sunfish, bass, crappie, bluegill, catfish, and other gamefish inhabit these waters.

Much of the survey area is underlain by deposits of oil, natural gas, and coal. Coal resources are estimated at 4.5 billion tons in Franklin County and 5.6 billion tons in Jefferson County. The coal is at a depth of 500 feet in Franklin County and at a depth of 700 to 900 feet in Jefferson County. By 1993, approximately 705,452,664 tons of coal had been mined in Franklin County and 168,938,733 tons of coal had been mined in Jefferson County. In 1992, three mines in Franklin County produced 7,577,848 tons of coal and two mines in Jefferson County produced 4,460,571 tons. About 90 percent of the coal in these counties has been used by utility companies in Illinois and in Florida, Georgia, Indiana, Missouri, and Tennessee.

Deposits of sand are in scattered small areas of soft sandstone bedrock or occur as pockets in glacial drift. These areas are near the higher elevations in both counties. These small sand pits provide material for construction.

## Relief, Physiography, and Drainage

Elevation in the survey area ranges from about 350 to 640 feet above sea level. The highest elevation is north of the town of Dix, in Rome Township of Jefferson County. The lowest is in an area near Royalton, in the southwestern part of Franklin County where the Big Muddy River leaves the survey area.

The soils in the survey area formed in several different kinds of parent material. These include material weathered from Pennsylvanian-age bedrock, Illinoian glacial drift (which includes valley fill sediments), recent alluvium, and Wisconsinan-age water-deposited clayey sediments. Pennsylvanian-age bedrock formations of sandstone, shale, ironstone, and siltstone are dominant in the more rugged areas where glaciers had little influence on the landscape. The ridges in these areas have a Peorian-age loess cap that is 2 to 3 feet thick. The loess is thinner on the steeper side slopes.

Illinoian glaciation influenced the landscape in the survey area by smoothing the hills and filling the valleys, which resulted in less pronounced relief. Glacial drift covers most of these areas. The thickness of the drift ranges from 2 to 15 feet. In some areas a strongly developed paleosol formed in the upper part of the glacial drift. The Peorian-age loess cap is typically 30 to 40 inches thick overlying the drift. The loess is thinner on the steeper side slopes.

Large areas of Franklin County are dominated by nearly level soils that formed either in recent water-deposited alluvial sediments or in Wisconsinan-age water-deposited clayey sediments. The recent alluvial soils formed in silty material deposited by floodwater from adjacent streams. The Wisconsinan-age material formed in clayey sediment in slackwater glacial lakes. Many of these soils are naturally poorly drained.

Surface drainage generally flows in two directions. Most of the survey area is in the watershed of the Big Muddy River. Two much smaller areas in the eastern part of the survey area drain toward the Ohio River.

The natural drainage pattern in the rolling uplands is well expressed. After heavy rains, the runoff results in serious erosion in these uplands and causes siltation and flooding on the flood plains (fig. 2). The water soon drains away, however, leaving the stream channels dry most of the time.

**Figure 2.—Runoff and erosion after heavy rains can create serious sedimentation problems on local roads.**

The less rolling uplands and benches are not as well drained because the degree of slope is not sufficient to allow the surface water to drain away. Permeability in the subsoil is too slow for maximum crop yields. Most of the areas that are subject to ponding have been drained with very shallow surface ditches. Although these soils tend to be poorly drained and somewhat poorly drained, they are among the most productive agronomic soils in the survey area.

Most of the nearly level soils on bottom land are naturally poorly drained and somewhat poorly drained. Most of these soils are used for agronomic purposes. Drainage systems have been installed to remove excess water from these soils. Some crop damage occurs in low-lying areas as a result of flooding, but most of these soils are flooded for less than 2 days at a time.

### Transportation Facilities and Industry

Franklin and Jefferson Counties have a well developed network of transportation routes. Interstate Highway 57 crosses both counties from north to south, and Interstate Highway 64 crosses Jefferson County from east to west. These highways intersect at Mt. Vernon. State Highway 14 crosses Franklin County from east to west. State Highway 14 and Interstate Highway 57 intersect at Benton. Several other State Highways and all-weather county roads provide access to the rural areas. A well developed railroad network furnishes freight service.

Several heavy and light industries are located in both counties. They are mostly located in the Mt. Vernon and Benton areas. The heavy industries include tire manufacturing, coal mining, and the rebuilding of locomotives. The light industries include manufacturing of pleasure boats and electrical transformers and rebuilders of underground coal mining equipment and oil well equipment. Also, the survey area has many agricultural and nonagricultural service industries.

## 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 maps in this publication show broad areas that have a distinctive pattern of soils, relief, and drainage. These broad areas are called associations. Each association on a general soil map is a unique natural landscape. Typically, it 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 maps can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the maps. Likewise, areas where the soils are not suitable can be identified.

Because of their small scale, the maps are 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.

The names of some of the associations on the general soil maps of Franklin and Jefferson Counties do not agree fully with those on the general soil maps of the surrounding counties. The Ava-Bluford-Plumfield association, which includes the Plumfield series established in this survey area, joins the Bluford-Ava association in Hamilton County, the Bluford-Hickory-Ava association in Marion County, the Ava-Hickory-Blair association in Perry County, the Ava-Bluford-Hickory association in Saline County, the Bluford-Hickory-Blair association in Washington County, and the Ava-Blair-Hickory association in Wayne County. The landscapes are similar in all these various associations. Blair and Hickory are minor soils in the Ava-Bluford-Plumfield association in Franklin and Jefferson Counties. Also, the Cisne-Hoyleton and Bluford-Wynoose associations in Franklin and Jefferson Counties join the Bluford-Hoyleton-Wynoose association in Washington County and the Bluford-Hoyleton-Cisne association in Hamilton County. Other differences in association names are the result of variations in the extent of the soils in the various survey areas.

## 1. Hoyleton-Cisne Association

*Nearly level to gently sloping, somewhat poorly drained and poorly drained soils that formed in loess and erosional sediments over till; on uplands*

This association consists mainly of soils on broad upland flats, on low knolls and ridges, and along side slopes at the upper end of drainageways. Scattered shallow depressions, more sloping areas along drainageways, and a few very small areas affected by sodium are scattered throughout the association. Slopes range from 0 to 5 percent.

This association makes up about 9 percent of the survey area. It is about 45 percent Hoyleton soils, 23 percent Cisne soils, and 32 percent soils of minor extent (fig. 3).

Hoyleton soils are nearly level to gently sloping and are somewhat poorly drained. They are generally on broad divides, on low knolls and ridges, and along side slopes of drainageways. Typically, the surface layer is dark brown, friable silt loam about 7 inches thick. The subsurface layer is brown, mottled silt loam about 2 inches thick. The subsoil is about 39 inches thick. The upper part is yellowish brown, mottled, friable and firm silty clay loam. The next part is grayish brown, mottled, firm silty clay. The lower part is yellowish brown and dark yellowish brown, mottled, very firm silty clay loam and silt loam. The underlying material to a depth of about 65 inches is yellowish brown, mottled loam.

Cisne soils are nearly level or depressional and are poorly drained. They are generally on broad flats and in slight depressions. Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsurface layer is light brownish gray, friable silt loam about 12 inches thick. The subsoil extends to a depth of more than 60 inches. It is mottled. The upper part is grayish brown and light gray, firm silty clay loam; the next part is gray and grayish brown, firm silty clay; and the lower part is very dark gray and brown, firm silt loam and silty clay loam.

Of minor extent in this association are Ava, Belknap, Wynoose, Blair, Creal, Chauncey, Racoon,

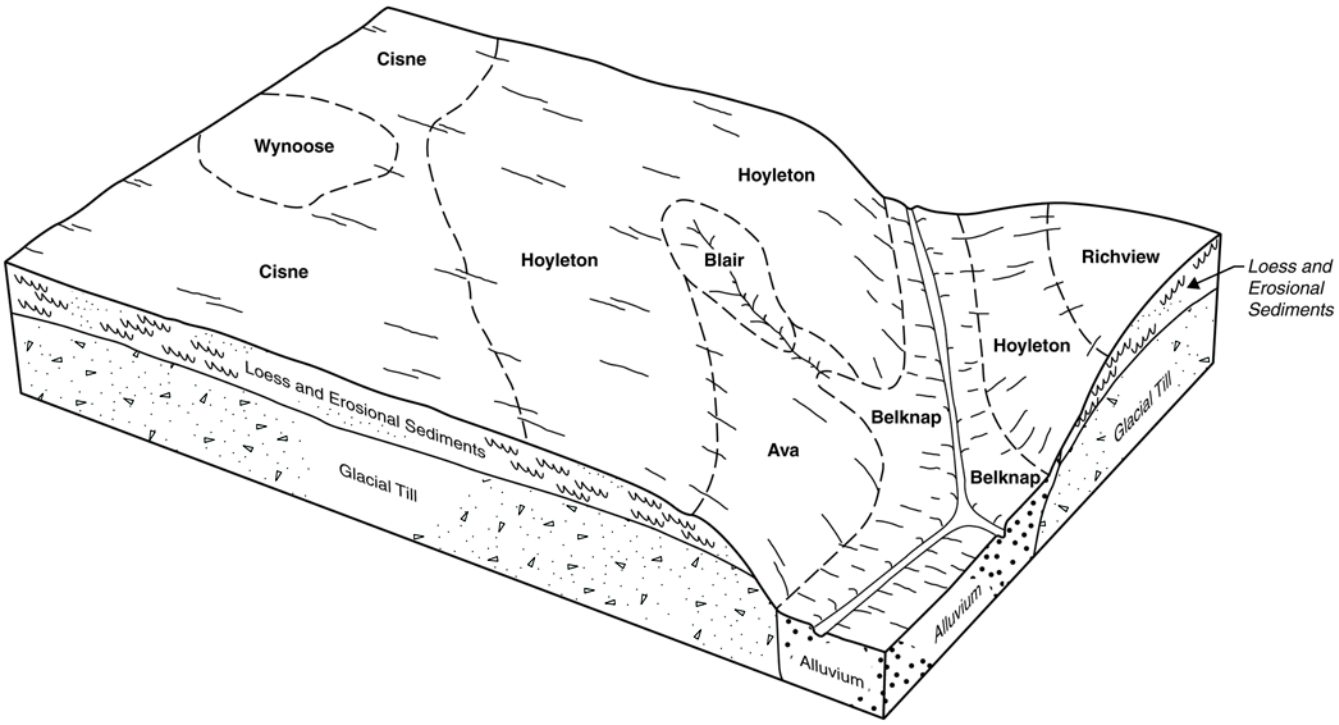



**Figure 3.—Typical pattern of soils and parent material in the Hoyleton-Cisne association.**

and Richview soils. The poorly drained Wynoose soils have a lighter colored surface layer than that of the major soils. They are on broad flats or in slight depressions. Ava and Richview soils are moderately well drained and are generally in the more sloping areas. Blair soils are somewhat poorly drained and are on the more sloping side slopes at the head of drainageways. The somewhat poorly drained Creal soils and the poorly drained Chauncey and Racoon soils have less clay in the subsoil than the major soils. They are on flats, on footslopes, or in depressions. The somewhat poorly drained Belknap soils are on flood plains.

Most areas of this association are used for cultivated crops. The soils are well suited to the cultivated crops commonly grown in the survey area. Seasonal wetness in areas of all of the major soils and a hazard of erosion in the gently sloping areas are management concerns if the soils are cultivated. The soils in this association are well suited or moderately well suited to use as wildlife habitat.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The seasonal wetness, the shrink-swell potential, and restricted permeability are the major limitations affecting these uses.

## 2. Bluford-Wynoose Association

*Nearly level to gently sloping, somewhat poorly drained and poorly drained soils that formed in loess and erosional sediments over till; on uplands*

This association consists mainly of soils on broad upland flats, on low knolls and ridges, and along the upper end of drainageways. Scattered shallow depressions, more sloping areas along drainageways, and a few very small areas affected by sodium are scattered throughout the association. Slopes range from 0 to 5 percent.

This association makes up about 28 percent of the survey area. It is about 50 percent Bluford soils, 30 percent Wynoose soils, and 20 percent soils of minor extent (fig. 4).

Bluford soils are nearly level to gently sloping and are somewhat poorly drained. They are generally on broad divides and on low knolls and ridges. Typically, the surface layer is grayish brown, friable silt loam about 5 inches thick. The subsurface layer is mottled, friable silt loam about 10 inches thick. The upper part is brown, and the lower part is light yellowish brown. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled very firm silty

clay loam. The next part is grayish brown, mottled, firm silty clay loam. The lower part is grayish brown and yellowish brown, mottled, firm, brittle silt loam and loam.

Wynoose soils are nearly level and depressional and are poorly drained. They are generally on broad flats and in slight depressions. Typically, the surface layer is grayish brown, firm silt loam about 7 inches thick. The subsurface layer is about 7 inches thick. It is light gray, mottled, friable silt loam in the upper part and light gray and light brownish gray, mottled, friable silty clay loam in the lower part. The subsoil extends to a depth of more than 60 inches. The upper part is light brownish gray, mottled, firm silty clay loam and grayish brown, firm silty clay. The next part is olive gray and grayish brown, mottled, very firm silty clay loam. The lower part is gray and dark gray, mottled, firm loam and clay loam.

Of minor extent in this association are Ava, Belknap, Blair, Bonnie, Creal, Plumfield, and Racoon soils. Ava and Plumfield soils are moderately well drained and are generally in the more sloping areas. Blair soils are somewhat poorly drained and are on side slopes at the head of drainageways. The poorly drained Bonnie and somewhat poorly drained Belknap soils are on narrow flood plains. The somewhat poorly drained Creal and poorly drained Racoon soils have less clay in the subsoil than the major soils. They are on footslopes or in depressions.

Most areas of this association are used for cultivated crops. A few areas are used for pasture or as woodland. The soils in the association are well suited to the cultivated crops commonly grown in the survey area. Seasonal wetness in areas of all of the major soils and a hazard of erosion in the gently sloping areas are management concerns if the soils are cultivated. The soils are well suited or moderately well suited to use as wildlife habitat.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The seasonal wetness, the shrink-swell potential, and restricted permeability are the major limitations affecting these uses.

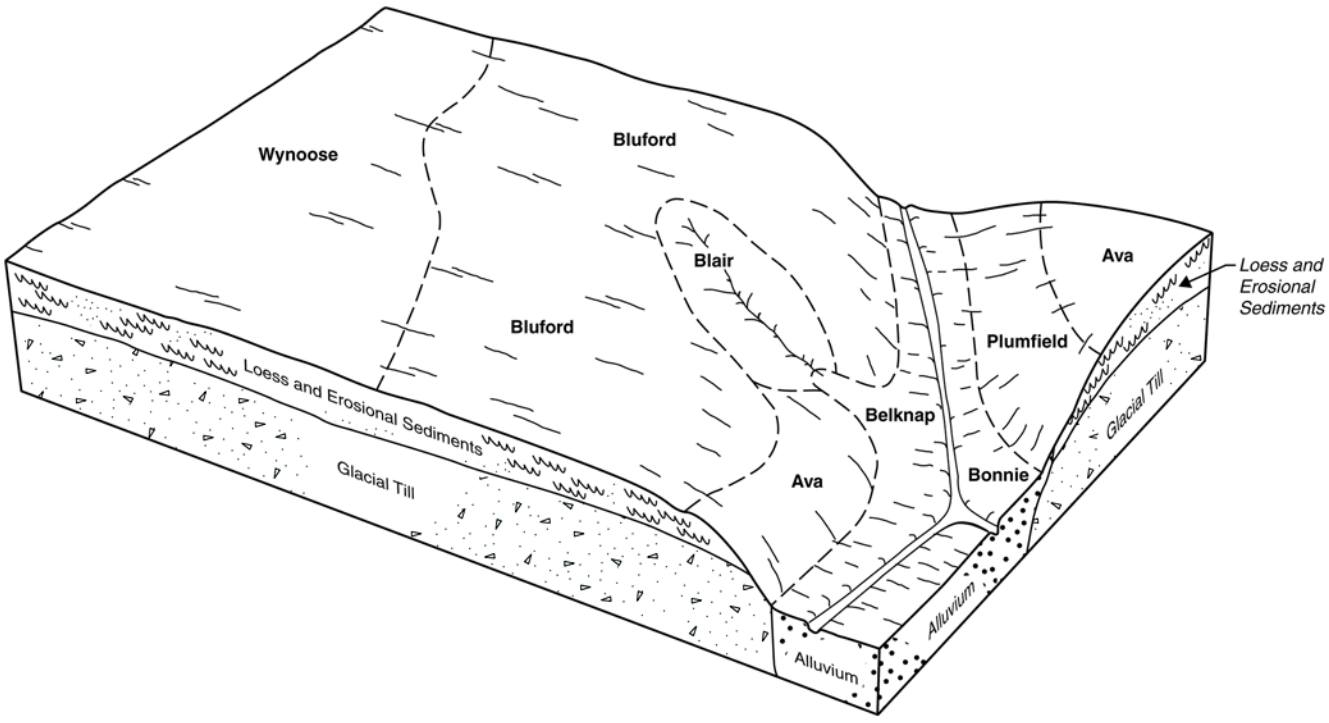



**Figure 4.—Typical pattern of soils and parent material in the Bluford-Wynoose association.**

## 3. Colp-Hurst-Okaw Association

*Nearly level to moderately steep, moderately well drained to poorly drained soils that formed in loess and clayey lacustrine sediments; on terraces*

This association consists mainly of soils on low, broad flats, ridges, and side slopes along terrace drainageways and in slackwater areas. It is generally in irregularly shaped areas adjacent to the lower flood plains of perennial streams and rivers. Slopes range from 0 to 18 percent.

This association makes up about 2 percent of the survey area. It is about 28 percent Colp soils, 26 percent Hurst soils, 21 percent Okaw soils, and 25 percent soils of minor extent (fig. 5).

Colp soils are gently sloping to moderately steep and are moderately well drained. They are on the slightly higher ridges and narrow divides and on terrace side slopes. Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. It is very firm. The upper part is strong brown silty clay loam. The next part is yellowish brown, brown, and grayish brown, mottled silty clay. The lower part is weak red, mottled silty clay.

Hurst soils are nearly level and are somewhat poorly drained. They are on terrace divides. Typically, the surface layer is dark grayish brown, firm silt loam about 4 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 4 inches thick. The subsoil is about 37 inches thick. It is mottled. The upper part is brown, firm silty clay loam. The next part is brown and yellowish brown, very firm silty clay. The lower part is light brownish gray, extremely firm clay. The underlying material to a depth of 60 inches or more is gray, mottled, extremely firm clay.

Okaw soils are nearly level and are poorly drained. They are generally on broad terrace divides. Typically, the surface layer is dark grayish brown, friable silt loam and firm silty clay loam about 8 inches thick. The

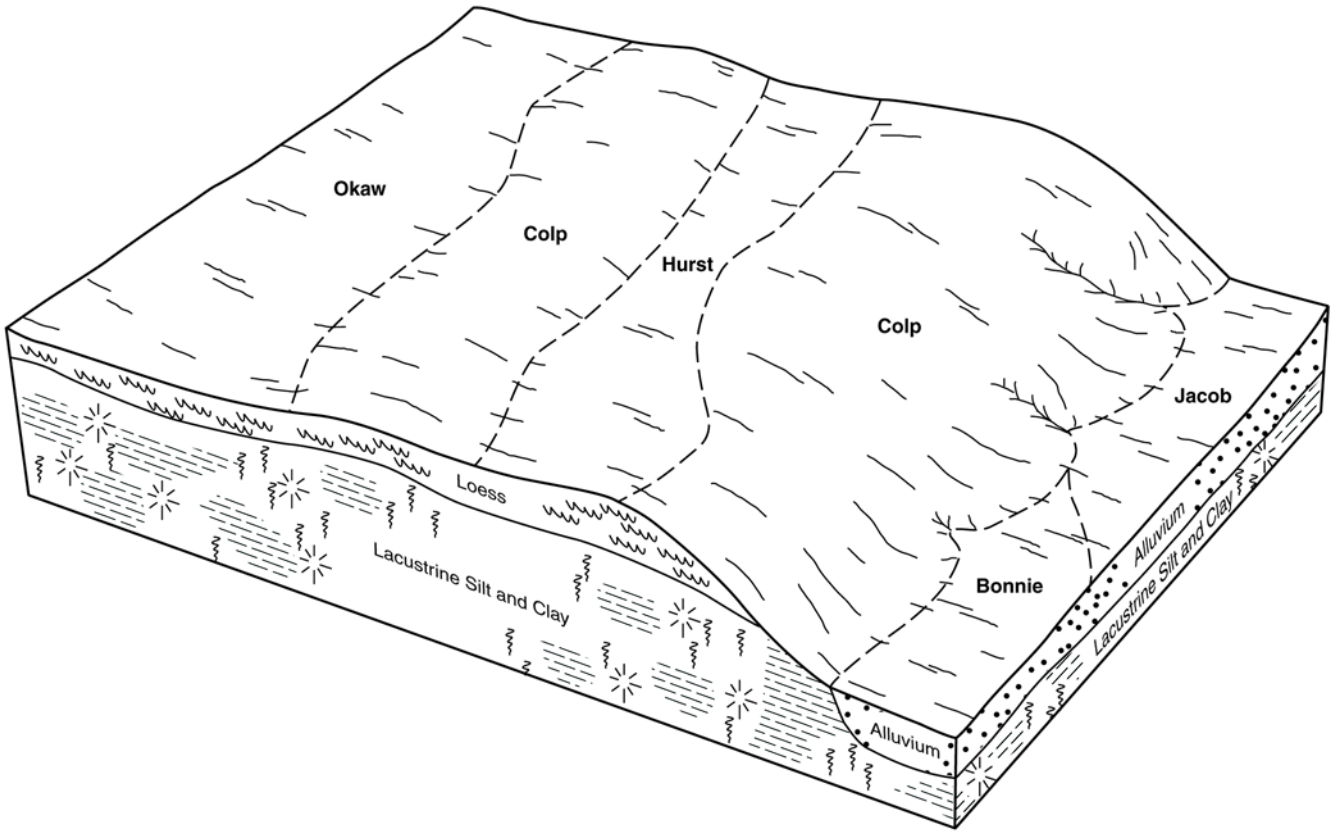



**Figure 5.—Typical pattern of soils and parent material in the Colp-Hurst-Okaw association.**

subsurface layer is light brownish gray, mottled, firm silty clay loam about 8 inches thick. The subsoil extends to a depth of more than 60 inches. It is gray and olive gray, mottled, very firm silty clay.

Of minor extent in this association are the very poorly drained Bonnie and Jacob soils on nearly level flood plains. Bonnie soils formed in silty alluvium, and Jacob soils formed in clayey slackwater sediments.

This association is used for cultivated crops or as woodland. The soils are well suited or moderately well suited to use as woodland and are moderately well suited to poorly suited to the cultivated crops commonly grown in the survey area. The soils are well suited or moderately well suited to use as wildlife habitat. The slope, the hazard of erosion, restricted permeability, and a high shrink-swell potential are management concerns.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The slope, seasonal wetness, the shrink-swell potential, and the restricted permeability are the major limitations affecting these uses.

## 4. Ava-Bluford-Plumfield Association

*Gently sloping to moderately steep, moderately well drained and somewhat poorly drained soils that formed in loess, erosional sediments, and glacial drift; on uplands*

This association consists mainly of soils on narrow ridges and side slopes along drainageways. Scattered narrow areas of nearly level soils on bottom land are throughout the association. Slopes range from 2 to 18 percent.

This association makes up about 31 percent of the survey area. It is about 30 percent Ava soils, 25 percent Bluford soils, 20 percent Plumfield soils, and 25 percent soils of minor extent (fig. 6).

Ava soils are gently sloping and moderately sloping and are moderately well drained. They are generally on narrow ridgetops and the upper side slopes. Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsurface layer is yellowish brown, firm silt loam about 8 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown and dark yellowish brown, mottled, firm and very firm silty clay loam. The next part is mixed yellowish brown and brown, mottled, very firm silty clay loam. The lower part is mixed yellowish brown, brown, and grayish brown, mottled, very firm, brittle silty clay loam, silt loam, and loam.

Bluford soils are gently sloping and are somewhat poorly drained. They are generally on divides and on low knolls and ridges. Typically, the surface layer is grayish brown, friable silt loam about 5 inches thick. The subsurface layer is mottled, friable silt loam about 10 inches thick. The upper part is brown, and the lower part is light yellowish brown. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, very firm silty clay loam. The next part is grayish brown, mottled, firm silty clay loam. The lower part is grayish brown and yellowish brown, mottled, firm, brittle silt loam and loam.

Plumfield soils are moderately sloping to moderately steep and are moderately well drained. They are on side slopes along drainageways. Typically, the surface layer is yellowish brown silty clay loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, very firm, brittle silty clay loam. The next part is yellowish brown, mottled, very firm, brittle silty clay loam and silt loam. The lower part is grayish brown, mottled, very firm silty clay loam.

Of minor extent in this association are Atlas, Blair, Bonnie, Belknap, Frondorf, Hickory, and Zanesville soils. The somewhat poorly drained Atlas soils formed in thin loess or silty sediments and in a paleosol. They have more clay in the subsoil than the major soils. The somewhat poorly drained Blair soils formed in silty sediments. They are generally on side slopes at the head of drainageways. The very poorly drained Bonnie and somewhat poorly drained Belknap soils are in nearly level areas on narrow flood plains. Frondorf and Hickory soils are in steep and very steep areas throughout the association. The well drained Frondorf soils formed in less than 24 inches of loess overlying residuum from acid sandstone, siltstone, and shale. The well drained Hickory soils formed in glacial till and in some areas are overlain by a thin layer of loess or silty sediments. Zanesville soils have a fragipan. They are underlain by shale and sandstone bedrock within a depth of 40 to 80 inches.

About half of this association is used for cultivated crops, and the rest is used for hay, pasture, or woodland. The soils are well suited or moderately well suited to use as woodland; moderately suited or poorly suited to hay and pasture; and poorly suited or unsuited to the cultivated crops commonly grown in the survey area. The soils are well suited or moderately well suited to use as wildlife habitat. The slope, a hazard of erosion, restricted permeability, and a high shrink-swell potential are management concerns.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The slope,

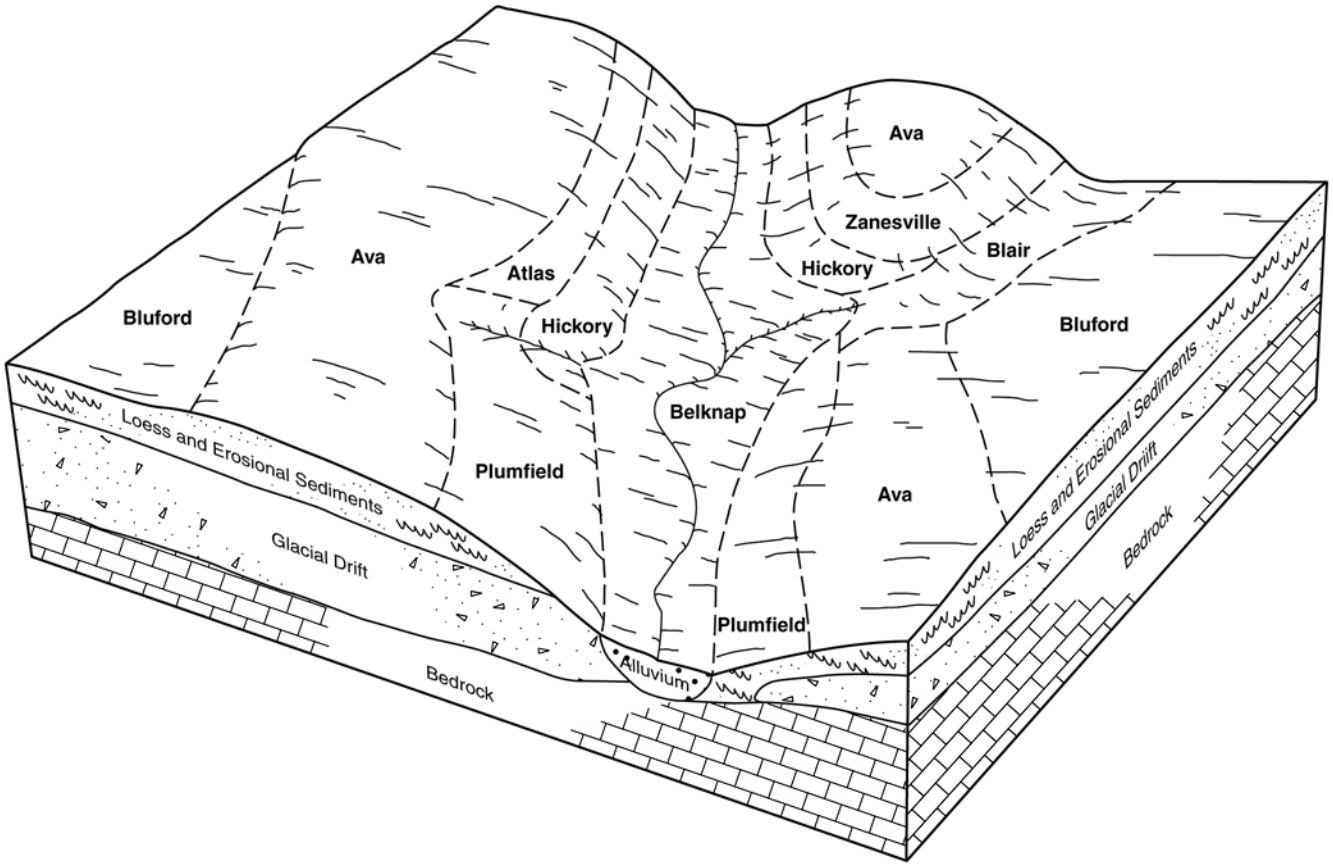



**Figure 6.—Typical pattern of soils and parent material in the Ava-Bluford-Plumfield association.**

seasonal wetness, the shrink-swell potential, and the restricted permeability are the major limitations affecting these uses.

## 5. Grantsburg-Zanesville Association

*Gently sloping to moderately steep, moderately well drained soils that formed in loess and silty and loamy material weathered from sandstone, siltstone, and shale; on uplands*

This association consists mainly of soils on ridgetops, knolls, and side slopes along drainageways. Slopes range from 2 to 18 percent.

This association makes up about 6 percent of the survey area. It is about 45 percent Grantsburg soils, 15 percent Zanesville soils, and 40 percent soils of minor extent (fig. 7).

Grantsburg soils are gently sloping and moderately sloping. They are generally on divides, high knolls, ridgetops, and side slopes. Typically, the surface layer is brown, friable silt loam about 4 inches thick. The subsurface layer is strong brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is strong brown and yellowish brown, firm silty clay loam. The next part is yellowish brown, pale brown, and dark yellowish brown, mottled, firm and very firm silty clay loam. The lower part is strong brown, mottled, firm, brittle silt loam.

Zanesville soils are moderately steep. They are generally on narrow ridgetops and side slopes. Typically, the surface layer is brown silty clay loam about 2 inches thick. The subsoil is about 48 inches thick. The upper part is yellowish brown and strong brown, mottled, firm silty clay loam. The lower part is brown, mottled, brittle silty clay loam and loam. The underlying material to a depth of 60 inches or more is mixed strong brown and light brown, weathered bedrock.

Of minor extent in this association are Atlas, Blair, Bonnie, Belknap, Hickory, Kell, and Plumfield soils. Atlas soils formed in loess or silty sediments and in a paleosol. They have more clay in the subsoil than the

major soils. The somewhat poorly drained Blair soils formed in silty sediments that are not brittle. They are generally on side slopes at the head of drainageways. The very poorly drained Bonnie and somewhat poorly drained Belknap soils are in nearly level areas on narrow flood plains. The well drained Hickory and Kell soils are on the steeper side slopes. The moderately well drained Plumfield soils formed in thin loess and erosional sediments over glacial drift.

About 40 percent of this association is used for cultivated crops, and the rest is used for hay, pasture, or woodland. The soils are well suited or moderately well suited to use as woodland and moderately suited or poorly suited to hay and pasture. Their suitability for the cultivated crops commonly grown in the survey area ranges from moderately well suited to unsuited. The soils are well suited or moderately well suited to use as wildlife habitat. The slope, a hazard of erosion, restricted permeability, and a moderate shrink-swell potential are management concerns.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The slope, seasonal wetness, the shrink-swell potential, and the restricted permeability are the major limitations affecting these uses.

## 6. Belknap-Bonnie Association

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

This association consists of silty soils on flood plains throughout the survey area and on the upper edges of glacial lakebeds. Slopes range from 0 to 2 percent.

This association makes up about 15 percent of the survey area. It is about 60 percent Belknap soils, 25 percent Bonnie soils, and 15 percent soils of minor extent.

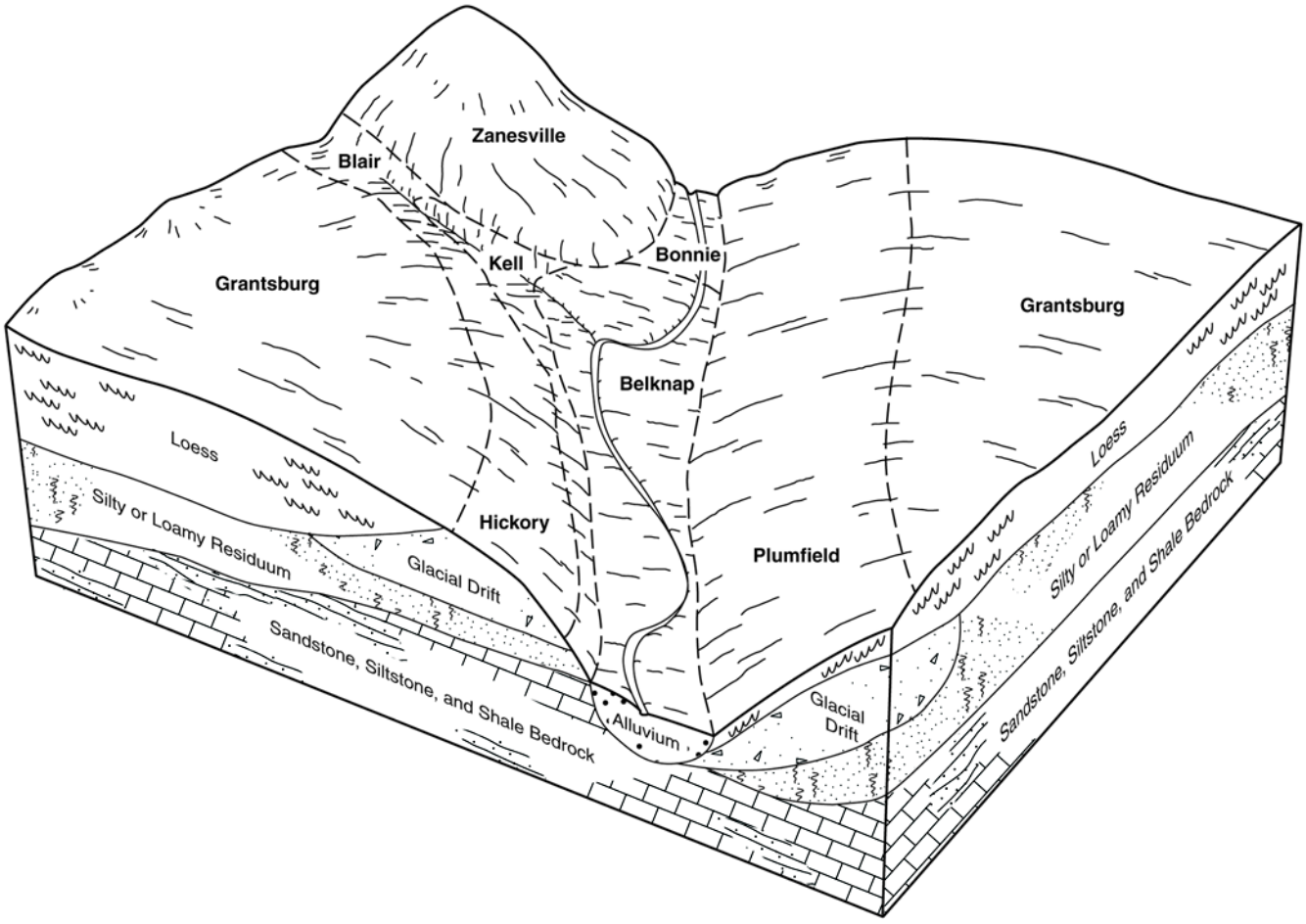



**Figure 7.—Typical pattern of soils and parent material in the Grantsburg-Zanesville association.**

The somewhat poorly drained Belknap soils are on the flood plains that dissect the uplands and along the higher parts of the major flood plains, commonly adjacent to the streams. They are frequently flooded for brief periods from January through June. Typically, the surface layer is brown silt loam about 9 inches thick. The underlying material to a depth of 60 inches or more is mottled, friable silt loam. The upper part is mixed yellowish brown and grayish brown, and the lower part is light brownish gray.

The very poorly drained Bonnie soils are on broad flats and in some depressional areas adjacent to the uplands and old slough channels. They are frequently flooded for brief periods from January through June. The areas that are depressional and in old slough channels are undrained, and they may become ponded during the growing season. Typically, the surface layer of the Bonnie soils is brown and light brownish gray, mottled silt loam about 10 inches thick. The underlying material to a depth of 60 inches or more is gray and light gray, mottled, friable silt loam.

Of minor extent in this association are the moderately well drained Sharon soils and the poorly drained Racoon soils. Sharon soils are in the slightly higher areas or on natural levees on flood plains. Racoon soils are on terraces or footslopes bordering the uplands.

This association is used mainly for cultivated crops, but some small areas are used as woodland. Because of ponding, the depressional areas and old slough channels are not suited to cultivated crops. Broad flat areas of the association are well suited or moderately well suited to use as cropland and are well suited to use as woodland. The soils in this association are generally unsuited to use as sites for dwellings or septic tank absorption fields because of flooding and wetness. They are well suited or moderately well suited to use as habitat for wetland and openland

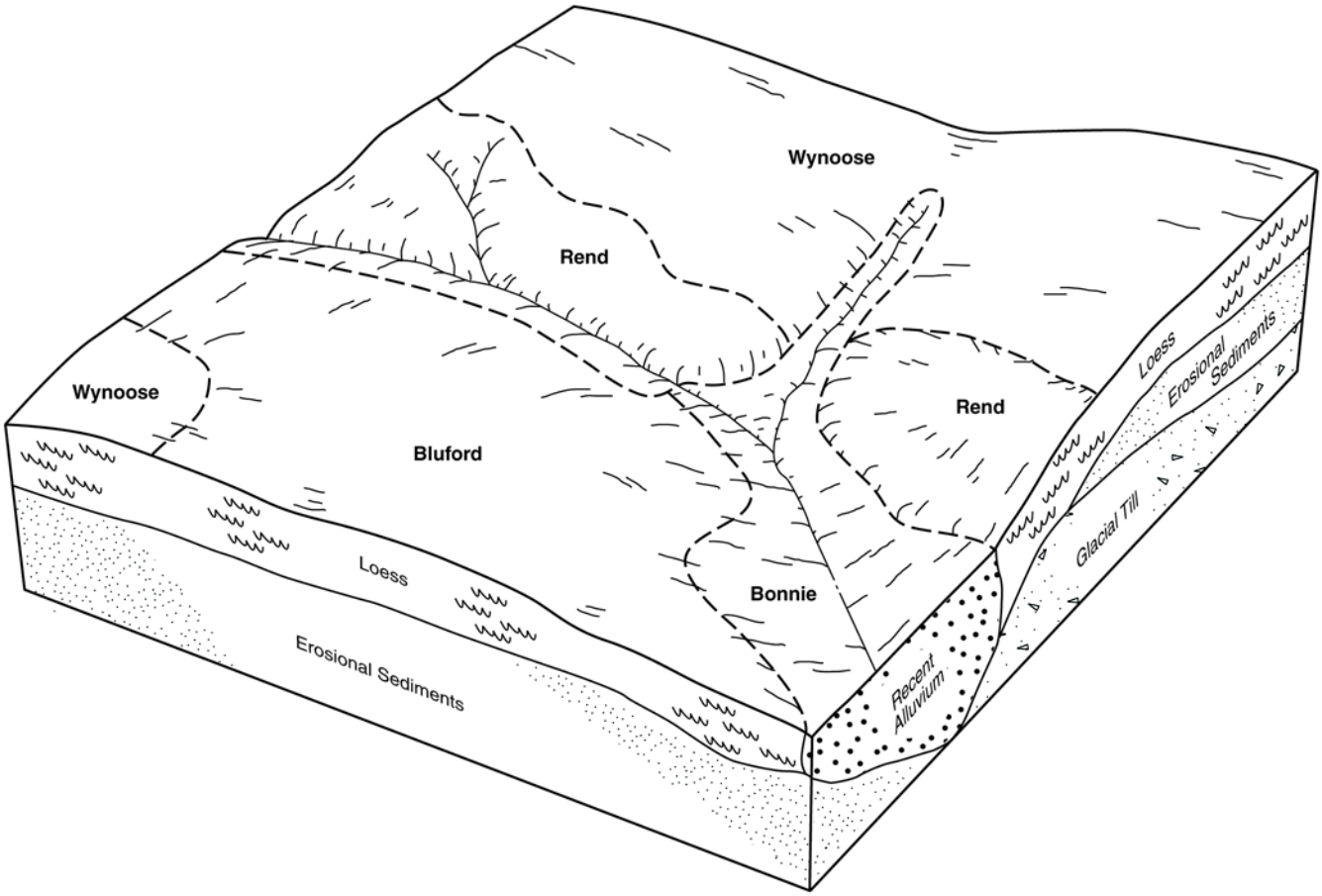



**Figure 8.—Typical pattern of soils and parent material in the Wynoose, bench-Rend-Bluford, bench, association.**

wildlife. The seasonal wetness, the ponding, and the flooding adversely affect most uses. Equipment limitations, seeding mortality, and windthrow are management concerns in areas used as woodland.

## 7. Wynoose, Bench-Rend-Bluford, Bench, Association

*Nearly level to moderately sloping, poorly drained to moderately well drained soils that formed in loess and erosional sediments over till; on benches*

This association consists mainly of soils on low, broad flats, ridges, and side slopes along terrace drainageways. It is generally in irregularly shaped areas adjacent to the lower flood plains of perennial streams and rivers. Slopes range from 0 to 5 percent.

This association makes up about 9 percent of the survey area. It is about 25 percent Wynoose soils, 24 percent Rend soils, 20 percent Bluford soils, and 31 percent soils of minor extent (fig. 8).

Wynoose soils are nearly level and are poorly drained. They are generally on broad divides on benches. Typically, the surface layer is dark brown, firm silt loam about 3 inches thick. The subsurface layer is mixed light gray and gray, mottled silt loam. It is about 19 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is gray, mottled, firm silty clay and silty clay loam. The lower part is mixed light gray and gray, mottled, firm and very firm silty clay loam.

Rend soils are gently sloping and moderately sloping and are moderately well drained. They are generally on narrow ridgetops and the upper side slopes. Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, firm silty clay loam; the next part is yellowish brown, mottled, firm silty clay loam; and the lower part is yellowish brown, mottled, firm, brittle silt loam.

Bluford soils are nearly level to gently sloping and are somewhat poorly drained. They are on the slightly higher ridges and narrow divides and on side slopes on benches. Typically, the surface layer is dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, very firm silty clay loam. The next part is brown and yellowish brown, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, firm, brittle silt loam.

Of minor extent in this association are Cisne, Hoyleton, Belknap, Bonnie, Creal, and Racoon soils. Cisne and Hoyleton soils formed under mixed forest and prairie vegetation. They are generally in the less sloping areas. The somewhat poorly drained Belknap and very poorly drained Bonnie soils are on narrow flood plains. The somewhat poorly drained Creal and poorly drained Racoon soils are on footslopes or in depressions. They have a thicker surface layer and subsurface layer than those of the major soils.

Most areas of this association are used for cultivated crops. A few areas are used for pasture or as woodland. The soils in this association are well suited to the cultivated crops commonly grown in the survey area. Seasonal wetness in areas of all of the major soils and a hazard of erosion in the gently sloping areas are management concerns if the soils are cultivated. The soils are well suited or moderately well suited to use as wildlife habitat.

These soils are poorly suited to use as sites for dwellings or septic tank absorption fields. The seasonal wetness, the shrink-swell potential, and restricted permeability are the major limitations affecting these uses.

# Detailed Soil Map Units

The map units delineated on the detailed soil maps in 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.

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. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils 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. If intensive use of small areas is planned, however, 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, Wynoose silt loam, bench, is a phase of the Wynoose series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called 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. Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded, is an example.

This survey includes *miscellaneous areas*. Such

areas have little or no soil material and support little or no vegetation. The map unit Dumps, mine, is an example.

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

## 2—Cisne silt loam

### *Setting*

*Landform:* Uplands
*Position on the landform:* Broad flats and depressions on divides
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Slow or very slow
*Available water capacity:* High or moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
8 to 20 inches—light brownish gray silt loam

*Subsoil:*
20 to 23 inches—mixed grayish brown and light gray, mottled silty clay loam
23 to 27 inches—mixed gray and grayish brown silty clay
27 to 40 inches—gray, mottled silty clay
40 to 49 inches—very dark gray, mottled silt loam
49 to 60 inches—gray, mottled silty clay loam

### *Composition*

Cisne soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
- Soils that have a lighter colored surface layer than that of the Cisne soil
- Soils that are deeper over a claypan than the Cisne soil
- Soils that have a seasonal high water table at a depth of more than 1 foot

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
- The use of machinery is limited to periods when the soil is firm enough to support a load.
- The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 3A—Hoyleton silt loam, 0 to 2 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Broad convex flats on divides
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
7 to 9 inches—brown, mottled silt loam

*Subsoil:*
9 to 13 inches—yellowish brown, mottled silty clay loam
13 to 17 inches—grayish brown, mottled silty clay loam
17 to 22 inches—grayish brown, mottled silty clay
22 to 33 inches—yellowish brown, mottled silty clay loam
33 to 48 inches—dark yellowish brown, mottled silt loam

*Substratum:*
48 to 65 inches—yellowish brown, mottled loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a lighter colored surface layer than that of the Hoyleton soil
• Soils that are more sloping than the Hoyleton soil
• Soils that have a seasonal high water table within a depth of 1 foot
• Soils that are deeper over a claypan than the Hoyleton soil

*Contrasting inclusions:*
• The moderately well drained Ava soils on side slopes and nose slopes of interfluves
• The poorly drained Wynoose soils in shallow closed depressions
• The poorly drained Chauncey soils in shallow closed depressions or on toeslopes

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth

*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4A

## 3B2—Hoyleton silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes and summits
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Moderate
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
7 to 10 inches—brown, mottled silty clay loam
10 to 25 inches—yellowish brown, mottled silty clay
25 to 39 inches—grayish brown, mottled silty clay loam
39 to 58 inches—dark grayish brown, mottled silt loam
58 to 78 inches—yellowish brown, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that have a lighter colored surface layer than that of the Hoyleton soil
- Soils that are less sloping than the Hoyleton soil
- Soils that have a seasonal high water table within a depth of 1 foot

*Contrasting inclusions:*
- The poorly drained Chauncey soils along footslopes and at the head of drainageways
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

**Woodland**

*Management measures or considerations:*
- This soil has only slight limitations affecting its use as woodland.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 4B2—Richview silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes and summits of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Moderately low or moderate

*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
9 to 11 inches—strong brown, mottled silty clay loam
11 to 19 inches—yellowish brown, mottled silty clay loam
19 to 22 inches—brown, mottled silty clay loam
22 to 31 inches—yellowish brown, mottled silt loam
31 to 39 inches—yellowish brown, mottled, brittle silt loam
39 to 50 inches—dark yellowish brown, mottled, brittle silt loam

*Substratum:*
50 to 70 inches—yellowish brown, mottled, brittle silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are more sloping than the Richview soil
• Soils that have a lighter colored surface layer than that of the Richview soil
• Soils that have a seasonal high water table within a depth of 4 feet

*Contrasting inclusions:*
• The poorly drained Chauncey soils along footslopes and at the head of drainageways
• The moderately well drained Ava soils in positions on the landform similar to those of the Richview soil

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 4C2—Richview silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
9 to 15 inches—strong brown, mottled silty clay loam
15 to 26 inches—yellowish brown, mottled silty clay loam
26 to 36 inches—brown, mottled silt loam
36 to 57 inches—yellowish brown, mottled silty clay loam
57 to 78 inches—mixed yellowish brown and light brownish gray silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less sloping than the Richview soil
• Soils that have a lighter colored surface layer than that of the Richview soil
• Soils that have a seasonal high water table within a depth of 4 feet

*Contrasting inclusions:*
• The poorly drained Chauncey soils along footslopes and at the head of drainageways
• The moderately well drained Ava soils in positions on the landform similar to those of the Richview soil

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 5C2—Blair silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Head slopes along drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Parent material:* Loess and/or silty or loamy water-worked erosional sediments
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 1.5 to 3.5 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 8 inches—dark yellowish brown silt loam

*Subsoil:*
8 to 42 inches—yellowish brown, mottled silt loam
42 to 60 inches—mixed light brownish gray and yellowish brown loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have thicker loess
• Soils that have a claypan
• Soils that contain sodium in the lower part of the subsoil
• Soils that have a fine textured paleosol
• Soils that are less sloping than the Blair soil

*Contrasting inclusions:*
• The moderately well drained Ava, Plumfield, and Zanesville soils, which are more brittle than the Blair soil
• Belknap soils, which are subject to frequent flooding; on narrow flood plains between side slopes of drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.

• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 5C3—Blair silty clay loam, 5 to 10 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Head slopes along drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Parent material:* Loess and/or silty or loamy water-worked erosional sediments
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 1.5 to 3.5 feet below the surface
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—yellowish brown silty clay loam

*Subsoil:*
6 to 15 inches—yellowish brown, mottled silty clay loam
15 to 27 inches—yellowish brown, mottled silt loam
27 to 42 inches—gray, mottled silt loam
42 to 50 inches—mixed gray and light gray, mottled silt loam
50 to 62 inches—light brownish gray, mottled loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have thicker loess
• Soils that have a claypan
• Soils that are less sloping than the Blair soil

*Contrasting inclusions:*
• The moderately well drained Ava, Plumfield, and Zanesville soils, which are more brittle than the Blair soil
• Belknap soils, which are subject to frequent flooding; on narrow flood plains between side slopes of drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 4A

## 7C2—Atlas silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes along drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Very slow
*Parent material:* Loess and the underlying paleosol, which formed in till
*Runoff:* Medium
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at a depth of 1 to 2 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
7 to 13 inches—brown silty clay loam
13 to 29 inches—mixed dark grayish brown and light brownish gray, mottled silty clay loam
29 to 64 inches—mixed olive gray and strong brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Somewhat poorly drained soils that contain more loess than the Atlas soil
• Soils that contain sodium in the lower part of the subsoil
• Soils that are less sloping than the Atlas soil

*Contrasting inclusions:*
• The moderately well drained Plumfield soils, which are more brittle than the Atlas soil
• The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas

on bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4C

## 7D2—Atlas silt loam, 10 to 18 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes of drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Very slow
*Parent material:* Loess and the underlying paleosol, which formed in till
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at a depth of 1 to 2 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—dark brown silt loam

*Subsoil:*
6 to 16 inches—brown, mottled silty clay loam
16 to 31 inches—mixed brown and light gray, mottled clay loam
31 to 60 inches—light gray, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Somewhat poorly drained soils that contain more loess than the Atlas soil
• Soils that are less sloping than the Atlas soil

*Contrasting inclusions:*
• The moderately well drained Plumfield soils, which are more brittle than the Atlas soil
• The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 4C

## 8D2—Hickory silt loam, 10 to 18 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major uses:* Pasture and woodland

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over till
*Runoff:* Rapid
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 6 inches—brown silt loam

*Subsoil:*
6 to 14 inches—dark yellowish brown silt loam
14 to 25 inches—dark yellowish brown silty clay loam
25 to 36 inches—yellowish brown, mottled silty clay loam
36 to 60 inches—strong brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are more sloping than the Hickory soil
- Soils that are more severely eroded than the Hickory soil

*Contrasting inclusions:*
- The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
- Kell soils, which are more sloping than the Hickory soil; on the lower side slopes
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential and the slope
*Management measures or considerations:*
- Onsite investigation is needed.

• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability and the slope
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 5A

## 8D3—Hickory clay loam, 10 to 18 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Pasture

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Till
*Runoff:* Rapid
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 8 inches—mixed brown and yellowish brown clay loam

*Subsoil:*
8 to 48 inches—yellowish brown clay loam
48 to 79 inches—yellowish brown, mottled sandy clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are more sloping than the Hickory soil
• Soils that are less severely eroded than the Hickory soil

*Contrasting inclusions:*
• The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
• Kell soils, which are more sloping than the Hickory soil; on the lower side slopes
• The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential and the slope
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability and the slope
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 5A

## 8F—Hickory silt loam, 18 to 35 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Pasture

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over till
*Runoff:* Rapid
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Typical Profile*

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

*Subsurface layer:*
3 to 12 inches—mixed brown and yellowish brown silt loam

*Subsoil:*
12 to 20 inches—yellowish brown loam
20 to 25 inches—yellowish brown clay loam
25 to 60 inches—yellowish brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are more sloping or less sloping than the Hickory soil
• Soils that are eroded

*Contrasting inclusions:*
• The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
• Kell soils, which are more sloping than the Hickory soil; on the lower side slopes
• The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management concerns:* Slope and erosion
*Management measures or considerations:*
• The slope limits the use of equipment and increases the hazard of erosion.
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred

grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Slope, erosion, and plant competition
*Management measures or considerations:*
• The slope limits the use of equipment and increases the hazard of erosion.
• Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
• Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* 5R

## 8G—Hickory silt loam, 35 to 60 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Woodland

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over till
*Runoff:* Very rapid
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 4 inches—dark grayish brown silt loam

*Subsurface layer:*
4 to 10 inches—yellowish brown silt loam

*Subsoil:*
10 to 21 inches—yellowish brown loam
21 to 27 inches—yellowish brown clay loam
27 to 44 inches—yellowish brown, mottled clay loam
44 to 60 inches—dark yellowish brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less sloping than the Hickory soil
• Soils that are more severely eroded than the Hickory soil

*Contrasting inclusions:*
• The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
• The shallow to moderately deep Kell soils on the lower side slopes
• The somewhat poorly drained Belknap soils and the

moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management measures or considerations:*
• Because of the slope, this soil is generally unsuited to use for pasture and hay.

**Woodland**

*Management concerns:* Slope, erosion, and plant competition
*Management measures or considerations:*
• The slope limits the use of equipment and increases the hazard of erosion.
• Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
• Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 7e
*Woodland ordination symbol:* 5R

## 10C—Plumfield silty clay loam, 5 to 10 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Thin loess and erosional sediments over glacial drift
*Runoff:* Rapid
*Available water capacity:* Low
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Very low or low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
5 to 7 inches—yellowish brown, brittle silty clay loam
7 to 21 inches—yellowish brown, mottled, brittle silty clay loam
21 to 36 inches—yellowish brown, mottled, brittle silt loam
36 to 70 inches—grayish brown, mottled silty clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less brittle than the Plumfield soil

• Soils that are less sloping than the Plumfield soil
• Soils that have thicker loess than the Plumfield soil

*Contrasting inclusions:*
• The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
• The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness
*Management measures or considerations:*
• Onsite investigation is needed.
• Installing subsurface drains around the foundations lowers the water table.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 4A

## 10D—Plumfield silty clay loam, 10 to 18 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major uses:* Cultivated crops and pasture

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Thin loess and erosional sediments over glacial drift
*Runoff:* Rapid
*Available water capacity:* Low
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Very low or low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—dark brown silty clay loam

*Subsoil:*
6 to 44 inches—yellowish brown, mottled, brittle silt loam
44 to 60 inches—yellowish brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are less brittle than the Plumfield soil
- Soils that are less sloping than the Plumfield soil
- Soils that have thicker loess than the Plumfield soil

*Contrasting inclusions:*
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

### *Use and Management*

**Cropland**

*Management measures or considerations:*
- Because of the erosion hazard and the shallow depth to a fragipan, this soil is generally unsuited to use as cropland.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality
*Management measures or considerations:*
- The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the slope
*Management measures or considerations:*
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table.
- Land shaping by cutting and filling helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* 4A

## 12—Wynoose silt loam

### *Setting*

*Landform:* Uplands
*Position on the landform:* Broad divides
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over a paleosol that formed in till
*Runoff:* Slow or very slow
*Available water capacity:* High or moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
7 to 11 inches—light gray, mottled silt loam
11 to 14 inches—mixed light gray and light brownish gray, mottled silty clay loam

*Subsoil:*
14 to 21 inches—light brownish gray, mottled silty clay loam
21 to 28 inches—grayish brown silty clay
28 to 38 inches—olive gray, mottled silty clay loam
38 to 53 inches—grayish brown, mottled silty clay loam
53 to 64 inches—gray, mottled loam
64 to 73 inches—dark gray, mottled clay loam

## *Composition*

Wynoose soil and similar inclusions: 100 percent

## *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Wynoose soil
• Soils that have a thicker surface layer and subsurface layer than those of the Wynoose soil
• Soils that have a seasonal high water table at a depth of more than 1 foot

## *Use and Management*

### Cropland

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

### Pasture and hay

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

### Woodland

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

### Wildlife habitat

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

### Dwellings

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

### Septic tank absorption fields

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

## *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 13A—Bluford silt loam, 0 to 2 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Broad convex flats on divides or interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess over silty or loamy erosional sediments
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* Perched at a depth of 1 to 3 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—grayish brown silt loam

*Subsurface layer:*
5 to 12 inches—brown, mottled silt loam

*Subsoil:*
12 to 15 inches—light yellowish brown, mottled silt loam
15 to 26 inches—brown, mottled silty clay loam
26 to 40 inches—grayish brown, mottled silty clay loam
40 to 64 inches—mixed grayish brown and yellowish brown, mottled, brittle silt loam
64 to 76 inches—yellowish brown, mottled loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that have a darker surface layer than that of the Bluford soil
- Soils that are more sloping than the Bluford soil
- Soils that have a seasonal high water table within a depth of 1 foot
- Soils that are deeper to a claypan than the Bluford soil

*Contrasting inclusions:*
- The moderately well drained Ava soils on side slopes and nose slopes of interfluves

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
- This soil has only slight limitations affecting its use as woodland.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness

*Management measures or considerations:*
• Onsite investigation is needed.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4A

## 13B2—Bluford silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes along drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess over silty or loamy erosional sediments
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* Perched at a depth of 1 to 3 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
7 to 11 inches—pale brown silty clay loam
11 to 44 inches—mixed yellowish brown and light brownish gray, mottled silty clay loam
44 to 62 inches—grayish brown, mottled, brittle silt loam
62 to 78 inches—mixed grayish brown and yellowish brown silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Bluford soil
• Soils that are less sloping than the Bluford soil
• Soils that have a seasonal high water table within a depth of 1 foot

*Contrasting inclusions:*
• The moderately well drained Ava soils on nose slopes and side slopes
• The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways
• The poorly drained Racoon soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.

• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness
*Management measures or considerations:*
• Onsite investigation is needed.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 14B—Ava silt loam, 2 to 5 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Convex ridgetops on interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* Moderate or high
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—brown silt loam

*Subsurface layer:*
5 to 13 inches—yellowish brown silt loam

*Subsoil:*
13 to 15 inches—yellowish brown silty clay loam
15 to 26 inches—dark yellowish brown, mottled silty clay loam
26 to 33 inches—mixed yellowish brown and brown, mottled silty clay loam
33 to 54 inches—mixed yellowish brown and brown, mottled, brittle silty clay loam
54 to 62 inches—mixed yellowish brown and grayish brown, mottled, brittle silt loam
62 to 80 inches—yellowish brown, mottled, brittle loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are redder and less brittle than the Ava soil
• Soils that are more severely eroded than the Ava soil
• Soils that are more sloping than the Ava soil
• Soils that formed in bedrock residuum

*Contrasting inclusions:*
• The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly

adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 14B2—Ava silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—dark grayish brown silt loam
6 to 9 inches—mixed brown and yellowish brown silt loam

*Subsoil:*
9 to 17 inches—yellowish brown silty clay loam
17 to 21 inches—yellowish brown, mottled silty clay loam and white silt
21 to 28 inches—brown, mottled silty clay loam
28 to 36 inches—dark yellowish brown, mottled, brittle silt loam
36 to 48 inches—yellowish brown, mottled, brittle silt loam
48 to 64 inches—yellowish brown, mottled, brittle loam
64 to 78 inches—yellowish brown, mottled clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are redder and less brittle than the Ava soil
- Soils that are less severely eroded than the Ava soil
- Soils that are more sloping than the Ava soil
- Soils that formed in bedrock residuum

*Contrasting inclusions:*
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 14C2—Ava silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Low or moderately low

*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—yellowish brown silt loam

*Subsoil:*
5 to 8 inches—mixed yellowish brown and brown silty clay loam
8 to 10 inches—yellowish brown, mottled silty clay loam and white silt
10 to 17 inches—mixed dark yellowish brown and yellowish brown, mottled silty clay loam
17 to 23 inches—mixed brown and dark yellowish brown, mottled, brittle silty clay loam
23 to 32 inches—dark yellowish brown, mottled, brittle silt loam
32 to 57 inches—yellowish brown, mottled, brittle silt loam
57 to 78 inches—yellowish brown, mottled silty clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are brittle at a depth of less than 17 inches
• Soils that are more severely eroded than the Ava soil
• Soils that are less sloping than the Ava soil
• Soils that formed in bedrock residuum

*Contrasting inclusions:*
• The somewhat poorly drained Blair and Atlas soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 15D3—Parke silty clay loam, 10 to 18 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

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

### *Typical Profile*

*Surface layer:*
0 to 9 inches—mixed brown and strong brown silty clay loam

*Subsoil:*
9 to 17 inches—strong brown silty clay loam
17 to 30 inches—brown silty clay loam
30 to 50 inches—reddish brown clay loam
50 to 78 inches—mixed reddish brown and yellowish red clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less red and more brittle than the Parke soil
• Soils that are less severely eroded than the Parke soil
• Soils that are less sloping than the Parke soil
• Soils that formed over bedrock

*Contrasting inclusions:*
• The somewhat poorly drained Creal soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential and the slope
*Management measures or considerations:*
• Onsite investigation is needed.

• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Slope
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 5A

## 84—Okaw silt loam

### *Setting*

*Landform:* Terraces
*Position on the landform:* Broad flats
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

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

### *Typical Profile*

*Surface layer:*
0 to 4 inches—dark grayish brown silt loam
4 to 8 inches—mixed dark grayish brown and light brownish gray silty clay loam

*Subsurface layer:*
8 to 16 inches—light brownish gray, mottled silty clay loam

*Subsoil:*
16 to 40 inches—gray, mottled silty clay
40 to 67 inches—olive gray, mottled silty clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are better drained than the Okaw soil

*Contrasting inclusions:*
• The somewhat poorly drained Bluford soils on convex slopes and side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.

• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Ponding and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The ponding is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Ponding and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 109—Racoon silt loam

### *Setting*

*Landform:* Uplands and benches
*Position on the landform:* Footslopes and shallow closed depressions
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

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

### *Typical Profile*

*Surface layer:*
0 to 10 inches—mixed brown and grayish brown silt loam

*Subsurface layer:*
10 to 16 inches—grayish brown, mottled silt loam
16 to 29 inches—gray, mottled silt loam

*Subsoil:*
29 to 41 inches—light brownish gray, mottled silty clay loam
41 to 51 inches—gray, mottled silty clay loam
51 to 60 inches—gray, mottled silt loam

### *Composition*

Racoon soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Racoon soil
• Soils that are less than 24 inches deep over a claypan
• Soils that have a seasonal high water table at a depth of more than 1 foot
• Soils that are subject to frequent flooding

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.

• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Ponding
*Management measures or considerations:*
• Onsite investigation is needed.
• Installing subsurface drains around the foundations lowers the water table. The ponding is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Ponding and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

***Interpretive Groups***

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 122B—Colp silt loam, 2 to 5 percent slopes

***Setting***

*Landform:* Terraces
*Position on the landform:* Convex ridgetops on interfluves
*Major use:* Cultivated crops

***Soil Properties and Qualities***

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

***Typical Profile***

*Surface layer:*
0 to 7 inches—brown silt loam

*Subsoil:*
7 to 13 inches—strong brown silty clay loam
13 to 22 inches—yellowish brown, mottled silty clay
22 to 37 inches—brown, mottled silty clay
37 to 45 inches—grayish brown, mottled silty clay
45 to 60 inches—weak red, mottled silty clay

***Composition***

Colp soil and similar inclusions: 100 percent

***Inclusions***

*Similar inclusions:*
• Soils that have more loess than the Colp soil
• Soils that are less sloping than the Colp soil
• Soils that are more severely eroded than the Colp soil

• Soils that have a seasonal high water table within a depth of 2 feet

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 122B2—Colp silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Terraces
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

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

### *Typical Profile*

*Surface layer:*
0 to 6 inches—grayish brown silt loam mixed with yellowish brown silty clay loam

*Subsoil:*
6 to 8 inches—mixed light brownish gray and yellowish brown silty clay loam
8 to 35 inches—yellowish brown, mottled silty clay
35 to 60 inches—light brownish gray, mottled silty clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have more loess than the Colp soil

• Soils that are more sloping than the Colp soil
• Soils that are more severely eroded than the Colp soil
• Soils that have a seasonal high water table within a depth of 2 feet

*Contrasting inclusions:*
• Soils that are more sandy than the Colp soil
• The very poorly drained Jacob soils on flood plains adjacent to side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 122C3—Colp silty clay loam, 5 to 10 percent slopes, severely eroded

### *Setting*

*Landform:* Terraces
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately drained
*Permeability:* Slow
*Parent material:* Lacustrine sediments
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* 2 to 4 feet below the surface
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 3 inches—dark grayish brown silty clay loam
3 to 7 inches—dark grayish brown silty clay

*Subsoil:*
7 to 18 inches—dark yellowish brown, mottled silty clay
18 to 27 inches—dark brown, mottled clay

27 to 48 inches—yellowish brown, mottled silty clay
48 to 60 inches—grayish brown, mottled, calcareous silty clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have more loess than the Colp soil
• Soils that are more sloping than the Colp soil
• Soils that are less severely eroded than the Colp soil
• Soils that have a seasonal high water table within a depth of 2 feet

*Contrasting inclusions:*
• The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains adjacent to side slopes
• The poorly drained Cape soils, which are subject to frequent flooding; on toeslopes adjacent to side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 4A

## 122D3—Colp silty clay loam, 10 to 18 percent slopes, severely eroded

### *Setting*

*Landform:* Terraces
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Slow
*Parent material:* Lacustrine sediments
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* 2 to 4 feet below the surface

*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 4 inches—brown silty clay loam

*Subsoil:*
4 to 20 inches—grayish brown, mottled silty clay
20 to 30 inches—light olive brown, mottled clay
30 to 37 inches—grayish brown, mottled silty clay
37 to 49 inches—dark grayish brown, mottled silty clay
49 to 60 inches—dark grayish brown, mottled, calcareous silty clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are more sloping than the Colp soil
• Soils that are less severely eroded than the Colp soil
• Soils that have a seasonal high water table within a depth of 2 feet

*Contrasting inclusions:*
• The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains adjacent to side slopes
• The poorly drained Cape soils, which are subject to frequent flooding; on toeslopes adjacent to side slopes

### *Use and Management*

**Cropland**

*Suitability:* Generally unsuited

**Pasture**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* 4A

## 287—Chauncey silt loam

### *Setting*

*Landform:* Uplands
*Position on the landform:* Footslopes and shallow closed depressions
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained

*Permeability:* Slow
*Parent material:* Loess over depositional sediments
*Runoff:* Slow or very slow
*Available water capacity:* High
*Seasonal high water table:* Perched at the surface to 2 feet below the surface
*Organic matter content:* Moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—very dark grayish brown silt loam
5 to 12 inches—very dark grayish brown, mottled silt loam

*Subsurface layer:*
12 to 17 inches—dark gray, mottled silt loam
17 to 26 inches—gray, mottled silt loam

*Subsoil:*
26 to 31 inches—gray, mottled silty clay loam
31 to 46 inches—grayish brown silty clay
46 to 60 inches—grayish brown silty clay loam

### *Composition*

Chauncey soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
• Soils that have a lighter colored surface layer than that of the Chauncey soil
• Soils that are shallower over a claypan than the Chauncey soil
• Soils that have a seasonal high water table at a depth of more than 2 feet

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe

limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4W

## 301B—Grantsburg silt loam, 2 to 5 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Convex ridgetops on interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess and silty sediments over bedrock
*Runoff:* Medium
*Available water capacity:* Moderate or high
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 4 inches—brown silt loam

*Subsurface layer:*
4 to 9 inches—strong brown silt loam

*Subsoil:*
9 to 19 inches—strong brown silty clay loam
19 to 27 inches—yellowish brown silty clay loam
27 to 29 inches—mixed yellowish brown and pale brown silty clay loam
29 to 37 inches—dark yellowish brown, mottled silty clay loam
37 to 60 inches—strong brown, mottled, brittle silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are redder and less brittle than the Grantsburg soil
• Soils that are more severely eroded than the Grantsburg soil
• Soils that are more sloping than the Grantsburg soil
• Soils that are 48 to 60 inches deep over bedrock
• Soils that formed in glacial drift

*Contrasting inclusions:*
• The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
• The somewhat poorly drained Blair soils at the head of drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the

remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 3D

## 301C3—Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess and silty sediments over bedrock
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at a depth of 1.5 to 3.5 feet
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
5 to 11 inches—strong brown silty clay loam
11 to 17 inches—mixed very pale brown and yellowish brown silty clay loam
17 to 47 inches—yellowish brown, mottled, brittle silty clay loam and silt loam
47 to 60 inches—yellowish brown silty clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are brittle within a depth of 20 inches
• Soils that are more sloping than the Grantsburg soil
• Soils that contain less loess than the Grantsburg soil
• Soils that are less than 80 inches deep over bedrock

*Contrasting inclusions:*
• The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion (fig. 9).
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly

**Figure 9.—Contour stripcropping helps to control erosion in an area of Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded.**

adding other organic material help to maintain tilth and fertility.

### Pasture and hay

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

### Woodland

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
- The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The woodland should be protected from fire and from grazing by livestock.

### Wildlife habitat

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.

• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 3D

## 337A—Creal silt loam, 0 to 2 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Footslopes and shallow closed depressions
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Parent material:* Loess over depositional sediments
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—brown silt loam

*Subsurface layer:*
6 to 25 inches—brown, mottled silt loam

*Subsoil:*
25 to 29 inches—light brownish gray, mottled silty clay loam
29 to 37 inches—mixed gray and light brownish gray, mottled silty clay loam
37 to 50 inches—light brownish gray, mottled silt loam
50 to 58 inches—gray, mottled silt loam
58 to 65 inches—light brownish gray, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Creal soil
• Soils that are less than 24 inches deep over a claypan
• Soils that are more sloping than the Creal soil
• Soils that have a seasonal high water table within a depth of 1 foot

*Contrasting inclusions:*
• The moderately well drained Richview soils on knolls and shoulders of uplands
• The well drained Pike soils on convex side slopes of uplands

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness
*Management measures or considerations:*
• Onsite investigation is needed.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4A

## 338A—Hurst silt loam, 0 to 2 percent slopes

### *Setting*

*Landform:* Terraces
*Position on the landform:* Summits of terrace divides
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Very slow
*Parent material:* Loess over lacustrine sediments
*Runoff:* Slow
*Available water capacity:* Moderate or high
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 4 inches—dark grayish brown silt loam

*Subsurface layer:*
4 to 8 inches—dark grayish brown, mottled silt loam

*Subsoil:*
8 to 14 inches—brown, mottled silty clay loam
14 to 25 inches—brown, mottled silty clay
25 to 38 inches—yellowish brown, mottled silty clay
38 to 45 inches—light brownish gray, mottled clay

*Substratum:*
45 to 60 inches—gray, mottled clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are more sloping than the Hurst soil
• Soils that are subject to rare flooding
• Soils that have a seasonal high water table within a depth of 1 foot

*Contrasting inclusions:*
• The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4C

## 339D—Wellston silt loam, 10 to 18 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major uses:* Woodland and pasture

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderately slow
*Parent material:* Loess and silty residuum over bedrock
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
3 to 8 inches; yellowish brown silt loam

*Subsoil:*
8 to 16 inches; yellowish brown silt loam
16 to 32 inches; strong brown silt loam
32 to 40 inches; strong brown channery loam
40 to 48 inches; strong brown very channery loam

*Bedrock:*
48 to 52 inches; thinly bedded, weathered sandstone and siltstone

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that contain more loess than the Wellston soil
- Soils that are less sloping than the Wellston soil
- Soils that are less than 40 inches deep over bedrock

*Contrasting inclusions:*
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes
- The moderately well drained Zanesville and Ava soils, which are brittle within a depth of 24 inches
- Soils that are more sloping than the Wellston soil

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Habitat for upland wildlife can be maintained by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Slope
- Onsite investigation is needed.
- Building on the contour or land shaping helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability and the slope
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 4R

## 340D3—Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major uses:* Cultivated crops and pasture

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Slow
*Parent material:* Loess and loamy residuum over bedrock
*Runoff:* Rapid
*Available water capacity:* Low or moderate
*Seasonal high water table:* Perched at a depth of 2 to 3 feet
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* Low
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 2 inches—brown silty clay loam

*Subsoil:*
2 to 8 inches—yellowish brown silty clay loam
8 to 13 inches—yellowish brown, mottled silty clay loam

13 to 19 inches—strong brown, mottled silty clay loam
19 to 40 inches—brown, mottled, brittle silty clay loam and loam
40 to 50 inches—brown, mottled loam

*Bedrock:*
50 to 60 inches—mixed strong brown and light brownish gray, weathered bedrock

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that contain less loess than the Zanesville soil
- Soils that are brittle within a depth of 20 inches
- Soils that are more sloping than the Zanesville soil
- Soils that are more than 80 inches deep over bedrock

*Contrasting inclusions:*
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes
- The well drained Hickory soils on the steeper side slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
- Because of the hazard of erosion and the shallow depth to a fragipan, this soil is generally unsuited to use as cropland.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
- The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* 6D

## 376—Cisne silt loam, bench

### *Setting*

*Landform:* Benches
*Position on the landform:* Broad flats and depressions
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained

*Permeability:* Very slow
*Parent material:* Loess over erosional sediments
*Runoff:* Slow or very slow
*Available water capacity:* High or moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Moderate or moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
7 to 16 inches—grayish brown silt loam

*Subsoil:*
16 to 18 inches—grayish brown, mottled silty clay loam and white silt
18 to 34 inches—gray, mottled silty clay loam
34 to 43 inches—grayish brown, mottled silt loam
43 to 64 inches—grayish brown silt loam

### *Composition*

Cisne soil and similar inclusions: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

### *Inclusions*

*Similar inclusions:*
• Soils that have a lighter colored surface layer than that of the Cisne soil
• Soils that are deeper over a claypan than the Cisne soil
• Soils that have a seasonal high water table at a depth of more than 2 feet

*Contrasting inclusions:*
• The poorly drained Okaw soils in closed depressions and at the head of drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe

limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 377A—Hoyleton silt loam, bench, 0 to 2 percent slopes

### *Setting*

*Landform:* Benches
*Position on the landform:* Broad, convex flats
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
8 to 11 inches—mixed dark yellowish brown and light yellowish brown, mottled silt loam

*Subsoil:*
11 to 16 inches—dark grayish brown, mottled silty clay loam
16 to 27 inches—grayish brown, mottled silty clay
27 to 41 inches—mixed light brownish gray and yellowish brown, mottled silty clay loam
41 to 55 inches—mixed yellowish brown and pale brown, mottled silty clay loam
55 to 60 inches—mixed yellowish brown and pale brown, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a lighter colored surface layer than that of the Hoyleton soil
• Soils that are more sloping than the Hoyleton soil
• Soils that are more severely eroded than the Hoyleton soil
• Soils that have a seasonal high water table within a depth of 3 feet

*Contrasting inclusions:*
• The poorly drained Bonnie soils on narrow flood plains
• The moderately well drained Rend soils on side slopes and nose slopes of interfluves
• The poorly drained Wynoose soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.

• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4A

## 377B2—Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Benches
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess and erosional sediments over till
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Moderate
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—dark brown silt loam

*Subsoil:*
6 to 8 inches—dark brown silty clay loam
8 to 12 inches—brown, mottled silty clay loam
12 to 22 inches—brown, mottled silty clay
22 to 38 inches—brown, mottled silty clay loam
38 to 45 inches—light brownish gray, mottled silt loam
45 to 66 inches—mixed light brownish gray and yellowish brown, mottled silty clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a lighter colored surface layer than that of the Hoyleton soil
• Soils that are more sloping than the Hoyleton soil
• Soils that are more severely eroded than the Hoyleton soil
• Soils that have a seasonal high water table within a depth of 3 feet

*Contrasting inclusions:*
• The poorly drained Bonnie soils on narrow flood plains
• The moderately well drained Rend soils on side slopes and nose slopes of interfluves
• The poorly drained Wynoose soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.

• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion, wetness, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 421G—Kell silt loam, 35 to 60 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Woodland

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loamy erosional deposits or glacial drift over residuum derived from acid sandstone, siltstone, or shale
*Runoff:* Very rapid
*Available water capacity:* Low
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Typical Profile*

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

*Subsurface layer:*
3 to 7 inches—mixed dark grayish brown and dark yellowish brown silt loam

*Subsoil:*
7 to 13 inches—yellowish brown loam
13 to 25 inches—yellowish brown silty clay loam
25 to 35 inches—mixed yellowish brown and light brownish gray very channery silty clay loam

*Bedrock:*
35 to 60 inches—mixed yellowish brown and light brownish gray, weathered bedrock

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are less sloping than the Kell soil
- Soils that contain thicker erosional sediments than those of the Kell soil and are deeper over bedrock
- Soils that have 20 to 40 inches of loess

*Contrasting inclusions:*
- The somewhat poorly drained Blair and Bluford soils at the head of drainageways and on the upper side slopes
- The moderately well drained Grantsburg and Zanesville soils on the upper convex side slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
- Because of the slope, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management measures or considerations:*
- Because of the slope, this soil is unsuited to use for pasture and hay.

**Woodland**

*Management concerns:* Slope, erosion, windthrow, and plant competition
*Management measures or considerations:*
- The slope limits the use of equipment and increases the hazard of erosion.
- Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
- Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
- Because of the slope, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
- Because of the slope, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 7e
*Woodland ordination symbol:* 4R

## 518B—Rend silt loam, 2 to 5 percent slopes

### *Setting*

*Landform:* Benches
*Position on the landform:* Convex ridgetops on interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess over erosional sediments
*Runoff:* Medium
*Available water capacity:* Moderate or high
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 8 inches—yellowish brown silt loam

*Subsurface layer:*
8 to 11 inches—yellowish brown silt loam

*Subsoil:*
11 to 13 inches—mixed white and yellowish brown silt loam

13 to 23 inches—brown silty clay loam
23 to 33 inches—mixed yellowish brown and brown, mottled silty clay loam
33 to 39 inches—mixed yellowish brown and brown, brittle silt loam
39 to 77 inches—mixed yellowish brown and brown, brittle silty clay loam
77 to 83 inches—mixed light brownish gray and yellowish brown, mottled loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are redder and less brittle than the Rend soil
• Soils that are more severely eroded than the Rend soil
• Soils that are more sloping than the Rend soil
• Soils that formed in glacial drift

*Contrasting inclusions:*
• The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 518B2—Rend silt loam, 2 to 5 percent slopes, eroded

### *Setting*

*Landform:* Benches
*Position on the landform:* Side slopes of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess over erosional sediments
*Runoff:* Medium
*Available water capacity:* Moderate or high
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
7 to 11 inches—pale brown silty clay loam
11 to 44 inches—mixed yellowish brown and light brownish gray, mottled silty clay loam
44 to 60 inches—grayish brown, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Rend soil
• Soils that are more sloping than the Rend soil and are more severely eroded
• Soils that have a seasonal high water table within a depth of 3 feet

*Contrasting inclusions:*
• The poorly drained Bonnie soils on narrow flood plains
• The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
• The somewhat poorly drained Hurst soils in the adjacent less sloping areas

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 4A

## 518C2—Rend silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Benches
*Position on the landform:* Side slopes of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Loess over erosional sediments
*Runoff:* Medium
*Available water capacity:* Moderate
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—brown silt loam

*Subsoil:*
5 to 15 inches—yellowish brown silty clay loam
15 to 24 inches—yellowish brown, mottled silty clay loam
24 to 60 inches—yellowish brown, mottled, brittle silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are brittle at a depth of less than 24 inches
- Soils that are more severely eroded than the Rend soil
- Soils that are less sloping than the Rend soil
- Soils that formed in glacial drift

*Contrasting inclusions:*
- The poorly drained Bonnie soils on narrow flood plains
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Hurst soils in the adjacent less sloping areas

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
- This soil has only slight limitations affecting its use as woodland.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
- Onsite investigation is needed.

• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 4A

## 533—Urban land

### *Setting*

*Position on the landform:* Upland bench and terrace positions that have been modified by urban development activities
*Shape of areas:* Rectangular
*Major uses:* Urban development

### *Properties and Qualities*

• This map unit consists of areas that generally are covered by buildings higher than two stories, shopping centers, and parking lots. Because of extensive land smoothing, areas of this unit generally are nearly level or gently sloping.

### *Composition*

Urban land and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
• Small areas of silty Orthents that have been disturbed as a result of urban development

### *Use and Management*

• Vegetation in this map unit is confined to large planter boxes and areas where topsoil was brought in. Periodic supplemental watering is needed in these areas to sustain trees, shrubs, and grasses.

### *Interpretive Groups*

*Land capability classification:* Not assigned
*Woodland ordination symbol:* Not assigned

## 536—Dumps, mine

### *Setting*

*Position on the landform:* Upland areas modified by coal mining and preparation activities
*Shape of areas:* Rectangular
*Major use:* Storage of refuse adjacent to coal mines

### *Properties and Qualities*

• This map unit occurs as nearly level to very steep areas of coarse refuse deposits derived from the washing and separation of coal.

### *Composition*

Dumps, mine, and similar inclusions: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

### *Inclusions*

*Similar inclusions:*
• Small amounts of coal, sandstone, shale, and pyrite mixed in with the gob

*Contrasting inclusions:*
• Small areas of silty Orthents that have been disturbed as a result of mine development

### *Use and Management*

• Most areas support little vegetation. Areas on the lower slopes near the perimeter may support plants that grow under extremely acid conditions. Some areas are reclaimed. They are covered with about 4 feet of soil material, which provides a growing medium for various plants.

### *Interpretive Groups*

*Land capability classification:* Not assigned
*Woodland ordination symbol:* Not assigned

## 551D2—Gosport loam, 10 to 18 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Pasture and hay

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Parent material:* Residuum over soft shale bedrock
*Runoff:* Rapid
*Available water capacity:* Low

*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* Moderate

### *Typical Profile*

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

*Subsoil:*
5 to 10 inches—brown silty clay
10 to 14 inches—yellowish brown, mottled silty clay
14 to 27 inches—pale brown, mottled silty clay loam

*Bedrock:*
27 to 46 inches—light gray silt loam residuum
46 to 60 inches—gray shale

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less sloping than the Gosport soil
• Soils that contain erosional sediments and are deeper over bedrock than the Gosport soil
• Soils that are shallower over bedrock than the Gosport soil
• Soils that have a surface layer of silt loam

*Contrasting inclusions:*
• The somewhat poorly drained Blair and Bluford soils at the head of drainageways and on the upper side slopes
• The moderately well drained Grantsburg and Zanesville soils on the upper convex side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Slope and the low available water capacity
*Management measures or considerations:*
• Because of the slope and the low available water capacity, this soil is generally unsuited to use as cropland.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Seedling mortality and windthrow
*Management measures or considerations:*
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential, the slope, and depth to rock
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Building on the contour or land shaping helps to overcome the slope.
• The depth to rock is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability and depth to rock
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* 2C

## 583B—Pike silt loam, 2 to 5 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Convex ridgetops on interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over glacial outwash
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 4 inches—brown silt loam

*Subsurface layer:*
4 to 8 inches—mixed brown and dark yellowish brown silt loam

*Subsoil:*
8 to 38 inches—strong brown silty clay loam
38 to 57 inches—strong brown silt loam
57 to 75 inches—yellowish red clay loam

### *Composition*

Pike soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
- Soils that are less red and more brittle than the Pike soil
- Soils that are more severely eroded than the Pike soil
- Soils that are more sloping than the Pike soil
- Soils that formed over bedrock

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
- This soil has only slight limitations affecting its use as a site for dwellings. Onsite investigation is needed.

**Septic tank absorption fields**

*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2e
*Woodland ordination symbol:* 5A

## 583C2—Pike silt loam, 5 to 10 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Convex ridgetops and side slopes of interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over glacial outwash
*Runoff:* Medium
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 6 inches—brown silt loam

*Subsoil:*
6 to 28 inches—dark yellowish brown and yellowish brown silty clay loam
28 to 41 inches—strong brown and reddish yellow silt loam
41 to 78 inches—yellowish red clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
- Soils that are less red and more brittle than the Pike soil
- Soils that are more severely eroded than the Pike soil
- Soils that are more sloping than the Pike soil
- Soils that formed over bedrock

*Contrasting inclusions:*
- The somewhat poorly drained Creal soils at the head of drainageways and on concave side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
- This soil has only slight limitations affecting its use as a site for dwellings. Onsite investigation is needed.

**Septic tank absorption fields**

*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3e
*Woodland ordination symbol:* 5A

## 639—Wynoose silt loam, bench

### *Setting*

*Landform:* Benches
*Position on the landform:* Broad flats and depressions
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained
*Permeability:* Very slow
*Parent material:* Loess and erosional sediments over a paleosol that formed in till
*Runoff:* Slow or very slow
*Available water capacity:* High or moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
3 to 22 inches—mixed light gray and gray, mottled silt loam

*Subsoil:*
22 to 37 inches—gray, mottled silty clay
37 to 47 inches—gray, mottled silty clay loam
47 to 60 inches—mixed light gray and gray, mottled silty clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Wynoose soil
• Soils that have a thicker surface layer and subsurface layer than those of the Wynoose soil
• Soils that are more sloping than the Wynoose soil
• Soils that have a seasonal high water table at a depth of more than 2 feet

*Contrasting inclusions:*
• The somewhat poorly drained Hurst soils in drainageways and on convex slopes and side slopes
• The poorly drained Okaw soils in closed depressions and at the head of drainageways

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 4W

## 640A—Bluford silt loam, bench, 0 to 2 percent slopes

### *Setting*

*Landform:* Benches
*Position on the landform:* Broad, convex interfluves
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Parent material:* Loess over silty or loamy erosional sediments
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* Perched at a depth of 1 to 3 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Moderate
*Potential for frost action:* High

### *Typical Profile*

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

*Subsurface layer:*
10 to 17 inches—brown silt loam

*Subsoil:*
17 to 30 inches—brown, mottled silty clay loam
30 to 41 inches—brown and yellowish brown, mottled silty clay
41 to 52 inches—brown, mottled silty clay loam
52 to 60 inches—light brownish gray, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Bluford soil
• Soils that have a thicker surface layer and subsurface layer than those of the Bluford soil
• Soils that are more sloping than the Bluford soil
• Soils that have a seasonal high water table at a depth of less than 2 feet

*Contrasting inclusions:*
• The moderately well drained Rend soils on nose slopes and side slopes
• The somewhat poorly drained Hurst soils in adjacent areas

### *Use and Management*

**Cropland**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• Measures that maintain a drainage system are needed.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management measures or considerations:*
• This soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Wetness and the shrink-swell potential
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 4A

## 786D2—Frondorf silt loam, 10 to 18 percent slopes, eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loess over residuum derived from acid sandstone, siltstone, and shale
*Runoff:* Rapid
*Available water capacity:* Low
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* Low

### *Typical Profile*

*Surface layer:*
0 to 6 inches—mixed dark grayish brown and yellowish brown silt loam

*Subsurface layer:*
6 to 10 inches—yellowish brown silt loam

*Subsoil:*
10 to 24 inches—light yellowish brown, mottled silty clay loam
24 to 35 inches—mixed yellowish brown and gray channery sandy clay loam

*Bedrock:*
35 to 60 inches—mixed yellowish brown and gray, weathered sandstone and siltstone

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that are less sloping than the Frondorf soil
• Soils that contain erosional sediments and are deeper over bedrock than the Frondorf soil

*Contrasting inclusions:*
• The somewhat poorly drained Blair and Bluford soils at the head of drainageways and on the upper side slopes
• The moderately well drained Grantsburg and Zanesville soils on the upper convex side slopes

### *Use and Management*

**Cropland**

*Management concerns:* Erosion and tilth
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* Slope and depth to rock
- Onsite investigation is needed.
- Building on the contour or land shaping helps to overcome the slope.
- The depth to rock is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

**Septic tank absorption fields**

*Management concerns:* Depth to rock
*Management measures or considerations:*
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 8A

## 802B—Orthents, loamy, undulating

### *Setting*

*Position on the landform:* Uplands; modified by construction at work sites
*Major uses:* Cut and fill areas, borrow areas, and surface-mined areas

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained to well drained
*Permeability:* Moderately slow
*Parent material:* Mixed
*Runoff:* Medium or slow
*Available water capacity:* High
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### *Composition*

Orthents and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

### *Inclusions*

*Similar inclusions:*
- Areas that are more sloping than the Orthents
- Small areas of natural soil
- Areas that have a high content of rock fragments, cinders, bricks, or other debris

*Contrasting inclusions:*
- Small areas where buildings, roads, railroads, parking lots, or storage facilities cover the surface

### *Interpretive Groups*

*Land capability classification:* Not assigned
*Woodland ordination symbol:* Not assigned

## 802F—Orthents, loamy, hilly and very hilly

### Setting

*Position on the landform:* Uplands; modified by construction at work sites
*Major uses:* Cut and fill areas, borrow areas, and surface-mined areas

### Soil Properties and Qualities

*Drainage class:* Somewhat poorly drained to well drained
*Permeability:* Moderately slow
*Parent material:* Mixed
*Runoff:* Very rapid or rapid
*Available water capacity:* High
*Seasonal high water table:* 4 to 6 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### Composition

Orthents and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

### Inclusions

*Similar inclusions:*
- Areas that are less sloping than the Orthents
- Small areas of natural soil
- Areas that have a high content of rock fragments, cinders, bricks, or other debris

*Contrasting inclusions:*
- Small areas where bridges, roads, or railroads cover the surface

### Interpretive Groups

*Land capability classification:* Not assigned
*Woodland ordination symbol:* Not assigned

## 823B—Schuline silt loam, 2 to 5 percent slopes

### Setting

*Landform:* Uplands
*Position on the landform:* Reclaimed surface-mined areas
*Major use:* Cultivated crops

### Soil Properties and Qualities

*Drainage class:* Well drained
*Permeability:* Slow
*Parent material:* Mine spoil
*Runoff:* Medium
*Available water capacity:* Moderate or high
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* Moderate
*Shrink-swell potential:* Moderate
*Potential for frost action:* Moderate

### Typical Profile

*Surface layer:*
0 to 3 inches—dark grayish brown silt loam
3 to 15 inches—mixed dark grayish brown and very dark gray silty clay loam

*Substratum:*
15 to 24 inches—mixed brown, black, and yellowish brown channery silty clay loam
24 to 31 inches—mixed dark yellowish brown and gray silty clay loam
31 to 52 inches—mixed very dark gray, dark yellowish brown, gray, and very pale brown channery silty clay loam
52 to 60 inches—mixed brown, black, gray, and grayish green channery clay loam

### Composition

Schuline soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

### Inclusions

*Similar inclusions:*
- Well drained soils that contain more rock fragments than the Schuline soil
- Soils that are more sloping than the Schuline soil
- Areas of Orthents

*Contrasting inclusions:*
- Soils in small depressions that are subject to ponding and that formed as a result of differential settling (fig. 10)

### Use and Management

**Cropland**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Figure 10.—Ponding of surface water in a small depression or sink formed by differential settling in a surface-mined area.**

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential
*Management measures or considerations:*
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

***Interpretive Groups***

*Land capability classification:* 2e
*Woodland ordination symbol:* Not assigned

## 866—Dumps, slurry

***Setting***

*Landform:* Uplands
*Position on the landform:* Areas modified by the activities of coal preparation plants
*Shape of areas:* Rectangular
*Size of areas:* 8 to 25 acres
*Major use:* Slurry storage adjacent to coal mines

***Soil Properties and Qualities***

• This map unit occurs as nearly level areas of loamy refuse material that has settled out from slurry derived from coal preparation plants. The slurry is pumped into a pond or into a box cut. Pumping continues until mining activities have ceased or until the pond or box cut has filled. In most areas the material then undergoes oxidation for several years and becomes strongly acid to extremely acid.

***Composition***

Dumps, slurry: 100 percent

***Use and Management***

• Most areas support little or no vegetation. Some areas support plants that grow under extremely acid conditions.

***Interpretive Groups***

*Land capability classification:* Not assigned
*Woodland ordination symbol:* Not assigned

## 871D—Lenzburg gravelly silty clay loam, 7 to 20 percent slopes

***Setting***

*Landform:* Uplands
*Position on the landform:* Surface-mined areas
*Major use:* Wildlife habitat

***Soil Properties and Qualities***

*Drainage class:* Well drained
*Permeability:* Moderately slow
*Parent material:* Mine spoil

*Runoff:* Medium or rapid
*Available water capacity:* Moderate
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low to moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 5 inches—mixed gray and brownish yellow gravelly silty clay loam

*Substratum:*
5 to 9 inches—gray channery silty clay loam
9 to 21 inches—mixed light brownish gray and brownish yellow silty clay loam
21 to 39 inches—mixed yellowish brown and light gray silty clay loam
39 to 60 inches—mixed light brownish gray, black, and dark gray channery clay

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Well drained soils that contain more or fewer rock fragments than the Lenzburg soil
• Soils that are less sloping than the Lenzburg soil

*Contrasting inclusions:*
• Soils in small depressions that are subject to ponding and that formed as a result of differential settling

### *Use and Management*

**Cropland**

*Management concerns:* Slope and erosion
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential and the slope
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Building on the contour or land shaping helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 4e
*Woodland ordination symbol:* 5A

## 871G—Lenzburg gravelly silty clay loam, 20 to 60 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Surface-mined areas
*Major use:* Wildlife habitat

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderately slow
*Parent material:* Mine spoil
*Runoff:* Rapid
*Available water capacity:* Moderate
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low to moderate
*Erosion hazard:* Severe
*Shrink-swell potential:* High
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 4 inches—mixed brown and gray gravelly silty clay loam

*Substratum:*
4 to 20 inches—mixed brown, light olive brown, and gray gravelly silty clay loam
20 to 43 inches—mixed light olive brown, gray, and yellowish brown gravelly silty clay loam
43 to 60 inches—mixed gray and black cobbly clay loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Well drained soils that contain more or fewer rock fragments than the Lenzburg soil
• Soils that are less sloping than the Lenzburg soil

*Contrasting inclusions:*
• Soils in small depressions that are subject to ponding and that formed as a result of differential settling

### *Use and Management*

**Cropland**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use for pasture and hay.

**Woodland**

*Management concerns:* Slope, erosion, and plant competition

*Management measures or considerations:*
• The slope limits the use of equipment and increases the hazard of erosion.
• Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
• Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the slope, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 7e
*Woodland ordination symbol:* 5R

## 908F—Hickory-Kell silt loams, 18 to 35 percent slopes

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes
*Major uses:* Pasture and woodland

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate

*Parent material:* Hickory—loess over till; Kell—loamy erosional deposits or glacial drift over residuum derived from acid sandstone, siltstone, or shale
*Runoff:* Rapid
*Available water capacity:* Hickory—moderate; Kell—low
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Moderately low
*Erosion hazard:* Severe
*Shrink-swell potential:* Hickory—low; Kell—moderate
*Potential for frost action:* Moderate

### *Typical Profile*

**Hickory**

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

*Subsurface layer:*
3 to 11 inches—brown silt loam
11 to 16 inches—dark yellowish brown silt loam

*Subsoil:*
16 to 23 inches—strong brown loam
23 to 36 inches—strong brown clay loam
36 to 43 inches—yellowish brown clay loam
43 to 60 inches—yellowish brown, mottled loam

**Kell**

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

*Subsurface layer:*
3 to 7 inches—mixed dark grayish brown and dark yellowish brown silt loam

*Subsoil:*
7 to 13 inches—yellowish brown loam
13 to 25 inches—yellowish brown silty clay loam
25 to 35 inches—mixed yellowish brown and light brownish gray very channery silty clay loam

*Bedrock:*
35 to 60 inches—mixed yellowish brown and light brownish gray, weathered bedrock

### *Composition*

Hickory and Kell soils and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

### *Inclusions*

*Similar inclusions:*
- Soils that are less sloping
- Soils that are more severely eroded

*Contrasting inclusions:*
- The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
- Because of the slope, these soils are unsuited to use as cropland.

**Pasture**

*Management concerns:* Slope, erosion, and tilth
*Management measures or considerations:*
- The slope limits the use of equipment and increases the hazard of erosion.
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

**Woodland**

*Management concerns:* Slope, erosion, windthrow, and plant competition
*Management measures or considerations:*
- The slope limits the use of equipment and increases the hazard of erosion.
- Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
- Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
- Because of the slope, these soils are unsuited to use as sites for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
- Because of the slope, these soils are unsuited to use as sites for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* Hickory—5R; Kell—4R

## 927D3—Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded

### *Setting*

*Landform:* Uplands
*Position on the landform:* Side slopes of drainageways
*Major use:* Cultivated crops

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Blair—moderately slow; Atlas—very slow
*Parent material:* Blair—loess and/or silty or loamy water-worked sediments; Atlas—loess and the underlying paleosol, which formed in till
*Runoff:* Rapid
*Available water capacity:* Blair—high; Atlas—moderate
*Seasonal high water table:* Blair—1.5 to 3.5 feet below the surface; Atlas—perched at a depth of 1 to 2 feet
*Organic matter content:* Low
*Erosion hazard:* Severe
*Shrink-swell potential:* Blair—moderate; Atlas—high
*Potential for frost action:* High

### *Typical Profile*

**Blair**

*Surface layer:*
0 to 5 inches—mixed dark brown and yellowish brown silty clay loam

*Subsoil:*
5 to 11 inches—mixed yellowish brown and light brownish gray, mottled silty clay loam
11 to 18 inches—light brownish gray, mottled clay loam
18 to 25 inches—light brownish gray, mottled silt loam
25 to 35 inches—light brownish gray silt loam
35 to 53 inches—light brownish gray, mottled silty clay loam
53 to 63 inches—light brownish gray, mottled loam
63 to 78 inches—yellowish brown, mottled silty clay loam
78 to 83 inches—light brownish gray, mottled silt loam
83 to 100 inches—yellowish brown loam

**Atlas**

*Surface layer:*
0 to 4 inches—mixed dark yellowish brown and yellowish brown silty clay loam
4 to 8 inches—mixed yellowish brown and gray silty clay loam

*Subsoil:*
8 to 20 inches—dark gray silty clay
20 to 43 inches—light gray, mottled clay loam
43 to 60 inches—mixed light brownish gray and yellowish brown silty clay loam

### *Composition*

Blair and Atlas soils and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

### *Inclusions*

*Similar inclusions:*
- Somewhat poorly drained soils that contain more loess in the profile
- Soils that are less sloping

*Contrasting inclusions:*
- The moderately well drained Plumfield soils, which are more brittle than the major soils
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

### *Use and Management*

**Cropland**

*Management measures or considerations:*
• Because of the slope and the hazard of erosion, these soils are unsuited to use as cropland.

**Pasture and hay**

*Management concerns:* Erosion and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Atlas—seedling mortality and windthrow
*Management measures or considerations:*
• The Blair soil has only slight limitations affecting its use as woodland.
• The woodland should be protected from fire and from grazing by livestock.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• These soils are suitable for upland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management concerns:* The shrink-swell potential, wetness, and the slope
*Management measures or considerations:*
• Onsite investigation is needed.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.
• Building on the contour or land shaping helps to overcome the slope.

**Septic tank absorption fields**

*Management concerns:* Wetness and restricted permeability
*Management measures or considerations:*
• Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

### *Interpretive Groups*

*Land capability classification:* 6e
*Woodland ordination symbol:* Blair—4A; Atlas—4C

## 1085—Jacob silty clay, undrained, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Long
*Major uses:* Wildlife habitat and woodland

### *Soil Properties and Qualities*

*Drainage class:* Very poorly drained
*Permeability:* Very slow
*Parent material:* Clayey slackwater sediments
*Runoff:* Ponded
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Moderate
*Erosion hazard:* None
*Shrink-swell potential:* Very high
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 2 inches—very dark grayish brown silty clay

*Subsoil:*
2 to 31 inches—dark gray clay
31 to 43 inches—dark grayish brown, mottled silty clay
43 to 60 inches—grayish brown, mottled clay

### *Composition*

Jacob soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
- Soils that have a darker surface layer than that of the Jacob soil
- Soils that contain less clay than the Jacob soil
- Soils that have a seasonal high water table at a depth of more than 1 foot; in the higher areas

### *Use and Management*

**Cropland**

*Management measures or considerations:*
- Because of the wetness and flooding, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management measures or considerations:*
- Because of the wetness and flooding, this soil is unsuited to use for pasture and hay.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
- Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
- Areas of this soil provide habitat and a water supply for wildlife. Shallow water areas generally are available or can be developed easily.
- During periods when it is flooded, this soil furnishes temporary feeding and nesting sites for waterfowl.
- The habitat should be protected from fire and from grazing by livestock.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 5w
*Woodland ordination symbol:* 4W

## 1108—Bonnie silt loam, undrained, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Long
*Major uses:* Wildlife habitat and woodland

### *Soil Properties and Qualities*

*Drainage class:* Very poorly drained
*Permeability:* Moderately slow
*Parent material:* Silty alluvium
*Runoff:* Ponded
*Available water capacity:* Very high
*Seasonal high water table:* 2 feet above to 1 foot below the surface
*Organic matter content:* Moderately low
*Erosion hazard:* None
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

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

*Substratum:*
6 to 9 inches—mixed grayish brown and gray, mottled silt loam
9 to 20 inches—gray, mottled silt loam
20 to 28 inches—light brownish gray, mottled silt loam
28 to 60 inches—light gray, mottled silt loam

### *Composition*

Bonnie soil: 100 percent

### *Use and Management*

**Cropland**

*Management measures or considerations:*
• Because of the flooding and ponding, this soil is unsuited to use as cropland.

**Pasture and hay**

*Management measures or considerations:*
• Because of the ponding, this soil is unsuited to use for pasture and hay.

**Woodland**

*Management measures or considerations:*
• Because of the ponding, this soil is unsuited to use as woodland (fig. 11).

**Wildlife habitat**

*Management measures or considerations:*
• Areas of this soil provide habitat and a water supply for wildlife. Shallow water areas generally are available or can be developed easily.
• During periods when it is flooded, this soil furnishes temporary feeding and nesting sites for waterfowl.
• The habitat should be protected from fire and from grazing by livestock.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and ponding, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and ponding, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 5w
*Woodland ordination symbol:* Not assigned

## 3072—Sharon silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland, pasture, and woodland

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Parent material:* Silty alluvium
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Low or moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 9 inches—mixed brown and dark brown silt loam
9 to 13 inches—very dark grayish brown silt loam

*Substratum:*
13 to 17 inches—mixed yellowish brown and brown silt loam
17 to 29 inches—yellowish brown silt loam
29 to 60 inches—yellowish brown, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Sharon soil
• Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

*Contrasting inclusions:*
• The very poorly drained Bonnie soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Flooding and tilth
*Management measures or considerations:*
• A well maintained surface drainage system helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Figure 11.—Because of long periods of ponding, areas of Bonnie silt loam, undrained, frequently flooded, are generally unsuitable for commercial timber production. This map unit is suited to use as habitat for wildlife.**

### Pasture and hay

*Management concerns:* Flooding and tilth
*Management measures or considerations:*
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

### Woodland

*Management concerns:* Plant competition
*Management measures or considerations:*
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The woodland should be protected from fire and from grazing by livestock.

### Wildlife habitat

*Management measures or considerations:*
- Wildlife habitat should be protected from fire and from grazing by livestock.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.

• This soil is suitable for wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 7A

## 3085—Jacob silty clay, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland and woodland

### *Soil Properties and Qualities*

*Drainage class:* Very poorly drained
*Permeability:* Very slow
*Parent material:* Clayey slackwater sediments
*Runoff:* Very slow
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Very high
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 6 inches—very dark gray silty clay

*Subsoil:*
6 to 41 inches—olive gray, mottled clay
41 to 53 inches—olive gray, mottled silty clay
53 to 60 inches—olive gray, mottled clay

### *Composition*

Jacob soil and similar inclusions: 95 percent
Contrasting inclusions: 5 percent

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Jacob soil
• Soils that contain less clay than the Jacob soil
• Soils that have a seasonal high water table at a depth of more than 1 foot; in the higher areas that are flooded less frequently than areas of the Jacob soil

*Contrasting inclusions:*
• Soils in small depressions that are subject to ponding

### *Use and Management*

**Cropland**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A well maintained surface drainage system reduces wetness and helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.

• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 4w
*Woodland ordination symbol:* 4W

## 3108—Bonnie silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland, pasture, and woodland

### *Soil Properties and Qualities*

*Drainage class:* Very poorly drained
*Permeability:* Moderately slow
*Parent material:* Silty alluvium
*Runoff:* Very slow
*Available water capacity:* Very high
*Seasonal high water table:* At the surface to 1 foot below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 5 inches—brown silt loam
5 to 10 inches—mixed light brownish gray and dark grayish brown, mottled silt loam

*Substratum:*
10 to 60 inches—gray and light gray, mottled silt loam

### *Composition*

Bonnie soil and similar inclusions: 100 percent

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Bonnie soil
• Soils that are less acid than the Bonnie soil
• Soils that have a seasonal high water table at a depth of more than 1 foot

### *Use and Management*

**Cropland**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A well maintained surface drainage system reduces wetness and helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition

*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 5W

## 3226—Wirt silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major use:* Cropland

### *Soil Properties and Qualities*

*Drainage class:* Well drained
*Permeability:* Moderate
*Parent material:* Loamy alluvium
*Runoff:* Slow
*Available water capacity:* High
*Seasonal high water table:* At a depth of more than 6 feet
*Organic matter content:* Low or moderately low
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* Moderate

### *Typical Profile*

*Surface layer:*
0 to 12 inches—dark grayish brown and brown silt loam

*Subsoil:*
12 to 36 inches—brown silt loam

*Substratum:*
36 to 46 inches—brown, stratified silt loam and loam
46 to 60 inches—yellowish brown sandy loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have less sand than the Wirt soil
• Soils that have a darker surface layer than that of the Wirt soil
• Soils that have a seasonal high water table at a depth of less than 6 feet; in the lower areas

*Contrasting inclusions:*
• The very poorly drained Bonnie soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Flooding and tilth
*Management measures or considerations:*
• A well maintained surface drainage system helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface

cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Flooding and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 8A

## 3336—Wilbur silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland, pasture, and woodland

### *Soil Properties and Qualities*

*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Parent material:* Silty alluvium
*Runoff:* Slow
*Available water capacity:* Very high
*Seasonal high water table:* 1.5 to 2.0 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

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

*Subsoil:*
8 to 19 inches—brown, mottled silt loam

*Substratum:*
19 to 60 inches—brown, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have more sand than the Wilbur soil
• Soils that have a darker surface layer than that of the Wilbur soil
• Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

*Contrasting inclusions:*
• The very poorly drained Bonnie soils in shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Flooding and tilth

*Management measures or considerations:*
• A well maintained surface drainage system helps to protect areas of this soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Flooding and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 2w
*Woodland ordination symbol:* 8A

## 3382—Belknap silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland, pasture, and woodland

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Parent material:* Silty alluvium
*Runoff:* Slow
*Available water capacity:* Very high or high
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

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

*Substratum:*
9 to 19 inches—mixed yellowish brown and grayish brown, mottled silt loam
19 to 60 inches—light brownish gray, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Belknap soil
• Soils that have a seasonal high water table at a depth of more than 3 feet; in the higher areas
• Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

*Contrasting inclusions:*
• The very poorly drained Bonnie and Cape soils in undrained, shallow closed depressions

• Areas that are less than 60 inches deep over Pennsylvanian-age shale bedrock

### *Use and Management*

**Cropland**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A well maintained surface drainage system reduces the wetness and helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to minimize surface crusting and maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 6A

## 3415—Orion silt loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major use:* Cropland

### *Soil Properties and Qualities*

*Drainage class:* Somewhat poorly drained
*Permeability:* Moderate
*Parent material:* Silty alluvium
*Runoff:* Slow
*Available water capacity:* Very high
*Seasonal high water table:* 1 to 3 feet below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* Low
*Potential for frost action:* High

### *Typical Profile*

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

*Substratum:*
7 to 19 inches—dark brown, mottled silt loam
19 to 24 inches—dark grayish brown, mottled silt loam
24 to 42 inches—mixed very dark gray and very dark grayish brown, mottled silt loam
42 to 60 inches—mixed grayish brown and very dark gray, mottled silt loam

### *Composition*

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

### *Inclusions*

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Orion soil

• Soils that have a seasonal high water table at a depth of more than 3 feet; in the higher areas
• Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

*Contrasting inclusions:*
• The very poorly drained Bonnie soils in undrained, shallow closed depressions

### *Use and Management*

**Cropland**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A well maintained surface drainage system reduces the wetness and helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

**Pasture and hay**

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

**Woodland**

*Management concerns:* Plant competition
*Management measures or considerations:*
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

**Wildlife habitat**

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

**Dwellings**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

**Septic tank absorption fields**

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

### *Interpretive Groups*

*Land capability classification:* 3w
*Woodland ordination symbol:* 2W

## 3422—Cape silty clay loam, frequently flooded

### *Setting*

*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Flooding frequency:* Frequent
*Flooding duration:* Brief
*Major uses:* Cropland and woodland

### *Soil Properties and Qualities*

*Drainage class:* Poorly drained
*Permeability:* Very slow
*Parent material:* Clayey slackwater sediments
*Runoff:* Very slow
*Available water capacity:* Moderate
*Seasonal high water table:* Perched at the surface to 1 foot below the surface
*Organic matter content:* Moderately low or moderate
*Erosion hazard:* None or slight
*Shrink-swell potential:* High
*Potential for frost action:* High

### *Typical Profile*

*Surface layer:*
0 to 3 inches—dark grayish brown silty clay loam
3 to 7 inches—mixed very dark grayish brown and brown silty clay loam

*Subsoil:*
7 to 17 inches—grayish brown, mottled silty clay
17 to 46 inches—mixed gray and brown, mottled silty clay
46 to 59 inches—gray, mottled silty clay

59 to 64 inches—light brownish gray, mottled silty clay

## Composition

Cape soil and similar inclusions: 95 percent
Contrasting inclusions: 5 percent

## Inclusions

*Similar inclusions:*
• Soils that have a darker surface layer than that of the Cape soil
• Soils that contain more clay or less clay than the Cape soil
• Soils that have a seasonal high water table at a depth of more than 1 foot and that are less frequently flooded than the Cape soil; in the higher areas

*Contrasting inclusions:*
• The very poorly drained Bonnie or Jacob soils in small depressions that are subject to ponding

## Use and Management

### Cropland

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A well maintained surface drainage system reduces the wetness and helps to protect the soil from flooding during the growing season.
• Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

### Pasture and hay

*Management concerns:* Wetness, flooding, and tilth
*Management measures or considerations:*
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

### Woodland

*Management concerns:* Wetness, seedling mortality, windthrow, and plant competition
*Management measures or considerations:*
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The seedling mortality rate can be reduced by planting mature stock and clearing all vegetation within 2 feet of the planted seedlings.
• Harvesting methods that do not isolate the remaining trees or leave them widely spaced reduce the hazard of windthrow. Only high-value trees should be removed from a strip 50 feet wide along the west and south edges of the woodland.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The woodland should be protected from fire and from grazing by livestock.

### Wildlife habitat

*Management measures or considerations:*
• Wildlife habitat should be protected from fire and from grazing by livestock.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

### Dwellings

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

### Septic tank absorption fields

*Management measures or considerations:*
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

## Interpretive Groups

*Land capability classification:* 3w
*Woodland ordination symbol:* 5W

# 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.

### 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 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 the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main 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 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

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 414,330 acres in the survey area, or nearly 64 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, but associations 1 and 6, which are described under the heading "General Soil Map Units," have the highest percentage of prime farmland.

A recent trend in land use in some parts of the survey area 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, wetness, and droughtiness, 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

Table 8 can help woodland owners or forest managers plan the use of soils for wood crops (fig. 12). 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; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

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

**Figure 12.—Woodland in an area of Ava silt loam, 2 to 5 percent slopes.**

seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

*Windthrow hazard* is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

*Plant competition* ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully

stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

*Trees to manage* 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 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

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 barley.

*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, wildrice, saltgrass, 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, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

*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. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

**Building Site Development**

Table 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.

The table 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.

The table 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 the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

*Daily cover for landfill* is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

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 this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed

that soil layers will be mixed during excavation 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 or have a water table at a depth of 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; are wet; or 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 organic matter content. 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; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in

construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways (fig. 13).

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

*Aquifer-fed excavated ponds* are pits or dugouts that extend to a ground-water aquifer or to a depth

**Figure 13.—This grassed waterway in a soybean field helps to control erosion and surface-water runoff in an area of Bluford soils.**

below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

*Drainage* is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, 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 wind erosion 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 wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

# Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

## 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. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 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 organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated*

*sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

## Physical and Chemical Properties

Tables 17 and 18 show 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.

In table 17, *clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

*Moist bulk density* is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after 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.

*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 buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

*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.

*Erosion factors* are shown in table 17 as the K factor (Kw and Kf) and the T factor. 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) and the Revised Universal Soil Loss Equation (RUSLE) 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 and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor Kw* indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

*Erosion factor Kf* indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

*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 wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, 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 wind erosion because of coarse fragments on the surface or because of surface wetness.

*Wind erodibility index* is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

In table 18, *cation-exchange capacity* is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

*Effective cation-exchange capacity* refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

*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.

*Calcium carbonate* equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

*Sodium adsorption ratio* (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration

divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

## Soil and Water Features

Tables 19 and 20 give estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

In table 19, *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 the table, the first letter is for drained areas and the second is for undrained areas.

*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 (redoximorphic features) in the soil. Indicated in the table are depth to the seasonal high water table, the kind of water table, 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 the table.

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. “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.

*Ponding* is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. *Ponding duration* classes are the same as those for flooding. *Surface water depth* refers to the depth of the water above the surface of the soil.

*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.

The table 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, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the

extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

In table 20, a *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*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 also is 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 21 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 horizonation, 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
*Landform:* Uplands
*Position on the landform:* Side slopes along drainageways
*Parent material:* Loess and the underlying paleosol, which developed in Illinoian till

*Slope range:* 5 to 18 percent

**Taxonomic classification:** Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

### Typical Pedon

Atlas silty clay loam, in an area of Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded; 2,110 feet west and 825 feet north of the southeast corner of sec. 5, T. 3 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 4 inches; 20 percent yellowish brown (10YR 5/4) and 80 percent dark yellowish brown (10YR 4/4) silty clay loam, very pale brown (10YR 7/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; few fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

Ap/Btg—4 to 8 inches; 70 percent yellowish brown (10YR 5/4) and 30 percent gray (10YR 5/1) silty clay loam; moderate medium angular blocky structure; firm; common very fine and fine roots between peds; few prominent strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; strongly acid; abrupt smooth boundary.

Btg1—8 to 20 inches; dark gray (10YR 4/1) silty clay; strong fine and medium prismatic structure parting to strong fine and medium angular blocky; very firm; few very fine roots between peds; many faint very dark gray (10YR 3/1) continuous clay films on faces of peds and in pores; few faint strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; few fine rounded barite crystals; strongly acid; abrupt smooth boundary.

Btg2—20 to 37 inches; light gray (10YR 7/2) clay loam; many medium distinct very pale brown (10YR 7/4) mottles; moderate medium prismatic structure; firm; few very fine roots between peds; common distinct grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; few prominent black (7.5YR 2/0) patchy manganese or iron-manganese stains on faces of peds and in pores; few prominent strong brown (7.5YR 5/6) iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; few fine rounded barite crystals; moderately acid; clear smooth boundary.

Btg3—37 to 43 inches; light gray (10YR 7/1) clay loam; many coarse prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; few very fine roots between peds; few prominent strong brown (7.5YR 5/6) patchy iron stains in root channels and/or pores; few prominent black (7.5YR 2/0) patchy manganese or iron-manganese stains on faces of peds and in pores; common distinct grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; few fine rounded barite crystals; slightly acid; clear smooth boundary.

Btg4—43 to 60 inches; 50 percent light brownish gray (10YR 6/2) and 50 percent yellowish brown (10YR 5/6) silty clay loam; moderate medium prismatic structure; firm; few very fine roots between peds; common prominent strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few distinct dark grayish brown (10YR 4/2) patchy clay films in root channels and/or pores; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common fine and medium rounded soft masses of iron-manganese; few fine rounded barite crystals; neutral.

### Range in Characteristics

*Thickness of the loess:* 0 to 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to the paleosol:* 5 to 30 inches

*Ap horizon:*
- Hue—10YR
- Value—4 or 5
- Chroma—2 to 4
- Texture—silty clay loam or silt loam

*Ap/Btg horizon:*
- Hue—10YR
- Value—4 to 6
- Chroma—1 to 3
- Texture—silty clay loam or silt loam

*Btg horizon:*
- Hue—10YR, 2.5Y, or N
- Value—4 to 7
- Chroma—0 to 2
- Texture—silty clay, silty clay loam, clay loam, or clay

## *Ava Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Landform:* Uplands
*Position on the landform:* Ridgetops and side slopes of interfluves

*Parent material:* Loess and erosional sediments over Illinoian till
*Slope range:* 2 to 10 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Oxyaquic Fragiudalfs

### Typical Pedon

Ava silt loam, 2 to 5 percent slopes, 740 feet west and 2,400 feet north of the southeast corner of sec. 34, T. 4 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

E—5 to 13 inches; yellowish brown (10YR 5/6) silt loam; moderate medium platy structure; firm; few very fine roots throughout; few fine rounded soft masses of iron-manganese; very strongly acid; abrupt smooth boundary.

BE—13 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots between peds; many distinct light gray (10YR 7/1) continuous skeletans (silt) on faces of peds; few fine rounded soft masses of iron-manganese; very strongly acid; abrupt smooth boundary.

Bt1—15 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots between peds; many faint brown (7.5YR 4/4) continuous clay films on faces of peds and few distinct light gray (10YR 7/1) patchy skeletans (silt); few fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

Bt2—26 to 33 inches; 70 percent yellowish brown (10YR 5/6) and 30 percent brown (10YR 5/3) silty clay loam; few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure; very firm; few very fine roots between peds; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and few faint dark yellowish brown (10YR 4/4) discontinuous clay films; few fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

2Btx1—33 to 54 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent brown (10YR 5/3) silty clay loam; common fine distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium platy; very firm, brittle; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and few faint brown (10YR 4/3) discontinuous clay films; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btx2—54 to 62 inches; 60 percent yellowish brown (10YR 5/4) and 40 percent grayish brown (10YR 5/2) silt loam; common fine and medium distinct pale brown (10YR 6/3) mottles; weak coarse prismatic structure parting to weak medium platy; very firm, brittle; very few faint brown (10YR 4/3) discontinuous clay films on faces of peds; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

3Btx3—62 to 80 inches; yellowish brown (10YR 5/6) loam; common fine and medium distinct pale brown (10YR 6/3) mottles; weak coarse prismatic structure; very firm, brittle; very few distinct brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; slightly acid; 1 percent igneous pebbles.

### Range in Characteristics

*Thickness of the loess:* 20 to 35 inches
*Depth to bedrock:* More than 60 inches
*Carbonates:* None
*Depth to the fragipan:* 25 to 40 inches

*A or Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

*E horizon:*
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam

*Bt horizon:*
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

*B/E horizon (if it occurs):*
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—1 to 6
Texture—silty clay loam or silt loam

*B´t horizon (if it occurs):*
Hue—10YR or 7.5YR

Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

*2Btx horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

## *Belknap Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Parent material:* Silty alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Coarse-silty, mixed, acid, mesic Aeric Fluvaquents

### Typical Pedon

Belknap silt loam, frequently flooded, 2,600 feet west and 1,860 feet north of the southeast corner of sec. 17, T. 2 S., R. 4 E., Jefferson County, Illinois:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common very fine roots throughout; common fine rounded soft masses of iron-manganese; slightly alkaline; abrupt smooth boundary.
AC—5 to 9 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; common very fine roots throughout; common fine rounded soft masses of iron-manganese; slightly alkaline; clear smooth boundary.
C—9 to 19 inches; 60 percent yellowish brown (10YR 5/4) and 40 percent grayish brown (10YR 5/2) silt loam; common fine prominent brown (7.5YR 4/4) mottles; massive; friable; few very fine roots throughout; common fine rounded soft masses of iron-manganese; strongly acid; clear wavy boundary.
Cg1—19 to 33 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct yellowish brown (10YR 5/4) and common prominent dark yellowish brown (10YR 4/6) mottles; massive; friable; few very fine roots throughout; common fine and medium rounded soft masses of iron-manganese; strongly acid; clear wavy boundary.
Cg2—33 to 60 inches; light brownish gray (10YR 6/2) silt loam; common fine and medium prominent brown (10YR 4/3) and common distinct yellowish brown (10YR 5/4) mottles; massive; friable; common fine and medium rounded soft masses of iron-manganese and common fine irregular iron-manganese concretions; strongly acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

*Cg or C horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam

## *Blair Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Landform:* Uplands
*Position on the landform:* Head slopes and side slopes along drainageways
*Parent material:* Loess and/or silty or loamy water-worked sediments
*Slope range:* 5 to 18 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Aquic Hapludalfs

### Typical Pedon

Blair silty clay loam, 5 to 10 percent slopes, severely eroded, 2,240 feet west and 140 feet south of the northeast corner of sec. 14, T. 6 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine granular structure; friable; common very fine and fine roots throughout; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.
Bt1—6 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; many fine and medium distinct light brownish gray (10YR 6/2) mottles; weak medium prismatic structure parting to weak medium platy; firm; few very fine and fine roots between peds; common distinct dark grayish brown (10YR 4/2) continuous clay films (cutans) on faces of peds

and in pores and few prominent strong brown (7.5YR 5/6) discontinuous iron stains; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt2—15 to 27 inches; yellowish brown (10YR 5/4) silt loam; many fine and medium distinct light brownish gray (10YR 6/2) mottles; weak medium prismatic structure; firm; few very fine roots between peds; few distinct light brownish gray (10YR 6/2) discontinuous clay films (cutans) on faces of peds and in pores and common prominent strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions and common fine and medium irregular soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

Btg—27 to 42 inches; gray (10YR 5/1) silt loam; many fine and medium prominent yellowish brown (10YR 5/4 and 5/6) mottles; weak thick platy structure; firm; few very fine roots between peds; few distinct brown (10YR 5/3) discontinuous clay films (cutans) on faces of peds and in pores, few prominent strong brown (7.5YR 5/8) patchy iron stains in root channels and/or pores, and few black (2.5Y 2/0) manganese or iron-manganese stains; common fine rounded iron-manganese concretions; very strongly acid; gradual smooth boundary.

BCg1—42 to 50 inches; gray (10YR 5/1 and 6/1) silt loam; common fine prominent yellowish brown (10YR 5/4 and 5/6) and common medium prominent dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure parting to weak fine subangular blocky; firm; few prominent black (2.5Y 2/0) patchy manganese or iron-manganese stains in root channels and/or pores and few strong brown (7.5YR 5/8) iron stains; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.

BCg2—50 to 62 inches; light brownish gray (10YR 6/2) loam; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) mottles; weak coarse prismatic structure; firm; few prominent strong brown (7.5YR 5/8) patchy iron stains in root channels and/or pores; common fine rounded iron-manganese concretions; strongly acid.

### Range in Characteristics

*Thickness of the loess:* Less than 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches

*Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam, loam, silty clay loam, or clay loam

*Bt horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam, silt loam, clay loam, or loam

*Btg or BCg horizon:*
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or loam

## *Bluford Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Landform:* Uplands and benches
*Position on the landform:* Broad flats on divides and side slopes along drainageways
*Parent material:* Loess and silty or loamy erosional sediments
*Slope range:* 0 to 5 percent

**Taxonomic classification:** Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

### Typical Pedon

Bluford silt loam, 0 to 2 percent slopes, 2,540 feet north and 140 feet west of the southeast corner of sec. 34, T. 4 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine roots throughout; common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

E—5 to 12 inches; brown (10YR 5/3) silt loam; many fine faint yellowish brown (10YR 5/4) and common grayish brown (10YR 5/2) mottles; weak medium platy structure; friable; few fine roots throughout; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

BE—12 to 15 inches; light yellowish brown (10YR 6/4) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few fine roots throughout; many distinct light gray (10YR 7/2)

continuous skeletans (silt) throughout; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Bt—15 to 26 inches; brown (10YR 5/3) silty clay loam; many fine faint grayish brown (10YR 5/2) and common fine and medium yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; common faint grayish brown (10YR 5/2) continuous clay films and few distinct light gray (10YR 7/2) discontinuous skeletans (silt) on faces of peds and in pores; few fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg—26 to 40 inches; grayish brown (10YR 5/2) silty clay loam; many fine and medium faint yellowish brown (10YR 5/4) and common brown (10YR 5/3) mottles; weak medium prismatic structure; firm; few fine roots between peds; few faint brown (10YR 5/3) discontinuous clay films and few faint gray (10YR 5/1) clay films on faces of peds and in pores; very few distinct light gray (10YR 7/2) skeletans (silt); very strongly acid; gradual smooth boundary.

2Bx—40 to 64 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/4) silt loam; many medium faint yellowish brown (10YR 5/6) mottles; moderate thin and medium platy structure; firm, brittle; few fine roots between peds; common fine rounded iron-manganese concretions; very strongly acid; gradual smooth boundary.

3BC—64 to 76 inches; yellowish brown (10YR 5/6) loam; common medium faint grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; firm; common fine rounded iron-manganese concretions and common medium irregular soft masses of iron-manganese; very strongly acid.

### Range in Characteristics

*Thickness of the loess:* 30 to 45 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches
*Depth to fragic soil properties:* 22 to 54 inches

*Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

*E or BE horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

*Bt or Btg horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silty clay

*2Bx or 2Btx horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, loam, silty clay loam, or clay loam

## *Bonnie Series*

*Depth class:* Very deep
*Drainage class:* Very poorly drained
*Permeability:* Moderately slow
*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Parent material:* Silty alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine-silty, mixed, acid, mesic Typic Fluvaquents

### Typical Pedon

Bonnie silt loam, frequently flooded, 2,660 feet north and 1,920 feet east of the southwest corner of sec. 21, T. 5 S., R. 4 E., Franklin County, Illinois:

Ap1—0 to 5 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; common fine and medium roots throughout; common fine rounded soft masses of iron-manganese; slightly acid; abrupt smooth boundary.

Ap2—5 to 10 inches; light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam; common fine and medium faint brown (10YR 4/3) mottles; weak medium angular blocky structure parting to weak medium platy; friable; common fine and medium roots throughout; common fine rounded soft masses of iron-manganese; moderately acid; abrupt smooth boundary.

Cg1—10 to 27 inches; gray (10YR 6/1) and light gray (10YR 7/1) silt loam; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) and common medium faint grayish brown (10YR 5/2) mottles; massive; friable; few very fine roots throughout; common fine rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Cg2—27 to 60 inches; gray (10YR 6/1) silt loam; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) mottles; massive; friable; common fine rounded soft masses of iron-manganese; very strongly acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*A or Ap horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silt loam

*Cg horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silt loam

## *Cape Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Very slow
*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Parent material:* Clayey slackwater sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, acid, mesic Vertic Fluvaquents

### Typical Pedon

Cape silty clay loam, frequently flooded, 2,000 feet south and 1,060 feet west of the northeast corner of sec. 18, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap1—0 to 3 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable; very fine roots throughout; common fine rounded soft masses of iron-manganese; neutral; abrupt smooth boundary.

Ap2—3 to 7 inches; 90 percent very dark grayish brown (10YR 3/2) and 10 percent brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; strong fine and medium angular blocky structure; friable; common very fine roots throughout; common fine rounded soft masses of iron-manganese; slightly acid; clear smooth boundary.

Bg1—7 to 17 inches; grayish brown (10YR 5/2) silty clay; common fine and medium distinct pale brown (10YR 6/3), common yellowish brown (10YR 5/6), and common prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium prismatic structure; firm; few very fine roots between peds; few prominent brown (7.5YR 4/4) continuous iron stains in root channels and/or pores; common faint grayish brown (10YR 5/2) nonintersecting slickensides on faces of peds and in pores; common fine rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Bg2—17 to 46 inches; 60 percent gray (10YR 6/1) and 40 percent brown (10YR 5/3) silty clay; many fine and medium distinct pale brown (10YR 6/3) and yellowish brown (10YR 5/6) and common medium and coarse prominent strong brown (7.5YR 5/6) mottles; moderate fine and medium prismatic structure; very firm; few very fine roots between peds; very few prominent brown and dark brown (7.5YR 4/4) patchy iron stains in root channels and/or pores; few distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

Bg3—46 to 59 inches; gray (10YR 6/1) silty clay; common fine and medium distinct brown (10YR 5/3) mottles; moderate medium prismatic structure; very firm; few very fine roots between peds; very few prominent brown and dark brown (7.5YR 4/4) patchy iron stains in root channels and/or pores; few distinct grayish brown (10YR 5/2) nonintersecting slickensides on faces of peds and in pores; few distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; common fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

Bg4—59 to 64 inches; light brownish gray (10YR 6/2) silty clay; common fine and medium distinct brown (10YR 5/3) and faint gray (10YR 6/1) mottles; strong fine and medium prismatic structure; firm; few fine roots between peds; few distinct very dark gray (10YR 3/1) continuous manganese or iron-manganese stains in root channels and/or pores; many distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; common fine rounded soft masses of iron-manganese; strongly acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*A or Ap horizon:*
Hue—10YR or 2.5YR
Value—3 to 6
Chroma—1 to 3
Texture—silty clay loam

*Bg horizon:*
Hue—10YR or 2.5YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silty clay, or clay

## *Chauncey Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Slow
*Landform:* Uplands
*Position on the landform:* Footslopes and shallow closed depressions
*Parent material:* Loess over depositional sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, mesic Typic Argialbolls

### Typical Pedon

Chauncey silt loam, 1,480 feet north and 940 feet west of the southeast corner of sec. 24, T. 3 S., R. 3 E., Jefferson County, Illinois:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine and fine roots throughout; few distinct dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores; common fine rounded iron-manganese concretions; neutral; abrupt smooth boundary.

A—5 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; common fine and medium distinct gray (10YR 5/1) mottles; moderate thick platy structure parting to moderate very fine subangular blocky; friable; common very fine and fine roots throughout; very few distinct dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores and faint very dark brown (10YR 2/2) organic coats; common fine and medium rounded iron-manganese concretions; neutral; abrupt smooth boundary.

Eg1—12 to 17 inches; dark gray (10YR 4/1) silt loam; common fine and medium distinct grayish brown (10YR 5/2) and common brown and dark brown (10YR 4/3) mottles; weak thin platy structure parting to moderate fine subangular blocky; friable; common very fine and fine roots throughout; very few prominent dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores and distinct very dark brown (10YR 2/2) organic coats; common fine and medium rounded iron-manganese concretions; slightly acid; clear smooth boundary.

Eg2—17 to 26 inches; gray (10YR 5/1) silt loam; common fine and medium distinct grayish brown (2.5Y 5/2) and common dark gray (10YR 4/1) mottles; moderate medium subangular blocky structure; friable; common very fine and fine roots throughout; few prominent yellowish brown (10YR 5/4) and few dark yellowish brown (10YR 4/6) discontinuous iron stains on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg1—26 to 31 inches; gray (10YR 5/1) silty clay loam; common fine and medium distinct dark grayish brown (10YR 4/2) mottles; moderate medium subangular blocky structure; firm; common very fine and fine roots between peds; common faint dark gray (10YR 4/1) continuous clay films (cutans) on faces of peds and in pores, few distinct light gray (10YR 7/2) patchy skeletans (silt), and few prominent dark gray (10YR 4/1) discontinuous iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; clear wavy boundary.

Btg2—31 to 46 inches; grayish brown (2.5Y 5/2) silty clay; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots between peds; common prominent dark grayish brown (10YR 4/2) continuous clay films on faces of peds and in pores, few strong brown (7.5YR 5/6) discontinuous iron stains, and few distinct very dark gray (10YR 3/1) patchy organic coats; common medium and coarse irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; gradual wavy boundary.

2Btg3—46 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; few prominent dark grayish brown (10YR 4/2) continuous clay films on faces of peds and in pores, strong brown (7.5YR 5/6) discontinuous iron stains, and very few prominent very dark gray (10YR 3/1) discontinuous organic coats in root channels and/or pores; common medium and coarse irregular soft masses of iron-manganese and few fine cylindrical barite crystals; very strongly acid.

### Range in Characteristics

*Thickness of the mollic epipedon:* 10 to 15 inches
*Thickness of the loess:* 50 to more than 60 inches
*Depth to bedrock:* More than 60 inches

*A or Ap horizon:*
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

*Eg horizon:*
Hue—10YR
Value—4 to 7
Chroma—1 or 2
Texture—silt loam

*Btg horizon:*
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay or silty clay loam

## *Cisne Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Very slow
*Landform:* Uplands and benches
*Position on the landform:* Broad flats and depressions on divides
*Parent material:* Loess and erosional sediments over till
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, mesic Vertic Albaqualfs

### Typical Pedon

Cisne silt loam, 45 feet south and 150 feet west of the northeast corner of sec. 4, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; common fine roots throughout; slightly alkaline; clear smooth boundary.
Eg—8 to 20 inches; light brownish gray (10YR 6/2) silt loam; weak medium granular structure; friable; common fine roots throughout; common fine rounded iron-manganese concretions; moderately acid; clear smooth boundary.
B/E—20 to 23 inches; grayish brown (10YR 5/2) and light gray (10YR 7/2) silty clay loam; common fine distinct strong brown (7.5YR 4/6), common faint yellowish red (5YR 5/6), and common brown (10YR 5/3) mottles; strong fine and medium subangular blocky structure; firm, brittle; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.
Btg1—23 to 27 inches; gray (10YR 5/1) and grayish brown (10YR 5/2) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine irregular iron-manganese concretions; very strongly acid; clear smooth boundary.
Btg2—27 to 40 inches; gray (10YR 5/1) silty clay; common fine distinct yellowish brown (10YR 5/6 and 5/4) mottles; weak medium prismatic structure; firm; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine irregular iron-manganese concretions; very strongly acid; gradual smooth boundary.
2Ab—40 to 49 inches; very dark gray (10YR 3/1) silt loam; common fine and medium faint dark gray (10YR 4/1) mottles; weak medium prismatic structure; firm; common fine and medium irregular iron-manganese concretions; few fine and medium irregular barite crystals; slightly acid; gradual smooth boundary.
2Btgb—49 to 60 inches; gray (10YR 5/1) silty clay loam; common fine and medium faint yellowish brown (10YR 5/4 and 5/6) mottles; weak medium prismatic structure; firm; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; many fine and medium irregular iron-manganese concretions; few fine and medium irregular barite crystals; slightly acid.

### Range in Characteristics

*Thickness of the dark surface layer:* 7 to 9 inches
*Thickness of the loess:* 30 to 55 inches
*Depth to bedrock:* More than 60 inches

*Ap horizon:*
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

*Eg horizon:*
Hue—10YR or 2.5Y
Value—4 to 7

Chroma—1 or 2
Texture—silt loam

*Btg horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

*2Btgb or 2Btg horizon:*
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam

## *Colp Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Slow
*Landform:* Interfluves and side slopes
*Position on the landform:* Terraces
*Parent material:* Loess over lacustrine sediments
*Slope range:* 2 to 18 percent

**Taxonomic classification:** Fine, smectitic, mesic Aquertic Chromic Hapludalfs

### Typical Pedon

Colp silt loam, 2 to 5 percent slopes, 2,175 feet west and 924 feet north of the southeast corner of sec. 35, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.
BE—7 to 13 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; very firm; few very fine and fine roots throughout; few faint strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; neutral; clear smooth boundary.
2Bt1—13 to 22 inches; yellowish brown (10YR 5/4) silty clay; many medium and coarse faint yellowish brown (10YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; very firm; few very fine and fine roots throughout; common faint strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; few fine cylindrical soft masses of iron-manganese; strongly acid; clear smooth boundary.
2Bt2—22 to 37 inches; brown (10YR 5/3) silty clay; many medium and coarse faint light olive brown (2.5Y 5/4) and grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; very firm; few very fine and fine roots throughout; common faint light olive brown (2.5Y 5/4) discontinuous clay films on faces of peds and in pores; few fine cylindrical soft masses of iron-manganese; very strongly acid; clear smooth boundary.
2Btg1—37 to 45 inches; grayish brown (2.5Y 5/2) silty clay; common fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common faint dark grayish brown (2.5Y 4/2) discontinuous clay films on faces of peds and in pores; common fine cylindrical soft masses of iron-manganese; strongly acid; gradual smooth boundary.
2Btg2—45 to 60 inches; weak red (2.5YR 5/2) silty clay; common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common faint dark grayish brown (2.5Y 4/2) discontinuous clay films on faces of peds and in pores; many medium and coarse irregular soft masses of iron-manganese; moderately alkaline.

### Range in Characteristics

*Thickness of the loess:* 0 to 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 42 inches

*Ap or A horizon:*
Hue—10YR
Value—3 to 5
Chroma—1 to 4
Texture—silt loam or silty clay loam

*E horizon (if it occurs):*
Hue—10YR
Value—5 or 6
Chroma—2 to 4
Texture—silt loam or silty clay loam

*2Bt horizon:*
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam, silty clay, clay, or clay loam

*2Btg horizon:*
Hue—2.5YR to 2.5Y
Value—4 to 6
Chroma—2
Texture—silty clay loam, silty clay, clay, or clay loam

## *Creal Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Moderately slow
*Landform:* Uplands
*Position on the landform:* Footslopes and shallow closed depressions
*Parent material:* Loess over depositional sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Aeric Endoaqualfs

### Typical Pedon

Creal silt loam, 0 to 2 percent slopes, 820 feet north and 300 feet west of the southeast corner of sec. 15, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 6 inches; brown 10YR 4/3) silt loam; moderate medium platy structure parting to weak fine granular; friable; common very fine roots throughout; rounded soft masses of iron-manganese; neutral; clear smooth boundary.

E—6 to 25 inches; brown (10YR 5/3) silt loam; many fine and medium faint pale brown (10YR 6/3) mottles; weak medium platy structure; friable; common very fine roots throughout; few fine rounded soft masses of iron-manganese; slightly acid; clear smooth boundary.

BE—25 to 29 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots between peds; few distinct gray (10YR 5/1) continuous clay films on faces of peds and in pores; few light gray (10YR 7/2) (dry) patchy skeletans on faces of peds and in pores; common fine and medium rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg1—29 to 37 inches; gray (10YR 6/1) and light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; common faint gray (10YR 6/1) continuous clay films on faces of peds and in pores; few distinct gray (10YR 5/1) and few light gray (10YR 7/2) patchy skeletans on faces of peds; common fine and medium rounded soft masses of iron-manganese; very strongly acid; abrupt wavy boundary.

Btg2—37 to 50 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct yellowish brown (10YR 5/6 and 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; few faint gray (10YR 6/1) discontinuous clay films on faces of peds and in pores; many light gray (10YR 7/1) skeletans on faces of peds and in pores; common medium rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg3—50 to 58 inches; gray (10YR 6/1) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to strong fine and medium angular blocky; firm; few faint gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; many prominent black (N 2/0) manganese or iron-manganese stains; common medium rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btg4—58 to 65 inches; light brownish gray (10YR 6/2) silt loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm, brittle; few faint gray (10YR 5/1) patchy clay films on faces of peds and in pores; common prominent black (N 2/0) discontinuous manganese or iron-manganese stains; common fine irregular barite crystals; common medium rounded soft masses of iron-manganese; strongly acid.

### Range in Characteristics

*Thickness of the loess:* 50 to 60 inches
*Depth to bedrock:* More than 60 inches

*Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

*E or Eg horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

*Btg or Bt horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

*2Btg or 2Bt horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or silty clay loam

## *Frondorf Series*

*Depth class:* Moderately deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Side slopes
*Position on the landform:* Uplands
*Parent material:* Loess over residuum derived from acid sandstone, siltstone, and shale
*Slope range:* 10 to 18 percent

**Taxonomic classification:** Fine-loamy, mixed, mesic Ultic Hapludalfs

### Typical Pedon

Frondorf silt loam, 10 to 18 percent slopes, eroded, 1,750 feet east and 400 feet south of the northwest corner of sec. 29, T. 1 N., R. 3 E., Marion County, Illinois:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; mixed with few fine pockets of yellowish brown (10YR 5/4) material; moderate very fine and fine granular structure; friable; common very fine and fine roots; neutral; abrupt smooth boundary.

E—6 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak medium platy structure; friable; common very fine and fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—10 to 24 inches; light yellowish brown (10YR 6/4) silty clay loam; common fine prominent red (2.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; friable; common very fine and fine roots; few distinct white (10YR 8/1) (dry) silt coatings and common distinct brown (10YR 4/3) clay films on faces of peds; very strongly acid; abrupt smooth boundary.

2Bt2—24 to 35 inches; yellowish brown (10YR 5/6) channery sandy clay loam; few medium prominent gray (10YR 6/1) pockets and strata; moderate medium prismatic structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; few prominent very dark gray (10YR 3/1) organic coatings in channels; about 20 percent weathered sandstone fragments; strongly acid; abrupt smooth boundary.

2Cr—35 to 60 inches; yellowish brown (10YR 5/6), weathered sandstone and siltstone; few medium prominent gray (10YR 6/1) pockets and strata; massive; very firm; few medium irregular accumulations of iron and manganese oxide; moderately acid.

### Range in Characteristics

*Thickness of the loess:* 12 to 24 inches
*Depth to bedrock:* 20 to 40 inches

*A horizon:*
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

*E horizon:*
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

*Bt horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam

*2Bt horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture—channery silt loam, channery silty clay loam, channery loam, or channery sandy clay loam

## *Gosport Series*

*Depth class:* Moderately deep
*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Landform:* Side slopes
*Position on the landform:* Uplands
*Parent material:* Residuum over shale bedrock
*Slope range:* 10 to 18 percent

**Taxonomic classification:** Fine, illitic, mesic Typic Dystrochrepts

### Typical Pedon

Gosport loam, 10 to 18 percent slopes, eroded, 1,815 feet south and 420 feet west of the northeast corner of sec. 31, T. 4 N., R. 3 E., Marion County, Illinois:

A—0 to 5 inches; dark brown (10YR 3/3) loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; common fine and medium roots throughout; strongly acid; 5 percent shale fragments; abrupt smooth boundary.

Bw1—5 to 10 inches; brown (10YR 5/3) silty clay; weak very fine subangular blocky structure; firm;

many fine roots between peds; very strongly acid; 10 percent shale pebbles; clear smooth boundary.
Bw2—10 to 14 inches; yellowish brown (10YR 5/4) silty clay; common fine prominent yellowish red (5YR 5/8) mottles; moderate fine subangular blocky structure; firm; common fine roots between peds; very strongly acid; 25 percent shale pebbles; gradual smooth boundary.
Bw3—14 to 27 inches; pale brown (10YR 6/3) silty clay loam; common medium distinct light gray (10YR 6/1) and few medium prominent strong brown (7.5YR 5/8) mottles; moderate fine subangular blocky structure; firm; common fine roots between peds; strongly acid; 35 percent shale pebbles; gradual smooth boundary.
Cr1—27 to 46 inches; light gray (10YR 6/1) silt loam; massive; firm; strongly acid; 90 percent shale residuum; gradual smooth boundary.
Cr2—46 to 60 inches; gray (10YR 5/1) shale bedrock; 99 percent shale.

### Range in Characteristics

*Depth to bedrock:* 20 to 40 inches

*A horizon:*
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—loam, silt loam, or silty clay loam

*Bw horizon:*
Hue—10YR
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam, silty clay, or clay

## *Grantsburg Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Landform:* Uplands (fig. 14)
*Position on the landform:* Convex ridgetops and side slopes on interfluves
*Parent material:* Loess and silty sediments over bedrock
*Slope range:* 2 to 10 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Oxyaquic Fragiudalfs

### Typical Pedon

Grantsburg silt loam, 2 to 5 percent slopes, 600 feet south and 1,313 feet west of the northeast corner of sec. 10, T. 2 S., R. 3 E., Jefferson County, Illinois:

Ap—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few fine roots throughout; strongly acid; abrupt smooth boundary.
E—4 to 9 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots throughout; extremely acid; clear smooth boundary.
Bt1—9 to 19 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots throughout; few distinct strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; extremely acid; clear smooth boundary.
Bt2—19 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; very few distinct light gray (10YR 7/1) discontinuous skeletans (silt) on faces of peds and in pores; few distinct strong brown (7.5YR 4/6) discontinuous clay films on faces of peds; common fine rounded iron-manganese concretions; extremely acid; abrupt smooth boundary.
B/E—27 to 29 inches; yellowish brown (10YR 5/6) and pale brown (10YR 6/3) silty clay loam (Bt); light gray (10YR 7/1) (dry) silt (E); moderate medium subangular blocky structure; firm; few faint brown (10YR 5/3) discontinuous clay films on faces of peds and in pores (mostly masked by silt coatings); common fine and medium rounded iron-manganese concretions; extremely acid; abrupt smooth boundary.
B´t—29 to 37 inches; dark yellowish brown (10YR 4/4) silty clay loam; many fine and medium faint grayish brown (10YR 5/2) and common fine yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak medium platy; very firm; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and in pores; few faint strong brown (7.5YR 4/6) patchy clay films on faces of peds and in pores; common fine and medium irregular iron-manganese concretions; very strongly acid; gradual smooth boundary.
2Bx—37 to 60 inches; strong brown (7.5YR 4/6) silt loam; common medium prominent grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; very firm; brittle; common fine and medium irregular iron-manganese concretions; very strongly acid.

### Range in Characteristics

*Thickness of the loess:* 36 to 60 inches
*Depth to bedrock:* 60 to 120 inches
*Depth to the fragipan:* 24 to 40 inches

**Figure 14.—The moderately well drained Grantsburg soils are on upland hills underlain by sandstone, siltstone, and shale.**

*A or Ap horizon:*
Hue—10YR
Value—3 to 5
Chroma—2 to 5
Texture—silt loam

*E horizon:*
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—3 or 4
Texture—silt loam

*BE horizon (if it occurs):*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silty clay loam

*Bt horizon:*
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silty clay loam

*B/E horizon:*
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—1 to 6
Texture—silt loam, silt, or silty clay loam

*B´t horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 6
Texture—silty clay loam

*2Btx or 2Bx horizon:*
Hue—10YR or 7.5YR
Value—4 to 7
Chroma—4 to 6
Texture—silt loam or silty clay loam

## *Hickory Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Loess over till
*Slope range:* 10 to 60 percent

**Taxonomic classification:** Fine-loamy, mixed, mesic Typic Hapludalfs

### Typical Pedon

Hickory silt loam, in an area of Hickory-Kell silt loams, 18 to 35 percent slopes, 1,979 feet west and 1,173 feet north of the southeast corner of sec. 15, T. 3 S., R. 3 E., Jefferson County, Illinois:

A—0 to 3 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine and medium roots throughout; very strongly acid; clear smooth boundary.

E—3 to 11 inches; brown (10YR 4/3) silt loam; weak thick platy structure; friable; few fine and medium roots throughout; very strongly acid; clear smooth boundary.

EB—11 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak thick platy structure parting to weak medium subangular blocky; friable; few fine and medium roots between peds; very strongly acid; clear smooth boundary.

Bt1—16 to 23 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; few fine and medium roots between peds; few distinct brown (10YR 4/3) and few dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; very strongly acid; 5 percent sedimentary pebbles; clear smooth boundary.

Bt2—23 to 36 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few medium and coarse roots throughout; few distinct brown (10YR 4/3) and few dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; few brown and dark brown (7.5YR 4/4) discontinuous iron stains; very strongly acid; 10 percent igneous pebbles; 5 percent sedimentary pebbles; clear smooth boundary.

Bt3—36 to 43 inches; yellowish brown (10YR 5/6) clay loam; moderate medium angular blocky structure; firm; few distinct dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores, prominent dark reddish brown (5YR 2/2) patchy manganese or iron-manganese stains, and few yellowish red (5YR 4/6) discontinuous iron stains; very strongly acid; 10 percent igneous pebbles; 10 percent sedimentary pebbles; gradual smooth boundary.

Bt4—43 to 52 inches; yellowish brown (10YR 5/6) loam; common coarse prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; few distinct dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; prominent dark reddish brown (5YR 2/2) patchy manganese or iron-manganese stains and very few yellowish red (5YR 4/6) discontinuous iron stains; very strongly acid; 5 percent igneous pebbles; 10 percent sedimentary pebbles; abrupt smooth boundary.

Bt5—52 to 60 inches; yellowish brown (10YR 5/6) loam; few coarse prominent light gray (10YR 7/2) mottles; strong medium subangular blocky structure; very firm; few distinct dark yellowish brown (10YR 3/4) discontinuous clay films on faces of peds and in pores; many prominent dark reddish brown (5YR 2/2) continuous manganese or iron-manganese stains; very strongly acid; 5 percent igneous pebbles; 10 percent sedimentary pebbles.

### Range in Characteristics

*Thickness of the loess:* 0 to 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* 40 to 72 inches

*A horizon:*
- Hue—10YR or 7.5YR
- Value—2 to 5
- Chroma—2 to 4
- Texture—silt loam, loam, silty clay loam, or clay loam

*E or EB horizon:*
- Hue—10YR
- Value—4 to 6
- Chroma—2 to 4
- Texture—silt loam or loam

*Bt horizon:*
- Hue—10YR, 7.5YR, or 2.5Y
- Value—4 to 6
- Chroma—3 to 6
- Texture—clay loam, silty clay loam, or loam

*C horizon (if it occurs):*
- Hue—10YR or 2.5Y
- Value—5 or 6
- Chroma—2 to 6

Texture—loam, clay loam, sandy loam, or the gravelly analogs of these textures

## *Hoyleton Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Slow
*Landform:* Uplands and benches
*Position on the landform:* Broad flats and side slopes on divides
*Parent material:* Loess and erosional sediments over till
*Slope range:* 0 to 5 percent

**Taxonomic classification:** Fine, smectitic, mesic Aquertic Hapludalfs

### Typical Pedon

Hoyleton silt loam, 0 to 2 percent slopes, 1,254 feet north and 2,112 feet west of the southeast corner of sec. 21, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; common very fine and fine roots throughout; slightly alkaline; abrupt smooth boundary.

E—7 to 9 inches; brown (10YR 5/3) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; common very fine and fine roots throughout; slightly alkaline; abrupt smooth boundary.

Bt1—9 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent strong brown (7.5YR 5/6) and common dark red (2.5YR 3/6) mottles; moderate fine subangular blocky structure; friable; common very fine and fine roots throughout; few faint pale brown (10YR 6/3) discontinuous clay films on faces of peds and in pores; very strongly acid; clear smooth boundary.

Bt2—13 to 17 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) and common dark red (2.5YR 3/6) mottles; moderate fine subangular blocky structure; firm; few very fine and fine roots between peds; many distinct white (10YR 8/1) continuous skeletans (silt) on faces of peds and in pores; common faint gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; extremely acid; abrupt smooth boundary.

Bt3—17 to 22 inches; grayish brown (10YR 5/2) silty clay; common fine and medium prominent dark red (2.5YR 3/6) and fine strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine and fine roots between peds; common faint gray (10YR 5/1) and few distinct dark brown (7.5YR 3/4) continuous clay films on faces of peds and in pores; very strongly acid; clear smooth boundary.

Bt4—22 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/8) and common fine and medium faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure; very firm; few very fine roots between peds; few distinct dark brown (7.5YR 3/4) continuous clay films on faces of peds and in pores and few prominent white (10YR 8/1) patchy skeletans (silt) on faces of peds; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2BC—33 to 48 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; brittle; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2CB—48 to 65 inches; yellowish brown (10YR 5/6) loam; common medium faint yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; brittle; few distinct black (10YR 2/1) discontinuous manganese or iron-manganese stains on faces of peds and in pores; common fine irregular soft masses of iron-manganese; very strongly acid; 1 percent igneous pebbles.

### Range in Characteristics

*Thickness of the dark surface layer:* 6 to 9 inches
*Thickness of the loess:* 30 to 50 inches
*Depth to bedrock:* More than 60 inches

*Ap horizon:*
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

*E horizon:*
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

*Bt horizon:*
Hue—10YR, 7.5YR, or 5YR
Value—4 to 6

Chroma—2 to 4
Texture—silty clay or silty clay loam

*2Bt or 2BC horizon:*
Hue—10YR
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, clay loam, loam, or silt loam

## *Hurst Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Very slow
*Landform:* Terraces
*Position on the landform:* Summits of terrace divides
*Parent material:* Loess over lacustrine sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

### Typical Pedon

Hurst silt loam, 0 to 2 percent slopes, 2,080 feet west and 180 feet north of the southeast corner of sec. 22, T. 7 S., R. 1 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; firm; common very fine and fine roots throughout; common fine rounded iron-manganese concretions; slightly alkaline; abrupt smooth boundary.

EA—4 to 8 inches; dark grayish brown (10YR 4/2) silt loam; common fine faint grayish brown (10YR 5/2) mottles; moderate thick platy structure parting to moderate fine subangular blocky; friable; common very fine and fine roots throughout; common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

2Bt1—8 to 14 inches; brown (10YR 5/3) silty clay loam; common fine and medium faint light brownish gray (10YR 6/2) mottles; moderate fine and medium prismatic structure parting to weak medium subangular blocky; firm; common very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) discontinuous iron stains; few faint brown (10YR 5/3) continuous clay films and few prominent light gray (10YR 7/2) patchy skeletans (silt) on faces of peds and in pores; common fine rounded iron-manganese concretions; very strongly acid; clear wavy boundary.

2Bt2—14 to 25 inches; brown (10YR 5/3) silty clay; common fine and medium faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; common very fine and fine roots between peds; few faint grayish brown (10YR 5/2) and common brown (10YR 5/3) continuous clay films on faces of peds and in pores; few prominent yellowish brown (10YR 5/8) discontinuous iron stains on faces of peds and in pores; common fine and medium rounded iron-manganese concretions; very strongly acid; gradual wavy boundary.

2Bt3—25 to 38 inches; yellowish brown (10YR 5/4) silty clay; common fine and medium distinct light brownish gray (10YR 6/2) mottles; strong medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine and fine roots between peds; many faint brown (10YR 5/3) continuous clay films and few prominent yellowish brown (10YR 5/8) patchy iron stains on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; extremely acid; gradual wavy boundary.

2Btg—38 to 45 inches; light brownish gray (2.5Y 6/2) clay; few fine prominent reddish brown (5YR 4/3) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; extremely firm; few very fine and fine roots between peds; common grayish brown (10YR 5/2) discontinuous clay films and few prominent yellowish brown (10YR 5/8) patchy iron stains on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2Cg1—45 to 50 inches; gray (10YR 5/1) clay; many coarse faint grayish brown (10YR 5/2) mottles; massive; extremely firm; few very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) patchy manganese or iron-manganese stains on faces of peds and in pores; common medium and coarse irregular soft masses of iron-manganese and many medium and coarse rounded iron-manganese concretions; slightly acid; gradual wavy boundary.

2Cg2—50 to 60 inches; gray (10YR 5/1) clay; many coarse faint light brownish gray (10YR 6/2) mottles; massive; extremely firm; few very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) patchy manganese or iron-manganese stains on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; moderately alkaline.

### Range in Characteristics

*Thickness of the loess:* 0 to 24 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 48 inches

*Ap or A horizon:*
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

*E horizon (if it occurs):*
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—2 or 3
Texture—silt loam or silty clay loam

*2Bt or 2Btg horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, silty clay, or clay

*2Cg or 2C horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, silty clay, or clay

## *Jacob Series*

*Depth class:* Very deep
*Drainage class:* Very poorly drained
*Permeability:* Very slow
*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Parent material:* Clayey slackwater sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Very fine, smectitic, acid, mesic Vertic Endoaquepts

### Typical Pedon

Jacob silty clay, frequently flooded, 2,520 feet east and 2,442 feet south of the northwest corner of sec. 35, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay; weak fine granular structure; firm; common fine to coarse roots throughout; common fine and medium rounded worm nodules; very strongly acid; abrupt smooth boundary.
Bg1—6 to 41 inches; olive gray (5Y 5/2) clay; common medium faint olive (5Y 5/3) mottles; weak medium prismatic structure; very firm; common fine roots throughout; few faint olive gray (5Y 5/2) discontinuous nonintersecting slickensides on vertical faces of peds; few fine irregular soft masses of iron-manganese; extremely acid; clear smooth boundary.
Bg2—41 to 53 inches; olive gray (5Y 5/2) silty clay; common fine prominent yellowish brown (10YR 5/6) and common medium faint olive (5Y 5/3) mottles; weak medium prismatic structure; very firm; few fine roots throughout; few faint olive gray (5Y 5/2) discontinuous nonintersecting slickensides on vertical faces of peds; few fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.
Bg3—53 to 60 inches; olive gray (5Y 5/2) clay; common fine prominent yellowish brown (10YR 5/6) and common medium faint olive (5Y 5/3) mottles; moderate medium angular blocky structure; very firm; few very fine roots between peds; few faint olive gray (5Y 5/2) discontinuous nonintersecting slickensides on vertical faces of peds; few fine irregular soft masses of iron-manganese and few fine rounded barite crystals; very strongly acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay or clay

*Bg horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silty clay or clay

## *Kell Series*

*Depth class:* Moderately deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Loamy erosional deposits or glacial drift over residuum derived from acid, sandstone, siltstone, and shale bedrock
*Slope range:* 18 to 60 percent

**Taxonomic classification:** Fine-loamy, mixed, mesic Ultic Hapludalfs

### Typical Pedon

Kell silt loam, in an area of Hickory-Kell silt loams, 18 to 35 percent slopes, 1,975 feet west and 1,175 feet north of the southeast corner of sec. 15, T. 3 S., R. 3 E., Jefferson County, Illinois:

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/1) dry; moderate medium granular structure; friable; common very fine and fine roots throughout; moderately acid; abrupt smooth boundary.

E—3 to 7 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent dark yellowish brown (10YR 4/4) silt loam; weak thin platy structure; friable; common very fine and fine roots; few fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; moderately acid; clear smooth boundary.

Bt1—7 to 13 inches; yellowish brown (10YR 5/4) silt loam; strong fine subangular blocky structure; friable; common fine and medium roots; very few distinct dark brown (10YR 4/3) iron stains on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; common fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; moderately acid; clear smooth boundary.

2Bt2—13 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few medium roots between peds; many distinct yellowish brown (10YR 5/8) iron stains on faces of peds; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2Bt3—18 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few medium roots between peds; few distinct yellowish brown (10YR 5/8) iron stains on faces of peds; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; common fine rounded iron-manganese concretions; 10 percent shale pebbles; few subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2BC—25 to 35 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2) very channery silty clay loam; massive; firm; few medium roots in cracks; few prominent yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) iron stains on rock fragments; 50 percent shale fragments; extremely acid; gradual wavy boundary.

2Cr—35 to 60 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2), weathered bedrock; few prominent yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) iron stains on rock fragments.

### Range in Characteristics

*Depth to bedrock:* 20 to 40 inches

*A horizon:*
- Hue—10YR
- Value—3 to 5
- Chroma—2 to 4
- Texture—silt loam, silty clay loam, loam, or clay loam

*E horizon:*
- Hue—10YR
- Value—4 or 5
- Chroma—2 to 4
- Texture—silt loam, silty clay loam, loam, or clay loam

*Bt horizon:*
- Hue—10YR or 7.5YR
- Value—4 to 6
- Chroma—4 to 8
- Texture—silt loam or silty clay loam

*2Bt horizon:*
- Hue—10YR, 7.5YR, or 2.5Y
- Value—4 to 6
- Chroma—2 to 8
- Texture—silt loam, silty clay loam, loam, or clay loam

*2BC horizon:*
- Hue—10YR, 7.5YR, or 2.5Y
- Value—4 to 6
- Chroma—2 to 8
- Texture—silt loam, silty clay loam, loam, or clay loam

## *Lenzburg Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Moderately slow
*Landform:* Uplands
*Position on the landform:* Surface-mined areas
*Parent material:* Mine spoil
*Slope range:* 7 to 60 percent

**Taxonomic classification:** Fine-loamy, mixed, calcareous, mesic Typic Udorthents

### Typical Pedon

Lenzburg gravelly silty clay loam, 20 to 60 percent slopes, 75 feet north and 925 feet east of the southwest corner of sec. 3, T. 4 S., R. 4 E., Jefferson County, Illinois:

A—0 to 4 inches; 90 percent brown (10YR 4/3) and 10 percent gray (2.5Y 5/1) gravelly silty clay loam; weak medium granular structure; firm; common fine roots throughout; neutral; 10 percent sedimentary pebbles; abrupt smooth boundary.

C1—4 to 20 inches; 60 percent brown 10YR 4/3), 20 percent light olive brown (2.5Y 5/6), and 20 percent gray (2.5Y 6/1) gravelly silty clay loam; massive; very firm; common fine roots throughout; common fine and medium rounded iron-manganese concretions; common fine and medium irregular soft masses of carbonate; slightly effervescent; slightly alkaline; 15 percent sedimentary pebbles; clear smooth boundary.

C2—20 to 43 inches; 34 percent light olive brown (2.5Y 5/6), 33 percent gray (2.5Y 6/1), and 33 percent yellowish brown (10YR 5/6) gravelly silty clay loam; common fine and medium prominent strong brown (7.5YR 4/6) mottles; massive or moderate medium prismatic structure; very firm; few fine roots throughout; common fine and medium rounded iron-manganese concretions; common fine and medium irregular soft masses of carbonate; very slightly effervescent; moderately alkaline; 25 percent sedimentary pebbles; 3 percent sedimentary channers; abrupt smooth boundary.

C3—43 to 60 inches; 90 percent gray (2.5Y 5/1) and 10 percent black (2.5Y 2.5/1) cobbly clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; extremely firm; few very fine roots throughout; common fine rounded iron-manganese concretions; slightly alkaline; 25 percent sedimentary cobbles; 5 percent coal channers.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches
*Carbonates:* Throughout the profile

*A horizon:*
Hue—10YR, 2.5Y, or 5Y
Value—2 to 5
Chroma—1 to 4
Texture—silt loam, silty clay loam, clay loam, loam, or the gravelly analogs of these textures

*C horizon:*
Hue—10YR, 2.5Y, or 7.5YR
Value—2 to 6
Chroma—1 to 6
Texture—silty clay, silty clay loam, silt loam, clay loam, loam, or the gravelly, channery, or cobbly analogs of these textures

## *Okaw Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Very slow
*Landform:* Terraces
*Position on the landform:* Broad flats
*Parent material:* Loess over clayey lacustrine sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, mesic Chromic Vertic Albaqualfs

### Typical Pedon

Okaw silt loam, 1,280 feet west and 554 feet south of the northeast corner of sec. 36, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; few very fine and fine roots throughout; neutral; abrupt smooth boundary.

Ap2—4 to 8 inches; dark grayish brown (10YR 4/2) and light brownish gray (10YR 6/2) silty clay loam; weak medium subangular blocky structure; firm; few very fine and fine roots throughout; common fine irregular soft masses of iron-manganese; neutral; abrupt smooth boundary.

Eg—8 to 16 inches; light brownish gray (10YR 6/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few very fine and fine roots throughout; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2Btg1—16 to 40 inches; gray (5Y 5/1) silty clay; common fine and medium prominent red (2.5YR 5/8) and yellowish brown (10YR 5/6) and common medium and coarse distinct dark bluish gray (5B 4/1) mottles; moderate medium prismatic

structure; very firm; few fine roots between peds and few very coarse roots throughout; few faint dark gray (5Y 4/1) discontinuous clay films on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btg2—40 to 54 inches; olive gray (5Y 5/2) silty clay; common fine prominent yellowish brown (10YR 5/6) and common medium prominent dark bluish gray (5B 4/1) mottles; moderate medium prismatic structure parting to weak medium angular blocky; very firm; few fine roots between peds and few very coarse roots throughout; common faint weak red (2.5YR 4/2) and olive gray (5Y 5/2) discontinuous clay films on faces of peds and in pores; common fine irregular soft masses of carbonate; many medium and coarse irregular soft masses of iron-manganese; slightly alkaline; gradual smooth boundary.

2Btg3—54 to 67 inches; olive gray (5Y 5/2) silty clay; common fine distinct yellowish brown (10YR 5/4 and 5/6) and common medium prominent dark bluish gray (5B 4/1) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few fine roots between peds; many faint dark grayish brown (2.5Y 4/2) and olive gray (5Y 5/2) continuous clay films on faces of peds and in pores; common fine irregular soft masses of carbonate; many medium and coarse irregular soft masses of iron-manganese; moderately alkaline.

### Range in Characteristics

*Thickness of the loess:* 8 to 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 40 inches

*Ap horizon:*
Hue—10YR
Value—3 to 5
Chroma—1 to 3
Texture—silt loam or silty clay loam

*Eg horizon:*
Hue—10YR
Value—4 to 7
Chroma—1 or 2
Texture—silt loam or silty clay loam

*2Btg horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay or clay

## *Orion Series*

*Depth class:* Very deep
*Drainage class:* Somewhat poorly drained
*Permeability:* Moderate
*Landform:* Flood plains
*Position on the landform:* Toeslopes
*Parent material:* Silty alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents

**Taxadjunct features:** The Orion soils in this survey area have slightly more sand in the particle-size control section than is defined as the range for the series. These soils are classified as coarse-loamy, mixed, nonacid, mesic Aquic Udifluvents.

### Typical Pedon

Orion silt loam, frequently flooded, 160 feet north and 455 feet east of the center of sec. 1, T. 1 N., R. 1 E., Marion County, Illinois:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine and very fine granular structure; friable; few very fine and fine roots throughout; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded soft masses of iron-manganese; moderately acid; about 14 percent sand; clear smooth boundary.

C1—7 to 19 inches; dark brown (10YR 4/3) silt loam; common fine faint dark grayish brown (10YR 4/2) and common fine distinct gray (10YR 5/1) mottles; weak medium and thick platy structure parting to weak medium granular; friable; few very fine and fine roots throughout; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine rounded soft masses of iron-manganese; slightly acid; gradual smooth boundary.

C2—19 to 24 inches; dark grayish brown (10YR 4/2) silt loam; common fine faint dark gray (10YR 4/1) and common fine distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few very fine roots throughout; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine and medium rounded soft masses of iron-manganese; moderately acid; about 21 percent sand; abrupt wavy boundary.

Ab1—24 to 35 inches; very dark gray (10YR 3/1) silt loam; many fine distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/4)

mottles; weak medium and fine prismatic structure parting to weak medium and fine subangular blocky; friable; very few fine roots; common fine and medium rounded soft masses of iron-manganese; moderately acid; about 23 percent sand; 1 percent igneous pebbles; clear smooth boundary.

Ab2—35 to 42 inches; 50 percent very dark gray (10YR 3/1) and 50 percent very dark grayish brown (10YR 3/2) silt loam; common fine distinct grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium and fine prismatic structure; friable; very few fine roots; common fine and medium rounded soft masses of iron-manganese; moderately acid; about 34 percent sand; 2 percent igneous pebbles; clear smooth boundary.

ACb—42 to 60 inches; 60 percent grayish brown (10YR 5/2) and 40 percent very dark gray (10YR 3/1) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; very few fine roots; common fine and medium rounded soft masses of iron-manganese; neutral; about 35 percent sand; 2 percent igneous pebbles.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches
*Depth to the buried horizon:* 20 to 40 inches

*Ap or A horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

*C horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

*Ab or ACb horizon:*
Hue—10YR or 2.5Y
Value—2 or 3 (Ab); 2 to 5 (ACb)
Chroma—1 or 2
Texture—silt loam

## *Parke Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Loess over glacial outwash
*Slope range:* 10 to 18 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Ultic Hapludalfs

**Taxadjunct features:** The Parke soils in this survey area have a base saturation of more than 60 percent at a depth of 125 cm below the top of the argillic horizon. These soils are classified fine-silty, mixed, mesic Typic Hapludalfs.

### Typical Pedon

Parke silty clay loam, 10 to 18 percent slopes, severely eroded, 620 feet north and 2,460 feet east of the southwest corner of sec. 16, T. 6 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; 40 percent brown (10YR 4/3), 20 percent brown (10YR 5/3), and 20 percent strong brown (7.5YR 4/6) silty clay loam; pale brown (10YR 6/3) dry; weak fine subangular blocky structure parting to weak very fine and fine granular; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

Ap/Bt—5 to 9 inches; 50 percent brown (10YR 4/3) and 50 percent strong brown (7.5YR 4/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots throughout; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; neutral; abrupt smooth boundary.

2Bt1—9 to 17 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots between peds; common distinct reddish brown (5YR 4/4) clay films on faces of peds and in pores; few fine irregular soft masses of iron-manganese; moderately acid; 1 percent sedimentary pebbles; clear smooth boundary.

2Bt2—17 to 30 inches; brown (7.5YR 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots between peds; common distinct reddish brown (5YR 4/3) clay films on faces of peds and in pores and few prominent pink (7.5YR 7/4) skeletans (sand or silt); few medium rounded soft masses of iron and few fine irregular soft masses of iron-manganese; moderately acid; 1 percent sedimentary pebbles; gradual smooth boundary.

3Btb1—30 to 50 inches; reddish brown (5YR 4/4) clay loam; weak medium prismatic structure; firm; few very fine roots between peds; few faint reddish brown (5YR 4/3) clay films on faces of peds and in pores and few prominent pink (7.5YR 7/4)

skeletans (sand or silt); few medium rounded soft masses of iron, few fine irregular soft masses of iron-manganese, and few fine irregular barite crystals; slightly acid; 2 percent igneous pebbles; clear smooth boundary.

3Btb2—50 to 78 inches; 60 percent reddish brown (5YR 4/4) and 40 percent yellowish red (5YR 5/6) clay loam; weak fine and medium subangular blocky structure; friable; few faint reddish brown (5YR 4/4) clay films on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese, common fine irregular barite crystals, and few medium rounded soft masses of iron; slightly acid; 13 percent igneous pebbles and 1 percent sedimentary pebbles.

### Range in Characteristics

*Thickness of the loess:* 20 to 40 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches

*A or Ap horizon:*
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—1 to 6
Texture—silt loam or silty clay loam

*Ap/Bt or Bt horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—silt loam or silty clay loam

*2Bt horizon:*
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam or silty clay loam

*3Btb horizon:*
Hue—2.5YR, 5YR, or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

## *Pike Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Uplands
*Position on the landform:* Convex ridgetops and side slopes of interfluves
*Parent material:* Loess over glacial outwash
*Slope range:* 2 to 10 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Ultic Hapludalfs

**Taxadjunct features:** The Pike soils in this survey area have a base saturation of more than 60 percent at a depth of 125 cm below the top of the argillic horizon. These soils are classified as fine-silty, mixed, mesic Typic Hapludalfs.

### Typical Pedon

Pike silt loam, 2 to 5 percent slopes, 2,060 feet north and 700 feet east of the southwest corner of sec. 22, T. 5 S., R. 1 E., Franklin County, Illinois:

A—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; strong fine crumb structure; very friable; many very fine and fine roots throughout; neutral; clear smooth boundary.

E—4 to 8 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; many very fine roots throughout; neutral; clear smooth boundary.

Bt1—8 to 12 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure parting to moderate fine subangular blocky; firm; common very fine roots throughout; very few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores and few brown (10YR 4/3) patchy organic coats; slightly acid; clear smooth boundary.

Bt2—12 to 38 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common very fine roots between peds; few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores; common fine rounded iron-manganese concretions; strongly acid; gradual smooth boundary.

2Bt3—38 to 57 inches; strong brown (7.5YR 4/6) silt loam; moderate coarse prismatic structure; firm; few very fine roots between peds; few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

3Btb—57 to 75 inches; yellowish red (5YR 4/6) clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots between peds; few distinct pinkish gray (7.5YR 7/2) discontinuous skeletans (silt) throughout and very few brown (7.5YR 4/4) clay films on faces of peds and in pores; very strongly acid; 2 percent igneous pebbles; gradual smooth boundary.

3BCb—75 to 104 inches; yellowish red (5YR 4/6) clay

loam; common fine distinct brown (7.5YR 4/4) mottles; massive; firm; very few distinct brown (7.5YR 4/4) discontinuous clay films in root channels and pores and few pinkish gray (7.5YR 7/2) patchy skeletans (silt) throughout; very strongly acid; 2 percent igneous pebbles; gradual smooth boundary.

3C—104 to 124 inches; red (2.5YR 4/6) clay loam; massive; firm; very strongly acid; 5 percent igneous pebbles; 2 percent sandstone pebbles.

### Range in Characteristics

*Thickness of the loess:* 40 to 60 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches

*A or Ap horizon:*
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—1 to 6
Texture—silt loam or silty clay loam

*E horizon:*
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—4 to 6
Texture—silt loam or silty clay loam

*Bt or 2Bt horizon:*
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—silt loam or silty clay loam

*2C horizon (if it occurs):*
Hue—2.5YR or 5YR
Value—3 to 5
Chroma—3 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

*3Btb horizon:*
Hue—2.5YR, 5YR, or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

## *Plumfield Series*

*Depth class:* Shallow over a fragipan
*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Thin loess and erosional sediments over glacial drift
*Slope range:* 5 to 18 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Ochreptic Fragiudalfs

### Typical Pedon

Plumfield silty clay loam, 5 to 10 percent slopes, 500 feet east and 2,060 feet south of the northwest corner of sec. 18, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; yellowish brown (10YR 5/4) silty clay loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; very strongly acid; abrupt smooth boundary.

Btx1—5 to 7 inches; yellowish brown (10YR 5/6) silty clay loam; strong thick platy structure parting to strong medium platy; very firm, brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; extremely acid; abrupt smooth boundary.

2Btx2—7 to 12 inches; yellowish brown (10YR 5/6) silty clay loam; common fine and medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; very firm, brittle; few very fine roots between peds; common faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films on faces of peds and in pores; few prominent white (10YR 8/1) skeletans (silt) on faces of peds and in pores; common fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

2Btx3—12 to 36 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct grayish brown (10YR 5/2) mottles; weak coarse and very coarse prismatic structure; very firm, brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; very strongly acid; 1 percent pebbles (igneous); gradual smooth boundary.

3Btg1—36 to 46 inches; grayish brown (10YR 5/2) silty clay loam; many fine and medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse and medium prismatic structure parting to moderate medium angular blocky; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; common fine

irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; strongly acid; gradual smooth boundary.

3Btg2—46 to 56 inches; grayish brown (10YR 5/2) silty clay loam; many fine and medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; moderately acid; gradual smooth boundary.

3Btg3—56 to 70 inches; grayish brown (10YR 5/2) silty clay loam; many fine and medium distinct yellowish brown (10YR 5/6) mottles; weak very coarse prismatic structure; very firm; common faint gray (10YR 5/1) and brown (10YR 5/3) clay films on faces of peds and in pores and few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; many fine and medium irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; slightly acid.

### Range in Characteristics

*Thickness of the loess:* 0 to 20 inches
*Depth to bedrock:* More than 60 inches
*Depth to the fragipan:* 5 to 20 inches

*Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam

*Btx horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam or silty clay loam

*2Btx horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, or loam

*3Btg horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—1 or 2
Texture—loam, silt loam, clay loam, or silty clay loam

## *Racoon Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Slow
*Landform:* Uplands and benches
*Position on the landform:* Footslopes and shallow closed depressions
*Parent material:* Loess over depositional sediments
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Typic Endoaqualfs

### Typical Pedon

Racoon silt loam, 1,460 feet east and 120 feet south of the northwest corner of sec. 3, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 7 inches; 50 percent brown (10YR 4/3) and 50 percent grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine and medium roots throughout; common fine irregular soft masses of iron-manganese; slightly alkaline; abrupt smooth boundary.

AE—7 to 10 inches; 30 percent brown (10YR 4/3) and 70 percent grayish brown (10YR 5/2) silt loam; moderate thin platy structure; friable; many fine and medium roots throughout; common fine irregular soft masses of iron-manganese; neutral; abrupt smooth boundary.

Eg1—10 to 16 inches; grayish brown (10YR 5/2) silt loam; common coarse prominent yellowish brown (10YR 5/4) mottles; weak thin platy structure; friable; many very fine and fine roots throughout; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Eg2—16 to 29 inches; gray (10YR 6/1) silt loam; common coarse prominent dark yellowish brown (10YR 4/6) and common coarse distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; common fine roots throughout; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg1—29 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; common coarse prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few very fine roots between peds; very few faint brown (10YR 5/3) patchy clay films

on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg2—41 to 51 inches; gray (10YR 5/1) silty clay loam; common medium prominent strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) mottles; weak medium subangular blocky structure; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) and few brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; very strongly acid; clear smooth boundary.

2Btg3—51 to 60 inches; gray (10YR 5/1) silt loam; many medium prominent strong brown (7.5YR 4/6) and common medium distinct light gray (10YR 7/1) mottles; weak medium subangular blocky structure; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; very strongly acid.

### Range in Characteristics

*Thickness of the loess:* 50 to 60 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches

*Ap or A horizon:*
Hue—10YR
Value—3 to 6
Chroma—2 or 3
Texture—silt loam

*Eg horizon:*
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam

*Btg horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silty clay loam or silt loam

*2Btg horizon:*
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silt loam or silty clay loam

## *Rend Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Very slow
*Landform:* Benches
*Position on the landform:* Ridgetops and side slopes
*Parent material:* Loess over erosional sediments
*Slope range:* 2 to 10 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Fragic Oxyaquic Hapludalfs

### Typical Pedon

Rend silt loam, 5 to 10 percent slopes, eroded, 710 feet south and 320 feet west of the northeast corner of sec. 14, T. 5 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; brown 10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine angular blocky structure parting to weak fine granular; friable; many fine roots throughout; few fine rounded iron-manganese concretions; slightly acid; abrupt smooth boundary.

Bt1—5 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine prismatic structure parting to strong fine subangular blocky; firm; common fine roots between peds; common distinct dark yellowish brown (10YR 4/6) discontinuous clay films on faces of peds and in pores; few fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Bt2—15 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; strong medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots between peds; many distinct brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; few fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

2Btx1—24 to 40 inches; yellowish brown (10YR 5/6) silt loam; common medium faint yellowish brown (10YR 5/4) and common fine and medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure; firm, brittle; few very fine roots between peds; few prominent gray (10YR 6/1) patchy skeletans (silt) on faces of peds and in pores; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; few fine rounded iron-

manganese concretions; very strongly acid; clear smooth boundary.

2Btx2—40 to 50 inches; yellowish brown (10YR 5/4) silt loam; common medium faint yellowish brown (10YR 5/4) and common fine and medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure; firm, brittle; few very fine roots between peds; few prominent gray (10YR 6/1) patchy skeletans (silt) on faces of peds and in pores; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.

2Btx3—50 to 60 inches; yellowish brown (10YR 5/4) silt loam; many fine and medium faint yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure; firm, brittle; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; few prominent black (2.5Y 2/0) patchy manganese or iron-manganese stains; common fine and medium rounded iron-manganese concretions; slightly acid.

### Range in Characteristics

*Thickness of the loess:* 16 to 40 inches
*Depth to bedrock:* More than 60 inches

*A or Ap horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

*E horizon (if it occurs):*
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam

*Bt horizon:*
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

*B/E horizon (if it occurs):*
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—1 to 6
Texture—silty clay loam or silt loam

*B´t horizon (if it occurs):*
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

*2Btx horizon:*
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

## *Richview Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Landform:* Uplands
*Position on the landform:* Side slopes and summits of interfluves
*Parent material:* Loess over erosional sediments over till
*Slope range:* 2 to 10 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Oxyaquic Hapludalfs

### Typical Pedon

Richview silt loam, 2 to 5 percent slopes, eroded, 1,200 feet west and 400 feet north of the southeast corner of sec. 21, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; many very fine and fine roots throughout; neutral; abrupt smooth boundary.

BE—9 to 11 inches; strong brown (7.5YR 5/6) silty clay loam; many fine distinct yellowish red (5YR 5/8) mottles; moderate fine subangular blocky structure parting to moderate very fine subangular blocky; friable; common very fine and fine roots throughout; common faint very dark grayish brown (10YR 3/2) discontinuous organic coats on faces of peds and in pores; neutral; clear smooth boundary.

Bt1—11 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; many fine and medium prominent red (2.5YR 5/8) and common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine and fine roots between peds; common faint yellowish brown (10YR 5/4) discontinuous clay films on faces of peds and in pores and few distinct very dark grayish brown (10YR 3/2)

organic coats on faces of peds; very strongly acid; clear smooth boundary.

Bt2—19 to 22 inches; brown (10YR 5/3) silty clay loam; many fine and medium prominent red (2.5YR 5/8) and common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots between peds; common faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; very few prominent white (10YR 8/1) skeletans (silt) on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coats on faces of peds; very strongly acid; clear smooth boundary.

2Bt3—22 to 31 inches; yellowish brown (10YR 5/4) silt loam; common fine and medium prominent red (2.5YR 5/8) and common medium faint brown (10YR 5/3) mottles; moderate medium prismatic structure parting to weak medium and coarse angular blocky; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common distinct very dark gray (10YR 3/1) continuous organic coats on faces of peds; few fine rounded barite crystals; extremely acid; clear smooth boundary.

2Bt4—31 to 39 inches; yellowish brown (10YR 5/4) silt loam; common fine faint brown (10YR 5/3) mottles; weak coarse prismatic structure; very firm, brittle; few very fine roots between peds; common distinct very dark grayish brown (10YR 3/2) continuous organic coats on faces of peds and in pores and few faint grayish brown (10YR 5/2) discontinuous clay films; few fine rounded barite crystals; very strongly acid; gradual smooth boundary.

2BC—39 to 50 inches; dark yellowish brown (10YR 4/4) silt loam; common fine and medium faint yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; very firm, brittle; few fine rounded barite crystals and few fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2CB—50 to 70 inches; yellowish brown (10YR 5/6) silt loam; common medium and coarse distinct brown (10YR 5/3) mottles; weak coarse prismatic structure; very firm, brittle; few fine rounded soft masses of iron-manganese; strongly acid.

### Range in Characteristics

*Thickness of the loess:* 30 to 50 inches
*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

*BE horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—silt loam or silty clay loam

*Bt horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

*2Bt horizon:*
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam

*2BC horizon:*
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam

*2C horizon (if it occurs):*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—loam, clay loam, or silt loam

## *Schuline Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Slow
*Landform:* Uplands
*Position on the landform:* Reclaimed surface-mined areas
*Parent material:* Mine spoil
*Slope range:* 2 to 5 percent

**Taxonomic classification:** Fine-silty, mixed, calcareous, mesic Typic Udorthents

### Typical Pedon

Schuline silt loam, 2 to 5 percent slopes, 500 feet east and 1,900 feet north of the southwest corner of sec. 25, T. 3 S., R. 4 E., Jefferson County, Illinois:

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) silt

loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common fine and medium roots throughout; strongly effervescent; moderately alkaline; 5 percent sedimentary pebbles; abrupt smooth boundary.

AC—3 to 15 inches; dark grayish brown (10YR 4/2) and very dark gray (10YR 3/1) silty clay loam; massive; firm; common fine and medium roots throughout; slightly effervescent; slightly alkaline; 10 percent sedimentary channers; 3 percent coal channers; clear wavy boundary.

C1—15 to 24 inches; 50 percent brown (10YR 5/3), 30 percent black (2.5Y 2.5/1), and 20 percent yellowish brown (10YR 5/8) channery silty clay loam; massive; firm; common fine roots in cracks; slightly effervescent; slightly alkaline; 30 percent igneous channers; abrupt wavy boundary.

C2—24 to 31 inches; 70 percent dark yellowish brown (10YR 4/6) and 30 percent gray (10YR 5/1) silty clay loam; massive; firm; common very fine roots in cracks; common medium irregular iron-manganese concretions; slightly effervescent; slightly alkaline; 10 percent sedimentary pebbles; abrupt wavy boundary.

C3—31 to 52 inches; very dark gray (10YR 3/1), dark yellowish brown (10YR 4/4), gray (2.5Y 5/1), and very pale brown (10YR 7/4) channery silty clay loam; massive; firm; common very fine roots in cracks; slightly effervescent; slightly alkaline; 30 percent sedimentary channers; 3 percent coal channers; abrupt wavy boundary.

C4—52 to 69 inches; brown (10YR 5/3), black (2.5Y 2.5/1), gray (2.5Y 5/1), and grayish green (5G 4/2) channery clay loam; massive; very firm; common very fine roots in cracks; common fine and medium rounded soft masses of carbonate; strongly effervescent; moderately alkaline; 15 percent sedimentary channers.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches
*Carbonates:* Throughout the profile

*Ap horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, or loam

*C horizon (to a depth of 48 inches):*
Hue—10YR or 7.5YR
Value—2 to 7 (dominantly 4 to 7)
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, or loam

*C horizon (below a depth of 48 inches):*
Color—mixed
Texture—silt loam, silty clay loam, clay loam, loam, silty clay, or the gravelly or channery analogs of these textures

## *Sharon Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Parent material:* Silty alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Coarse-silty, mixed, acid, mesic Typic Udifluvents

### Typical Pedon

Sharon silt loam, frequently flooded, 1,800 feet west and 140 feet south of the northeast corner of sec. 25, T. 7 S., R. 4 E., Franklin County, Illinois:

Ap—0 to 3 inches; 60 percent brown (10YR 4/3) and 40 percent dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) dry; strong fine and medium granular structure; friable; common fine and medium roots throughout; slightly acid; abrupt smooth boundary.

A1—3 to 9 inches; 60 percent brown (10YR 4/3) and 40 percent dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) dry; strong medium granular structure; friable; common fine and medium roots throughout; strongly acid; abrupt smooth boundary.

A2—9 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; strong fine granular structure; friable; common fine and medium roots throughout; moderately acid; clear smooth boundary.

CA—13 to 17 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent brown (10YR 4/3) silt loam; massive; friable; few fine roots throughout; strongly acid; clear smooth boundary.

C1—17 to 23 inches; yellowish brown (10YR 5/6) silt loam; massive; friable; few fine roots throughout; very strongly acid; clear smooth boundary.

C2—23 to 29 inches; yellowish brown (10YR 5/4) silt

loam; massive; friable; strongly acid; clear smooth boundary.

C3—29 to 40 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (10YR 5/2) mottles; massive; friable; very few faint brown (10YR 4/3) discontinuous organic coats in root channels and pores; few fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

C4—40 to 60 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown (10YR 5/2) mottles; massive; friable; few faint very dark grayish brown (10YR 3/2) discontinuous organic coats in root channels and pores; few fine rounded soft masses of iron-manganese; moderately acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam

*C horizon:*
Hue—10YR or 7.5YR
Value—4 to 7
Chroma—2 to 6
Texture—silt loam or silt

## *Wellston Series*

*Depth class:* Deep or very deep
*Drainage class:* Well drained
*Permeability:* Moderately slow
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Loess and silty residuum over bedrock
*Slope range:* 10 to 18 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Ultic Hapludalfs

### Typical Pedon

Wellston silt loam, 15 to 20 percent slopes, 700 feet east and 2,800 feet south of the northwest corner of sec. 6, T. 7 S., R. 5 E., Hamilton County, Illinois:

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; very dark grayish brown (10YR 4/2) organic coatings on faces of peds and in some root channels; friable; common very fine and fine roots throughout; moderately acid; clear smooth boundary.

E—3 to 8 inches; yellowish brown (10YR 5/4) silt loam, very pale brown (10YR 7/4) dry; weak medium platy structure parting to weak medium granular; friable; common very fine and fine roots throughout; common distinct dark grayish brown (10YR 4/2) organic stains on faces of peds and in pores; strongly acid; clear smooth boundary.

BE—8 to 16 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; common very fine and fine roots throughout; few faint dark brown (10YR 4/3) organic stains on faces of peds; very strongly acid; clear smooth boundary.

Bt1—16 to 26 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common very fine and fine roots between peds; common distinct dark brown (7.5YR 5/6) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—26 to 32 inches; strong brown (7.5YR 5/6) silt loam; moderate coarse subangular blocky structure parting to moderate fine and very fine subangular blocky; friable; few fine roots between peds; common distinct brown (7.5YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt3—32 to 40 inches; strong brown (7.5YR 5/6) channery loam; moderate fine and medium subangular blocky structure; friable; few fine roots between peds; common distinct brown (7.5YR 4/4) clay films on faces of peds; about 25 percent sandstone channers; strongly acid; gradual smooth boundary.

2BC—40 to 48 inches; strong brown (7.5YR 5/6) very channery loam; weak coarse subangular blocky structure; friable; few thin brown (7.5YR 4/4) clay films on vertical faces of peds; about 45 percent sandstone channers; very strongly acid; clear smooth boundary.

2R—48 to 52 inches; thinly bedded, weathered Pennsylvanian-age sandstone and siltstone.

### Range in Characteristics

*Thickness of the loess:* 20 to 40 inches
*Depth to bedrock:* 40 to 72 inches

*A horizon:*
Hue—10YR
Value—3 or 4

Chroma—2
Texture—silt loam

*E horizon:*
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

*Bt horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—silt loam or silty clay loam

*2Bt or 2BC horizon:*
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 8
Texture—loam, clay loam, or the channery or very channery analogs of these textures

## *Wilbur Series*

*Depth class:* Very deep
*Drainage class:* Moderately well drained
*Permeability:* Moderate
*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Parent material:* Silty alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Coarse-silty, mixed, mesic Fluvaquentic Eutrochrepts

### Typical Pedon

Wilbur silt loam, frequently flooded, 1,890 feet north and 1,660 feet west of the southeast corner of sec. 16, T. 3 S., R. 1 W., Washington County, Illinois:

Ap—0 to 8 inches; brown (10YR 4/3) and dark grayish brown (10YR 4/2) silt loam, very pale brown (10YR 7/3) and light brownish gray (10YR 6/2) dry; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.
Bw1—8 to 13 inches; brown (10YR 4/3) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and common fine faint dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.
Bw2—13 to 19 inches; brown (10YR 4/3) silt loam; common fine distinct dark gray (10YR 4/1) and few fine distinct dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; few very fine and fine roots; slightly acid; clear smooth boundary.
C1—19 to 33 inches; brown (10YR 4/3) silt loam; common medium faint grayish brown (10YR 5/2) and few fine faint yellowish brown (10YR 5/4) mottles; massive; friable; few very fine roots; moderately acid; clear smooth boundary.
C2—33 to 60 inches; brown (10YR 5/3) silt loam; common medium distinct grayish brown (2.5Y 5/2) and few fine faint dark yellowish brown (10YR 4/4) mottles; massive; friable; few very fine roots; moderately acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

*Bw horizon:*
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam

*C or Cg horizon:*
Hue—10YR
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, or sandy loam

## *Wirt Series*

*Depth class:* Very deep
*Drainage class:* Well drained
*Permeability:* Moderate
*Landform:* Flood plains
*Position on the landform:* Natural levees along stream channels and slight rises on broad flood plains
*Parent material:* Loamy alluvium
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts

### Typical Pedon

Wirt silt loam, frequently flooded, 2,560 feet south and 250 feet west of the northeast corner of sec. 21, T. 3 N., R. 1 E., Marion County, Illinois:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt

loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine to coarse roots throughout; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded soft masses of iron-manganese; neutral; abrupt wavy boundary.

A2—3 to 12 inches; brown (10YR 4/3) silt loam; weak coarse angular blocky structure; friable; common very fine to coarse roots throughout; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded soft masses of iron-manganese; slightly acid; abrupt wavy boundary.

Bw—12 to 36 inches; brown (10YR 4/3) silt loam; moderate medium prismatic structure parting to moderate coarse angular blocky; friable; common very fine to coarse roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded soft masses of iron-manganese; moderately acid; gradual wavy boundary.

C1—36 to 46 inches; brown (10YR 5/3), stratified silt loam and loam; massive; friable; few very fine to coarse roots; common distinct very dark grayish brown (10YR 3/2) organic coatings in pores; few fine rounded soft masses of iron-manganese; moderately acid; abrupt wavy boundary.

C2—46 to 60 inches; yellowish brown (10YR 5/6) sandy loam; common fine distinct yellowish brown (10YR 5/6) and common medium distinct grayish brown (10YR 5/2) mottles; massive; very friable; moderately acid.

### Range in Characteristics

*Depth to bedrock:* More than 60 inches

*Ap or A horizon:*
- Hue—10YR
- Value—3 to 5
- Chroma—2 to 4
- Texture—silt loam or loam

*Bw horizon:*
- Hue—10YR
- Value—3 to 5
- Chroma—3 to 6
- Texture—silt loam, loam, or sandy loam

*C horizon:*
- Hue—10YR
- Value—4 or 5
- Chroma—3 to 6
- Texture—silt loam, loam, sandy loam, or the gravelly analogs of these textures

## *Wynoose Series*

*Depth class:* Very deep
*Drainage class:* Poorly drained
*Permeability:* Very slow
*Landform:* Uplands and benches
*Position on the landform:* Broad flats and depressions on divides
*Parent material:* Loess and erosional sediments over a paleosol that formed in till
*Slope range:* 0 to 2 percent

**Taxonomic classification:** Fine, smectitic, mesic Chromic Vertic Albaqualfs

### Typical Pedon

Wynoose silt loam, 2,040 feet west and 1,000 feet south of the northeast corner of sec. 26, T. 4 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; weak very fine and fine granular structure; firm; many fine roots throughout; slightly alkaline; abrupt smooth boundary.

Eg—7 to 11 inches; light gray (10YR 7/1) silt loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium platy structure parting to moderate thick platy; friable; many fine roots throughout; neutral; abrupt smooth boundary.

B/Eg—11 to 14 inches; 60 percent light gray (10YR 7/1) (exterior) silty clay loam (E) and light brownish gray (10YR 6/2) silty clay loam (B); few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable; many fine roots throughout; very strongly acid; abrupt wavy boundary.

Btg1—14 to 21 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine distinct yellowish brown (10YR 5/8) mottles; strong medium subangular blocky structure; firm; common fine roots throughout; few faint grayish brown (2.5Y 5/2) discontinuous clay films on faces of peds; few prominent white (10YR 8/1) discontinuous skeletans (silt) on faces of peds; extremely acid; clear smooth boundary.

Btg2—21 to 28 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots throughout; few faint grayish brown (2.5Y 5/2) discontinuous clay films on faces of peds; few prominent white (10YR

8/1) patchy skeletans (silt) on faces of peds; very strongly acid; gradual smooth boundary.
2Btg3—28 to 38 inches; olive gray (5Y 5/2) silty clay loam; common fine faint yellowish brown (10YR 5/4) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm; common very fine and fine roots between peds; few grayish brown (2.5Y 5/2) clay films on faces of peds; few faint yellowish red (5YR 5/8) patchy iron stains on faces of peds and common fine rounded soft masses of iron-manganese throughout; very strongly acid; gradual smooth boundary.
2Btg4—38 to 53 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; few faint dark grayish brown (2.5Y 4/2) patchy clay films on faces of peds; common medium rounded iron concretions; very strongly acid; gradual smooth boundary.
3Btgb1—53 to 64 inches; gray (10YR 5/1) loam; few coarse prominent strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few fine roots between peds; few prominent black (10YR 2/1) continuous organic coats in root channels and/or pores; few faint dark gray (10YR 4/1) patchy clay films on faces of peds; common medium rounded barite crystals and common medium rounded iron concretions; slightly acid; 1 percent igneous pebbles; gradual smooth boundary.
3Btgb2—64 to 73 inches; dark gray (10YR 4/1) clay loam; common medium and coarse distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few faint dark gray (10YR 4/1) patchy clay films on faces of peds; common medium rounded barite crystals and common medium rounded iron concretions; neutral; 1 percent igneous pebbles.

### Range in Characteristics

*Thickness of the loess:* 30 to 55 inches
*Depth to bedrock:* More than 60 inches
*Depth to carbonates:* More than 60 inches
*Depth to a claypan:* 13 to 24 inches

*A or Ap horizon:*
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

*Eg horizon:*
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam

*Btg horizon:*
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

*2Btg horizon:*
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt clay loam, clay loam, loam, or silt loam

*3Btgb horizon:*
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt clay loam, clay loam, loam, or silt loam

## *Zanesville Series*

*Depth class:* Deep or very deep
*Drainage class:* Moderately well drained
*Permeability:* Slow
*Landform:* Uplands
*Position on the landform:* Side slopes
*Parent material:* Loess and loamy residuum over bedrock
*Slope range:* 10 to 18 percent

**Taxonomic classification:** Fine-silty, mixed, mesic Oxyaquic Fragiaqualfs

### Typical Pedon

Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded, 250 feet west and 100 feet north of the southeast corner of sec. 29, T. 1 S., R. 4 E., Jefferson County, Illinois:

Ap—0 to 2 inches; brown (10YR 4/3) silty clay loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.
Bt1—2 to 8 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common very fine and fine roots throughout; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores and few prominent light gray (10YR 7/2)

skeletans (silt); common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

Bt2—8 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; few fine prominent gray (10YR 5/1) mottles; strong fine subangular blocky structure; firm; common very fine and fine roots between peds; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; few prominent light gray (10YR 7/2) skeletans (silt); few strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt3—13 to 17 inches; strong brown (7.5YR 4/6) silty clay loam; common fine prominent gray (10YR 5/1) mottles; strong fine angular blocky structure; firm; common very fine and fine roots between peds; common distinct brown (7.5YR 4/4) clay films on faces of peds and in pores; few prominent light gray (10YR 7/2) skeletans (silt); few faint strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

B/E—17 to 19 inches; strong brown (7.5YR 4/6) silty clay loam; few fine prominent gray (10YR 5/1) mottles; moderate fine subangular blocky structure; firm; common very fine and fine roots between peds; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; common prominent light gray (10YR 7/2) skeletans (silt); few faint strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

2Btx1—19 to 34 inches; brown (7.5YR 4/4) silty clay loam; common fine and medium prominent light brownish gray (10YR 6/2) and common medium distinct pale brown (10YR 6/3) mottles; moderate very coarse prismatic structure parting to weak medium subangular blocky; extremely firm, brittle; few fine roots between peds; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; few distinct strong brown (7.5YR 5/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular barite crystals; very strongly acid; 2 percent sedimentary pebbles; clear smooth boundary.

2Btx2—34 to 40 inches; brown (7.5YR 4/4) loam; common fine and medium prominent light brownish gray (10YR 6/2) mottles; moderate coarse and very coarse prismatic structure parting to weak medium subangular blocky; extremely firm, brittle; few fine roots between peds; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; few distinct strong brown (7.5YR 4/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular iron concretions; common fine cylindrical barite crystals; very strongly acid; 3 percent sedimentary pebbles; clear smooth boundary.

3Btb—40 to 50 inches; brown (7.5YR 4/4) loam; common fine and medium prominent light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; very firm; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; few distinct strong brown (7.5YR 4/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular iron concretions; very strongly acid; 15 percent sandstone-shale pebbles; clear smooth boundary.

3Cr—50 to 60 inches; 80 percent strong brown (7.5YR 4/6) and 20 percent light brownish gray (10YR 6/2), weathered bedrock; massive; extremely firm; very strongly acid.

## Range in Characteristics

*Thickness of the loess:* 19 to 40 inches
*Depth to bedrock:* 40 to 80 inches
*Carbonates:* None
*Depth to the fragipan:* 19 to 32 inches

*Ap or A horizon:*
- Hue—10YR or 7.5YR
- Value—4 or 5
- Chroma—2 to 4
- Texture—silt loam or silty clay loam

*Bt horizon:*
- Hue—10YR or 7.5YR
- Value—4 or 5
- Chroma—2 to 6
- Texture—silt loam or silty clay loam

*2Btx horizon:*
- Hue—10YR or 7.5YR
- Value—4 or 5
- Chroma—3 to 6
- Texture—silty clay loam, silt loam, loam, clay loam, or sandy clay loam

*3Btb horizon:*
- Hue—10YR or 7.5YR
- Value—4 to 6
- Chroma—3 to 6
- Texture—silty clay loam, silt loam, loam, clay loam, or sandy clay loam

*3C horizon (if it occurs):*
- Hue—10YR or 7.5YR
- Value—4 to 6
- Chroma—3 to 6
- Texture—silty clay loam, silt loam, loam, sandy clay loam, or weathered bedrock

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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.

**Alluvial fan.** The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipyridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**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.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

| | |
|---|---|
| Very low | 0 to 3 |
| Low | 3 to 6 |
| Moderate | 6 to 9 |
| High | 9 to 12 |
| Very high | more than 12 |

**Backslope.** The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

**Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

**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.

**Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

**Bench (structural).** A platformlike, nearly level to gently inclined erosional surface developed in resistant strata in areas where valleys are cut in alternating strong and weak layers that are essentially horizontal.

**Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

**Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

**Bottom land.** The normal flood plain of a stream, subject to flooding.

**Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

**Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

**Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

**Cable yarding.** A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**California bearing ratio** (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

**Canopy.** The leafy crown of trees or shrubs. (See Crown.)

**Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Catsteps.** Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

**Cement rock.** Shaly limestone used in the manufacture of cement.

**Channery soil material.** Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**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 depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

**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.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

**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.

**Congeliturbate.** Soil material disturbed by frost action.

**Conglomerate.** A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coppice dune.** A small dune of fine grained soil material stabilized around shrubs or small trees.

**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.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cross-slope farming.** Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**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.

**Delta.** A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

**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, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Divided-slope farming.** A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

**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.

**Draw.** A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**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.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**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.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion* (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more

gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Esker.** A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

**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.

**Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

**Fan terrace.** A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

**Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

**Fine textured soil.** Sandy clay, silty clay, or clay.

**Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

**First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.

**Flaggy soil material.** Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

**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.

**Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.

**Footslope.** The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

**Forb.** Any herbaceous plant not a grass or a sedge.

**Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.

**Forest type.** A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

**Fragipan.** A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

**Frost action** (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Glacial drift.** Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

**Glacial outwash.** Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

**Glacial till.** Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

**Glaciofluvial deposits.** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

**Glaciolacustrine deposits.** Material ranging from fine

clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

**Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.

**Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

**Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that has 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.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Head out.** To form a flower head.

**Head slope.** A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

**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.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**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.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**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 |

**Interfluve.** An elevated area between two drainageways that sheds water to those drainageways.

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**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.

**Kame.** An irregular, short ridge or hill of stratified glacial drift.

**Karst** (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

**Knoll.** A small, low, rounded hill rising above adjacent landforms.

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones** (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Low strength.** The soil is not strong enough to support loads.

**Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

**Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

**Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Moraine.** An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

**Muck.** Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

**Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

**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.

**Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil.** A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

**Nose slope.** A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

**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. The content of organic matter in the surface layer is described as follows:

| | |
|---|---|
| Very low | less than 0.5 percent |
| Low | 0.5 to 1.0 percent |
| Moderately low | 1.0 to 2.0 percent |
| Moderate | 2.0 to 4.0 percent |
| High | 4.0 to 8.0 percent |
| Very high | more than 8.0 percent |

**Outwash plain.** A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The movement of water through the soil.

**Percs slowly** (in tables). The slow movement of water through the soil adversely affects the specified use.

**Permafrost.** Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability."

Terms describing permeability, measured in inches per hour, are as follows:

| | |
|---|---|
| Extremely slow | 0.0 to 0.01 inch |
| Very slow | 0.01 to 0.06 inch |
| Slow | 0.06 to 0.2 inch |
| Moderately slow | 0.2 to 0.6 inch |
| Moderate | 0.6 inch to 2.0 inches |
| Moderately rapid | 2.0 to 6.0 inches |
| Rapid | 6.0 to 20 inches |
| Very rapid | more than 20 inches |

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**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.

**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.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**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.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

| | |
|---|---|
| Ultra acid | less than 3.5 |
| Extremely acid | 3.5 to 4.4 |
| Very strongly acid | 4.5 to 5.0 |
| Strongly acid | 5.1 to 5.5 |
| Moderately acid | 5.6 to 6.0 |
| Slightly acid | 6.1 to 6.5 |
| Neutral | 6.6 to 7.3 |
| Slightly alkaline | 7.4 to 7.8 |
| Moderately alkaline | 7.9 to 8.4 |
| Strongly alkaline | 8.5 to 9.0 |
| Very strongly alkaline | 9.1 and higher |

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**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.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**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.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shoulder.** The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

**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.

**Side slope.** A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio.** The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**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.

**Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Sloughed till.** Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

**Slow intake** (in tables). The slow movement of water into the soil.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Small stones** (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodic (alkali) 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.

**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 |

**Soft bedrock.** Bedrock that can be excavated with

trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**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 and by the passage of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

| | |
|---|---|
| Very coarse sand | 2.0 to 1.0 |
| Coarse sand | 1.0 to 0.5 |
| Medium sand | 0.5 to 0.25 |
| Fine sand | 0.25 to 0.10 |
| Very fine sand | 0.10 to 0.05 |
| Silt | 0.05 to 0.002 |
| Clay | less than 0.002 |

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion 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 grained* (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 wind erosion 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.

**Summit.** The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terminal moraine.** A belt of thick glacial drift that generally marks the termination of important glacial advances.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace** (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and

*clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

**Thin layer** (in tables). Otherwise suitable soil material that is too thin for the specified use.

**Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.

**Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope.** The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

**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.

**Variegation.** 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.

**Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wilting point (or permanent wilting point).** The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow.** The uprooting and tipping over of trees by the wind.

# Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Mt. Vernon, Illinois)

| Month | Temperature | | | | | | Precipitation | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 years in 10 will have-- | | | | 2 years in 10 will have-- | | |
| | Average daily maximum | Average daily minimum | Average | Maximum temperature higher than-- | Minimum temperature lower than-- | Average number of growing degree days* | Average | Less than-- | More than-- | Average number of days with 0.10 inch or more |
| | °F | °F | °F | °F | °F | Units | In | In | In | |
| January---- | 38.2 | 19.2 | 28.7 | 67 | -13 | 5 | 2.23 | 0.80 | 3.42 | 4 |
| February--- | 43.0 | 23.2 | 33.1 | 71 | -6 | 8 | 2.62 | 1.25 | 3.80 | 5 |
| March------ | 54.7 | 33.8 | 44.2 | 81 | 10 | 63 | 4.10 | 2.34 | 5.67 | 7 |
| April------ | 66.8 | 44.3 | 55.6 | 86 | 24 | 216 | 4.23 | 2.67 | 5.65 | 8 |
| May-------- | 76.3 | 52.9 | 64.6 | 91 | 34 | 432 | 4.42 | 2.50 | 6.11 | 7 |
| June------- | 85.4 | 61.8 | 73.6 | 97 | 45 | 706 | 3.39 | 1.91 | 4.71 | 6 |
| July------- | 88.9 | 66.0 | 77.5 | 99 | 51 | 807 | 4.04 | 1.82 | 5.94 | 5 |
| August----- | 87.1 | 63.7 | 75.4 | 100 | 49 | 774 | 3.15 | 1.33 | 4.69 | 4 |
| September-- | 80.6 | 56.9 | 68.7 | 95 | 37 | 550 | 3.28 | 1.69 | 4.67 | 4 |
| October---- | 69.2 | 44.6 | 56.9 | 88 | 25 | 240 | 2.80 | 1.29 | 4.26 | 4 |
| November--- | 55.6 | 35.7 | 45.6 | 78 | 14 | 72 | 3.94 | 1.80 | 5.77 | 6 |
| December--- | 42.5 | 24.7 | 33.6 | 69 | -3 | 11 | 3.58 | 1.85 | 5.09 | 6 |
| Yearly: | | | | | | | | | | |
| Average--- | 65.7 | 43.9 | 54.8 | --- | --- | --- | --- | --- | --- | --- |
| Extreme--- | 104 | -20 | --- | 101 | -14 | --- | --- | --- | --- | --- |
| Total----- | --- | --- | --- | --- | --- | 3,884 | 41.78 | 34.72 | 47.44 | 66 |

* 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 Mt. Vernon, Illinois)

| Probability | Temperature | | |
|---|---|---|---|
| | 24 °F or lower | 28 °F or lower | 32 °F or lower |
| Last freezing temperature in spring: | | | |
| 1 year in 10 later than-- | Apr. 7 | Apr. 12 | Apr. 30 |
| 2 years in 10 later than-- | Apr. 1 | Apr. 8 | Apr. 24 |
| 5 years in 10 later than-- | Mar. 22 | Mar. 29 | Apr. 13 |
| First freezing temperature in fall: | | | |
| 1 year in 10 earlier than-- | Oct. 28 | Oct. 16 | Oct. 7 |
| 2 years in 10 earlier than-- | Nov. 2 | Oct. 22 | Oct. 12 |
| 5 years in 10 earlier than-- | Nov. 13 | Nov. 1 | Oct. 22 |

Table 3.--Growing Season

(Recorded in the period 1961-90 at Mt. Vernon, 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 | 195 | 184 | 160 |
| 8 years in 10 | 202 | 191 | 168 |
| 5 years in 10 | 217 | 203 | 182 |
| 2 years in 10 | 231 | 215 | 196 |
| 1 year in 10 | 239 | 222 | 204 |

Table 4.--Acreage and Proportionate Extent of the Soils

| Map symbol | Soil name | Franklin County | Jefferson County | Total | |
|---|---|---|---|---|---|
| | | | | Area | Extent |
| | | Acres | Acres | Acres | Pct |
| 2 | Cisne silt loam | 6,585 | 16,820 | 23,405 | 3.6 |
| 3A | Hoyleton silt loam, 0 to 2 percent slopes | 11,600 | 22,090 | 33,690 | 5.2 |
| 3B2 | Hoyleton silt loam, 2 to 5 percent slopes, eroded | 4,820 | 7,565 | 12,385 | 1.9 |
| 4B2 | Richview silt loam, 2 to 5 percent slopes, eroded | 1,495 | 2,675 | 4,170 | 0.6 |
| 4C2 | Richview silt loam, 5 to 10 percent slopes, eroded | 645 | 615 | 1,260 | 0.2 |
| 5C2 | Blair silt loam, 5 to 10 percent slopes, eroded | 0 | 10 | 10 | * |
| 5C3 | Blair silty clay loam, 5 to 10 percent slopes, severely eroded | 11,700 | 20,655 | 32,355 | 5.0 |
| 7C2 | Atlas silt loam, 5 to 10 percent slopes, eroded | 0 | 5 | 5 | * |
| 7D2 | Atlas silt loam, 10 to 18 percent slopes, eroded | 0 | 5 | 5 | * |
| 8D2 | Hickory silt loam, 10 to 18 percent slopes, eroded | 0 | 5 | 5 | * |
| 8D3 | Hickory clay loam, 10 to 18 percent slopes, severely eroded | 4,850 | 13,695 | 18,545 | 2.9 |
| 8F | Hickory silt loam, 18 to 35 percent slopes | 0 | 80 | 80 | * |
| 8G | Hickory silt loam, 35 to 60 percent slopes | 5 | 5 | 10 | * |
| 10C | Plumfield silty clay loam, 5 to 10 percent slopes | 10,300 | 13,445 | 23,745 | 3.7 |
| 10D | Plumfield silty clay loam, 10 to 18 percent slopes | 3,625 | 3,725 | 7,350 | 1.1 |
| 12 | Wynoose silt loam | 8,425 | 13,380 | 21,805 | 3.4 |
| 13A | Bluford silt loam, 0 to 2 percent slopes | 25,800 | 38,620 | 64,420 | 9.9 |
| 13B2 | Bluford silt loam, 2 to 5 percent slopes, eroded | 16,010 | 17,175 | 33,185 | 5.1 |
| 14B | Ava silt loam, 2 to 5 percent slopes | 19,270 | 24,450 | 43,720 | 6.7 |
| 14B2 | Ava silt loam, 2 to 5 percent slopes, eroded | 8,130 | 7,390 | 15,520 | 2.4 |
| 14C2 | Ava silt loam, 5 to 10 percent slopes, eroded | 8,840 | 8,455 | 17,295 | 2.7 |
| 15D3 | Parke silty clay loam, 10 to 18 percent slopes, severely eroded | 1,080 | 0 | 1,080 | 0.2 |
| 84 | Okaw silt loam | 3,170 | 0 | 3,170 | 0.5 |
| 109 | Racoon silt loam | 2,095 | 1,655 | 3,750 | 0.6 |
| 122B | Colp silt loam, 2 to 5 percent slopes | 2,580 | 0 | 2,580 | 0.4 |
| 122B2 | Colp silt loam, 2 to 5 percent slopes, eroded | 5 | 0 | 5 | * |
| 122C3 | Colp silty clay loam, 5 to 10 percent slopes, severely eroded | 960 | 0 | 960 | 0.1 |
| 122D3 | Colp silty clay loam, 10 to 18 percent slopes, severely eroded | 535 | 0 | 535 | * |
| 287 | Chauncey silt loam | 345 | 705 | 1,050 | 0.2 |
| 301B | Grantsburg silt loam 2 to 5 percent slopes | 4,455 | 21,395 | 25,850 | 4.0 |
| 301C3 | Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded | 3,280 | 13,715 | 16,995 | 2.6 |
| 337A | Creal silt loam, 0 to 2 percent slopes | 955 | 550 | 1,505 | 0.2 |
| 338A | Hurst silt loam, 0 to 2 percent slopes | 3,820 | 5 | 3,825 | 0.6 |
| 339D | Wellston silt loam, 10 to 18 percent slopes | 0 | 5 | 5 | * |
| 340D3 | Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded | 1,645 | 4,880 | 6,525 | 1.0 |
| 376 | Cisne silt loam, bench | 3,580 | 2,305 | 5,885 | 0.9 |
| 377A | Hoyleton silt loam, bench, 0 to 2 percent slopes | 1,955 | 1,165 | 3,120 | 0.5 |
| 377B2 | Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded | 1,025 | 430 | 1,455 | 0.2 |
| 421G | Kell silt loam, 35 to 60 percent slopes | 420 | 3,085 | 3,505 | 0.5 |
| 518B | Rend silt loam, 2 to 5 percent slopes | 1,340 | 865 | 2,205 | 0.3 |
| 518B2 | Rend silt loam, 2 to 5 percent slopes, eroded | 5,140 | 3,555 | 8,695 | 1.3 |

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

| Map symbol | Soil name | Franklin County | Jefferson County | Total | |
|---|---|---|---|---|---|
| | | | | Area | Extent |
| | | Acres | Acres | Acres | Pct |
| 518C2 | Rend silt loam, 5 to 10 percent slopes, eroded | 1,450 | 1,565 | 3,015 | 0.5 |
| 533 | Urban land | 595 | 685 | 1,280 | 0.2 |
| 536 | Dumps, mine | 895 | 270 | 1,165 | 0.2 |
| 551D2 | Gosport loam, 10 to 18 percent slopes, eroded | 0 | 5 | 5 | * |
| 583B | Pike silt loam 2 to 5 percent slopes | 920 | 70 | 990 | 0.2 |
| 583C2 | Pike silt loam, 5 to 10 percent slopes, eroded | 1,345 | 50 | 1,395 | 0.2 |
| 639 | Wynoose silt loam, bench | 7,070 | 7,800 | 14,870 | 2.3 |
| 640A | Bluford silt loam, bench, 0 to 2 percent slopes | 7,090 | 4,650 | 11,740 | 1.8 |
| 786D2 | Frondorf silt loam, 10 to 18 percent slopes, eroded | 0 | 60 | 60 | * |
| 802B | Orthents, loamy, undulating | 3,600 | 3,070 | 6,670 | 1.0 |
| 802F | Orthents, loamy, hilly and very hilly | 180 | 505 | 685 | 0.1 |
| 823B | Schuline silt loam, 2 to 5 percent slopes | 770 | 2,320 | 3,090 | 0.5 |
| 866 | Dumps, slurry | 545 | 280 | 825 | 0.1 |
| 871D | Lenzburg gravelly silty clay loam, 7 to 20 percent slopes | 40 | 250 | 290 | * |
| 871G | Lenzburg gravelly silty clay loam, 20 to 60 percent slopes | 0 | 935 | 935 | 0.1 |
| 908F | Hickory-Kell silt loams, 18 to 30 percent slopes | 4,315 | 17,305 | 21,620 | 3.3 |
| 927D3 | Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded | 2,705 | 4,975 | 7,680 | 1.2 |
| 1085 | Jacob silty clay, undrained, frequently flooded | 1,185 | 0 | 1,185 | 0.2 |
| 1108 | Bonnie silt loam, undrained, frequently flooded | 2,985 | 2,225 | 5,210 | 0.8 |
| 3072 | Sharon silt loam, frequently flooded | 1,840 | 5,610 | 7,450 | 1.1 |
| 3085 | Jacob silty clay, frequently flooded | 2,445 | 0 | 2,445 | 0.4 |
| 3108 | Bonnie silt loam, frequently flooded | 14,075 | 10,820 | 24,895 | 3.8 |
| 3226 | Wirt silt loam, frequently flooded | 0 | 5 | 5 | * |
| 3336 | Wilbur silt loam, frequently flooded | 0 | 45 | 45 | * |
| 3382 | Belknap silt loam, frequently flooded | 24,095 | 35,255 | 59,350 | 9.1 |
| 3415 | Orion silt loam, frequently flooded | 0 | 5 | 5 | * |
| 3422 | Cape silty clay loam, frequently flooded | 5,235 | 60 | 5,295 | 0.8 |
| W | Water areas less than 40 acres | 1,135 | 665 | 1,800 | 0.3 |
| WATER | Water areas greater than 40 acres | 11,300 | 8,855 | 20,155 | 3.1 |
| | Total | 276,300 | 373,520 | 649,820 | 100.0 |

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

| Map symbol and soil name | Land capability | Corn | Soybeans | Winter wheat | Grass-legume hay | Grass-legume pasture |
|---|---|---|---|---|---|---|
| | | Bu | Bu | Bu | Tons | AUM* |
| 2---------- Cisne | 3w | 115 | 35 | 52 | 4.5 | 7.5 |
| 3A---------- Hoyleton | 2w | 116 | 34 | 53 | 4.7 | 7.5 |
| 3B2---------- Hoyleton | 2e | 111 | 33 | 51 | 4.5 | 7.2 |
| 4B2---------- Richview | 2e | 107 | 32 | 49 | 4.5 | 7.5 |
| 4C2---------- Richview | 3e | 103 | 29 | 47 | 4.5 | 7.1 |
| 5C2---------- Blair | 3e | 89 | 31 | 41 | 3.5 | 5.8 |
| 5C3---------- Blair | 4e | 82 | 29 | 38 | 3.2 | 5.4 |
| 7C2---------- Atlas | 3e | 52 | --- | 19 | 2.2 | 3.6 |
| 7D2---------- Atlas | 4e | --- | --- | 18 | 2.1 | 3.4 |
| 8D2---------- Hickory | 3e | 72 | 23 | 26 | 2.7 | 4.5 |
| 8D3---------- Hickory | 4e | --- | --- | --- | 2.5 | 4.1 |
| 8F---------- Hickory | 6e | --- | --- | --- | 2.4 | 4.0 |
| 8G---------- Hickory | 7e | --- | --- | --- | --- | --- |
| 10C---------- Plumfield | 4e | 67 | 20 | 34 | 3.3 | 5.5 |
| 10D---------- Plumfield | 6e | --- | --- | --- | 3.0 | 5.1 |
| 12---------- Wynoose | 3w | 96 | 33 | 46 | 3.9 | 6.5 |
| 13A---------- Bluford | 2w | 103 | 33 | 49 | 4.1 | 6.8 |
| 13B2---------- Bluford | 2e | 99 | 32 | 47 | 3.9 | 6.5 |
| 14B---------- Ava | 2e | 97 | 33 | 48 | 4.3 | 7.1 |

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

| Map symbol and soil name | Land capability | Corn | Soybeans | Winter wheat | Grass-legume hay | Grass-legume pasture |
|---|---|---|---|---|---|---|
| | | Bu | Bu | Bu | Tons | AUM* |
| 14B2<br>Ava | 2e | 92 | 31 | 45 | 4.0 | 6.8 |
| 14C2<br>Ava | 3e | 89 | 30 | 44 | 3.9 | 6.6 |
| 15D3<br>Parke | 4e | 85 | 30 | 34 | 2.8 | 5.6 |
| 84<br>Okaw | 3w | 84 | 28 | 41 | 4.0 | 6.8 |
| 109<br>Racoon | 3w | 108 | 35 | 35 | 4.1 | 6.8 |
| 122B<br>Colp | 3e | 85 | 32 | 43 | 3.6 | 5.9 |
| 122B2<br>Colp | 3e | 83 | 31 | 41 | 3.5 | 5.8 |
| 122C3<br>Colp | 4e | 65 | 24 | 33 | 2.7 | 4.6 |
| 122D3<br>Colp | 6e | --- | --- | --- | 2.6 | 4.3 |
| 287<br>Chauncey | 2w | 120 | 37 | 53 | 4.7 | 7.8 |
| 301B<br>Grantsburg | 2e | 94 | 33 | 46 | 4.1 | 6.7 |
| 301C3<br>Grantsburg | 4e | 72 | --- | 35 | 3.1 | 5.2 |
| 337A<br>Creal | 2w | 109 | 35 | 51 | 4.3 | 7.2 |
| 338A<br>Hurst | 3w | 87 | 32 | 45 | 3.6 | 6.0 |
| 339D<br>Wellston | 4e | 95 | --- | 35 | 4.3 | 5.8 |
| 340D3<br>Zanesville | 6e | --- | --- | --- | 2.5 | 4.5 |
| 376<br>Cisne | 3w | 115 | 35 | 52 | 4.5 | 7.5 |
| 377A<br>Hoyleton | 2w | 116 | 34 | 53 | 4.7 | 7.5 |
| 377B2<br>Hoyleton | 2e | 111 | 33 | 51 | 4.5 | 7.2 |
| 421G<br>Kell | 7e | --- | --- | --- | --- | --- |
| 518B<br>Rend | 2e | 103 | 33 | 50 | 4.5 | 7.2 |

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

| Map symbol and soil name | Land capability | Corn | Soybeans | Winter wheat | Grass-legume hay | Grass-legume pasture |
|---|---|---|---|---|---|---|
| | | Bu | Bu | Bu | Tons | AUM* |
| 518B2<br>Rend | 2e | 97 | 30 | 48 | 4.3 | 7.1 |
| 518C2<br>Rend | 3e | 90 | 28 | 44 | 3.9 | 6.6 |
| 533.<br>Urban land | | | | | | |
| 536.<br>Dumps, mine | | | | | | |
| 551D2<br>Gosport | 6e | --- | --- | --- | 2.2 | 2.3 |
| 583B<br>Pike | 2e | 120 | 42 | 48 | 4.0 | 8.0 |
| 583C2<br>Pike | 3e | 105 | 37 | 42 | 3.4 | 6.8 |
| 639<br>Wynoose | 3w | 96 | 33 | 46 | 3.9 | 6.5 |
| 640A<br>Bluford | 2w | 103 | 33 | 49 | 4.1 | 6.8 |
| 786D2<br>Frondorf | 4e | 80 | 25 | 30 | 2.5 | 5.0 |
| 802B, 802F.<br>Orthents | | | | | | |
| 823B<br>Schuline | 2e | 92 | 31 | 34 | 3.7 | 6.1 |
| 866.<br>Dumps, slurry | | | | | | |
| 871D<br>Lenzburg | 4e | 70 | --- | 24 | 2.7 | 4.7 |
| 871G<br>Lenzburg | 7e | --- | --- | --- | --- | --- |
| 908F<br>Hickory-Kell | 6e | --- | --- | --- | 2.4 | 4.0 |
| 927D3<br>Blair-Atlas | 6e | --- | --- | --- | 3.1 | 5.1 |
| 1085<br>Jacob | 5w | --- | --- | --- | --- | --- |
| 1108<br>Bonnie | 5w | --- | --- | --- | --- | --- |
| 3072<br>Sharon | 2w | 90 | 25 | --- | 3.4 | 5.0 |

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

| Map symbol and soil name | Land capability | Corn | Soybeans | Winter wheat | Grass-legume hay | Grass-legume pasture |
|---|---|---|---|---|---|---|
| | | Bu | Bu | Bu | Tons | AUM* |
| 3085---------- Jacob | 4w | 66 | 26 | --- | 2.3 | 3.9 |
| 3108---------- Bonnie | 3w | 96 | 31 | --- | 3.4 | 5.7 |
| 3226---------- Wirt | 2w | 95 | 33 | --- | 3.1 | 6.2 |
| 3336---------- Wilbur | 2w | 120 | 42 | --- | 4.0 | 8.0 |
| 3382---------- Belknap | 3w | 112 | 35 | --- | 4.6 | 6.7 |
| 3415---------- Orion | 3w | 80 | 26 | --- | 3.0 | 6.0 |
| 3422---------- Cape | 3w | 91 | 30 | --- | 2.8 | 4.8 |

* 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, water areas, and Orthents are excluded. Absence of an entry indicates no acreage.)

| Class | Total acreage | Major management concerns (Subclass) | | | |
|---|---|---|---|---|---|
| | | Erosion (e) | Wetness (w) | Soil problem (s) | Climate (c) |
| | | Acres | Acres | Acres | Acres |
| 1 | --- | --- | --- | --- | --- |
| 2 | 256,930 | 149,622 | 107,308 | --- | --- |
| 3 | 189,210 | 32,240 | 156,970 | --- | --- |
| 4 | 96,485 | 94,040 | 2,445 | --- | --- |
| 5 | 6,395 | --- | 6,395 | --- | --- |
| 6 | 43,790 | 43,790 | --- | --- | --- |
| 7 | 5,140 | 5,140 | --- | --- | --- |

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 |
|---|---|
| 2 | Cisne silt loam (where drained) |
| 3A | Hoyleton silt loam, 0 to 2 percent slopes (where drained) |
| 3B2 | Hoyleton silt loam, 2 to 5 percent slopes, eroded |
| 4B2 | Richview silt loam, 2 to 5 percent slopes, eroded |
| 13A | Bluford silt loam, 0 to 2 percent slopes (where drained) |
| 13B2 | Bluford silt loam, 2 to 5 percent slopes, eroded |
| 14B | Ava silt loam, 2 to 5 percent slopes |
| 14B2 | Ava silt loam, 2 to 5 percent slopes, eroded |
| 109 | Racoon silt loam (where drained) |
| 122B | Colp silt loam, 2 to 5 percent slopes |
| 122B2 | Colp silt loam, 2 to 5 percent slopes, eroded |
| 287 | Chauncey silt loam (where drained) |
| 301B | Grantsburg silt loam, 2 to 5 percent slopes |
| 337A | Creal silt loam, 0 to 2 percent slopes (where drained) |
| 376 | Cisne silt loam, bench (where drained) |
| 377A | Hoyleton silt loam, bench, 0 to 2 percent slopes (where drained) |
| 377B2 | Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded |
| 518B | Rend silt loam, 2 to 5 percent slopes |
| 518B2 | Rend silt loam, 2 to 5 percent slopes, eroded |
| 583B | Pike silt loam, 2 to 5 percent slopes |
| 639 | Wynoose silt loam, bench (where drained) |
| 640A | Bluford silt loam, bench, 0 to 2 percent slopes (where drained) |
| 823B | Schuline silt loam, 2 to 5 percent slopes |
| 3072 | Sharon silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season) |
| 3108 | Bonnie silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season) |
| 3226 | Wirt silt loam, frequently flooded (where 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) |
| 3382 | Belknap silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season) |
| 3415 | Orion silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season) |
| 3422 | Cape silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season) |

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.)

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 2: | | | | | | | | | | |
| Cisne | 4W | Slight | Severe | Moderate | Moderate | Severe | Pin oak | 70 | 57 | Green ash, pin oak, red maple, water tupelo. |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Bitternut hickory | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| 3A: | | | | | | | | | | |
| Hoyleton | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern cottonwood, eastern white pine, green ash, northern red oak, shortleaf pine, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| | | | | | | | Green ash | --- | --- | |
| 3B2: | | | | | | | | | | |
| Hoyleton | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern cottonwood, eastern white pine, green ash, northern red oak, shortleaf pine, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| | | | | | | | Green ash | --- | --- | |
| 4B2: | | | | | | | | | | |
| Richview | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| | | | | | | | Green ash | --- | --- | |
| 4C2: | | | | | | | | | | |
| Richview | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| | | | | | | | Green ash | --- | --- | |
| 5C2: | | | | | | | | | | |
| Blair | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 5C3: | | | | | | | | | | |
| Blair | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |
| 7C2: | | | | | | | | | | |
| Atlas | 4C | Slight | Slight | Moderate | Moderate | Slight | White oak | 70 | 57 | Austrian pine, green ash, pin oak, red maple. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |
| 7D2: | | | | | | | | | | |
| Atlas | 4C | Slight | Slight | Moderate | Moderate | Slight | White oak | 70 | 57 | Austrian pine, green ash, pin oak, red maple. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |
| 8D2: | | | | | | | | | | |
| Hickory | 5A | Slight | Slight | Slight | Slight | Moderate | White oak | 85 | 72 | Black walnut, eastern white pine, red pine, sugar maple, tuliptree, white oak. |
| | | | | | | | Northern red oak | 85 | 72 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Tuliptree | 95 | 100 | |
| | | | | | | | Bitternut hickory | --- | --- | |
| 8D3: | | | | | | | | | | |
| Hickory | 5A | Slight | Slight | Slight | Slight | Moderate | White oak | 85 | 57 | Black walnut, eastern white pine, red pine, sugar maple, tuliptree, white oak. |
| | | | | | | | Northern red oak | 85 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Tuliptree | 95 | 100 | |
| | | | | | | | Bitternut hickory | --- | --- | |
| 8F: | | | | | | | | | | |
| Hickory | 5R | Moderate | Moderate | Slight | Slight | Moderate | White oak | 85 | 57 | Black walnut, eastern white pine, red pine, sugar maple, tuliptree, white oak. |
| | | | | | | | Northern red oak | 85 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Tuliptree | 95 | 100 | |
| | | | | | | | Bitternut hickory | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 8G: | | | | | | | | | | |
| Hickory | 5R | Severe | Severe | Slight | Slight | Moderate | White oak | 85 | 57 | Black walnut, eastern white pine, red pine, sugar maple, tuliptree, white oak. |
| | | | | | | | Northern red oak | 85 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Tuliptree | 95 | 100 | |
| | | | | | | | Bitternut hickory | --- | --- | |
| 10C: | | | | | | | | | | |
| Plumfield | 4A | Slight | Slight | Moderate | Slight | Slight | White oak | 70 | 57 | American sycamore, black walnut, eastern cottonwood, sweetgum, tuliptree, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Tuliptree | 70 | 57 | |
| | | | | | | | Black walnut | --- | --- | |
| 10D: | | | | | | | | | | |
| Plumfield | 4A | Slight | Slight | Moderate | Slight | Slight | White oak | 70 | 57 | American sycamore, black walnut, eastern cottonwood, sweetgum, tuliptree, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Tuliptree | 70 | 57 | |
| | | | | | | | Black walnut | --- | --- | |
| 12: | | | | | | | | | | |
| Wynoose | 4W | Slight | Severe | Moderate | Moderate | Severe | Pin oak | 70 | 57 | Pin oak, red maple. |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| 13A: | | | | | | | | | | |
| Bluford | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Southern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |
| 13B2: | | | | | | | | | | |
| Bluford | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Southern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 14B: | | | | | | | | | | |
| Ava | 4A | Slight | Slight | Slight | Slight | Moderate | White oak | 75 | 57 | American sycamore, black walnut, eastern cottonwood, sweetgum, tuliptree, white oak. |
| | | | | | | | Northern red oak | 80 | 57 | |
| | | | | | | | Tuliptree | 90 | 86 | |
| | | | | | | | Black walnut | --- | --- | |
| 14B2: | | | | | | | | | | |
| Ava | 4A | Slight | Slight | Slight | Slight | Moderate | White oak | 75 | 57 | American sycamore, black walnut, eastern cottonwood, sweetgum, tuliptree, white oak. |
| | | | | | | | Northern red oak | 80 | 57 | |
| | | | | | | | Tuliptree | 90 | 86 | |
| | | | | | | | Black walnut | --- | --- | |
| 14C2: | | | | | | | | | | |
| Ava | 4A | Slight | Slight | Slight | Slight | Moderate | White oak | 75 | 57 | American sycamore, black walnut, eastern cottonwood, sweetgum, tuliptree, white oak. |
| | | | | | | | Northern red oak | 80 | 57 | |
| | | | | | | | Tuliptree | 90 | 86 | |
| | | | | | | | Black walnut | --- | --- | |
| 15D3: | | | | | | | | | | |
| Parke | 5A | Slight | Slight | Slight | Slight | Moderate | White oak | 90 | 72 | American sycamore, black cherry, black locust, black walnut, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash. |
| | | | | | | | Tuliptree | 98 | 100 | |
| | | | | | | | Sweetgum | 76 | 72 | |
| 84: | | | | | | | | | | |
| Okaw | 4W | Slight | Severe | Severe | Severe | Severe | Pin oak | 70 | 57 | Baldcypress, green ash, pin oak, red maple, swamp white oak, water tupelo. |
| | | | | | | | Blackjack oak | 60 | 43 | |
| | | | | | | | Black oak | 55 | 43 | |
| | | | | | | | White oak | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 109: | | | | | | | | | | |
| Racoon | 4W | Slight | Severe | Severe | Severe | Severe | Pin oak | 80 | 57 | Baldcypress, pin oak, red maple, water tupelo. |
| | | | | | | | Post oak | 80 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| 122B: | | | | | | | | | | |
| Colp | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Bur oak | 70 | 57 | |
| 122B2: | | | | | | | | | | |
| Colp | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Bur oak | 70 | 57 | |
| 122C3: | | | | | | | | | | |
| Colp | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Bur oak | 70 | 57 | |
| 122D3: | | | | | | | | | | |
| Colp | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Bur oak | 70 | 57 | |
| 287: | | | | | | | | | | |
| Chauncey | 4W | Slight | Severe | Moderate | Moderate | Moderate | Pin oak | 80 | 57 | Green ash, pin oak, red maple, water tupelo. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Tuliptree | 80 | 72 | |
| | | | | | | | White oak | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 301B: | | | | | | | | | | |
| Grantsburg | 3D | Slight | Slight | Moderate | Moderate | Slight | White oak | 60 | 43 | Scotch pine, eastern redcedar, eastern white pine, loblolly pine, white ash. |
| | | | | | | | Southern red oak | 60 | 43 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Black oak | 60 | 43 | |
| 301C3: | | | | | | | | | | |
| Grantsburg | 3D | Slight | Slight | Moderate | Moderate | Slight | White oak | 60 | 43 | Scotch pine, eastern redcedar, eastern white pine, loblolly pine, white ash. |
| | | | | | | | Southern red oak | 60 | 43 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Black oak | 60 | 43 | |
| 337A: | | | | | | | | | | |
| Creal | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern white pine, green ash, northern red oak, pecan, tuliptree, white ash, white oak. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| 338A: | | | | | | | | | | |
| Hurst | 4C | Slight | Slight | Moderate | Moderate | Slight | White oak | 70 | 57 | Austrian pine, baldcypress, eastern redcedar, green ash, pin oak, red maple, shortleaf pine. |
| | | | | | | | Southern red oak | 70 | 57 | |
| | | | | | | | White ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |
| 339D: | | | | | | | | | | |
| Wellston | 4R | Slight | Slight | Slight | Slight | Severe | Northern red oak | 81 | 57 | Fraser's fir, Norway spruce, Scotch pine, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak, white spruce. |
| | | | | | | | Virginia pine | 70 | 114 | |
| | | | | | | | Black cherry | --- | --- | |
| | | | | | | | Black walnut | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| | | | | | | | Sugar maple | --- | --- | |
| | | | | | | | Tuliptree | 90 | 86 | |
| | | | | | | | White ash | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 340D3: | | | | | | | | | | |
| Zanesville | 6D | Slight | Slight | Moderate | Moderate | Slight | Virginia pine | 60 | 86 | Virginia pine, eastern white pine, shortleaf pine, white oak. |
| | | | | | | | Black locust | --- | --- | |
| | | | | | | | Black oak | 60 | 43 | |
| | | | | | | | Post oak | --- | --- | |
| | | | | | | | Scarlet oak | --- | --- | |
| | | | | | | | White oak | 60 | 43 | |
| 376: | | | | | | | | | | |
| Cisne | 4W | Slight | Severe | Moderate | Moderate | Severe | Pin oak | 70 | 57 | Green ash, pin oak, red maple, water tupelo. |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Bitternut hickory | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| 377A: | | | | | | | | | | |
| Hoyleton | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern cottonwood, eastern white pine, green ash, northern red oak, shortleaf pine, white oak. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| 377B2: | | | | | | | | | | |
| Hoyleton | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern cottonwood, eastern white pine, green ash, northern red oak, shortleaf pine, white oak. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | --- | --- | |
| 421G: | | | | | | | | | | |
| Kell | 4R | Severe | Severe | Slight | Moderate | Moderate | White oak | 80 | 57 | Black walnut, eastern white pine, tuliptree, white ash, white oak. |
| | | | | | | | Black walnut | --- | --- | |
| | | | | | | | Shagbark hickory | --- | --- | |
| | | | | | | | Tuliptree | --- | --- | |
| | | | | | | | Black cherry | --- | --- | |
| 518B: | | | | | | | | | | |
| Rend | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, white oak, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 518B2: | | | | | | | | | | |
| Rend | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, white oak, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |
| 518C2: | | | | | | | | | | |
| Rend | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, white oak, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |
| 551D2: | | | | | | | | | | |
| Gosport | 2C | Slight | Slight | Severe | Severe | Slight | White oak | 45 | 29 | Norway spruce, Scotch pine, cottonwood, eastern white pine, red pine, white spruce. |
| 583B: | | | | | | | | | | |
| Pike | 5A | Slight | Slight | Slight | Slight | Moderate | White oak | 90 | 72 | Black locust, black walnut, eastern white pine, red pine, tuliptree, white ash. |
| | | | | | | | Tuliptree | 98 | 100 | |
| | | | | | | | Sweetgum | 76 | 72 | |
| 583C2: | | | | | | | | | | |
| Pike | 5A | Slight | Slight | Slight | Slight | Moderate | White oak | 90 | 72 | Black locust, black walnut, eastern white pine, red pine, tuliptree, white ash. |
| | | | | | | | Tuliptree | 98 | 100 | |
| | | | | | | | Sweetgum | 76 | 72 | |
| 639: | | | | | | | | | | |
| Wynoose | 4W | Slight | Severe | Moderate | Moderate | Severe | Pin oak | 70 | 57 | Pin oak, red maple. |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | White oak | --- | --- | |
| 640A: | | | | | | | | | | |
| Bluford | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern redcedar, eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Southern red oak | 70 | 57 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Bur oak | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 786D2: | | | | | | | | | | |
| Frondorf | 8A | Slight | Slight | Slight | Slight | Moderate | Virginia pine | 78 | 114 | Eastern white pine, loblolly pine, northern red oak, shortleaf pine, tuliptree, white oak. |
| | | | | | | | Black oak | 78 | 57 | |
| | | | | | | | hickory | --- | --- | |
| | | | | | | | Sweetgum | 82 | 86 | |
| | | | | | | | Tuliptree | --- | --- | |
| | | | | | | | White oak | 74 | 57 | |
| 802B: | | | | | | | | | | |
| Orthents | --- | --- | --- | --- | --- | --- | --- | --- | --- | Black walnut, northern red oak, tuliptree, white oak. |
| 802F: | | | | | | | | | | |
| Orthents, very hilly | --- | --- | --- | --- | --- | --- | --- | --- | --- | Black walnut, northern red oak, tuliptree, white oak. |
| 823B: | | | | | | | | | | |
| Schuline | --- | --- | --- | --- | --- | --- | --- | --- | --- | Black walnut, eastern white pine, green ash, loblolly pine, northern red oak, white ash, white oak. |
| 871D: | | | | | | | | | | |
| Lenzburg | 5A | Slight | Slight | Slight | Slight | Moderate | Sweetgum | 76 | 72 | Black walnut, eastern cottonwood, green ash, white ash. |
| | | | | | | | Eastern cottonwood | --- | --- | |
| | | | | | | | Black walnut | --- | --- | |
| 871G: | | | | | | | | | | |
| Lenzburg | 5R | Severe | Severe | Slight | Slight | Moderate | Sweetgum | 76 | 72 | Black walnut, eastern cottonwood, green ash, white ash. |
| | | | | | | | Eastern cottonwood | --- | --- | |
| | | | | | | | Black walnut | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 908F: | | | | | | | | | | |
| Hickory | 5R | Moderate | Moderate | Slight | Slight | Moderate | White oak | 85 | 72 | Black walnut, eastern white pine, red pine, sugar maple, tuliptree, white oak. |
| | | | | | | | Black oak | --- | --- | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 85 | 72 | |
| | | | | | | | Tuliptree | 95 | 100 | |
| | | | | | | | Bitternut hickory | --- | --- | |
| Kell | 4R | Moderate | Moderate | Slight | Moderate | Moderate | White oak | 80 | 57 | Black walnut, eastern white pine, tuliptree, white ash, white oak. |
| | | | | | | | Black walnut | --- | --- | |
| | | | | | | | Shagbark hickory | --- | --- | |
| | | | | | | | Tuliptree | --- | --- | |
| | | | | | | | Black cherry | --- | --- | |
| 927D3: | | | | | | | | | | |
| Blair | 4A | Slight | Slight | Slight | Slight | Slight | White oak | 70 | 57 | Eastern white pine, loblolly pine, shortleaf pine. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |
| Atlas | 4C | Slight | Slight | Moderate | Moderate | Slight | White oak | 70 | 57 | Austrian pine, green ash, pin oak, red maple. |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Northern red oak | 70 | 57 | |
| | | | | | | | Bur oak | 70 | 57 | |
| 1085: | | | | | | | | | | |
| Jacob | 4W | Slight | Severe | Severe | Moderate | Severe | Pin oak | 80 | 57 | American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, swamp white oak, water tupelo. |
| | | | | | | | Eastern cottonwood | --- | --- | |
| | | | | | | | American sycamore | --- | --- | |
| | | | | | | | Silver maple | --- | --- | |
| | | | | | | | Swamp white oak | --- | --- | |
| 3072: | | | | | | | | | | |
| Sharon | 7A | Slight | Slight | Slight | Slight | Moderate | Tuliptree | 95 | 100 | Black walnut, pecan, pin oak. |
| | | | | | | | Cherrybark oak | --- | --- | |
| | | | | | | | Eastern cottonwood | 105 | 143 | |
| | | | | | | | Green ash | --- | --- | |
| | | | | | | | Southern red oak | --- | --- | |
| | | | | | | | Sweetgum | --- | --- | |
| | | | | | | | American sycamore | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 3085: | | | | | | | | | | |
| Jacob | 4W | Slight | Severe | Severe | Moderate | Severe | Pin oak | 80 | 57 | American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, swamp white oak, water tupelo. |
| | | | | | | | Eastern cottonwood | --- | --- | |
| | | | | | | | American sycamore | 80 | 57 | |
| | | | | | | | Silver maple | --- | --- | |
| | | | | | | | Swamp white oak | --- | --- | |
| 3108: | | | | | | | | | | |
| Bonnie | 5W | Slight | Severe | Severe | Severe | Severe | Pin oak | 90 | 72 | American sycamore, baldcypress, eastern cottonwood, pin oak, red maple, sweetgum. |
| | | | | | | | Cherrybark oak | --- | --- | |
| | | | | | | | Eastern cottonwood | 100 | 129 | |
| | | | | | | | American sycamore | --- | --- | |
| | | | | | | | Sweetgum | --- | --- | |
| 3226: | | | | | | | | | | |
| Wirt | 8A | Slight | Slight | Slight | Slight | Severe | Tuliptree | 105 | 114 | Black locust, black oak, black walnut, eastern white pine, green ash, jack pine, northern red oak, red pine, tuliptree, white oak. |
| 3336: | | | | | | | | | | |
| Wilbur | 8A | Slight | Slight | Slight | Slight | Severe | Tuliptree | 100 | 114 | Black cherry, bur oak, green ash, pin oak, red maple, swamp white oak, sweetgum. |
| 3382: | | | | | | | | | | |
| Belknap | 6A | Slight | Slight | Slight | Slight | Severe | Tuliptree | 90 | 86 | American sycamore, baldcypress, eastern cottonwood, red maple, sweetgum. |
| | | | | | | | Eastern cottonwood | 100 | 129 | |
| | | | | | | | Pin oak | 90 | 72 | |
| | | | | | | | Sweetgum | --- | --- | |
| | | | | | | | American sycamore | --- | --- | |

Table 8.--Woodland Management and Productivity--Continued

| Map symbol and soil name | Ordination symbol | Management concerns | | | | | Potential productivity | | | Trees to manage |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Erosion hazard | Equipment limitation | Seedling mortality | Windthrow hazard | Plant competition | Common trees | Site index | Volume of wood fiber | |
| | | | | | | | | | cu ft/ac | |
| 3415: | | | | | | | | | | |
| Orion | 2W | Slight | Slight | Slight | Slight | Severe | Silver maple | 80 | 29 | Eastern cottonwood, silver maple, white ash, white spruce. |
| | | | | | | | Red maple | --- | --- | |
| | | | | | | | White ash | --- | --- | |
| 3422: | | | | | | | | | | |
| Cape | 5W | Slight | Severe | Moderate | Moderate | Severe | Pin oak | 90 | 72 | American sycamore, eastern cottonwood, silver maple, sweetgum. |
| | | | | | | | Cherrybark oak | --- | --- | |
| | | | | | | | Eastern cottonwood | 100 | 129 | |
| | | | | | | | American sycamore | --- | --- | |
| | | | | | | | Sweetgum | --- | --- | |

Table 9.--Windbreaks and Environmental Plantings

(Only the soils suitable for windbreaks and environmental plantings are listed. Absence of an entry indicates that trees generally do not grow to the given height.)

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 2: | | | | | |
| Cisne | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 3A: | | | | | |
| Hoyleton | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 3B2: | | | | | |
| Hoyleton | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 4B2: | | | | | |
| Richview | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 4C2: | | | | | |
| Richview | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 5C2: | | | | | |
| Blair | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 5C3: | | | | | |
| Blair | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 7C2: | | | | | |
| Atlas | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 7D2: | | | | | |
| Atlas | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 8D2: | | | | | |
| Hickory | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 8D3: | | | | | |
| Hickory | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 8F: | | | | | |
| Hickory | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 8G: | | | | | |
| Hickory | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 10C: | | | | | |
| Plumfield | --- | --- | Green ash, Austrian pine. | Eastern white pine, pin oak. | --- |
| 10D: | | | | | |
| Plumfield | --- | --- | Green ash, Austrian pine. | Eastern white pine, pin oak. | --- |
| 12: | | | | | |
| Wynoose | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 13A: | | | | | |
| Bluford | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 13B2: | | | | | |
| Bluford | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 14B: | | | | | |
| Ava | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 14B2: | | | | | |
| Ava | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 14C2: | | | | | |
| Ava | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 15D3: | | | | | |
| Parke | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 84: | | | | | |
| Okaw | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 109: | | | | | |
| Racoon | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 122B: | | | | | |
| Colp | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | Silky dogwood. |
| 122B2: | | | | | |
| Colp | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | Silky dogwood. |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 122C3: | | | | | |
| Colp | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | Silky dogwood. |
| 122D3: | | | | | |
| Colp | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | Silky dogwood. |
| 287: | | | | | |
| Chauncey | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 301B: | | | | | |
| Grantsburg | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 301C3: | | | | | |
| Grantsburg | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 337A: | | | | | |
| Creal | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 338A: | | | | | |
| Hurst | American cranberrybush, silky dogwood. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 339D: | | | | | |
| Wellston | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 340D3: | | | | | |
| Zanesville | American cranberrybush. | Southern arrowwood | Washington hawthorn, common hackberry, eastern redcedar, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 376: | | | | | |
| Cisne | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 377A: | | | | | |
| Hoyleton | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 377B2: | | | | | |
| Hoyleton | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 518B: | | | | | |
| Rend | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 518B2: | | | | | |
| Rend | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 518C2: | | | | | |
| Rend | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 551D2: | | | | | |
| Gosport | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 583B: | | | | | |
| Pike | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 583C2: | | | | | |
| Pike | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 639: | | | | | |
| Wynoose | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 640A: | | | | | |
| Bluford | American cranberrybush. | Southern arrowwood | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 786D2: | | | | | |
| Frondorf | Siberian peashrub, common lilac. | Washington hawthorn, eastern redcedar, radiant crabapple. | Austrian pine, jack pine, red pine, eastern white pine. | --- | --- |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 802B: Orthents | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 802F: Orthents, very hilly | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 823B: Schuline | Siberian peashrub, silky dogwood. | Washington hawthorn, Russian-olive, eastern redcedar, jack pine, osageorange. | Northern catalpa, honeylocust. | --- | --- |
| 871D: Lenzburg | Siberian peashrub | Washington hawthorn, Russian-olive, eastern redcedar, jack pine, osageorange. | Northern catalpa, honeylocust. | --- | --- |
| 871G: Lenzburg | Siberian peashrub | Washington hawthorn, Russian-olive, eastern redcedar, jack pine, osageorange. | Northern catalpa, honeylocust. | --- | --- |
| 908F: Hickory | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| Kell. | | | | | |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 927D3: | | | | | |
| Blair | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| Atlas | American cranberrybush. | Silky dogwood, southern arrowwood. | Washington hawthorn, eastern redcedar, green ash, osageorange, Austrian pine. | Eastern white pine, pin oak. | --- |
| 1085: | | | | | |
| Jacob | Gray dogwood, redosier dogwood, southern arrowwood. | Forsythia, silky dogwood. | Amur maple, baldcypress. | Green ash, pin oak | American sycamore, eastern cottonwood, red maple. |
| 3072: | | | | | |
| Sharon | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 3085: | | | | | |
| Jacob | Gray dogwood, redosier dogwood, southern arrowwood. | Forsythia, silky dogwood. | Amur maple, baldcypress. | Green ash, pin oak | American sycamore, eastern cottonwood, red maple. |
| 3108: | | | | | |
| Bonnie | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |
| 3226: | | | | | |
| Wirt | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |

Table 9.--Windbreaks and Environmental Plantings--Continued

| Map symbol and soil name | Trees having predicted 20-year average height, in feet, of-- | | | | |
|---|---|---|---|---|---|
| | <8 | 8-15 | 16-25 | 26-35 | >35 |
| 3336: | | | | | |
| Wilbur | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 3382: | | | | | |
| Belknap | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 3415: | | | | | |
| Orion | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, northern whitecedar, white fir. | Austrian pine, Norway spruce. | Pin oak, eastern white pine. |
| 3422: | | | | | |
| Cape | Silky dogwood | American cranberrybush. | Washington hawthorn, blue spruce, white fir, northern whitecedar, Austrian pine. | Norway spruce, eastern white pine. | Pin oak. |

Table 10.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 2: | | | | | |
| Cisne | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: wetness | Severe: wetness |
| 3A: | | | | | |
| Hoyleton | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 3B2: | | | | | |
| Hoyleton | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 4B2: | | | | | |
| Richview | Slight | Slight | Moderate: slope | Slight | Slight |
| 4C2: | | | | | |
| Richview | Slight | Slight | Severe: slope | Slight | Slight |
| 5C2: | | | | | |
| Blair | Moderate: percs slowly wetness | Moderate: percs slowly wetness | Severe: slope | Severe: erodes easily | Moderate: wetness |
| 5C3: | | | | | |
| Blair | Moderate: percs slowly wetness | Moderate: percs slowly wetness | Severe: slope | Severe: erodes easily | Moderate: wetness |
| 7C2: | | | | | |
| Atlas | Severe: percs slowly wetness | Severe: percs slowly | Severe: percs slowly slope wetness | Severe: erodes easily | Moderate: wetness droughty |
| 7D2: | | | | | |
| Atlas | Severe: percs slowly wetness | Severe: percs slowly | Severe: percs slowly slope wetness | Severe: erodes easily | Moderate: slope wetness droughty |
| 8D2: | | | | | |
| Hickory | Moderate: slope | Moderate: slope | Severe: slope | Severe: erodes easily | Moderate: slope |
| 8D3: | | | | | |
| Hickory | Moderate: slope | Moderate: slope | Severe: slope | Severe: erodes easily | Moderate: slope |
| 8F: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: erodes easily slope | Severe: slope |

Table 10.--Recreational Development--Continued

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 8G: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: erodes easily slope | Severe: slope |
| 10C: | | | | | |
| Plumfield | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly slope | Severe: erodes easily | Moderate: wetness droughty |
| 10D: | | | | | |
| Plumfield | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly slope | Severe: erodes easily | Moderate: slope wetness droughty |
| 12: | | | | | |
| Wynoose | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: wetness | Severe: wetness |
| 13A: | | | | | |
| Bluford | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 13B2: | | | | | |
| Bluford | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 14B: | | | | | |
| Ava | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly | Severe: erodes easily | Moderate: wetness |
| 14B2: | | | | | |
| Ava | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly | Severe: erodes easily | Moderate: wetness |
| 14C2: | | | | | |
| Ava | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly slope | Severe: erodes easily | Moderate: wetness |
| 15D3: | | | | | |
| Parke | Moderate: slope | Moderate: slope | Severe: slope | Severe: erodes easily | Moderate: slope |
| 84: | | | | | |
| Okaw | Severe: percs slowly ponding | Severe: percs slowly ponding | Severe: percs slowly ponding | Severe: ponding | Severe: ponding |
| 109: | | | | | |
| Racoon | Severe: ponding | Severe: ponding | Severe: ponding | Severe: ponding | Severe: ponding |
| 122B: | | | | | |
| Colp | Moderate: wetness | Moderate: percs slowly wetness | Moderate: percs slowly slope wetness | Severe: erodes easily | Slight |

Table 10.--Recreational Development--Continued

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 122B2: | | | | | |
| Colp | Moderate: wetness | Moderate: percs slowly wetness | Moderate: percs slowly slope wetness | Severe: erodes easily | Slight |
| 122C3: | | | | | |
| Colp | Moderate: wetness | Moderate: percs slowly wetness | Severe: slope | Severe: erodes easily | Slight |
| 122D3: | | | | | |
| Colp | Moderate: slope wetness | Moderate: percs slowly slope wetness | Severe: slope | Severe: erodes easily | Moderate: slope |
| 287: | | | | | |
| Chauncey | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness |
| 301B: | | | | | |
| Grantsburg | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly | Severe: erodes easily | Moderate: wetness |
| 301C3: | | | | | |
| Grantsburg | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly slope | Severe: erodes easily | Moderate: wetness |
| 337A: | | | | | |
| Creal | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 338A: | | | | | |
| Hurst | Severe: percs slowly wetness | Severe: percs slowly | Severe: percs slowly wetness | Severe: erodes easily | Moderate: wetness |
| 339D: | | | | | |
| Wellston | Severe: slope | Severe: slope | Severe: slope | Severe: erodes easily | Severe: slope |
| 340D3: | | | | | |
| Zanesville | Moderate: percs slowly slope wetness | Moderate: percs slowly slope wetness | Severe: slope | Severe: erodes easily | Moderate: slope |
| 376: | | | | | |
| Cisne | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: wetness | Severe: wetness |
| 377A: | | | | | |
| Hoyleton | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 377B2: | | | | | |
| Hoyleton | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |

Table 10.--Recreational Development--Continued

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 421G: | | | | | |
| Kell | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 518B: | | | | | |
| Rend | Moderate: percs slowly wetness | Moderate: percs slowly wetness | Moderate: slope wetness percs slowly | Severe: erodes easily | Slight |
| 518B2: | | | | | |
| Rend | Moderate: percs slowly wetness | Moderate: percs slowly wetness | Moderate: slope wetness percs slowly | Severe: erodes easily | Slight |
| 518C2: | | | | | |
| Rend | Moderate: percs slowly wetness | Moderate: percs slowly wetness | Severe: slope | Severe: erodes easily | Slight |
| 533: | | | | | |
| Urban land. | | | | | |
| 536: | | | | | |
| Dumps, mine. | | | | | |
| 551D2: | | | | | |
| Gosport | Severe: percs slowly | Severe: percs slowly | Severe: percs slowly slope | Severe: erodes easily | Moderate: slope depth to rock |
| 583B: | | | | | |
| Pike | Slight | Slight | Moderate: slope | Severe: erodes easily | Slight |
| 583C2: | | | | | |
| Pike | Slight | Slight | Severe: slope | Severe: erodes easily | Slight |
| 639: | | | | | |
| Wynoose | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: percs slowly wetness | Severe: wetness | Severe: wetness |
| 640A: | | | | | |
| Bluford | Severe: wetness | Moderate: percs slowly wetness | Severe: wetness | Moderate: wetness | Moderate: wetness |
| 786D2: | | | | | |
| Frondorf | Moderate: slope | Moderate: slope | Severe: slope | Slight | Moderate: slope thin layer |
| 802B: | | | | | |
| Orthents | Moderate: percs slowly | Moderate: percs slowly | Moderate: percs slowly slope | Severe: erodes easily | Slight |
| 802F: | | | | | |
| Orthents, very hilly | Severe: slope | Severe: slope | Severe: slope | Severe: erodes easily slope | Severe: slope |

Table 10.--Recreational Development--Continued

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 823B: | | | | | |
| Schuline | Moderate: percs slowly | Moderate: percs slowly | Moderate: percs slowly slope | Severe: erodes easily | Slight |
| 866: | | | | | |
| Dumps, slurry. | | | | | |
| 871D: | | | | | |
| Lenzburg | Moderate: percs slowly slope | Moderate: percs slowly slope | Severe: slope | Slight | Moderate: large stones slope |
| 871G: | | | | | |
| Lenzburg | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 908F: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: erodes easily slope | Severe: slope |
| Kell | Severe: slope | Severe: slope | Severe: slope | Moderate: slope | Severe: slope |
| 927D3: | | | | | |
| Blair | Moderate: percs slowly slope wetness | Moderate: percs slowly slope wetness | Severe: slope | Severe: erodes easily | Moderate: slope wetness |
| Atlas | Severe: percs slowly wetness | Severe: percs slowly | Severe: percs slowly slope wetness | Severe: erodes easily | Moderate: slope wetness droughty |
| 1085: | | | | | |
| Jacob | Severe: flooding percs slowly wetness | Severe: percs slowly too clayey wetness | Severe: flooding too clayey wetness | Severe: too clayey wetness | Severe: flooding too clayey wetness |
| 1108: | | | | | |
| Bonnie | Severe: flooding ponding | Severe: ponding | Severe: flooding ponding | Severe: ponding | Severe: flooding ponding |
| 3072: | | | | | |
| Sharon | Severe: flooding | Moderate: flooding | Severe: flooding | Moderate: flooding | Severe: flooding |
| 3085: | | | | | |
| Jacob | Severe: flooding percs slowly wetness | Severe: percs slowly too clayey wetness | Severe: flooding too clayey wetness | Severe: too clayey wetness | Severe: flooding too clayey wetness |
| 3108: | | | | | |
| Bonnie | Severe: flooding wetness | Severe: wetness | Severe: flooding wetness | Severe: wetness | Severe: flooding wetness |

Table 10.--Recreational Development--Continued

| Map symbol and soil name | Camp areas | Picnic areas | Playgrounds | Paths and trails | Golf fairways |
|---|---|---|---|---|---|
| 3226: | | | | | |
| Wirt | Severe: flooding | Moderate: flooding | Severe: flooding | Moderate: flooding | Severe: flooding |
| 3336: | | | | | |
| Wilbur | Severe: flooding | Moderate: flooding wetness | Severe: flooding | Moderate: flooding wetness | Severe: flooding |
| 3382: | | | | | |
| Belknap | Severe: flooding wetness | Moderate: flooding percs slowly wetness | Severe: flooding wetness | Moderate: flooding wetness | Severe: flooding |
| 3415: | | | | | |
| Orion | Severe: flooding wetness | Moderate: flooding wetness | Severe: flooding wetness | Moderate: flooding wetness | Severe: flooding |
| 3422: | | | | | |
| Cape | Severe: flooding percs slowly wetness | Severe: percs slowly wetness | Severe: flooding percs slowly wetness | Severe: wetness | Severe: flooding wetness |

Table 11.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Potential for habitat elements | | | | | | | Potential as habitat for-- | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grain and seed crops | Grasses and legumes | Wild herbaceous plants | Hardwood trees | Coniferous plants | Wetland plants | Shallow water areas | Openland wildlife | Woodland wildlife | Wetland wildlife |
| 2: | | | | | | | | | | |
| Cisne | Fair | Fair | Fair | Fair | Poor | Good | Good | Fair | Fair | Good |
| 3A: | | | | | | | | | | |
| Hoyleton | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 3B2: | | | | | | | | | | |
| Hoyleton | Fair | Good | Good | Good | Good | Fair | Poor | Good | Good | Poor |
| 4B2: | | | | | | | | | | |
| Richview | Good | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 4C2: | | | | | | | | | | |
| Richview | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 5C2: | | | | | | | | | | |
| Blair | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 5C3: | | | | | | | | | | |
| Blair | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 7C2: | | | | | | | | | | |
| Atlas | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 7D2: | | | | | | | | | | |
| Atlas | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 8D2: | | | | | | | | | | |
| Hickory | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 8D3: | | | | | | | | | | |
| Hickory | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 8F: | | | | | | | | | | |
| Hickory | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| 8G: | | | | | | | | | | |
| Hickory | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| 10C: | | | | | | | | | | |
| Plumfield | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 10D: | | | | | | | | | | |
| Plumfield | Poor | Fair | Good | Good | Good | Very poor | Very poor | Fair | Good | Very poor |

Table 11.--Wildlife Habitat--Continued

| Map symbol and soil name | Potential for habitat elements | | | | | | | Potential as habitat for-- | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grain and seed crops | Grasses and legumes | Wild herbaceous plants | Hardwood trees | Coniferous plants | Wetland plants | Shallow water areas | Openland wildlife | Woodland wildlife | Wetland wildlife |
| 12: | | | | | | | | | | |
| Wynoose | Poor | Fair | Fair | Fair | Fair | Good | Good | Fair | Fair | Good |
| 13A: | | | | | | | | | | |
| Bluford | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 13B2: | | | | | | | | | | |
| Bluford | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 14B: | | | | | | | | | | |
| Ava | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |
| 14B2: | | | | | | | | | | |
| Ava | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |
| 14C2: | | | | | | | | | | |
| Ava | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |
| 15D3: | | | | | | | | | | |
| Parke | Poor | Fair | Good | Good | Good | Very poor | Very poor | Fair | Good | Very poor |
| 84: | | | | | | | | | | |
| Okaw | Fair | Fair | Fair | Fair | Poor | Good | Good | Fair | Fair | Good |
| 109: | | | | | | | | | | |
| Racoon | Fair | Fair | Fair | Fair | Fair | Good | Good | Fair | Fair | Good |
| 122B: | | | | | | | | | | |
| Colp | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |
| 122B2: | | | | | | | | | | |
| Colp | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 122C3: | | | | | | | | | | |
| Colp | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 122D3: | | | | | | | | | | |
| Colp | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 287: | | | | | | | | | | |
| Chauncey | Poor | Fair | Fair | Fair | Fair | Good | Good | Fair | Fair | Good |
| 301B: | | | | | | | | | | |
| Grantsburg | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |
| 301C3: | | | | | | | | | | |
| Grantsburg | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 337A: | | | | | | | | | | |
| Creal | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 338A: | | | | | | | | | | |
| Hurst | Fair | Good | Good | Good | Fair | Fair | Fair | Good | Good | Fair |

Table 11.--Wildlife Habitat--Continued

| Map symbol and soil name | Potential for habitat elements | | | | | | | Potential as habitat for-- | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grain and seed crops | Grasses and legumes | Wild herba-ceous plants | Hard-wood trees | Conif-erous plants | Wetland plants | Shallow water areas | Open-land wild-life | Wood-land wild-life | Wetland wild-life |
| 339D: | | | | | | | | | | |
| Wellston | Poor | Fair | Good | Good | Good | Very poor | Very poor | Fair | Good | Very poor |
| 340D3: | | | | | | | | | | |
| Zanesville | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 376: | | | | | | | | | | |
| Cisne | Fair | Fair | Fair | Fair | Poor | Good | Good | Fair | Fair | Good |
| 377A: | | | | | | | | | | |
| Hoyleton | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 377B2: | | | | | | | | | | |
| Hoyleton | Fair | Good | Good | Good | Good | Fair | Poor | Good | Good | Poor |
| 421G: | | | | | | | | | | |
| Kell | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| 518B: | | | | | | | | | | |
| Rend | Good | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 518B2: | | | | | | | | | | |
| Rend | Good | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 518C2: | | | | | | | | | | |
| Rend | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 533: | | | | | | | | | | |
| Urban land. | | | | | | | | | | |
| 536: | | | | | | | | | | |
| Dumps, mine. | | | | | | | | | | |
| 551D2: | | | | | | | | | | |
| Gosport | Very poor | Poor | Fair | Fair | Fair | Very poor | Very poor | Poor | Fair | Very poor |
| 583B: | | | | | | | | | | |
| Pike | Good | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 583C2: | | | | | | | | | | |
| Pike | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 639: | | | | | | | | | | |
| Wynoose | Poor | Fair | Fair | Fair | Fair | Good | Good | Fair | Fair | Good |
| 640A: | | | | | | | | | | |
| Bluford | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 786D2: | | | | | | | | | | |
| Frondorf | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |

Table 11.--Wildlife Habitat--Continued

| Map symbol and soil name | Potential for habitat elements | | | | | | | Potential as habitat for-- | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grain and seed crops | Grasses and legumes | Wild herbaceous plants | Hardwood trees | Coniferous plants | Wetland plants | Shallow water areas | Openland wildlife | Woodland wildlife | Wetland wildlife |
| 802B: | | | | | | | | | | |
| Orthents | Fair | Fair | Good | Good | Good | Very poor | Very poor | Fair | Good | Very poor |
| 802F: | | | | | | | | | | |
| Orthents, very hilly | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| 823B: | | | | | | | | | | |
| Schuline | Good | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 866: | | | | | | | | | | |
| Dumps, slurry. | | | | | | | | | | |
| 871D: | | | | | | | | | | |
| Lenzburg | Fair | Good | Good | Good | Good | Very poor | Very poor | Good | Good | Very poor |
| 871G: | | | | | | | | | | |
| Lenzburg | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| 908F: | | | | | | | | | | |
| Hickory | Very poor | Poor | Good | Good | Good | Very poor | Very poor | Poor | Good | Very poor |
| Kell | Very poor | Fair | Good | Good | Good | Very poor | Very poor | Fair | Good | Very poor |
| 927D3: | | | | | | | | | | |
| Blair | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| Atlas | Fair | Good | Good | Good | Good | Poor | Very poor | Good | Good | Very poor |
| 1085: | | | | | | | | | | |
| Jacob | Very poor | Poor | Poor | Fair | Very poor | Fair | Good | Poor | Fair | Good |
| 1108: | | | | | | | | | | |
| Bonnie | Very poor | Very poor | Very poor | Very poor | Very poor | Good | Good | Very poor | Very poor | Good |
| 3072: | | | | | | | | | | |
| Sharon | Poor | Fair | Fair | Good | Good | Poor | Very poor | Fair | Good | Very poor |
| 3085: | | | | | | | | | | |
| Jacob | Very poor | Poor | Poor | Fair | Very poor | Fair | Good | Poor | Fair | Good |
| 3108: | | | | | | | | | | |
| Bonnie | Poor | Fair | Fair | Fair | Poor | Good | Good | Fair | Fair | Good |
| 3226: | | | | | | | | | | |
| Wirt | Poor | Fair | Fair | Good | Good | Poor | Very poor | Fair | Good | Very poor |
| 3336: | | | | | | | | | | |
| Wilbur | Good | Good | Good | Good | Good | Poor | Poor | Good | Good | Poor |

Table 11.--Wildlife Habitat--Continued

| Map symbol and soil name | Potential for habitat elements | | | | | | | Potential as habitat for-- | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grain and seed crops | Grasses and legumes | Wild herbaceous plants | Hardwood trees | Coniferous plants | Wetland plants | Shallow water areas | Openland wildlife | Woodland wildlife | Wetland wildlife |
| 3382: | | | | | | | | | | |
| Belknap | Fair | Good | Good | Good | Good | Fair | Fair | Good | Good | Fair |
| 3415: | | | | | | | | | | |
| Orion | Good | Good | Good | Good | Good | Good | Fair | Good | Good | Good |
| 3422: | | | | | | | | | | |
| Cape | Poor | Fair | Fair | Fair | Fair | Good | Good | Fair | Fair | Good |

Table 12.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 2: | | | | | | |
| Cisne | Severe: wetness | Severe: shrink-swell wetness | Severe: wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell wetness. | Severe: wetness |
| 3A: | | | | | | |
| Hoyleton | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: frost action low strength shrink-swell | Moderate: wetness |
| 3B2: | | | | | | |
| Hoyleton | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: frost action low strength shrink-swell | Moderate: wetness |
| 4B2: | | | | | | |
| Richview | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell | Severe: frost action low strength | Slight |
| 4C2: | | | | | | |
| Richview | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell slope | Severe: frost action low strength | Slight |
| 5C2: | | | | | | |
| Blair | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell slope wetness | Severe: frost action low strength | Moderate: wetness |
| 5C3: | | | | | | |
| Blair | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell slope wetness | Severe: frost action low strength | Moderate: wetness |
| 7C2: | | | | | | |
| Atlas | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell | Moderate: wetness droughty |
| 7D2: | | | | | | |
| Atlas | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell slope wetness | Severe: low strength shrink-swell | Moderate: slope wetness droughty |
| 8D2: | | | | | | |
| Hickory | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |

Table 12.--Building Site Development--Continued

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 8D3: | | | | | | |
| Hickory | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |
| 8F: | | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 8G: | | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 10C: | | | | | | |
| Plumfield | Severe: wetness | Moderate: wetness | Severe: wetness | Moderate: slope wetness | Severe: frost action low strength | Moderate: wetness droughty |
| 10D: | | | | | | |
| Plumfield | Severe: wetness | Moderate: slope wetness | Severe: wetness | Severe: slope | Severe: frost action low strength | Moderate: slope wetness droughty |
| 12: | | | | | | |
| Wynoose | Severe: wetness | Severe: shrink-swell wetness | Severe: wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: wetness |
| 13A: | | | | | | |
| Bluford | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness | Severe: frost action low strength | Moderate: wetness |
| 13B2: | | | | | | |
| Bluford | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness | Severe: frost action low strength | Moderate: wetness |
| 14B: | | | | | | |
| Ava | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell wetness | Severe: frost action low strength | Moderate: wetness |
| 14B2: | | | | | | |
| Ava | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell wetness | Severe: frost action low strength | Moderate: wetness |
| 14C2: | | | | | | |
| Ava | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell slope wetness | Severe: frost action low strength | Moderate: wetness |
| 15D3: | | | | | | |
| Parke | Moderate: slope | Moderate: shrink-swell slope | Moderate: slope | Severe: slope | Severe: frost action low strength | Moderate: slope |

Table 12.--Building Site Development--Continued

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 84: | | | | | | |
| Okaw | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: ponding |
| 109: | | | | | | |
| Racoon | Severe: ponding | Severe: ponding | Severe: ponding | Severe: ponding | Severe: frost action low strength ponding | Severe: ponding |
| 122B: | | | | | | |
| Colp | Severe: wetness | Severe: shrink-swell | Severe: wetness | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 122B2: | | | | | | |
| Colp | Severe: wetness | Severe: shrink-swell | Severe: wetness | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 122C3: | | | | | | |
| Colp | Severe: wetness | Severe: shrink-swell | Severe: wetness | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 122D3: | | | | | | |
| Colp | Severe: wetness | Severe: shrink-swell | Severe: wetness | Severe: shrink-swell slope | Severe: low strength shrink-swell | Moderate: slope |
| 287: | | | | | | |
| Chauncey | Severe: wetness | Severe: wetness | Severe: shrink-swell wetness | Severe: wetness | Severe: frost action wetness | Severe: wetness |
| 301B: | | | | | | |
| Grantsburg | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell wetness | Severe: frost action low strength | Moderate: wetness |
| 301C3: | | | | | | |
| Grantsburg | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell slope wetness | Severe: frost action low strength | Moderate: wetness |
| 337A: | | | | | | |
| Creal | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness | Severe: frost action | Moderate: wetness |
| 338A: | | | | | | |
| Hurst | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell | Moderate: wetness |
| 339D: | | | | | | |
| Wellston | Moderate: slope | Moderate: slope | Moderate: slope | Severe: slope | Severe: frost action | Moderate: slope |

Table 12.--Building Site Development--Continued

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 340D3: | | | | | | |
| Zanesville | Moderate: slope wetness depth to rock | Moderate: slope wetness | Severe: wetness | Severe: slope | Severe: low strength | Moderate: slope |
| 376: | | | | | | |
| Cisne | Severe: wetness | Severe: shrink-swell wetness | Severe: wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: wetness |
| 377A: | | | | | | |
| Hoyleton | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: frost action low strength shrink-swell | Moderate: wetness |
| 377B2: | | | | | | |
| Hoyleton | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: frost action low strength shrink-swell | Moderate: wetness |
| 421G: | | | | | | |
| Kell | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 518B: | | | | | | |
| Rend | Severe: wetness | Moderate: wetness shrink-swell | Severe: wetness | Moderate: wetness shrink-swell | Severe: frost action low strength | Slight |
| 518B2: | | | | | | |
| Rend | Severe: wetness | Moderate: wetness shrink-swell | Severe: wetness | Moderate: wetness shrink-swell | Severe: frost action low strength | Slight |
| 518C2: | | | | | | |
| Rend | Severe: wetness | Moderate: wetness shrink-swell | Severe: wetness | Moderate: wetness shrink-swell slope | Severe: frost action low strength | Slight |
| 533: | | | | | | |
| Urban land. | | | | | | |
| 536: | | | | | | |
| Dumps, mine. | | | | | | |
| 551D2: | | | | | | |
| Gosport | Moderate: slope too clayey depth to rock | Severe: shrink-swell | Moderate: slope depth to rock | Severe: shrink-swell slope | Severe: low strength shrink-swell | Moderate: slope depth to rock |
| 583B: | | | | | | |
| Pike | Slight | Slight | Slight | Slight | Severe: frost action low strength | Slight |
| 583C2: | | | | | | |
| Pike | Slight | Slight | Slight | Moderate: slope | Severe: frost action low strength | Slight |

Table 12.--Building Site Development--Continued

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 639: | | | | | | |
| Wynoose | Severe: wetness | Severe: shrink-swell wetness | Severe: wetness | Severe: shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: wetness |
| 640A: | | | | | | |
| Bluford | Severe: wetness | Severe: wetness | Severe: wetness | Severe: wetness | Severe: frost action low strength | Moderate: wetness |
| 786D2: | | | | | | |
| Frondorf | Moderate: slope depth to rock | Moderate: slope | Moderate: slope depth to rock | Severe: slope | Moderate: slope | Moderate: slope thin layer |
| 802B: | | | | | | |
| Orthents | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 802F: | | | | | | |
| Orthents, very hilly | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 823B: | | | | | | |
| Schuline | Moderate: too clayey dense layer | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 866: | | | | | | |
| Dumps, slurry. | | | | | | |
| 871D: | | | | | | |
| Lenzburg | Moderate: slope too clayey | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: large stones slope |
| 871G: | | | | | | |
| Lenzburg | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 908F: | | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| Kell | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 927D3: | | | | | | |
| Blair | Severe: wetness | Moderate: shrink-swell slope wetness | Severe: wetness | Severe: slope | Severe: frost action low strength | Moderate: slope wetness |
| Atlas | Severe: wetness | Severe: shrink-swell wetness | Severe: shrink-swell wetness | Severe: shrink-swell slope wetness | Severe: low strength shrink-swell | Moderate: slope wetness droughty |

Table 12.--Building Site Development--Continued

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|---|---|---|---|---|---|---|
| 1085: | | | | | | |
| Jacob | Severe: wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: flooding too clayey wetness |
| 1108: | | | | | | |
| Bonnie | Severe: ponding | Severe: flooding ponding | Severe: flooding ponding | Severe: flooding ponding | Severe: flooding low strength ponding | Severe: flooding ponding |
| 3072: | | | | | | |
| Sharon | Moderate: flooding wetness | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding frost action | Severe: flooding |
| 3085: | | | | | | |
| Jacob | Severe: wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: flooding too clayey wetness |
| 3108: | | | | | | |
| Bonnie | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding low strength wetness | Severe: flooding wetness |
| 3226: | | | | | | |
| Wirt | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding |
| 3336: | | | | | | |
| Wilbur | Severe: wetness | Severe: flooding | Severe: flooding wetness | Severe: flooding | Severe: flooding frost action | Severe: flooding |
| 3382: | | | | | | |
| Belknap | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding frost action | Severe: flooding |
| 3415: | | | | | | |
| Orion | Severe: wetness cutbanks cave | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding frost action low strength | Severe: flooding |
| 3422: | | | | | | |
| Cape | Severe: wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: flooding wetness |

Table 13.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 2: | | | | | |
| Cisne | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |
| 3A: | | | | | |
| Hoyleton | Severe: percs slowly wetness | Slight | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 3B2: | | | | | |
| Hoyleton | Severe: percs slowly wetness | Moderate: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 4B2: | | | | | |
| Richview | Moderate: percs slowly wetness | Moderate: seepage slope wetness | Severe: wetness | Moderate: wetness | Fair: too clayey |
| 4C2: | | | | | |
| Richview | Moderate: percs slowly wetness | Severe: slope | Severe: wetness | Moderate: wetness | Fair: too clayey |
| 5C2: | | | | | |
| Blair | Severe: percs slowly wetness | Severe: slope wetness | Severe: wetness | Severe: wetness | Fair: too clayey wetness |
| 5C3: | | | | | |
| Blair | Severe: percs slowly wetness | Severe: slope wetness | Severe: wetness | Severe: wetness | Fair: too clayey wetness |
| 7C2: | | | | | |
| Atlas | Severe: percs slowly wetness | Severe: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 7D2: | | | | | |
| Atlas | Severe: percs slowly wetness | Severe: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 8D2: | | | | | |
| Hickory | Moderate: percs slowly slope | Severe: slope | Moderate: slope too clayey | Moderate: slope | Fair: slope small stones too clayey |
| 8D3: | | | | | |
| Hickory | Moderate: percs slowly slope | Severe: slope | Moderate: slope too clayey | Moderate: slope | Fair: slope small stones too clayey |

Table 13.--Sanitary Facilities--Continued

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 8F: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Poor: slope |
| 8G: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Poor: slope |
| 10C: | | | | | |
| Plumfield | Severe: percs slowly wetness | Severe: slope | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 10D: | | | | | |
| Plumfield | Severe: percs slowly wetness | Severe: slope | Severe: wetness | Moderate: slope wetness | Fair: slope too clayey wetness |
| 12: | | | | | |
| Wynoose | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |
| 13A: | | | | | |
| Bluford | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |
| 13B2: | | | | | |
| Bluford | Severe: percs slowly wetness | Moderate: slope | Severe: wetness | Severe: wetness | Poor: wetness |
| 14B: | | | | | |
| Ava | Severe: percs slowly wetness | Severe: wetness | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 14B2: | | | | | |
| Ava | Severe: percs slowly wetness | Severe: wetness | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 14C2: | | | | | |
| Ava | Severe: percs slowly wetness | Severe: slope wetness | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 15D3: | | | | | |
| Parke | Moderate: slope | Severe: slope | Moderate: slope | Moderate: slope | Fair: slope |
| 84: | | | | | |
| Okaw | Severe: percs slowly ponding | Severe: ponding | Severe: too clayey ponding | Severe: ponding | Poor: hard to pack too clayey ponding |
| 109: | | | | | |
| Racoon | Severe: percs slowly ponding | Severe: ponding | Severe: ponding | Severe: ponding | Poor: thin layer ponding |

Table 13.--Sanitary Facilities--Continued

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 122B: | | | | | |
| Colp | Severe: percs slowly wetness | Moderate: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 122B2: | | | | | |
| Colp | Severe: percs slowly wetness | Moderate: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 122C3: | | | | | |
| Colp | Severe: percs slowly wetness | Severe: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 122D3: | | | | | |
| Colp | Severe: percs slowly wetness | Severe: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey |
| 287: | | | | | |
| Chauncey | Severe: percs slowly wetness | Moderate: seepage | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 301B: | | | | | |
| Grantsburg | Severe: percs slowly wetness | Moderate: seepage slope | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 301C3: | | | | | |
| Grantsburg | Severe: percs slowly wetness | Severe: slope | Severe: wetness | Moderate: wetness | Fair: too clayey wetness |
| 337A: | | | | | |
| Creal | Severe: percs slowly wetness | Severe: wetness | Severe: wetness | Severe: wetness | Poor: wetness |
| 338A: | | | | | |
| Hurst | Severe: percs slowly wetness | Slight | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 339D: | | | | | |
| Wellston | Severe: slope | Severe: slope | Severe: seepage slope depth to rock | Severe: slope | Poor: slope |
| 340D3: | | | | | |
| Zanesville | Severe: percs slowly wetness | Severe: slope wetness | Severe: depth to rock | Moderate: slope wetness depth to rock | Fair: area reclaim slope too clayey |
| 376: | | | | | |
| Cisne | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |

Table 13.--Sanitary Facilities--Continued

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 377A: | | | | | |
| Hoyleton | Severe: percs slowly wetness | Slight | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 377B2: | | | | | |
| Hoyleton | Severe: percs slowly wetness | Moderate: slope | Severe: too clayey wetness | Severe: wetness | Poor: hard to pack too clayey wetness |
| 421G: | | | | | |
| Kell | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock | Severe: slope depth to rock | Poor: slope small stones depth to rock |
| 518B: | | | | | |
| Rend | Severe: percs slowly wetness | Moderate: seepage slope | Moderate: wetness too clayey | Moderate: wetness | Fair: too clayey wetness |
| 518B2: | | | | | |
| Rend | Severe: percs slowly wetness | Moderate: seepage slope | Moderate: wetness too clayey | Moderate: wetness | Fair: too clayey wetness |
| 518C2: | | | | | |
| Rend | Severe: percs slowly wetness | Severe: slope | Moderate: wetness too clayey | Moderate: wetness | Fair: too clayey wetness |
| 533: | | | | | |
| Urban land. | | | | | |
| 536: | | | | | |
| Dumps, mine. | | | | | |
| 551D2: | | | | | |
| Gosport | Severe: percs slowly depth to rock | Severe: slope depth to rock | Severe: depth to rock | Severe: depth to rock | Poor: depth to rock |
| 583B: | | | | | |
| Pike | Slight | Moderate: seepage slope | Severe: seepage | Slight | Fair: too clayey |
| 583C2: | | | | | |
| Pike | Slight | Severe: slope | Severe: seepage | Slight | Fair: too clayey |
| 639: | | | | | |
| Wynoose | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |
| 640A: | | | | | |
| Bluford | Severe: percs slowly wetness | Slight | Severe: wetness | Severe: wetness | Poor: wetness |

Table 13.--Sanitary Facilities--Continued

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 786D2: | | | | | |
| Frondorf | Severe: depth to rock | Severe: slope, depth to rock | Severe: depth to rock | Severe: depth to rock | Poor: area reclaim, small stones |
| 802B: | | | | | |
| Orthents | Severe: percs slowly | Moderate: slope, wetness | Moderate: too clayey | Slight | Fair: too clayey |
| 802F: | | | | | |
| Orthents, very hilly | Severe: percs slowly, slope | Severe: slope | Severe: slope | Severe: slope | Poor: slope |
| 823B: | | | | | |
| Schuline | Severe: percs slowly | Moderate: slope | Moderate: too clayey | Slight | Fair: large stones, too clayey |
| 866: | | | | | |
| Dumps, slurry. | | | | | |
| 871D: | | | | | |
| Lenzburg | Severe: percs slowly | Severe: slope | Moderate: slope, too clayey | Moderate: slope | Fair: slope, small stones, too clayey |
| 871G: | | | | | |
| Lenzburg | Severe: percs slowly, slope | Severe: slope | Severe: slope | Severe: slope | Poor: slope |
| 908F: | | | | | |
| Hickory | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Poor: slope |
| Kell | Severe: slope, depth to rock | Severe: slope, depth to rock | Severe: slope, depth to rock | Severe: slope, depth to rock | Poor: slope, small stones, depth to rock |
| 927D3: | | | | | |
| Blair | Severe: percs slowly, wetness | Severe: slope, wetness | Severe: wetness | Severe: wetness | Fair: slope, too clayey, wetness |
| Atlas | Severe: percs slowly, wetness | Severe: slope | Severe: too clayey, wetness | Severe: wetness | Poor: hard to pack, too clayey |
| 1085: | | | | | |
| Jacob | Severe: flooding, percs slowly, wetness | Severe: flooding | Severe: flooding, too clayey, wetness | Severe: flooding, wetness | Poor: hard to pack, too clayey, wetness |
| 1108: | | | | | |
| Bonnie | Severe: flooding, percs slowly, ponding | Severe: flooding, ponding | Severe: flooding, ponding | Severe: flooding, ponding | Poor: ponding |

Table 13.--Sanitary Facilities--Continued

| Map symbol and soil name | Septic tank absorption fields | Sewage lagoon areas | Trench sanitary landfill | Area sanitary landfill | Daily cover for landfill |
|---|---|---|---|---|---|
| 3072: | | | | | |
| Sharon | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Fair: wetness |
| 3085: | | | | | |
| Jacob | Severe: flooding percs slowly wetness | Severe: flooding | Severe: flooding too clayey wetness | Severe: flooding wetness | Poor: hard to pack too clayey wetness |
| 3108: | | | | | |
| Bonnie | Severe: flooding percs slowly wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Poor: wetness |
| 3226: | | | | | |
| Wirt | Severe: flooding | Severe: flooding seepage | Severe: flooding seepage | Severe: flooding seepage | Good |
| 3336: | | | | | |
| Wilbur | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Fair: wetness |
| 3382: | | | | | |
| Belknap | Severe: flooding percs slowly wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Poor: wetness |
| 3415: | | | | | |
| Orion | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Poor: wetness |
| 3422: | | | | | |
| Cape | Severe: flooding percs slowly wetness | Severe: flooding | Severe: flooding too clayey wetness | Severe: flooding wetness | Poor: hard to pack too clayey wetness |

Table 14.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 2: | | | | |
| Cisne | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 3A: | | | | |
| Hoyleton | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 3B2: | | | | |
| Hoyleton | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 4B2: | | | | |
| Richview | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Good |
| 4C2: | | | | |
| Richview | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Good |
| 5C2: | | | | |
| Blair | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: small stones, too clayey |
| 5C3: | | | | |
| Blair | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: small stones, too clayey |
| 7C2: | | | | |
| Atlas | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 7D2: | | | | |
| Atlas | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 8D2: | | | | |
| Hickory | Fair: low strength | Improbable: excess fines | Improbable: excess fines | Poor: small stones |
| 8D3: | | | | |
| Hickory | Fair: low strength | Improbable: excess fines | Improbable: excess fines | Poor: small stones |
| 8F: | | | | |
| Hickory | Poor: slope | Improbable: excess fines | Improbable: excess fines | Poor: slope, small stones |
| 8G: | | | | |
| Hickory | Poor: slope | Improbable: excess fines | Improbable: excess fines | Poor: slope, small stones |

Table 14.--Construction Materials--Continued

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 10C: | | | | |
| Plumfield | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim |
| 10D: | | | | |
| Plumfield | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim |
| 12: | | | | |
| Wynoose | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 13A: | | | | |
| Bluford | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 13B2: | | | | |
| Bluford | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 14B: | | | | |
| Ava | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 14B2: | | | | |
| Ava | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 14C2: | | | | |
| Ava | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 15D3: | | | | |
| Parke | Good | Improbable: excess fines | Improbable: excess fines | Fair: slope, small stones, too clayey |
| 84: | | | | |
| Okaw | Poor: low strength, shrink-swell, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 109: | | | | |
| Racoon | Poor: wetness | Improbable: excess fines | Improbable: excess fines | Poor: wetness |
| 122B: | | | | |
| Colp | Poor: low strength, shrink-swell | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 122B2: | | | | |
| Colp | Poor: low strength, shrink-swell | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 122C3: | | | | |
| Colp | Poor: low strength, shrink-swell | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |

Table 14.--Construction Materials--Continued

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 122D3: | | | | |
| Colp | Poor: low strength, shrink-swell | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 287: | | | | |
| Chauncey | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: wetness |
| 301B: | | | | |
| Grantsburg | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 301C3: | | | | |
| Grantsburg | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 337A: | | | | |
| Creal | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Good |
| 338A: | | | | |
| Hurst | Poor: low strength, shrink-swell | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 339D: | | | | |
| Wellston | Fair: area reclaim, low strength, slope | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim, slope, small stones |
| 340D3: | | | | |
| Zanesville | Severe: low strength | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim |
| 376: | | | | |
| Cisne | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 377A: | | | | |
| Hoyleton | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 377B2: | | | | |
| Hoyleton | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 421G: | | | | |
| Kell | Poor: slope, depth to rock | Improbable: excess fines | Improbable: excess fines | Poor: slope, small stones |
| 518B: | | | | |
| Rend | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 518B2: | | | | |
| Rend | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |

Table 14.--Construction Materials--Continued

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 518C2: | | | | |
| Rend | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 533: | | | | |
| Urban land. | | | | |
| 536: | | | | |
| Dumps, mine. | | | | |
| 551D2: | | | | |
| Gosport | Poor: depth to rock | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 583B: | | | | |
| Pike | Good | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 583C2: | | | | |
| Pike | Good | Improbable: excess fines | Improbable: excess fines | Fair: too clayey |
| 639: | | | | |
| Wynoose | Poor: low strength wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey wetness |
| 640A: | | | | |
| Bluford | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 786D2: | | | | |
| Frondorf | Poor: area reclaim | Improbable: excess fines | Improbable: excess fines | Poor: small stones |
| 802B: | | | | |
| Orthents | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: small stones too clayey |
| 802F: | | | | |
| Orthents, very hilly | Poor: low strength slope | Improbable: excess fines | Improbable: excess fines | Poor: slope |
| 823B: | | | | |
| Schuline | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: small stones too clayey |
| 866: | | | | |
| Dumps, slurry. | | | | |
| 871D: | | | | |
| Lenzburg | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim small stones |
| 871G: | | | | |
| Lenzburg | Poor: low strength slope | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim slope small stones |

Table 14.--Construction Materials--Continued

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 908F: | | | | |
| Hickory | Poor: slope | Improbable: excess fines | Improbable: excess fines | Poor: slope, small stones |
| Kell | Poor: depth to rock | Improbable: excess fines | Improbable: excess fines | Poor: slope, small stones |
| 927D3: | | | | |
| Blair | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Fair: slope, small stones, too clayey |
| Atlas | Poor: low strength | Improbable: excess fines | Improbable: excess fines | Poor: too clayey |
| 1085: | | | | |
| Jacob | Poor: low strength, shrink-swell, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 1108: | | | | |
| Bonnie | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: wetness |
| 3072: | | | | |
| Sharon | Good | Improbable: excess fines | Improbable: excess fines | Good |
| 3085: | | | | |
| Jacob | Poor: low strength, shrink-swell, wetness | Improbable: excess fines | Improbable: excess fines | Poor: too clayey, wetness |
| 3108: | | | | |
| Bonnie | Poor: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Poor: wetness |
| 3226: | | | | |
| Wirt | Good | Improbable: excess fines | Improbable: excess fines | Poor: area reclaim |
| 3336: | | | | |
| Wilbur | Fair: low strength, wetness | Improbable: excess fines | Improbable: excess fines | Good |
| 3382: | | | | |
| Belknap | Fair: thin layer, wetness | Improbable: excess fines | Improbable: excess fines | Good |
| 3415: | | | | |
| Orion | Fair: wetness | Improbable: excess fines | Improbable: excess fines | Poor: thin layer |

Table 14.--Construction Materials--Continued

| Map symbol and soil name | Roadfill | Sand | Gravel | Topsoil |
|---|---|---|---|---|
| 3422: Cape | Poor: low strength wetness | Improbable: excess fines | Improbable: excess fines | Poor: wetness |

Table 15.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 2: | | | | | | | |
| Cisne | Slight | Severe: wetness | Severe: no water | Frost action, percs slowly | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 3A: | | | | | | | |
| Hoyleton | Slight | Severe: thin layer, wetness | Severe: slow refill | Frost action, percs slowly | Percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 3B2: | | | | | | | |
| Hoyleton | Moderate: slope | Severe: thin layer, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 4B2: | | | | | | | |
| Richview | Moderate: seepage, slope | Slight | Moderate: slow refill, deep to water | Deep to water | Slope | Erodes easily | Erodes easily |
| 4C2: | | | | | | | |
| Richview | Moderate: seepage, slope | Slight | Moderate: slow refill, deep to water | Deep to water | Slope | Erodes easily | Erodes easily |
| 5C2: | | | | | | | |
| Blair | Moderate: slope | Severe: wetness | Severe: slow refill | Frost action, slope | Erodes easily, slope, wetness | Erodes easily, wetness | Erodes easily |
| 5C3: | | | | | | | |
| Blair | Moderate: slope | Severe: wetness | Severe: slow refill | Frost action, slope | Erodes easily, slope, wetness | Erodes easily, wetness | Erodes easily |
| 7C2: | | | | | | | |
| Atlas | Moderate: slope | Severe: hard to pack | Severe: no water | Frost action, percs slowly, slope | Slope, wetness, droughty | Erodes easily, wetness | Erodes easily, wetness |
| 7D2: | | | | | | | |
| Atlas | Severe: slope | Severe: hard to pack | Severe: no water | Frost action, percs slowly, slope | Slope, wetness, droughty | Erodes easily, slope, wetness | Erodes easily, slope, wetness |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 8D2: | | | | | | | |
| Hickory | Severe: slope | Moderate: thin layer | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 8D3: | | | | | | | |
| Hickory | Severe: slope | Moderate: thin layer | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 8F: | | | | | | | |
| Hickory | Severe: slope | Moderate: thin layer | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 8G: | | | | | | | |
| Hickory | Severe: slope | Moderate: thin layer | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 10C: | | | | | | | |
| Plumfield | Moderate: slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Slope, wetness, droughty | Erodes easily, wetness | Erodes easily, droughty |
| 10D: | | | | | | | |
| Plumfield | Severe: slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Slope, wetness, droughty | Erodes easily, slope, wetness | Erodes easily, slope, droughty |
| 12: | | | | | | | |
| Wynoose | Slight | Severe: wetness | Severe: no water | Frost action, percs slowly | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 13A: | | | | | | | |
| Bluford | Slight | Severe: piping | Severe: no water | Frost action, percs slowly | Percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly wetness |
| 13B2: | | | | | | | |
| Bluford | Moderate: slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 14B: | | | | | | | |
| Ava | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, rooting depth |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 14B2: | | | | | | | |
| Ava | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, rooting depth |
| 14C2: | | | | | | | |
| Ava | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, rooting depth |
| 15D3: | | | | | | | |
| Parke | Severe: slope | Moderate: piping | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 84: | | | | | | | |
| Okaw | Slight | Severe: ponding | Severe: slow refill | Frost action, percs slowly, ponding | Erodes easily, percs slowly, ponding | Erodes easily, percs slowly, ponding | Erodes easily, percs slowly, wetness |
| 109: | | | | | | | |
| Racoon | Slight | Severe: piping, ponding | Severe: slow refill | Frost action, percs slowly, ponding | Erodes easily, percs slowly, ponding | Erodes easily, ponding | Erodes easily, percs slowly, wetness |
| 122B: | | | | | | | |
| Colp | Moderate: slope | Moderate: hard to pack, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, percs slowly |
| 122B2: | | | | | | | |
| Colp | Moderate: slope | Moderate: hard to pack, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, percs slowly |
| 122C3: | | | | | | | |
| Colp | Moderate: slope | Moderate: hard to pack, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, percs slowly |
| 122D3: | | | | | | | |
| Colp | Severe: slope | Moderate: hard to pack, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, slope, wetness | Erodes easily, percs slowly, slope |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 287: | | | | | | | |
| Chauncey | Slight | Severe: wetness | Severe: no water | Frost action, percs slowly | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 301B: | | | | | | | |
| Grantsburg | Moderate: seepage, slope | Moderate: piping, thin layer, wetness | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope wetness | Erodes easily, wetness | Erodes easily, rooting depth |
| 301C3: | | | | | | | |
| Grantsburg | Moderate: seepage, slope | Moderate: piping, thin layer, wetness | Severe: no water | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, wetness | Erodes easily, rooting depth |
| 337A: | | | | | | | |
| Creal | Slight | Severe: thin layer, wetness | Severe: slow refill | Frost action | Erodes easily, wetness | Erodes easily, wetness | Erodes easily, wetness |
| 338A: | | | | | | | |
| Hurst | Slight | Severe: wetness | Severe: slow refill | Percs slowly | Percs slowly, wetness | Erodes easily, wetness | Erodes easily, wetness |
| 339D: | | | | | | | |
| Wellston | Severe: slope | Severe: piping | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |
| 340D3: | | | | | | | |
| Zanesville | Moderate: seepage, depth to rock | Severe: piping | Severe: no water | Percs slowly, slope | Percs slowly, wetness, rooting depth | Erodes easily, slope, wetness | Erodes easily, rooting depth, slope |
| 376: | | | | | | | |
| Cisne | Slight | Severe: wetness | Severe: no water | Frost action, percs slowly | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 377A: | | | | | | | |
| Hoyleton | Slight | Severe: thin layer, wetness | Severe: slow refill | Frost action, percs slowly | Percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 377B2: | | | | | | | |
| Hoyleton | Moderate: slope | Severe: thin layer, wetness | Severe: slow refill | Frost action, percs slowly, slope | Percs slowly, slope, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 421G: | | | | | | | |
| Kell | Severe: slope | Severe: piping | Severe: no water | Deep to water | Slope, depth to rock | Erodes easily, slope, depth to rock | Erodes easily, slope, depth to rock |
| 518B: | | | | | | | |
| Rend | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, slope | Slope, wetness, percs slowly | Erodes easily, wetness | Erodes easily |
| 518B2: | | | | | | | |
| Rend | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, slope | Slope, wetness, percs slowly | Erodes easily, wetness | Erodes easily |
| 518C2: | | | | | | | |
| Rend | Moderate: seepage, slope | Severe: piping | Severe: no water | Frost action, slope | Slope, wetness, percs slowly | Erodes easily, wetness | Erodes easily |
| 533: | | | | | | | |
| Urban land. | | | | | | | |
| 536: | | | | | | | |
| Dumps, mine. | | | | | | | |
| 551D2: | | | | | | | |
| Gosport | Severe: slope | Slight | Severe: no water | Deep to water | Percs slowly, slope, depth to rock | Erodes easily, slope, depth to rock | Erodes easily, slope, depth to rock |
| 583B: | | | | | | | |
| Pike | Moderate: seepage, slope | Moderate: piping | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily | Erodes easily |
| 583C2: | | | | | | | |
| Pike | Moderate: seepage, slope | Moderate: piping | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily | Erodes easily |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 639: | | | | | | | |
| Wynoose | Slight | Severe: wetness | Severe: no water | Frost action, percs slowly | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 640A: | | | | | | | |
| Bluford | Slight | Severe: piping | Severe: no water | Frost action, percs slowly | Percs slowly, wetness | Erodes easily, percs slowly, wetness | Erodes easily, percs slowly, wetness |
| 786D2: | | | | | | | |
| Frondorf | Severe: slope | Severe: piping | Severe: no water | Deep to water | Slope, depth to rock | Large stones, slope, depth to rock | Large stones, slope, depth to rock |
| 802B: | | | | | | | |
| Orthents | Moderate: slope | Moderate: piping | Severe: no water | Deep to water | Erodes easily, slope, rooting depth | Erodes easily | Erodes easily, rooting depth |
| 802F: | | | | | | | |
| Orthents, very hilly | Severe: slope | Moderate: piping | Severe: no water | Deep to water | Erodes easily, slope, rooting depth | Erodes easily, slope | Erodes easily, rooting depth, slope |
| 823B: | | | | | | | |
| Schuline | Moderate: slope | Moderate: piping, thin layer | Severe: no water | Deep to water | Percs slowly, slope, rooting depth | Erodes easily | Erodes easily, rooting depth |
| 866: | | | | | | | |
| Dumps, slurry. | | | | | | | |
| 871D: | | | | | | | |
| Lenzburg | Severe: slope | Moderate: piping | Severe: no water | Deep to water | Slope | Erodes easily, slope | Erodes easily, slope |
| 871G: | | | | | | | |
| Lenzburg | Severe: slope | Moderate: piping | Severe: no water | Deep to water | Slope | Erodes easily, slope | Erodes easily, slope |
| 908F: | | | | | | | |
| Hickory | Severe: slope | Moderate: thin layer | Severe: no water | Deep to water | Erodes easily, slope | Erodes easily, slope | Erodes easily, slope |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 908F: | | | | | | | |
| Kell | Severe: slope | Severe: piping | Severe: no water | Deep to water | Slope, depth to rock | Erodes easily, slope, depth to rock | Erodes easily, slope, depth to rock |
| 927D3: | | | | | | | |
| Blair | Severe: slope | Severe: wetness | Severe: slow refill | Frost action, slope | Erodes easily, slope, wetness | Erodes easily, slope, wetness | Erodes easily, slope |
| Atlas | Severe: slope | Severe: hard to pack | Severe: no water | Frost action, percs slowly, slope | Slope, wetness, droughty | Erodes easily, slope, wetness | Erodes easily, slope, wetness |
| 1085: | | | | | | | |
| Jacob | Slight | Severe: hard to pack, wetness | Severe: no water | Flooding, percs slowly | Percs slowly, slow intake, wetness | Percs slowly, wetness | Percs slowly, wetness |
| 1108: | | | | | | | |
| Bonnie | Slight | Severe: ponding | Severe: slow refill | Flooding, frost action, ponding | Erodes easily, flooding, ponding | Erodes easily, ponding | Erodes easily, wetness |
| 3072: | | | | | | | |
| Sharon | Moderate: seepage | Severe: piping | Moderate: slow refill, deep to water | Deep to water | Erodes easily, flooding | Erodes easily | Erodes easily |
| 3085: | | | | | | | |
| Jacob | Slight | Severe: hard to pack, wetness | Severe: no water | Flooding, percs slowly | Percs slowly, slow intake, wetness | Percs slowly, wetness | Percs slowly, wetness |
| 3108: | | | | | | | |
| Bonnie | Slight | Severe: wetness | Severe: slow refill | Flooding, frost action | Erodes easily, flooding, wetness | Erodes easily, wetness | Erodes easily, wetness |
| 3226: | | | | | | | |
| Wirt | Severe: seepage | Severe: piping | Severe: no water | Deep to water | Erodes easily, flooding | Erodes easily | Erodes easily |

Table 15.--Water Management--Continued

| Map symbol and soil name | Limitations for-- | | | Features affecting-- | | | |
|---|---|---|---|---|---|---|---|
| | Pond reservoir areas | Embankments, dikes, and levees | Aquifer-fed excavated ponds | Drainage | Irrigation | Terraces and diversions | Grassed waterways |
| 3336: | | | | | | | |
| Wilbur | Moderate: seepage | Severe: piping, wetness | Moderate: slow refill | Flooding, frost action | Erodes easily, flooding, wetness | Erodes easily, wetness | Erodes easily |
| 3382: | | | | | | | |
| Belknap | Moderate: seepage | Severe: piping, wetness | Severe: slow refill | Flooding, frost action | Erodes easily, wetness | Erodes easily, wetness | Erodes easily, wetness |
| 3415: | | | | | | | |
| Orion | Moderate: seepage | Severe: piping, wetness | Severe: cutbanks cave | Flooding, frost action | Wetness | Erodes easily, wetness | Erodes easily, wetness |
| 3422: | | | | | | | |
| Cape | Slight | Severe: hard to pack, wetness | Severe: no water | Flooding, frost action, percs slowly | Percs slowly, wetness | Percs slowly, wetness | Percs slowly, wetness |

Table 16.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated.)

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 2: | | | | | | | | | | | | |
| Cisne | 0-10 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 25-35 | 5-10 |
| | 10-16 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 16-34 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 45-60 | 20-35 |
| | 34-55 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 100 | 90-100 | 70-95 | 50-90 | 30-50 | 15-30 |
| | 55-63 | Silt loam, loam, clay loam | CL | A-6 | 0 | 0-5 | 100 | 90-100 | 70-95 | 50-90 | 25-40 | 10-25 |
| 3A: | | | | | | | | | | | | |
| Hoyleton | 0-9 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 25-35 | 5-15 |
| | 9-33 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 40-55 | 20-30 |
| | 33-65 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-95 | 20-45 | 5-25 |
| 3B2: | | | | | | | | | | | | |
| Hoyleton | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 25-35 | 5-15 |
| | 7-39 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 40-55 | 20-30 |
| | 39-78 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-95 | 20-45 | 5-25 |
| 4B2: | | | | | | | | | | | | |
| Richview | 0-9 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 9-39 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-50 | 15-30 |
| | 39-70 | Silt loam, loam, clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 90-100 | 90-100 | 70-95 | 25-45 | 10-20 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 4C2: | | | | | | | | | | | | |
| Richview-------- | 0-9 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 9-36 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-50 | 15-30 |
| | 36-78 | Silt loam, loam, clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 90-100 | 90-100 | 70-95 | 25-45 | 10-20 |
| 5C2: | | | | | | | | | | | | |
| Blair----------- | 0-8 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0-2 | 95-100 | 90-100 | 90-100 | 85-95 | 20-35 | 5-15 |
| | 8-17 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 80-100 | 30-50 | 15-30 |
| | 17-60 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 85-100 | 70-95 | 30-50 | 15-30 |
| 5C3: | | | | | | | | | | | | |
| Blair----------- | 0-6 | Silty clay loam | CL | A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 85-100 | 25-40 | 10-20 |
| | 6-15 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 80-100 | 30-50 | 15-30 |
| | 15-50 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 85-100 | 70-95 | 30-50 | 15-30 |
| | 50-62 | Silty clay loam, clay loam, silt loam | CL | A-6 | 0 | 0-5 | 95-100 | 90-100 | 85-100 | 70-90 | 20-40 | 10-25 |
| 7C2: | | | | | | | | | | | | |
| Atlas----------- | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 75-95 | 25-35 | 5-15 |
| | 7-29 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |
| | 29-60 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 7D2: | | | | | | | | | | | | |
| Atlas---------- | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 75-95 | 25-35 | 5-15 |
| | 7-29 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |
| | 29-60 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |
| 8D2: | | | | | | | | | | | | |
| Hickory--------- | 0-6 | Silt loam | CL | A-4, A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 75-95 | 20-35 | 8-15 |
| | 6-60 | 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 |
| 8D3: | | | | | | | | | | | | |
| Hickory--------- | 0-8 | Clay loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 80-95 | 70-85 | 30-50 | 15-30 |
| | 8-72 | 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 |
| | 72-79 | Sandy loam, loam, gravelly clay loam | CL, CL-ML | A-4, A-6 | 0-1 | 0-5 | 85-100 | 75-95 | 70-95 | 60-80 | 20-40 | 5-20 |
| 8F: | | | | | | | | | | | | |
| Hickory--------- | 0-12 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 75-95 | 20-35 | 3-15 |
| | 12-46 | 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 |
| | 46-60 | Sandy loam, loam, gravelly clay loam | CL, CL-ML | A-4, A-6 | 0-1 | 0-5 | 85-100 | 75-95 | 70-95 | 60-80 | 20-40 | 5-20 |
| 8G: | | | | | | | | | | | | |
| Hickory--------- | 0-10 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 75-95 | 20-35 | 3-15 |
| | 10-60 | 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 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 10C: | | | | | | | | | | | | |
| Plumfield------- | 0-5 | Silty clay loam | CL | A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 30-40 | 10-20 |
| | 5-21 | Silty clay loam, silt loam | CL, CL-ML | A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-100 | 15-40 | 5-20 |
| | 21-36 | Silt loam, silty clay loam | CL, CL-ML | A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-100 | 15-40 | 5-20 |
| | 36-60 | Silt loam, silty clay loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 75-100 | 15-40 | 4-20 |
| 10D: | | | | | | | | | | | | |
| Plumfield------- | 0-6 | Silty clay loam | CL | A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 30-40 | 10-20 |
| | 6-21 | Silty clay loam, silt loam | CL, CL-ML | A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-100 | 15-40 | 5-20 |
| | 21-44 | Silt loam, silty clay loam | CL-ML, CL | A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-100 | 15-40 | 5-20 |
| | 44-60 | Silt loam, silty clay loam, loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 75-100 | 15-40 | 4-20 |
| 12: | | | | | | | | | | | | |
| Wynoose--------- | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 20-35 | 5-15 |
| | 7-11 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 15-30 | 2-15 |
| | 11-28 | Silty clay, silty clay loam | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 40-55 | 20-35 |
| | 28-53 | Silt loam, clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-90 | 30-45 | 15-25 |
| | 53-73 | Loam, clay loam, silty clay loam | CL | A-6, A-7 | 0-1 | 0-10 | 95-100 | 90-100 | 85-100 | 70-90 | 25-45 | 15-30 |
| 13A: | | | | | | | | | | | | |
| Bluford--------- | 0-5 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 20-35 | 5-15 |
| | 5-15 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 20-30 | NP-10 |
| | 15-40 | Silty clay loam, silty clay | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 35-50 | 15-30 |
| | 40-76 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6 | 0 | 0-5 | 100 | 95-100 | 90-100 | 70-90 | 25-40 | 5-20 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 13B2: | | | | | | | | | | | | |
| Bluford--------- | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 20-35 | 5-15 |
| | 7-27 | Silty clay loam, silty clay | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 35-50 | 15-30 |
| | 27-98 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6 | 0 | 0-5 | 100 | 95-100 | 90-100 | 70-90 | 25-40 | 5-20 |
| 14B: | | | | | | | | | | | | |
| Ava---------- | 0-5 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 5-13 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 13-33 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 33-62 | Silty clay loam, loam, clay loam | CL, CL-ML, ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 20-45 | 5-20 |
| | 62-80 | Loam, silt loam, clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 25-40 | 5-20 |
| 14B2: | | | | | | | | | | | | |
| Ava---------- | 0-9 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 9-28 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 28-64 | Silty clay loam, loam, clay loam | CL, CL-ML, ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 20-45 | 5-20 |
| | 64-78 | Loam, silt loam, clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 25-40 | 5-20 |
| 14C2: | | | | | | | | | | | | |
| Ava---------- | 0-5 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 5-23 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 23-57 | Silty clay loam, loam, clay loam | CL, CL-ML, ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 20-45 | 5-20 |
| | 57-78 | Loam, silt loam, clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 25-40 | 5-20 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 15D3: | | | | | | | | | | | | |
| Parke | 0-9 | Silty clay loam | CL | A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 30-40 | 10-15 |
| | 9-17 | Silty clay loam, silt loam | CL | A-4, A-6 | 0 | 0 | 95-100 | 95-100 | 90-100 | 80-100 | 25-40 | 7-15 |
| | 17-78 | Sandy clay loam, loam, sandy loam | CL, SC | A-2, A-4, A-6 | 0 | 0-3 | 90-100 | 85-95 | 55-90 | 30-60 | 25-35 | 7-15 |
| 84: | | | | | | | | | | | | |
| Okaw | 0-4 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-40 | 5-15 |
| | 4-16 | Silty clay, clay, silty clay loam | CH | A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 50-70 | 30-50 |
| | 16-67 | Silty clay, clay, silty clay loam | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 45-60 | 20-35 |
| 109: | | | | | | | | | | | | |
| Racoon | 0-7 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 20-40 | 8-20 |
| | 7-29 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 20-40 | 5-20 |
| | 29-41 | Silty clay loam | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 35-60 | 15-30 |
| | 41-51 | Silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 35-50 | 15-30 |
| | 51-60 | Silty clay loam, silt loam | CL, CL-ML, ML | A-7, A-4, A-6 | 0 | 0 | 95-100 | 90-100 | 75-100 | 50-100 | 25-45 | 3-20 |
| 122B: | | | | | | | | | | | | |
| Colp | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 7-45 | Silty clay loam, silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-60 | 20-40 |
| | 45-60 | Stratified silty clay loam to silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 35-55 | 15-30 |
| 122B2: | | | | | | | | | | | | |
| Colp | 0-6 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 6-60 | Silty clay loam, silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-60 | 20-40 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 122C3: | | | | | | | | | | | | |
| Colp---------- | 0-7 | Silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 30-45 | 10-20 |
| | 7-48 | Silty clay loam, silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-60 | 20-40 |
| | 48-60 | Stratified silty clay loam to silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 35-55 | 15-30 |
| 122D3: | | | | | | | | | | | | |
| Colp---------- | 0-4 | Silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 30-45 | 10-20 |
| | 4-30 | Silty clay loam, silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-60 | 20-40 |
| | 30-60 | Stratified silty clay loam to silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 35-55 | 15-30 |
| 287: | | | | | | | | | | | | |
| Chauncey-------- | 0-12 | Silt loam | CL, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 25-35 | 7-15 |
| | 12-26 | Silt loam | CL, CL-ML | A-4 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 20-30 | 5-10 |
| | 26-46 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 40-55 | 20-35 |
| | 46-60 | Silty clay loam, clay loam, silt loam | CL, ML | A-6, A-7 | 0 | 0-5 | 95-100 | 95-100 | 90-100 | 80-95 | 35-45 | 10-20 |
| 301B: | | | | | | | | | | | | |
| Grantsburg------ | 0-9 | Silt loam | CL, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-40 | 7-15 |
| | 9-27 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-45 | 10-20 |
| | 27-37 | Silt loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-45 | 10-20 |
| | 37-60 | Silt loam | CL, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 85-100 | 30-40 | 7-15 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 301C3: | | | | | | | | | | | | |
| Grantsburg------ | 0-5 | Silty clay loam | CL | A-6 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-40 | 10-20 |
| | 5-17 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-45 | 10-20 |
| | 17-60 | Silt loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 90-100 | 30-45 | 10-20 |
| 337A: | | | | | | | | | | | | |
| Creal---------- | 0-6 | Silt loam | CL, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 30-40 | 5-15 |
| | 6-25 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 25-35 | 4-12 |
| | 25-37 | Silt loam, silty clay loam | CL, ML | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 35-50 | 10-25 |
| | 37-65 | Silt loam | CL, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-100 | 30-40 | 7-15 |
| 338A: | | | | | | | | | | | | |
| Hurst---------- | 0-8 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 95-100 | 75-100 | 20-35 | 4-15 |
| | 8-14 | Silty clay loam, silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 20-35 | 5-15 |
| | 14-60 | Silty clay loam, silty clay, clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 40-60 | 20-35 |
| 339D: | | | | | | | | | | | | |
| Wellston-------- | 0-8 | Silt loam | ML | A-4 | 0 | 0 | 95-100 | 90-100 | 85-100 | 70-95 | 25-35 | 3-10 |
| | 8-32 | Silt loam, silty clay loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 80-100 | 75-100 | 65-95 | 60-90 | 25-40 | 5-20 |
| | 32-48 | Silt loam, loam, channery loam | CL, CL-ML, SC, SC-SM | A-4, A-6 | 0-1 | 0-10 | 65-90 | 65-90 | 60-90 | 40-65 | 20-35 | 5-15 |
| | 48-52 | Unweathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 340D3: | | | | | | | | | | | | |
| Zanesville------ | 0-2 | Silty clay loam | CL | A-6 | 0 | 0 | 95-100 | 95-100 | 90-100 | 80-100 | 30-40 | 10-20 |
| | 2-19 | Silt loam, silty clay loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 95-100 | 95-100 | 90-100 | 80-100 | 25-40 | 5-20 |
| | 19-34 | Silt loam, silty clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0-3 | 90-100 | 85-100 | 80-100 | 60-100 | 20-40 | 2-20 |
| | 34-50 | Sandy clay loam, clay loam, channery sandy clay loam | CL, GM, SC, SM | A-1-b, A-2, A-4, A-6 | 0-1 | 0-10 | 65-100 | 50-100 | 40-100 | 20-85 | 20-40 | 2-20 |
| | 50-60 | Unweathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 376: | | | | | | | | | | | | |
| Cisne---------- | 0-8 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 25-35 | 5-10 |
| | 8-17 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 17-37 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 90-100 | 90-100 | 45-60 | 20-35 |
| | 37-60 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 100 | 90-100 | 70-95 | 50-90 | 30-50 | 15-30 |
| | 60-70 | Silt loam, loam, clay loam | CL | A-6 | 0 | 0-5 | 100 | 90-100 | 70-95 | 50-90 | 25-40 | 10-25 |
| 377A: | | | | | | | | | | | | |
| Hoyleton-------- | 0-8 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 25-35 | 5-15 |
| | 8-11 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 11-55 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 40-55 | 20-30 |
| | 55-85 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-95 | 20-45 | 5-25 |
| 377B2: | | | | | | | | | | | | |
| Hoyleton-------- | 0-6 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 25-35 | 5-15 |
| | 6-38 | Silty clay loam, silty clay | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-100 | 40-55 | 20-30 |
| | 38-90 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-95 | 20-45 | 5-25 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 421G: | | | | | | | | | | | | |
| Kell | 0-3 | Silt loam | CL-ML, ML | A-4 | 0 | 0-1 | 95-100 | 80-100 | 75-95 | 60-90 | 20-35 | 2-10 |
| | 3-7 | Silt loam, loam | CL-ML, ML | A-4 | 0 | 0-1 | 95-100 | 80-100 | 75-95 | 60-90 | 20-35 | 2-10 |
| | 7-18 | Silty clay loam, loam, silt loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0-1 | 90-100 | 75-100 | 65-90 | 50-85 | 25-40 | 4-18 |
| | 18-35 | Silty clay loam, very channery silty clay loam, sandy loam | CL, GM, SM | A-4, A-6, A-7 | 0-2 | 0-10 | 60-90 | 45-90 | 40-80 | 35-75 | 20-35 | NP-10 |
| | 35-60 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 518B: | | | | | | | | | | | | |
| Rend | 0-11 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 11-23 | Silt loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 23-77 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 77-83 | Loam, silt loam, clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 25-40 | 5-20 |
| 518B2: | | | | | | | | | | | | |
| Rend | 0-6 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 6-33 | Silt loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 33-64 | Silt loam, silty clay loam | CL, CL-ML, ML | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 20-45 | 5-20 |
| | 64-93 | Silt loam, silty clay loam, clay loam | CL, CL-ML, ML | A-4, A-6, A-7 | 0 | 0 | 100 | 85-100 | 80-100 | 70-90 | 25-40 | 5-20 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 518C2: | | | | | | | | | | | | |
| Rend | 0-5 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 5-15 |
| | 5-24 | Silt loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-45 | 10-20 |
| | 24-40 | Silt loam, silty clay loam | CL, CL-ML, ML | A-4, A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 80-90 | 20-45 | 5-20 |
| | 40-60 | Silt loam, silty clay loam, clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 85-100 | 70-90 | 25-40 | 5-20 |
| 533: | | | | | | | | | | | | |
| Urban land. | | | | | | | | | | | | |
| 536: | | | | | | | | | | | | |
| Dumps, mine. | | | | | | | | | | | | |
| 551D2: | | | | | | | | | | | | |
| Gosport | 0-5 | Loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 90-100 | 90-100 | 70-100 | 25-40 | 5-15 |
| | 5-27 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 583B: | | | | | | | | | | | | |
| Pike | 0-8 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-95 | 25-35 | 8-15 |
| | 8-38 | Silty clay loam, silt loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 85-100 | 80-90 | 30-45 | 10-25 |
| | 38-57 | Silty clay loam, silt loam, sandy clay loam | CL, SC | A-2-6, A-6 | 0 | 0 | 80-90 | 70-90 | 60-90 | 30-80 | 20-35 | 10-20 |
| | 57-99 | Stratified sand to sandy clay loam | SM, CL-ML, ML, SC-SM | A-1, A-2-4, A-4 | 0 | 0 | 70-90 | 65-85 | 35-70 | 15-65 | 0-20 | NP-5 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 583C2: | | | | | | | | | | | | |
| Pike | 0-6 | Silt loam | CL | A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-95 | 30-40 | 10-15 |
| | 6-41 | Silty clay loam, silt loam | CL | A-7, A-6 | 0 | 0 | 100 | 95-100 | 85-100 | 80-90 | 30-45 | 10-25 |
| | 41-78 | Silty clay loam, silt loam, sandy clay loam | CL, SC | A-2-6, A-6 | 0 | 0 | 80-90 | 70-90 | 60-90 | 30-80 | 20-35 | 10-20 |
| 639: | | | | | | | | | | | | |
| Wynoose | 0-3 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 20-35 | 5-15 |
| | 3-22 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 15-30 | 2-15 |
| | 22-37 | Silty clay, silty clay loam | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 40-55 | 20-35 |
| | 37-47 | Silt loam, clay loam, silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 90-100 | 70-90 | 30-45 | 15-25 |
| | 47-99 | Loam, clay loam, silty clay loam | CL | A-6, A-7 | 0-1 | 0-10 | 95-100 | 90-100 | 85-100 | 70-90 | 25-45 | 15-30 |
| 640A: | | | | | | | | | | | | |
| Bluford | 0-4 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 20-35 | 5-15 |
| | 4-17 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 20-30 | NP-10 |
| | 17-41 | Silty clay loam, silty clay | CL | A-6, A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 90-100 | 35-50 | 15-30 |
| | 41-60 | Silt loam, loam, clay loam | CL, CL-ML | A-4, A-6 | 0 | 0-5 | 100 | 95-100 | 90-100 | 70-90 | 25-40 | 5-20 |
| 786D2: | | | | | | | | | | | | |
| Frondorf | 0-6 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0-5 | 90-100 | 90-100 | 85-100 | 75-100 | 25-35 | 5-10 |
| | 6-35 | Channery silty clay loam, channery silt loam, channery loam | CL, GC, GM, ML | A-2, A-4, A-6, A-7 | 0-5 | 10-40 | 55-90 | 50-85 | 40-80 | 30-75 | 0-45 | NP-25 |
| | 35-39 | Unweathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 802B: | | | | | | | | | | | | |
| Orthents | 0-6 | 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, 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

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 802F: | | | | | | | | | | | | |
| Orthents, very hilly---------- | 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, clay loam | CL | A-6 | 0-1 | 0-5 | 95-100 | 90-100 | 85-95 | 60-90 | 20-40 | 10-20 |
| 823B: | | | | | | | | | | | | |
| Schuline-------- | 0-3 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 80-100 | 70-95 | 25-40 | 5-15 |
| | 3-15 | Loam, silty clay loam, clay loam | CL | A-6, A-7 | 0-2 | 0-5 | 90-100 | 85-100 | 80-95 | 70-85 | 30-50 | 10-25 |
| | 15-52 | Loam, silty clay loam, clay loam | CL | A-4, A-6, A-7 | 0-5 | 0-15 | 85-95 | 85-90 | 75-85 | 60-80 | 25-50 | 7-25 |
| | 52-69 | Loam, clay loam, silty clay | CH, CL, MH, ML | A-6, A-7 | 0-5 | 0-15 | 85-95 | 80-90 | 75-85 | 60-80 | 35-55 | 10-30 |
| 866: | | | | | | | | | | | | |
| Dumps, slurry. | | | | | | | | | | | | |
| 871D: | | | | | | | | | | | | |
| Lenzburg-------- | 0-5 | Gravelly silty clay loam | CL | A-4, A-6, A-7 | 0-2 | 3-15 | 80-95 | 75-90 | 65-90 | 55-85 | 25-45 | 8-25 |
| | 5-21 | Silt loam, silty clay loam, clay loam | CL | A-6, A-7 | 0-2 | 2-10 | 80-95 | 75-90 | 70-90 | 55-85 | 25-45 | 10-25 |
| | 21-39 | Silty clay loam, silt loam, gravelly loam | CL | A-6, A-7 | 0-2 | 5-15 | 75-95 | 70-90 | 65-85 | 60-85 | 25-45 | 10-25 |
| | 39-60 | Silty clay, silty clay loam, gravelly clay loam | CH, CL | A-6, A-7 | 0-5 | 5-25 | 70-95 | 60-90 | 55-90 | 50-90 | 30-55 | 15-30 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 871G: | | | | | | | | | | | | |
| Lenzburg-------- | 0-4 | Gravelly silty clay loam | CL | A-4, A-6, A-7 | 0-2 | 3-15 | 80-95 | 75-90 | 65-90 | 55-85 | 25-45 | 8-25 |
| | 4-20 | Silt loam, silty clay loam, clay loam | CL | A-6, A-7 | 0-2 | 2-10 | 80-95 | 75-90 | 70-90 | 55-85 | 25-45 | 10-25 |
| | 20-43 | Silty clay loam, silt loam, gravelly loam | CL | A-6, A-7 | 0-2 | 5-15 | 75-95 | 70-90 | 65-85 | 60-85 | 25-45 | 10-25 |
| | 43-60 | Silty clay, silty clay loam, gravelly clay loam | CH, CL | A-6, A-7 | 0-5 | 5-25 | 70-95 | 60-90 | 55-90 | 50-90 | 30-55 | 15-30 |
| 908F: | | | | | | | | | | | | |
| Hickory--------- | 0-16 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 75-95 | 20-35 | 3-15 |
| | 16-60 | Sandy loam, loam, gravelly clay loam | CL, CL-ML | A-4, A-6 | 0-1 | 0-5 | 85-100 | 75-95 | 70-95 | 60-80 | 20-40 | 5-20 |
| Kell------------ | 0-3 | Silt loam | CL-ML, ML | A-4 | 0 | 0-1 | 95-100 | 80-100 | 75-95 | 60-90 | 20-35 | 2-10 |
| | 3-7 | Silt loam, loam | CL-ML, ML | A-4 | 0 | 0-1 | 95-100 | 80-100 | 75-95 | 60-90 | 20-35 | 2-10 |
| | 7-18 | Silty clay loam, loam, silt loam | CL, CL-ML | A-4, A-6, A-7 | 0 | 0-1 | 90-100 | 75-100 | 65-90 | 50-85 | 25-40 | 4-18 |
| | 18-35 | Silty clay loam, very channery silty clay loam, sandy loam | CL, GM, SM | A-4, A-6, A-7 | 0-2 | 0-10 | 60-90 | 45-90 | 40-80 | 35-75 | 20-35 | NP-10 |
| | 35-60 | Weathered bedrock | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 927D3: | | | | | | | | | | | | |
| Blair | 0-5 | Silty clay loam | CL | A-6 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 85-100 | 25-40 | 10-20 |
| | 5-35 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 90-100 | 80-100 | 30-50 | 15-30 |
| | 35-78 | Silty clay loam, clay loam, silt loam | CL | A-6, A-7 | 0 | 0-5 | 95-100 | 90-100 | 85-100 | 70-95 | 30-50 | 15-30 |
| | 78-99 | Silty clay loam, clay loam, silt loam | CL | A-6 | 0 | 0-5 | 95-100 | 90-100 | 85-100 | 70-90 | 20-40 | 10-25 |
| Atlas | 0-8 | Silty clay loam | CH, CL | A-7 | 0 | 0 | 100 | 100 | 95-100 | 75-100 | 40-60 | 25-40 |
| | 8-20 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |
| | 20-60 | Silty clay loam, clay, clay loam | CH | A-7 | 0 | 0 | 100 | 95-100 | 95-100 | 75-95 | 50-70 | 30-45 |
| 1085: | | | | | | | | | | | | |
| Jacob | 0-2 | Silty clay | CH, MH | A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 60-85 | 33-45 |
| | 2-60 | Clay, silty clay | MH | A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 65-85 | 30-45 |
| 1108: | | | | | | | | | | | | |
| Bonnie | 0-6 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 8-15 |
| | 6-20 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 25-35 | 8-15 |
| | 20-60 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-100 | 25-35 | 8-15 |
| 3072: | | | | | | | | | | | | |
| Sharon | 0-17 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 20-30 | 2-10 |
| | 17-40 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 100 | 95-100 | 85-95 | 20-30 | 2-10 |
| | 40-60 | Silt loam, loam, sandy loam | CL, ML, SC, SM | A-4 | 0 | 0 | 100 | 100 | 70-95 | 40-90 | 15-30 | NP-10 |
| 3085: | | | | | | | | | | | | |
| Jacob | 0-6 | Silty clay | CH, MH | A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 60-85 | 33-45 |
| | 6-60 | Clay, silty clay | MH | A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 65-85 | 30-45 |

Table 16.--Engineering Index Properties--Continued

| Map symbol and soil name | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number-- | | | | Liquid limit | Plasticity index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | In | | | | Pct | Pct | | | | | Pct | |
| 3108: | | | | | | | | | | | | |
| Bonnie---------- | 0-10 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 27-34 | 8-12 |
| | 10-27 | Silt loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 95-100 | 90-100 | 27-34 | 8-12 |
| | 27-60 | Silt loam, silty clay loam | CL | A-4, A-6 | 0 | 0 | 100 | 100 | 90-100 | 80-100 | 25-39 | 8-15 |
| 3226: | | | | | | | | | | | | |
| Wirt---------- | 0-12 | Silt loam | CL-ML, ML | A-4 | 0 | 0 | 98-100 | 95-100 | 80-100 | 60-90 | 14-24 | 2-7 |
| | 12-36 | Silt loam, loam, sandy loam | CL-ML, ML, SC-SM, SM | A-2-4, A-4 | 0 | 0 | 95-100 | 80-100 | 50-100 | 25-85 | 12-24 | 1-7 |
| | 36-60 | Loam, gravelly sandy loam, loamy sand | CL-ML, ML, SC-SM, SM | A-1-b, A-2-4, A-4 | 0 | 0-2 | 80-100 | 50-100 | 30-95 | 15-75 | 0-24 | NP-7 |
| 3336: | | | | | | | | | | | | |
| Wilbur---------- | 0-8 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 100 | 95-100 | 70-100 | 20-30 | 3-10 |
| | 8-60 | Silt loam, loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 100 | 80-100 | 60-100 | 20-35 | 3-15 |
| 3382: | | | | | | | | | | | | |
| Belknap--------- | 0-9 | Silt loam | CL, CL-ML, ML | A-4 | 0 | 0 | 100 | 95-100 | 90-100 | 80-100 | 20-30 | 2-8 |
| | 9-19 | Silt loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 80-100 | 20-35 | NP-12 |
| | 19-60 | Silt loam, loam, silty clay loam | CL, CL-ML, ML | A-4, A-6 | 0 | 0 | 100 | 95-100 | 90-100 | 75-100 | 20-40 | 3-20 |
| 3415: | | | | | | | | | | | | |
| Orion----------- | 0-7 | Silt loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 85-100 | 80-100 | 25-35 | 4-12 |
| | 7-24 | Stratified silt loam to very fine sand | CL, CL-ML | A-4 | 0 | 0 | 100 | 100 | 90-100 | 70-80 | 20-30 | 4-10 |
| | 24-42 | Silt loam, silty clay loam | CL, CL-ML | A-4, A-6 | 0 | 0 | 100 | 100 | 85-100 | 85-100 | 20-40 | 4-18 |
| | 42-60 | Stratified silt loam to sand | CL, CL-ML | A-4 | 0 | 0 | 80-100 | 80-100 | 80-100 | 80-100 | 20-30 | 4-10 |
| 3422: | | | | | | | | | | | | |
| Cape------------ | 0-7 | Silty clay loam | CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 35-50 | 20-30 |
| | 7-46 | Silty clay, clay | CH | A-7 | 0 | 0 | 100 | 100 | 100 | 95-100 | 50-70 | 30-45 |
| | 46-64 | Silty clay loam, silty clay | CH, CL | A-6, A-7 | 0 | 0 | 100 | 100 | 100 | 90-100 | 35-65 | 20-35 |

Table 17.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 2: | | | | | | | | | | | | |
| Cisne | 0-10 | 15-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .37 | .37 | 5 | 6 | 48 |
| | 10-16 | 15-27 | 1.25-1.45 | 0.06-0.6 | 0.18-0.20 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 16-34 | 35-45 | 1.40-1.60 | <0.06 | 0.09-0.15 | High | 0.0-1.0 | .37 | .37 | | | |
| | 34-55 | 25-37 | 1.50-1.70 | <0.06 | 0.08-0.14 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 55-63 | 22-30 | 1.60-1.80 | <0.06 | 0.14-0.22 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| 3A: | | | | | | | | | | | | |
| Hoyleton | 0-9 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 9-33 | 35-45 | 1.40-1.65 | 0.06-0.2 | 0.13-0.20 | High | 0.2-0.5 | .43 | .43 | | | |
| | 33-65 | 15-33 | 1.35-1.70 | 0.06-0.2 | 0.17-0.22 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| 3B2: | | | | | | | | | | | | |
| Hoyleton | 0-7 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 7-39 | 35-45 | 1.40-1.65 | 0.06-0.2 | 0.13-0.20 | High | 0.2-0.5 | .43 | .43 | | | |
| | 39-78 | 15-33 | 1.35-1.70 | 0.06-0.2 | 0.17-0.22 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| 4B2: | | | | | | | | | | | | |
| Richview | 0-9 | 20-27 | 1.20-1.40 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 9-39 | 25-35 | 1.30-1.50 | 0.6-2 | 0.18-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 39-70 | 22-35 | 1.50-1.70 | 0.6-2 | 0.14-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| 4C2: | | | | | | | | | | | | |
| Richview | 0-9 | 20-27 | 1.20-1.40 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 9-36 | 25-35 | 1.30-1.50 | 0.6-2 | 0.18-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 36-78 | 22-35 | 1.50-1.70 | 0.6-2 | 0.14-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| 5C2: | | | | | | | | | | | | |
| Blair | 0-8 | 20-27 | 1.35-1.55 | 0.6-2 | 0.15-0.24 | Low | 1.0-3.0 | .37 | .37 | 5 | 6 | 48 |
| | 8-17 | 25-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 17-60 | 18-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.3 | .37 | .37 | | | |
| 5C3: | | | | | | | | | | | | |
| Blair | 0-6 | 27-35 | 1.35-1.55 | 0.2-0.6 | 0.14-0.18 | Moderate | 0.5-1.0 | .37 | .37 | 5 | 7 | 38 |
| | 6-15 | 25-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 15-50 | 18-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.3 | .37 | .37 | | | |
| | 50-62 | 20-27 | 1.35-1.60 | 0.2-0.6 | 0.19-0.22 | Low | 0.0-0.1 | .37 | .37 | | | |
| 7C2: | | | | | | | | | | | | |
| Atlas | 0-7 | 20-27 | 1.30-1.50 | 0.2-0.6 | 0.20-0.25 | Moderate | 1.0-3.0 | .43 | .43 | 3 | 6 | 48 |
| | 7-29 | 35-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| | 29-60 | 30-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| 7D2: | | | | | | | | | | | | |
| Atlas | 0-7 | 20-27 | 1.30-1.50 | 0.2-0.6 | 0.20-0.25 | Moderate | 1.0-3.0 | .43 | .43 | 3 | 6 | 48 |
| | 7-29 | 35-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| | 29-60 | 30-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| 8D2: | | | | | | | | | | | | |
| Hickory | 0-6 | 19-25 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 1.0-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 6-60 | 27-35 | 1.45-1.65 | 0.6-2 | 0.15-0.19 | Moderate | 0.0-0.5 | .28 | .28 | | | |
| 8D3: | | | | | | | | | | | | |
| Hickory | 0-8 | 27-35 | 1.40-1.65 | 0.6-2 | 0.17-0.19 | Moderate | 0.5-1.0 | .37 | .37 | 5 | 6 | 48 |
| | 8-72 | 27-35 | 1.45-1.65 | 0.6-2 | 0.15-0.19 | Moderate | 0.0-0.5 | .28 | .28 | | | |
| | 72-79 | 15-32 | 1.50-1.70 | 0.6-2 | 0.11-0.19 | Low | 0.0-0.2 | .28 | .28 | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 8F: | | | | | | | | | | | | |
| Hickory | 0-12 | 19-25 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 1.0-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 12-46 | 27-35 | 1.45-1.65 | 0.6-2 | 0.15-0.19 | Moderate | 0.0-0.5 | .28 | .28 | | | |
| | 46-60 | 15-32 | 1.50-1.70 | 0.6-2 | 0.11-0.19 | Low | 0.0-0.2 | .28 | .28 | | | |
| 8G: | | | | | | | | | | | | |
| Hickory | 0-10 | 19-25 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 1.0-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 10-60 | 27-35 | 1.45-1.65 | 0.6-2 | 0.15-0.19 | Moderate | 0.0-0.5 | .28 | .28 | | | |
| 10C: | | | | | | | | | | | | |
| Plumfield | 0-5 | 27-35 | 1.40-1.60 | 0.2-0.6 | 0.18-0.21 | Moderate | 0.0-1.0 | .43 | .43 | 2 | 7 | 38 |
| | 5-21 | 20-30 | 1.65-1.90 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 21-36 | 20-30 | 1.65-1.90 | <0.06 | 0.09-0.11 | Low | 0.0-0.2 | .43 | .43 | | | |
| | 36-60 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.08 | Low | 0.0-0.2 | .43 | .43 | | | |
| 10D: | | | | | | | | | | | | |
| Plumfield | 0-6 | 27-35 | 1.40-1.60 | 0.2-0.6 | 0.18-0.21 | Moderate | 0.0-1.0 | .43 | .43 | 2 | 7 | 38 |
| | 6-21 | 20-30 | 1.65-1.90 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 21-44 | 20-30 | 1.65-1.90 | <0.06 | 0.09-0.11 | Low | 0.0-0.2 | .43 | .43 | | | |
| | 44-60 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.08 | Low | 0.0-0.2 | .43 | .43 | | | |
| 12: | | | | | | | | | | | | |
| Wynoose | 0-7 | 15-25 | 1.25-1.45 | 0.6-2 | 0.22-0.24 | Low | 0.5-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 7-11 | 12-18 | 1.30-1.50 | 0.06-0.2 | 0.18-0.20 | Low | 0.2-0.5 | .43 | .43 | | | |
| | 11-28 | 35-42 | 1.40-1.60 | <0.06 | 0.09-0.13 | High | 0.2-0.5 | .43 | .43 | | | |
| | 28-53 | 25-37 | 1.50-1.70 | 0.06-0.2 | 0.11-0.15 | Moderate | 0.2-0.5 | .43 | .43 | | | |
| | 53-73 | 20-35 | 1.60-1.80 | 0.06-0.2 | 0.10-0.16 | Moderate | 0.2-0.5 | .32 | .32 | | | |
| 13A: | | | | | | | | | | | | |
| Bluford | 0-5 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .43 | .43 | 5 | 6 | 48 |
| | 5-15 | 15-25 | 1.40-1.60 | 0.2-0.6 | 0.18-0.20 | Low | 0.0-1.0 | .43 | .43 | | | |
| | 15-40 | 35-42 | 1.45-1.65 | 0.06-0.6 | 0.11-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 40-76 | 22-35 | 1.60-1.70 | 0.06-0.2 | 0.11-0.16 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| 13B2: | | | | | | | | | | | | |
| Bluford | 0-7 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .43 | .43 | 5 | 6 | 48 |
| | 7-27 | 35-42 | 1.45-1.65 | 0.06-0.6 | 0.11-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 27-98 | 22-35 | 1.60-1.70 | 0.06-0.2 | 0.11-0.16 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| 14B: | | | | | | | | | | | | |
| Ava | 0-5 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 5-13 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 13-33 | 24-35 | 1.50-1.70 | 0.2-0.6 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 33-62 | 20-30 | 1.55-1.80 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 62-80 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 14B2: | | | | | | | | | | | | |
| Ava | 0-9 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 9-28 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 28-64 | 20-30 | 1.55-1.80 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 64-78 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 14C2: | | | | | | | | | | | | |
| Ava | 0-5 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 5-23 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 23-57 | 20-30 | 1.55-1.80 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 57-78 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 15D3: | | | | | | | | | | | | |
| Parke | 0-9 | 27-35 | 1.30-1.45 | 0.6-2 | 0.20-0.23 | Moderate | 0.5-1.0 | .37 | .37 | 5 | 7 | 38 |
| | 9-17 | 22-35 | 1.30-1.45 | 0.6-2 | 0.18-0.20 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 17-78 | 18-30 | 1.55-1.65 | 0.6-2 | 0.16-0.18 | Low | 0.0-0.2 | .28 | .32 | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 84: | | | | | | | | | | | | |
| Okaw | 0-4 | 15-27 | 1.20-1.40 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .43 | .43 | 3 | 6 | 48 |
| | 4-16 | 35-60 | 1.35-1.60 | <0.06 | 0.09-0.18 | High | 0.5-1.0 | .32 | .32 | | | |
| | 16-67 | 35-55 | 1.50-1.70 | <0.06 | 0.08-0.20 | High | 0.0-0.5 | .32 | .32 | | | |
| 109: | | | | | | | | | | | | |
| Racoon | 0-7 | 18-27 | 1.30-1.50 | 0.2-0.6 | 0.22-0.24 | Low | 1.0-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 7-29 | 18-27 | 1.35-1.55 | 0.2-0.6 | 0.20-0.22 | Low | 0.2-0.5 | .37 | .37 | | | |
| | 29-41 | 27-40 | 1.35-1.60 | 0.06-0.2 | 0.15-0.20 | High | 0.5-1.0 | .37 | .37 | | | |
| | 41-51 | 27-35 | 1.35-1.60 | 0.06-0.2 | 0.18-0.20 | Moderate | 0.5-1.0 | .37 | .37 | | | |
| | 51-60 | 18-35 | 1.40-1.65 | 0.2-0.6 | 0.15-0.20 | Moderate | 0.5-1.0 | .37 | .37 | | | |
| 122B: | | | | | | | | | | | | |
| Colp | 0-7 | 20-27 | 1.30-1.50 | 0.2-0.6 | 0.21-0.25 | Low | 1.0-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 7-45 | 35-50 | 1.45-1.70 | 0.06-0.2 | 0.10-0.17 | High | 0.0-0.5 | .32 | .32 | | | |
| | 45-60 | 30-45 | 1.50-1.70 | 0.06-0.2 | 0.10-0.18 | High | 0.0-0.5 | .32 | .32 | | | |
| 122B2: | | | | | | | | | | | | |
| Colp | 0-6 | 20-27 | 1.30-1.50 | 0.2-0.6 | 0.21-0.25 | Low | 1.0-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 6-60 | 35-50 | 1.45-1.70 | 0.06-0.2 | 0.10-0.17 | High | 0.0-0.5 | .32 | .32 | | | |
| 122C3: | | | | | | | | | | | | |
| Colp | 0-7 | 27-35 | 1.35-1.55 | 0.2-0.6 | 0.14-0.19 | Moderate | 0.5-1.0 | .43 | .43 | 5 | 7 | 38 |
| | 7-48 | 35-50 | 1.45-1.70 | 0.06-0.2 | 0.10-0.17 | High | 0.0-0.5 | .32 | .32 | | | |
| | 48-60 | 30-45 | 1.50-1.70 | 0.06-0.2 | 0.10-0.18 | High | 0.0-0.5 | .32 | .32 | | | |
| 122D3: | | | | | | | | | | | | |
| Colp | 0-4 | 27-35 | 1.35-1.55 | 0.2-0.6 | 0.14-0.19 | Moderate | 0.5-1.0 | .43 | .43 | 5 | 7 | 38 |
| | 4-30 | 35-50 | 1.45-1.70 | 0.06-0.2 | 0.10-0.17 | High | 0.0-0.5 | .32 | .32 | | | |
| | 30-60 | 30-45 | 1.50-1.70 | 0.06-0.2 | 0.10-0.18 | High | 0.0-0.5 | .32 | .32 | | | |
| 287: | | | | | | | | | | | | |
| Chauncey | 0-12 | 15-22 | 1.30-1.50 | 0.6-2 | 0.22-0.25 | Low | 2.0-4.0 | .37 | .37 | 5 | 6 | 48 |
| | 12-26 | 15-22 | 1.25-1.50 | 0.2-0.6 | 0.20-0.22 | Low | 0.0-1.0 | .37 | .37 | | | |
| | 26-46 | 35-42 | 1.35-1.60 | 0.06-0.2 | 0.11-0.15 | High | 0.0-0.5 | .37 | .37 | | | |
| | 46-60 | 22-35 | 1.50-1.70 | 0.06-0.2 | 0.14-0.18 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| 301B: | | | | | | | | | | | | |
| Grantsburg | 0-9 | 13-25 | 1.10-1.40 | 0.6-2 | 0.20-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 9-27 | 20-30 | 1.30-1.60 | 0.6-2 | 0.18-0.20 | Moderate | 0.1-0.5 | .43 | .43 | | | |
| | 27-37 | 20-32 | 1.55-1.80 | <0.06 | 0.08-0.10 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| | 37-60 | 20-27 | 1.50-1.70 | 0.06-0.2 | 0.18-0.20 | Low | 0.0-0.2 | .43 | .43 | | | |
| 301C3: | | | | | | | | | | | | |
| Grantsburg | 0-5 | 27-30 | 1.30-1.45 | 0.6-2 | 0.18-0.20 | Moderate | 0.5-1.0 | .43 | .43 | 3 | 7 | 38 |
| | 5-17 | 20-30 | 1.30-1.60 | 0.6-2 | 0.18-0.20 | Moderate | 0.1-0.5 | .43 | .43 | | | |
| | 17-60 | 20-32 | 1.55-1.80 | <0.06 | 0.08-0.10 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| 337A: | | | | | | | | | | | | |
| Creal | 0-6 | 20-27 | 1.30-1.50 | 0.2-0.6 | 0.22-0.24 | Low | 1.0-3.0 | .37 | .37 | 5 | 6 | 48 |
| | 6-25 | 18-25 | 1.35-1.60 | 0.2-0.6 | 0.18-0.20 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 25-37 | 25-35 | 1.35-1.60 | 0.2-0.6 | 0.18-0.20 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 37-65 | 20-27 | 1.40-1.60 | 0.2-0.6 | 0.20-0.22 | Low | 0.0-0.5 | .37 | .37 | | | |
| 338A: | | | | | | | | | | | | |
| Hurst | 0-8 | 20-27 | 1.25-1.45 | 0.2-0.6 | 0.22-0.24 | Low | 1.0-2.0 | .43 | .43 | 3 | 6 | 48 |
| | 8-14 | 18-30 | 1.30-1.50 | 0.2-0.6 | 0.20-0.22 | Low | 0.1-0.4 | .43 | .43 | | | |
| | 14-60 | 35-48 | 1.45-1.70 | <0.06 | 0.10-0.17 | High | 0.0-0.2 | .32 | .32 | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 339D: | | | | | | | | | | | | |
| Wellston | 0-8 | 13-27 | 1.30-1.50 | 0.6-2 | 0.18-0.22 | Low | 1.0-3.0 | .37 | .37 | 3 | 6 | 48 |
| | 8-32 | 18-35 | 1.30-1.65 | 0.6-2 | 0.17-0.21 | Low | 0.3-1.0 | .37 | .43 | | | |
| | 32-48 | 15-30 | 1.30-1.60 | 0.6-2 | 0.12-0.17 | Low | 0.1-0.5 | .37 | .55 | | | |
| | 48-52 | --- | --- | 0.2-2 | --- | --- | --- | --- | --- | | | |
| 340D3: | | | | | | | | | | | | |
| Zanesville | 0-2 | 27-35 | 1.35-1.40 | 0.6-2 | 0.18-0.23 | Low | 0.5-1.0 | .37 | .37 | 2 | 7 | 38 |
| | 2-19 | 18-35 | 1.35-1.45 | 0.6-2 | 0.17-0.22 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 19-34 | 18-33 | 1.50-1.75 | 0.06-0.6 | 0.08-0.12 | Low | 0.0-0.5 | .37 | .43 | | | |
| | 34-50 | 20-40 | 1.50-1.70 | 0.2-2 | 0.08-0.12 | Low | 0.0-0.5 | .28 | .32 | | | |
| | 50-60 | --- | --- | 0.0-0.2 | --- | --- | --- | --- | --- | | | |
| 376: | | | | | | | | | | | | |
| Cisne | 0-8 | 15-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .37 | .37 | 5 | 6 | 48 |
| | 8-17 | 15-27 | 1.25-1.45 | 0.06-0.6 | 0.18-0.20 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 17-37 | 35-45 | 1.40-1.60 | <0.06 | 0.09-0.15 | High | 0.0-1.0 | .37 | .37 | | | |
| | 37-60 | 25-37 | 1.50-1.70 | <0.06 | 0.08-0.14 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 60-70 | 22-30 | 1.60-1.80 | <0.06 | 0.14-0.22 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| 377A: | | | | | | | | | | | | |
| Hoyleton | 0-8 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 8-11 | 15-27 | 1.35-1.60 | 0.2-0.6 | 0.16-0.18 | Low | 0.2-1.0 | .43 | .43 | | | |
| | 11-55 | 35-45 | 1.40-1.65 | 0.06-0.2 | 0.13-0.20 | High | 0.2-0.5 | .43 | .43 | | | |
| | 55-85 | 15-33 | 1.35-1.70 | 0.06-0.2 | 0.17-0.22 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| 377B2: | | | | | | | | | | | | |
| Hoyleton | 0-6 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .32 | .32 | 5 | 6 | 48 |
| | 6-38 | 35-45 | 1.40-1.65 | 0.06-0.2 | 0.13-0.20 | High | 0.2-0.5 | .43 | .43 | | | |
| | 38-90 | 15-33 | 1.35-1.70 | 0.06-0.2 | 0.17-0.22 | Moderate | 0.0-0.2 | .43 | .43 | | | |
| 421G: | | | | | | | | | | | | |
| Kell | 0-3 | 15-27 | 1.25-1.35 | 0.6-2 | 0.18-0.22 | Low | 1.0-4.0 | .32 | .32 | 3 | 5 | 56 |
| | 3-7 | 15-27 | 1.25-1.40 | 0.6-2 | 0.18-0.20 | Low | 0.2-0.5 | .32 | .32 | | | |
| | 7-18 | 22-35 | 1.35-1.50 | 0.6-2 | 0.15-0.18 | Low | 0.2-1.0 | .37 | .37 | | | |
| | 18-35 | 10-40 | 1.40-1.55 | 0.6-2 | 0.10-0.15 | Moderate | 0.2-0.5 | .37 | .43 | | | |
| | 35-60 | --- | --- | 0.0-2 | --- | --- | --- | --- | --- | | | |
| 518B: | | | | | | | | | | | | |
| Rend | 0-11 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 11-23 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 23-77 | 20-30 | 1.50-1.70 | <0.06 | 0.09-0.11 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 77-83 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 518B2: | | | | | | | | | | | | |
| Rend | 0-6 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 6-33 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 33-64 | 20-30 | 1.50-1.70 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 64-93 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 518C2: | | | | | | | | | | | | |
| Rend | 0-5 | 20-27 | 1.40-1.60 | 0.6-2 | 0.21-0.24 | Low | 0.5-2.0 | .43 | .43 | 4 | 6 | 48 |
| | 5-24 | 22-33 | 1.40-1.60 | 0.6-2 | 0.18-0.21 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 24-40 | 20-30 | 1.50-1.70 | <0.06 | 0.09-0.11 | Low | 0.0-0.5 | .43 | .43 | | | |
| | 40-60 | 20-30 | 1.55-1.75 | 0.2-0.6 | 0.05-0.10 | Low | 0.0-0.5 | .43 | .43 | | | |
| 533: | | | | | | | | | | | | |
| Urban land. | | | | | | | | | | | | |
| 536: | | | | | | | | | | | | |
| Dumps, mine. | | | | | | | | | | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 551D2: | | | | | | | | | | | | |
| Gosport | 0-5 | 18-27 | 1.30-1.40 | 0.2-0.6 | 0.18-0.20 | Low | 1.0-2.0 | .43 | .43 | 3 | 6 | 48 |
| | 5-27 | 36-60 | 1.50-1.60 | <0.06 | 0.12-0.14 | High | 0.0-0.5 | .32 | .32 | | | |
| | 27-60 | --- | --- | <0.06 | --- | --- | --- | --- | --- | | | |
| 583B: | | | | | | | | | | | | |
| Pike | 0-8 | 18-27 | 1.25-1.40 | 0.6-2 | 0.22-0.24 | Low | 0.5-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 8-38 | 22-35 | 1.30-1.45 | 0.6-2 | 0.18-0.22 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 38-57 | 18-35 | 1.30-1.45 | 0.6-2 | 0.12-0.18 | Low | 0.0-0.5 | .37 | .49 | | | |
| | 57-99 | 14-20 | 1.45-1.65 | 2-6 | 0.05-0.12 | Low | 0.0-0.5 | .37 | .55 | | | |
| 583C2: | | | | | | | | | | | | |
| Pike | 0-6 | 18-27 | 1.25-1.40 | 0.6-2 | 0.22-0.24 | Low | 0.5-2.0 | .37 | .37 | 5 | 7 | 38 |
| | 6-41 | 22-35 | 1.30-1.45 | 0.6-2 | 0.18-0.22 | Low | 0.0-0.5 | .37 | .37 | | | |
| | 41-78 | 18-35 | 1.30-1.45 | 0.6-2 | 0.12-0.18 | Low | 0.0-0.5 | .37 | .49 | | | |
| 639: | | | | | | | | | | | | |
| Wynoose | 0-3 | 15-25 | 1.25-1.45 | 0.6-2 | 0.22-0.24 | Low | 0.5-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 3-22 | 12-18 | 1.30-1.50 | 0.06-0.2 | 0.18-0.20 | Low | 0.2-0.5 | .43 | .43 | | | |
| | 22-37 | 35-42 | 1.40-1.60 | <0.06 | 0.09-0.13 | High | 0.2-0.5 | .43 | .43 | | | |
| | 37-47 | 25-37 | 1.50-1.70 | 0.06-0.2 | 0.11-0.15 | Moderate | 0.2-0.5 | .43 | .43 | | | |
| | 47-99 | 20-35 | 1.60-1.80 | 0.06-0.2 | 0.10-0.16 | Moderate | 0.2-0.5 | .32 | .32 | | | |
| 640A: | | | | | | | | | | | | |
| Bluford | 0-4 | 20-27 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .43 | .43 | 5 | 6 | 48 |
| | 4-17 | 15-25 | 1.40-1.60 | 0.2-0.6 | 0.18-0.20 | Low | 0.0-1.0 | .43 | .43 | | | |
| | 17-41 | 35-42 | 1.45-1.65 | 0.06-0.6 | 0.11-0.20 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| | 41-60 | 22-35 | 1.60-1.70 | 0.06-0.2 | 0.11-0.16 | Moderate | 0.0-0.5 | .43 | .43 | | | |
| 786D2: | | | | | | | | | | | | |
| Frondorf | 0-6 | 18-27 | 1.20-1.40 | 0.6-2 | 0.18-0.22 | Low | 1.0-3.0 | .37 | .37 | 3 | 5 | 56 |
| | 6-35 | 18-35 | 1.20-1.45 | 0.6-2 | 0.08-0.16 | Low | 0.0-0.5 | .17 | .28 | | | |
| | 35-39 | --- | --- | 0.0-2 | --- | --- | --- | --- | --- | | | |
| 802B: | | | | | | | | | | | | |
| Orthents | 0-6 | 22-30 | 1.70-1.75 | 0.2-0.6 | 0.18-0.22 | Moderate | 0.5-2.0 | .43 | .43 | 5 | 4 | 86 |
| | 6-60 | 22-30 | 1.70-1.80 | 0.2-0.6 | 0.16-0.20 | Moderate | 0.2-1.0 | .43 | .43 | | | |
| 802F: | | | | | | | | | | | | |
| Orthents, very hilly | 0-6 | 22-30 | 1.70-1.75 | 0.2-0.6 | 0.18-0.22 | Moderate | 0.5-2.0 | .43 | .43 | 5 | 4 | 86 |
| | 6-60 | 22-30 | 1.70-1.80 | 0.2-0.6 | 0.16-0.20 | Moderate | 0.2-1.0 | .43 | .43 | | | |
| 823B: | | | | | | | | | | | | |
| Schuline | 0-3 | 15-27 | 1.30-1.50 | 0.6-2 | 0.20-0.23 | Low | 0.5-2.0 | .37 | .37 | 3 | 5 | 56 |
| | 3-15 | 18-35 | 1.60-1.80 | 0.06-0.2 | 0.08-0.12 | Moderate | 0.2-0.5 | .37 | .37 | | | |
| | 15-52 | 18-35 | 1.40-1.70 | 0.2-0.6 | 0.15-0.21 | Moderate | 0.2-0.5 | .37 | .37 | | | |
| | 52-69 | 20-45 | 1.60-1.90 | 0.06-0.6 | 0.08-0.18 | Moderate | 0.2-0.5 | .37 | .37 | | | |
| 866: | | | | | | | | | | | | |
| Dumps, slurry. | | | | | | | | | | | | |
| 871D: | | | | | | | | | | | | |
| Lenzburg | 0-5 | 20-35 | 1.30-1.60 | 0.6-2 | 0.15-0.19 | Moderate | 0.5-4.0 | .24 | .37 | 5 | 8 | 0 |
| | 5-21 | 20-35 | 1.30-1.60 | 0.2-0.6 | 0.15-0.18 | Moderate | 0.2-1.0 | .37 | .43 | | | |
| | 21-39 | 20-35 | 1.40-1.70 | 0.2-0.6 | 0.11-0.17 | Moderate | 0.2-1.0 | .37 | .43 | | | |
| | 39-60 | 25-45 | 1.40-1.70 | 0.2-0.6 | 0.08-0.18 | High | 0.2-1.0 | .32 | .32 | | | |
| 871G: | | | | | | | | | | | | |
| Lenzburg | 0-4 | 20-35 | 1.30-1.60 | 0.6-2 | 0.15-0.19 | Moderate | 0.5-4.0 | .24 | .37 | 5 | 8 | 0 |
| | 4-20 | 20-35 | 1.30-1.60 | 0.2-0.6 | 0.15-0.18 | Moderate | 0.2-1.0 | .37 | .43 | | | |
| | 20-43 | 20-35 | 1.40-1.70 | 0.2-0.6 | 0.11-0.17 | Moderate | 0.2-1.0 | .37 | .43 | | | |
| | 43-60 | 25-45 | 1.40-1.70 | 0.2-0.6 | 0.08-0.18 | High | 0.2-1.0 | .32 | .32 | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 908F: | | | | | | | | | | | | |
| Hickory | 0-16 | 19-25 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 1.0-2.0 | .37 | .37 | 5 | 6 | 48 |
| | 16-60 | 15-32 | 1.50-1.70 | 0.6-2 | 0.11-0.19 | Low | 0.0-0.2 | .28 | .28 | | | |
| Kell | 0-3 | 15-27 | 1.25-1.35 | 0.6-2 | 0.18-0.22 | Low | 1.0-4.0 | .32 | .32 | 3 | 5 | 56 |
| | 3-7 | 15-27 | 1.25-1.40 | 0.6-2 | 0.18-0.20 | Low | 0.2-0.5 | .32 | .32 | | | |
| | 7-18 | 22-35 | 1.35-1.50 | 0.6-2 | 0.15-0.18 | Low | 0.2-1.0 | .37 | .37 | | | |
| | 18-35 | 10-40 | 1.40-1.55 | 0.6-2 | 0.10-0.15 | Moderate | 0.2-0.5 | .37 | .43 | | | |
| | 35-60 | --- | --- | 0.0-2 | --- | --- | --- | --- | --- | | | |
| 927D3: | | | | | | | | | | | | |
| Blair | 0-5 | 27-35 | 1.35-1.55 | 0.2-0.6 | 0.14-0.18 | Moderate | 0.5-1.0 | .37 | .37 | 5 | 7 | 38 |
| | 5-35 | 25-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.5 | .37 | .37 | | | |
| | 35-78 | 18-35 | 1.45-1.60 | 0.2-0.6 | 0.16-0.21 | Moderate | 0.0-0.3 | .37 | .37 | | | |
| | 78-99 | 20-27 | 1.35-1.60 | 0.2-0.6 | 0.19-0.22 | Low | 0.0-0.1 | .37 | .37 | | | |
| Atlas | 0-8 | 30-40 | 1.35-1.55 | 0.06-0.2 | 0.14-0.19 | High | 0.5-1.0 | .43 | .43 | 5 | 7 | 38 |
| | 8-20 | 35-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| | 20-60 | 30-45 | 1.35-1.55 | <0.06 | 0.07-0.19 | High | 0.0-1.0 | .32 | .32 | | | |
| 1085: | | | | | | | | | | | | |
| Jacob | 0-2 | 55-70 | 1.30-1.50 | 0.06-0.2 | 0.11-0.13 | Very high | 2.0-4.0 | .28 | .28 | 5 | 8 | 0 |
| | 2-60 | 60-75 | 1.35-1.45 | <0.06 | 0.10-0.13 | Very high | 0.0-1.0 | .28 | .28 | | | |
| 1108: | | | | | | | | | | | | |
| Bonnie | 0-6 | 18-27 | 1.30-1.50 | 0.6-2 | 0.21-0.25 | Low | 1.0-2.0 | .43 | .43 | 5 | 6 | 48 |
| | 6-20 | 18-27 | 1.40-1.60 | 0.2-0.6 | 0.20-0.22 | Low | 0.0-1.0 | .43 | .43 | | | |
| | 20-60 | 18-27 | 1.45-1.65 | 0.2-0.6 | 0.20-0.22 | Low | 0.0-1.0 | .43 | .43 | | | |
| 3072: | | | | | | | | | | | | |
| Sharon | 0-17 | 10-18 | 1.30-1.50 | 0.6-2 | 0.22-0.24 | Low | 0.5-2.0 | .37 | .37 | 5 | 5 | 56 |
| | 17-40 | 10-18 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 0.2-0.5 | .37 | .37 | | | |
| | 40-60 | 5-18 | 1.35-1.65 | 0.6-2 | 0.11-0.22 | Low | 0.2-0.5 | .37 | .37 | | | |
| 3085: | | | | | | | | | | | | |
| Jacob | 0-6 | 55-70 | 1.30-1.50 | 0.06-0.2 | 0.11-0.13 | Very high | 2.0-4.0 | .28 | .28 | 5 | 8 | 0 |
| | 6-60 | 60-75 | 1.35-1.45 | <0.06 | 0.10-0.13 | Very high | 0.0-1.0 | .28 | .28 | | | |
| 3108: | | | | | | | | | | | | |
| Bonnie | 0-10 | 18-27 | 1.30-1.50 | 0.6-2 | 0.22-0.25 | Low | 1.0-3.0 | .43 | .43 | 5 | 6 | 48 |
| | 10-27 | 18-27 | 1.35-1.55 | 0.2-0.6 | 0.21-0.24 | Low | 0.0-1.0 | .43 | .43 | | | |
| | 27-60 | 18-30 | 1.35-1.55 | 0.2-0.6 | 0.14-0.24 | Low | 0.0-1.0 | .43 | .43 | | | |
| 3226: | | | | | | | | | | | | |
| Wirt | 0-12 | 10-18 | 1.30-1.55 | 0.6-2 | 0.19-0.24 | Low | 0.5-2.0 | .43 | .43 | 5 | 5 | 56 |
| | 12-36 | 7-18 | 1.40-1.55 | 0.6-2 | 0.11-0.20 | Low | 0.0-1.0 | .43 | .49 | | | |
| | 36-60 | 4-18 | 1.45-1.60 | 0.6-6 | 0.07-0.19 | Low | 0.0-0.5 | .24 | .37 | | | |
| 3336: | | | | | | | | | | | | |
| Wilbur | 0-8 | 10-18 | 1.30-1.50 | 0.6-2 | 0.20-0.24 | Low | 1.0-3.0 | .49 | .49 | 5 | 5 | 56 |
| | 8-60 | 10-26 | 1.30-1.50 | 0.6-2 | 0.20-0.22 | Low | 0.5-1.0 | .49 | .49 | | | |
| 3382: | | | | | | | | | | | | |
| Belknap | 0-9 | 8-18 | 1.35-1.55 | 0.2-2 | 0.21-0.25 | Low | 1.0-3.0 | .37 | .37 | 5 | 5 | 56 |
| | 9-19 | 8-25 | 1.40-1.60 | 0.2-2 | 0.21-0.24 | Low | 0.0-2.0 | .37 | .37 | | | |
| | 19-60 | 8-30 | 1.35-1.65 | 0.2-2 | 0.14-0.24 | Low | 0.0-1.0 | .37 | .37 | | | |

Table 17.--Physical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Clay | Moist bulk density | Permeability | Available water capacity | Shrink-swell potential | Organic matter | Erosion factors | | | Wind erodibility group | Wind erodibility index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Kw | Kf | T | | |
| | In | Pct | g/cc | In/hr | In/in | | Pct | | | | | |
| 3415: | | | | | | | | | | | | |
| Orion | 0-7 | 10-18 | 1.20-1.30 | 0.6-2 | 0.22-0.24 | Low | 1.0-3.0 | .37 | .37 | 5 | 5 | 56 |
| | 7-24 | 10-18 | 1.20-1.30 | 0.6-2 | 0.20-0.22 | Low | 1.0-3.0 | .37 | .37 | | | |
| | 24-42 | 10-30 | 1.25-1.45 | 0.6-2 | 0.18-0.22 | Low | 3.0-8.0 | .37 | .37 | | | |
| | 42-60 | 10-18 | 1.20-1.40 | 0.6-2 | 0.18-0.22 | Low | 0.0-0.5 | .37 | .37 | | | |
| 3422: | | | | | | | | | | | | |
| Cape | 0-7 | 30-40 | 1.25-1.45 | 0.06-0.2 | 0.15-0.19 | Moderate | 1.0-3.0 | .32 | .32 | 5 | 7 | 38 |
| | 7-46 | 40-60 | 1.30-1.50 | <0.06 | 0.10-0.13 | High | 0.1-2.0 | .32 | .32 | | | |
| | 46-64 | 35-60 | 1.25-1.50 | 0.06-0.2 | 0.11-0.19 | Moderate | 0.1-2.0 | .32 | .32 | | | |

Table 18.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 2: | | | | | | |
| Cisne | 0-10 | 11-22 | --- | 4.5-7.8 | 0 | 0 |
| | 10-16 | --- | 9.0-17 | 4.5-6.0 | 0 | 0 |
| | 16-34 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 34-55 | 15-23 | --- | 5.1-6.5 | 0 | --- |
| | 55-63 | 13-19 | --- | 5.6-7.3 | 0 | 0-3 |
| 3A: | | | | | | |
| Hoyleton | 0-9 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 9-33 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 33-65 | 9.0-21 | --- | 5.1-7.3 | 0 | 0-5 |
| 3B2: | | | | | | |
| Hoyleton | 0-7 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 7-39 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 39-78 | 9.0-21 | --- | 5.1-7.3 | 0 | 0-5 |
| 4B2: | | | | | | |
| Richview | 0-9 | 12-17 | --- | 5.1-7.3 | --- | --- |
| | 9-39 | 15-25 | --- | 4.5-6.5 | --- | --- |
| | 39-70 | 10-20 | --- | 4.5-6.5 | --- | --- |
| 4C2: | | | | | | |
| Richview | 0-9 | 12-17 | --- | 5.1-7.3 | --- | --- |
| | 9-36 | 15-25 | --- | 4.5-6.5 | --- | --- |
| | 36-78 | 10-20 | --- | 4.5-6.5 | --- | --- |
| 5C2: | | | | | | |
| Blair | 0-8 | 14-22 | --- | 5.1-7.3 | 0 | 0 |
| | 8-17 | --- | 15-23 | 4.5-6.0 | 0 | 0 |
| | 17-60 | 11-22 | --- | 5.1-7.8 | 0-5 | 0 |
| 5C3: | | | | | | |
| Blair | 0-6 | 17-23 | --- | 5.1-7.3 | 0 | 0 |
| | 6-15 | --- | 15-23 | 4.5-6.0 | 0 | 0 |
| | 15-50 | 11-22 | --- | 5.1-7.8 | 0-5 | 0 |
| | 50-62 | 12-17 | --- | 5.6-7.8 | 0-20 | 0-3 |
| 7C2: | | | | | | |
| Atlas | 0-7 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 7-29 | 21-29 | --- | 4.5-7.3 | 0 | 0 |
| | 29-60 | 18-29 | --- | 4.5-7.8 | 0-25 | 0 |
| 7D2: | | | | | | |
| Atlas | 0-7 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 7-29 | 21-29 | --- | 4.5-7.3 | 0 | 0 |
| | 29-60 | 18-29 | --- | 4.5-7.8 | 0-25 | 0 |
| 8D2: | | | | | | |
| Hickory | 0-6 | 14-19 | --- | 4.5-7.3 | 0 | 0 |
| | 6-60 | --- | 16-22 | 4.5-6.0 | 0 | 0 |
| 8D3: | | | | | | |
| Hickory | 0-8 | 17-23 | --- | 4.5-7.3 | 0 | 0 |
| | 8-72 | --- | 16-22 | 4.5-6.0 | 0 | 0 |
| | 72-79 | 9.0-19 | --- | 5.1-8.4 | 0-15 | 0 |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 8F: | | | | | | |
| Hickory | 0-12 | 14-19 | --- | 4.5-7.3 | 0 | 0 |
| | 12-46 | 16-22 | --- | 4.5-7.3 | 0 | 0 |
| | 46-60 | 9.0-19 | --- | 5.1-8.4 | 0-15 | 0 |
| 8G: | | | | | | |
| Hickory | 0-10 | 14-19 | --- | 4.5-7.3 | 0 | 0 |
| | 10-60 | 16-22 | --- | 4.5-7.3 | 0 | 0 |
| 10C: | | | | | | |
| Plumfield | 0-5 | 17-23 | --- | 4.5-7.3 | 0 | 0 |
| | 5-21 | 12-19 | --- | 4.5-6.5 | 0 | 0 |
| | 21-36 | --- | 12-18 | 4.5-5.5 | 0 | 0 |
| | 36-60 | --- | 12-18 | 4.5-5.5 | 0 | 0 |
| 10D: | | | | | | |
| Plumfield | 0-6 | 17-23 | --- | 4.5-7.3 | 0 | 0 |
| | 6-21 | 12-19 | --- | 4.5-6.5 | 0 | 0 |
| | 21-44 | --- | 12-18 | 4.5-5.5 | 0 | 0 |
| | 44-60 | --- | 12-18 | 4.5-5.5 | 0 | 0 |
| 12: | | | | | | |
| Wynoose | 0-7 | 10-19 | --- | 4.5-7.8 | 0 | 0 |
| | 7-11 | 7.0-12 | --- | 3.6-7.3 | 0 | 0 |
| | 11-28 | --- | 21-26 | 3.6-6.0 | 0 | 0 |
| | 28-53 | --- | 15-23 | 3.6-6.0 | 0 | 0 |
| | 53-73 | 12-22 | --- | 4.5-7.3 | 0 | 0 |
| 13A: | | | | | | |
| Bluford | 0-5 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 5-15 | --- | 9.0-17 | 3.6-6.0 | 0 | 0 |
| | 15-40 | --- | 21-26 | 3.6-5.5 | 0 | 0 |
| | 40-76 | --- | 13-22 | 3.6-6.0 | 0 | 0 |
| 13B2: | | | | | | |
| Bluford | 0-7 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 7-27 | --- | 21-26 | 3.6-5.5 | 0 | 0 |
| | 27-98 | --- | 13-22 | 3.6-6.0 | 0 | 0 |
| 14B: | | | | | | |
| Ava | 0-5 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 5-13 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 13-33 | --- | 14-22 | 4.5-5.5 | 0 | 0 |
| | 33-62 | --- | 12-19 | 4.5-5.5 | 0 | 0 |
| | 62-80 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 14B2: | | | | | | |
| Ava | 0-9 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 9-28 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 28-64 | --- | 12-19 | 4.5-5.5 | 0 | 0 |
| | 64-78 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 14C2: | | | | | | |
| Ava | 0-5 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 5-23 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 23-57 | --- | 12-19 | 4.5-5.5 | 0 | 0 |
| | 57-78 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 15D3: | | | | | | |
| Parke | 0-9 | 11-25 | --- | 5.1-6.5 | 0 | 0 |
| | 9-17 | --- | 8.0-22 | 4.5-6.0 | 0 | 0 |
| | 17-78 | --- | 7.0-19 | 4.5-5.5 | 0 | 0 |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 84: | | | | | | |
| Okaw | 0-4 | 11-22 | --- | 4.5-7.3 | 0 | 0 |
| | 4-16 | 22-38 | --- | 4.5-7.3 | 0 | 0 |
| | 16-67 | 21-34 | --- | 3.6-8.4 | --- | 0 |
| 109: | | | | | | |
| Racoon | 0-7 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 7-29 | 11-17 | --- | 4.5-7.3 | 0 | 0 |
| | 29-41 | --- | 17-26 | 4.5-5.5 | 0 | 0 |
| | 41-51 | --- | 17-22 | 4.5-6.0 | 0 | 0 |
| | 51-60 | --- | 12-22 | 4.5-6.0 | 0 | 0 |
| 122B: | | | | | | |
| Colp | 0-7 | 14-20 | --- | 5.1-7.8 | 0 | 0 |
| | 7-45 | --- | 21-31 | 4.5-5.0 | 0 | 0 |
| | 45-60 | 18-28 | --- | 4.5-8.4 | 0-15 | 0 |
| 122B2: | | | | | | |
| Colp | 0-6 | 14-20 | --- | 5.1-7.8 | 0 | 0 |
| | 6-60 | --- | 21-31 | 4.5-5.0 | 0 | 0 |
| 122C3: | | | | | | |
| Colp | 0-7 | 17-23 | --- | 5.1-7.8 | 0 | 0 |
| | 7-48 | --- | 21-31 | 4.5-5.0 | 0 | 0 |
| | 48-60 | 18-28 | --- | 4.5-8.4 | 0-15 | 0 |
| 122D3: | | | | | | |
| Colp | 0-4 | 17-23 | --- | 5.1-7.8 | 0 | 0 |
| | 4-30 | --- | 21-31 | 4.5-5.0 | 0 | 0 |
| | 30-60 | 18-28 | --- | 4.5-8.4 | 0-15 | 0 |
| 287: | | | | | | |
| Chauncey | 0-12 | 13-21 | --- | 4.5-6.5 | 0 | 0 |
| | 12-26 | --- | 9.0-14 | 4.5-6.0 | 0 | 0 |
| | 26-46 | --- | 21-27 | 4.5-6.0 | 0 | 0 |
| | 46-60 | 13-22 | --- | 5.6-7.3 | 0 | 0 |
| 301B: | | | | | | |
| Grantsburg | 0-9 | --- | 9.0-20 | 3.6-6.5 | 0 | 0 |
| | 9-27 | --- | 13-18 | 3.6-5.5 | 0 | 0 |
| | 27-37 | --- | 12-19 | 3.6-5.5 | 0 | 0 |
| | 37-60 | --- | 12-16 | 3.6-6.0 | 0 | 0 |
| 301C3: | | | | | | |
| Grantsburg | 0-5 | --- | 17-20 | 3.6-6.5 | 0 | 0 |
| | 5-17 | --- | 13-18 | 3.6-5.5 | 0 | 0 |
| | 17-47 | --- | 12-19 | 3.6-5.5 | 0 | 0 |
| | 47-91 | --- | 12-16 | 3.6-6.0 | 0 | 0 |
| 337A: | | | | | | |
| Creal | 0-6 | 14-22 | --- | 5.1-7.3 | 0 | 0 |
| | 6-25 | 11-16 | --- | 3.6-7.3 | 0 | 0 |
| | 25-37 | 15-22 | --- | 4.5-6.5 | 0 | 0 |
| | 37-65 | 12-17 | --- | 4.5-7.3 | 0 | 0 |
| 338A: | | | | | | |
| Hurst | 0-8 | 14-20 | --- | 5.1-7.3 | 0 | 0 |
| | 8-14 | --- | 11-19 | 3.6-6.0 | 0 | 0 |
| | 14-60 | 21-29 | --- | 3.6-7.3 | 0 | 0 |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 339D: | | | | | | |
| Wellston | 0-8 | 8.0-16 | --- | 5.1-6.5 | 0 | --- |
| | 8-32 | --- | 12-20 | 4.5-6.0 | 0 | --- |
| | 32-48 | --- | 12-22 | 4.5-6.0 | 0 | --- |
| | 48-52 | --- | 0.0-0.0 | --- | 0 | --- |
| 340D3: | | | | | | |
| Zanesville | 0-2 | --- | 8.0-15 | 4.5-6.0 | --- | --- |
| | 2-19 | --- | 8.0-15 | 4.5-6.0 | --- | --- |
| | 19-34 | --- | 8.0-15 | 4.5-6.0 | --- | --- |
| | 34-50 | --- | 5.0-20 | 4.5-6.0 | --- | --- |
| | 50-60 | --- | --- | --- | --- | --- |
| 376: | | | | | | |
| Cisne | 0-8 | 11-22 | --- | 4.5-7.8 | 0 | 0 |
| | 8-17 | --- | 9.0-17 | 4.5-6.0 | 0 | 0 |
| | 17-37 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 37-60 | 15-23 | --- | 5.1-6.5 | 0 | --- |
| | 60-70 | 13-19 | --- | 5.6-7.3 | 0 | 0-3 |
| 377A: | | | | | | |
| Hoyleton | 0-8 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 8-11 | 9.0-17 | --- | 4.5-6.5 | 0 | 0 |
| | 11-55 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 55-85 | 9.0-21 | --- | 5.1-7.3 | 0 | 0-5 |
| 377B2: | | | | | | |
| Hoyleton | 0-6 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 6-38 | --- | 21-28 | 4.5-6.0 | 0 | 0 |
| | 38-90 | 9.0-21 | --- | 5.1-7.3 | 0 | 0-5 |
| 421G: | | | | | | |
| Kell | 0-3 | 10-23 | --- | 5.1-6.0 | 0 | 0 |
| | 3-7 | 7.0-14 | --- | 5.1-6.0 | 0 | 0 |
| | 7-18 | --- | 11-19 | 4.5-6.0 | 0 | 0 |
| | 18-35 | --- | 5.0-21 | 4.0-6.0 | 0 | 0 |
| | 35-60 | --- | --- | --- | --- | --- |
| 518B: | | | | | | |
| Rend | 0-11 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 11-23 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 23-77 | --- | 14-22 | 4.5-5.5 | 0 | 0 |
| | 77-83 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 518B2: | | | | | | |
| Rend | 0-6 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 6-33 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 33-64 | --- | 12-19 | 4.5-5.5 | 0 | 0 |
| | 64-93 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 518C2: | | | | | | |
| Rend | 0-5 | 13-20 | --- | 4.5-7.3 | 0 | 0 |
| | 5-24 | --- | 13-21 | 4.5-5.5 | 0 | 0 |
| | 24-40 | --- | 12-19 | 4.5-5.5 | 0 | 0 |
| | 40-60 | --- | 12-19 | 4.5-6.0 | 0 | 0 |
| 533: | | | | | | |
| Urban land. | | | | | | |
| 536: | | | | | | |
| Dumps, mine. | | | | | | |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 551D2: | | | | | | |
| Gosport | 0-5 | 15-20 | --- | 5.1-6.5 | 0 | 0 |
| | 5-27 | --- | 30-50 | 3.6-5.5 | 0 | 0 |
| | 27-60 | --- | --- | --- | --- | --- |
| 583B: | | | | | | |
| Pike | 0-8 | 8.0-21 | --- | 5.1-7.3 | 0 | 0 |
| | 8-38 | 8.0-15 | --- | 4.5-6.5 | 0 | 0 |
| | 38-57 | --- | 7.0-21 | 4.5-6.0 | 0 | 0 |
| | 57-99 | 2.0-10 | --- | 4.5-8.4 | 0-20 | 0 |
| 583C2: | | | | | | |
| Pike | 0-6 | 11-20 | --- | 5.1-7.3 | 0 | 0 |
| | 6-41 | 8.0-15 | --- | 4.5-6.5 | 0 | 0 |
| | 41-78 | --- | 7.0-21 | 4.5-6.0 | 0 | 0 |
| 639: | | | | | | |
| Wynoose | 0-3 | 10-19 | --- | 4.5-7.8 | 0 | 0 |
| | 3-22 | 7.0-12 | --- | 3.6-7.3 | 0 | 0 |
| | 22-37 | --- | 21-26 | 3.6-6.0 | 0 | 0 |
| | 37-47 | --- | 15-23 | 3.6-6.0 | 0 | 0 |
| | 47-99 | 12-22 | --- | 4.5-7.3 | 0 | 0 |
| 640A: | | | | | | |
| Bluford | 0-4 | 14-22 | --- | 4.5-7.3 | 0 | 0 |
| | 4-17 | --- | 9.0-17 | 3.6-6.0 | 0 | 0 |
| | 17-41 | --- | 21-26 | 3.6-5.5 | 0 | 0 |
| | 41-60 | --- | 13-22 | 3.6-6.0 | 0 | 0 |
| 786D2: | | | | | | |
| Frondorf | 0-6 | --- | 8.0-15 | 4.5-5.5 | --- | --- |
| | 6-35 | --- | 8.0-15 | 4.5-5.5 | --- | --- |
| | 35-39 | --- | --- | --- | --- | --- |
| 802B: | | | | | | |
| Orthents | 0-6 | 10-25 | --- | 5.6-7.8 | 0-10 | 0 |
| | 6-60 | 10-20 | --- | 5.6-7.8 | 0-20 | 0 |
| 802F: | | | | | | |
| Orthents, very hilly | 0-6 | 10-25 | --- | 5.6-7.8 | 0-10 | 0 |
| | 6-60 | 10-20 | --- | 5.6-7.8 | 0-20 | 0 |
| 823B: | | | | | | |
| Schuline | 0-3 | 10-20 | --- | 5.6-8.4 | 0-20 | 0 |
| | 3-15 | 11-22 | --- | 7.4-8.4 | 5-35 | 0 |
| | 15-52 | 11-22 | --- | 7.4-8.4 | 5-35 | 0 |
| | 52-69 | 12-28 | --- | 7.4-8.4 | 5-35 | 0 |
| 866: | | | | | | |
| Dumps, slurry. | | | | | | |
| 871D: | | | | | | |
| Lenzburg | 0-5 | 13-29 | --- | 6.6-8.4 | 0-20 | 0 |
| | 5-21 | 12-23 | --- | 6.6-8.4 | 0-25 | 0 |
| | 21-39 | 12-23 | --- | 7.4-8.4 | 0-25 | 0 |
| | 39-60 | 15-29 | --- | 7.4-8.4 | 0-26 | 0 |
| 871G: | | | | | | |
| Lenzburg | 0-4 | 13-29 | --- | 6.6-8.4 | 0-20 | 0 |
| | 4-20 | 12-23 | --- | 6.6-8.4 | 0-25 | 0 |
| | 20-43 | 12-23 | --- | 7.4-8.4 | 0-25 | 0 |
| | 43-60 | 15-29 | --- | 7.4-8.4 | 0-26 | 0 |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 908F: | | | | | | |
| Hickory | 0-16 | 14-19 | --- | 4.5-7.3 | 0 | 0 |
| | 16-43 | 9.0-19 | --- | 5.1-8.4 | 0-15 | 0 |
| | 43-60 | --- | --- | --- | --- | --- |
| Kell | 0-3 | 10-23 | --- | 5.1-6.0 | 0 | 0 |
| | 3-7 | 7.0-14 | --- | 5.1-6.0 | 0 | 0 |
| | 7-18 | --- | 11-19 | 4.5-6.0 | 0 | 0 |
| | 18-35 | --- | 5.0-21 | 4.0-6.0 | 0 | 0 |
| | 35-60 | --- | --- | --- | --- | --- |
| 927D3: | | | | | | |
| Blair | 0-5 | 17-23 | --- | 5.1-7.3 | 0 | 0 |
| | 5-35 | --- | 15-23 | 4.5-6.0 | 0 | 0 |
| | 35-78 | 11-22 | --- | 5.1-7.8 | 0-5 | 0 |
| | 78-99 | 12-17 | --- | 5.6-7.8 | 0-20 | 0-3 |
| Atlas | 0-8 | 19-26 | --- | 4.5-7.3 | 0 | 0 |
| | 8-20 | 21-29 | --- | 4.5-7.3 | 0 | 0 |
| | 20-60 | 18-29 | --- | 4.5-7.8 | 0-25 | 0 |
| 1085: | | | | | | |
| Jacob | 0-2 | 35-45 | --- | 5.1-6.5 | 0 | 0 |
| | 2-60 | --- | 35-45 | 3.6-5.5 | 0 | 0 |
| 1108: | | | | | | |
| Bonnie | 0-6 | 13-20 | --- | 4.5-6.5 | 0 | 0 |
| | 6-20 | --- | 11-16 | 4.5-5.5 | 0 | 0 |
| | 20-60 | --- | 11-16 | 4.5-5.5 | 0 | 0 |
| 3072: | | | | | | |
| Sharon | 0-17 | --- | 7.0-20 | 4.5-5.5 | 0 | 0 |
| | 17-40 | --- | 6.0-10 | 4.5-5.5 | 0 | 0 |
| | 40-60 | --- | 3.0-10 | 4.5-5.5 | 0 | 0 |
| 3085: | | | | | | |
| Jacob | 0-6 | 35-45 | --- | 5.1-6.5 | 0 | 0 |
| | 6-60 | --- | 35-45 | 3.6-5.5 | 0 | 0 |
| 3108: | | | | | | |
| Bonnie | 0-10 | 13-22 | --- | 4.5-7.3 | 0 | 0 |
| | 10-27 | --- | 11-18 | 4.5-5.5 | 0 | 0 |
| | 27-60 | 11-20 | --- | 4.5-7.8 | 0 | 0 |
| 3226: | | | | | | |
| Wirt | 0-12 | 6.0-13 | --- | 5.6-7.3 | 0 | 0 |
| | 12-36 | 4.0-12 | --- | 5.6-7.3 | 0 | 0 |
| | 36-60 | 3.0-12 | --- | 5.6-7.3 | 0 | 0 |
| 3336: | | | | | | |
| Wilbur | 0-8 | 4.0-16 | --- | 5.6-7.3 | 0 | 0 |
| | 8-60 | 4.0-16 | --- | 5.6-7.8 | 0 | 0 |
| 3382: | | | | | | |
| Belknap | 0-9 | 7.0-17 | --- | 4.5-7.3 | 0 | 0 |
| | 9-19 | --- | 5.0-19 | 4.5-6.0 | 0 | 0 |
| | 19-60 | 5.0-22 | --- | 4.5-7.3 | 0 | 0 |
| 3415: | | | | | | |
| Orion | 0-7 | 7.0-20 | --- | 5.6-7.8 | 0 | 0 |
| | 7-24 | 7.0-20 | --- | 5.6-7.8 | 0 | 0 |
| | 24-42 | 10-35 | --- | 5.6-7.8 | 0 | 0 |
| | 42-60 | 5.0-15 | --- | 5.6-7.8 | 0 | 0 |

Table 18.--Chemical Properties of the Soils--Continued

| Map symbol and soil name | Depth | Cation-exchange capacity | Effective cation-exchange capacity | Soil reaction | Calcium carbonate | Sodium adsorption ratio |
|---|---|---|---|---|---|---|
| | In | meq/100 g | meq/100 g | pH | Pct | |
| 3422: | | | | | | |
| Cape | 0-7 | 20-30 | --- | 4.5-7.3 | 0 | 0 |
| | 7-46 | --- | 24-40 | 3.6-5.5 | 0 | 0 |
| | 46-64 | --- | 21-40 | 3.6-5.5 | 0 | 0 |

Table 19.--Water Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

| Map symbol and soil name | Hydrologic group | High water table | | | Ponding | | Flooding | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Months | Depth | Kind | Surface water depth | Duration | Duration | Frequency | Months |
| | | | Ft | | Ft | | | | |
| 2: | | | | | | | | | |
| Cisne | D | Feb-Jun | 0.0-1.0 | Perched | --- | --- | --- | None | All months |
| 3A: | | | | | | | | | |
| Hoyleton | C | Mar-Jun | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 3B2: | | | | | | | | | |
| Hoyleton | C | Mar-Jun | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 4B2: | | | | | | | | | |
| Richview | C | Feb-May | 4.0-6.0 | Apparent | --- | --- | --- | None | All months |
| 4C2: | | | | | | | | | |
| Richview | C | Feb-May | 4.0-6.0 | Apparent | --- | --- | --- | None | All months |
| 5C2: | | | | | | | | | |
| Blair | C | Mar-Jun | 1.5-3.5 | Apparent | --- | --- | --- | None | All months |
| 5C3: | | | | | | | | | |
| Blair | C | Mar-Jun | 1.5-3.5 | Apparent | --- | --- | --- | None | All months |
| 7C2: | | | | | | | | | |
| Atlas | D | Apr-Jun | 1.0-2.0 | Perched | --- | --- | --- | None | All months |
| 7D2: | | | | | | | | | |
| Atlas | D | Apr-Jun | 1.0-2.0 | Perched | --- | --- | --- | None | All months |
| 8D2: | | | | | | | | | |
| Hickory | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 8D3: | | | | | | | | | |
| Hickory | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 8F: | | | | | | | | | |
| Hickory | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 8G: | | | | | | | | | |
| Hickory | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 10C: | | | | | | | | | |
| Plumfield | C | Feb-Jun | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 10D: | | | | | | | | | |
| Plumfield | C | Feb-Jun | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 12: | | | | | | | | | |
| Wynoose | D | Mar-Jun | 0.0-1.0 | Perched | --- | --- | --- | None | All months |
| 13A: | | | | | | | | | |
| Bluford | C | Mar-Jun | 1.0-3.0 | Perched | --- | --- | --- | None | All months |
| 13B2: | | | | | | | | | |
| Bluford | C | Mar-Jun | 1.0-3.0 | Perched | --- | --- | --- | None | All months |
| 14B: | | | | | | | | | |
| Ava | C | Mar-Jun | 1.5-3.5 | Perched | --- | --- | --- | None | All months |

Table 19.--Water Features--Continued

| Map symbol and soil name | Hydrologic group | High water table | | | Ponding | | Flooding | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Months | Depth | Kind | Surface water depth | Duration | Duration | Frequency | Months |
| | | | Ft | | Ft | | | | |
| 14B2: | | | | | | | | | |
| Ava | C | Mar-Jun | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 14C2: | | | | | | | | | |
| Ava | C | Mar-Jun | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 15D3: | | | | | | | | | |
| Parke | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 84: | | | | | | | | | |
| Okaw | D | Mar-Jun | 0.0-1.0 | Apparent | 0.0-0.5 | Brief | --- | None | All months |
| 109: | | | | | | | | | |
| Racoon | C/D | Mar-Jun | 0.0-1.0 | Apparent | 0.0-0.5 | Brief | --- | None | All months |
| 122B: | | | | | | | | | |
| Colp | C | Mar-Jun | 2.0-4.0 | Apparent | --- | --- | --- | None | All months |
| 122B2: | | | | | | | | | |
| Colp | C | Mar-Jun | 2.0-4.0 | Apparent | --- | --- | --- | None | All months |
| 122C3: | | | | | | | | | |
| Colp | C | Mar-Jun | 2.0-4.0 | Apparent | --- | --- | --- | None | All months |
| 122D3: | | | | | | | | | |
| Colp | C | Mar-Jun | 2.0-4.0 | Apparent | --- | --- | --- | None | All months |
| 287: | | | | | | | | | |
| Chauncey | C | Feb-Jun | 0.0-2.0 | Perched | --- | --- | --- | None | All months |
| 301B: | | | | | | | | | |
| Grantsburg | C | Feb-Apr | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 301C3: | | | | | | | | | |
| Grantsburg | C | Feb-Apr | 1.5-3.5 | Perched | --- | --- | --- | None | All months |
| 337A: | | | | | | | | | |
| Creal | C | Feb-Apr | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 338A: | | | | | | | | | |
| Hurst | D | Feb-Apr | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 339D: | | | | | | | | | |
| Wellston | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 340D3: | | | | | | | | | |
| Zanesville | C | Dec-Apr | 2.0-3.0 | Perched | --- | --- | --- | None | All months |
| 376: | | | | | | | | | |
| Cisne | D | Feb-Jun | 0.0-1.0 | Perched | --- | --- | --- | None | All months |
| 377A: | | | | | | | | | |
| Hoyleton | C | Mar-Jun | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 377B2: | | | | | | | | | |
| Hoyleton | C | Mar-Jun | 1.0-3.0 | Apparent | --- | --- | --- | None | All months |
| 421G: | | | | | | | | | |
| Kell | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 518B: | | | | | | | | | |
| Rend | C | Feb-May | 4.0-6.0 | Apparent | --- | --- | --- | None | All months |

Table 19.--Water Features--Continued

| Map symbol and soil name | Hydrologic group | High water table | | | Ponding | | Flooding | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Months | Depth | Kind | Surface water depth | Duration | Duration | Frequency | Months |
| | | | Ft | | Ft | | | | |
| 518B2: | | | | | | | | | |
| Rend | C | Feb-May | 4.0-6.0 | Apparent | --- | --- | --- | None | All months |
| 518C2: | | | | | | | | | |
| Rend | C | Feb-May | 4.0-6.0 | Apparent | --- | --- | --- | None | All months |
| 533: | | | | | | | | | |
| Urban land. | | | | | | | | | |
| 536: | | | | | | | | | |
| Dumps, mine. | | | | | | | | | |
| 551D2: | | | | | | | | | |
| Gosport | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 583B: | | | | | | | | | |
| Pike | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 583C2: | | | | | | | | | |
| Pike | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 639: | | | | | | | | | |
| Wynoose | D | Mar-Jun | 0.0-1.0 | Perched | --- | --- | --- | None | All months |
| 640A: | | | | | | | | | |
| Bluford | C | Mar-Jun | 1.0-3.0 | Perched | --- | --- | --- | None | All months |
| 786D2: | | | | | | | | | |
| Frondorf | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 802B: | | | | | | | | | |
| Orthents | B | Jan-May | 4.0-6.0 | Perched | --- | --- | --- | None | All months |
| 802F: | | | | | | | | | |
| Orthents, very hilly | B | Jan-May | 4.0-6.0 | Perched | --- | --- | --- | None | All months |
| 823B: | | | | | | | | | |
| Schuline | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 866: | | | | | | | | | |
| Dumps, slurry. | | | | | | | | | |
| 871D: | | | | | | | | | |
| Lenzburg | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 871G: | | | | | | | | | |
| Lenzburg | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 908F: | | | | | | | | | |
| Hickory | C | All months | >6.0 | --- | --- | --- | --- | None | All months |
| Kell | B | All months | >6.0 | --- | --- | --- | --- | None | All months |
| 927D3: | | | | | | | | | |
| Blair | C | Mar-Jun | 1.5-3.5 | Apparent | --- | --- | --- | None | All months |
| Atlas | D | Apr-Jun | 1.0-2.0 | Perched | --- | --- | --- | None | All months |
| 1085: | | | | | | | | | |
| Jacob | D | Feb-Jul | 0.0-1.0 | Perched | --- | --- | Long | Frequent | Feb-Jul |

Table 19.--Water Features--Continued

| Map symbol and soil name | Hydrologic group | High water table | | | Ponding | | Flooding | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Months | Depth | Kind | Surface water depth | Duration | Duration | Frequency | Months |
| | | | Ft | | Ft | | | | |
| 1108: | | | | | | | | | |
| Bonnie | C | Jan-Dec | 0.0-1.0 | Apparent | 0.0-2.0 | Long | Very long | Frequent | Jan-Dec |
| 3072: | | | | | | | | | |
| Sharon | B | Mar-Jun | 3.0-6.0 | Apparent | --- | --- | Brief | Frequent | Mar-Jun |
| 3085: | | | | | | | | | |
| Jacob | D | Feb-Jul | 0.0-1.0 | Perched | --- | --- | Brief | Frequent | Feb-Jul |
| 3108: | | | | | | | | | |
| Bonnie | C/D | Jan-Jun | 0.0-1.0 | Apparent | --- | --- | Brief | Frequent | Jan-Jun |
| 3226: | | | | | | | | | |
| Wirt | B | Nov-Jun | >6.0 | --- | --- | --- | Brief | Frequent | Nov-Jun |
| 3336: | | | | | | | | | |
| Wilbur | B | Dec-Jun | 1.5-2.0 | Apparent | --- | --- | Brief | Frequent | Dec-Jun |
| 3382: | | | | | | | | | |
| Belknap | C | Jan-Jun | 1.0-3.0 | Apparent | --- | --- | Brief | Frequent | Jan-Jun |
| 3415: | | | | | | | | | |
| Orion | C | Nov-May | 1.0-3.0 | Apparent | --- | --- | Brief | Frequent | Mar-Nov |
| 3422: | | | | | | | | | |
| Cape | D | Mar-Jul | 0.0-1.0 | Perched | --- | --- | Brief | Frequent | Mar-Jun |

Table 20.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

| Map symbol and soil name | Restrictive layer | | Potential for frost action | Risk of corrosion | |
|---|---|---|---|---|---|
| | Kind | Depth to top | | Uncoated steel | Concrete |
| | | In | | | |
| 2: | | | | | |
| Cisne | --- | --- | High | High | Moderate. |
| 3A: | | | | | |
| Hoyleton | --- | --- | High | High | High. |
| 3B2: | | | | | |
| Hoyleton | --- | --- | High | High | High. |
| 4B2: | | | | | |
| Richview | --- | --- | High | Moderate | High. |
| 4C2: | | | | | |
| Richview | --- | --- | High | Moderate | High. |
| 5C2: | | | | | |
| Blair | --- | --- | High | High | High. |
| 5C3: | | | | | |
| Blair | --- | --- | High | High | High. |
| 7C2: | | | | | |
| Atlas | --- | --- | High | High | Moderate. |
| 7D2: | | | | | |
| Atlas | --- | --- | High | High | Moderate. |
| 8D2: | | | | | |
| Hickory | --- | --- | Moderate | Moderate | Moderate. |
| 8D3: | | | | | |
| Hickory | --- | --- | Moderate | Moderate | Moderate. |
| 8F: | | | | | |
| Hickory | --- | --- | Moderate | Moderate | Moderate. |
| 8G: | | | | | |
| Hickory | --- | --- | Moderate | Moderate | Moderate. |
| 10C: | | | | | |
| Plumfield | --- | --- | High | High | High. |
| 10D: | | | | | |
| Plumfield | --- | --- | High | High | High. |
| 12: | | | | | |
| Wynoose | --- | --- | High | High | High. |
| 13A: | | | | | |
| Bluford | --- | --- | High | High | High. |
| 13B2: | | | | | |
| Bluford | --- | --- | High | High | High. |
| 14B: | | | | | |
| Ava | --- | --- | High | Moderate | High. |

Table 20.--Soil Features--Continued

| Map symbol and soil name | Restrictive layer | | Potential for frost action | Risk of corrosion | |
|---|---|---|---|---|---|
| | Kind | Depth to top | | Uncoated steel | Concrete |
| | | In | | | |
| 14B2: | | | | | |
| Ava | --- | --- | High | Moderate | High. |
| 14C2: | | | | | |
| Ava | --- | --- | High | Moderate | High. |
| 15D3: | | | | | |
| Parke | --- | --- | High | Moderate | High. |
| 84: | | | | | |
| Okaw | --- | --- | High | High | High. |
| 109: | | | | | |
| Racoon | --- | --- | High | High | High. |
| 122B: | | | | | |
| Colp | --- | --- | High | High | High. |
| 122B2: | | | | | |
| Colp | --- | --- | High | High | High. |
| 122C3: | | | | | |
| Colp | --- | --- | High | High | High. |
| 122D3: | | | | | |
| Colp | --- | --- | High | High | High. |
| 287: | | | | | |
| Chauncey | --- | --- | High | High | High. |
| 301B: | | | | | |
| Grantsburg | --- | --- | High | High | High. |
| 301C3: | | | | | |
| Grantsburg | --- | --- | High | High | High. |
| 337A: | | | | | |
| Creal | --- | --- | High | High | High. |
| 338A: | | | | | |
| Hurst | --- | --- | Moderate | High | High. |
| 339D: | | | | | |
| Wellston | Bedrock (lithic) | 40-72 | High | Moderate | High. |
| 340D3: | | | | | |
| Zanesville | Bedrock (lithic) | 40 | Moderate | Moderate | High. |
| 376: | | | | | |
| Cisne | --- | --- | High | High | Moderate. |
| 377A: | | | | | |
| Hoyleton | --- | --- | High | High | High. |
| 377B2: | | | | | |
| Hoyleton | --- | --- | High | High | High. |
| 421G: | | | | | |
| Kell | Bedrock (paralithic) | 20-40 | Moderate | Moderate | High. |

Table 20.--Soil Features--Continued

| Map symbol and soil name | Restrictive layer | | Potential for frost action | Risk of corrosion | |
|---|---|---|---|---|---|
| | Kind | Depth to top | | Uncoated steel | Concrete |
| | | In | | | |
| 518B: | | | | | |
| Rend | --- | --- | High | Moderate | High. |
| 518B2: | | | | | |
| Rend | --- | --- | High | Moderate | High. |
| 518C2: | | | | | |
| Rend | --- | --- | High | Moderate | High. |
| 533: | | | | | |
| Urban land. | | | | | |
| 536: | | | | | |
| Dumps, mine. | | | | | |
| 551D2: | | | | | |
| Gosport | Bedrock (paralithic) | 20-40 | Moderate | High | High. |
| 583B: | | | | | |
| Pike | --- | --- | High | Low | High. |
| 583C2: | | | | | |
| Pike | --- | --- | High | Low | High. |
| 639: | | | | | |
| Wynoose | --- | --- | High | High | High. |
| 640A: | | | | | |
| Bluford | --- | --- | High | High | High. |
| 786D2: | | | | | |
| Frondorf | Bedrock (paralithic) | 20-40 | Moderate | Moderate | High. |
| 802B: | | | | | |
| Orthents | --- | --- | Moderate | Moderate | Moderate. |
| 802F: | | | | | |
| Orthents, very hilly | --- | --- | Moderate | Moderate | Moderate. |
| 823B: | | | | | |
| Schuline | --- | --- | Moderate | Moderate | Low. |
| 866: | | | | | |
| Dumps, slurry. | | | | | |
| 871D: | | | | | |
| Lenzburg | --- | --- | Moderate | Moderate | Low. |
| 871G: | | | | | |
| Lenzburg | --- | --- | Moderate | Moderate | Low. |
| 908F: | | | | | |
| Hickory | --- | --- | Moderate | Moderate | Moderate. |
| Kell | Bedrock (paralithic) | 20-50 | Moderate | Moderate | High. |
| 927D3: | | | | | |
| Blair | --- | --- | High | High | High. |
| Atlas | --- | --- | High | High | Moderate. |

Table 20.--Soil Features--Continued

| Map symbol and soil name | Restrictive layer | | Potential for frost action | Risk of corrosion | |
|---|---|---|---|---|---|
| | Kind | Depth to top | | Uncoated steel | Concrete |
| | | In | | | |
| 1085: | | | | | |
| Jacob | --- | --- | Moderate | High | High. |
| 1108: | | | | | |
| Bonnie | --- | --- | High | Moderate | High. |
| 3072: | | | | | |
| Sharon | --- | --- | High | Low | High. |
| 3085: | | | | | |
| Jacob | --- | --- | Moderate | High | High. |
| 3108: | | | | | |
| Bonnie | --- | --- | High | High | High. |
| 3226: | | | | | |
| Wirt | --- | --- | Moderate | Low | Moderate. |
| 3336: | | | | | |
| Wilbur | --- | --- | High | Moderate | Low. |
| 3382: | | | | | |
| Belknap | --- | --- | High | High | High. |
| 3415: | | | | | |
| Orion | --- | --- | High | High | Low. |
| 3422: | | | | | |
| Cape | --- | --- | High | High | High. |

Table 21.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

| Soil name | Family or higher taxonomic class |
|---|---|
| Atlas | Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs |
| Ava | Fine-silty, mixed, mesic Oxyaquic Fragiudalfs |
| Belknap | Coarse-silty, mixed, acid, mesic Aeric Fluvaquents |
| Blair | Fine-silty, mixed, mesic Aquic Hapludalfs |
| Bluford | Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs |
| Bonnie | Fine-silty, mixed, acid, mesic Typic Fluvaquents |
| Cape | Fine, smectitic, acid, mesic Vertic Fluvaquents |
| Chauncey | Fine, smectitic, mesic Typic Argialbolls |
| Cisne | Fine, smectitic, mesic Vertic Albaqualfs |
| Colp | Fine, smectitic, mesic Aquertic Chromic Hapludalfs |
| Creal | Fine-silty, mixed, mesic Aeric Endoaqualfs |
| Frondorf | Fine-loamy, mixed, mesic Ultic Hapludalfs |
| Gosport | Fine, illitic, mesic Typic Dystrochrepts |
| Grantsburg | Fine-silty, mixed, mesic Oxyaquic Fragiudalfs |
| Hickory | Fine-loamy, mixed, mesic Typic Hapludalfs |
| Hoyleton | Fine, smectitic, mesic Aquertic Hapludalfs |
| Hurst | Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs |
| Jacob | Very fine, smectitic, acid, mesic Vertic Endoaquepts |
| Kell | Fine-loamy, mixed, mesic Ultic Hapludalfs |
| Lenzburg | Fine-loamy, mixed, calcareous, mesic Typic Udorthents |
| Okaw | Fine, smectitic, mesic Chromic Vertic Albaqualfs |
| *Orion | Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents |
| Orthents | Fine-loamy, mixed, mesic Typic Udorthents |
| *Parke | Fine-silty, mixed, mesic Ultic Hapludalfs |
| *Pike | Fine-silty, mixed, mesic Ultic Hapludalfs |
| Plumfield | Fine-silty, mixed, mesic Ochreptic Fragiudalfs |
| Racoon | Fine-silty, mixed, mesic Typic Endoaqualfs |
| Rend | Fine-silty, mixed, mesic Fragic Oxyaquic Hapludalfs |
| Richview | Fine-silty, mixed, mesic Oxyaquic Hapludalfs |
| Schuline | Fine-loamy, mixed, calcareous, mesic Typic Udorthents |
| Sharon | Coarse-silty, mixed, acid, mesic Oxyaquic Udifluvents |
| Wellston | Fine-silty, mixed, mesic Ultic Hapludalfs |
| Wilbur | Coarse-silty, mixed, mesic Fluvaquentic Eutrochrepts |
| Wirt | Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts |
| Wynoose | Fine, smectitic, mesic Chromic Vertic Albaqualfs |
| Zanesville | Fine-silty, mixed, mesic Oxyaquic Fragiudalfs |

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3/95

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

# CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

DESCRIPTION SYMBOL

## CULTURAL FEATURES

### BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation, (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access areas
- Field sheet matchline & neatline
- Previously published survey
- OTHER BOUNDARY (label)
- Airport, airfield (Davis airstrip)
- Cemetery (St Johns Cemetery)
- City / county Park (Central Park)
- STATE COORDINATE TICK
- LAND DIVISION CORNERS (section and land grants)
- GEOGRAPHIC COORDINATE TICK

### TRANSPORTATION

- Divided roads
- Other roads
- # Trails

### ROAD EMBLEMS & DESIGNATIONS

- Interstate (79, 79 345)
- Federal (410, 410 224)
- State (92, 92 347)
- County, farm, or ranch (376)
- RAILROAD
- POWER TRANSMISSION LINE (normally not shown)
- PIPELINE (normally not shown)
- FENCE (normally not shown)
- LEVEES
- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

### DAMS

- Medium or small (W)

### LANDFORM FEATURES

- Prominent Hill or Peak
- Soil Sample Site (S)

* Cultural features for use in Illinois

DESCRIPTION SYMBOL

## CULTURAL FEATURES (cont.)

### MISCELLANEOUS CULTURAL FEATURES

- Farmland, house (omit in urban areas)
- Church
- School
- Other Religion (label) (Mt Carmel)
- Located object (label) (Ranger Station)
- Tank (label) (Petroleum)
- Lookout Tower
- Oil and / or Natural Gas Wells
- Windmill
- Lighthouse

## HYDROGRAPHIC FEATURES

### STREAMS

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

### DRAINAGE AND IRRIGATION

- Double line canal (label) (CANAL)
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/or irrigation ditch

### SMALL LAKES, PONDS, AND RESERVOIRS

- Perennial water
- Miscellaneous water
- Flood pool line (FLOOD POOL LINE)

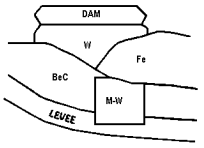
### MISCELLANEOUS WATER FEATURES

- Spring
- Well, artesian
- Well, irrigation

DESCRIPTION SYMBOL

## SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

### SOIL DELINEATIONS AND SYMBOLS




### LANDFORM FEATURES

- ESCARPMENTS
  - Bedrock
  - Other than bedrock
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION, closed
- SINKHOLE

### EXCAVATIONS

- PITS
  - Borrow pit
  - Gravel pit
  - Mine or quarry
- LANDFILL

### MISCELLANEOUS SURFACE FEATURES

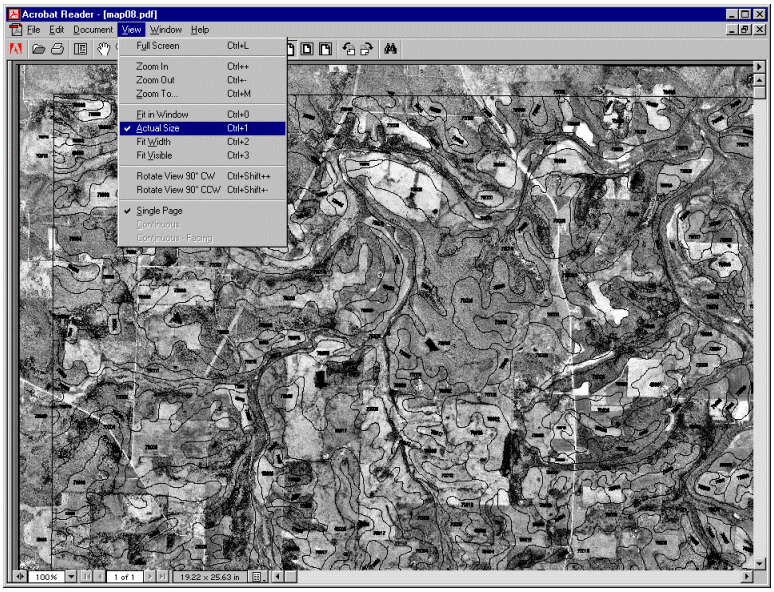
- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot

### RECOMMENDED AD HOC SOIL SYMBOLS

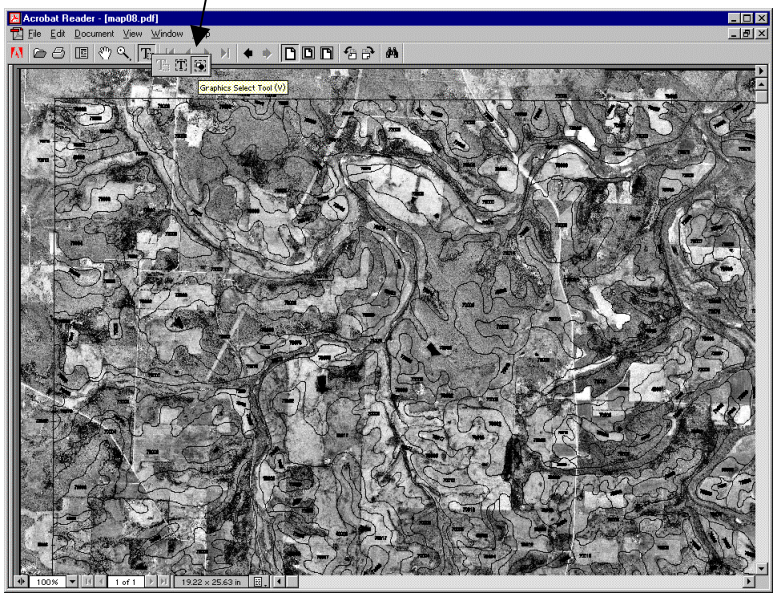
| | SYMBOL_ID | | SYMBOL_ID | |
|---|---|---|---|---|
| | 1 | | 23 | |
| | 2 | | 24 | |
| | 3 | | 25 | |
| | 4 | Gray spot | 26 GSP | |
| | 5 | | 27 | |
| | 6 | | 28 | |
| | 7 | Calcareous spot | 29 CSP | |
| | 8 | Muck spot | 30 MUC | |
| | 9 | | 31 | |
| | 10 | | 32 | |
| | 11 | | 33 | |
| Dumps | 12 DMP | | 34 | |
| | 13 | Mine subsided Area | 35 MSA | |
| | 14 | | 36 | |
| Oil brine spot | 15 OBS | | 37 | |
| | 16 | | 38 | |
| | 17 | | 39 | |
| | 18 | Glacial Till spot | 40 GLA | |
| | 19 | | 41 | |
| Disturbed soil spot | 20 DSS | | 42 | |
| | 21 | | 43 | |
| | 22 | | 44 | |

Printing Soil Survey Maps

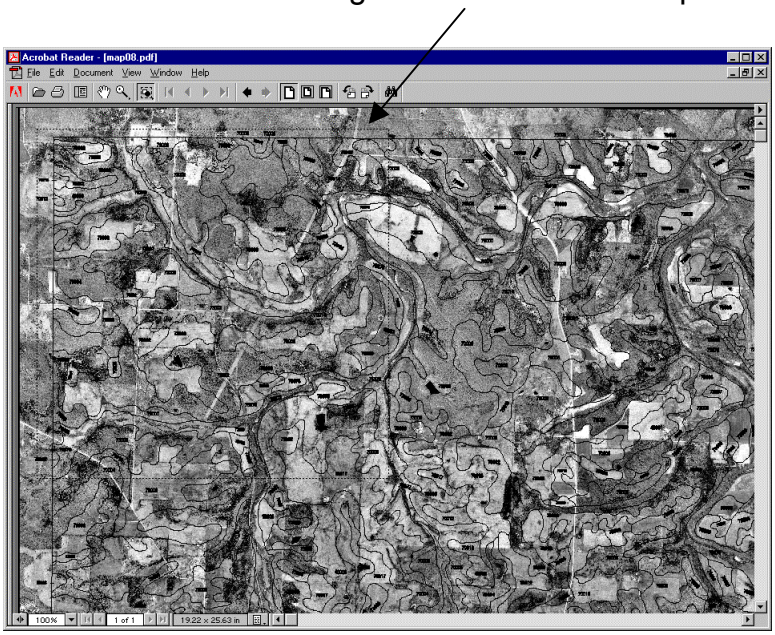
The soil survey maps were made at a scale of 1:12000 and were designed to be used at that scale. To print the maps at 1:12000 scale, set the view to Actual Size from the View pull down menu.



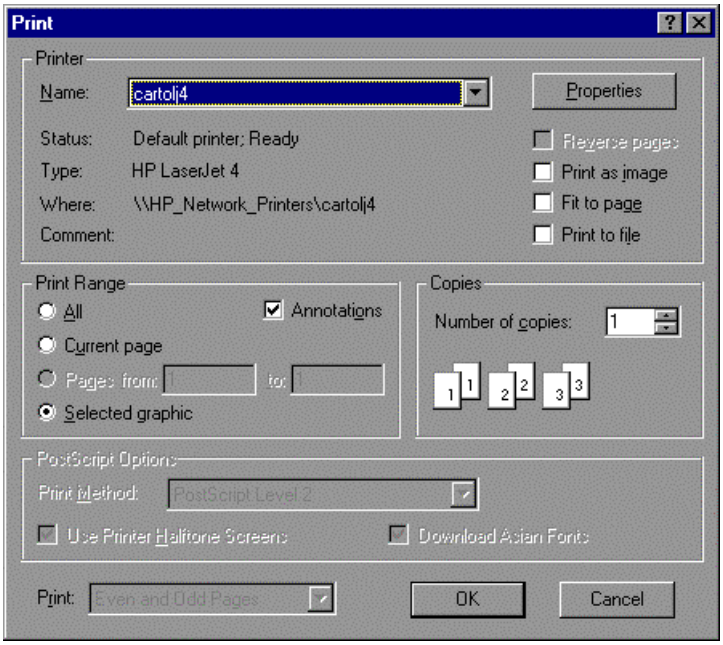

Using the pan tool, go to the area you would like to print. Select the Graphic Selection Tool by holding down the Text Selection Tool button and clicking on the Graphic Selection Tool button.



Then using the Graphic Selection Tool drag a box around the area you would like to print. Note dashed lines forming a box around area to print.

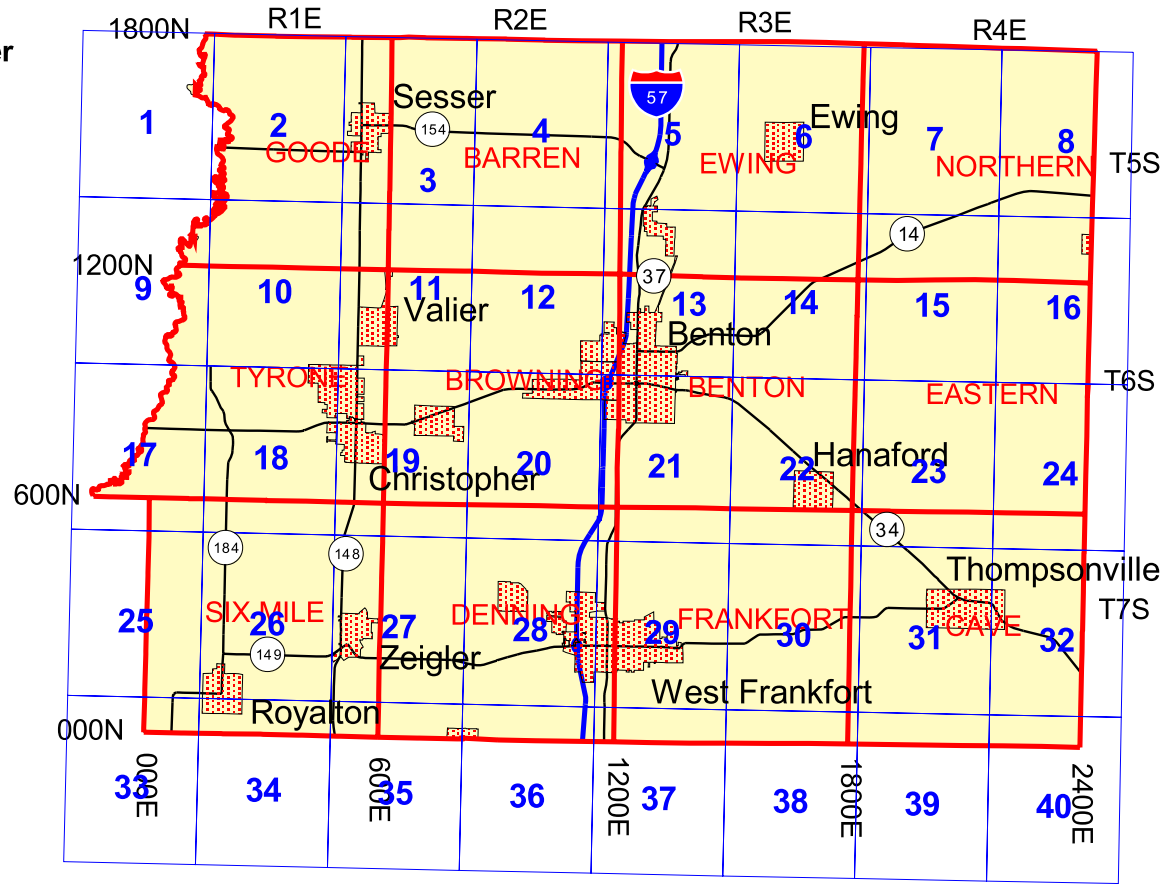



Select File Print. The Print Range will be set to Selected graphic. Click OK and the map will be sent to the printer.



**Franklin County, Illinois**
**Index to atlas sheets.**

**Click on a blue number to view soil map of area**



## Descriptions of Special Features

| Name | Description | Label |
|---|---|---|
| Blowout | A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. Typically 0.2 acre to 2.0 acres. | BLO |
| Borrow pit | An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically 0.2 acre to 2.0 acres. | BPI |
| Calcareous spot | An area in which the soil contains carbonates in the surface layer. The surface layer of the named soils in the surrounding map unit is noncalcareous. Typically 0.5 acre to 2.0 acres. | CSP |
| Clay spot | A spot where the surface layer is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser. Typically 0.2 acre to 2.0 acres. | CLA |
| Depression, closed | A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage. Typically 0.2 acre to 2.0 acres. | DEP |
| Disturbed soil spot | An area in which the soil has been removed and materials redeposited as a result of human activity. Typically 0.25 acre to 2.0 acres. | DSS |
| Dumps | Areas of nonsoil material that support little or no vegetation. Typically 0.5 acre to 2.0 acres. | DMP |
| Escarpment, bedrock | A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock. | ESB |
| Escarpment, nonbedrock | A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil. | ESO |
| Glacial till spot | An exposure of glacial till at the surface of the earth. Typically 0.25 acre to 2.0 acres. | GLA |
| Gravel pit | An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0.2 acre to 2.0 acres. | GPI |
| Gravelly spot | A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments. Typically 0.2 acre to 2.0 acres. | GRA |

| Name | Description | Label |
|---|---|---|
| Gray spot | A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres. | GSP |
| Gully | A small channel with steep sides cut by running water through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage. | GUL |
| Iron bog | An accumulation of iron in the form of nodules, concretions, or soft masses on the surface or near the surface of soils. Typically 0.2 acre to 2.0 acres. | BFE |
| Landfill | An area of accumulated waste products of human habitation, either above or below natural ground level. Typically 0.2 acre to 2.0 acres. | LDF |
| Levee | An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands. | LVS |
| Marsh or swamp | A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Typically 0.2 acre to 2.0 acres. | MAR |
| Mine or quarry | An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines. Typically 0.2 acre to 2.0 acres. | MPI |
| Mine subsided area | An area that is lower than the soils in the surrounding map unit because of subsurface coal mining. Typically 0.25 acre to 3.0 acres. | MSA |
| Miscellaneous water | A small, constructed body of water that is used for industrial, sanitary, or mining applications and that contains water most of the year. Typically 0.2 acre to 2.0 acres. | MIS |
| Muck spot | An area that occurs within an area of poorly drained or very poorly drained soil and that has a histic epipedon or an organic surface layer. The symbol is used only in map units consisting of mineral soil. Typically 0.2 acre to 2.0 acres. | MUC |
| Oil brine spot | An area of soil that has been severely damaged by the accumulation of oil brine, with or without liquid oily wastes. The area is typically barren but may have a vegetative cover of salt-tolerant plants. Typically 0.2 acre to 2.0 acres. | OBS |
| Perennial water | A small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0.2 acre to 2.0 acres. | WAT |

| Name | Description | Label |
|---|---|---|
| Rock outcrop | An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0.2 acre to 2.0 acres. | ROC |
| Saline spot | An area where the surface layer has an electrical conductivity of 8 mmhos/cm-l more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm-l or less. Typically 0.2 acre to 2.0 acres. | SAL |
| Sandy spot | A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer. Typically 0.2 acre to 2.0 acres. | SAN |
| Severely eroded spot | An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name. Typically 0.2 acre to 2.0 acres. | ERO |
| Short steep slope | A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit. | SLP |
| Sinkhole | A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Typically 0.2 acre to 2.0 acres. | SNK |
| Slide or slip | A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces. Typically 0.2 acre to 2.0 acres. | SLI |
| Sodic spot | An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less. Typically 0.2 acre to 2.0 acres. | SOD |
| Spoil area | A pile of earthy materials, either smoothed or uneven, resulting from human activity. Typically 0.2 acre to 2.0 acres. | SPO |
| Stony spot | A spot where 0.01 to 0.1 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically 0.2 acre to 2.0 acres. | STN |
| Unclassified water | A small, natural or manmade lake, pond, or pit that contains water, of an unspecified nature, most of the year. Typically 0.2 acre to 2.0 acres. | UWT |

| Name | Description | Label |
|---|---|---|
| Very stony spot | A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres. | STV |
| Wet depression | A shallow, concave area within an area of poorly drained or very poorly drained soils in which water is ponded for intermittent periods. The concave area is saturated for appreciably longer periods of time than the surrounding soil. Typically 0.2 acre to 2.0 acres. | WDP |
| Wet spot | A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0.2 acres to 2.0 acres. | WET |