United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Champaign County, Illinois

Part I

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How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area, descriptions of the detailed soil map units and soil series in the area, and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

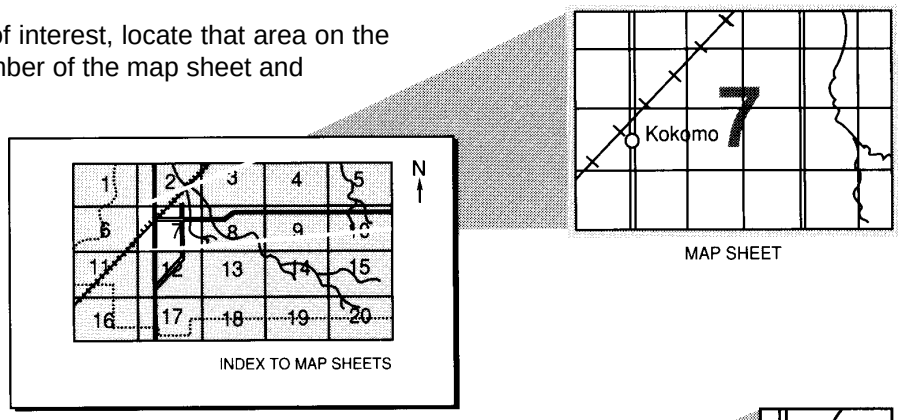
Detailed Soil Maps

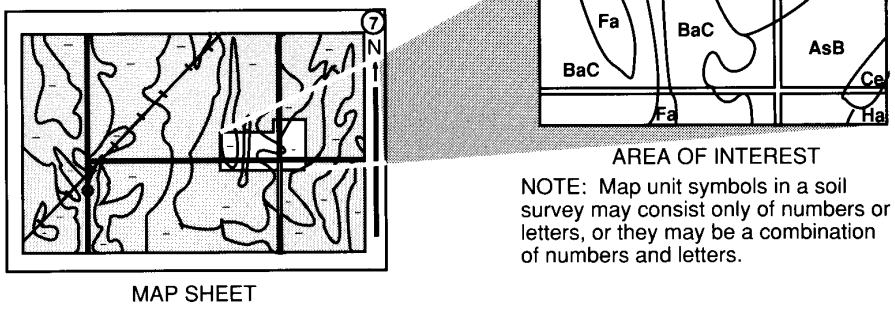
The detailed soil maps can be useful in planning the use and management of small areas.

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** in Part I, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** in Part II 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 1998. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. 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 Champaign County Soil and Water Conservation District. Funding was provided by the Champaign County Soil and Water Conservation District and the Illinois Department of Agriculture.

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

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Cover: The Morrow Plots in an area of Flanagan silt loam, 0 to 2 percent slopes, at the University of Illinois. These fields, which were established in 1876, are the oldest continuously used experiment fields in the United States.

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

Contents

Issued 2001

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

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

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

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

William J. Gradle
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Soil Survey of
Champaign County, Illinois

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Updated fieldwork by Tonie J. Endres and Sam E. Werner, soil scientists, Natural Resources Conservation Service

Map compilation by J.D. Ennis, geographer, and Tonie J. Endres and Sam E. Werner, soil scientists, Natural Resources Conservation Service; Earl E. Voss, Certified Professional Soil Classifier; and the Illinois State Geological Survey

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

Champaign County is in east-central Illinois (fig. 1). It is bounded by Ford County on the north, Vermilion County on the east, Douglas County on the south, and Piatt and McLean Counties on the west. Champaign County has an area of 638,860 acres, or about 998 square miles. In 1990, the population of the county was 175,179. Urbana, the county seat, had a population of 36,081, and Champaign, the largest city, had a population of 64,350 (U.S. Department of Commerce, 1994).

This soil survey updates previous surveys of Champaign County (Mount, 1982; Alexander and others, 1974; Hopkins and others, 1918). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides general information about Champaign County. It describes history and development; natural resources; physiography, relief, and drainage; and climate.

History and Development

The area now known as Champaign County was formerly occupied by the Kickapoo Indians. On July 30, 1819, a treaty was entered into between the United States and the Kickapoo Indians (Cunningham, 1984). Champaign County was established on February 20, 1833, and Urbana was named as the county seat.

Originally, the survey area had much wet, marshy land. Settlement of Champaign County was curtailed by the extent of land needing drainage. Raising cattle was the primary early industry. Extensive work on drainage began in 1878. This drainage system allowed the cultivation of the wet, marshy areas. As a result, the major land use changed from cattle raising to grain farming.

In 1867, a land grant college, later to become the University of Illinois, was established in the Champaign-Urbana area. The university has been a major influence in the economic and cultural development of the county. About 1,900 acres of

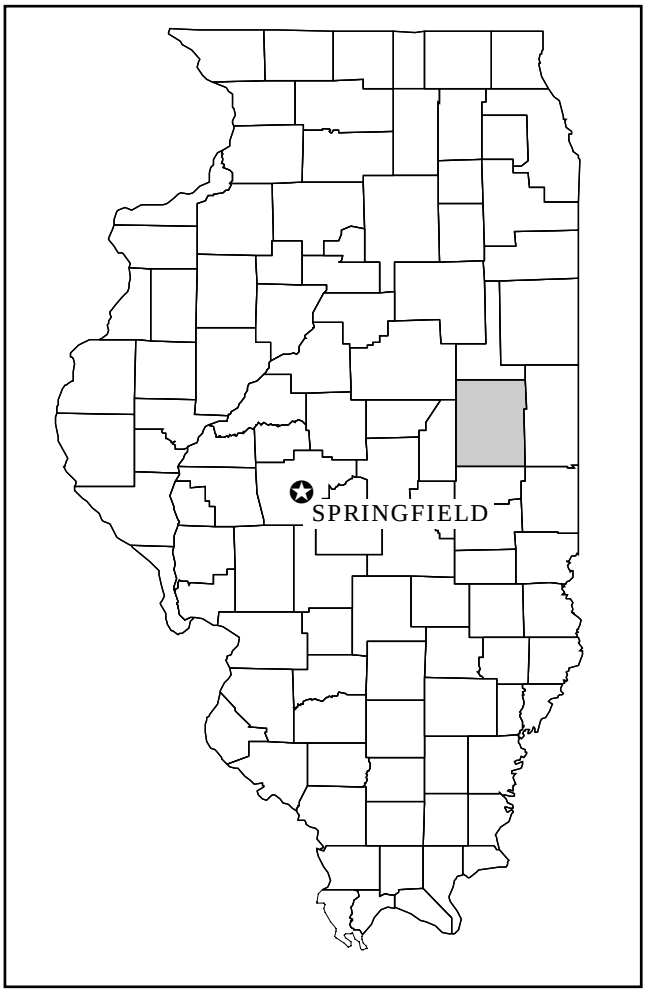

Figure 1.—Location of Champaign County in Illinois.

agricultural experiment fields, including the Morrow Plots, the oldest continuously used experimental plots in the United States, is adjacent to the campus. Parkland Junior College is also located in Champaign County.

Although urban development is likely to continue in the future, agriculture and agribusiness will remain important parts of the local economy. About 86 percent of the acreage in the county is used for cultivated crops, primarily corn and soybeans (USDA, 1997).

Natural Resources

Soil is a major and valuable resource in Champaign County. It provides a base for agriculture, the mainstay of the economy in the county. In 1997, there were 1,371 farms in the county on 567,697 acres. The average farm size was about 414 acres (USDA, 1997). The major crops are corn and soybeans. Secondary farm products include wheat, oats, hay, cattle, hogs, and dairy products. The county has some of the most productive farmland in the state. Most of the soils are nearly level or gently sloping and formed in medium textured soil material under tall prairie grasses. Combined with a favorable climate, these factors result in highly productive farmland.

About 5,330 acres in the county is forestland (USDA, 1997). Much of this acreage is unimproved land along the major streams. Wildlife generally is scarce because much of the suitable habitat has been destroyed. There are no natural lakes in the county. The many manmade ponds and the streams provide opportunities for fishing. Homer Lake and Lake of the Woods are the largest artificial water impoundments in the county. Sunfish, bass, crappie, catfish, and northern pike are the major game fish.

Subsurface natural resources include water, sand and gravel, and coal. Most of the water supply is pumped from an aquifer system in the Teays-Mahomet Valley, a major bedrock valley in the northwestern part of the county. Sand and gravel resources in the county are of glacial origin, deposited by meltwater from receding glaciers (Anderson, 1960). Outwash plains near the Cerro Gordo and Bloomington moraines are a major source of commercial sand and gravel in the county. There are about 305 million tons of coal, consisting of the Danville (No. 7) and Herrin (No. 6) seams, below the surface of the county (Treworgy and Bargh, 1982).

The transportation facilities in Champaign County include Federal and State highways, county and township roads, railroads, and small airports. Interstate Highways 57, 72, and 74 and Federal Highways 45, 136, and 150 cross the county. Several State and county roads also provide important transportation links. Most of the secondary township and county roads are blacktop. Railroads provide both passenger and freight service. Several rail lines pass through the Champaign-Urbana area. A major airport south of Savoy provides commercial air service, and several smaller airports are throughout the county.

Physiography, Relief, and Drainage

Champaign County is entirely within the Bloomington Ridged Plain of the Central Lowland physiographic province (Leighton and others, 1948). The Bloomington Ridged Plain is part of the Wisconsinan till plain that is characterized by a series of end moraines and ground moraines.

Champaign County also lies within two major land resource areas (MLRA's). MLRA's are geographic areas that are characterized by a particular pattern of soils, climate, water resources, and land uses (USDA,

1981). Each MLRA is designated by an Arabic number and identified by a descriptive geographic name. MLRA 108 (Illinois and Iowa Deep Loess and Drift) is the most extensive MLRA in Champaign County. Brenton, Catlin, Dana, Drummer, Elburn, Flanagan, Pella, and Raub soils are common in MLRA 108 (fig. 2). MLRA 110 (Northern Illinois and Indiana Heavy Till Plain) is in the northern part of Champaign County. Ashkum, Elliott, Ozaukee, Swygert, and Varna soils are common in MLRA 110 (fig. 3).

The Wisconsinan glacier was the most recent stage of glaciation in the county (Willman and others, 1975). This glacier deposited an average of 200 to 300 feet of glacial drift, forming the present relief in the county (Piskin and Bergstrom, 1967). In most areas, this drift was covered by as much as 5 feet of windblown silt, or loess.

The county is dissected by several end moraines separated by wide, nearly level ground moraines and outwash plains. The highest feature in the county is the Champaign Moraine, which reaches an elevation of 860 feet above sea level, north of Rising. The lowest elevation, in the area where the Salt Fork leaves the county, is about 630 feet above sea level.

Most areas are sufficiently drained for the crops commonly grown in the county. Subsurface drainage systems have been installed in fields across the county, and an extensive system of drainage ditches helps to supplement the natural drainage.

The county is divided by five major river basins: the Embarras River, the Little Vermilion River, the Vermilion River, the Upper Kaskaskia River, and the Upper Sangamon River. The Upper Kaskaskia River basin and the Upper Sangamon River basin are in the western part of the county, and watersheds drain in a southwesterly direction. Watersheds within the Embarras River, the Little Vermilion River, and the Vermilion River basins drain in a southeasterly direction.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Urbana in the

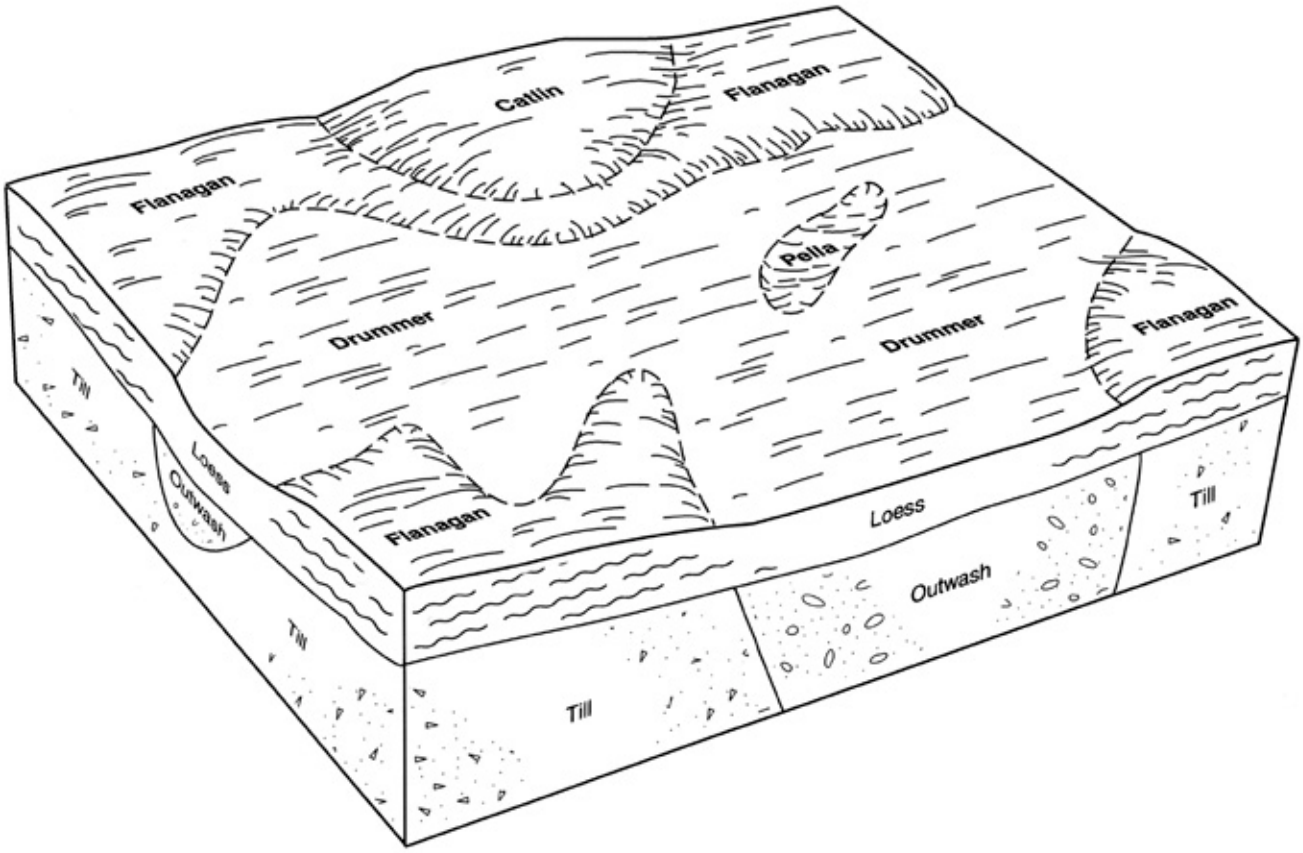

Figure 2.—Typical pattern of soils and parent material in MLRA 108 (Illinois and Iowa Deep Loess and Drift).

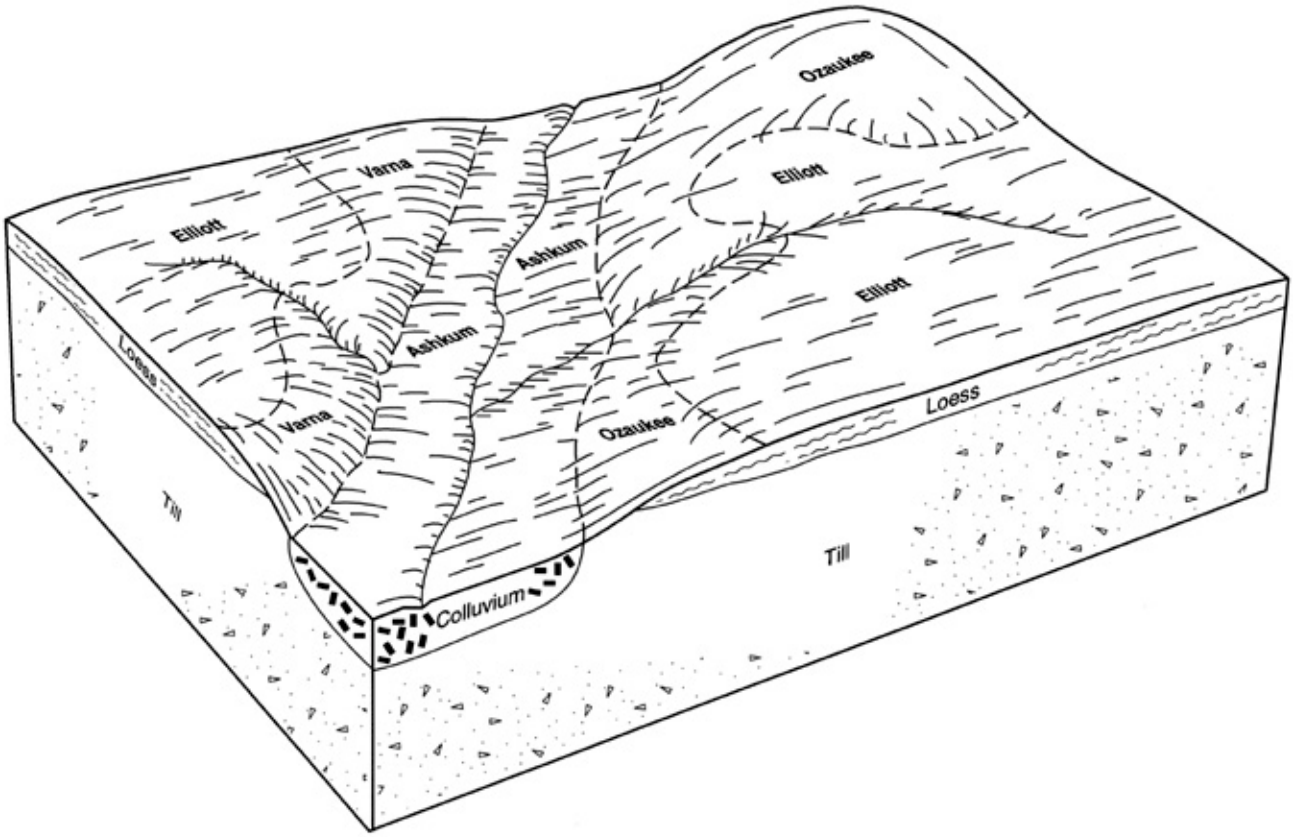

Figure 3.—Typical pattern of soils and parent material in MLRA 110 (Northern Illinois and Indiana Heavy Till Plain).

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 27.1 degrees F and the average daily minimum temperature is 19.4 degrees. The lowest temperature on record, which occurred on January 19, 1994, is -25 degrees. In summer, the average temperature is 73.2 degrees and the average daily maximum temperature is 83.7 degrees. The highest recorded temperature, which occurred on July 14, 1954, is 109 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 39.71 inches. Of this, 23.83 inches, or 60 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 11.95 inches. The heaviest 1-day rainfall on record was 5.32 inches on August 12, 1993. Thunderstorms occur on about 48 days each year, and most occur between May and August.

The average seasonal snowfall is about 28.1 inches. The greatest snow depth at any one time during the period of record was 19 inches. On the average, 33 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 67 percent of the time possible in summer and 46

percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 to 12 miles per hour, from November to April.

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; and the kinds of crops and native plants. To study the soil profile, which is the sequence of natural layers, or horizons, in a soil, soil scientists examine the soil with the aid of a soil probe or spade. 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.

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.

The original fieldwork in Champaign County (Mount, 1982) was updated primarily by use of soil transects conducted by soil scientists. Soil transects are a systematic way of sampling a specific soil type. Soil borings are taken at regular intervals. In addition, field notes, laboratory data, and other data collected during the previous soil survey of Champaign County and data from other soil surveys within MLRA's 108 and 110 were reviewed. Reviewing data on a regional

basis allows improved consistency in the identification, classification, and interpretations of soils on similar landscapes.

Aerial photographs used in this survey were taken in 1993. Soil scientists also studied U.S. Geological Survey topographic maps enlarged to a scale of 1:12,000 and ortho-photographs to relate land and image features. Specific soil boundaries were drawn on the ortho-photographs. Adjustments of soil boundary lines were made to coincide with the U.S. Geological Survey topographic map contour lines and tonal patterns on aerial photographs.

Formation and Classification of the Soils

Formation of the Soils

Soils are natural bodies that have formed on the earth's surface. They contain living matter and are capable of supporting and providing nutrients to plants. Soils form through processes that act on deposited or accumulated geologic material. The characteristics of a soil are determined by the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the relief, or lay of the land; the plant and animal life on and in the soil; and the length of time that the processes of soil formation have acted on the parent material (Jenny, 1941).

The factors of soil formation are so closely related in their effects on the soil that few generalizations can be made regarding the effects of any one factor unless conditions are specified for the other four. In Champaign County, differences in soil properties between adjacent soils are mainly a result of differences in relief. Changes in parent material and vegetation have also had significant influence on the properties of the soils in the county.

Parent Material

Parent material is the unconsolidated geologic material in which a soil forms. The physical and mineralogical composition of the soils affects the kind of soil profile that forms. The soils in Champaign County formed in a variety of parent materials, including till, loess, outwash, lacustrine deposits, organic material, and alluvium.

Till is material laid down directly by glaciers with a minimum of water action. It typically has particles that vary in size, including sand, silt, clay, gravel, cobbles, and larger rock fragments. The smaller rock fragments in till generally have distinct edges and corners, indicating that they have not been subjected to intense washing by water. Unweathered till is generally calcareous and very dense.

Through the processes of soil formation, calcium carbonates are leached from the till and the material becomes more acidic and less dense.

The till in which some of the soils in Champaign County formed was deposited during the Woodfordian Substage of the Wisconsinan glaciation (Willman and others, 1975). This substage occurred between 22,000 and 12,500 years ago. Most of the surficial till deposits consist of two till members of the Wedron Formation, although others are present in the county. The oldest of these till members is the Batestown Member. It occurs throughout the county but is overlain by other till members in some areas. Senachwine and Wyanet soils formed in this material. The youngest till member is the Snider Member, which overlies the Batestown Member in the northeast corner of the county. The Snider Member generally contains more clay than the Batestown Member. The clay mineralogy is dominantly illitic. Elliott and Ozaukee soils formed in the Snider Member.

Loess is silty material that was deposited by the wind. The meltwaters from the glaciers, carrying vast quantities of silt, deposited these sediments in the major river valleys. As these sediments were exposed when the meltwaters subsided, the winds carried these silts and deposited them over much of the countryside. Loess is the most extensive parent material in Champaign County. Most of the soils in the county formed either entirely in loess or in loess and the underlying parent material. Peoria Loess and Richland Loess overlie till, outwash, and lacustrine deposits in the county (Willman and others, 1975). The Richland Loess is of variable thickness and is continuous with the overlying Peoria Loess. On ground moraines of Wisconsinan age, the thickness of the loess commonly ranges from 40 to 60 inches. Flanagan soils are in these areas. These soils formed in 40 to 60 inches of loess and in the underlying till. On end moraines of Wisconsinan age, the loess is generally less than 40 inches thick. Raub soils are commonly in these areas. These soils formed in 22 to 40 inches of loess and the underlying till.

Outwash is material deposited by glacial meltwater from the Wisconsinan glacier. As the glacier melted, the ice produced great quantities of water. The meltwaters washed out material that had been held in the ice. The flowing water sorted the outwash material and deposited the sediments in layers, or strata, of

different textures. The size of the particles that make up the outwash material varies, depending upon the velocity of the meltwater that carried the material. As the velocity of the meltwater slowed, the coarser textured material was deposited first. The depositing of particles of different sizes caused the layering, or stratification, in the outwash deposits. The outwash in Champaign County ranges from loamy sediments to sand and gravel. Blackberry, Drummer, and Elburn soils are common on outwash plains. These soils formed in loess and in the underlying outwash. Kishwaukee soils formed mostly in outwash that overlies sand and gravel deposits. In some places on Wisconsinan ground moraines, a thin layer of outwash occurs between the loess and the underlying till. Other areas of outwash occur on stream terraces. Campton, Drummer, Kendall, and Martinsville soils are common on stream terraces. In some areas of the county, the outwash has been a commercial source of sand and gravel.

Lacustrine deposits consist of glacial material that was deposited in glacial lakes, mainly by meltwaters. These deposits typically have a high content of clay. The clay mineralogy is dominantly illitic. Areas of lacustrine deposits are mostly in the northern and northeastern parts of Champaign County. Swygert soils formed in a thin mantle of loess or other silty material and in the underlying lacustrine deposits and till.

Organic material consists of plant remains. After the glacier retreated, water was left standing in low-lying areas. These areas were very wet during the time of soil formation. As a result, the decaying grasses and sedges accumulated more rapidly than the rate of decomposition. Most of the plant material has decomposed to a point were the original type of plant is not identifiable. Muskego soils formed in this organic material.

Alluvium is material recently deposited by floodwater from streams. Rains and water flowing over the land have eroded and removed some of the soil material from upland landforms. These sediments are carried in the runoff and enter streams and rivers. When the streams rise higher than the stream channel, the water spreads out over the flood plain, reducing the velocity of the floodwaters. The sediments are deposited as the water slows. Soils that formed in alluvium are generally stratified in color and texture. Stratification is caused by additions of material during separate flooding events. Variations in soil texture indicate differences in the speed of the floodwaters. Coarse particles of sand can settle out in rapidly moving water, but fine particles can settle out only in very slowly moving or stagnant water. The alluvial soils in Champaign County consist mostly of moderately fine textured or medium textured sediments with strata of coarse textured sediments. Ambraw and Sawmill soils are examples of soils that formed in alluvium.

Climate

Climate influences soil formation through its effect on weathering, plant and animal life, and erosion. Rainfall and temperature are especially important. As water from rains and melting snow seeps downward through the soils, it causes physical and chemical changes. Clay is moved down from the surface layer to the subsoil, where it accumulates. The water also dissolves minerals, which are then moved downward through the profile. This leaching has removed calcium carbonates from the upper layers in most of the soils in Champaign County. As a result, these layers are now more acidic.

Climate also influences the kind and extent of plant and animal life. The climate in Champaign County has favored tall prairie grasses and deciduous hardwood forests. It has also favored the decomposition of plants and animals, which provides humus to the soil.

Heavy rains can be harmful if they fall on soils that are bare of vegetation. The raindrops disperse the soil particles, thereby contributing to erosion and the formation of crusts. Early spring rains can also cause extensive erosion when the soil is partially frozen. The freezing restricts the rate of water infiltration and thus increases the amount of runoff and erosion.

Champaign County has a temperate, humid, continental climate. The climate has been essentially uniform throughout the county and has not caused any obvious differences among the soils. The influence of climate becomes more obvious, however, when comparisons are made on a broad regional basis.

Relief

Relief includes such landform characteristics as position on the landform, slope gradient, slope shape, and slope aspect. Relief has strongly affected the soils in Champaign County through its influence on natural soil drainage, surface runoff, erosion, and deposition.

Variations in relief in the county reflect the variety of glacial landforms. The most extensive glacial landforms in the county are end moraines, ground moraines, and outwash plains.

The presence of a series of end moraines in Champaign County represents successive advances and retreats of the ice front. The end moraines have slopes that are quite variable, commonly ranging from

gently sloping to very steep. The Newton Moraine and Gifford Moraine in the northeastern part of the county mark the farthest advance of the Snider Till in the county. Elliott, Ozaukee, and Varna soils occur in this area. Other moraines in the county include the Arcola, Cerro Gordo, Champaign, Pesotum, Rantoul, Ridge Farm, Urbana, and West Ridge moraines. Dana, Senachwine, and Wyanet soils are examples of soils on end moraines in the county.

Ground moraines of Wisconsinan age, which occur between the end moraines, generally consist of broad, nearly level or gently sloping interfluves. The relief on ground moraines is less variable than the relief on end moraines, and the loess deposits are thicker. Drummer and Flanagan soils are examples of soils on Wisconsinan ground moraines.

Outwash plains of Wisconsinan age occur along the outer margins of most of the end moraines in the county (Anderson, 1960). They generally consist of broad, nearly level or gently sloping interfluves. In some areas of the county, this outwash has been a commercial source of sand and gravel.

Where the parent material is relatively uniform, differences in natural drainage are closely related to landform position, such as summit and backslope, and to slope gradient and shape. Drummer and Blackberry soils, for example, both formed in loess and in the underlying outwash. Drummer soils are on toeslopes. The slopes are nearly level and are commonly concave. Precipitation and runoff from the higher adjacent soils contribute to the ponding of surface water on the poorly drained Drummer soils. The water in the saturated soil pores restricts the circulation of air in the soils. Under these conditions, naturally occurring iron and manganese compounds are chemically reduced. The reduced form of iron and manganese is more soluble than the oxidized form and can be leached readily from the soil, leaving the subsoil with a grayish color. Blackberry soils are moderately well drained and are on gently sloping summits and backslopes that are convex. They are in higher landform positions than those of the Drummer soils. The water table is lower in the Blackberry soils, and some of the rainfall runs off the more sloping surface. The soil pores in the Blackberry soils contain less water and more air. The iron and manganese compounds are well oxidized, resulting in a brownish subsoil.

Erosion and deposition are both processes related to relief. As slope gradient and slope length increase, the rate of surface runoff and the hazard of erosion also increase. The loss of surface soil material in one place results in deposition and accumulation in another place and thus affects the rate of soil formation and the development and thickness of soil horizons.

Plant and Animal Life

Soils are greatly affected by the type of vegetation under which they formed. Vegetation influences certain soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Humus is very important in the development of soil structure and good tilth. Roots of plants not only contribute organic matter to the soil as they decay, but they also provide channels for the downward movement of water through the soil. The kind of organic matter in the soil depends primarily on the kind of native plants that grew on the soil during its formation.

At the time of early settlement, about 94 percent of the county supported prairie grasses and forbs (Iverson and others, 1989). These prairie grasses had many fine, fibrous roots concentrated near the surface that added large amounts of organic material to the soil as they died and decayed. Soils that formed under prairie vegetation have a thick surface layer that is commonly black or very dark grayish brown. Dana, Drummer, and Flanagan soils formed under prairie vegetation.

About 6 percent of the county supported hardwood forests at the time of early settlement (Iverson and others, 1989). The trees contributed organic material to the soil mainly as leaf litter. The root systems of the trees were less fibrous than those of the prairie grasses and were generally not as densely concentrated near the surface. Consequently, the trees did not contribute as much organic material to the surface layer as the prairie grasses. Soils that formed under trees have a thinner, lighter colored surface layer than the soils that formed under prairie grasses. Most of the forests were in areas near the major streams in the county. Birkbeck, Senachwine, and Xenia soils formed under woodland vegetation.

The native vegetation in the rest of the county was mixed prairie grasses and hardwood forests. Millbrook and Sunbury soils formed under mixed vegetation. These soils have a surface layer that is similar to but darker than that of the soils that formed under predominantly wooded vegetation.

Bacteria, fungi, and other micro-organisms and earthworms, insects, and burrowing animals that live in or on the soil have also affected soil formation. The bacteria, fungi, and other micro-organisms help to

break down and decompose dead plants and animals and turn them into humus. Earthworms, insects, and burrowing animals incorporate the humus into the soil and create small channels that influence soil aeration and the percolation of water.

Human activities, such as cultivation, construction, artificial drainage, the clearing of native forests, and surface mining, have significantly altered the nature of the existing plant and animal communities. These activities have also contributed to the loss of soil material and organic matter through accelerated erosion.

Time

Time is needed for the transformation of parent material into a soil that has differentiated horizons. In general, soil profiles become more strongly expressed over time. The effects of the other soil-forming factors, however, can modify the influence of time on soil formation.

Ambraw soils, for example, formed in recent alluvium. These soils have only weakly expressed horizons because the soil-forming processes are interrupted with each new deposition. Chatsworth soils formed in calcareous silty clay and clay till or lacustrine deposits. Like the Ambraw soils, they have weakly expressed horizons. The consolidated nature of the clayey till or lacustrine deposits has slowed the processes of soil formation, even though the parent material has been subjected to weathering for thousands of years.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1998 and 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 4 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; 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 is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic 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, mineral content, temperature regime, thickness of the root zone, cation-exchange activity, rupture resistance, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

In some instances, the typical pedon for the series is located outside of Champaign County. The selection of the typical pedons is based on the range of characteristics of the series as it occurs throughout a particular Major Land Resource Area (MLRA). The Bryce series, for example, is a common soil series in MLRA 110 (Northern Illinois and Indiana Heavy Till Plain), which covers most of northeastern Illinois. The typical pedon of the Bryce series is located in Iroquois County, Illinois. The soil properties of this pedon are representative of the Bryce soils that occur not only in Champaign County but in other counties that are within MLRA 110.

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

A map unit delineation on the detailed soil maps represents an area on the landscape and consists of one or more soils 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 and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, soils. 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, soils. 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 segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit. The principal hazards and

limitations to be considered in planning for specific uses are described in Part II of this survey.

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

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

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents in Part II of this survey) 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.

Alvin Series

Drainage class: Well drained
Permeability: Moderate and moderately rapid
Landform: Outwash plains and stream terraces
Parent material: Eolian deposits
Slope range: 2 to 5 percent

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Alvin fine sandy loam, 2 to 5 percent slopes, at an elevation of about 660 feet; Vermilion County, Illinois; about 2,320 feet south and 1,760 feet east of the northwest corner of sec. 32, T. 21 N., R. 11 W.; USGS Danville NE topographic quadrangle; lat. 40 degrees 14 minutes 8 seconds N. and long. 87 degrees 36 minutes 58 seconds W., NAD 27; UTM zone 16, 447588E and 4454088N, NAD 83:

Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; moderately acid; abrupt smooth boundary.

BE—8 to 11 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine subangular blocky structure; very friable; few distinct grayish brown (10YR 5/2) silt coatings on faces of peds; moderately acid; clear smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate fine subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—15 to 25 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

E and Bt—25 to 74 inches; yellowish brown (10YR 5/4) loamy fine sand (E); weak medium subangular blocky structure; very friable; dark yellowish brown (10YR 4/6) fine sandy loam (Bt); 3 to 10 percent of volume; occurs as common or many thin lamellae; moderate medium subangular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

C—74 to 80 inches; 80 percent brown (10YR 4/3) and 20 percent yellowish brown (10YR 5/6), stratified fine sandy loam; massive; friable; moderately acid.

Range in Characteristics

Depth to the base of the argillic horizon: 40 to more than 80 inches

Particle-size control section: Averages 15 to 18 percent clay and 45 to 70 percent sand

Ap or A horizon:
- Hue—10YR
- Value—3 or 4; 3 in A horizons that are less than 6 inches thick
- Chroma—1 to 4
- Texture—fine sandy loam

E, EB, or BE horizon (if it occurs):
- Hue—10YR or 7.5YR
- Value—4 to 6
- Chroma—2 to 4
- Texture—very fine sandy loam, fine sandy loam, sandy loam, or loamy fine sand

Bt horizon:
- Hue—10YR or 7.5YR
- Value—4 to 6
- Chroma—3 to 6
- Texture—very fine sandy loam, loam, fine sandy loam, or sandy loam; thin layers of sandy clay loam are included

E and Bt or Bt and E horizon (E part):
- Hue—10YR or 7.5YR

Value—4 to 6
Chroma—2 to 6
Texture—sandy loam, loamy sand, sand, or the fine or very fine analogs of these textures

E and Bt or Bt and E horizon (Bt part):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam, loamy sand, the fine or very fine analogs of these textures, or loam

BC or C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam, loamy sand, sand, or the fine or very fine analogs of these textures

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Alvin and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have a surface layer of sandy loam
- Soils that have more clay and less sand in the subsoil
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The somewhat poorly drained La Hogue and similar soils; on summits and footslopes in positions below those of the Alvin soil
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Alvin soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Ambraw Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Typical pedon of Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded, at an elevation of about 587 feet; Whiteside County, Illinois; about 2,080 feet north and 1,120 feet east of the southwest corner of sec. 34, T. 20 N., R. 4 E.; USGS Erie topographic quadrangle; lat. 40 degrees 18 minutes 0 seconds N. and long. 90 degrees 2 minutes 27 seconds W., NAD 27; UTM zone 15, 751493E and 4465262N, NAD 83:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; neutral; abrupt smooth boundary.
A1—8 to 14 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; moderate medium and fine subangular blocky structure; friable; neutral; clear smooth boundary.
A2—14 to 23 inches; very dark gray (10YR 3/1) clay loam, dark gray (10YR 4/1) dry; moderate medium and fine subangular blocky structure; friable; few fine iron and manganese oxides; neutral; clear smooth boundary.
Bg1—23 to 29 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; friable; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; few fine iron and manganese oxides; neutral; clear smooth boundary.
Bg2—29 to 39 inches; dark gray (10YR 4/1) clay loam; moderate medium prismatic structure; friable; few fine distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few fine iron and manganese oxide concretions; krotovinas at a depth of 31 to 35 inches; neutral; clear smooth boundary.

BCg—39 to 50 inches; dark gray (10YR 4/1) and gray (10YR 5/1) clay loam; weak medium and coarse prismatic structure; friable; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; few fine iron and manganese oxide concretions; neutral; gradual smooth boundary.
Cg—50 to 60 inches; gray (5Y 5/1), stratified clay loam and sandy clay loam; massive; friable; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; few fine iron and manganese oxide concretions; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 50 to more than 60 inches
Depth to the base of the cambic horizon: 40 to more than 60 inches
Particle-size control section: Averages 24 to 35 percent clay and 15 to 50 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam

Bg horizon (upper part):
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—1 or 2
Texture—clay loam or loam

Bg horizon (lower part):
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—clay loam, loam, or sandy clay loam

BCg or Cg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 or 5
Chroma—0 to 2
Texture—clay loam or sandy clay loam, less commonly sandy loam or loam; may be stratified with loam, sandy loam, silt loam, loamy sand, or sand

3302A—Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Flood plains

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ambraw and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a mollic epipedon more than 24 inches thick
- Soils that have more clay in the subsoil
- Soils that have less sand in the subsoil
- Soils that are occasionally flooded

Dissimilar soils:
- The well drained Rossburg and similar soils in the higher positions on flood plains

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Ashkum Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Colluvium and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Typical pedon of Ashkum silty clay loam, 0 to 2 percent slopes, at an elevation of about 705 feet; Will County, Illinois; about 96 feet south and 2,030 feet east of the northwest corner of sec. 22, T. 34 N., R. 11 E.; USGS Prairie Center topographic quadrangle; lat. 41 degrees 25 minutes 28 seconds N. and long. 87 degrees 57 minutes 24 seconds W., NAD 27; UTM zone 16, 420056E and 4586321N, NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular

structure; friable; many very fine roots; neutral; clear smooth boundary.

A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.

BAg—12 to 18 inches; dark gray (2.5Y 4/1) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine roots; many distinct continuous black (10YR 2/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; neutral; clear smooth boundary.

Bg1—18 to 29 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; neutral; clear wavy boundary.

2Bg2—29 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/8) and common fine and medium distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium distinct gray (5Y 5/1) iron depletions in the matrix; 8 percent gravel; neutral; gradual wavy boundary.

2BCg—49 to 54 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to weak coarse angular blocky; firm; few very fine roots; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/6) and faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cg—54 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; common fine prominent yellowish brown (10YR 5/6) and common fine and medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the colluvium: 15 to 40 inches
Depth to carbonates: 24 to 60 inches
Depth to the base of the cambic horizon: 30 to 60 inches
Particle-size control section: Averages 35 to 42 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR, 2.5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam

BAg, Bg, 2Bg, or 2BCg horizon:
Hue—10YR, 2.5Y, 5Y, 5GY, or neutral
Value—3 to 6
Chroma—0 to 2; 3 in pedons that have hue of 5Y
Texture—silty clay loam or silty clay

2Cg horizon:
Hue—10YR, 2.5Y, 5Y, 5GY, or neutral
Value—4 to 6
Chroma—1 to 8
Texture—silty clay loam

232A—Ashkum silty clay loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ashkum and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a mollic epipedon more than 24 inches thick

- Soils that have carbonates within a depth of 24 inches
- Soils that have stratified loamy outwash in the underlying material

Dissimilar soils:
- The somewhat poorly drained Elliott and similar soils that are not subject to ponding; on footslopes and backslopes in positions above those of the Ashkum soil
- The moderately well drained Varna and similar soils; on backslopes in positions above those of the Ashkum soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Birkbeck Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon

Typical pedon of Birkbeck silt loam, 2 to 5 percent slopes, at an elevation of about 680 feet; Macon County, Illinois; about 750 feet south and 160 feet east of the northwest corner of sec. 25, T. 17 N., R. 3 E.; USGS Argenta topographic quadrangle; lat. 39 degrees 54 minutes 24 seconds N. and long. 88 degrees 48 minutes 59 seconds W., NAD 27; UTM zone 16, 344732E and 4418982N, NAD 83:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak thin platy structure parting to moderate very fine granular; friable; slightly acid; abrupt smooth boundary.

E—4 to 9 inches; brown (10YR 4/3) silt loam; moderate very thin platy structure; friable; few distinct dark brown (10YR 3/3) organic coatings on faces of peds; few distinct light gray (10YR 6/1 dry) clay depletions on faces of peds; moderately acid; clear smooth boundary.

Bt1—9 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine subangular blocky structure parting to moderate very fine granular; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common distinct light gray (10YR 7/1 dry) clay depletions on faces of peds; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt2—13 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and very fine subangular blocky structure; friable; many distinct brown (7.5YR 4/4) clay films on faces of peds; common fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt3—24 to 29 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; many distinct brown (7.5YR 4/4) clay films on faces of peds; common fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt4—29 to 42 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; many distinct brown (7.5YR 4/4) clay films on faces of peds; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine distinct light yellowish brown (2.5Y 6/4) masses of iron accumulation in the matrix; slightly acid; gradual smooth boundary.

Bt5—42 to 54 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; friable; many distinct brown (7.5YR 4/4) clay films on faces of peds; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine distinct light yellowish brown (2.5Y 6/4) and few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

2Bt6—54 to 60 inches; dark yellowish brown (10YR 4/4) loam; weak coarse subangular blocky structure; friable; few distinct brown (7.5YR 4/4) clay films on faces of peds; few distinct very dark

grayish brown (10YR 3/2) organo-clay films in pores; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; common medium distinct light yellowish brown (2.5Y 6/4) and common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.

2C—60 to 68 inches; light olive brown (2.5Y 5/4) loam; massive; firm; few distinct very dark grayish brown (10YR 3/2) organo-clay films in pores; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine faint light yellowish brown (2.5Y 6/4) and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to 70 inches
Depth to the base of the argillic horizon: 40 to 70 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

A horizon:
Hue—10YR
Value—3 or 4; 3 in A horizons that are less than 6 inches thick
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam or silty clay loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—loam, clay loam, silty clay loam, or silt loam

2C horizon:
Hue—10YR or 2.5Y; less commonly 7.5YR
Value—4 to 6
Chroma—2 to 4
Texture—loam, clay loam, silty clay loam, or silt loam

233B—Birkbeck silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Birkbeck and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have less than 40 inches of loess
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 0.5 foot to 2.0 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Birkbeck soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Blackberry Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Typical pedon of Blackberry silt loam, 2 to 5 percent slopes, at an elevation of about 748 feet; Champaign County, Illinois; about 25 feet north and 450 feet west of the southeast corner of sec. 19, T. 21 N., R. 7 E.; USGS Foosland topographic quadrangle; lat. 40 degrees 15 minutes 10 seconds N. and long. 88 degrees 26 minutes 36 seconds W., NAD 27; UTM zone 16, 377259E and 4456799N, NAD 83:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A—10 to 16 inches; dark brown (10YR 3/3) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

BA—16 to 20 inches; brown (10YR 4/3) silty clay loam; weak very fine subangular blocky structure; friable; many faint dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—20 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—24 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules in the matrix; moderately acid; clear smooth boundary.

Bt3—34 to 47 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse prismatic structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules in the matrix; moderately acid; clear smooth boundary.

2Bt4—47 to 62 inches; yellowish brown (10YR 5/4), stratified silt loam and loam; weak coarse subangular blocky structure; friable; very few faint brown (10YR 4/3) and grayish brown (10YR 5/2) clay films lining pores and on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules in the matrix; slightly acid; gradual smooth boundary.

2C—62 to 70 inches; light olive brown (2.5Y 5/4), stratified silt loam, loam, and sandy loam; massive; friable; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules in the matrix; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 40 to 60 inches
Depth to carbonates: More than 40 inches
Depth to the base of the argillic horizon: 45 to 70 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

BA or AB horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—2 to 4
Texture—silt loam or silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, silty clay loam, silt loam, loam, sandy loam, sandy clay loam, or the gravelly analogs of these textures

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—loam, clay loam, loamy sand, sandy loam, silt loam, or the gravelly analogs of these textures

679B—Blackberry silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Blackberry and similar soils: 93 percent
Dissimilar soils: 7 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 40 inches of loess
- Soils that have calcareous loamy till in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Blackberry soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Blount Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow or slow in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent

Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Typical pedon of Blount silt loam, 0 to 2 percent slopes, at an elevation of about 705 feet; Livingston County, Illinois; about 2,480 feet south and 1,203 feet west of the northeast corner of sec. 29, T. 26 N., R. 6 E.; USGS Fairbury topographic quadrangle; lat. 40 degrees 41 minutes 39 seconds N. and long. 88 degrees 32 minutes 59 seconds W., NAD 27; UTM zone 16, 369058E and 4505966N, NAD 83:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few fine roots; moderately acid; abrupt smooth boundary.

E—7 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate thin platy structure; friable; few fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.

2Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent fine gravel; moderately acid; clear smooth boundary.

2Bt2—17 to 26 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions

throughout; 2 percent gravel; slightly acid; clear smooth boundary.
2Bt3—26 to 32 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct gray (5Y 5/1) clay films on faces of peds; many medium prominent gray (5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2Cd—32 to 60 inches; 60 percent light olive brown (2.5Y 5/4) and 40 percent gray (5Y 6/1) silty clay loam; massive; very firm; common medium prominent white (10YR 8/1) calcium carbonate concretions throughout; 3 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: Less than 18 inches
Depth to densic contact: 30 to 48 inches
Depth to carbonates: 19 to 40 inches
Depth to the base of the argillic horizon: 20 to 45 inches
Particle-size control section: Averages 35 to 45 percent clay and 5 to 25 percent sand

Ap or A horizon:
Hue—10YR
Value—2 to 4; 2 or 3 in horizons that are less than 5 inches thick
Chroma—1 to 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 to 3
Texture—silt loam

BE or EB horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silt loam

Bt, 2Bt, or 2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, clay loam, clay, or silty clay

2BCtg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam, clay loam, or silty clay

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or clay loam

23A—Blount silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Blount and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have a mollic epipedon
- Soils that have less clay and more silt in the subsoil and underlying material
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet

Dissimilar soils:
- The poorly drained Ashkum and similar soils that are subject to ponding; on toeslopes in positions below those of the Blount soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

23B2—Blount silt loam, 2 to 4 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Blount and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have a mollic epipedon
- Soils that are not moderately eroded, have a thicker surface layer, and have a subsurface layer
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 5 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils that are subject to ponding; on toeslopes in positions below those of the Blount soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Brenton Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of Brenton silt loam, 0 to 2 percent slopes, at an elevation of about 715 feet; Champaign County, Illinois; about 1,722 feet south and 114 feet east of the northwest corner of sec. 10, T. 22 N., R. 8 E.; USGS Gibson City East topographic quadrangle; lat. 40 degrees 22 minutes 45 seconds N. and long. 88 degrees 17 minutes 24 seconds W., NAD 27; UTM zone 16, 390492E and 4470645N, NAD 83:

Ap—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

AB—10 to 16 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; common very fine roots; neutral; clear smooth boundary.

Bt1—16 to 26 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films in root channels and pores; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt2—26 to 35 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films in pores; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide nodules throughout; common fine distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine distinct light gray (10YR 7/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2Bt3—35 to 53 inches; dark yellowish brown (10YR 4/4) and brown (10YR 5/3) clay loam; moderate medium prismatic structure; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide

nodules throughout; common fine distinct very pale brown (10YR 7/3) iron depletions in the matrix; slightly acid; abrupt smooth boundary.
2C—53 to 72 inches; brownish yellow (10YR 6/8) and light gray (10YR 7/2), stratified silt loam and sandy loam with thin layers of loamy sand; massive; friable; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 22 inches
Thickness of the loess: 24 to 40 inches
Depth to carbonates: 40 inches or more
Depth to the base of the argillic horizon: 38 to 60 inches
Particle-size control section: Averages 25 to 35 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 to 8
Texture—clay loam, loam, sandy loam, silty clay loam, silt loam, or sandy clay loam or stratified with these textures

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 to 8
Texture—commonly stratified loam, sandy loam, sandy clay loam, clay loam, or silt loam; thin strata of sand or loamy sand

149A—Brenton silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Brenton and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 24 inches of loess
- Soils that have more than 15 percent gravel in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Brenton soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Bryce Series

Drainage class: Poorly drained
Permeability: Slow in the upper part and very slow in the lower part
Landform: Ground moraines and glacial lakes (relict)
Parent material: Colluvium and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, mixed, superactive, mesic Vertic Endoaquolls

Typical Pedon

Typical pedon of Bryce silty clay, 0 to 2 percent slopes, at an elevation of about 675 feet; Iroquois County, Illinois; about 2,559 feet north and 45 feet west of the center of sec. 7, T. 25 N., R. 13 W.; USGS Woodworth topographic quadrangle; lat. 40 degrees 38 minutes 39 seconds N. and long. 87 degrees 52 minutes 23 seconds W., NAD 27; UTM zone 16, 426178E and 4499628N, NAD 83:

Ap1—0 to 10 inches; black (10YR 2/1) silty clay, dark

gray (10YR 4/1) dry; weak very fine granular structure; friable; few fine black (7.5YR 2.5/1) weakly cemented nodules of iron and manganese oxides throughout; slightly acid; abrupt smooth boundary.

Ap2—10 to 13 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; moderately acid; abrupt smooth boundary.

Bg—13 to 19 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; firm; many distinct black (10YR 2/1) organic coatings on faces of peds; common fine faint dark grayish brown (2.5Y 4/2) and few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear wavy boundary.

Btg1—19 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; many distinct dark gray (10YR 4/1) clay films on faces of peds; many distinct black (N 2.5/0) organo-clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

Btg2—24 to 35 inches; olive gray (5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct olive gray (5Y 4/2) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few slickensides on faces of peds; common fine black (7.5YR 2.5/1) weakly cemented iron and manganese oxides nodules throughout; common fine faint dark gray (2.5Y 4/1) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.

Btg3—35 to 45 inches; gray (5Y 5/1) silty clay; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots; few continuous distinct dark gray (5Y 4/1) clay films on faces of peds; few slickensides and pressure faces on faces of peds; common medium prominent light olive brown (2.5Y 5/4) and few medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

2BCg—45 to 58 inches; gray (5Y 5/1) silty clay; weak very coarse prismatic structure; very firm; few fine white (10YR 8/1) very weakly cemented calcium carbonate nodules and weakly cemented calcium carbonate concretions throughout; common coarse prominent brown (10YR 4/3) and common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent fine gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

2Cg—58 to 66 inches; gray (5Y 5/1) silty clay; massive; very firm; many medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; 3 percent fine gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the colluvium: 15 to 55 inches
Depth to the base of the cambic horizon: 30 to more than 60 inches
Particle-size control section: Averages 42 to 52 percent clay and 5 to 20 percent sand

Ap or A horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay

Bg, Btg, or BCg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 to 6; 2 or 3 in the upper part only
Chroma—0 to 3
Texture—silty clay or clay

2BCg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—commonly silty clay or clay; silty clay loam in some pedons

2Cg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—commonly silty clay or clay; silty clay loam in some pedons

235A—Bryce silty clay, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Bryce and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that have stratified loamy outwash in the underlying material

Dissimilar soils:
- The somewhat poorly drained Elliott and similar soils that are not subject to ponding; on footslopes and backslopes in positions above those of the Bryce soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Camden Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Camden silt loam, 2 to 5 percent slopes, at an elevation of about 720 feet; Champaign County, Illinois; about 30 feet north and 100 feet west of the southeast corner of sec. 6, T. 22 N., R. 14 W.; USGS Rankin topographic quadrangle; lat. 40 degrees 23 minutes 6 seconds N. and long. 87 degrees 58 minutes 16 seconds W., NAD 27; UTM zone 16, 417582E and 4470957N, NAD 83:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and very fine granular structure; friable; neutral; abrupt smooth boundary.

E—9 to 14 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; moderate thin platy structure; friable; few distinct light brownish gray (10YR 6/2 dry) clay depletions on faces of peds; neutral; abrupt smooth boundary.

Bt1—14 to 18 inches; yellowish brown (10YR 5/4) silt loam; weak very fine subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; few distinct light brownish gray (10YR 6/2 dry) clay depletions on faces of peds; neutral; clear smooth boundary.

Bt2—18 to 22 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; few distinct light brownish gray (10YR 6/2 dry) clay depletions on faces of peds; slightly acid; clear smooth boundary.

Bt3—22 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt4—28 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; 3 percent chert pebbles; moderately acid; clear smooth boundary.

2Bt5—35 to 52 inches; yellowish brown (10YR 5/6) loam; moderate coarse prismatic structure parting to weak medium subangular blocky; friable; common distinct brown (10YR 4/3) clay films on faces of peds; common fine and medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; 5 percent, by volume, chert and quartz pebbles; moderately acid; clear smooth boundary.

2Bt6—52 to 62 inches; brown (10YR 4/3) and yellowish brown (10YR 5/4) sandy loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few faint brown (10YR 4/3) clay films as bridges between sand grains; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; 5 percent, by volume, chert and quartz pebbles; moderately acid; clear smooth boundary.

2C—62 to 80 inches; yellowish brown (10YR 5/4 and 5/6), stratified sandy loam, loam, and sandy clay loam; massive; very friable; moderately acid.

Range in Characteristics

Thickness of the loess: 24 to 40 inches
Depth to carbonates: More than 60 inches
Depth to the base of the argillic horizon: 30 to 65 inches
Particle-size control section: Averages 22 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—3 to 5; 3 in horizons that are less than 6 inches thick
Chroma—2 or 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
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

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam, clay loam, loam, sandy loam, sandy clay loam, or silt loam

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—stratified sandy loam, loam, silt loam, loamy sand, sandy clay loam, or clay loam

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

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Outwash plains and stream terraces
Position on the landform: Summits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Camden and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that have more clay in the subsoil

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Camden soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Camden and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have less than 24 inches of loess
- Soils that have calcareous loamy till in the underlying material
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Camden soil
- The somewhat poorly drained Kendall and similar

soils; on summits and footslopes in positions below those of the Camden soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Campton Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon

Typical pedon of Campton silt loam, 2 to 5 percent slopes, at an elevation of about 710 feet; Champaign County, Illinois; about 650 feet north and 1,250 feet west of the southeast corner of sec. 10, T. 20 N., R. 7 E.; USGS Mahomet topographic quadrangle; lat. 40 degrees 12 minutes 7 seconds N. and long. 88 degrees 23 minutes 35 seconds W., NAD 27; UTM zone 16, 381448E and 4451111N, NAD 83:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thin platy structure parting to weak medium granular; friable; neutral; abrupt smooth boundary.
E—6 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak thin platy structure; friable; neutral; abrupt smooth boundary.
BE—8 to 13 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; neutral; clear smooth boundary.
Bt1—13 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt2—19 to 27 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; few fine faint pale brown (10YR 6/3) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Bt3—27 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Bt4—38 to 44 inches; yellowish brown (10YR 5/4) silt loam; weak coarse prismatic structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; common fine faint pale brown (10YR 6/3) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
2BCt—44 to 53 inches; yellowish brown (10YR 5/4), stratified silt loam and sandy loam; weak coarse prismatic structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; common medium faint pale brown (10YR 6/3) iron depletions in the matrix; common medium distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.
2C—53 to 60 inches; yellowish brown (10YR 5/4) loam; massive; very friable; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: 36 to 48 inches
Depth to carbonates: More than 40 inches
Depth to the base of the argillic horizon: 44 to 60 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—3 to 5; 3 in horizons that are less than 6 inches thick
Chroma—1 to 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt or 2BCt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, sandy loam, fine sandy loam, sandy clay loam, or clay loam or stratified with these textures

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, sandy loam, loamy sand, gravelly loam, or gravelly sandy loam or stratified with these textures

680B—Campton silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Campton and similar soils: 92 percent
Dissimilar soils: 8 percent

Similar soils:
- Soils that have less than 36 inches of loess
- Soils that have calcareous loamy till in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 0.5 foot to 2.0 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Campton soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Catlin Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Typical pedon of Catlin silt loam, 2 to 5 percent slopes, at an elevation of about 750 feet; Champaign County, Illinois; about 287 feet north and 1,362 feet east of the southwest corner of sec. 20, T. 19 N., R. 9 E.; USGS Urbana topographic quadrangle; lat. 40 degrees 5 minutes 3 seconds N. and long. 88 degrees 12 minutes 50 seconds W., NAD 27; UTM zone 16, 396505E and 4437809N, NAD 83:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.
Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine and fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
Bt2—15 to 22 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; moderately acid; clear smooth boundary.
Bt3—22 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct strong brown (7.5YR 4/6) masses of

iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bt4—30 to 45 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak coarse subangular blocky structure; friable; many distinct brown (10YR 4/3) clay films on faces of peds; common prominent very dark grayish brown (10YR 3/2) organo-clay films lining root channels; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; common fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear wavy boundary.

2Bt5—45 to 57 inches; light olive brown (2.5YR 5/4) clay loam; weak coarse subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; common prominent very dark grayish brown (10YR 3/2) organo-clay films lining root channels; common fine distinct light olive gray (5Y 6/2) iron depletions in the matrix; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; common fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; neutral; clear wavy boundary.

2C—57 to 70 inches; light olive brown (2.5Y 5/4) loam; massive; firm; common prominent very dark grayish brown (10YR 3/2) clay films lining root channels; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Depth to the base of the argillic horizon: 45 to 65 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 8 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt, 2BC, or 2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—clay loam, loam, silty clay loam, or silt loam

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Catlin and similar soils: 94 percent
Dissimilar components: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 40 inches of loess
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes between 5 and 7 percent

Dissimilar components:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Catlin soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Catlin soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Chatsworth Series

Drainage class: Moderately well drained
Permeability: Very slow
Landform: Ground moraines and end moraines

Parent material: Till or lacustrine deposits
Slope range: 4 to 12 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Eutrudepts

Typical Pedon

Typical pedon of Chatsworth silty clay, 6 to 12 percent slopes, severely eroded, at an elevation of about 735 feet; Iroquois County, Illinois; about 148 feet north and 1,870 feet west of the southeast corner of sec. 7, T. 24 N., R. 10 E.; USGS Buckley topographic quadrangle; lat. 40 degrees 32 minutes 48 seconds N. and long. 88 degrees 6 minutes 20 seconds W., NAD 27; UTM zone 16, 406382E and 4489026N, NAD 83:

Ap—0 to 2 inches; dark grayish brown (2.5Y 4/2) silty clay, light brownish gray (10YR 6/2) dry; moderate medium granular structure; firm; common medium roots; slightly effervescent; moderately alkaline; abrupt smooth boundary.

Bw1—2 to 11 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate very fine and fine subangular blocky structure; firm; few medium and fine roots; few fine white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common fine faint dark gray (5Y 4/1) iron depletions in the matrix; few fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

Bw2—11 to 15 inches; dark grayish brown (2.5Y 4/2) silty clay; weak medium prismatic structure parting to moderate fine and medium angular blocky; very firm; few fine roots between peds; common faint dark gray (5Y 4/1) coatings on faces of peds; common medium white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common fine distinct dark gray (5Y 4/1) iron depletions in the matrix; common fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bw3—15 to 22 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; common faint dark gray (5Y 4/1) coatings on faces of peds; common medium white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common fine faint dark gray (5Y 4/1) iron depletions in the matrix; common fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd1—22 to 35 inches; dark grayish brown (2.5Y 4/2) silty clay; massive; very firm; few fine roots along cleavage planes; many faint gray (5Y 5/1) coatings along cleavage planes; few medium white (10YR 8/1) very weakly cemented calcium carbonate nodules along cleavage planes; many fine faint gray (5Y 5/1) iron depletions in the matrix; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2—35 to 60 inches; dark gray (5Y 4/1) silty clay; massive; very firm; very few fine roots along widely spaced cleavage planes; many faint gray (5Y 5/1) coatings along cleavage planes; few medium white (10YR 8/1) very weakly cemented calcium carbonate nodules along cleavage planes; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to densic contact: 10 to 24 inches
Depth to carbonates: Less than 20 inches
Depth to the base of the cambic horizon: 10 to 24 inches
Particle-size control section: Averages 50 to 60 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 or 4; 3 in horizons that are less than 7 inches thick
Chroma—1 or 2
Texture—silty clay

Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 or 3
Texture—silty clay or clay; less commonly silty clay loam

Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 to 6
Texture—silty clay, clay, or silty clay loam

241C3—Chatsworth silty clay, 4 to 6 percent slopes, severely eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines

Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Chatsworth and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that are not severely eroded and have a thicker surface layer that contains less clay
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Bryce and similar soils; on toeslopes in positions below those of the Chatsworth soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

241D3—Chatsworth silty clay, 6 to 12 percent slopes, severely eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Chatsworth and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that are not severely eroded and have a thicker surface layer that contains less clay
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Bryce and similar soils; on toeslopes in positions below those of the Chatsworth soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Clare Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Typical pedon of Clare silt loam, 2 to 5 percent slopes, at an elevation of about 700 feet; Champaign County, Illinois; about 66 feet south and 1,700 feet west of the northeast corner of sec. 34, T. 19 N., R. 9 E.; USGS Urbana topographic quadrangle; lat. 40 degrees 4 minutes 9 seconds N. and long. 88 degrees 10 minutes 5 seconds W., NAD 27; UTM zone 16, 400405E and 4436088N, NAD 83:

Ap—0 to 8 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

A—8 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

Bt1—14 to 19 inches; brown (10YR 4/3) silty clay loam; moderate medium and fine subangular blocky structure; firm; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—19 to 27 inches; brown (10YR 4/3) silty clay loam; moderate medium and fine subangular

blocky structure; firm; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; moderately acid; clear smooth boundary.

Bt3—27 to 36 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.

2Bt4—36 to 44 inches; brown (10YR 4/3) clay loam; weak medium subangular blocky structure; firm; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; many fine and medium rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; many medium faint grayish brown (10YR 5/2) and brown (10YR 5/3) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.

2BC—44 to 50 inches; light olive brown (2.5Y 5/4) and olive brown (2.5Y 4/4), stratified loam and sandy loam; weak medium angular blocky and subangular blocky structure; friable; few distinct brown (10YR 4/3) clay films lining pores; many fine and medium rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

2C—50 to 60 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4), stratified loam and sandy loam; massive; friable; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 20 to 40 inches
Depth to carbonates: 40 to more than 70 inches
Depth to the base of the argillic horizon: 40 to 70 inches
Particle-size control section: Averages 25 to 35 percent clay and less than 10 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt or BA horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam, sandy loam, clay loam, silty clay loam, silt loam, or sandy clay loam or stratified with these textures

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—stratified sandy loam, loam, silt loam, or the gravelly analogs of these textures; thin strata of loamy sand or sand

663B—Clare silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Clare and similar soils: 92 percent
Dissimilar soils: 8 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 20 inches of loess
- Soils that have calcareous loamy till in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Clare soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Dana Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Taxadjunct features: Dana silt loam, 2 to 5 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs.

Typical Pedon

Typical pedon of Dana silt loam, 2 to 5 percent slopes, at an elevation of about 706 feet; Edgar County, Illinois; about 1,810 feet north and 750 feet east of the southwest corner of sec. 10, T. 16 N., R. 14 W.; USGS Newman topographic quadrangle; lat. 39 degrees 51 minutes 21 seconds N. and long. 87 degrees 56 minutes 5 seconds W., NAD 27; UTM zone 16, 420041E and 4412178N, NAD 83:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, brown (10YR 4/3) dry; moderate fine granular structure; friable; common very fine and fine roots throughout; moderately acid; clear smooth boundary.

Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots throughout; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—15 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; common very fine and fine roots between peds; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt3—25 to 32 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine and fine roots between peds; common medium vesicular and tubular pores; few distinct dark brown (10YR 3/3) organo-clay films on faces of peds and in pores; many distinct brown (10YR 4/3) clay films on faces of peds; common fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear smooth boundary.

2Bt4—32 to 38 inches; brown (10YR 5/3) clay loam; moderate medium prismatic structure; firm; few very fine and fine roots between peds; common medium vesicular and tubular pores; few distinct very dark grayish brown (10YR 3/2) organo-clay films along root channels and pores; many distinct brown (10YR 4/3) clay films on faces of peds; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; 3 percent fine and medium gravel; neutral; clear smooth boundary.

2Bt5—38 to 53 inches; brown (10YR 5/3) clay loam; moderate coarse prismatic structure; firm; few very fine and fine roots between peds; common medium and coarse vesicular and tubular pores; few prominent very dark gray (10YR 3/1) organo-clay films along root channels and pores; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct gray (10YR 6/1) iron depletions in the matrix; many medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; 7 percent fine and medium gravel; neutral; clear smooth boundary.

2Bt6—53 to 58 inches; brown (10YR 5/3) clay loam; weak coarse angular blocky structure; firm; few very fine and fine roots between peds; common medium and coarse vesicular and tubular pores; few prominent very dark gray (10YR 3/1) organo-

clay films along root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct gray (10YR 6/1) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; 7 percent fine and medium gravel; neutral; clear smooth boundary.

2C—58 to 80 inches; pale brown (10YR 6/3) loam; massive; firm; few fine and medium vesicular and tubular pores; common medium distinct gray (10YR 6/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium irregular brown (10YR 4/3) extremely weakly cemented iron and manganese oxide masses on horizontal fracture planes; few fine to coarse rounded yellowish red (5YR 5/8) weakly cemented iron oxide nodules throughout; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium rounded and irregular white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; 7 percent fine and medium gravel; violently effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 22 to 40 inches
Depth to carbonates: 40 to 60 inches
Depth to the base of the argillic horizon: 32 to 60 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 15 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

BA horizon (if it occurs):
Hue—10YR
Value—4
Chroma—3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—clay loam

2BC horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—loam or clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam or clay loam

56B—Dana silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Dana and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 22 inches of loess
- Soils that have carbonates within a depth of 40 inches
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Dana soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

56B2—Dana silt loam, 2 to 5 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Dana and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have less than 22 inches of loess
- Soils that have carbonates within a depth of 40 inches
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Dana soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Drummer Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and ground moraines
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Typical pedon of Drummer silty clay loam, 0 to 2 percent slopes, at an elevation of about 715 feet; Champaign County, Illinois; about 300 feet north and 1,600 feet east of the southwest corner of sec. 19, T. 19 N., R. 9 E.; USGS Urbana topographic quadrangle; lat. 40 degrees 5 minutes 4 seconds N. and long. 88 degrees 13 minutes 56 seconds W., NAD 27; UTM zone 16, 394944E and 4437865N, NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; many fine roots; moderately acid; clear smooth boundary.

A—7 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; many fine and medium roots; slightly acid; clear smooth boundary.

BA—14 to 19 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium subangular blocky structure; firm; many fine and medium roots; few fine faint very dark grayish brown (2.5Y 3/2) masses of manganese accumulation in the matrix; slightly acid; gradual smooth boundary.

Bg—19 to 25 inches; dark gray (10YR 4/1) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; many fine roots; common fine distinct and prominent yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation in the matrix; many worm holes; neutral; gradual smooth boundary.

Btg1—25 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine angular blocky; firm; many fine roots; common distinct dark gray (N 4/0) clay films on faces of peds; many medium distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.

Btg2—32 to 41 inches; gray (N 5/0) silty clay loam; weak medium prismatic structure parting to weak medium angular blocky; firm; few fine roots; few distinct dark gray (N 4/0) clay films on faces of peds; many medium prominent yellowish brown

(10YR 5/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
2Btg3—41 to 47 inches; gray (N 5/0) loam; weak coarse subangular blocky structure; friable; few fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 4 percent fine gravel; neutral; abrupt wavy boundary.
2Cg—47 to 60 inches; dark gray (10YR 4/1), stratified loam and sandy loam; massive; friable; many medium prominent olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; many medium faint gray (N 5/0) iron depletions in the matrix; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to 65 inches
Depth to the base of the cambic horizon: 42 to 65 inches
Particle-size control section: Averages 20 to 35 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

BA, Bg, or Btg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—3 to 6
Chroma—0 to 4
Texture—silty clay loam or silt loam

2Btg, 2Bg, or 2BCg horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—commonly loam or silt loam; some pedons may be stratified with sandy loam, clay loam, silty clay loam, sandy clay loam, or fine sandy loam

2Cg or 2C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—4 to 7
Chroma—0 to 8
Texture—stratified loam, sandy loam, sandy clay loam, clay loam, silt loam, or silty clay loam; thin strata of loamy sand

152A—Drummer silty clay loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Drummer and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have a mollic epipedon more than 24 inches thick
- Soils that have a surface soil of silty clay
- Soils that have calcareous loamy till in the underlying material
- Soils that have carbonates within a depth of 40 inches

Dissimilar components:
- The moderately well drained Catlin and similar soils; on summits and backslopes in positions above those of the Drummer soil
- The somewhat poorly drained Flanagan and similar soils that are not subject to ponding; on summits and footslopes in positions above those of the Drummer soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Drummer soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Elburn Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part

Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of Elburn silt loam, 0 to 2 percent slopes, at an elevation of about 600 feet; Logan County, Illinois; about 1,320 feet north and 50 feet west of the southeast corner of sec. 2, T. 20 N., R. 2 W.; USGS Lincoln East topographic quadrangle; lat. 40 degrees 12 minutes 30 seconds N. and long. 89 degrees 16 minutes 27 seconds W., NAD 27; UTM zone 16, 306453E and 4453366N, NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly alkaline; abrupt smooth boundary.

A—7 to 13 inches; black (10YR 2/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly alkaline; clear smooth boundary.

Bt1—13 to 17 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common distinct black (10YR 2/1) organo-clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—17 to 25 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; moderately acid; clear smooth boundary.

Bt3—25 to 35 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; very few distinct very dark gray (10YR 3/1) and black (10YR 2/1) organo-clay films in worm holes and root channels and on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Bt4—35 to 44 inches; yellowish brown (10YR 5/8) and light olive brown (2.5Y 5/4) silty clay loam; weak coarse prismatic structure parting to moderate coarse subangular blocky; friable; very few distinct very dark gray (10YR 3/1) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; abrupt smooth boundary.

2Btg—44 to 50 inches; light brownish gray (10YR 6/2) and strong brown (7.5YR 5/8) sandy loam; weak coarse subangular blocky structure; friable; very few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.

2BCg—50 to 65 inches; dark grayish brown (10YR 4/2), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/6) sandy loam with 1- to 2-inch strata of loam; weak coarse subangular blocky structure; friable; about 5 percent gravel; slightly alkaline; clear smooth boundary.

2C1—65 to 77 inches; brown (10YR 5/3), stratified sandy loam and sand; massive; friable; common medium prominent strong brown (7.5YR 5/8) and distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; about 5 percent gravel; slightly alkaline; clear smooth boundary.

2C2—77 to 80 inches; dark grayish brown (10YR 4/2) and brown (10YR 4/3), stratified coarse sandy loam and sand; massive; friable; about 5 percent gravel; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to 70 inches
Depth to the base of the argillic horizon: 40 to 70 inches
Particle-size control section: Averages 25 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR, 2.5Y, or 5Y; 5Y only occurs in the lower subhorizons
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Btg, 2Bt, 2Bg, 2BC, or 2BCg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y

Value—4 to 6
Chroma—2 to 8
Texture—sandy loam, clay loam, loam, silty clay loam, or silt loam or stratified with these textures

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 8
Texture—stratified sandy loam or loam with thin strata of loamy sand, sand, or silt loam

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Elburn and similar soils: 94 percent
Dissimilar components: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 40 inches of loess
- Soils that have calcareous loamy till in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar components:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Elburn soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Elburn soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Elliott Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 6 percent

Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Taxadjunct features: Elliott silty clay loam, 2 to 4 percent slopes, eroded, and Elliott silty clay loam, 4 to 6 percent slopes, eroded, have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine, illitic, mesic Aquollic Hapludalfs.

Typical Pedon

Typical pedon of Elliott silt loam, 0 to 2 percent slopes, at an elevation of about 704 feet; Livingston County, Illinois; about 690 feet south and 2,436 feet west of the center of sec. 21, T. 29 N., R. 8 E.; USGS Cullom topographic quadrangle; lat. 40 degrees 58 minutes 11 seconds N. and long. 88 degrees 19 minutes 58 seconds W., NAD 27; UTM zone 16, 387854E and 4536255N, NAD 83:

Ap—0 to 6 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.
A—6 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.
Bt1—11 to 16 inches; light olive brown (2.5Y 5/4) silty clay; moderate fine subangular blocky structure; friable; common fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.
2Bt2—16 to 23 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron

accumulation in the matrix; few fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt3—23 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt4—28 to 35 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium white (10YR 8/1) moderately cemented calcium carbonate concretions throughout; 1 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt5—35 to 41 inches; olive brown (2.5Y 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common distinct gray (5Y 6/1) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

2Cd—41 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; massive; very firm; common fine prominent gray (5Y 5/1) iron depletions in the matrix; 3 percent pebbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: Less than 20 inches
Depth to densic material: 20 to 45 inches
Depth to carbonates: 17 to 40 inches
Depth to the base of the argillic horizon: 20 to 45 inches
Particle-size control section: Averages 35 to 45 percent clay and 4 to 25 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam or silty clay loam

BA, Bt, 2Bt, or 2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay; less commonly clay or clay loam

2BC, 2BCg, 2Cd, or 2Cdg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or clay loam

146A—Elliott silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Elliott and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils that are subject to ponding; on toeslopes in positions below those of the Elliott soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

146B2—Elliott silty clay loam, 2 to 4 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Elliott and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that are not moderately eroded and have a thicker surface layer
- Soils that are more than 40 inches deep to carbonates
- Soils that are loam or sandy loam in the lower part of the subsoil
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of less than 2 percent
- Soils that have slopes between 4 and 6 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils that are subject to ponding; on toeslopes in positions below those of the Elliott soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

146C2—Elliott silty clay loam, 4 to 6 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Elliott and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that are not moderately eroded and have a thicker surface layer
- Soils that are more than 40 inches deep to carbonates
- Soils that are loam or sandy loam in the lower part of the subsoil
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes between 2 and 4 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils that are subject to ponding; on toeslopes in positions below those of the Elliott soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Flanagan Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of Flanagan silt loam, 0 to 2 percent slopes, at an elevation of about 730 feet; Champaign County, Illinois; about 1,405 feet north and 1,607 feet east of the southwest corner of sec. 19, T. 19 N., R. 9 E.; USGS Urbana topographic quadrangle; lat. 40 degrees 5 minutes 15 seconds N. and long. 88

degrees 13 minutes 56 seconds W., NAD 27; UTM zone 16, 394950E and 4438193N, NAD 83:

A1—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; slightly acid; gradual smooth boundary.

A2—8 to 15 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

A3—15 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; clear smooth boundary.

Bt1—18 to 23 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine subangular blocky structure; firm; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few fine faint brown (10YR 4/3) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Bt2—23 to 32 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium subangular blocky structure; firm; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common fine faint brown (10YR 5/3 and 4/3) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Bt3—32 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common fine faint light yellowish brown (10YR 6/4) and distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bt4—38 to 45 inches; 40 percent yellowish brown (10YR 5/6), 30 percent light brownish gray (10YR 6/2), and 30 percent brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; slightly acid; gradual smooth boundary.

2Bt5—45 to 49 inches; 35 percent yellowish brown (10YR 5/4), 35 percent light olive brown (2.5Y 5/4), and 30 percent light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 5 percent fine gravel; neutral; abrupt smooth boundary.

2C—49 to 60 inches; yellowish brown (10YR 5/4) loam; massive; firm; common medium rounded white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; 5 percent fine gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess: 40 to 60 inches
Depth to carbonates: 45 to 65 inches
Depth to the base of the argillic horizon: 45 to 65 inches
Particle-size control section: Averages 35 to 42 percent clay and less than 10 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam; may be silty clay loam in the lower subhorizons

BA horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 6
Texture—commonly silty clay loam or silty clay; the range includes silt loam in the lower part

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—loam, clay loam, silt loam, or silty clay loam

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 6
Texture—loam, clay loam, silt loam, or silty clay loam

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines

Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Flanagan and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have more than 60 inches of loess
- Soils that have less than 40 inches of loess
- Soils that are more than 65 inches deep to carbonates
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar components:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Flanagan soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Flanagan soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Harpster Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and ground moraines
Parent material: Colluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Calciaquolls

Typical Pedon

Typical pedon of Harpster silty clay loam, 0 to 2 percent slopes, at an elevation of about 722 feet; Ford County, Illinois; about 855 feet south and 70 feet west of the northeast corner of sec. 20, T. 23 N., R. 7 E.; USGS Gibson City West topographic quadrangle; lat. 40 degrees 26 minutes 24 seconds N. and long. 88 degrees 25 minutes 23 seconds W., NAD 27; UTM zone 16, 379305E and 4477571N, NAD 83:

Apk—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; many snail shells; strongly effervescent (20 percent calcium carbonate); moderately alkaline; abrupt smooth boundary.

Ak—9 to 18 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine and medium granular structure; firm; common very fine roots; many snail shells; strongly effervescent (18 percent calcium carbonate); moderately alkaline; clear smooth boundary.

Bg1—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium angular blocky structure; firm; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; few snail shells; slightly effervescent (7 percent calcium carbonate); moderately alkaline; gradual smooth boundary.

Bg2—25 to 31 inches; dark gray (5Y 4/1) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine prominent dark yellowish brown (10YR 4/4) and few fine distinct olive (5Y 4/4) masses of iron accumulation in the matrix; few snail shells; slightly effervescent (5 percent calcium carbonate); slightly alkaline; gradual smooth boundary.

Bg3—31 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak coarse prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common medium distinct olive (5Y 4/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; slightly effervescent (2 percent calcium carbonate); slightly alkaline; gradual smooth boundary.

Bg4—36 to 41 inches; 40 percent olive brown (2.5Y 4/4), 35 percent olive yellow (2.5Y 6/6), and 25 percent gray (5Y 5/1) silty clay loam; weak coarse angular blocky structure; firm; few very fine roots; slightly effervescent (2 percent calcium

carbonate); 2 percent gravel; slightly alkaline; gradual smooth boundary.
Cg1—41 to 56 inches; 55 percent gray (5Y 5/1), 40 percent light olive brown (2.5Y 5/6), and 5 percent dark yellowish brown (10YR 4/4) silt loam; massive; firm; 1 percent gravel; strongly effervescent (16 percent calcium carbonate); moderately alkaline; clear smooth boundary.
Cg2—56 to 60 inches; gray (10YR 5/1) loam; massive; friable; 5 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to calcic horizon: Less than 16 inches
Depth to the base of the cambic horizon: 22 to 46 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 15 percent sand

Apk or Ak horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—3 to 6
Chroma—0 to 2
Texture—typically silty clay loam; the range includes silt loam, clay loam, or loam in the lower part

Cg or 2Cg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam or loam; some pedons have strata of sandy loam, very fine sandy loam, or clay loam

67A—Harpster silty clay loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Harpster and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
• Soils that have more sand in the upper part of the subsoil

Dissimilar soils:
• The poorly drained Drummer and similar soils that do not have a calcic horizon within 16 inches of the surface; in positions similar to those of the Harpster soil
• The somewhat poorly drained Elburn and similar soils that are not subject to ponding; on footslopes and summits in positions above those of the Harpster soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• “Agronomy” section
• “Recreation” section
• “Wildlife Habitat” section
• “Engineering” section
• “Soil Properties” section

Kendall Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon

Typical pedon of Kendall silt loam, 0 to 2 percent slopes, at an elevation of about 650 feet; Douglas County, Illinois; about 1,160 feet north and 400 feet west of the center of sec. 36, T. 15 N., R. 10 E.; USGS Oakland topographic quadrangle; lat. 39 degrees 42 minutes 24 seconds N. and long. 88 degrees 2 minutes 17 seconds W., NAD 27; UTM zone 16, 411010E and 4395720N, NAD 83:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light grayish brown (10YR 6/2) dry; weak

medium granular structure; friable; many very fine and fine roots; few fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; neutral; abrupt smooth boundary.

E—7 to 11 inches; grayish brown (10YR 5/2) silt loam; moderate fine and medium granular structure; friable; many very fine and fine roots; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear smooth boundary.

BE—11 to 14 inches; brown (10YR 5/3) silty clay loam; moderate fine subangular blocky structure; firm; many very fine and fine roots; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear smooth boundary.

Btg1—14 to 25 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; strongly acid; clear smooth boundary.

Btg2—25 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; few very fine and fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Btg3—41 to 51 inches; 55 percent yellowish brown (10YR 5/6) and 45 percent gray (5Y 5/1) silty clay loam; weak medium prismatic structure parting to weak coarse subangular blocky; firm; few very fine and fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; few medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear smooth boundary.

2Btg4—51 to 58 inches; 40 percent strong brown (7.5YR 5/6), 30 percent yellowish brown (10YR 5/6), and 30 percent gray (5Y 5/1) loam; weak coarse subangular blocky structure; friable; few distinct discontinuous dark gray (10YR 4/1) clay films on faces of peds; common fine and medium rounded black (7.5YR 2.5/1) weakly cemented nodules throughout; about 5 percent fine gravel; neutral; clear smooth boundary.

2Cg1—58 to 74 inches; 45 percent yellowish brown (10YR 5/6), 45 percent gray (5Y 5/1), and 10 percent strong brown (7.5YR 5/6), stratified loam, sandy loam, and silt loam; massive; friable; about 5 percent fine gravel; slightly alkaline; abrupt smooth boundary.

2Cg2—74 to 80 inches; 60 percent grayish brown (10YR 5/2), 30 percent gray (10YR 5/1), and 10 percent yellowish brown (10YR 5/6), stratified gravelly loam, gravelly sandy loam, and silt loam; massive; friable; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to 80 inches
Depth to the base of the argillic horizon: 40 to more than 60 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—2 to 5; 2 or 3 in A horizons less than 7 inches thick
Chroma—1 to 3
Texture—silt loam

E or Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—2 or 3
Texture—silt loam

BE horizon (if it occurs):
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam

Btg or Bt horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silty clay loam

2Btg, 2Bt, 2BCg, or 2BC horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—loam, clay loam, silt loam, or sandy loam

2Cg or 2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y

Value—4 to 6
Chroma—1 to 8
Texture—stratified silt loam, loam, sandy loam, clay loam, silty clay loam, sandy clay loam, or the gravelly analogs of these textures

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Kendall and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have a mollic epipedon
- Soils that are less than 40 inches to the base of the argillic horizon
- Soils that have calcareous loamy till in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The well drained Camden and similar soils; on summits and backslopes in positions above those of the Kendall soil
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Kendall soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Kishwaukee Series

Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Thin mantle of loess or other silty material and the underlying outwash over sand and gravel
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Typical pedon of Kishwaukee silt loam, 0 to 2 percent slopes, at an elevation of about 702 feet; Vermilion County, Illinois; about 2,060 feet south and 200 feet east of the northwest corner of sec. 22, T. 22 N., R. 14 W.; USGS Penfield topographic quadrangle; lat. 40 degrees 21 minutes 3 seconds N. and long. 87 degrees 55 minutes 49 seconds W., NAD 27; UTM zone 16, 420997E and 4467114N, NAD 83:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.
Bt1—11 to 16 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; common faint dark brown (10YR 3/3) and many faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; moderately acid; clear smooth boundary.
2Bt2—16 to 32 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common faint dark brown (10YR 3/3) and common faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; 3 percent fine gravel; moderately acid; clear smooth boundary.
2Bt3—32 to 54 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common faint dark brown (10YR 3/3) organo-clay films on faces of peds; 10 percent fine gravel; slightly acid; clear smooth boundary.
3C—54 to 64 inches; light yellowish brown (10YR 6/4), stratified sand and very gravelly sand; single grain; loose; 15 percent fine gravel; 35 percent medium and coarse gravel; 2 percent cobbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: Less than 20 inches
Depth to horizons that contain more than 15 percent gravel: 40 to 60 inches
Depth to calcareous sand and gravel: 50 to 70 inches
Depth to the base of the argillic horizon: 40 to 60 inches
Particle-size control section: Averages 20 to 32 percent clay and 15 to 40 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, silty clay loam, loam, gravelly loam, gravelly sandy loam, or gravelly sandy clay loam

3C horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—sand and gravel or gravelly or very gravelly loamy sand or sand

623A—Kishwaukee silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Outwash plains and stream terraces
Position on the landform: Summits

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Kishwaukee and similar soils: 96 percent

Dissimilar soils: 4 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that are more than 60 inches deep to horizons containing more than 15 percent gravel
- Soils that are less than 40 inches deep to horizons containing more than 15 percent gravel
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Kishwaukee soil
- The somewhat poorly drained La Hogue and similar soils; on summits and footslopes in positions below those of the Kishwaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

La Hogue Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of La Hogue loam, 0 to 2 percent slopes, at an elevation of about 675 feet; Champaign County, Illinois; about 1,910 feet north and 150 feet east of the southwest corner of sec. 7, T. 19 N., R. 14 W.; USGS Homer topographic quadrangle; lat. 40 degrees 7 minutes 4 seconds N. and long. 87 degrees 59 minutes 38 seconds W., NAD 27; UTM zone 16, 415311E and 4441308N, NAD 83:

Ap—0 to 10 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.
A—10 to 16 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak medium

subangular blocky structure parting to moderate fine granular; friable; neutral; clear smooth boundary.

Bt1—16 to 26 inches; brown (10YR 4/3) clay loam; weak medium prismatic structure; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—26 to 36 inches; brown (10YR 4/3) sandy clay loam; moderate medium prismatic structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few fine faint light brownish gray (10YR 6/2) iron depletions in the matrix; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt3—36 to 43 inches; brown (10YR 4/3) sandy loam; weak medium prismatic structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium distinct reddish brown (5YR 4/4) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.

Cg1—43 to 54 inches; 75 percent grayish brown (10YR 5/2) and 25 percent strong brown (7.5YR 5/6) sandy loam; massive; very friable; common medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium prominent reddish brown (5YR 4/4) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.

Cg2—54 to 61 inches; gray (10YR 5/1) sandy loam; massive; friable; common medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.

Cg3—61 to 65 inches; 55 percent light olive gray (5Y 6/2) and 45 percent brownish yellow (10YR 6/6) silt loam; massive; friable; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; gradual smooth boundary.

Cg4—65 to 80 inches; 60 percent light brownish gray (2.5Y 6/2) and 40 percent yellowish brown (10YR 5/8), stratified silt loam and loam; massive; friable; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 60 inches
Depth to the base of the argillic horizon: 35 to 60 inches
Particle-size control section: Averages 18 to 35 percent clay and 15 to 55 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam

Bt horizon (upper part):
Hue—7.5YR or 10YR; less commonly 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—sandy clay loam, loam, clay loam, sandy loam, silt loam, or silty clay loam

Bt horizon (lower part) or BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2 to 6
Texture—sandy loam, sandy clay loam, or loamy sand; thin strata of loam or silt loam in some pedons

Cg or C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 8
Texture—commonly stratified with textures ranging from sand to silt loam

102A—La Hogue loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit,

such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

La Hogue and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have calcareous loamy till in the underlying material
- Soils that have less sand in the upper part of the subsoil
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the La Hogue soil
- The well drained Penfield and similar soils; on summits and backslopes in positions above those of the La Hogue soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

830—Landfills

- This map unit consists of nearly level to very steep accumulations of refuse.

Composition

Landfills and similar components: 85 percent
Dissimilar components: 15 percent

Dissimilar components:
- Orthents, loamy, and similar soils; in border areas that have been cut and filled with loamy materials

Management

- Reclamation would involve grading, shaping, and covering the areas with enough natural soil material to support vegetation. The feasibility and extent of reclamation depend on the conditions determined by onsite investigation and on the particular use intended.

Martinsville Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Stream terraces and outwash plains
Parent material: Thin mantle of loess or other silty material and the underlying outwash
Slope range: 0 to 18 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Martinsville silt loam, 2 to 5 percent slopes, at an elevation of about 695 feet; Champaign County, Illinois; about 250 feet south and 1,430 feet east of the northwest corner of sec. 36, T. 21 N., R. 7 E.; USGS Rising topographic quadrangle; lat. 40 degrees 14 minutes 14 seconds N. and long. 88 degrees 21 minutes 37 seconds W., NAD 27; UTM zone 16, 384292E and 4454970N, NAD 83:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak very fine and fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

BE—9 to 12 inches; yellowish brown (10YR 5/4) silt loam; moderate fine angular blocky structure; friable; common very fine roots; few faint brown (10YR 4/3) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt1—12 to 19 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to strong fine angular blocky; firm; common very fine roots; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Bt2—19 to 28 inches; strong brown (7.5YR 4/6) clay loam; weak medium prismatic structure parting to strong medium angular blocky; firm; many very fine roots; many distinct dark brown (7.5YR 3/4) clay films on faces of peds and in pores; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt3—28 to 36 inches; strong brown (7.5YR 4/6) sandy clay loam; moderate medium and coarse angular blocky structure; firm; common very fine roots;

many distinct dark brown (7.5YR 3/4) clay films on faces of peds and in pores; few fine faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

Bt4—36 to 45 inches; yellowish brown (10YR 5/4) sandy clay loam; weak coarse angular blocky structure; firm; few very fine roots; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; abrupt smooth boundary.

Bt5—45 to 57 inches; yellowish brown (10YR 5/4), stratified silt loam; weak coarse angular blocky structure; friable; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; abrupt smooth boundary.

BCt—57 to 69 inches; yellowish brown (10YR 5/4), stratified silt loam, loam, and sandy loam; weak coarse angular blocky structure; friable; few distinct brown (10YR 4/3) clay films on vertical faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint pale brown (10YR 6/3) masses of iron depletions in the matrix; common fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

C—69 to 80 inches; light yellowish brown (10YR 6/4), stratified loam and sandy loam; massive; friable; slightly acid.

Range in Characteristics

Thickness of the loess: Less than 20 inches
Depth to carbonates: 40 to 80 inches
Depth to the base of the argillic horizon: 40 to 70 inches
Particle-size control section: Averages 22 to 33 percent clay and 20 to 50 percent sand

Ap or A horizon:
Hue—10YR
Value—3 to 5; 3 in A horizons less than 6 inches thick
Chroma—2 to 6
Texture—silt loam or loam

E horizon (if it occurs):
Hue—10YR
Value—4
Chroma—3
Texture—silt loam or loam

Bt, BCt, 2Bt, or 2BCt horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—clay loam, sandy clay loam, silty clay loam, silt loam, or loam in the upper part; loam, sandy clay loam, silt loam, sandy loam, fine sandy loam, or very fine sandy loam in the lower part or stratified with these textures

C or 2C horizon:
Hue—10YR
Value—3 to 6
Chroma—3 to 6
Texture—stratified fine sandy loam, sandy loam, loam, or silt loam; thin strata of fine sand, loamy sand, loamy fine sand, very fine sandy loam, coarse sand, or sand

570B—Martinsville silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Stream terraces and outwash plains
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Martinsville and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have less sand and more silt in the subsoil
- Soils that have calcareous loamy till in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on

toeslopes in positions below those of the Martinsville soil
- The somewhat poorly drained Kendall and similar soils; on summits and footslopes in positions below those of the Martinsville soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

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

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Stream terraces and outwash plains
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Martinsville and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that have less sand and more silt in the subsoil
- Soils that have calcareous loamy till in the underlying material
- Soils that have calcareous sand and gravel in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Martinsville soil
- The somewhat poorly drained Kendall and similar soils; on summits and footslopes in positions below those of the Martinsville soil
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Martinsville soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

570D2—Martinsville loam, 10 to 18 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Stream terraces and outwash plains
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Martinsville and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have less sand and more clay in the subsoil
- Soils that have calcareous loamy till in the underlying material
- Soils that have calcareous sand and gravel in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Martinsville soil
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Martinsville soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section

- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Millbrook Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs

Typical Pedon

Typical pedon of Millbrook silt loam, 0 to 2 percent slopes, at an elevation of about 660 feet; Champaign County, Illinois; about 55 feet north and 2,240 feet west of the southeast corner of sec. 36, T. 17 N., R. 9 E.; USGS Villa Grove NW topographic quadrangle; lat. 39 degrees 52 minutes 49 seconds N. and long. 88 degrees 7 minutes 51 seconds W., NAD 27; UTM zone 16, 403299E and 4415085N, NAD 83:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; neutral; abrupt smooth boundary.

E—7 to 14 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure parting to moderate medium granular; friable; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; many fine faint brown (10YR 4/3) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt—14 to 21 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; few medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine distinct yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; moderately acid; clear smooth boundary.

Btg1—21 to 35 inches; 70 percent gray (10YR 5/1) and 30 percent yellowish brown (10YR 5/6) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; common medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; moderately acid; clear smooth boundary.

2Btg2—35 to 44 inches; gray (10YR 5/1) clay loam; moderate medium prismatic structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organo-clay films in pores; few medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

2BCg—44 to 55 inches; 60 percent gray (10YR 5/1) and 40 percent yellowish brown (10YR 5/4), stratified clay loam and sandy loam; weak medium prismatic structure; friable; few medium irregular black (7.5YR 2.5/1) iron and manganese oxide coatings on faces of peds; common medium prominent (10YR 5/8) masses of iron accumulation in the matrix; 10 percent fine gravel in clay loam strata; neutral; clear smooth boundary.

2Cg1—55 to 73 inches; 60 percent gray (10YR 5/1) and 40 percent yellowish brown (10YR 5/4) sandy loam stratified with thin lenses of coarse sand; massive; very friable; 5 percent fine gravel; neutral; abrupt smooth boundary.

2Cg2—73 to 80 inches; 60 percent pale brown (10YR 6/3) and 40 percent light brownish gray (10YR 6/2) sandy loam; massive; very friable; 5 percent fine gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess: 24 to 40 inches
Depth to carbonates: More than 40 inches
Depth to the base of the argillic horizon: 40 to 60 inches
Particle-size control section: Averages 25 to 35 percent clay and less than 15 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR

Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam

2Btg, 2Bt, 2BCg, or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—sandy loam, sandy clay loam, loam, or clay loam; thin strata of sand or silt loam

2Cg or 2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—stratified sandy loam, loam, clay loam, sandy clay loam, or silt loam; thin strata of loamy sand, sand, or coarse sand

219A—Millbrook silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Millbrook and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils in which the color of the surface layer has value of 4 or 5
- Soils that have more sand in the subsoil
- Soils that have calcareous loamy till in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet

Dissimilar soils:
- The well drained Camden and similar soils; on summits and backslopes in positions above those of the Millbrook soil
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Millbrook soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Mona Series

Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part and very slow in the lower part
Landform: Ground moraines and glacial lakes (relict)
Parent material: Thin mantle of loess or other silty material and the underlying outwash and lacustrine deposits or till
Slope range: 2 to 5 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Typical pedon of Mona silt loam, 2 to 5 percent slopes, at an elevation of about 718 feet; Vermilion County, Illinois; about 130 feet south and 600 feet west of the northeast corner of sec. 20, T. 23 N., R. 13 W.; USGS East Lynn topographic quadrangle; lat. 40 degrees 26 minutes 36 seconds N. and long. 87 degrees 50 minutes 22 seconds W., NAD 27; UTM zone 16, 428808E and 4477307N, NAD 83:

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; common fine and medium roots; slightly acid; clear smooth boundary.
Bt1—11 to 15 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common fine and medium roots; common faint brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; slightly acid; clear smooth boundary.
2Bt2—15 to 22 inches; yellowish brown (10YR 5/4)

clay loam; moderate fine subangular blocky structure; friable; common medium to very fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; neutral; clear smooth boundary.

2Bt3—22 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few faint very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

2Bt4—31 to 39 inches; light olive brown (2.5Y 5/4) clay loam; weak medium subangular blocky structure; firm; few fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

3BC—39 to 44 inches; grayish brown (2.5Y 5/2) silty clay; weak coarse subangular blocky structure; very firm; few fine rounded white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; few fine irregular strong brown (7.5YR 5/8) weakly cemented iron oxide nodules throughout; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

3Cd—44 to 60 inches; grayish brown (2.5Y 5/2) silty clay; massive; very firm; few fine rounded white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; few fine irregular strong brown (7.5YR 5/8) weakly cemented iron oxide nodules throughout; common medium faint gray (10YR 5/1) iron depletions in the matrix; few fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; 3 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess: Less than 24 inches
Depth to densic contact: 36 to 54 inches
Depth to carbonates: 30 to 54 inches
Depth to the base of the argillic horizon: 30 to 54 inches
Particle-size control section: Averages 25 to 35 percent clay and 15 to 40 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Part of the Bt horizon that formed in loess (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam

Part of the Bt, BC, 2Bt, or 2BC horizon that formed in outwash:
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—clay loam, silty clay loam with more than 15 percent sand, or sandy clay loam

2BC, 2Cd, 3BC, or 3Cd horizon (formed in till or lacustrine deposits):
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay or clay

448B—Mona silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Mona and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that are moderately eroded and have a thinner surface layer
- Soils that have a surface layer of silty clay loam
- Soils that average more than 35 percent clay and less than 15 percent sand in the particle-size control section
- Soils that have stratified loamy outwash in the underlying material

• Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
• Soils that have slopes between 5 and 7 percent

Dissimilar soils:
• The poorly drained Bryce and similar soils; on toeslopes in positions below those of the Mona soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

• "Agronomy" section
• "Recreation" section
• "Wildlife Habitat" section
• "Engineering" section
• "Soil Properties" section

Muskego Series

Drainage class: Very poorly drained
Permeability: Moderately slow to moderately rapid in the upper part and slow in the lower part
Landform: Glacial lakes (relict) and stream terraces
Parent material: Colluvium and the underlying organic material over coprogenous earth
Slope range: 0 to 2 percent

Taxonomic classification: Coprogenous, euic, mesic Limnic Haplosaprists

Typical Pedon

Typical pedon of Muskego silty clay loam, 0 to 2 percent slopes, overwash, at an elevation of about 695 feet; Champaign County, Illinois; about 1 foot south and 1 foot west of the northeast corner of sec. 18, T. 22 N., R. 14 W.; USGS Penfield topographic quadrangle; lat. 40 degrees 22 minutes 14 seconds N. and long. 87 degrees 58 minutes 13 seconds W., NAD 27; UTM zone 16, 417638E and 4469343N, NAD 83:

Ap—0 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; massive; firm; few fine distinct brown (10YR 4/3) and few fine prominent reddish brown (5YR 4/3) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.
A—11 to 16 inches; black (N 2.5/0) silty clay loam, very dark gray (10YR 3/1) dry; weak medium platy structure parting to moderate fine subangular blocky; friable; few fine dark reddish brown (5YR 3/4) roots; few fine prominent dark reddish brown (2.5YR 3/4) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.
Oa1—16 to 23 inches; black (N 2.5/0) sapric material; about 4 percent fiber, 1 percent rubbed; moderate medium subangular blocky structure; friable; few fine dark reddish brown (5YR 3/4) roots; few fine prominent dark yellowish brown (10YR 3/4) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.
Oa2—23 to 31 inches; black (N 2.5/0) sapric material; about 6 percent fiber, 1 percent rubbed; weak medium subangular blocky structure; friable; common fine dark reddish brown (2.5YR 3/4) roots; few fine prominent reddish brown (5YR 4/4) masses of iron accumulation in the matrix; slightly acid; abrupt smooth boundary.
Oa3—31 to 50 inches; black (10YR 2/1) and very dark grayish brown (10YR 3/2) sapric material; about 30 percent fiber, 4 percent rubbed; weak medium platy structure; friable; neutral; abrupt smooth boundary.
Lco—50 to 70 inches; black (5Y 2.5/2) and olive gray (5Y 4/2) coprogenous earth; massive; friable; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of overwash material: 8 to 16 inches
Depth to coprogenous earth: 25 to 51 inches
Depth to carbonates: 25 to 51 inches
Depth to the base of soil development: 25 to 51 inches

Ap or A horizon:
Hue—10YR or neutral
Value—2
Chroma—0 or 1
Texture—silty clay loam

Oa horizon:
Hue—7.5YR, 10YR, or neutral
Value—2 or 3
Chroma—0 to 2

Lco horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 5
Chroma—1 to 3

637A+—Muskego silty clay loam, 0 to 2 percent slopes, overwash

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Glacial lakes (relict) and stream terraces
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Muskego and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that have more than 16 inches of overwash material
- Soils that have stratified loamy outwash or calcareous silty clay loam till in the underlying material

Dissimilar soils:
- The very poorly drained Peotone and similar fine textured mineral soils; on toeslopes in positions adjacent to those of the Muskego soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Ockley Series

Drainage class: Well drained
Permeability: Moderate in the upper part and very rapid in the lower part
Landform: Stream terraces and outwash plains
Parent material: Thin mantle of loess or other silty material and the underlying outwash over sand and very gravelly sand
Slope range: 2 to 10 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Ockley silt loam, 2 to 5 percent slopes, at an elevation of about 718 feet; Champaign County, Illinois; about 2,490 feet south and 80 feet east of the northwest corner of sec. 6, T. 22 N., R. 14 W.; USGS Rankin topographic quadrangle; lat. 40 degrees 23 minutes 33 seconds N. and long. 87 degrees 59 minutes 23 seconds W., NAD 27; UTM zone 16, 416000E and 4471779N, NAD 83:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak thick platy structure parting to moderate fine granular; friable; few faint brown (10YR 5/3) clay depletions on faces of peds; slightly acid; abrupt smooth boundary.

Bt1—10 to 19 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; moderately acid; clear smooth boundary.

2Bt2—19 to 24 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

2Bt3—24 to 35 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse prismatic structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; few medium distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

2Bt4—35 to 45 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) gravelly clay loam; weak medium subangular blocky structure; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common medium distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

3C1—45 to 53 inches; brown (10YR 4/3) gravelly loamy sand; massive; very friable; slightly effervescent; slightly alkaline; abrupt smooth boundary.

3C2—53 to 60 inches; brown (10YR 5/3) sand and gravel; single grain; loose; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: Less than 20 inches
Depth to sand and gravel: 40 to 72 inches
Depth to carbonates: 40 to 72 inches
Depth to the base of the argillic horizon: 40 to 72 inches
Particle-size control section: Averages 22 to 34 percent clay and 25 to 70 percent sand

Ap, A, or BA horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or clay loam in severely eroded pedons

Bt horizon, if it occurs (part formed in loess):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—silt loam or silty clay loam

Bt or 2Bt horizon, upper part (part formed in outwash):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—loam, clay loam, or sandy clay loam

Bt or 2Bt horizon, lower part:
Hue—5YR or 7.5YR
Value—3 or 4
Chroma—2 to 6
Texture—sandy clay loam, sandy loam, coarse sandy loam, or the gravelly or very gravelly analogs of these textures, clay loam, or gravelly clay loam

2BC horizon (if it occurs):
Hue—5YR or 7.5YR
Value—3 or 4
Chroma—2 to 6
Texture—sandy loam, coarse sandy loam, or the gravelly or very gravelly analogs of these textures

3C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—stratified gravelly or very gravelly loamy coarse sand or gravelly or very gravelly coarse sand; includes strata of loamy sand, coarse sand, sand, or extremely gravelly sand

387B—Ockley silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Stream terraces and outwash plains
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ockley and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils in which the color of the surface layer has value of 3
- Soils that are less than 40 inches deep to sand and gravel
- Soils that are more than 72 inches deep to sand and gravel
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The somewhat poorly drained Blount and similar soils; on summits and backslopes in positions above those of the Ockley soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

387C3—Ockley clay loam, 5 to 10 percent slopes, severely eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Stream terraces and outwash plains
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ockley and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that are less than 40 inches deep to sand and gravel
- Soils that have calcareous silty clay loam till in the underlying material
- Soils that have slopes between 10 and 12 percent

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Ockley soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Odell Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of Odell silt loam, 0 to 2 percent slopes, at an elevation of about 709 feet; Champaign County, Illinois; about 35 feet north and 1,240 feet west of the center of sec. 4, T. 21 N., R. 14 W.; USGS Penfield topographic quadrangle; lat. 40 degrees 18 minutes 24 seconds N. and long. 87 degrees 56 minutes 38 seconds W., NAD 27; UTM zone 16, 419788E and 4462214N, NAD 83:

Ap—0 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine and medium angular blocky structure; friable; neutral; abrupt smooth boundary.
Bt1—11 to 16 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; friable; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; neutral; clear smooth boundary.
2Bt2—16 to 21 inches; light olive brown (2.5Y 5/4) clay loam; moderate fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
2Bt3—21 to 26 inches; light olive brown (2.5Y 5/4) clay loam; moderate medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; neutral; clear smooth boundary.
2C—26 to 60 inches; light olive brown (2.5Y 5/4) loam; massive; firm; common fine prominent gray (N 6/0) iron depletions in the matrix; few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: Less than 18 inches
Depth to carbonates: 24 to 40 inches
Depth to the base of the argillic horizon: 24 to 40 inches
Particle-size control section: Averages 25 to 35 percent clay and 15 to 45 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam, clay loam, or loam

C or 2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—2 to 4
Texture—loam

490A—Odell silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Odell and similar soils: 92 percent
Dissimilar soils: 8 percent

Similar soils:
- Soils that have less sand in the subsoil
- Soils that are more than 40 inches deep to carbonates
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Odell soil
- The well drained Wyanet and similar soils; on summits and backslopes in positions above those of the Odell soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Onarga Series

Drainage class: Well drained
Permeability: Moderate or moderately rapid in the upper part and rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Eolian deposits
Slope range: 2 to 5 percent

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Typical pedon of Onarga sandy loam, 2 to 5 percent slopes, at an elevation of about 675 feet; Champaign County, Illinois; about 840 feet south and 2,525 feet west of the northeast corner of sec. 17, T. 19 N., R. 14 W.; USGS Homer topographic quadrangle; lat. 40 degrees 6 minutes 36 seconds N. and long. 87 degrees 58 minutes 4 seconds W., NAD 27; UTM zone 16, 417520E and 4440419N, NAD 83:

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak thin play structure parting to moderate fine granular; very friable; neutral; abrupt smooth boundary.
BA—12 to 16 inches; brown (10YR 4/3) sandy loam; weak fine subangular blocky structure; very friable; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.
Bt1—16 to 25 inches; brown (10YR 4/3) sandy clay loam; weak medium subangular blocky structure; very friable; common faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
Bt2—25 to 37 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium subangular blocky structure; very friable; common faint brown (10YR 4/3) clay films bridging sand grains; few faint very dark gray (10YR 3/1) organo-clay films lining root channels; neutral; gradual smooth boundary.
Bt3—37 to 49 inches; brown (10YR 5/3) sandy loam; weak medium subangular blocky structure; very friable; few faint brown (10YR 4/3) clay films bridging sand grains; slightly acid; clear smooth boundary.
E and Bt—49 to 65 inches; yellowish brown (10YR 5/4) sand (E); single grain; loose; brown (7.5YR 4/4) loamy sand (Bt); occurs as common lamellae that are 1 to 2 inches thick; massive; very friable; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: More than 60 inches
Depth to the base of the argillic horizon: 30 to more than 60 inches
Particle-size control section: Averages 15 to 18 percent clay and 45 to 70 percent sand

Ap or A horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—1 to 3
Texture—sandy loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6

Texture—loam, sandy loam, fine sandy loam, sandy clay loam, or clay loam

BC horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam, loamy sand, fine sandy loam, or loamy fine sand

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—stratified loamy fine sand, fine sand, fine sandy loam, loamy sand, sand, sandy loam, loam, and silt loam

150B—Onarga sandy loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Onarga and similar soils: 92 percent
Dissimilar soils: 8 percent

Similar soils:
- Soils that have a surface layer of loam
- Soils that average less than 15 percent clay in the upper part of the subsoil
- Soils that are moderately well drained or well drained and have a seasonal high water table within a depth of 6.5 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Onarga soil
- The somewhat poorly drained La Hogue and similar soils; on summits and footslopes in positions below those of the Onarga soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

802B—Orthents, loamy, undulating

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Slope range: 1 to 7 percent
Description: This map unit consists of soils that have been extensively modified by cutting, filling, and leveling. These soils are in residential and industrial areas, near interstate interchanges and airports, along railroads, and in fill areas.

Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Orthents, loamy, and similar soils: 85 percent
Dissimilar components: 15 percent

Similar soils:
- Soils that are moderately steep

Dissimilar components:
- Urban land and similar miscellaneous areas in positions adjacent to those of the Orthents

Soil Properties and Qualities

Parent material: Earthy fill
Drainage class: Moderately well drained and somewhat poorly drained
Permeability: Moderate to slow

Management

- Most areas are idle or are developed for residential or other nonfarm uses. The plant cover ranges from none in newly exposed areas to a good cover of sod in developed areas. Onsite investigation is needed to determine the limitations or hazards affecting the development of areas of this map unit for specific uses.

Ozaukee Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 30 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon

Typical pedon of Ozaukee silt loam, 2 to 4 percent slopes, at an elevation of about 780 feet; Du Page County, Illinois; about 2,540 feet north and 2,220 feet east of the southwest corner of sec. 31, T. 39 N., R. 10 E.; USGS Naperville topographic quadrangle; lat. 41 degrees 49 minutes 13 seconds N. and long. 88 degrees 8 minutes 29 seconds W., NAD 27; UTM zone 16, 405201E and 4630455N, NAD 83:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, yellowish brown (10YR 5/4) dry; moderate very fine and fine granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

BE—4 to 10 inches; brown (10YR 4/3) silt loam; weak medium platy structure parting to moderate fine subangular blocky; friable; many very fine roots; few distinct dark grayish brown (10YR 4/2) coatings on faces of peds; moderately acid; clear smooth boundary.

2Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 1 percent gravel; slightly acid; abrupt smooth boundary.

2Bt2—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films and brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent gravel; neutral; clear smooth boundary.

2Bt3—21 to 27 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt4—27 to 33 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 8 percent gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

2BCt—33 to 39 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine and medium subangular blocky structure; firm; common very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cd—39 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; very firm; few very fine roots; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in

the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; many medium white (10YR 8/1) carbonate concretions throughout; 6 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: Less than 18 inches
Depth to densic contact: 20 to 45 inches
Depth to carbonates: Less than 40 inches
Depth to the base of the argillic horizon: 20 to 45 inches
Particle-size control section: Averages 35 to 50 percent clay and less than 15 percent sand

Ap or A horizon:
Hue—10YR
Value—2 to 4; 2 or 3 in horizons less than 6 inches thick
Chroma—1 to 3
Texture—silt loam

BE or E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Bt horizon, if it occurs (part formed in loess):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—silt loam or silty clay loam

2Bt or 2BCt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam, silty clay, or clay

2Cd horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or clay loam

530B—Ozaukee silt loam, 2 to 4 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ozaukee and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that are moderately eroded and in which the surface layer is mixed with subsoil material
- Soils that have less clay and more sand in the subsoil
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes of 5 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

530C2—Ozaukee silt loam, 4 to 6 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: End moraines and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ozaukee and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that are not moderately eroded and have a thicker surface layer
- Soils that have less clay and more sand in the subsoil
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530D2—Ozaukee silt loam, 6 to 12 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: End moraines and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ozaukee and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have less clay and more sand in the subsoil
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

530E2—Ozaukee silt loam, 12 to 20 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: End moraines and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Ozaukee and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that have a thinner surface layer and subsoil
- Soils that have less clay and more sand in the subsoil
- Soils that have stratified loamy and sandy outwash in the underlying material

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Ozaukee soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Pella Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and ground moraines
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Typical pedon of Pella silty clay loam, 0 to 2 percent slopes, at an elevation of about 613 feet; Bureau County, Illinois; about 1,820 feet south and 320 feet east of the northwest corner of sec. 30, T. 17 N., R. 6 E.; USGS Mineral topographic quadrangle; lat. 41 degrees 26 minutes 25 seconds N. and long. 89 degrees 51 minutes 32 seconds W., NAD 27; UTM zone 16, 261149E and 4591584N, NAD 83:

Ap—0 to 8 inches; black (N 2.5/0) silty clay loam, black (10YR 2/1) dry; moderate medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

A1—8 to 18 inches; black (N 2.5/0) silty clay loam, black (10YR 2/1) dry; moderate medium subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.

A2—18 to 23 inches; black (N 2.5/0) silty clay loam, black (10YR 2/1) dry; moderate fine subangular blocky structure; friable; few fine roots; few fine prominent brown (10YR 4/3) and few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few snail shells; neutral; clear smooth boundary.

Bg1—23 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure; friable; few fine roots; black (N 2.5/0) krotovinas at a depth of 26 to 31 inches; many medium prominent yellowish red (5YR 5/8) and few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few snail shells; neutral; clear smooth boundary.

2Bg2—35 to 46 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common medium prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common snail shells; 15 percent fine sand; strongly effervescent; slightly alkaline; clear smooth boundary.

2BCg—46 to 50 inches; grayish brown (10YR 5/2), stratified silt loam and loam; weak medium prismatic structure; friable; common medium prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; common snail shells; strongly effervescent; slightly alkaline; clear smooth boundary.

2Cg—50 to 60 inches; dark grayish brown (2.5Y 4/2), stratified silt loam and sandy loam; massive; friable; common medium prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess: 20 to 40 inches
Depth to carbonates: 16 to 40 inches
Depth to the base of the cambic horizon: 30 to 50 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

Bg or Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam

2Bg, 2Btg, or 2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—silty clay loam, clay loam, silt loam, or loam or stratified with these textures or with sandy loam, loamy sand, or sand

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—stratified silt loam, loam, silty clay loam, clay loam, or sandy loam; thin strata of sand or loamy sand

153A—Pella silty clay loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Pella and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that have a mollic epipedon more than 24 inches thick
- Soils that have a surface soil of silty clay
- Soils that have a subsoil of silty clay
- Soils that are more than 40 inches deep to carbonates
- Soils that have less sand in the underlying material

Dissimilar soils:
- The moderately well drained Catlin and similar soils; on summits and backslopes in positions above those of the Pella soil
- The somewhat poorly drained Elburn and similar soils that are not subject to ponding; on summits and footslopes in positions above those of the Pella soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Penfield Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and ground moraines
Parent material: Outwash
Slope range: 2 to 10 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Taxadjunct features: Penfield loam, 5 to 10 percent slopes, eroded, has a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soil. This soil is classified as fine-loamy, mixed, superactive, mesic Mollic Hapludalfs.

Typical Pedon

Typical pedon of Penfield loam, 2 to 5 percent slopes, at an elevation of about 685 feet; Champaign County, Illinois; about 910 feet south and 465 feet west of the northeast corner of sec. 30, T. 20 N., R. 14 W.; USGS Royal topographic quadrangle; lat. 40 degrees 10 minutes 6 seconds N. and long. 87 degrees 58 minutes 50 seconds W., NAD 27; UTM zone 16, 416502E and 4446906N, NAD 83:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.
Bt1—10 to 14 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure parting to moderate very fine subangular blocky; friable; common distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; neutral; clear smooth boundary.
Bt2—14 to 20 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine prismatic structure parting to moderate very fine angular blocky; firm; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; neutral; clear smooth boundary.
Bt3—20 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; many distinct dark brown (10YR 3/3) organo-clay films on faces of peds; 5 percent fine gravel; neutral; abrupt smooth boundary.
Bt4—31 to 44 inches; 80 percent dark yellowish brown (10YR 4/4) sandy clay loam and 20 percent yellowish brown (10YR 5/6) fine sandy loam; moderate coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.
Bt5—44 to 51 inches; yellowish brown (10YR 5/4) sandy clay loam; weak coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; common medium

black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg—51 to 61 inches; 60 percent light brownish gray (10YR 6/2) and 40 percent yellowish brown (10YR 5/6) sandy clay loam; weak coarse prismatic structure parting to weak coarse angular blocky; friable; common distinct very dark gray (10YR 3/1) organo-clay films along root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; neutral; clear smooth boundary.

BCt—61 to 72 inches; strong brown (7.5YR 5/6), stratified fine sandy loam and sandy clay loam; weak coarse angular blocky structure; friable; common distinct very dark gray (10YR 3/1) organo-clay films along root channels and pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent light brownish gray (10YR 6/2) iron depletions in the matrix; common medium faint yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

C—72 to 80 inches; yellowish brown (10YR 5/4 and 5/6) fine sandy loam; massive; very friable; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: Less than 22 inches
Depth to carbonates: 35 to more than 80 inches
Depth to the base of the argillic horizon: 25 to 65 inches
Particle-size control section: Averages 20 to 32 percent clay and 15 to 55 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—loam

Bt or Btg horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 8 in the upper part; 2 to 6 in the lower part
Texture—clay loam, sandy clay loam, sandy loam, loam, or silty clay loam

BCt or BC horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—2 to 6
Texture—fine sandy loam, sandy loam, very fine sandy loam, loam, sandy clay loam, or clay loam

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—1 to 6
Texture—stratified sandy clay loam, silt loam, loam, very fine sandy loam, fine sandy loam, sandy loam, loamy sand, fine sand, or sand

687B—Penfield loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Penfield and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less sand and more silt in the subsoil
- Soils that have calcareous loamy till in the underlying material
- Soils that do not have a seasonal high water table within a depth of 6.5 feet
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Penfield soil
- The somewhat poorly drained La Hogue and similar soils; on summits and footslopes in positions below those of the Penfield soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section

- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

687C2—Penfield loam, 5 to 10 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Penfield and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that are not moderately eroded and have a thicker surface layer
- Soils that are severely eroded and have more clay in the surface layer
- Soils that have less sand and more silt in the subsoil
- Soils that have calcareous loamy till in the underlying material
- Soils that do not have a seasonal high water table within a depth of 6.5 feet

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Penfield soil
- The somewhat poorly drained La Hogue and similar soils; on summits and footslopes in positions below those of the Penfield soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Peotone Series

Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Ground moraines and outwash plains
Parent material: Colluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon

Typical pedon of Peotone silty clay loam, 0 to 2 percent slopes, at an elevation of about 707 feet; Ford County, Illinois; about 315 feet south and 2,233 feet east of the northwest corner of sec. 21, T. 29 N., R. 9 E.; USGS Cabery topographic quadrangle; lat. 40 degrees 48 minutes 58 seconds N. and long. 88 degrees 12 minutes 2 seconds W., NAD 27; UTM zone 16, 398746E and 4519041N, NAD 83:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

A—7 to 13 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

Bg1—13 to 27 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.

Bg2—27 to 41 inches; dark gray (10YR 4/1) silty clay; moderate fine prismatic structure; firm; common very fine roots; common fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Bg3—41 to 50 inches; dark gray (10YR 4/1) silty clay; moderate medium prismatic structure; few very fine roots; firm; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Cg—50 to 60 inches; dark gray (10YR 4/1) silty clay loam; massive; firm; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to the base of the cambic horizon: 38 to 60 inches
Particle-size control section: Averages 35 to 45 percent clay and less than 10 percent fine sand

Ap, A, AB, or BA horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 to 4 in the upper part; 4 to 6 in the lower part
Chroma—0 to 2
Texture—silty clay loam or silty clay; silt loam in the lower part in some pedons

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—typically silty clay loam; silt loam or silty clay in some pedons

330A—Peotone silty clay loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and outwash plains
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Peotone and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have a mollic epipedon less than 24 inches thick
- Soils that have a surface soil of silt loam
- Soils that have coprogenous earth in the underlying material

Dissimilar soils:
- The somewhat poorly drained Elliott and similar soils that are not subject to ponding; on summits and footslopes in positions above those of the Peotone soil
- The moderately well drained Varna soils; on backslopes in positions above those of the Peotone soil
- The well drained Wyanet soils; on backslopes in positions above those of the Peotone soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

865—Pits, gravel

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Description: This map unit consists of excavations from which gravel has been removed.

Composition

Pits, gravel, and similar components: 85 percent
Dissimilar components: 15 percent

Similar components:
- Pits, sand

Dissimilar components:
- Natural soils in border areas that have not been disturbed by mining operations
- Orthents, loamy, in areas where mine spoil has been mixed with soil material
- Water areas less than 3 acres in size

Management

- If reclaimed, some abandoned pits are suitable for recreational uses, such as hiking and fishing, or for commercial and industrial uses. Topdressing and grading generally are needed to establish vegetation. The feasibility of reclamation depends on the condition at the site and the proposed alternative use. Onsite investigation is needed to plan the development for a specific use.

Proctor Series

Drainage class: Well drained
Permeability: Moderate in the upper part and

moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess and the underlying outwash
Slope range: 0 to 10 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Typical pedon of Proctor silt loam, 2 to 5 percent slopes, eroded, at an elevation of about 700 feet; McLean County, Illinois; about 2,300 feet south and 1,000 feet east of the northwest corner of sec. 21, T. 23 N., R. 1 E.; USGS Bloomington West topographic quadrangle; lat. 40 degrees 26 minutes 13 seconds N. and long. 89 degrees 6 minutes 40 seconds W., NAD 27; UTM zone 16, 320937E and 4478400N, NAD 83:

Ap1—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; few fine roots; slightly alkaline; clear wavy boundary.
Ap2—5 to 11 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; mixed with pockets of brown (10YR 4/3) subsoil material; weak fine angular blocky structure; friable; few fine roots; slightly alkaline; abrupt smooth boundary.
Bt1—11 to 20 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; common faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; slightly acid; clear wavy boundary.
Bt2—20 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; slightly acid; clear wavy boundary.
2Bt3—26 to 35 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; few fine pebbles; slightly acid; clear wavy boundary.
2BC—35 to 40 inches; strong brown (7.5YR 4/6) sandy clay loam; weak fine and medium subangular blocky structure; friable; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; few fine pebbles; neutral; clear wavy boundary.
2C—40 to 60 inches; mixed dark yellowish brown (10YR 4/4) and strong brown (7.5YR 4/6) sandy loam; massive; friable; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; few fine pebbles; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: 20 to 40 inches
Depth to carbonates: 40 to more than 65 inches
Depth to the base of the argillic horizon: 40 to 65 inches
Particle-size control section: Averages 25 to 35 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt or BA horizon:
Hue—7.5YR or 10YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam, silt loam, clay loam, sandy clay loam, loam, or sandy loam or stratified with these textures

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—commonly stratified sandy loam, loam, or silt loam; thin strata of loamy sand or sand

148B2—Proctor silt loam, 2 to 5 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit,

such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Proctor and similar soils: 90 percent
Dissimilar soils: 10 percent

Similar soils:
- Soils that have more than 40 inches of loess
- Soils that are moderately well drained or well drained and have a seasonal high water table within a depth of 6.5 feet

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Proctor soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Raub Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Typical pedon of Raub silt loam, 0 to 2 percent slopes, at an elevation of about 680 feet; Champaign County, Illinois; about 2,550 feet north and 1,690 feet east of the southwest corner of sec. 19, T. 20 N., R. 14 W.; USGS Royal topographic quadrangle; lat. 40 degrees 10 minutes 40 seconds N. and long. 87 degrees 59 minutes 18 seconds W., NAD 27; UTM zone 16, 415855E and 4447961N, NAD 83:

Ap—0 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and very fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

A—10 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; slightly acid; clear smooth boundary.

Bt1—18 to 22 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few distinct very dark gray (10YR 3/1) organo-clay films lining pores; many distinct grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary.

Bt2—22 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine and medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct dark grayish brown (10YR 4/2) and few fine faint brown (10YR 5/3) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; slightly acid; clear smooth boundary.

2Bt3—32 to 40 inches; yellowish brown (10YR 5/4) clay loam; weak medium subangular blocky structure; firm; common distinct black (10YR 2/1) organo-clay films lining root channels; few coarse prominent light olive gray (5Y 6/2) iron depletions in the matrix; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine pebbles; neutral; clear smooth boundary.

2BC—40 to 50 inches; yellowish brown (10YR 5/4) clay loam; weak medium and coarse subangular blocky structure; firm; many medium distinct gray (10YR 5/1) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular black (7.5YR 2.5/1) very weakly cemented iron and manganese oxide nodules throughout; few fine pebbles; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—50 to 60 inches; yellowish brown (10YR 5/4) and gray (5Y 6/1) loam; massive; firm; common fine distinct and prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 22 to 40 inches

Depth to carbonates: 40 to 70 inches
Depth to the base of the argillic horizon: 40 to 70 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 15 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—2 to 8
Texture—silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, or silty clay loam

2BC or 2C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—loam or clay loam

481A—Raub silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Raub and similar soils: 96 percent
Dissimilar components: 4 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have less than 22 inches of loess
- Soils that have stratified loamy and sandy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar components:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Raub soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Raub soil
- The well drained Wyanet and similar soils; on summits and backslopes in positions above those of the Raub soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Rossburg Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls

Typical Pedon

Typical pedon of Rossburg silt loam, 0 to 2 percent slopes, frequently flooded, at an elevation of about 689 feet; Champaign County, Illinois; about 1,790 feet north and 225 feet west of the southeast corner of sec. 22, T. 21 N., R. 7 E.; USGS Foosland topographic quadrangle; lat. 40 degrees 15 minutes 27 seconds N. and long. 88 degrees 23 minutes 8 seconds W., NAD 27; UTM zone 16, 382170E and 4457259N, NAD 83:

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; neutral; clear smooth boundary.
A—10 to 21 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; common medium brown (10YR 4/3) flecks of material from the B horizon; moderate fine subangular blocky structure; friable; neutral; clear smooth boundary.
Bw1—21 to 31 inches; brown (10YR 4/3) loam; moderate medium subangular blocky structure; friable; few faint very dark gray (10YR 3/1) organic

coatings lining pores; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.
Bw2—31 to 55 inches; brown (10YR 4/3) loam; weak medium prismatic structure; friable; common faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; gradual smooth boundary.
C—55 to 63 inches; brown (10YR 4/3) loam; massive; friable; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 24 to more than 60 inches
Depth to the base of the cambic horizon: 24 to 60 inches
Particle-size control section: Averages 18 to 27 percent clay and 15 to 35 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bw horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam, loam, or sandy loam

C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—loam, silt loam, or sandy loam or stratified with these textures

3473A—Rossburg silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Flood plains

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Rossburg and similar soils: 92 percent
Dissimilar soils: 8 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have a surface soil of loam or sandy loam
- Soils that have more sand in the subsoil
- Soils that have calcareous sand and gravel in the underlying material
- Soils that are subject to occasional flooding

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Rossburg soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Russell Series

Drainage class: Well drained
Permeability: Moderate in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 2 to 18 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Russell silt loam, 5 to 10 percent slopes, eroded, at an elevation of about 738 feet; Edgar County, Illinois; about 115 feet north and 235 feet west of the center of sec. 18, T. 12 N., R. 13 W.; USGS Westfield East topographic quadrangle; lat. 39 degrees 29 minutes 24 seconds N. and long. 87 degrees 53 minutes 53 seconds W., NAD 27; UTM zone 16, 422772E and 4371544N, NAD 83:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; mixed with few yellowish brown (10YR 5/4) pockets of subsoil material in the lower part; moderate very fine and fine granular structure; friable; many very fine roots; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; slightly acid; abrupt smooth boundary.

Bt1—7 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; very strongly acid; clear smooth boundary.

Bt2—13 to 21 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; common very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; very strongly acid; clear smooth boundary.

Bt3—21 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct light yellowish brown (10YR 6/4) clay depletions on faces of peds; common distinct brown (7.5YR 4/4) clay films on faces of peds; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; very strongly acid; clear smooth boundary.

2Bt4—27 to 36 inches; yellowish brown (10YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine roots; common distinct light yellowish brown (10YR 6/4) clay depletions on faces of peds; few distinct brown (7.5YR 4/4) clay films on faces of peds; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine pebbles; neutral; clear smooth boundary.

2Bt5—36 to 56 inches; strong brown (7.5YR 5/6) clay loam; weak coarse subangular blocky structure; firm; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark brown (10YR 3/3) organo-clay films lining root channels and pores; few prominent black (10YR 2/1) iron and manganese oxide coatings on faces of peds; few fine and medium rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine gravel; neutral; gradual smooth boundary.

2C—56 to 72 inches; yellowish brown (10YR 5/4) loam; massive; firm; few fine rounded black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine gravel; very slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: 20 to 40 inches
Depth to carbonates: 40 to 60 inches
Depth to the base of the argillic horizon: 40 to 60 inches
Particle-size control section: Averages 27 to 33 percent clay and less than 15 percent sand

Ap or A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, loam, or silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—5
Chroma—3 to 6
Texture—loam

322C2—Russell silt loam, 5 to 10 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Russell and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils in which the color of the surface layer has value of 3
- Soils that have less than 20 inches of loess
- Soils that have carbonates within a depth of 40 inches
- Soils that are moderately well drained or well drained and have a seasonal high water table within a depth of 6.5 feet
- Soils that are slightly less sloping or slightly more sloping

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Russell soil
- The somewhat poorly drained Sabina and similar soils; on summits in positions above those of the Russell soil or on footslopes in positions below those of the Russell soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Sabina Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Aeric Epiaqualfs

Typical Pedon

Typical pedon of Sabina silt loam, 0 to 2 percent slopes, at an elevation of about 665 feet; Douglas County, Illinois; about 1,785 feet north and 36 feet east of the southwest corner of sec. 13, T. 16 N., R. 7 E.; USGS Tuscola topographic quadrangle; lat. 39 degrees 50 minutes 25 seconds N. and long. 88 degrees 22 minutes 5 seconds W., NAD 27; UTM zone 16, 382945E and 4410929N, NAD 83:

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam, pale brown (10YR 6/3) dry; weak very fine granular structure; friable; few fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; moderately acid; abrupt smooth boundary.

E—6 to 8 inches; brown (10YR 5/3) silt loam; weak thin platy structure; friable; few fine and medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; moderately acid; clear smooth boundary.

Btg1—8 to 12 inches; light brownish gray (2.5Y 6/2) silty clay loam; moderate fine prismatic structure parting to moderate very fine angular blocky; firm; few prominent light gray (10YR 7/2 dry) clay depletions on faces of peds; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.

Btg2—12 to 19 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate fine angular blocky; very firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very strongly acid; clear wavy boundary.

Btg3—19 to 33 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few prominent very dark gray (10YR 3/1) organo-clay films in pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.

Btg4—33 to 40 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; few prominent very dark gray (10YR 3/1) organo-clay films in pores; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; many medium prominent yellowish

brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear wavy boundary.

2Btg5—40 to 47 inches; grayish brown (2.5YR 5/2) clay loam; moderate coarse prismatic structure parting to weak coarse angular blocky; very firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint gray (10YR 6/1) iron depletions in the matrix; 5 percent gravel; slightly effervescent; slightly alkaline; abrupt wavy boundary.

2C—47 to 80 inches; light olive brown (2.5Y 5/3) clay loam; massive; very firm; common medium irregular white (10YR 8/1) very weakly cemented calcium carbonate nodules throughout; common medium rounded black (7.5YR 2.5/1) moderately cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct gray (10YR 6/1) iron depletions in the matrix; 7 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Depth to carbonates: 40 to more than 60 inches
Depth to the base of the argillic horizon: 44 to more than 60 inches
Particle-size control section: Averages 35 to 42 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—3 to 5; 3 in A horizons less than 5 inches thick
Chroma—2
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—1 to 3
Texture—silt loam

BE horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

Btg or Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Btg, 2Bt, 2BCg, or 2BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 4
Texture—clay loam, loam, silt loam, or silty clay loam

2C or 2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 4
Texture—loam, clay loam, silt loam, or silty clay loam

236A—Sabina silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Sabina and similar soils: 90 percent
Dissimilar components: 10 percent

Similar soils:
- Soils that are less than 40 inches deep to carbonates
- Soils that have stratified loamy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar components:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Sabina soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Sabina soil

Management

For general and detailed information about

managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sawmill Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls

Typical Pedon

Typical pedon of Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded, at an elevation of about 535 feet; Sangamon County, Illinois; about 300 feet south and 750 feet east of the northwest corner of sec. 20, T. 15 N., R. 4 W.; USGS New City topographic quadrangle; lat. 39 degrees 44 minutes 34 seconds N. and long. 89 degrees 34 minutes 15 seconds W., NAD 27; UTM zone 16, 279712E and 4402375N, NAD 83:

Ap—0 to 10 inches; very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) silty clay loam, gray (10YR 5/1) dry; weak fine subangular blocky structure; firm; few fine roots; few subrounded pebbles 1 to 3 mm in diameter; slightly acid; clear smooth boundary.

A1—10 to 17 inches; black (10YR 2/1) and very dark grayish brown (10YR 3/2) silty clay loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; firm; few fine roots; few subrounded pebbles 1 to 3 mm in diameter; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

A2—17 to 25 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium angular blocky structure; firm; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

AB—25 to 32 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium prismatic structure parting to moderate fine subangular blocky; firm; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg—32 to 40 inches; dark gray (10YR 4/1) silty clay loam; weak medium prismatic structure parting to moderate fine and medium angular blocky; firm; common faint discontinuous very dark gray (10YR 3/1) organic coatings on faces of peds; few fine roots; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining root channels and pores; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Btg1—40 to 49 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese concretions with diffuse boundaries lining root channels and pores; few fine prominent strong brown (7.5YR 5/6) and common fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Btg2—49 to 58 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure; firm; thin continuous gray (10YR 5/1) clay films on faces of peds; few fine rounded black (7.5YR 2.5/1) weakly cemented iron and manganese oxide concretions with diffuse boundaries lining pores; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

Cg—58 to 65 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; very dark gray (10YR 3/1) channel linings and fillings; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation lining pores; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: 36 to more than 60 inches

Depth to the base of the cambic horizon: 36 to 60 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 15 percent sand

Ap, A, or AB horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam

Bg or Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—dominantly silty clay loam but ranges to clay loam or loam in the lower part; strata of silt loam or sandy loam in some pedons

BCg or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam or clay loam; commonly stratified with loam, silt loam, sandy loam, or silty clay

3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Flood plains

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Sawmill and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have a mollic epipedon more than 36 inches thick
- Soils that have a surface soil of loam or clay loam
- Soils that have silt loam or silty clay loam overwash material that is lighter in color
- Soils that are subject to occasional flooding

Dissimilar soils:
- The well drained Alvin and similar soils; on summits and backslopes in positions above those of the Sawmill soil
- The well drained Rossburg and similar soils; in the higher positions on the flood plains

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Selma Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Typical pedon of Selma loam, 0 to 2 percent slopes, at an elevation of about 660 feet; Lee County, Illinois; about 2,511 feet south and 150 feet west of the northeast corner of sec. 3, T. 20 N., R. 8 E.; USGS Harmon topographic quadrangle; lat. 41 degrees 50 minutes 5 seconds N. and long. 89 degrees 33 minutes 45 seconds W., NAD 27; UTM zone 16, 287215E and 4634604N, NAD 83:

Ap—0 to 7 inches; black (N 2.5/0) loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; friable; few fine roots; few fine pebbles; neutral; abrupt smooth boundary.
A—7 to 12 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; few fine roots; few fine pebbles; neutral; clear smooth boundary.
AB—12 to 23 inches; very dark gray (10YR 3/1) loam, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure parting to moderate fine granular; friable; few fine roots; few fine pebbles; few dark gray (10YR 4/1) pockets of subsoil material mixed by animal activity; neutral; clear smooth boundary.

Bg1—23 to 28 inches; dark gray (5Y 4/1) loam; weak medium prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine pebbles; neutral; clear smooth boundary.
Bg2—28 to 35 inches; olive gray (5Y 5/2) silt loam; moderate medium prismatic structure parting to moderate fine subangular blocky; friable; few fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; krotovinas between depths of 33 and 35 inches; neutral; clear smooth boundary.
Bg3—35 to 41 inches; olive gray (5Y 5/2) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; few fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.
BCg—41 to 53 inches; olive gray (5Y 5/2) sandy loam; weak medium prismatic structure; very friable; few fine roots; krotovinas between depths of 43 and 44 inches; few fine and medium pebbles; slightly alkaline; clear smooth boundary.
Cg—53 to 60 inches; olive gray (5Y 5/2), stratified sandy loam and loamy sand; massive; very friable; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; krotovinas between depths of 54 and 56 inches; few fine and medium pebbles; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to the base of the cambic horizon: 35 to 55 inches
Particle-size control section: Averages 20 to 30 percent clay and 25 to 45 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam

Bg or BCg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—loam, clay loam, silty clay loam, silt loam, sandy clay loam, fine sandy loam, or sandy loam

Cg or C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 6
Texture—stratified sandy loam, loam, silt loam, loamy sand, or sand

125A—Selma loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Selma and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that have less sand and more silt in the surface layer and subsoil
- Soils that have calcareous loamy till in the underlying material

Dissimilar soils:
- The somewhat poorly drained La Hogue and similar soils that are not subject to ponding; on summits and footslopes in positions above those of the Selma soil
- The well drained Penfield and similar soils; on summits and backslopes in positions above those of the Selma soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Senachwine Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Landform: Ground moraines and end moraines

Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 35 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Typical pedon of Senachwine silt loam, 10 to 18 percent slopes, eroded, at an elevation of about 863 feet; Bureau County, Illinois; about 1,300 feet south and 860 feet west of the northeast corner of sec. 21, T. 15 N., R. 8 E.; USGS Wyanet topographic quadrangle; lat. 41 degrees 16 minutes 25 seconds N. and long. 89 degrees 34 minutes 18 seconds W., NAD 27; UTM zone 16, 284598E and 4572325N, NAD 83:

Ap—0 to 6 inches; mixed dark brown (10YR 4/3) and yellowish brown (10YR 5/4) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.
Bt1—6 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; moderately acid; clear smooth boundary.
2Bt2—15 to 28 inches; brown (7.5YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint brown (7.5YR 4/4) clay films on faces of peds; few fine rounded black (N 2.5/0) weakly cemented iron and manganese oxide concretions throughout; neutral; clear smooth boundary.
2BCt—28 to 34 inches; brown (7.5YR 5/4) loam; weak coarse prismatic structure; firm; few fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds; 5 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2C—34 to 60 inches; brown (7.5YR 5/4) loam; massive; firm; 5 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: Less than 18 inches
Depth to carbonates: 20 to 40 inches
Depth to the base of the argillic horizon: 24 to 40 inches
Particle-size control section: Averages 27 to 35 percent clay and 15 to 40 percent sand

Ap or A horizon:
Hue—10YR
Value—3 to 5; 3 in A horizons less than 6 inches thick
Chroma—1 to 4
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam

Bt or 2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—clay loam or silty clay loam

2BCt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—clay loam or loam

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6
Chroma—3 or 4
Texture—clay loam or loam

618B—Senachwine silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Senachwine and similar soils: 95 percent
Dissimilar components: 5 percent

Similar soils:
- Soils that have less sand in the subsoil
- Soils that are more than 40 inches deep to carbonates

Dissimilar components:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Senachwine soil
- The somewhat poorly drained Sabina and similar soils; on summits in positions above those of the

Senachwine soil or on footslopes in positions below those of the Senachwine soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Senachwine soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

618C2—Senachwine silt loam, 5 to 10 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Senachwine and similar soils: 97 percent
Dissimilar components: 3 percent

Similar soils:
- Soils that are severely eroded and have a surface layer of clay loam or silty clay loam
- Soils that have less sand in the subsoil
- Soils that are more than 40 inches deep to carbonates

Dissimilar components:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Senachwine soil
- Urban land and similar miscellaneous areas in positions adjacent to those of the Senachwine soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

618D2—Senachwine silt loam, 10 to 18 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Senachwine and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that have carbonates within a depth of 20 inches
- Soils that have more clay and less sand in the underlying material
- Soils that have stratified loamy outwash in the underlying material

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Senachwine soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Forestland" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

618E2—Senachwine silt loam, 18 to 25 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: End moraines and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Senachwine and similar soils: 96 percent
Dissimilar soils: 4 percent

Similar soils:
- Soils that have carbonates within a depth of 20 inches
- Soils that have more clay and less sand in the underlying material
- Soils that have stratified loamy outwash in the underlying material

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Senachwine soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

618F—Senachwine silt loam, 18 to 35 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Senachwine and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that have more sand in the surface layer
- Soils that have carbonates within a depth of 20 inches
- Soils that have more clay and less sand in the underlying material
- Soils that have stratified loamy outwash in the underlying material

Dissimilar soils:
- The poorly drained Sawmill and similar soils; on flood plains in positions below those of the Senachwine soil
- The moderately well drained Xenia and similar soils; on gently sloping summits and backslopes in positions above those of the Senachwine soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Sunbury Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Aquollic Hapludalfs

Typical Pedon

Typical pedon of Sunbury silt loam, 0 to 2 percent slopes, at an elevation of about 680 feet; Douglas County, Illinois; about 1,270 feet north and 1,410 feet east of the southwest corner of sec. 19, T. 16 N., R. 7 E.; USGS Atwood topographic quadrangle; lat. 39 degrees 49 minutes 28 seconds N. and long. 88

degrees 27 minutes 33 seconds W., NAD 27; UTM zone 16, 375120E and 4409295N, NAD 83:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots throughout; slightly acid; clear smooth boundary.

E—8 to 12 inches; brown (10YR 5/3) silt loam; moderate thin and medium platy structure parting to moderate fine granular; friable; common very fine roots throughout; moderately acid; clear smooth boundary.

BE—12 to 15 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; firm; common very fine and fine roots throughout; many distinct light gray (10YR 7/2 dry) clay depletions on faces of peds; moderately acid; clear smooth boundary.

Bt1—15 to 25 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots between peds; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; common fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Bt2—25 to 36 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium and coarse subangular blocky; firm; common fine roots between peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct black (10YR 3/1) organo-clay films on faces of peds; few medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; few medium distinct dark gray (10YR 4/1) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bt3—36 to 43 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to weak coarse subangular blocky; friable; few very fine and fine roots between peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct black (10YR 3/1) organo-clay films on faces of peds and in pores; common medium rounded and irregular black (7.5YR 2.5/1) iron and manganese oxide nodules throughout; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; clear smooth boundary.

2Btg—43 to 47 inches; grayish brown (10YR 5/2) loam; weak coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct black (10YR 3/1) organo-clay films on faces of peds and in pores; few fine and medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent fine gravel; slightly alkaline; abrupt smooth boundary.

2Cg—47 to 72 inches; 50 percent grayish brown (10YR 5/2) and 50 percent yellowish brown (10YR 5/6) loam; massive; firm; common fine and medium rounded white (10YR 8/1) weakly cemented calcium carbonate nodules throughout; few fine and medium irregular black (7.5YR 2.5/1) weakly cemented iron and manganese oxide nodules throughout; 3 percent fine gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Depth to carbonates: 45 to 60 inches
Depth to the base of the argillic horizon: 45 to 65 inches
Particle-size control section: Averages 35 to 45 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR or 2.5Y
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon:
Hue—10YR
Value—3 to 5
Chroma—2 or 3
Texture—silt loam

BE horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—silt loam or silty clay loam

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6

Chroma—2 to 4
Texture—silty clay loam or silty clay

2Btg or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—loam, clay loam, silt loam, or silty clay loam

2Cg or 2C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 to 8
Texture—loam, clay loam, silt loam, or silty clay loam

234A—Sunbury silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Sunbury and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have a mollic epipedon
- Soils that have carbonates within a depth of 45 inches
- Soils that have stratified loamy outwash in the underlying material
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of 3 percent

Dissimilar soils:
- The poorly drained Drummer and similar soils that are subject to ponding; on toeslopes in positions below those of the Sunbury soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Swygert Series

Drainage class: Somewhat poorly drained
Permeability: Slow in the upper part and very slow in the lower part
Landform: Ground moraines and glacial lakes (relict)
Parent material: Thin mantle of loess or other silty material and the underlying lacustrine deposits and till
Slope range: 0 to 6 percent

Taxonomic classification: Fine, mixed, superactive, mesic Aquertic Argiudolls

Taxadjunct features: Swygert silty clay loam, 2 to 4 percent slopes, eroded, and Swygert silty clay loam, 4 to 6 percent slopes, eroded, have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine, mixed, superactive, mesic Aquertic Hapludalfs.

Typical Pedon

Typical pedon of Swygert silty clay loam, 0 to 2 percent slopes, at an elevation of about 675 feet; Iroquois County, Illinois; about 339 feet south and 66 feet east of the northwest corner of sec. 7, T. 25 N., R. 13 W.; USGS Onarga East topographic quadrangle; lat. 40 degrees 38 minutes 36 seconds N. and long. 87 degrees 53 minutes 2 seconds W., NAD 27; UTM zone 16, 425261E and 4499544N, NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; many fine roots; slightly acid; abrupt wavy boundary.
A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium angular blocky structure parting to weak fine subangular blocky; friable; many fine roots; common black (N 2.5/0) krotovinas; slightly acid; abrupt smooth boundary.
Bt1—12 to 18 inches; very dark grayish brown (10YR 3/2) silty clay, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; many fine roots; many distinct black (10YR 2/1) and very dark gray (10YR 3/1) organo-clay films on faces of peds; common fine black (10YR 2/1) iron and

manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.

Bt2—18 to 26 inches; brown (10YR 4/3) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct olive gray (5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt3—26 to 31 inches; yellowish brown (10YR 5/4) silty clay; moderate medium prismatic structure parting to weak medium and fine angular blocky; firm; common fine roots; common distinct very dark gray (10YR 3/1) organo-clay films in root channels; common distinct dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; common very dark gray (10YR 3/1) krotovinas; slightly effervescent (7 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2Bt4—31 to 41 inches; light olive brown (2.5Y 5/4) silty clay; moderate medium prismatic structure parting to weak coarse angular blocky; very firm; few fine roots; common prominent very dark gray (10YR 3/1) organo-clay films and gray (5Y 5/1) clay films on faces of peds; common medium prominent gray (5Y 5/1) iron depletions in the matrix; slightly effervescent (16 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2Bt5—41 to 51 inches; light olive brown (2.5Y 5/4) silty clay; weak coarse prismatic structure; very firm; few fine roots; common distinct very dark gray (5Y 3/1) organo-clay films in root channels; many distinct dark gray (5Y 4/1) clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; few fine distinct olive (5Y 5/6) and prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine prominent gray (5Y 5/1) iron depletions in the matrix; strongly effervescent (18 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

2Cd—51 to 60 inches; brown (10YR 5/3) silty clay; massive; very firm; many distinct gray (5Y 6/1) pressure faces; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; few coarse distinct and prominent strong brown (7.5YR 5/6 and 5/8) masses of iron accumulation in the matrix; strongly effervescent (19 percent calcium carbonate equivalent); moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess: Less than 20 inches
Thickness of the lacustrine deposits: Less than 45 inches
Depth to densic contact: 35 to 55 inches
Depth to carbonates: 20 to 50 inches
Depth to the base of the argillic horizon: 35 to 55 inches
Particle-size control section: Averages 45 to 50 percent clay and 5 to 20 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silty clay loam

BA or Bt horizon (part formed in lacustrine deposits):
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 to 4
Texture—silty clay loam or silty clay

Bt or 2Bt horizon (part formed in till):
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—2 to 6
Texture—silty clay or clay

BCt, 2BCt, Cd, or 2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay, silty clay loam, or clay

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

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Summits and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this

section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Swygert and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that are moderately eroded and do not have a mollic epipedon
- Soils that have less clay in the subsoil
- Soils that have slopes between 2 and 4 percent

Dissimilar soils:
- The poorly drained Bryce and similar soils that are subject to ponding; on toeslopes in positions below those of the Swygert soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

91B2—Swygert silty clay loam, 2 to 4 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Backslopes and footslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Swygert and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that are not moderately eroded and have a mollic epipedon
- Soils that are more than 55 inches deep to a densic contact
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes of less than 2 percent
- Soils that have slopes between 4 and 6 percent

Dissimilar soils:
- The poorly drained Bryce and similar soils that are subject to ponding; on toeslopes in positions below those of the Swygert soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

91C2—Swygert silty clay loam, 4 to 6 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and glacial lakes (relict)
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Swygert and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that are not moderately eroded and have a mollic epipedon
- Soils that are more than 55 inches deep to a densic contact
- Soils that are moderately well drained and have a seasonal high water table at a depth of 2.0 to 3.5 feet
- Soils that have slopes between 2 and 4 percent

Dissimilar soils:
- The poorly drained Bryce and similar soils that are subject to ponding; on toeslopes in positions below those of the Swygert soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Thorp Series

Drainage class: Poorly drained
Permeability: Slow in the upper part and moderate or moderately rapid in the lower part
Landform: Outwash plains and ground moraines
Parent material: Loess and the underlying outwash
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls

Typical Pedon

Typical pedon of Thorp silt loam, 0 to 2 percent slopes, at an elevation of about 640 feet; La Salle County, Illinois; about 990 feet north and 2,240 feet west of the southeast corner of sec. 27, T. 36 N., R. 5 E.; USGS Sheridan topographic quadrangle; lat. 41 degrees 33 minutes 20 seconds N. and long. 88 degrees 38 minutes 10 seconds W., NAD 27; UTM zone 16, 363554E and 4601728N, NAD 83:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate very fine granular structure; friable; neutral; abrupt smooth boundary.
A—7 to 14 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.
Eg—14 to 19 inches; dark gray (10YR 4/1) silt loam, gray (10YR 6/1) dry; weak fine granular structure; friable; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Btg1—19 to 21 inches; dark gray (10YR 4/1) and dark grayish brown (2.5Y 4/2) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; firm; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Btg2—21 to 33 inches; gray (5Y 5/1) and olive gray (5Y 4/2) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; many prominent very dark gray (10YR 3/1) organo-clay films on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.
Btg3—33 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine prismatic structure parting to moderate fine angular and subangular blocky; firm; many distinct very dark gray (10YR 3/1) organo-clay films and dark gray (N 4/0) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) and distinct light yellowish brown (2.5Y 6/4) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.
2Btg4—43 to 50 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) sandy clay loam; weak coarse subangular blocky structure; friable; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.
2Cg—50 to 65 inches; mixed grayish brown (10YR 5/2) and yellowish brown (10YR 5/8) sandy loam with thin strata of sand; friable in the sandy loam part; loose in the sand part; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 14 inches
Thickness of the loess: 30 to 54 inches
Depth to carbonates: More than 40 inches
Depth to the base of the argillic horizon: 40 to 65 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
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 silt loam

2Btg or 2BCg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 8
Texture—sandy clay loam, loam, clay loam, silt

loam, or sandy loam; may be stratified with silty clay loam, loamy sand, or sand in the lower part

2Cg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 8
Texture—stratified sandy loam, sandy clay loam, clay loam, loam, silt loam, or silty clay loam; thin strata of sand or loamy sand

206A—Thorp silt loam, 0 to 2 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Outwash plains and ground moraines
Position on the landform: Toeslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Thorp and similar soils: 97 percent
Dissimilar soils: 3 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have a surface layer of silty clay loam
- Soils that do not have an Eg horizon

Dissimilar soils:
- The somewhat poorly drained Flanagan and similar soils that are not subject to ponding; on summits and footslopes in positions above those of the Thorp soil
- The well drained Kishwaukee and similar soils; on summits in positions above those of the Thorp soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

533—Urban land

- This map unit occurs as areas covered by pavement and buildings. Because of extensive land smoothing, the areas generally are nearly level or gently sloping. Most of the paved areas are parking lots adjacent to shopping centers, industrial plants, and other commercial buildings.

Composition

Urban land and similar components: 92 percent
Dissimilar components: 8 percent

Similar components:
- Areas covered by gravel

Dissimilar components:
- The poorly drained Drummer and similar soils; on toeslopes
- The somewhat poorly drained Flanagan and similar soils; on summits
- Orthents, loamy, and similar soils; in areas disturbed by cutting and filling

Management

- The potential for surface runoff is very high. Because of the design of most paved areas, the water commonly is diverted to storm drainage systems. In some areas, however, it is diverted to areas of adjacent soils. Controlling runoff reduces the hazard of erosion in adjacent areas and helps to control flooding.

Varna Series

Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 20 percent

Taxonomic classification: Fine, illitic, mesic Oxyaquic Argiudolls

Taxadjunct features: Varna silt loam, 4 to 6 percent slopes, eroded, and Varna silty clay loam, 6 to 12 percent slopes, severely eroded, have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are classified as fine, illitic, mesic Oxyaquic Hapludalfs.

Typical Pedon

Typical pedon of Varna silt loam, 2 to 4 percent slopes, eroded, at an elevation of about 730 feet; Ford County, Illinois; about 850 feet south and 150 feet east of the northwest corner of sec. 31, T. 29 N., R. 9 E.; USGS Cabery topographic quadrangle; lat. 40 degrees 56

minutes 56 seconds N. and long. 88 degrees 14 minutes 43 seconds W., NAD 27; UTM zone 16, 395184E and 4533834N, NAD 83:

Ap—0 to 12 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; mixed with dark yellowish brown (10YR 4/4) fragments of subsoil material; moderate fine and medium granular structure; friable; neutral; abrupt smooth boundary.

2Bt1—12 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium angular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

2Bt2—18 to 27 inches; olive brown (2.5Y 4/4) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct light olive gray (5Y 6/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

2Bt3—27 to 39 inches; olive brown (2.5Y 4/4) silty clay loam; moderate medium prismatic structure; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; many medium distinct light olive gray (5Y 6/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd—39 to 60 inches; mottled light olive brown (2.5Y 5/4), light gray (5Y 6/1), and yellowish brown (10YR 5/6) silty clay loam; massive; very firm; common greenish gray (5GY 6/1) pressure faces; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 16 inches
Thickness of the loess: Less than 20 inches
Depth to densic contact: 24 to 60 inches
Depth to carbonates: 24 to 42 inches
Depth to the base of the argillic horizon: 24 to 60 inches
Particle-size control section: Averages 35 to 50 percent clay and 5 to 20 percent sand

Ap, A, or AB horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y; may be 5Y in the lower part
Value—4 to 6
Chroma—3 or 4 in the upper part; 1 to 4 in the lower part
Texture—silty clay loam, silty clay, or clay

BC, 2BC, Cd, or 2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or clay loam; subhorizons of loam or silty clay in some pedons

223B2—Varna silt loam, 2 to 4 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Varna and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that do not have a mollic epipedon
- Soils that have more sand and less clay in the subsoil
- Soils that have more clay in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes between 4 and 6 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Varna soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section

- “Engineering” section
- “Soil Properties” section

223C2—Varna silt loam, 4 to 6 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: Ground moraines and end moraines
Position on the landform: Shoulders and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Varna and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils in which the color of the surface layer has value of 4 or 5
- Soils that have more sand and less clay in the subsoil
- Soils that have more clay in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes between 2 and 4 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Varna soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

223D3—Varna silty clay loam, 6 to 12 percent slopes, severely eroded

Setting

Major Land Resource Area: MLRA 110 (Northern Illinois and Indiana Heavy Till Plain)
Landform: End moraines and ground moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Varna and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils in which the color of the surface layer has value of 4 or 5
- Soils that have more sand and less clay in the subsoil
- Soils that have more clay in the underlying material
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 1 to 2 feet
- Soils that have slopes of 5 percent

Dissimilar soils:
- The poorly drained Ashkum and similar soils; on toeslopes in positions below those of the Varna soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

Wyanet Series

Drainage class: Well drained
Permeability: Moderate in the upper part and moderately slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 18 percent

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Taxadjunct features: Wyanet silt loam, 5 to 10 percent slopes, eroded, and Wyanet clay loam, 10 to 18 percent slopes, severely eroded, have a thinner dark surface layer than is defined as the range for the series. This difference, however, does not significantly affect the use or behavior of the soils. These soils are

classified as fine-loamy, mixed, superactive, mesic Mollic Hapludalfs.

Typical Pedon

Typical pedon of Wyanet silt loam, 2 to 5 percent slopes, at an elevation of about 743 feet; Champaign County, Illinois; about 225 feet south and 1,300 feet east of the northwest corner of sec. 31, T. 22 N., R. 14 W.; USGS Penfield topographic quadrangle; lat. 40 degrees 19 minutes 36 seconds N. and long. 87 degrees 59 minutes 0 seconds W., NAD 27; UTM zone 16, 416469E and 4464492N, NAD 83:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common very fine and fine roots; 1 percent fine gravel; neutral; abrupt smooth boundary.

Bt1—10 to 14 inches; brown (10YR 4/3) clay loam; moderate fine subangular blocky structure; firm; common fine roots; few fine pores; common faint very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; 3 percent fine gravel; slightly acid; clear smooth boundary.

Bt2—14 to 27 inches; light olive brown (2.5Y 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common fine pores; common prominent very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; few prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 7 percent fine and medium gravel; slightly acid; clear smooth boundary.

BC—27 to 31 inches; light olive brown (2.5Y 5/4) loam; weak medium subangular blocky structure; firm; 7 percent fine and medium gravel; slightly effervescent; slightly alkaline; gradual smooth boundary.

C—31 to 80 inches; light olive brown (2.5Y 5/4) loam; massive; very firm; common prominent irregular light gray (10YR 7/1) very weakly cemented calcium carbonate nodules in pores; few fine and medium rounded red (2.5YR 4/8) weakly cemented iron oxide nodules throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 7 percent fine and medium gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the loess: Less than 18 inches
Depth to carbonates: 20 to 40 inches
Depth to the base of the argillic horizon: 24 to 40 inches
Particle-size control section: Averages 22 to 32 percent clay and 15 to 40 percent sand

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam; clay loam in severely eroded pedons

Bt or 2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—4 to 6
Texture—clay loam, loam, or silty clay loam

BC, 2BC, C, or 2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 7
Chroma—3 or 4
Texture—loam or clay loam

622B—Wyanet silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Wyanet and similar soils: 95 percent
Dissimilar soils: 5 percent

Similar soils:
- Soils that are moderately eroded and in which the color of the surface layer has value of 4 or 5
- Soils that have more clay and less sand in the subsoil
- Soils that have stratified loamy and sandy outwash in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Wyanet soil
- The somewhat poorly drained Raub and similar soils; on summits in positions above those of the Wyanet soil or on footslopes in positions below those of the Wyanet soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

622C2—Wyanet silt loam, 5 to 10 percent slopes, eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Wyanet and similar soils: 93 percent
Dissimilar soils: 7 percent

Similar soils:
- Soils in which the color of the surface layer has value of 4 or 5
- Soils that have carbonates within a depth of 20 inches
- Soils that have stratified loamy and sandy outwash in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Wyanet soil
- The somewhat poorly drained Raub and similar soils; on summits in positions above those of the Wyanet soil or on footslopes in positions below those of the Wyanet soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

622D3—Wyanet clay loam, 10 to 18 percent slopes, severely eroded

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines
Position on the landform: Backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Wyanet and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils in which the color of the surface layer has value of 4 or 5
- Soils that have carbonates within a depth of 20 inches
- Soils that have stratified loamy and sandy outwash in the underlying material

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Wyanet soil
- The somewhat poorly drained Flanagan and similar soils; on summits in positions above those of the Wyanet soil or on footslopes in positions below those of the Wyanet soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- "Agronomy" section
- "Recreation" section
- "Wildlife Habitat" section
- "Engineering" section
- "Soil Properties" section

Xenia Series

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and slow in the lower part
Landform: Ground moraines and end moraines
Parent material: Loess and the underlying till
Slope range: 0 to 5 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Typical Pedon

Typical pedon of Xenia silt loam, 2 to 5 percent slopes, at an elevation of about 705 feet; Champaign County, Illinois; about 390 feet north and 860 feet west of the southeast corner of sec. 34, T. 20 N., R. 9 E.; USGS Thomasboro topographic quadrangle; lat. 40 degrees 8 minutes 35 seconds N. and long. 88 degrees 9 minutes 57 seconds W., NAD 27; UTM zone 16, 400688E and 4444290N, NAD 83:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; neutral; abrupt smooth boundary.

E—4 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium platy structure; friable; many faint light brownish gray (10YR 6/2) clay depletions on faces of peds; moderately acid; clear smooth boundary.

Bt1—10 to 16 inches; brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct light brownish gray (10YR 6/2) clay depletions on faces of peds; moderately acid; clear smooth boundary.

Bt2—16 to 23 inches; brown (10YR 4/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct light brownish gray (10YR 6/2) clay depletions on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; moderately acid; clear smooth boundary.

Bt3—23 to 37 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common distinct dark brown (10YR 3/3) organo-clay films on faces of peds; many distinct grayish brown (10YR 5/2) clay depletions on faces of peds; few medium distinct grayish brown (10YR 5/2) and few medium faint brown (10YR 5/3) iron depletions in the matrix; moderately acid; clear smooth boundary.

2Bt4—37 to 48 inches; brown (10YR 5/3) and light olive brown (2.5Y 5/4) clay loam; weak coarse subangular blocky structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

2Bt5—48 to 57 inches; brown (10YR 5/3) and light olive brown (2.5Y 5/4) loam; weak coarse prismatic structure; firm; few distinct dark brown (10YR 3/3) organo-clay films on faces of peds; slightly acid; clear smooth boundary.

2C—57 to 72 inches; light olive brown (2.5Y 5/4) loam; massive; firm; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess: 22 to 40 inches
Depth to carbonates: 40 to 60 inches
Depth to the base of the argillic horizon: 40 to 60 inches
Particle-size control section: Averages 27 to 35 percent clay and less than 10 percent sand

Ap or A horizon:
Hue—10YR
Value—3 or 4; 3 in A horizons less than 6 inches thick
Chroma—2 to 4
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam

2Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—loam or clay loam

2BC horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture—loam or clay loam

2C horizon:
Hue—10YR
Value—5
Chroma—3 or 4
Texture—loam

291B—Xenia silt loam, 2 to 5 percent slopes

Setting

Major Land Resource Area: MLRA 108 (Illinois and Iowa Deep Loess and Drift)
Landform: Ground moraines and end moraines

Position on the landform: Summits and backslopes

A typical soil series description with range in characteristics is included, in alphabetical order, in this section. Additional information specific to this map unit, such as horizon depth and textures, is available in the tables in Part II of this publication.

Composition

Xenia and similar soils: 94 percent
Dissimilar soils: 6 percent

Similar soils:
- Soils that have less than 22 inches of loess
- Soils that are somewhat poorly drained and have a seasonal high water table at a depth of 0.5 foot to 1.5 feet

Dissimilar soils:
- The poorly drained Drummer and similar soils; on toeslopes in positions below those of the Xenia soil

Management

For general and detailed information about managing this map unit, see the following sections in Part II of this publication:

- “Agronomy” section
- “Forestland” section
- “Recreation” section
- “Wildlife Habitat” section
- “Engineering” section
- “Soil Properties” section

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Glossary

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.

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 till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

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.

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.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

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.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, 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.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly

changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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.

End moraine. A ridgelike accumulation that was produced or is being produced at the outer margin of an actively flowing glacier at any given time.

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.

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.

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.

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.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. 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.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

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.

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 lake (relict). An area formerly occupied by a glacial lake.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that 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 moraine. An extensive, fairly even layer of till, having an uneven or undulating surface.

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.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

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.

Lacustrine 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.

Landform. Any physical, recognizable form or feature on the earth's surface, having a characteristic shape and produced by natural causes.

Landscape. A collection of related natural landforms; usually the land surface that the eye can comprehend in a single view.

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.

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.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

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.

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.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

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. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch

Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

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. Descriptive terms for concentrations and depletions 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).

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.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

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.

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.

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.

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.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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. The slope classes for MLRA 108 in this survey are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Moderately sloping	5 to 10 percent
Moderately steep	10 to 18 percent
Steep	18 to 35 percent

The slope classes for MLRA 110 in this survey are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 4 percent

Moderately sloping	4 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 20 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

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.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream, and representing the dissected remnants of an abandoned flood plain, streambed, or valley floor produced during a former state of erosion or deposition.

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 grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from 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.

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.

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. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

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.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

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 Urbana, 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	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	31.7	16.0	23.8	60	-14	0	1.83	0.65	2.81	4	8.1
February---	36.3	20.3	28.3	63	-7	2	1.97	1.06	2.78	4	7.0
March------	48.8	31.1	40.0	79	8	36	3.30	1.92	4.54	7	4.1
April------	62.4	41.4	51.9	85	23	145	3.94	1.94	5.69	7	.8
May--------	73.6	51.7	62.7	92	34	400	3.97	2.10	5.61	7	.0
June-------	82.9	60.7	71.8	96	46	655	4.07	1.93	5.92	5	.0
July-------	85.3	64.7	75.0	97	51	775	4.46	2.36	6.31	6	.0
August-----	83.0	62.3	72.7	96	48	703	4.03	2.22	5.62	6	.0
September--	77.7	55.2	66.4	93	37	495	3.36	1.40	5.01	5	.0
October----	65.1	43.8	54.5	86	26	195	2.66	1.21	3.91	5	.1
November---	50.3	33.8	42.0	75	13	39	3.10	1.67	4.35	5	2.0
December---	36.5	22.0	29.2	64	-8	4	3.02	1.31	4.48	6	6.0
Yearly:											
Average---	61.1	41.9	51.5	---	---	---	---	---	---	---	---
Extreme---	---	---	---	98	-16	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,449	39.71	19.77	57.03	67	28.1

* 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 Urbana, 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. 8	Apr. 16	Apr. 30
2 years in 10 later than--	Apr. 2	Apr. 12	Apr. 25
5 years in 10 later than--	Mar. 23	Apr. 4	Apr. 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 28	Oct. 16	Oct. 5
2 years in 10 earlier than--	Nov. 3	Oct. 21	Oct. 10
5 years in 10 earlier than--	Nov. 13	Nov. 1	Oct. 19

Table 3.--Growing Season

(Recorded in the period 1961-90 at Urbana, 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	212	189	164
8 years in 10	219	196	171
5 years in 10	233	210	185
2 years in 10	247	224	198
1 year in 10	255	231	205

Table 4.--Classification of the Soils

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, superactive, mesic Typic Hapludalfs
Ambraw	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
Ashkum	Fine, mixed, superactive, mesic Typic Endoaquolls
Birkbeck	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Blackberry	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Brenton	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Bryce	Fine, mixed, superactive, mesic Vertic Endoaquolls
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Campton	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Catlin	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Chatsworth	Fine, illitic, mesic Oxyaquic Eutrudepts
Clare	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Dana	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Drummer	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Elburn	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Flanagan	Fine, smectitic, mesic Aquic Argiudolls
Harpster	Fine-silty, mixed, superactive, mesic Typic Calciaquolls
Kendall	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Kishwaukee	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
La Hogue	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Millbrook	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Mona	Fine-loamy, mixed, superactive, mesic Oxyaquic Argiudolls
Muskego	Coprogenous, euic, mesic Limnic Haplosaprists
Ockley	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Odell	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Onarga	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Orthents, loamy	Fine-loamy, mixed, active, nonacid, mesic Aquic Udorthents
Ozaukee	Fine, illitic, mesic Oxyaquic Hapludalfs
Pella	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Penfield	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Peotone	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Proctor	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Raub	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Rossburg	Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls
Russell	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sabina	Fine, smectitic, mesic Aeric Epiaqualfs
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Selma	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Senachwine	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Sunbury	Fine, smectitic, mesic Aquollic Hapludalfs
Swygert	Fine, mixed, superactive, mesic Aquertic Argiudolls
Thorp	Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls
Varna	Fine, illitic, mesic Oxyaquic Argiudolls
Wyanet	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Xenia	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	804	0.1
23B2	Blount silt loam, 2 to 4 percent slopes, eroded	808	0.1
56B	Dana silt loam, 2 to 5 percent slopes	22,846	3.6
56B2	Dana silt loam, 2 to 5 percent slopes, eroded	136	*
67A	Harpster silty clay loam, 0 to 2 percent slopes	2,155	0.3
91A	Swygert silty clay loam, 0 to 2 percent slopes	73	*
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded	2,790	0.4
91C2	Swygert silty clay loam, 4 to 6 percent slopes, eroded	411	*
102A	La Hogue loam, 0 to 2 percent slopes	1,424	0.2
125A	Selma loam, 0 to 2 percent slopes	2,906	0.5
131B	Alvin fine sandy loam, 2 to 5 percent slopes	205	*
134A	Camden silt loam, 0 to 2 percent slopes	14	*
134B	Camden silt loam, 2 to 5 percent slopes	1,207	0.2
146A	Elliott silt loam, 0 to 2 percent slopes	761	0.1
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded	28,476	4.5
146C2	Elliott silty clay loam, 4 to 6 percent slopes, eroded	1,485	0.2
148B2	Proctor silt loam, 2 to 5 percent slopes, eroded	14	*
149A	Brenton silt loam, 0 to 2 percent slopes	16,473	2.6
150B	Onarga sandy loam, 2 to 5 percent slopes	290	*
152A	Drummer silty clay loam, 0 to 2 percent slopes	254,334	39.8
153A	Pella silty clay loam, 0 to 2 percent slopes	6,422	1.0
154A	Flanagan silt loam, 0 to 2 percent slopes	100,542	15.7
171B	Catlin silt loam, 2 to 5 percent slopes	17,400	2.7
198A	Elburn silt loam, 0 to 2 percent slopes	17,649	2.8
206A	Thorp silt loam, 0 to 2 percent slopes	2,641	0.4
219A	Millbrook silt loam, 0 to 2 percent slopes	1,455	0.2
223B2	Varna silt loam, 2 to 4 percent slopes, eroded	8,041	1.3
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	3,116	0.5
223D3	Varna silty clay loam, 6 to 12 percent slopes, severely eroded	2,828	0.4
232A	Ashkum silty clay loam, 0 to 2 percent slopes	29,161	4.6
233B	Birkbeck silt loam, 2 to 5 percent slopes	2,668	0.4
234A	Sunbury silt loam, 0 to 2 percent slopes	2,013	0.3
235A	Bryce silty clay, 0 to 2 percent slopes	1,621	0.3
236A	Sabina silt loam, 0 to 2 percent slopes	3,010	0.5
241C3	Chatsworth silty clay, 4 to 6 percent slopes, severely eroded	36	*
241D3	Chatsworth silty clay, 6 to 12 percent slopes, severely eroded	286	*
242A	Kendall silt loam, 0 to 2 percent slopes	1,441	0.2
291B	Xenia silt loam, 2 to 5 percent slopes	4,836	0.8
322C2	Russell silt loam, 5 to 10 percent slopes, eroded	1,931	0.3
330A	Peotone silty clay loam, 0 to 2 percent slopes	3,744	0.6
387B	Ockley silt loam, 2 to 5 percent slopes	1,123	0.2
387C3	Ockley clay loam, 5 to 10 percent slopes, severely eroded	301	*
448B	Mona silt loam, 2 to 5 percent slopes	245	*
481A	Raub silt loam, 0 to 2 percent slopes	22,901	3.6
490A	Odell silt loam, 0 to 2 percent slopes	1,269	0.2
530B	Ozaukee silt loam, 2 to 4 percent slopes	509	*
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	411	*
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	542	*
530E2	Ozaukee silt loam, 12 to 20 percent slopes, eroded	381	*
533	Urban land	1,606	0.3
570B	Martinsville silt loam, 2 to 5 percent slopes	708	0.1
570C2	Martinsville loam, 5 to 10 percent slopes, eroded	1,021	0.2
570D2	Martinsville loam, 10 to 18 percent slopes, eroded	360	*
618B	Senachwine silt loam, 2 to 5 percent slopes	270	*
618C2	Senachwine silt loam, 5 to 10 percent slopes, eroded	850	0.1
618D2	Senachwine silt loam, 10 to 18 percent slopes, eroded	632	*
618E2	Senachwine silt loam, 18 to 25 percent slopes, eroded	510	*
618F	Senachwine silt loam, 18 to 35 percent slopes	398	*
622B	Wyanet silt loam, 2 to 5 percent slopes	7,316	1.1
622C2	Wyanet silt loam, 5 to 10 percent slopes, eroded	6,334	1.0
622D3	Wyanet clay loam, 10 to 18 percent slopes, severely eroded	358	*

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
623A	Kishwaukee silt loam, 0 to 2 percent slopes	3,105	0.5
637A+	Muskego silty clay loam, 0 to 2 percent slopes, overwash	48	*
663B	Clare silt loam, 2 to 5 percent slopes	8,398	1.3
679B	Blackberry silt loam, 2 to 5 percent slopes	4,990	0.8
680B	Campton silt loam, 2 to 5 percent slopes	1,651	0.3
687B	Penfield loam, 2 to 5 percent slopes	2,329	0.4
687C2	Penfield loam, 5 to 10 percent slopes, eroded	810	0.1
802B	Orthents, loamy, undulating	4,287	0.7
830	Landfills	115	*
865	Pits, gravel	460	*
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	11,073	1.7
3302A	Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded	2,791	0.4
3473A	Rossburg silt loam, 0 to 2 percent slopes, frequently flooded	982	0.2
W	Water	1,323	0.2
	Total	638,860	100.0

* Less than 0.1 percent.

United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Champaign County, Illinois

Part II

How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area, descriptions of the detailed soil map units and soil series in the area, and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

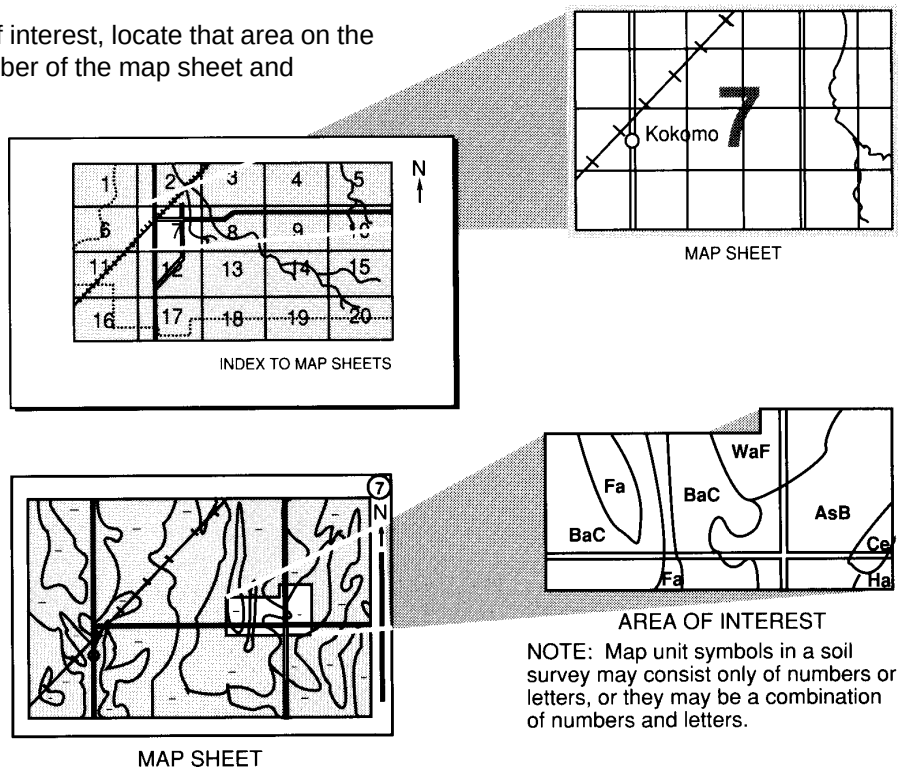
Detailed Soil Maps

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** in Part I, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** in Part II 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 1998. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. 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 Champaign County Soil and Water Conservation District. Funding was provided by the Champaign County Soil and Water Conservation District and the Illinois Department of Agriculture.

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

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Cover: The Morrow Plots in an area of Flanagan silt loam, 0 to 2 percent slopes, at the University of Illinois. These fields, which were established in 1876, are the oldest continuously used experiment fields in the United States.

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

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Issued 2001

Soil Survey of
Champaign County, Illinois

By Tonie J. Endres, soil scientist, Natural Resources Conservation Service

Original fieldwork by H.R. Mount, C.C. Cochran, and C.E. Wacker, soil scientists, Soil Conservation Service, and S. Engel, soil scientist, Champaign County

Updated fieldwork by Tonie J. Endres and Sam E. Werner, soil scientists, Natural Resources Conservation Service

Map compilation by J.D. Ennis, geographer, and Tonie J. Endres and Sam E. Werner, soil scientists, Natural Resources Conservation Service; Earl E. Voss, Certified Professional Soil Classifier; and the Illinois State Geological Survey

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

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, pasture and hayland, and forestland; 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.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

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.

Agronomy

Leon W. Wendte, district conservationist, Natural Resources Conservation Service, helped prepare this section.

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 can obtain specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1997, an estimated 548,908 acres in Champaign County was used as cropland and 6,480 acres was used as pastureland (USDA, 1997). The major row crops are corn and soybeans. Wheat and oats are the major small grain crops grown.

The soils in Champaign County have good potential for continued crop production, particularly if the latest crop production technologies are applied. This soil survey can be used as a guide for applying the latest crop production technologies.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 6. The main concerns in managing cropland in Champaign County are water erosion, wetness and ponding, flooding, restricted permeability, poor tilth, surface crusting, low available water capacity, and excess lime.

Water erosion is a potential problem on about 23 percent of the cropland and pastureland in the county. Sheet and rill erosion is a hazard on soils that have slopes of more than 2 percent, such as Birkbeck, Dana, Senachwine, and Wyanet soils. Sheet and rill erosion may also occur on soils that have slopes of less than 2 percent if the slope length is very long.

Loss of the surface layer by sheet and rill erosion lowers the productive capacity of the soil. As the surface layer is removed, material from the subsoil is incorporated into the tilled layer. The subsoil generally has lower levels of plant nutrients, a lower content of organic matter, and a higher content of clay than the surface layer. As the content of organic matter in the tilled layer decreases and the clay content increases, soil tilth is reduced. Loss of soil tilth increases the likelihood that a crust will form on the surface and that the rate of water infiltration will be reduced. The higher clay content also increases the likelihood that the surface layer will become cloddy when tilled, especially if tilled when wet. Once this happens, preparing a seedbed becomes very difficult. The soils in eroded areas also tend to puddle after hard rains and to form a crust when they dry out. The surface crusting can increase the runoff rate.

Water erosion can also result in sediments entering streams, rivers, water impoundments, and road ditches. Removing the sediments is expensive. Management measures that lower the amount of water erosion can minimize this pollution and improve the quality of water for rural, municipal, and recreational uses and for fish and wildlife (fig. 4).

Generally, a combination of several practices is needed to control water erosion. Conservation tillage, contour stripcropping, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss (fig. 5).

Wetness and *ponding* are concerns in some cropland areas. Drainage systems consist of subsurface tile drains, surface inlets, open drainage ditches, or a combination of these. Drainage systems have been installed in most areas of poorly drained and somewhat poorly drained soils in the county. As a result, these soils are adequately drained for the crops commonly grown in the area. Poorly drained soils, such as Ashkum, Drummer, and Selma soils, have subsurface drainage. In addition, in some areas of poorly drained soils, surface tile inlets or shallow surface ditches are required to remove ponded water. In some areas, somewhat poorly drained soils are wet long enough that productivity is reduced in some years unless the soils are artificially drained. Most areas of somewhat poorly drained soils, such as Brenton, Elburn, and Flanagan soils, have subsurface drainage.

Additional information about erosion-control measures and design of surface and subsurface

Figure 4.—Using filter strips in this area of Drummer silty clay loam, 0 to 2 percent slopes, helps to trap sediments and nutrients before they enter ditches.

drainage systems suitable for each kind of soil is provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Flooding is a hazard on approximately 15,000 acres in Champaign County. Damage to crops, particularly winter small grain crops, occurs in some years. Dikes and floodwater diversions can reduce the extent of crop damage. Reducing runoff from higher ground within the watershed helps to minimize the frequency and severity of flooding. Changing land use from cropland to pasture or forestland can also minimize economic damage. Ambraw, Rossburg, and Sawmill soils are subject to flooding.

Restricted permeability can increase a soil's susceptibility to erosion and limit the effectiveness of drainage systems. Soils that have slowly permeable or very slowly permeable layers, such as Elliott and Swygert soils, have a higher potential for surface runoff than more permeable soils. In addition, in soils with slow or very slow permeability, such as Ashkum and Bryce soils, tile spacing of about 50 to 70 feet is needed to achieve adequate subsurface drainage.

Poor tilth and *surface crusting* inhibit seedling germination and emergence, increase runoff and erosion, and reduce the rate of water infiltration. Soils that have good tilth are granular and porous and have a high content of organic matter in the surface layer. Brenton, Dana, and Penfield soils have good tilth. Soils that have poor tilth generally have more clay, a lower content of organic matter, and weaker soil structure in the surface layer. Ashkum, Drummer, Peotone, and

Swygert soils have a surface layer of silty clay loam. If these soils are plowed while wet, they become cloddy. The cloddiness makes preparing a good seedbed difficult.

Birkbeck, Kendall, Ozaukee, and Senachwine soils have a low content of organic matter in the surface layer. Generally, the structure in the surface layer of these soils is weak, and a crust forms on the surface during periods of intense rainfall. This crust is hard when dry.

Practices that help to prevent surface crusting and improve poor tilth include incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage. Surface cloddiness can be controlled by avoiding tillage when the soil is too wet or by using a no-till system.

Low available water capacity limits the productivity of some of the soils used for crops in Champaign County. The physical composition of these soils limits the amount of water available for plant growth. Bryce and Swygert soils are examples. Conservation of soil moisture is needed where the soils have a low available water capacity. The effects of droughtiness can be minimized by reducing the amount of runoff and increasing the water-holding capacity of the soils. Using conservation tillage and cropping systems, contour farming, contour stripcropping, establishing field windbreaks, and leaving crop residue on the surface after planting conserve soil moisture.

Incorporating green manure crops, manure, or crop residue into the soil increases the content of organic matter and the water-holding capacity of the soils.

Excess lime is a management concern in areas of Harpster soils. These soils have a calcic horizon at or near the surface. This limitation can be overcome by incorporating green manure crops, manure, or crop

Figure 5.—A combination of grassed waterways and narrow-based terraces helps to prevent further erosion in an area of Wyanet silt loam, 5 to 10 percent slopes, eroded.

residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer.

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in table 6. The criteria used to determine the limitations or hazards identified in the table are as follows:

Crusting.—The organic matter content in the surface layer is less than 2 percent, and the clay content is more than 20 percent.

Excess lime.—The calcium carbonate equivalent is 15 percent or more in the surface layer and meets the calcic horizon classification criteria.

Flooding.—The component of the map unit is occasionally flooded or frequently flooded.

Low available water capacity.—The weighted average of the available water capacity from the surface to a depth of 60 inches is 0.1 inch or less.

Ponding.—The water table is above the surface.

Poor tilth.—The component of the map unit has 27 percent or more clay in the surface layer.

Restricted permeability.—Permeability is less than 0.2 inch per hour from the surface to a depth of 40 inches.

Subsidence.—The decrease in surface elevation is more than 0 inches. (Muskego silty clay loam, 0 to 2 percent slopes, overwash, is subject to subsidence because of its high content of organic matter.)

Water erosion.—The surface K factor multiplied by the slope is 0.8 or more, and the slope is 3 percent or more.

Wetness.—The component of the map unit has a water table within a depth of 2 feet.

Pasture Limitations and Hazards

Growing legumes, cool-season grasses, and warm-season grasses that are suited to the soils and climate of the area helps to maintain a productive stand of pasture.

Suitable pasture and hay plants include several legumes, cool-season grasses, and native warm-season grasses. Alfalfa, red clover, alsike clover, and ladino clover are legumes commonly grown in the county. Alfalfa is best suited to well drained and moderately well drained soils and to some of the somewhat poorly drained soils. Examples of suitable soils are Brenton, Flanagan, Russell, Senachwine, and Xenia soils. Other legumes, such as alsike clover, red clover, and ladino clover, are more tolerant of wetter conditions and are grown on very poorly drained and poorly drained soils and some of the somewhat poorly drained soils. Examples are Blount, Drummer, Kendall, and Sabina soils.

Cool-season grasses commonly grown in the county include smooth bromegrass, orchardgrass, reed canarygrass, and tall fescue. These grasses can be used alone or in mixtures with legumes. Native warm-season grasses, such as indiangrass, big bluestem, and switchgrass, grow very well in the summer. They require different management techniques from those used for cool-season grasses.

Proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control is generally needed. Rotation grazing, deferred grazing when the soil is wet, and applications of lime and fertilizer as needed are also important management practices.

The management concerns affecting the use of the detailed soil map units in the survey area for pasture are shown in table 7. The main concerns in managing pastureland in Champaign County are water erosion, wetness and ponding, flooding, equipment limitations, frost heave, low available water capacity, low fertility, and low pH.

In soils that are susceptible to *water erosion* when used for pasture, the slope is equal to or greater than 3 percent and the value of the K factor multiplied by the percent slope is 0.8 or more. Water erosion reduces the productivity of the soil. It also results in sediments, livestock manure, and added nutrients entering streams, rivers, water impoundments, and road ditches.

Measures that are effective in controlling water erosion include establishing or renovating stands of legumes and grasses. Controlling erosion during seedbed preparation is a major concern. Tilling on the contour or using a no-till method for seeding or pasture renovation helps to establish forage species and helps to control erosion.

Wetness and *ponding* are management concerns in poorly drained and very poorly drained soils, such as Ashkum, Drummer, and Selma soils. Surface and subsurface drainage systems and land grading help to lower the seasonal high water table and reduce the hazard of ponding if suitable outlets are available.

Flooding may damage pasture plants in some years. Dikes and diversions can help to minimize the extent of damage from frequent or occasional flooding. Ambraw, Rossburg, and Sawmill soils are subject to flooding.

The use of farm equipment for seeding or harvesting of hay is more difficult on soils that have

slopes of more than 10 percent. *Equipment limitations* are a problem in moderately steep areas of Ozaukee, Senachwine, Varna, and Wyanet soils because of the slope.

Frost heave is a concern in soils that are subject to moderate or high frost action. Most of the soils in the county are subject to frost action. Leaving stubble 4 to 6 inches high in winter helps to prevent frost heave. Using grass-legume mixtures can also help to prevent frost heave.

Low available water capacity reduces the quality and quantity of the pasture. The available water capacity is considered low when the weighted average between the surface and a depth of 60 inches is 0.1 inch or less. The physical composition of the soils in which the available water capacity is restricted, such as Chatsworth and Swygert soils, limits the amount of water available for plant growth. Measures that conserve soil moisture are needed in areas of these soils. The effects of droughtiness can be minimized by reducing the amount of runoff and increasing the water-holding capacity of the soils. Planting drought-resistant species of grasses and legumes also helps to establish a cover of vegetation.

Low fertility affects the health and vigor of the plants and thus has a direct impact on the quantity and quality of livestock forage produced. Soils with low fertility have an average organic matter content in the surface layer of less than 1 percent, or the cation-exchange capacity is 7 percent or less. Soil fertility is low in severely eroded soils, such as Chatsworth and Ockley soils, that have lost most or all of the nutrient-rich topsoil. Fertility is also low in Alvin soils, which formed in eolian deposits and have a low content of clay and organic matter in the surface layer.

Three cultural practices can be used to maintain or improve soil fertility. First, planting legumes in rotation or as a cover crop adds nitrogen and organic material to the soil. Second, returning crop residue, animal manure, green manure crops, and other organic material to the soil increases the content of organic matter. Increasing the content of organic matter improves the nutrient-holding capacity of the soil and supplies nutrients to growing plants. Third, commercial fertilizers can be used. On most soils in the county, crops respond well to applications of nitrogen, phosphorus, potassium, and certain micronutrients. Applications of lime and fertilizer should be based on the results of soil tests, the needs of the plants, and the expected level of yields. The local office of the Cooperative Extension Service can help in determining the kinds and amounts of nutrients needed.

A *low pH*, 5.5 or less within the root zone, also affects the health and vigor of the plants. Applications of limestone help to raise the pH in the surface layer to a level that is optimum for plant growth. Selecting species that are more tolerant of acidic conditions, such as red clover or alsike clover, can improve the quantity and quality of livestock forage.

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 8. 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 (Fehrenbacher and others, 1978). 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 8 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 forestland 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 slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of the map units in this survey area is given in table 8.

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, forestland, 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 613,440 acres in the survey area, or nearly 96 percent of the total acreage, meets the soil requirements for prime farmland.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland

Figure 6.—Urban development in an area of Drummer silty clay loam, 0 to 2 percent slopes, and Elburn silt loam, 0 to 2 percent slopes.

to industrial and urban uses (fig. 6). 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 9. 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 5. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Soil Series and Detailed Soil Map Units" in Part I of this publication and in the tables in Part II.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. 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.

About 6 percent of the soils in the county are

moderately susceptible to wind erosion. These soils have a surface layer of very fine sandy loam or sandy loam or have a high content of finely divided calcium carbonate or clay in the surface layer. Alvin and Onarga soils are subject to wind erosion because they have a sandy surface layer; Harpster soils have a high content of calcium carbonate in the surface layer; and Ashkum, Bryce, Chatsworth, and Peotone soils have a high content of clay in the surface layer.

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 10 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 10 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.

Forestland

When the first settlers arrived in the survey area, forests covered about 6 percent of the land (Iverson and others, 1989). Since that time, most of the trees have been cleared from the areas that are the most suitable for cultivation.

By 1997, only 5,330 acres, or less than 1 percent of the acreage in the county, was forested (USDA, 1997). Most of the forestland acreage is privately owned. The major woodland species are oaks, hickories, elms, ashes, and maples, especially soft maple. The rest of the forestland is mainly in areas that have some type of severe limitation affecting their use for cultivated crops. If properly managed, the soils in these forested areas are generally well suited to growing high-quality trees. The largest areas of forestland are along the major streams in the county, such as the Sangamon River and the Middle Fork Vermilion River.

The productivity of many of the remaining forestland stands could be improved with proper management. Management measures needed in these areas are those that exclude livestock from the stands and that protect the stands from fire, insects, and diseases. Using proper logging methods and proven silvicultural practices that enhance growth and regeneration are also needed.

Forestland Management and Productivity

Information about the productivity and management of the forested map units in the county is given in table 11. This table can be used by forest managers in planning the use of the soils for wood crops. Only the soils that are suitable for wood crops are listed.

In table 11, *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 forestland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be

uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forestland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Suggested trees to plant are those that are suitable for commercial wood production.

Recreation

Only a small acreage in Champaign County is developed for recreational uses. The growing metropolitan population has subsequently increased the demand for recreational facilities. Lake of the Woods Park is one of the busiest recreational areas in the county. Other facilities include golf courses, playgrounds, athletic fields, swimming pools, and camping and picnic areas.

The potential for further recreational development is favorable throughout the county. The soils having the best potential are in areas where hilly terrain, wooded slopes, and numerous streams provide a variety of opportunities for recreational activities.

The soils of the survey area are rated in table 12 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 12, 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 12 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 14 and interpretations for septic tank absorption fields in table 15.

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

Originally, much of Champaign County was part of a broad tall-grass prairie that contained wet meadows, marshes, and areas of open water. This area is near the southern limit of the midwestern prairie pothole region that traditionally provided valuable nesting and stop-over habitat for migratory waterfowl and also provided habitat for other wetland and openland wildlife. Although some areas were wooded, especially those along creeks and on moderately steep to very steep landforms, the native plant communities were dominated by tall prairie grasses.

As the county was settled, conversion of land for agriculture and urbanization altered these natural communities and the wildlife species associated with them. The landscape of Champaign County is now a mosaic of urban development, cropland, pasture, isolated areas of forestland, and wetlands and other waterways that support wildlife species that have adapted to the human-altered landscape. These species include whitetail deer, fox, coyotes, mourning doves, pheasants, squirrels, cardinals, and raccoons.

Areas of wildlife habitat in Champaign County are not necessarily set aside for this purpose. Wildlife habitat is commonly a secondary use in areas used for other purposes, such as farming. Good land management practices, however, can also improve an area's value for wildlife.

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 13, 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 orchardgrass, 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,

Figure 7.—Switchgrass in an area of Xenia silt loam, 2 to 5 percent slopes, provides wildlife habitat and protects the soil from erosion.

surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, ragweed, foxtail, and smartweed.

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 oaks, hickories, sycamore, cottonwood, elms, sassafras, serviceberry, gray dogwood, flowering dogwood, hazelnut, sumacs, and raspberries. Planting exotic trees and shrubs, such as autumn-olive, amur maple, Russian-olive, introduced crabapples, and bush honeysuckle, should be avoided. These plants, once promoted as good wildlife plants, have escaped cultivation and are now reaching nuisance proportions in many areas. Native plants, such as hazelnut, gray dogwood, silky dogwood, oaks, and hickories, are best suited for planting on soils rated *good*.

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 white pine, Norway spruce, balsam fir, redcedar, 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. Shallow water areas can often be included in the design of ponds and lakes by utilizing the naturally shallow end of the impoundment. Wetland areas can also be created by installing water-control valves on field drainage tiles. The valves can be used to flood the fields at times when they are not being used for production of crops, such as after fall harvest. Opening the valves allows the fields to drain for spring planting but keeps the soil moisture content high enough for good productivity. Islands, wood duck boxes, and an even mix of open water and aquatic plants help to provide optimum wildlife habitat in permanent wetland areas.

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 woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, frogs, snakes, and turtles.

Measures that improve the habitat for openland wildlife include seeding roadsides, fence rows, wildlife travel lanes, and land that has been set aside, as part of government commodity programs, to perennial plants and legumes, such as smooth bromegrass, timothy, redtop, bluegrass, alfalfa, red clover, ladino clover, or alsike clover; enhancing grassy areas with perennial native prairie grasses, such as big bluestem and little bluestem, switchgrass, and indiangrass (fig. 7); and protecting nesting cover from fire, traffic, grazing, mowing, or other disturbance until August 1. Warm-season grasses grow best if periodic prescribed burning is applied. Any existing woody cover should be

Figure 8.—A constructed wetland in an area of Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded. Floodwater captured by berms and constructed islands provides valuable habitat for waterfowl.

protected from fire and grazing. Hedgerows and windbreaks of trees and shrubs that provide a source of food and roosting areas should be established. Building brush piles for cover along fence rows and in odd-shaped areas that are inconvenient for cultivation can also enhance the habitat. Leaving crop residue on the surface after harvest and leaving waste grain in the fields can provide cover and food for wildlife throughout the winter. Also, unharvested areas can be left next to areas of wildlife cover.

Measures that improve the habitat for woodland wildlife include protecting native trees, shrubs, and prairie plants from grazing livestock and uncontrolled fire, thereby minimizing the destruction of the leaf mulch and of desirable young trees, shrubs, and sprouts that provide food and cover. Establishing hedgerows, farm windbreaks, brush piles, food plots, and strips of grass or grass-legume mixtures can provide additional food and cover. Plantings for food and cover may be difficult to establish and maintain in the steeper areas because of the slope and the hazard of erosion. Food plots of grain or seed crops should be established in the less sloping areas. Planting on the contour reduces the hazard of erosion. Leaving dead trees to provide den sites for raccoons, woodpeckers, opossum, and other cavity-dwelling species also improves the habitat.

Measures that improve the habitat for wetland wildlife include delaying or limiting the cultivation and planting of commodity crops in the shallow depressions that are subject to ponding. Protecting areas of smartweeds, bulrushes, burreeds, and barnyard grasses and planting Japanese millet, milo, and short corn varieties can provide food and cover. Shallow ponds and marshes can be created by blocking natural channels and manmade drainage systems (fig. 8). Digging pits can encourage nesting by ducks. The pits should be dug in areas of poorly drained or very poorly drained soils and should be at least 30 feet in diameter and 2 to 3 feet deep. These pits can help to provide open water during the spring and early summer. These areas should be protected from grazing.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

67A Harpster silty clay loam, 0 to 2 percent slopes
125A Selma loam, 0 to 2 percent slopes
152A Drummer silty clay loam, 0 to 2 percent slopes
153A Pella silty clay loam, 0 to 2 percent slopes
206A Thorp silt loam, 0 to 2 percent slopes
232A Ashkum silty clay loam, 0 to 2 percent slopes
235A Bryce silty clay, 0 to 2 percent slopes
330A Peotone silty clay loam, 0 to 2 percent slopes
637A+ Muskego silty clay loam, 0 to 2 percent slopes, overwash
3107A Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded
3302A Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

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 14 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.

Even though agricultural erosion accounts for most of the total eroded sediment in the county because of the large acreage of farmland, urban erosion is quickly becoming a major factor affecting water quality. Urban erosion-control practices utilize essentially the same concepts as those applied to agriculture. The soil surface should be protected from the impact of raindrops, and the runoff from accumulated rainwater must be controlled. Effective control of erosion and sediment involves three major elements. First, stabilizing the soil can be accomplished by maintaining a permanent or temporary vegetative cover, mulching, or using a variety of other practices. Second, conservation practices can be used to control runoff. These practices include installing diversions, grassed waterways or lined swales, storm sewers, or gully-control structures. Third, sediment can be controlled by using sediment basins, sediment traps, or filter fences.

Erosion-control measures are effective alone or in combinations. The measures used and their effectiveness depend on the soil characteristics and topography. Information about the design of erosion-control measures is provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Sanitary Facilities

Table 15 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 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of

roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, 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 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are

generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the 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. These results are reported in table 23.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

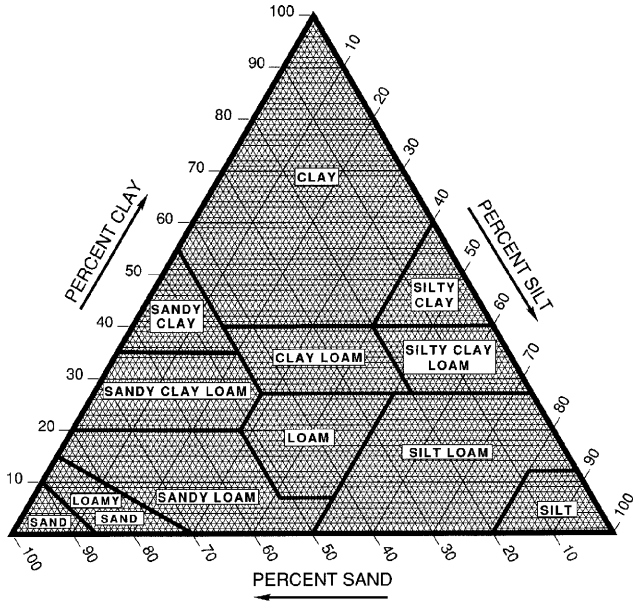

Figure 9.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 18 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 Detailed Soil Map Units” in Part I of this publication.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 9). “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, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

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 Properties

Table 19 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 19, the estimated clay content of each 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 affect the fertility and physical condition of the soil and 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 $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each 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. Depending on soil texture, a bulk density of more than 1.4 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 (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, 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 soil layer. The capacity varies, depending on soil properties that affect retention of water. 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.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Erosion factors are shown in table 19 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 susceptibility to wind erosion in cultivated areas. 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.

Chemical Properties

Table 20 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the 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.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil 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.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 20, 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 by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Cation-exchange capacity is the total amount of extractable bases 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. The ability to retain cations reduces the hazard of ground-water pollution.

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.

Water Features

Table 21 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very 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 to very 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.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 20 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water 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.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding 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 ponding 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 ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area 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.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal

weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

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.

Soil Features

Table 22 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

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. The table indicates the thickness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

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 to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes 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 or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete 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.

Engineering Index Test Data

Table 23 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section “Soil Series and Detailed Soil Map Units” in Part I of this publication. The soil samples were tested by the Illinois Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); and Moisture density—T 99 (AASHTO), D 698 (ASTM).

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Glossary

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.

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 till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

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.

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.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

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.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, 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.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly

changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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.

End moraine. A ridgelike accumulation that was produced or is being produced at the outer margin of an actively flowing glacier at any given time.

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.

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.

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.

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.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. 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.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

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.

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 lake (relict). An area formerly occupied by a glacial lake.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that 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 moraine. An extensive, fairly even layer of till, having an uneven or undulating surface.

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.

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.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

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.

Lacustrine 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.

Landform. Any physical, recognizable form or feature on the earth's surface, having a characteristic shape and produced by natural causes.

Landscape. A collection of related natural landforms; usually the land surface that the eye can comprehend in a single view.

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.

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.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

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.

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.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

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. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch

Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

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. Descriptive terms for concentrations and depletions 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).

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.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

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.

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.

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.

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.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

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. The slope classes for MLRA 108 in this survey are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Moderately sloping	5 to 10 percent
Moderately steep	10 to 18 percent
Steep	18 to 35 percent

The slope classes for MLRA 110 in this survey are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 4 percent

Moderately sloping	4 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 20 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

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.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream, and representing the dissected remnants of an abandoned flood plain, streambed, or valley floor produced during a former state of erosion or deposition.

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 grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from 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.

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.

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. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

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.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

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 Urbana, 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	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	31.7	16.0	23.8	60	-14	0	1.83	0.65	2.81	4	8.1
February	36.3	20.3	28.3	63	-7	2	1.97	1.06	2.78	4	7.0
March	48.8	31.1	40.0	79	8	36	3.30	1.92	4.54	7	4.1
April	62.4	41.4	51.9	85	23	145	3.94	1.94	5.69	7	.8
May	73.6	51.7	62.7	92	34	400	3.97	2.10	5.61	7	.0
June	82.9	60.7	71.8	96	46	655	4.07	1.93	5.92	5	.0
July	85.3	64.7	75.0	97	51	775	4.46	2.36	6.31	6	.0
August	83.0	62.3	72.7	96	48	703	4.03	2.22	5.62	6	.0
September	77.7	55.2	66.4	93	37	495	3.36	1.40	5.01	5	.0
October	65.1	43.8	54.5	86	26	195	2.66	1.21	3.91	5	.1
November	50.3	33.8	42.0	75	13	39	3.10	1.67	4.35	5	2.0
December	36.5	22.0	29.2	64	-8	4	3.02	1.31	4.48	6	6.0
Yearly:											
Average	61.1	41.9	51.5	---	---	---	---	---	---	---	---
Extreme	---	---	---	98	-16	---	---	---	---	---	---
Total	---	---	---	---	---	3,449	39.71	19.77	57.03	67	28.1

* 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 Urbana, 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. 8	Apr. 16	Apr. 30
2 years in 10 later than--	Apr. 2	Apr. 12	Apr. 25
5 years in 10 later than--	Mar. 23	Apr. 4	Apr. 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 28	Oct. 16	Oct. 5
2 years in 10 earlier than--	Nov. 3	Oct. 21	Oct. 10
5 years in 10 earlier than--	Nov. 13	Nov. 1	Oct. 19

Table 3.--Growing Season

(Recorded in the period 1961-90 at Urbana, 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	212	189	164
8 years in 10	219	196	171
5 years in 10	233	210	185
2 years in 10	247	224	198
1 year in 10	255	231	205

Table 4.--Classification of the Soils

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, superactive, mesic Typic Hapludalfs
Ambraw	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
Ashkum	Fine, mixed, superactive, mesic Typic Endoaquolls
Birkbeck	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Blackberry	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Brenton	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Bryce	Fine, mixed, superactive, mesic Vertic Endoaquolls
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Campton	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Catlin	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Chatsworth	Fine, illitic, mesic Oxyaquic Eutrudepts
Clare	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Dana	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Drummer	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Elburn	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Flanagan	Fine, smectitic, mesic Aquic Argiudolls
Harpster	Fine-silty, mixed, superactive, mesic Typic Calciaquolls
Kendall	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Kishwaukee	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
La Hogue	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Millbrook	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Mona	Fine-loamy, mixed, superactive, mesic Oxyaquic Argiudolls
Muskego	Coprogenous, euic, mesic Limnic Haplosaprists
Ockley	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Odell	Fine-loamy, mixed, superactive, mesic Aquic Argiudolls
Onarga	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Orthents, loamy	Fine-loamy, mixed, active, nonacid, mesic Aquic Udorthents
Ozaukee	Fine, illitic, mesic Oxyaquic Hapludalfs
Pella	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Penfield	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Peotone	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Proctor	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Raub	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Rossburg	Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls
Russell	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sabina	Fine, smectitic, mesic Aeric Epiaqualfs
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Selma	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Senachwine	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Sunbury	Fine, smectitic, mesic Aquollic Hapludalfs
Swygert	Fine, mixed, superactive, mesic Aquertic Argiudolls
Thorp	Fine-silty, mixed, superactive, mesic Argiaquic Argialbolls
Varna	Fine, illitic, mesic Oxyaquic Argiudolls
Wyanet	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Xenia	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	804	0.1
23B2	Blount silt loam, 2 to 4 percent slopes, eroded	808	0.1
56B	Dana silt loam, 2 to 5 percent slopes	22,846	3.6
56B2	Dana silt loam, 2 to 5 percent slopes, eroded	136	*
67A	Harpster silty clay loam, 0 to 2 percent slopes	2,155	0.3
91A	Swygert silty clay loam, 0 to 2 percent slopes	73	*
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded	2,790	0.4
91C2	Swygert silty clay loam, 4 to 6 percent slopes, eroded	411	*
102A	La Hogue loam, 0 to 2 percent slopes	1,424	0.2
125A	Selma loam, 0 to 2 percent slopes	2,906	0.5
131B	Alvin fine sandy loam, 2 to 5 percent slopes	205	*
134A	Camden silt loam, 0 to 2 percent slopes	14	*
134B	Camden silt loam, 2 to 5 percent slopes	1,207	0.2
146A	Elliott silt loam, 0 to 2 percent slopes	761	0.1
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded	28,476	4.5
146C2	Elliott silty clay loam, 4 to 6 percent slopes, eroded	1,485	0.2
148B2	Proctor silt loam, 2 to 5 percent slopes, eroded	14	*
149A	Brenton silt loam, 0 to 2 percent slopes	16,473	2.6
150B	Onarga sandy loam, 2 to 5 percent slopes	290	*
152A	Drummer silty clay loam, 0 to 2 percent slopes	254,334	39.8
153A	Pella silty clay loam, 0 to 2 percent slopes	6,422	1.0
154A	Flanagan silt loam, 0 to 2 percent slopes	100,542	15.7
171B	Catlin silt loam, 2 to 5 percent slopes	17,400	2.7
198A	Elburn silt loam, 0 to 2 percent slopes	17,649	2.8
206A	Thorp silt loam, 0 to 2 percent slopes	2,641	0.4
219A	Millbrook silt loam, 0 to 2 percent slopes	1,455	0.2
223B2	Varna silt loam, 2 to 4 percent slopes, eroded	8,041	1.3
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	3,116	0.5
223D3	Varna silty clay loam, 6 to 12 percent slopes, severely eroded	2,828	0.4
232A	Ashkum silty clay loam, 0 to 2 percent slopes	29,161	4.6
233B	Birkbeck silt loam, 2 to 5 percent slopes	2,668	0.4
234A	Sunbury silt loam, 0 to 2 percent slopes	2,013	0.3
235A	Bryce silty clay, 0 to 2 percent slopes	1,621	0.3
236A	Sabina silt loam, 0 to 2 percent slopes	3,010	0.5
241C3	Chatsworth silty clay, 4 to 6 percent slopes, severely eroded	36	*
241D3	Chatsworth silty clay, 6 to 12 percent slopes, severely eroded	286	*
242A	Kendall silt loam, 0 to 2 percent slopes	1,441	0.2
291B	Xenia silt loam, 2 to 5 percent slopes	4,836	0.8
322C2	Russell silt loam, 5 to 10 percent slopes, eroded	1,931	0.3
330A	Peotone silty clay loam, 0 to 2 percent slopes	3,744	0.6
387B	Ockley silt loam, 2 to 5 percent slopes	1,123	0.2
387C3	Ockley clay loam, 5 to 10 percent slopes, severely eroded	301	*
448B	Mona silt loam, 2 to 5 percent slopes	245	*
481A	Raub silt loam, 0 to 2 percent slopes	22,901	3.6
490A	Odell silt loam, 0 to 2 percent slopes	1,269	0.2
530B	Ozaukee silt loam, 2 to 4 percent slopes	509	*
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	411	*
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	542	*
530E2	Ozaukee silt loam, 12 to 20 percent slopes, eroded	381	*
533	Urban land	1,606	0.3
570B	Martinsville silt loam, 2 to 5 percent slopes	708	0.1
570C2	Martinsville loam, 5 to 10 percent slopes, eroded	1,021	0.2
570D2	Martinsville loam, 10 to 18 percent slopes, eroded	360	*
618B	Senachwine silt loam, 2 to 5 percent slopes	270	*
618C2	Senachwine silt loam, 5 to 10 percent slopes, eroded	850	0.1
618D2	Senachwine silt loam, 10 to 18 percent slopes, eroded	632	*
618E2	Senachwine silt loam, 18 to 25 percent slopes, eroded	510	*
618F	Senachwine silt loam, 18 to 35 percent slopes	398	*
622B	Wyanet silt loam, 2 to 5 percent slopes	7,316	1.1
622C2	Wyanet silt loam, 5 to 10 percent slopes, eroded	6,334	1.0
622D3	Wyanet clay loam, 10 to 18 percent slopes, severely eroded	358	*

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
623A	Kishwaukee silt loam, 0 to 2 percent slopes	3,105	0.5
637A+	Muskego silty clay loam, 0 to 2 percent slopes, overwash	48	*
663B	Clare silt loam, 2 to 5 percent slopes	8,398	1.3
679B	Blackberry silt loam, 2 to 5 percent slopes	4,990	0.8
680B	Campton silt loam, 2 to 5 percent slopes	1,651	0.3
687B	Penfield loam, 2 to 5 percent slopes	2,329	0.4
687C2	Penfield loam, 5 to 10 percent slopes, eroded	810	0.1
802B	Orthents, loamy, undulating	4,287	0.7
830	Landfills	115	*
865	Pits, gravel	460	*
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	11,073	1.7
3302A	Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded	2,791	0.4
3473A	Rossburg silt loam, 0 to 2 percent slopes, frequently flooded	982	0.2
W	Water	1,323	0.2
	Total	638,860	100.0

* Less than 0.1 percent.

Table 6.--Main Cropland Limitations and Hazards

(Only the soils that are generally suited to crop production are listed. See text for descriptions of the limitations and hazards listed in this table.)

Map symbol and soil name	Cropland limitations and hazards
23A:	
Blount	Wetness, restricted permeability
23B2:	
Blount	Crusting, wetness, water erosion, restricted permeability
56B, 56B2:	
Dana	Water erosion
67A:	
Harpster	Poor tilth, ponding, excess lime
91A:	
Swygert	Poor tilth, wetness, restricted permeability
91B2, 91C2:	
Swygert	Poor tilth, wetness, water erosion, low available water capacity, restricted permeability
102A:	
La Hogue	Wetness
125A:	
Selma	Ponding
131B:	
Alvin	Water erosion
134A:	
Camden	Crusting
134B:	
Camden	Crusting, water erosion
146A:	
Elliott	Wetness, restricted permeability
146B2, 146C2:	
Elliott	Poor tilth, wetness, water erosion, restricted permeability
148B2:	
Proctor	Water erosion
149A:	
Brenton	Wetness
150B:	
Onarga	None
152A:	
Drummer	Poor tilth, ponding
153A:	
Pella	Poor tilth, ponding

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations and hazards
154A:	
Flanagan	Wetness
171B:	
Catlin	Water erosion
198A:	
Elburn	Wetness
206A:	
Thorp	Ponding, restricted permeability
219A:	
Millbrook	Wetness
223B2, 223C2:	
Varna	Water erosion, restricted permeability
223D3:	
Varna	Crusting, poor tilth, water erosion, restricted permeability
232A:	
Ashkum	Poor tilth, ponding
233B:	
Birkbeck	Crusting, water erosion
234A:	
Sunbury	Wetness
235A:	
Bryce	Poor tilth, ponding, low available water capacity, restricted permeability
236A:	
Sabina	Crusting, wetness
242A:	
Kendall	Crusting, wetness
291B:	
Xenia	Crusting, wetness, water erosion
322C2:	
Russell	Crusting, water erosion
330A:	
Peotone	Poor tilth, ponding
387B:	
Ockley	Crusting, water erosion
387C3:	
Ockley	Crusting, poor tilth, water erosion, low available water capacity
448B:	
Mona	Water erosion, restricted permeability
481A:	
Raub	Wetness

Table 6.--Main Cropland Limitations and Hazards--Continued

Map symbol and soil name	Cropland limitations and hazards
490A:	
Odell	Wetness, restricted permeability
530B, 530C2, 530D2, 530E2:	
Ozaukee	Crusting, water erosion, restricted permeability
570B, 570C2, 570D2:	
Martinsville	Water erosion
618B, 618C2, 618D2:	
Senachwine	Crusting, water erosion
622B, 622C2:	
Wyanet	Water erosion
622D3:	
Wyanet	Crusting, poor tilth, water erosion
623A:	
Kishwaukee	None
637A+:	
Muskego	Poor tilth, ponding, subsidence
663B:	
Clare	Water erosion
679B:	
Blackberry	Water erosion
680B:	
Campton	Crusting, water erosion
687B, 687C2:	
Penfield	Water erosion
802B:	
Orthents, loamy	Crusting, poor tilth, water erosion, restricted permeability
3107A:	
Sawmill	Poor tilth, ponding, flooding
3302A:	
Ambraw	Poor tilth, wetness, flooding
3473A:	
Rossburg	Flooding

Table 7.--Main Pasture Limitations and Hazards

(Only the soils that are generally suited to pasture are listed. See text for descriptions of the limitations and hazards listed in this table.)

Map symbol and soil name	Pasture limitations and hazards
23A: Blount	Frost heave, low pH
23B2: Blount	Water erosion, frost heave, low pH
56B, 56B2: Dana	Water erosion, frost heave, low pH
67A: Harpster	Ponding, frost heave
91A: Swygert	Frost heave
91B2, 91C2: Swygert	Water erosion, low available water capacity, frost heave
102A: La Hogue	Frost heave, low pH
125A: Selma	Ponding, frost heave
131B: Alvin	Water erosion, frost heave, low pH, low fertility
134A: Camden	Frost heave, low pH
134B: Camden	Water erosion, frost heave, low pH
146A: Elliott	Frost heave
146B2, 146C2: Elliott	Water erosion, frost heave
148B2: Proctor	Water erosion, frost heave, low pH
149A: Brenton	Frost heave
150B: Onarga	Frost heave, low pH
152A: Drummer	Ponding, frost heave
153A: Pella	Ponding, frost heave

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations and hazards
154A:	
Flanagan	Frost heave, low pH
171B:	
Catlin	Water erosion, frost heave, low pH
198A:	
Elburn	Frost heave
206A:	
Thorp	Ponding, frost heave, low pH
219A:	
Millbrook	Frost heave, low pH
223B2, 223C2, 223D3:	
Varna	Water erosion, frost heave
232A:	
Ashkum	Ponding, frost heave
233B:	
Birkbeck	Water erosion, frost heave, low pH
234A:	
Sunbury	Frost heave
235A:	
Bryce	Ponding, low available water capacity, frost heave
236A:	
Sabina	Frost heave, low pH
241C3, 241D3:	
Chatsworth	Water erosion, low available water capacity, frost heave, low fertility
242A:	
Kendall	Frost heave, low pH
291B:	
Xenia	Water erosion, frost heave, low pH
322C2:	
Russell	Water erosion, frost heave, low pH
330A:	
Peotone	Ponding, frost heave
387B:	
Ockley	Water erosion, frost heave, low pH
387C3:	
Ockley	Water erosion, low available water capacity, frost heave, low fertility, low pH
448B:	
Mona	Water erosion, frost heave
481A:	
Raub	Frost heave, low pH

Table 7.--Main Pasture Limitations and Hazards--Continued

Map symbol and soil name	Pasture limitations and hazards
490A: Odell	Frost heave
530B, 530C2, 530D2: Ozaukee	Water erosion, frost heave
530E2: Ozaukee	Water erosion, frost heave, equipment limitation
570B, 570C2: Martinsville	Water erosion, frost heave, low pH
570D2: Martinsville	Water erosion, frost heave, equipment limitation, low pH
618B, 618C2: Senachwine	Water erosion, frost heave, low pH
618D2, 618E2, 618F: Senachwine	Water erosion, frost heave, equipment limitation, low pH
622B, 622C2: Wyanet	Water erosion, frost heave
622D3: Wyanet	Water erosion, frost heave, equipment limitation
623A: Kishwaukee	Frost heave, low pH
637A+: Muskego	Ponding, frost heave
663B: Clare	Water erosion, frost heave, low pH
679B: Blackberry	Water erosion, frost heave, low pH
680B: Campton	Water erosion, frost heave, low pH
687B, 687C2: Penfield	Water erosion, frost heave, low pH
802B: Orthents, loamy	Water erosion, frost heave
3107A: Sawmill	Ponding, flooding, frost heave
3302A: Ambraw	Wetness, flooding, frost heave, low pH
3473A: Rossburg	Flooding, frost heave

Table 8.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
23A:							
Blount	2w	106.00	35.00	48.00	64.00	4.30	7.20
23B2:							
Blount	2e	102.00	34.00	46.00	61.00	4.10	6.90
56B:							
Dana	2e	142.00	45.00	59.00	84.00	5.40	9.10
56B2:							
Dana	2e	137.00	43.00	58.00	82.00	5.30	8.80
67A:							
Harpster	2w	136.00	44.00	52.00	74.00	5.00	8.30
91A:							
Swygert	2w	114.00	39.00	51.00	73.00	4.50	7.50
91B2:							
Swygert	2e	107.00	37.00	48.00	69.00	4.20	7.10
91C2:							
Swygert	3e	106.00	36.00	47.00	68.00	4.20	7.00
102A:							
La Hogue	1	129.00	43.00	56.00	80.00	5.20	8.70
125A:							
Selma	2w	136.00	44.00	53.00	76.00	5.00	8.30
131B:							
Alvin	2e	98.00	37.00	47.00	66.00	4.10	6.80
134A:							
Camden	1	125.00	39.00	55.00	72.00	5.00	8.30
134B:							
Camden	2e	124.00	39.00	54.00	71.00	5.00	8.20
146A:							
Elliott	2w	128.00	45.00	55.00	79.00	5.10	8.50
146B2:							
Elliott	2e	123.00	43.00	53.00	76.00	4.90	8.20
146C2:							
Elliott	2e	122.00	43.00	52.00	75.00	4.80	8.10
148B2:							
Proctor	2e	138.00	42.00	57.00	84.00	5.30	8.80
149A:							
Brenton	1	160.00	47.00	62.00	91.00	5.90	9.80
150B:							
Onarga	2e	109.00	36.00	48.00	73.00	4.20	6.90

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
152A:							
Drummer	2w	154.00	51.00	61.00	83.00	5.50	9.20
153A:							
Pella	2w	140.00	48.00	56.00	78.00	5.20	8.70
154A:							
Flanagan	1	162.00	52.00	67.00	92.00	6.10	10.20
171B:							
Catlin	2e	149.00	46.00	60.00	86.00	5.70	9.60
198A:							
Elburn	1	161.00	50.00	63.00	94.00	6.10	10.20
206A:							
Thorp	2w	126.00	42.00	51.00	69.00	4.60	7.70
219A:							
Millbrook	1	144.00	43.00	59.00	81.00	5.40	9.00
223B2:							
Varna	2e	118.00	39.00	51.00	72.00	4.60	7.70
223C2:							
Varna	3e	117.00	39.00	50.00	71.00	4.60	7.60
223D3:							
Varna	4e	106.00	35.00	46.00	65.00	4.10	6.90
232A:							
Ashkum	2w	130.00	47.00	54.00	79.00	5.00	8.30
233B:							
Birkbeck	2e	122.00	41.00	54.00	69.00	5.00	8.20
234A:							
Sunbury	1	147.00	45.00	62.00	84.00	5.60	9.30
235A:							
Bryce	2w	120.00	43.00	48.00	70.00	4.40	7.30
236A:							
Sabina	2w	133.00	42.00	56.00	75.00	5.20	8.70
241C3:							
Chatsworth	6e	---	---	---	---	1.60	2.70
241D3:							
Chatsworth	7e	---	---	---	---	1.60	2.60
242A:							
Kendall	2w	135.00	41.00	55.00	75.00	5.20	8.70
291B:							
Xenia	2e	125.00	41.00	54.00	71.00	4.80	7.90
322C2:							
Russell	3e	118.00	39.00	52.00	65.00	4.50	7.50

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
330A:							
Peotone	2w	123.00	42.00	43.00	58.00	4.20	7.00
387B:							
Ockley	2e	125.00	42.00	50.00	74.00	5.00	8.20
387C3:							
Ockley	4e	110.00	37.00	44.00	65.00	4.40	7.20
448B:							
Mona	2e	114.00	37.00	50.00	73.00	4.50	7.40
481A:							
Raub	1	155.00	51.00	63.00	92.00	6.10	10.20
490A:							
Odell	1	143.00	48.00	61.00	87.00	5.60	9.30
530B:							
Ozaukee	2e	105.00	32.00	47.00	75.00	4.30	7.10
530C2:							
Ozaukee	2e	101.00	30.00	45.00	72.00	4.10	6.80
530D2:							
Ozaukee	3e	99.00	30.00	44.00	71.00	4.00	6.70
530E2:							
Ozaukee	4e	91.00	28.00	40.00	65.00	3.70	6.20
533:							
Urban land.							
570B:							
Martinsville	2e	120.00	37.00	50.00	65.00	4.80	7.90
570C2:							
Martinsville	3e	114.00	35.00	48.00	62.00	4.50	7.50
570D2:							
Martinsville	4e	108.00	33.00	45.00	59.00	4.30	7.10
618B:							
Senachwine	2e	120.00	40.00	50.00	67.00	4.80	7.90
618C2:							
Senachwine	3e	114.00	38.00	48.00	64.00	4.50	7.50
618D2:							
Senachwine	4e	108.00	36.00	45.00	61.00	4.30	7.10
618E2:							
Senachwine	6e	---	---	---	---	3.70	6.20
618F:							
Senachwine	6e	---	---	---	---	3.50	5.80
622B:							
Wyanet	2e	128.00	44.00	56.00	77.00	5.20	8.70

See footnote at end of table.

Table 8.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
622C2:							
Wyanet	3e	121.00	41.00	54.00	73.00	5.00	8.30
622D3:							
Wyanet	4e	104.00	36.00	46.00	63.00	4.30	7.20
623A:							
Kishwaukee	1	144.00	47.00	61.00	80.00	5.50	9.20
637A+:							
Muskego	3w	123.00	42.00	---	---	---	7.30
663B:							
Clare	2e	143.00	44.00	58.00	87.00	5.40	9.10
679B:							
Blackberry	2e	150.00	45.00	59.00	89.00	5.70	9.60
680B:							
Campton	2e	126.00	40.00	55.00	72.00	5.00	8.40
687B:							
Penfield	2e	137.00	42.00	56.00	87.00	5.20	8.70
687C2:							
Penfield	3e	130.00	39.00	54.00	83.00	5.00	8.30
802B:							
Orthents, loamy.							
830:							
Landfills.							
865:							
Pits, gravel.							
3107A:							
Sawmill	3w	132.00	42.00	49.00	68.00	5.00	8.20
3302A:							
Ambraw	3w	119.00	39.00	47.00	63.00	4.10	6.90
3473A:							
Rossburg	3w	117.00	38.00	47.00	64.00	4.50	7.50

* 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 9.--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
23A	Blount silt loam, 0 to 2 percent slopes (where drained)
23B2	Blount silt loam, 2 to 4 percent slopes, eroded
56B	Dana silt loam, 2 to 5 percent slopes
56B2	Dana silt loam, 2 to 5 percent slopes, eroded
67A	Harpster silty clay loam, 0 to 2 percent slopes (where drained)
91A	Swygert silty clay loam, 0 to 2 percent slopes
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded
91C2	Swygert silty clay loam, 4 to 6 percent slopes, eroded
102A	La Hogue loam, 0 to 2 percent slopes
125A	Selma loam, 0 to 2 percent slopes (where drained)
131B	Alvin fine sandy loam, 2 to 5 percent slopes
134A	Camden silt loam, 0 to 2 percent slopes
134B	Camden silt loam, 2 to 5 percent slopes
146A	Elliott silt loam, 0 to 2 percent slopes
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded
146C2	Elliott silty clay loam, 4 to 6 percent slopes, eroded
148B2	Proctor silt loam, 2 to 5 percent slopes, eroded
149A	Brenton silt loam, 0 to 2 percent slopes
150B	Onarga sandy loam, 2 to 5 percent slopes
152A	Drummer silty clay loam, 0 to 2 percent slopes (where drained)
153A	Pella silty clay loam, 0 to 2 percent slopes (where drained)
154A	Flanagan silt loam, 0 to 2 percent slopes
171B	Catlin silt loam, 2 to 5 percent slopes
198A	Elburn silt loam, 0 to 2 percent slopes
206A	Thorp silt loam, 0 to 2 percent slopes (where drained)
219A	Millbrook silt loam, 0 to 2 percent slopes (where drained)
223B2	Varna silt loam, 2 to 4 percent slopes, eroded
223C2	Varna silt loam, 4 to 6 percent slopes, eroded
232A	Ashkum silty clay loam, 0 to 2 percent slopes (where drained)
233B	Birkbeck silt loam, 2 to 5 percent slopes
234A	Sunbury silt loam, 0 to 2 percent slopes
235A	Bryce silty clay, 0 to 2 percent slopes (where drained)
236A	Sabina silt loam, 0 to 2 percent slopes (where drained)
242A	Kendall silt loam, 0 to 2 percent slopes (where drained)
291B	Xenia silt loam, 2 to 5 percent slopes
330A	Peotone silty clay loam, 0 to 2 percent slopes (where drained)
387B	Ockley silt loam, 2 to 5 percent slopes
448B	Mona silt loam, 2 to 5 percent slopes
481A	Raub silt loam, 0 to 2 percent slopes
490A	Odell silt loam, 0 to 2 percent slopes
530B	Ozaukee silt loam, 2 to 4 percent slopes
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded
570B	Martinsville silt loam, 2 to 5 percent slopes
618B	Senachwine silt loam, 2 to 5 percent slopes
622B	Wyanet silt loam, 2 to 5 percent slopes
623A	Kishwaukee silt loam, 0 to 2 percent slopes
663B	Clare silt loam, 2 to 5 percent slopes
679B	Blackberry silt loam, 2 to 5 percent slopes
680B	Campton silt loam, 2 to 5 percent slopes
687B	Penfield loam, 2 to 5 percent slopes
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3302A	Ambraw silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)

Table 9.--Prime Farmland--Continued

Map symbol	Soil name
3473A	Rossburg silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)

Table 10.--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
23A:					
Blount	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
23B2:					
Blount	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
56B:					
Dana	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
56B2:					
Dana	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
67A:					
Harpster	Coralberry, mapleleaf arrowwood, redosier dogwood.	Blackhaw, cock's-spur hawthorn, nannyberry, shadbush, silky dogwood.	Eastern redcedar, hackberry, northern red oak, northern white-cedar, tamarack.	Baldcypress, green ash.	---
91A:					
Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--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
91B2:					
Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
91C2:					
Swygert	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
102A:					
La Hogue	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
125A:					
Selma	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
131B:					
Alvin	American plum, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf arrowwood.	Arnold hawthorn, blackhaw, hazelnut, prairie crabapple, shadbush, witchhazel.	Baldcypress, eastern redcedar, green ash, northern red oak, northern white-cedar, tuliptree.	Norway spruce, eastern white pine, hackberry, pin oak.	Eastern cottonwood, imperial Carolina poplar.
134A:					
Camden	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
134B:					
Camden	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
146A:					
Elliott	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
146B2:					
Elliott	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
146C2:					
Elliott	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
148B2:					
Proctor	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
149A:					
Brenton	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
150B:					
Onarga	American plum, black chokeberry, common winterberry, coralberry, gray dogwood, mapleleaf arrowwood.	Arnold hawthorn, blackhaw, hazelnut, prairie crabapple, shadbush, witchhazel.	Baldcypress, eastern redcedar, green ash, northern red oak, northern white-cedar, tuliptree.	Norway spruce, eastern white pine, hackberry, pin oak.	Eastern cottonwood, imperial Carolina poplar.
152A:					
Drummer	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
153A:					
Pella	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
154A:					
Flanagan	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
171B:					
Catlin	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
198A:					
Elburn	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
206A: Thorp	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
219A: Millbrook	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
223B2: Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
223C2: Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
223D3: Varna	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
232A: Ashkum	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
233B: Birkbeck	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
234A: Sunbury	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
235A: Bryce	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
236A: Sabina	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
241C3: Chatsworth	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
241D3: Chatsworth	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
242A: Kendall	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
291B:					
Xenia	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
322C2:					
Russell	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
330A:					
Peotone	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
387B:					
Ockley	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
387C3:					
Ockley	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
448B:					
Mona	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
481A:					
Raub	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
490A:					
Odell	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
530B:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530C2:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530D2:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.
530E2:					
Ozaukee	American plum, black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	Washington hawthorn, blackhaw, hazelnut, nannyberry, prairie crabapple, shadbush.	Baldcypress, eastern redcedar, green ash, northern white-cedar, tamarack.	Norway spruce, eastern white pine, pin oak.	Eastern cottonwood, imperial Carolina poplar.

Table 10.--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
570B: Martinsville	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
570C2: Martinsville	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
570D2: Martinsville	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
618B: Senachwine	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
618C2: Senachwine	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
618D2: Senachwine	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
618E2: Senachwine	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
618F:					
Senachwine	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
622B:					
Wyanet	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
622C2:					
Wyanet	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
622D3:					
Wyanet	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
623A:					
Kishwaukee	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
637A+:					
Muskego	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
663B:					
Clare	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 10.--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
679B: Blackberry	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
679B: Blackberry	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
680B: Campton	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
687B: Penfield	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
687C2: Penfield	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
802B: Orthents, loamy	Common winterberry, coralberry, gray dogwood, mapleleaf arrowwood, redosier dogwood.	American plum, blackhaw, hazelnut, prairie crabapple, roughleaf dogwood.	Eastern redcedar, nannyberry, northern white-cedar, shadbush, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.
3107A: Sawmill	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.

Table 10.--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
3302A: Ambraw	Black chokeberry, coralberry, gray dogwood, mapleleaf arrowwood.	American plum, blackhaw, nannyberry, prairie crabapple, roughleaf dogwood.	Eastern redcedar, hackberry, northern white-cedar, shadbush, tamarack, witchhazel.	Norway spruce, baldcypress, eastern white pine, green ash, northern red oak, tuliptree.	Eastern cottonwood, imperial Carolina poplar, pin oak.
3473A: Rossburg	Black chokeberry, common winterberry, coralberry, mapleleaf arrowwood, silky dogwood.	American plum, prairie crabapple, rusty blackhaw, shadbush.	Washington hawthorn, eastern redcedar, nannyberry, northern red oak, northern white-cedar, tamarack.	Norway spruce, baldcypress, green ash, hackberry, tuliptree.	Eastern cottonwood, eastern white pine, imperial Carolina poplar, pin oak.

Table 11.--Forestland Management and Productivity

(Only the soils suitable for production of commercial trees are listed.)

Map symbol and soil name	Management concerns					Potential productivity			Suggested trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	
23A:									
Blount	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	57	43	Green ash, shagbark hickory, pin oak, baldcypress, eastern redcedar, northern white-cedar.
						White oak	57	43	
						Sugar maple	54	29	
						White ash	57	43	
23B2:									
Blount	Slight	Moderate	Moderate	Moderate	Severe	Northern red oak	57	43	Green ash, shagbark hickory, pin oak, baldcypress, eastern redcedar, northern white-cedar.
						White oak	57	43	
						Sugar maple	54	29	
						White ash	57	43	
131B:									
Alvin	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Black walnut	---	---	
						Northern red oak	80	57	
						Tuliptree	90	86	
134A:									
Camden	Slight	Slight	Slight	Slight	Severe	White oak	85	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Green ash	76	72	
						Northern red oak	85	72	
						Sweetgum	80	86	
						Tuliptree	95	100	
134B:									
Camden	Slight	Slight	Slight	Slight	Severe	White oak	85	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Green ash	76	72	
						Northern red oak	85	72	
						Sweetgum	80	86	
						Tuliptree	95	100	
219A:									
Millbrook	Slight	Moderate	Moderate	Moderate	Severe	White oak	80	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Black walnut	---	---	
						Northern red oak	80	57	
						Tuliptree	90	86	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Management concerns					Potential productivity			Suggested trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	
233B:									
Birkbeck	Slight	Slight	Slight	Slight	Severe	White oak	86	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Green ash	---	---	
						Northern red oak	---	---	
236A:									
Sabina	Slight	Moderate	Moderate	Moderate	Severe	White oak	80	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Black walnut	---	---	
						Northern red oak	80	57	
242A:									
Kendall	Slight	Moderate	Moderate	Moderate	Severe	White oak	80	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Black walnut	---	---	
						Northern red oak	80	57	
						Tuliptree	90	86	
291B:									
Xenia	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
322C2:									
Russell	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Northern red oak	90	72	
						Tuliptree	96	100	
387B:									
Ockley	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Northern red oak	90	72	
						Sweetgum	76	72	
						Tuliptree	98	100	
387C3:									
Ockley	Slight	Slight	Moderate	Slight	Moderate	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Northern red oak	90	72	
						Sweetgum	76	72	
						Tuliptree	98	100	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Management concerns					Potential productivity			Suggested trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	
530B:									
Ozaukee	Slight	Slight	Slight	Moderate	Severe	Northern red oak	66	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sugar maple	---	---	
						White ash	---	---	
						American basswood	---	---	
530C2:									
Ozaukee	Slight	Slight	Slight	Moderate	Severe	Northern red oak	66	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sugar maple	---	---	
						White ash	---	---	
						American basswood	---	---	
530D2:									
Ozaukee	Slight	Slight	Slight	Moderate	Severe	Northern red oak	66	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sugar maple	---	---	
						White ash	---	---	
						American basswood	---	---	
530E2:									
Ozaukee	Moderate	Moderate	Slight	Moderate	Severe	Northern red oak	66	57	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sugar maple	---	---	
						White ash	---	---	
						American basswood	---	---	
570B:									
Martinsville	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
570C2:									
Martinsville	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
570D2:									
Martinsville	Slight	Slight	Slight	Slight	Severe	White oak	80	57	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Management concerns					Potential productivity			Suggested trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	
618B:									
Senachwine	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
618C2:									
Senachwine	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
618D2:									
Senachwine	Slight	Slight	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
618E2:									
Senachwine	Moderate	Moderate	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
618F:									
Senachwine	Moderate	Moderate	Slight	Slight	Severe	White oak	90	72	White oak, northern red oak, green ash, white ash, eastern white pine.
						Sweetgum	76	72	
						Tuliptree	98	100	
680B:									
Campton	Slight	Slight	Slight	Slight	Severe	White oak	85	72	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Green ash	---	---	
						Northern red oak	85	72	
						Sweetgum	---	---	
						Tuliptree	95	100	
3107A:									
Sawmill	Slight	Moderate	Severe	Severe	Severe	Pin oak	90	72	Swamp white oak, bur oak, baldcypress, green ash, pin oak, hackberry, northern white-cedar.
						American sycamore	---	---	
						Eastern cottonwood	---	---	
						Sweetgum	---	---	

See footnote at end of table.

Table 11.--Forestland Management and Productivity--Continued

Map symbol and soil name	Management concerns					Potential productivity			
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume of wood fiber*	Suggested trees to plant
3302A:									
Ambraw	Slight	Moderate	Severe	Moderate	Severe	Pin oak	90	72	Swamp white oak, bur oak, baldcypress, green ash, pin oak, hackberry, northern white-cedar.
						American sycamore	---	---	
						Eastern cottonwood	---	---	
						Sweetgum	---	---	
3473A:									
Rossburg	Slight	Slight	Slight	Slight	Severe	White oak	---	---	White oak, northern red oak, black walnut, green ash, white ash, eastern white pine.
						Black cherry	---	---	
						Black walnut	---	---	
						Northern red oak	86	72	
						Sugar maple	85	57	
						Tuliptree	96	100	
						White ash	---	---	

* Volume of wood fiber is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 12.--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
23A:					
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
23B2:					
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
56B:					
Dana	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
56B2:					
Dana	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
67A:					
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
91A:					
Swygert	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
91B2:					
Swygert	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
91C2:					
Swygert	Severe: percs slowly, wetness.	Severe: percs slowly.	Severe: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
102A:					
La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
125A:					
Selma	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
131B:					
Alvin	Slight	Slight	Moderate: slope.	Slight	Slight.
134A:					
Camden	Slight	Slight	Slight	Slight	Slight.
134B:					
Camden	Slight	Slight	Moderate: slope.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
146A: Elliott	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
146B2: Elliott	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
146C2: Elliott	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
148B2: Proctor	Slight	Slight	Moderate: slope.	Slight	Slight.
149A: Brenton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
150B: Onarga	Slight	Slight	Moderate: slope.	Slight	Slight.
152A: Drummer	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
153A: Pella	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
154A: Flanagan	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
171B: Catlin	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
198A: Elburn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
206A: Thorp	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
219A: Millbrook	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
223B2: Varna	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
223C2:					
Varna	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
223D3:					
Varna	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Slight	Moderate: large stones, slope.
232A:					
Ashkum	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
233B:					
Birkbeck	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
234A:					
Sunbury	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
235A:					
Bryce	Severe: ponding, too clayey.	Severe: ponding, too clayey.	Severe: ponding, too clayey.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
236A:					
Sabina	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
241C3:					
Chatsworth	Severe: percs slowly, too clayey.	Severe: percs slowly, too clayey.	Severe: percs slowly, too clayey.	Severe: too clayey.	Severe: too clayey.
241D3:					
Chatsworth	Severe: percs slowly, too clayey.	Severe: percs slowly, too clayey.	Severe: percs slowly, slope, too clayey.	Severe: too clayey.	Severe: too clayey.
242A:					
Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
291B:					
Xenia	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Moderate: wetness.	Moderate: wetness.
322C2:					
Russell	Slight	Slight	Severe: slope.	Slight	Slight.
330A:					
Peotone	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
387B: Ockley	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
387C3: Ockley	Slight	Slight	Severe: slope.	Slight	Slight.
448B: Mona	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
481A: Raub	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
490A: Odell	Severe: wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
530B: Ozaukee	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
530C2: Ozaukee	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Slight	Slight.
530D2: Ozaukee	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Slight	Moderate: slope.
530E2: Ozaukee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
533: Urban land.					
570B: Martinsville	Slight	Slight	Moderate: slope.	Slight	Slight.
570C2: Martinsville	Slight	Slight	Severe: slope.	Slight	Slight.
570D2: Martinsville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
618B: Senachwine	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
618C2: Senachwine	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
618D2: Senachwine	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Slight	Moderate: slope.
618E2: Senachwine	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
618F: Senachwine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
622B: Wyanet	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
622C2: Wyanet	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
622D3: Wyanet	Moderate: percs slowly, slope.	Moderate: percs slowly, slope.	Severe: slope.	Slight	Moderate: slope.
623A: Kishwaukee	Slight	Slight	Slight	Slight	Slight.
637A+: Muskego	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
663B: Clare	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
679B: Blackberry	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
680B: Campton	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
687B: Penfield	Slight	Slight	Moderate: slope.	Slight	Slight.

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
687C2: Penfield	Slight	Slight	Severe: slope.	Slight	Slight.
802B: Orthents, loamy	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly, slope.	Slight	Slight.
830: Landfills.					
865: Pits, gravel.					
3107A: Sawmill	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.	Severe: ponding.	Severe: flooding, ponding.
3302A: Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
3473A: Rossburg	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.

Table 13.--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
23A: Blount	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
23B2: Blount	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
56B: Dana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
56B2: Dana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
67A: Harpster	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
91A: Swygert	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
91B2: Swygert	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
91C2: Swygert	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
102A: La Hogue	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
125A: Selma	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
131B: Alvin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
134A: Camden	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
134B: Camden	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
146A: Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
146B2: Elliott	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
146C2: Elliott	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
148B2: Proctor	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 13.--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	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
149A: Brenton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
150B: Onarga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
152A: Drummer	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
153A: Pella	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
154A: Flanagan	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
171B: Catlin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
198A: Elburn	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
206A: Thorp	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
219A: Millbrook	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
223B2: Varna	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C2: Varna	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
223D3: Varna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
232A: Ashkum	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
233B: Birkbeck	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
234A: Sunbury	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
235A: Bryce	Fair	Fair	Poor	Fair	Fair	Good	Good	Fair	Fair	Good.
236A: Sabina	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
241C3: Chatsworth	Poor	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.

Table 13.--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
241D3: Chatsworth	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
242A: Kendall	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
291B: Xenia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
322C2: Russell	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
330A: Peotone	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
387B: Ockley	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
387C3: Ockley	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
448B: Mona	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
481A: Raub	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
490A: Odell	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
530B: Ozaukee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
530C2: Ozaukee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
530D2: Ozaukee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
530E2: Ozaukee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
533: Urban land.										
570B: Martinsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
570C2: Martinsville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 13.--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	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
570D2:										
Martinsville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
618B:										
Senachwine	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
618C2:										
Senachwine	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
618D2:										
Senachwine	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
618E2:										
Senachwine	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
618F:										
Senachwine	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
622B:										
Wyanet	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
622C2:										
Wyanet	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
622D3:										
Wyanet	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
623A:										
Kishwaukee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
637A+:										
Muskego	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
663B:										
Clare	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
679B:										
Blackberry	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
680B:										
Campton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
687B:										
Penfield	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
687C2:										
Penfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 13.--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, loamy	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
830: Landfills.										
865: Pits, gravel.										
3107A: Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3302A: Ambraw	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3473A: Rossburg	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.

Table 14.--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
23A:						
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
23B2:						
Blount	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
56B:						
Dana	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
56B2:						
Dana	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
67A:						
Harpster	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
91A:						
Swygert	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
91B2:						
Swygert	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
91C2:						
Swygert	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
102A:						
La Hogue	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, shrink-swell, wetness.	Moderate: wetness.
125A:						
Selma	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, ponding.	Severe: ponding.
131B:						
Alvin	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.

Table 14.--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
134A: Camden	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
134B: Camden	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
146A: Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
146B2: Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
146C2: Elliott	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
148B2: Proctor	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
149A: Brenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
150B: Onarga	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
152A: Drummer	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
153A: Pella	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
154A: Flanagan	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
171B: Catlin	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
198A: Elburn	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.

Table 14.--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
206A:						
Thorp	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, low strength, ponding.	Severe: ponding.
219A:						
Millbrook	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
223B2:						
Varna	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
223C2:						
Varna	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Slight.
223D3:						
Varna	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
232A:						
Ashkum	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
233B:						
Birkbeck	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
234A:						
Sunbury	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
235A:						
Bryce	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
236A:						
Sabina	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: wetness.
241C3:						
Chatsworth	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Severe: too clayey.

Table 14.--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
241D3:						
Chatsworth	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Severe: too clayey.
242A:						
Kendall	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength, wetness.	Severe: wetness.
291B:						
Xenia	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Moderate: wetness.
322C2:						
Russell	Moderate: dense layer.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: frost action, low strength.	Slight.
330A:						
Peotone	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding.
387B:						
Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, low strength, shrink-swell.	Slight.
387C3:						
Ockley	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: frost action, low strength, shrink-swell.	Slight.
448B:						
Mona	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.
481A:						
Raub	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, low strength.	Moderate: wetness.
490A:						
Odell	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: frost action, low strength, wetness.	Moderate: wetness.
530B:						
Ozaukee	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: low strength.	Slight.

Table 14.--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
530C2: Ozaukee	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: low strength.	Slight.
530D2: Ozaukee	Severe: wetness.	Moderate: shrink-swell, slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
530E2: Ozaukee	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
533: Urban land.						
570B: Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: frost action, low strength, shrink-swell.	Slight.
570C2: Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: frost action, low strength, shrink-swell.	Slight.
570D2: Martinsville	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, shrink-swell, slope.	Moderate: slope.
618B: Senachwine	Moderate: dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
618C2: Senachwine	Moderate: dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
618D2: Senachwine	Moderate: dense layer, slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
618E2: Senachwine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
618F: Senachwine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

Table 14.--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
622B:						
Wyanet	Moderate: dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Severe: low strength.	Slight.
622C2:						
Wyanet	Moderate: dense layer.	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
622D3:						
Wyanet	Moderate: dense layer, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
623A:						
Kishwaukee	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
637A+:						
Muskego	Severe: excess humus, ponding.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: low strength, ponding, subsides.	Severe: frost action, ponding, subsides.	Severe: ponding.
663B:						
Clare	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
679B:						
Blackberry	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
680B:						
Campton	Severe: cutbanks cave, wetness.	Moderate: shrink-swell, wetness.	Severe: wetness.	Moderate: shrink-swell, wetness.	Severe: frost action, low strength.	Slight.
687B:						
Penfield	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell.	Moderate: frost action, low strength, shrink-swell.	Slight.
687C2:						
Penfield	Severe: cutbanks cave.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Moderate: frost action, low strength, shrink-swell.	Slight.
802B:						
Orthents, loamy	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, wetness.	Moderate: shrink-swell, slope.	Moderate: frost action, low strength, shrink-swell.	Slight.
830:						
Landfills.						
865:						
Pits, gravel.						

Table 14.--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
3107A: Sawmill	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, low strength, ponding.	Severe: flooding, ponding.
3302A: Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
3473A: Rossburg	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.

Table 15.--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
23A:					
Blount	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
23B2:					
Blount	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
56B:					
Dana	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
56B2:					
Dana	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
67A:					
Harpster	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: hard to pack, ponding.
91A:					
Swygert	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
91B2:					
Swygert	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
91C2:					
Swygert	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
102A:					
La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
125A:					
Selma	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
131B:					
Alvin	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.

Table 15.--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
134A: Camden	Moderate: percs slowly.	Moderate: seepage.	Severe: seepage.	Slight	Good.
134B: Camden	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: seepage.	Slight	Good.
146A: Elliott	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: too clayey, wetness.
146B2: Elliott	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
146C2: Elliott	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
148B2: Proctor	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Good.
149A: Brenton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
150B: Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.
152A: Drummer	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
153A: Pella	Severe: ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
154A: Flanagan	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
171B: Catlin	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
198A: Elburn	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.

Table 15.--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
206A:					
Thorp	Severe: percs slowly, ponding.	Severe: ponding, seepage.	Severe: ponding, seepage.	Severe: ponding.	Poor: ponding.
219A:					
Millbrook	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
223B2:					
Varna	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey.
223C2:					
Varna	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey.
223D3:					
Varna	Severe: percs slowly, wetness.	Severe: slope.	Moderate: slope, too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey.
232A:					
Ashkum	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
233B:					
Birkbeck	Severe: percs slowly, wetness.	Severe: wetness.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
234A:					
Sunbury	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
235A:					
Bryce	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
236A:					
Sabina	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
241C3:					
Chatsworth	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: hard to pack, too clayey.
241D3:					
Chatsworth	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey.	Moderate: slope, wetness.	Poor: hard to pack, too clayey.

Table 15.--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
242A:					
Kendall	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
291B:					
Xenia	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
322C2:					
Russell	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
330A:					
Peotone	Severe: percs slowly, ponding.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: hard to pack, ponding, too clayey.
387B:					
Ockley	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Fair: small stones.
387C3:					
Ockley	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Slight	Fair: small stones.
448B:					
Mona	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: thin layer.
481A:					
Raub	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
490A:					
Odell	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
530B:					
Ozaukee	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
530C2:					
Ozaukee	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
530D2:					
Ozaukee	Severe: percs slowly, wetness.	Severe: slope.	Moderate: slope, too clayey, wetness.	Moderate: slope, wetness.	Fair: slope, too clayey, wetness.

Table 15.--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
530E2:					
Ozaukee	Severe: percs slowly, slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
533:					
Urban land.					
570B:					
Martinsville	Slight	Severe: seepage.	Severe: seepage.	Slight	Good.
570C2:					
Martinsville	Slight	Severe: seepage, slope.	Severe: seepage.	Slight	Good.
570D2:					
Martinsville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: slope.
618B:					
Senachwine	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
618C2:					
Senachwine	Severe: percs slowly.	Severe: slope.	Slight	Slight	Good.
618D2:					
Senachwine	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
618E2:					
Senachwine	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
618F:					
Senachwine	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
622B:					
Wyanet	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
622C2:					
Wyanet	Severe: percs slowly.	Severe: slope.	Slight	Slight	Good.
622D3:					
Wyanet	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
623A:					
Kishwaukee	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Slight	Good.

Table 15.--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
637A+:					
Muskego	Severe: percs slowly, ponding, subsides.	Severe: excess humus, ponding, seepage.	Severe: excess humus, ponding.	Severe: ponding, seepage.	Poor: excess humus, ponding.
663B:					
Clare	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
679B:					
Blackberry	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
680B:					
Campton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
687B:					
Penfield	Moderate: percs slowly, wetness.	Moderate: seepage, slope, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Good.
687C2:					
Penfield	Moderate: percs slowly, wetness.	Severe: slope.	Severe: seepage, wetness.	Moderate: wetness.	Good.
802B:					
Orthents, loamy	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
830:					
Landfills.					
865:					
Pits, gravel.					
3107A:					
Sawmill	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3302A:					
Ambraw	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3473A:					
Rossburg	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Severe: flooding.	Good.

Table 16.--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
23A:				
Blount	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
23B2:				
Blount	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
56B:				
Dana	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
56B2:				
Dana	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
67A:				
Harpster	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
91A:				
Swygert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
91B2:				
Swygert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
91C2:				
Swygert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
102A:				
La Hogue	Fair: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
125A:				
Selma	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
131B:				
Alvin	Good	Probable	Improbable: too sandy.	Good.
134A:				
Camden	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
134B: Camden	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
146A: Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
146B2: Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
146C2: Elliott	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
148B2: Proctor	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
149A: Brenton	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
150B: Onarga	Good	Probable	Improbable: too sandy.	Good.
152A: Drummer	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
153A: Pella	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
154A: Flanagan	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
171B: Catlin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
198A: Elburn	Poor: low strength.	Probable	Improbable: too sandy.	Fair: too clayey.
206A: Thorp	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
219A: Millbrook	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
223B2: Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
223C2: Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
223D3: Varna	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, too clayey.
232A: Ashkum	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
233B: Birkbeck	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
234A: Sunbury	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
235A: Bryce	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
236A: Sabina	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
241C3: Chatsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
241D3: Chatsworth	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
242A: Kendall	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
291B: Xenia	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
322C2: Russell	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
330A: Peotone	Poor: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
387B: Ockley	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim, small stones.
387C3: Ockley	Fair: shrink-swell.	Probable	Probable	Poor: area reclaim, small stones.
448B: Mona	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
481A: Raub	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
490A: Odell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
530B: Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530C2: Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530D2: Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
530E2: Ozaukee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
533: Urban land.				
570B: Martinsville	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
570C2: Martinsville	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
570D2:				
Martinsville	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, too clayey.
618B:				
Senachwine	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
618C2:				
Senachwine	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
618D2:				
Senachwine	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, too clayey.
618E2:				
Senachwine	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
618F:				
Senachwine	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
622B:				
Wyanet	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
622C2:				
Wyanet	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
622D3:				
Wyanet	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones.
623A:				
Kishwaukee	Poor: low strength.	Probable	Probable	Poor: area reclaim.
637A+:				
Muskego	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
663B:				
Clare	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
679B:				
Blackberry	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
680B: Campton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
687B: Penfield	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
687C2: Penfield	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
802B: Orthents, loamy	Fair: low strength, shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
830: Landfills.				
865: Pits, gravel.				
3107A: Sawmill	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3302A: Ambraw	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3473A: Rossburg	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

Table 17.--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
23A:							
Blount	Slight	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
23B2:							
Blount	Moderate: slope.	Severe: wetness.	Severe: no water.	Frost action, percs slowly.	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easiily, rooting depth, wetness.
56B:							
Dana	Moderate: seepage, slope.	Moderate: wetness.	Severe: no water.	Frost action, slope.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
56B2:							
Dana	Moderate: seepage, slope.	Moderate: wetness.	Severe: no water.	Frost action, slope.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
67A:							
Harpster	Severe: seepage.	Severe: ponding.	Moderate: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
91A:							
Swygert	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly--	Percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, rooting depth, wetness.
91B2:							
Swygert	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly--	Percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, rooting depth, wetness.
91C2:							
Swygert	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
102A:							
La Hogue	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Favorable	Wetness	Wetness	Wetness.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
125A:							
Selma	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Ponding	Wetness.
131B:							
Alvin	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
134A:							
Camden	Severe: seepage.	Slight	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
134B:							
Camden	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
146A:							
Elliott	Slight	Moderate: hard to pack, piping, wetness.	Severe: no water.	Favorable	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
146B2:							
Elliott	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
146C2:							
Elliott	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
148B2:							
Proctor	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
149A:							
Brenton	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
150B:							
Onarga	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
152A: Drummer	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
153A: Pella	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
154A: Flanagan	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Favorable	Wetness	Erodes easily, wetness.	Erodes easily, rooting depth, wetness.
171B: Catlin	Moderate: seepage, slope.	Moderate: wetness.	Severe: no water.	Frost action, slope.	Slope	Erodes easily, wetness.	Erodes easily, rooting depth.
198A: Elburn	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, wetness.
206A: Thorp	Severe: seepage.	Severe: ponding.	Severe: cutbanks cave, slow refill.	Frost action, percs slowly, ponding.	Percs slowly, ponding.	Erodes easily, percs slowly, ponding.	Erodes easily, percs slowly, wetness.
219A: Millbrook	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
223B2: Varna	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
223C2: Varna	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
223D3: Varna	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.

Table 17.--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
232A: Ashkum	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
233B: Birkbeck	Moderate: seepage, slope.	Moderate: piping, wetness.	Severe: no water.	Frost action, slope.	Erodes easily, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
234A: Sunbury	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Favorable	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, rooting depth, wetness.
235A: Bryce	Slight	Severe: ponding.	Severe: slow refill.	Frost action, percs slowly, ponding.	Percs slowly, ponding, slow intake.	Percs slowly, ponding.	Percs slowly, wetness.
236A: Sabina	Slight	Severe: wetness.	Severe: no water.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, rooting depth, wetness.
241C3: Chatsworth	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Droughty, slope, slow intake.	Erodes easily, percs slowly, wetness.	Droughty, erodes easily, rooting depth.
241D3: Chatsworth	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Droughty, slope, slow intake.	Erodes easily, slope, wetness.	Droughty, erodes easily, slope.
242A: Kendall	Severe: seepage.	Severe: wetness.	Severe: cutbanks cave.	Frost action	Erodes easily, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
291B: Xenia	Moderate: slope, seepage.	Moderate: wetness.	Severe: no water.	Frost action, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth.
322C2: Russell	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Erodes easily, percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, rooting depth.

Table 17.--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
330A: Peotone	Slight	Severe: ponding.	Severe: slow refill.	Frost action, ponding.	Ponding	Erodes easily, ponding.	Erodes easily, wetness.
387B: Ockley	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
387C3: Ockley	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
448B: Mona	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, wetness.	Percs slowly, rooting depth.
481A: Raub	Slight	Moderate: wetness.	Severe: no water.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily, rooting depth, wetness.
490A: Odell	Slight	Severe: piping.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, rooting depth, wetness.
530B: Ozaukee	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
530C2: Ozaukee	Moderate: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, rooting depth.
530D2: Ozaukee	Severe: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.
530E2: Ozaukee	Severe: slope.	Moderate: wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, slope, wetness.	Erodes easily, rooting depth, slope.

Table 17.--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
533: Urban land.							
570B: Martinsville	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
570C2: Martinsville	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
570D2: Martinsville	Severe: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
618B: Senachwine	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily, rooting depth.
618C2: Senachwine	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily, rooting depth.
618D2: Senachwine	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily, slope.	Erodes easily, rooting depth, slope.
618E2: Senachwine	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily, slope.	Erodes easily, rooting depth, slope.
618F: Senachwine	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily, slope.	Erodes easily, rooting depth, slope.
622B: Wyanet	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily, rooting depth.

Table 17.--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
622C2:							
Wyanet	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily, rooting depth.
622D3:							
Wyanet	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily, slope.	Erodes easily, rooting depth, slope.
623A:							
Kishwaukee	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
637A+:							
Muskego	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Frost action, ponding, subsides.	Percs slowly, ponding.	Percs slowly, ponding.	Percs slowly, wetness.
663B:							
Clare	Severe: seepage.	Moderate: piping, wetness.	Severe: cutbanks cave.	Frost action, slope.	Slope	Erodes easily, wetness.	Erodes easily.
679B:							
Blackberry	Moderate: seepage, slope.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Frost action, slope.	Slope	Erodes easily, wetness.	Erodes easily.
680B:							
Campton	Severe: seepage.	Moderate: piping, wetness.	Severe: cutbanks cave.	Frost action, slope.	Erodes easily, slope.	Erodes easily, wetness.	Erodes easily.
687B:							
Penfield	Moderate: seepage, slope.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Deep to water	Slope	Favorable	Favorable.
687C2:							
Penfield	Severe: seepage.	Moderate: piping, wetness.	Severe: cutbanks cave.	Deep to water	Slope	Favorable	Favorable.

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
802B: Orthents, loamy	Moderate: seepage, slope.	Moderate: piping, wetness.	Severe: slow refill.	Percs slowly, slope.	Erodes easily, percs slowly, slope.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly.
830: Landfills.							
865: Pits, gravel.							
3107A: Sawmill	Moderate: seepage.	Severe: ponding.	Moderate: slow refill.	Flooding, frost action, ponding.	Flooding, ponding.	Ponding	Wetness.
3302A: Ambraw	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Flooding, wetness.	Wetness	Wetness.
3473A: Rossburg	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Flooding	Favorable	Favorable.

Table 18.--Engineering Index Properties

(Absence of an entry indicates that the 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	
23A:												
Blount	0-7	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	7-13	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	13-26	Silty clay loam, silty clay, clay loam.	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	26-32	Silty clay loam, clay loam, silty clay.	CH, ML, CL	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	32-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
23B2:												
Blount	0-4	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	4-16	Silty clay loam, silty clay, clay loam.	CH, CL	A-6, A-7	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	16-31	Silty clay loam, clay loam, silty clay.	CH, ML, CL	A-6, A-7	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	31-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
56B:												
Dana	0-11	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-35	8-15
	11-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	20-35
	32-58	Clay loam	CL	A-6, A-7	0	0-3	90-98	90-98	80-90	55-80	30-50	15-30
	58-80	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	80-98	75-85	50-80	15-30	5-15
56B2:												
Dana	0-7	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-35	8-15
	7-34	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	20-35
	34-53	Clay loam	CL	A-6, A-7	0	0-3	90-98	90-98	80-90	55-80	30-50	15-30
	53-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	80-98	75-85	50-80	15-30	5-15
67A:												
Harpster	0-18	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	45-60	20-35
	18-36	Silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	85-100	40-60	20-35
	36-41	Silty clay loam, silt loam, loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	65-100	35-55	20-35
	41-60	Stratified sandy loam to clay loam.	CL-ML, SC, CL, SC-SM	A-4, A-6, A-7	0	0	100	95-100	90-100	45-95	20-50	5-25

Table 18.--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	
91A:												
Swygert	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	12-18	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	18-51	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	51-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
91B2:												
Swygert	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	7-12	Silty clay, silty clay loam.	CH, CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-55	15-30
	12-48	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	48-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
91C2:												
Swygert	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-95	35-50	15-25
	7-36	Silty clay, clay	CH	A-7	0	0-5	95-100	95-100	90-100	75-95	50-60	25-35
	36-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	95-100	95-100	90-100	75-95	40-65	20-40
102A:												
La Hogue	0-16	Loam	ML, CL-ML, CL	A-4	0	0	100	95-100	80-100	50-75	20-35	3-10
	16-43	Clay loam, silty clay loam, sandy loam.	CL, SC	A-4, A-6	0	0	100	90-100	80-100	40-85	25-40	8-20
	43-80	Stratified loamy sand to silt loam.	SM, SC, ML, CL	A-2-4, A-4, A-6	0	0	100	80-100	75-90	15-85	15-30	2-15
125A:												
Selma	0-23	Loam	CL	A-4, A-6, A-7	0	0	100	90-100	85-100	50-75	30-45	8-20
	23-53	Silt loam, sandy loam, clay loam.	ML, SM	A-6, A-7	0	0	100	85-100	80-95	40-75	35-50	10-20
	53-60	Stratified loamy sand to silt loam.	SM, SC, ML, CL	A-2-4, A-4	0	0	90-100	80-100	50-85	15-85	20-30	NP-10

Table 18.--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	
131B:												
Alvin	0-8	Fine sandy loam	SM	A-2-4, A-4	0	0	100	100	80-95	30-45	15-25	NP-4
	8-11	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2-4, A-4	0	0	100	100	80-95	30-45	15-25	NP-4
	11-25	Very fine sandy loam, sandy loam, loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	0	100	95-100	70-100	30-55	15-40	NP-15
	25-80	Very fine sand, fine sandy loam, loamy fine sand.	SP, SP-SM	A-1, A-2, A-3	0	0	95-100	95-100	45-95	4-35	15-20	NP-4
134A:												
Camden	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	8-13	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	13-38	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	38-56	Clay loam, silt loam, sandy loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-85	20-40	3-15
	56-60	Stratified loamy sand to silt loam.	SM, SC, ML, CL	A-2-4, A-4	0	0-5	90-100	80-100	50-85	15-85	15-25	3-10
134B:												
Camden	0-9	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	9-14	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	14-35	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	35-62	Clay loam, silt loam, sandy loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	0-5	90-100	85-100	60-100	30-85	20-40	3-15
	62-80	Stratified loamy sand to silt loam.	SM, SC, ML, CL	A-2-4, A-4	0	0-5	90-100	80-100	50-85	15-85	15-25	3-10
146A:												
Elliott	0-6	Silt loam	CL	A-4, A-6	0	0	95-100	95-100	90-100	80-100	30-40	8-18
	6-11	Silty clay loam	CL, ML	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	11-41	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	41-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24

Table 18.--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	
146B2:												
Elliott	0-8	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	8-27	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	27-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24
146C2:												
Elliott	0-8	Silty clay loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	80-100	30-50	11-20
	8-29	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0	0-5	95-100	85-100	80-100	70-96	30-52	11-26
	29-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0-5	90-100	80-100	75-100	65-95	28-45	11-24
148B2:												
Proctor	0-11	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	11-26	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-50	10-25
	26-40	Clay loam, silty clay loam, sandy loam.	CL-ML, CL, SC-SM, SC	A-4, A-6, A-7, A-2	0	0	90-100	85-100	75-100	25-90	20-45	5-25
	40-60	Stratified loamy sand to silt loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	85-100	80-100	50-100	15-85	20-40	5-20
149A:												
Brenton	0-16	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	8-15
	16-35	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	35-53	Clay loam, silt loam, sandy loam.	CL, SC	A-6, A-7	0	0	100	95-100	90-100	40-85	30-45	10-20
	53-72	Stratified loamy sand to clay loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	95-100	80-100	80-100	15-85	20-35	5-20
150B:												
Onarga	0-12	Sandy loam	SM, SC-SM, SC	A-2, A-4, A-6	0	0	100	100	75-95	25-50	15-30	NP-15
	12-49	Loam, sandy clay loam, sandy loam.	CL-ML, CL, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	0	95-100	95-100	75-95	30-55	20-30	5-15
	49-65	Stratified sand to silt loam.	SP-SM, SC-SM, CL-ML	A-2-4, A-4	0	0	85-100	80-100	70-95	10-55	15-20	NP-6

Table 18.--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	
152A:												
Drummer	0-14	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	14-41	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	95-100	85-100	30-50	15-30
	41-47	Loam, clay loam, sandy loam	CL, SC	A-6, A-7	0	0-5	95-100	90-100	75-95	40-85	30-50	15-30
	47-60	Stratified loamy sand to silty clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	95-100	80-98	75-95	15-85	20-35	7-20
153A:												
Pella	0-23	Silty clay loam	CL	A-7	0	0	100	95-100	90-100	85-100	40-50	15-25
	23-35	Silty clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-100	30-50	15-30
	35-50	Silty clay loam, silt loam, sandy loam	CL, SC	A-6, A-7	0-1	0-5	95-100	85-100	85-95	40-90	25-45	10-25
	50-60	Stratified loamy sand to silty clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0-1	0-5	90-100	80-100	50-100	15-85	20-35	7-20
154A:												
Flanagan	0-18	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-30
	18-45	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	15-30
	45-49	Silt loam, loam, clay loam	CL	A-6, A-7	0	0	85-100	80-100	70-95	50-85	20-45	10-30
	49-60	Loam, clay loam, silt loam	CL-ML, CL	A-4, A-6, A-7	0	0	85-100	80-100	70-95	50-85	20-45	5-20
171B:												
Catlin	0-11	Silt loam	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	95-100	90-100	25-45	5-20
	11-45	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	90-100	90-100	30-50	15-30
	45-57	Clay loam, silty clay loam, loam	CL	A-6, A-7	0	0-3	90-100	85-100	85-100	50-85	25-45	10-20
	57-70	Loam, clay loam, silty clay loam	CL-ML, CL	A-4, A-6, A-7	0	0-3	90-100	85-100	85-100	50-85	25-45	5-20
198A:												
Elburn	0-13	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-25
	13-44	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	90-100	30-50	15-35
	44-65	Loam, sandy loam, silty clay loam	CL-ML, CL, SC-SM, SC	A-2, A-4, A-6	0	0	90-100	80-100	60-90	25-85	20-40	5-20
	65-80	Stratified loamy sand to silt loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	90-100	80-100	60-90	15-85	20-40	5-20

Table 18.--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	
206A:												
Thorp	0-14	Silt loam	CL	A-4, A-6	0	0	100	95-100	90-100	85-100	20-40	8-20
	14-19	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	90-100	85-100	15-35	7-15
	19-43	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	90-100	85-100	35-50	15-30
	43-50	Silt loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-7	0	0	90-100	85-100	75-95	40-90	20-50	8-25
	50-65	Stratified loamy sand to silty clay loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-6	0	0	85-100	80-95	65-85	20-85	15-25	NP-15
219A:												
Millbrook	0-7	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	20-35	7-15
	7-14	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	15-35	5-15
	14-35	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-25
	35-55	Clay loam, loam, sandy loam.	CL, SC	A-6, A-7	0-1	0-5	95-100	80-100	70-90	30-80	25-50	10-25
	55-80	Stratified loamy sand to clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-1	0-5	95-100	80-100	70-95	15-85	15-30	NP-15
223B2:												
Varna	0-12	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	12-39	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	39-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26
223C2:												
Varna	0-9	Silt loam	CL	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	9-40	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	40-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26
223D3:												
Varna	0-8	Silty clay loam	CL	A-6, A-7	0-1	0-10	95-100	90-100	85-100	75-95	30-50	12-25
	8-20	Silty clay, silty clay loam, clay.	CH, CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	75-95	35-56	15-29
	20-60	Silty clay loam, clay loam.	CL	A-6, A-7	0-1	0-10	95-100	85-100	80-100	70-95	30-45	13-26

Table 18.--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	
232A:												
Ashkum----------	0-12	Silty clay loam--	CH, CL	A-7	0	0	100	95-100	95-100	75-100	40-55	20-30
	12-29	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	90-100	85-100	75-100	45-65	20-35
	29-60	Silty clay loam--	CL	A-6, A-7	0-1	0-5	95-100	85-100	80-100	75-95	35-50	15-30
233B:												
Birkbeck--------	0-4	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	4-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	9-54	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	95-100	90-100	30-50	10-25
	54-60	Loam, silty clay loam, clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	95-100	80-100	70-100	50-85	25-40	5-20
	60-68	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	95-100	80-100	70-100	50-85	20-40	5-20
234A:												
Sunbury---------	0-8	Silt loam--------	CL	A-4, A-6	0	0	100	100	95-100	90-100	30-40	8-15
	8-12	Silt loam--------	CL	A-4, A-6	0	0	100	100	95-100	90-100	30-40	8-15
	12-43	Silty clay loam, silty clay.	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-60	20-35
	43-47	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0-2	95-100	90-100	90-100	50-85	20-45	5-30
	47-72	Loam, silt loam, clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0-2	95-100	90-100	90-100	50-85	20-45	5-30
235A:												
Bryce-----------	0-13	Silty clay-------	CH, CL	A-7	0	0	100	100	95-100	85-95	45-60	20-30
	13-45	Silty clay, clay	CH	A-7	0-1	0-5	95-100	95-100	95-100	75-95	50-60	25-35
	45-66	Silty clay, silty clay loam, clay.	CH, CL	A-7	0-1	0-5	95-100	90-100	90-100	75-95	40-65	20-40
236A:												
Sabina----------	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	6-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	8-40	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-60	20-40
	40-47	Clay loam, loam, silt loam.	CL-ML, CL	A-4, A-6, A-7	0-1	0-5	95-100	90-100	70-100	60-85	20-50	5-30
	47-80	Clay loam, loam, silt loam.	CL-ML, CL	A-4, A-6, A-7	0-1	0-5	95-100	85-100	70-100	50-85	20-50	5-30

Table 18.--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	
241C3:												
Chatsworth------	0-5	Silty clay-------	CH	A-7	0	0	100	100	95-100	90-100	50-65	25-35
	5-16	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-75	20-45
	16-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	90-100	80-95	45-65	20-35
241D3:												
Chatsworth------	0-2	Silty clay-------	CH	A-7	0	0	100	100	95-100	90-100	50-65	25-35
	2-22	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	95-100	90-100	45-75	20-45
	22-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	95-100	90-100	80-95	45-65	20-35
242A:												
Kendall---------	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	7-11	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	11-51	Silty clay loam--	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	51-58	Clay loam, silt loam, sandy loam.	CL-ML, CL, SC-SM, SC	A-2, A-4, A-6	0	0-5	90-100	80-100	60-90	30-85	15-40	5-20
	58-80	Stratified gravelly loamy sand to clay loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	90-100	70-100	55-90	15-85	15-25	4-15
291B:												
Xenia-----------	0-4	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	90-100	20-35	5-15
	4-10	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	90-100	20-35	5-15
	10-37	Silty clay loam--	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-45	15-25
	37-57	Clay loam, loam--	CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-75	30-45	10-25
	57-72	Loam-------------	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	20-30	5-15
322C2:												
Russell---------	0-7	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	20-35	5-15
	7-27	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	85-100	30-40	10-20
	27-56	Clay loam, loam, silty clay loam.	CL	A-6	0	0	95-100	85-95	80-95	50-80	30-35	10-15
	56-72	Loam-------------	CL-ML, CL	A-4	0	0-3	85-95	85-95	65-90	50-75	20-30	5-10
330A:												
Peotone---------	0-13	Silty clay loam--	CH, CL	A-7	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay.	CH, CL	A-7	0	0-5	100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay.	CH, CL	A-6, A-7	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30

Table 18.--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	
387B:												
Ockley	0-10	Silt loam	ML, CL-ML, CL	A-4	0	0	95-100	85-100	70-100	60-90	15-30	3-10
	10-35	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6	0	0	90-100	85-100	70-90	60-90	25-40	8-15
	35-45	Gravelly clay loam, sandy clay loam, sandy loam.	CL, SC	A-2, A-4, A-6	0	0-2	70-85	40-85	40-70	10-65	25-40	8-15
	45-60	Stratified very gravelly loamy sand to sand.	GP, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-15	NP.
387C3:												
Ockley	0-6	Clay loam	CL	A-6	0	0	95-100	85-100	75-100	60-80	30-35	10-15
	6-14	Silty clay loam, clay loam, silt loam.	CL	A-4, A-6	0	0	90-100	85-100	70-90	60-90	25-40	8-15
	14-41	Gravelly clay loam, sandy clay loam, sandy loam.	CL, SC	A-2, A-4, A-6	0	0-2	70-85	40-85	40-70	10-65	25-40	8-15
	41-60	Stratified very gravelly loamy sand to sand.	GP, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-15	NP.
448B:												
Mona	0-11	Silt loam	CL	A-4, A-6, A-7	0	0	100	95-100	95-100	85-100	25-45	8-25
	11-39	Clay loam, silty clay loam, sandy clay loam.	CL	A-6, A-7	0	0-5	95-100	85-100	75-90	40-85	35-50	11-25
	39-44	Silty clay, clay	CH, CL	A-7	0-1	0-10	95-100	85-95	80-95	75-95	40-60	15-35
	44-60	Silty clay, clay	CH, CL	A-7	0-1	0-10	95-100	85-95	80-95	75-95	40-60	15-35
481A:												
Raub	0-18	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	25-35	5-15
	18-32	Silty clay loam	CL, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-55	20-35
	32-50	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	95-100	85-100	85-95	50-85	35-50	15-25
	50-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-5	85-95	85-95	70-85	40-70	15-30	5-15
490A:												
Odell	0-11	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	95-100	80-100	70-90	20-35	5-15
	11-26	Clay loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	75-100	50-85	25-40	7-15
	26-60	Loam	CL-ML, CL, SC-SM, SC	A-4, A-6	0	0-3	95-100	85-100	70-95	40-70	15-25	5-15

Table 18.--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	
530B:												
Ozaukee---------	0-4	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam--------	CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-39	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	39-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530C2:												
Ozaukee---------	0-6	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530D2:												
Ozaukee---------	0-6	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	45-65	25-40
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
530E2:												
Ozaukee---------	0-6	Silt loam--------	CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-28	Silty clay loam, clay, silty clay.	CH, CL	A-7	0-1	0-10	90-98	85-98	85-95	75-95	30-65	25-40
	28-60	Silty clay loam, clay loam.	CL	A-6, A-7-6	0-1	0-10	90-98	80-95	75-95	70-90	35-45	15-25
533:												
Urban land.												
570B:												
Martinsville----	0-9	Silt loam--------	ML, CL-ML, CL	A-4	0	0	100	85-100	75-100	65-90	15-25	3-8
	9-12	Silt loam, loam--	ML, CL-ML, CL	A-4	0	0	100	85-100	75-100	45-90	15-25	3-8
	12-45	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	40-90	25-40	7-15
	45-57	Sandy loam, sandy clay loam, silt loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	35-80	20-30	5-15
	57-80	Stratified sand to silt loam.	SM, SC-SM, SC, CL-ML	A-1, A-2-4, A-4	0	0	95-100	85-100	45-95	10-85	15-25	NP-8

Table 18.--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	
570C2:												
Martinsville----	0-9	Loam----------	ML, CL-ML, CL, SC-SM	A-4	0	0	100	85-100	75-100	45-70	15-25	3-8
	9-45	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	40-90	25-40	7-15
	45-57	Sandy loam, sandy clay loam, silt loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	35-80	20-30	5-15
	57-80	Stratified sand to silt loam.	SM, SC-SM, SC, CL-ML	A-1, A-2-4, A-4	0	0	95-100	85-100	45-95	10-85	15-25	NP-8
570D2:												
Martinsville----	0-9	Loam----------	ML, CL-ML, CL, SC-SM	A-4	0	0	100	85-100	75-100	45-70	15-25	3-8
	9-45	Clay loam, silty clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	70-100	40-90	25-40	7-15
	45-57	Sandy loam, sandy clay loam, silt loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	35-80	20-30	5-15
	57-80	Stratified sand to silt loam.	SM, SC-SM, SC, CL-ML	A-1, A-2-4, A-4	0	0	95-100	85-100	45-95	10-85	15-25	NP-8
618B:												
Senachwine------	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	65-95	20-30	5-15
	9-12	Silt loam, loam--	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	55-95	20-30	5-15
	12-34	Clay loam, silty clay loam.	CL	A-6, A-7-6	0	0	90-98	85-98	85-95	50-85	35-45	15-20
	34-40	Clay loam, loam--	CL	A-6	0-1	0-3	90-98	85-98	75-95	50-80	30-35	10-15
	40-60	Loam, clay loam--	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	85-98	75-95	45-80	25-35	5-15
618C2:												
Senachwine------	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	65-95	20-30	5-15
	6-28	Clay loam, silty clay loam.	CL	A-6, A-7-6	0	0	90-98	85-98	85-95	50-85	35-45	15-20
	28-34	Clay loam, loam--	CL	A-6	0-1	0-3	90-98	85-98	75-95	50-80	30-35	10-15
	34-60	Loam, clay loam--	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	85-98	75-95	45-80	25-35	5-15
618D2:												
Senachwine------	0-6	Silt loam--------	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	65-95	20-30	5-15
	6-28	Clay loam, silty clay loam.	CL	A-6, A-7-6	0	0	90-98	85-98	85-95	50-85	35-45	15-20
	28-34	Clay loam, loam--	CL	A-6	0-1	0-3	90-98	85-98	75-95	50-80	30-35	10-15
	34-60	Loam, clay loam--	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	85-98	75-95	45-80	25-35	5-15

Table 18.--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	
618E2:												
Senachwine	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	65-95	20-30	5-15
	6-28	Clay loam, silty clay loam.	CL	A-6, A-7-6	0	0	90-98	85-98	85-95	50-85	35-45	15-20
	28-34	Clay loam, loam	CL	A-6	0-1	0-3	90-98	85-98	75-95	50-80	30-35	10-15
	34-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	85-98	75-95	45-80	25-35	5-15
618F:												
Senachwine	0-5	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	65-95	20-30	5-15
	5-11	Silt loam, loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-95	55-95	20-30	5-15
	11-32	Clay loam, silty clay loam.	CL	A-6, A-7-6	0	0	90-98	85-98	85-95	50-85	35-45	15-20
	32-40	Clay loam, loam	CL	A-6	0-1	0-3	90-98	85-98	75-95	50-80	30-35	10-15
	40-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-98	85-98	75-95	45-80	25-35	5-15
622B:												
Wyanet	0-10	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-100	65-95	20-30	5-15
	10-27	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	90-100	85-100	75-100	50-85	30-45	15-20
	27-31	Clay loam, loam	CL	A-6	0	0-3	85-98	85-98	75-85	50-80	30-35	10-15
	31-80	Loam, clay loam	CL-ML, CL	A-4	0	0-3	85-98	85-98	75-85	50-80	20-30	5-10
622C2:												
Wyanet	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	80-100	65-95	20-30	5-15
	8-26	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	90-100	85-100	75-100	50-85	30-45	15-20
	26-34	Clay loam, loam	CL	A-6	0	0-3	85-98	85-98	75-85	50-80	30-35	10-15
	34-60	Loam, clay loam	CL-ML, CL	A-4	0	0-3	85-98	85-98	75-85	50-80	20-30	5-10
622D3:												
Wyanet	0-4	Clay loam	CL	A-6	0	0	95-100	90-100	80-100	55-80	30-35	10-15
	4-20	Clay loam, loam, silty clay loam.	CL	A-6, A-7	0	0	90-100	85-100	75-100	50-85	30-45	15-20
	20-60	Loam, clay loam	CL-ML, CL	A-4	0	0-3	85-98	85-98	75-85	50-80	20-30	5-10
623A:												
Kishwaukee	0-11	Silt loam	CL-ML, CL, SC-SM, SC	A-4, A-6	0	0	95-100	90-100	45-100	45-100	20-30	4-15
	11-54	Silty clay loam, clay loam, loam.	CL	A-6	0	0	90-100	85-100	75-100	50-90	30-40	10-20
	54-64	Stratified very gravelly loamy sand to sand.	GP, SP	A-1	0-1	1-5	30-70	30-70	10-40	1-15	0-15	NP.

Table 18.--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	
637A+:												
Muskego	0-16	Silty clay loam	CL, CH	A-6, A-7	0	0	100	100	95-100	85-95	35-60	15-30
	16-50	Muck	PT	A-8	0	0	---	---	---	---	---	---
	50-70	Coprogenous earth.	OL	A-8	0	0	---	---	---	---	---	---
663B:												
Clare	0-14	Silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	10-20
	14-36	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	90-100	90-100	25-50	10-25
	36-50	Clay loam, silty clay loam, sandy loam.	CL-ML, SC-SM, CL, SC	A-4, A-6, A-7	0	0	90-100	80-100	75-100	45-85	20-45	5-25
	50-66	Stratified loamy sand to gravelly loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0	85-100	70-98	50-95	15-85	20-40	5-20
679B:												
Blackberry	0-16	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-30	5-15
	16-47	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-25
	47-62	Silt loam, gravelly clay loam, sandy loam.	CL-ML, CL, SC-SM, SC	A-2, A-4, A-6	0	0-5	90-100	70-100	60-90	30-85	20-40	5-20
	62-70	Stratified loamy sand to gravelly clay loam.	SC-SM, SC, CL-ML, CL	A-2, A-4	0	0-5	90-100	65-100	60-90	15-85	15-25	5-10
680B:												
Campton	0-6	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	7-15
	6-8	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	7-15
	8-44	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	95-100	90-100	30-40	10-20
	44-53	Silt loam, clay loam, sandy loam.	CL, SC	A-2, A-4, A-6	0	0	90-100	80-100	75-90	30-80	20-35	8-20
	53-60	Stratified loamy sand to gravelly loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	90-100	70-100	60-90	15-85	15-35	5-15

Table 18.--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	
687B:												
Penfield--------	0-10	Loam----------	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	50-70	25-35	5-15
	10-61	Clay loam, silty clay loam, sandy loam.	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	61-72	Fine sandy loam, loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	0	100	85-100	60-70	30-55	20-30	5-15
	72-80	Stratified sand to silt loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0	100	85-100	75-90	10-85	15-30	5-10
687C2:												
Penfield--------	0-7	Loam----------	CL-ML, CL	A-4, A-6	0	0	100	95-100	85-100	50-70	25-35	5-15
	7-37	Clay loam, silty clay loam, sandy loam.	CL, SC	A-6	0	0	100	95-100	80-95	45-85	20-35	10-20
	37-42	Fine sandy loam, loam, sandy clay loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4, A-6	0	0	100	85-100	60-70	30-55	20-30	5-15
	42-60	Stratified sand to silt loam.	SC-SM, SC, CL-ML, CL	A-2-4, A-4	0	0	100	85-100	75-90	10-85	15-30	5-10
802B:												
Orthents, loamy-	0-10	Clay loam--------	CL	A-6	0-1	0-5	95-100	90-100	85-95	50-80	20-40	10-15
	10-60	Clay loam, silty clay loam, loam.	CL	A-6	0-1	0-5	95-100	85-100	85-95	40-85	20-40	10-20
830:												
Landfills.												
865:												
Pits, gravel.												
3107A:												
Sawmill---------	0-17	Silty clay loam--	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	17-32	Silty clay loam--	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-50	15-30
	32-58	Silty clay loam--	CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-50	8-30
	58-65	Silty clay loam, clay loam, sandy loam.	CL, SC	A-4, A-6, A-7	0	0	100	90-100	75-100	40-95	20-50	8-30

Table 18.--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	
3302A:												
Ambraw----------	0-8	Silty clay loam--	CL	A-6, A-7	0	0	100	100	85-95	80-95	30-45	10-20
	8-39	Clay loam, loam--	CL, CH	A-6, A-7	0	0	100	100	80-90	60-80	35-55	15-30
	39-50	Clay loam, sandy clay loam, loam.	CL, SC	A-6, A-7	0	0	100	90-100	85-95	35-80	30-50	10-25
	50-60	Stratified clay loam to sandy loam.	ML, CL, SM, SC	A-4, A-6	0	0	100	90-100	80-90	35-80	20-40	NP-20
3473A:												
Rossburg--------	0-21	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	0	90-100	90-100	80-100	65-95	20-35	NP-15
	21-55	Loam, silt loam, sandy loam.	ML, CL-ML, CL, SC	A-4, A-6, A-7	0	0	90-100	85-100	70-100	40-95	20-45	3-20
	55-63	Stratified sandy loam to silt loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	0-5	90-100	80-100	65-100	30-80	15-30	NP-15

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
23A:										
Blount	0-7	18-27	1.25-1.45	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	7-13	15-27	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37		
	13-26	35-48	1.40-1.70	0.06-0.60	0.12-0.19	3.0-5.9	.37	.37		
	26-32	27-45	1.50-1.70	0.06-0.20	0.12-0.19	3.0-5.9	.37	.37		
	32-60	27-40	1.70-2.00	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
23B2:										
Blount	0-4	18-27	1.25-1.45	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	4-16	35-48	1.40-1.70	0.06-0.60	0.12-0.19	3.0-5.9	.37	.37		
	16-31	27-45	1.50-1.70	0.06-0.20	0.12-0.19	3.0-5.9	.37	.37		
	31-60	27-40	1.70-2.00	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
56B:										
Dana	0-11	18-27	1.25-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	11-32	27-35	1.25-1.55	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	32-58	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	58-80	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
56B2:										
Dana	0-7	18-27	1.25-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	7-34	27-35	1.25-1.55	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	34-53	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	53-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
67A:										
Harpster	0-18	27-35	1.05-1.25	0.60-2.00	0.21-0.24	3.0-5.9	.24	.24	5	4L
	18-36	27-35	1.20-1.50	0.60-2.00	0.18-0.22	3.0-5.9	.37	.37		
	36-41	22-35	1.25-1.55	0.60-2.00	0.17-0.22	3.0-5.9	.37	.37		
	41-60	15-30	1.40-1.60	0.60-6.00	0.11-0.22	0.0-2.9	.32	.32		
91A:										
Swygert	0-12	27-40	1.25-1.50	0.20-0.60	0.18-0.22	3.0-5.9	.20	.20	4	7
	12-18	30-45	1.30-1.55	0.20-0.60	0.08-0.16	6.0-8.9	.32	.32		
	18-51	45-50	1.40-1.70	0.06-0.20	0.05-0.12	6.0-8.9	.32	.32		
	51-60	38-60	1.70-1.90	0.00-0.06	0.03-0.05	6.0-8.9	.37	.37		
91B2:										
Swygert	0-7	27-40	1.25-1.50	0.20-0.60	0.18-0.22	3.0-5.9	.20	.20	4	7
	7-12	30-45	1.30-1.55	0.20-0.60	0.08-0.16	6.0-8.9	.32	.32		
	12-48	45-50	1.40-1.70	0.06-0.20	0.05-0.12	6.0-8.9	.32	.32		
	48-60	38-60	1.70-1.90	0.00-0.06	0.03-0.05	6.0-8.9	.37	.37		
91C2:										
Swygert	0-7	27-40	1.25-1.50	0.20-0.60	0.18-0.22	3.0-5.9	.20	.20	4	7
	7-36	45-50	1.40-1.70	0.06-0.20	0.05-0.12	6.0-8.9	.32	.32		
	36-60	38-60	1.70-1.90	0.00-0.06	0.03-0.05	6.0-8.9	.37	.37		
102A:										
La Hogue	0-16	10-27	1.40-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	5
	16-43	18-35	1.50-1.70	0.60-2.00	0.12-0.20	3.0-5.9	.32	.32		
	43-80	5-25	1.55-1.75	0.60-6.00	0.08-0.20	0.0-2.9	.28	.28		
125A:										
Selma	0-23	20-27	1.40-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	6
	23-53	18-30	1.40-1.60	0.60-2.00	0.15-0.20	3.0-5.9	.32	.32		
	53-60	3-15	1.60-1.90	0.60-6.00	0.05-0.13	0.0-2.9	.28	.28		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
131B:										
Alvin	0-8	10-15	1.45-1.65	2.00-6.00	0.14-0.17	0.0-2.9	.20	.20	5	3
	8-11	10-15	1.45-1.65	0.60-6.00	0.10-0.17	0.0-2.9	.24	.24		
	11-25	15-18	1.40-1.65	0.60-6.00	0.14-0.18	0.0-2.9	.24	.24		
	25-80	3-10	1.45-1.65	2.00-6.00	0.10-0.15	0.0-2.9	.20	.20		
134A:										
Camden	0-8	14-27	1.35-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6
	8-13	12-25	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.49	.49		
	13-38	22-35	1.40-1.60	0.60-2.00	0.14-0.24	3.0-5.9	.37	.37		
	38-56	18-30	1.45-1.65	0.60-2.00	0.11-0.22	3.0-5.9	.32	.32		
	56-60	5-25	1.40-1.70	0.60-6.00	0.08-0.20	0.0-2.9	.28	.28		
134B:										
Camden	0-9	14-27	1.35-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6
	9-14	12-25	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.49	.49		
	14-35	22-35	1.40-1.60	0.60-2.00	0.14-0.24	3.0-5.9	.37	.37		
	35-62	18-30	1.45-1.65	0.60-2.00	0.11-0.22	3.0-5.9	.32	.32		
	62-80	5-25	1.40-1.70	0.60-6.00	0.08-0.20	0.0-2.9	.28	.28		
146A:										
Elliott	0-6	24-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.24	.24	4	6
	6-11	27-35	1.15-1.35	0.60-2.00	0.21-0.23	3.0-5.9	.20	.20		
	11-41	35-50	1.30-1.60	0.20-0.60	0.11-0.20	3.0-5.9	.37	.37		
	41-60	27-40	1.70-1.90	0.06-0.20	0.07-0.10	3.0-5.9	.43	.43		
146B2:										
Elliott	0-8	27-35	1.15-1.35	0.60-2.00	0.21-0.23	3.0-5.9	.20	.20	4	7
	8-27	35-50	1.30-1.60	0.20-0.60	0.11-0.20	3.0-5.9	.37	.37		
	27-60	27-40	1.70-1.90	0.06-0.20	0.07-0.10	3.0-5.9	.43	.43		
146C2:										
Elliott	0-8	27-35	1.15-1.35	0.60-2.00	0.21-0.23	3.0-5.9	.20	.20	4	7
	8-29	35-50	1.30-1.60	0.20-0.60	0.11-0.20	3.0-5.9	.37	.37		
	29-60	27-40	1.70-1.90	0.06-0.20	0.07-0.10	3.0-5.9	.43	.43		
148B2:										
Proctor	0-11	18-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	11-26	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	26-40	18-32	1.30-1.55	0.60-2.00	0.13-0.16	3.0-5.9	.32	.32		
	40-60	5-20	1.40-1.70	0.60-6.00	0.07-0.19	0.0-2.9	.28	.28		
149A:										
Brenton	0-16	20-27	1.25-1.45	0.60-2.00	0.22-0.26	0.0-2.9	.28	.28	5	6
	16-35	25-35	1.30-1.55	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	35-53	18-30	1.40-1.60	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	53-72	5-30	1.50-1.70	0.60-6.00	0.11-0.20	0.0-2.9	.28	.28		
150B:										
Onarga	0-12	8-15	1.15-1.45	0.60-6.00	0.13-0.22	0.0-2.9	.15	.15	5	3
	12-49	5-28	1.45-1.70	0.60-6.00	0.15-0.19	0.0-2.9	.28	.28		
	49-65	2-10	1.65-1.90	6.00-20.00	0.05-0.13	0.0-2.9	.24	.24		
152A:										
Drummer	0-14	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	.24	.24	5	7
	14-41	20-35	1.20-1.45	0.60-2.00	0.21-0.24	3.0-5.9	.37	.37		
	41-47	15-33	1.30-1.55	0.60-2.00	0.17-0.20	3.0-5.9	.32	.32		
	47-60	10-32	1.40-1.70	0.60-6.00	0.11-0.19	0.0-2.9	.28	.28		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
153A:										
Pella	0-23	27-35	1.10-1.30	0.60-2.00	0.21-0.23	3.0-5.9	.24	.24	5	7
	23-35	27-35	1.20-1.45	0.60-2.00	0.21-0.24	3.0-5.9	.37	.37		
	35-50	15-30	1.35-1.60	0.60-2.00	0.15-0.20	3.0-5.9	.32	.32		
	50-60	10-30	1.40-1.70	0.60-6.00	0.10-0.22	0.0-2.9	.28	.28		
154A:										
Flanagan	0-18	20-27	1.20-1.40	0.60-2.00	0.22-0.24	3.0-5.9	.28	.28	5	6
	18-45	35-42	1.25-1.45	0.20-0.60	0.15-0.22	6.0-8.9	.37	.37		
	45-49	20-35	1.45-1.70	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	49-60	20-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
171B:										
Catlin	0-11	18-27	1.25-1.45	0.60-2.00	0.23-0.26	0.0-2.9	.28	.28	5	6
	11-45	24-35	1.25-1.55	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	45-57	20-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	57-70	20-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
198A:										
Elburn	0-13	22-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	13-44	25-35	1.20-1.40	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	44-65	15-30	1.50-1.70	0.60-2.00	0.12-0.18	3.0-5.9	.32	.32		
	65-80	2-15	1.50-1.75	0.60-6.00	0.06-0.10	0.0-2.9	.28	.28		
206A:										
Thorp	0-14	20-27	1.15-1.35	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	14-19	18-25	1.30-1.50	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43		
	19-43	22-35	1.35-1.55	0.06-0.20	0.18-0.20	3.0-5.9	.37	.37		
	43-50	18-30	1.40-1.60	0.60-2.00	0.15-0.22	3.0-5.9	.32	.32		
	50-65	5-30	1.50-1.70	0.60-6.00	0.05-0.13	0.0-2.9	.28	.28		
219A:										
Millbrook	0-7	18-27	1.40-1.60	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	5	6
	7-14	16-25	1.40-1.60	0.60-2.00	0.20-0.22	0.0-2.9	.43	.43		
	14-35	25-35	1.45-1.65	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	35-55	18-35	1.45-1.70	0.60-2.00	0.12-0.19	3.0-5.9	.32	.32		
	55-80	5-30	1.50-1.75	0.60-6.00	0.11-0.19	0.0-2.9	.28	.28		
223B2:										
Varna	0-12	20-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.24	.24	4	6
	12-39	35-50	1.30-1.60	0.20-0.60	0.09-0.19	3.0-5.9	.37	.37		
	39-60	27-40	1.65-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
223C2:										
Varna	0-9	20-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.24	.24	4	6
	9-40	35-50	1.30-1.60	0.20-0.60	0.09-0.19	3.0-5.9	.37	.37		
	40-60	27-40	1.65-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
223D3:										
Varna	0-8	27-35	1.20-1.40	0.60-2.00	0.20-0.22	3.0-5.9	.20	.20	3	7
	8-20	35-50	1.30-1.60	0.20-0.60	0.09-0.19	3.0-5.9	.37	.37		
	20-60	27-40	1.65-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
232A:										
Ashkum	0-12	35-40	1.15-1.35	0.20-0.60	0.15-0.20	6.0-8.9	.20	.20	5	4
	12-29	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	.32	.32		
	29-60	30-40	1.45-1.75	0.20-0.60	0.09-0.18	3.0-5.9	.43	.43		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
233B:										
Birkbeck--------	0-4	15-27	1.20-1.50	0.60-2.00	0.22-0.25	0.0-2.9	.43	.43	5	6
	4-9	13-25	1.35-1.55	0.60-2.00	0.21-0.24	0.0-2.9	.49	.49		
	9-54	25-35	1.35-1.55	0.60-2.00	0.14-0.24	3.0-5.9	.37	.37		
	54-60	20-35	1.35-1.60	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	60-68	17-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
234A:										
Sunbury---------	0-8	20-27	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.37	.37	5	6
	8-12	18-25	1.30-1.45	0.60-2.00	0.18-0.22	0.0-2.9	.43	.43		
	12-43	35-45	1.35-1.55	0.20-0.60	0.18-0.20	6.0-8.9	.37	.37		
	43-47	20-35	1.40-1.60	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	47-72	20-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
235A:										
Bryce-----------	0-13	40-48	1.30-1.50	0.20-0.60	0.12-0.16	6.0-8.9	.17	.17	5	4
	13-45	42-52	1.35-1.60	0.06-0.20	0.09-0.13	6.0-8.9	.32	.32		
	45-66	38-60	1.60-1.75	0.00-0.06	0.03-0.05	6.0-8.9	.37	.37		
236A:										
Sabina----------	0-6	20-27	1.25-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6
	6-8	18-25	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.49	.49		
	8-40	35-42	1.35-1.55	0.20-0.60	0.11-0.20	6.0-8.9	.37	.37		
	40-47	20-35	1.50-1.75	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	47-80	15-32	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
241C3:										
Chatsworth------	0-5	40-60	1.35-1.60	0.00-0.06	0.09-0.18	3.0-5.9	.32	.32	2	4
	5-16	35-60	1.50-1.70	0.00-0.06	0.05-0.07	3.0-5.9	.32	.32		
	16-60	35-50	1.70-1.90	0.00-0.06	0.03-0.05	3.0-5.9	.37	.37		
241D3:										
Chatsworth------	0-2	40-60	1.35-1.60	0.00-0.06	0.09-0.18	3.0-5.9	.32	.32	2	4
	2-22	35-60	1.50-1.70	0.00-0.06	0.05-0.07	3.0-5.9	.32	.32		
	22-60	35-50	1.70-1.90	0.00-0.06	0.03-0.05	3.0-5.9	.37	.37		
242A:										
Kendall---------	0-7	20-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6
	7-11	18-25	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.49	.49		
	11-51	27-35	1.30-1.50	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	51-58	10-30	1.55-1.70	0.60-2.00	0.11-0.22	3.0-5.9	.32	.32		
	58-80	5-30	1.55-1.70	0.60-6.00	0.11-0.22	0.0-2.9	.28	.28		
291B:										
Xenia-----------	0-4	11-22	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	5
	4-10	10-20	1.35-1.55	0.60-2.00	0.21-0.23	0.0-2.9	.49	.49		
	10-37	27-35	1.45-1.65	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	37-57	24-35	1.45-1.65	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	57-72	15-27	1.60-1.85	0.06-0.20	0.05-0.10	0.0-2.9	.37	.37		
322C2:										
Russell---------	0-7	10-22	1.30-1.45	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	4	5
	7-27	25-35	1.35-1.50	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	27-56	23-33	1.40-1.60	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	56-72	15-27	1.60-1.85	0.06-0.20	0.05-0.10	0.0-2.9	.37	.37		
330A:										
Peotone---------	0-13	33-40	1.20-1.40	0.20-0.60	0.21-0.23	6.0-8.9	.24	.24	5	4
	13-50	35-45	1.30-1.60	0.20-0.60	0.11-0.20	6.0-8.9	.37	.37		
	50-60	25-42	1.40-1.65	0.20-0.60	0.18-0.20	6.0-8.9	.43	.43		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
387B:										
Ockley	0-10	11-22	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	4	5
	10-35	22-34	1.45-1.60	0.60-2.00	0.15-0.22	3.0-5.9	.32	.32		
	35-45	10-32	1.40-1.55	0.60-2.00	0.06-0.11	3.0-5.9	.28	.32		
	45-60	2-5	1.60-1.80	20.00-99.90	0.02-0.04	0.0-2.9	.02	.05		
387C3:										
Ockley	0-6	27-30	1.30-1.45	0.60-2.00	0.17-0.23	3.0-5.9	.32	.32	3	6
	6-14	22-34	1.45-1.60	0.60-2.00	0.15-0.22	3.0-5.9	.32	.32		
	14-41	10-32	1.40-1.55	0.60-2.00	0.06-0.11	3.0-5.9	.28	.32		
	41-60	2-5	1.60-1.80	20.00-99.90	0.02-0.04	0.0-2.9	.02	.05		
448B:										
Mona	0-11	20-27	1.10-1.30	0.60-2.00	0.17-0.24	0.0-2.9	.24	.24	4	6
	11-39	25-35	1.35-1.55	0.20-0.60	0.15-0.20	3.0-5.9	.32	.32		
	39-44	40-50	1.40-1.65	0.06-0.20	0.05-0.08	3.0-5.9	.32	.32		
	44-60	40-50	1.70-1.90	0.00-0.06	0.03-0.05	3.0-5.9	.37	.37		
481A:										
Raub	0-18	20-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	18-32	27-35	1.50-1.70	0.20-0.60	0.18-0.20	3.0-5.9	.37	.37		
	32-50	24-35	1.50-1.70	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	50-60	20-32	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
490A:										
Odell	0-11	18-27	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	6
	11-26	25-35	1.50-1.70	0.20-0.60	0.15-0.19	3.0-5.9	.32	.32		
	26-60	10-20	1.60-1.85	0.06-0.20	0.05-0.10	0.0-2.9	.37	.37		
530B:										
Ozaukee	0-4	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	4-10	15-27	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37		
	10-39	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	.37	.37		
	39-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
530C2:										
Ozaukee	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	6-28	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	.37	.37		
	28-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
530D2:										
Ozaukee	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	6-28	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	.37	.37		
	28-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
530E2:										
Ozaukee	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	4	6
	6-28	35-50	1.60-1.70	0.06-0.20	0.08-0.20	3.0-5.9	.37	.37		
	28-60	27-35	1.70-1.90	0.06-0.20	0.05-0.10	3.0-5.9	.43	.43		
533:										
Urban land.										
570B:										
Martinsville	0-9	8-20	1.30-1.45	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	5	5
	9-12	8-18	1.35-1.50	0.60-2.00	0.19-0.23	0.0-2.9	.37	.37		
	12-45	20-33	1.40-1.60	0.60-2.00	0.16-0.20	3.0-5.9	.32	.32		
	45-57	15-25	1.40-1.60	0.60-2.00	0.12-0.17	0.0-2.9	.32	.32		
	57-80	5-20	1.50-1.70	0.60-6.00	0.08-0.17	0.0-2.9	.28	.28		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
570C2:										
Martinsville----	0-9	12-20	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	5	5
	9-45	20-33	1.40-1.60	0.60-2.00	0.16-0.20	3.0-5.9	.32	.32		
	45-57	15-25	1.40-1.60	0.60-2.00	0.12-0.17	0.0-2.9	.32	.32		
	57-80	5-20	1.50-1.70	0.60-6.00	0.08-0.17	0.0-2.9	.28	.28		
570D2:										
Martinsville----	0-9	12-20	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	5	5
	9-45	20-33	1.40-1.60	0.60-2.00	0.16-0.20	3.0-5.9	.32	.32		
	45-57	15-25	1.40-1.60	0.60-2.00	0.12-0.17	0.0-2.9	.32	.32		
	57-80	5-20	1.50-1.70	0.60-6.00	0.08-0.17	0.0-2.9	.28	.28		
618B:										
Senachwine------	0-9	11-22	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5
	9-12	10-20	1.30-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37		
	12-34	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	34-40	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	40-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
618C2:										
Senachwine------	0-6	11-22	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5
	6-28	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	28-34	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	34-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
618D2:										
Senachwine------	0-6	11-22	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5
	6-28	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	28-34	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	34-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
618E2:										
Senachwine------	0-6	11-22	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5
	6-28	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	28-34	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	34-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
618F:										
Senachwine------	0-5	11-22	1.20-1.55	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5
	5-11	10-20	1.30-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37		
	11-32	27-35	1.40-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	32-40	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	40-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
622B:										
Wyanet----------	0-10	12-22	1.30-1.45	0.60-2.00	0.22-0.24	0.0-2.9	.24	.24	5	5
	10-27	22-32	1.40-1.55	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	27-31	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	31-80	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
622C2:										
Wyanet----------	0-8	12-22	1.30-1.45	0.60-2.00	0.22-0.24	0.0-2.9	.24	.24	5	5
	8-26	22-32	1.40-1.55	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	26-34	20-30	1.60-1.80	0.20-0.60	0.07-0.17	3.0-5.9	.32	.32		
	34-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		
622D3:										
Wyanet----------	0-4	27-30	1.40-1.55	0.60-2.00	0.17-0.19	0.0-2.9	.32	.32	4	6
	4-20	22-32	1.40-1.55	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
	20-60	15-30	1.60-1.85	0.20-0.60	0.05-0.10	0.0-2.9	.37	.37		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
623A:										
Kishwaukee	0-11	12-22	1.30-1.45	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	5
	11-54	20-32	1.40-1.60	0.60-2.00	0.15-0.20	3.0-5.9	.32	.32		
	54-64	1-5	1.60-1.80	20.00-99.90	0.02-0.04	0.0-2.9	.02	.05		
637A+:										
Muskego	0-16	27-35	0.80-1.10	0.60-2.00	0.15-0.23	6.0-8.9	.20	.20	5	7
	16-50	2-4	0.10-0.21	0.20-6.00	0.35-0.45	---	---	---		
	50-70	0-0	0.10-0.40	0.06-0.20	0.18-0.24	---	---	---		
663B:										
Clare	0-14	18-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	14-36	25-35	1.20-1.45	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	36-50	18-32	1.30-1.55	0.60-2.00	0.13-0.19	3.0-5.9	.32	.32		
	50-66	5-20	1.40-1.70	0.60-6.00	0.07-0.19	0.0-2.9	.24	.28		
679B:										
Blackberry	0-16	18-27	1.10-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.28	.28	5	6
	16-47	25-35	1.20-1.40	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	47-62	15-35	1.30-1.55	0.60-2.00	0.11-0.22	3.0-5.9	.32	.32		
	62-70	5-30	1.40-1.70	0.60-6.00	0.05-0.19	0.0-2.9	.24	.28		
680B:										
Campton	0-6	20-27	1.15-1.30	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6
	6-8	18-25	1.35-1.55	0.60-2.00	0.20-0.22	0.0-2.9	.49	.49		
	8-44	25-35	1.30-1.50	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37		
	44-53	15-30	1.30-1.50	0.60-2.00	0.11-0.16	3.0-5.9	.32	.32		
	53-60	5-25	1.55-1.75	0.60-6.00	0.11-0.16	0.0-2.9	.24	.28		
687B:										
Penfield	0-10	10-22	1.30-1.45	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	5
	10-61	18-32	1.40-1.60	0.60-2.00	0.16-0.18	3.0-5.9	.32	.32		
	61-72	12-30	1.40-1.60	0.60-2.00	0.14-0.16	0.0-2.9	.28	.28		
	72-80	5-20	1.50-1.70	0.60-6.00	0.10-0.21	0.0-2.9	.24	.24		
687C2:										
Penfield	0-7	10-22	1.30-1.45	0.60-2.00	0.20-0.24	0.0-2.9	.24	.24	5	5
	7-37	18-32	1.40-1.60	0.60-2.00	0.16-0.18	3.0-5.9	.32	.32		
	37-42	12-30	1.40-1.60	0.60-2.00	0.14-0.16	0.0-2.9	.28	.28		
	42-60	5-20	1.50-1.70	0.60-6.00	0.10-0.21	0.0-2.9	.24	.24		
802B:										
Orthents, loamy-	0-10	27-35	1.50-1.70	0.20-0.60	0.18-0.20	3.0-5.9	.43	.43	5	6
	10-60	22-30	1.40-1.75	0.06-2.00	0.15-0.20	3.0-5.9	.43	.43		
830:										
Landfills.										
865:										
Pits, gravel.										
3107A:										
Sawmill	0-17	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	.28	.28	5	7
	17-32	27-35	1.20-1.40	0.60-2.00	0.21-0.23	3.0-5.9	.28	.28		
	32-58	27-35	1.30-1.45	0.60-2.00	0.17-0.20	3.0-5.9	.32	.32		
	58-65	18-35	1.35-1.50	0.60-2.00	0.15-0.19	3.0-5.9	.32	.32		
3302A:										
Ambraw	0-8	27-35	1.25-1.45	0.60-2.00	0.15-0.19	3.0-5.9	.28	.28	5	7
	8-39	24-40	1.30-1.55	0.60-2.00	0.08-0.19	3.0-5.9	.24	.24		
	39-50	24-35	1.40-1.65	0.60-2.00	0.10-0.15	3.0-5.9	.28	.28		
	50-60	18-30	1.35-1.65	0.60-2.00	0.11-0.22	0.0-2.9	.28	.28		

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors			Wind erodibility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct				
3473A:										
Rossburg--------	0-21	15-27	1.20-1.45	0.60-2.00	0.19-0.24	0.0-2.9	.32	.32	5	6
	21-55	18-27	1.20-1.50	0.60-2.00	0.16-0.22	0.0-2.9	.32	.32		
	55-63	5-15	1.35-1.60	0.60-6.00	0.05-0.18	0.0-2.9	.28	.28		

Table 20.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
23A:					
Blount	0-7	5.1-7.3	2.0-3.0	15-22	0
	7-13	5.1-7.3	0.2-1.0	9.0-18	0
	13-26	4.5-6.5	0.2-1.0	21-31	0
	26-32	6.1-7.8	0.0-0.5	16-30	0-25
	32-60	7.4-8.4	0.0-0.5	16-25	22-35
23B2:					
Blount	0-4	5.1-7.3	1.0-2.0	13-20	0
	4-16	4.5-6.5	0.2-1.0	21-31	0
	16-31	6.1-7.8	0.0-0.5	16-28	0-25
	31-60	7.4-8.4	0.0-0.5	16-25	22-35
56B:					
Dana	0-11	5.6-7.3	3.0-5.0	17-26	0
	11-32	5.1-7.3	0.5-1.0	17-23	0
	32-58	5.6-7.8	0.2-0.5	17-22	0-5
	58-80	7.4-8.4	0.0-0.5	9.0-19	15-25
56B2:					
Dana	0-7	5.6-7.3	2.0-4.0	15-24	0
	7-34	5.1-7.3	0.5-1.0	17-23	0
	34-53	5.6-7.8	0.2-0.5	17-22	0-5
	53-60	7.4-8.4	0.0-0.5	9.0-19	15-25
67A:					
Harpster	0-18	7.4-8.4	4.0-6.0	24-33	10-40
	18-36	7.4-8.4	0.5-2.0	17-25	5-40
	36-41	7.4-8.4	0.5-1.0	14-23	5-40
	41-60	7.4-8.4	0.0-0.5	9.0-19	10-40
91A:					
Swygert	0-12	5.6-7.3	3.0-5.0	22-34	0
	12-18	5.6-7.3	1.0-3.0	20-33	0
	18-51	6.6-8.4	0.5-1.0	28-32	0-20
	51-60	7.4-8.4	0.0-0.5	23-37	15-30
91B2:					
Swygert	0-7	5.6-7.3	2.0-4.0	20-32	0
	7-12	5.6-7.3	1.0-3.0	20-33	0
	12-48	6.6-8.4	0.5-1.0	28-32	0-20
	48-60	7.4-8.4	0.0-0.5	23-37	15-30
91C2:					
Swygert	0-7	5.6-7.3	2.0-4.0	20-32	0
	7-36	6.6-8.4	0.5-1.0	28-32	0-20
	36-60	7.4-8.4	0.0-0.5	23-37	15-30
102A:					
La Hogue	0-16	5.6-7.8	3.0-4.0	12-24	0
	16-43	5.1-7.8	0.5-2.0	12-25	0
	43-80	6.1-7.8	0.5-1.0	4.0-17	0-20
125A:					
Selma	0-23	6.1-7.8	4.0-6.0	20-28	0
	23-53	6.1-8.4	1.0-3.0	14-24	0-5
	53-60	6.6-8.4	0.5-1.0	3.0-11	0-20

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
131B:					
Alvin	0-8	4.5-7.3	0.5-1.0	7.0-11	0
	8-11	4.5-7.3	0.0-0.5	6.0-10	0
	11-25	4.5-7.3	0.0-0.5	9.0-12	0
	25-80	5.1-8.4	0.0-0.3	2.0-7.0	0-25
134A:					
Camden	0-8	5.1-7.3	1.0-3.0	10-22	0
	8-13	5.1-7.3	0.1-1.0	7.0-17	0
	13-38	5.1-7.3	0.1-0.5	13-22	0
	38-56	5.1-7.3	0.0-0.5	11-19	0
	56-60	5.1-8.4	0.0-0.5	3.0-16	0-5
134B:					
Camden	0-9	5.1-7.3	1.0-3.0	10-22	0
	9-14	5.1-7.3	0.1-1.0	7.0-17	0
	14-35	5.1-7.3	0.1-0.5	13-22	0
	35-62	5.1-7.3	0.0-0.5	11-19	0
	62-80	5.1-8.4	0.0-0.5	3.0-16	0-5
146A:					
Elliott	0-6	5.6-7.3	4.0-5.0	22-26	0
	6-11	5.6-7.3	3.0-4.0	22-29	0
	11-41	5.6-7.8	0.0-2.0	21-34	0-5
	41-60	7.4-8.4	0.0-0.5	16-25	10-40
146B2:					
Elliott	0-8	5.6-7.3	3.0-4.0	22-29	0
	8-27	5.6-7.8	0.0-2.0	21-34	0-5
	27-60	7.4-8.4	0.0-0.5	16-25	10-40
146C2:					
Elliott	0-8	5.6-7.3	3.0-4.0	22-29	0
	8-29	5.6-7.8	0.0-2.0	21-34	0-5
	29-60	7.4-8.4	0.0-0.5	16-25	10-40
148B2:					
Proctor	0-11	5.1-7.8	2.0-4.0	15-24	0
	11-26	5.6-7.3	0.5-2.0	16-25	0
	26-40	5.6-7.3	0.2-1.0	11-21	0
	40-60	5.6-7.8	0.2-0.5	3.0-13	0-10
149A:					
Brenton	0-16	5.6-7.8	3.0-5.0	18-26	0
	16-35	5.6-7.3	0.0-1.0	15-23	0
	35-53	5.6-7.8	0.0-0.5	12-19	0-5
	53-72	5.6-8.4	0.0-0.5	3.0-19	0-20
150B:					
Onarga	0-12	5.6-7.8	2.0-4.0	9.0-17	0
	12-49	4.5-7.3	0.5-1.0	4.0-19	0
	49-65	5.1-7.3	0.2-0.5	2.0-7.0	0
152A:					
Drummer	0-14	5.6-7.8	4.0-7.0	24-35	0
	14-41	5.6-7.8	0.5-2.0	13-25	0
	41-47	6.1-8.4	0.2-0.5	9.0-21	0-20
	47-60	6.6-8.4	0.0-0.2	6.0-20	0-40

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
153A:					
Pella	0-23	6.1-7.8	5.0-6.0	26-33	0
	23-35	6.6-7.8	0.5-1.0	17-23	0-10
	35-50	7.4-8.4	0.2-0.5	9.0-19	5-30
	50-60	7.4-8.4	0.0-0.2	6.0-18	5-40
154A:					
Flanagan	0-18	5.1-7.3	4.0-5.0	20-26	0
	18-45	5.6-7.3	0.0-1.0	21-27	0
	45-49	6.1-7.8	0.0-0.5	12-22	0-5
	49-60	7.4-8.4	0.0-0.5	12-19	5-25
171B:					
Catlin	0-11	5.1-7.3	3.0-4.0	17-24	0
	11-45	5.1-7.3	0.0-1.0	14-23	0
	45-57	6.1-7.8	0.0-0.5	12-22	0-5
	57-70	7.4-8.4	0.0-0.5	12-19	5-25
198A:					
Elburn	0-13	5.6-7.8	4.0-5.0	21-26	0
	13-44	5.6-7.8	0.5-2.0	16-25	0
	44-65	6.1-8.4	0.0-0.2	9.0-18	0-20
	65-80	6.1-8.4	0.0-0.2	1.0-9.0	0-20
206A:					
Thorp	0-14	5.1-7.8	4.0-6.0	20-28	0
	14-19	5.1-7.3	0.2-1.0	11-17	0
	19-43	5.1-7.3	0.2-1.0	14-23	0
	43-50	5.6-7.8	0.2-0.5	11-19	0-5
	50-65	6.1-8.4	0.0-0.5	3.0-19	0-20
219A:					
Millbrook	0-7	5.1-7.8	2.0-4.0	15-24	0
	7-14	5.1-7.3	0.5-1.0	11-17	0
	14-35	5.1-7.3	0.0-1.0	15-23	0
	35-55	5.1-7.8	0.0-0.5	11-22	0
	55-80	5.6-8.4	0.0-0.5	3.0-16	0-20
223B2:					
Varna	0-12	5.6-7.8	2.0-3.0	16-22	0
	12-39	5.6-7.8	0.5-1.0	22-32	0-15
	39-60	6.6-8.4	0.2-0.5	17-25	5-30
223C2:					
Varna	0-9	5.6-7.8	2.0-3.0	16-22	0
	9-40	5.6-7.8	0.5-1.0	22-32	0-15
	40-60	6.6-8.4	0.2-0.5	17-25	5-30
223D3:					
Varna	0-8	5.6-7.8	1.0-2.0	18-25	0
	8-20	5.6-7.8	0.5-1.0	22-32	0-15
	20-60	6.6-8.4	0.2-0.5	17-25	5-30
232A:					
Ashkum	0-12	5.6-7.8	3.0-7.0	27-38	0
	12-29	6.1-7.8	0.5-2.0	22-31	0-5
	29-60	6.1-8.4	0.0-0.5	18-25	0-25

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
233B:					
Birkbeck	0-4	5.1-7.3	1.0-3.0	11-22	0
	4-9	4.5-7.3	0.1-1.0	8.0-17	0
	9-54	4.5-7.3	0.0-1.0	15-23	0
	54-60	5.6-7.8	0.0-0.5	12-19	0-5
	60-68	6.6-8.4	0.0-0.5	10-19	0-20
234A:					
Sunbury	0-8	5.6-7.3	2.0-4.0	16-24	0
	8-12	5.6-7.3	0.2-1.0	11-17	0
	12-43	5.6-7.8	0.0-1.0	21-29	0
	43-47	5.6-7.8	0.0-0.5	12-22	0-5
	47-72	7.4-8.4	0.0-0.5	12-19	0-25
235A:					
Bryce	0-13	5.6-7.8	5.0-7.0	34-43	0
	13-45	6.6-8.4	0.0-1.0	25-33	0-20
	45-66	7.4-8.4	0.0-0.5	23-37	5-25
236A:					
Sabina	0-6	5.1-7.3	1.0-3.0	14-22	0
	6-8	5.1-7.3	0.1-1.0	11-17	0
	8-40	4.5-7.3	0.0-1.0	21-27	0
	40-47	6.6-7.8	0.0-0.5	12-22	0-5
	47-80	7.4-8.4	0.0-0.5	9.0-20	0-25
241C3:					
Chatsworth	0-5	5.6-8.4	0.5-1.0	25-38	0-20
	5-16	6.1-8.4	0.0-0.5	21-37	0-25
	16-60	7.4-8.4	0.0-0.5	21-30	5-30
241D3:					
Chatsworth	0-2	5.6-8.4	0.5-1.0	25-38	0-20
	2-22	6.1-8.4	0.0-0.5	21-37	0-25
	22-60	7.4-8.4	0.0-0.5	21-30	5-30
242A:					
Kendall	0-7	5.1-7.3	1.0-3.0	14-22	0
	7-11	5.1-7.3	0.1-1.0	11-17	0
	11-51	4.5-7.3	0.0-0.5	16-22	0
	51-58	5.1-7.8	0.0-0.5	6.0-19	0-15
	58-80	5.6-8.4	0.0-0.5	3.0-19	0-15
291B:					
Xenia	0-4	5.6-7.3	1.0-3.0	9.0-19	0
	4-10	5.1-7.3	0.2-1.0	6.0-14	0
	10-37	5.1-7.3	0.2-1.0	17-23	0
	37-57	5.6-7.3	0.0-1.0	14-23	0-5
	57-72	7.4-8.4	0.0-0.5	9.0-17	15-50
322C2:					
Russell	0-7	5.1-7.3	1.0-2.0	8.0-17	0
	7-27	4.5-6.0	0.5-1.0	16-23	0
	27-56	5.1-7.3	0.0-1.0	14-22	0-5
	56-72	7.4-8.4	0.0-0.5	9.0-17	10-35
330A:					
Peotone	0-13	5.6-7.8	5.0-7.0	30-38	0
	13-50	6.1-7.8	0.5-3.0	22-33	0
	50-60	6.6-8.4	0.2-0.5	15-26	0-15

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
387B:					
Ockley	0-10	5.6-7.3	1.0-3.0	8.0-17	0
	10-35	4.5-6.5	0.0-0.5	11-18	0
	35-45	5.1-7.3	0.0-0.5	5.0-17	0
	45-60	7.4-8.4	0.0-0.2	1.0-3.0	10-40
387C3:					
Ockley	0-6	5.6-7.3	0.5-1.0	15-17	0
	6-14	4.5-6.5	0.0-0.5	11-18	0
	14-41	5.1-7.3	0.0-0.5	5.0-17	0
	41-60	7.4-8.4	0.0-0.2	1.0-3.0	10-40
448B:					
Mona	0-11	6.1-7.8	2.0-5.0	16-26	0
	11-39	5.6-7.8	0.2-0.5	15-22	0-5
	39-44	7.4-8.4	0.2-0.5	24-31	5-30
	44-60	7.4-8.4	0.0-0.5	24-31	5-30
481A:					
Raub	0-18	5.6-7.3	2.0-4.0	16-24	0
	18-32	5.1-6.5	1.0-2.0	18-25	0
	32-50	6.1-7.8	0.0-1.0	16-23	0-5
	50-60	7.4-8.4	0.0-0.5	12-20	10-35
490A:					
Odell	0-11	5.6-7.3	4.0-5.0	19-26	0
	11-26	5.6-7.3	0.2-1.0	15-23	0
	26-60	7.4-8.4	0.0-0.2	6.0-12	5-35
530B:					
Ozaukee	0-4	6.1-7.3	1.0-3.0	11-22	0
	4-10	5.6-7.3	0.2-1.0	9.0-18	0
	10-39	6.1-8.4	0.2-0.5	21-31	0-20
	39-60	7.9-8.4	0.0-0.5	16-22	10-40
530C2:					
Ozaukee	0-6	6.1-7.3	1.0-2.0	11-20	0
	6-28	6.1-8.4	0.2-0.5	21-31	0-20
	28-60	7.9-8.4	0.0-0.5	16-22	10-40
530D2:					
Ozaukee	0-6	6.1-7.3	1.0-2.0	11-20	0
	6-28	6.1-8.4	0.2-0.5	21-31	0-20
	28-60	7.9-8.4	0.0-0.5	16-22	10-40
530E2:					
Ozaukee	0-6	6.1-7.3	1.0-2.0	11-20	0
	6-28	6.1-8.4	0.2-0.5	21-31	0-20
	28-60	7.9-8.4	0.0-0.5	16-22	10-40
533:					
Urban land.					
570B:					
Martinsville	0-9	5.1-7.3	1.0-3.0	6.0-16	0
	9-12	5.1-7.3	0.1-1.0	4.0-11	0
	12-45	5.1-7.3	0.0-0.5	10-18	0
	45-57	5.1-7.8	0.0-0.2	8.0-13	0
	57-80	6.1-8.4	0.0-0.2	3.0-10	0-45

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
570C2:					
Martinsville----	0-9	5.1-7.3	1.0-2.0	8.0-14	0
	9-45	5.1-7.3	0.0-0.5	10-18	0
	45-57	5.1-7.8	0.0-0.2	8.0-13	0
	57-80	6.1-8.4	0.0-0.2	3.0-10	0-45
570D2:					
Martinsville----	0-9	5.1-7.3	1.0-2.0	8.0-14	0
	9-45	5.1-7.3	0.0-0.5	10-18	0
	45-57	5.1-7.8	0.0-0.2	8.0-13	0
	57-80	6.1-8.4	0.0-0.2	3.0-10	0-45
618B:					
Senachwine------	0-9	5.6-7.3	1.0-3.0	8.0-17	0
	9-12	5.6-7.3	0.1-1.0	5.0-12	0
	12-34	5.1-7.3	0.0-0.5	14-19	0
	34-40	6.6-7.8	0.0-0.5	10-16	0-20
	40-60	7.4-8.4	0.0-0.5	8.0-16	25-45
618C2:					
Senachwine------	0-6	5.6-7.3	1.0-2.0	8.0-15	0
	6-28	5.1-7.3	0.0-0.5	14-19	0
	28-34	6.6-7.8	0.0-0.5	10-16	0-20
	34-60	7.4-8.4	0.0-0.5	8.0-16	25-45
618D2:					
Senachwine------	0-6	5.6-7.3	1.0-2.0	8.0-15	0
	6-28	5.1-7.3	0.0-0.5	14-19	0
	28-34	6.6-7.8	0.0-0.5	10-16	0-20
	34-60	7.4-8.4	0.0-0.5	8.0-16	25-45
618E2:					
Senachwine------	0-6	5.6-7.3	1.0-2.0	8.0-15	0
	6-28	5.1-7.3	0.0-0.5	14-19	0
	28-34	6.6-7.8	0.0-0.5	10-16	0-20
	34-60	7.4-8.4	0.0-0.5	8.0-16	25-45
618F:					
Senachwine------	0-5	5.6-7.3	1.0-3.0	8.0-17	0
	5-11	5.6-7.3	0.1-1.0	5.0-12	0
	11-32	5.1-7.3	0.0-0.5	14-19	0
	32-40	6.6-7.8	0.0-0.5	10-16	0-20
	40-60	7.4-8.4	0.0-0.5	8.0-16	25-45
622B:					
Wyanet----------	0-10	5.6-7.3	3.0-5.0	13-23	0
	10-27	5.6-7.3	0.0-0.5	13-20	0
	27-31	6.6-7.8	0.0-0.5	12-19	0-20
	31-80	7.4-8.4	0.0-0.5	9.0-19	5-35
622C2:					
Wyanet----------	0-8	5.6-7.3	2.0-4.0	11-21	0
	8-26	5.6-7.3	0.0-0.5	13-20	0
	26-34	6.6-7.8	0.0-0.5	12-19	0-20
	34-60	7.4-8.4	0.0-0.5	9.0-19	5-35
622D3:					
Wyanet----------	0-4	5.6-7.3	1.0-2.0	18-22	0
	4-20	5.6-7.3	0.0-0.5	9.0-20	0
	20-60	7.4-8.4	0.0-0.5	9.0-19	5-35

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
623A:					
Kishwaukee	0-11	5.6-7.3	2.0-5.0	11-23	0
	11-54	5.1-7.3	0.5-2.0	13-23	0
	54-64	7.4-8.4	0.0-1.0	1.0-5.0	5-35
637A+:					
Muskego	0-16	6.1-7.3	7.0-19	39-59	0
	16-50	5.6-7.3	60-90	140-180	0
	50-70	6.6-8.4	6.0-20	10-45	60-80
663B:					
Clare	0-14	5.6-7.8	3.0-5.0	17-26	0
	14-36	5.1-7.3	0.5-2.0	16-25	0
	36-50	5.6-7.8	0.2-1.0	11-21	0-5
	50-66	6.1-8.4	0.2-0.5	3.0-13	0-20
679B:					
Blackberry	0-16	6.1-7.3	3.0-5.0	17-26	0
	16-47	5.1-7.3	0.2-1.0	15-23	0
	47-62	5.6-8.4	0.1-0.5	9.0-22	0-20
	62-70	5.6-8.4	0.0-0.5	3.0-19	0-20
680B:					
Campton	0-6	5.1-7.8	1.0-3.0	14-22	0
	6-8	5.1-7.3	0.1-1.0	11-17	0
	8-44	4.5-7.3	0.0-0.5	15-22	0
	44-53	5.1-7.8	0.0-0.5	9.0-19	0-5
	53-60	5.1-7.8	0.0-0.5	3.0-16	0-20
687B:					
Penfield	0-10	5.1-7.3	3.0-5.0	12-23	0
	10-61	5.1-7.3	0.5-1.0	12-21	0
	61-72	5.6-7.8	0.0-0.5	7.0-19	0-5
	72-80	6.6-8.4	0.0-0.5	3.0-13	0-25
687C2:					
Penfield	0-7	5.1-7.3	2.0-4.0	10-21	0
	7-37	5.1-7.3	0.5-1.0	12-21	0
	37-42	5.6-7.8	0.0-0.5	7.0-19	0-5
	42-60	6.6-8.4	0.0-0.5	3.0-13	0-25
802B:					
Orthents, loamy	0-10	5.6-7.3	0.5-2.0	14-22	0-10
	10-60	5.6-7.8	0.0-1.0	11-17	0-20
830:					
Landfills.					
865:					
Pits, gravel.					
3107A:					
Sawmill	0-17	6.1-7.8	4.0-5.0	24-31	0
	17-32	6.1-7.8	1.0-4.0	18-29	0
	32-58	6.1-7.8	0.2-2.0	17-25	0-10
	58-65	6.1-8.4	0.2-1.0	11-23	0-30
3302A:					
Ambraw	0-8	5.6-7.3	2.0-3.0	20-27	0
	8-39	5.1-7.3	0.5-2.0	15-28	0
	39-50	5.1-7.3	0.5-1.0	15-23	0-5
	50-60	5.6-8.4	0.5-1.0	12-20	0-10

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100g	Pct
3473A:					
Rossburg--------	0-21	6.1-7.8	4.0-5.0	17-26	0
	21-55	6.1-7.8	0.5-1.0	12-18	0
	55-63	6.6-8.4	0.2-0.5	3.0-10	0-10

Table 21.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months or parts of the year. 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	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
23A:										
Blount	C									
		January	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		February	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		March	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		April	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		May	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
23B2:										
Blount	C									
		January	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		February	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		March	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		April	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
		May	0.5-2.0	2.0-4.5	Perched	---	---	---	---	---
56B:										
Dana	B									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
56B2:										
Dana	B									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
67A:										
Harpster	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
91A:										
Swygert	C									
		January	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
91B2:										
Swygert	C									
		January	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
91C2:										
Swygert	C									
		January	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-5.0	Perched	---	---	---	---	---
102A:										
La Hogue	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		February	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		March	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		April	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		May	1.0-2.0	>6.0	Apparent	---	---	---	---	---
125A:										
Selma	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
131B:										
Alvin	B									
		All months	>6.0	>6.0	---	---	---	---	---	
134A:										
Camden	B									
		All months	>6.0	>6.0	---	---	---	---	---	
134B:										
Camden	B									
		All months	>6.0	>6.0	---	---	---	---	---	
146A:										
Elliott	C									
		January	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
146B2:										
Elliott	C									
		January	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
146C2:										
Elliott	C									
		January	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-4.5	Perched	---	---	---	---	---
148B2:										
Proctor	B									
		All months	>6.0	>6.0	---	---	---	---	---	

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
149A:										
Brenton	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		February	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		March	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		April	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		May	1.0-2.0	>6.0	Apparent	---	---	---	---	---
150B:										
Onarga	B									
		All months	>6.0	>6.0	---	---	---	---	---	
152A:										
Drummer	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
153A:										
Pella	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
154A:										
Flanagan	B									
		January	1.0-2.0	3.5-6.0	Perched	---	---	---	---	---
		February	1.0-2.0	3.5-6.0	Perched	---	---	---	---	---
		March	1.0-2.0	3.5-6.0	Perched	---	---	---	---	---
		April	1.0-2.0	3.5-6.0	Perched	---	---	---	---	---
		May	1.0-2.0	3.5-6.0	Perched	---	---	---	---	---
171B:										
Catlin	B									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
198A:										
Elburn	B									
		January	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		February	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		March	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		April	1.0-2.0	>6.0	Apparent	---	---	---	---	---
		May	1.0-2.0	>6.0	Apparent	---	---	---	---	---
206A:										
Thorp	C									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
219A:										
Millbrook	B									
		January	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		February	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		March	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		April	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		May	0.5-2.0	>6.0	Apparent	---	---	---	---	---
223B2:										
Varna	C									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
223C2:										
Varna	C									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
223D3:										
Varna	C									
		February	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.5	Perched	---	---	---	---	---
232A:										
Ashkum	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
233B:										
Birkbeck	B									
		February	2.0-3.5	3.5-6.6	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-6.6	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-6.6	Perched	---	---	---	---	---
234A:										
Sunbury	B									
		January	1.0-2.0	3.5-5.5	Perched	---	---	---	---	---
		February	1.0-2.0	3.5-5.5	Perched	---	---	---	---	---
		March	1.0-2.0	3.5-5.5	Perched	---	---	---	---	---
		April	1.0-2.0	3.5-5.5	Perched	---	---	---	---	---
		May	1.0-2.0	3.5-5.5	Perched	---	---	---	---	---
235A:										
Bryce	D									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
236A:										
Sabina	C									
		January	0.5-2.0	3.5-5.5	Perched	---	---	---	---	---
		February	0.5-2.0	3.5-5.5	Perched	---	---	---	---	---
		March	0.5-2.0	3.5-5.5	Perched	---	---	---	---	---
		April	0.5-2.0	3.5-5.5	Perched	---	---	---	---	---
		May	0.5-2.0	3.5-5.5	Perched	---	---	---	---	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
241C3:										
Chatsworth	D									
		February	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
241D3:										
Chatsworth	D									
		February	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
242A:										
Kendall	B									
		January	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		February	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		March	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		April	0.5-2.0	>6.0	Apparent	---	---	---	---	---
		May	0.5-2.0	>6.0	Apparent	---	---	---	---	---
291B:										
Xenia	B									
		January	1.5-3.0	3.5-5.5	Perched	---	---	---	---	---
		February	1.5-3.0	3.5-5.5	Perched	---	---	---	---	---
		March	1.5-3.0	3.5-5.5	Perched	---	---	---	---	---
		April	1.5-3.0	3.5-5.5	Perched	---	---	---	---	---
		May	1.5-3.0	3.5-5.5	Perched	---	---	---	---	---
322C2:										
Russell	B									
		All months	>6.0	>6.0	---	---	---	---	---	
330A:										
Peotone	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
		June	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	---
387B:										
Ockley	B									
		All months	>6.0	>6.0	---	---	---	---	---	
387C3:										
Ockley	B									
		All months	>6.0	>6.0	---	---	---	---	---	
448B:										
Mona	B									
		February	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-5.0	Perched	---	---	---	---	---
481A:										
Raub	C									
		January	1.0-2.0	3.5-6.6	Perched	---	---	---	---	---
		February	1.0-2.0	3.5-6.6	Perched	---	---	---	---	---
		March	1.0-2.0	3.5-6.6	Perched	---	---	---	---	---
		April	1.0-2.0	3.5-6.6	Perched	---	---	---	---	---
		May	1.0-2.0	3.5-6.6	Perched	---	---	---	---	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
490A:										
Odell	B									
		January	1.0-2.0	2.0-4.0	Perched	---	---	---	---	---
		February	1.0-2.0	2.0-4.0	Perched	---	---	---	---	---
		March	1.0-2.0	2.0-4.0	Perched	---	---	---	---	---
		April	1.0-2.0	2.0-4.0	Perched	---	---	---	---	---
		May	1.0-2.0	2.0-4.0	Perched	---	---	---	---	---
530B:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
530C2:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
530D2:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
530E2:										
Ozaukee	C									
		February	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		March	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
		April	2.0-3.5	3.5-4.5	Perched	---	---	---	---	---
533:										
Urban land.										
570B:										
Martinsville	B									
		All months	>6.0	>6.0	---	---	---	---	---	
570C2:										
Martinsville	B									
		All months	>6.0	>6.0	---	---	---	---	---	
570D2:										
Martinsville	B									
		All months	>6.0	>6.0	---	---	---	---	---	
618B:										
Senachwine	B									
		All months	>6.0	>6.0	---	---	---	---	---	
618C2:										
Senachwine	B									
		All months	>6.0	>6.0	---	---	---	---	---	
618D2:										
Senachwine	B									
		All months	>6.0	>6.0	---	---	---	---	---	
618E2:										
Senachwine	B									
		All months	>6.0	>6.0	---	---	---	---	---	

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
618F:										
Senachwine	B									
		All months	>6.0	>6.0	---	---	---	---	---	
622B:										
Wyanet	B									
		All months	>6.0	>6.0	---	---	---	---	---	
622C2:										
Wyanet	B									
		All months	>6.0	>6.0	---	---	---	---	---	
622D3:										
Wyanet	B									
		All months	>6.0	>6.0	---	---	---	---	---	
623A:										
Kishwaukee	B									
		All months	>6.0	>6.0	---	---	---	---	---	
637A+:										
Muskego	A									
		January	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		February	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		March	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		April	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		June	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		November	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
		December	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	---
663B:										
Clare	B									
		February	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		March	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		April	2.0-3.5	>6.0	Apparent	---	---	---	---	---
679B:										
Blackberry	B									
		February	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		March	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		April	2.0-3.5	>6.0	Apparent	---	---	---	---	---
680B:										
Campton	B									
		February	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		March	2.0-3.5	>6.0	Apparent	---	---	---	---	---
		April	2.0-3.5	>6.0	Apparent	---	---	---	---	---
687B:										
Penfield	B									
		February	3.5-6.0	>6.0	Apparent	---	---	---	---	---
		March	3.5-6.0	>6.0	Apparent	---	---	---	---	---
		April	3.5-6.0	>6.0	Apparent	---	---	---	---	---
687C2:										
Penfield	B									
		February	3.5-6.0	>6.0	Apparent	---	---	---	---	---
		March	3.5-6.0	>6.0	Apparent	---	---	---	---	---
		April	3.5-6.0	>6.0	Apparent	---	---	---	---	---

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
802B:										
Orthents, loamy-	---									
		February	2.5-6.0	>6.0	Apparent	---	---	---	---	---
		March	2.5-6.0	>6.0	Apparent	---	---	---	---	---
		April	2.5-6.0	>6.0	Apparent	---	---	---	---	---
830:										
Landfills.										
865:										
Pits, gravel.										
3107A:										
Sawmill---------	B									
		January	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		February	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		March	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		April	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		June	---	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	---	Brief	Frequent
3302A:										
Ambraw----------	B									
		January	0.0-1.0	>6.0	Apparent	---	---	---	Brief	Frequent
		February	0.0-1.0	>6.0	Apparent	---	---	---	Brief	Frequent
		March	0.0-1.0	>6.0	Apparent	---	---	---	Brief	Frequent
		April	0.0-1.0	>6.0	Apparent	---	---	---	Brief	Frequent
		May	0.0-1.0	>6.0	Apparent	---	---	---	Brief	Frequent
		June	---	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	---	Brief	Frequent
3473A:										
Rossburg--------	B									
		January	---	---	---	---	---	---	Brief	Frequent
		February	---	---	---	---	---	---	Brief	Frequent
		March	---	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	---	Brief	Frequent

Table 22.--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			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Initial	Total		Uncoated steel	Concrete
		In	In	In	In			
23A:								
Blount	Dense material	30-48	---	---	---	High	High	High.
23B2:								
Blount	Dense material	30-48	---	---	---	High	High	High.
56B:								
Dana	---	>80	---	---	---	High	High	Moderate.
56B2:								
Dana	---	>80	---	---	---	High	High	Moderate.
67A:								
Harpster	---	>80	---	---	---	High	High	Low.
91A:								
Swygert	Dense material	35-55	---	---	---	Moderate	High	Moderate.
91B2:								
Swygert	Dense material	35-55	---	---	---	Moderate	High	Moderate.
91C2:								
Swygert	Dense material	35-55	---	---	---	Moderate	High	Moderate.
102A:								
La Hogue	---	>80	---	---	---	Moderate	High	Moderate.
125A:								
Selma	---	>80	---	---	---	High	High	Low.
131B:								
Alvin	---	>80	---	---	---	Moderate	Low	High.
134A:								
Camden	---	>80	---	---	---	High	Moderate	Moderate.
134B:								
Camden	---	>80	---	---	---	High	Moderate	Moderate.
146A:								
Elliott	Dense material	20-45	---	---	---	Moderate	High	Moderate.
146B2:								
Elliott	Dense material	20-45	---	---	---	Moderate	High	Moderate.
146C2:								
Elliott	Dense material	20-45	---	---	---	Moderate	High	Moderate.
148B2:								
Proctor	---	>80	---	---	---	High	Moderate	Moderate.
149A:								
Brenton	---	>80	---	---	---	High	High	Moderate.
150B:								
Onarga	---	>80	---	---	---	Moderate	Low	High.

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Initial	Total		Uncoated steel	Concrete
		In	In	In	In			
152A:								
Drummer	---	>80	---	---	---	High	High	Moderate.
153A:								
Pella	---	>80	---	---	---	High	High	Low.
154A:								
Flanagan	---	>80	---	---	---	Moderate	High	Moderate.
171B:								
Catlin	---	>80	---	---	---	High	High	Moderate.
198A:								
Elburn	---	>80	---	---	---	High	High	Moderate.
206A:								
Thorp	---	>80	---	---	---	High	High	Moderate.
219A:								
Millbrook	---	>80	---	---	---	High	High	Moderate.
223B2:								
Varna	Dense material	24-60	---	---	---	Moderate	High	Moderate.
223C2:								
Varna	Dense material	24-60	---	---	---	Moderate	High	Moderate.
223D3:								
Varna	Dense material	24-60	---	---	---	Moderate	High	Moderate.
232A:								
Ashkum	---	>80	---	---	---	High	High	Moderate.
233B:								
Birkbeck	---	>80	---	---	---	High	High	High.
234A:								
Sunbury	---	>80	---	---	---	Moderate	High	Moderate.
235A:								
Bryce	---	>80	---	---	---	High	High	Moderate.
236A:								
Sabina	---	>80	---	---	---	High	High	High.
241C3:								
Chatsworth	Dense material	10-24	---	---	---	Moderate	High	Low.
241D3:								
Chatsworth	Dense material	10-24	---	---	---	Moderate	High	Low.
242A:								
Kendall	---	>80	---	---	---	High	High	High.
291B:								
Xenia	---	>80	---	---	---	High	High	Moderate.
322C2:								
Russell	---	>80	---	---	---	High	Moderate	High.
330A:								
Peotone	---	>80	---	---	---	High	High	Moderate.

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Initial	Total		Uncoated steel	Concrete
		In	In	In	In			
387B:								
Ockley	---	>80	---	---	---	Moderate	Moderate	High.
387C3:								
Ockley	---	>80	---	---	---	Moderate	Moderate	High.
448B:								
Mona	Dense material	36-54	---	---	---	Moderate	High	Moderate.
481A:								
Raub	---	>80	---	---	---	High	High	Moderate.
490A:								
Odell	---	>80	---	---	---	Moderate	High	Moderate.
530B:								
Ozaukee	Dense material	20-45	---	---	---	Moderate	High	Low.
530C2:								
Ozaukee	Dense material	20-45	---	---	---	Moderate	High	Low.
530D2:								
Ozaukee	Dense material	20-45	---	---	---	Moderate	High	Low.
530E2:								
Ozaukee	Dense material	20-45	---	---	---	Moderate	High	Low.
533:								
Urban land.								
570B:								
Martinsville	---	>80	---	---	---	Moderate	Moderate	Moderate.
570C2:								
Martinsville	---	>80	---	---	---	Moderate	Moderate	Moderate.
570D2:								
Martinsville	---	>80	---	---	---	Moderate	Moderate	Moderate.
618B:								
Senachwine	---	>80	---	---	---	Moderate	Moderate	Moderate.
618C2:								
Senachwine	---	>80	---	---	---	Moderate	Moderate	Moderate.
618D2:								
Senachwine	---	>80	---	---	---	Moderate	Moderate	Moderate.
618E2:								
Senachwine	---	>80	---	---	---	Moderate	Moderate	Moderate.
618F:								
Senachwine	---	>80	---	---	---	Moderate	Moderate	Moderate.
622B:								
Wyanet	---	>80	---	---	---	Moderate	Moderate	Moderate.
622C2:								
Wyanet	---	>80	---	---	---	Moderate	Moderate	Moderate.
622D3:								
Wyanet	---	>80	---	---	---	Moderate	Moderate	Moderate.

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Initial	Total		Uncoated steel	Concrete
		In	In	In	In			
623A:								
Kishwaukee	---	>80	---	---	---	Moderate	Moderate	Moderate.
637A+:								
Muskego	---	>80	---	---	35-45	High	Moderate	Moderate.
663B:								
Clare	---	>80	---	---	---	High	High	Moderate.
679B:								
Blackberry	---	>80	---	---	---	High	High	Moderate.
680B:								
Campton	---	>80	---	---	---	High	High	High.
687B:								
Penfield	---	>80	---	---	---	Moderate	Moderate	Moderate.
687C2:								
Penfield	---	>80	---	---	---	Moderate	Moderate	Moderate.
802B:								
Orthents, loamy	---	>80	---	---	---	Moderate	High	Moderate.
830:								
Landfills.								
865:								
Pits, gravel.								
3107A:								
Sawmill	---	>80	---	---	---	High	High	Low.
3302A:								
Ambraw	---	>80	---	---	---	High	High	Moderate.
3473A:								
Rossburg	---	>80	---	---	---	Moderate	High	Low.

Table 23.--Engineering Index Test Data

(MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; and PI, plasticity index)

Soil name and location	Sample number	Horizon	Depth	Moisture density		Percentage passing sieve--				Percentage smaller than--						Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200	0.05 mm	0.02 mm	0.005 mm	0.002 mm	LL	PI	AASHTO	Unified
			In	Lb/ft^3	Pct									Pct			
Catlin silt loam:																	
1,600 feet north	78-IL-19-9-1	Ap	0-10	97	21	100	100	98	91	75	70	35	26	38	15	A-6	CL
of the southwest	78-IL-19-9-4	Bt1	19-30	100	21	100	100	99	94	94	77	40	33	52	27	A-7-6	CH
corner of sec. 19,	78-IL-19-9-8	2C	57-66	122	12	94	93	84	63	58	50	29	20	26	11	A-6	CL
T. 19 N., R. 9 E.																	
Drummer silty clay loam:	77-IL-19-34-1	Ap	0-7	97	23	100	99	95	83	79	70	42	31	53	26	A-7-6	CH
300 feet north and	77-IL-19-34-5	Btg1	25-32	127	17	99	98	93	81	76	67	37	29	40	22	A-7-6	CL
1,600 feet east of	77-IL-19-34-8	2Cg	47-60	123	12	96	93	80	55	50	44	26	19	26	11	A-7-6	CL
the southwest corner of sec. 19, T. 19 N., R. 9 E.																	
Flanagan silt loam:																	
1,405 feet north	76-IL-19-22-1	A1	0-8	95	24	100	100	99	93	87	73	39	26	42	20	A-7-6	CL
and 1,607 feet east	76-IL-19-22-5	Bt2	23-32	97	20	100	100	98	94	93	77	42	36	51	26	A-7-6	CH
of the southwest	76-IL-19-22-9	2C	49-60	124	11	97	95	86	65	62	60	25	17	23	8	A-4	CL
corner of sec. 19, T. 19 N., R. 9 E.																	
Swygert silty clay loam:	78-IL-19-4-1	Ap	0-7	99	21	100	100	98	91	84	70	34	28	35	11	A-6	ML
280 feet south and	78-IL-19-4-5	2Bt2	19-30	100	23	99	99	98	92	91	79	57	44	50	27	A-7-6	CH
1,100 feet west of	78-IL-19-4-7	2Cd	38-60	113	16	86	83	80	75	73	69	44	31	38	16	A-6	CL
the northeast corner of sec. 8, T. 22 N., R. 14 W.																	

NRCS SOILS 37A
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)

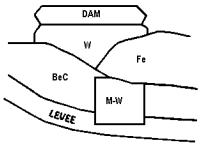
MISCELLANEOUS WATER FEATURES

- 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	

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

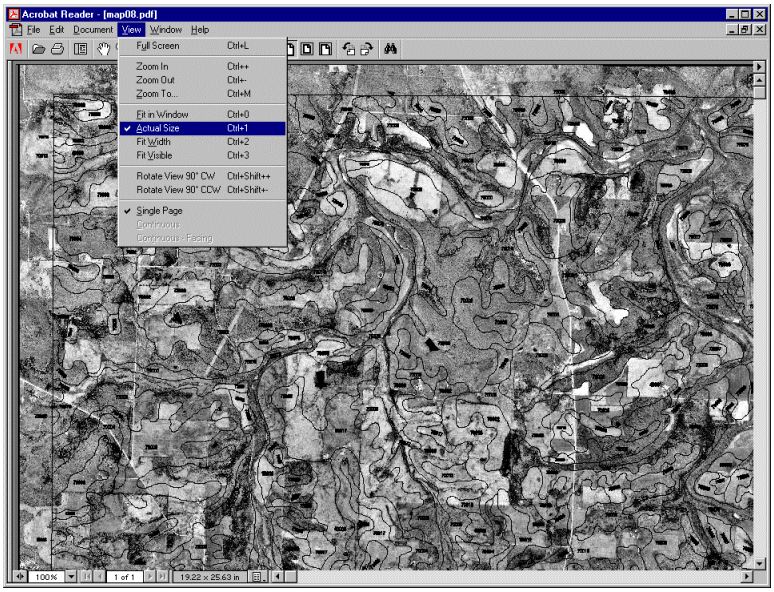
Name	Description	Label
Gray spot	A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres.	GSP
Gully	A small channel with steep sides cut by running water through which water ordinarily runs 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

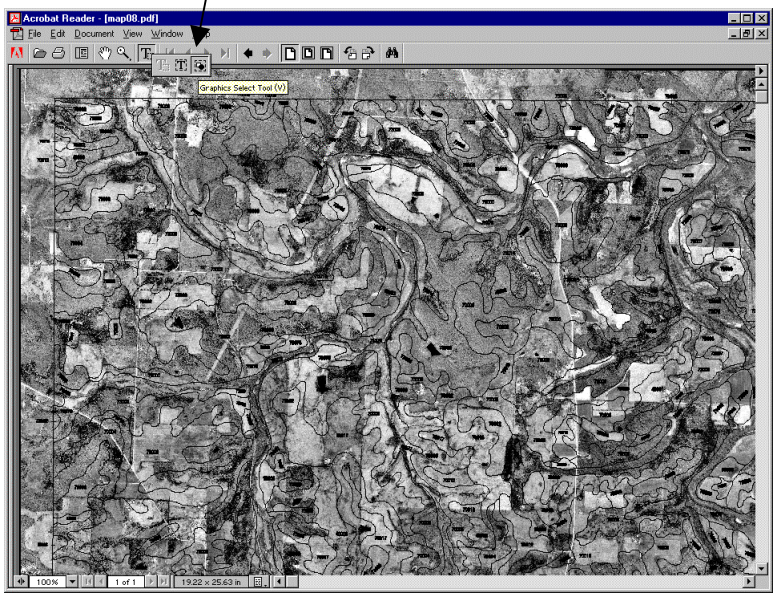
Name	Description	Label
Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres.	STV
Wet depression	A shallow, 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

Printing Soil Survey Maps

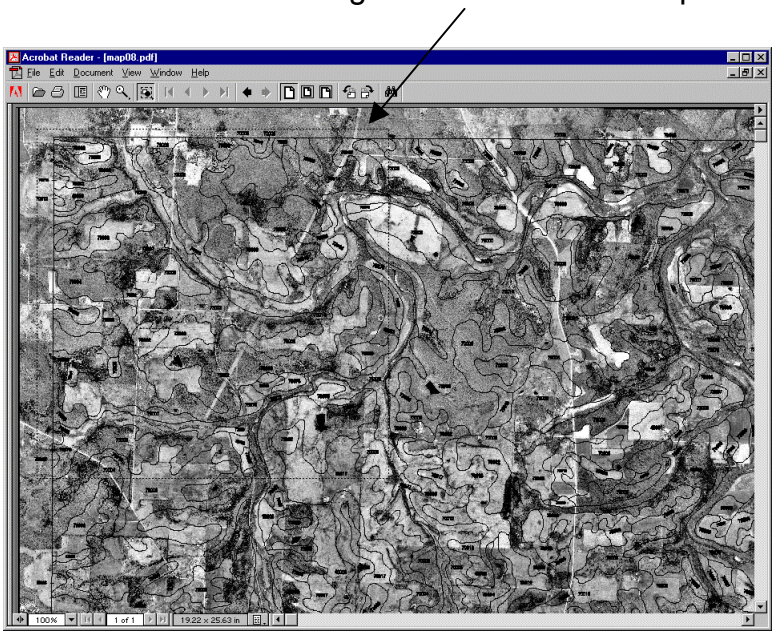
The soil survey maps were made at a scale of 1:12000 and were designed to be used at that scale. To print the maps at 1:12000 scale, set the view to Actual Size from the View pull down menu.



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.