USDA United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Kentucky Natural Resources and Environmental Protection Cabinet and Kentucky Agricultural Experiment Station

Soil Survey of Graves County, Kentucky

How to Use This Soil Survey

General Soil Map

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

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

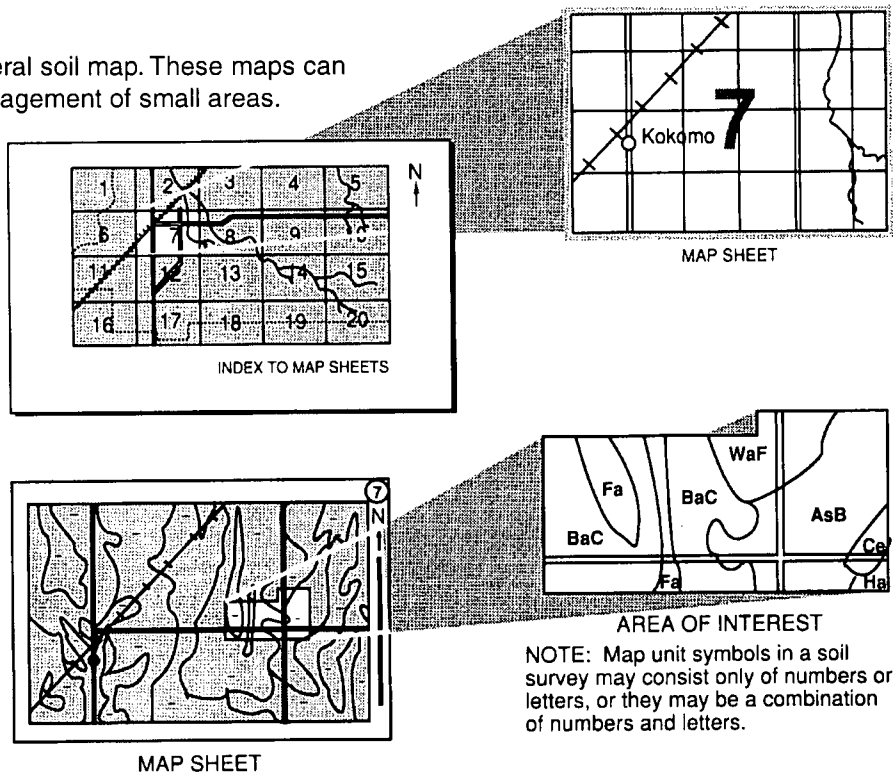
Detailed Soil Maps

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

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

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

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



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

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

Major fieldwork for this soil survey was completed in 1995. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1995. This soil survey was made cooperatively by the Natural Resources Conservation Service, the Kentucky Natural Resources and Environmental Protection Cabinet, and the Kentucky Agricultural Experiment Station. It is part of the technical assistance furnished to the Graves County Conservation District.

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

Cover: Typical fall scene in Graves County—soybeans being harvested in an area of Grenada silt loam, 2 to 6 percent slopes, eroded.

Contents

Summary of Tables v
Foreword vii
General Nature of the Survey Area 1
History and Development 1
Physiography, Relief, and Drainage 2
Farming 3
Natural Resources and Industry 4
Transportation Facilities 7
Climate 7
How This Survey Was Made 7
Survey Procedures 8
Map Unit Composition 9
General Soil Map Units 11
1. Grenada-Collins-Calloway 11
2. Grenada-Purchase 12
3. Loring-Purchase-Brandon 13
4. Brandon-Loring 14
5. Smithdale-Providence-Loring 16
6. Collins-Falaya 17
7. Routon-Rosebloom-Natalbany 17
Detailed Soil Map Units 21
BdD2—Brandon-Purchase-Smithdale complex, 12 to 20 percent slopes, eroded 21
BnE2—Brandon-Saffell-Smithdale complex, 20 to 35 percent slopes, eroded 23
BsD3—Brandon-Smithdale complex, 12 to 20 percent slopes, severely eroded 24
CaA—Calloway silt loam, 0 to 3 percent slopes 26
CeA—Center silt loam, 1 to 3 percent slopes 27
Cn—Collins silt loam, occasionally flooded 28
Co—Collins silt loam, frequently flooded 29
Cu—Collins-Iuka complex, occasionally flooded 30
DAM—Large Dam 32
Fa—Falaya silt loam, occasionally flooded 32
Ff—Falaya silt loam, frequently flooded 33
FnB2—Feliciana silt loam, 2 to 6 percent slopes, eroded 34
FnC2—Feliciana silt loam, 6 to 12 percent slopes, eroded 35
GrA—Grenada silt loam, 0 to 2 percent slopes 36
GrB2—Grenada silt loam, 2 to 6 percent slopes, eroded 37
GuE—Gullied land-Smithdale-Feliciana complex, 15 to 55 percent slopes 38
KrA—Kurk silt loam, 0 to 2 percent slopes 40
LoB2—Loring silt loam; 2 to 6 percent slopes, eroded 41
LoC2—Loring silt loam, 6 to 12 percent slopes, eroded 42
NaA—Natalbany silt loam, 0 to 2 percent slopes 43
Pd—Pits-Dumps-Udorthents complex 44
PeC3—Providence-Purchase complex, 6 to 12 percent slopes, severely eroded 45
PfC2—Providence-Loring-Feliciana complex, 2 to 12 percent slopes, eroded 47
PmD3—Providence-Smithdale complex, 12 to 20 percent slopes, severely eroded 48
PrD3—Purchase silt loam, 12 to 20 percent slopes, severely eroded 50
PsC3—Purchase-Brandon complex, 6 to 12 percent slopes, severely eroded 51
PuB3—Purchase-Loring complex, 4 to 6 percent slopes, severely eroded 52
PuC3—Purchase-Loring complex, 6 to 12 percent slopes, severely eroded 53
Ro—Rosebloom silt loam, frequently flooded 55
Rp—Rosebloom silt loam, ponded 56
RtA—Routon silt loam, 0 to 2 percent slopes 57
SaC—Saffell gravelly sandy loam, 2 to 10 percent slopes 58
SmE2—Smithdale sandy loam, 20 to 45 percent slopes, eroded 59
SsE2—Smithdale-Saffell complex, 35 to 55 percent slopes, eroded 60

Issued 2005

UdC—Udorthents-Urban land complex, 5 to 25 percent slopes 62
UrB—Urban land-Udorthents complex, 2 to 8 percent slopes 62
Vb—Vicksburg silt loam, occasionally flooded 63
W—Water 64
Wa—Waverly silt loam, occasionally flooded 64
Prime Farmland 67
Use and Management of the Soils 69
Crops and Pasture 69
Woodland Management and Productivity 76
Recreation 78
Wildlife Habitat 79
Engineering 81
Soil Properties 87
Engineering Index Properties 87
Physical and Chemical Properties 88
Soil and Water Features 89
Physical and Chemical Analyses of Selected Soils 90
Engineering Index Test Data 90
Classification of the Soils 93
Soil Series and Their Morphology 94
Brandon Series 94
Calloway Series 95
Center Series 96
Collins Series 98
Falaya Series 99
Feliciana Series 100
Grenada Series 100
Iuka Series 103
Kurk Series 103
Loring Series 104
Natalbany Series 106
Providence Series 107
Purchase Series 109
Rosebloom Series 110
Routon Series 111
Saffell Series 112
Smithdale Series 113
Vicksburg Series 115
Waverly Series 115
Formation of the Soils 117
Factors of Soil Formation 117
Processes of Horizon Differentiation 121
Geology, Geomorphic, and Soil Relationships 124
References 131
Glossary 135
Tables 143

Summary of Tables

Temperature and precipitation (table 1) 144

Freeze dates in spring and fall (table 2) 145

Growing season (table 3) 145

Acreage and proportionate extent of the soils (table 4) 146

Land capability and yields per acre of crops and pasture (table 5) 147

Capability classes and subclasses (table 6) 150

Woodland management and productivity (table 7) 151

Recreational development (table 8) 158

Wildlife habitat (table 9) 162

Building site development (table 10) 166

Sanitary facilities (table 11) 170

Construction materials (table 12) 174

Water management (table 13) 178

Engineering index properties (table 14) 182

Physical and chemical properties of the soils (table 15) 190

Soil and water features (table 16) 194

Physical analyses of selected soils (table 17) 197

Chemical analyses of selected soils (table 18) 198

Engineering index test data (table 19) 199

Classification of the soils (table 20) 200

Foreword

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

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

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

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

David G. Sawyer
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Graves County, Kentucky

By Jerry E. McIntosh, Natural Resources Conservation Service

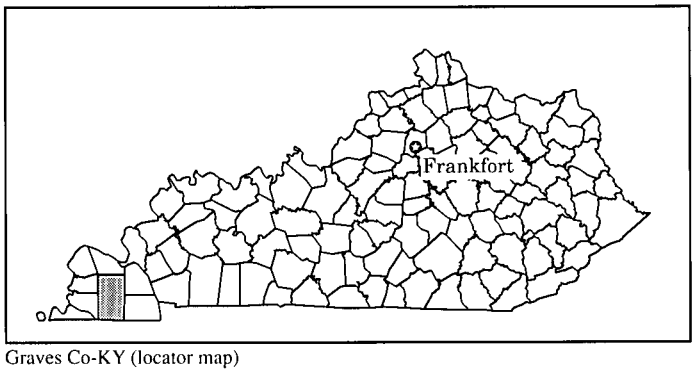
Fieldwork by Jerry E. McIntosh and Phillip G. Gregory, Natural Resources Conservation Service, and by Kenneth E. Scott, Division of Conservation, Kentucky Natural Resources and Environmental Protection Cabinet

United States Department of Agriculture, Natural Resources Conservation Service
in cooperation with
Kentucky Natural Resources and Environmental Protection Cabinet and Kentucky Agricultural Experiment Station

GRAVES COUNTY is located in western Kentucky in the heart of the Jackson Purchase Region (fig. 1). It consists of 356,358 acres that covers nearly 557 square miles. Graves County is bounded on the south by Tennessee, on the east by Calloway and Marshall Counties, on the north by McCracken County, and on the west by Carlisle and Hickman Counties. In 1993, Graves County had a population of 33,550. Mayfield, the largest town and county seat, is located near the geographic center of the county at the intersection of U.S. Highway 45 and Kentucky State Highways 80 and 121. Mayfield's population in 1993 was 9,935.

Traditionally, Graves County has been a rural, agricultural area. Its gently rolling terrain and favorable climate contribute to it being a leading agricultural area in the state. Row crop production and livestock farming are the dominant farm enterprises. Corn, wheat, soybeans, and tobacco are the principal crops. The major kinds of livestock are beef cattle and hogs. The location of several manufacturers in Mayfield and the surrounding county provides a variety of employment opportunities. General Tire, located just north of Mayfield, has been one of the region's largest employers for more than 30 years.

This soil survey updates an older survey published in 1953 *(21)*. The 1953 survey is currently out-of-print with copies no longer available to the general public. This updated soil survey provides newer soil maps containing photographic imagery, contemporary soil series names and descriptions, and improved soil interpretive data for land-use planning and management.



Graves Co-KY (locator map)

Figure 1.—Location of Graves County in Kentucky.

General Nature of the Survey Area

This section gives general information about the survey area. It describes the county's history, physiography, farming, natural resources and industry, transportation facilities, and climate.

History and Development

Graves County was established in 1823 in western Kentucky's Jackson Purchase Region. The rights to the area, known as the Purchase, were acquired for $300,000 by the U.S. government in 1818 from the Chickasaw Indians. General Andrew Jackson was the chief negotiator for this land deal, thus, establishing the common association of his name with this physiographic area of

Kentucky that stretches from the Tennessee River (Kentucky Lake) westward to the Mississippi River.

The area was organized three years later into Hickman County with the county seat located at Columbus. In 1823, a section of Hickman County was set apart and organized as a separate county named in honor of Captain Benjamin Graves, an officer in the War of 1812. A site near the center of Graves County was chosen for the county seat and named after George Mayfield, an Indian scout and interpreter for General Jackson during negotiations with the Indians. Mayfield was surveyed and incorporated in 1824.

Historical records indicate there were no permanent Indian settlements in Graves County. A young white man from South Carolina, John Anderson, along with his wife Nancy, arrived in 1819 and are considered the first permanent settlers to the area. The early settlers came from farther east in Kentucky and Virginia, eastern Tennessee, and the Carolinas. Virtually all of them were of American birth.

Most of the small communities still in existence today were settled during the period 1825 to 1870. Feliciana, one of the earliest towns, was founded about 1826. Lowes was settled about 1828, and Fancy Farm was settled around 1830. The Farmington community was laid out in 1841. Water Valley and Wingo began as stations on the Memphis, New Orleans, and Northern railroad about 1854. Symsonia and Hickory were surveyed in 1860 and 1867, respectively *(21)*.

The population of Graves County has remained relatively constant since the late 1800's. In 1910, the population was 33,539; 30,778 in 1930; 31,364 in 1950; and 33,550 in 1993.

From its earliest beginnings, Graves County has relied heavily on agricultural production as a way of life. For the early settlers, farming was mainly on a subsistence level with crops grown primarily for local consumption and meeting livestock needs. Today, however, agriculture in Graves County is much more diversified with fewer farmers and larger individual farming enterprises. Also, a larger portion of the population is employed by various industries in and around Mayfield and throughout the Purchase Region.

Graves County is the home of one of Kentucky's most accomplished politicians. Alben Barkley was born in 1877 in the northwestern part of the county near the small community of Wheel. Barkley, nicknamed the "Veep", served as a U.S. Congressman and senate majority leader and later as Vice-President to Harry S. Truman from 1949 to 1953.

The small Catholic community of Fancy Farm in western Graves County is home of the world's largest one-day outdoor picnic and barbecue, according to the Guinness Book of World Records. The Fancy Farm Picnic, held annually every first Saturday in August, began in 1880 and features barbecue, bingo, and political speeches from both national and state politicians.

The Graves County Conservation District was established in the summer of 1941. Through the leadership of local supervisors and technical assistance provided by the Natural Resources Conservation Service (formerly the Soil Conservation Service), it has had a positive impact on the total quality of the environment in Graves County. The district has been a leader in implementing cost effective erosion-control measures and practices, improving drainage on thousands of acres of cropland, and establishing watershed projects to aid in controlling flooding along the major creeks.

Physiography, Relief, and Drainage

Graves County lies in the heart of Kentucky's Jackson Purchase Physiographic Region and is part of the larger Southern Mississippi Valley Silty Uplands *(37)*. Most of the county is part of a gentle, northerly sloping undulating plain that has been modified by varying degrees of erosion. Approximately 55 percent of the county is characterized by nearly level to sloping uplands; 20 percent is hilly to steep uplands; and 25 percent is nearly level to gently sloping bottoms and stream terraces. Elevations range from 575 feet just west of Lynnville to 335 feet where the West Fork Clarks River exits the county northwest of Symsonia.

Generally, the landscape in the survey area consists of nearly level to sloping ridgetops dissected by a young, dendritic drainage system. The slopes on the valley sides commonly range from 6 to 15 percent with local relief seldom exceeding 50 feet. South of State Highway 94 the valley sides are considerably longer, steeper, and much more dissected with local relief ranging from 75 feet to as much as 100 feet. A similar landform occurs along the eastern side of the lower courses of Mayfield Creek and West Fork Clarks River.

Two major watershed divides occur within the survey area. The Tennessee Valley Divide occurs along a southeast-northwesterly trend from just east of Farmington to the northern part of the county near where U.S. Highway 45 exits into McCracken County. The area east of this divide drains into the Tennessee River via West Fork Clarks River. West of the divide the area drains into the Mississippi River via Mayfield Creek. A second prominent watershed divide occurs in the southern portion of the county, roughly parallel to State Highway 94. Approximately 90 percent of the survey area lies north of this divide. Water north of the divide drains into the Mississippi River through larger tributaries, such as Bayou de Chien, Obion Creek, and Mayfield Creek. South of the divide water exits the county through a series of

tributaries flowing southward to the North Fork Obion River in Tennessee.

Several flood retarding structures have been constructed throughout the survey area to aid in controlling downstream flooding along the major streams (fig. 2). The majority of these structures occur within the West Fork Mayfield Creek watershed.

Farming

Agriculture plays a major role in the Graves County economy. In 1995, there were about 4,400 farms and 141,000 acres of cropland (Graves County Farm Service Agency staff, personal communication). An additional 54,000 acres of potential cropland was idled as a result of the Conservation Reserve Program. Graves County traditionally is among the leading agricultural counties in Kentucky in terms of cash receipts from farm marketing.

Row crop production is the primary farm enterprise. In 1995, the county ranked among the top 10 counties in the state in the production of corn, wheat, soybeans, grain sorghum, and dark fire-cured and dark air-cured tobaccos *(18)*.

Graves County is consistently the number one producer of dark fire-cured tobacco. In 1994, approximately 3.5 million pounds were produced on 1,400 acres (fig. 3). In addition, there were about 480,000 pounds of dark air-cured tobacco raised on 358 acres (Graves County Farm Service Agency staff, personal communication). Four tobacco warehouses in Mayfield serve as a market for both the burley and dark tobaccos produced in Graves and surrounding counties.

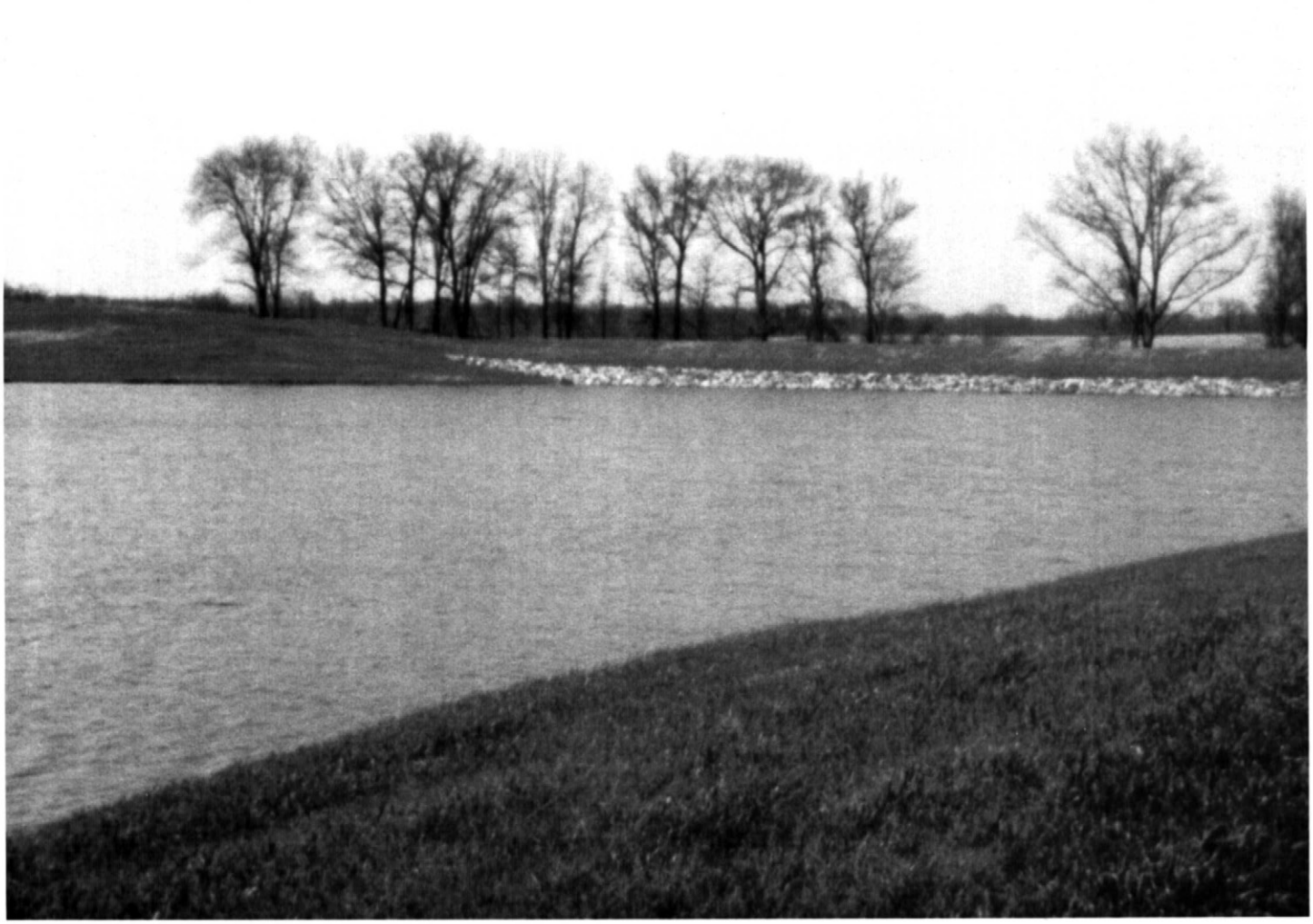


Figure 2.—Flood retarding structure in West Fork Mayfield Creek watershed. This structure helps protect valuable farmland by controlling downstream flooding.

Figure 3.—An area of Collins silt loam, occasionally flooded, in which dark tobacco is harvested.

No-till or minimum-till cropping systems occur on virtually every major farm operation producing corn, wheat, and soybeans (fig. 4). On the average, 50 percent of the acreage planted to these commodity crops utilize such cropping systems. The long growing season and favorable soil conditions permit a corn-wheat-soybean cropping rotation in which farmers produce three crops in two years.

The areas of hayland and pasture in the county support various mixtures of grasses and legumes. Principal hay crops are alfalfa, red clover, timothy, orchardgrass, and Kentucky 31 fescue. Red clover, white clover, and fescue are commonly grown in pasture mixtures.

A significant number of livestock and poultry operations compliment the row crop enterprises. Most livestock income is derived from the sale of beef cattle, hogs, and dairy products. According to the 1994 Kentucky Agricultural Statistics, Graves County ranked fourth in the state in total receipts generated from livestock sales *(18)*.

Since 1991, poultry production has been an important addition to Graves County's agricultural economy. Approximately 23.4 million broilers are produced annually in Graves County through production contracts between local growers and Seaboard Farms of Kentucky. To meet the needs of this grow-out partnership, Seaboard purchases six million bushels of corn annually. The corn is purchased from area farmers and has a positive impact on local corn prices.

Natural Resources and Industry

Other than soil, the principal natural resources of Graves County are clay, gravel and sand, ground water, and timber.

Figure 4.—No-till soybeans planted in wheat stubble in an area of the Purchase-Loring complex, 4 to 6 percent slopes, severely eroded. About 40 percent of the harvested soybeans are double-cropped behind wheat.

Clay has been mined in the survey area since the late 1800's and is the most important mineral resource *(31)*. Two clay companies, Kentucky-Tennessee Clay and Old Hickory Clay, operate open-pit mines in the county. Greater than 90 percent of all ball clay mined in the United States is from the Jackson Purchase Region and west Tennessee (27). Ball clay has the unique property of being highly plastic, essentially grit free, with excellent suspending and bonding characteristics *(20, 31)*. These qualities target the ceramic industry as the primary market for this raw material. Ball clay is used in the manufacture of ceramic bathroom fixtures, stoneware and fine china dinnerware, floor and wall tile, spark plugs, and refractories *(27)*.

Graves County has abundant gravel resources with numerous small gravel pits scattered throughout the survey area (fig. 5). The gravel is obtained from the Continental deposits underlying the surficial loess cap. A few older pits occur in alluvial gravel bars associated with the West Fork Clarks River flood plain in the northeastern

Figure 5.—Ball clay and gravel mined in an area of the Pits-Dumps-Udorthents complex.

part of the county near Symsonia. Sand is obtained from both the Continental deposits and the underlying sand formations of the Coastal Plain sediments. It is commonly mined in conjunction with gravel. The greater part of the sand and gravel produced is used locally for general construction and building purposes, such as subgrade for highways, parking lots, and foundations. Sand and gravel are used less extensively for bridges, sidewalks, and other concrete structures. Reserves of both gravel and sand are large.

The survey area is a model for obtaining quality ground water from aquifer (water-bearing formation) flow regimes. Large quantities of good quality ground water for domestic, industrial, and municipal uses are available *(16)*. Most domestic and municipal wells are less than 175 feet deep and obtain ground water from an Eocene sand aquifer within the Coastal Plain sediments. A number of the larger volume industrial wells penetrate deeper into the aquifer at depths generally ranging from 240 to 260 feet. Shallow wells utilized primarily for domestic needs obtain water from alluvium along the major streams and perched water in the Continental gravel deposits. The quality and quantity of water obtained from these shallow means are generally inferior to that obtained from the deeper sand aquifer.

Graves County has about 77,000 acres of forest land

(41). The larger tracts occur on the steeper uplands and poorly drained bottomlands. Mixed stands of second- and third-growth hardwoods are predominant, but several small stands of pine trees are also scattered throughout the county. There are four local sawmills in operation with the largest one located at Kaler on Kentucky Highway 131 between Mayfield and Symsonia. Most of the smaller pulpwood and wood chips are shipped to Westvaco Corporation at Wickliffe to make paper.

A rather diversified industrial base provides employment for more than one-third of Graves County's labor force *(23).* Presently, the local industry includes enterprises engaged in the manufacture of clothing, tires, air compressors, cabinet doors, lamps and shades, and plastic injection molds *(22).*

Seaboard Farms of Kentucky, a poultry grow-out and processing business, began initial operations in 1990. Seaboard operates a processing plant at Hickory, along with a feed mill and hatchery near Mayfield. Ingersoll-Rand manufactures air compressors and has its international headquarters for its Centac Division located in Mayfield. General Tire is one of the region's largest employers. It has been the principal industrial staple for the local economy since its beginning in 1960.

Transportation Facilities

Located in the center of Kentucky's Jackson Purchase Region, Graves County is accessible by state and federal highways, railway, and air. Major highways include the Purchase Parkway, which connects to I-24 and runs diagonally from the northeastern part of the county to the southwest corner; and U.S. Highway 45, which extends from Memphis to Paducah, runs north-south through the survey area, and is four-laned between Mayfield and Paducah. There are a number of state highways running through Graves County. Two of the larger ones, State Highways 80 and 121, pass directly through Mayfield.

The main line of the Illinois Central Gulf Railroad runs north-south through the western portion of the county passing near the communities of Fancy Farm and Lowes. A spur of the Paducah & Louisville Railroad runs parallel to U.S. Highway 45 North and serves Mayfield's freight needs.

The Mayfield/Graves County Airport is located 3.4 miles east of Mayfield and contains a 4,625-foot lighted runway that services light aircraft.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Radio Station WNGO at Mayfield in the period 1967 to 1993. 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 37.4 degrees F and the average daily minimum temperature is 27.3 degrees. The lowest temperature on record, which occurred at Radio Station WNGO at Mayfield on January 17, 1982, is -18 degrees. In summer, the average temperature is 76.8 degrees and the average daily maximum temperature is 88.2 degrees. The highest recorded temperature, which occurred at Radio Station WNGO at Mayfield on July 15, 1980, is 103 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 (40 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 52.88 inches. Of this, 25.27 inches, or 48 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.45 inches at Radio Station WNGO at Mayfield on September 21, 1979. Thunderstorms occur on about 60 days each year, and most occur in June.

The average seasonal snowfall is 10.5 inches. The greatest snow depth at any one time during the period of record was 14 inches recorded on March 22, 1968. On an average, 2 days per 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 58 percent. Humidity is higher at night, and the average at dawn is about 86 percent. The sun shines 68 percent of the time possible in summer and 47 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9.7 miles per hour, in March.

How This Survey Was Made

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted 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. 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 are generally 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 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 assure that a high water table will always be at a specific level in the soil on a specific date.

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

Survey Procedures

The general procedures followed in making this survey are described in the "National Soils Handbook" of the Natural Resources Conservation Service and in the "Soil Survey Manual" *(39)*. The soil survey of Graves County published in 1953 and other surveys published in the Jackson Purchase Region were used as references.

The soil survey of Graves County is among the first surveys in the state to be updated. The maps and soil descriptions in the 1953 survey were used as a reference of where to plot soil boundaries on modern photographic imagery and where to plan more intensive soil investigations and transects.

Before the fieldwork began, aerial photographs taken in March and October 1985 and enlarged to a scale of 1:20,000 were studied. Soil scientists studied U.S. Geological Survey geologic and topographic maps at a scale of 1:24,000 to relate land and image features *(42 to 59)*. Color infrared maps were used to assist with interpreting soil drainage, degree and extent of soil erosion, vegetation patterns, and three-dimensional stereoscopic viewing of major landforms and slopes. Refinement of existing map units or the design of new units were then made according to the pattern of soils interpreted from photographs, maps, and field observations *(35)*.

Two levels of mapping intensity were used in this survey. More closely spaced observations were made in the valleys and gently sloping uplands where the soils are used for agriculture or potential urban development. Less closely spaced observations were made on the steeper hillsides where the soils are used as woodland or wildlife habitat. For either level of mapping intensity, the information about the soils can be used to determine soil

management and to predict the suitability of the soils for various uses.

Some areas required remapping, particularly on flood plains along the major creeks and streams. Traverses in these areas were made by truck or on foot. The soils were examined at intervals ranging from a few hundred feet to about 1/4 mile, depending on the landscape and complexity of the soil pattern. Over the course of the previous 50 years, ditches have been cut and channels have been deepened and straightened, along with land clearing and land grading operations, to improve the drainage of many of the soils in these areas. Also, some soil drainage classes recognized today were not included in the 1953 survey. Some soil series mapped in the older survey are either inactive or no longer used in this state.

On the nearly level to gently sloping deep loess uplands, most of the soil series from the older survey are still valid. In these areas, traverse intervals were much wider than the norm for original mapping. Adjustments of some slope lines and map unit delineations were made to improve the usefulness and readability of the soil map.

In many areas, such as those where steep slopes intersect flood plains, soil boundaries are precise because of the abrupt change in landform. In other areas, soil boundaries cannot be exact because they fall within a zone of gradual change between landforms or geology, such as an area where a narrow, sloping ridgetop becomes a moderately steep hillside. Much intermingling of the soils occurs in these zones.

Soil boundaries were determined on the basis of soil examinations, observations, and photo interpretation. The soils were examined with the aid of a hand probe, bucket auger, or a spade to a depth of 3 to 6 feet. The pedons described as typical for each soil series were observed in pits excavated with a backhoe or dug by hand. Additional soil descriptions were obtained through statistical sampling techniques.

Estimating the amount of soil loss due to erosion is a challenge for any soil survey, particularly one having a significant acreage of highly erodible soils. With this survey, the degree and extent of soil erosion was determined based on the depth from the surface to some diagnostic subsoil feature, such as depth to fragic properties, depth to an argillic horizon, or depth to a lithologic discontinuity. Using these criteria rather than trying to estimate how much soil has actually been lost from the surface layer promoted more consistent mapping among different soil scientists and recognized the practical differences in soil management.

Samples for chemical and physical analyses were taken from the site of the typical pedon of some of the major soils in the survey area. Most of the analyses were made by the Kentucky Agricultural Experiment Station. Bulk density analyses were made by the National Soil Survey Center in Lincoln, Nebraska. Analyses for engineering properties were performed by the Soil Mechanics Laboratory at Fort Worth, Texas. Commonly used laboratory procedures were followed *(38, 40)*. The results of the analyses of selected soils are given in tables 17, 18, and 19. In addition to the selected data published in this survey, particle-size reference data were collected on the Center, Collins, Falaya, Iuka, Rosebloom, and Waverly soils. These analyses were made by the soil survey staff at the Murray State University Agronomy Lab in Murray, Kentucky. A pH database of 60 samples representative of the fluvial soils in the survey area was developed and used as reference data for proper classification. These reference data are not published in this report.

After completion of soil mapping on 1/3 quadrangle aerial photographs, map unit delineations were transferred by hand to 7.5 minute orthophotographs at a scale of 1:24,000. These maps were then converted to digital format from which the published survey was made at a 1:20,000 scale. Surface drainage and cultural features were transferred from 7.5 minute topographic maps of the U.S. Geological Survey.

Map Unit Composition

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

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas

and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

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

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

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

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

Soil Descriptions

Nearly level to sloping, moderately well and somewhat poorly drained soils; on deep loess uplands and narrow flood plains

The map units in this group consist of very deep soils that have a silt loam surface layer. The soils on the uplands formed in thick Pleistocene loess deposits ranging from 6 to 15 feet or more and generally have a dense fragipan in the subsoil. The soils along narrow flood plains formed in silty alluvium about 5 to 20 feet thick. These map units make up about 39 percent of Graves County.

Most areas of these map units are cleared and are used for row crops, pasture, or hay (fig. 6). Rural and urban development are also prevalent with most of the larger communities in Graves County located within this area. Erosion and seasonal wetness in the winter and early spring due to restricted permeability are the main management concerns affecting most uses.

1. Grenada-Collins-Calloway

Nearly level to gently sloping, somewhat poorly and moderately well drained soils; on broad upland ridges and narrow flood plains

Setting

Landform: Broad uplands and flood plains
Slope range: 0 to 6 percent

Composition

Percent of the survey area: 16
Grenada soils—66 percent
Collins soils—12 percent
Calloway soils—9 percent
Minor soils—13 percent

Soil Properties and Qualities

Grenada

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 24 to 38 inches
Position on the landform: Broad upland summits and shoulders
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 0 to 6 percent

Collins

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Along small streams and creeks
Parent material: Silty alluvial deposits
Surface texture: Silt loam
Slope: 0 to 2 percent

Calloway

Depth class: Very deep
Drainage class: Somewhat poorly drained
Depth to fragipan: 14 to 36 inches
Position on the landform: Nearly level to slightly concave upland summits
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 0 to 3 percent

Minor soils

- Falaya soils along flood plains and narrow drainageways
- Purchase and Loring soils on upland side slopes
- Center, Routon, and Kurk soils on stream terraces

Figure 6.—Typical land use and topography within the Grenada-Purchase general soil map unit. Grenada soils occur on the broad ridgetops, and Purchase soils are on the steeper side slopes between the ridgetops and natural drainageways.

Use and Management

Major uses: Cropland

Management concerns: Seasonal wetness, the fragipan in the Grenada and Calloway soils, erosion, susceptibility to compaction, maintaining tilth and fertility

Management measures: Maintenance of drainage system, conservation tillage, crop residue management, careful site selection and proper installation procedures for buildings and septic systems

2. Grenada-Purchase

Nearly level to sloping, moderately well drained soils; on broad uplands

Setting

Landform: Broad uplands
Slope range: 0 to 12 percent

Composition

Percent of the survey area: 23
Grenada soils—53 percent
Purchase soils—24 percent
Minor soils—23 percent

Soil Properties and Qualities

Grenada

Depth class: Very deep
Drainage class: Moderately well drained

Depth to fragipan: 24 to 38 inches
Position on the landform: Broad summits and shoulders
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 0 to 6 percent

Purchase

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 5 to 20 inches
Position on the landform: Side slopes and shoulders below the Grenada soils
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 4 to 12 percent

Minor soils

- Collins and Falaya soils along flood plains and narrow drainageways
- Center, Routon, and Kurk soils on stream terraces
- Calloway soils on upland depressions
- Loring and Brandon soils on side slopes

Use and Management

Major uses: Cropland

Management concerns: Erosion, seasonal wetness, the fragipan, seasonal droughtiness, maintaining tilth and fertility
Management measures: Maintenance of water control structures, cover crops and conservation tillage, crop residue management, careful site selection and proper installation procedures for buildings and septic systems

Gently sloping to very steep, moderately well drained and well drained soils; on loess uplands underlain by gravelly Continental deposits and loamy Coastal Plain sediments

The map units in this group consist of very deep soils that have a silt loam and, to a limited extent, a sandy loam surface. The soils on the ridgetops and more gently sloping side slopes formed in thick Pleistocene loess deposits ranging from 5 to 15 feet and generally have a dense fragipan in the subsoil that restricts vertical water movement. The soils on the steeper side slopes formed in moderate to thin amounts of loess and the underlying gravelly or loamy sediments. These soils are quite fragile with most areas being highly dissected by ephemeral drains and gullies. These map units make up about 45 percent of Graves County.

Most areas of these map units are used for pasture, woodland, hay, and row crops. The areas used for growing hay and row crops are restricted to the more gentle portions of the landscape. Most of the steeper areas are used as woodland or permanent pastureland. Erosion, seasonal wetness, and the steep slopes, in places, are the main management concerns affecting most uses.

3. Loring-Purchase-Brandon

Gently sloping to steep, moderately well drained and well drained soils; on dissected loess uplands with narrow ridges (fig. 7)

Setting

Landform: Uplands
Slope range: 2 to 35 percent

Composition

Percent of the survey area: 29
Loring soils—30 percent
Purchase soils—27 percent
Brandon soils—22 percent
Minor soils—21 percent

Soil Properties and Qualities

Loring

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 22 to 36 inches
Position on the landform: Ridgetops and shoulders above the Purchase and Brandon soils
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 2 to 12 percent

Purchase

Depth class: Very deep
Drainage class: Moderately well drained to well drained
Depth to fragipan: 5 to 18 inches
Position on the landform: Side slopes and shoulders below the Loring soils
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 4 to 20 percent

Brandon

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Side slopes below the Loring and Purchase soils
Parent material: Loess over gravelly Continental deposits
Surface texture: Silt loam
Slope: 12 to 35 percent

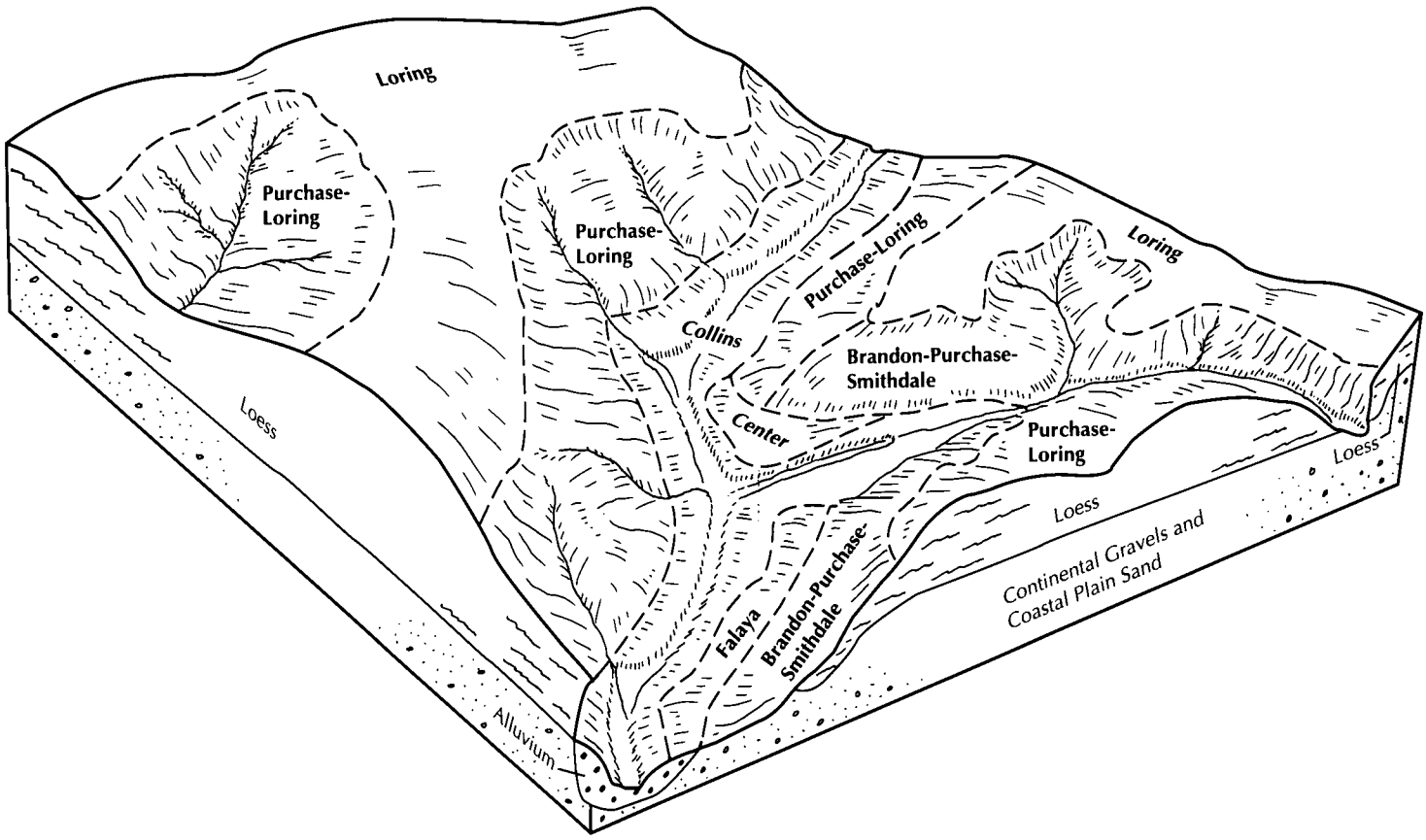


Figure 7.—Relationship of soils to parent material and topography in the Loring-Purchase-Brandon general soil map unit.

Minor soils

- Vicksburg, Collins, Falaya, and Iuka soils on narrow flood plains
- Feliciana soils on ridges and footslopes
- Saffell and Smithdale soils on steep side slopes
- Small areas of a soil similar to Purchase with gravelly layers below about 3½ feet

Use and Management

Major uses: Cropland and pastureland

Management concerns: Erosion, seasonal wetness, the fragipan in the Loring and Purchase soils, seasonal droughtiness, overgrazing pastures, maintaining tilth and fertility

Management measures: Maintenance of water control structures, cover crops and conservation tillage, crop residue management, pasture rotation, periodic pasture renovation with proper grasses and legumes, careful site selection and proper installation procedures for buildings and septic systems

4. Brandon-Loring

Gently sloping to steep, well drained and moderately well drained soils; on dissected loess uplands underlain by gravelly Continental deposits (fig. 8)

Setting

Landform: Uplands
Slope range: 2 to 35 percent

Composition

Percent of the survey area: 9
Brandon soils—34 percent
Loring soils—29 percent
Minor soils—37 percent

Soil Properties and Qualities

Brandon

Depth class: Very deep
Drainage class: Well drained

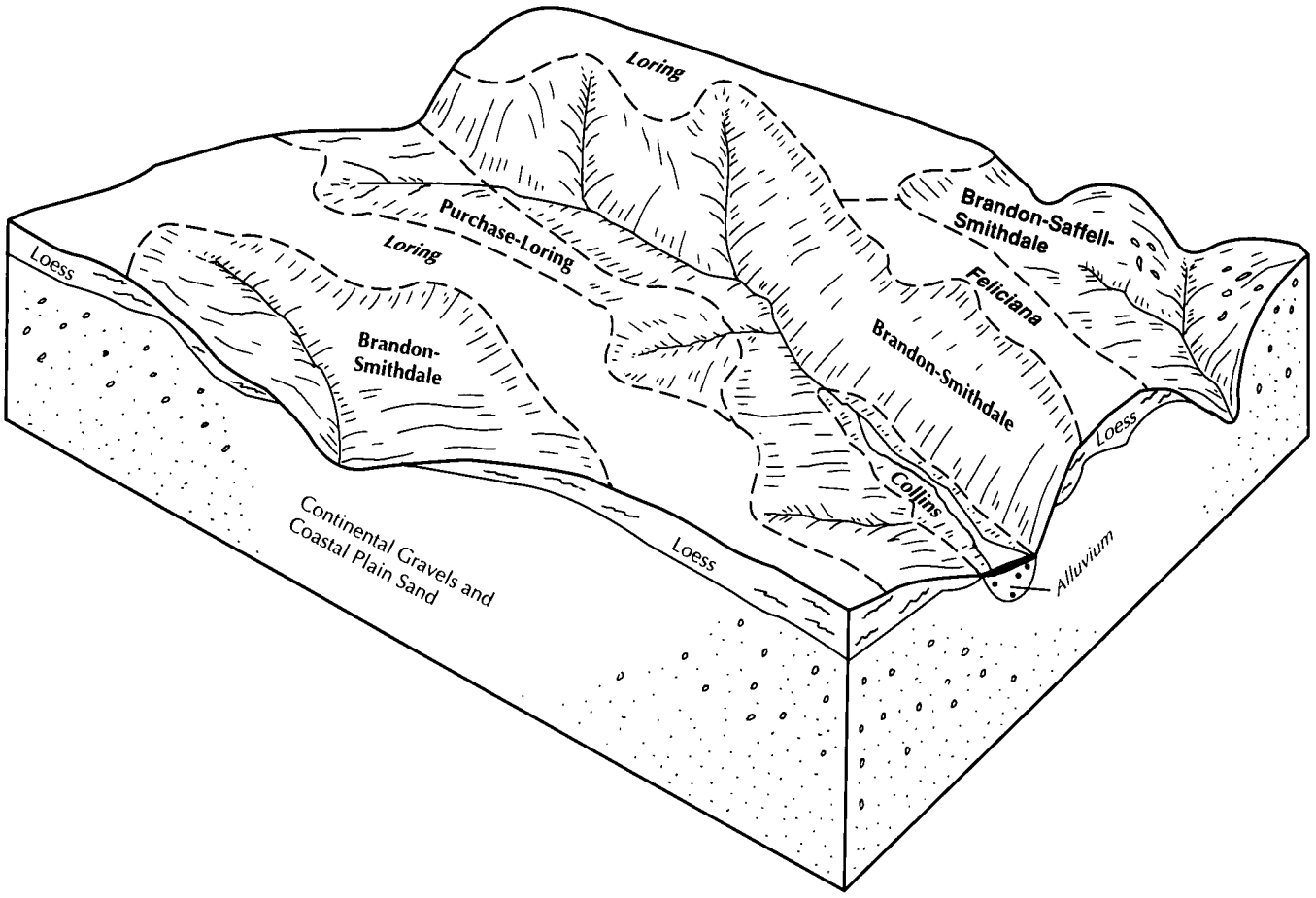


Figure 8.—Relationship of soils to parent material and topography in the Brandon-Loring general soil map unit.

Position on the landform: Side slopes below the Loring soils
Parent material: Loess over gravelly Continental deposits
Surface texture: Silt loam
Slope: 12 to 35 percent

Loring

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 24 to 36 inches
Position on the landform: Ridgetops and shoulders
Parent material: Thick loess deposits
Surface texture: Silt loam
Slope: 2 to 12 percent

Minor soils

- Collins, Falaya, Iuka, and Vicksburg soils along narrow flood plains
- Feliciana soils on ridgetops and shoulders
- Purchase, Saffell, Smithdale, and Providence soils on side slopes and footslopes
- A soil similar to Brandon with a fragipan at 1 1/2 to 2 feet below the surface

Use and Management

Major uses: Woodland and pastureland

Management concerns: Erosion, seasonal wetness, the fragipan in the Loring soils, seasonal droughtiness, overgrazing pastures, equipment limitations, maintaining tilth and fertility
Management measures: Maintenance of water control structures, cover crops and conservation tillage, crop residue management, pasture rotation, periodic pasture renovation with proper grasses and legumes, careful site selection and proper installation procedures for buildings and septic systems

5. Smithdale-Providence-Loring

Gently sloping to very steep, well drained and moderately well drained soils; on highly dissected uplands underlain by loamy Coastal Plain sediments (fig. 9)

Setting

Landform: Uplands
Slope range: 2 to 45 percent

Composition

Percent of the survey area: 7
Smithdale soils—38 percent
Providence soils—25 percent
Loring soils—20 percent
Minor soils—17 percent

Soil Properties and Qualities

Smithdale

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Steep side slopes
Parent material: Loamy Coastal Plain sediments
Surface texture: Sandy loam
Slope: 12 to 55 percent

Providence

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 17 to 32 inches
Position on the landform: Side slopes below the Loring soils
Parent material: Loess overlying loamy Coastal Plain sediments
Surface texture: Silt loam
Slope: 2 to 20 percent

Loring

Depth class: Very deep
Drainage class: Moderately well drained
Depth to fragipan: 22 to 36 inches
Position on the landform: Ridgetops and shoulders
Parent material: Thick loess deposits

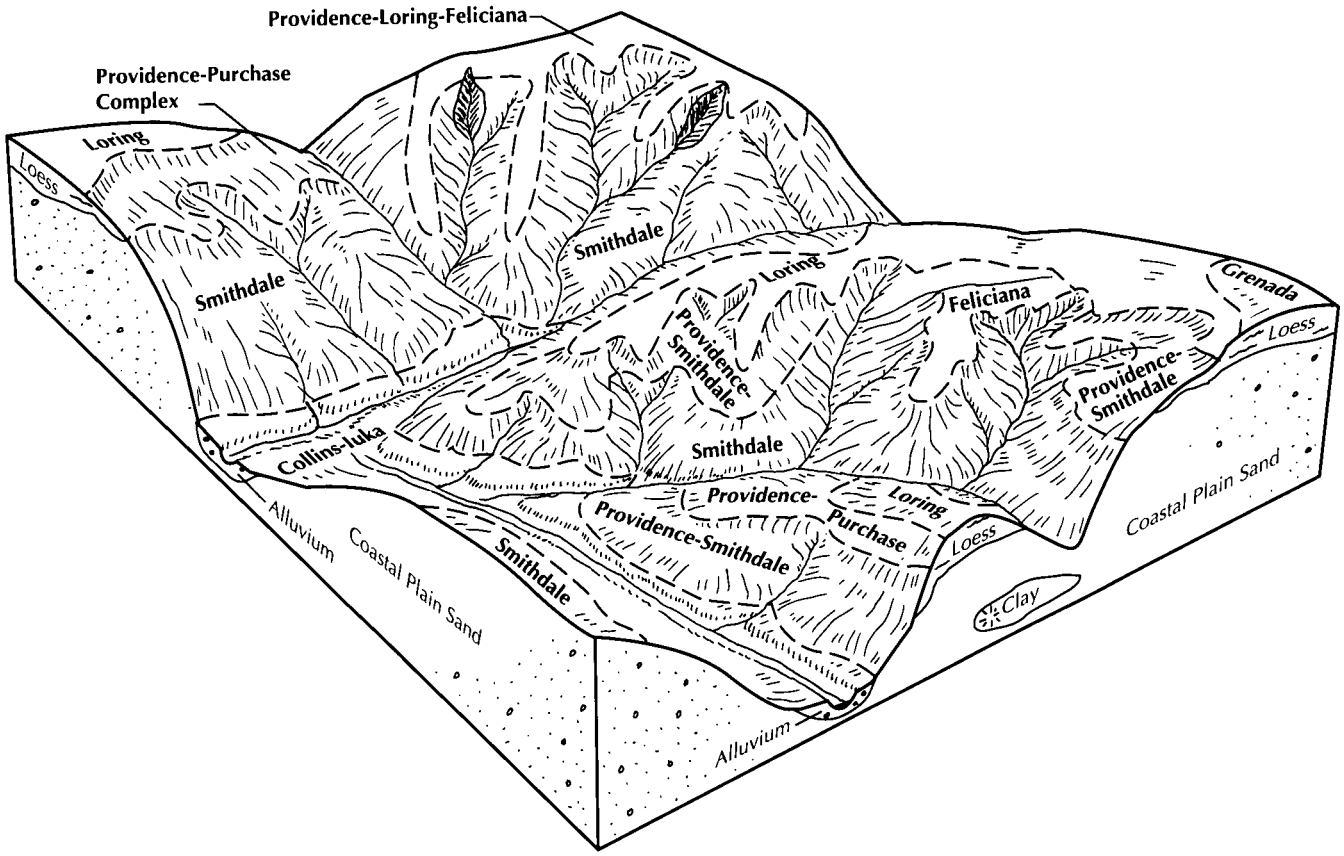


Figure 9.—Relationship of soils to parent material and topography in the Smithdale-Providence-Loring general soil map unit.

Surface texture: Silt loam
Slope: 2 to 12 percent

Minor soils

- Collins, Falaya, and Iuka soils along narrow flood plains
- Feliciana soils on ridgetops and shoulders
- Purchase soils on side slopes

Use and Management

Major uses: Woodland and pastureland

Management concerns: Severe erosion hazard, the fragipan in the Loring and Providence soils, seasonal droughtiness, overgrazing pastures, equipment limitations due to gullies and steep slopes, maintaining tilth and fertility

Management measures: Maintenance of water control structures, cover crops and conservation tillage, crop residue management, pasture rotation, periodic pasture renovation with proper grasses and legumes, bioengineering to stabilize active gullies, careful site selection and proper installation procedures for buildings and septic systems

Nearly level, moderately well to poorly drained soils; on flood plains and stream terraces

The map units in this group consist of very deep soils that have a silt loam surface layer and a silty or clayey subsoil. The soils with a clayey subsoil are restricted to stream terraces near the mouth of the West Fork Clarks River in the northeastern part of the survey area. The soils generally formed in silty alluvium washed from loess uplands (fig. 10). These map units make up about 16 percent of Graves County.

Most areas of these map units are cleared and are used for row crop production. The principal crops are corn and soybeans. Soils that are poorly drained are generally still in woodland. Flooding and wetness are the main management concerns affecting most uses.

6. Collins-Falaya

Nearly level, moderately well drained and somewhat poorly drained soils; on flood plains

Setting

Landform: Flood plains
Slope range: 0 to 2 percent

Composition

Percent of the survey area: 14
Collins soils—63 percent
Falaya soils—22 percent
Minor soils—15 percent

Soil Properties and Qualities

Collins

Depth class: Very deep
Drainage class: Moderately well drained
Depth to dominant chroma of 2 or less: 24 to 36 inches
Position on the landform: Along major creeks and their tributaries
Parent material: Silty alluvium
Surface texture: Silt loam
Slope: 0 to 2 percent

Falaya

Depth class: Very deep
Drainage class: Somewhat poorly drained
Depth to dominant chroma of 2 or less: 14 to 20 inches
Position on the landform: Slightly depressional areas along major creeks and their tributaries
Parent material: Silty alluvium
Surface texture: Silt loam
Slope: 0 to 2 percent

Minor soils

- Waverly and Rosebloom soils on the lowest depressional areas of the flood plain
- Iuka and Vicksburg soils near the stream channel of major creeks and their tributaries
- Center, Kurk, and Routon soils at higher elevations on nearby stream terraces

Use and Management

Major uses: Cropland

Management concerns: Flooding, seasonal wetness, susceptibility to compaction, low strength, weed control and maintaining a good stand on pasture and hayland, seasonal equipment limitations, maintaining tilth and fertility

Management measures: Maintenance of outlet ditches and the existing drainage system, periodic deep tillage to break up traffic pans, periodic pasture renovation with proper grasses and legumes, restricting logging operations to dry periods in the summer and fall

7. Routon-Rosebloom-Natalbany

Nearly level, poorly drained soils; on stream terraces and flood plains

Setting

Landform: Stream terraces and flood plains
Slope range: 0 to 2 percent

Figure 10.—Most areas of the Collins-Falaya general soil map unit are used to produce corn and soybeans.

Composition

Percent of the survey area: 2
Routon soils—32 percent
Rosebloom soils—13 percent
Natalbany soils—7 percent
Minor soils—48 percent

Soil Properties and Qualities

Routon

Depth class: Very deep
Drainage class: Poorly drained
Depth to dominant chroma of 2 or less: 0 to 10 inches
Position on the landform: Depressional areas on stream terraces
Parent material: Silty alluvium and loess
Surface texture: Silt loam
Slope: 0 to 2 percent

Rosebloom

Depth class: Very deep
Drainage class: Poorly drained
Depth to dominant chroma of 2 or less: 4 to 10 inches
Position on the landform: Depressional areas on flood plains
Parent material: Silty alluvium
Surface texture: Silt loam
Slope: 0 to 2 percent

Natalbany

Depth class: Very deep
Drainage class: Poorly drained

Depth to dominant chroma of 2 or less: 0 to 6 inches
Position on the landform: Nearly level depressional areas on stream terraces of the West Fork Clarks River
Parent material: Clayey alluvium
Surface texture: Silt loam
Slope: 0 to 2 percent

Minor soils

- Collins, Falaya, and Iuka soils on flood plains
- Center, Kurk, and Saffell soils on stream terraces
- Small areas of Grenada and Calloway soils on upland summits

Use and Management

Major uses: Woodland and cropland

Management concerns: Wetness, flooding on the Rosebloom soils, low strength, susceptibility to compaction, high content of clay in the Natalbany soils, poor suitability of the Routon and Natalbany soils for a conventional septic system, weed control and maintaining a good stand on areas used for pasture, seasonal equipment limitations, maintaining tilth and fertility
Management measures: Maintaining outlet ditches and the existing drainage system, periodic deep tillage to break up traffic pans, periodic pasture renovation with proper grasses and legumes, restricting logging operations to dry periods in the summer and fall

Detailed Soil Map Units

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

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

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

Soils are rated on the basis of their suitability for various uses. The suitability is expressed as well suited, suited, or poorly suited.

Soils that are *well suited* have favorable properties for the specified use. Limitations can be easily overcome. Good performance and low maintenance can be expected.

Soils that are *suited* have moderately favorable properties for the selected use. One or more properties make these soils less desirable than well suited soils.

Soils that are *poorly suited* have one or more properties that are unfavorable for the selected use. Overcoming the limitations requires special design, extra maintenance, or costly operation.

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 material, 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 material. 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, Grenada silt loam, 2 to 6 percent slopes, eroded, is a phase of the Grenada series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Brandon-Saffell-Smithdale complex, 20 to 35 percent slopes, eroded, is an example.

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

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

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

Soil Descriptions

BdD2—Brandon-Purchase-Smithdale complex, 12 to 20 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Moderately steep side slopes. The three soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Irregular
Size of areas: 5 to 75 acres
Major uses: Woodland

Composition

Brandon and similar soils: 40 percent
Purchase and similar soils: 25 percent
Smithdale and similar soils: 20 percent
Contrasting components of minor extent: about 15 percent

Minor Components

Contrasting:
- Loring soils on narrow ridgetops
- Feliciana soils on ridgetops and side slopes
- Providence soils on the more gentle portions of upper side slopes
- Saffell soils on short, steep, convex side slopes
- Small areas with moderately deep to very deep gullies

Typical Profile

Brandon

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

Subsurface layer:
5 to 10 inches—yellowish brown silt loam

Subsoil:
10 to 29 inches—brown silt loam

Substratum:
29 to 65 inches—brown extremely gravelly loam

Purchase

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

Subsoil:
5 to 19 inches—a fragipan of strong brown, mottled silt loam
19 to 68 inches—brown silt loam

Smithdale

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

Transitional layer:
3 to 7 inches—dark yellowish brown silt loam

Subsoil:
7 to 17 inches—strong brown silt loam
17 to 46 inches—yellowish red and dark red clay loam
46 to 65 inches—yellowish red sandy clay loam
65 to 80 inches—yellowish red sandy loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Brandon and Smithdale—well drained; Purchase—moderately well drained to well drained
Organic matter content: Low
Permeability: Brandon—moderate in the solum and moderately rapid in the substratum; Purchase—slow; Smithdale—moderate
Available water capacity: Brandon and Smithdale—high; Purchase—low
Depth of root zone: Brandon—deep; Purchase—shallow, limited by the fragipan; Smithdale—very deep
Surface runoff: Moderate
Depth to water table: Brandon and Smithdale—>6 feet; Purchase—4 to 7 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Very severe erosion hazard
- Droughtiness
- Maintaining fertility

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, yellow-poplar, northern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition

Management measures:
- Skid trails and roads are subject to rilling and gullying. To help reduce erosion, the area of soil disturbance can be kept to 10 percent or less. Logs can be yarded to

roads and trails located on ridgetops. Cable skidding is generally safer on these areas and disturbs the soil less.
• A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
• Brushy thickets can be established by clearing small areas within large tracts of mature woodland
• Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
• The slope affects most sanitary facilities and building site developments
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitation in some areas

Interpretive Group

Land capability classification: IVe

BnE2—Brandon-Saffell-Smithdale complex, 20 to 35 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Steep side slopes scattered throughout the county and underlain by gravelly Continental deposits and loamy Coastal Plain sediments. Brandon soils generally occupy the upper portions of the side slope closer to the ridgetop; Smithdale soils are found on the lower parts of the side slope; Saffell soils occur throughout the map unit but are found primarily on the mid to upper portions of the side slope. The three soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Linear and distinctly corrugated
Size of areas: 5 to 75 acres
Major uses: Woodland

Composition

Brandon and similar soils: 35 percent
Saffell and similar soils: 25 percent
Smithdale and similar soils: 15 percent
Contrasting components of minor extent: about 25 percent

Minor Components

Contrasting:
• Feliciana and Loring soils on narrow ridgetops scattered throughout the map unit
Soils similar to Saffell:
• Soils with less gravel in the upper part of the subsoil

Typical Profile

Brandon

Surface layer:
0 to 2 inches—very dark grayish brown silt loam

Subsurface layer:
2 to 6 inches—yellowish brown silt loam

Subsoil:
6 to 29 inches—brown silt loam

Substratum:
29 to 65 inches—brown extremely gravelly loam

Saffell

Surface layer:
0 to 3 inches—dark grayish brown fine sandy loam

Subsurface layer:
3 to 14 inches—yellowish brown fine sandy loam

Subsoil:
14 to 21 inches—yellowish red gravelly sandy clay loam
21 to 32 inches—strong brown extremely gravelly sandy clay loam

Substratum:
32 to 65 inches—strong brown extremely gravelly sandy loam

Smithdale

Surface layer:
0 to 2 inches—dark grayish brown fine sandy loam

Subsurface layer:
2 to 10 inches—yellowish brown fine sandy loam

Subsoil:
10 to 40 inches—strong brown and yellowish red loam
40 to 65 inches—yellowish red sandy loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Low
Permeability: Brandon—moderate in the solum and moderately rapid in the substratum; Saffell and Smithdale—moderate

Available water capacity: Brandon and Smithdale—high; Saffell—low
Depth of root zone: Brandon—deep; Saffell—moderately deep; Smithdale—very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Suited to pasture; poorly suited to hay production
Management concerns:
- Very severe erosion hazard
- Droughtiness
- Equipment limitation
- Maintaining fertility

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Brandon and Smithdale—high; Saffell—moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, and yellow-poplar
Preferred species for planting: Loblolly pine, shortleaf pine, yellow-poplar, northern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition

Management measures:
- Skid trails and roads are subject to rilling and gullying. To help reduce erosion, a grade of less than 10 percent can be used for roads and trails. In addition, the area of soil disturbance can be kept to 10 percent or less. Logs can be yarded to roads and trails located on narrow ridgetops. Cable skidding is generally safer on these areas and disturbs the soil less.
- A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
- Brushy thickets can be established by clearing small areas within large tracts of mature woodland
- Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- The slope affects most sanitary facilities and building site developments

Corrective measures:
- This limitation is difficult to overcome in most areas

Interpretive Group

Land capability classification: VIe

BsD3—Brandon-Smithdale complex, 12 to 20 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Moderately steep side slopes. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Linear
Size of areas: 10 to 200 acres
Major uses: Woodland

Composition

Brandon and similar soils: 65 percent
Smithdale and similar soils: 15 percent
Contrasting components of minor extent: 20 percent

Minor Components

Contrasting:
- Feliciana and Loring soils on narrow ridgetops scattered throughout the map unit
- A soil similar to Brandon but containing a fragipan at 1½ to 2 feet in depth

• Saffell soils on short, steep, convex portions of the side slope
• Small areas with moderately deep to very deep gullies

Typical Profile

Brandon

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

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

Subsoil:
10 to 29 inches—brown silt loam and silty clay loam

Substratum:
29 to 39 inches—brown extremely gravelly clay loam
39 to 65 inches—brown extremely gravelly loam

Smithdale

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

Subsoil:
4 to 17 inches—yellowish brown silt loam
17 to 27 inches—strong brown loam
27 to 70 inches—yellowish red and strong brown clay loam
70 to 80 inches—yellowish red sandy clay loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Low
Permeability: Brandon—moderate in the solum and moderately rapid in the substratum; Smithdale—moderate
Available water capacity: Brandon—high; Smithdale—moderate
Depth of root zone: Brandon—deep; Smithdale—very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
• Slope
• Very severe erosion hazard

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Very severe erosion hazard
• Droughtiness
• Maintaining fertility
Management measures:
• Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, northern red oak, and white oak
Management concerns:
• Erosion hazard
• Equipment limitation
• Seedling mortality
• Plant competition
Management measures:
• Skid trails and roads are subject to rilling and gullying. To help reduce erosion, the area of soil disturbance can be kept to 10 percent or less. Logs can be yarded to roads and trails located on ridgetops. Cable skidding is generally safer on these areas and disturbs the soil less.
• A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
• Brushy thickets can be established by clearing small areas within large tracts of mature woodland
• Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
• The slope affects most sanitary facilities and building site developments

Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitation in some areas

Interpretive Group

Land capability classification: VIe

CaA—Calloway silt loam, 0 to 3 percent slopes

Setting

Major landform: Uplands
Landform position: Nearly level to slightly concave, depressional areas of broad summits
Shape of areas: Nearly oval
Size of areas: 3 to 200 acres
Major uses: Cropland

Composition

Calloway and similar soils: 90 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
• Grenada soils on higher parts of the landscape
• Center and Routon soils on lower lying stream terraces
• Small areas of Collins soils occupying narrow drainageways
• Soils similar to Calloway that are poorly drained
• Small eroded areas

Typical Profile

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

Subsoil:
7 to 18 inches—yellowish brown silt loam
18 to 22 inches—gray, mottled silt loam
22 to 34 inches—grayish brown, mottled silty clay loam
34 to 69 inches—a fragipan of yellowish brown, mottled silt loam
69 to 75 inches—yellowish brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Somewhat poorly drained
Organic matter content: Moderate
Permeability: Moderate above the fragipan and slow in the fragipan
Available water capacity: Moderate
Depth of root zone: Moderately deep, limited by the fragipan
Surface runoff: Slow
Depth to water table: 1 foot to 2 feet during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo; generally not suited to tobacco because of the rooting depth and excessive wetness
Management concerns:
• Seasonal high water table
• Susceptibility to compaction
• Maintaining tilth and fertility
• Planting is oftentimes delayed by the wetness
• Plant production is limited during dry years because of the fragipan
Management measures:
• Surface drainage is needed in places to effectively remove excess water
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Suited to pasture and hay production, but plant selection and good management are critical
Management concerns:
• Seasonal high water table
• Fragipan
• Maintaining fertility
• Commonly too wet for grazing for several weeks in winter and early spring
Management measures:
• Grasses and legumes that are adapted to shallow rooting depths and can withstand wetness are best suited; deep rooted plants, such as alfalfa, are poorly suited to this soil
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, sweetgum, sugar maple, red maple, and shagbark hickory
Preferred species for planting: Cherrybark oak, loblolly pine, and sweetgum
Management concerns:
• Seedling mortality

- Plant competition
- Equipment limitation due to seasonal wetness

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- Wetness affects most sanitary facilities and building site developments
- Excessive seasonal wetness and slow permeability due to the fragipan are severe limitations for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- An alternative septic system, enlarging the absorption field, and proper installation procedures can overcome the limitation for sanitary facilities in some areas
- Strengthening or replacing the base material can overcome the limitation for roads and streets

Interpretive Group

Land capability classification: IIw

CeA—Center silt loam, 1 to 3 percent slopes

Setting

Major landform: Stream terraces
Landform position: Higher, gently undulating portions of stream terraces
Shape of areas: Nearly oval
Size of areas: 3 to 100 acres
Major uses: Cropland

Composition

Center and similar soils: 90 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
- Small areas of Kurk soils in depressional areas
- Small areas about 50 feet wide around the periphery of the map unit containing slopes ranging from 4 to 6 percent

Typical Profile

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

Subsoil:
10 to 24 inches—yellowish brown, mottled silt loam
24 to 46 inches—mottled light brownish gray and light olive brown silt loam
46 to 80 inches—mottled strong brown and light olive brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Moderate
Permeability: Moderate in the upper part of the solum and moderately slow in the lower part of the solum
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Moderately slow
Depth to water table: 1½ to 2½ feet during winter and early spring
Frequency of flooding: None (a few of the lowest lying areas may experience rare flooding)

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, wheat, tobacco, and milo
Management concerns:
- Seasonal high water table
- Susceptibility to compaction
- Sheet erosion
- Maintaining tilth and fertility

Management measures:
- Surface drainage can be used to help remove excess water
- Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion terraces or across the field in waterways
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as affording protection against erosion losses

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
- Seasonal high water table
- Maintaining fertility

Management measures:
• Grasses and legumes that can withstand seasonal wetness are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Green ash, sweetgum, yellow-poplar, and southern red oak
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, and American sycamore
Management concerns:
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
• Wetness affects most sanitary facilities and building site developments
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IIw

Cn—Collins silt loam, occasionally flooded

Setting

Major landform: Flood plains
Landform position: Along creeks and streams
Slopes: 0 to 2 percent
Shape of areas: Linear
Size of areas: 10 to 500 acres
Major uses: Cropland

Composition

Collins and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
• Falaya, Iuka, and Vicksburg soils in similar positions
Similar:
• Soils that are less acid throughout
• Soils containing sandy and gravelly substratums below 40 inches
• Soils that do not contain 2 chroma mottles until about 2 feet below the surface

Typical Profile

Surface layer:
0 to 12 inches—brown and dark yellowish brown silt loam

Subsoil:
12 to 19 inches—yellowish brown, mottled silt loam

Substratum:
19 to 42 inches—yellowish brown and dark yellowish brown, mottled silt loam
42 to 64 inches—mottled yellowish brown and light brownish gray silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Slow
Depth to water table: 2 to 5 feet during late winter and early spring
Frequency of flooding: Occasional (once in 2 years to about once in 20 years) and of very brief duration

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, wheat, tobacco, and milo; however, small grains and other winter cover crops may be damaged by brief flooding
Management concerns:
• Seasonal high water table
• Flooding
• Susceptibility to compaction
• Maintaining tilth and fertility

Management measures:
• Surface drainage or tile drainage can be used to help remove excess water
• Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion terraces or across the field in waterways
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
• Hazard of flooding
• Maintaining fertility
Management measures:
• Grasses and legumes that can withstand limited wetness and short periods of flooding are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Bottomland oaks, American sycamore, green ash, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, and American sycamore
Management concerns:
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
• Wetness and the hazard of flooding affect most sanitary facilities and building site developments
Corrective measures:
• These limitations are difficult to overcome in most areas

Interpretive Group

Land capability classification: IIw

Co—Collins silt loam, frequently flooded

Setting

Major landform: Flood plains
Landform position: Along major creeks and rivers
Slopes: 0 to 2 percent
Shape of areas: Linear
Size of areas: 10 to 1,000 acres
Major uses: Cropland

Composition

• Collins and similar soils: 85 percent
• Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
• Rosebloom and Falaya soils in depressional areas
• Iuka soils in similar positions
• Soils containing a thin sandy loam overwash surface layer
Similar:
• Soils that are less acid in the upper part of the solum
• Soils that do not contain 2 chroma mottles until about 2 feet below the surface

Typical Profile

Surface layer:
0 to 12 inches—brown and dark yellowish brown silt loam

Subsoil:
12 to 19 inches—yellowish brown, mottled silt loam

Substratum:
19 to 42 inches—yellowish brown and dark yellowish brown, mottled silt loam
42 to 64 inches—mottled yellowish brown and light brownish gray silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep

Surface runoff: Slow
Depth to water table: 2 to 5 feet during late winter and early spring
Frequency of flooding: Frequent (on average, about once every 2 years) and of brief duration

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, tobacco, and milo; however, small grains and other winter cover crops may be damaged by brief flooding
Management concerns:
- Seasonal high water table
- Hazard of flooding
- Susceptibility to compaction
- Maintaining tilth and fertility

Management measures:
- Surface drainage or tile drainage can be used to help remove excess water
- Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion terraces or across the field in waterways
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
- Hazard of flooding
- Maintaining fertility

Management measures:
- Grasses and legumes that can withstand limited wetness and short periods of flooding are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
- Table 7 provides specific information relating to potential productivity

Native trees: Bottomland oaks, American sycamore, green ash, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, and American sycamore
Management concerns:
- Plant competition
- Equipment limitation due to seasonal wetness and flooding

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
- Wetness and the hazard of flooding severely affect most sanitary facilities and building site developments

Corrective measures:
- None feasible

Interpretive Group

Land capability classification: IIw

Cu—Collins-luka complex, occasionally flooded

Setting

Major landform: Flood plains
Landform position: Along streams, creeks, and tributary headwaters. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Slopes: 0 to 2 percent
Shape of areas: Linear
Size of areas: 10 to 500 acres
Major uses: Cropland

Composition

Collins and similar soils: 55 percent
luka and similar soils: 30 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
- Vicksburg and Falaya soils in similar positions
- A well drained soil similar to luka

Similar:
- Soils that are less acid throughout
- Soils that do not contain 2 chroma mottles until about 2 feet below the surface

Typical Profile

Collins

Surface layer:
0 to 4 inches—dark brown loam
4 to 12 inches—dark yellowish brown silt loam

Subsoil:
12 to 26 inches—brown, mottled silt loam

Substratum:
26 to 65 inches—light brownish gray, mottled silt loam

Iuka

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

Subsoil:
9 to 15 inches—yellowish brown, mottled silt loam
15 to 27 inches—yellowish brown, mottled loam

Substratum:
27 to 65 inches—yellowish brown, mottled sandy loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Slow
Depth to water table: 2 to 5 feet during late winter and early spring
Frequency of flooding: Occasional (once in 2 years to about once in 20 years) and of very brief duration

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, wheat, tobacco, and milo; however, small grains and other winter cover crops may be damaged by brief flooding
Management concerns:
- Seasonal high water table
- Flooding
- Susceptibility to compaction
- Maintaining tilth and fertility

Management measures:
- Surface drainage or tile drainage can be used to help remove excess water
- Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion terraces or across the field in waterways
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility; the coarser texture of the soils lend to lesser amounts but more frequent applications of lime within this map unit

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
- Hazard of flooding
- Maintaining fertility

Management measures:
- Grasses and legumes that can withstand limited wetness and short periods of flooding are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
- Table 7 provides specific information relating to potential productivity

Native trees: Bottomland oaks, American sycamore, green ash, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, yellow-poplar, and American sycamore
Management concerns:
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
- Wetness and the hazard of flooding are limitations affecting most sanitary facilities and building site developments

Corrective measures:
- These limitations are difficult to overcome in most areas

Interpretive Group

Land capability classification: IIw

DAM—Large Dam

This map unit consists of one dam near the headwaters of Obion Creek located 2 miles northwest of Cuba. It is an earthen embankment containing a central impervious core and designed as a flood retarding structure for the Obion Creek watershed. The dam is approximately 30 feet high, 1,700 feet in length, and 14 feet average width across the top.

Interpretive Group

Land capability classification: VIIIs

Fa—Falaya silt loam, occasionally flooded

Setting

Major landform: Flood plains
Landform position: Slightly depressional areas along creeks and streams
Slopes: 0 to 2 percent
Shape of areas: Oval
Size of areas: 5 to 250 acres
Major uses: Cropland

Composition

Falaya and similar soils: 85 to 90 percent
Contrasting components of minor extent: 10 to 15 percent

Minor Components

Contrasting:
- Waverly and Collins soils in similar positions
- Soils that contain more sand throughout

Similar:
- Soils that are less acid throughout
- Soils with a sandy or gravelly substratum below about 40 inches

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 14 inches—brown, mottled silt loam
14 to 24 inches—light brownish gray, mottled silt loam

Substratum:
24 to 52 inches—light brownish gray and gray, mottled silt loam
52 to 63 inches—mottled brown and light brownish gray silty clay loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Somewhat poorly drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Slow
Depth to water table: 1 foot to 2 feet during winter and spring
Frequency of flooding: Occasional (once in 2 years to about once in 20 years) and of very brief duration

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo; however, tobacco, small grains, and other winter cover crops may be damaged by brief flooding
Management concerns:
- Excessive wetness
- Flooding
- Maintaining tilth and fertility

Management measures:
- Surface drainage or tile drainage can be used to remove excess water
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Excessive wetness
- Fertility

Management measures:
- Plants that are tolerant of wet conditions are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds and fertilizing

Woodland

Potential productivity: Very high
- Table 7 provides specific information relating to potential productivity

Native trees: Bottomland oaks, red maple, green ash, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, pin oak, and cherrybark oak
Management concerns:
- Equipment limitation due to seasonal wetness
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
• Wetness
• Hazard of flooding
Corrective measures:
• None feasible

Interpretive Group

Land capability classification: IIw

Ff—Falaya silt loam, frequently flooded

Setting

Major landform: Flood plains
Landform position: Slightly depressional areas along major creeks and rivers
Slopes: 0 to 2 percent
Shape of areas: Nearly oval and generally parallel to the channel
Size of areas: 10 to 250 acres
Major uses: Cropland

Composition

Falaya and similar soils: 85 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
• Rosebloom, Collins, and Iuka soils in similar positions
• Soils with 22 to 25 percent clay in the subsoil
• Soils containing a fine sandy loam overwash surface layer
Similar:
• Soils that are less acid throughout

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Subsoil:
8 to 14 inches—brown, mottled silt loam
14 to 24 inches—light brownish gray, mottled silt loam

Substratum:
24 to 52 inches—light brownish gray and gray, mottled silt loam
52 to 63 inches—mottled brown and light brownish gray silty clay loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Somewhat poorly drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Slow
Depth to water table: 1 foot to 2 feet during winter and spring
Frequency of flooding: Frequent (on average, about once every 2 years) and of brief duration

Use and Management

Cropland

Suitability: Suited to corn, soybeans, and milo in areas that have been adequately drained; however, small grains and other winter cover crops may be damaged by flooding in the winter or early spring
Management concerns:
• Excessive wetness
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Surface drainage or tile drainage can be used to help remove excess water
• Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion channels or across the field in waterways
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Excessive wetness
• Fertility
Management measures:
• Plants that are tolerant of limited wetness are best suited
• Surface drainage or tile drainage can be used to help remove excess water
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions

• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
• Table 7 provides specific information relating to potential productivity
Native trees: Bottomland oaks, shagbark hickory, green ash, red maple, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, pin oak, and cherrybark oak
Management concerns:
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
• Wetness and the hazard of flooding severely affect most sanitary facilities and building site developments
Corrective measures:
• None feasible

Interpretive Group

Land capability classification: IIIw

FnB2—Feliciana silt loam, 2 to 6 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Gently sloping, narrow ridgetops
Shape of areas: Nearly oval
Size of areas: 5 to 50 acres
Major uses: Cropland

Composition

Feliciana and similar soils: 90 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
• Loring and Grenada soils in similar positions

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Transitional layer:
5 to 10 inches—brown silt loam

Subsoil:
10 to 21 inches—strong brown silty clay loam
21 to 65 inches—strong brown and brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, wheat, tobacco, and milo
Management concerns:
• Erodibility
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
• Maintaining fertility
Management measures:
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions

• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, southern red oak, and yellow-poplar
Management concerns:
• Plant competition
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Well suited to most urban uses and conventional septic tank absorption fields
Limitations:
• Low strength is a limitation for local roads and streets
Corrective measures:
• Strengthening or replacing the base material can overcome the limitation for roads and streets

Interpretive Group

Land capability classification: IIe

FnC2—Feliciana silt loam, 6 to 12 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Sloping, narrow ridgetops and upper shoulders of side slopes
Shape of areas: Nearly oval
Size of areas: 5 to 75 acres
Major uses: Cropland

Composition

Feliciana and similar soils: 90 percent
Contrasting components of minor extent: about 10 percent

Minor Components

Contrasting:
• Loring and Providence soils in similar positions
• Brandon soils on upper side slopes
• Small severely eroded areas

Typical Profile

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

Subsoil:
7 to 31 inches—brown and strong brown silty clay loam
31 to 53 inches—strong brown silt loam
53 to 66 inches—brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo if a resource management system is implemented
Management concerns:
• Erodibility
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
• Maintaining fertility
Management measures:
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions

• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, southern red oak, and yellow-poplar
Management concerns:
• Seedling mortality
• Plant competition
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to most urban uses; well suited to conventional septic tank absorption fields
Limitations:
• The slope affects sanitary facilities and building site developments
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in most areas

Interpretive Group

Land capability classification: IIIe

GrA—Grenada silt loam, 0 to 2 percent slopes

Setting

Major landform: Uplands
Landform position: Nearly level, broad summits
Shape of areas: Nearly oval
Size of areas: 5 to 350 acres
Major uses: Cropland

Composition

Grenada and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
• Small areas of Calloway soils in similar positions
• Small areas of Collins soils occupying narrow drainageways
• Areas that are eroded
• Areas with slopes ranging to 4 percent
Similar:
• Center soils on lower lying stream terraces

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Transitional layer:
7 to 13 inches—yellowish brown silt loam

Subsoil:
13 to 21 inches—yellowish brown, mottled silt loam
21 to 28 inches—mottled light brownish gray and strong brown silty clay loam
28 to 38 inches—fragic properties consisting of mottled yellowish brown, light brownish gray, and brown silt loam
38 to 80 inches— a fragipan of brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Moderate
Permeability: Moderate above the fragipan and slow in the fragipan
Available water capacity: Moderate
Depth of root zone: Moderately deep, limited by the fragipan
Surface runoff: Moderately slow
Depth to water table: 1½ to 2½ feet during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo
Management concerns:
• Seasonal high water table
• Fragipan
• Susceptibility to compaction
• Maintaining tilth and fertility
• Planting is sometimes delayed by the wetness

Management measures:
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Fragipan
• Maintaining fertility
• Seasonal high water table; alfalfa stands are likely to become sparse after 2 or 3 years due to the seasonal high water table
Management measures:
• Grasses and legumes that are adapted to moderately deep rooting depths and can withstand seasonal wetness are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, sweetgum, hickory, and yellow-poplar
Preferred species for planting: Cherrybark oak, loblolly pine, white oak, yellow-poplar, and sweetgum
Management concerns:
• Seedling mortality
• Plant competition
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
• Wetness affects most sanitary facilities and building site developments
• Excessive seasonal wetness and slow permeability of the fragipan are severe limitations for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• An alternative septic system, enlarging the absorption field, and proper installation procedures can overcome the limitation for sanitary facilities in some areas
• Strengthening or replacing the base material can overcome the limitation for roads and streets

Interpretive Group

Land capability classification: IIw

GrB2—Grenada silt loam, 2 to 6 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Gently sloping, broad summits
Shape of areas: Nearly oval
Size of areas: 5 to 350 acres
Major uses: Cropland

Composition

Grenada and similar soils: 85 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
• Small areas of Calloway soils in slightly concave positions
• Purchase soils on the steeper portions of convex side slopes
• Small areas of Collins soils occupying narrow drainageways
• Areas that are severely eroded
Similar:
• Loring soils on the more convex portions of the landscape

Typical Profile

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

Subsoil:
8 to 18 inches—yellowish brown silt loam
18 to 22 inches—brown silt loam
22 to 32 inches—brown, mottled silt loam
32 to 72 inches—a fragipan of yellowish brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained

Organic matter content: Moderate
Permeability: Moderate above the fragipan and slow in the fragipan
Available water capacity: Moderate
Depth of root zone: Moderately deep, limited by the fragipan
Surface runoff: Moderate
Depth to water table: 1 1/2 to 2 1/2 feet during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo
Management concerns:
- Erodibility
- Seasonal high water table
- Fragipan
- Susceptibility to compaction
- Maintaining tilth and fertility
- Planting is sometimes delayed by the wetness
- Plant production is limited during dry years because of the fragipan

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Fragipan
- Maintaining fertility
- Seasonal high water table; alfalfa stands are likely to become sparse after 2 or 3 years due to the seasonal high water table

Management measures:
- Grasses and legumes that are adapted to moderately deep rooting depths and can withstand limited wetness are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, sweetgum, hickory, and yellow-poplar
Preferred species for planting: Cherrybark oak, loblolly pine, white oak, yellow-poplar, and sweetgum
Management concerns:
- Seedling mortality
- Plant competition
- Equipment limitation due to seasonal wetness

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
- Wetness affects most sanitary facilities and building site developments
- Slow permeability of the fragipan is a severe limitation for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IIe

GuE—Gullied land-Smithdale-Feliciana complex, 15 to 55 percent slopes

Setting

Major landform: Uplands
Landform position: Side slopes and ridgetops. Gullied land is a miscellaneous land type consisting of areas where erosion has cut a network of V-shaped or U-shaped channels; Smithdale and Feliciana soils occur as remnants of the original land surface on areas between the gullied land. The three components occur

as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Irregular, often V-shaped and highly dissected; many areas resemble miniature badlands
Size of areas: 5 to 75 acres
Major uses: Woodland and idle land

Composition

Gullied land and similar soils: 40 percent
Smithdale and similar soils: 40 percent
Feliciana and similar soils: 15 percent
Contrasting components of minor extent: 5 percent

Minor Components

Contrasting:
- Loring soils on narrow ridgetops scattered throughout the map unit
- Brandon and Saffell soils on upper side slopes
- A well drained soil similar to Smithdale but contains 2 feet of loess overlying loamy sediments and contains higher clay content throughout the profile

Typical Profile

Smithdale

Surface layer:
0 to 5 inches—brown loam

Subsoil:
5 to 16 inches—strong brown loam
16 to 60 inches—yellowish red and dark red sandy clay loam
60 to 80 inches—yellowish red and brownish yellow sandy loam

Feliciana

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 29 inches—brown silty clay loam
29 to 65 inches—brown and strong brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Smithdale—low; Feliciana—moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Poorly suited to pasture and hayland without major reclamation involving earthmoving, reshaping, and revegetation
Management concerns:
- Very severe erosion hazard
- Equipment limitation
- Reclamation expense
- Maintaining fertility

Management measures:
- With proper reclamation, grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
- Hardy perennial plants, such as tall fescue and sericea lespedeza, can be established with adequate seedbed preparation and applying lime, fertilizer, and mulch

Woodland

Potential productivity: Smithdale and Feliciana—high.
- Table 7 provides specific information relating to potential productivity

Native trees: Woodland management on these soils is impractical without major reclamation. Much of the acreage has naturally reforested with a sparse growth of mixed hardwoods. Some areas have been smoothed, graded, and planted to loblolly pine. The trees on such areas are cut for pulpwood when the stand is thinned.
Preferred species for planting: Loblolly pine, shortleaf pine, southern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition

Management measures:
- Planting can be done by hand or direct seeding
- Less costly reclamation alternatives include planting pine trees on the existing irregular slopes

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited
Limitations:
• The slope affects most sanitary facilities and building site developments
Corrective measures:
• This limitation is difficult to overcome in most areas

Interpretive Group

Land capability classification: VIIe

KrA—Kurk silt loam, 0 to 2 percent slopes

Setting

Major landform: Stream terraces
Landform position: Nearly level to slightly concave, depressional areas
Shape of areas: Nearly oval
Size of areas: 3 to 50 acres
Major uses: Cropland

Composition

Kurk and similar soils: 70 to 75 percent
Contrasting components of minor extent: 25 to 30 percent

Minor Components

Contrasting:
• Center and Routon soils in similar positions

Typical Profile

Surface layer:
0 to 8 inches—brown silt loam

Transitional layer:
8 to 16 inches—brown, mottled silt loam

Subsoil:
16 to 38 inches—light brownish gray and grayish brown, mottled silty clay loam
38 to 65 inches—yellowish brown, mottled silt loam
65 to 80 inches—strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Somewhat poorly drained
Organic matter content: Moderate
Permeability: Moderate in the upper part of the solum and moderately slow in the lower part of the solum
Available water capacity: High
Depth of root zone: Deep in summer, but restricted by the water table in winter and spring
Surface runoff: Slow
Depth to water table: 1 foot to 2 feet during winter and early spring
Frequency of flooding: None (a few of the lowest lying areas may experience rare flooding)

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo in areas that have been adequately drained
Management concerns:
• Wetness
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Surface drains can be used to remove excess water from the soil; tile drainage is not as effective because of the silty clay loam texture in the subsoil
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Suited to pasture and hay production, but limited acreage is devoted to such usage
Management concerns:
• Maintaining fertility
• The seasonal high water table makes the soil too soft for grazing for extended periods during winter and early spring
Management measures:
• Grasses and legumes that can withstand seasonal wetness are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Green ash, sweetgum, shagbark hickory, southern red oak, and red maple
Preferred species for planting: Green ash, cherrybark oak, and yellow-poplar
Management concerns:
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good; wetland wildlife habitat potential—fair
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses
Limitations:
• Wetness affects most sanitary facilities and building site developments
• Wetness and slow permeability of the subsoil are severe limitations for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• An alternative septic system, enlarging the absorption field, and proper installation procedures can overcome the limitation for sanitary facilities in some areas
• Strengthening or replacing the base material can overcome the limitation for roads and streets

Interpretive Group

Land capability classification: IIw

LoB2—Loring silt loam, 2 to 6 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Gently sloping, narrow ridgetops
Shape of areas: Nearly oval
Size of areas: 5 to 500 acres
Major uses: Cropland

Composition

Loring and similar soils: 90 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
• Feliciana soils in similar positions
• Small areas of Calloway soils near the head of drainageways
• Small areas of Collins soils occupying narrow drainageways
• Areas that are severely eroded
Similar:
• Grenada soils in similar positions

Typical Profile

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

Transitional layer:
4 to 9 inches—dark yellowish brown silt loam

Subsoil:
9 to 22 inches—strong brown silt loam
22 to 35 inches—a fragipan of strong brown, mottled silty clay loam
35 to 49 inches—a fragipan of strong brown, mottled silt loam
49 to 66 inches—strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Low
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Moderate
Depth of root zone: Moderately deep, limited by the fragipan
Surface runoff: Moderate
Depth to water table: 2 to 3 feet during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo
Management concerns:
• Erodibility
• Seasonal high water table
• Fragipan
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Seasonal high water table
• Fragipan
• Maintaining fertility
Management measures:
• Grasses and legumes that are adapted to moderately deep rooting depths and can withstand limited wetness are best suited

• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, yellow-poplar, and northern red oak
Management concerns:
• Plant competition
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to most urban uses
Limitations:
• Wetness affects most sanitary facilities and building site developments
• Moderately slow permeability of the fragipan is a limitation for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IIe

LoC2—Loring silt loam, 6 to 12 percent slopes, eroded

Setting

Major landform: Uplands
Landform position: Sloping, narrow ridgetops and upper side slopes
Shape of areas: Nearly oval
Size of areas: 5 to 50 acres
Major uses: Cropland

Composition

Loring and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
• Feliciana, Providence, and Purchase soils in similar positions
• Small areas of Calloway soils in slightly concave positions near the head of drainageways
• Areas that are severely eroded

Typical Profile

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

Subsoil:
4 to 21 inches—strong brown silt loam
21 to 35 inches—a fragipan of strong brown, mottled silty clay loam
35 to 49 inches—a fragipan of strong brown, mottled silt loam
49 to 66 inches—strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained
Organic matter content: Low
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Moderate
Depth of root zone: Moderately deep, limited by the fragipan
Surface runoff: Moderate to moderately rapid
Depth to water table: 2 to 3 feet during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo if a resource management system is implemented
Management concerns:
• Erodibility
• Seasonal high water table
• Fragipan
• Susceptibility to compaction
• Maintaining tilth and fertility

• Planting or harvesting is sometimes delayed by the wetness
• Crop production is limited during dry years
Management measures:
• Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Seasonal high water table
• Fragipan
• Maintaining fertility
Management measures:
• Grasses and legumes that are adapted to moderately deep rooting depths and can withstand limited wetness are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, yellow-poplar, and northern red oak
Management concerns:
• Erosion hazard
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
• Wetness and the slope affect most sanitary facilities and building site developments
• Moderately slow permeability of the fragipan is a limitation for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IIIe

NaA—Natalbany silt loam, 0 to 2 percent slopes

Setting

Major landform: Stream terraces
Landform position: Nearly level to slightly concave, depressional areas
Shape of areas: Nearly oval
Size of areas: 5 to 50 acres
Major uses: Woodland

Composition

Natalbany and similar soils: 95 percent
Contrasting components of minor extent: about 5 percent

Minor Components

Contrasting:
• Small areas of Routon soils in similar positions

Typical Profile

Surface layer:
0 to 3 inches—grayish brown, mottled silt loam

Subsoil:
3 to 19 inches—gray, mottled silty clay loam
19 to 25 inches—gray, mottled silty clay
25 to 37 inches—gray, mottled clay

Substratum:
37 to 65 inches—olive brown, mottled clay

Soil Properties and Qualities

Depth: Very deep
Drainage class: Poorly drained
Organic matter content: Low
Permeability: Very slow
Available water capacity: Moderate

Depth of root zone: Deep in summer, but restricted by the water table in winter and spring
Surface runoff: Slow
Depth to water table: From the surface to 1 foot during winter and early spring
Frequency of flooding: None (a few of the lowest lying areas may experience rare flooding)

Use and Management

Cropland

Suitability: Suited to corn and soybeans in areas that have been adequately drained; poorly suited in areas that have not been drained; not suited to tobacco and small grains because of excessive wetness
Management concerns:
- Wetness
- Susceptibility to compaction
- High content of clay in the subsoil
- Maintaining tilth and fertility

Management measures:
- Conservation tillage and the use of lime and fertilizer help to keep the soil in good tilth and fertility
- Late plantings are common
- Maintaining existing drainage systems

Pasture and Forage

Suitability: Suited to pasture and hay production in areas that have been adequately drained
Management concerns:
- High content of clay within the subsoil
- Controlling weeds
- Maintaining fertility
- The seasonal high water table makes the soil too soft for grazing for extended periods during winter and early spring

Management measures:
- Grasses and legumes that can withstand seasonal wetness are best suited
- Tall fescue, reed canary grass, big bluestem, and Ladino clover are tolerant of wet soils and can be grown
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Green ash, sweetgum, pin oak, cherrybark oak, shagbark hickory, and red maple
Preferred species for planting: Green ash, baldcypress, eastern cottonwood, and cherrybark oak
Management concerns:
- Seedling mortality
- Plant competition
- Equipment limitation due to seasonal wetness

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—fair; wetland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- Wetness affects most sanitary facilities and building site developments
- Wetness and very slow permeability of the subsoil are severe limitations for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- These limitations are difficult to overcome

Interpretive Group

Land capability classification: IIIw

Pd—Pits-Dumps-Udorthents complex

Setting

Major landform: Uplands
Landform position: Moderately steep to steep side slopes scattered throughout the county. The three components occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Nearly oval
Size of areas: 5 to 300 acres
Major uses: Commercial development of clay, gravel, and sand

This map unit consists of areas that have been mined for clay, gravel, and/or sand. Some areas have been mined for high-grade clay used in the manufacture of fine china, porcelain, sanitary hardware, and tile. In other places, the soil material has been removed, and the

underlying gravel and sand are used for general construction and building purposes, such as subgrade for highways, parking lots, and foundations.

Pits are open excavations from which soil and the underlying material have been removed, exposing stratified gravelly Continental deposits and/or loamy Coastal Plain sediments. Typically, the pits have vertical walls that are 10 to 40 feet high.

Dumps are areas of smooth or uneven accumulations or piles of gravel, sand, or clay refuse. Most of these areas are incapable of supporting vegetative growth without major reclamation.

Udorthents consist of loamy material containing a mixture of topsoil, subsoil, and the substratum where the three materials have been smoothed and graded. Many areas have been "reclaimed" with about 1/2 to 1 foot of topsoil placed over the substratum material and seeded to a permanent vegetative cover.

In some places, each miscellaneous area is large enough to map separately, but because of present and predicted use, they are mapped as one unit. Most delineations contain each of these miscellaneous areas, but a few contain two or only one of these areas.

Composition

Pits: 60 percent
Dumps: 20 percent
Udorthents: 10 percent
Contrasting components of minor extent: about 10 percent

Minor Components

Contrasting:
- Very small areas of Brandon, Feliciana, Loring, Saffell, and Smithdale soils
- Areas with water at the bottom of some pits

Soil Properties and Qualities

Udorthents

Depth: Very deep
Drainage class: Well drained to excessively drained
Natural fertility: Very low
Organic matter content: Very low
Permeability: Highly variable because of the nature of the materials
Available water capacity: Low
Depth of root zone: Shallow to moderately deep
Surface runoff: Rapid
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

These areas are barren or support a sparse growth of grasses, forbs, and small trees. A considerable portion of the Udorthents associated with the abandoned clay pit at Pryorsburg has been planted to loblolly pine trees.

Where the establishment of vegetation on these materials is desired, the main soil limitations are acidity, droughtiness, and very low fertility levels. Some places contain a large volume of gravel, sand, and clay refuse, along with steep slopes. On most areas, these materials can be topsoiled with a soil material better suited to the establishment and maintenance of a vegetative cover. The steep slopes can be smoothed.

Once these problems have been mitigated, lime and fertilizer can be added to improve the chemical deficiencies. These practices in conjunction with mulching and the selection of species suited to growing under such adverse conditions can aid in establishing a vegetative cover. Such reclamation fosters the development of an excellent wildlife habitat.

Interpretive Group

Land capability classification: VIIIe

PeC3—Providence-Purchase complex, 6 to 12 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Sloping shoulders and back slopes. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Nearly oval
Size of areas: 5 to 250 acres
Major uses: Cropland and pastureland

Composition

Providence and similar soils: 65 percent
Purchase and similar soils: 20 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
- Small areas of Feliciana and Loring soils on ridgetops and upper side slopes
- Small areas of Collins and Iuka soils occupying narrow drainageways

Typical Profile

Providence

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

Subsoil:
3 to 15 inches—brown and strong brown, mottled silt loam

15 to 22 inches—a fragipan of brown, mottled silt loam
22 to 34 inches—a fragipan of yellowish red, mottled loam
34 to 65 inches—reddish brown sandy clay loam

Purchase

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

Subsoil:
4 to 18 inches—brown, mottled silt loam
18 to 54 inches—a fragipan of strong brown, mottled silt loam
54 to 72 inches—brown and strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Providence—moderately well drained; Purchase—moderately well drained to well drained
Organic matter content: Low
Permeability: Providence—moderate above the fragipan and moderately slow in the fragipan; Purchase—slow
Available water capacity: Low
Depth of root zone: Providence—moderately deep, limited by the fragipan; Purchase—shallow, limited by the fragipan
Surface runoff: Moderate
Depth to water table: Providence—perched at 1 1/4 to 2 1/2 feet below the surface during winter and early spring; Purchase—4 to 7 feet, a perched water table may occur at 1 foot to 1 1/2 feet for brief duration during high rainfall periods in winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo if a resource management system is implemented; however, not suited to tobacco production due to the shallow to moderately deep rooting depth imposed by the fragipan
Management concerns:
- Droughtiness
- Erodibility
- Fragipan
- Maintaining tilth and fertility
- Crop production is severely limited during dry years

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against accelerated erosion

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- The shallow to moderately deep depth to the fragipan
- Maintaining fertility

Management measures:
- Grasses and legumes that are adapted to shallow to moderately deep rooting depths are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Providence—high; Purchase—moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Loblolly pine, yellow-poplar, and southern red oak
Management concerns:
- Equipment limitation due to seasonal wetness
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
- Seasonal wetness and the slope affect most sanitary facilities and building site developments
- Moderately slow permeability and shallow depth of the fragipan are severe limitations for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IVe

PfC2—Providence-Loring-Feliciana complex, 2 to 12 percent slopes, eroded

Setting

Major landform: Uplands south of Kentucky Highway 94
Landform position: Gently sloping to sloping, narrow ridgetops and upper shoulders of side slopes. Providence soils occur on the steeper, convex portions of the ridgetop and upper side slope; Loring soils occur on the broader, gently sloping crests of ridgetops; Feliciana soils occur along narrow, convex ridges. The three soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Narrow and nearly oval
Size of areas: 5 to 75 acres
Major uses: Meadow

Composition

Providence and similar soils: 35 percent
Loring and similar soils: 30 percent
Feliciana and similar soils: 25 percent
Contrasting components of minor extent: about 10 percent

Minor Components

Contrasting:
- Severely eroded areas of Providence soils
- A well drained soil with 2 to 3 feet of loess overlying loamy Coastal Plain sediments

Typical Profile

Providence

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

Subsoil:
4 to 15 inches—strong brown silt loam
15 to 32 inches—a fragipan of strong brown, mottled silt loam
32 to 48 inches—a fragipan of strong brown, mottled loam
48 to 70 inches—yellowish red sandy clay loam

Loring

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

Transitional layer:
5 to 10 inches—dark yellowish brown silt loam

Subsoil:
10 to 21 inches—strong brown silt loam
21 to 35 inches—a fragipan of strong brown, mottled silty clay loam
35 to 49 inches—a fragipan of strong brown, mottled silt loam
49 to 62 inches—strong brown, mottled silt loam

Feliciana

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

Subsoil:
6 to 31 inches—dark brown and strong brown silty clay loam
31 to 53 inches—strong brown silt loam

Substratum:
53 to 68 inches—dark brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Providence and Loring—moderately well drained; Feliciana—well drained
Organic matter content: Providence and Loring—low; Feliciana—moderate
Permeability: Providence and Loring—moderate above the fragipan and moderately slow in the fragipan; Feliciana—moderate
Available water capacity: Providence—low; Loring—moderate; Feliciana—high
Depth of root zone: Providence and Loring—moderately deep, limited by the fragipan; Feliciana—very deep
Surface runoff: Moderate
Depth to water table: Providence—perched at 1¼ to 2½ feet below the surface during winter and early spring; Loring—2 to 3 feet during winter and early spring; Feliciana—>6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, tobacco, and milo if a resource management system is implemented
Management concerns:
- Erodibility
- Susceptibility to compaction
- Maintaining tilth and fertility
- Providence and Loring—fragipan

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime,

and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
- Erodibility
- Susceptibility to compaction
- Maintaining tilth and fertility
- Providence and Loring—fragipan

Management measures:
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, southern red oak, and yellow-poplar
Management concerns:
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- Providence and Loring—the seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to most urban uses; Providence and Loring—poorly suited to conventional septic tank absorption fields; Feliciana—well suited to conventional septic tank absorption fields
Limitations:
- The slope affects sanitary facilities and building site developments
- Low strength is a limitation for local roads and streets
- Providence and Loring—moderately slow permeability of the fragipan is a limitation for conventional septic tank absorption fields

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in most areas

Interpretive Group

Land capability classification: IIIe

PmD3—Providence-Smithdale complex, 12 to 20 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Moderately steep side slopes that contain thin loess overlying loamy Coastal Plain sediments. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Irregular
Size of areas: 10 to 75 acres
Major uses: Woodland and pastureland

Composition

Providence and similar soils: 50 percent
Smithdale and similar soils: 40 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
- Small areas of Feliciana, Loring, and Purchase soils scattered throughout the map unit
- A soil similar to Smithdale with 2 to 3 feet of loess overlying loamy sediments
- Small areas with moderately deep to very deep gullies

Typical Profile

Providence

Surface layer:
0 to 2 inches—dark grayish brown silt loam

Subsurface layer:
2 to 8 inches—yellowish brown silt loam

Subsoil:
8 to 22 inches—strong brown silt loam
22 to 42 inches—a fragipan of brown, mottled silt loam
42 to 51 inches—a fragipan of brown, mottled loam
51 to 75 inches—yellowish red sandy loam

Smithdale

Surface layer:
0 to 2 inches—dark grayish brown silt loam

Subsurface layer:
2 to 10 inches—light yellowish brown silt loam

Subsoil:
10 to 18 inches—brown silt loam
18 to 24 inches—strong brown loam
24 to 60 inches—yellowish red and reddish brown sandy clay loam
60 to 80 inches—yellowish red and reddish brown sandy loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Providence—moderately well drained; Smithdale—well drained
Organic matter content: Low
Permeability: Providence—moderate above the fragipan and moderately slow in the fragipan; Smithdale—moderate
Available water capacity: Providence—moderate; Smithdale—high
Depth of root zone: Providence—moderately deep; Smithdale—very deep
Surface runoff: Moderate
Depth to water table: Providence—perched at a depth of 1½ to 3 feet during winter and early spring; Smithdale—>6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Very severe erosion hazard
- Maintaining fertility
- Providence—fragipan

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, yellow-poplar, southern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition

Management measures:
- Skid trails and roads are subject to rilling and gullying. It is desirable for the area of soil disturbance to be kept to 10 percent or less. Cable skidding results in less soil disturbance and is generally preferred on these areas. Logs can be yarded to more gently sloping areas located on ridgetops.
- A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
- Brushy thickets can be established by clearing small areas within large tracts of mature woodland
- Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- The slope affects most sanitary facilities and building site developments
- Low strength is a limitation for local roads and streets
- Providence—moderately slow permeability of the fragipan is a severe limitation for conventional septic tank absorption fields

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: VIe

PrD3—Purchase silt loam, 12 to 20 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Moderately steep side slopes
Shape of areas: Irregular
Size of areas: 10 to more than 100 acres
Major uses: Pasture and hayland

Composition

Purchase and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
- Brandon, Feliciana, and Providence soils in similar positions
- Small areas that are not severely eroded

Typical Profile

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

Subsoil:
5 to 19 inches—a fragipan of strong brown, mottled silt loam
19 to 68 inches—dark brown silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Moderately well drained to well drained
Organic matter content: Low
Permeability: Slow
Available water capacity: Low
Depth of root zone: Shallow, limited by the fragipan
Surface runoff: Moderate to moderately rapid
Depth to water table: 4 to 7 feet, a perched water table may occur at 1/2 to 1 foot depth for brief duration following periods of excessively high rainfall in winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Poorly suited
Management concerns:
- Severe erosion hazard
- Very shallow depth to the fragipan
- Droughtiness
- Susceptibility to compaction
- Maintaining tilth and fertility
- Crop production is severely limited during dry years because of low available water capacity

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Severe erosion hazard
- Very shallow depth to the fragipan
- Maintaining fertility

Management measures:
- Grasses and legumes that are adapted to shallow rooting depths and capable of providing satisfactory ground cover should be selected to prevent further erosion losses
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Shortleaf pine, yellow-poplar, southern red oak, and white oak
Management concerns:
- Seedling mortality
- Plant competition
- Erosion hazard
- Equipment limitation

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses

Limitations:
• The slope affects most sanitary facilities and building site developments
• Slow permeability and very shallow depth of the fragipan are severe limitations for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: VIe

PsC3—Purchase-Brandon complex, 6 to 12 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Side slopes and shoulders. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Linear
Size of areas: 5 to 75 acres
Major uses: Meadow

Composition

Purchase and similar soils: 60 percent
Brandon and similar soils: 20 percent
Contrasting components of minor extent: 20 percent

Minor Components

Contrasting:
• A soil similar to Purchase with 5 to 30 percent gravel below 3½ feet
• Feliciana and Loring soils on narrow ridgetops scattered throughout the map unit
• Small areas of Collins and Falaya soils occupying narrow drainageways
• Small areas with moderately deep gullies

Typical Profile

Purchase

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

Subsoil:
4 to 12—yellowish brown silt loam
12 to 30 inches—a fragipan of strong brown, mottled silt loam
30 to 62 inches—dark brown, mottled silt loam

Substratum:
62 to 75 inches—dark brown loam

Brandon

Surface layer:
0 to 2 inches—dark yellowish brown silt loam

Subsoil:
2 to 7 inches—strong brown silt loam
7 to 32 inches—strong brown silty clay loam

Substratum:
32 to 65 inches—brown extremely gravelly loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Purchase—moderately well drained to well drained; Brandon—well drained
Organic matter content: Low
Permeability: Purchase—slow; Brandon—moderate in the solum and moderately rapid in the extremely gravelly substratum
Available water capacity: Purchase—low; Brandon—high
Depth of root zone: Purchase—shallow, limited by the fragipan; Brandon—deep
Surface runoff: Purchase—moderate to moderately rapid; Brandon—moderate
Depth to water table: Purchase—4 to 7 feet, a perched water table may occur at 1 foot to 1½ feet for very brief periods during excessively high rainfall in winter and early spring; Brandon—>6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo if a resource management system is implemented; however, not suited to tobacco production due to the shallow rooting depth imposed by the fragipan
Management concerns:
• Droughtiness
• Erodibility
• Maintaining tilth and fertility
• Crop production is severely limited during dry years
• Purchase—shallow depth to the fragipan
Management measures:
• Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
• Maintaining fertility
• Purchase—shallow depth to the fragipan
Management measures:
• Grasses and legumes that are adapted to shallow to moderately deep rooting depths are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
• Table 7 provides specific information relating to potential productivity
Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: White oak, shortleaf pine, loblolly pine, and southern red oak
Management concerns:
• Seedling mortality
• Plant competition
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
• The slope affects most sanitary facilities and building site developments
• Purchase—slow permeability and shallow depth of the fragipan are limitations for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IVe

PuB3—Purchase-Loring complex, 4 to 6 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Gently sloping, convex shoulders and side slopes. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Nearly oval
Size of areas: 5 to 50 acres
Major uses: Cropland

Composition

Purchase and similar soils: 60 percent
Loring and similar soils: 35 percent
Contrasting components of minor extent: about 5 percent

Minor Components

Contrasting:
• Small areas of Calloway soils in slightly concave positions
• Small areas of Collins and Falaya soils occupying narrow drainageways
• Areas that are not severely eroded
Similar:
• Grenada soils in similar positions

Typical Profile

Purchase

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

Subsurface layer:
5 to 8 inches—brown, mottled silt loam

Subsoil:
8 to 46 inches—a fragipan of dark yellowish brown and brown, mottled silt loam
46 to 72 inches—strong brown silt loam

Loring

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

Subsoil:
5 to 21 inches—yellowish brown and strong brown, mottled silt loam
21 to 48 inches—a fragipan of yellowish brown and brown, mottled silt loam
48 to 65 inches—strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Purchase—moderately well drained to well drained; Loring—moderately well drained
Organic matter content: Low
Permeability: Purchase—slow; Loring—moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Low
Depth of root zone: Purchase—shallow, limited by the fragipan; Loring—moderately deep, limited by the fragipan
Surface runoff: Moderate
Depth to water table: Purchase—4 to 7 feet, a perched water table may occur at 1 foot to 1½ feet for very brief periods during excessively high rainfall in winter and early spring; Loring—perched for very brief periods at 1½ to 2 feet below the surface during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo if a resource management system is implemented; poorly suited to tobacco due to the shallow depth to the fragipan
Management concerns:
- Erodibility
- Fragipan
- Susceptibility to compaction
- Maintaining tilth and fertility
- Crop production is severely limited during dry years due to the low available water capacity

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Shallow depth to the fragipan
- Maintaining fertility

Management measures:
- Grasses and legumes that are adapted to shallow to moderately deep rooting depths are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, yellow-poplar, and southern red oak
Management concerns:
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
- Slow permeability and shallow depth of the fragipan are severe limitations for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IIIe

PuC3—Purchase-Loring complex, 6 to 12 percent slopes, severely eroded

Setting

Major landform: Uplands
Landform position: Shoulders and side slopes. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Nearly oval
Size of areas: 5 to 500 acres
Major uses: Cropland and pastureland

Composition

Purchase and similar soils: 70 percent
Loring and similar soils: 20 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
- Small areas of Calloway soils in slightly concave positions at the head of small drainageways
- Small areas of Collins and Falaya soils occupying narrow drainageways
- Areas that are not severely eroded

Typical Profile

Purchase

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

Subsoil:
7 to 51 inches—a fragipan of strong brown, mottled silt loam
51 to 72 inches—brown, mottled silt loam

Loring

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

Subsoil:
4 to 21 inches—yellowish brown and strong brown, mottled silt loam
21 to 48 inches—a fragipan of yellowish brown and brown, mottled silt loam
48 to 72 inches—strong brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Purchase—moderately well drained to well drained; Loring—moderately well drained
Organic matter content: Low
Permeability: Purchase—slow; Loring—moderate above the fragipan and moderately slow in the fragipan
Available water capacity: Low
Depth of root zone: Shallow, limited by the fragipan; Loring—moderately deep, limited by the fragipan
Surface runoff: Moderate
Depth to water table: Purchase—4 to 7 feet, a perched water table may occur at 1 foot to 1½ feet for very brief periods during excessively high rainfall in winter and early spring; Loring—perched for very brief periods at 1½ to 2 feet below the surface during winter and early spring
Frequency of flooding: None

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo if a resource management system is implemented; however, not suited to tobacco production due to the shallow rooting depth imposed by the fragipan
Management concerns:
- Droughtiness
- Erodibility
- Fragipan
- Maintaining tilth and fertility
- Crop production is severely limited during dry years

Management measures:
- Conservation tillage, establishing and maintaining grassed waterways within areas of concentrated water flow patterns, contour farming, and managing crop residue can be used to reduce erosion
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility, as well as afford protection against erosion losses

Pasture and Forage

Suitability: Suited to pasture and hay production
Management concerns:
- Shallow depth to the fragipan
- Maintaining fertility

Management measures:
- Grasses and legumes that are adapted to shallow to moderately deep rooting depths are best suited
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, sugar maple, and red maple
Preferred species for planting: Cherrybark oak, loblolly pine, yellow-poplar, and southern red oak
Management concerns:
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
- Seasonal wetness and the slope affect most sanitary facilities and building site developments
- Moderately slow permeability and shallow depth of the fragipan are limitations for conventional septic tank absorption fields
- Low strength is a limitation for local roads and streets

Corrective measures:
- Proper design, adequate site preparation, and proper installation procedures can minimize or overcome the limitations in some areas

Interpretive Group

Land capability classification: IVe

Ro—Rosebloom silt loam, frequently flooded

Setting

Major landform: Flood plains
Landform position: Depressional areas along major creeks and rivers
Slopes: 0 to 2 percent
Shape of areas: Oval
Size of areas: 5 to 200 acres
Major uses: Woodland

Composition

Rosebloom and similar soils: 85 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
- Small areas of Falaya and Waverly soils scattered throughout the map unit
- Soils with a thin sandy loam surface layer
- Small ponded areas

Similar:
- Soils that are less acid throughout

Typical Profile

Surface layer:
0 to 5 inches—brown, mottled silt loam

Subsoil:
5 to 26 inches—light brownish gray, mottled silt loam
26 to 38 inches—mottled light brownish gray and grayish brown silty clay loam

Substratum:
38 to 65 inches—gray, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Poorly drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Deep
Surface runoff: Slow
Depth to water table: Within 1 foot of the surface during winter and spring
Frequency of flooding: Frequent (on average, about once every 2 years) and of brief duration

Use and Management

Cropland

Suitability: Suited to corn and soybeans in areas that have been adequately drained; generally not suited in areas that have not been drained; generally not suited to tobacco and small grains because of excessive wetness and the hazard of flooding
Management concerns:
- Wetness
- Susceptibility to compaction
- Maintaining tilth and fertility

Management measures:
- Conservation tillage and the use of lime and fertilizer help to keep the soil in good tilth and fertility
- Late plantings are common
- Maintaining existing drainage system

Pasture and Forage

Suitability: Suited to pasture and hay production, and a few areas are being managed for such usage
Management concerns:
- Excessive wetness
- Hazard of flooding
- Fertility
- The seasonal high water table makes the soil too soft for grazing for extended periods during winter and early spring

Management measures:
- Plants that are tolerant of seasonal wetness are best suited
- Tall fescue, reed canary grass, big bluestem, and Ladino clover tolerate wet conditions and can be grown
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions

• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Bottomland oaks, green ash, sweetgum, red maple, and baldcypress
Preferred species for planting: Cherrybark oak, green ash, pin oak, and eastern cottonwood
Management concerns:
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Wetland wildlife habitat potential—good; woodland wildlife habitat—fair
• Wildlife habitat can be maintained and improved by providing food, cover, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
• Wetness and the hazard of flooding severely affect most sanitary facilities and building site developments
• Low strength is a limitation for local roads and streets
Corrective measures:
• These limitations are difficult to overcome

Interpretive Group

Land capability classification: IIIw

Rp—Rosebloom silt loam, ponded

Setting

Major landform: Flood plain
Landform position: Depressional areas along major creeks and rivers
Slopes: 0 to 1 percent
Shape of areas: Oval
Size of areas: 5 to 100 acres
Major uses: Woodland and wetland wildlife habitat

Composition

Rosebloom and similar soils: 90 percent
Contrasting components of minor extent: 10 percent

Minor Components

Contrasting:
• Small areas of Falaya soils scattered throughout the map unit
• Soils with a thin sandy loam surface layer
Similar:
• Soils that are less acid
• Soils similar to Rosebloom at a slightly higher elevation that are ponded for only short periods throughout the year

Typical Profile

Surface layer:
0 to 3 inches—grayish brown, mottled silt loam

Subsoil:
3 to 7 inches—light brownish gray, mottled silt loam
7 to 18 inches—gray, mottled silt loam

Substratum:
18 to 38 inches—gray, mottled silty clay loam
38 to 65 inches—gray, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Poorly drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Shallow
Surface runoff: Slow
Depth to water table: 2 feet above the soil surface to within 1/2 foot of the surface throughout most of the year
Duration of ponding: November through July most years

Use and Management

Cropland

Suitability: Not suited
Management concerns:
• Excessive wetness throughout most of the year

Pasture and Forage

Suitability: Not suited to pasture or hayland
Management concerns:
• Excessive wetness throughout most of the year

Woodland

Potential productivity: Moderate
• Table 7 provides specific information relating to potential productivity

Native trees: Suited to water-tolerant trees
Preferred species for planting: Baldcypress, water tupelo, and black willow
Management concerns:
• Timber management is limited by the ponding; bottomland hardwoods grew in some areas during the last 10 to 15 years, but they have been killed by the ponded water
Management measures:
• None feasible

Wildlife Habitat

• Well suited to wetland wildlife habitat; wetland wildlife habitat potential—good
• Wetland wildlife habitat can be maintained and improved by providing food, cover, and places to nest or den

Urban

Suitability: Not suited to urban uses and sanitary facilities
Limitations:
• Excessive wetness and the hazard of flooding and ponding severely affect sanitary facilities and building site developments
• Low strength is a limitation for local roads and streets
Corrective measures:
• None feasible

Interpretive Group

Land capability classification: Vw

RtA—Routon silt loam, 0 to 2 percent slopes

Setting

Major landform: Stream terraces
Landform position: Slightly depressional areas
Shape of areas: Nearly oval
Size of areas: 3 to 50 acres
Major uses: Cropland

Composition

Routon and similar soils: 80 percent
Contrasting components of minor extent: 20 percent

Minor Components

Contrasting:
• Small areas of Center and Kurk soils in similar positions
• Soils similar to Routon that contain a fragipan

Typical Profile

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

Subsurface layer:
4 to 17 inches—light brownish gray, mottled silt loam

Subsoil:
17 to 42 inches—light brownish gray and gray, mottled silt loam
42 to 52 inches—gray, mottled silty clay loam
52 to 65 inches—fragic properties consisting of mottled strong brown and gray silt loam

Substratum:
65 to 74 inches—yellowish brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Poorly drained
Organic matter content: Low
Permeability: Moderate in the upper part of the profile and slow in the lower part of the profile
Available water capacity: High
Depth of root zone: Deep in summer, but restricted by the water table in winter and spring
Surface runoff: Slow
Depth to water table: From the surface to 1 foot during winter and early spring
Frequency of flooding: None (a few of the lowest lying areas may experience rare flooding)

Use and Management

Cropland

Suitability: Suited to corn, soybeans, wheat, and milo in areas that have been adequately drained; poorly suited in areas that have not been drained; generally not suited to tobacco and small grains because of excessive wetness
Management concerns:
• Seasonal wetness
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility
• Maintaining existing drainage system

Pasture and Forage

Suitability: Suited to pasture and hay production, but limited acreage is devoted to such usage
Management concerns:
• Maintaining fertility
• The seasonal high water table makes the soil too soft for grazing for extended periods during winter and early spring
Management measures:
• Grasses and legumes that can withstand seasonal wetness are best suited
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions

• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Green ash, sweetgum, shagbark hickory, and red maple
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, and American sycamore
Management concerns:
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Woodland wildlife habitat and openland wildlife habitat potential—fair; wetland wildlife habitat potential—good
• Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses
Limitations:
• Wetness affects most sanitary facilities and building site developments
• Wetness and slow permeability of the subsoil are severe limitations for conventional septic tank absorption fields
• Low strength is a limitation for local roads and streets
Corrective measures:
• An alternative septic system, enlarging the absorption field, and proper installation procedures can overcome the limitation for sanitary facilities in some areas
• Strengthening or replacing the base material can overcome the limitation for roads and streets

Interpretive Group

Land capability classification: IIIw

SaC—Saffell gravelly sandy loam, 2 to 10 percent slopes

Setting

Major landform: Narrow, elongated stream terraces of the West Fork of Clarks River
Landform position: Gently sloping to sloping ridges and convex side slopes at about 350 feet in elevation
Shape of areas: Narrow, elongated and oval
Size of areas: 10 to 75 acres
Major uses: Meadow and wildlife habitat

Composition

Saffell and similar soils: 70 percent
Contrasting components of minor extent: about 30 percent

Minor Components

Contrasting:
• Soils with less clay in the subsoil and a higher sand and gravel content throughout
• Soils with a thicker argillic horizon
• Soils that are deeper to an extremely gravelly substratum
• Small areas of soils that have a silt loam texture to 1½ feet
• Narrow, convex side slopes with slopes ranging from 12 to 15 percent

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown gravelly sandy loam

Subsoil:
7 to 14 inches—strong brown gravelly loam

Substratum:
14 to 65 inches—extremely gravelly loamy sand

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Low
Permeability: Moderate
Available water capacity: Low
Depth of root zone: Moderately deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Poorly suited
Management concerns:
• Droughtiness
• Equipment limitation due to the gravelly surface texture
Management measures:
• None feasible

Pasture and Forage

Suitability: Poorly suited to pasture and hay production

Management concerns:
- Droughtiness
- Equipment limitation
- Maintaining an adequate stand of grasses and legumes

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, American beech, sugar maple, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, southern red oak, and white oak
Management concerns:
- Seedling mortality
- Plant competition

Management measures:
- A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—fair
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Suited to some urban uses
Limitations:
- Areas having slope of more than 8 percent and excessive gravel content in the substratum are limitations affecting building site developments
- Moderately rapid permeability of the substratum is a limitation for conventional septic tank absorption fields

Corrective measures:
- Strengthen building foundations with well compacted base material
- Measures that improve the filtering capacity of the septic effluent are needed

Interpretive Group

Land capability classification: IIIs

SmE2—Smithdale sandy loam, 20 to 45 percent slopes, eroded

Setting

Major landform: Dissected Coastal Plain uplands south of Kentucky Highway 94
Landform position: Steep to very steep side slopes with relief generally ranging from 75 to 100 feet
Shape of areas: Irregular
Size of areas: 10 to more than 500 acres
Major uses: Woodland

Composition

Smithdale and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
- Saffell soils indiscriminately scattered throughout the upper 1/3 of the side slope
- Feliciana soils on narrow ridgetops throughout the map unit
- Soils containing a loess mantle averaging about 14 inches thick on the more gentle portions of the landscape
- Small areas containing slopes ranging to 60 percent
- Small areas with moderately deep to very deep gullies
- Soils containing a clayey substratum below about 42 inches

Similar:
- Soils similar to Smithdale but with less clay throughout

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown and brown sandy loam

Subsurface layer:
4 to 12 inches—light yellowish brown sandy loam

Subsoil:
12 to 56 inches—red sandy clay loam
56 to 63 inches—yellowish red sandy loam

Substratum:
63 to 72 inches—strong brown loamy sand

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Low
Permeability: Moderate
Available water capacity: Moderate
Depth of root zone: Very deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Suited to pasture; poorly suited to hay production
Management concerns:
- Very severe erosion hazard
- Droughtiness
- Maintaining fertility

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: High
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, yellow-poplar, sugar maple, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, southern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition

Management measures:
- Skid trails and roads are subject to rilling and gullying. To help reduce erosion, a grade of less than 10 percent can be used for roads and trails. In addition, the area of soil disturbance can be kept to 10 percent or less. Logs can be yarded to roads and trails located on narrow ridgetops. Cable skidding is generally safer on these areas and disturbs the soil less.
- A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
- Brushy thickets can be established by clearing small areas within large tracts of mature woodland
- Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- The slope affects most sanitary facilities and building site developments

Corrective measures:
- This limitation is difficult to overcome in most areas

Interpretive Group

Land capability classification: VIe

SsE2—Smithdale-Saffell complex, 35 to 55 percent slopes, eroded

Setting

Major landform: Uplands consisting of Continental deposits and Coastal Plain sediments
Landform position: Very steep side slopes associated with the West Fork Clarks River drainage basin. Smithdale soils occur on the middle and lower parts of the side slope; Saffell soils occur on shoulders and the upper one-third of the side slope. Individual areas of each soil are large enough to map separately; however, because of the present and predicted land use, they were mapped as one unit.
Shape of areas: Linear and distinctly corrugated
Size of areas: 5 to 75 acres
Major uses: Woodland

Composition

Smithdale and similar soils: 50 percent
Saffell and similar soils: 25 percent
Contrasting components of minor extent: 25 percent

Minor Components

Contrasting:
- Soils with less clay throughout
- Feliciana and Loring soils on narrow ridgetops
- Small areas of a soil similar to Smithdale in which the upper 1 foot to 1½ feet of the solum formed in loess
- Small areas less than 1 acre in size containing a 2 to 4 inch thick ledge of ironstone or indurated ferruginous gravel below about 3 feet
- Soils with geologic clay deposits below 2½ feet

Typical Profile

Smithdale

Surface layer:
0 to 2 inches—dark grayish brown gravelly sandy loam

Subsurface layer:
2 to 11 inches—yellowish brown gravelly sandy loam

Subsoil:
11 to 23 inches—strong brown loam
23 to 36 inches—yellowish red gravelly loam
36 to 48 inches—yellowish red very gravelly sandy clay loam
48 to 65 inches—yellowish red and brownish yellow sandy loam

Saffell

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

Subsurface layer:
5 to 10 inches—yellowish brown sandy loam

Subsoil:
10 to 17 inches—strong brown gravelly sandy loam
17 to 43 inches—dark brown and strong brown very gravelly sandy loam

Substratum:
43 to 64 inches—light yellowish brown gravelly sandy loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Low
Permeability: Moderate
Available water capacity: Smithdale—moderate; Saffell—low
Depth of root zone: Smithdale—very deep; Saffell—moderately deep
Surface runoff: Moderate
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Cropland

Suitability: Not suited
Management concerns:
- Slope
- Very severe erosion hazard

Pasture and Forage

Suitability: Poorly suited to pasture; not suited to hay production
Management concerns:
- Very severe erosion hazard
- Droughtiness
- Equipment limitation
- Maintaining fertility

Management measures:
- Grasses and legumes that can provide satisfactory ground cover with minimum need for renovation should be selected to prevent further erosion losses

Woodland

Potential productivity: Smithdale—high; Saffell—moderate
- Table 7 provides specific information relating to potential productivity

Native trees: Upland oaks, hickory, American beech, and red maple
Preferred species for planting: Loblolly pine, shortleaf pine, southern red oak, and white oak
Management concerns:
- Erosion hazard
- Equipment limitation
- Seedling mortality
- Plant competition
- Saffell—windthrow hazard

Management measures:
- Skid trails and roads are subject to rilling and gullying. To help reduce erosion, a grade of less than 10 percent can be used for roads and trails. In addition, the area of soil disturbance can be kept to 10 percent or less. Logs can be yarded to roads and trails located on narrow ridgetops. Cable skidding is generally safer on these areas and disturbs the soil less.
- A new forest crop can be established by managing the existing stand and applying herbicides or cutting; planting can be done by hand or direct seeding

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den
- Brushy thickets can be established by clearing small areas within large tracts of mature woodland
- Food plots or green browse areas can be planted along logging roads and trails

Urban

Suitability: Poorly suited to most urban uses
Limitations:
- The slope affects most sanitary facilities and building site developments

Corrective measures:
- This limitation is difficult to overcome in most areas

Interpretive Group

Land capability classification: VIIe

UdC—Udorthents-Urban land complex, 5 to 25 percent slopes

Setting

Major landform: Uplands and flood plains along U.S. Highway 45 and Purchase Parkway
Landform position: Gently sloping to moderately steep ridges and side slopes and along nearly level flood plains. The two components occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Linear
Size of areas: 25 to 250 acres
Major uses: Highways

This map unit consists of cut-and-fill areas containing loamy material of mixed topsoil, subsoil, sand, and/or gravel where the natural soil was graded and smoothed in order to build highways. The natural soil has been so altered or obscured by cut-and-fill operations that soil identification is no longer feasible.

Udorthents consist of areas in which the natural soil has been cut and graded or has been filled with loamy material containing a mixture of topsoil, subsoil, sand, and/or gravel that has been smoothed and graded. Most areas containing fill material occur where the highway extends across a natural flood plain. Areas that have been cut and regraded occur primarily on upland ridges and side slopes.

Urban land is primarily land covered by highways but also includes commercial buildings, parking lots, and other urban structures. In places, the natural drainage pattern has been altered and replaced by a system of ditches and storm drains.

In some places, each miscellaneous area is large enough to map separately, but because of present and predicted use, they are mapped as one unit. Most delineations contain both miscellaneous areas, but a few contain only one of these areas.

Composition

Udorthents: 55 percent
Urban land: 35 percent
Contrasting components of minor extent: about 10 percent

Minor Components

Contrasting:
- Small areas of Brandon, Collins, Falaya, Feliciana, Grenada, Loring, Purchase, and Saffell soils
- Narrow areas containing slopes that range to 40 percent

Soil Properties and Qualities

Udorthents

Depth: Very deep; commonly, the depth of mixed "fill" material ranges from 2 to 8 feet; areas having been cut and regraded have from 10 inches to 2 feet or more of the natural soil removed
Drainage class: Well drained to excessively drained
Natural fertility: Low
Organic matter content: Low
Permeability: Highly variable because of the nature of the materials
Available water capacity: Low to moderate
Depth of root zone: Shallow to moderately deep
Surface runoff: Moderately rapid to rapid
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Except for the more steeply sloping areas, the soil conditions are generally favorable for establishing permanent vegetative cover. Less favorable conditions commonly occur as a result of an abundance of small gravel, excessive compaction during grading and smoothing operations, steep slopes, limited rooting depth, removal of the surface soil, or various combinations of these factors.

The main soil limitations are acidity, droughtiness, and low fertility levels. Species such as tall fescue, Ladino clover, and lespedeza are tolerant of such conditions and are commonly found along highways. Periodic fertilization helps maintain a lush, vegetative cover for erosion control along these areas.

Interpretive Group

Land capability classification: Not assigned to a capability subclass

UrB—Urban land-Udorthents complex, 2 to 8 percent slopes

Setting

Major landform: Primarily upland ridges, and to a less extent on flood plains
Landform position: Gently sloping to sloping summits, and less commonly, nearly level flood plains. The two components occur as areas so intricately mixed or so small that mapping them separately is not practical at the scale used.
Shape of areas: Oval
Size of areas: 5 to 40 acres
Major uses: Commercial development

This map unit consists of areas containing loamy material of mixed topsoil, subsoil, sand, and/or gravel where the natural soil was graded and smoothed in order to build urban structures. It is generally found in and around cities, towns, industrial sites, and housing developments. The natural soils, primarily those of the Grenada, Loring, and Purchase series, have been so altered or obscured by urban works and structures that soil identification is no longer feasible.

Urban land is land covered by commercial buildings, streets, parking lots, and other urban structures. In places, the natural drainage pattern has been altered and replaced by a system of ditches and storm drains.

Udorthents consist of areas in which the natural soil has been cut and graded or has been filled with loamy material containing a mixture of topsoil, subsoil, sand, and/or gravel that has been smoothed and graded. On most areas, either the depth of the mixed material is 2 to 5 feet, or about 10 inches or more of the natural soil was removed.

In some places, each miscellaneous area is large enough to map separately, but because of present and predicted use, they are mapped as one unit. Most delineations contain both miscellaneous areas, but a few contain only one of these areas.

Composition

Urban land: 65 percent
Udorthents: 20 percent
Contrasting components of minor extent: about 15 percent

Minor Components

Contrasting:
- Very small areas of Grenada, Loring, and Purchase soils on upland ridges and side slopes
- Collins and Falaya soils on flood plains

Soil Properties and Qualities

Udorthents

Depth: Very deep
Drainage class: Well drained to excessively drained
Natural fertility: Very low
Organic matter content: Very low
Permeability: Highly variable because of the nature of the materials
Available water capacity: Low to moderate
Depth of root zone: Shallow to moderately deep
Surface runoff: Rapid
Depth to water table: >6 feet
Frequency of flooding: None

Use and Management

Most areas of this complex are used for commercial urban development. There are little, if any, limitations for such usage. Because of the slopes, there is a hazard of erosion during and after construction until permanent vegetation is established.

The soil conditions are generally favorable for establishing lawns and other landscaping plants. Less favorable conditions occur as a result of an abundance of small gravel, excessive compaction during grading and smoothing operations, limited rooting depth, removal of the surface soil, or various combinations of these factors. Where the establishment of vegetation on these materials is desired, the main soil limitations are acidity, droughtiness, and very low fertility levels.

With adequate lime, fertilizer, and water, most commonly grown lawn and landscaping plants can be used. Incorporating organic matter, such as bark and mulching, helps to assure successful seeding. In some places, a better suited topsoil material needs to be added.

A diverse, ecological habitat in urban areas can be improved by providing food, cover, and places to nest and den. Many shrubs and trees furnish food and shelter. Field borders around parks, cemeteries, and utility right-of-ways promote habitat diversity. Certain grass and wildflower species can provide an alternative ground cover to manicured lawns, as well as wildlife benefits.

Interpretive Group

Land capability classification: Not assigned to a capability subclass

Vb—Vicksburg silt loam, occasionally flooded

Setting

Major landform: Flood plains
Landform position: Nearly level flood plains along creeks and streams
Slopes: 0 to 2 percent
Shape of areas: Linear
Size of areas: 10 to 250 acres
Major uses: Cropland

Composition

Vicksburg and similar soils: 80 to 85 percent
Contrasting components of minor extent: <20 percent

Minor Components

Contrasting:
- Collins, Falaya, and Iuka soils in similar positions
- Soils that contain 2 chroma mottles at about 2 feet below the surface

Similar:
- Soils that are less acid throughout
- Soils containing a sandy or gravelly substratum below 40 inches

Typical Profile

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

Subsoil:
7 to 45 inches—dark yellowish brown and brown silt loam

Substratum:
45 to 65 inches—dark yellowish brown, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Well drained
Organic matter content: Moderate
Permeability: Moderate
Available water capacity: High
Depth of root zone: Very deep
Surface runoff: Slow
Depth to water table: 3 to 5 feet during late winter and early spring
Frequency of flooding: Occasional (once in 2 years to about once in 20 years) and of very brief duration

Use and Management

Cropland

Suitability: Well suited to corn, soybeans, wheat, tobacco, and milo; however, small grains and other winter cover crops may be damaged by brief flooding
Management concerns:
- Flooding
- Susceptibility to compaction
- Maintaining tilth and fertility

Management measures:
- Some areas are subject to scour and deposition caused by runoff from adjacent side slopes; this runoff can be carried around the field with diversion terraces or across the field in waterways
- Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility

Pasture and Forage

Suitability: Well suited to pasture and hay production
Management concerns:
- Hazard of flooding
- Maintaining fertility

Management measures:
- Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
- Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
- Table 7 provides specific information relating to potential productivity

Native trees: Bottomland oaks, green ash, American sycamore, and sweetgum
Preferred species for planting: Green ash, eastern cottonwood, cherrybark oak, black walnut, loblolly pine, and American sycamore
Management concerns:
- Seedling mortality
- Plant competition
- Equipment limitation due to seasonal wetness

Management measures:
- A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
- The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

- Woodland wildlife habitat and openland wildlife habitat potential—good
- Wildlife habitat can be maintained and improved by providing food, cover, water, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities
Limitations:
- The hazard of flooding affects most sanitary facilities and building site developments

Corrective measures:
- This limitation is difficult to overcome in most areas

Interpretive Group

Land capability classification: IIw

W—Water

This map unit consists of ponds, lakes, and flood retarding structures. These areas are covered with water in most years, at least during the period that is warm enough for plants to grow. However, most areas are covered with water throughout the year. Pits containing water most of the time are also mapped as Water.

Wa—Waverly silt loam, occasionally flooded

Setting

Major landform: Flood plains

Landform position: Depressional areas along creeks and streams
Slopes: 0 to 2 percent
Shape of areas: Nearly oval
Size of areas: 5 to 30 acres
Major uses: Woodland

Composition

Waverly and similar soils: 85 percent
Contrasting components of minor extent: 15 percent

Minor Components

Contrasting:
• Small areas of Falaya, Collins, and Rosebloom soils in similar positions
Soils with a thin sandy loam overwash surface layer
Similar:
Soils that are less acid throughout

Typical Profile

Surface layer:
0 to 10 inches—brown and grayish brown, mottled silt loam

Subsoil:
10 to 54 inches—light brownish gray and gray, mottled silt loam

Substratum:
54 to 62 inches—gray, mottled silt loam

Soil Properties and Qualities

Depth: Very deep
Drainage class: Poorly drained
Organic matter content: Low
Permeability: Moderate
Available water capacity: High
Depth of root zone: Deep
Surface runoff: Slow
Depth to water table: Within 1 foot of the surface during winter and early spring
Frequency of flooding: Occasional (once in 2 years to about once in 20 years) and of brief duration

Use and Management

Cropland

Suitability: Suited to corn and soybeans in areas that have been adequately drained; generally not suited in areas that have not been drained; generally not suited to tobacco and small grains because of excessive wetness and the hazard of flooding
Management concerns:
• Wetness
• Susceptibility to compaction
• Maintaining tilth and fertility
Management measures:
• Conservation tillage and the use of cover crops, lime, and fertilizer help to keep the soil in good tilth and fertility
• Late plantings are common
• Maintaining existing drainage system

Pasture and Forage

Suitability: Suited to pasture and hay production, and a few areas are being managed for such usage
Management concerns:
• Excessive wetness
• Occasional flooding
• Fertility
• The seasonal high water table makes the soil too soft for grazing for extended periods during winter and early spring
Management measures:
• Plants that are tolerant of seasonal wetness are best suited
• Tall fescue, reed canary grass, big bluestem, and Ladino clover tolerate wet conditions and can be grown
• Proper stocking rates, pasture rotation, and deferred grazing maximize the forage efficiency and help to maintain good sod conditions
• Maintain the quality and quantity of forage by controlling weeds, fertilizing, and renovating pastures often enough to maintain the desired plants

Woodland

Potential productivity: Very high
• Table 7 provides specific information relating to potential productivity
Native trees: Bottomland oaks, shagbark hickory, green ash, red maple, and sweetgum
Preferred species for planting: Cherrybark oak, green ash, pin oak, eastern cottonwood, and American sycamore
Management concerns:
• Seedling mortality
• Plant competition
• Equipment limitation due to seasonal wetness
Management measures:
• A new forest crop can be established by clearing and disking, using herbicides, or by managing the existing stand
• The seasonal high water table restricts the use of equipment to periods when the soil is dry

Wildlife Habitat

• Wetland wildlife habitat potential—good; woodland wildlife habitat—fair
• Wildlife habitat can be maintained and improved by providing food, cover, and places to nest or den

Urban

Suitability: Poorly suited to most urban uses and sanitary facilities

Limitations:

- Wetness and the hazard of flooding severely affect most sanitary facilities and building site developments
- Low strength is a limitation for local roads and streets

Corrective measures:

- These limitations are difficult to overcome in most areas

Interpretive Group

Land capability classification: IIIw

Prime Farmland

In this section, prime farmland is defined, and the soils in Graves County that are considered prime farmland are listed.

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. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent.

About 197,331 acres in Graves County, or 55 percent of the total acreage, meets the soil requirements for prime farmland. This land is scattered throughout the county, but the largest areas occur in general soil map units 1, 2, and 6 (see the general soil map at the back of this publication). The main crops produced on the prime farmland soils are corn, soybeans, wheat, tobacco, and hay. These crops account for approximately 38 percent of the county's total agricultural income each year.

The following map units are considered prime farmland in Graves County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. If applicable, the need for these measures is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine if the limitations have been overcome by corrective measures.

The soils identified as prime farmland in Graves County are:

CaA	Calloway silt loam, 0 to 3 percent slopes (where drained)
CeA	Center silt loam, 1 to 3 percent slopes
Cn	Collins silt loam, occasionally flooded
Co	Collins silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
Cu	Collins-Iuka complex, occasionally flooded
Fa	Falaya silt loam, occasionally flooded (where drained)
Ff	Falaya silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
FnB2	Feliciana silt loam, 2 to 6 percent slopes, eroded
GrA	Grenada silt loam, 0 to 2 percent slopes
GrB2	Grenada silt loam, 2 to 6 percent slopes, eroded
KrA	Kurk silt loam, 0 to 2 percent slopes (where drained)

LoB2 Loring silt loam, 2 to 6 percent slopes, eroded
NaA Natalbany silt loam, 0 to 2 percent slopes (where drained)
Ro Rosebloom silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
RtA Routon silt loam, 0 to 2 percent slopes (where drained)
Vb Vicksburg silt loam, occasionally flooded
Wa Waverly silt loam, occasionally flooded (where drained)

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service.

In 1992, about 180,000 acres in the survey area was used for crops and pasture. Two-thirds of this acreage was used for producing crops consisting mainly of corn, soybeans, dark fire-cured tobacco, dark air-cured tobacco, burley tobacco, wheat, grain sorghum, and hay. An additional 15 percent (55,000 acres) of the land area in Graves County had a history of crop production in previous years but was idled due to participation in the Conservation Reserve Program.

The specialty crops grown in the survey area are vegetables, small fruits, tree fruits, Christmas trees, and nursery stock. Some of the areas are used for melons, sweet corn, strawberries, tomatoes, and peppers. Apples and peaches are the most common tree fruits, with a few orchards being managed for commercial production. Areas containing moderately well drained or well drained soils are best suited for orchard crops and nursery plants. However, soils in low areas where frost is more frequent and air drainage is poor are generally poorly suited to early vegetables, small fruits, and orchard crops. The latest information about growing specialty crops can be obtained from the local office of the Kentucky Cooperative Extension Service.

About 197,000 acres in the survey area qualifies as prime farmland. Prime farmland is land considered most suitable for growing crops. Most of this land consists of the nearly level to gently sloping upland areas of Grenada, Loring, and Feliciana soils and the nearly level bottomlands and stream terraces containing Vicksburg, Collins, Falaya, Center, and Kurk soils. The moderately steep areas of Brandon, Purchase, Providence, and Smithdale soils are not prime farmland and, therefore, are commonly used for pasture or woodland.

In addition to the topographical features, differences in land-use management and suitability result from differences in soil characteristics, such as fertility, erodibility, organic matter content, available water holding

capacity, drainage, and flooding. Cropping systems, tillage, and field size are also important parts of efficient crop production systems *(61)*. Extending the latest crop production technology to all of the cropland in the survey area will help increase production and maintain a sustainable soil resource base. The information in this soil survey can facilitate the application of such technology. The following describes some general principles of soil management that can be applied widely within the survey area.

Managing Cropland

The main management systems needed on cropland are those that protect or improve soil quality, help to control erosion, and minimize the water pollution caused by plant nutrients, soil particles, and agrichemicals.

Water erosion is a major concern on slopes of more than about 2 percent. Unless protected, such areas are especially susceptible to erosion of the surface layer rich in humus, organic matter, and plant available nutrients. Unabated, accelerated erosion affects a number of physical, chemical, and biological properties resulting in diminished soil quality. Erosion of the surface layer can result in decreased water infiltration rates, lower available water holding capacity, decreased soil tilth and workability due to increases in clay content and bulk density, diminished rooting depths, and increased erodibility *(11, 14, 15, 17, 24, 26, 30)*.

Erosion is especially harmful to soils that already have a layer in or below the subsoil that limits the depth of the root zone, such as the fragipan in Purchase, Loring, Grenada, and Providence soils. Purchase soils are shallow to the upper boundary of a dense, root restricting fragipan layer. Once water-storage capacity becomes a yield limiting factor in these soils, it becomes difficult to maintain productivity to the extent that row crop farming is profitable without irrigation *(30)*.

Other soils of particular concern are those which have droughty, infertile gravelly layers within 40 inches of the surface, such as Brandon and Saffell. Erosion is less harmful, though still a concern, on soils that have few root restricting characteristics, such as Feliciana and Center. Applications of fertilizer help to offset the lower fertility caused by erosion, but overcoming much of the damage is difficult or impractical.

In addition to improvements in soil quality, controlling erosion improves water quality by minimizing the pollution of streams due to sedimentation. The quality of water for farm and city uses, wildlife habitat, and recreational uses is enhanced when measures are taken to keep soil erosion in check.

Erosion-control measures generally provide a protective cover of crop residue or vegetation, control runoff, and increase the rate of water infiltration. In Graves County, erosion is controlled mainly through a combination of cultural and structural practices.

Some of the more commonly used cultural practices include conservation tillage, no-tillage, crop residue management, crop rotations, contour farming, and using cover crops. Conservation tillage, which includes no-till planting, minimum tillage, strip tillage, and chisel plowing, is becoming more common in the county. Minimizing tillage and leaving crop residue on the surface increase the rate of water infiltration and can reduce sheet erosion by one-half or more as compared to fall plowing. In the more sloping areas used for producing corn or soybeans, no-till farming is effective in helping keep erosion in check. Maintaining crop residue on the soil surface improves the water balance within the soil, which is generally the yield limiting factor with most upland soils in the county.

Crop rotations that alternate cultivated crops from year-to-year help to control erosion. This cultural practice is used quite extensively in Graves County via a corn-wheat-soybean rotation. This system allows farmers to produce three crops within a two-year period. In addition to the erosion-control benefits, nitrogen fertilizer efficiency is improved along with a significant suppression of soybean cyst nematode populations. Diversified farms that have livestock requiring pasture and hay can reap even greater benefits by including forage crops of grasses and legumes in the cropping rotation system.

Contour farming and contour stripcropping can be used on fields that have smooth, uniform slopes. These practices are most practical and effective on the Grenada, Calloway, and Loring soils that occur within General Soil Map Units 1 and 2 in this publication.

In some areas, structural practices are needed to effectively control rill and gully erosion. Parallel terraces with pipe outlets are effective in controlling erosion by breaking up slope lengths and diverting surface runoff to safe outlets. They generally can be farmed more easily than contour terraces.

In less sloping areas, grassed waterways may be used to control surface runoff and prevent rill and gully erosion. Small, natural drainageways are the best sites for grassed waterways (fig. 11). Grassed waterways are efficient and generally quite economical. Properly installed, they can be easily crossed by farm machinery. Livestock panels (fig. 12) are sometimes used in conjunction with a grassed waterway to stabilize outlets that contain a sudden change in elevation. Other grade stabilization structures less commonly used in Graves County are rock chutes, earthen embankments, and gabion structures (fig. 13). These measures are generally more expensive, but nonetheless have a demonstrated need and use in preventing excessive rill and gully erosion in areas having a particularly high volume of overland flow.

Information about the design and application of erosion-

Figure 11.—A grassed waterway in an area of the Purchase-Loring complex, 4 to 6 percent slopes, severely eroded. Where slopes are gentle, establishing a persistent perennial sod, such as fescue, along natural drainageways helps to control rill and gully erosion.

control measures for each kind of soil in the county is available at the local office of the Natural Resources Conservation Service.

Soil drainage is a management concern on about 7 percent of the acreage in Graves County. Soils that have a seasonal high water table need an adequate drainage system to reduce wetness during the spring. The design of both surface and subsurface drainage systems varies with the kind of soil. Crop production on Falaya, Kurk, and other somewhat poorly drained soils benefits from a well designed drainage system. Surface ditches and/or tile drains can be used on these soils if suitable outlets are available. Surface drains are generally more effective on the slowly permeable Kurk soils and should be installed at closer intervals. Other somewhat poorly drained soils, such as Calloway, have a hard, compact fragipan in the subsoil. The fragipan limits the depth to which tile drains will function properly; therefore, surface ditches are more commonly used to improve drainage on most areas of these soils.

The poorly drained soils in the survey area are the Natalbany, Rosebloom, Routon, and Waverly. Adequate drainage is a major factor in managing crops and pasture on these soils. Areas that have previously been cleared

Figure 12.—A cattle panel grade stabilization structure. The wire mesh helps to keep the rip-rap in place, which in turn stabilizes outlets for natural drainageways into larger streams and creeks.

and are currently used for agricultural production can maintain the current drainage system in order to continue row crop production or pasture/hayland use. Management of drainage to conform with regulations influencing wetlands may require special permits and extra planning.

Soil tilth is an important factor on cropland, primarily because of its influence on seed germination and the infiltration of water into the soil. Soils that have good tilth are granular and porous. In the uplands, most soils used for cultivated crops have a silt loam surface layer that is low in organic matter content. Examples are Calloway, Grenada, Loring, and Purchase soils. Generally, tilling these soils weakens the soil structure and increases the degree of compaction and the extent of surface crusting. Tilling when the soils are too wet can further increase the degree of compaction, even below the surface layer.

A crop production system geared toward systematic additions and management of crop residue, poultry or

Figure 13.—This gabion structure is used to stabilize creek banks and areas along a natural waterway having a relatively high flow volume coupled with an abrupt change in elevation. The gabion baskets are filled with 6-inch rocks.

other animal manures, along with other organic material, can improve soil structure and minimize surface crusting. Increasing surface soil organic matter will improve rainfall infiltration rates and increase the amount of crop-available soil water. Such a system is critical to sustaining yields on eroded soils. In today's technologically advanced agriculture, the ability of the soil to store water for crop use between significant precipitation events is, in most cases, the yield limiting factor.

Most of the bottomland soils in Graves County have a surface layer of silt loam or loam that is moderate or high in organic matter content. These soils retain favorable tilth under normal tillage operations. They are, however, susceptible to compaction via traffic pans in and below the plow layer. This impedes vertical root growth and exploration for water and essential nutrients. Soil compaction is particularly a concern on poorly drained soils, such as Rosebloom, Routon, and Waverly. Periodic

deep tillage, either with a paraplow, chisel plow, or by subsoiling, can minimize compaction and the formation of traffic pans on bottomland soils.

Natural soil fertility is medium in most of the bottomland soils and low or medium in the soils on uplands and stream terraces. Most soils throughout the county are strongly acid to moderately acid in their natural state. In addition to the inherent acidity of the soils, applications of nitrogen fertilizers have an acidifying effect on the upper few inches of the soil profile. This is especially notable on areas used to produce burley and dark tobacco. Periodic additions of ground agricultural lime are needed to maintain a favorable pH environment for optimum plant growth. A soil pH between 6.2 and 6.8 is best suited for most commonly grown crops in Graves County. Maintaining soil acidity levels within this range enhances nutrient availability to all crops and inhibits toxic levels of certain elements (e.g., manganese toxicity in burley tobacco).

Additions of agricultural lime are most effective when incorporated into the upper 4 to 6 inches of the soil. Coarser textured soils, such as Collins and Iuka, need smaller amounts but more frequent applications of lime than do finer textured soils, such as Grenada, Loring, Center, and Rosebloom, in order to maintain adequate pH levels.

On all soils within the survey area, applications of lime and fertilizer should be based on the results of soil tests, the specific needs of the crop, and the desired target yield level. The local office of the Kentucky Cooperative Extension Service provides assistance in determining the kind and amount of fertilizer to be applied.

Managing Pasture and Hayland

According to the 1992 National Resources Inventory, about 17 percent, or 61,000 acres, in Graves County is used for hay and pasture *(41)*. However, nearly 60 percent of the total farm income in the county is derived from the sale of livestock or livestock products *(18)*. Therefore, a good quality forage program is important. A successful livestock enterprise depends on a forage program that can supply large quantities of quality homegrown feed. A good forage program can furnish as much as 78 percent of the feed required for beef cattle and 66 percent for dairy cattle *(13)*.

Most of the hayland and pasture in Graves County support a mixture of grasses and legumes. Much of the hay is grown in rotation with pasture. Most of the harvested hay is rolled into large round bales (fig. 14).

The soils in the survey area vary widely in their ability to produce forage because of differences in the depth to root limiting layers (e.g., fragipan), internal drainage, available water capacity, and other properties. Grasses and legumes and grass-legume combinations vary widely in their ability to persist and provide forage on different soils.

The nearly level to sloping, very deep, well drained soils should be planted to the highest producing forage species. Such species include alfalfa or a mixture of alfalfa and orchardgrass or of alfalfa and timothy. Sod-forming grasses, such as tall fescue, are needed to minimize erosion on the steeper soils.

The acreage of well drained soils, such as Feliciana, is limited. Moderately well drained soils, such as Grenada, Loring, Center, and Providence, are best suited to clover-grass mixtures or to pure stands of clover or grasses, depending on the intended need and/or use.

The forage species selected for planting should be those that are suited not only to the soil but also to the intended use and should provide maximum quality and versatility in the forage program. Legumes generally produce higher quality feed and are more digestible and nutritious than grasses alone; therefore, they should be used to the maximum extent possible. The taller legumes, such as alfalfa and red clover, are more versatile but less persistent than legumes that are used primarily for grazing, such as white clover. Grasses, such as orchardgrass and timothy, generally should be grown for hay and silage.

In Kentucky, tall fescue is an important cool-season grass that is suited to a wide range of soil conditions. It is grown for both pasture and hay. The growth that occurs from August to November should be permitted to accumulate in the field and "stockpiled" for deferred grazing during late fall and early winter.

A large percentage of Kentucky's fescue has an endophyte which causes lower animal performance in beef production. Adding legumes, such as red or white clover, to fescue pastures help to offset the problems caused by the endophyte by increasing yields, improving forage quality, reducing production costs via nitrogen fixation, and alleviating the summer slump resulting from pure stands of cool-season grasses. Such improvements in a quality forage program can be made during periodic pasture renovations between the late winter and early spring months. When an area is renovated, the sod is partially destroyed, lime and fertilizer are applied, and desirable forage plants are seeded.

Warm-season grasses are a complimentary addition to many quality western Kentucky forage programs. These grasses are planted from early April to mid-June and provide extra forage during the summer slump period commonly experienced with such cool-season grasses as tall fescue. They grow well during warm periods, with the greatest growth occurring from June to September when the cool-season grasses are at their lowest production levels. Some of the more common warm-season grasses

Figure 14.—Mixed fescue and clover hay harvested in an area of Loring silt loam, 2 to 6 percent slopes, eroded (foreground), and in an area of the Purchase-Loring complex, 6 to 12 percent slopes, severely eroded (background in the vicinity of the tractor).

are switchgrass, big bluestem, eastern gamagrass, Hardie bermudagrass, indiangrass, and Caucasian bluestem.

Additional information about pasture and hayland management is available at the local office of the Kentucky Cooperative Extension Service or of the Natural Resources Conservation Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The

productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table 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 use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a 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.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w, s,* or *c.*

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Commercial forest land makes up about 22 percent of the land area in Graves County *(19)*. The county is part of the Western Mesophytic Forest Region of Kentucky, a transitional area in which oaks are dominant. The characteristic trees are red oak, white oak, red maple, sugar maple, yellow-poplar, black oak, and hickory on upland areas. Bottomlands are dominated by sweetgum, red maple, cherrybark oak, green ash, American sycamore, hickory, and pin oak.

The dominant forest types are oak-hickory, which makes up about 90 percent of the commercial forest land; elm-ash-red maple, 7 percent; and oak-pine, about 3 percent *(1)*. Woodland tracts throughout the county are generally small, private holdings of about 24 acres and are essentially unmanaged. Farmers and individual landowners own about 92 percent of all woodland in Graves County. The remaining 8 percent is controlled by industry or state government, with Westvaco Corporation owning a little more than 2,000 acres, or 3 percent, of the commercial woodland.

Most of the forest land is capable of growing 50 cubic feet or more per acre per year, but actual growth is about 33 cubic feet per acre per year. An obstacle in managing private forest land is the fact that about 30 percent of the landowners have woodland simply because its part of the farm or tract; therefore, little effort is made to manage the trees as a crop and a potential means for generating revenue for the farm.

Good management can improve tree growth, stocking, and the quality of the stands. Removing low quality trees in fully stocked and understocked stands along with regenerating sawtimber stands after harvest are good management practices.

Loblolly pines have been planted on several small tracts containing severely eroded soils and gullied areas. The trees that occur on such areas have, in many instances, reached pulpwood size, and some trees can be used as poles or pilings. Eastern redcedar and thickets of black locust dominate some of the older, abandoned fields within the survey area.

The wood industry in the county consists of four commercial sawmills that produce rough lumber, crossties, hardwood construction dimension stock, timbers, pallets, hardwood chips, and slabs. Three of the mills have the capacity to produce 1 to 3 million board feet per year.

The secondary wood products industry in Graves County includes businesses that make wooden cabinets, trusses, and creosote railroad ties and utility poles. Most of the pulpwood and wood chips produced in Graves County are shipped to Westvaco Corporation in neighboring Ballard County.

Soils vary in their ability to produce trees. Available water capacity and depth of the root zone have major effects on tree growth. Fertility and texture also influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Elevation and aspect are of particular importance in mountainous areas.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, and the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the periods when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, or bedrock or by a combination of such factors as wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if

moderate or strong winds commonly blow trees over. Ratings of moderate or severe indicate that care is needed in thinning or that the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail systems may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A moderate or severe rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The estimates of the productivity of the soils in this survey are based on published data *(4, 6, 7, 8, 9, 10, 12, 25, 28, 32, 36).*

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year calculated at the age of culmination of mean annual increment.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Recreation

Hunting and fishing are the more common outdoor recreational activities in Graves County. Abundant crop fields, meadows, and wooded areas provide habitat for a variety of game. Wooded areas provide good habitat for deer, squirrel, and wild turkey. Some landowners lease such areas to individuals in exchange for the right to hunt upland game, primarily deer. Crop fields and meadows provide excellent habitat for quail, mourning dove, rabbit, and deer. In 1995, the Kentucky Department of Fish and Wildlife owned approximately 788 acres in the West Fork Clarks River flood plain in an area commonly referred to as Kaler bottoms.

Numerous farm ponds and watershed lakes provide excellent fishing opportunities. More than 20 flood retarding structures, known locally as watershed lakes, exist in Graves County, with multipurpose benefits for fishing, wildlife, and other recreational uses.

Other outdoor recreational facilities are available, such as golf courses, campgrounds, picnic and sports areas, and community parks.

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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 gentle 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, 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

Raymond E. Toor, biologist, Natural Resources Conservation Service, helped prepare this section

Graves County has a valuable commodity in its fish and wildlife resources. Streams, rivers, and man-made impoundments provide suitable habitat for fish. Habitat for wildlife is found throughout the survey area in forested areas interspersed with open land.

Many of the soils found in Graves County are suitable for impounding water. Ponds, small streams, and large impoundments are stocked and managed for largemouth bass, smallmouth bass, channel catfish, and bluegill. The West Fork Clarks River is the only major river in the survey area. Over 20 man-made flood retarding structures exist throughout the survey area, many of which are amply stocked with quality fish.

At present, the most important wildlife species are those which provide recreation in the form of sport hunting, economic gain in the form of trapping, and aesthetic enjoyment in the form of observation and photography. The major game species include gray squirrel, fox squirrel, cottontail rabbit, white-tailed deer, bobwhite quail, mourning dove, and raccoon. Eastern wild turkey has been reintroduced to the county. Trapping efforts are concentrated on the muskrat, beaver, raccoon, mink, red fox, and gray fox.

Very little aquaculture exists in Graves County. Expansion of aquaculture will depend upon adequate water supplies, improvement of water quality, and marketing.

Successful management of wildlife on any tract of land requires that food, cover, and water be available in a suitable combination. Lack of any one of these necessities, an unfavorable balance among them, or inadequate distribution of them may limit the reproduction or dissemination of desired kinds of wildlife. Soils information provides a valuable tool in creating, improving, or maintaining suitable food, cover, and water for wildlife. Soil interpretations for wildlife habitat aid in selecting the more suitable sites for various kinds of management. They serve as indicators of the intensity of management needed to achieve satisfactory results. They also serve as a means of showing why it may not be generally feasible to manage a particular area for a given kind of wildlife. Interpretations also serve in broad-scale planning of wildlife management areas, parks, and nature areas, or for acquiring wildlife lands.

In table 9, the soils of Graves County are rated for the potential creation, improvement, or maintenance of seven wildlife habitat elements. These ratings are based on limitations imposed by the characteristics or behavior of the soil.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results

can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and 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 are also considerations. Examples of grasses and legumes are fescue, orchardgrass, bermudagrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, aster, and tick clover.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, cattail, 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, ponds, and constructed wetlands.

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 (fig. 15).

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas (fig. 16). Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Land used for cropland, pastureland, or woodland also furnishes quality habitat for many kinds of wildlife when practices, such as the following examples, are effectively applied: planned crop rotation, crop residue management, fallow, spring disking of idle field borders, stripmowing, and leaving small areas of unharvested grain next to good cover.

Conservation practices, such as carefully planned mechanical mowing, deferred grazing, prescribed grazing systems, selective brush management, and maintaining shrub field borders, are often beneficial to wildlife on improved pastureland.

Other practices employed in woodland areas which are beneficial to wildlife include clearing and thinning selectively; planting winter annuals on pipeline right-of-ways, firebreaks, and open areas; and protecting den trees and quality mast-producing trees.

Proper application of conservation practices should be based on the habitat needs of the wildlife to be managed. Arbitrarily applied, many of these practices could be detrimental rather than beneficial. When managing for game species, many nongame species are also benefited. Trained professionals from the Kentucky Department of Fish and Wildlife Resources, Kentucky Agricultural Extension Service, or the Natural Resources Conservation Service can provide technical assistance in the planning or application of needed wildlife management practices.

Figure 15.—English pointers indicate a nearby covey of quail. Wildlife habitat is enhanced when leaving a few rows of unharvested grain along the outer edges of fields in cropland areas.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not

Figure 16.—Baldcypress trees grow well in areas of Rosebloom silt loam, ponded. These shallow water areas provide excellent habitat for wetland wildlife.

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 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm, dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock or to a cemented pan, large stones, 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, depth to 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, depth to a high water table, depth to bedrock or to a cemented pan, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. Soil physical properties are particularly important in selecting sites for these facilities. Identifying the limiting soil properties and site features are critical to ensuring proper design and installation of such facilities. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials.

Table 11 shows the degree and the 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 that 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, depth to 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, depth to 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 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, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 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 the table, 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 releases a variety of plant nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special

design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, 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 greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. 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.

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. Low available water capacity, restricted rooting depth, toxic substances such as salts or 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 19.

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 *(5)*. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 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 *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

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, SP-SM.

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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 19.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters,

respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil 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 in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum

average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep 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 or 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. Brandon and Feliciana soils are examples.

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. Grenada and Calloway soils are examples.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Natalbany soils are an example.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than a 50 percent in any year). *Common* is used when the occasional and frequent classes are grouped for certain purposes. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding 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 is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in the table are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian*, or *apparent*; and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water

table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 17 and the results of chemical analysis in table 18. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Most soil samples were analyzed by the Kentucky Agricultural Experiment Station, Lexington, Kentucky. Bulk density analysis for the Grenada and Purchase soils was conducted by the National Soil Survey Laboratory, Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(38, 40)*.

Coarse materials—(2-75 mm fraction) weight estimates of the percentages of all material less than 75 mm (3B1).
Coarse materials—(2-250 mm fraction) volume estimates of the percentages of all material greater than 2 mm (3B2).
Sand—(0.05-2.0 mm fraction) weight percentages of material less than 2 mm (3A1).
Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all material less than 2 mm (3A1).
Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of material less than 2 mm (3A1).
Water retained—pressure extraction, percentage of ovendry weight of less than 2 mm material; 1/3 or 1/10 bar (4B1), 15 bars (4B2).
Water-retention difference—between 1/3 bar and 15 bars for whole soil (4C1).
Water-retention difference—between 1/10 bar and 15 bars for whole soil (4C2).
Bulk density—of less than 2 mm material, saran-coated clods field moist (4A1a), 1/3 bar (4A1d), ovendry (4A1h).
Moist bulk density—of less than 2 mm material, cores (4A3).
Moist bulk density—of less than 2 mm material, compliant cavity (4A5).
Organic carbon—dry combustion (6A2d).
Extractable cations—ammonium acetate pH 7.0, atomic absorption; calcium (6N2e), magnesium (6O2d), sodium (6P2d), potassium (6Q2b).
Extractable acidity—barium chloride-triethanolamine IV (6H5a).
Cation-exchange capacity—ammonium acetate, pH 7.0, steam distillation (5A8b).
Cation-exchange capacity—sum of cations (5A3a).
Effective cation-exchange capacity—sum extractable cations plus aluminum (5A3b).
Base saturation—ammonium acetate, pH 7.0 (5C1).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—1:1 water dilution (8C1f).
Extractable phosphorus—Bray P-1 (6S3).

Engineering Index Test Data

Table 19 shows laboratory test data for two pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the Soil Mechanics Laboratory, Fort Worth, Texas.

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); Moisture density—T 99 (AASHTO), D 698 (ASTM); and Specific gravity—T 100 (AASHTO), D 854 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(34, 35)*. 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 on laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Fragiudalfs (*Fragi* from the Latin fragilis, meaning brittle pan, 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 *Oxyaquic* identifies the subgroup that typifies the great group. An example is Oxyaquic Fragiudalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, thermic Oxyaquic Fragiudalfs.

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. There can be some variation in the texture of the surface layer or of the substratum within a series. The Loring series is an example of fine-silty, mixed, thermic Oxyaquic Fragiudalfs.

The orders in this survey area are Entisols, Alfisols, and Ultisols.

Entisols have been affected only slightly by soil-forming processes. An A horizon is the only distinct pedogenic horizon in these soils.

Fluvaquents are very deep, poorly drained or somewhat poorly drained soils that have a thin A horizon. Typic Fluvaquents are fine-silty or coarse-silty with mixed mineralogy. They include the Rosebloom and Waverly soils on wet, depressional areas on flood plains. Aeric Fluvaquents are a bit better drained than the Typic subgroup. They are coarse-silty, somewhat poorly drained with mixed mineralogy. They include the Falaya soils on nearly level flood plains.

Udifluvents are very deep, well drained or moderately well drained soils that have a moderately thick A horizon. Typic Udifluvents are coarse-silty, well drained with mixed mineralogy. They include the Vicksburg soils. Aquic Udifluvents are moderately well drained and are either coarse-loamy or coarse-silty. They include the Iuka and Collins soils along natural drainageways.

Udorthents are very deep, well drained soils that have a very thin A horizon. They occur in areas of cut-and-fill associated with road construction and urban development. These soils are not classified below the great group level.

Alfisols and *Ultisols* have an argillic horizon that contains evidence of clay translocation. The Ultisols are leached of soluble bases to a greater degree than the Alfisols.

Epiaqualfs are very deep, poorly drained or somewhat poorly drained soils with a thin A horizon. These soils have perched layers of saturation within the upper 2 meters, with periodic saturation generally occurring during the winter and early spring months. These soils occur on nearly level to slightly depressional stream terraces. Typic Epiaqualfs are fine-silty, poorly drained soils with mixed mineralogy. They include the Routon soils. Aeric Epiaqualfs are a bit better drained than the Typic Epiaqualfs. They include the Kurk soils. Vertic Epiaqualfs have a fine (i.e., clayey) argillic horizon that contains montmorillonitic mineralogy and exhibit cracks resulting from shrinking and swelling within the subsoil during most years. They include the Natalbany soils.

Fragiudalfs are very deep, moderately well drained or somewhat poorly drained soils with a root restricting fragipan layer in the subsoil. The fragipan is relatively impermeable to vertical water movement and, therefore, creates a perched ground water table during the winter and early spring months. These soils occur on gently sloping to moderately steep upland ridges and side slopes. They are the most extensive soils in the survey area, comprising about 55 percent of the total area. Typic, Glossic and Oxyaquic Fragiudalfs are fine-silty with mixed mineralogy. They contain a moderately thick, yellowish brown or dark brown subsoil above the fragipan. They include the Providence, Grenada, and Loring soils. Ochreptic Fragiudalfs are coarse-silty with mixed mineralogy and are shallow to the fragipan. These soils occur on erosional landforms, primarily sloping to moderately steep side slopes, and include the Purchase soils. Glossaqaic Fragiudalfs are wet, somewhat poorly drained soils that occur on nearly level and slightly depressional upland summits. These soils are fine-silty with mixed mineralogy and include the Calloway soils.

Hapludalfs are very deep, moderately well drained and well drained soils that have a moderately thick A horizon and a thick subsoil. The subsoil is commonly brown to yellowish brown. Ultic Hapludalfs are well drained, fine-silty soils with mixed mineralogy. They include the Feliciana soils on gently sloping and sloping upland ridges and comprise only about 1 percent of the survey area. Aquic Hapludalfs are moderately well drained, fine-silty soils with mixed mineralogy. They include the Center soils on nearly level stream terraces.

Hapludults are very deep, well drained soils that have a thin A horizon and moderately thick or thick, acid subsoil. The subsoil ranges from brown to red. Typic Hapludults are fine-loamy, fine-silty, or loamy-skeletal with mixed or siliceous mineralogy. They include the Smithdale, Brandon, and Saffell soils and occur primarily on moderately steep to steep upland side slopes.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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" *(39)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(35)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Brandon Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the solum; moderately rapid in the substratum
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loess over gravelly Continental deposits
Slope range: 12 to 35 percent
Associated soils: Loring, Feliciana, Purchase, Saffell, and Smithdale; Loring, Feliciana, and Purchase soils formed in more than 4 feet of loess, and Loring and Purchase soils contain a fragipan; Saffell soils do not contain a loess mantle and are in a loamy-skeletal family; Smithdale soils contain siliceous mineralogy and are fine-loamy
Taxonomic class: Fine-silty, mixed, thermic Typic Hapludults

Typical Pedon

Brandon silt loam, in an area of Brandon-Smithdale complex, 12 to 20 percent slopes, severely eroded; on an 18 percent linear side slope in a forest of white oak, hickory, white ash, and red maple; 1.7 miles northwest of the junction of Kentucky Highways 131 and 483 at Westplains; about 1,400 feet southeast of the intersection of Spring Creek and Johnson Road, then about 400 feet northeast of the gravel road; Westplains 7.5 minute quadrangle, soil map sheet 11, east 1,166,000 feet and north 200,400 feet by the Kentucky coordinate system:

A—0 to 4 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; weak fine granular

structure; very friable; common fine and medium roots; slightly acid; clear smooth boundary.
BE—4 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; very friable; common fine and medium roots; 1 percent gravel; slightly acid; clear smooth boundary.
Bt1—10 to 20 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct reddish brown (5YR 4/4) clay films on faces of peds and common distinct brown (10YR 5/3) silt coats on faces of peds; 1 percent gravel; very strongly acid; gradual smooth boundary.
Bt2—20 to 29 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; firm; very few fine roots; many distinct reddish brown (5YR 4/4) clay films throughout and common distinct pale brown (10YR 6/3) silt coats in lower 5 inches; 10 percent gravel; strongly acid; abrupt smooth boundary.
2C1—29 to 39 inches; brown (7.5YR 4/4) extremely gravelly clay loam; massive; very firm; weakly cemented; 70 percent gravel; strongly acid; gradual smooth boundary.
2C2—39 to 65 inches; brown (7.5YR 4/4) extremely gravelly loam; massive; very firm; 80 percent gravel; strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches or more
Kind of rock fragments: Gravel
Reaction: Unless limed, very strongly acid to strongly acid

A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—1 to 4
Texture of the fine-earth fraction—silt loam

BE horizon (and E horizon where present):
Hue—10YR
Value—3 to 6
Chroma—3, 4, or 6
Texture of the fine-earth fraction—silt loam
Rock fragment content—0 to 5 percent

Bt horizon:
Hue—5YR or 7.5YR
Value—4 or 5
Chroma—4 or 6
Texture of the fine-earth fraction—silt loam or silty clay loam
Rock fragment content—0 to 10 percent

2C horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 to 6
Chroma—3, 4, 6, or 8
Texture of the fine-earth fraction—silt loam, loam, clay loam, sandy clay loam, or sandy loam
Rock fragment content—30 to 80 percent

Calloway Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate above the fragipan and slow in the fragipan
Landform: Uplands
Position on the landform: Broad, smooth to slightly concave summits and heads of drainageways
Parent material: Thick loess deposits
Slope range: 0 to 3 percent
Associated soils: Grenada and Routon; Grenada soils are moderately well drained; Routon soils are poorly drained and do not have a fragipan
Taxonomic class: Fine-silty, mixed, thermic Glossaquic Fragiudalfs

Typical Pedon

Calloway silt loam, 0 to 3 percent slopes; on a smooth 1 percent slope in a cultivated field; 2 miles northwest of Tri City along Kentucky Highway 97 near Burnetts Chapel Church, 1,300 feet south of the highway; Lynnville 7.5 minute quadrangle, soil map sheet 35, east 1,177,300 feet and north 113,100 feet by the Kentucky coordinate system:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium granular structure; very friable; common fine roots; few fine distinct grayish brown (10YR 5/2) iron depletions and few fine distinct dark brown (7.5YR 4/3) masses of iron accumulations; neutral; abrupt smooth boundary.
Bw—7 to 18 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common medium distinct light brownish gray (10YR 6/2) iron depletions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulations; common distinct dark brown (7.5YR 3/3) soft iron-manganese stains and concretions; strongly acid; clear smooth boundary.
E—18 to 22 inches; gray (10YR 6/1) silt loam; moderate fine subangular blocky structure; friable; very few fine roots; common medium distinct yellowish strong brown (10YR 5/6) masses of iron accumulations; common distinct dark brown (7.5YR 3/3) iron-manganese stains and concretions; very strongly acid; clear smooth boundary.
Btg—22 to 34 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium subangular blocky structure;

firm; very few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulations; common distinct light brownish gray (10YR 6/2) clay depletions on faces of peds and many distinct gray (10YR 5/1) clay films on faces of peds; few prominent black (N 2.5/0) manganese stains and concretions; very strongly acid; gradual smooth boundary.

Btx—34 to 44 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; compact and brittle; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulations and many medium distinct light brownish gray (10YR 6/2) iron depletions; common distinct grayish brown (2.5Y 5/2) clay films on faces of prisms; and few prominent black (N 2.5/0) manganese stains; very strongly acid; gradual smooth boundary.

Bx—44 to 69 inches; yellowish brown (10YR 5/6) silt loam; moderate coarse prismatic structure parting to weak medium platy; firm; compact and brittle; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulations and common medium distinct light brownish gray (10YR 6/2) iron depletions; few prominent black (N 2.5/0) manganese stains; strongly acid; gradual smooth boundary.

BC—69 to 75 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few medium distinct light brownish gray (10YR 6/2) iron depletions; few prominent black (N 2.5/0) manganese stains; moderately acid.

Range in Characteristics

Solum thickness: >60 inches
Depth to fragipan: 17 to 36 inches
Reaction: Unless limed, moderately acid to very strongly acid

Ap horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

E horizon (and E part of Btg/E horizon where present):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 to 3
Redoximorphic features—shades of gray and brown
Texture of the fine-earth fraction—silt or silt loam

Btg horizon (and Btg part of Btg/E horizon where present):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Redoximorphic features—shades of gray and brown
Texture of the fine-earth fraction—silt loam or silty clay loam

Btx and Bx horizons:
Hue—10YR
Value—5
Chroma—2, 3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

BC horizon:
Hue—10YR
Value—5
Chroma—4 or 6
Redoximorphic features—shades of gray
Texture of the fine-earth fraction—silt loam

Center Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part of the solum and moderately slow in the lower part
Landform: Stream terraces
Position on the landform: Higher, nearly level to gently undulating
Parent material: Silty alluvium and loess
Slope range: 1 to 3 percent
Associated soils: Kurk and Routon soils on other portions of stream terraces and Collins, Falaya, and Waverly soils on flood plains; Kurk soils are somewhat poorly drained, and Routon soils are poorly drained; Collins, Falaya, and Waverly soils do not have argillic horizons
Taxonomic class: Fine-silty, mixed, thermic Aquic Hapludalfs

Typical Pedon

Center silt loam, 1 to 3 percent slopes; on a slightly undulating 2 percent slope in a meadow of fescue; 2.1 miles south of Wingo; 2,600 feet south of the confluence of Brush Creek and Barn Creek; Cuba 7.5 minute quadrangle, soil map sheet 34, east about 1,120,500 feet and north 112,600 feet by the Kentucky coordinate grid system:

Ap1—0 to 4 inches; brown (10YR 4/3) and dark yellowish

brown (10YR 4/4) silt loam; moderate fine granular structure; very friable; many fine roots; few fine distinct pale brown (10YR 6/3) iron depletions and few medium distinct dark brown (7.5YR 4/3) masses of iron accumulations; slightly acid; clear smooth boundary.

Ap2—4 to 10 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silt loam; weak medium granular structure; very friable; many fine roots; common fine distinct pale brown (10YR 6/3) iron depletions and common medium distinct dark brown (7.5YR 4/3) masses of iron accumulations; slightly acid; abrupt smooth boundary.

Bt1—10 to 17 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; common fine roots; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulations and few fine distinct light yellowish brown (2.5Y 6/3) iron depletions; few faint discontinuous clay films on faces of peds; few distinct soft brown and black iron-manganese concretions; moderately acid; clear smooth boundary.

Bt2—17 to 24 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common medium distinct light brownish gray (10YR 6/2) iron depletions and common medium prominent strong brown (7.5YR 5/6) masses of iron accumulations; few distinct soft dark brown (7.5YR 3/3) and black (N 2.5/0) iron-manganese concretions; few faint discontinuous clay films on faces of peds; strongly acid; clear smooth boundary.

Btg/E—24 to 28 inches; 85 percent light brownish gray (10YR 6/2) silt loam (Bt) and less than 15 percent light yellowish brown (2.5Y 6/3) silt (10YR 7/1 dry) (E); moderate fine subangular blocky structure; friable; few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulations; few distinct grayish brown (10YR 5/2) clay films on faces of peds; the E portion of this horizon is a silt loam clay depletion; few distinct soft brown and black iron-manganese concretions; strongly acid; clear smooth boundary.

Btg—28 to 46 inches; 60 percent light brownish gray (10YR 6/2) and 40 percent light olive brown (2.5Y 5/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulations; common distinct brown (7.5YR 5/2) and grayish brown (2.5Y 5/2) clay films on faces of peds; common distinct light brownish gray (2.5Y 6/2) clay depletions on faces of peds (N 7/0 dry); many distinct strong brown (7.5YR 4/6) concretions; strongly acid; clear smooth boundary.

2B't—46 to 63 inches; 60 percent strong brown (7.5YR 4/6) and 40 percent light olive brown (2.5Y 5/3) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; many coarse distinct light brownish gray (10YR 6/2) iron depletions; few distinct brown (7.5YR 5/2) and gray (10YR 5/1) clay films and few distinct light gray (10YR 7/2) clay depletions; common distinct strong brown (7.5YR 4/6) and few prominent black (N 2.5/0) iron-manganese concretions; slight brittleness attributed to the concretions; strongly acid; gradual smooth boundary.

2BC—63 to 80 inches; strong brown (7.5YR 4/6) silt loam; weak medium subangular blocky structure; firm; common medium distinct light brownish gray (10YR 6/2) iron depletions; common distinct strong brown (7.5YR 4/6) and few prominent black (N 2.5/0) iron-manganese concretions; strongly acid.

Range in Characteristics

Solum thickness: 40 to 60 inches or more

Reaction: Unless limed, very strongly acid to moderately acid in the upper part of the profile and strongly acid to neutral in the lower part

Ap horizon:
- Hue—10YR
- Value—4
- Chroma—2 to 4
- Texture of the fine-earth fraction—silt loam

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6
- Chroma—4 or 6
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam or silty clay loam

Btg/E and Btg horizons:

Btg:
- Hue—10YR or 2.5Y
- Value—5 or 6
- Chroma—1 or 2
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam or silty clay loam

E:
- Hue—10YR or 2.5Y
- Value—6 or 7
- Chroma—2 or 3
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam or less commonly silt

2B't and 2BC horizons:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

BC horizon (where present):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

Collins Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Along creeks and streams
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Associated soils: Falaya, Iuka, Rosebloom, Vicksburg, and Waverly; Falaya soils are somewhat poorly drained, Rosebloom and Waverly soils are poorly drained, and Vicksburg soils are well drained; Iuka soils contain more sand throughout the profile and are coarse-loamy
Taxonomic class: Coarse-silty, mixed, acid, thermic Aquic Udifluvents

Typical Pedon

Collins silt loam, occasionally flooded; on a nearly level 1 percent slope in a cultivated field; 0.8 mile east of Mayfield city limits along Kentucky Highway 464; 1,000 feet east of the intersection of Mayfield Creek and Kentucky Highway 464, then about 1,500 feet due south into the field; Farmington 7.5 minute quadrangle, soil map sheet 23, east 1,162,900 feet and north 158,300 feet by the Kentucky coordinate grid system:

Ap1—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.
Ap2—7 to 12 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; very friable; few fine roots; few prominent black (N 2.5/0) carbonaceous stains throughout; very strongly acid; clear smooth boundary.
Bw—12 to 19 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) iron depletions; very strongly acid; clear smooth boundary.
C1—19 to 30 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; very few fine roots; many coarse distinct light brownish gray (10YR 6/2) iron depletions and few medium distinct yellowish brown (10YR 5/6) masses of iron accumulations; few distinct light gray (10YR 7/2) clay depletions throughout; very strongly acid; clear smooth boundary.
C2—30 to 42 inches; dark yellowish brown (10YR 4/4) silt loam; massive; friable; common medium distinct light brownish gray (10YR 6/2) iron depletions; few distinct light gray (10YR 7/2) clay depletions throughout; very strongly acid; clear smooth boundary.
C3—42 to 64 inches; 60 percent yellowish brown (10YR 5/4) and 40 percent light brownish gray (10YR 6/2) silt loam; massive; friable; common coarse distinct yellowish brown (10YR 5/6) masses of iron accumulations; very strongly acid.

Range in Characteristics

Solum thickness: 15 to 30 inches
Reaction: Unless limed, very strongly acid or strongly acid throughout the profile

Ap horizon:
Hue—10YR
Value—4
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam or less commonly loam

Bw and C horizons (and BC horizon where present):
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—6 or 7
Chroma—1 or 2
Redoximorphic features—shades of brown
Texture of the fine-earth fraction—silt or silt loam

The Collins soils in Graves County are taxadjuncts to the Collins series because they have a cambic subsoil horizon. This difference, however, does not affect the use and management of the soils. In this survey area, the Collins soils are coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts.

Falaya Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Slightly depressional areas along streams and creeks
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Associated soils: Collins, Iuka, Rosebloom, and Waverly; Collins soils are moderately well drained, and Rosebloom and Waverly soils are poorly drained; Iuka soils are moderately well drained and are coarse-loamy
Taxonomic class: Coarse-silty, mixed, acid, thermic Aeric Fluvaquents

Typical Pedon

Falaya silt loam, occasionally flooded; on a 1 percent smooth slope in a cultivated field; 1.2 miles east of Mayfield city limits; 3,500 feet northeast of the confluence of Vulton Creek and Mayfield Creek; 150 feet south of Kentucky Highway 1710 and 150 feet west of a small wooded area; Farmington 7.5 minute quadrangle, soil map sheet 23, east 1,164,700 feet and north 161,700 feet by the Kentucky coordinate grid system:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine roots; neutral; clear smooth boundary.
Bw—8 to 14 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure parting to moderate medium granular; friable; few fine roots; common fine distinct light brownish gray (10YR 6/2) iron depletions and few fine distinct strong brown (7.5YR 5/6) masses of iron accumulations; slightly acid; clear smooth boundary.
Bg—14 to 24 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; friable; common medium prominent brown (10YR 5/3) and strong brown (7.5YR 5/6) masses of iron accumulations; few distinct black (N 2.5/0) manganese or iron-manganese stains and concretions throughout; neutral; gradual smooth boundary.
Cg1—24 to 33 inches; light brownish gray (10YR 6/2) silt loam; massive; friable; common fine and medium prominent strong brown (7.5YR 4/6) masses of iron accumulations; few distinct black (N 2.5/0) manganese or iron-manganese stains and concretions throughout; very strongly acid; gradual smooth boundary.
Cg2—33 to 52 inches; gray (10YR 6/1) silt loam; massive; friable; few fine prominent dark brown (7.5YR 4/4) and common fine prominent yellowish brown (10YR 5/6) masses of iron accumulations; few distinct black (N 2.5/0) manganese or iron-manganese stains and concretions throughout; very strongly acid; clear smooth boundary.
Btb—52 to 63 inches; 60 percent brown (10YR 5/3) and 40 percent light brownish gray (10YR 6/2) silty clay loam; massive; firm; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulations; few distinct black (N 2.5/0) manganese or iron-manganese stains throughout; very strongly acid.

Range in Characteristics

Depth to dominant chroma of 2 or less: 14 to 20 inches
Reaction: Unless limed, very strongly acid or strongly acid throughout the profile

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Bg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Redoximorphic features—shades of brown, red, and gray
Texture of the fine-earth fraction—silt loam

Cg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Redoximorphic features—shades of brown and yellow
Texture of the fine-earth fraction—silt loam

Btb horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

Feliciana Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Narrow ridgetops and upper side slopes
Parent material: Thick loess
Slope range: 2 to 12 percent
Associated soils: Brandon, Loring, Purchase, Providence, and Smithdale; Brandon soils occur on lower side slopes and contain a gravelly substratum underlying a thin mantle of loess; Loring soils have a fragipan; Purchase and Providence soils are generally on lower side slopes and contain a fragipan; Smithdale soils are on steeper side slopes and formed in loamy Coastal Plain sediments
Taxonomic class: Fine-silty, mixed, thermic Ultic Hapludalfs

Typical Pedon

Feliciana silt loam, 6 to 12 percent slopes, eroded (fig. 17); on a narrow convex ridgetop averaging 7 percent slope in a meadow of fescue; about 2 miles southwest of Lynnville; 1,300 feet south-southwest of Rhodes Chapel Church; Lynnville 7.5 minute quadrangle, soil map sheet 43, east 1,165,400 feet and north 87,000 feet by the Kentucky coordinate grid system:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; about 10 percent B horizon material; moderate fine and medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

Bt1—7 to 19 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark brown (7.5YR 4/3) clay films on faces of peds; few prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; neutral; gradual smooth boundary.

Bt2—19 to 31 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark brown (7.5YR 4/3) clay films on faces of peds; common prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; strongly acid; gradual smooth boundary.

Bt3—31 to 53 inches; strong brown (7.5YR 4/6) silt loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark brown (7.5YR 4/3) clay films on faces of peds and few distinct pale brown (10YR 6/3) clay depletions along ped faces; few prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; strongly acid; gradual wavy boundary.

2BC—53 to 66 inches; brown (7.5YR 4/4) silt loam; weak coarse subangular blocky structure; friable; few distinct pale brown (10YR 6/3) clay depletions along ped faces; few prominent black (N 2.5/0) manganese or iron-manganese stains; strongly acid.

Range in Characteristics

Solum thickness: 48 to 80 inches
Reaction: Unless limed, very strongly acid to moderately acid

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 or 6
Texture of the fine-earth fraction—silt loam or silty clay loam

2BC horizon (and 2C horizon where present):
Hue—7.5YR
Value—4 or 5
Chroma—4 or 6
Texture of the fine-earth fraction—silt loam

Grenada Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragipan and slow in the fragipan
Landform: Uplands
Position on the landform: Broad summits
Parent material: Thick loess
Slope range: 0 to 6 percent
Associated soils: Calloway, Center, Feliciana, Loring, Purchase, and Routon; Calloway soils are somewhat poorly drained, and Routon soils are poorly drained; Feliciana soils are well drained and do not have a fragipan; Center and Routon soils are on stream terraces and contain argillic horizons without a fragipan; Loring soils occur on narrower ridges and side slopes and do not have a glossic horizon; Purchase soils occur on side slopes and are shallow to the fragipan
Taxonomic class: Fine-silty, mixed, thermic Glossic Fragiudalfs

Typical Pedon

Grenada silt loam, 0 to 2 percent slopes (fig. 18); on a

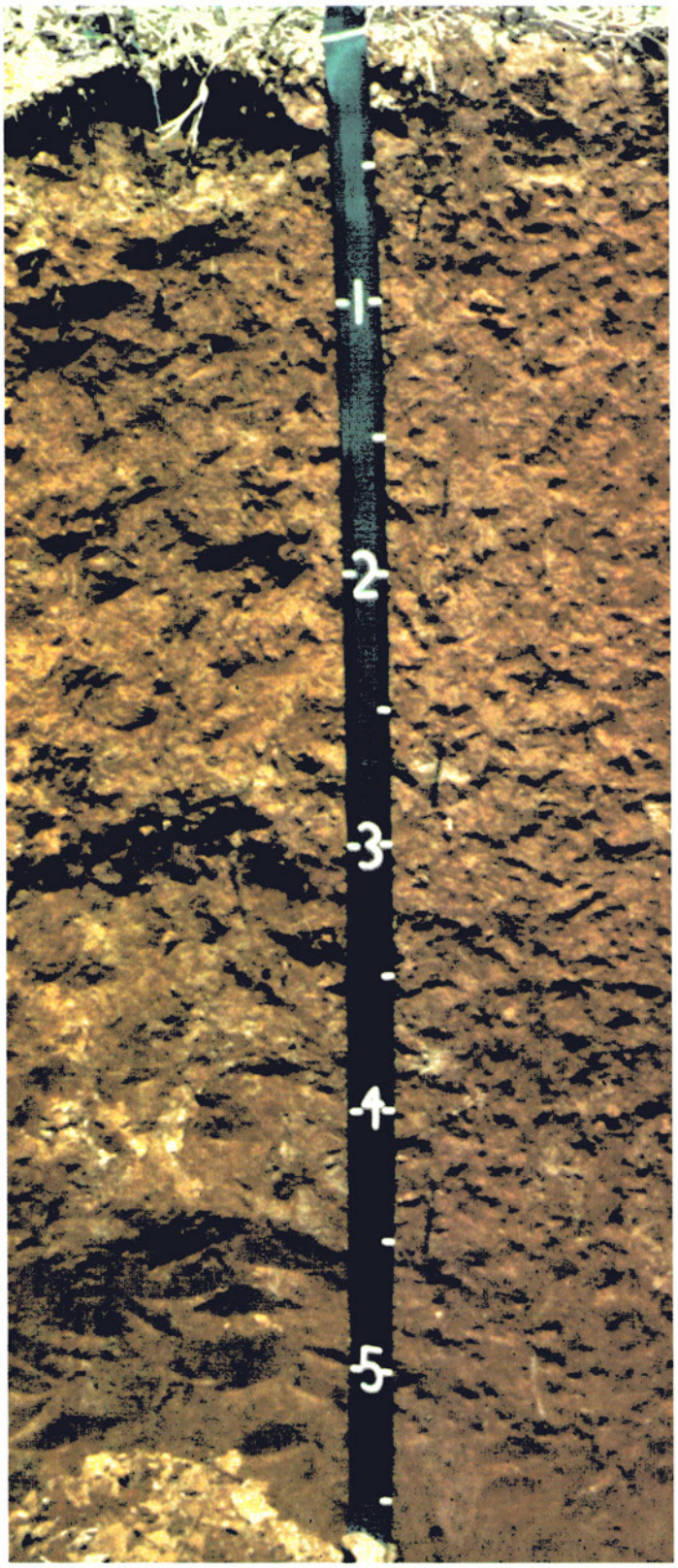


Figure 17.—Profile of Feliciana silt loam, eroded. This very deep soil is well drained with a well developed argillic horizon from 7 to 53 inches. Depth is marked in feet.

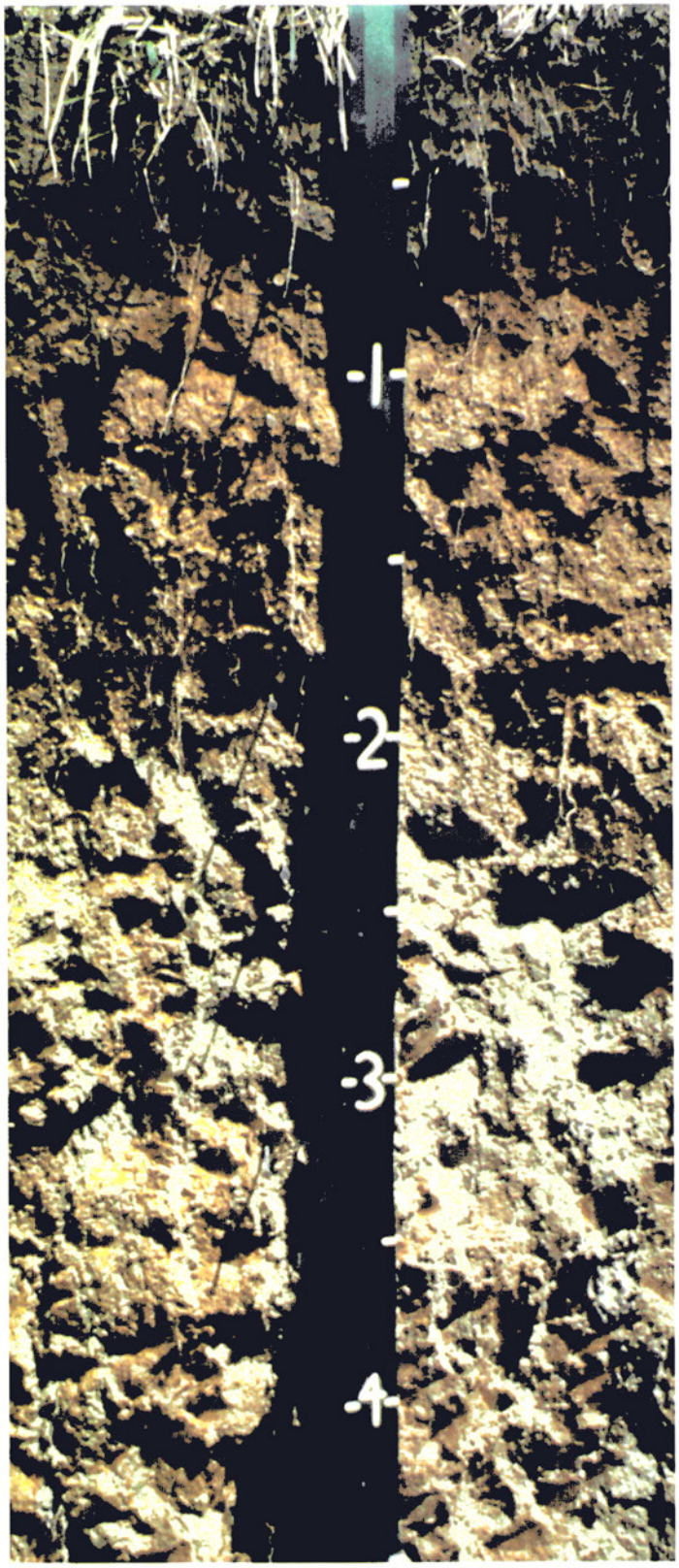


Figure 18.—Profile of Grenada silt loam. This soil contains fragic properties at about 2 feet, which restrict plant roots and water movement. Depth is marked in feet.

smooth 1 percent slope in a meadow of fescue; 1.8 miles due north of Lynnville; 0.6 mile east of the intersection of Kentucky Highway 381 and Vealsburg-Gus Moffitt Road, then about 900 feet south of Gus Moffitt Road along a fencerow, and about 30 feet east of the fencerow; Lynnville 7.5 minute quadrangle, soil map sheet 35, east about 1,172,300 feet and north about 104,800 feet by the Kentucky coordinate grid system:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; many fine roots; moderately acid; abrupt smooth boundary.

BA—7 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.

Bw—13 to 21 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; few fine distinct pale brown (10YR 6/3) iron depletions; few distinct soft brown and black iron-manganese stains; strongly acid; abrupt wavy boundary.

E/Bt—21 to 28 inches; 65 percent light brownish gray (10YR 6/2) silt loam (E) and 35 percent yellowish brown (10YR 5/6) silty clay loam (Bt); moderate fine and medium subangular blocky structure; friable; common fine roots; few distinct brown (7.5YR 4/3) clay films on faces of peds; the E portion of this horizon consists of tongues of silt loam clay depletions; few distinct soft brown and black iron-manganese stains; very strongly acid; clear irregular boundary.

Btx1—28 to 38 inches; 35 percent yellowish brown (10YR 5/6), 35 percent light brownish gray (10YR 6/2), and 30 percent brown (7.5YR 4/4) silt loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; very few fine roots occupying gray zones between prisms; common distinct brown (7.5YR 4/3) clay films on faces of peds; the areas of brown color are iron accumulations, and the areas of gray color are iron depletions; common distinct black (N 2.5/0) manganese stains; strongly acid; gradual wavy boundary.

Btx2—38 to 66 inches; brown (7.5YR 4/4) silt loam; moderate very coarse prismatic structure; very firm; compact and brittle; very few fine roots occupying gray zones between prisms; few distinct brown (7.5YR 4/3) clay films throughout; common medium prominent light brownish gray (10YR 6/2) iron depletions; common distinct black (N 2.5/0) manganese stains; strongly acid; gradual wavy boundary.

Bx—66 to 80 inches; brown (7.5YR 4/4) silt loam; moderate very coarse prismatic structure; very firm; compact and brittle; common medium prominent light brownish gray (10YR 6/2) iron depletions; many prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; strongly acid.

Range in Characteristics

Solum thickness: 60 to 80 inches or more
Depth to fragipan: 24 to 38 inches
Reaction: Unless limed, very strongly acid to moderately acid in the upper part of the solum and strongly acid to neutral in the lower part

Ap and BA horizons:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—4 or 6
Redoximorphic features—shades of brown
Texture of the fine-earth fraction—silt loam

E/Bt horizon:
E:
Hue—10YR or 2.5Y
Value—6 or 7
Chroma—2 or 3
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silt
Bt:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

Btx horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

Bx horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Iuka Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Along streams and creeks
Parent material: Loamy alluvium
Slope range: 0 to 2 percent
Associated soils: Collins, Falaya, and Vicksburg; Collins soils are coarse-silty; Falaya soils are somewhat poorly drained and coarse-silty, and Vicksburg soils are well drained and coarse-silty
Taxonomic class: Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents

Typical Pedon

Iuka silt loam, in an area of Collins-Iuka complex, occasionally flooded; on a smooth slope of 1 percent in a cultivated field; 3.3 miles southwest of the junction of Kentucky Highways 303 and 94 south of Cuba; 4,000 feet north of the Kentucky-Tennessee state line; 1,100 feet northeast of Foy Cemetery and 600 feet west of Old Knob Creek; Cuba 7.5 minute quadrangle, soil map sheet 42, east 1,149,100 feet and north 78,500 feet by the Kentucky coordinate grid system:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.
Bw1—9 to 15 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; very friable; few fine roots; few fine distinct light brownish gray (10YR 6/2) iron depletions and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulations; strongly acid; clear smooth boundary.
Bw2—15 to 27 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; very friable; very few fine roots; common fine distinct light brownish gray (10YR 6/2) iron depletions and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulations; strongly acid; clear smooth boundary.
C—27 to 65 inches; yellowish brown (10YR 5/4) sandy loam; massive; very friable; common medium distinct light brownish gray (10YR 6/2) iron depletions and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulations; strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches
Reaction: Unless limed, very strongly acid or strongly acid throughout the profile

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam, loam, or fine sandy loam

Bw horizon:
Hue—10YR
Value—4 to 6
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam, loam, or sandy loam

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam, loam, or sandy loam

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—loam or sandy loam

The Iuka soils in Graves County are taxadjuncts to the Iuka series because they have a cambic subsoil horizon. This difference, however, does not affect the use and management of the soils. In this survey area, the Iuka soils are coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts.

Kurk Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part of the solum and moderately slow in the lower part
Landform: Stream terraces and near the head of upland drainageways
Position on the landform: Slightly concave depressional areas
Parent material: Silty alluvium and loess
Slope range: 0 to 2 percent
Associated soils: Center and Routon soils on stream terraces and Collins, Falaya, and Waverly soils on flood plains; Center soils are moderately well drained, and Routon soils are poorly drained; Collins, Falaya, and Waverly soils do not have argillic horizons
Taxonomic class: Fine-silty, mixed, thermic Aeric Epiaqualfs

Typical Pedon

Kurk silt loam, 0 to 2 percent slopes (fig. 19); on a smooth 1 percent slope in a cultivated field; 1.8 miles north of Sedalia; 2,100 feet east of the junction of Ford Creek and Kentucky Highway 97; Farmington 7.5 minute quadrangle, soil map sheet 31, east 1,162,100 feet and north 134,200 feet by the Kentucky coordinate grid system:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; neutral; clear smooth boundary.

BE—8 to 16 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; common fine roots; common medium distinct light brownish gray (10YR 6/2) iron depletions and common medium distinct brown (7.5YR 4/3) masses of iron accumulations; common prominent black (N 2.5/0) iron-manganese stains on faces of peds; moderately acid; clear smooth boundary.

Btg1—16 to 31 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulations; common distinct pale brown (10YR 6/3) clay depletions along ped faces and common distinct grayish brown (10YR 5/2) clay films in root channels and pores; common prominent black (N 2.5/0) iron-manganese stains and concretions; strongly acid; gradual smooth boundary.

Btg2—31 to 38 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; many medium prominent gray (10YR 6/1) iron depletions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulations; many distinct gray (10YR 5/1) clay films in root channels and pores; common prominent black (N 2.5/0) iron-manganese stains and soft brown (7.5YR 4/6) concretions; very strongly acid; clear smooth boundary.

2Bt1—38 to 55 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm; very few fine roots; common coarse prominent light brownish gray (10YR 6/2) iron depletions; common distinct gray (10YR 5/1) clay films in root channels; common prominent black (N 2.5/0) iron-manganese stains; strongly acid.

2Bt2—55 to 65 inches; yellowish brown (10YR 5/6) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; very few fine roots; common coarse prominent light brownish gray (10YR 6/2) iron depletions; common distinct gray (10YR 5/1) and grayish brown (2.5Y 5/2) clay films in root channels; common prominent black (N 2.5/0) carbonaceous stains along old root channels; strongly acid; gradual smooth boundary.

2BC—65 to 80 inches; strong brown (7.5YR 4/6) silt loam; weak medium subangular blocky structure; firm; few fine distinct pale brown (10YR 6/3) iron depletions; moderately acid.

Range in Characteristics

Solum thickness: 60 to 80 inches or more
Depth to dominant chroma of 2 or less: 14 to 20 inches
Reaction: Unless limed, strongly acid to slightly acid in the upper part of the solum and strongly acid to moderately acid in the lower part

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

BE horizon (and Bt horizon where present):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Btg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

2Bt and 2BC horizons (and 2Btx horizon if it occurs):
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

Loring Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Landform: Uplands
Position on the landform: Ridgetops and side slopes
Parent material: Thick loess
Slope range: 2 to 12 percent
Associated soils: Brandon, Calloway, Feliciana, Grenada, Providence, Purchase, and Smithdale; Brandon soils are well drained and contain a thin loess mantle

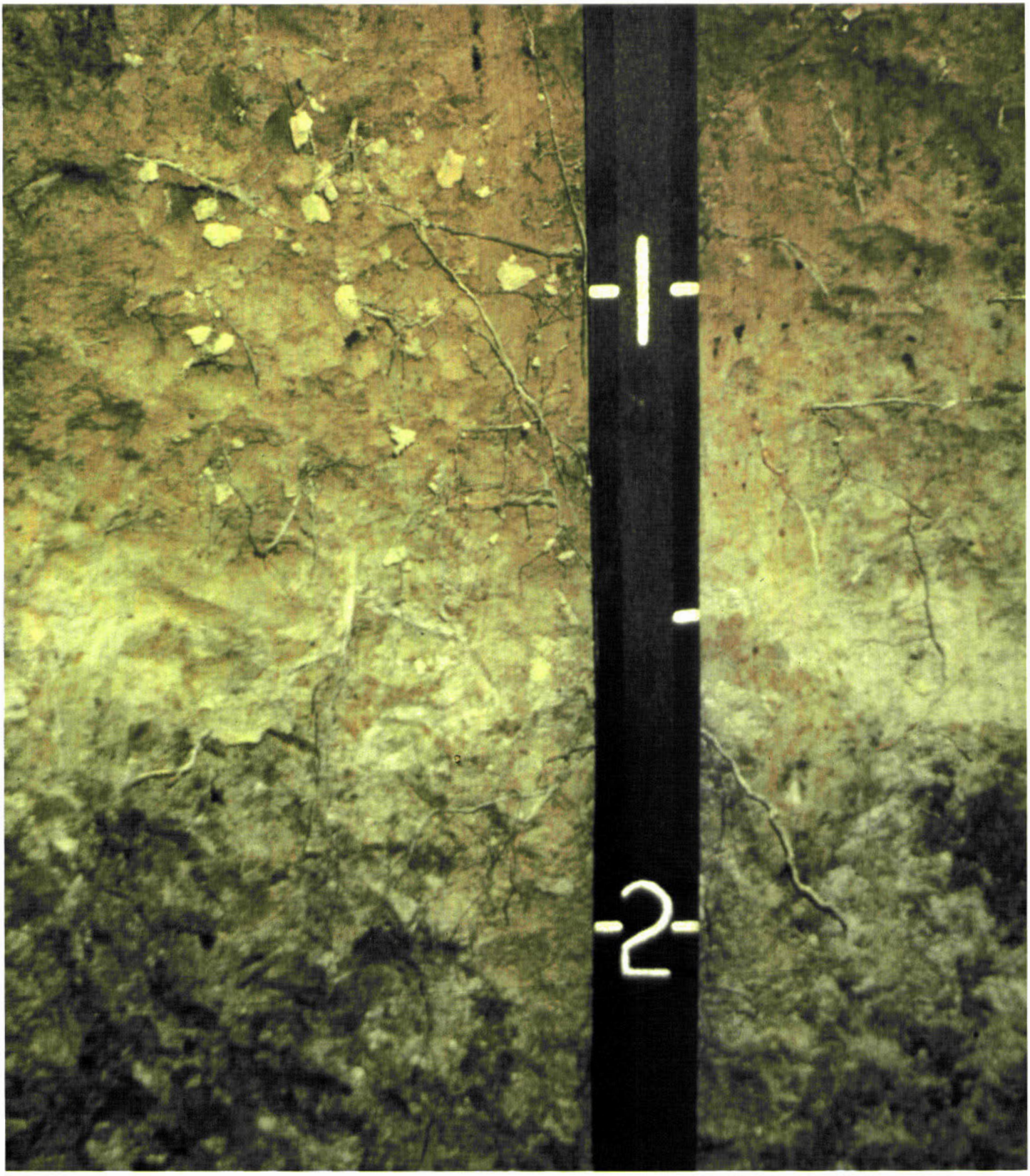


Figure 19.—Profile of Kurk silt loam. This soil has an aquic moisture regime with a seasonally perched water table ranging from 1 foot to 1½ feet during late winter and early spring. Depth is marked in feet.

overlying gravelly deposits; Calloway soils are somewhat poorly drained; Feliciana soils are well drained and do not contain a fragipan; Grenada soils occupy broader upland summits and contain a glossic horizon; Providence soils formed in less than 4 feet of loess and are underlain by loamy Coastal Plain sediments; Purchase soils occur on similar positions but are shallow or very shallow to the fragipan; Smithdale soils formed in loamy Coastal Plain sediments

Taxonomic class: Fine-silty, mixed, thermic Oxyaquic Fragiudalfs

Typical Pedon

Loring silt loam, 2 to 6 percent slopes, eroded; on a slightly convex ridgetop with 3 percent slope in a meadow of fescue; 2.2 miles southwest of Wingo along U.S. Highway 45; 1.1 miles west of the junction of U.S. Highway 45 and Grissom Road; 2,200 feet west past the Purchase Parkway overpass along Grissom Road, then southwest 800 feet along the crest of the ridge; Water Valley 7.5 minute quadrangle, soil map sheet 33, east 1,108,000 feet and north 118,200 feet by the Kentucky coordinate grid system:

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

BA—4 to 9 inches; dark yellowish brown (10YR 4/6) silt loam; weak medium subangular blocky structure; friable; common fine roots; neutral; clear smooth boundary.

Bt—9 to 22 inches; strong brown (7.5YR 4/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; few faint brown clay films on faces of peds; moderately acid; clear smooth boundary.

Btx1—22 to 35 inches; strong brown (7.5YR 4/6) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; very firm; very few fine roots in gray zones between prisms; many coarse prominent light brownish gray (10YR 6/2) and pale brown (10YR 6/3) iron depletions; many distinct brown (7.5YR 4/3) clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btx2—35 to 49 inches; strong brown (7.5YR 4/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; compact and brittle; very few fine roots in gray zones between prisms; common coarse prominent light brownish gray (10YR 6/2) iron depletions; common distinct brown (7.5YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

BC—49 to 66 inches; strong brown (7.5YR 4/6) silt loam; moderate medium platy structure; friable; common medium prominent light brownish gray (10YR 6/2) iron depletions; moderately acid.

Range in Characteristics

Solum thickness: 60 to 80 inches or more
Depth to fragipan: 20 to 35 inches
Reaction: Unless limed, very strongly acid to moderately acid

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

BA horizon (and BE horizon where present):
Hue—10YR
Value—4 or 5
Chroma—4 or 6
Texture of the fine-earth fraction—silt loam

Bt and Btx horizons (and Bx horizon where present):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

BC horizon (and C horizon where present):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Natalbany Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Stream terraces
Position on the landform: Nearly level to slightly concave positions
Parent material: Slackwater alluvium or lacustrine deposit
Slope range: 0 to 2 percent
Associated soils: Center, Kurk, Rosebloom, and Routon; these soils contain less clay throughout the profile and do not have vertic properties; Center and Kurk soils are better drained; Rosebloom soils occur on adjacent lower lying flood plains
Taxonomic class: Fine, montmorillonitic, thermic Vertic Epiaqualfs

Typical Pedon

Natalbany silt loam, 0 to 2 percent slopes; in a nearly level

forest of pin oak, shagbark hickory, and cherrybark oak; 1.7 miles southeast of Hardmoney near the McCracken County line; 1 mile due south of the intersection of the Graves-McCracken County line and Kentucky Highway 348, then due east 600 feet into the woods; Symsonia 7.5 minute quadrangle, soil map sheet 3, east about 1,178,900 feet and north 228,800 feet by the Kentucky coordinate grid system:

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; friable; many fine and common medium roots; common medium distinct gray (10YR 6/1) iron depletions and common medium distinct strong brown (7.5YR 5/6) masses of iron accumulations; strongly acid; clear smooth boundary.

Btg1—3 to 19 inches; gray (10YR 6/1) silty clay loam; moderate coarse subangular blocky structure; firm; common fine and few medium roots; many medium prominent strong brown (7.5YR 5/6) and common medium distinct yellowish brown (10YR 5/6) masses of iron accumulations; few distinct light gray (10YR 7/1) clay depletions and common distinct gray (10YR 5/1) clay films on faces of peds; few prominent dark brown (7.5YR 3/3) iron-manganese concretions; strongly acid; clear smooth boundary.

Btg2—19 to 25 inches; gray (10YR 5/1) silty clay; moderate coarse subangular blocky structure parting to strong medium angular blocky; very firm; few fine roots; many medium prominent strong brown (7.5YR 5/6) and few fine distinct yellowish red (5YR 5/8) masses of iron accumulations; few faint clay films on faces of peds; few prominent brown (7.5YR 4/3) iron-manganese concretions; 3-millimeter wide vertical desiccation cracks; common pressure faces; strongly acid; gradual smooth boundary.

BCg—25 to 37 inches; gray (10YR 5/1) clay; weak coarse subangular blocky structure; extremely firm; very few fine roots; many medium prominent strong brown (7.5YR 5/6) and few fine distinct yellowish red (5YR 5/8) masses of iron accumulations; few prominent brown (7.5YR 4/3) iron-manganese concretions; 10-millimeter wide vertical desiccation cracks; common pressure faces; strongly acid; gradual smooth boundary.

C—37 to 65 inches; olive brown (2.5Y 4/4) clay; massive; breaks to angular blocks containing pressure faces; extremely firm; many medium distinct gray (10YR 5/1) iron depletions and many medium prominent yellowish brown (10YR 5/6) masses of iron accumulations; 10-millimeter wide vertical desiccation cracks; less than 1 percent 15-millimeter gravel; moderately acid.

Range in Characteristics

Solum thickness: 36 to 60 inches
Depth to dominant chroma of 2 or less: 0 to 6 inches
Depth to vertic properties: 20 to 40 inches
Reaction: Unless limed, strongly acid to neutral

A horizon:
Hue—10YR
Value—3 to 5
Chroma—1 or 2
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Redoximorphic features—shades of brown, red, or gray
Texture of the fine-earth fraction—silty clay loam, silty clay, or clay

BCg horizon (and Cg horizon where present):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silty clay or clay

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silty clay or clay

Providence Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate above the fragipan and moderately slow in the fragipan
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loess over loamy Coastal Plain sediments
Slope range: 6 to 20 percent
Associated soils: Feliciana, Loring, Purchase, and Smithdale; Feliciana, Loring, and Purchase soils formed in more than 4 feet of loess; Smithdale soils formed entirely in loamy Coastal Plain sediments and do not have a fragipan
Taxonomic class: Fine-silty, mixed, thermic Typic Fragiudalfs

Typical Pedon

Providence silt loam, in an area of Providence-Smithdale complex, 12 to 20 percent slopes, severely eroded; on a linear side slope with 15 percent slope in a forest of red

oak, white oak, yellow poplar, and hickory; 2.5 miles southeast of Pilot Oak and 1.4 miles north of the Kentucky-Tennessee state line; 1.5 miles north-northwest of the confluence of Blackamore Creek and Knob Creek; Cuba 7.5 minute quadrangle, soil map sheet 42, east 1,137,300 feet and north 82,300 feet by the Kentucky coordinate grid system:

A—0 to 2 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

E—2 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt—8 to 22 inches; strong brown (7.5YR 4/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct brown (7.5YR 4/3) clay films throughout; very strongly acid; clear wavy boundary.

Btx1—22 to 31 inches; brown (7.5YR 4/4) silt loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; very few fine roots; common distinct (7.5YR 4/3) clay films throughout; many medium prominent light brownish gray (10YR 6/2) iron depletions; common prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; very strongly acid; clear smooth boundary.

2Btx2—31 to 42 inches; brown (7.5YR 4/4) silt loam; weak coarse prismatic structure parting to moderate medium angular blocky; very firm; compact and brittle; very few fine roots in gray zones; common distinct brown (7.5YR 4/3) clay films in pores and root channels; common medium prominent light brownish gray (10YR 6/2) iron depletions; common prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; noticeable increase in sand content compared to the horizon above; strongly acid; gradual smooth boundary.

2Btx3—42 to 51 inches; brown (7.5YR 4/4) loam; weak very coarse prismatic structure; very firm; compact and brittle; very few fine roots; common distinct brown (7.5YR 4/3) clay films in pores and root channels; common prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; strongly acid; clear smooth boundary.

2B't—51 to 62 inches; yellowish red (5YR 4/6) sandy loam with pockets of pale brown (10YR 6/3) loamy sand; weak coarse subangular blocky structure; firm; common distinct reddish brown (5YR 4/4) clay films bridging sand grains; common prominent black (N 2.5/0) manganese or iron-manganese stains on faces of peds; moderately acid; gradual smooth boundary.

2BC—62 to 75 inches; yellowish red (5YR 4/6) sandy loam with pockets of pale brown (10YR 6/3) loamy sand; weak coarse subangular blocky structure; firm; moderately acid.

Range in Characteristics

Solum thickness: 45 to 80 inches or more
Depth to fragipan: 20 to 36 inches
Reaction: Unless limed, very strongly acid to moderately acid

A or Ap horizon:
- Hue—10YR
- Value—4 or 5
- Chroma—2 to 4
- Texture of the fine-earth fraction—silt loam

E horizon:
- Hue—10YR
- Value—4 to 6
- Chroma—3 or 4
- Texture of the fine-earth fraction—silt loam

Bt horizon:
- Hue—7.5YR or 10YR
- Value—4 or 5
- Chroma—4 or 6
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam or silty clay loam

Btx horizon:
- Hue—5YR or 7.5YR
- Value—4 or 5
- Chroma—4 or 6
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam or silty clay loam

2Btx horizon:
- Hue—5YR or 7.5YR
- Value—4 or 5
- Chroma—4 or 6
- Redoximorphic features—shades of brown and gray
- Texture of the fine-earth fraction—silt loam, loam, clay loam, and sandy clay loam

2B't and 2BC horizons:
- Hue—5YR or 7.5YR
- Value—4 or 5
- Chroma—4 or 6
- Texture of the fine-earth fraction—loam, sandy loam, clay loam, and sandy clay loam

Purchase Series

Depth class: Very deep
Drainage class: Moderately well drained to well drained
Permeability: Slow
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loess
Slope range: 4 to 20 percent
Associated soils: Brandon, Feliciana, Grenada, Loring, and Providence; Brandon soils are well drained and contain a thin loess mantle overlying gravelly deposits; Feliciana soils are well drained and do not contain a fragipan; Grenada soils occur on broader upland summits and contain glossic horizons; Loring soils are deeper to the fragipan; Providence soils formed in less than 4 feet of loess and are underlain by loamy Coastal Plain sediments
Taxonomic class: Coarse-silty, mixed, thermic Ochreptic Fragiudalfs

Typical Pedon

Purchase silt loam (fig. 20), in an area of Purchase-Loring complex, 6 to 12 percent slopes, severely eroded; on a 10 percent linear side slope in a fescue meadow; 2.2 miles southwest of Wingo along the Purchase Parkway and 3,000 feet west of the junction of the Purchase Parkway and Grissom Road; Water Valley 7.5 minute quadrangle, soil map sheet 33, east 1,108,100 feet and north 119,300 feet by the Kentucky coordinate grid system:

Ap—0 to 7 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure and moderate fine subangular blocky; friable; many fine roots; moderately acid; abrupt smooth boundary.

Btx—7 to 31 inches; strong brown (7.5YR 4/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; very firm; compact and brittle; very few fine roots in vertical seams between prisms; common medium prominent light brownish gray (10YR 6/2) iron depletions; common distinct pale brown (10YR 6/3) clay depletions and common distinct brown (7.5YR 5/3) clay films on faces of peds; few prominent black (N 2.5/0) stains (Fe & Mn oxides); very strongly acid; gradual smooth boundary.

Bx—31 to 51 inches; strong brown (7.5YR 4/6) silt loam; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; compact and brittle; many medium prominent light olive brown (2.5Y 5/3) and common medium prominent light brownish gray (10YR 6/2) iron and clay depletions; many prominent black (N 2.5/0) stains (Fe & Mn oxides); strongly acid; gradual smooth boundary.

BC—51 to 72 inches; brown (7.5YR 4/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common medium prominent light brownish gray (10YR 6/2) iron and clay depletions; moderately acid.

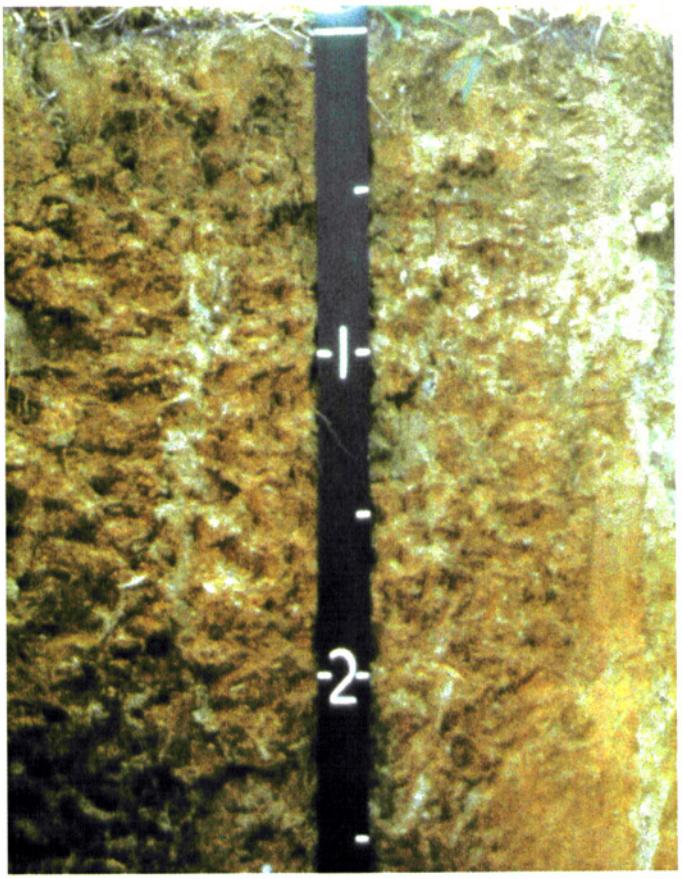


Figure 20.—Profile of Purchase silt loam. This soil has a layer that restricts water movement and root penetration at about 1 foot below the surface. Depth is marked in feet.

Range in Characteristics

Solum thickness: 60 to 80 inches or more
Depth to fragipan: 5 to 20 inches
Reaction: Unless limed, moderately acid to very strongly acid in the upper part of the solum and moderately acid to strongly acid in the lower part

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—3, 4, or 6
Texture of the fine-earth fraction—silt loam

Btx and Bx horizons:
Hue—10YR or 7.5YR
Value—4 or 5

Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or silty clay loam

BC horizon (and C horizon where present):
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam or loam

BE and Bw horizons (if they occur):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Rosebloom Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Nearly level to slightly concave depressions
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Associated soils: Collins, Falaya, and Routon; Collins soils are moderately well drained, and Falaya soils are somewhat poorly drained; Routon soils are on stream terraces and contain an argillic horizon
Taxonomic class: Fine-silty, mixed, acid, thermic Typic Fluvaquents

Typical Pedon

Rosebloom silt loam, frequently flooded; on a nearly level smooth slope in a forest of green ash, swamp white oak, sweetgum, box elder, and bald cypress; 700 feet southeast of the intersection of the West Fork Clarks River and Kentucky Highway 131 at Kaler; Symsonia 7.5 minute quadrangle, soil map sheet 7, east 1,180,900 feet and north 212,300 feet by the Kentucky coordinate grid system:

A—0 to 5 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; common fine roots; few fine distinct light brownish gray (10YR 6/2) iron depletions and common fine prominent yellowish red (5YR 4/6) masses of iron accumulations; strongly acid; abrupt smooth boundary.
Bg1—5 to 14 inches; light brownish gray (10YR 6/2) silt loam; weak fine subangular blocky structure; friable; many medium prominent dark red (2.5YR 3/6) and common fine prominent yellowish red (5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains and soft concretions; very strongly acid; clear smooth boundary.
Bg2—14 to 26 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; firm; many medium prominent dark red (2.5YR 3/6) and common fine prominent yellowish red (5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains and concretions; very strongly acid; clear smooth boundary.
Bg3—26 to 38 inches; 55 percent light brownish gray (10YR 6/2) and 45 percent grayish brown (2.5Y 5/2) silty clay loam; weak medium subangular blocky structure; firm; many medium prominent dark red (2.5YR 3/6) and common fine prominent yellowish red (5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains and few soft concretions; very strongly acid; clear smooth boundary.
Cg—38 to 60 inches; gray (10YR 6/1) silt loam; massive; firm; many coarse prominent dark red (2.5YR 3/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains and few soft concretions; very strongly acid.

Range in Characteristics

Depth to dominant chroma of 2 or less: Directly below the surface layer
Reaction: Unless limed, very strongly acid or strongly acid throughout the profile

A horizon:
Hue—10YR
Value—4 to 6
Chroma—1 to 3
Redoximorphic features—shades of brown, red, and gray
Texture of the fine-earth fraction—Silt loam

Bg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Redoximorphic features—shades of brown, yellow, and red
Texture of the fine-earth fraction—Silt loam or silty clay loam

Cg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2

Redoximorphic features—shades of brown, yellow, and red
Texture of the fine-earth fraction—Silt loam

Routon Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Stream terraces and uplands
Position on the landform: Nearly level to slightly concave depressional areas
Parent material: Silty alluvium and loess
Slope range: 0 to 2 percent
Associated soils: Calloway, Center, Grenada, and Kurk soils on similar landforms and Collins, Falaya, and Waverly soils on adjacent flood plains; Calloway soils are somewhat poorly drained and have a fragipan, and Grenada soils are moderately well drained and have a fragipan; Center soils are moderately well drained, and Kurk soils are somewhat poorly drained; Collins, Falaya, and Waverly soils do not have an argillic horizon
Taxonomic class: Fine-silty, mixed, thermic Typic Epiaqualfs

Typical Pedon

Routon silt loam, 0 to 2 percent slopes; in a nearly level forest of cherrybark oak, shagbark hickory, red maple, and sweetgum; 1.5 miles northeast of Hickory; north from Pleasant Grove Church about 0.56 mile along the Mayfield-Paducah Road, then due west about 3,000 feet; Westplains 7.5 minute quadrangle, soil map sheet 15, east 1,159,700 feet and north 194,700 feet by the Kentucky coordinate grid system:

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; very friable; many fine and common medium roots; common fine distinct grayish brown (10YR 5/2) iron depletions; very strongly acid; clear smooth boundary.
Eg—4 to 17 inches; light brownish gray (10YR 6/2) silt loam; moderate fine and medium subangular blocky structure; friable; many fine and common medium roots; common medium prominent strong brown (7.5YR 5/6) and few fine distinct yellowish brown (10YR 5/6) masses of iron accumulations; few prominent dark brown (7.5YR 3/2) concretions; very strongly acid; clear smooth boundary.
Btg1—17 to 33 inches; light brownish gray (10YR 6/2) silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots; common medium distinct yellowish brown (10YR 5/6) and many medium prominent (7.5YR 5/6) masses of iron accumulations; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few prominent black (N 2.5/0) manganese stains and concretions; very strongly acid; clear smooth boundary.
Btg2—33 to 42 inches; gray (10YR 6/1) silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many fine prominent dark brown (7.5YR 4/3) and common fine prominent strong brown (7.5YR 5/6) masses of iron accumulations; few distinct grayish brown (10YR 5/2) clay films on faces of peds; common prominent black (N 2.5/0) manganese stains and soft dark brown (7.5YR 4/3) concretions; very strongly acid; clear smooth boundary.
Btg3—42 to 52 inches; gray (10YR 6/1) silty clay loam; moderate medium subangular blocky structure; firm; very few fine roots; many distinct gray (10YR 5/1) clay films throughout; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains and soft dark brown (7.5YR 4/3) concretions; very strongly acid; clear wavy boundary.
Btx—52 to 65 inches; 50 percent gray (10YR 6/1) and 50 percent strong brown (7.5YR 5/6) silt loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; 20 percent brittleness; very few fine roots; common distinct brown (7.5YR 5/2) clay films; common prominent black (N 2.5/0) manganese stains; the areas of brown color are iron accumulations, and the areas of gray color are iron depletions; strongly acid; clear smooth boundary.
C—65 to 74 inches; yellowish brown (10YR 5/4) silt loam; massive; firm; common medium distinct light brownish gray (10YR 6/2) iron depletions and few fine distinct (7.5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains; strongly acid.

Range in Characteristics

Solum thickness: 40 to 65 inches
Depth to dominant chroma of 2 or less: 0 to 10 inches
Reaction: Unless limed, very strongly acid to moderately acid

A horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—6 or 7
Chroma—1 or 2

Redoximorphic features—shades of brown
Texture of the fine-earth fraction—silt loam

Btg horizon:
Hue—10YR or 2.5Y
Value—6 or 7
Chroma—1 or 2
Redoximorphic features—shades of brown and red
Texture of the fine-earth fraction—silt loam or silty clay loam

Btx horizon:
Hue—10YR
Value—5 or 6
Chroma—1 or 2
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

C horizon (and BC horizon where present):
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2, 3, 4, or 6
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam

Saffell Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands and to a limited extent on old stream terraces
Position on the landform: Side slopes
Parent material: Gravelly Continental deposits
Slope range: 2 to 55 percent
Associated soils: Brandon and Smithdale; Brandon soils contain a loess mantle overlying the gravelly deposits and are fine-silty; Smithdale soils formed in thick loamy Coastal Plain sediments and are fine-loamy
Taxonomic class: Loamy-skeletal, siliceous, thermic Typic Hapludults

Typical Pedon

Saffell fine sandy loam (fig. 21), in an area of Brandon-Saffell-Smithdale complex, 20 to 35 percent slopes, eroded; on a 28 percent convex side slope in a forest of white oak, white ash, hickory, and black oak; 2.9 miles northwest of Lowes; 2,400 feet north of the confluence of Brush Creek and Little Brush Creek; Lovelaceville 7.5 minute quadrangle, soil map sheet 1, east 1,111,300 feet and north 229,600 feet by the Kentucky coordinate grid system:

A—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate fine granular structure; very friable; many fine roots; 2 percent gravel; neutral; abrupt smooth boundary.
E—3 to 14 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; common fine roots; 5 percent gravel; strongly acid; clear smooth boundary.
Bt1—14 to 21 inches; yellowish red (5YR 4/6) gravelly sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct reddish brown (5YR 4/3) clay films on faces of peds and in pores; 15 percent gravel; strongly acid; gradual wavy boundary.
Bt2—21 to 32 inches; strong brown (7.5YR 4/6) extremely gravelly sandy clay loam; weak fine subangular blocky structure; friable; few fine roots; few distinct reddish brown (5YR 4/3) clay films on faces of peds and gravel; 65 percent gravel; very strongly acid; gradual wavy boundary.
C—32 to 65 inches; strong brown (7.5YR 4/6) extremely gravelly sandy loam; single grained; friable; 80 percent gravel; strongly acid.

Range in Characteristics

Solum thickness: 32 to 60 inches
Kind of rock fragments: Gravel
Reaction: Unless limed, very strongly acid to strongly acid

A horizon:
Hue—10YR
Value—4
Chroma—2 to 4
Texture of the fine-earth fraction—sandy loam or fine sandy loam
Rock fragment content—1 to 20 percent

E horizon (or BE horizon where present):
Hue—10YR
Value—4 or 5
Chroma—4
Texture of the fine-earth fraction—fine sandy loam or loam
Rock fragment content—5 to 25 percent

Bt horizon:
Hue—7.5YR or 5YR
Value—4 to 6
Chroma—4, 6, or 8
Texture of the fine-earth fraction—sandy clay loam, clay loam, or loam
Rock fragment content—15 to 65 percent

C horizon:
Hue—7.5YR or 5YR
Value—4 to 6
Chroma—4, 6, or 8

Texture of the fine-earth fraction—sandy loam or sandy clay loam
Rock fragment content—40 to 80 percent

BC horizon (if it occurs):
Hue—7.5YR or 5YR
Value—4 to 6
Chroma—4, 6, or 8
Texture of the fine-earth fraction—sandy loam or sandy clay loam
Rock fragment content—35 to 65 percent

Smithdale Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loamy Coastal Plain sediments
Slope range: 12 to 55 percent
Associated soils: Brandon, Feliciana, Loring, Providence, and Saffell; Brandon soils contain a thin loess mantle overlying gravelly Continental deposits; Feliciana and Loring soils formed in more than 4 feet of loess; Providence soils have a fragipan and contain a loess mantle overlying the loamy Coastal Plain sediments; Saffell soils formed in gravelly deposits and are in a loamy-skeletal family
Taxonomic class: Fine-loamy, siliceous, thermic Typic Hapludults

Typical Pedon

Smithdale sandy loam, 20 to 45 percent slopes, eroded (fig. 22); on a convex-linear side slope averaging 32 percent slope in a forest of white oak, yellow poplar, southern red oak, and hickory; about 2 miles southwest of Lynnville; 1,600 feet south-southwest of Rhodes Chapel Church; Lynnville 7.5 minute quadrangle, soil map sheet 43, east 1,165,700 feet and north 86,400 feet by the Kentucky coordinate grid system:

A—0 to 4 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; common fine and medium roots; trace of gravel; slightly acid; clear smooth boundary.
E—4 to 12 inches; light yellowish brown (10YR 6/4) sandy loam; weak fine subangular blocky structure; friable; common fine roots; 10 percent gravel; moderately acid; abrupt smooth boundary.
Bt1—12 to 28 inches; dark red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark reddish brown (2.5YR 3/4) clay films throughout; very strongly acid; gradual smooth boundary.
Bt2—28 to 40 inches; dark red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; very few fine roots; common distinct dark red (2.5YR 3/6) clay coatings bridging sand grains; strongly acid; clear smooth boundary.
Bt3—40 to 56 inches; dark red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; firm; very few fine roots; common distinct dark red (2.5YR 3/6) clay coatings bridging sand grains; strongly acid, clear smooth boundary.
Bt4—56 to 63 inches; yellowish red (5YR 5/6) sandy loam with pockets of brownish yellow (10YR 6/6) and pale brown (10YR 6/3) loamy sand; weak medium and coarse subangular blocky structure; very friable; common distinct dark red (2.5YR 4/6) clay coatings bridging sand grains; strongly acid, clear smooth boundary.
C—63 to 72 inches; strong brown (7.5YR 5/8) loamy sand; single grained; very friable; strongly acid.

Range in Characteristics

Solum thickness: 60 to 100 inches or more
Reaction: Unless limed, very strongly acid or strongly acid

A horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—1 to 3
Texture of the fine-earth fraction—sandy loam, fine sandy loam, or silt loam

E horizon:
Hue—10YR
Value—5 or 6
Chroma—4 or 6
Texture of the fine-earth fraction—sandy loam, fine sandy loam, or silt loam

Upper Bt horizon:
Hue—5YR or 2.5YR
Value—4 or 5
Chroma—6 or 8
Texture of the fine-earth fraction—clay loam, sandy clay loam, loam, or silt loam

Lower Bt horizon:
Hue—5YR or 2.5YR
Value—4 or 5
Chroma—6 or 8
Texture of the fine-earth fraction—loam or sandy loam
Rock fragment content—0 to 10 percent

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6

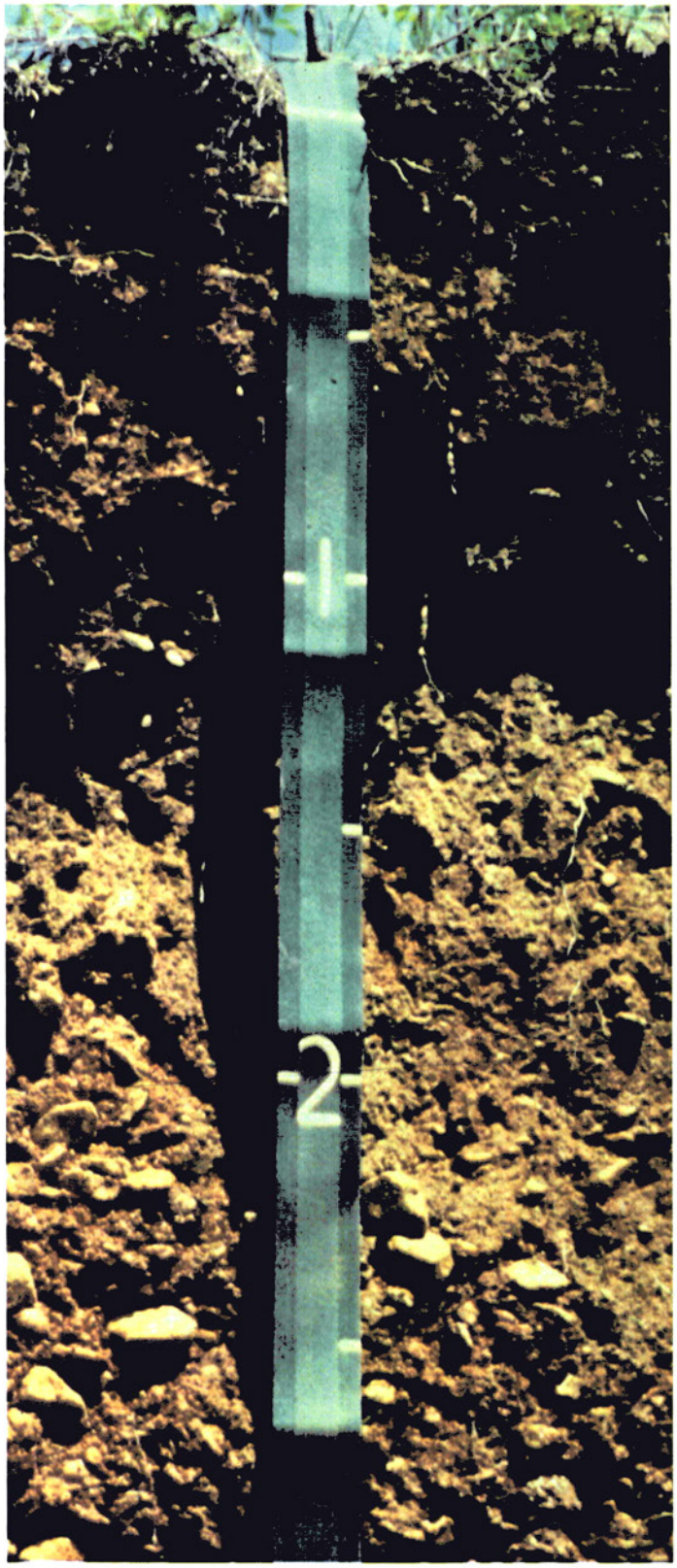


Figure 21.—Profile of Saffell fine sandy loam. Below a depth of 21 inches, gravel makes up more than 50 percent of the volume within this soil. Depth is marked in feet.

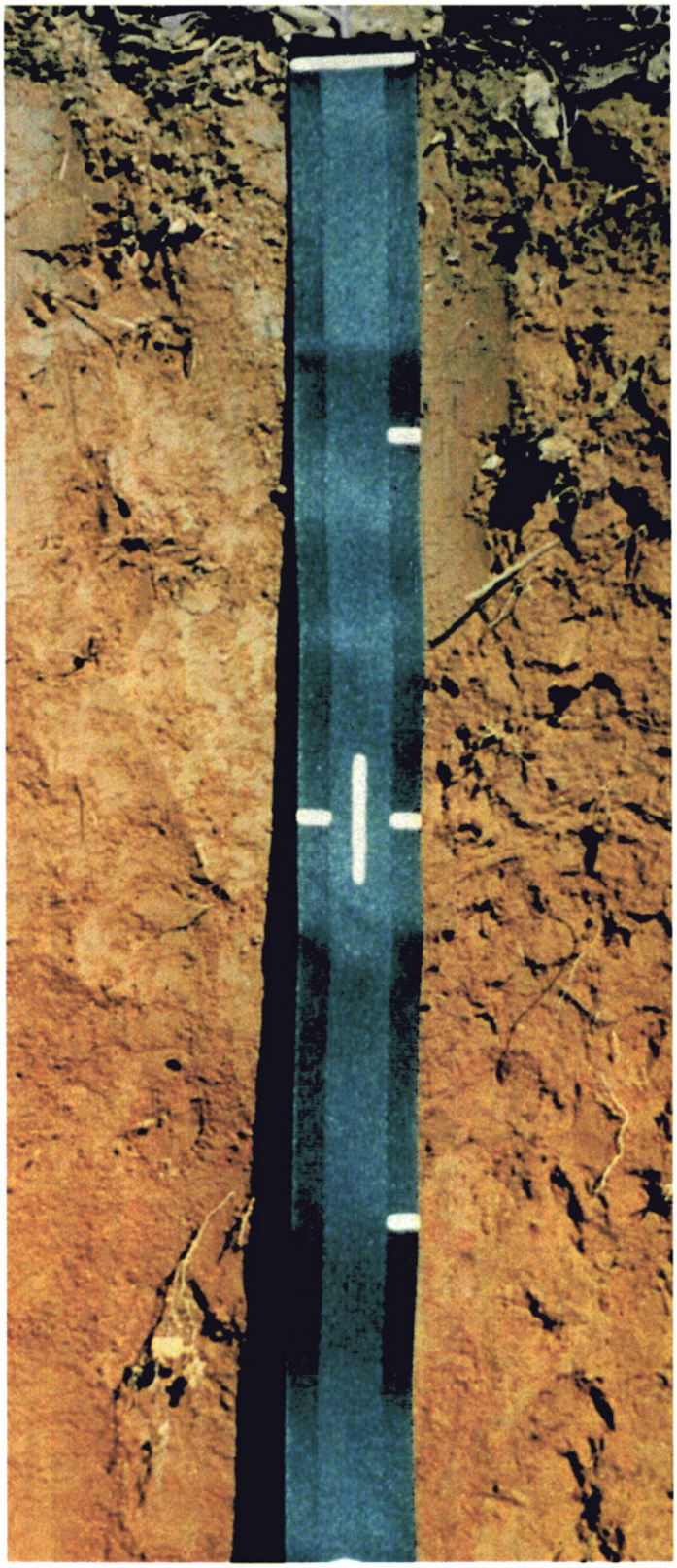


Figure 22.—Profile of Smithdale sandy loam. This soil is red below about 1 foot and has a high content of sand throughout the profile. Depth is marked in feet.

Chroma—4, 6, or 8
Texture of the fine-earth fraction—sandy loam, loamy sand, or sand

Vicksburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Along streams and creeks
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Associated soils: Collins, Iuka, and Falaya; Collins soils are moderately well drained, and Falaya soils are somewhat poorly drained; Iuka soils are moderately well drained and contain more sand throughout the profile
Taxonomic class: Coarse-silty, mixed, acid, thermic Typic Udifluvents

Typical Pedon

Vicksburg silt loam, occasionally flooded; on a 1 percent slightly undulating slope in a cultivated field; 1.8 miles south of Lynnville along Kentucky Highway 381 to the intersection with Caldwell Creek, northeast of this intersection about 1,800 feet along Caldwell Creek, then 200 feet northwest of the creek channel in a cultivated field; Lynnville 7.5 minute quadrangle, soil map sheet 43, east 1,162,900 feet and north 158,300 feet by the Kentucky coordinate grid System:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; common fine roots; slightly acid; clear smooth boundary.
Bw—7 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.
Ab—16 to 21 inches; brown (10YR 4/3) silt loam; weak fine and medium subangular blocky structure; friable; fine roots; few prominent black (N 2.5/0) carbonaceous stains; slightly acid; clear smooth boundary.
B'w—21 to 45 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; very few fine roots; strongly acid; clear smooth boundary.
C—45 to 65 inches; dark yellowish brown (10YR 4/4) silt loam; massive and stratified; friable; common medium distinct light brownish gray (10YR 6/2) iron depletions and common fine distinct strong brown (7.5YR 5/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains; strongly acid.

Range in Characteristics

Solum thickness: 30 to 60 inches
Reaction: Unless limed, very strongly acid or strongly acid

Ap and Ab horizons:
Hue—10YR
Value—4
Chroma—2 to 4
Texture of the fine-earth fraction—silt loam

Bw and B'w horizons:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Texture of the fine-earth fraction—silt loam

C horizon:
Hue—10YR
Value—4 or 5
Chroma—3 or 4
Redoximorphic features—shades of brown and gray
Texture of the fine-earth fraction—silt loam, loam, or very fine sandy loam

The Vicksburg soils in Graves County are taxadjuncts to the Vicksburg series because they have a cambic subsoil horizon and are less acid in the upper part of the solum than allowed for the series. This difference, however, does not affect the use and management of the soils. In this survey area, the Vicksburg soils are coarse-silty, mixed, thermic Fluventic Dystrochrepts.

Waverly Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Nearly level to slightly concave depressions
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Associated soils: Collins and Falaya; Collins soils are moderately well drained, and Falaya soils are somewhat poorly drained
Taxonomic class: Coarse-silty, mixed, acid, thermic Typic Fluvaquents

Typical Pedon

Waverly silt loam, occasionally flooded; on a nearly level 1 percent slope in a meadow of wheat, ladino clover, and fescue; 2.3 miles north of Water Valley; 1,900 feet northwest of the intersection of the Purchase Parkway with Bayou de Chien; about 200 feet west of Bayou de Chien; Water Valley 7.5 minute quadrangle, soil

map sheet 33, east 1,101,800 feet and north 111,900 feet by the Kentucky coordinate grid system:

Ap1—0 to 5 inches; brown (10YR 5/3) silt loam; weak medium granular structure; very friable; common fine roots; many coarse distinct gray (10YR 5/1) iron depletions and common fine prominent yellowish red (5YR 4/6) masses of iron accumulations; common prominent black (N 2.5/0) manganese stains; neutral; clear smooth boundary.

Ap2—5 to 10 inches; grayish brown (10YR 5/2) silt loam; weak medium granular structure; very friable; few fine roots; common medium distinct gray (10YR 6/1) iron depletions and many fine prominent red (2.5YR 4/6) masses of iron accumulations; many prominent black (N 2.5/0) manganese stains; slightly acid; clear smooth boundary.

Bg—10 to 27 inches; light brownish gray (10YR 6/2) silt loam; weak coarse subangular blocky structure; friable; many medium distinct dark yellowish brown (10YR 4/4) and many fine prominent red (2.5YR 4/6) masses of iron accumulations; many prominent black (N 2.5/0) manganese stains; strongly acid; gradual smooth boundary.

BCg—27 to 54 inches; gray (10YR 6/1) silt loam; massive structure parting to weak coarse subangular blocky; friable; many medium prominent yellowish red (5YR 4/6) and red (2.5YR 4/6) masses of iron accumulations; many prominent black (N 2.5/0) manganese stains; strongly acid; gradual smooth boundary.

Cg—54 to 62 inches; gray (2.5Y 5/1) silt loam; massive; friable; many medium prominent yellowish red (5YR 4/6) masses of iron accumulations; many prominent black (N 2.5/0) and dark brown (7.5YR 3/3) weakly cemented iron-manganese concretions; strongly acid.

Range in Characteristics

Depth to dominant chroma of 2 or less: Directly below the surface layer

Reaction: Unless limed, strongly acid or very strongly acid

A or Ap horizon:
- Hue—10YR
- Value—4 to 6
- Chroma—1 to 3
- Redoximorphic features—shades of brown, red, and gray
- Texture of the fine-earth fraction—Silt loam

Bg horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7
- Chroma—1 or 2
- Redoximorphic features—shades of brown, yellow, and red
- Texture of the fine-earth fraction—Silt loam or silt

BCg and Cg horizons:
- Hue—10YR or 2.5Y
- Value—5 to 7
- Chroma—1 or 2
- Redoximorphic features—shades of brown, yellow, and red
- Texture of the fine-earth fraction—Silt loam or silt

Formation of the Soils

Soils are natural bodies on the earth's surface that exhibit unique features and properties. Many soil properties can be measured in laboratories. Other properties, such as depth to a seasonal water table, can only be measured or observed in the field. Soil formation is determined by the interaction of topography, climate, and living organisms over a period of time. In this section, the factors of soil formation are described and related to the soils in Graves County. Also, the processes of horizon differentiation are explained.

Factors of Soil Formation

The characteristics of a soil depend on the physical and chemical composition of the parent material as influenced by climate, topography, living organisms, and time. All five factors are active in the formation of every soil, but the relative importance of each factor can differ from one soil to another *(62)*. In some areas, one factor may have a greater influence on the development of certain soil characteristics, and in other areas, another factor may dominate. The five factors and how they interact to produce the soils in Graves County are described in the following paragraphs.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It is a product of the weathering or decomposition of underlying bedrock or transported materials. Parent material influences the chemical, mineral, and textural composition of the soil. In the early stages of soil formation, a soil has properties similar to that of the parent material. As weathering takes place, these properties are modified, and each soil develops its own characteristics. Grenada and Smithdale soils illustrate how the mineral and textural composition is determined by the parent material. Grenada soils formed in thick silty loess containing appreciable amounts of micaceous minerals *(5)*. Smithdale soils formed in sandy Coastal Plain sediments dominated by quartz, with only trace amounts of mica in the parent material. Grenada soils have mixed mineralogy and are fine-silty. Smithdale soils have siliceous mineralogy and are fine-loamy.

Parent material can be weathered in place, or it can be transported and deposited by water, wind, gravity, or ice. Most of the soils in the survey area weathered from parent materials deposited by wind and/or water.

Wind-transported material, or loess, is dominant on the uplands. Soils forming in loess parent material are high in silt and very low in sand-size particles. Examples are the Grenada, Loring, Purchase, Calloway, and Feliciana soils. These soils generally contain more than 65 percent silt and less than 10 percent sand to a depth of 4 feet or more (fig. 23).

Moderately steep side slopes within the uplands contain loess underlain by water deposited gravel or sand. Therefore, the soils formed in dual parent materials. The surface layer and upper part of the subsoil formed in loess and are silty. The lower part of the subsoil and underlying substratum formed in gravelly deposits or loamy Coastal Plain sediments. Brandon soils formed in loess underlain by gravelly deposits. Providence soils formed in loess underlain by loamy, sandier sediments.

The steepest side slopes in the survey area contain soils that have formed completely in gravelly deposits or loamy Coastal Plain sediments. Saffell and Smithdale soils, respectively, are examples.

Alluvial material deposited by major creeks and associated tributaries covers about 25 percent of the survey area. The most recent deposits occur on active flood plains. Soils such as Collins, Falaya, Rosebloom, Waverly, Iuka, and Vicksburg are examples of soils formed in recent stream alluvium.

Older alluvial deposits occur at elevations slightly higher than the present-day flood plain. Soils occurring on these higher positions, or stream terraces, contain more clay in the subsoil and exhibit greater morphological development than those formed in more recent alluvium. Center, Kurk, and Routon soils are on stream terraces and formed in older alluvial deposits.

Topography

Topography relates to the variations of the land surface, or perhaps better understood as "the lay of the land." Topographic components, such as relief, slope, landform, and aspect, influence or modify the effects of the other

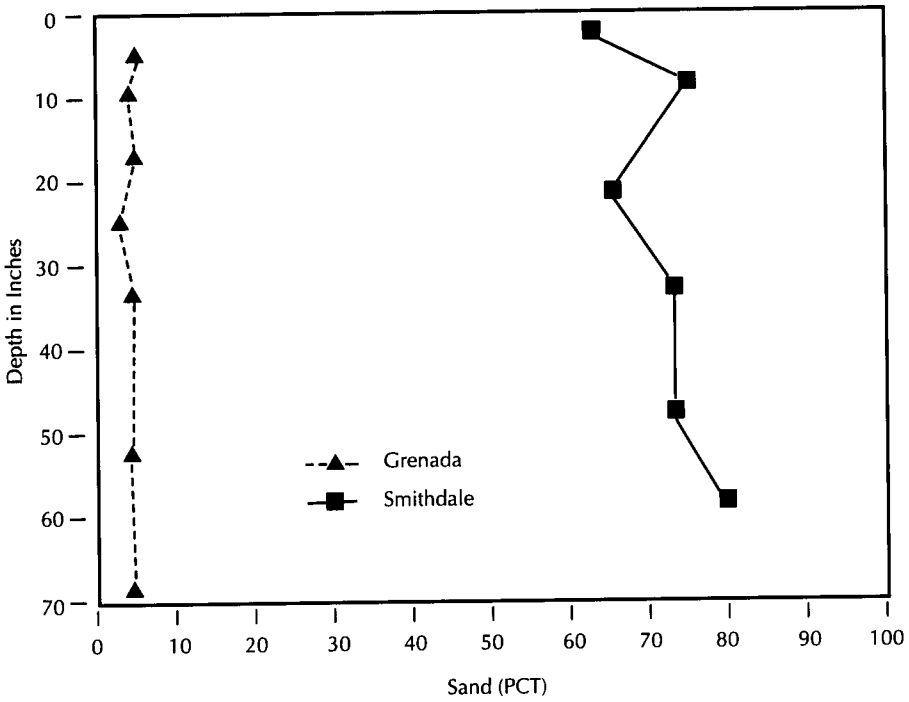


Figure 23.—Comparison of sand content and distribution as a function of depth between Grenada and Smithdale soils.

soil-forming factors. The gradient, shape, and length of slope directly influence the rate of water infiltration and runoff.

Nearly level, slightly concave areas receive water from higher, surrounding landscapes, with the water moving vertically and, in most cases, slowly through the soil. These soils are saturated during much of the year when plants are dormant. The excessive wetness inhibits oxidation processes within the soil and produces a gray, mottled subsoil due to the reduction and transfer of iron. Examples are the Waverly, Rosebloom, Routon, Natalbany, Calloway, and Kurk soils.

On steep areas, water tends to move more laterally than vertically through the soil. This lateral movement is facilitated by increases in bulk density within the soil, thus retarding downward movement of water by gravity. Soils occurring on steeper areas generally have a brown subsoil that contain little, if any, gray color. Such soils are considered to be naturally well drained. Examples are the Smithdale, Brandon, and Saffell soils.

Most of the survey area, however, is characterized as having gently sloping to sloping topography. With adequate surface cover, water infiltrates the soil surface and moves downward through the soil to cause leaching of soluble minerals and the translocation of clay throughout the subsoil. In most areas of the county, free water moving downward through the soil is restricted at about 1.5 to 2 feet depths. This water often becomes perched for days or weeks above a relatively impermeable fragipan. Soils such as Grenada and Loring are examples and are considered moderately well drained.

On the more sloping, convex portions of the landscape, runoff exceeds infiltration rates, thus resulting in loss of the surface layer due to accelerated erosion from overland flow. On such areas, the relatively impermeable fragipan commonly occurs within 1 foot of the soil surface. Any water having infiltrated the surface layer moves out of the soil quite readily via lateral movement along the top of the fragipan. Purchase soils commonly occur on such landscapes and are quite droughty during the summer months (fig. 24).

Climate

Climatic factors, namely temperature and precipitation, affect the physical, chemical, and biological properties of soils. Climate affects the kind and number of plants and animals on and in the soil, the weathering of rocks and minerals, the susceptibility of the soils to erosion, and the rate of soil formation. Its affect on such factors as erosion and deposition has an influence upon the relief of an area and the degree of profile development within the soil.

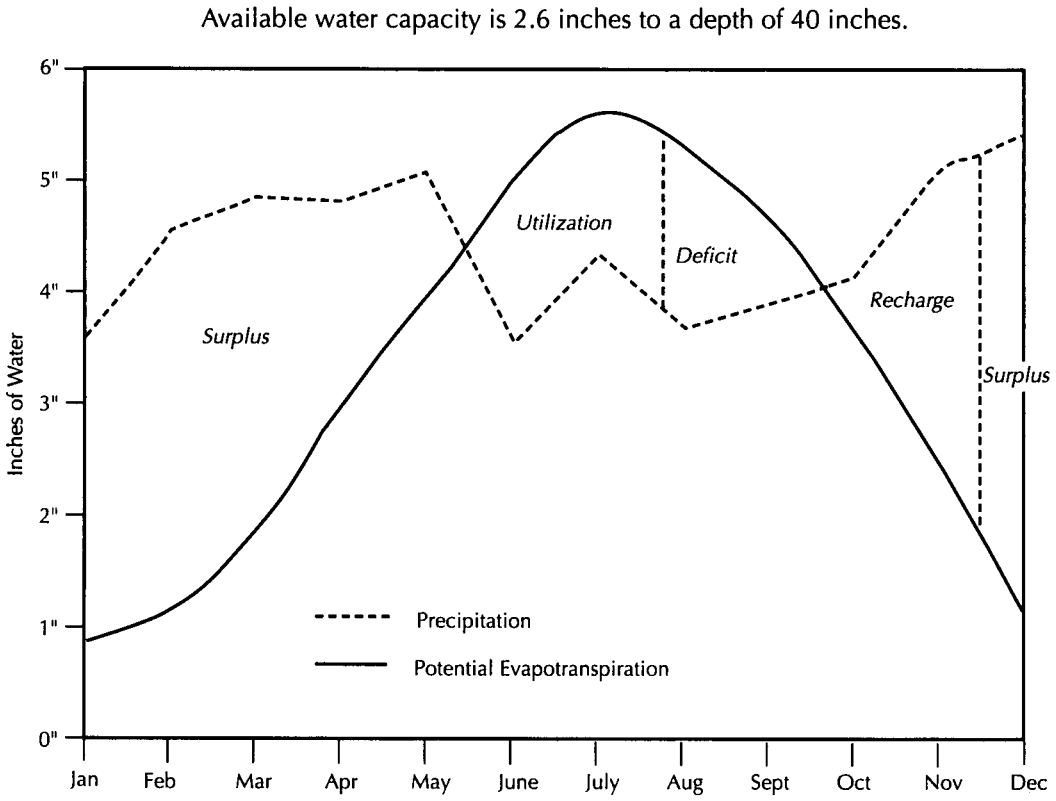


Figure 24.—Mean monthly water balance in an area of Purchase soils at Mayfield, Kentucky.

Climate is considered one, if not the most important, factor of soil formation.

The climate of the survey area is temperate and humid. During winter, the average temperature is about 37 degrees F, with an average daily minimum temperature of 27.3 degrees F. In summer, the average temperature is about 77 degrees F, and the average daily maximum temperature is 88.2 degrees F. Periods of extremely low or high temperature are short. Because the climate is relatively uniform throughout the county, the differences among the soils within the survey area are the result of other factors.

The average annual precipitation is about 53 inches (Table 1). The precipitation is fairly well distributed throughout the year. Under average conditions, the monthly precipitation equals or exceeds evaporative losses during two-thirds of the year (fig. 25).

The survey area's humid, temperate climate fosters geologic weathering and subsequent soil development. The abundant moisture leaches soluble bases, such as calcium and magnesium, from the soil, resulting in a typically acid subsoil. Water also carries clay minerals from the surface layer into the subsoil; therefore, most soils have a higher content of clay in the subsoil than in the surface layer. Upland soils, such as Grenada, Loring, Feliciana, Smithdale, and Brandon, all exhibit such characteristics within their respective soil profile.

Living Organisms

Plants affect soil formation primarily by adding organic matter and acting as a major link in nutrient cycling. Animals, bacteria, and fungi contribute to soil formation by converting the remains of plants to organic matter and plant nutrients. Small animal life, such as earthworms, grubs, and insects, live in or on the soil and play a significant role in altering soil structure. Larger animals, such as moles, mice, groundhogs, and crawfish, burrow through and mix the soil. Crawfish tunnels are very common on Waverly, Rosebloom, and Routon soils.

Trees and other plants transport plant nutrients from the lower part of the soil to the upper part. They also add organic matter via decomposition of plant residue, provide a protective cover that reduces erosion, and influence soil temperature and moisture conditions. The organic matter added by both plants and animals alters the chemical

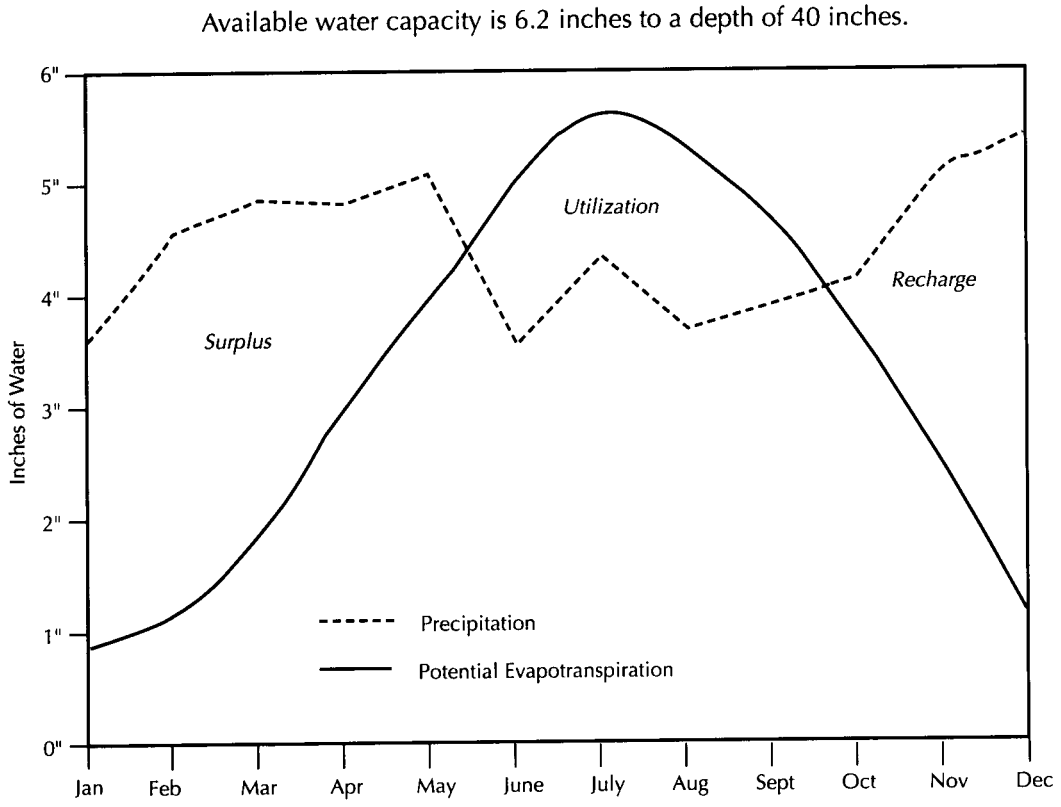


Figure 25.—Mean monthly water balance in an area of Grenada soils at Mayfield, Kentucky.

processes in the soil and forms humus. The decay of this matter releases acids that accelerate weathering processes within the soil.

Human activity has affected soil formation by clearing woodland, draining wet areas, and plowing. Traditional agricultural cultivation practices of previous decades resulted in accelerated erosion on many sloping and moderately steep upland areas. On many of these areas, the original surface layer has been eroded and deposited on flood plains or carried into streams causing increased siltation. Purchase soils have formed partly as a result of accelerated erosion.

On many bottom land areas, man has leveled and graded the soil and cut ditches to improve drainage and agricultural production. Other areas within the county have been excavated and filled for road construction and urban/industrial development (fig. 26). Udorthents formed in urban areas where the natural soil has been disturbed.

Time

Time is needed for climate, living organisms, and topography to act upon the parent material and form a soil. In terms of soil formation, time is considered a relative rather than absolute variable. The age of a soil is determined by the relative degree of profile development rather than the number of years the soil has been subject to the soil-forming processes. A soil is considered to be old or "mature" if it has distinct, well expressed horizons. Conversely, a soil is considered young if individual soil horizons are indistinguishable or weakly expressed.

Soils such as Falaya and Waverly have weakly expressed soil horizons with characteristics quite similar to the parent material. These soils occur on flood plains and formed in recent alluvium deposited by streams or washed from nearby upland areas. Because they periodically receive new depositional material, they have not remained in place long enough to develop well expressed soil horizons.

Distinct soil horizons will develop if no additional sediments are deposited. The weathering process causes some of the finer material in the surface layer to move into the subsoil, thus altering the color, texture, and structure of the subsoil. Center and Kurk soils are examples of older, intermediate age soils that have formed in alluvium on stable stream terraces which no longer receive frequent deposition of new materials.

The oldest soils in the survey area have soil profiles

Figure 26.—An area of the Udorthents-Urban land complex, 5 to 25 percent slopes. Foreground—4 feet of mixed soil, gravel, and sand being smoothed and leveled as subgrade material for highway development.

with distinct, well expressed horizons. Smithdale and Brandon soils have been in place and subjected to the influence of plants, animals, and climate long enough to acquire distinct profile characteristics. These soils have distinct or prominent clay films within the subsoil due to the finer clay particles being translocated from the uppermost surface horizons. Most of the soluble bases have been leached downward through the soil profile, resulting in a naturally acid subsoil (fig. 27). Soils exhibiting such characteristics are considered mature.

Processes of Horizon Differentiation

Soil horizons form as parent material weathers. These horizons are discernible by such soil properties as color, structure, texture, and consistence. "Soil Taxonomy" identifies certain soil horizons or diagnostic features used in the classification system *(34, 35)*. Some of the more prominent pedogenic processes and diagnostic features commonly found in the soils within the survey area are described in this section.

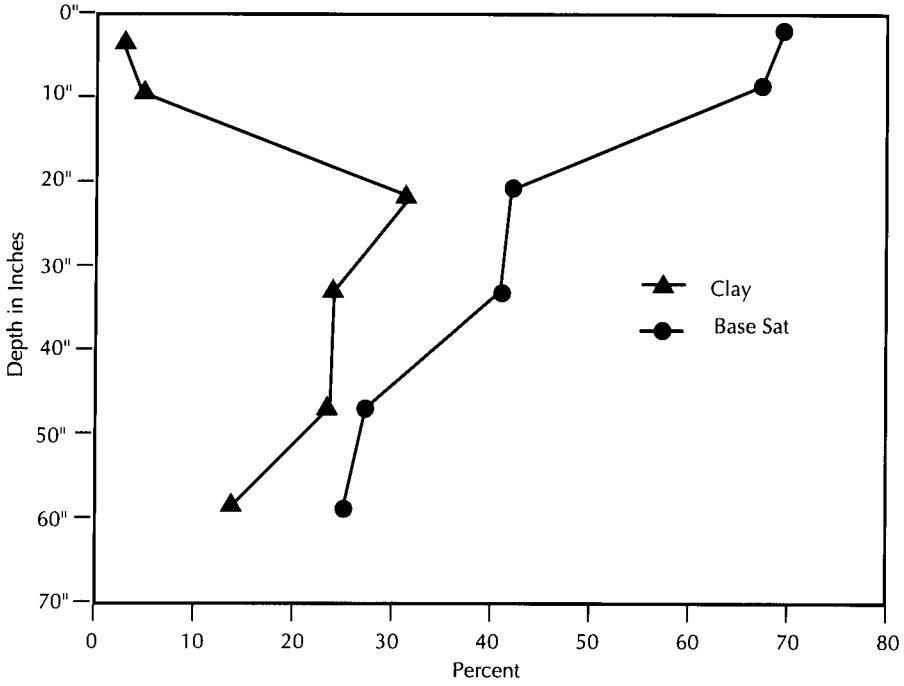


Figure 27.—Clay distribution and base saturation as a function of depth in Smithdale sandy loam.

Most soils within the survey area have three major horizons—the A, B, and C horizons. The A horizon is the dark surface layer enriched with humus or organic matter. If undisturbed, it has a loose granular structure. A surface layer that has been disturbed by plowing or disking is called an Ap horizon. The B horizon, or subsoil, lies below the A horizon. It is characterized by the maximum accumulation of dissolved or suspended material, such as iron and clay. It generally has a blocky structure and is firmer than the overlying A horizon. Very young soils, such as Udorthents, commonly do not have a B horizon. Below the B horizon is the C horizon, which is little affected by the soil-forming processes, but can be highly modified by geologic weathering.

Some organic matter has accumulated in all the soils within the survey area. Moderate amounts of organic matter occur in the surface layer of soils on flood plains, stream terraces, and nearly level uplands. The more sloping portions of the uplands contain low amounts of organic matter. In most soils, the organic matter content decreases sharply from the surface layer to the subsoil.

The size of particles in soils ranges from gravels to very small clay minerals. Some of the clay particles form via weathering of larger particles, but most of the differences among the soils in the survey area are attributed to differences among varying parent materials. The smaller particles, particularly the clay fraction, are subject to redistribution within the soil profile. As water moves vertically through the soil, clay particles are removed from the A horizon and deposited as clay films in the subsoil. This leads to the development of an argillic diagnostic subsoil horizon. Most of the soils occurring on uplands and stream terraces within the survey area have well expressed argillic horizons. The better expressed argillic horizons occur in the Feliciana, Brandon, and Smithdale soils. Although clay migration is not the only cause of a higher content of clay in the subsoil, it is presumed to be the dominant cause within the survey area.

A fragipan layer, or layers containing fragic properties, occurs within the subsoil of most nearly level to sloping soils on uplands. The fragipan is a diagnostic subsoil horizon that is dense, compact, and slowly permeable to vertical water movement. It contains bleached fracture planes that form "honeycomb-shaped" polygons when observed in plan view (fig. 28). The brown soil material between the bleached polygons is virtually impermeable to vertical water movement. Soils containing fragipan layers include the Calloway, Grenada, Loring, Providence, and Purchase soils.

Soils that are saturated for long periods have a matrix

color of various shades of gray that is often speckled with brown, red, or orange mottles. These features are considered redoximorphic features. Gleying is the process that yields the gray colors. It is caused by a combination of excessive wetness and a corresponding low content of dissolved oxygen. The gray color represents an area where iron has been reduced from Fe^{3+} to Fe^{2+} and has been depleted.

The brown, red, and orange speckled colors are areas where iron has reoxidized and accumulated during occasional periods when the soil dries out. Quite commonly, black stains, nodules, or concretions of iron

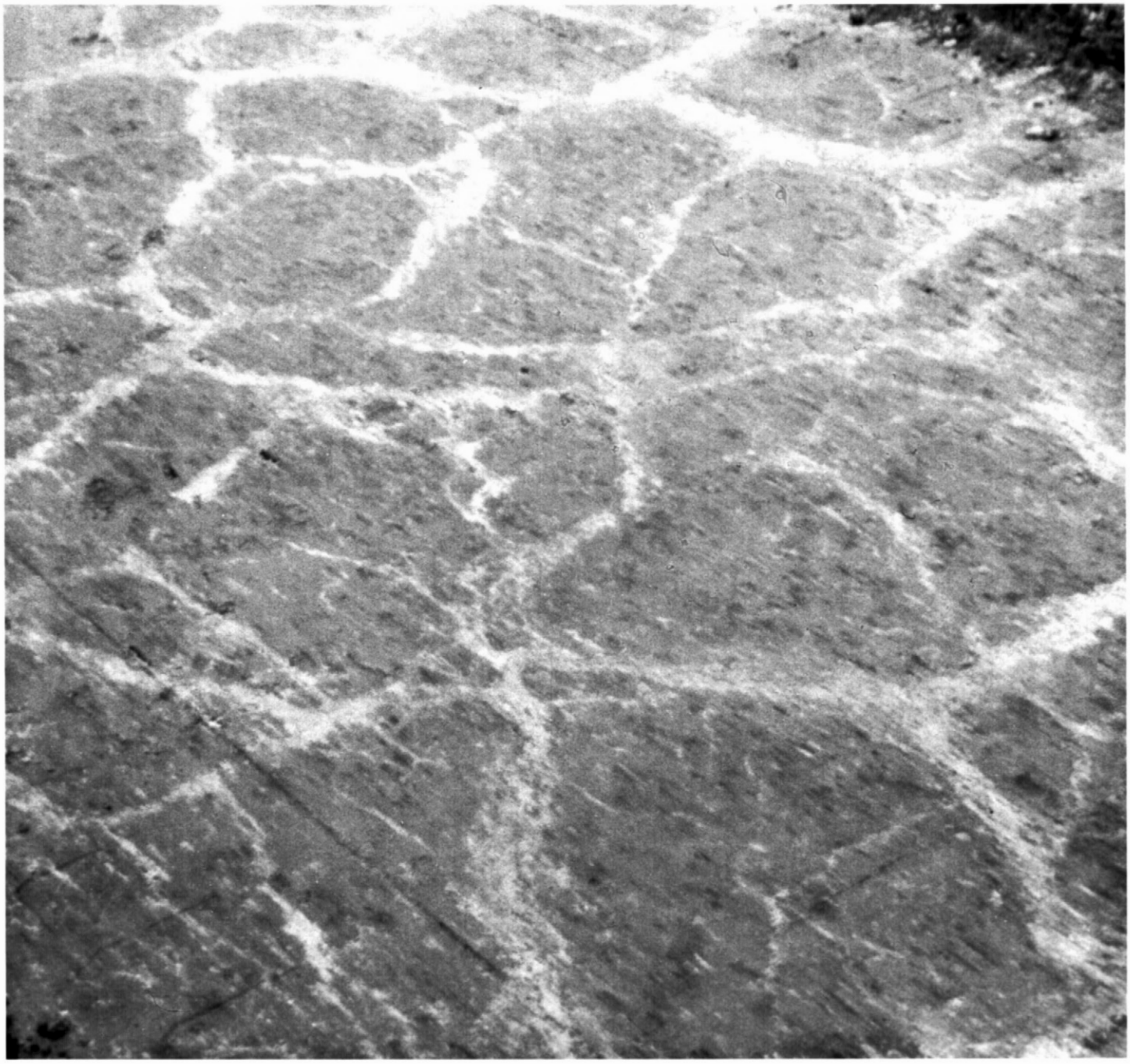


Figure 28.—Polygonal network characteristic of a fragipan layer within the subsoil of Purchase silt loam. The outer edges of the polygon(s), represented by the lighter colored bleached zones, are where water moves vertically through the soil. The darker area inside the polygon(s) is relatively impermeable to water movement.

and/or manganese oxides form as a result of these oxidation-reduction processes. Rosebloom, Waverly, Routon, and Natalbany soils have a gray or light brownish gray, mottled subsoil as a result of gleying. Unless drained, these soils have aquic conditions resulting from a fluctuating ground water table and are saturated throughout the winter and early spring. These soils, however, are commonly dry during the summer and early fall.

Geology, Geomorphic, and Soil Relationships

The survey area is in the heart of Kentucky's Jackson Purchase Physiographic Region. This region stretches from the Tennessee River (Kentucky Lake) westward to the Mississippi River and is bounded on the north by the Ohio River and to the south by the state of Tennessee. The region represents the northernmost tip of the Gulf Coast embayment area, a down-warped basin of Paleozoic rocks filled in upward succession with unconsolidated Cretaceous, Tertiary, and Quaternary age sediments (fig. 29).

These sediments were deposited when the Gulf of Mexico extended as far north as the southern tip of Illinois, just north of the present-day Ohio River. Sediments consisting primarily of sands, silts, clays, and gravels were deposited on top of consolidated Paleozoic rocks ranging in age from Mississippian in the eastern and northeastern periphery of the region to Ordovician in the southwest. The eroded bedrock floor of the basin and the overlying sediments dip gently to the west from the periphery of the embayment along the western edge of Kentucky Lake toward the embayment's axis, which roughly parallels the Mississippi River. In Graves County, the depth to bedrock ranges from about 550 feet in the northeastern part near Symsonia to 1,500 feet in the southwestern part near Water Valley.

In most of the Jackson Purchase Region, strata of Eocene age and older are mostly concealed by alluvium, loess, and Continental deposits which are composed of gravel, sand, and clay. The following paragraphs discuss the types of sediments occurring within the survey area and the soils commonly associated with each type.

Loess

Loess, derived from the German *Loss* meaning "loose," occurs as a surficial blanket capping most of the uplands in the survey area. It consists of wind-blown deposits, mostly quartz silt, of varying thickness whose likely source was "glacial outwash flour" from the flood plains of the Mississippi River valley during the Pleistocene ice age.

During the Pleistocene, the retreat of Continental ice sheets northward resulted in glacial meltwaters depositing debris along the flood plains of the Mississippi valley. Most geologists consider this event to have begun about 40,000 years ago and lasted for nearly 30,000 years *(33)*. As the broad flood plain "flats" dried out, the finer glacial debris (or "rock flour") was exposed to southward blowing wind currents that picked up the "rock flour" and redeposited it over adjoining upland areas. This dual fluvatile-aeolian origin of loess is supported by the fact that these deposits are thickest near the bluffs along the major river valleys and progressively become thinner with distance away from the broad alluvial valleys *(31, 33)*.

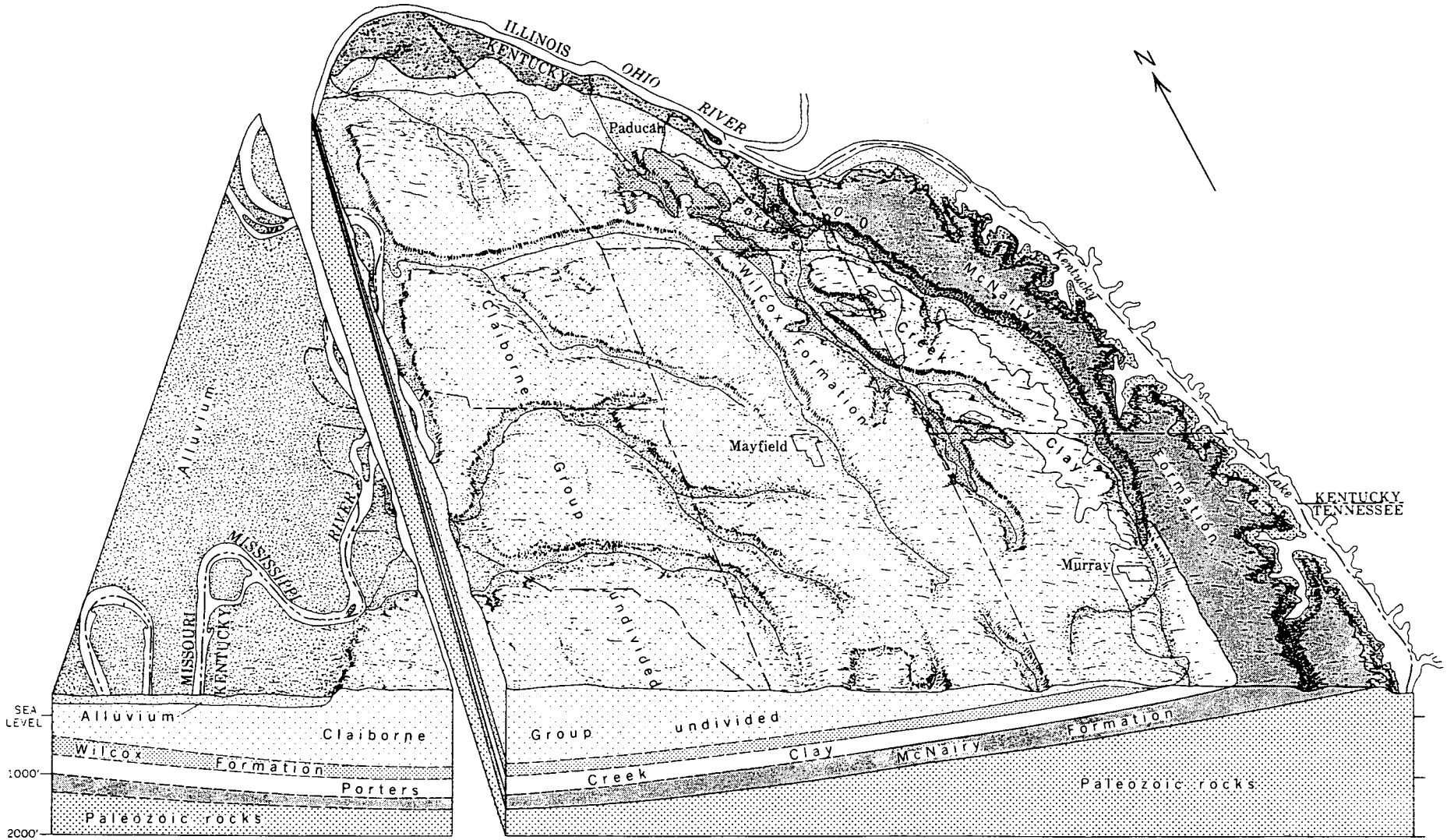
Most of Graves County is transitional between the thick and thin loess deposits that occur within the Jackson Purchase. The loess is noticeably thicker in the western part of the survey area, with considerable thinning east of Mayfield Creek. The loess is commonly 10 to 15 feet thick on the broader upland ridges. On the steeper side slopes, it generally ranges from 1 foot to 4 feet, but in places is nonexistent.

Two primary loess deposits blanket most of the uplands within the survey area (fig. 30). The uppermost loess, commonly referred to as the Peoria loess, is buff to tan colored with a highly silty character. Underlying the Peoria is a darker, chocolate-brown colored loess that is a bit more gritty in texture than the Peoria. This lower loess deposit is commonly referred to as the Roxana silt. With both loess deposits, quartz and feldspar minerals dominate the coarse silt fraction; quartz, illite, feldspar, and kaolinite dominate the fine silt fraction. Dominant soils that have formed in thick loess deposits are the Feliciana, Grenada, Loring, Purchase, and Calloway soils. These soils are very deep with a strongly acid or very strongly acid subsoil. With the exception of the Feliciana soils, these soils have a dense, relatively impermeable fragipan within the subsoil.

Continental Deposits

The Continental deposits consist of gravel, sand, and clay that stratigraphically underlie the surficial loess deposits. The deposits range from gravel with very little interstitial sand and fines to, in places, gravel occurring only as irregularly shaped bodies in a sandy matrix. However, in most of the survey area, the gravel phase predominates.

The gravels typically have a brown color and range in size from 3/4 inch to 3 inches long and less than 2 inches in diameter (fig. 31). They are rounded or subrounded, oftentimes flattened or tabular. Compositionally, the gravels consist of quartz, chert, sandstone, quartzite, and a few silicified fossils eroded from Mississippian limestones. In most places, the pebbles are coated with iron oxide, thus giving them a brown color. The



Front of drawing is along Kentucky-Tennessee State line

Figure 29.—This diagram shows the generalized stratigraphy and structure of the Jackson Purchase Region in Kentucky (from plate 9, USGS Wtr. Sup. Pap. 1987; Davis, Lambert, and Hansen, Jr., 1973).

Figure 30.—Peoria and Roxana loess showing prismatic jointing. Most of the survey area is covered with a surficial blanket of loess.

Continental deposits are loose and unconsolidated, except where they form 1/2- to 4-inch thick indurated ledges of ferruginous pebbly conglomerate (fig. 32).

Early mapping of the Continental deposits resulted in mixed views among the geologic community regarding the age, origin, and mode of deposition of these deposits. Subsequent work by the U.S. Geological Survey and state geological surveys have shown these deposits to have a fluvial, Continental origin rather than an older, marine origin.

These deposits are generally agreed to be terrace deposits laid down on an older, erosional Eocene landform. Potter *(29)* provides evidence that the Continental deposits in the Jackson Purchase and adjoining areas were laid down as coalescing alluvial fans via rivers ancestral to the present-day Tennessee, Cumberland, Ohio, and Mississippi Rivers. Silicified fossils commonly found in these deposits (e.g., corals, brachiopods, crinoid stems, etc.) suggest the source area for these gravels was the erosion of the Mississippian limestones that occur east of the Jackson Purchase. Deposition of these sediments began during the late Pliocene Epoch of the Tertiary Period and continued on into the early Pleistocene of the Quaternary Period. Quite frequently the Continental deposits are referred to as the Plio-Pleistocene deposits.

Within the survey area, the thickness of these deposits varies considerably. The entire section can commonly be observed in the walls of any of the various clay pits in Graves County. As a general rule, the deposits are thickest in the northeastern part of the county and progressively thin to the south. Field investigations have

Figure 31.—Subrounded gravels and sand characteristic of Continental deposits. These deposits are used for road fill, surfacing secondary roads, and general construction and building.

Figure 32.—Continental deposits cemented with iron to form thin ledges of pebbly conglomerate.

observed the Continental gravels to be as much as 50 feet thick between Mayfield and Symsonia and less than 2 feet thick to nonexistent south of Kentucky Highway 94 toward the Weakley County, Tennessee, state line. The amount and size of the gravels also follow this general pattern. The deposits outcrop only on the steeper side slopes within the survey area.

The Continental deposits are used extensively for road fill and surfacing of secondary roads. Because of an abundant supply and availability, they are also widely used for general construction and building purposes. Where underlain by impermeable clay bodies, ground water is obtained from within the Continental deposits. Most wells are less than 50 feet deep and are generally confined to the northeastern part of the county near Symsonia.

Dominant soils associated with the Continental deposits

are the Brandon, Saffell, and Smithdale series. These soils occur on moderately steep to steep side slopes throughout the survey area and have a strongly acid or very strongly acid subsoil. The Brandon and Saffell soils are gravelly in the lower subsoil and substratum, whereas the Smithdale soils contain a loamy, sandier subsoil and substratum.

Coastal Plain Sediments

Underlying the Continental deposits is a thick sequence of interbedded sands and clays that are several hundred feet thick. Within the survey area, these sediments occur in the mid to lower Eocene of the Tertiary Period and are part of the Claiborne Formation. The sediments are

Figure 33.—Ball clay deposits occurring within the middle Eocene near Fancy Farm. Ninety percent of all ball clay mined in the U.S. comes from west Kentucky and west Tennessee. The darker colored layer marking the upper boundary is lignite.

distinctly marine in origin, as indicated by their fossil and flora assemblages. They were deposited in a shallow sea 35 to 60 million years ago when the Gulf of Mexico extended as far north as the present-day Ohio River.

The Claiborne sands, which comprise the vast majority of the formation, are predominantly subrounded to subangular and fine to medium grained. The sand grains are clean, consisting primarily of clear angular quartz with little mica *(31, 53)*.

Clay bodies occurring within the formation are often interbedded with the sand, but sometimes also occur as individual lenses. Fresh clay exposures are dark gray to dark brown, but weather white, cream, pink, or lavender.

In some places, the clay bodies occur as lenses 30 to 35 feet thick and cover tens of acres in areal extent. Lateral boundaries of such lenses are commonly very abrupt, with the upper boundary characteristically well defined and often marked by a black lignite horizon conforming in areal extent to the underlying clay lens. These thicker clay lenses within the Claiborne Formation are often economical deposits and mined as ball clays (fig. 33). Ball clays are highly plastic, nearly grit free, and mineralogically are kaolinitic. Most ball clays are used for ceramic products and refractories.

The favorable physical, chemical, and hydrologic character of the Claiborne Formation make it a model aquifer system for obtaining abundant, quality ground water. The majority of the survey area's domestic, municipal, and industrial water needs are met via wells penetrating the formation at depths generally ranging from 50 to 175 feet. Most of the Claiborne Formation in Graves County is part of a regional recharge area that extends southward into Tennessee and Mississippi *(16, 60)*. Wells developed within the formation have reported yields as high as 800 gallons per minute *(48)*.

Sands of the Claiborne Formation exhibit little cohesiveness and are, therefore, particularly susceptible to erosion. Outcropping of the Claiborne Formation is especially evident on the steep, highly dissected side slopes south of Kentucky Highway 94 between Bell City, Pilot Oak, and the Tennessee state line. Other prominent outcrops occur on the steep side slopes along the east side of the West Fork Clarks River alluvial valley.

Principal soils associated with the Claiborne Formation are the Providence and Smithdale series. These soils are very deep and contain a loamy, strongly acid to very strongly acid subsoil. Providence soils formed in 2 to 4 feet of loess overlying the loamy Claiborne residuum. Smithdale soils generally formed entirely in loamy residuum weathered from the Claiborne, but in some places contain 1 foot to 1.5 feet of loess mantle.

Other Coastal Plain sediments that occur only minutely within the survey area are the Wilcox sands and Porters Creek clay. These formations are of the lower Eocene and upper Paleocene, respectively, within the Tertiary System. Their outcrop is limited to the steepest side slopes along the eastern edge of Graves County between Farmington and Symsonia.

Alluvium

Alluvial deposits occur on flood plains and stream terraces along the major drainageways within the survey area. Like the loess deposits, these sediments are of the Quaternary Period and, geologically, are the youngest sediments in Graves County. Most of the alluvium consists of silt washed from adjoining loess uplands, which in places has become intermixed with sand, gravel, and clay.

The largest areas of alluvium occur along Mayfield Creek, Obion Creek, Bayou de Chien, West Fork Mayfield Creek, Terrapin Creek, and West Fork Clarks River. Dominant soils are the Collins, Falaya, Waverly, Rosebloom, and Iuka soils on flood plains and Center, Kurk, and Routon soils on stream terraces. These soils are very deep and contain a strongly acid or very strongly acid, silty or loamy subsoil.

References

(1) Alerich, Carol L. 1990. Forest statistics for Kentucky—1975 and 1988. U.S. Dep. Agric., Forest Serv. Forest Res. Bull. NE-117, 295 pp.

(2) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vol.

(3) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

(4) Applequist, M.B. 1959. Soil-site studies of southern hardwoods. *In* Southern forest soils—eighth annual forestry symposium, pp. 49-63.

(5) Bailey, H.H. , R.L. Blevins, and R.I. Barnhisel. 1972. Descriptions and laboratory data for some soils in Kentucky: I. Purchase Region. Univ. Ky. Agric. Exp. Stn., 57 pp.

(6) Beck, Donald E. 1962. Yellow-poplar site index curves. U.S. Dep. Agric., Forest Serv., Southeast. Forest Exp. Stn. Res. Note 180, 2 pp., illus.

(7) Broadfoot, Walter M. 1960. Field guide for evaluating cottonwood sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Occas. Pap. 178, 6 pp., illus.

(8) Broadfoot, Walter M. 1963. Guide for evaluating water oak sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Res. Pap. SO-1, 8 pp., illus.

(9) Broadfoot, Walter M. 1964. Soil suitability for hardwoods in the Midsouth. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Res. Note SO-10, 10 pp., illus.

(10) Broadfoot, Walter M., and R.M. Krinard. 1959. Guide for evaluating sweetgum sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Occas. Pap. 176, 8 pp., illus.

(11) Bruce, R.R., G.W. Langdale, L.T. West, and W.P. Miller. 1995. Surface soil degradation and soil productivity and maintenance. Soil Sci. Soc. Am. J. 59: 654-660.

(12) Coile, T.S. and F.X. Schumacher. 1953. Site index of young stands of loblolly and shortleaf pines in the Piedmont Plateau Region. J. For. 51: 432-435, illus.

(13) Evans, J. Kenneth and Gary Lacefield. 1977. Establishing forage crops. Univ. Ky., Coll. Agric., Coop. Ext. Serv. AGR-64, 2 pp.

(14) Frye, W.W., S.A. Ebelhar, L.W. Murdock, and R.L. Blevins. 1982. Soil erosion effects on properties and productivity of two Kentucky soils. Soil Sci. Soc. Am. J. 46: 1051-1055.

(15) Frye, W.W., L.W. Murdock, and R.L. Blevins. 1983. Corn yield-fragipan depth relations on a Zanesville soil. Soil Sci. Soc. Am. J. 47: 1043-1045.

(16) Grubb, H.F. and J.K. Arthur. 1991. Gulf Coast regional aquifer system analysis—A Kentucky perspective. U.S. Geol. Sur. Wtr. Res. Invest. Rep. 90-4138, 28 pp., illus.

(17) Hudson, Berman. 1994. Soil organic matter and available water capacity. J. Soil Wtr. Cons. 49(2): 189-194.

(18) Kentucky Agricultural Statistics Service. 1995. Kentucky agricultural statistics, 1994-1995, 158 pp., illus.

(19) Kinsley, Neal P. and Douglas E. Powell. 1978. The forest resources of Kentucky. U.S. Dep. Agric., Forest Serv., Forest Res. Bull. NE-54, 97 pp., illus.

(20) Kirk, L.G. and A.K. Bougher. 1986. Geology, mining, and marketing of Mississippi embayment ball clays. Paper presented at Soc. Min. Engrs. Fall Mtg. Sep. 7-10.

(21) Leighty, W.J. and C.E. Wyatt. 1953. Soil survey of Graves County, Kentucky. U.S. Dep. Agric. in coop. with Ky. Agric. Exp. Stn. and Tenn. Valley Authority. Ser. 1941, no. 4, 139 pp., illus.

(22) Mayfield-Graves County Chamber of Commerce. 1993. Industrial Guide: Mayfield-Graves County, 2 pp.

(23) Mayfield-Graves County Local Development Corporation, Dick Armstrong, Exec. Director. 1991. Strategic economic development plan, 66 pp.

(24) Mokma, D.L. and M.A. Sietz. 1992. Effects of soil erosion on corn yields on Marlette soils in south-central Michigan. J. Soil Wtr. Cons. 47(4): 325-327.

(25) Nelson, T.C., J.L. Clutter, and L.E. Chaiken. 1961. Yield of Virginia pine. U.S. Dep. Agric., Forest Serv., Southeast. Forest Exp. Stn. Pap. 124, 11 pp.

(26) Nizeyimana, E. and K.R. Olson. 1988. Chemical, mineralogical, and physical property differences between moderately and severely eroded Illinois soils. Soil Sci. Soc. Am. J. 52: 1740-1748.

(27) Olive, W.W. 1972. Geology of the Jackson Purchase Region, Kentucky. Geol. Soc. Ky. Spring Field Conf., 11 pp., illus.

(28) Olson, D.J. 1959. Site index curves for upland oak in the southeast. U.S. Dep. Agric., Forest Serv., Southeast. Forest Exp. Stn. Res. Note 125, 2 pp.

(29) Potter, P.E. 1955b. The petrology and origin of the Lafayette gravel—Part 2, geomorphic history. J. Geol. vol. 63, no. 2, pp. 115-132.

(30) Rhoton, F.E. and D.D. Tyler. 1990. Erosion-induced changes in the properties of a fragipan soil. Soil Sci. Soc. Am. J. 54: 223-228.

(31) Roberts, J.K. and B. Gildersleeve. 1950. Geology and mineral resources of the Jackson Purchase Region, Kentucky. Ky. Geol. Surv. Bull. 4, Ser. IX, 114 pp., illus.

(32) Smalley, Glendon W. 1991. Classification and evaluation of forest sites on the Natchez Trace State Forest, State Resort Park, and Wildlife Management Area in West Tennessee. U.S. Dep. Agric., For. Serv. Gen. Tech. Rep. SO-85, 73 pp., illus.

(33) Smith, Guy D. 1942. Illinois loess—Variations in its properties and distribution: a pedologic interpretation. Univ. Ill. Agric. Exp. Stn. Bull. 490, 184 pp., illus.

(34) Soil Survey Staff. 1992. Keys to soil taxonomy, sixth edition, 1994. SMSS Tech. Monogr. 306 pp.

(35) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(36) United States Department of Agriculture. 1976. Volume, yield, and stand tables for second growth southern pines. Forest Serv. Misc. Publ. 50, 302 pp., illus.

(37) United States Department of Agriculture. 1981. Land resource regions and major land resource areas of the United States. U.S. Dep. Agric. Handb. 296, illus.

(38) United States Department of Agriculture. 1991. Soil survey laboratory methods. Soil Conserv. Serv. Soil Surv. Invest. Rep. 42.

(39) United States Department of Agriculture. 1993. Soil survey manual. Soil Surv. Staff, U.S. Dep. Agric. Handb. 18, 437 pp., illus.

(40) United States Department of Agriculture. 1995. Soil survey laboratory information manual. Nat. Res. Conserv. Serv. Soil Surv. Invest. Rep. 45, 305 pp.

(41) United States Department of Agriculture. 1996. 1992 National resources inventory: Kentucky's land resources conditions and trends. Nat. Res. Conserv. Serv., 53 pp.

(42) United States Department of the Interior, Geological Survey. 1963. Geologic map of the Elva quadrangle, Kentucky. Map GQ-230.

(43) United States Department of the Interior, Geological Survey. 1963. Geologic map of the Kirksey quadrangle, Kentucky. Map GQ-246.

(44) United States Department of the Interior, Geological Survey. 1963. Geologic map of the Lynn Grove quadrangle, Kentucky. Map GQ-268.

(45) United States Department of the Interior, Geological Survey. 1963. Geologic map of the Water Valley quadrangle, Kentucky. Map GQ-269.

(46) United States Department of the Interior, Geological Survey. 1964. Geologic map of the Cuba quadrangle, Kentucky. Map GQ-322.

(47) United States Department of the Interior, Geological Survey. 1964. Geologic map of the Symsonia quadrangle, Kentucky. Map GQ-326.

(48) United States Department of the Interior, Geological Survey. 1965. Availability of ground water in the Hickory quadrangle, Jackson Purchase Region, Kentucky. Hydrol. Inv. Atlas HA-163.

(49) United States Department of the Interior, Geological Survey. 1965. Geologic map of the Hickory quadrangle, Graves County, Kentucky. Map GQ-457.

(50) United States Department of the Interior, Geological Survey. 1965. Geologic map of the Lynnville quadrangle, Kentucky. Map GQ-414.

(51) United States Department of the Interior, Geological Survey. 1965. Geologic map of the Mayfield quadrangle, Graves County, Kentucky. Map GQ-372.

(52) United States Department of the Interior, Geological Survey. 1966. Geologic map of the Farmington quadrangle, Graves County, Kentucky. Map GQ-530.

(53) United States Department of the Interior, Geological Survey. 1967. Geologic map of the Westplains quadrangle, Graves County, Kentucky. Map GQ-587.

(54) United States Department of the Interior, Geological Survey. 1968. Geologic map of the Lovelaceville quadrangle, western Kentucky. Map GQ-763.

(55) United States Department of the Interior, Geological Survey. 1968. Geologic map of the Oak Level quadrangle, western Kentucky. Map GQ-744.

(56) United States Department of the Interior, Geological Survey. 1970. Geologic map of the Melber quadrangle, Graves and McCracken Counties, Kentucky. Map GQ-860.

(57) United States Department of the Interior, Geological Survey. 1972. Geologic map of the Dublin quadrangle, Graves and Hickman Counties, Kentucky. Map GQ-972.

(58) United States Department of the Interior, Geological Survey. 1973. Subsurface geology and ground-water resources of the Jackson Purchase Region, Kentucky. USGS Water Sup. Pap. 1987.

(59) United States Department of the Interior, Geological Survey. 1978. Geologic map of the Fancy Farm quadrangle, western Kentucky. Map GQ-1491.

(60) Wells, Francis G. 1933. Ground-water resources of western Tennessee. U.S. Dep. Int., Geol. Surv. Water Supply Pap. 656, 313 pp., illus.

(61) Wells, K.L. 1992. Developing efficient crop production systems. Soil Sci. News and Views, Univ. Ky., Dep. Agron., vol. 13, no. 1, 3 pp.

(62) Yaalon, D.H. 1983. Climate, time, and soil development. *In* Pedogenesis and soil taxonomy, vol. 1, pp. 233-251, illus.

Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

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.

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

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.

Bottom land. The normal flood plain of a stream, subject to flooding.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

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.

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.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes,

shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

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.

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.

Cretaceous. The third period of the Mesozoic era of geologic time extending from the end of the Jurassic period (144 million years ago) to the beginning of the Tertiary period (63 million years ago).

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

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 periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer

within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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.

Eocene. The second epoch of the Tertiary period of geologic time beginning 58 million years ago and ending 37 million years ago.

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 the human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not 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.

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 earth. Portion of the soil finer than a number 10 (2 millimeter) U.S. standard sieve.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The inclined surface at the base of a hill.

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.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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 up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

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 at the surface of a mineral soil.

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 O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

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 A or B horizon. 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 rock (unweathered bedrock) beneath the soil. The bedrock commonly underlies a C horizon but 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-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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. This contrasts with percolation, which is movement of water through soil layers or material.

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.

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.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

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.

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.

Mississippian. The fifth period of the Paleozoic era of geologic time extending from the end of the Devonian period (about 345 million years ago) to the beginning of the Pennsylvanian period (about 310 million years ago).

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the 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.

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.

Ordovician. The second period of the Paleozoic era of geologic time extending from the end of the Cambrian period (about 500 million years ago) to the beginning of the Silurian period (about 425 million years ago).

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Paleocene. The first epoch of the Tertiary period of geologic time beginning 66 million years ago and ending approximately 58 million years ago.

Paleozoic. The geologic era between the Precambrian and Mesozoic eras. The Paleozoic era was between 600 million and 230 million years ago and was characterized by abundant fishes, amphibians, reptiles, and land plants.

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.

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.

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 to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed 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.

Pleistocene. The first epoch of the Quaternary period of geologic time beginning about 1 million years ago and ending approximately 10,000 years ago in which the dominant feature was marked by extensive glaciation.

Pliocene. The fifth epoch of the Tertiary period of geologic time beginning about 5 million years ago and ending approximately 1 million years ago, immediately preceding the Quaternary period.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid 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.

Quaternary. The second period of the Cenozoic era of geologic time extending from the end of the Tertiary period (about 1 million years ago) to the present.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe^{2}). 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^{3}). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally 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.

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.

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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. 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.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

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 feet.

Slope. The inclination of the land surface from the

horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

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 depth classes. Terms used in this survey to describe soil depth are:

Shallow	less than 20 inches deep
Moderately deep	20 to 40 inches deep
Deep	40 to 60 inches deep
Very deep	more than 60 inches deep

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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the ""plow layer," or the ""Ap horizon."

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.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Tertiary. The first period of the Cenozoic era of geologic time, following the Mesozoic era and preceding the Quaternary period (about 63 million to 1 million years ago).

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). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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, such as zinc, cobalt,

manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

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 1967-93 at Radio Station WNGO, Mayfield, KY)

Month	Temperature						Precipitation				
				2 years in 10 will have--		Average		2 years in 10 will have--		Average	
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	number of growing degree days*	Average	Less than--	More than--	number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	44.1	24.9	34.5	71	-5	63	3.60	1.77	5.19	6	3.4
February----	49.7	27.7	38.7	76	2	110	4.55	2.25	6.56	6	4.1
March-------	60.9	37.0	49.0	83	15	305	4.85	2.93	6.57	8	1.7
April-------	71.5	45.5	58.5	88	25	553	4.82	3.06	6.42	7	0.0
May---------	78.8	54.5	66.7	91	35	820	5.06	2.90	6.98	7	0.0
June--------	86.6	63.0	74.8	97	45	1,039	3.53	1.62	5.17	5	0.0
July--------	89.7	67.5	78.6	98	44	1,173	4.34	2.29	6.15	5	0.0
August------	88.3	65.4	76.9	98	50	1,110	3.67	1.39	5.57	5	0.0
September---	82.8	58.5	70.7	95	38	910	3.85	2.33	5.22	5	0.0
October-----	72.6	46.3	59.4	88	26	597	4.12	2.28	5.75	5	0.1
November----	59.3	37.7	48.5	80	16	278	5.08	2.96	6.98	7	0.1
December----	48.7	29.3	39.0	71	3	111	5.39	2.75	7.70	7	1.1
Yearly:											
Average---	69.4	46.4	57.9	---	---	---	---	---	---	---	---
Extreme---	103	-18	---	99	-7	---	---	---	---	---	---
Total-----	---	---	---	---	---	7,070	52.88	45.14	58.44	73	10.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (threshold: 50 degrees F)

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1967-93 at Radio Station WNGO, Mayfield, KY)

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. 9	Apr. 13	Apr. 26
2 years in 10 later than--	Apr. 4	Apr. 9	Apr. 22
5 years in 10 later than--	Mar. 25	Apr. 1	Apr. 14
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 29	Oct. 19	Oct. 5
2 years in 10 earlier than--	Nov. 4	Oct. 25	Oct. 10
5 years in 10 earlier than--	Nov. 14	Nov. 3	Oct. 20

TABLE 3.--GROWING SEASON

(Recorded in the period 1967-93 at Radio Station WNGO, Mayfield, KY)

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	216	200	171
8 years in 10	222	206	177
5 years in 10	234	217	189
2 years in 10	246	228	201
1 year in 10	252	233	207

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
BdD2	Brandon-Purchase-Smithdale conplex, 12 to 20 percent slopes, eroded	9,939	2.8
BnE2	Brandon-Saffell-Smithdale complex, 20 to 35 percent slopes, eroded	14,822	4.2
BsD3	Brandon-Smithdale complex, 12 to 20 percent slopes, severely eroded	14,131	4.0
CaA	Calloway silt loam, 0 to 3 percent slopes	2,663	0.8
CeA	Center silt loam, 1 to 3 percent slopes	4,291	1.2
Cn	Collins silt loam, occasionally flooded	46,185	13.0
Co	Collins silt loam, frequently flooded	4,178	1.2
Cu	Collins-Iuka complex, occasionally flooded	7,111	2.0
DAM	Large dam	7	*
Fa	Falaya silt loam, occasionally flooded	8,897	2.5
Ff	Falaya silt loam, frequently flooded	4,024	1.1
FnB2	Feliciana silt loam, 2 to 6 percent slopes, eroded	1,121	0.3
FnC2	Feliciana silt loam, 6 to 12 percent slopes, eroded	2,366	0.7
GrA	Grenada silt loam, 0 to 2 percent slopes	8,778	2.5
GrB2	Grenada silt loam, 2 to 6 percent slopes, eroded	52,394	14.7
GuE	Gullied land-Smithdale-Feliciana complex, 15 to 55 percent slopes	1,907	0.5
KrA	Kurk silt loam, 0 to 2 percent slopes	2,261	0.6
LoB2	Loring silt loam, 2 to 6 percent slopes, eroded	38,847	10.9
LoC2	Loring silt loam, 6 to 12 percent slopes, eroded	2,895	0.8
NaA	Natalbany silt loam, 0 to 2 percent slopes	327	0.1
Pd	Pits-Dumps-Udorthents complex	1,561	0.4
PeC3	Providence-Purchase complex, 6 to 12 percent slopes, severely eroded	3,339	0.9
PfC2	Providence-Loring-Feliciana complex, 2 to 12 percent slopes, eroded	1,477	0.4
PmD3	Providence-Smithdale complex, 12 to 20 percent slopes, severely eroded	4,636	1.3
PrD3	Purchase silt loam, 12 to 20 percent slopes, severely eroded	8,132	2.3
PsC3	Purchase-Brandon complex, 6 to 12 percent slopes, severely eroded	3,791	1.1
PuB3	Purchase-Loring complex, 4 to 6 percent slopes, severely eroded	17,368	4.9
PuC3	Purchase-Loring complex, 6 to 12 percent slopes,	57,158	16.0
Ro	Rosebloom silt loam, frequently flooded	2,289	0.6
Rp	Rosebloom silt loam, ponded	1,410	0.4
RtA	Routon silt loam, 0 to 2 percent slopes	2,604	0.7
SaC	Saffell gravelly sandy loam, 2 to 10 percent slopes	127	*
SmE2	Smithdale sandy loam, 20 to 45 percent slopes, eroded	9,749	2.7
SsE2	Smithdale-Saffell complex, 35 to 55 percent slopes	433	0.1
UdC	Udorthents-Urban land complex, 5 to 25 percent slopes	1,304	0.4
UrB	Urban land-Udorthents complex, 2 to 8 percent slopes	801	0.2
Vb	Vicksburg silt loam, occasionally flooded	9,730	2.7
W	Water	1,674	0.5
Wa	Waverly silt loam, occasionally flooded	1,631	0.5
	Total	356,358	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Dark Tobacco	Soybeans	Wheat	Grass-legume hay	Pasture
		Bu	Lb	Bu	Bu	Ton	AUM*
BdD2--- Brandon-Purchase-Smithdale	IVe	---	---	---	---	3.0	5.5
BnE2--- Brandon-Saffell-Smithdale	VIe	---	---	---	---	---	4.5
BsD3--- Brandon-Smithdale	VIe	---	---	---	---	3.0	5.0
CaA--- Calloway	IIw	110	---	38	48	3.5	6.5
CeA--- Center	IIw	130	2,850	40	60	4.5	8.0
Cn--- Collins	IIw	150	3,150	50	60	4.5	9.0
Co--- Collins	IIw	145	3,000	50	---	4.0	8.0
Cu--- Collins-Iuka	IIw	140	3,000	50	60	4.5	9.0
DAM**--- Large dam	VIIIs	---	---	---	---	---	---
Fa--- Falaya	IIIw	120	2,700	45	48	3.5	6.5
Ff--- Falaya	IIw	120	---	45	---	3.5	6.5
FnB2--- Feliciana	IIe	130	3,150	45	55	4.5	8.5
FnC2--- Feliciana	IIIe	115	2,900	38	50	4.0	8.5
GrA--- Grenada	IIw	125	2,850	45	50	4.0	7.5
GrB2--- Grenada	IIe	125	2,950	45	50	4.0	7.5
GuE--- Gullied land-Smithdale-Feliciana	VIIe	---	---	---	---	---	---
KrA--- Kurk	IIw	115	---	40	50	3.5	7.0
LoB2--- Loring	IIe	125	2,950	50	50	4.0	7.5

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Dark Tobacco	Soybeans	Wheat	Grass-legume hay	Pasture
		Bu	Lb	Bu	Bu	Ton	AUM*
LoC2--Loring	IIIe	115	2750	38	45	3.0	6.5
NaA--Natalbany	IIIW	100	---	35	---	3.0	5.5
Pd**--Pits-Dumps-Udorthents	VIIIe	---	---	---	---	---	---
PeC3--Providence-Purchase	IVe	75	---	30	40	3.0	5.0
PfC2--Providence-Loring-Feliciana	IIIe	115	2,850	38	45	3.5	6.5
PmD3--Providence-Smithdale	VIe	---	---	---	---	3.0	5.0
PrD3--Purchase	VIe	---	---	---	---	2.0	5.0
PsC3--Purchase-Brandon	IVe	70	---	30	40	3.0	6.0
PuB3--Purchase-Loring	IIIe	75	2,500	35	40	3.0	5.5
PuC3--Purchase-Loring	IVe	70	---	30	40	3.0	5.5
Ro--Rosebloom	IIIw	120	---	35	---	3.0	5.5
Rp--Rosebloom	Vw	---	---	---	---	---	---
RtA--Routon	IIIw	110	---	35	35	3.5	7.0
SaC--Saffell	IIIs	70	---	25	30	2.5	5.5
SmE2--Smithdale	VIe	---	---	---	---	---	5.0
SsE2--Smithdale-Saffell	VIIe	---	---	---	---	---	---
UdC**--Udorthents-Urban land	---	---	---	---	---	---	---
UrB**--Urban land-Udorthents	---	---	---	---	---	---	---
Vb--Vicksburg	IIw	150	3,200	50	60	4.5	9.0
W**. Water							

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Dark Tobacco	Soybeans	Wheat	Grass-legume hay	Pasture
		Bu	Lb	Bu	Bu	Ton	AUM*
Wa---------- Waverly	IIIw	120	---	35	---	3.0	5.5

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

(Miscellaneous areas are excluded. Dashes indicate no acreage)

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	---	---	---	---
II	190,480	92,362	98,118	---
III	31,084	24,106	6,851	127
IV	74,227	74,227	---	---
V	1,410	---	1,410	---
VI	51,470	51,470	---	---
VII	2,340	2,340	---	---
VIII	1,561	1,561	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
BdD2:								
Brandon	Moderate	Moderate	Moderate	Severe	Hickory	---	---	White oak, shortleaf pine, yellow-poplar, loblolly pine, northern red oak.
					Yellow-poplar	80	72	
					Scarlet oak	69	57	
					Southern red oak	71	57	
					Chestnut oak	---	---	
					White oak	61	43	
					Northern red oak	66	57	
					Sugar maple	---	---	
Purchase	Severe	Moderate	Moderate	Moderate	Hickory	75	100	White oak, yellow-poplar.
					White oak	75	100	
Smithdale	Moderate	Moderate	Moderate	Moderate	White oak	---	---	Loblolly pine.
					Yellow-poplar	---	---	
					Red Maple	---	---	
					Loblolly Pine	80	114	
BnE2:								
Brandon	Moderate	Moderate	Moderate	Severe	Hickory	---	---	White oak, shortleaf pine, loblolly pine, northern red oak.
					Yellow-poplar	80	72	
					Scarlet oak	69	57	
					Southern red oak	71	57	
					Chestnut oak	---	--	
					White oak,	61	43	
					Northern red oak	66	57	
					Sugar maple	---	---	
Saffell	Moderate	Moderate	Moderate	Moderate	White oak	55	43	White oak, shortleaf pine, loblolly pine.
					Shortleaf pine	65	100	
					Loblolly pine	72	100	
					Black oak	60	43	
					Chestnut oak	47	29	
					Scarlet oak	56	43	
					Hickory	---	---	
					Post oak	---	---	
Smithdale	Moderate	Moderate	Moderate	Slight	Yellow-poplar	---	---	Loblolly pine.
					White oak	---	---	
					Red Maple	---	---	
					Loblolly pine	80	114	
BsD3:								
Brandon	Moderate	Moderate	Moderate	Moderate	Hickory	---	---	Shortleaf pine, loblolly pine, white oak, northern red oak.
					White oak	---	---	
					Scarlet oak	60	43	
					Southern red oak	61	43	
					Chestnut oak	---	--	
					Post oak	---	--	
Smithdale	Moderate	Moderate	Moderate	Moderate	Yellow-poplar	---	---	Loblolly pine.
					Shortleaf pine	69	114	
					White oak	---	---	
					Red maple	---	---	
					Loblolly pine	80	114	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
CaA---------- Calloway	Slight	Moderate	Moderate	Severe	Cherrybark oak------	80	114	Sweetgum, loblolly pine, cherrybark oak.
					Water oak----------	80	72	
					Southern red oak----	83	72	
					Hickory------------	---	---	
					White oak----------	---	---	
					Black oak----------	---	---	
					Sweetgum-----------	80	86	
					Loblolly pine-------	83	114	
					Sugar maple--------	---	---	
					Red maple----------	---	---	
CeA---------- Center	Slight	Moderate	Slight	Moderate	Yellow-poplar-------	90	86	American sycamore, eastern cottonwood, green ash, cherrybark oak.
					Sweetgum-----------	90	100	
					American sycamore---	90	100	
					Eastern cottonwood--	95	114	
					Southern red oak----	75	57	
					American elm--------	---	---	
					Silver maple--------	---	---	
					Blackgum-----------	---	---	
					Swamp white oak-----	---	---	
Cn---------- Collins	Slight	Slight	Slight	Severe	Green ash----------	95	57	Green ash, cherrybark oak, American sycamore, eastern cottonwood.
					Cherrybark oak------	120	186	
					Southern red oak----	---	---	
					Yellow-poplar-------	102	114	
					Red maple----------	---	---	
					Sweetgum-----------	100	143	
					American sycamore---	95	114	
Co---------- Collins	Slight	Moderate	Slight	Severe	Sweetgum-----------	105	157	American sycamore, cherrybark oak, green ash, eastern cottonwood.
					Yellow-poplar-------	110	129	
					Loblolly pine-------	95	129	
					Shumard oak--------	105	57	
					Southern red oak----	---	---	
					Red maple----------	---	---	
					American elm--------	---	---	
					American sycamore---	95	114	
					Green ash----------	---	---	
Cu:								
Collins--------	Slight	Slight	Slight	Severe	Green ash----------	95	57	Green ash, eastern cottonwood, cherrybark oak, yellow-poplar, American sycamore.
					Eastern cottonwood--	115	160	
					Cherrybark oak------	120	186	
					Southern red oak----	---	---	
					Yellow-poplar-------	102	114	
					Red maple----------	---	---	
					Sweetgum-----------	100	143	
					American elm--------	---	---	
					American sycamore---	95	114	
Iuka----------	Slight	Slight	Slight	Severe	Sweetgum-----------	100	143	Eastern cottonwood, yellow-poplar.
					Water oak----------	100	100	
					Loblolly pine-------	100	129	
					Eastern cottonwood--	105	143	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
Fa---------- Falaya	Slight	Moderate	Moderate	Severe	Water oak----------	100	100	Green ash, eastern cottonwood, cherrybark oak, pin oak.
					Green ash----------	90	129	
					Eastern cottonwood--	112	157	
					Cherrybark oak------	108	186	
					Sweetgum----------	102	143	
					Red maple----------	---	---	
					River birch---------	---	---	
					Blackgum----------	---	---	
					Black willow--------	---	---	
					Pin oak----------	---	---	
					Sugar maple---------	---	---	
					Hickory----------	---	---	
Ff---------- Falaya	Slight	Moderate	Moderate	Severe	Red maple----------	---	---	Green ash, eastern cottonwood, cherrybark oak, pin oak.
					Water oak----------	100	100	
					Hickory----------	---	---	
					Green ash----------	90	129	
					Eastern cottonwood--	112	157	
					Cherrybark oak------	108	186	
					Sweetgum----------	102	143	
FnB2---------- Feliciana	Slight	Slight	Slight	Severe	Yellow-poplar-------	---	---	Loblolly pine, southern red oak, cherrybark oak, yellow-poplar.
					Loblolly pine-------	90	129	
					Cherrybark oak------	90	114	
					Red maple----------	---	---	
					Sugar maple---------	---	---	
FnC2---------- Feliciana	Slight	Slight	Slight	Severe	Sweetgum----------	90	100	Loblolly pine, cherrybark oak, southern red oak.
					Loblolly pine-------	90	129	
					Cherrybark oak------	90	114	
					Sugar maple---------	---	---	
					Red maple----------	---	---	
GrA---------- Grenada	Slight	Slight	Slight	Moderate	Cherrybark oak------	85	100	Cherrybark oak, water oak, sweetgum, white oak, yellow-poplar.
					Water oak----------	80	72	
					Southern red oak----	72	57	
					Hickory----------	---	---	
					Post oak----------	---	---	
					Yellow-poplar	96	100	
GrB2---------- Grenada	Slight	Slight	Slight	Moderate	Loblolly pine-------	95	143	Loblolly pine, cherrybark oak, water oak, sweetgum, white oak, yellow-poplar.
					Cherrybark oak------	85	100	
					Water oak----------	80	72	
					Hickory----------	---	---	
					Southern red oak----	72	57	
					Post oak----------	---	---	
					Yellow-poplar-------	96	100	
GuE:								
Smithdale------	Moderate	Moderate	Moderate	Moderate	----------	---	---	Shortleaf pine, white oak.
Feliciana------	Severe	Moderate	Moderate	Severe	----------	---	---	Loblolly pine, southern red oak.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
KrA---------- Kurk	Slight	Moderate	Moderate	Severe	Red maple----------	75	43	Cherrybark oak, green ash, yellow-poplar.
					Hickory----------	85	100	
					White oak----------	80	57	
					Southern red oak----	80	57	
					Sweetgum----------	90	100	
					Green ash----------	---	---	
LoB2---------- Loring	Slight	Slight	Slight	Moderate	Southern red oak----	75	57	Loblolly pine, cherrybark oak, yellow-poplar, northern red oak.
					White oak----------	70	57	
					Cherrybark oak------	86	100	
					Yellow-poplar-------	88	86	
					Black oak----------	67	43	
					Sugar maple---------	---	---	
					Hickory----------	---	---	
					Scarlet oak---------	70	57	
					Red maple----------	---	---	
LoC2---------- Loring	Moderate	Slight	Slight	Moderate	Southern red oak----	75	57	Loblolly pine, cherrybark oak, yellow-poplar, northern red oak.
					White oak----------	70	57	
					Cherrybark oak------	86	100	
					Yellow-poplar-------	88	86	
					Black oak----------	67	43	
					Hickory----------	---	---	
					Scarlet oak---------	70	57	
					Sugar maple---------	---	---	
					Red maple----------	---	---	
NaA---------- Natalbany	Slight	Moderate	Moderate	Moderate	Red maple----------	---	---	Green ash, baldcypress, eastern cottonwood, cherrybark oak.
					Sweetgum----------	---	---	
					Green ash----------	85	57	
					Pin oak----------	---	---	
					Hickory----------	---	---	
					Cherrybark oak------	---	---	
PeC3:								
Providence-----	Slight	Slight	Slight	Moderate	Sugar maple---------	---	---	Loblolly pine, yellow-poplar.
					Red maple----------	---	---	
Purchase-------	Moderate	Slight	Slight	Moderate	Southern red oak----	75	100	Southern red oak, yellow poplar.
					Hickory----------	---	---	
PfC2:								
Providence-----	Slight	Slight	Slight	Moderate	Loblolly pine-------	84	114	Loblolly pine, yellow-poplar, southern red oak.
					Southern red oak----	---	---	
					White oak----------	---	---	
					Hickory----------	---	---	
					Red maple----------	---	---	
					Shortleaf pine------	64	100	
					Sugar maple---------	---	---	
Loring---------	Slight	Slight	Slight	Moderate	Southern red oak----	75	57	Loblolly pine, cherrybark oak, yellow-poplar, shortleaf pine.
					Water oak----------	90	86	
					Loblolly pine-------	95	143	
					Cherrybark oak------	86	100	
Feliciana------	Slight	Slight	Moderate	Severe	Loblolly pine-------	90	129	Loblolly pine, cherrybark oak.
					Cherrybark oak------	90	114	
					Yellow-poplar-------	---	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
PmD3:								
Providence-----	Slight	Slight	Moderate	Moderate	Shortleaf pine------	64	100	Loblolly pine,
					Southern red oak----	---	---	yellow poplar,
					White oak-----------	---	---	shortleaf pine,
					Hickory------------	---	---	southern red oak,
					Red maple-----------	---	---	white oak.
					Loblolly pine-------	84	114	
Smithdale------	Moderate	Moderate	Moderate	Severe	Yellow-poplar-------	---	---	Loblolly pine.
					Red maple-----------	---	---	
					Shortleaf pine------	69	114	
					White oak-----------	---	---	
					Sugar maple---------	---	---	
PrD3------------	Severe	Moderate	Moderate	Moderate	Hickory------------	75	100	Shortleaf pine,
Purchase					White oak-----------	75	100	yellow-poplar,
					Sugar maple---------	---	---	white oak,
					Red maple-----------	---	---	southern red oak.
PsC3:								
Purchase------	Moderate	Slight	Moderate	Moderate	Southern red oak----	75	100	Southern red
					Hickory------------	80	114	oak, shortleaf
					Sugar maple---------	---	---	pine.
					Red maple-----------	---	---	
Brandon--------	Slight	Slight	Slight	Severe	Hickory------------	---	---	White oak,
					Yellow-poplar-------	80	72	shortleaf pine,
					Scarlet oak---------	69	57	eastern white
					Southern red oak----	71	57	pine, loblolly
					Chestnut oak--------	---	---	pine, northern
					White oak-----------	61	43	red oak.
PuB3:								
Purchase------	Moderate	Slight	Moderate	Moderate	White oak-----------	75	100	White oak,
					Hickory------------	75	100	yellow-poplar.
					Virgina pine--------	76	114	
					Scarlet oak---------	---	---	
Loring---------	Slight	Slight	Slight	Moderate	Southern red oak----	75	57	White oak,
					White oak-----------	70	57	loblolly pine,
					Loblolly pine-------	95	143	cherrybark oak,
					Cherrybark oak------	86	100	yellow-poplar,
					Black oak-----------	67	43	shortleaf pine.
					Sugar maple---------	---	---	
					Red maple-----------	---	---	
PuC3:								
Purchase-------	Moderate	Slight	Moderate	Moderate	Southern red oak----	80	114	Southern red
					Shortleaf pine------	---	---	oak, shortleaf
					Hickory------------	---	---	pine,
								yellow-poplar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
PuC3: Loring	Slight	Slight	Slight	Moderate	Southern red oak	75	57	White oak, loblolly pine, cherrybark oak, yellow-poplar, shortleaf pine, northern red oak.
					White oak	70	57	
					Loblolly pine	95	143	
					Cherrybark oak	86	100	
					Black oak	67	43	
					Virginia pine	76	114	
					Hickory	---	---	
					Sugar maple	---	---	
					Red maple	---	---	
Ro Rosebloom	Slight	Severe	Severe	Moderate	American sycamore	80	86	Green ash, eastern cottonwood, cherrybark oak, pin oak.
					Red maple	---	---	
					Pin oak	---	---	
					Green ash	95	57	
					Sweetgum	95	114	
					Eastern cottonwood	100	129	
					Cherrybark oak	95	129	
					Baldcypress	---	---	
Rp Rosebloom	Slight	Severe	Severe	Moderate	Water tupelo	---	---	Baldcypress, water tupelo, black willow.
					Pin oak	---	---	
					Black willow	---	---	
					Baldcypress	80	57	
RtA Routon	Slight	Moderate	Severe	Severe	Sweetgum	105	157	Green ash, cherrybark oak, American sycamore, eastern cottonwood.
					Cherrybark oak	110	186	
					Red maple	---	---	
SaC Saffell	Slight	Slight	Moderate	Moderate	White oak	55	43	White oak, shortleaf pine, loblolly pine. southern red oak.
					Shortleaf pine	65	100	
					Loblolly pine	72	100	
					Black oak	60	43	
					Chestnut oak	47	29	
					Scarlet oak	56	43	
					Hickory	---	---	
					Post oak	---	---	
					Sugar maple	---	---	
					Red maple	---	---	
SmE2 Smithdale	Severe	Moderate	Moderate	Slight	Loblolly pine	86	129	Loblolly pine, shortleaf pine, southern red oak, white oak.
					Yellow-poplar	---	---	
					White oak	---	---	
					Red maple	---	---	
					Sugar maple	---	---	
SsE2: Smithdale	Severe	Moderate	Severe	Slight	Yellow-poplar	---	---	Loblolly pine, southern red oak, shortleaf pine, white oak.
					Loblolly pine	80	114	
					White oak	---	---	
					Red maple	---	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Volume*	
SsE2:								
Saffell	Severe	Severe	Severe	Moderate	White oak	55	43	White oak, shortleaf pine, loblolly pine.
					Shortleaf pine	65	100	
					Loblolly pine	72	100	
					Black oak	60	43	
					Chestnut oak	47	29	
					Hickory	---	---	
					Post oak	---	---	
					Sugar maple	---	---	
Vb	Slight	Slight	Moderate	Severe	Cherrybark oak	110	186	Green ash, loblolly pine, eastern cottonwood, black walnut, American sycamore, cherrybark oak.
Vicksburg					Green ash	90	57	
					Sweetgum	100	143	
					American sycamore	---	---	
Wa	Slight	Moderate	Severe	Severe	Pin oak	---	---	Cherrybark oak, pin oak, American sycamore, green ash, eastern cottonwood.
Waverly					Sweetgum	100	143	
					Loblolly pine	95	143	
					Cherrybark oak	100	143	
					Water oak	95	86	
					Willow oak	95	86	
					Red maple	---	---	
					Green ash	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BdD2*:					
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Purchase	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BnE2*:					
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Saffell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsD3*:					
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CaA Calloway	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
CeA Center	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Cn Collins	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight	Moderate: flooding.
Co Collins	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Cu*:					
Collins	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight	Moderate: flooding.
Iuka	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
DAM*. Large dam					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Fa Falaya	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
Ff Falaya	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
FnB2 Feliciana	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
FnC2 Feliciana	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
GrA Grenada	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
GrB2 Grenada	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
GuE*: Gullied land.					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Feliciana	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
KrA Kurk	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LoB2 Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
LoC2 Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
NaA Natalbany	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
Pd*: Pits.					
Dumps.					
Udorthents.					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PeC3*:					
Providence	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Purchase	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: droughty, slope.
PfC2*:					
Providence	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Feliciana	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
PmD3*:					
Providence	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PrD3 Purchase	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
PsC3*:					
Purchase	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: droughty, slope.
Brandon	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
PuB3*:					
Purchase	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: droughty.
Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
PuC3*:					
Purchase	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: droughty, slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PuC3*:					
Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ro	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Rosebloom					
Rp	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Rosebloom					
RtA	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Routon					
SaC	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Moderate: droughty.
Saffell					
SmE2	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale					
SsE2*:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Saffell	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
UdC*:					
Udorthents.					
Urban land.					
UrB*:					
Urban land.					
Udorthents.					
Vb	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Vicksburg					
W*.					
Water					
Wa	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Waverly					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BdD2*:										
Brandon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Purchase	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BnE2*:										
Brandon	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Saffell	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BsD3*:										
Brandon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CaA, Calloway	Fair	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
CeA, Center	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Cn, Collins	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Co, Collins	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Cu*:										
Collins	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Iuka	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
DAM*. Large dam										
Fa, Falaya	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ff, Falaya	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	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
FnB2---------- Feliciana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FnC2---------- Feliciana	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GrA, GrB2---------- Grenada	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GuE*: Gullied land.										
Smithdale---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Feliciana---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
KrA---------- Kurk	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LoB2---------- Loring	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoC2---------- Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
NaA---------- Natalbany	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Pd*: Pits.										
Dumps.										
Udorthents.										
PeC3*: Providence--------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Purchase----------	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PfC2*: Providence--------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Loring------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Feliciana---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PmD3*: Providence--------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	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
PmD3*:										
Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PrD3--- Purchase	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PsC3*:										
Purchase	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Brandon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PuB3*:										
Purchase	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PuC3*:										
Purchase	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ro--- Rosebloom	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
Rp--- Rosebloom	Very poor.	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good.
RtA--- Routon	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
SaC--- Saffell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SmE2--- Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SsE2*:										
Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Saffell	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
UdC*:										
Udorthents.										
Urban land.										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
UrB*: Urban land. Udorthents.										
Vb---------- Vicksburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
W*. Water										
Wa---------- Waverly	Poor	Fair	Good	Fair	---	Good	Fair	Fair	Fair	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BdD2*:						
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Purchase	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BnE2*:						
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsD3*:						
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CaA	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Calloway						
CeA	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Center						
Cn	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Collins						
Co	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Collins						
Cu*:						
Collins	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Iuka	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.
DAM*.						
Large dam						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Fa---------- Falaya	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.
Ff---------- Falaya	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
FnB2---------- Feliciana	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
FnC2---------- Feliciana	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
GrA---------- Grenada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
GrB2---------- Grenada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
GuE*: Gullied land.						
Smithdale--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Feliciana--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
KrA---------- Kurk	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LoB2---------- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
LoC2---------- Loring	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
NaA---------- Natalbany	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Pd*: Pits.						
Dumps.						
Udorthents.						
PeC3*: Providence-------	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
PeC3*:						
Purchase	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
PfC2*:						
Providence	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
Feliciana	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
PmD3*:						
Providence	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PrD3 Purchase	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
PsC3*:						
Purchase	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
Brandon	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
PuB3*:						
Purchase	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Severe: low strength.	Moderate: droughty.
Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
PuC3*:						
Purchase	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength.	Moderate: droughty, slope.
Loring	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ro Rosebloom	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Rp---------- Rosebloom	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
RtA---------- Routon	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
SaC---------- Saffell	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
SmE2---------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SsE2*: Smithdale--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Saffell----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
UdC*: Udorthents.						
Urban land.						
UrB*: Urban land.						
Udorthents.						
Vb---------- Vicksburg	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
W*. Water						
Wa---------- Waverly	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BdD2*:					
Brandon	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Purchase	Severe: percs slowly, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
BnE2*:					
Brandon	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
BsD3*:					
Brandon	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
CaA Calloway	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
CeA Center	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cn, Co Collins	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Cu*:					
Collins	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Cu*:					
Iuka	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
DAM*.					
Large dam					
Fa, Ff	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Falaya					
FnB2	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Feliciana					
FnC2	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Feliciana					
GrA	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Grenada					
GrB2	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Grenada					
GuE*:					
Gullied land.					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Feliciana	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
KrA	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Kurk					
LoB2	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
Loring					
LoC2	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.
Loring					
NaA	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness, hard to pack.
Natalbany					
Pd*:					
Pits.					
Dumps.					

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Pd*: Udorthents.					
PeC3*: Providence	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
Purchase	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
PfC2*: Providence	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
Loring	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
Feliciana	Moderate: percs slowly.	Severe: slope.	Slight	Slight	Good.
PmD3*: Providence	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
PrD3: Purchase	Severe: percs slowly, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.
PsC3*: Purchase	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
Brandon	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
PuB3*: Purchase	Severe: percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Loring	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PuC3*:					
Purchase	Severe: percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
Loring	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.
Ro	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Rosebloom					
Rp	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
Rosebloom					
RtA	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Routon					
SaC	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Poor: small stones.
Saffell					
SmE2	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Smithdale					
SsE2*:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
UdC*:					
Udorthents.					
Urban land.					
UrB*:					
Urban land.					
Udorthents.					
Vb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Vicksburg					
W*.					
Water					
Wa	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Waverly					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BdD2*:				
Brandon	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Purchase	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BnE2*:				
Brandon	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
BsD3*:				
Brandon	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
CaA Calloway	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
CeA Center	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Cn, Co Collins	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Cu*:				
Collins	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Iuka	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
DAM*. Large dam				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Fa, Ff---------- Falaya	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
FnB2---------- Feliciana	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
FnC2---------- Feliciana	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
GrA, GrB2---------- Grenada	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GuE*: Gullied land.				
Smithdale---------- 	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Feliciana---------- 	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
KrA---------- Kurk	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
LoB2---------- Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LoC2---------- Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
NaA---------- Natalbany	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pd*: Pits.				
Dumps.				
Udorthents.				
PeC3*: Providence----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Purchase---------- 	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
PfC2*: Providence----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PfC2*:				
Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Feliciana	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
PmD3*:				
Providence	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
PrD3 Purchase	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
PsC3*:				
Purchase	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Brandon	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
PuB3*:				
Purchase	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
PuC3*:				
Purchase	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Ro, Rp Rosebloom	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RtA Routon	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SaC Saffell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SmE2 Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SsE2*:				
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SsE2*: Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
UdC*: Udorthents.				
Urban land.				
UrB*: Urban land.				
Udorthents.				
Vb Vicksburg	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
W*. Water				
Wa Waverly	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
BdD2*:					
Brandon	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Purchase	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
BnE2*:					
Brandon	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Saffell	Severe: slope, seepage.	Moderate: thin layer.	Deep to water	Slope, soil blowing.	Slope, droughty, percs slowly.
Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
BsD3*:					
Brandon	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
CaA Calloway	Moderate: seepage.	Severe: thin layer.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
CeA Center	Slight	Severe: piping, wetness.	Favorable	Erodes easily, wetness.	Wetness, erodes easily.
Cn, Co Collins	Moderate: seepage.	Severe: piping.	Flooding	Erodes easily, wetness.	Erodes easily.
Cu*:					
Collins	Moderate: seepage.	Severe: piping.	Flooding	Erodes easily, wetness.	Erodes easily.
Iuka	Moderate: seepage.	Severe: piping, wetness.	Flooding	Erodes easily, wetness.	Erodes easily, wetness.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
DAM*. Large dam					
Fa, Ff---------- Falaya	Moderate: seepage.	Severe: piping, wetness.	Flooding, poor outlets.	Erodes easily, wetness.	Wetness, erodes easily.
FnB2---------- Feliciana	Moderate: seepage, slope.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
FnC2---------- Feliciana	Severe: slope.	Severe: piping.	Deep to water----	Slope, erodes easily.	Slope, erodes easily.
GrA---------- Grenada	Moderate: seepage.	Severe: piping.	Percs slowly-----	Erodes easily, wetness.	Erodes easily, rooting depth.
GrB2---------- Grenada	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
GuE*: Gullied land.					
Smithdale--------	Severe: seepage, slope.	Severe: piping.	Deep to water----	Slope----------	Slope.
Feliciana--------	Severe: slope.	Severe: piping.	Deep to water----	Slope, erodes easily.	Slope, erodes easily.
KrA---------- Kurk	Slight----------	Severe: thin layer.	Favorable--------	Erodes easily, wetness.	Wetness, erodes easily.
LoB2---------- Loring	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
LoC2---------- Loring	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
NaA---------- Natalbany	Slight----------	Severe: wetness, hard to pack.	Percs slowly-----	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Pd*: Pits.					
Dumps.					
Udorthents.					
PeC3*: Providence-------	Severe: slope.	Moderate: thin layer, piping, wetness.	Slope----------	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
PeC3*:					
Purchase	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
PfC2*:					
Providence	Severe: slope.	Moderate: thin layer, piping, wetness.	Slope	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
Loring	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
Feliciana	Moderate: seepage, slope.	Severe: piping.	Deep to water	Erodes easily	Erodes easily.
PmD3*:					
Providence	Severe: slope.	Moderate: thin layer, piping, wetness.	Slope	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope.
PrD3 Purchase	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
PsC3*:					
Purchase	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
Brandon	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
PuB3*:					
Purchase	Moderate: slope.	Severe: piping.	Deep to water	Erodes easily, rooting depth.	Erodes easily, droughty.
Loring	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
PuC3*:					
Purchase	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily, rooting depth.	Slope, erodes easily, droughty.
Loring	Severe: slope.	Moderate: piping, wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
Ro---------- Rosebloom	Moderate: seepage.	Severe: wetness.	Flooding---------	Erodes easily, wetness.	Wetness, erodes easily.
Rp---------- Rosebloom	Moderate: seepage.	Severe: ponding.	Ponding, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
RtA---------- Routon	Slight----------	Severe: piping, wetness.	Percs slowly-----	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
SaC---------- Saffell	Severe: seepage.	Moderate: thin layer.	Deep to water----	Soil blowing-----	Droughty, percs slowly.
SmE2---------- Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water----	Slope----------	Slope.
SsE2*:					
Smithdale--------	Severe: seepage, slope.	Severe: piping.	Deep to water----	Slope----------	Slope.
Saffell----------	Severe: slope, seepage.	Moderate: thin layer.	Deep to water----	Slope, soil blowing.	Slope, droughty, percs slowly.
UdC*:					
Udorthents.					
Urban land.					
UrB*:					
Urban land.					
Udorthents.					
Vb---------- Vicksburg	Moderate: seepage.	Severe: piping.	Flooding---------	Erodes easily, wetness.	Erodes easily.
W*. Water					
Wa---------- Waverly	Moderate: seepage.	Severe: piping, wetness.	Flooding---------	Erodes easily, wetness.	Wetness, erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
BdD2*:											
Brandon---------	0-10	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	10-29	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	95-100	90-100	85-100	75-100	35-48	15-25
	29-65	Very gravelly fine sandy loam, extremely gravelly loam, extremely gravelly clay loam.	SC, GC, GM-GC, SC-SM	A-2, A-4, A-1, A-6	0-5	30-70	20-60	15-55	10-50	10-38	5-20
Purchase--------	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
	5-19	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6	0	100	100	100	95-100	20-40	10-22
	19-68	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18
Smithdale-------	0-17	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	90-100	85-95	10-30	0-15
	17-80	Clay loam, sandy clay loam, sandy loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
BnE2*:											
Brandon---------	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	6-29	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	95-100	90-100	85-100	75-100	35-48	15-25
	29-65	Very gravelly fine sandy loam, extremely gravelly loam, extremely gravelly clay loam.	SC, GC, GM-GC, SC-SM	A-2, A-4, A-1, A-6	0-5	30-70	20-60	15-55	10-50	10-38	5-20

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
BnE2*:											
Saffell---------	0-14	Fine sandy loam	SM, ML, SC-SM, CL-ML	A-2, A-4	0	75-100	75-98	50-90	25-65	<25	NP-7
	14-21	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4, A-6	0-10	30-75	25-75	20-70	12-50	20-40	3-15
	21-32	Extremely gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4, A-6	0-10	35-85	25-55	20-50	12-40	20-40	4-15
	32-65	Extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2	0-15	25-80	10-75	10-65	5-35	<30	3-10
Smithdale-------	0-10	Fine sandy loam	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	10-40	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	40-65	Loam, sandy loam, sandy clay loam.	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
BsD3*:											
Brandon---------	0-10	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	10-29	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	95-100	90-100	85-100	75-100	35-48	15-25
	29-65	Very gravelly fine sandy loam, very gravelly loam, extremely gravelly clay loam.	SC, GC, GM-GC, SC-SM	A-2, A-4, A-1, A-6	0-5	30-70	20-60	15-55	10-50	10-38	5-20
Smithdale-------	0-17	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	90-100	25-75	10-30	NP-15
	17-80	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
CaA---------------	0-22	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
Calloway	22-69	Silt loam, silty clay loam.	CL	A-6	0	100	100	100	90-95	30-40	12-20
	69-75	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
CeA---------------	0-10	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	<30	3-11
Center	10-46	Silty clay loam, silt loam.	CL, ML	A-6, A-4	0	100	95-100	95-100	90-100	28-40	8-16
	46-80	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	<30	3-11

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Cn, Co---------- Collins	0-12	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	<30	NP-8
	12-64	Silt loam, silt	ML, CL-ML	A-4	0	100	100	100	90-100	<35	NP-10
Cu*: Collins---------	0-12	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	85-100	70-90	<30	NP-8
	12-65	Silt loam, silt	ML, CL-ML	A-4	0	100	100	100	90-100	<35	NP-10
Iuka----------	0-15	Silt loam--------	ML, CL-ML	A-4	0	95-100	95-100	80-95	50-80	<30	NP-7
	15-27	Fine sandy loam, loam, sandy loam.	SM, SC-SM, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	27-65	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	90-100	70-100	25-60	<30	NP-7
DAM*. Large dam											
Fa, Ff---------- Falaya	0-52	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	95-100	<30	NP-10
	52-63	Silt loam, silty clay loam.	ML, CL	A-4, A-6, A-7	0	100	100	100	95-100	25-43	7-16
FnB2---------- Feliciana	0-10	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	10-21	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	21-65	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
FnC2---------- Feliciana	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	7-53	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	53-66	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
GrA---------- Grenada	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	90-100	25-31	4-7
	7-21	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	95-100	90-100	27-40	8-19
	21-28	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	28-38	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
	38-80	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
GrB2---------- Grenada	0-8	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	90-100	25-31	4-7
	8-18	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	95-100	90-100	27-40	8-19
	18-22	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	22-32	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
	32-72	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	90-100	25-45	5-24
GuE*: Gullied land.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
GuE*:											
Smithdale-------	0-16	Sandy loam--------	SM, SC-SM, ML	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	16-60	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	60-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Feliciana--------	0-5	Silt loam---------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	5-29	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	29-65	Silt loam---------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
KrA--------------- Kurk	0-16	Silt loam---------	ML, CL-ML, CL	A-4	0	100	100	95-100	85-95	15-25	NP-10
	16-38	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	85-95	35-50	15-25
	38-80	Silt loam, silty clay loam, loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	70-95	20-35	3-15
LoB2, LoC2------- Loring	0-4	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	4-22	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	22-49	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
	49-66	Silt loam---------	CL, ML	A-4, A-6	0	100	100	95-100	70-100	28-40	7-16
NaA---------------	0-3	Silt loam---------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
Natalbany	3-37	Silty clay, clay	CH	A-7-6	0	100	100	95-100	95-100	51-63	30-41
	37-65	Silty clay, clay	CH	A-7-6	0	100	100	95-100	95-100	51-63	30-41
Pd*:											
Pits.											
Dumps.											
Udorthents.											
PeC3*:											
Providence------	0-3	Silt loam---------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	3-15	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	15-22	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	22-34	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
	34-65	Sandy loam, sandy clay loam, loam.	SM, SC, CL, ML	A-2, A-4	0	100	95-100	60-85	30-80	<30	NP-10
Purchase---------	0-18	Silt loam---------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
	18-54	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	30-45	10-22
	54-72	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
PfC2*:											
Providence------	0-15	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	15-32	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	32-48	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
	48-70	Sandy loam, sandy clay loam, loam.	SM, SC, CL, ML	A-2, A-4	0	100	95-100	60-85	30-80	<30	NP-10
Loring----------	0-10	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	10-21	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	21-49	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
	49-62	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	70-100	28-40	7-16
Feliciana-------	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<30	NP-10
	6-31	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	90-100	35-48	15-25
	31-68	Silt loam--------	ML, CL	A-4, A-6	0	100	100	100	90-100	30-40	6-15
PmD3*:											
Providence------	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	100	100	100	85-100	<30	NP-10
	8-22	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	30-45	11-20
	22-42	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-90	25-40	11-20
	42-51	Loam, clay loam, sandy clay loam.	CL, SC	A-6, A-4	0	100	95-100	70-95	40-80	20-35	8-18
	51-75	Sandy loam, sandy clay loam, loam.	SM, SC, CL, ML	A-2, A-4	0	100	95-100	60-85	30-80	<30	NP-10
Smithdale-------	0-18	Silt loam--------	ML, CL-ML	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	18-60	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	60-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
PrD3-------------	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
Purchase	5-19	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6	0	100	100	100	95-100	20-40	10-22
	19-68	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18
PsC3*:											
Purchase--------	0-12	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
	12-30	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6	0	100	100	100	95-100	20-40	10-22
	30-75	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
PsC3*:											
Brandon---------	0-2	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	2-32	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	95-100	90-100	85-100	75-100	35-48	15-25
	32-65	Very gravelly fine sandy loam, extremely gravelly loam, gravelly clay loam.	SC, GC, GM-GC, SC-SM	A-2, A-4, A-1, A-6	0-5	30-70	20-60	15-55	10-50	10-38	5-20
PuB3*:											
Purchase--------	0-8	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
	8-46	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	30-45	10-22
	46-72	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18
Loring----------	0-5	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	5-21	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	21-48	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
	48-65	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	70-100	28-40	7-16
PuC3*:											
Purchase--------	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	95-100	15-25	NP-10
	7-51	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	30-45	10-22
	51-72	Silt loam, loam	ML, CL-ML	A-4	0	100	100	95-100	70-100	20-35	7-18
Loring----------	0-4	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	4-21	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	10-20
	21-48	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	10-22
	48-72	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	70-100	28-40	7-16
Ro---------------	0-5	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	80-95	28-40	9-20
Rosebloom	5-65	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	85-100	28-40	9-20
Rp---------------	0-3	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	80-95	28-40	9-20
Rosebloom	3-65	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-100	28-45	11-25
RtA--------------	0-17	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	16-32	3-12
Routon	17-52	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	90-95	20-40	5-17
	52-74	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	90-100	85-95	16-32	3-12

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
SaC---------- Saffell	0-7	Gravelly sandy loam.	SM, GC, SC-SM, CL-ML	A-2, A-4	0-10	25-90	10-75	10-65	5-30	<25	NP-7
	7-14	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4, A-6	0-10	30-75	25-75	20-70	12-50	20-40	3-15
	14-65	Gravelly sandy loam, very gravelly sandy loam, extremely gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2	0-15	25-80	10-75	10-65	5-35	<30	3-10
SmE2---------- Smithdale	0-12	Sandy loam-------	SM, SC-SM	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	12-56	Clay loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	56-72	Loam, sandy loam, loamy sand.	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
SsE2*:											
Smithdale-------	0-11	Gravelly sandy loam.	SM, SC-SM	A-4, A-2	0	60-85	25-75	20-70	12-40	<20	NP-5
	11-48	Gravelly loam, very gravelly sandy clay loam, loam.	SC-SM, SC, GC, GM-GC	A-6, A-4	0	60-85	25-75	20-70	12-40	23-38	7-16
	48-65	Loam, gravelly sandy loam.	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Saffell---------	0-10	Fine sandy loam, sandy loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	75-100	75-98	50-90	25-65	<25	NP-7
	10-43	Gravelly sandy loam, gravelly sandy clay loam, very gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4, A-6	0-10	30-75	25-75	20-70	12-50	20-40	3-15
	43-64	Very gravelly sandy clay loam, gravelly sandy loam, very gravelly loam.	GC, SC, SC-SM, GM-GC	A-2, A-1, A-4, A-6	0-10	35-85	25-55	20-50	12-40	20-40	4-15
UdC*:											
Udorthents.											
Urban land.											
UrB*:											
Urban land.											
Udorthents.											
Vb---------- Vicksburg	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	70-100	<35	NP-10
	7-65	Silt loam, silt, very fine sandy loam.	ML, CL, CL-ML	A-4	0	100	100	90-100	70-100	<35	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
W*. Water											
Wa---------- Waverly	0-10	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	65-95	<25	NP-9
	10-62	Silt, silt loam	ML, CL, CL-ML	A-4	0	100	100	95-100	85-100	20-30	3-10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
BdD2*:										
Brandon	0-10	12-27	1.20-1.40	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	3	1-2
	10-29	18-35	1.20-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28		
	29-65	15-35	1.20-1.45	2.0-6.0	0.05-0.12	4.5-5.5	Low	0.17		
Purchase	0-5	10-18	1.30-1.50	0.6-2.0	0.18-0.23	4.5-6.0	Low	0.49	2	.5-2
	5-19	15-30	1.50-1.70	0.06-0.2	0.06-0.15	4.5-5.5	Low	0.43		
	19-68	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		
Smithdale	0-17	2-15	1.40-1.50	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.43	5	.5-2
	17-80	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
BnE2*:										
Brandon	0-6	12-27	1.20-1.40	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	3	1-2
	6-29	18-35	1.20-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28		
	29-65	15-35	1.20-1.45	2.0-6.0	0.05-0.12	4.5-5.5	Low	0.17		
Saffell	0-3	5-20	1.30-1.60	2.0-6.0	0.08-0.20	4.5-5.5	Low	0.24	4	1-2
	3-14	10-35	1.35-1.60	0.6-2.0	0.06-0.15	4.5-5.5	Low	0.28		
	14-32	12-35	1.35-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low	0.28		
	32-65	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low	0.17		
Smithdale	0-10	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28	5	.5-2
	10-40	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
	40-65	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28		
BsD3*:										
Brandon	0-10	12-27	1.20-1.40	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	3	1-2
	10-29	18-35	1.20-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28		
	29-65	15-35	1.20-1.45	2.0-6.0	0.05-0.12	4.5-5.5	Low	0.17		
Smithdale	0-17	2-15	1.40-1.50	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.43	5	.5-2
	17-80	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
CaA	0-22	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3	2-3
Calloway	22-69	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Low	0.43		
	69-75	16-32	1.45-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Low	0.43		
CeA	0-10	12-24	1.35-1.50	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.49	5	2-3
Center	10-46	18-32	1.30-1.50	0.2-0.6	0.16-0.20	4.5-6.0	Low	0.43		
	46-80	15-25	1.30-1.50	0.2-0.6	0.16-0.20	5.1-7.3	Low	0.49		
Cn, Co	0-12	7-16	1.40-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low	0.43	5	2-3
Collins	12-64	5-18	1.40-1.50	0.6-2.0	0.20-0.24	4.5-5.5	Low	0.43		
Cu*:										
Collins	0-12	7-16	1.40-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low	0.43	5	2-3
	12-65	5-18	1.40-1.50	0.6-2.0	0.20-0.24	4.5-5.5	Low	0.43		
Iuka	0-15	6-15	1.35-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.37	5	2-3
	15-27	8-18	1.40-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.28		
	27-65	5-15	1.50-1.60	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.20		
DAM*.										
Large dam										

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Fa, Ff	0-14	6-18	1.25-1.45	0.6-2.0	0.20-0.22	4.5-5.5	Low	0.43	5	2-3
Falaya	14-63	6-32	1.25-1.50	0.6-2.0	0.14-0.22	4.5-5.5	Low	0.43		
FnB2	0-10	8-22	1.30-1.50	0.6-2.0	0.20-0.23	5.1-6.0	Low	0.49	5	2-4
Feliciana	10-21	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49		
	21-65	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
FnC2	0-7	8-22	1.30-1.50	0.6-2.0	0.20-0.23	5.1-6.0	Low	0.49	5	2-4
Feliciana	7-53	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49		
	53-66	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
GrA	0-7	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3	2-3
Grenada	7-21	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.43		
	21-28	12-29	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
	28-38	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low	0.37		
	38-80	15-32	1.45-1.60	0.06-0.2	0.10-0.12	5.1-7.3	Low	0.37		
GrB2	0-8	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3	2-3
Grenada	8-18	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.43		
	18-22	12-29	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
	22-32	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low	0.37		
	32-72	15-32	1.45-1.60	0.06-0.2	0.10-0.12	5.1-7.3	Low	0.37		
GuE*:										
Gullied land.										
Smithdale	0-16	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28	5	.5-2
	16-60	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
	60-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28		
Feliciana	0-5	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	5	2-4
	5-29	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49		
	29-65	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
KrA	0-16	12-22	1.30-1.50	0.6-2.0	0.20-0.24	5.1-6.5	Low	0.49	5	2-3
Kurk	16-38	25-35	1.40-1.60	0.2-0.6	0.16-0.20	5.1-6.0	Low	0.43		
	38-80	15-30	1.50-1.70	0.2-0.6	0.06-0.20	5.1-6.0	Low	0.43		
LoB2, LoC2	0-4	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3	.5-2
Loring	4-22	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.43		
	22-49	15-30	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low	0.43		
	49-66	10-25	1.30-1.60	0.2-2.0	0.06-0.13	4.5-6.0	Low	0.43		
NaA	0-3	14-27	1.20-1.65	0.2-0.6	0.21-0.23	5.1-7.3	Low	0.43	5	.5-2
Natalbany	3-37	40-50	1.10-1.65	<0.06	0.12-0.21	5.1-7.3	High	0.32		
	37-65	40-50	1.10-1.65	<0.06	0.12-0.21	5.1-7.3	High	0.32		
Pd*:										
Pits.										
Dumps.										
Udorthents.										
PeC3*:										
Providence	0-3	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49	3	.5-2
	3-15	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.43		
	15-22	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	22-34	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	34-65	10-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.32		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
PeC3*:										
Purchase	0-18	10-18	1.30-1.50	0.6-2.0	0.18-0.23	4.5-6.0	Low	0.49	2	.5-2
	18-54	15-30	1.50-1.70	0.06-0.2	0.06-0.08	4.5-5.5	Low	0.43		
	54-72	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		
PfC2*:										
Providence	0-15	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49	3	.5-2
	15-32	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	32-48	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	48-70	10-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.32		
Loring	0-10	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	3	.5-2
	10-21	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.43		
	21-49	15-30	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low	0.43		
	49-62	10-25	1.30-1.60	0.2-2.0	0.06-0.13	4.5-6.5	Low	0.43		
Feliciana	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	5	2-4
	6-31	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49		
	31-68	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49		
PmD3*:										
Providence	0-8	5-12	1.30-1.40	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.49	3	.5-2
	8-22	18-30	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.43		
	22-42	20-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	42-51	12-30	1.40-1.60	0.2-0.6	0.08-0.10	4.5-6.0	Low	0.32		
	51-75	10-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.32		
Smithdale	0-18	2-15	1.40-1.50	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.43	5	.5-2
	18-60	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
	60-80	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28		
PrD3	0-5	10-18	1.30-1.50	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.49	2	.5-2
Purchase	5-19	15-30	1.50-1.70	0.06-0.2	0.06-0.15	4.5-5.5	Low	0.43		
	19-68	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		
PsC3*:										
Purchase	0-12	10-18	1.30-1.50	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.49	2	.5-2
	12-30	15-30	1.50-1.70	0.06-0.2	0.06-0.15	4.5-5.5	Low	0.43		
	30-75	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		
Brandon	0-2	12-27	1.20-1.40	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	4-3	1-2
	2-32	18-35	1.20-1.45	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28		
	32-65	15-35	1.20-1.45	2.0-6.0	0.05-0.12	4.5-5.5	Low	0.17		
PuB3*:										
Purchase	0-8	10-18	1.30-1.50	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.49	2	.5-2
	8-46	15-30	1.50-1.70	0.06-0.2	0.06-0.15	4.5-5.5	Low	0.43		
	46-72	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		
Loring	0-5	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.49	4-3	.5-2
	5-21	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low	0.43		
	21-48	15-30	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low	0.43		
	48-65	10-25	1.30-1.60	0.2-2.0	0.06-0.13	4.5-6.0	Low	0.43		
PuC3*:										
Purchase	0-7	10-18	1.30-1.50	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.49	2	.5-2
	7-51	15-30	1.50-1.75	0.06-0.2	0.06-0.08	4.5-5.5	Low	0.43		
	51-72	15-25	1.50-1.65	0.06-0.2	0.06-0.15	5.1-6.0	Low	0.43		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
PuC3*:										
Loring----------	0-4	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.49	3	.5-2
	4-21	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	21-48	15-30	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low----------	0.43		
	48-72	10-25	1.30-1.60	0.2-2.0	0.06-0.13	4.5-6.0	Low----------	0.43		
Ro----------	0-5	18-25	1.40-1.55	0.6-2.0	0.2-0.22	4.5-5.5	Low----------	0.43	5	2-3
Rosebloom	5-65	20-35	1.40-1.55	0.6-2.0	0.2-0.22	4.5-5.5	Low----------	0.37		
Rp----------	0-3	15-27	1.40-1.55	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43	5	2-4
Rosebloom	3-65	20-35	1.40-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low----------	0.37		
RtA----------	0-17	15-25	1.40-1.55	0.6-2.0	0.20-0.24	4.5-6.0	Low----------	0.49	5	.5-2
Routon	17-52	20-35	1.35-1.50	0.06-0.2	0.18-0.22	4.5-6.0	Low----------	0.49		
	52-74	18-27	1.35-1.55	0.06-0.2	0.20-0.24	4.5-6.0	Low----------	0.49		
SaC----------	0-7	5-20	1.30-1.60	2.0-6.0	0.08-0.20	4.5-5.5	Low----------	0.20	4	1-2
Saffell	7-14	10-30	1.35-1.60	0.6-2.0	0.06-0.15	4.5-5.5	Low----------	0.28		
	14-65	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
SmE2----------	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
Smithdale	12-56	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	56-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
SsE2*:										
Smithdale-------	0-11	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.24	5	.5-2
	11-48	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	48-65	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Saffell---------	0-10	5-20	1.30-1.60	2.0-6.0	0.08-0.20	4.5-5.5	Low----------	0.24	4	1-2
	10-43	10-35	1.35-1.60	0.6-2.0	0.06-0.15	4.5-5.5	Low----------	0.28		
	43-64	12-35	1.35-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
UdC*:										
Udorthents.										
Urban land.										
UrB*:										
Urban land.										
Udorthents.										
Vb----------	0-7	5-18	1.40-1.50	0.6-2.0	0.20-0.24	4.5-5.5	Low----------	0.43	5	2-3
Vicksburg	7-65	5-18	1.45-1.50	0.6-2.0	0.20-0.24	4.5-5.5	----------	0.43		
W*.										
Water										
Wa----------	0-10	6-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43	5	1-2
Waverly	10-62	10-18	1.40-1.55	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
BdD2*:											
Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Purchase	C	None	---	---	4.0-7.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
BnE2*:											
Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Saffell	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
BsD3*:											
Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
CaA---- Calloway	C	None	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High	Moderate.
CeA---- Center	C	None	---	---	1.5-2.5	Apparent	Dec-Mar	>60	---	High	Moderate.
Cn---- Collins	C	Occasional	Very brief	Jan-Apr	2.0-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Co---- Collins	C	Frequent	Brief	Jan-Apr	2.0-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Cu*:											
Collins	C	Occasional	Very brief	Jan-Apr	2.0-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Iuka	C	Occasional	Very brief	Dec-Apr	2.0-5.0	Apparent	Dec-Apr	>60	---	Moderate	High.
DAM*. Large dam											
Fa---- Falaya	D	Occasional	Very brief	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	>60	---	High	Moderate.
Ff---- Falaya	D	Frequent	Brief	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	>60	---	High	Moderate.
FnB2, FnC2---- Feliciana	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
GrA, GrB2---- Grenada	C	None	---	---	1.5-2.5	Perched	Jan-Apr	>60	---	Moderate	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
GuE*: Gullied land.											
Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Feliciana	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
KrA--- Kurk	C	None	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
LoB2, LoC2--- Loring	C	None	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
NaA--- Natalbany	D	None	---	Dec-Apr	0-1.0	Apparent	Dec-Apr	>60	---	High	Moderate.
Pd*: Pits.											
Dumps.											
Udorthents.											
PeC3*:											
Providence	C	None	---	---	1.2-2.5	Perched	Jan-Mar	>60	---	Moderate	Moderate.
Purchase	C	None	---	---	4.0-7.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
PfC2*:											
Providence	C	None	---	---	1.2-2.5	Perched	Jan-Mar	>60	---	Moderate	Moderate.
Loring	C	None	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
Feliciana	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
PmD3*:											
Providence	C	None	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	Moderate	Moderate.
Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
PrD3--- Purchase	C	None	---	---	4.0-7.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
PsC3*:											
Purchase	C	None	---	---	4.0-7.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
PuB3*, PuC3*:											
Purchase	C	None	---	---	4.0-7.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate.
Loring	C	None	---	---	1.5-2.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
Ro--- Rosebloom	D	Frequent	Brief	Jan-Mar	0-1.0	Apparent	Jan-Mar	>60	---	High	Moderate.
Rp--- Rosebloom	D	Frequent	Brief to long.	Jan-Apr	+2-0.5	Apparent	Nov-Jul	>60	---	High	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
RtA---------- Routon	D	None--------	---	---	0-1.0	Apparent	Dec-Mar	>60	---	High-----	Moderate.
SaC---------- Saffell	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
SmE2---------- Smithdale	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
SsE2*:											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Saffell----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
UdC*:											
Udorthents.											
Urban land.											
UrB*:											
Urban land.											
Udorthents.											
Vb---------- Vicksburg	B	Occasional	Very brief	Jan-Apr	3.0-5.0	Apparent	Jan-Apr	>60	---	Low------	Moderate.
W*. Water											
Wa---------- Waverly	B/D	Occasional	Brief-----	Jan-Mar	0-1.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS

(The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see "Soil Series and Their Morphology")

Soil name, report number, horizon, and depth in inches	Total			Size class and particle diameter (mm)							Textural class
				Sand						Very fine sand plus silt (0.1-0.002	
	Sand (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Sand coarser than very fine (2-0.1)		
	Pct <2mm										
Feliciana silt loam: (S92KY-083-1)											
Ap------- 0-7	5.8	72.0	22.2	0.2	0.6	1.3	1.4	2.3	3.5	74.3	Silt loam
Bt1------ 7-19	2.4	65.4	32.2	0.0	0.1	0.3	0.6	1.4	1.0	66.8	Silty clay loam
Bt2------ 19-31	2.3	69.3	28.4	0.0	1.0	0.5	0.5	1.4	2.0	70.7	Silty clay loam
Bt3------ 31-53	4.7	74.9	20.4	0.1	0.4	1.7	1.1	1.4	3.3	76.3	Silt loam
2BC------ 53-66	19.1	63.5	17.4	0.4	2.0	8.8	5.5	2.4	16.7	65.9	Silt loam
Grenada silt loam: (S92KY-083-4)											
Ap------- 0-7	7.7	79.8	12.5	0.2	1.1	2.0	1.9	2.5	5.2	82.3	Silt loam
BA------- 7-13	4.6	75.7	19.7	0.2	0.9	1.1	0.8	1.6	3.0	77.3	Silt loam
Bw1------ 13-21	6.6	73.0	20.4	1.1	1.8	1.5	0.9	1.3	5.3	74.3	Silt loam
E/Bt----- 21-28	3.5	67.9	28.6	0.2	0.7	0.8	0.6	1.2	2.3	69.1	Silty clay loam
Btx1----- 28-38	4.3	73.1	22.6	0.4	0.9	0.9	0.9	1.2	3.1	74.3	Silt loam
Btx2----- 38-66	3.9	75.0	21.1	0.1	0.6	0.7	0.8	1.7	2.2	76.7	Silt loam
Bx------- 66-80	5.6	74.4	20.0	0.4	0.6	0.9	1.4	2.3	3.3	76.7	Silt loam
Purchase silt loam: (S92KY-083-2)											
Ap------- 0-7	6.5	77.2	16.3	0.4	1.2	1.3	1.4	2.2	4.3	79.4	Silt loam
Btx------ 7-31	3.1	79.2	17.6	0.1	0.3	0.5	0.2	1.9	1.2	81.2	Silt loam
Bx------- 31-51	5.3	79.8	14.9	0.3	0.4	0.7	0.8	3.1	2.2	82.9	Silt loam
BC------- 51-72	5.4	77.6	17.0	0.3	0.6	0.8	1.1	2.6	2.8	80.2	Silt loam
Smithdale sandy loam: (S92KY-083-3)											
A-------- 0-4	62.1	34.4	3.5	1.2	4.7	30.6	22.9	2.7	59.4	37.1	Sandy loam
E-------- 4-12	73.7	21.6	4.7	2.4	3.9	30.5	33.8	3.1	70.6	24.7	Sandy loam
Bt1------ 12-28	64.0	5.0	31.0	0.6	1.1	17.3	42.2	2.8	61.2	7.8	Sandy clay loam
Bt2------ 28-40	72.4	5.0	22.6	0.1	0.7	20.0	48.9	2.7	69.7	7.7	Sandy clay loam
Bt3------ 40-56	72.2	5.0	22.7	0.0	0.5	14.7	51.5	5.5	66.7	10.5	Sandy clay loam
Bt4------ 56-63	80.2	5.6	14.2	0.1	0.6	10.5	60.3	8.7	71.5	14.3	Sandy loam

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS

(A blank indicates the determination was not made. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons, see the section "Soil Series and Their Morphology")

Soil name, report number, horizon, and depth in inches	H_2O 1:1	Extractable cations					Cation-exchange capacity		Extractable acidity	Base saturation		Organic matter	Calcium carbonate equivalent	P	K
		Ca	Mg	K	Na	Total (TEC)	Ammonium acetate	Sum of cations		Ammonium acetate	Sum of cations				
	pH	Milliequivalents per 100 grams of soil								Pct	Pct	Pct	Pct	p/m	p/m
Feliciana silt loam: (S92KY-083-1)															
Ap-------- 0 to 7	6.8	5.1	1.0	0.4	0.0	6.5	8.1	10.3	3.8	81	63	2.7	0.1	4.0	208
Bt1------- 7 to 19	7.0	6.3	3.6	0.3	0.0	10.2	12.4	14.4	4.2	82	71	0.8	0.1	2.5	129
Bt2------- 19 to 31	5.4	3.4	4.2	0.3	0.0	7.9	12.3	15.1	7.1	64	52	0.6	0.1	4.0	113
Bt3------- 31 to 53	5.3	2.0	3.4	0.3	0.0	5.7	9.5	12.8	7.0	61	45	0.6	0.1	7.0	126
2BC------- 53 to 66	5.5	1.0	2.3	0.2	0.1	3.6	7.8	9.1	5.5	46	40	0.4	0.1	7.5	105
Grenada silt loam: (S92KY-083-4)															
Ap-------- 0 to 7	6.0	3.2	0.6	0.1	0.0	3.9	6.1	9.5	5.7	64	41	2.3	0.2	6.5	43
BA-------- 7 to 13	5.4	3.0	1.7	0.1	0.1	4.8	8.0	9.6	4.8	60	50	0.8	0.1	3.5	45
Bw1------- 13 to 21	5.1	1.7	2.2	0.1	0.1	4.1	9.5	12.8	8.7	43	32	0.4	0.1	3.0	44
E/Bt------ 21 to 28	4.9	2.0	4.1	0.1	0.3	6.4	14.5	15.8	9.3	44	41	0.3	0.1	2.5	71
Btx1------ 28 to 38	5.1	1.9	4.0	0.1	0.3	6.3	12.7	15.3	9.0	49	41	0.3	0.1	4.0	63
Btx2------ 38 to 66	5.1	2.4	4.4	0.0	0.3	7.1	10.8	13.3	6.2	66	54	0.1	0.1	10.0	46
Bx-------- 66 to 80	5.5	2.5	4.0	0.1	0.3	6.8	9.5	10.4	3.6	72	65	0.2	0.1	14.0	36
Purchase silt loam: (S92KY-083-2)															
Ap-------- 0 to 7	6.0	5.5	1.9	0.2	0.1	7.7	9.9	13.2	5.5	77	58	2.6	0.1	15.0	83
Btx------- 7 to 31	4.8	2.4	4.2	0.0	0.2	6.9	10.8	14.2	7.3	64	49	0.3	0.1	10.8	45
Bx-------- 31 to 51	5.3	3.0	4.2	0.1	0.5	7.7	9.0	12.1	4.4	86	63	0.2	0.1	27.5	30
BC-------- 51 to 72	5.7	3.7	4.4	0.1	0.5	8.7	10.0	12.8	4.1	88	68	0.3	0.1	22.5	36
Smithdale sandy loam: (S92KY-083-3)															
A--------- 0 to 4	6.3	3.4	0.5	0.0	0.0	4.1	4.3	5.8	1.7	95	70	4.4	0.1	6.5	68
E--------- 4 to 12	5.8	1.0	0.4	0.1	0.0	1.4	2.0	2.1	0.7	70	68	0.6	0.1	4.0	28
Bt1------- 12 to 28	5.0	1.9	1.8	0.2	0.0	3.9	7.3	9.2	5.3	54	42	0.4	0.1	2.5	112
Bt2------- 28 to 40	5.2	1.0	1.2	0.2	0.0	2.4	4.8	5.9	3.4	50	41	0.3	0.1	3.0	83
Bt3------- 40 to 56	5.1	0.7	1.5	0.2	0.0	2.3	4.9	8.3	6.0	48	28	0.2	0.1	3.0	84
Bt4------- 56 to 63	5.1	0.2	0.8	0.1	0.0	1.1	3.1	4.0	3.0	35	26	0.2	0.1	3.5	57
Center silt loam: (S95KY-083-2)															
2B't3----- 46 to 63	5.5	2.7	5.2	0.2	0.4	8.6	12.4	14.2	5.6	69	60				

TABLE 19.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; and NP, nonplastic. The soils are the typical pedons for the soil series in the survey area unless noted. For the location of the pedons, see "Soil Series and Their Morphology")

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											LL	PI	Moisture density		Specific gravity
			Percentage passing sieve--								Percentage smaller than--							
	AASHTO	Unified	3 in.	2 in.	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM	
														Pct		Lb/ cu ft	Pct	
Purchase silt loam: (S92KY-083-2)																		
Ap, Btx---- 0 to 13	A-6(14)	CL	100	100	100	100	100	100	100	100	61	29	22	36	13	105	18	2.69
Bx------ 13 to 51	A-4(0)	ML	100	100	100	100	100	100	100	93	55	26	17	---	NP	106	18	2.68
Smithdale sandy loam: (S92KY-083-3)																		
A, E---- 0 to 12	A-2-4(0)	SM	100	100	97	94	91	87	78	31	20	10	6	---	NP	119	9	2.65
Bt1, Bt2, Bt3---- 12 to 56	A-2-4(0)	SM	100	100	100	100	100	100	98	29	28	26	24	---	NP	112	14	2.67

TABLE 20.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Brandon	Fine-silty, mixed, thermic Typic Hapludults
Calloway	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Center	Fine-silty, mixed, thermic Aquic Hapludalfs
*Collins	Coarse-silty, mixed, acid, thermic Aquic Udifluvents
Falaya	Coarse-silty, mixed, acid, thermic Aeric Fluvaquents
Feliciana	Fine-silty, mixed, thermic Ultic Hapludalfs
Grenada	Fine-silty, mixed, thermic Glossic Fragiudalfs
*Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Kurk	Fine-silty, mixed, thermic Aeric Epiaqualfs
Loring	Fine-silty, mixed, thermic Oxyaquic Fragiudalfs
Natalbany	Fine, montmorillonitic, thermic Vertic Epiaqualfs
Providence	Fine-silty, mixed, thermic Typic Fragiudalfs
Purchase	Coarse-silty, mixed, thermic Ochreptic Fragiudalfs
Rosebloom	Fine-silty, mixed, acid, thermic Typic Fluvaquents
Routon	Fine-silty, mixed, thermic Typic Epiaqualfs
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
*Vicksburg	Coarse-silty, mixed, acid, thermic Typic Udifluvents
Waverly	Coarse-silty, mixed, acid, thermic Typic Fluvaquents

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